



# **Enhancing at an Early Stage the Investment Value Chain of Energy Efficiency Projects**

**Deliverable 6.3: Triple-A Synthesis paper for  
each case study**

April 2022



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<b>Lead Beneficiary</b>	<b>IEECP</b>
<b>Author(s) (Organisation)</b>	<b>Zoe Mylona; Erik Faassen (IEECP); Katerina Papapostolou; Philip Mexis; Chara Karakosta (NTUA); Nikos Kleanthis; Alexandros Flamos (UPRC); Ruth Domínguez, Adrián Cañamares (CREARA); Václav Šebek; Jiri Karasek (SEVEN); Konstantina Tripodi (JRC); Svenja Hector (adelphi); Maurizio Megliola (GFT); Tomas Gavenas; Justinas Bučys (VIPA)</b>
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## Preface











Triple-A has a very practical result-oriented approach, seeking to provide reliable information answering on three questions:

- How to **assess** the financing instruments and risks at an early stage?
- How to **agree** on the Triple-A investments, based on selected key performance indicators?
- How to **assign** the identified investment ideas with possible financing schemes?

The Triple-A scheme comprises three critical steps:

- **Step 1 - Assess:** Based on Member States (MS) risk profiles and mitigation policies, including a Web based database, enabling national and sectoral comparability, market maturity identification, good practices experiences exchange, reducing thus uncertainty for investors.
- **Step 2 - Agree:** Based on standardised Triple-A tools, efficient benchmarks, and guidelines, translated in consortium partners' languages, accelerating and scaling up investments.
- **Step 3 - Assign:** Based on in-country demonstrations, replicability and overall exploitation, including recommendations on realistic and feasible investments in the national and sectoral context, as well as on short and medium term financing.

## Who We Are

	Participant Name	Short Name	Country Code	Logo
1	National Technical University of Athens	NTUA	GR	
2	ABN AMRO Bank N.V.	ABN AMRO	NL	
3	Institute for European Energy and Climate Policy Stichting	IEECP	NL	
4	JRC Capital Management Consultancy & Research GmbH	JRC	DE	
5	GFT Italy srl	GFT Italy	IT	
6	CREARA Consulting SL	CREARA	ES	
7	Adelphi Research Gemeinnützige GMBH	adelphi	DE	
8	Piraeus Bank SA	PB	GR	
9	University of Piraeus Research Center	UPRC	GR	
10	SEVEEn, The Energy Efficiency Center	SEVEEn	CZ	
11	Public Investment Development Agency	VIPA	LT	
12	National Trust Ecofund	NTEF	BG	



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## Executive Summary

This report sets out a set of procedures and policy interventions in the form of a Synthesis paper for the Triple-A specified sectors, namely buildings, industry, transportation, District Energy Networks and outdoor lighting in the Triple-A case study countries (Bulgaria, Czech Republic, Germany, Greece, Italy, Lithuania, Spain and The Netherlands). These sets are an overview of the policy framework and market format in the eight countries and can be used for decision-making purposes to guide a more detailed set of policies or guide ongoing maintenance of the already implemented. All the input required for the preparation of the Synthesis paper per case study country has been derived through extended and analytical literature a review of the current market architecture and policy framework and based on outcomes of all Triple-A activities and mainly WP2 - Stakeholder Facilitative Dialogue and Capacity Building, WP4 - Tools and Benchmarks for Mainstreaming Energy Efficiency Investments and WP5 - In-country Demonstration of Triple-A Investments. This report also works as recommendation for other countries including but not limited to EU Member State countries.

Each Synthesis paper provides an overview of the current condition in the energy efficiency field in combination with their stakeholders' activity insights and provides in-depth review of the market architecture and policy framework on each Triple-A identified sector, where applicable. It should be noted that the buildings sector is the highest attention paid in all Triple-A countries. Thus, the majority of the support schemes refer to this sector although leading countries in the economy (Germany, The Netherlands, Lithuania) are providing support schemes covering the majority of the Triple-A sectors.

# 1 Introduction

This report gives an overview of the applicable regulatory forces, the market architecture, and the policy framework related to the projects and tools identified under the Triple-A project. This happens on a per country basis and also works as a basis for the Triple-A Deliverable *D6.4 Triple-A European Synthesis Paper* (April 22). It also provides input for the preparation of Triple-A Briefing Notes for policy frameworks in energy efficiency financing of several case study countries (Germany, Czech Republic, The Netherlands and Italy). The overview and recommendations presented in this report focus on the case study countries situation and are based on the sectors and projects that were identified during the project and, in turn, are available through Standardised Triple-A Tools<sup>1</sup>, the Triple-A Database on Energy Efficiency Financing<sup>2</sup>, and the project fiches that are made publicly available through the Triple-A website<sup>3</sup>. The per-country Synthesis papers lead to the preparation of several dedicated Briefing Notes where all the info has been outlined and provided publicly<sup>4</sup>.

The Triple-A project defines five sectors in its project description. This structure will be followed in this synthesis report for ease of accessibility, comparison, and subsequent dissemination. These five sectors are: (1) Buildings, (2) Industry, (3) Transportation, (4) District Energy Networks, and (5) Outdoor Lighting.

## 1.1 Triple-A Case study countries

The Synthesis papers focus on the eight countries selected and involved in the project to promote diversity across a number of factors, including a leading European economy (**Germany**), an innovation front-runner in energy (**The Netherlands**), a weak economy, that went through one of the most prolonged and most severe recessions (**Greece**), an economy with slow economic recovery (**Italy**), a diversified economy with a strategic geographical location having some of the largest European firms (**Spain**), a country that has experienced one of the fastest economic recoveries in Europe (**Lithuania**), a progressing country with a once sceptical stance towards low-carbon development (**Czech Republic**), and a country, recovering from a slow transition to a market economy, with growing regional strategic role and significant ambition towards EU processes (**Republic of Bulgaria**).

## 1.2 Outline of the Synthesis papers

Each Synthesis paper is outlined in a way so as to provide a general overview of the regulatory framework along with the market architecture mainly focusing on Triple-A five specific sectors and according to the needs of each case study country. For that reason, hints and input has been taken from the market needs as defined via the activities for stakeholder engagement (WP2) and Project Fiches preparation (WP5). However, lessons learnt from all the Triple-A WPs have been taken into consideration so as to provide a clear and complete Synthesis paper per case study country. The outline of each Synthesis paper is as follows:

---

1 <https://aaa-h2020.eu/tools>

2 <https://database.aaa-h2020.eu/>

3 <https://aaa-h2020.eu/>

4 <https://aaa-h2020.eu/briefing-notes>

## 1. Country's Overview

The Synthesis paper starts with the country's overview of the market condition and policy goals. The outline of stakeholders who participated in Triple-A and highlights derived from all Triple-A consultation activities are presented with the ultimate scope to depict the targeted group's needs and recommendations. In order to capture stakeholders' needs as well and gather input for the formulation of the Triple-A methodology and design of the Triple-A Tool, four Triple-A questionnaires were released.

- [Triple-A Questionnaire for building sector](#)
- [Questionnaire on EE Financing Schemes](#)
- [Questionnaire on EE Financing Risks & Project Ideas Evaluation](#)
- [Investor Preference Questionnaire](#)
- [Questionnaire on Financial Instruments & Risks of EE Investments](#)

However, this information is consolidated description of what is being reported under *D2.2 Report on national stakeholders' consultation*, *D2.3 Report on Advisory Board Activities* and *D2.4 Report on Regional Training Workshops on energy efficiency financing*. This part is completed with a summarised description and brief analysis (facts and figures) of Triple-A identified projects under the activities of *WP5 In-country Demonstration of Triple-A Investments*. All the Triple-A identified projects per country are presented in Appendix.

## 2. Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning but not limited the selected projects per country and their specific sector.

## 3. Market Architecture & Policy Frameworks

The Synthesis paper continues with market architecture and policy framework and how these apply to each of the Triple-A specific sectors identified per case study country (if applicable) and their Triple-A projects.

It is important to stress that by no means is this, nor pretends to be, a holistic overview of each case study country situation regarding applicable rules and regulations impacting or fostering energy efficiency investments.

## 2 Bulgaria

### 2.1 Country's Overview

As in other European countries, Bulgaria is highly dependent on energy sources imports. That is why much attention is paid to the energy efficiency sector. There are many strategic documents that address the needs of energy sources for Bulgaria and future development of the energy sector, the most important of which are the Integrated Energy and Climate Plan of The Republic of Bulgaria, Long-term National Strategy to Support the Renovation of the National Building Stock of Residential and Non-residential Buildings by 2050, National Climate Change Adaptation Strategy and Action Plan by 2030. The Energy efficiency is also regulated by Bulgarian Laws such as Energy Efficiency Act and Energy from Renewable Sources Act. The main strategic directions for achieving energy efficiency are increasing energy independence, transition to renewable energy sources, decreasing the energy consumption by implementing the modern low energy technologies etc.

Energy savings are supported by numerous funding opportunities as grants and financial instruments provided by national as well as EU funds.

#### 2.1.1 Bulgaria stakeholder overview & Analysis

As defined in the Triple-A stakeholder consultation methodology, a 3-step methodological approach (identification, prioritisation and analysis, engagement activities and effective communication) was followed to ensure the active engagement of all the involved parties towards the successful financing of EE projects.

The stakeholders list is completed based on the experience and long-lasting partnerships of NTEF with different types of institutions. NTEF as national leader for the case of Bulgaria, followed the basic steps of the Triple-A methodology on stakeholder engagement to identify and prioritise the key actors that may benefit from Triple-A outcomes and should be engaged through the various pre-defined activities.

The list with the identified stakeholders consists of 80 Bulgarian key actors that may benefit from Triple-A methods and Tools and should be contacted and engaged accordingly (Figure 1). It is obvious that investors and project developers are the major recipients in the field of EE financing (17 Investors; 44 Project developers/companies). Additional target groups but focusing on different level of the EE financing concept are policy makers, research and academia and other bodies.

After identifying and prioritising the identified as the most relevant Greek stakeholders, several dissemination actions were realized, so as to actively engage them in the Triple-A activities and Tools.

The table gives an indicative example of the Bulgarian figures related to the Triple-A project.

**Table 1: Overview of Bulgarian Stakeholders activity**

What happened in Bulgaria?	#
No. of in Country meetings with stakeholders	7
Workshops	1
External participants involved in bilateral discussions	19

Investor Preference Questionnaire responses	3
Stakeholder Questionnaire responses	3
<b>Triple-A Country Capacity Building Webinar participants:</b>	<b>23</b>
A - Financing bodies	3
B - Companies / Project developers	6
C - Policy makers and Policy support Institutes	-
D - Researchers and Academia	-
E - Other	14
<b>Triple-A Country Follow up Capacity Building Webinar participants:</b>	<b>35</b>
A - Financing bodies	11
B - Companies / Project developers	9
C - Policy makers and Policy support Institutes	1
D - Researchers and Academia	-
E - Other	14

### First Workshop on the Web-based tools of the Triple-A project

The Workshop that was conducted in Bulgaria has brought together policy makers, representatives from the financing sector, project developers and energy efficiency experts. The event was organized on Tuesday, September 29, 2020, at 2.30 pm, by the NTEF. The title was “Unleashing the potential of investments in EE / Web-based tools of the Triple-A project”. Based on the analytics of the Zoom platform, where the event was hosted, **12 stakeholders** participated the workshop. Among the participants were representatives of the Ministry of Energy, Sustainable Energy Development Agency, the Ministry of Economy and Industry, as well as representatives of financial institutions such as: Fund of Funds (Fund Manager of Financial Instruments in Bulgaria), Sustainable Cities Fund, Regional Fund for Urban Development. The goal of the event was to introduce the innovative assessment model for energy efficiency projects to the stakeholders. The assessment through the model would provide them access to financing.

During the Workshop session the following topics were addressed:

Main Stages of realisation of the Triple-A methodology:

- Stage 1 (Assess) including screening indicators set in the EU Taxonomy; The most common risks associated with the implementation of EE projects and mitigation strategies to reduce their impact.
- Stage 2 (Agree) with the envisaged indicators for evaluation and categorization of the evaluated projects (Triple A, Reserved or Rejected).

- Stage 3 (Assign) showing the possibilities for linking the evaluated projects with different financial instruments.

## Bulgarian Capacity Building Webinar series

### First Bulgarian Capacity Building Webinar

The First Capacity Building Webinar that was conducted in Bulgaria has brought together project developers with representatives from the financing sector and energy efficiency experts. The event was organized by NTEF on Thursday, May 26, 2021, 13.00 CET. The title was “Financing Energy Efficiency Projects”. Based on the analytics of the Zoom platform, where the event was hosted, **39 participants** had submitted a preliminary application for participation in the webinar, but in fact **23 joined**.

During the First Capacity Building Webinar session the following topics were addressed:

- The EU Taxonomy Regulation.
- The Risk and Mitigation strategies to assess potential future investments.
- Financial Instruments for financing EE projects - Part One.

#### Feedback received:

- The EU Taxonomy is important for three main players: (1) Financial market participants and issuers offering financial products within the EU; (2). Large companies (with more than 500 employees) that are already required to provide non-financial reporting under the EU Non-Financial Reporting Directive (NFRD); The EU and Member States when setting public measures, standards or labels for green financial products or green bonds
- From the point of view of financial institutions, the risks cover all aspects of the EE “business” (from the idea - through the implementation - to the operation, maintenance and monitoring of the results).
- In Bulgaria there is a need for more and flexible financial mechanisms for the implementation of EE projects. Debt-based financial instruments are preferable for projects with high financial performance or for owners of private buildings who want to implement EEM. Subsidies and grants are more appropriate for the implementation of projects in the public sector (EE measures in school buildings, kindergartens, public buildings).

### Follow up Capacity Building Webinar in Bulgaria:

The interest aroused by the first Webinar led to a second event. This time the emphasis was on the existing instruments for financing EE projects. The event was organized by NTEF on Thursday, June 18, 2021, 9.00 CET. Based on the analytics of the Zoom platform, where the event was hosted, 35 participants joined in the webinar.

During the Follow up Capacity Building Webinar session the following topics were addressed:

- Review of available financial instruments that minimize risk and maximize the potential of EE projects.
- Financial instruments for the implementation of EE projects in the Republic of Bulgaria.
- Opportunities for new financial instruments for the implementation of EE projects in the Republic of Bulgaria.

### Feedback received:

- Available financial instruments for EE projects: (1) Large variety of sources of funds and solid potential for their accumulation and targeted use 2. There are innovative models for EE financing, but few of them are applied in Europe. 3 Great potential for using Green Bonds as a source of funds.
- Used financial models for EE projects in the Republic of Bulgaria. (1) Grant schemes have a large share (accompanied by their advantages and disadvantages). (2) Green loans for single-family buildings and industrial enterprises, guarantees and mixed financing models are used to a small extent
- In Bulgaria there is a need for more and flexible financial mechanisms for the implementation of EE projects. (1) Debt- based financial instruments are preferable for projects with high financial performance or for owners of private buildings who want to implement EEM. (2) There is great potential for the introduction of innovative models, such as On-Bill Financing or On-Bill Repayments and ESCO contracts. (3) Subsidies and grants are more appropriate for the implementation of projects in the public sector (EE measures in school buildings, kindergartens, public buildings).

### Bulgarian Regional Training Workshop on energy efficiency financing

The event was organized by NTEF on Thursday, December 16, 2021, 9.00 CET. The title was “Practical use of Online-based Triple A tools for evaluating energy efficiency projects”.

Within this context, a practical testing of the Standardised Triple-A Tools and Database were implemented during the event, in order to validate their use and results and discuss their aspect with relevant stakeholders through a live interactive session.

Based on the analytics of the Zoom platform, where the event was hosted, **14 participants** joined to the webinar. The participants come from entities such as municipalities, financial institutions and representatives of ESKO companies and energy efficiency experts.

During the Workshop session the following topics were addressed:

- Risks to energy efficiency projects and mitigation strategies - Online "database" for financing energy efficiency projects.
- Online-based Triple-A EE Project Evaluation Tools – “Assess” Tool, “Agree” Tool
- Linking energy efficiency projects with appropriate financial mechanisms (“Assign” Tool)

### Feedback received:

- The Triple-A Tools may provide added value to the respective stakeholders, building trust between EE investors and projects developers.
- The importance of the Triple-A tools is great in the initial phase of the bilateral discussion (between the bank and the project owner).
- When considering the risks, more attention should be paid to the Time factor. It often takes so long time from the energy audit to the financing decision.
- There must be a possibility to upgrade the Assign tool with other financial mechanisms.

In general, the Triple-A project has aroused serious interest among financial institutions as Sustainable Cities Fund, Bulgarian Development Bank, Fund for Local Authorities and Governments, Energy Efficiency and Renewables Fund, Fund Manager of Financial Instruments in Bulgaria and municipalities - one of the primary users the of funds for energy efficiency projects.

As a result of the meetings with the stakeholders and especially after the two webinars and the Regional Workshop, the following trends emerged:

- There are innovative models for EE financing, but few of them are applied in Europe.
- In Bulgaria there is a need for more and flexible financial mechanisms for the implementation of EE projects.
- EE projects with extremely strong capacity to meet their financial commitments by achieving the set energy savings targets are tempting to use Debt Financial Instruments, but banks in Bulgaria still consider these investments highly risky.
- In the public sector, grants and subsidies are still the preferred funding sources for energy efficiency projects.
- There is great potential for using Green Bonds as a source of funds for energy efficiency projects.
- In Bulgaria, green loans for single-family buildings and industrial enterprises, guarantees and mixed financing models are used to a small extent.
- There is great potential for the introduction of innovative models, such as On-Bill Financing or On-Bill Repayments and ESCO contracts.

### 2.1.2 Triple-A identified projects

Within the framework of the Triple-A project, five (5) Bulgarian projects have been identified, inserted in the Triple-A Tools and benchmarked. The identified projects belong to the sector determined by the Triple-A methodology, namely: the Building Sector. The energy demand of these buildings is very high, as they have no insulation, while their contribution to the country's CO<sub>2</sub> emissions is substantial.

The projects mentioned above are expected to trigger ~ 3,82 GWh of energy savings per year, including savings in electricity, natural gas and heating oil. In order to achieve these savings, a total aggregated investment cost of 2,46 million € is needed.

## 2.2 Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning the selected Triple-A projects in Bulgaria.

### 2.2.1 Bulgarian Strategic Documents

#### 2.2.1.1 The National Climate Change Adaptation Strategy and Action Plan

The National Climate Change Adaptation Strategy and Action Plan for the Republic of Bulgaria<sup>5</sup> is intended to serve as a reference document, setting a framework for climate change adaptation (CCA) action and priority directions up to 2030, identifying and confirming the need for climate adaptation action both at economy-wide and sectoral levels, while highlighting the consequences of no action. It covers the following nine sectors: Agriculture, Forests, Biodiversity and Ecosystems, Water, Energy, Transport, Urban Environment, Human Health and Tourism. A set of strategic objectives for each sector have been

<sup>5</sup> Ministry of Environment and Water (MOEW) in Bulgaria, (<https://www.moew.government.bg>)

developed to address the adaptation needs in specific sectors. A set of operational objectives and proposed adaptation activities, related to the specific strategic objectives of each sector, have also been developed. Selection of adaptation activities is based on the range of adaptation options identified in the sector assessment reports written for this strategy and have been informed by a priority setting exercise for the identified adaptation options in which stakeholders were consulted using a multicriteria analysis (MCA) approach.

### **2.2.1.2 Long-term national strategy for support for national residential and non-residential building stock renovation with an implementation horizon until 2050**

This strategy consists of several important sections:

- Overview of the national building stock (Residential and non- Residential);
- Identifying cost-effective approaches to improving the energy performance of buildings;
- Energy saving effect and environmental impact. Contribution to the achievement of the EU 2020 target;
- The roadmap 2030, 2040, 2050 - The roadmap to this strategy document sets out indicators that will be used to measure the results achieved during the following periods: 2021-2030, 2031-2040 and 2041-2050, which correspond to the milestones set for the process of renovation of building stock in Bulgaria.
- Policies and measures promoting substantial cost-effective improvement in the energy performance of buildings.

The Long-term National Strategy<sup>6</sup> is a dedicated systematic instrument that sets out the vision [of the Bulgarian government] for the renovation of housing stock in Bulgaria by 2050, the strategic objectives for achieving that vision, the priorities of each strategic objective, the measures and policies envisaged under the priorities identified and the indicators for measuring the results achieved for the period 2021-2030. The strategic objectives are aligned with the EU energy efficiency targets and are based on strategic EU documents, EU and national energy efficiency legislation:

- Adopting a modern, up-to-date and cost-effective regulatory framework in keeping with the principle 'Energy Efficiency First' at the heart of the process of harmonisation of Bulgarian legislation with EU law and ensuring the security of investments in the energy efficiency of buildings;
- Ensuring that sustainable financial instruments are available to enable the implementation of the Long-term strategy for the renovation of buildings in Bulgaria;
- Support for building administrative and professional capacity at the level of central government, local authorities and actors in the investment process.
- Assessment of necessary investments until 2050, including analysis of existing sources of funding, financial instruments and opportunities for new sources, instruments and mechanisms.

<sup>6</sup> Sustainable Energy Development Agency (SEDA), (<https://www.seea.government.bg>)

### 2.2.1.3 Integrated Transport Strategy until 2030

The Integrated Transport Strategy<sup>7</sup> for the period until 2030 represents a comprehensive plan for sustainable development of the transport system of the Republic of Bulgaria and a framework for investments in transport. The document complies with the requirements for the scope, structure and content of a comprehensive transport plan and complies with the applicable thematic prerequisites for ESIF for the period 2014-2020 undertaken as a commitment in the Partnership Agreement with the Republic of Bulgaria. The strategy defines the contribution of the Republic of Bulgaria to the Single European Transport Area in accordance with the general priorities under Article 10 of Regulation (EU) No. 1315/2013 of the European Parliament and the Council, including priorities for investments in primary and extended TEN-T network in secondary connectivity.

With the development of the Integrated Transport Strategy for the period until 2030 the following specific objectives have been achieved:

- A database required for the analysis of the transport sector for forecast of the development of the transport system and for the development of a national transport model;
- A detailed analysis of the needs of the transport sector was performed, including road transport, railway transport, inland waterways transport, maritime transport, air and intermodal transport;
- A national multi-modal transport model was developed;
- National strategic objectives and strategic priorities have been defined;
- Appropriate measures to achieve the objectives have been formulated;
- A list of realistic projects was proposed, planned for financing from CF and ERDF (with the relevant timetable, budget and funding sources);
- Based on the analyses performed are measures were proposed to develop the administrative capacity of the beneficiaries to prepare and implement the planned projects;
- A Strategic Environmental Assessment (SEA) of the Integrated Transport Strategy was prepared for the period until 2030, according to the requirements of Art. 29, para. 1 of the Ordinance on the conditions and procedure for carrying out ecological assessment of plans and programs, which has been approved by the MoEW. The statement regarding EA No 1-1/2017 and the conditions and measures set out therein form an integral part of ITS, in particular Report 7. These will be applied to all plans, programs, projects and investment proposals relevant to or stemming from the strategy and will be taken into account in their design and implementation phases.

### 2.2.1.4 Integrated Energy and Climate Plan of The Republic of Bulgaria 2021 – 2030 (IECP)

This Integrated Plan<sup>8</sup> has been developed in accordance with the requirements laid down in Regulation (EU) 2018/1999 and takes into account all recommendations received from the Commission on the draft INECP. It sets out the main objectives and measures for the implementation of Bulgaria's national energy and climate policies in the context of EU law, and the principles and priorities for energy sector development.

<sup>7</sup> Ministry of transport and communications of Bulgaria (<https://www.mtc.government.bg>)

<sup>8</sup> Ministry of Environment and Water (MOEW) in Bulgaria, Ministry of Energy (<https://www.me.government.bg>)

The national energy priorities can be summarised as follows:

- Increasing energy security and diversifying the supply of energy resources;
- Developing an integrated and competitive energy market;
- Using and developing energy from renewable sources based on available resources, network capacity and country specifics;
- Enhancing energy efficiency by developing and implementing new technologies for a modern and sustainable energy sector;
- Consumer protection by ensuring fair, transparent and non-discriminatory conditions for the use of energy services.

Bulgaria's INECP sets out the following **strategic goals and priorities** in the area of energy and climate:

- **Decarbonisation** - Bulgaria will make efforts to increase the share of energy from renewable sources in gross final energy consumption and reduce 17 GHG emissions. Bulgaria has raised the level of ambition regarding the share of energy from renewable sources in gross final energy consumption from 25 % to 27.09 % and will thus aim to achieve the target set in Annex II to Regulation (EU) 2018/1999.
- **Energy Efficiency** - In line with the EU's priorities for increasing energy efficiency, Bulgaria considers energy efficiency to be a top priority in view of its importance for improving energy security by lowering dependence on energy imports, for reducing energy costs for businesses and households, for creating more jobs, for improving air quality, for cutting GHG emissions and for improving the quality of life of citizens. In connection with this, national targets have been set for achieving a 27.89 % reduction in primary energy consumption and a 31.67 % reduction in final energy consumption by 2030 as compared with the PRIMES 2007 reference scenario.
- **Energy Security** - Bulgaria's top priority is to diversify the sources of - and the routes for – its natural gas supply by implementing the following projects: building an interconnector between Bulgaria and Greece (IGB project), building an interconnector between Bulgaria and Serbia (IBS project), participating in the construction of a liquefied natural gas (LNG) terminal in Alexandroupoli, and gas infrastructure development in connection with the plan to build a regional gas distribution centre (Balkan Gas Hub).
- **Internal Energy Market** - Bulgaria will develop a competitive market by fully liberalising the market and integrating it into the regional and wider EU market, as stated in relation to the Energy Security dimension. The protection of vulnerable consumers is a key element of full liberalisation. Bulgaria will phase out regulated electricity prices by the end of 2025 while promoting competition and transitioning to fully market conditions.
- **Research, Innovation and Competitiveness** - Bulgaria is committed to promoting scientific progress in the area of innovative energy technologies, including clean power generation. Important projects promoting business innovations and digitalisation will be developed.

**Table 2: Bulgaria's targets until 2030**

Renewable energy sources	
National target for the share of renewable energy in gross final energy consumption by 2030	27.09 %

RS-E <sup>1</sup>	30.33 %
RS-heating and cooling <sup>2</sup>	42.60 %
RS — transport <sup>3</sup>	14.20 %
<b>Energy efficiency</b>	
Lowering primary energy consumption as compared with the PRIMES 2007 baseline projection	27.89 %
Lowering final energy consumption as compared with the PRIMES 2007 baseline projection	31.67 %
Primary energy consumption	17 466 ktoe
Final energy consumption	10 318 ktoe
<b>Greenhouse gas emissions</b>	
National objective for reducing GHG emissions by 2030 as compared with 2005 for non-ETS sectors (building stock, agriculture, waste management and transport) in line with Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.	0%
National target for the Land use, land use change and forestry (LULUCF) sector in accordance with Regulation (EU) 2018/841 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework.	Ensure that for the periods 2021—2025 and 2026—2030 GHG emissions do not exceed removals, calculated as the sum of total emissions and total removals on its territory in all land accounting categories (no-debit commitment).
Electricity interconnection level	15 %

## 2.2.2 The Energy efficiency notification obligation

The state policy in Bulgaria in the field of energy efficiency is implemented by all state and local bodies and in particular by Sustainable Energy Development Agency and the Municipal Administrations, through the adoption and implementation of strategic articles and programs.

According to the Bulgarian Energy Efficiency Act<sup>9</sup>, large companies that trade in or produce fuels and energy have individual energy saving targets and are required to report the results achieved.

<sup>9</sup> Sustainable Energy Development Agency

The individual goals are determined according to the provisions of the Energy Efficiency Act and the Integrated Plan in the field of energy and climate of the Republic of Bulgaria 2021-2030.

Sustainable Energy Development Agency generally performs monitoring and application of these regulatory requirements. Organisations that do not report on time may be penalised financially in the form of a non-compliance penalty.

Reporting on the implementation of the Municipal plans and programs for Energy Efficiency and the Programs for promoting of the use of RES is done by the Municipalities themselves. The institution responsible for reviewing and controlling the reports received is the Sustainable Energy Development Agency. The reporting is on an annual basis and the results are compared with the set medium-term strategic goals in the Integrated Plan in the field of energy and climate of the Republic of Bulgaria for the period 2021-2030.

More information on Bulgarian Energy efficiency notification obligation is available through the website of the Sustainable Energy Development Agency<sup>10</sup>.

### 2.2.3 National Inventory Entity – NIE

The Republic of Bulgaria has obligations related to the signed UN Framework Convention on Climate Change (UNFCCC) and has National System for monitoring and reporting greenhouse gases. The Annual National Inventory include an inventory of greenhouse gas emissions for the country by sources and sinks according to the methodology approved by the UNFCCC. The inventories cover emissions of direct greenhouse gases: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), greenhouse gas precursors (NO<sub>x</sub>, CO and NMVOCs) and sulfur dioxide (SO<sub>2</sub>). Emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF<sub>6</sub>) have been the subject of studies in Bulgaria since 1995. The responsible institution is the Executive Environment Agency (ExEA). It is an administration of the Minister of Environment and Water for the implementation of management, coordination and information functions regarding the control and protection of the environment in Bulgaria. Designs and manages the National Environmental Monitoring System and collects and analyses information on the state of environmental components and factors throughout the country.

The Institutional framework of the Greenhouse Gas Inventory in Bulgaria:

The Bulgarian National Inventory System (BGNIS) is developed following the requirements of the provisions of Decision 19/CMP.1 Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol.

The activities for the preparation of the GHG inventory in Bulgaria are coordinated and managed at the state level by the Ministry of Environment and Water. As part of the Ministry is the Executive Environment Agency (ExEA), which coordinates all activities related to the collection of data on GHG emission sources. The ExEA collects inventory data at the national level from various state bodies, including the Ministry of Interior, the Ministry of Energy, Sustainable Energy Development Agency.

#### *National Inventory Methodology*

According to Clean Air Act, article 25 <sup>11</sup>, The Minister of Environment and Water in co-ordination with the interested ministers issues an order for the approval of a Methodology for the calculation, with balance methods, of the emissions of harmful substances (pollutants), emitted in the ambient air. The national Methodology (approved with Order RD 77 from 03.02.2006 of MOEW) is harmonized with

<sup>10</sup> <https://www.seea.government.bg/en/documents-en>

<sup>11</sup> Ministry of Environment and Water

CORINAIR methodology<sup>12</sup> for calculation of the emissions according to the UNECE/LRTAP Convention<sup>13</sup>.

In 2007, the common methodology for emission inventory was updated and harmonized with the requirements of the IPCC, including the three main greenhouse gases - CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O (plus the respective ODS and SF<sub>6</sub>). The Bulgarian National Greenhouse Gas Inventory<sup>14</sup> and the NIP are compiled according to the requirements of the following documents:

- 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 IPCC GL)
- EMEP/EEA Air Pollutant Emissions Inventory Guide - 2019

The emission factors are mainly from:

- 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 IPCC GL)
- EMEP / EEA Air Pollutant Emissions Inventory Guide - 2019
- Specific for country emission factors. The national emission estimates were prepared using country-specific emission factors, including oxidation factor for anthracite, lignite, other bituminous coke and petroleum coke. For all other solid fuels, default emission factors were used and an oxidation factor of 1 was applied.

The GHG inventory represents a process, covering the following main activities:

- Collecting, processing and assessment of input data on used fuels, produced output, materials and other GHG emission sources;
- Selection and application of emission factors for estimating the emissions;
- Determination of the basic (key) GHG emission sources and assessment of the uncertainty of the results.

Each year and during inventory, some changes occur that directly affect the activities above enlisted. The important inventory stage is the process of data transformation into a form, suitable for CRF Tables format. During this process, aggregation of the fuels by type is made (solid, liquid and gaseous), and further data is added, regarding parameters and indices, specifying the systems for transportation and distribution of oil and natural gas, the systems for fertilizer processing, etc. These activities are just a part of additional data, filled in the CRF Tables.

## 2.3 Market Architecture & Policy Frameworks

This section provides an overview of the EE financing schemes in Bulgaria suitable for the Triple-A project.

Generally speaking, the number and scope of sustainability schemes available in Bulgaria or are currently planned, aiming to improve and absorb investments in energy efficiency, are insufficient. The potential for significant financial benefits is not business-oriented enough, and there is much to be desired.

<sup>12</sup> European Environment Agency (EEA)

<sup>13</sup> The United Nations Economic Commission for Europe (UNECE)

<sup>14</sup> Executive Environment Agency (ExEA)

Currently, the Bulgarian government offers limited business support to encourage investment in energy efficiency. Most often, government support is in the form of subsidies to municipalities and aims to improve the energy performance of the building sector and outdoor street lighting.

A considerable percentage of the funds provided for energy efficiency in Bulgaria are European funds.

### 2.3.1 National Funds and Energy Efficiency Programs Managed by the National Trust Ecofund (NTEF)

- Through the current Climate Investment Program - Energy Efficiency Scheme<sup>15</sup>. Municipalities and other state institutions can receive a subsidy of 25 - 70% for the implementation of energy efficiency measures in buildings, municipal or state property. The investments applied under this scheme must meet the following conditions: be supported by up-to-date energy audits and the technical documentation must be highly prepared to implement the prescribed energy efficiency measures.
- Through the Climate Investment Program - Electric Cars Scheme<sup>16</sup>. Municipalities and other state institutions can apply for the replacement of conventional motor vehicles with electric ones. The subsidy is from EUR 5,000 - for plug-in hybrids up to EUR 20,000 for the purchase of electric vehicles, category M2 or H2. The 2021 budget is EUR 5,6 million.

### 2.3.2 Energy efficiency programs supported by European funds

The following financial schemes have been created with funds from the Financial Mechanism of the European Economic Area 2014-2021<sup>17</sup>:

- Program "Renewable energy, energy efficiency and energy security": The procedure "Energy efficiency in buildings". The purpose of the procedure is to renovate the buildings and turn them into ones with close to zero energy consumption. The total budget is EUR 10,7 million. Beneficiaries will be able to receive 100% of the value of each project, with a minimum aid amount of EUR 200,000 and a maximum of EUR 1.2 million. Eligible candidates are municipal administrations and state institutions
- Program "Renewable energy, energy efficiency and energy security": The procedure "Use of geothermal energy for heating or for heating and cooling in state or municipal buildings". The total value of the budget is EUR 3.4 million. Municipal administrations and state institutions can apply for it. Each of the projects can be financed with an amount between 200 thousand and 400 thousand euros, and the grant fully covers the project's cost.
- Program "Renewable energy, energy efficiency and energy security"-The procedure "Rehabilitation and modernization of municipal infrastructure - outdoor lighting systems of municipalities". The procedure aims to increase energy efficiency through technological renewal and the modernisation of outdoor lighting systems owned by Bulgarian municipalities and improve the country's living conditions. Eligible applicants under the procedure are the municipalities, and their partners for the implementation of the projects can be legal entities from Bulgaria or the donor countries, as well as international organizations. The total amount of the

<sup>15</sup> National Trust Eco Fund - Bulgaria

<sup>16</sup> National Trust Eco Fund - Bulgaria

<sup>17</sup> Iceland, Leichtenstein, Norway Grants (EEA grants), Ministry of Energy

grant is EUR 8.2 million. The budget of each individual project can be from 200 thousand to 600 thousand euros. There is no requirement for co-financing by the applicants.

### 2.3.3 Financing schemes supporting energy efficiency and offered by financial institutions

### 2.3.4 Special financing instruments

Fund Manager of Financial Instruments in Bulgaria EAD (FMFIB)<sup>18</sup> operates as a Fund of Funds (FoF); and allocates targeted public funds from European Union programmes and national co-financing using special financing schemes (financial instruments).

- Urban Development Fund with its two divisions:
  - For the regions of Southern Bulgaria and the City of Sofia, the Fund for Sustainable Cities Consortium (FSC)
  - For the region of Northern Bulgaria, the Regional Urban Development Fund (RUDF)

Among the priority areas is improved energy efficiency of single-family residential buildings and student dormitories. Through this financial instrument, banks can offer low-interest investment loans. Eligible sites are single-family buildings falling within the urban territory of eligible cities.

The Energy Efficiency and Renewable Sources Fund (FEEI)<sup>19</sup> is structured as a self-financing trade mechanism and focuses its efforts on supporting the identification, development and financing of feasible projects to improve energy efficiency, leading to the reduction of greenhouse gas emissions. Another goal is to encourage the development of a functioning energy efficiency market in Bulgaria. The Fund provides low-interest loans, partial credit guarantees, portfolio guarantees; purchase of receivables and consultations. Beneficiaries can be Municipalities, corporate clients, individuals, ESCO companies.

### 2.3.5 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided. The EE projects are linked to the schemes in the overview table at the end of the chapter.

#### 2.3.5.1 (1) Buildings:

##### Regulation

There are many rules and regulations, or policy interventions, in the building sector impacting the renovation of old and construction of new buildings. A summary of the most impactful interventions related to the Triple-A projects is provided in Table 3.

<sup>18</sup> Fund Manager of Financial Instruments in Bulgaria, Financial instruments

<sup>19</sup> The Energy Efficiency and Renewable Sources Fund (FEEI), Financial products

Table 3: Overview of policy interventions in the building sector

Title:	Concerning:	Description:	Source:
<b>Energy efficiency notification obligation</b>	Existing	According to the provisions of the Energy Efficiency Act, Municipalities and major producers and traders of energy resources are obliged to implement energy efficiency measures by implementing National, Municipal or Corporate Energy Efficiency Programs. Every year they are obliged to submit reports on the achieved results of the Sustainable Energy Development Agency	<a href="#">Link</a>
<b>The Energy Performance of Buildings Directive has been integrated into Bulgarian legislation through the adoption of the updated Energy Efficiency Act, a number of other normative documents</b>	Existing & New construction	<p>A broad number of interventions primarily concerning:</p> <ul style="list-style-type: none"> <li>- system requirements for technical building systems;</li> <li>- documenting the energy performance of technical building systems;</li> <li>- self-regulating equipment for controlling the temperature per room or zone;</li> <li>- charging infrastructure for electric cars;</li> <li>- inspections of heating and air-conditioning systems;</li> <li>- building automation and control systems.</li> <li>- energy performance of enterprises, industrial systems and outdoor lighting systems.</li> </ul>	<a href="#">Link</a>
<b>Energy label C for offices</b>	Existing	As of the 1st of January, 2023, every office building must have at least energy label C. This means a primary fossil energy consumption of a maximum of 225 kWh per m <sup>2</sup> per year. If the building does not meet the requirements,	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
		the building may no longer be used as an office.	
<b>Energy label utility buildings</b>	Existing	<p>An energy label is mandatory for the sale, rental or delivery of non-residential buildings.</p> <p>In addition, it is mandatory to display the energy performance indicator (the label class) of a valid energy label when a building is offered for sale or rent through advertisements in commercial media.</p>	<a href="#">Link</a>
<b>Energy performance requirements for conversion and renovation</b>	Existing & construction	<p>New</p> <p>The Building Decree sets requirements for:</p> <p>cultivation; renewal or replacement of insulation layers; dormer windows; major renovation and addition renovation with the adaptation of the technical building system (installation).</p>	<a href="#">Link</a>
<b>Energy performance</b>	Existing & construction	<p>New</p> <p>For all new construction, both residential and non-residential, the permit applications must meet the requirements for Nearly Zero Energy Buildings (NZEB) from the 1st of January 2021. These requirements arise from the Energy Agreement for sustainable growth and the European Energy Performance of Buildings Directive (EPBD).</p>	<a href="#">Link</a>

Source: Sustainable Energy Development Agency

### Support schemes

#### Climate Investment Program - Energy Efficiency Scheme, NTEF pilot Financial scheme<sup>20</sup>

Based on the existing scheme for financing energy efficiency in municipal buildings, proposed by the NTEF and in connection with the use of Triple-A web-based tools for preliminary evaluation of EE projects, the Fund can promote a pilot financial mechanism to ensure funds for projects classified as "Reserved".

<sup>20</sup> National Trust Eco Fund, Climate Investment Program - Energy Efficiency Scheme

Based on the experience gained in financing Energy Efficiency in Buildings and based on the evaluation results with Triple-A web-based tools, it is clear that these projects have good potential to achieve energy savings. However, due to technical reasons or an insufficiently short payback period, they are not classified as Triple-A. It is envisaged that the financial mechanism will be based on a mix of subsidies and borrowings. After an in-depth financial analysis, the amount of the minimum required subsidy can be determined, with which a project will become sufficiently sustainable and acceptable for attracting credit capital for its overall implementation.

#### Urban Development Fund<sup>21</sup>

One of the priority areas is the Improvement of the energy efficiency of single-family residential buildings and student dormitories. Through this financial instrument, banks can offer low-interest loans suitable for Triple-A projects.

#### The Energy Efficiency and Renewable Sources (FEEI)<sup>22</sup>

The Fund is available to consumers and businesses and offers a range of support to increase the energy efficiency of buildings or homes.

#### Program "Renewable energy, energy efficiency and energy security"- The procedure "Energy efficiency in buildings"<sup>23</sup>

Another scheme targeted at improving energy efficiency in buildings and turn them into ones with close to zero energy consumption is the Program "Renewable energy, energy efficiency and energy security", developed under the Financial Mechanism of the European Economic Area 2014-2021.

### 2.3.5.2 (2) Industry

#### Regulation

Electricity consumption is the fastest growing category of final energy consumption and this trend is expected to continue over the next 20-30 years. Improving energy efficiency, which largely leads to the achievement of the Community's greenhouse gas emission reduction targets, is a key factor in more efficient final electricity consumption. The measures in the eco-design work plan are estimated to have the potential to generate more than 260 TWh of total annual final energy savings in 2030, equivalent to a reduction in greenhouse gas emissions of around 100 million tonnes per year in 2030.

Table 4: Overview of policy interventions in the industry sector

Title:	Concerning:	Description:	Source:
<b>DIRECTIVE 2012/27/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC</b>	Final energy consumption in goods production	Directive 2012/27 / EU aims to improve energy efficiency by 20% by 2020 compared to 1990 levels and, to achieve this, requires all EU countries to set national energy	<a href="#">Link</a> <a href="#">Link</a>

<sup>21</sup> Fund Manager of Financial Instruments in Bulgaria\ Urban Development Fund

<sup>22</sup> The Energy Efficiency and Renewable Sources Fund (FEEI)\Financial Products

<sup>23</sup> Ministry of Energy\ Program "Renewable energy, energy efficiency and energy security"- The procedure "Energy efficiency in buildings

Title:	Concerning:	Description:	Source:
and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC		<p>efficiency targets. It promotes energy efficiency across the EU through a common framework of measures covering all stages of the energy chain, from generation to distribution and final consumption.</p> <p>The Directive has been transposed into national law by the Energy Efficiency Act.</p>	
The labelling requirements for energy-related products are defined in Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 laying down a regulatory framework for energy labelling and repealing Directive 2010/30 / EU.	Labelling of product groups	<p>The Regulation is directly applicable in the territory of all Member States of the Union. The requirements for the individual product groups regarding the definition of energy efficiency classes are set out in the relevant delegated regulations.</p>	<a href="#">Link</a>
The requirements for eco-design of energy-related products are regulated in Directive 2009/125 / EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of eco-design requirements for energy-related products.	Energy related products	<p>The directive is a framework and sets out general requirements for energy-related products.</p>	<a href="#">Link</a>
Energy Efficiency Act\ ORDINANCE № E-ПД-04-3 of 4.05.2016 on the eligible measures for the implementation of energy savings in final consumption, the methods of proving the	Industry, building sector, energy production sector, boiler and heating systems	<p>The documents set out the basic rules and methods for determining and monitoring energy savings in a number of industries.</p>	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
<p>achieved energy savings, the requirements to the methodologies for their evaluation and the methods for their confirmation;</p> <p>Ordinance № E-ПД-04-05 of September 8, 2016 on determining the energy consumption indicators, energy characteristics of enterprises, industrial systems and outdoor artificial lighting systems, as well as on determining the terms and conditions for conducting inspections for energy efficiency and preparation of an assessment of energy savings and its applications;</p> <p>Ordinance № E-ПД-04-1 of March 14, 2019 on the terms and conditions for performing an inspection for energy efficiency of heating installations with hot water boilers under Art. 50, para. 1 and of the air-conditioning installations under Art. 51, para. 1, the conditions and the order for the preparation of an assessment of the energy savings, as well as the conditions and the order for creation, maintenance and use of the database under art. 52 of the Energy Efficiency Act</p>			

## Support schemes

### Urban Development Fund

Its financing priorities also include low-interest loans for specific projects for recycling & waste, re-use and use of bio-based manufacturing sources.

NTEF does not have access to additional information related to financial schemes to support energy efficiency in industry

### 2.3.5.3 (3) Transportation

#### Regulation

Table 5: Overview of policy interventions in the transportation sector

Title:	Concerning:	Description:	Source:
<b>Integrated transport strategy until 2030 (approved by Decision № 336 / 23.06.2017 of the Council of Ministers).</b>	Increasing the efficiency and competitiveness of the transport sector	Integrated transport strategy until 2030 (approved by Decision № 336 / 23.06.2017 of the Council of Ministers).	<a href="#">Link</a>
<b>WHITE BOOK - Roadmap for achieving a Single European Transport Area - to a competitive transport system with efficient use of resources</b>	Defines the main goals of a competitive and efficient transport system	Development of Environmentally friendly public transport and commuting, Effective core network for multi-species long-distance travel and transport, Growth in transport and support for mobility while achieving the planned 60% reduction in emissions including Development and implementation of sustainable fuels and propulsion systems, Optimizing the operation of multimodal logistics chains, including through the wider use of species with higher energy efficiency	<a href="#">Link</a>

## Support schemes

### Climate Investment Program - Electric Cars Scheme (NTEF)<sup>24</sup>

The only scheme that promotes the use of electric vehicles is the Electric Vehicles Scheme, managed

<sup>24</sup> National Trust Eco Fund, Climate Investment Program - Electric Cars Scheme

by the NTEF. It stimulates the purchase of various categories of electric vehicles in the public sector.

NTEF, which is a partner in the Triple-A project, does not have access to additional information related to financial schemes to support energy efficiency in transport.

### 2.3.5.4 (4) District Energy Networks

#### Regulation

Table 6: Overview of policy interventions in the District Energy Network sector

Title:	Concerning:	Description:	Source:
<b>DIRECTIVE 2006/32 / EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76 / EEC</b>	Promoting the Efficiency of the final energy consumption and energy services	The purpose of this Directive is to promote cost-effectiveness increasing efficiency in final energy consumption in the Member States by:	<a href="#">Link</a>
<b>DIRECTIVE 2009/28 / EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77 / EC and 2003/30 / EC</b>	Promotion of the use of energy from renewable sources	This Directive establishes a common framework for the promotion of energy from renewable sources. It sets mandatory national targets for the total share of energy from renewable sources in gross final consumption of energy, as well as for the share of energy from renewable sources in transport	<a href="#">Link</a>
<b>DIRECTIVE 2001/77 / EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 September 2001 on the promotion of the production and consumption of electricity from renewable energy sources in the internal electricity market</b>	The increase in the share of renewable energy sources in the production of electricity on the internal market in electricity and lays the foundations for the future Community framework in this area.	The purpose of this Directive is to encourage an increase in the share of renewable energy sources in the production of electricity on the internal market in electricity and to lay the foundations for a future Community framework in this field.	<a href="#">Link</a>
<b>Energy from Renewable Sources Act</b>	promotion of production and consumption of energy produced from renewable sources	The primary objectives of this Act are as follows: 1. promotion of production and consumption of energy produced from renewable	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
		<p>sources; 2. promotion of production and use of biofuels and energy; creating conditions for integrating gas from renewable sources in the natural gas transmission and distribution networks; 4. creation of conditions for inclusion of heating and cooling from renewable sources in heating transmission networks; 5. providing information regarding the support schemes, the benefits and practical specifics of the development and use of energy from renewable sources of all stakeholders involved in the process of production and consumption of electricity, heating and cooling from renewable sources, of production and consumption of gas from renewable sources, as well as the production and consumption of biofuels and energy from renewable sources in transport; 6. creating conditions for achieving sustainable and competitive energy policy and economic growth through innovation, and implementation of new products and technologies; 7. creating conditions for achieving sustainable development at regional and local levels; 8. creating conditions for increasing the competitiveness of small- and medium-size enterprises by production and consumption of electricity, heating and cooling from renewable sources; 9. security of</p>	

Title:	Concerning:	Description:	Source:
		energy deliveries, supplies and technical safety; 10. environmental protection and restricting climate change; 11. improving the living standards of the population through economically efficient use of energy from renewable sources.	
<b>Energy Efficiency Act</b>	Industry, building sector, energy production sector, boiler and heating systems	The documents set out the basic rules and methods for determining and monitoring energy savings in a number of industries.	<a href="#">Link</a>

### Support schemes

NTEF does not have access to information related to financial schemes to support energy efficiency in District Energy Networks.

## **2.3.5.5 (5) Outdoor Lighting**

### Regulation

Table 7: Overview of policy interventions in the outdoor lighting sector

Title:	Concerning:	Description:	Source:
<b>Energy Efficiency Act</b>	Industry, building sector, energy production sector, boiler and heating systems	The documents set out the basic rules and methods for determining and monitoring energy savings in a number of industries.	<a href="#">Link</a>
<b>ORDINANCE № E-ПД-04-05 of September 8, 2016 to determine the indicators of energy consumption, energy performance of enterprises, industrial systems and outdoor artificial lighting systems, as well as to determine the terms and conditions for conducting energy</b>	Determination of energy consumption indicators, energy performance of enterprises, industrial systems and outdoor artificial lighting systems	<p>This ordinance determines:</p> <ul style="list-style-type: none"> <li>- The energy consumption indicators of enterprises, industrial systems and systems for outdoor artificial lighting;</li> <li>- The energy characteristics of enterprises, industrial systems and systems for outdoor artificial lighting;</li> </ul>	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
efficiency audits and preparing an assessment of energy savings		<ul style="list-style-type: none"> <li>- The conditions and the order for carrying out an inspection for energy efficiency of enterprises, industrial systems and outdoor artificial lighting systems;</li> <li>- The conditions and the order for preparation of an assessment of the achieved energy savings in enterprises, industrial systems and outdoor artificial lighting systems</li> </ul>	

### Support schemes

#### Financial schemes created with funds from the Financial Mechanism of the European Economic Area 2014-2021:

Program "Renewable energy, energy efficiency and energy security"<sup>25</sup> - The procedure "Rehabilitation and modernization of municipal infrastructure - outdoor lighting systems of municipalities". The procedure aims to increase energy efficiency through technological renewal and modernization of outdoor lighting systems, owned by Bulgarian municipalities.

NTEF does not have access to additional information related to financial schemes to support energy efficiency in Outdoor Lighting.

## 2.4 Triple-A partners in Bulgaria



**National Trust EcoFund** is a Public Institution established by the Environmental Protection Act and managed by a Board consisting of 50/50 Governmental and Non-governmental institutions. It provides funding to environmental projects using proceeds from international and national sources. Priority areas in which the Fund's efforts are focused are climate change and air pollution, waste management, water management, and biodiversity conservation. There are currently four active programs - EE for public buildings, electric vehicles for public bodies, municipal mineral water infrastructure, educational programs for schools, and efficiency improvement of public investments. Most recent trends – design and implementation of pilot actions for flexible financial mechanisms to attract private sector capital in the public sector funding.

**Web:** <https://ecofund-bg.org/>

<sup>25</sup> Ministry of Energy, EEA Grants\ Program "Renewable energy, energy efficiency and energy security"

## 3 Czech Republic

### 3.1 Country's Overview

In the Czech Republic, the energy efficiency sector is relatively advanced. There is a developed market for Energy Performance Contracting (EPC) projects. Energy savings are supported by numerous incentive programmes based on co-financing grants and some financial instruments (such as interest rate discounts). Energy efficiency falls under the auspices of several public institutions, viz. ministries, state funds and other agencies (such as an independent Energy Regulatory Office).

Energy efficiency is ingrained in numerous public policies and laws on a national level – e.g. National Climate and Energy Plan, regulations on energy production and management etc. – and lately also on regional and municipal levels. Many municipalities have joined the Covenant of Mayors in the last two years and prepared or issued Sustainable Energy and Climate Action Plans (SECAPs). Improving buildings' energy performance is a core part of SECAP.

#### 3.1.1 Czech stakeholder overview & Analysis

The development of Triple-A tools, database, and the project's overall progress were thoroughly discussed within the national energy efficiency and financial community. SEVEN exploited its extensive network that includes key stakeholders from banks, public administration, ESCOs and industry representatives. In the Czech Republic, ministries are the key institutions for promoting and supporting EE in all sectors of the economy via national and EU funds. Thus, ministries administering operational programmes are among the most influential EE financing bodies, especially for energy savings in the public sector and households. Banks focus primarily on commercial and industrial EE projects. Energy Performance Contracting (EnPC) is the most widespread project method. Due to the relatively short payback period of EnPC – 5-10 years – these projects' implementation is financed mainly by loans to the ESCO that are transferred to the building user/owner after the project is completed. Some of the larger projects are co-financed by public grants.

Among the most important stakeholders consulted during the Triple-A consultations were the Ministry of Industry and trade, provider of the bulk of public support in energy efficiency, the National Development Bank, a state bank with a specialized EPC branch, and the Association of Energy Services Providers (Czech abr. APES), an association of Czech ESCOs.

**Table 8: Overview of Czech Stakeholders activity**

What happened in the Czech Republic?	#
No. of in Country meetings with stakeholders	15
External participants involved in bilateral discussions	11
Investor Preference Questionnaire responses	7
Stakeholder Questionnaire responses	8
General outreach to individual contacts	183
<b>Triple-A Country Webinar participants:</b>	<b>21</b>

A - Financing bodies	9
B - Companies / Project developers	0
C - Policy makers and Policy support Institutes	2
D - Researchers and Academia	6
E - Other	4
<b>Triple-A Country Capacity Building Workshop participants:</b>	<b>23</b>
A - Financing bodies	11
B - Companies / Project developers	6
C - Policy makers and Policy support Institutes	3
D - Researchers and Academia	3
E - Other	0

### 3.1.2 Triple-A identified projects

Within the framework of the Triple-A project, thirteen (13) projects have been identified in the Czech Republic, inserted in the Triple-A Tools and benchmarked. All the identified projects belong to the building sectors as determined by the Triple-A methodology. This should not be surprising since this is the most numerous energy efficiency project category in the country and is also most widely supported by public funds. At the same time, buildings have the most extensive energy and GHG saving potential. However, the renovation rate reaches nowhere near the desired target of a 1,5% yearly rate. Speeding up the pace of renovations and their quality – ensuring most projects are deep renovations – is thus critical to achieving energy efficiency objectives.

Of the thirteen projects, six (6) were shortlisted for detailed elaboration (others being dropped by the investor). The projects mentioned above are expected to trigger more than **2.8 GWh** of energy savings per year, including savings in electricity, natural gas and district heating supply (in order to achieve these savings, a total aggregated investment cost of **11.5 million €** is estimated. All the Czech projects have been declared EU Taxonomy compliant, in the checking that is performed by the Triple-A Assess Tool.

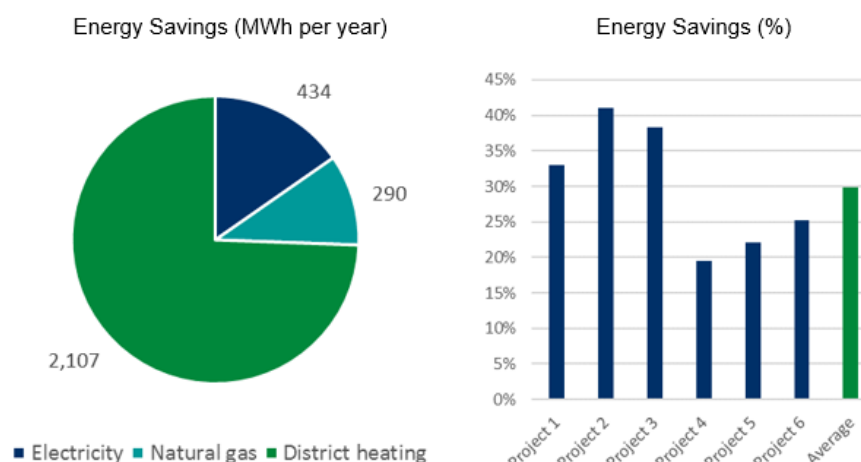


Figure 1: Structure of energy savings of the Czech projects

## 3.2 Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning the selected Triple-A projects in the Czech Republic.

Table 9: Czech overview of laws and regulations

Instrument	Date	Brief description
<b>Act No. 406/2000 Coll. on Energy Management</b>	2000	<p>Last updated in 2020</p> <p>The Act includes:</p> <ul style="list-style-type: none"> <li>measures to increase the efficiency of energy use (implemented by the degree of the energy performance of buildings) the obligations of natural and legal persons in energy management (energy audits, energy performance of building certificates...)</li> <li>requirements for reducing the energy performance of buildings (nearly zero energy buildings;</li> <li>rules for the creation of the State Energy Concept, the Territorial Energy Concept and the State Program for the Support of Energy Savings;</li> <li>eco-design requirements for energy-related products along with requirements for the indication of the consumption of energy and other significant resources on the energy labels of energy-related products;</li> <li>information and education requirements in the field of energy-saving and the use of renewable and secondary resources (energy specialists);</li> <li>certain rules for the provision of energy services (e.g. the ESCO market).</li> </ul>
<b>Decree No. 78/2013 Coll. on Energy Performance of Buildings</b>	2013-2020	<p>The decree is an implementing regulation for the Act No. 406/2000 and includes:</p> <ul style="list-style-type: none"> <li>cost-optimal level of energy performance requirements for buildings (including nearly zero energy buildings – nZEB);</li> <li>the method of calculating the energy performance of the building.</li> </ul>

Instrument	Date	Brief description
		<ul style="list-style-type: none"> <li>a template for assessment of technical, economic and ecological feasibility of alternative energy supply systems and recommended measures.</li> <li>a template and content of the energy performance of building certificate along with requirements for its publication in the building.</li> </ul>
<b>Decree No. 264/2020 Coll. on Energy Performance of Buildings</b>	2020	<p>Same as above</p> <p>Updated to latest EU requirements</p>
<b>Decree No. 480/2012 Coll. on Energy Audit and Energy Assessment</b>	2012	Specifies calculation of energy savings and stipulates the scope, content and processing method of the energy audit and energy assessment.
<b>Decree No. 140/2021 Coll. on Energy Audit</b>	2021	Stipulates the scope, content and processing method of the energy audit.
<b>Decree No. 141/2021 Coll. on Energy Assessment and data kept in the Energy Consumption Monitoring System</b>	2021	Stipulates the energy assessment's scope, content, processing method and data kept in the Energy Consumption Monitoring System.
<b>ČSN EN 0540-2 Thermal protection of buildings – Part 2: Requirements</b>	2011	<p>Specifies thermal technical requirements for the design and verification of buildings with the required state of the indoor environment within their use, which ensure compliance with the basic requirements for buildings, exceptionally cost-effective compliance with the essential requirement for energy-saving and thermal protection of buildings.</p> <p>An update of the standard is currently being prepared.</p>

Data source: Act No. 406/2000, Degree No. 264/2020, Decree No. 480/2012, Decree No. 140/2021, Decree No. 141/2021, ČSN EN 0540-2

Since 2013, the Ministry of Industry and Trade had issued a yearly report<sup>26</sup> on meeting energy efficiency objectives according to the EED: set a national non-obligatory energy saving target by the Article 3; renovate public buildings by Article 5; generate cumulative savings that amount to 1.5 % of final energy consumption per year. Below, the current status is shown from the latest report:

**Table 10: Status of national EE objectives as of 2021**

Targets and commitments, the Czech Republic till 2020		
Article 3 (non-binding)	Article 5 (obligatory)	Article 7 (obligatory)
Final energy consumption: 1,060 PJ	Final energy saving: 98.7 TJ	Yearly energy savings: 51.1 PJ
Primary energy consumption: 1,855 PJ		Cumulated savings: 204,4 PJ
Meeting targets and commitments evaluation for 2014-2020 (on March 18, 2021)		
Final energy consumption: 1,057 PJ 100 %	Final energy saving: 97.1 TJ	Yearly energy savings: 44.5 PJ

<sup>26</sup> Available at: <https://www.mpo.cz/cz/energetika/energeticka-ucinnost/strategicke-dokumenty/zprava-o-pokroku-v-oblasti-plneni-vnitrostatnich-cilu-energeticke-ucinnosti-v-cr--172771/>

	98 %	87 %
Primary energy consumption: 1,679.5 PJ	Cumulated savings: 138.1 PJ	
110 %	68 %	

It can be seen that the Czech Republic is lacking in achieving cumulative savings according to Article 7. Therefore, increasing the renovation rate and generally boosting energy efficiency is a must.

## 3.3 Market Architecture & Policy Frameworks

A series of schemes fostering sustainable investments are available to the Czech public and businesses. This section provides a general overview, listing the most relevant to the Triple-A project and the identified Czech cases. Generally speaking, the amount and scope of sustainability schemes available in the Czech Republic or are currently planned and targeted to enhance and uptake energy efficiency investments is quite significant. Significant financial benefits are available to businesses (and citizens). Various funds are funnelled towards increasing energy efficiency in the Czech Republic. Currently, the most significant allocations are allocated in Operational Programmes (i.e. EU ESIF funds), EU ETS via Modernization and Innovation Funds, COVID recovery fund, and various national sources.

### 3.3.1 Homeowners

#### 3.3.1.1 New Green Savings Programme 2021-2030

New Green Savings Programme (NGS) is a follow up to a successful eponymous initiative. It supports charging stations for electric cars or water heating using heat pumps on top of the former programme. NGS is funded primarily from the sale of emission allowances within the European Union Emissions Trading Scheme (EU ETS). The secondary source of funds comes from the National Recovery Plan. NGS supports both family houses and apartment houses in all of the Czech Republic.

### 3.3.2 Public and commercial

Incentive schemes for the non-residential sector cover the public and commercial buildings. While there is just one comprehensive programme (NGS) for the residential sector, different programmes cover numerous types of non-residential buildings.

#### 3.3.2.1 State programme to promote energy savings (EFEKT 2 & 3)

EFEKT programme administered by the Ministry of Industry and Trade supports small-scale investment projects (sub-program 1) and non-investment projects in the form of energy consulting, implementation of energy management, preparation of energy-saving projects, events and documents to support energy savings (sub-program 2). Its current incarnation, EFEKT 3, covering the years 2022-2027, focuses on investment and noninvestment aid for energy efficiency support measures. The financial mechanism provides support for specific energy-saving measures with an emphasis on non-investment financial assistance. EFEKT programme is financed solely by national funds.

### 3.3.3 Mixed focus

#### 3.3.3.1 Energy Consultation and Information Centres ('EKIS')

EKIS Energy Consultation<sup>27</sup> is a free service for the public that supports the introduction of energy savings and renewables. Funds are provided through the EFEKT programme.

#### 3.3.3.2 Modernisation Fund

Modernisation Fund, administered by the Environment Ministry, generally focuses on generating and using energy from renewable sources, energy efficiency, and facilities for the accumulation and distribution of energy. It includes programmes supporting “Energy efficiency in public buildings and infrastructure” and “Community energy” (Energy communities). The Fund draws funds primarily from the monetisation of 2 % of the total number of emission allowances in the EU ETS system for the period 2021-2030.

#### 3.3.3.3 National Recovery Plan

National Recovery Plan is a part of post-COVID investment action and includes measures for “Energy consumption reduction in the public sector” and “Building renovation and air protection” (incl. households). Specific calls are yet to be called.

#### 3.3.3.4 Voluntary scheme

The voluntary scheme for improving energy efficiency is an alternative policy measure based on a voluntary arrangement between the State and stakeholders (energy distributors and/or energy sellers) to carry out end-consumer end-use activities to reduce final energy consumption. Individual stakeholders will implement individual energy-saving measures.

### 3.3.4 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided. The EE projects are linked to the schemes in the overview table at the end of the chapter.

#### 3.3.4.1 (1) Buildings:

##### Regulation

There are many rules and regulations, or policy interventions, in the building sector impacting the renovation of old and construction of new buildings. A summary of the most impactful interventions related to the Triple-A projects is provided in Table 11.

Table 11: Overview of policy interventions in the building sector

Title:	Concerning:	Description:	Source:
<b>Act No. 406/2000 Coll. on Energy Management</b>	Existing & New construction	<ul style="list-style-type: none"> <li>Energy audits obligation</li> <li>requirements for reducing the energy performance of buildings (nearly zero energy buildings);</li> </ul>	<a href="#">Link</a>

<sup>27</sup> <https://www.mpo-efekt.cz/cz/ekis/strediska-EKIS>

Title:	Concerning:	Description:	Source:
		<ul style="list-style-type: none"> <li>rules for the creation of the State Energy Concept, the Territorial Energy Concept and the State Program for the Support of Energy Savings;</li> <li>eco-design requirements for energy-related products along with requirements for the indication of the consumption of energy and other major resources on the energy labels of energy-related products;</li> <li>information and education requirements in the field of energy saving and the use of renewable and secondary resources (energy specialists);</li> <li>certain rules for the provision of energy services (e.g. the ESCO market).</li> </ul>	
<b>Decree No. 78/2013 Coll. on Energy Performance of Buildings</b>	Existing & New construction	<p>The decree is an implementing regulation for the Act No. 406/2000 and includes :</p> <ul style="list-style-type: none"> <li>cost-optimal level of energy performance requirements for buildings (including nearly zero energy buildings – nZEB);</li> <li>the method of calculating the energy performance of the building;</li> <li>a template for assessment of technical, economic and ecological feasibility of alternative energy supply systems and recommended measures;</li> </ul> <p>a template and content of the energy performance of building certificate along with requirements for its publication in the building.</p>	<a href="#">Link</a>
<b>Decree No. 264/2020 Coll. on Energy Performance of Buildings</b>	Existing & New construction	<p>Same as above</p> <p>Updated to latest EU requirements</p>	<a href="#">Link</a>
<b>Decree No. 480/2012 Coll. on Energy Audit and Energy Assessment</b>	Existing & New construction	Specifies calculation of energy savings and stipulates the scope, content and processing method of the energy audit and energy assessment.	<a href="#">Link</a>
<b>Decree No. 140/2021 Coll. on Energy Audit</b>	Existing & New construction	Stipulates the energy assessment's scope, content, processing method and data kept in the Energy Consumption Monitoring System.	<a href="#">Link</a>
<b>Decree No. 141/2021 Coll. on Energy Assessment and data kept in the Energy Consumption Monitoring System</b>	Existing & New construction	Stipulates the scope, content and processing method of the energy assessment and data kept in the Energy Consumption Monitoring System.	<a href="#">Link</a>
<b>ČSN EN 0540-2 Thermal protection of buildings – Part 2: Requirements</b>	Existing & New construction	Specifies thermal technical requirements for the design and verification of buildings with the required state of the indoor environment within their use, which ensure compliance with the basic requirements for buildings, especially cost-effective compliance with the essential	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
		requirement for energy-saving and thermal protection of buildings.	
		An update of the standard is currently being prepared.	

## Support Schemes

### New Green Savings Programme 2021-2030

New Green Savings Programme (NGS) is a follow up to a successful eponymous initiative. It supports charging stations for electric cars or water heating using heat pumps on top of the former programme. NGS is funded primarily from the sale of emission allowances within the European Union Emissions Trading Scheme (EU ETS). The secondary source of funds comes from the National Recovery Plan. NGS supports both family houses and apartment houses in all of the Czech Republic.

### State programme to promote energy savings (EFEKT 2 & 3)

EFEKT programme administered by the Ministry of Industry and Trade supports small-scale investment projects (sub-program 1) and non-investment projects in the form of energy consulting, implementation of energy management, preparation of energy-saving projects, events and documents to support energy savings (sub-program 2). Its current incarnation, EFEKT 3, covering the years 2022-2027, focuses on investment and noninvestment aid for energy efficiency support measures. The financial mechanism provides support for specific energy-saving measures with an emphasis on non-investment financial assistance. EFEKT programme is financed solely by national funds.

### Operational Programmes

2021 marked the end of the seven years' Operational Programme (OP)<sup>28</sup> Environment and, at the same time, the commencement of the new one tied with the upcoming EU budget period. Both old and new **OP Environment** have allocated significant funds for EE investments. The OP Environment is a backbone of EE support for the buildings in the public sector in the country. Upcoming OP allocates CZK 3.3 billion (EUR 126 million).

The other grand **OP Technology and Applications for Competitiveness**<sup>29</sup> (OP TAC) is under the auspices of MIT. The current OP design is still being discussed. However, EE is one of the sub-objectives with a considered allocation of up to CZK 13 billion (EUR 500 million) for commercial subjects (i.e. mainly enterprises). When compared with OP Environment, OP TAC covers more EE applications. On top of building renovations, technology upgrades are also eligible for support. Along with the grant schemes, there is also loan support in the form of interest rate discounts, a programme in preparation with the National Development Bank.

#### **3.3.4.2 (2) Industry:**

Although there are many regulations for the Czech industry sector specifically, none of the projects considered for Triple-A and classified as industry specific did not bear noteworthy environmental regulation or support schemes, which are not already mentioned in the section before.

<sup>28</sup> <https://www.opzp.cz/opzp-2021-2027/>

<sup>29</sup> <https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/optak-2021-2027/>

### 3.3.4.3 (3) Transportation:

As the projects considered and identified as Triple-A typically fall in the first category, no stand-out governmental regulations or supporting schemes affect the Triple-A identified projects considered in this report. However, this does not mean that there isn't any environmental regulation associated with the Czech Republic's transportation sector.

### 3.3.4.4 (4) District Energy Networks:

There is no associated Triple-A project with this sector for the Czech Republic that is not directly affected by regulations or supporting schemes surrounding the district energy network; as per the previous sections, this does not mean no regulations are impacting the sector, in particular, just none that are within the scope of the Triple-A identified projects analysed in this report.

### 3.3.4.5 (5) Outdoor Lighting:

No related sector-specific subsidy schemes or regulations concerning the 'outdoor lighting' sector were identified in the Triple-A project for the Czech Republic; hence there is nothing to be reported under this category in terms of regulations.

## 3.4 Triple-A partners in Czech Republic



SEVEn, The Energy Efficiency Center is a non-profit consulting organisation that has been operating in the Czech Republic since 1990. The organisation's mission is to protect the environment and support economic development by encouraging more efficient use of energy. It focuses on consultancy in the area of business development and cost-effective use of energy, employing its extensive knowledge of the transforming Central European economies together with the experience and approach of other European countries and the USA. It cooperates with a number of domestic and foreign partners, including state authorities, financial institutions, industrial enterprises, municipalities, schools, hospitals, and energy generators and distributors.

**Web:** <http://www.svn.cz>

## 4 Germany

### 4.1 Country's Overview

The overview and recommendations presented in this report focus on Germany's situation regarding the energy efficiency targets, strategies, funding programmes and laws. Germany's energy system is currently undergoing a massive transformation. Besides the shift towards renewable energies in electricity generation and fuel substitution, energy efficiency plays a crucial part in the transformation towards a green energy economy. Thus, the contribution of energy efficiency policies as part of Germany's green energy system transformation is analysed in the following sections. Germany's current energy efficiency policy framework and the intended developments laid down in the Federal Government's latest National Energy Efficiency Action Plan, designed to deliver considerable additional savings by 2030-2050, are presented. The new National Energy Efficiency Action Plan also makes an appropriate contribution to achieving the EU energy efficiency target (of reducing primary and final energy consumption by at least 32.5% by 2030).

#### 4.1.1 German stakeholder overview & analysis

The table below gives an indicative example of the German Triple-A figures and activities carried out during the project. Several bilateral meetings took place along with one webinar on the 30<sup>th</sup> of June 2021 focusing on the Financing Energy Efficiency Projects and a workshop on the 17<sup>th</sup> of December 2021 aiming at the Step-by-step Training in the Triple-A Tools for Energy Efficiency Projects.

**Table 12: Overview of German Stakeholders activity**

What happened in Germany?	#
No. of in Country meetings with stakeholders	11
External participants involved in bilateral discussions	16
Investor Preference Questionnaire responses	6
Stakeholder Questionnaire responses	5
General outreach to individual contacts	50+
<b>Triple-A German Webinar participants:</b>	<b>14</b>
A - Financing bodies	0
B - Companies / Project developers	1
C - Policy makers and Policy support Institutes	0
D - Researchers and Academia	5
E - Other	8
<b>Triple-A German Workshop participants:</b>	<b>16</b>

A - Financing bodies	6
B - Companies / Project developers	7
C - Policy makers and Policy support Institutes	0
D - Researchers and Academia	1
E - Other	2

Overview and highlights of the feedback received from the stakeholder engagement are listed below:

- Germany aims to create an environmentally sound energy supply by improving energy efficiency and increasing the use of renewable energy sources.
- Cost efficiency is a vital factor in ensuring that energy remains affordable. The transformation of energy supply structures also aims to strengthen Germany's position as a competitive business location. Providing energy in an environmentally sound way is a vital prerequisite for safeguarding the very basis of human existence.
- The energy transition represents a substantial economic opportunity for innovative businesses. At the same time, the energy transition will mean far-reaching structural changes in specific regions and sectors of the economy.
- Policies are needed to support and accompany this shift, resulting in a fundamental transformation of how we live and do business.
- The German government promotes sustainable national energy and climate plan and focuses on the Energy Performance of Buildings Directive (EPBD).
- The issue of energy and climate policy is of vital importance for an industrial nation like Germany and affects other policy areas, particularly economic, environmental and social policy.
- The three energy policy objectives (reliability of supply, environmental sustainability and affordability) are therefore and will remain a key reference point for Germany's energy policy.
- Triple-A suggests these steps that are missing from the field of energy efficiency project assessments and therefore represent a massive opportunity for companies and financial institutions to improve, especially given the upcoming changes in legislation.
- The EU taxonomy, SDG and ESG criteria make up a green fraction and, if used appropriately, could lead to the identification of sustainable and green investments.

### 4.1.2 Triple-A identified projects

This section provides a brief overview of the Triple-A identified projects in Germany, including a summary per project, the strategic framework of Germany, and an introduction to the overall project governance structure.

Within the framework of the Triple-A project, ten (10) German projects have been identified, inserted in the Triple-A Tools and benchmarked. The identified projects belong to the sectors determined by the Triple-A methodology, namely: the Building Sector, Industry, Transportation, and Outdoor Lighting. The figures below show that most German projects belong to the building and transport sector, with the industrial and outdoor lighting sector following.

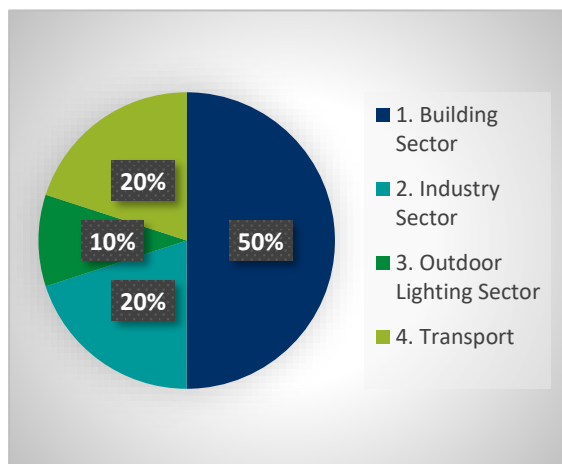


Figure 2: Sector distribution of the identified German Projects

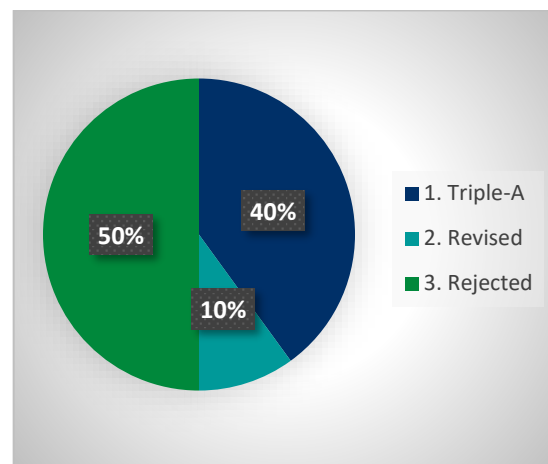


Figure 3: Benchmarking classification of the German projects

The benchmarking based on Financial, Risk and Sustainable Development Goals indicators performed by the Triple-A Agree Tool has designated the projects as “Triple-A”, “Rejected” and “Revised” ones. The “Triple-A” projects are the ones that are the most feasible and attractive for investors, having a high potential of achieving energy savings that will repay the initial investment cost (Figure 3 the classification of German projects through the Triple-A Assess, Agree, and Assign).

## 4.2 Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning *the selected Triple-A projects* in Germany.

### 4.2.1 Energy Efficiency Strategy and Goals for 2030 & 2050<sup>30</sup>

Germany has set a comprehensive energy efficiency (EE) strategy affecting corporates and consumers in various key sectors, aligned with the goals set by the European Union (EU) by its European Green Deal and framed by the regulations of the Federal Climate Action Act.<sup>31</sup> Over the last two years, more than €80bn have already been earmarked for climate action investments under the Climate Action Program and the economic stimulus package. Based on the same rationale under the Climate Action Program 2030, incentives and rules will gradually replace initial financial support for the transition to climate-friendly technologies.

To reach the targets of the EU Green Deal, Germany has set an Energy Efficiency Strategy (EffSTRA). The strategy defines Germany’s EE goals and lays out its roadmap for 2030 and 2050. By 2030 Germany will reduce its primary energy consumption (PEC) by 30% and by 2050 by 50% compared to 2008. EffSTRA comprises targets and measures for EE in the key sectors:

- (i) Buildings,
- (ii) Industry/commerce/trade and services,

<sup>30</sup> [https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffizienzstrategie-2050.pdf?\\_\\_blob=publicationFile&v=12](https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffizienzstrategie-2050.pdf?__blob=publicationFile&v=12)

<sup>31</sup> [https://www.bmuv.de/fileadmin/Daten\\_BMU/Pool/Broschueren/klimaschutzplan\\_2050\\_en\\_bf.pdf](https://www.bmuv.de/fileadmin/Daten_BMU/Pool/Broschueren/klimaschutzplan_2050_en_bf.pdf)

### (iii) Transport

Germany's EE goals for each sector until 2030 and the definition of the "Roadmap for Energy Efficiency 2050" are the cornerstones of EffSTRA. The EffSTRA together with the Climate Protection Program provide a broad framework for many sector-specific EE plans, instruments and incentives

Germany aims to achieve an environmentally sound energy transition by improving EE, increasing the use of renewable energy sources, and by fostering technical innovation that enables an overall reduction of energy consumption.

The issue of energy and climate policy is of vital importance for an industrial nation like Germany and affects other policy areas, particularly economic, environmental and social policy. The three energy policy objectives, namely reliability of supply, environmental sustainability, and affordability, are and will remain a key reference point for Germany's energy policy.

## 4.2.2 Energy Efficiency Status in Key Sectors

### 4.2.2.1 Building sector<sup>32</sup>

The building sector has a key role to play in the energy transition and mitigating climate change in Germany. The potential for reducing energy demand and generating heating and cooling from renewables rather than fossil fuels is high. The German Government has taken account of this fact in the NAPE 2.0, focusing on ensuring that energy consumption in the building sector is reduced in an affordable, economical, sustainable and socially equitable manner. The core aim is to leverage the potential of using local and district heating networks to decarbonise the heating and cooling supply. Such networks are good for increasing the share of renewable energy in heat generation as they can be fed by solar thermal systems or large heat pumps, for example. Heat pumps are also an excellent example of how sector coupling helps raise EE in buildings significantly: heat pumps are very efficient because they generate three to four kilowatt-hours of heat with a one-kilowatt hour of electricity.

For this reason, sector coupling is given a high priority in German plans. However, even here, the priority is still to reduce consumption. To monitor and quantify the progress of EE improvements, particularly in the building sector, Germany has 2020 prepared a so-called Long-term Renovation Strategy (LTRS)<sup>33</sup> which every EU member state has to submit to the EU.

### 4.2.2.2 Industry sector<sup>34</sup>

EE in the industry takes a significant share of the EffSTRA. Since EE in the industry mainly goes along with the aim to reduce GHG, there are various other initiatives related to EE to some extent. One is, for example, the introduction of climate change mitigation contracts in the form of Carbon Contracts for Difference (CCfD). Those contracts shall support the use of climate-neutral technologies in the raw materials industry.

Heat pumps are a key technology for heat transition. Funding and restructuring of the levies, fees and payments on electricity make the installation and operation of a heat pump almost as cheap nowadays as oil or gas heating. They will, therefore, become cost-effective and efficient standard solutions in new buildings and for detached and semi-detached houses in the building stock when, in 2024, the installation of new fossil fuel heating systems is no longer legal except in exceptional cases.

32 [https://ec.europa.eu/energy/sites/default/files/documents/de\\_final\\_necp\\_main\\_en.pdf](https://ec.europa.eu/energy/sites/default/files/documents/de_final_necp_main_en.pdf)

33 [https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies\\_en](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies_en)

34 [https://www.stiftung-klima.de/app/uploads/2021/08/2021-08-03\\_Policy-instruments-climate-neutral-Germany\\_WEB.pdf](https://www.stiftung-klima.de/app/uploads/2021/08/2021-08-03_Policy-instruments-climate-neutral-Germany_WEB.pdf)

#### 4.2.2.3 **Transport**<sup>35</sup>

Transport is a sector with a wide range of development in various domains. The critical starting points for stepping up EE and climate action in transport are raising the efficiency of combustion engines, utilising electrified drives, using renewable energy for producing fuel, and restructuring the transport system. Thus, The Federal Transport Infrastructure Plan (FTIP) will be adapted to the requirements of a climate-neutral Germany in 2045. The review of the requirements plan set for December 2021 will be used to introduce a reorientation. Priority will be given to maintaining the substance of the transport infrastructure. The available budget resources will be primarily used for expanding the rail network. The review of the requirements plan will be completed in 2023. In 2024 the expansion legislation will be adapted for the different modes of transport.

#### 4.2.3 **Act on Energy Services and Other Energy Efficiency Measures (EDL-G)**<sup>36</sup>

The measures under this Act aim to increase the efficiency of energy use by end customers in Germany with energy services and other energy efficiency measures in a cost-effective manner. To this end, the Federal Government shall set indicative energy savings values to be achieved as energy savings targets by May of the year 2017 and a strategy for achieving these targets. The indicative value shall be calculated in accordance with Annexes I, II and IV to Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC (OJ L 114, 27.4.2006, p. 64). The indicative energy savings values shall be achieved through economic and appropriate measures. Measures shall be deemed to be financial if, in general, the necessary expenditure can be generated within the average useful life by the savings that occur. In the case of measures in existing buildings, the expected useful life shall be taken into account. In order to achieve the indicative energy savings values, in particular:

- The necessary energy efficiency mechanisms, incentives and institutional, financial and legal framework conditions are to be created, and market barriers that impede efficient energy use by end customers are to be removed;
- Create the conditions for the development and promotion of a market for energy services and for the provision of other energy efficiency measures to final customers.

#### 4.2.4 **Climate Target Plan Goal: A more ambitious and cost-effective direction to achieve climate neutrality by 2050**<sup>37</sup>

With the Climate Target Plan for 2030, the Commission proposes to raise the EU target for reducing greenhouse gas emissions to at least 55% by 2030 compared to 1990 levels. A more ambitious 2030 target now provides certainty for policymakers and investors so that future decisions do not include emission level that conflict with the EU's goal of climate neutrality by 2050.

EU leaders agreed at the European Council on December 10-11, 2020 - in line with the EU Commission's proposal - to raise the EU climate target for 2030 to at least 55%. The European Commission will now start preparing detailed legislative proposals to achieve this target. It will review

<sup>35</sup> [https://www.stiftung-klima.de/app/uploads/2021/08/2021-08-03\\_Policy-instruments-climate-neutral-Germany\\_WEB.pdf](https://www.stiftung-klima.de/app/uploads/2021/08/2021-08-03_Policy-instruments-climate-neutral-Germany_WEB.pdf)

<sup>36</sup> [https://www.gesetze-im-internet.de/edl-g/\\_3.html](https://www.gesetze-im-internet.de/edl-g/_3.html)

<sup>37</sup> [https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/achter-monitoring-bericht-energie-der-zukunft.pdf?\\_\\_blob=publicationFile&v=32](https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/achter-monitoring-bericht-energie-der-zukunft.pdf?__blob=publicationFile&v=32)

all relevant policy instruments by June 2021 and, if necessary, propose revisions to ensure that the additional emission reductions can be achieved.

#### 4.2.5 Energy System Integration: a strategy for the integration of the energy system<sup>38</sup>

The strategy outlines how to accelerate the transition to a more integrated energy system - one that supports a climate-neutral economy at the lowest possible cost for all sectors, while at the same time strengthening energy security, protecting the health and the environment and the environment, as well as promoting growth and innovation, and consolidating industrial leadership global industrial leadership.

Concrete policy and, from 2021, legislative measures are proposed at the EU level to shape a new integrated energy system progressively. The measures concern the following areas in particular:

- Increasing energy efficiency, for example by using waste heat from industrial plants and data centres;
- accelerating the electrification of final energy consumption with a steadily increasing supply of electricity from renewable sources;
- promotion of renewable and low-CO<sub>2</sub> fuels - this concerns, among others, hydrogen, for which a separate hydrogen strategy has been published (see measure 21);
- strengthening competitive and consumer-oriented markets;
- better integration of infrastructures;
- Supporting the digitalisation of the energy system.

#### 4.2.6 Regulation establishing the Programme for the Environment and Climate Policy (LIFE)<sup>39</sup>

Protect, restore and enhance the quality of the environment and halt and reverse biodiversity loss and ecosystem degradation, and support the transition to a sustainable, circular, energy-efficient, climate-neutral and climate-resilient economy—the transition to a sustainable, circular, energy-efficient, renewable, energy-based, climate-neutral and climate-resilient economic system.

The LIFE programme<sup>40</sup>, which already exists in the 2014-2020 budget period, is to be continued in the 2021-2027 period. Funding is to be provided for projects in a new sub-programme on the energy transition, among others, which help build capacity and disseminate knowledge and innovations to achieve the renewable energy and efficiency targets at the EU level.

The EU Commission proposed the regulation to continue the LIFE programme in June 2018. The programme is to be endowed with a total of €4.81 billion; of this, a large of this is earmarked for the area of climate policy, which also includes the Energy Transition sub-programme.

<sup>38</sup> [https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/achter-monitoring-bericht-energie-der-zukunft.pdf?\\_\\_blob=publicationFile&v=32](https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/achter-monitoring-bericht-energie-der-zukunft.pdf?__blob=publicationFile&v=32)

<sup>39</sup> [https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/achter-monitoring-bericht-energie-der-zukunft.pdf?\\_\\_blob=publicationFile&v=32](https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/achter-monitoring-bericht-energie-der-zukunft.pdf?__blob=publicationFile&v=32)

<sup>40</sup> [https://cinea.ec.europa.eu/system/files/2022-03/Germany\\_Update\\_EN\\_Final\\_March22.pdf](https://cinea.ec.europa.eu/system/files/2022-03/Germany_Update_EN_Final_March22.pdf)

## 4.3 Market Architecture & Policy Frameworks

A series of schemes fostering sustainable investments are available to the German public and businesses. This section provides a general overview, listing the most relevant to the Triple-A project and the identified German cases. The amount and scope of sustainability schemes available in Germany are currently planned and targeted at the enhancement and uptake of energy efficiency investments is quite significant, and major financial benefits are available to businesses (and citizens).

### 4.3.1 Market Architecture

#### 4.3.1.1 Market Incentive Programme/ Federal Funding Scheme for energy-efficient Buildings

The Market Incentive Programme (MAP) is a funding programme operated by the Federal Ministry for Economic Affairs and Energy which provides incentives to make greater use of renewable energy to generate heat: private consumers, members of the professions, companies, municipalities and other eligible parties such as non-profit organisations receive a grant from the state if they install an efficient and climate-friendly heating system.

#### 4.3.1.2 “Energy Efficiency” Market Incentive Programme<sup>41</sup>

The Energy Efficiency Incentive Programme replaces the tax support scheme for energy efficiency building renovation measures, initially foreseen in the National Energy Efficiency Action Plan (NEAP). The volume of support amounts to EUR 165 million per year. The programme supports the following:

- Market introduction of innovative fuel cell heating systems,
- Installation of ventilation systems combined with measures for the building envelope to prevent damage to the building (e.g. mould),
- Replacement of inefficient heating systems with efficient ones; this includes heating system optimisation measures (heating and heat distribution) that address the full efficiency potential of the heating system, as well as a quality, efficiency and visibility initiative.

### 4.3.2 Policy Frameworks

To track the progress under the EU Green Deal, Germany publishes its National Energy and Climate Plan (NECP), which serves as a planning and monitoring instrument and provides an overview of the energy and climate policy within the six dimensions of decarbonisation, renewable energy, energy security, internal energy market, innovation, research and competitiveness and also energy efficiency. The NECP displays the current status of projects in all these areas.

Amongst the NECP, Germany has set its National Energy Efficiency Plan (NAPE 2.0) as part of the EffSTRA. It is a comprehensive action plan that focuses on measures to decrease final energy consumption across all sectors. It provides the foundation for various new funding schemes (private and public) or incentives to foster energy efficiency, innovation and research programs, and updated legal frameworks that match the current EE goals and technological standards.<sup>42</sup>

Since the building sector plays a vital role in reaching the energy efficiency targets under the NAPE 2.0, Germany has published its Energy Efficiency Strategy for Buildings, which provides a detailed

<sup>41</sup> [https://www.bmwi.de/Redaktion/EN/Publikationen/energy-efficiency-strategy-buildings.pdf?\\_\\_blob=publicationFile&v=7](https://www.bmwi.de/Redaktion/EN/Publikationen/energy-efficiency-strategy-buildings.pdf?__blob=publicationFile&v=7)

<sup>42</sup> [https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffizienzstrategie-2050.pdf?\\_\\_blob=publicationFile&v=12](https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffizienzstrategie-2050.pdf?__blob=publicationFile&v=12)

framework and guidance to a climate-neutral building stock by 2050 with a focus on the reduction of energy consumption for electricity and heat and on an increase of the renewable energy share<sup>43</sup>.

Furthermore, the review of the Building Energy Act will be brought forward in 2022. As part of this review, the Act will undergo more far-reaching amendments. This will also include a review of whether the requirements stipulated in the Act need to be updated. In addition, the standards for new buildings may be raised.

#### 4.3.2.1 National Action Plan on Energy Efficiency (NAPE)

The National Action Plan on Energy Efficiency (NAPE) represents the energy efficiency strategy of the Federal Government of Germany. The National Action Plan on Energy Efficiency (NAPE) defines immediate measures and more far-reaching work processes for attaining the national efficiency and climate-action targets. The most important areas for action in energy-efficiency policy are: to advance energy efficiency in the buildings sector and industry, commerce, and the tertiary sector; to establish energy efficiency as a business model and a model for economic return; in addition to raising users' own sense of individual and group responsibility for energy efficiency. The National Action Plan on Energy Efficiency (NAPE) measures are currently being reworked and transferred into a NAPE, using an effective set of measures to pre-empt any shortfall regarding the attainment of the energy targets.

#### 4.3.2.2 'Efficiency First' <sup>44</sup>

'Efficiency First' is the overarching principle in all areas. First, energy demand must be reduced significantly and permanently ('efficiency first'); second, renewable energies must be used directly in all sectors as much as possible; and third, electricity from renewable sources must be used efficiently for heating, transportation, and industry within the framework of sectoral coupling. The primary goal is to replace as many fossil fuels as possible with less electricity technology. On the other hand, sectoral coupling poses issues for electricity grids, particularly at the distribution network level; this necessitates grid expansion and strengthening measures to ensure supply security, at least during the ramp-up phase of e-mobility and heat pumps. As a result, the Efficiency First approach is critical to solving this issue and reducing rising electricity demand. Limiting demand is required to ensure the timely and "resource-friendly" deployment of renewable energies and infrastructures and contribute to decarbonisation and supply security dimensions. The Federal Government is also pushing for the implementation of energy-saving measures in all sectors through a variety of financial programs and standards to ensure that economically efficient measures in the area of energy efficiency are implemented as a matter of priority. These measures and funding programmes are presented in this chapter.

In addition, the 'Efficiency First' principle will be pursued in the buildings sector. Measures such as insulation of the building envelope, installation of efficient windows or other facade elements, airtight building construction and the use of highly efficient technical systems for heating, cooling and lighting equipment and technology can enhance efficiency potentials. At the same time, however, technological and economic limitations and impediments need to be addressed with regard to other parameters such as behaviour and information transparency.

<sup>43</sup> <https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffizienzstrategie-gebaeude.html>

<sup>44</sup> [https://ec.europa.eu/energy/sites/default/files/documents/de\\_final\\_necp\\_main\\_en.pdf](https://ec.europa.eu/energy/sites/default/files/documents/de_final_necp_main_en.pdf)

#### 4.3.2.3 Federal funding for efficient buildings - (*Bundesförderung für effiziente Gebäude – BEG*)<sup>45</sup>

The German federal government is taking steps to meet its goal of becoming climate-neutral by 2050. One way to achieve this goal is to provide additional funding for newly built houses and apartment buildings that meet certain energy efficiency standards. Buildings consume more than one-third of Germany's total energy supply to heat, cool and provide hot water to residents. To reduce the amount of energy wasted, the government gives incentives to developers and house-builders to (re)construct buildings in an energy-saving way. The "Federal Funding for Efficient Buildings" (*Bundesförderung für effiziente Gebäude – BEG*) program was launched in January 2021 and implemented as the *Kreditförderung* (KfW) "Energy-Efficient Construction and Refurbishment" program. It consists of three sub-programs: one for residential buildings, one for non-residential buildings, and one for individual measures. "Individual measures" means that the energy-efficiency standards are not created for the building as a whole but rather smaller renovation projects designed to save energy - for example, replacing drafty doors and windows with better insulating ones.

#### 4.3.2.4 Funding for building renovation/ modernisations<sup>46</sup>

Companies, organisations and owners looking to modernize-renovate their existing building are now able to apply directly through the KfW for the BEG funding scheme. The government will provide funding for the following types of interventions:

- Replacing draughty doors or windows (up to 20 % of the costs covered by government)
- Insulating building facade and roof (20%)
- Installation of digital heating systems (20%)
- Oil heating system replacements (50%)

#### 4.3.2.5 Energy-Efficiency Strategy for Buildings (ESG)<sup>47</sup>

In the buildings sector, the Energy-Efficiency Strategy for Buildings (Energieeffizienzstrategie Gebäude ESG) serves as the strategic foundation for policy. The long-term renovation strategy stated here is the implementation of the ESG. The ESG is the Federal Government's strategy paper for the energy transition in the buildings sector (*Triple-A*). The Federal Government has set itself the ambitious target of attaining an almost climate-neutral stock of buildings by 2050. In the buildings sector, the primary demand for energy must be reduced by 80 % by 2050, compared to 2008. The ESG highlights how this target can be attained through a combination of energy efficiency and the use of renewable energies. The target of an almost climate-neutral stock of buildings is assessed as being attainable in principle, despite restrictions in energy efficiency and specific limits to potential regarding renewable energies. Yet massive additional efforts are needed to achieve this, both in the realm of energy efficiency and in the use of renewable energies in the buildings sector. Alongside the technical and energy-related aspects, the ESG also considers first approaches to economic issues and the outlook on social-policy matters, as these relate to the buildings sector. Beyond this, the energy-policy aspects, spanning a variety of disciplines (for instance, questions on how electricity and heating interact), are addressed in terms of future prospects. The ESG's results are taken up in the Climate Action Plan 2050.

<sup>45</sup> <https://www.bmwi-energiewende.de/EWD/Redaktion/EN/Newsletter/2021/01/Meldung/news1.html>

<sup>46</sup> <https://www.iamexpat.de/housing/real-estate-news/funding-energy-efficient-housing-germany-how-can-expats-benefit>

<sup>47</sup> [https://www.bmwi.de/Redaktion/EN/Publikationen/energy-efficiency-strategy-buildings.pdf?\\_\\_blob=publicationFile&v=7](https://www.bmwi.de/Redaktion/EN/Publikationen/energy-efficiency-strategy-buildings.pdf?__blob=publicationFile&v=7)

### 4.3.3 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided.

The funding of planning, investment and operating costs related to EE helps to create a level playing field in the industrial, building and transport sector. Since the very beginning of the energy transition in Germany, there have been various incentives and funding schemes<sup>48</sup>. Already in 2011, Germany established the German Energy and Climate Fund (EKF)<sup>49</sup>. Financing from this fund is solely utilised to support the transition towards climate neutrality and EE across all sectors. In 2019 the fund had a volume of EUR 45bn.

The most recent schemes focusing on the key sectors of transport, industry/trade/commerce, buildings and District Energy Networks (Heating & Cooling) will be outlined.

#### 4.3.3.1 (1) Buildings

##### Regulation

There are many rules and regulations in the building sector affecting the renovation of old and construction of new buildings. A summary of the most impactful interventions related is provided in the table below.

**Table 13: Overview of policy interventions in the building sector**

Title:	Concerning:	Description:	Source:
<b>The Civil Code (BGB – Bürgerliches Gesetzbuch)</b>	Existing	The Civil Code (BGB – Bürgerliches Gesetzbuch) lays out the main rules for tort liability (such as injuries to third parties, statutory violations, and liability for damages caused by agents or subcontractors) and construction liability (such as architects, engineers, and building contractors) for construction defects.	<a href="#">Link</a> <a href="#">Link</a>
<b>Energy certificate</b>	Existing	Energy performance certificates shall serve exclusively to provide information on the energy characteristics of a building and shall enable a rough comparison of buildings. An energy performance certificate shall be issued as an energy demand certificate or as an energy consumption certificate.	<a href="#">Link</a>
<b>Renovation Wave Goal</b>	Existing	The renovation wave is part of the EU's Green Deal initiative. The Commission's Renovation Wave aims to speed up and deepen energy renovations of residential and non-residential buildings. The EU-wide yearly refurbishment pace must be at least quadrupled by 2030 to achieve this. By 2030, 35 million properties in the EU will have been modified, and 160,000 new "green" construction jobs will have been generated. Information, legal certainty and incentives (including the announcement of amendments to EPBD, EED, and RED II), financing (public and private), skills and technical advice, "green" jobs, sustainable construction, life-cycle approach, digitalization, integrated,	<a href="#">Link</a>

<sup>48</sup>[https://www.bundesfinanzministerium.de/Content/EN/Downloads/Climate-Action/immediate-climate-action-programme-for-2022.pdf?\\_\\_blob=publicationFile&v=3](https://www.bundesfinanzministerium.de/Content/EN/Downloads/Climate-Action/immediate-climate-action-programme-for-2022.pdf?__blob=publicationFile&v=3)

<sup>49</sup> <https://www.bmwi-energiewende.de/EWD/Redaktion/Newsletter/2020/04/Meldung/direkt-erklaert.html>

Title:	Concerning:	Description:	Source:
		participatory, and neighborhood (neighbourhood) approach, and "New European Bauhaus" approach are all focal points of the renovation wave.	

### Support Schemes

The following table provides samples of policies and measures implemented in the **building sector**. The main ones are the Federal funding for efficient buildings and the tax incentives for energy-related building renovations. Some of the Efficiency measures and support schemes for the buildings sector are the following:

- Tax incentives for the energy-efficient refurbishment of buildings
- Federal support for efficient buildings (BEG), including a replacement premium for oil heating systems
- Promotion of serial renovation in the building sector (planned)
- Further development of energy consulting and more specific design of public relations structure
- Role model function of Federal buildings will be developed for and extended to new buildings and existing buildings
- Further development of the energy standard
- Further development of the innovation programme 'Zukunft Bau' [Future of Construction]
- Conversion and expansion of heating networks towards making them more efficient and based to an increasing extent on renewables (under 'Energy Industry' in the Climate Action Programme) (planned)
- Replacement of small storage tanks with electrical flow heaters
- Supporting energy performance contracting as an instrument for increasing energy efficiency at all levels of the public sector
- Climate control/ventilation package incorporating efficiency tools for non-residential buildings
- Minimum specification of meters and sensors for a new heating and air conditioning/ventilation systems
- Efficiency-optimised modelling within the framework of Building Information Modelling (BIM)
- Amendment of the Heating Costs Ordinance
- Heating suitability check for consumers

**Table 14: Overview of support schemes in the building sector**

Title:	Concerning:	Description:	Source:
<b>Tax incentives for energy-related building renovations</b>	New construction	Tax reduction for energy-related measures for buildings used for own residential purposes.  Expected savings, impact evaluation  2030: 24.3 PJ (net impact without measure interaction effect) / 23.1 PJ (net impact and also taking into account measure interaction)	<a href="#">Link</a>
<b>Federal funding for efficient buildings (BEG)</b>	Existing & New construction	New funding program for existing building merging previous programs and improved funding conditions.	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
		Expected savings, impact evaluation	
		2030: 79.3 PJ (net impact without measure interaction effect) / 55.5 PJ (net impact and also taking into account measure interaction))	

#### 4.3.3.2 (2) Industry

##### Regulation

For the Triple-A project, the 2 out of the 10 projects that were considered and classified as industry-specific did not bear noteworthy environmental regulation. EE in the industry takes a significant share of the EffSTRA, and most impactful regulations steer towards reducing emissions in large scale industries, which were not part of the projects considered in this report.

**Table 15: Overview of policy interventions in the industry sector**

Title:	Concerning:	Description:	Source:
<b>Federal Climate Protection Act</b>	Existing & New construction	The Federal Climate Protection Act establishes the legal framework for Germany's 2030 GHG reduction objective. As a long-term goal, Germany has also committed to achieving greenhouse gas neutrality by 2050. Annual emissions for the years after 2030 will be set in 2025. The Act establishes annual emissions for the sectors of energy, industry, transportation, buildings, and agriculture, and annually examines these levels.	<a href="#">Link</a>
<b>Energy Industry Act</b>	Existing	The European Union has built a detailed framework for addressing energy supply constraints and interruptions, and is continuing to work on improving it. In the case of a crisis, the Member States' responses are determined by this framework. A disruption in gasoline, gas, or power supply might be part of such a catastrophe. The Energy Industry Act lays out the most important conditions for supply reliability.	<a href="#">Link</a>

##### Support Schemes

Measures and support schemes for raising energy efficiency in the industry are:

- Investment programme – energy efficiency and process heat from renewable energy in the economy
- Competitive tendering for energy efficiency
- The Federal Government will examine on a case-by-case basis to what extent the existing energy tax breaks for fossil fuels can be more closely aligned with the government's climate policy goals.
- By promoting advisory services, investment measures, and further training courses on resource efficiency and substitution, the Federal Government seeks to establish the circular economy principle in German companies.
- Industry commitment to speeding up implementation

- The National Decarbonisation Programme is intended to promote low-carbon and energy-saving technologies for energy-intensive industries as they progress towards market maturity (including the optimisation of process chains, the conversion of processes towards the use of renewable energy sources, etc.).
- Programme for preventing carbon emissions from arising and implementation of this in primary industries
- Further development of the Energy Efficiency Network initiative
- Efficiency analysis tools for energy audits
- Promotion of process heat efficiency and the potential for using waste heat
- Training drive for energy consultants on the efficient use of renewable energy for process heat supply

The following table provides samples of policies and measures implemented in the industry sector. The main ones are the Federal funding for energy efficient in companies-Subsidy and credit and the energy efficiency networks initiative.

**Table 16: Overview of support schemes in the industry sector**

Title:	Concerning:	Description:	Source:
<b>Federal Funding for Energy and Resources Efficiency in Industry and Commerce (Energie und Ressourceneffizienz in der Wirtschaft)</b>	Existing & New construction	<p>The funding is aimed at all sectors and consists of six modules linked to a subsidy. The subsidised investment fields are defined as:</p> <ul style="list-style-type: none"> <li>• High efficiency cross-sectoral systems;</li> <li>• Process heat from renewable energies;</li> <li>• Smart energy and/or resource management systems;</li> <li>• Individual energy and resource efficiency concepts;</li> <li>• Decarbonisation;</li> <li>• Funding competition for energy and resource efficient business processes.</li> </ul> <p>Subsidies range from 30 % to 60 % of the eligible investment costs with higher rates for SMEs. The subsidised amounts can range up to EUR 15,000,000 per investment project but vary for the different investment fields. For more flexibility, some modules include the choice of a subsidy and/or a KfW loan with preferential conditions. The EEW funding scheme comprises a vast variety of funding possibilities for corporates and municipalities in EE to fit their individual needs.</p>	<a href="#">Link</a>
<b>Federal Funding for Efficient Heating Networks (Wärmenetzsysteme 4.0.)</b>	Existing & New construction	<p>The funding is provided for (a) the construction of new heating networks that draw large parts of their heat from sustainable and renewable energy sources or unavoidable waste heat and (b) the decarbonisation of existing heating networks. This funding is primarily relevant for communities and communal companies. The scheme is structured in four modules along with the project phases of the construction/conversion of heating networks. The subsidies range from 50 % to 80 % of eligible investment costs up to a maximum amount of EUR 15,000,000 per investment project.</p>	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
<b>Federal grants for stationary cooling and air condition systems (commercial usage)</b>	Existing & New construction	These grants are provided for (a) new stationary refrigeration, air-conditioning systems and heat pumps operated with non-halogenated refrigerants and additional measures for climate-protective operation and for (b) the purchase of new air-conditioning systems in electric buses and rail vehicles and the retrofitting of air-conditioning systems in rail vehicles if they are operated with non-halogenated refrigerants. The grant amounts are calculated based on the efficiency of the relevant system but make up to 50 % of the eligible investment costs in a maximum amount of EUR 150,000 per investment project.	<a href="#">Link</a>
<b>KfW Energy Efficiency Program for Production Facilities/ Processes</b>	Existing & New construction	KfW offers promotional loans to corporates for EE investments relating to production facilities and commercial processes. The program covers measures such as heat recovery, waste heat utilisation, combined heat and power plants, EE in production plants or control technologies. Only new investments or modernisations, which lead to pre-defined energy savings, can be financed. The KfW loans can amount to up to EUR 25,000,000 with a preferential interest rate.	<a href="#">Link</a>
<b>Additional funds for the decarbonisation of industry program (carbon contracts for difference)</b>	Existing & New construction	As part of the decarbonisation of industry program, the Federal Government will expand the pilot scheme for carbon contracts for difference. Carbon contracts help mitigate the higher operating costs of low- and zero-emission processes. The Chemistry4Climate platform will also be set up as part of the program.	

### 4.3.3.3 (3) Transportation

#### Regulation

There are many rules and regulations or policy interventions impacting the renovation of old and construction of new buildings in the transportation sector. A summary of the most impactful interventions related is provided in the table below.

Table 17: Overview of policy interventions in the transportation sector

Title:	Concerning:	Description:	Source:
<b>Energy efficiency in electric motors</b>	Existing	This Regulation sets out eco-design requirements for the placing on the market or putting into service of electric motors and speed governors, including those integrated into other products.	<a href="#">Link</a>

#### Support Schemes

Efficiency measures and support schemes for the field of transport are summarised below:

- Enhancing rail passenger transport and freight transport in order to increase its attractiveness as an energy-saving transport alternative
- Increasing the attractiveness of public transport to take advantage of its high level of energy efficiency and a high degree of electrification
- Development of cycling infrastructure and improvement of the conditions for cycling
- Modernisation of inland shipping and use of shore-side electricity in ports should be promoted by speeding up the adaptation of infrastructure and promoting progressive technologies
- Promotion of low-carbon passenger cars through purchase premiums for e-vehicles and tax relief for low-carbon passenger cars
- Expansion of the refuelling and charging infrastructure to support the market ramp-up of alternative drive systems viii. Promotion of low-carbon trucks
- Expand refuelling, charging and overhead line infrastructure for alternative truck drive systems
- Automation and networking of traffic, measures to make traffic more fluid; facilitating innovative forms of mobility
- Tax incentives for electric mobility and alternative means of transport
- Energy efficiency standards for electric vehicles at the EU level

The following table provides samples of policies and measures implemented in the transport sector. The main is the Funding for e-mobility by an environmental bonus.

**Table 18: Overview of support schemes in the transportation sector**

Title:	Concerning:	Description:	Source:
<b>Federal Funding for Energy Efficiency in Electric Rail Transport (Energieeffizienz des elektrischen Eisenbahnverkehrs)</b>	Existing & New construction	Eligible for funding are railway companies, which are investing in technologies and measures to improve the efficiency of the electrical transport capacity (e.g., new converter technologies, implementation of network driver assistance systems and regenerative power supply). The amount of the funding is calculated based on the EE improvement concerning the provided electrical transport service and is capped at a maximum of 50% of the eligible investment costs. The subsidies will cease to be available end of 2022.	<a href="#">Link</a>
<b>Federal funding for sustainable modernisation of inland and coastal vessels</b>	Existing & New construction	The two funding schemes for inland vessels and coastal vessels aim to reduce emissions and energy consumption relating to vessels—the modernisation of the vessels by replacing the engines and improving hydrodynamic or propulsion. Measures are eligible for funding if they reduce energy consumption by a minimum of 10 %. For coastal vessels, the subsidy covers up to 30 % of the investment costs; it covers up to 90 % of the eligible additional investment expenditure for inland vessels.	<a href="#">Link</a>

#### 4.3.3.4 (4) District Energy Networks (Heating & Cooling)

##### Regulation

No related sector-specific regulations concerning the District Energy Networks sector were identified in the Triple-A project for Germany; hence, an overview is reported under this category.

**Table 19: Overview of policy interventions in the District Energy Network sector**

Title:	Concerning:	Description:	Source:
<b>District Heating Systems</b>	Existing	District heating systems are important solutions for decarbonizing the heating sector in the Net Zero Emissions by 2050 Scenario. Modern networks with low operating temperatures can integrate 100% renewable sources to supply energy-efficient buildings, especially in areas where decentralized solutions would not allow the direct integration of available clean energy sources or efficient operations, due to space or infrastructure constraints.	<a href="#">Link</a>

##### Support Schemes

The following table provides samples of policies and measures implemented in the *District Heating systems*.

**Table 20: Overview of support schemes in the District Energy Network sector**

Title:	Concerning:	Description:	Source:
<b>Regal Sources on Renewable Energy</b>	Existing	In Germany, the Guidelines for the support of RES-H set out the Market Incentive Programme (MAP), stipulating support schemes for the promotion of heat produced from renewable energy. BAFA is providing investment support for individual heat installations as well as district heating systems, while KfW offers low-interest loans	<a href="#">Link</a>
<b>The Integration of Renewable Energy Sources into existing District Heating and Cooling Systems (RES DHC)</b>	Existing	<p>The overall objective of this cooperation is to address the R&amp;D challenges related to this topic in order to implement renewable heat sources as environmentally friendly and emission-free heat generation technologies for the DHC sector.</p> <p>The specific support schemes are based on:</p> <ul style="list-style-type: none"> <li>• Gaining knowledge and development of improved solutions for the technical and operational integration of renewable energy plants into existing traditional and modern DHC systems</li> <li>• Providing practical know-how on the development of DHC RES projects, technical solutions and business cases to DHC market players</li> <li>• Development and presentation of innovative demonstration cases initiated by DHC market players</li> </ul>	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
		and in cooperation with RES market players (both for technical and organisational solutions).	
		<ul style="list-style-type: none"> <li>Development of advanced tools to address non-technical market barriers and opportunities</li> </ul>	

#### 4.3.3.5 (5) Outdoor Lighting

There are many rules and regulations, or policy interventions for the outdoor lighting sector. A summary of the most impactful interventions related is provided in table below.

Table 21: Overview of policy interventions in the outdoor lighting sector

Title:	Concerning:	Description:	Source:
<b>Analysis of the political and legal framework and the examples Country Report Germany</b>	Existing	<p>In Germany, general street lighting is regulated by the Roads and Paths Act at the federal level. (Straßen- und Wegegesetz or StrWG). Accordingly, municipalities are obliged to maintain the safety and order within built-up areas according to their performance and ability to illuminate public roads.</p> <p>The lighting of public roads within the district is part of the municipal tasks defined by the municipal code, based on the federal constitution. Moreover, it is an independent public duty within the framework of public utilities. The StrWG defines street lighting as a statutory public duty of the municipalities to maintain public safety and order, which clarifies the safety nature of the regulations. Accordingly, general street lighting is expressly excluded from the duties of this also applies to federal highways.</p>	<a href="#">Link</a>

#### Support Schemes

Table 22: Overview of support schemes in the outdoor lighting sector

Title:	Concerning:	Description:	Source:
<b>Federal funding for efficient buildings (BEG)</b>	Existing and funding programme	Some programme sections of the funding for climate protection projects in the local area 'Local guideline' cover 'Exterior lighting and interior lighting. <i>Permissible actions proposed as part of the relevant measure are:</i> Lighting and technical building services.	<a href="#">Link</a>
<b>Municipal guideline (Kommunalrichtlinie)</b>	Existing and funding programme	The guideline is targeting municipalities and municipal associations and enterprises and public institutions (e.g. schools, religious institutions). Funding is provided for the installation of highly efficient lighting technology for the refurbishment of outdoor and street lighting systems as well as traffic light systems - including control and regulation technology. Funding can also be obtained for lighting technology for new light points to remedy lighting deficits (e.g. at pedestrian crossings or bus stops). The focus for all funding eligible project lays on the installment	<a href="#">Link</a>

Title:	Concerning:	Description:	Source:
		of technologies for time or presence-dependent controlled outdoor and street lighting or adaptively controlled street lighting.	
<b>Electricity saving check</b>	Existing and funding programme	The measure specifically includes consultancy for low-income households regarding electricity and energy saving. As part of the consultancy, households receive free energy-saving items (e.g. LED lights and switchable multiple socket strips) with which they can directly reduce their electricity requirement and contribute to climate protection.	<a href="#">Link</a>

## 4.4 Triple-A partners in Germany



**JRC Capital Management Consultancy & Research GmbH** is a strongly research oriented independent investment house specialized in Forex and Derivatives. Apart from the front office, JRC's R&D department with its highly skilled team of specialists who combine economic knowledge and financial modelling expertise with mathematical and IT-background is central to the company. Our philosophy is to generate returns for our investors at

every stage of the market. This is done by continuously researching the foreign exchange markets. As markets sometimes develop inefficiently and unpredictably, it is of fundamental importance to expand internal knowledge and to keep a finger on the pulse of the markets. External impulses are provided by the exchange with scientists and users within the framework of EU-funded research projects and ensure the incorporation of the latest state of the art in data analysis and financial market research.

**Website:** <https://jrconline.com/?lang=en>



**adelphi** is a leading independent think tank and strategic consultancy on climate, environment and development. We offer demand-driven, tailor-made services for sustainable development, assisting governments, businesses, organisations and financial institutions.

This includes supporting financial intermediaries in the preparation and implementation of green, sustainable finance, both in a wide variety of developing countries and emerging economies and in Europe. Within our sustainable finance work-stream, we plan and implement capacity building programmes, conduct feasibility studies, market analyses, and advice banks on assessing, selecting and monitoring sustainable investments. Overall, at adelphi, we are some 280 strategists, thought leaders and practitioners working at the local and global levels to find solutions to the most urgent political, economic and social challenges of our time. Since 2001, we have successfully completed more than 1,000 projects worldwide for numerous international clients and partner organisations in the fields of energy, climate, resources, finance, diplomacy and business.

**Website:** <https://www.adelphi.de/en>

## 5 Greece

### 5.1 Country's Overview

Energy efficiency in Greece is one of the country's main priorities due to its high dependency on energy imports, the uprising energy prices and the increased pollution in its big cities, mainly in the capital of Athens. The energy-consuming manufacturing sector in Greece is relatively small compared to other northern European countries, although it represents 23% of the country's energy needs. In addition, the building sector, which consists of the residential and tertiary sectors, consumed 44% of the final energy in Greece in 2019. From 2000 to 2019, the final energy consumption in households has decreased by 10%.

The Greek government has developed strategic plans to increase energy efficiency rates to tackle climate change and make the building stock as energy efficient as possible. Such a plan is the National Energy and Climate Plans (NECP). The NECP stresses Greece's priorities and development potential in terms of energy and addressing climate change and aims to serve as the key tool for drawing up the national energy and climate policy in the next decade, considering the European Commission's recommendations and the UN sustainable development goals.

Innovative and dedicated financing instruments have been designed in Greece to promote energy services more broadly and exploit the untapped potential for energy savings in specific sectors. The new financing instruments to be implemented will contribute primarily to the effective use of potentially available resources for improving energy efficiency and reducing carbon dioxide emissions.

To increase energy savings through improved energy efficiency in the different sectors of activities, and mainly the building sector, the Greek government has announced related programmes for subsidising the cost of investments for energy savings. More particularly, incentives are provided for energy-saving interventions in the residential building sector in the context of the transition to an "Energy Efficient Home", while improving the energy efficiency of public buildings through EPCs and generally through PPPs is also promoted through specific programmes. In addition, financing programmes supporting private companies for energy-efficient renovations of buildings and their operating procedures and the implementation of infrastructure projects in the field of road and rail transport are also in place.

It is worth also mentioning that the Recovery and Resilience Facility (RRF) includes loans and grants to support reforms and investments made by EU countries (723.8 billion € in total). The Greek Recovery and Resilience Plan provides a total of 31.16 billion € investment resources, while a total of 60 billion € is expected from the banking sector's leverage or private investments.

Greek Banks appear to have great interest in providing Green Loans and sustainable debt products to end customers, SMEs, and other legal entities in the private financing sector. According to the banks' corporate presentations to investors, the largest Greek Banks have a well-planned baseline scenario with new green financing products and options. Many Greek banks have already financed green and social investments and have designed relevant financing products, also incorporating the principles of ESG financing into their corporate transformation. Furthermore, green corporate bonds have become popular in the last several years, while several green corporate bonds have been issued by companies and the Greek Government, triggering an immediate response from the Greek private sector.

### 5.1.1 Greek Stakeholders Overview & Analysis

As defined in the Triple-A stakeholder consultation methodology, for the Greek case a 3-step methodological approach (identification, prioritisation and analysis, engagement activities and effective communication) was followed in order to ensure the active engagement of all the involved parties towards the successful financing of EE projects.

NTUA, as a national leader for the case of Greece, followed the basic steps of the Triple-A methodology on stakeholder engagement to identify and prioritise the key Greek actors that may benefit from Triple-A outcomes and should be engaged through the various pre-defined activities.

To this end, NTUA examined thoroughly its extended contact list, including more than **650 contacts**, as well as the lists that UPRC and PB partners provided, and identified **190 Greek stakeholders** relevant to the field of energy, climate and sustainable finance from different kinds of institutions. This list was filtered according to Step 1 of the proposed methodology and the profile characteristics that Triple-A Greek stakeholders should have and based on the relationship and trust that has been built in the past among specific actors and Greek partners.

The list with the identified stakeholders consists of **136 Greek key actors** that may benefit from Triple-A methods and Tools and should be contacted and engaged accordingly (Figure 4). It is evident that investors and project developers are the major recipients in the field of EE financing. Additional target groups that focus on different levels of the EE financing concept are policy makers, research and academia and other groups. These stakeholders aim to build up more efficient, and stable conditions and guidelines on innovative financing tools and methodologies for EE investments. After identifying the key professionals to be engaged with, a prioritization followed according to their power and interest (Figure 5). According to the power-interest combination, the overall importance reveals that more than a half of the stakeholders identified are prioritized as “High” importance.

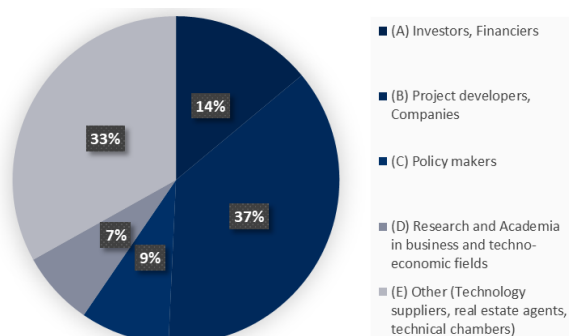


Figure 4: Greek Triple-A Stakeholders' categories

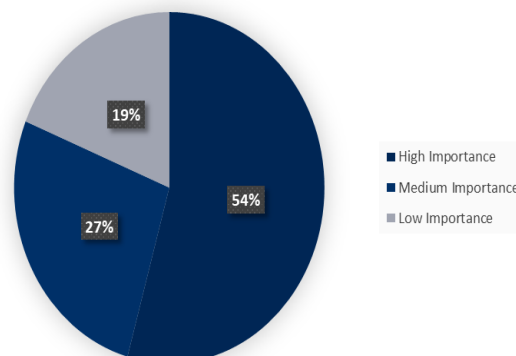


Figure 5: Greek Triple-A Stakeholders' prioritisation

After identifying and prioritising the identified as the most relevant Greek stakeholders, several dissemination actions were realized to engage them in the Triple-A activities and Tools actively.

Table 23: Overview of Greek Stakeholders activity

What happened in Greece?	#
No. of in Country meetings with stakeholders	8

Workshops	2
External participants involved in bilateral discussions	3
Investor Preference Questionnaire responses	21
Stakeholder Questionnaire responses	103
<b>Triple-A Country Capacity Building Webinar participants:</b>	<b>54</b>
A - Financing bodies	9
B - Companies / Project developers	16
C - Policy makers and Policy support Institutes	1
D - Researchers and Academia	14
E - Other	14
<b>Triple-A Country Follow up Capacity Building Workshop participants:</b>	<b>215</b>
A - Financing bodies	18
B - Companies / Project developers	17
C - Policy makers and Policy support Institutes	5
D - Researchers and Academia	9
E - Other	166

## Greek Capacity Building Webinar

The Capacity Building Webinar conducted in Greece has brought together project developers with representatives from the financing sector, policymakers and energy efficiency experts. The event was organised on Wednesday, 26 May 2021, at 11.00 CET, by Triple-A, supported by Build Back Better Greece. The title was “Triple-A Energy Efficiency Investments: Incorporating the Principles of Sustainable Financing and the EU Taxonomy”. Based on the analytics of the Zoom platform, where the event was hosted, **54 stakeholders** participated in the webinar, while the related recording available on YouTube<sup>50</sup> has **54 views**.

During the Greek Capacity Building Webinar session the following topics were addressed:

- The EU Taxonomy Regulation sets the stage and allows discussing and comparing projects through a uniform language.
- The Risk and Mitigation strategies to assess potential future investments.

<sup>50</sup> Webinar Recording: [https://www.youtube.com/watch?v=gM\\_9svuWhZ0&feature=emb\\_title](https://www.youtube.com/watch?v=gM_9svuWhZ0&feature=emb_title)

- An overview of Financial Instruments available that minimise risk and maximize projects potential.

Furthermore, a roundtable discussion was held, which resulted in valuable finding and outcomes regarding energy efficiency financing in Greece and the role of the Triple-A project.

#### Feedback received:

- Many times, when projects are implemented through public energy efficiency funding, only the initial investment cost is examined and granted. There is no further responsibility or reward for the beneficiary for the achievement of the promised energy savings.
- Upscaling energy efficiency ensures that human activities will keep fostering but consuming less. This is beneficial for all humans and the planet.
- Our experience shows that although Triple-A proposes these “simple” steps, these steps are missing from the scope of energy efficiency project assessments and are, therefore, a huge opportunity for companies and financial institutions to improve upon, especially when considering the upcoming legislation changes.
- The EU Taxonomy, SDG and ESG criteria compile a green fraction, and if they are appropriately used, they could lead to identifying sustainable and green investments.
- Covid-19 acts as an accelerator toward green energy recovery.
- The 2020 energy efficiency target has not yet been achieved in Greece due to difficulties in financing such projects (less than 50% of the applications for energy efficiency investments are finally financed).
- There is an effort to incorporate and promote the ESG criteria in the Triple-A Tools and methodology in order for the companies to report their contribution to ESG factors.
- The new technical directive of the Technical Chamber of Greece (TCG) in cooperation with the Hellenic Ministry of Environment and Energy on the economic evaluation of energy investments takes into account what Triple-A examines, i.e. the EU Taxonomy, ESG criteria and the need for information homogenisation in the field of energy efficiency financing.
- Municipalities could benefit from European Programmes and be supported towards developing energy communities.
- With the assistance of European H2020 projects, the sustainable city Network facilitates municipalities to establish Energy Communities and produce energy from renewable sources. Many aspects of these projects could be facilitated by the Triple-A project methodology (such as the installation of net metering systems).
- The Triple-A project could support municipalities by indicating which energy efficiency project ideas could be included in Sustainable Energy Action Plans and facilitating the procedure of financing matchmaking.
- Many similar to Triple-A projects provide high academic knowledge, but they cannot be applied to face real market problems.
- The Triple-A Tools could save time and money since they could be applied in several sectors.
- A typical evaluation framework should be adopted when a company is regarded as ESG ready.

- Through its synergies and wide engagement of stakeholders, the Triple-A project has a remarkable ability to find and promote good practices in energy efficiency financing that are useful for ESCO and other EE companies.
- The Triple-A Tools could also support energy efficiency promotion in public buildings, benchmarking projects and connecting them with the financing market.
- Triple-A Tools provide a standardised way of projects' evaluation which could be integrated into banks' and financing institutions' evaluation procedures, standards and policies.
- It is essential that Triple-A Tools be tested by market actors in order to ensure that they are correctly calibrated.

### Workshop: National Recovery and Resilience Plan: Investing in Buildings' Renovation for a Climate Neutral Future

The online event **National Recovery and Resilience Plan: Investing in Buildings' Renovation for a Climate Neutral Future** organised by **INZEB** and **GIZ** was held on the Thursday 21<sup>st</sup> of October 2021 at 13:00-15:00 CET. The event highlighted the importance of building renovation to achieve the EU's long-term objective of a climate-neutral economy by 2050. The H2020 projects **iBRoad2EPC** and **Triple-A** and **Build Back Better Greece** initiative, perform as supporting partners of the event.

Attention was given to elements that can support the EU objective through the implementation of the National Recovery and Resilience Plan. Specifically, the online event discussed:

Based on the analytics of the Zoom platform, where the event was hosted, **150 stakeholders** participated the webinar, while the related recording available on YouTube has **88 views**. The vast majority of the attendees were engineers (mechanical, civil, electrical, architects), energy experts and consultants, while policy officers and governmental actors have also participated.

#### Feedback received:

- In order for the 2030 energy and climate targets set by the EU and through the Fit for 55 packages to be achieved and for the implementation of the European Green Deal, it is vital for the investments to be oriented toward projects that contribute to sustainability.
- The Triple-A project aims to evaluate and promote energy efficiency projects by facilitating their financing through private investments and various financing mechanisms. She also stressed that the Triple-A tools incorporate the principles of the EU Taxonomy.
- Triple-A tools promote energy efficiency projects through an integrated methodology and through platforms that facilitate communication between investors and project implementers.
- The National Recovery and Resilience Plan is based on the principle of non-infliction of significant damage, which is an essential principle of the EU Taxonomy, for the redirection of capital flows to sustainable green investments in order to achieve CO<sub>2</sub> reduction targets.
- Improving energy efficiency and saving energy should be a priority, and buildings should be radically upgraded so that energy needs are significantly reduced and energy subsidies are not required.
- Building Renovation Passports are a tool and a methodology that can be combined with both ESCOs and OSSs, and their use in various ways is desirable in order to improve the situation of building owners.

- ESCOs play an important role in energy upgrades but also in the normalisation of models
- Living Future Europe has set one of the most demanding objectives in order for the buildings to be sustainable, ecologically restorative and socially just.
- The private sector should get acquainted with the production and renovation of building stock with both EU Taxonomy and sustainability criteria.

### Greek Regional Training Workshop

Within this context, Triple-A and SMAFIN, supported by Build Back Better Greece, jointly organised a roundtable discussion with national field experts aiming to identify the ways to overcome the barriers and minimise the risks to increase the investment rates for energy efficiency projects in Greece. In addition, the national policies and available financial private and public funding schemes were examined, and enhancement proposals were evaluated and discussed.

Practical testing of the Standardised Triple-A Tools and Database was also implemented during the event to validate their use and results and discuss their aspect with relevant stakeholders through a live interactive session. The Triple-A Tools may provide added value to the respective stakeholders, building trust between EE investors and project developers.

Based on the analytics of the Zoom platform, where the event was hosted, **215 stakeholders** participated in the webinar, while the related recording available on YouTube has **99views**. Obviously, most of the participants come from entities such as Technology suppliers, property valuers, real estate agents, Technical chambers, notaries, associations, individuals (e.g. architects, engineers), etc. However, the target of the participation of 15-20 actors from the financing community has been achieved with representatives from Piraeus Banks, National Bank of Greece and Alpha Bank. Important companies and individuals, such as project developers and policymakers, were also present. SustChem S.A., TOLIS ECOENERGY, Managing Authority of Epirus, Ministry of Environment and Energy, AICO S.A., EBOCAT, MECCANICA GROUP AE, ENERCA P.C., Mytilineos, PPC Renewables, etc.).

### Feedback received:

- Energy efficiency auctions are a quite fresh measure for Greece. It is desirable to be activated the soonest, and Triple-A tools seem very useful for monitoring this measure.
- The importance of the Triple-A Tools is high while it is expressed the desire for further bilateral discussion on the part of banks both in terms of its use and the possible assistance of banks. He also mentioned that the
- The taxonomy tool is taking on an international character now, while it is imperative to find funds for the financing and further development of the project.
- The Hellenic Ministry of Environment & Energy has designed a variety of measures and projects that help citizens, the country, and businesses. Specifically, the Ministry has requested economic support from the RRF, for the development of electricity transmission and distribution networks, in order to include much more RES for reasons of dependence on imports, reduction of emissions, energy security, and green energy as a country.
- TCG has for many years contributed to the formulation of technical instructions as a technical advisor to the state. The new technical directive will cover the part of energy investment evaluation and includes many elements from the taxonomy and the criteria we saw in Triple-A.
- EPCs can play an important role in achieving the goals, especially for the public and private building sectors.

- All systemic banks and almost all Greek banks offer specialised financial tools for financing energy efficiency projects, and in fact, they offer them on more favourable terms. Increasing energy efficiency projects is a one-way street. They are supported by European and national policies through development programmes. There is the background to start and grow this market faster.
- Research has shown that 97% of companies operating in this field are exposed to risks and dangers related to the ESG criteria. Thus It's time for companies to realise that by incorporating ESG criteria, they gain resilience and added value.
- ESG should be absorbed by companies as a core element and not as another marketing tool. He also noted that all three dimensions of ESG criteria -environmental, social, and governance- should equally be taken into account.

### Bilateral Meetings with Greek Stakeholders

A number of bilateral meetings with relevant interested key actors have been implemented. The scope of these meetings is to further disseminate Triple-A and its outcomes, engage stakeholders, provide consultation regarding project activities, gather feedback and create possible synergies.

**Table 24: Highlights of the Triple-A Bilateral Meetings with Greek Stakeholders**

Date	Participants	Highlights
12.03.2020	NTUA, Greenesco S.A., EnerSave Capital S.a.r.l	A holistic approach to energy efficiency investments should be followed. For that reason, emphasis was given to the importance of the Triple-A project in fostering energy efficiency investments and the valuable aspects of the cooperation with EnerSave Capital and GreenEsco with the project. An idea of creating green bonds for big enterprises in Greece was proposed.
06.05.2020	NTUA, A.VA.G., INZEB	Discussion about possible synergies between Triple-A and A.VA.G. Synergy Ideas: participation in the Triple-A consultation process, feedback/ input to the Triple-A Tools, participation in the Triple-A Greek Case Study webinars and Greek Training Workshops.
26.05.2020	NTUA, A.VA.G.	Triple-A will develop a dedicated building sector questionnaire for input by the A.VA.G. Members. The specific content of the online questionnaire and timeline for completion was discussed and agreed upon.
06.07.2020	NTUA, A.VA.G.	The questionnaire's results and analysis will be communicated to the A.VA.G. members for their information and comments. A related Newsletter will be developed and distributed to both Triple-A and A.VA.G. networks. An English version of the questionnaire will be elaborated to be distributed to all Triple-A case study country leaders and contact a comparison analysis.
12.01.2021	NTUA, A.VA.G.	Discussion on developing analysis on the results of the questionnaires on the building sector that A.VA.G. members supported. Discussion on and analysis of the key points of the results and their promotion through a targeted presentation.
19.01.2021	NTUA, A.VA.G.	Finalisation of the presentation with the highlights from the Triple-A Questionnaire on Building Sector. Discussion on the ways that the survey and its important results will be further explored and promoted among interested stakeholders.
20.01.2021	NTUA, A.VA.G.	The organisation of a targeted webinar to further promote the Triple-A Questionnaire on Building Sector results and key conclusions to interested A.VA.G. members

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<b>21.01.2021</b>	NTUA, Group	ABEC	Demonstration of the Triple-A Tools. Discussion on the Triple-A methodology. Discussion on the EU Taxonomy Discussion on possible updates of the Triple-A Assign Tool.
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## Bilateral Meetings with Greek Advisory Board Members

The AB Members advise on matters related to the implementation and development of the Triple-A project activities, including, but not limited, to the scope, transparency and legitimacy of the activities and methods applied and the robustness and dissemination of the results produced.

Additionally, the AB Members:

- facilitate interlinkages with targeted stakeholder groups in the EU.
- support project dissemination activities, acting as “project ambassadors”, by keeping informed their organisations and various networks on the project activities and outcomes.
- help boost the project's impact.

In total 25 interactions have been realised with Greek Triple-A AB Members. The analytical highlights of the bilateral meetings with Greek Advisory Board Members are available in D2.3 Report on Advisory Board Activities.

## Triple-A Questionnaires

The Greek community was actively engaged and responded to the surveys, which is amply demonstrated by the **103 responses** gathered by Greek stakeholders.<sup>51</sup>

### Triple-A Survey on the Building Sector:

Special emphasis is given to the Triple-A Questionnaire for the building sector, translated into the Greek language after several bilateral meetings and requests by the Association of Greek Valuers (AV.A.G.).

The questionnaire was disseminated through invitations to stakeholders in an online format. **Seventy-seven (77) responses** were gathered by key stakeholders (i.e., bankers, investors, and real estate professionals).

### Highlights:

Key highlights arising from the analysis of EEMs impact on the building sector include:

- Building's EE profile is considered an asset for long-term capital investments.
- Lack of capital and high costs are major factors that hinder building owners from implementing EE measures.
- Building envelope retrofits may increase the value of the property.
- The COVID-19 pandemic has affected the real estate sector.
- EE upgrades result in a price increase in the case of selling or renting a property.
- Benchmarking Tools could provide valuable services in the real estate sector.

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<sup>51</sup> See some results in the 2<sup>nd</sup> and 3<sup>rd</sup> Briefing Notes: <https://aaa-h2020.eu/briefing-notes>

## 5.1.2 Triple-A identified projects

Within the framework of the Triple-A project, **twenty-two (22) Greek projects** have been identified, inserted in the Triple-A Tools and benchmarked. The identified projects belong to the sectors determined by the Triple-A methodology, namely: the Building Sector, Manufacturing, Transportation, District Energy Networks, and Outdoor Lighting. As it is depicted in Figure 9, the majority of Greek projects belong to the building sector. This happens since most of the Greek building stock is in urgent need of renovation because of ageing. The energy demand for these buildings increases, as they have poor or no insulation, while their contribution to the country's CO<sub>2</sub> emissions is substantial. For all the reasons mentioned above, plenty of actions and financing mechanisms are ongoing in Greece, described in the following sections of the present paper.

The projects mentioned above are expected to trigger **~69 GWh of energy savings per year** (Figure 6), including savings in electricity, natural gas and heating oil. In order to achieve these savings, a total aggregated investment cost (aggregated for all Greek projects) of **49,4 million €** is needed (Figure 7).

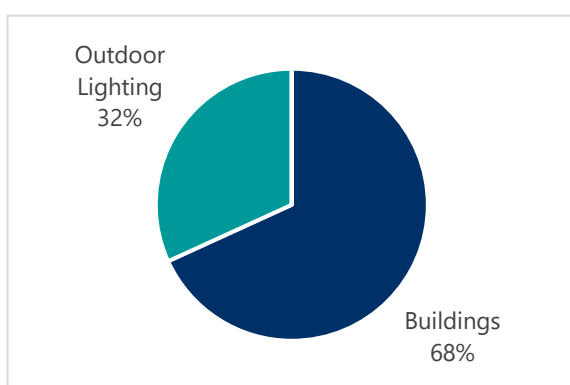


Figure 6: Sector distribution of the identified Greek projects

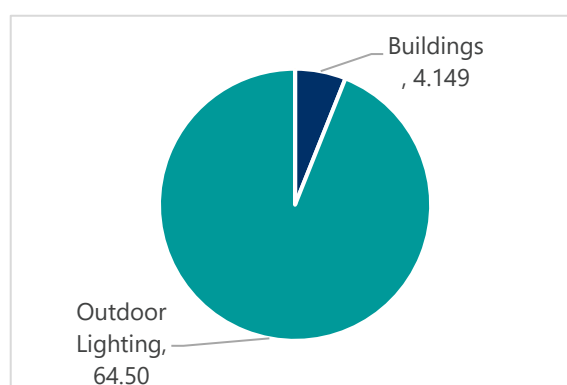


Figure 7: Sector distribution of GWh triggered by the identified Greek projects

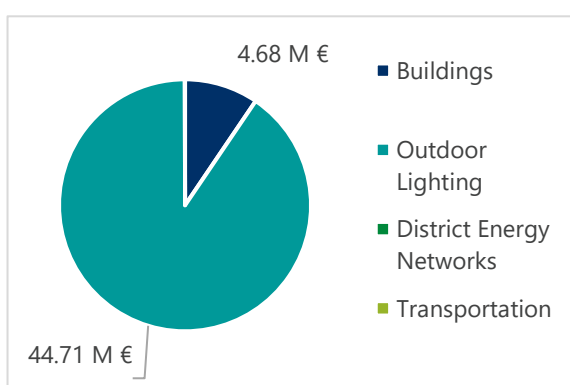


Figure 8: Sector distribution of the total investment emerged by the identified Greek projects

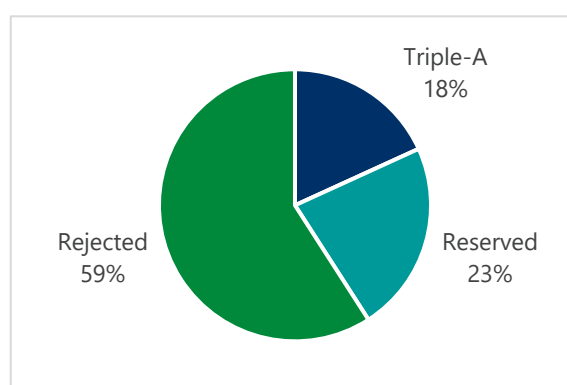


Figure 9: Benchmarking classification of the Greek projects

In addition, all the Greek projects have been declared EU Taxonomy compliant, in the checking performed by the Triple-A Assess Tool. Although the Greek projects belonging to the Outdoor Lighting sector trigger higher energy savings, they have much higher investment cost than those belonging to

the building sector. The benchmarking based on Financial, Risk and Sustainable Development Goals indicators that are being performed by the Triple-A Agree Tool has designated the building sector projects as the “Triple-A” ones. The “Triple-A” projects are the ones that are the most feasible and attractive for investors, having a high potential of achieving energy savings that will repay the initial investment cost (See Figure 9 for the classification of Greek projects).

## 5.2 Monitoring and Regulation

### 5.2.1 EU Directives and Greek Legislation

The main pillar of all the efforts towards achieving the EU target of improving energy efficiency was Directive 2006/32/EC<sup>52</sup>, transposed into the Greek National **Law 3855/2010** “Measures to improve energy efficiency in end-use, energy services and other provisions<sup>53</sup>. The Greek National Law defines, inter alia, the policies, regulations and measures to develop the energy services market in Greece. It also specifies the content and principles of Energy Performance Contracts (EPCs) and allocates obligations and responsibilities arising from these contracts between energy services and clients.

In 2010, Directive 2010/31/EU on the energy performance of buildings was published, including numerous provisions on reducing energy consumption in the building sector and improving the energy performance of buildings<sup>54</sup>. One of the most important components of the Directive is the reference made to nearly zero-energy buildings (NZEBs). The Directive was later transposed into Greek legislation by **Law 4122/2013**<sup>55</sup>. Article 9 of the Directive goes on to state that all new buildings should be NZEBs by 1 January 2021 and that this should be achieved for new buildings occupied by public services and the broader public sector by 1 January 2019.

In October 2012, the European Commission adopted the new Directive 2012/27/EU on energy efficiency, establishing a common framework of measures for the promotion of energy efficiency within the EU, with a clear focus on achieving the overall energy efficiency target of reducing primary energy consumption by 20% by 2020<sup>56</sup>. The requirement to amend Directive 2006/32/EC on energy services and to adopt the new Directive 2012/27/EU on energy efficiency was the result of the signs of divergence in achieving the energy savings target of 9% by 2016 of Directive 2006/32/EC, which were apparent from the National Energy Efficiency Action Plans (NEEAP) I & II already submitted by the Member States, and the need to update the legal framework for energy efficiency in the EU. The Directive 2012/27/EC was transposed into Greek legislation by **Law 4342/2015** and the updated **NEEAP**<sup>57</sup>.

In 2018, as part of the Clean Energy for all Europeans package, the new amending Directive on Energy Efficiency (2018/2002) was agreed to update the policy framework in view of 2030 and beyond. The key element of the amended Directive is a non-binding energy efficiency target for 2030 of at least 32.5%<sup>58</sup>.

<sup>52</sup> European Parliament and the Council, DIRECTIVE 2006/32/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 2006.

<sup>53</sup> ΦΕΚ 95, Νόμος 3855/2010: Μέτρα για τη βελτίωση της ενεργειακής απόδοσης κατά την τελική χρήση (In Greek), (2010).

<sup>54</sup> European Parliament and the Council, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 2010.

<sup>55</sup> ΦΕΚ 42, ΝΟΜΟΣ ΥΠ' ΑΡΙΘ. 4122 Ενεργειακή Απόδοση Κτιρίων – Εναρμόνιση με την Οδηγία 2010/31/ΕΕ του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου και λοιπές διατάξεις (In Greek), 2013.

<sup>56</sup> European Parliament and the Council, DIRECTIVE 2012/27/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 2012.

<sup>57</sup> ΦΕΚ 143, Νόμος 4342/2015: Συνταξιοδοτικές ρυθμίσεις, ενσωμάτωση στο Ελληνικό Δίκαιο της Οδηγίας 2012/27/ΕΕ του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 25ης Οκτωβρίου 2012 «Για την ενεργειακή απόδοση, την τροποποίηση των Οδηγιών 2009/125/ΕΚ και 2010/30/ΕΕ», 2015.

<sup>58</sup> European Parliament, Directive 2018/2002/EU, 2018.

The new act of the Ministry of Energy and Environment foresees new goals and procedures for energy efficiency<sup>59</sup>. Based on what is reported, the final energy consumption in 2030 should be reduced by 38% compared to 2017 in all economic sectors (industry, transport, business, household) while an annual target of 0.8% of new savings compared to the last three years is set each year.

Various policy developments have been put in place in past years, namely (i) Law 3899/2005 on Public-Private Partnerships (PPPs), (ii) Law 3855/2010 on the institutional framework for the provision of energy services, (iii) the National Code of Conduct of Ministerial Decision (MD) 13280/2011 and later MD 176381/2018, and (iv) Law 4342/2015, which includes references to EPC<sup>60</sup>.

**Law 3389/2005 on PPPs** has assisted the public sector to overcome the prohibition to employ a private body to operate and manage public establishments' building energy services infrastructure<sup>61</sup> [10]. **Law 3389/2005** allows multi-year concession contracting for the installation, operation and maintenance of energy-efficient equipment in buildings.

The **National Code of Conduct of Ministerial Decision 13280/2011** "Energy service companies. Function, Registry, Code of Conduct and related provisions" preceded the publication of the European Code of Conduct of the TRANSPARENSE project<sup>62</sup>; however, it was consistent with eight (8) of its nine (9) guiding principles<sup>21</sup>. MD 13280/2011 aimed to implement the existing legislative framework and fix all relevant issues related to the development and activation in the Greek market of Energy Service Companies (ESCOs). This MD set: the content of the ESCOs Registry<sup>63</sup>, criteria and documents required for registration, Register's data management and use, the conditions of establishment and operation of ESCOs, the criteria governing the performance of their work, Code of Ethics of ESCOs on the principles and commitments that those registered ESCO businesses should meet in order to achieve the proper operation and correct development of the market<sup>64</sup>, etc.

**MD 13280/2011** was replaced by **MD 176381/2018** "Energy service companies. Energy Services, Registry and Code of Conduct of Energy service companies.", which determines the content of (i) the energy efficiency projects carried out by the companies in the Energy Service Companies Registry, (ii) the Energy Service Companies Registry itself and the process, the criteria and the necessary documents to register as well as establishes the Code of Ethics of ESCOs in order to achieve the smooth operation and the proper development of the energy service market<sup>65</sup>.

As a result, the Greek legislation is strongly influenced by the EC Directives, incorporating the majority of aspects that they cover. In brief, the forthcoming Greek Climate Law will focus on the following pillars:

- Increase of RES target
- Increase of EE target
- Higher requirements for buildings
- Renovation Wave

<sup>59</sup> Ministry of Environment and Energy, National Energy and Climate Plan: Greece, 2019.

<sup>60</sup> A. Botzios-Valaskakis, COUNTRY REPORT ON THE ENERGY EFFICIENCY SERVICES MARKET AND QUALITY, 2018.

<sup>61</sup> ΦΕΚ 232, Νόμος 3389/2005 : Συμπράξεις Δημόσιου και Ιδιωτικού Τομέα (In Greek), 2005.

<sup>62</sup> The European Code of Conduct for EPC defines the basic values and principles considered fundamental for the successful preparation and implementation of EPC projects. The Code of Conduct has been developed within the Intelligent Energy Europe project TRANSPARENSE in cooperation with EPC providers, clients and European ESCO associations, among others. In Greece, the European Code of Conduct for EPC has been translated into Greek within the framework of the TRANSPARENSE project and is available for use to all Greek Energy Service Providers.

<sup>63</sup> Ministry of Environment and Energy, Μητρώο Επιχειρήσεων Ενεργειακών Υπηρεσιών (In Greek), (2021).

<sup>64</sup> taxheaven.gr, Αριθ. Δ6/13280/7.6.2011 Επιχειρήσεις Ενεργειακών Υπηρεσιών. Λειτουργία, Μητρώο, Κώδικας Δεοντολογίας και συναφείς διατάξεις (In Greek), (2011).

<sup>65</sup> ΦΕΚ 2672, Αριθμ. ΔΕΠΕΑ/Γ/οικ. 176381 Επιχειρήσεις Ενεργειακών Υπηρεσιών. Ενεργειακές Υπηρεσίες, Μητρώο και Κώδικας Δεοντολογίας Επιχειρήσεων Ενεργειακών Υπηρεσιών (In Greek), 2018.

- European Recovery Fund

## 5.2.2 Greek Strategic Plans

Greece has legislated various laws, strategic plans and actions towards increasing the country's energy efficiency in buildings, small and medium-sized enterprises (SMEs), industry and other sectors. The existing framework for mandatory energy audits on large enterprises will promote similar audits on SMEs and households<sup>20</sup>. Furthermore, incentives will be established to implement the energy savings measures proposed through energy audits to oblige large enterprises, SMEs, and households. Moreover, new measures will be developed to support the implementation of energy management systems in SMEs in order to keep improving their energy efficiency, including the design and implementation of energy efficiency auctions measure, which was foreseen in the National Energy and Climate Plan. This measure is expected to focus on achieving final energy savings, making a significant contribution to achieving the objective of Article 7 of the Directive 2012/27/EU to improve energy efficiency. It will also provide financial support for energy-saving technical interventions in sectors with high potential, such as the industrial and tertiary.

More active involvement of stakeholders at local and regional levels will be ensured initially by drawing up both the Action Plans for Sustainable Energy and the Action Plans for Energy Efficiency of Buildings under the responsibility of regions and municipalities and then by implementing the proposed interventions with support from targeted financing programmes under regional operational programmes<sup>20</sup>. The focus should be given to actions aimed at ensuring that the energy communities scheme contributes both to the use of waste to produce electricity or biomethane for use in transport and the implementation of energy upgrading projects by the use of recyclable materials.

### 5.2.2.1 National Energy and Climate Plan

To promote energy efficiency over the period 2021-2030, the National Energy and Climate Plan (NECP) proposes the following policy priorities<sup>66</sup>:

- Improvement of energy efficiency of public buildings and exemplary role of the public sector - Improvement of urban public space microclimate.
- Strategy for the renovation of the building stock in the residential and tertiary sector.
- Promoting energy efficiency contracts by ESCOs.
- Promoting market mechanisms.
- Promoting innovative financial instruments to ensure private capital leverage and financial sector involvement.
- Improvement in energy efficiency and competitiveness of the industrial sector.
- Framework for the replacement of polluting passenger vehicles and goods vehicles.
- Developing infrastructure and plans for a shift in transport operations.
- Energy efficiency improvement of electricity and gas infrastructures.
- Promoting measures for modernising water supply/sewage and irrigation infrastructures
- Promoting efficient heating and cooling.

<sup>66</sup> Next Generation EU, Ελλάδα 2.0. Εθνικό Σχέδιο Ανάκαμψης και Ανθεκτικότητας (In Greek), 2021.

- Training/informing professionals and consumers on energy-efficient equipment and rational energy use.
- Decarbonization of electricity production

The energy savings potential related to the correct implementation of the EU legislative framework for eco-design and energy labelling of products will be best utilised through systematic controls of their implementation. Information actions on energy efficiency will also contribute to awareness-raising and, ultimately, encourage final consumers to adopt more rational energy use practices. Both are upgrading the role of EPCs - by looking into alternative ways of converting them into tailored roadmaps for the energy upgrading of buildings or building units - and developing new certification schemes for installers to ensure the proper implementation of energy savings interventions and the maximum utilisation of the options offered by the relevant technologies are expected to contribute to this direction.

In the industrial sector, new policy measures will support an industrial-business zone for better energy management and increased savings, such as central heat production and distribution systems<sup>20</sup>. Special financing mechanisms will be designed to strengthen the implementation of energy efficiency improvement measures in the industrial sector through EPCs, such as subsidising borrowing costs and facilitating access of energy services companies to financing.

The energy savings objective under Directive (EU) 2018/2002 on energy efficiency in the period 2021-2030 amounts to 7,299 ktoe of cumulative energy savings taking into account the obligation to achieve energy savings annually equal to 0.8% of the average final energy consumption of the 2016-2018 period. This energy savings objective will be attained by combining energy efficiency obligation schemes (EEOS) with a mix of alternative policy measures.

EEOS are considered a 'purchase subsidy' because they appear from the beneficiaries perspective when installing measures<sup>67</sup>. EEOS are the most widespread market mechanism that leads to the optimal implementation of energy efficiency improvement measures in terms of costs and results. EEOS will significantly contribute to attaining the objective under Article 7 in the period 2021-2030 by aiming to promote specific energy savings interventions to minimise the burden imposed on obliged parties. More specifically, EEOS will account for 20% of the total cumulative objective for the period 2021-2030.

The contribution of alternative policy measures to attaining this target will be significantly more remarkable, and the process for further specifying these measures is under way. A total of nine alternative policy measures will be implemented to cover the remaining part of the objective, reflecting the key policy priorities and the most crucial energy efficiency improvement measures, as follows:

#### Energy upgrading of residential buildings

- Energy upgrading of public buildings
- Energy upgrading of tertiary sector buildings and industrial plants
- Improvement in energy efficiency through ESCOs
- Energy managers in public buildings
- Energy upgrading of pumping equipment
- Energy upgrading of street lighting
- Development of transport infrastructures

<sup>67</sup> J. Rosenow, T. Fawcett, N. Eyre, V. Oikonomou, Combining of Energy Efficiency Obligations and alternative policies. ENSPOL. Report funded by the European Commission, 2015.

- Promotion of alternative fuels in transport

Additional horizontal actions contributing to the implementation of energy upgrades in the building sector are both the development of a common and open database and the establishment of a legislative framework for setting up innovative technology procurement groups, as well as the use of innovative digital models for the construction and management of buildings over their lifecycle. The database will aim to better identify the relevant savings potential of the projects under preparation and facilitate benchmarking between similar buildings through the available energy features of listed buildings and ex-post data of energy savings projects to mitigate the risk of relevant investments. Accordingly, the setup of innovative technology procurement groups will lead to lower costs for designing and implementing energy savings measures.

According to the NECP, successful financing programmes will be continued and adjusted to make them more cost-effective by increasing the levels of leverage and ensuring effective contribution towards protecting vulnerable social groups in the population. An effort will be launched in this direction for the energy upgrading of 12-15% of buildings and/or building units in the decade 2021-2030 through targeted policy measures designed and implemented in the context of the implementation of the NECP by 2030. Overall, the energy upgrading of the building stock is expected to increase added value by EUR 8 million and create and maintain over 22 thousand new full-time jobs.

#### 5.2.2.2 Long Term Renovation Strategy of the National Building Stock

The Long-Term Renovation Strategy (LTRS) for the renovation of the building stock aims to ensure the technical-financial analysis and determination of optimally efficient measures for attaining the high renovation rate set for the building stock<sup>68</sup>. Similarly to the NECP, the latest edition of the LTRS was submitted in March 2021<sup>69</sup> and suggested that the financing programmes for the renovation of both residential and tertiary sector buildings in the context of the new programming period will be implemented by adjusting and improving the existing financing model, with a view an increase in the existing leverage levels by beneficiaries.

In the new programming period, successful financing programmes for improving the energy efficiency of residential buildings will continue, and their operating framework will be duly modified by streamlining the incentives for maximising energy benefits while at the same time supporting households that are vulnerable in terms of finances and energy. Taking into account that the share of the Greek building sector in the country's energy consumption reaches 40%, the high scale renovation of the building stock is characterized as critical.

The LTRS objective concerns the energy upgrading of 12-15% of buildings and/or units within 2021-2030 through targeted policy measures.

Compared to this target, and in order for the building stock to be close to zero energy, the targets for 2050 must be significantly more ambitious. Policy instruments should therefore be of greater scope, namely:

- to apply strict standards for new buildings regarding the energy performance of the shell and

<sup>68</sup> Ministry of Environment and Energy, Report on the long-term strategy to mobilise investment in the renovation of private and public residential and commercial buildings in the national building stock, 2018.

<sup>69</sup> ΦΕΚ 974, Έγκριση της έκθεσης μακροπρόθεσμης στρατηγικής ανακαίνισης του δημόσιου και ιδιωτικού κτιριακού αποθέματος και μετατροπής του σε κτιριακό δυναμικό απαλλαγμένο από ανθρακούχες εκπομπές και υψηλής ενεργειακής απόδοσης έως το έτος 2050, σύμφωνα με την παρ. 2, 2021.

- to upgrade the old buildings and renovate them to a large extent. Almost all of the building stock in 2050 will be energy upgraded.

Because the pace of construction of new buildings is relatively small and based on historical data it is expected to show a low growth trend in the future. The energy upgrade of old buildings is of great importance.

In the case of public buildings, the redrafting of the financing model for energy upgrading actions has been completed. In contrast, in the case of other tertiary sector buildings, the focus will be given to adopting new smart technologies, and an effort will be made to achieve an optimal cost-benefit ratio and ensure equal access for all interested parties. Meanwhile, alternative financing mechanisms, such as EPC will be adopted.

Upgrading the role of energy managers of public buildings is expected to make a significant contribution, as a relevant clause will be added in financing programmes for the energy upgrading of public buildings. The electronic platform for monitoring the energy behaviour of buildings, which has been completed, aims to assist energy managers in carrying out their functions. The revision of the relevant regulatory framework seeks to upgrade its role to ensure the rational use of energy.

Continued improvement of the energy efficiency of public buildings will also be strengthened through the implementation of the Action Plans for Sustainable Energy and the Action Plans for Energy Efficiency of Buildings drawn up by regions and municipalities and supported by targeted financing programmes. The implementation of energy management systems will substantially contribute to this direction. In any case, a key priority for public buildings will be to promote measures and programmes that are technically feasible and optimal in terms of social costs and results.

In order to achieve the high energy saving rates, the LTRS notes that specific targets must first be set for the energy upgrading of the building envelope renovation. On the one hand, these interventions are more capital intensive and, on the other hand, contribute a more significant percentage to the final energy savings. In addition, interventions on the building envelope are accompanied by other benefits, such as improving the quality of life in the building and achieving thermal comfort conditions throughout the year.

At the same time, taking into account that especially in the domestic sector – which is also responsible for the largest share of final energy consumption in buildings – the rate of construction of new buildings is relatively low. It is expected to remain low in the future, the energy upgrading of old buildings is of great importance. Therefore, 23% of old residential buildings should already be upgraded by 2030, while this figure should be almost doubled by 2040 to reach 50% in 2050.

The new minimum requirements will be incorporated in the revised Regulation on Energy Efficiency Performance of Buildings (KENAK), and emphasis will be placed on increasing the number of NZEBs in accordance with the requirements of Directive 2010/31/EU. The adoption of new regulatory measures (also in the context of Directive 2010/31/EU, as amended by Directive (EU) 2018/844) will aim to elaborate an appropriate framework and create incentives for maximising the number of buildings that would exceed the minimum energy efficiency requirements. For example, the following regulatory provisions will be promoted:

- After 31 December 2023, all buildings housing public authorities must be classified under energy category B or higher based on the energy performance certificate.
- As of 1 January 2021, all new buildings or building units rented or purchased by central government bodies must be NZEBs (energy category A or higher).

- As of 1 January 2021, for each building or building unit available for sale or rent, the energy efficiency index shown in the energy performance certificate should be declared in all commercial advertisements.

Successful and efficient policy measures, such as the mandatory installation of solar thermal systems in new buildings and those undergoing a major renovation, will be continued and improved as appropriate. Finally, the new regulatory framework, coupled with tax, financial and town planning incentives, is expected to increase the pace of energy upgrading of private buildings.

In short, the LTRS sets the following timetable for the achievement of its targets:

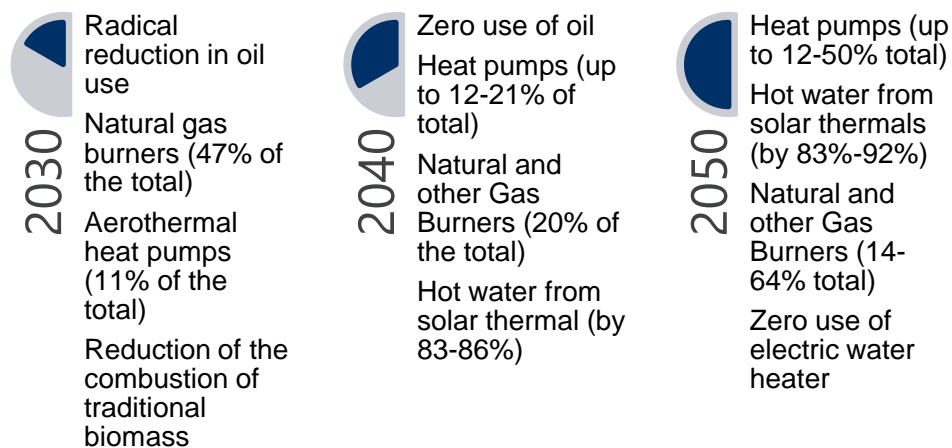


Figure 10: Timetable for the achievement of LTRS targets

### 5.2.2.3 National Energy Efficiency Action Plans (NEEAPs)

Under Directive 2006/32/EC, and by extension of Greek National Law 3855/2010, a NEEAP should be prepared every three years and submitted to the European Commission<sup>70</sup>. The NEEAPs are a practical demonstration and presentation of national obligations to the European Commission and provide a framework for developing a strategy at a national level to further improve energy end-use efficiency by implementing concrete measures and policies in the various energy end-use sectors<sup>71</sup>. The NEEAP seeks to translate the national indicative quantitative target for energy savings with specific measures and actions at the level set by each Member State while establishing a dialogue between the European Commission and the Member States. In this context, NEEAPs consist of useful policy tools for meeting the obligation of reporting to the EU on the applied and planned measures for energy end-use and savings achieved and as a national energy policy tool focusing on the improvement of energy efficiency.

According to the latest version of the National Energy Efficiency Action Plan (NEEAP – December 2017), the Ministry of Environment and Energy is responsible for the proper functioning of the energy services market and access to it for small and medium-sized enterprises<sup>72</sup>. It identifies and makes publicly available on its website contact points through which end-users can receive information on energy services. In addition, it shall take measures to remove regulatory and non-regulatory barriers to implementing projects with EPC and other energy efficiency services to identify and implement energy-saving projects.

<sup>70</sup> ΣΧΕΔΙΑ ΔΡΑΣΗΣ ΕΝΕΡΓΕΙΑΚΗΣ ΑΠΟΔΟΤΙΚΟΤΗΤΑΣ (ΣΔΕΑ) Ε.Ε. & ΕΛΛΑΔΑ (In Greek), n.d.

<sup>71</sup> CRES, Energy Efficiency trends and policies in Greece, 2018.

<sup>72</sup> Ministry of Environment and Energy, National plan for increasing the number of nearly zero-energy buildings, 2017.

#### 5.2.2.4 National Recovery and Resilience Plan

The primary consideration of the Recovery and Resilience Plan (RRP) is to cover the large investment, output and employment gap endemic to the performance of the Greek economy over the last decade, which deteriorated due to the current pandemic. Thus, the Greek RRP intends to mobilising significant private sector resources by (a) extensively using PPPs as a method of materialising public investments, (b) using ESCOs for the implementation of energy efficiency projects in the public sector, and (c) using co-financing through various financial instruments to leverage very significant additional private resources in the implementation of eligible private investments.

For the Green transition, the plan's investments and reforms include, among others, the installation of millions of smart telemetric energy meters, a massive programme of energy efficiency renovation for residential buildings, businesses and public sector buildings and infrastructure and the development of publicly accessible charging infrastructure for electric vehicles. The final version of the National Recovery and Resilience Plan<sup>6</sup> was submitted to the EC on April 27th, 2021. The Plan includes 106 investment programmes and 67 reforms utilising both private funds as well as funds from the Recovery and Resilience Facility for projects until the end of 2026. The establishment of the Energy Efficiency Fund is expected to facilitate the access of market actors to financing, help improve the cost-result indicator of the programmes implemented and allow for more effectively utilising the untapped potential for energy savings in specific sectors.

Specifically, “Component 1.1. – Power up of the RRP” (Greek title: Component 1.1 Transition to a new environmentally friendly energy model) aims to contribute to the climate and energy plans through a batch of investments and reforms that improve energy efficiency, energy storage and digitalise e-monitoring of energy consumption, including the implementation of smart metering sensors, etc., and “Component 1.2. – Renovate” (Greek title: Component 1.2 Energy upgrading of the country's building stock and spatial reform) includes reforms and investments that promote the renovation and energy upgrade of buildings and the implementation of urban planning. Regarding buildings, the component includes investments aiming at the renovation of the existing stock of buildings, including residential, commercial, industrial and public buildings as well as social infrastructure. Component 1.2 will contribute directly and indirectly to developing the national economy and the creation of new employment opportunities in multiple sectors. By providing incentives for energy renovation, the component favours the attraction of sustainable private capital flows, the creation of employment and the sustainable growth of multiple sectors while advancing the resilience of the Greek economy.

Table 25: Investments and Links to Reforms in response to the National baseline<sup>73</sup>

	National baseline	Investments	Reforms	Expected contribution to the achievement of EU objectives
<b>Component 1.1 – Power up</b>	<ol style="list-style-type: none"> <li>1. Grid congested areas where no new RES-e plant can be installed</li> <li>2. Limited on-site RES power generation at the building sector</li> <li>3. Coal-fired district heating systems and households exposed to energy poverty (regions in energy transition)</li> </ol>	<ol style="list-style-type: none"> <li>1. Upgrade electricity infrastructures to allow higher RES share and connection of new RES-e plants both at the transmission and distribution systems as well as through the interconnection of islands.</li> <li>2. Deploy smart electricity meters for the consumers in order to allow and enhance their role in the new electricity markets and to foster installation of on-site small-scale RES systems</li> <li>3. Enhance and improve the energy efficiency of district heating systems in the energy transition regions</li> <li>4. Allow the green transition by substituting fossil fuel products in energy consumption through the expansion of natural gas grids</li> <li>5. Hellenic Electricity Distribution Network Operator S.A. (HEDNO) network upgrades aimed at enhancing resilience and protecting the environment</li> <li>6. Upgrade of HEDNO's overhead network in forest areas</li> </ol>	<p>Ensure the sustainability of the national RES account for the operating aid support of RES generation through structural reforms and by addressing the covid-19 pandemic impact on the account's balance (also linked to ongoing national reforms non presented under NRRP that improve the RES licensing process, the RES auto-consumption scheme, the operation of RES in the electricity market as well as the regulatory adoption of grid development plans)</p>	<p>The Greek RRP is expected to contribute to:</p> <ol style="list-style-type: none"> <li>1. the development and completion of at least 3GW of new RES capacity, facilitated by the proposed reforms</li> <li>2. the installation of an energy storage capacity of 1.38GW</li> <li>3. the increase of the installed capacity in existing HV / MV substations of the electricity distribution network by 800 MVA, allowing the integration of a capacity of 1,755 MW of RES into the network</li> <li>4. the development of 150kV cables (approximately 353 km of submarine cables and c.20km of ground cables) for the interconnection of the Cyclades and the estimated reduction of CO2 emissions (by 99,562 tons / year from 2025 and by 120,808 tons / year in 2030)</li> </ol>
<b>Component 1.2 – Renovate</b>	<p>&lt;8000 energy renovations of residential buildings per year if no financing programme is in place (no foreseen national programme for the period 2021-2022)</p>	<ol style="list-style-type: none"> <li>1. Integrated investment activity that concerns the provision of incentives (grant and interest-free loan if the beneficiary households choose the latter) for the energy-efficient upgrade of the residential building stock (also linked with the power-up initiative as it foresees promoting the role of the active consumers</li> </ol>	<p>Linked to ongoing national reforms non presented under NRRP, like the recently adopted LTS and the operation of ESCOs in the public sector via energy efficiency contracts.</p> <ol style="list-style-type: none"> <li>1. Preparation of urban plans for the</li> </ol>	<p>By 2025, the residential energy upgrade program will contribute up to 15% to the NEC target with annual energy savings of 210 ktoe</p>

<sup>73</sup> Presidency of the Council of Ministers, National Recovery and Resilience Plan, (2021).

National baseline	Investments	Reforms	Expected contribution to the achievement of EU objectives
	<p>through the support for the installation of on-site RES power generation systems (PV), electricity storage infrastructure (batteries) and charging stations for electric vehicles, as well as the upgrade to a smart home, via the installation of smart energy management systems and devices.</p> <p>2. Dedicated measures with hybrid financial instruments also for companies in the secondary and tertiary sector, including the tourism sector, regardless of size, to improve their energy efficiency, promote the use of Renewable Energy Sources, and upgrade their competitive position by upgrading their competitive position investing in “green” development.</p> <p>3. Dedicated sub-measure for the energy renovation of public buildings and through the mobilisation of Energy Service Companies.</p> <p>4. Interventions in residential areas and buildings.</p> <p>5. Interventions in the Athens Olympic Sports Center.</p> <p>6. Infrastructure development and restoration of buildings in former royal estates in Tatoi</p>	<p>implementation of the urban policy reform</p> <p>2. Action Plan on energy poverty</p> <p>3. Creation of new maritime spatial planning</p> <p>4. Creation of a new specific spatial planning for RES, industry, tourism and aquaculture</p>	

### 5.2.2.5 National Plan for Increasing the Number of nearly Zero Energy Buildings

This report aimed to define nZEBs and describe the policies and actions that need to be adopted to increase their number according to the requirements laid down in Article 9 of Directive 2010/31/EU<sup>74</sup>. This national plan was prepared to meet the requirements laid down in Article 9 of the Directive and Law 4122/2013, as it is stated clearly that the Member States should draw up national plans for increasing the number of nZEBs. The national plan includes the following elements:

- the technical characteristics of nZEBs, reflecting national, regional or local conditions, and including a numerical indicator of primary energy use expressed in kWh/m<sup>2</sup>a per year;
- intermediate targets for improving the energy performance of new buildings;
- information on the policies and financial or other measures taken to promote nZEBs, including details of national requirements and measures concerning the use of energy from renewable sources in new buildings and existing buildings undergoing a major renovation.

### 5.2.2.6 National Plan for Energy Efficiency of Regional and Municipal buildings

According to this plan, potential options for filling the funding gap for energy efficiency projects in buildings of regions and municipalities are the operational programmes that could include the specific actions, the implementation of measures through financial mechanisms such as EPCs through ESCOs, PPPs or the implementation of projects through energy communities. Concerning the participation on behalf of the Municipalities or Regions, an apparent reference should be made regarding the available financial resources per year for energy upgrade of their building stock. Additional possible funding sources are the Infrastructure Fund of Funds, the Consignment Deposits and Loans Fund, and available EU funding and advisory mechanisms such as European Local ENergy Assistance (ELENA) and the Electra programme.

### 5.2.2.7 Regulation of Energy Performance of Buildings (KENAK)

Law 4122/2003 (Government Gazette, Series II, No 42, 19.2.2013) approved the KENAK<sup>75</sup>. The KENAK are a set of regulations that combine all the parameters affecting the energy performance of a building, namely its design, envelope and electrical and mechanical installations<sup>76</sup>. All new buildings with a total surface area of more than 50 m<sup>2</sup> and the existing ones are subject to major renovations. KENAK shall institutionalise integrated energy design in the building sector in order to improve the energy efficiency of buildings, energy-saving and environmental protection, with specific actions<sup>77</sup>:

- Determines the type and content of the necessary Energy Performance Study (EPS) of buildings and building units subject to deep renovation,
- Establishes minimum energy performance requirements of buildings,
- Classifies buildings in Energy Performance Certificates and determines the type and content of the Energy Performance Certificate (Building Energy Rating),

<sup>74</sup> Ministry of Environment and Energy, National plan for increasing the number of nearly zero-energy buildings, 2017.

<sup>75</sup> Technical Chamber of Greece, KENAK (in Greek), (n.d.).

<sup>76</sup> BPIE, Energy Performance Certificates across Europe from design to implementation, 2011.

<sup>77</sup> ANADRASIS, Regulation of Energy Performance of Buildings (KENAK), (2021).

- Sets up the procedure and frequency for the conduction of Energy Audits of buildings, boilers, heating and air conditioning installations.

In April 2021, the Technical Chamber of Greece reviewed its Technical Instructions related to energy projects in buildings and introduced new Technical Instructions. The institutionalisation of the new Technical Instructions will lead to a revision of the current KENAK, in accordance with the legislative and regulatory developments of the Ministry of Environment and Energy<sup>78</sup>.

According to article 8 of KENAK, in all new or deeply renovated buildings, it is mandatory to cover a significant part of the needs for hot water use by solar thermal systems<sup>79</sup>. The minimum percentage of the solar share on an annual basis is set at 60%<sup>80</sup>.

#### 5.2.2.8 Building Renovation Passports

The Building Renovation Passports have been launched in order to set the ground for promoting more concrete procedures in energy efficiency for buildings. In its most recent study, the BPIE proposes the evolution of Energy Performance Certificates (EPCs) into Building Renovation Passports, which are considered as EPCs 2.0, but also the perfect tools that lead to better building performance and more comfortable houses<sup>81</sup>. The Building Renovation Passport focuses on the combination of on-site technical energy audits and quality criteria that have been set, always in dialogue with the building owners. The result of this combination is a user-friendly long-term roadmap that building owners can use to plan their major renovation, gather all the relevant building information in one place and thus have a complete updated image of their building throughout its life, where among other things, there will be information about comfort levels, e.g., air quality, etc., but also possible access to financial instruments<sup>82</sup>. According to the iBRoad project<sup>83</sup> [30] stakeholder meetings, Greek stakeholders were positive toward adopting Building Renovation Passports in the Greek market<sup>84</sup>. At the same time, there are plenty of recommendations for introducing building renovation passports throughout the EU.

## 5.3 Market Architecture and Policy Frameworks

### 5.3.1 Capital Mobilisation for Energy Efficiency

Innovative and dedicated financing instruments will be designed to promote energy services more broadly and exploit the untapped potential for energy savings in specific sectors. The new financing instruments to be implemented will contribute primarily to the effective use of potentially available resources for improving energy efficiency and reducing carbon dioxide emissions. These include mobilising additional sources of funding from the Greek financial sector, the envisaged NEFF, or the Structural Funds in the context of the new programming period 2021-2027.

Innovative blended/hybrid finance programmes will be designed in cooperation with the domestic financial sector. These programmes will combine public and private financing on favourable terms to support energy efficiency improvement in specific sectors with high potential, such as the tertiary, domestic and industrial sectors. In this direction, new mechanisms will be considered, such as blended

<sup>78</sup> Technical Chamber of Greece, Ανοικτή Διαβούλευση για τις «ενεργειακές» Τεχνικές Οδηγίες ΤΕΕ (TOTE) (In Greek), (2021).

<sup>79</sup> Ministry of Environment and Energy, 4th National Energy Efficiency Action Plan of Greece, 2017.

<sup>80</sup> Χατζηλιόντος Χριστόδουλος, ΤΕΕ ΚΕΝΑΚ Manual - 6.3.7. Εγκατάσταση ηλιακού συλλέκτη (In Greek), (2020).

<sup>81</sup> M. Fabbri, M. De Groote, O. Rapf, Building Renovation Passports: Customised roadmaps towards deep renovation and better homes, 2016.

<sup>82</sup> Άλις Κοροβέση, Διαβατήρια Ανακαίνισης Κτιρίων - Η εξέλιξη των Πιστοποιητικών Ενεργειακής Απόδοσης (ΠΕΑ 2.0), (2017).

<sup>83</sup> iBRoad project, iBRoad Individual Building Renovation Roadmaps, (2021).

<sup>84</sup> Άλις Κοροβέση, ΔΙΑΒΑΤΗΡΙΑ ΑΝΑΚΑΙΝΙΣΗΣ ΚΤΙΡΙΩΝ (in Greek), in: Upgrad. Build. Conf., 2021.

financing on favourable terms ('blended' concessional loans), lease-financing, risk-sharing instruments such as combined insurance and guarantee instruments, as well as mechanisms focusing on aggregation. Financing instruments can be used by energy service companies that need financing to implement energy efficiency plans to manage repayment better, whereas consideration will also be given to extending their scope to include other sectors (SMEs).

This section describes financing instruments and programmes based on public and private funding. For public funding, the following schemes and programmes are presented: (i) ELENA, (ii) the National Energy Efficiency Fund, (iii) tendering procedures for energy savings, (iv) tax incentives, (v) the Partnership Agreement for the Development Framework 2021-2027, (vi) national programmes for residential and public buildings, (vii) national programme for transportation, (viii) national programme for the tertiary sector. For private funding, information about green Debt Financing, green corporate bonds and the ESCO market is provided.

### **5.3.1.1 Financing Instruments based on Public Funding**

In this section, Public European and National Instruments that are applied in Greece are presented. According to the NECP, all available resources will be mobilised at national and EU levels, including the structural funds. Particular emphasis will be placed on the energy upgrading of the building stock through EPCs and generally through PPPs. In addition, EU funding mechanisms exist that are applicable in Greece, such as the ELENA programme, as described in the following paragraphs.

### **5.3.1.2 ELENA – European Local ENergy Assistance**

ELENA supports the preparation of projects that improve energy efficiency and renewable energy use in buildings<sup>85</sup>. Eligible projects include energy efficiency in residential and non-residential buildings, building-integrated renewables (such as solar panels), public lighting, district heating (including combined heat and power plants and biomass boilers), smart grids.

The eligible sectors are the Public Sector (the EU Member States, Government organisations, Regional, local and municipal authorities, Public corporations, Financial institutions) and the Private sector (Private entities planning to develop and support eligible investments (associations, mixed public/private, banks etc.). Some other private associations are Eligible (social housing associations or homeowner associations).

ELENA supports the preparation of projects that improve energy efficiency and renewable energy use in buildings. Eligible projects include:

- energy efficiency in residential and non-residential buildings
- building-integrated renewables (such as solar panels)
- public lighting
- district heating (including combined heat and power plants and biomass boilers)
- smart grids

In Greece, there are a number of ongoing projects funded by ELENA.

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<sup>85</sup> European Investment Bank, ELENA – European Local ENergy Assistance, (2021).

Table 26: Ongoing Projects Funded by ELENA<sup>86,87</sup>

Improving Energy Efficiency in the Region of South Aegean	
Location of planned investments	Greece, Region of South Aegean
Final Beneficiary	Region of South Aegean
Sector(s) of investment	Energy efficiency in public lighting and public buildings
Total Project Development Services (PDS) cost	EUR 868 770
ELENA co-financing	EUR 780 851
PDS Timeframe	July 2019 to June 2022
Investment programme description	The Investment Programme consists of 2 schemes addressing energy efficiency measures in the regional and municipal street lighting network and implementation of Energy Efficiency Retrofits in Public Buildings, owned by the Region of South Aegean. The investments related to street lighting are planned to be implemented through PPP schemes, where private capital is used to co-fund public infrastructure projects. It is also possible to blend these fundings with some European Structural and Investment Funds under the so-called National Strategic Reference Framework (NSRF 2014-2020) in order to finance works related to pole replacement and electric system upgrade, if necessary. . Six hospitals were identified regarding the investments in buildings (Kos, Kalymnos, Leros, Rhodes, Syros and Naxos), and financing is expected to be ensured by NSRF 2014-2020 (regional funds) and by private investors, based on the energy performance contract.
INTEgrated sustainable enERgy ACTions and projects in Crete (INTERACT in Crete)	
Location of planned investments	Region of Crete, Greece
Final Beneficiary	Regional Authority of Crete
Sector(s) of investment	EE in non-residential buildings Renewable Energy Source
Total Project Development Services (PDS) cost	EUR 1,496,000
ELENA co-financing	EUR 1,346,400
PDS Timeframe	From Q1 2021 to Q4 2023
Investment programme description	The investments related to street lighting and public buildings are planned to be implemented through EPC/ESCO or PPP schemes where private capital is used to co-fund public infrastructure projects. It is also planned to blend these funding with European Structural and Investment Funds and State Funding in order to finance works for which the pay-back is not attractive enough to be included in the EPC contracts. The integrated Renewable Energy investments will be implemented through the setup of at least 4 Energy Communities. The PV panels will be used for self-consumption of the buildings, and the setup will provide the possibility of Virtual Net-metering in order to spread the benefits to more than one facility of each Land Reclamation Local Authorities concerned.

<sup>86</sup> European Investment Bank, ELENA Project Factsheet. Improving Energy Efficiency in the Region of South Aegean, (2019).

<sup>87</sup> European Investment Bank, ELENA Project Factsheet. INTEgrated sustainable enERgy ACTions and projects in Crete (INTERACT in Crete), (2020).

### 5.3.1.3 National Energy Efficiency Fund

The Ministry of Environment and Energy is promoting a new Fund for the utilisation, development and financing of new, innovative financial energy-saving tools, the National Energy Efficiency Fund<sup>20</sup> (NEEF). The establishment of the NEEF will significantly enhance the implementation of energy efficiency improvement measures in all energy consumption areas. More specifically, the NEEF is expected to facilitate the access of stakeholders to financing, to help improve the cost-result indicator of the programmes implemented and allow for more effectively utilising of the untapped potential for energy savings in specific sectors.

According to the Secretary-General of Energy and Mineral Resources, Ms Alexandra Sdoukou, the NEEF is expected to provide the basis for developing new financing tools, aiming to finance programmes and other measures for energy efficiency improvement and expand the market in energy services<sup>88</sup>. The Fund may serve as both a lending fund and a guarantee fund. Initially, part of the capital of the structural funds is expected to be transferred to the NEEF in order to support energy savings projects by considering the use of the revolving capital mechanism. The Fund's main activity can be to refinance loans from available funds from which loans are granted and in the context of which loan repayments are made and released. Using this mechanism, the NEEF can grant favourable loans to public authorities or ESCOs with a view to implementing savings projects. To make investment more attractive, available funds may be used to subsidise part of the project's cost or further improve the conditions for financing loans to ESCOs or public authorities. In total, 1700 million Euros will be targeted for the upgrade and the achievement of EE in buildings, including both residential and commercial buildings. Finally, advisory services are expected to be funded to identify potential savings and monitor projects to ensure proper results.

### 5.3.1.4 Tendering procedures for energy savings

Implementing a wholly new measure introducing tendering procedures for achieving energy savings is expected to significantly boost energy efficiency improvement by providing financial support for technical energy savings interventions in specific sectors with high potentials, such as the tertiary and industrial sectors. This measure will introduce tendering procedures to improve the cost-effectiveness of the technologies used and reduce the risk of measures implemented by third parties through project aggregation, i.e., the grouping of small individual projects.

The tendering procedures are expected to focus on final energy savings in the pilot application, thus significantly contributing to attaining the objective under Article 7. Provision is made for the tendering procedure to focus primarily on the interventions' cost-effectiveness and conform to clear-cut guidelines for calculating and verifying the energy savings achieved. Moreover, the measure will be highly flexible as it will be open to all domestic enterprises, while it is expected to increase the competitiveness of energy savings investment projects.

### 5.3.1.5 Tax incentives

Tax reliefs through the doubling of depreciation rates for fixed assets used in energy savings investment and tax exemptions through expenditure on the energy upgrading of buildings are going to be implemented toward promoting energy efficiency investments. The implementation of a wholly new measure introducing tendering procedures for achieving energy savings is expected to give a significant boost to energy efficiency improvement in specific sectors, such as the tertiary and industrial sectors. This measure will introduce tendering procedures to improve the cost-effectiveness of the technologies

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<sup>88</sup> [www.worldenergynews.gr](http://www.worldenergynews.gr), Α. Σδούκου: Νέο «εργαλείο» για χρηματοδότηση δράσεων εξοικονόμησης (In Greek), (2021).

used and reduce the risk of measures implemented by third parties through the grouping of small individual projects<sup>89</sup>.

### **5.3.1.6 Partnership Agreement for the Development Framework 2021-2027**

The planning of the Partnership Agreement for the Development Framework 2021-2027 (PADF 2021-2027) has been prepared by the Ministry of Development and Investments through the Special Strategy, Planning and Evaluation Service<sup>90</sup> of the National Coordination Authority<sup>91</sup> of the PADF. It has been submitted to the European Commission<sup>92</sup>. The implementation of the PADF 2021-2027 has started, and the consultation is in progress with the aim of achieving more efficient planning, faster approval and implementation of the actions.

The PADF 2021-2027 is divided into sectoral operational programmes and corresponding regional operational programmes classed by funding actions which include energy efficiency<sup>93</sup> [40]. Energy efficiency issues are integrated into the selected objective Greener Europe, including funding from the Cohesion Fund, which supports investments through specific national or regional programmes, and European Regional Development Fund, which provides funding to public and private bodies in all EU regions and supports investments through dedicated national or regional programmes.

### **5.3.1.7 “New Saving at home 2021” Programme for Residential Buildings**

The Programme consists of providing incentives for energy-saving interventions in the residential building sector in the context of the transition to an "Energy Efficient Home"<sup>94</sup>. The Programme concerns buildings with a building permit or other legal documents, which are used as the main residence and whose owners meet specific income criteria. Incentives are also provided for energy upgrading interventions in apartment buildings with applications for individual apartments that include shared and non-shared upgrading interventions. The budget of the Programme amounts to 632 million Euros. The Programme is funded by the Recovery and Resilience Facility and is distributed by the prefecture.

### **5.3.1.8 “Eksikonomo-Aytonomo” Programme for Residential Buildings**

The “Eksikonomo-Aytonomo” Programme is the new programme for energy upgrading and housing autonomy, which is the successor to the "Saving at Home" programmes, with a total budget of approximately 900 million euros<sup>95</sup>. The Programme provides incentives for energy-saving interventions and aims to enhance energy autonomy in the residential building sector in the transition to a "Smart Home"<sup>96</sup>. It concerns buildings with a building permit or other legal document used as the main residence and whose owners meet specific income criteria.

<sup>89</sup> CRES & INZEB, FACTSHEET Investments in Greece Policy Analysis and Market Assessment, 2021.

<sup>90</sup> Ειδική Υπηρεσία Στρατηγικής, Σχεδιασμού και Αξιολόγησης (ΕΥΣΣΑ) (In Greek), (n.d.).

<sup>91</sup> Γενική Γραμματεία Δημοσίων Επενδύσεων και ΕΣΠΑ, Εθνική Αρχή Συντονισμού (In Greek), (2009).

<sup>92</sup> Γενική Γραμματεία Δημοσίων Επενδύσεων και ΕΣΠΑ, Σχεδιασμός ΕΣΠΑ και Επιχειρησιακών Προγραμμάτων 2021-2027 (in Greek), (2021).

<sup>93</sup> Ministry of Development and Investments, Partnership Agreement for the Development Framework 2021-2027, 2021.

<sup>94</sup> Ministry of Environment and Energy, ΠΡΟΔΗΜΟΣΙΕΥΣΗ ΟΔΗΓΟΥ ΕΦΑΡΜΟΓΗΣ ΠΡΟΓΡΑΜΜΑΤΟΣ «ΝΕΟ ΕΞΟΙΚΟΝΟΜΩ», 2021.

<sup>95</sup> Ministry of Environment and Energy, ΕΞΟΙΚΟΝΟΜΩ - ΑΥΤΟΝΟΜΩ, (2020).

<sup>96</sup> Ministry of Environment and Energy, ΟΔΗΓΟΣ ΕΦΑΡΜΟΓΗΣ ΠΡΟΓΡΑΜΜΑΤΟΣ «ΕΞΟΙΚΟΝΟΜΩ – ΑΥΤΟΝΟΜΩ» (In Greek), 2020.

### 5.3.1.9 ELEKTRA programme (2019 – 2025) for Public Buildings

Improving the energy efficiency of public buildings through EPCs and generally through PPPs will be one of the key policy measures in the following period. Therefore, an immediate priority is to adjust the relevant framework of support financing programmes and structures to address further the technical and administrative difficulties detected and develop energy services in public buildings.

A significant contribution to the above pursuits will be made by the redrafted ELEKTRA programme, consisting of financing energy efficiency interventions in general government buildings, including participation in the implementation of interventions by energy service companies through energy performance contracts.

Furthermore, the "Saving in the public sector" programme is expected to lead to significant energy savings that currently burden the state budget<sup>97</sup>. 200 million euros will be provided for renovation and energy upgrade of infrastructure and public buildings as well as local government and energy upgrade of street lighting, with the partnership of the private sector.

The key aim of the programme is to create attractive and sustainable energy upgrade investments for the buildings used by public bodies (general government bodies) by effectively leveraging funds from both the private and public sectors<sup>98</sup>. More specifically, the ELEKTRA programme strengthens the energy upgrading of public buildings by financing part of the required investments through investment loans, which the programme will repay. It also provides for the participation of energy service companies, whereas payments to them, in the context of energy performance contracts, are guaranteed through securities. The programme is funded by the Consignment Deposits and Loans Fund, and its total budget is 500 million euros.

### 5.3.1.10 "Saving for Businesses" Programme

This programme provides support to private companies for energy efficient renovations of buildings and their operating procedures. The action includes two sub-programmes depending on the size of the business. The first sub-programme concerns energy savings for large and substantial enterprises in the secondary and tertiary sectors, and the second sub-programme targets the supply and installation of energy efficient equipment for very small enterprises<sup>99</sup>. The amount of the subsidy is determined by the type of eligible expenditures, the area in which the company operates and its size. The energy interventions that will be implemented in the companies must ensure the reduction of greenhouse gas emissions by at least 30% compared to their current situation.

The total cost of the investment is estimated at 947.5 million euros, of which 450 million euros will come from the RRF and the remaining 497.5 million euros from the private sector<sup>100</sup>. The implementation phase will last about three years, after the evaluation and approval of the applications, and the programme is estimated to be completed in the fourth quarter of 2024. The Greek plan stipulates that at least 9,700 companies (8,500 very small and 1,200 medium, large and very large) in various productive sectors such as tourism, agri-food, etc., and private offices and commercial buildings with these funds will be upgraded.

<sup>97</sup> ecopress, Ξεκλειδώνουν οι δράσεις του Ταμείου Ανάκαμψης για ενεργειακή εξοικονόμηση (in Greek), (2021).

<sup>98</sup> Hellenic Agency for Local Development and Local Government, ΗΛΕΚΤΡΑ: Πρόγραμμα Ενεργειακής Αναβάθμισης Δημόσιων Κτιρίων (in Greek), (n.d.).

<sup>99</sup> tovima.gr, «Εξοικονομώ» για επιχειρήσεις: Πότε θα ανοίξει η πλατφόρμα και ποιους αφορά (In Greek), (2021).

<sup>100</sup> newmoney.gr, «Εξοικονομώ»: Πότε έρχεται ο οδηγός στο πρόγραμμα για επιχειρήσεις (In Greek), (2021).

### 5.3.1.11 “Kinoume Ilektrika” programme for Transportation

The implementation of infrastructure projects in the field of road and rail transport, combined with the drafting of plans for a shift in commercial transport operations, is expected to significantly improve energy efficiency in the sector. Sustainable urban mobility plans will play a significant role in improving energy efficiency in the transport sector by incorporating circular and cooperative economy principles. Sustainable urban mobility plans will cover all modes and means of transport, including public transport and active modes of travel, such as walking and cycling, and shared means of movement and smart mobility. On a complimentary basis, targeted actions, such as bioclimatic restructuring programmes, will be launched in conjunction with sustainable urban mobility plans.

Furthermore, priority will be given to the definition of a compulsory quota of vehicles with higher energy efficiency in public agencies and organisations by setting higher energy efficiency limits, while at the same time making plans for upgrading public transport by the use of new technology vehicles to the extent that this is efficient in financial, technological and energy terms. Finally, the replacement of passenger vehicles and light goods vehicles with new high energy efficiency ones will be promoted through a combination of measures such as planning a targeted programme for passenger vehicle scrapping, putting in place a more effective legislative framework to link vehicle taxation to energy efficiency and CO<sub>2</sub> emissions, and implementing a broader financing programme for the replacement of public and freight vehicles with low-emission ones.

The purpose of this action is to define the terms, conditions and procedures for strengthening the market for electric or hybrid electric vehicles (with a CO<sub>2</sub> emission limit of 50 g/km), including bicycles and tricycles with the possibility of withdrawing (or replacing) an old vehicle, as well as the purchase and installation of infrastructure for charging electric vehicles at home<sup>101</sup>. The total Public Expenditure of the action is 45.8 million euros<sup>102</sup>.

## 5.3.2 Private funding

Many energy efficiency renovations of the building stock are implemented on a one-off basis by the property owner, either as part of more general renovations to the property or as separate renovations to improve its energy performance. In cases where energy efficiency improvements are funded entirely by the owner, it is not always easy to raise the initial capital required. The difficulty in raising the initial capital is exacerbated by the difficulty in obtaining loans from financial institutions, especially in the current economic climate and Greece, where renovations to improve the energy performance of buildings are still not appreciated. Private funding also includes investment via ESCOs, a vehicle to promote, manage, fund, and monitor energy efficiency projects and, more importantly, eliminate the economic barriers to energy-saving interventions. According to the LTS, this method for implementing and funding energy projects is expected to play an important role, especially in renovating public buildings and infrastructure and hospitals, hotels and other energy-intensive buildings.

### 5.3.2.1 Green Debt Financing

Greek Banks have widely demonstrated interest in providing Green Loans and sustainable debt products to end customers, SMEs and other legal entities. According to the banks' corporate presentations to investors, the largest Greek Banks have a well-planned baseline scenario with new Green financing products and options.

<sup>101</sup> Ministry of Environment and Energy, Κινούμαι Ηλεκτρικά, (2020).

<sup>102</sup> ΦΕΚ 3323, Προκήρυξη της δράσης «ΚΙΝΟΥΜΑΙ ΗΛΕΚΤΡΙΚΑ» (In Greek), 2020.

Furthermore, another Greek Bank - the Alpha Bank - has already financed investments with a green and social footprint, while it has designed special products for that reason, also incorporating into its corporate transformation the principles of the ESG financing<sup>103</sup>. The series of these Green Solutions will finance the energy upgrade of the building stock to a degree of 80% of the value of the property and up to 100% of the purchase contract, with a minimum amount of 10,000 euros and a repayment duration of 5 to 35 years. Also, green solutions are extended to consumer loans with a repayment period from 6 to 96 months and amounts from 1,500 euros to 30,000 euros. Alpha Bank has also been involved in large infrastructure sustainable projects, such as constructing three waste management units in the Peloponnese, which is the largest of its kind in the country.

One of the largest Greek Banks, Piraeus Bank, is planning new financing products that will exceed €5 billion in 2022, aiming to support the Green Economy. The bank provides standardized products, such as the "Green Consumer Loan for Green Purchases", which finances green household equipment or the purchase of electric vehicles with a financing rate of up to 100% of the expenditure and for amounts from 1,500 euros to 20,000 euros. Another similar product is the "Consumer Loan Green for Green Retrofits" for the purchase or repair/upgrade of a house under mortgage loan terms with many options for repayment period and interest rate. Piraeus Bank has also proceeded in incorporating ESG criteria and ambitious targets in specific financing contracts, focusing on the improvement of the ESG performance of its customers. Other Greek Banks are expected to provide relevant financing solutions in short time. Piraeus Bank is one of the 30 banks worldwide and the first from Greece to participate in the formation of the Principles for Responsible Banking in the framework of the United Nations Environment Programme Finance Initiative.

In addition, the Greek institution of Eurobank Asset Management is also stirring towards sustainable financing for large private sector infrastructure and the retrofits of households. Its fixed programmes are the "Green Home Loan - Energy Saving", which is given without collateral up to the amount of 15,000 euros and with collateral for more significant amounts. The loan duration depends on the borrower's financial data and the existence of collateral, which ranges between 2 and 30 years. At the same time, Eurobank is implementing an investment programme of €500 million. Euro for the energy upgrade and the exploitation of 6,000 properties in its portfolio with a total value of €2.1 billion, with a horizon of 2022. The aim is to upgrade an ageing building stock based on international standards and trends for green development, sustainability and energy upgrading of buildings. Also, the aim is to exploit through renting, selling and listing to increase its profitability and capital through capital gains.

In Greece, except for financing products for individuals, partnerships have arisen between banks in order to fund significant infrastructure projects, such as that of Hellinikon with Eurobank and the support of the development of the Greek Electricity System, through the investment program of the Greek Independent Power Transmission Operator, with the issuance of a syndicated loan of 400 million euro from National Bank of Greece, Piraeus Bank, Alpha Bank and Bank of China.

### 5.3.2.2 Green Corporate Bonds

In Greece, the issuance of "green" corporate bonds began in 2019. Up to date, several green corporate bonds have been issued by companies, raising a total of 2.62 billion euros<sup>104</sup>. In addition, the Greek Government has announced the issuance of a government Green Bond by 2022. The bond will be fully

<sup>103</sup> [naftemporiki.gr](https://www.naftemporiki.gr), Η συμβολή των Τραπεζών στην προώθηση της βιώσιμης ανάπτυξης - Χρηματοδοτικά προϊόντα (In Greek), (2021).

<sup>104</sup> Τα «πράσινα» εταιρικά ομόλογα κερδίζουν έδαφος και στην Ελλάδα, (n.d.). <https://m.naftemporiki.gr/story/1768109/ta-prasina-etairika-omologa-kerdizoun-edafos-kai-stin-ellada> (accessed November 10, 2021).

aligned with the principles of the EU Taxonomy, and the capital that will emerge will be used to finance projects, actions and programmes oriented exclusively towards green and sustainable economic growth.

In addition, the Greek Ministry of Finance plans to roll out a package of measures that will encourage companies to proceed with the issuance of Green Bonds. These measures include Tax Reduction (e.g., by 50%) and Tax Incentives (such as reduced capital accumulation tax, coupons, dividends) for the purchase of Green Bonds and shares, applicable to Green SMEs listed on the Athens Stock Exchange. Furthermore, the subsidy of Green Bonds and shares to cover the additional costs of external environmental sustainability verification is also considered, along with providing guarantees to banks or collective investment schemes, such as insurance funds and insurance companies, to support sustainable investments. In order to avoid Greenwashing, the Greek Government will define a list of strategic private Green Investments based on clear criteria in line with the recommendation and criteria of the EU Taxonomy.

The response of the Greek private financing sector has been immediate. However, the National Bank of Greece has already issued a 500 million euro Green Bond with a yield of 2.75% ending in October 2025. Two Greek institutional banks, Eurobank and Piraeus Bank, have already formed a green framework<sup>105,106</sup>, which take provision metrics for high energy efficiency buildings and high energy performance interventions in buildings. In October 2021, Piraeus Bank successfully completed the book building process for the issuance of a €500 million Green Senior Preferred Bond. That bond will be linked to several energy projects that belong to the bank's portfolio, such as the electrical interconnection of Crete and the largest Greek Wind Farm (Kafireas).

### 5.3.2.3 ESCOs

The Greek Government provides an online registry of Greek ESCOs, in which more than 60 ESCOs are already included. These ESCOs are not located only in the Greek capital of Athens, but many of them are scattered around the Greek territory, which demonstrates diversity and interest in the ESCO funding. These companies provide services regarding installing High Efficiency Led luminaires that ensure a higher quality luminaire result with energy savings of more than 65%, Smart Energy Monitoring & Management, Studies and implementation of energy production projects from RES. and Support for Energy Communities.

## 5.3.3 Triple-A Sector Specific Schemes

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided. The EE projects are linked to the schemes in the overview table at the end of the chapter.

### 5.3.3.1 (1) Buildings:

#### Regulation

There are many rules and regulations, or policy interventions, in the building sector impacting the renovation of old and construction of new buildings. A summary of the most impactful interventions related to the Triple-A projects is provided in Table 27.

<sup>105</sup> Eurobank, Eurobank Green Bond Framework, (2021) 1–23. <https://www.eurobank.gr/-/media/eurobank/omilos/enimerosi-ependuton/enimerosi-metoxon-eurobank/pistotikoi-titloi/green-bond-framework/green-bond-framework.pdf>.

<sup>106</sup> Piraeus Bank successfully priced its inaugural Green Senior Preferred Bond amounting to €500mn, (n.d.). <https://www.piraeusholdings.gr/en/press-office/announcement/2021/10/announcement-27-10-2021> (accessed January 17, 2022).

Table 27: Overview of policy interventions in the building sector

Title:	Concerning:	Description:	Source:
Law 3855/2010	Existing & New construction	Measures to improve energy efficiency in end-use, energy services and other provisions	<a href="#">link</a>
Law 4122/2013	Existing & New construction	Energy Performance of Buildings - Harmonization with Directive 2010/31/EU of the European Parliament and of the Council and other provisions.	<a href="#">link</a>
Law 4342/2015	Existing and new constructions	On energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC", as amended by Council Directive 2013/12/EU of 13 May 2013 "Adapting Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, due to the accession of the Republic of Croatia" and other provisions.	<a href="#">link</a>
Law 3389/2005	Existing and new constructions	Assists the public sector to overcome the prohibition to employ a private body to operate and manage public establishments' building energy services infrastructure. It allows multi-year concession contracting for the installation, operation and maintenance of energy-efficient equipment in buildings.	<a href="#">link</a>
National Code of Conduct of Ministerial Decision 13280/2011	Existing and new constructions	Implements the existing legislative framework and fixes all relevant issues related to the development and activation in the Greek market of Energy Service Companies (ESCOs).	<a href="#">link</a>
MD 176381/2018	Existing and new constructions	Replaces MD 13280/2011. Determines the content of (i) the energy efficiency projects carried out by the companies in the Energy Service Companies Registry, (ii) the Energy Service Companies Registry itself and the process, the criteria and the necessary documents to register as well as establishes the Code of Ethics of ESCOs in order to achieve the smooth operation and the proper development of the energy service market	<a href="#">link</a>
Regulation of Energy Performance of Buildings (KENAK)	Existing and new constructions	The KENAK are a set of regulations that combine all the parameters affecting the energy performance of a building, namely its design, envelope and electrical and mechanical installations. All new buildings with a total surface area of more than 50 m <sup>2</sup> and the existing ones are subject to major renovations.	<a href="#">link</a>

### Support schemes

The following table provides samples of policies and measures implemented in the **building sector**. The main ones are the Federal funding for efficient buildings and the tax incentives for energy-related building renovations.

Table 28: Overview of support schemes in the building sector

Title	Description	Source
<b>National Energy Efficiency Action Plans (NEEAP) I &amp; II</b>	The NEEAPs are a practical demonstration and presentation of national obligations to the European Commission and provide a framework for developing a strategy at a national level to further improve energy end-use efficiency by implementing concrete measures and policies in the various energy end-use sectors	<a href="#">link</a>
<b>National Energy and Climate Plan</b>	Concerning the period 2021-2030, the National Energy and Climate Plan (NECP) proposes, among others, the main policy priorities regarding the improvement of energy efficiency of public buildings, strategies for the renovation of the building stock in the residential and tertiary sector, promotes energy efficiency contracts by ESCOs, market mechanisms, innovative financial instruments to ensure private capital leverage and financial sector involvement.	<a href="#">link</a>
<b>Long Term Renovation Strategy of the National Building Stock</b>	The Long Term Renovation Strategy (LTRS) for the renovation of the building stock aims to ensure the technical-financial analysis and determination of optimally efficient measures for attaining the high renovation rate set for the building stock	<a href="#">link</a>
<b>National Recovery and Resilience Plan</b>	It intends to mobilising significant private sector resources by (a) extensively using PPPs as a method of materialising public investments, (b) using ESCOs for the implementation of energy efficiency projects in the public sector, and (c) using co-financing through various financial instruments to leverage very significant additional private resources in the implementation of eligible private investments.	<a href="#">link</a>
<b>National Plan for Increasing the Number of nearly Zero Energy Buildings</b>	Aims to define nZEBs and describe the policies and actions that need to be adopted to increase their number, according to the requirements laid down in Article 9 of Directive 2010/31/EU.	<a href="#">link</a>
<b>National Plan for Energy Efficiency of Regional and Municipal buildings</b>	Targeted in filling the funding gap for energy efficiency projects in buildings of regions and municipalities are the operational programmes that could include the specific actions, the implementation of measures through financial mechanisms such as EPCs through ESCOs, PPPs or the implementation of projects through energy communities.	<a href="#">link</a>
<b>ELENA – European Local Energy Assistance</b>	ELENA supports the preparation of projects that improve energy efficiency and renewable energy use in buildings. Eligible projects include energy efficiency in residential and non-residential buildings, building-integrated renewables (such as solar panels), public lighting, district	<a href="#">link</a>

	heating (including combined heat and power plants and biomass boilers), and smart grids.	
<b>National Energy Efficiency Fund</b>	NEEF will enhance the implementation of energy efficiency improvement measures in all energy consumption areas. More specifically, the NEEF is expected to facilitate the access of stakeholders to financing, to help improve the cost-result indicator of the programmes implemented and allow for more effectively utilising of the untapped potential for energy savings in specific sectors.	<a href="#">link</a>
<b>Partnership Agreement for the Development Framework 2021-2027</b>	In the PADF, energy efficiency issues are integrated, including funding from the Cohesion Fund, which supports investments through specific national or regional programmes. The European Regional Development Fund, which provides funding to public and private bodies in all EU regions support investments through dedicated national or regional programmes.	<a href="#">link</a>
<b>“New Saving at home 2021” Programme for Residential Buildings</b>	The Programme consists of providing incentives for energy-saving interventions in the residential building sector in the context of the transition to an “Energy Efficient Home”. The Programme concerns buildings with a building permit or other legal documents, which are used as the main residence and whose owners meet specific income criteria.	<a href="#">link</a>
<b>ELEKTRA programme (2019 – 2025) for Public Buildings</b>	Improving the energy efficiency of public buildings through EPCs and generally through PPPs will be one of the key policy measures in the following period. Therefore, an immediate priority is to adjust the relevant framework of support financing programmes and structures to address further the technical and administrative difficulties detected and develop energy services in public buildings.	<a href="#">link</a>
<b>“Saving for Businesses” Programme</b>	This programme provides support to private companies for energy efficient renovations of buildings and their operating procedures. The action includes two sub-programmes depending on the size of the business.	<a href="#">link</a>

### 5.3.3.2 [\(2\) Industry](#)

No related sector-specific subsidy schemes or regulations concerning the industry sector were identified in the Triple-A project for Greece; hence there is nothing to be reported under this category.

### 5.3.3.3 [\(3\) Transportation](#)

No related sector-specific regulations concerning the transportation sector were identified in the Triple-A project for Greece; however, one support scheme has been identified and listed in the table below.

Table 29: Overview of support schemes in the transportation sector

Title	Description	Source
<b>“Kinoume Ilektrika” programme for Transportation</b>	The implementation of infrastructure projects in the field of road and rail transport, combined with the drafting of plans for a shift in commercial transport operations, is expected to improve energy efficiency in the sector significantly <sup>20</sup>	<a href="#">link</a>

#### 5.3.3.4 (4) District Energy Networks

No related sector-specific subsidy schemes or regulations concerning the District Energy Networks sector were identified in the Triple-A project for Greece; hence there is nothing to be reported under this category.

#### 5.3.3.5 (5) Outdoor Lighting

No related sector-specific subsidy schemes or regulations concerning the outdoor lighting sector were identified in the Triple-A project for Greece; hence there is nothing to be reported under this category.

## 5.4 Triple-A partners in Greece



**EPU-NTUA** is a multidisciplinary scientific unit within the School of Electrical and Computer Engineering, which conducts research and development, scientific / technical support and training activities addressing a wide range of complex research and application problems. EPU-NTUA has a long tradition in research activities in the areas of management and decision support for energy efficiency investments, financial engineering & modelling, policies/strategies and planning at national & community level, climate change and sustainable development

**Web:** [www.epu.ntua.gr](http://www.epu.ntua.gr)



**UPRC** is among the oldest and most prestigious business schools in Greece currently running Departments covering the fields of Economics, Business Administration, Industrial Management, Financial Management and Banking, Statistics and Insurance Science, Maritime Studies, Informatics and International and European Studies. A primary scope of TEESlab is the provision of knowledge, skills and tools in matters that integrate business and technology. In this respect, TEESlab employs a collection of approaches and tools to enable the quantitative and the qualitative assessment of critical issues (policies, market tools, financing schemes etc.) governing the evolution of the energy system.

**Web:** <https://teeslab.UPRC.gr/>



**PB** leads a group of companies covering all financial activities in the Greek market. PB possesses particular know-how in the areas of medium-sized and small enterprises, in agricultural banking, in consumer and mortgage credit and green banking, capital markets and investment banking, as well as leasing and factoring. Since 2004, PB Group, guided by its integrated environmental policy, has created an extensive range of specialised green products and services. The aim of these products is to finance innovative investments by promoting emerging green technologies in all sectors of green entrepreneurship PB is the only bank in Greece, which takes advantage of Private Finance for Energy Efficiency (PF4EE) Instrument, provided by the European Investment Bank (EIB) in collaboration with the LIFE programme.

**Web:** [www.piraeusbank.gr/en](http://www.piraeusbank.gr/en)

## 6 Italy

### 6.1 Country's Overview

Compared to some of the other Triple-A case study countries' governments, the Italian government is only recently starting to put more attention on renewables and energy efficiency. With the launch of the Next Generation EU (NGEU) program in 2020, the EU provided a huge number of financial resources to accelerate its growth. The NGEU initiative channels significant resources to countries such as Italy, which, although characterised by levels of GDP in line with the EU average, have recently suffered from low economic growth and high unemployment. This money is being used by the Italian government within the PNRR (Piano Nazionale di Ripresa e Resilienza) to provide financial aid to the entities interested in a green and sustainable transition.

The Italian plan belongs to an unprecedented, coordinated EU response to the COVID-19 crisis to address common European challenges by embracing the green and digital transitions, to strengthen economic and social resilience. The Commission's assessment finds that Italy's plan devotes 37% of total expenditure on measures that support climate objectives. The plan includes investments to finance a large-scale renovation programme to increase buildings' energy efficiency and provides measures to promote the use of renewable energy sources, including hydrogen. It also places a special emphasis on reducing greenhouse gas emissions from transportation with investments in sustainable urban mobility and railway infrastructure.

The Plan is divided into 6 Missions, which representing the structural "thematic" areas of intervention<sup>107</sup>.

- Digitalization, innovation, competitiveness, culture and tourism
- Green revolution and ecological transition
- Infrastructure for sustainable mobility
- Education and Research
- Inclusion and Cohesion
- Health

#### 6.1.1 Italian stakeholder overview & Analysis

In the context of the Triple-A European project, GFT Italia acts as the National Leader for the Italian case study, coordinating the stakeholders' network for the contribution to the methodology and projects pipeline: more in detail, a consultation process with more than 100 stakeholders has been realised in order to engage national stakeholders, through bilateral discussions, questionnaires, country meetings, webinars, training sessions and information request.

The below table gives an indicative example of the Italian Triple-A figures regarding the stakeholder engagement.

<sup>107</sup> Piano Nazionale di Ripresa e Resilienza, Italia Domani, <https://www.governo.it/sites/governo.it/files/PNRR.pdf>

**Table 30: Overview of Italian Stakeholders' activity**

What happened in Italy?	#
No. of in Country meetings with stakeholders	23
External participants involved in bilateral discussions	33
Investor Preference Questionnaire responses	2
Stakeholder Questionnaire responses	3
General outreach to individual contacts	~100
<b>Triple-A Country Webinar participants:</b>	<b>5</b>
A - Financing bodies	-
B - Companies / Project developers	5
C - Policy makers and Policy support Institutes	0
D - Researchers and Academia	-
E – Other	-
Off-line webinar views	0
<b>Triple-A Regional Training Workshop participants:</b>	<b>18</b>
A - Financing bodies	2
B - Companies / Project developers	16
C - Policy makers and Policy support Institutes	-
D - Researchers and Academia	-
E – Other	-
Off-line webinar views	0

Among the different institutions that took part in the consultation process, the following ones have provided the identified Triple-A project investments:

- Seacsub S.p.A., Genova (Italy)<sup>108</sup>, is an equipment manufacturing company for diving which has been a benchmark in the dive industry since 1971.
- Benetutti Municipality, Sassari (Italy), is an Italian town of 1737 inhabitants in the province of Sassari, Sardinia, Italy, active in the Smart City sector.

<sup>108</sup> <https://www.seacsub.com/it/>

- UpNET, Bari (Italy) is a company founded with the aim of developing new activities and technologies for the management, maintenance (preventive and corrective), technological adaptation and / or updating and security of terrestrial telecommunications networks, exploiting the know-how of the partners. constituents in the management and maintenance of infrastructures and telecommunications networks.
- Enerbrain, Torino (Italy) <sup>109</sup>, is a company developing IoT technology and Artificial Intelligence for buildings' sustainability, comfort, and efficiency. Thanks to hardware and software technology, Enerbrain optimizes energy consumption for air conditioning, improving environmental comfort and reducing CO2 emissions.

In general, most of our stakeholders cooperating with the Triple-A projects pipeline have reported positive feedback regarding the Triple-A Tools by providing some interesting suggestions for improving the platform. For example, the option to keep the projects "private" is required because of the sensitivity of information (even when it is anonymized) about some stakeholders' projects and the possibility of storing a draft version of the project inserted in the Assess/Agree Tools, so that it could be completed at a later stage.

### Bilateral Meetings with Italian Stakeholders

In Italy, the Triple-A project boosted the interest among different kinds of energy efficiency stakeholders, from companies to policy makers, from municipalities to financial institutions, who want to know innovative methodologies and technological tools to meet project ideas with concrete financing systems. As a result of the bilateral meetings with the stakeholders in order to further disseminate Triple-A and its outcomes, main findings and learnings emerged:

- An issue has been raised with regards to the upload of sensitive information from client projects to the Triple-A on-line tools, due to restrictions about client information, even if anonymised.
- In general, there is a need for more flexible financial systems for implementing EE projects.

Some more specific feedback:

- Energy efficiency financing tools for the smart grid decision support and management, including public illumination have great potential for municipalities, public building, and Smart Grid.
- It is interesting to explore the possibility developing on-demand one or more modules of the energy efficiency financing tools.
- These tools flexibility and modularity are good options managing different aspects of energy management and efficiency, including outdoor lighting.

### Capacity Building Webinar with Italian Stakeholders – 29 June 2021

[Triple-A Capacity Building Webinar in Italy | Triple-A \(aaa-h2020.eu\)](https://triple-a.eu/triple-a-capacity-building-webinar-in-italy)

The main focus of the discussion during the Italian Capacity Building Webinar was identifying which investments can foster sustainable growth while also having the capacity to meet their commitments from the first stages of investment generation, an objective that remains a severe challenge in the European context.

During the session the following topics will be addressed:

- The EU Taxonomy Regulation sets the stage and allows discussing and comparing projects through a uniform language.

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<sup>109</sup> <https://www.enerbrain.com/>

- The Risk and Mitigation strategies to assess potential future investments.
- An overview of Financial Instruments available that minimize risk and maximize project potential.

The feedback coming from the event was mainly addressed to the **Triple-A tools**, for example:

- There was a general interest in innovative financing schemes among the attendees.
- Attendees expressed interest in following the Triple-A projects results and collaborating with it.
- Attendees were interested in the possibility of using the toolbox starting only from a preliminary project idea.
- Attendees were concerned about the management of sensitive information on the tools, especially the Agree Tool.
- Attendees showed interest in the standardised and automatic tools to close the financing agreement, rather than only a means to bring the parties together.
- Attendees asked for more information about the timescales to define a contract between a project and a lender and were interested in a future option to close a contract.

Finally, to increase the number of participants from the financing community, the webinar has been recorded and it is being further exploited “on-demand” through the recording that has been published on the project media channels. So far, about **90 views** have been reached.

### ***Regional Training Workshop with Italian Stakeholders – 25 February 2022***

[Triple-A Regional Training Workshop in Italy | Triple-A \(aaa-h2020.eu\)](https://triple-a.eu/aaa-h2020.eu)

The main focus of the discussion that took place during the Italian Regional Training Workshop, “Valutazione e finanziamento di progetti di efficientamento energetico aimed to address the Triple-A approach and the risk mitigation strategies for assessing potential EE investments by offering a live demonstration of the Triple-A tools for the assessment and financing of EE projects, and finally providing an overview of the national context in the EE sector, including financing opportunities.

Some recommendations related to the relationship between Developers and Financial Institutions during a project life cycle have been highlighted, such as:

- Developers and financial institutions often do not speak the same language and it is vitally important to engage and establish a common language at the beginning of or prior to, the commencement of project development.
- Financial institutions should work with developers to communicate their process and define inputs and lending/investment criteria as early as possible in the project life cycle.

Special attention was given to the risk relevance for financing bodies, underlining when EE risk assessment becomes relevant for financing bodies.

About the National Context in EE financing, it was highlighted that:

- Compared to some of the governments of the other countries in Triple-A, the Italian government is recently starting to pay more attention to renewable energy and energy efficiency
- With the Next Generation EU (NGEU) program launched in 2020 (better known in Italy as the Recovery Fund), the EU has provided a considerable number of financial resources to accelerate growth. These resources are used by the Italian government within the PNRR

(National Recovery and Resilience Plan) to provide financial aid to entities interested in a green and sustainable transition.

An overview of the Italian regulation in Energy Efficiency was discussed, highlighting some important points related to Energy Efficiency policies and tax deductions. In particular:

- The Budget Law 2020 extended tax deductions for energy requalification of existing buildings (Ecobonus) and fiscal deductions for building renovations (Bonus Casa).
- Also, to give an important boost to the economy following the SarsCoV-2 pandemic, Law Decree 34/2020 raised the tax deduction rate for some energy efficiency and anti-seismic interventions to 110% of the expenditure incurred (Superbonus).

As far as Italy's support programmes and funding sources, there was a discussion about the subsidy scheme fostering sustainable investments and energy transition.

In this aspect, it was underlined that:

- Loans at a subsidized rate of 200 million euros were announced under the Kyoto fund for the energy upgrading of school buildings, sports facilities, and publicly owned health facilities.
- Energy efficiency interventions such as the replacement of systems, installing heat pumps, and constructing the thermal coat are eligible for financing.
- In addition, the Italian National Recovery and Resilience Plan (PNRR) has a dedicated fund, to which REACT-EU funds are added, along with a complementary national fund.

Regarding the Triple-A tools, it has been suggested to include more details about the financing institutions so that companies may feel more confident.

Finally, to increase the number of participants from the financing community, the meeting has been recorded and it is being further exploited “on-demand” through the recording that has been published on the project media channels so that many more views will be reached. So far, about **60 views** have been reached.

### 6.1.2 Triple-A identified projects

Within the framework of the Triple-A project, five (5) Italian projects have been identified, inserted in the Triple-A Tools and benchmarked. The identified projects belong to the sectors determined by the Triple-A methodology, namely: the Building Sector, Industry, Transportation, District Energy Networks, and Outdoor Lighting. As depicted in Figure 11a, two out of five Italian projects belong to the District Energy Networks sector, which then are also the ones that would allow more substantial energy savings (Figure 11b). It can be observed that Figure 11b does not appear in the Energy sector because the Triple-A project identified is focus on the natural gas savings, which would be of 1.27 MWh/year. All the five Italian projects have been benchmarked as Triple-A projects.

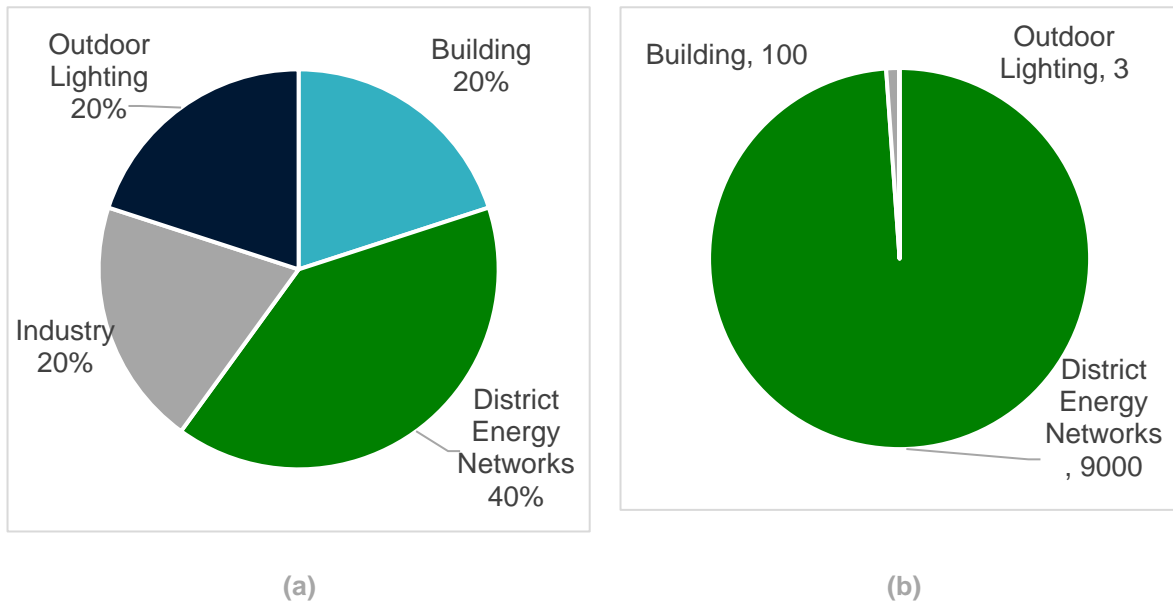


Figure 11: Triple-A Italian projects (a) distribution and (b) energy savings [MWh/year]

The huge difference in energy savings between the sectors is directly connected to the total investment of the project related to the district energy network (Figure 12b), whose 2 projects account for a total investment of 1.5M€, while for energy if of 74.5k€, for the industry of 50k€, and outdoor lighting of 20k€. Finally, in Figure 12a the CO<sub>2</sub> reduction that this project would guarantee is reported. In particular, all the projects together would allow a CO<sub>2</sub> reduction of 6560.55 tonnes/year.

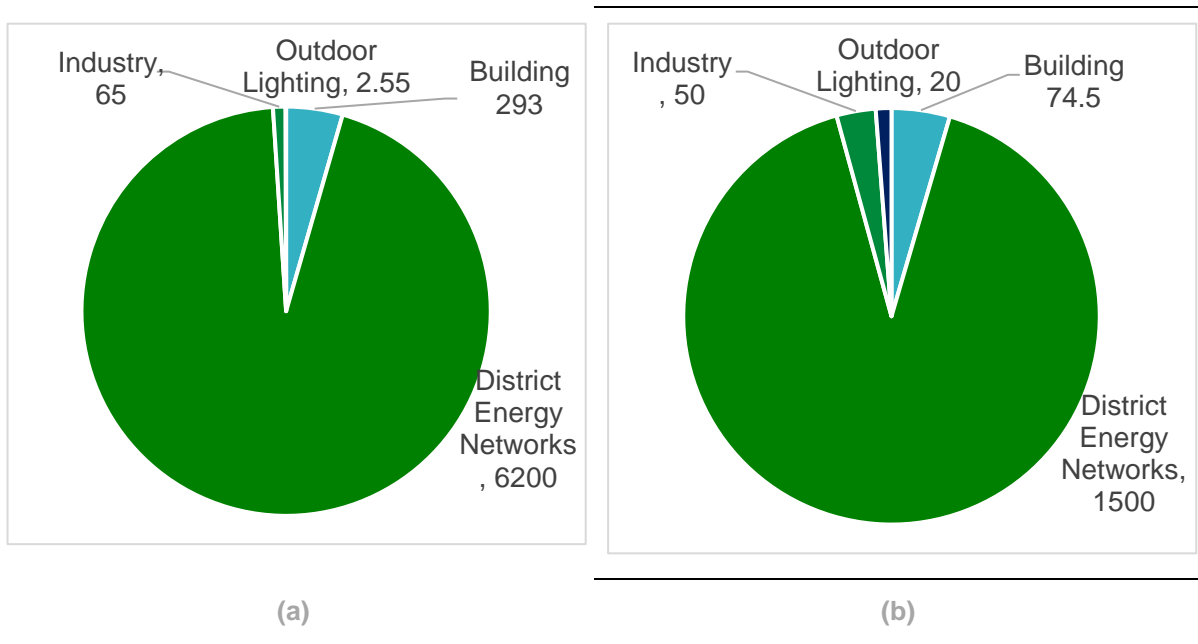


Figure 12: Triple-A Italian projects (a) CO<sub>2</sub> reduction [tonnes/year] and (b) the total amount of the investment [k€]

## 6.2 Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning the selected Triple-A projects in Italy.

### 6.2.1 Energy Efficiency policies and tax deductions

- Budget Law 2020 extended tax deductions for energy requalification of existing buildings (Ecobonus)<sup>110</sup> and fiscal deductions for building renovations (Bonus Casa)<sup>111</sup> until 31 December 2020 regarding expenditure incurred from 1 January to 31 December 2020.
- Law Decree 34/2020<sup>112</sup> raised the tax deduction rate for some energy efficiency and anti-seismic interventions to 110% of the expenditure incurred (Superbonus)<sup>113</sup> to give an important boost to the economy following the SarsCoV-2 pandemic.
- Legislative Decree 48/2020 provides a long-term strategy to support the renovation of the national park of residential and non-residential buildings, both public and private, to obtain a decarbonised and energy-efficient real estate park by 2050. The strategy will be incorporated into the Integrated National Energy and Climate Plan (PNIEC)<sup>114</sup>. The PNIEC was established to stabilize the tax deductions for the energy requalification and renovation of buildings for at least three years, take all the incentives in a single mechanism and modulate the benefit in relation to the expected energy savings.
- The programme for the improvement of the energy performance of the central PA buildings (PREPAC)<sup>115</sup> has been refinanced for the period 2021-2030 (Legislative Decree 73/2020).

### 6.2.2 National Inventory Report - ISPRA

The National System for the Italian Greenhouse Gas Inventory was established by the Legislative Decree 51 of March 7<sup>th</sup> 2008 and confirmed by the Legislative Decree 30 of March 13<sup>th</sup> 2013. Article 5.1 of the Kyoto Protocol established that Annex I Parties should have in place a National System since the end of 2006 for estimating anthropogenic greenhouse gas emissions by sources and removals by sinks and for reporting and archiving inventory information according to the guidelines specified in the UNFCCC Decision 20/COP.7

In Italy, every year, the Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) publish a document that reports the national inventory of the GHG gas emission as established by the Kyoto Protocol. The final aim is for ISPRA to improve the implementation of country-specific methodologies and the use of national emission factors and parameters.

<sup>110</sup> <https://ecobonus.mise.gov.it/>

<sup>111</sup> <https://detrazionifiscali.enea.it/bonuscasa.asp>

<sup>112</sup> <https://www.gazzettaufficiale.it/eli/id/2020/05/19/20G00052/sg>

<sup>113</sup> <https://www.agenziaentrate.gov.it/portale/web/guest/superbonus-110%25>

<sup>114</sup> Piano Nazionale Integrato per l'Energia e il Clima 2030, Ministero dello sviluppo economico, 2019

<sup>115</sup> [https://www.mise.gov.it/images/stories/documenti/linee\\_guida\\_prepac\\_12\\_luglio\\_2017.pdf](https://www.mise.gov.it/images/stories/documenti/linee_guida_prepac_12_luglio_2017.pdf)

## Methodology Reports

In the following table, a summary of the methods and emission factors used in the compilation of the Italian inventory is reported<sup>116</sup>.

**Table 31: Summary of the methods and emission factors for Italian inventory**

Sector	Activity Data	Source
<b>1 Energy</b>	Fuel use	Energy Balance - Ministry of Economic Development Major national electricity producers
<b>1A1 Energy Industries</b>		European Emissions Trading Scheme
<b>1A2 Manufacturing Industries and Construction</b>	Fuel use	Energy Balance - Ministry of Economic Development Major National Industry Corporation
		European Emissions Trading Scheme
<b>1A3 Transport</b>	Fuel use Number of vehicles Aircraft landing and take-off cycles and maritime activities	Energy Balance - Ministry of Economic Development Statistical Yearbooks - National Statistical System Statistical Yearbooks - Ministry of Transportation Statistical Yearbooks - Italian Civil Aviation Authority (ENAC) Maritime and Airport local authorities
<b>1A4 Residential-public-commercial sector</b>	Fuel use	Energy Balance - Ministry of Economic Development
<b>1B Fugitive Emissions from Fuel</b>	Amount of fuel treated, stored, distributed	Energy Balance - Ministry of Economic Development Statistical Yearbooks - Ministry of Transportation Major National Industry Corporation
<b>2 Industrial Processes and Product Use</b>	Production data	National Statistical Yearbooks- National Institute of Statistics International Statistical Yearbooks-UN European Emissions Trading Scheme European Pollutant Release and Transfer Register Sectoral Industrial Associations
<b>3 Agriculture</b>	Agricultural surfaces Production data Number of animals Fertiliser consumption	Agriculture Statistical Yearbooks - National Institute of Statistics Sectoral Agriculture Associations
<b>4 Land Use, Land Use Change and Forestry</b>	Forest area, biomass increment and stock Biomass burnt	National Forestry Service (CFS) - National and Regional Forestry Inventor Statistical Yearbooks - National Institute of Statistics Universities and Research Institutes
<b>5 Waste</b>	Amount of waste	National Waste Cadastre - Institute for Environmental Protection and Research, National Waste Observatory

<sup>116</sup> Italian Greenhouse Gas Inventory 1990 -2019. National Inventory Report - ISPRA

## 6.3 Market Architecture & Policy Frameworks

This section provides an overview of schemes fostering sustainable investments available to the Italian public and businesses. This section provides a general overview, listing the most relevant to the Triple-A project and the identified Italian cases.

### 6.3.1 Italian subsidy scheme's fostering sustainable investments and energy transition

Loans at a subsidised rate of 200 million euros were announced under the Kyoto fund for the energy upgrading of school buildings, sports facilities, and publicly owned health facilities. The implementing decree of the new Kyoto fund, published in the Gazzetta Ufficiale on Saturday 24<sup>th</sup> of April 2021, provides for loans at an interest rate of 0.25% for a maximum duration of the loan of twenty years.

The projects presented must ensure an improvement in the building's energy efficiency parameter of at least two energy classes. Energy efficiency interventions such as the replacement of systems, the installation of heat pumps, the replacement of windows, the construction of the thermal coat, as well as water-saving and efficiency measures are eligible for financing. Seismic adaptation interventions can also be financed functional to the project and a maximum extent of 50% of the total value of the work.

Then, The Italian National Recovery and Resilience Plan (PNRR) has a dedicated fund, to which REACT-EU funds are added, along with a complementary national fund. The total budgets of the missions dedicated to energy are as follows:

M2: Green revolution and energy transition

- M2C1: Sustainable agriculture and circular economy (EUR 6.97 billion)
- M2C2: Energy transition and sustainable mobility (EUR 25.36 billion)
- M2C3: Energy efficiency and buildings renovation (EUR 22.24 billion)

M3: Infrastructure for sustainable mobility

- M3C1: Rail network and secure roads (EUR 27.97 billion)

### 6.3.2 Energy Efficiency National Fund

With reforms, Italy has introduced numerous financial incentives to increase the country's attractiveness as an FDI's destination, encouraging R&D operations, supporting industrial crisis areas, and fostering new innovative enterprises' growth. To increase energy efficiency, the Energy Efficiency National Fund has been adopted. The fund has a budget of € 310 MLN<sup>117</sup> and supports energy efficiency investments in buildings, plants, and production processes (district heating and cooling networks, cogeneration and trigeneration plants).

The aid consists in:

- soft loan up to the 70% of the total eligible investment for a total amount between € 250 K and € 4 MLN;
- guarantee on individual financing operation, up to 80% of the investment, for a total amount between € 150K and € 2.5 MLN.

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<sup>117</sup> <https://www.mise.gov.it/index.php/it/energia/efficienza-energetica/fondo-nazionale-efficienza-energetica>

### 6.3.3 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided.

#### 6.3.3.1 (1) Buildings:

##### Regulation

There are many rules and regulations, or policy interventions, in the building sector impacting the renovation of old and construction of new buildings. A summary of the most impactful interventions related to the Triple-A projects is provided in Table 32.

**Table 32: Overview of policy interventions in the building sector**

Title:	Concerning:	Description:	Source:
<b>National guidelines for the energy certification of buildings</b>	Existing	<p>The decree for the adaptation of the national guidelines for the energy certification of buildings:</p> <ul style="list-style-type: none"> <li>- describes the Guidelines and the means of connection between the State and the Regions for the preparation of Energy Performance Certificates (APE)</li> <li>- establishes an information system for the management of a national cadastre of energy performance certificates and thermal plants, the Information System on Energy Performance Certificates (SIAPE)</li> </ul> <p>it introduces the constraint for the Regions and Provinces to establish control plans and procedures, in order to analyse at least 2% per year of the EPAs of their territory.</p>	<a href="#">link</a>
<b>Methodologies for calculating energy performance and defining the prescriptions and minimum requirements of buildings</b>	Existing & New construction	<p>The decree on the methodologies for calculating energy performance and defining the prescriptions and minimum requirements defines:</p> <ul style="list-style-type: none"> <li>- the requirements for nearly zero-energy buildings and sets the new minimum standards in force since 1 October 2015</li> <li>- introduces a new method of calculating the energy performance value of a building</li> <li>- modifies the services to be taken into consideration for the evaluation of the performance of the building</li> <li>- establishes a new method for determining the energy class of buildings</li> <li>- divides the renovations of existing buildings into two levels, depending on the extent of the intervention.</li> </ul>	<a href="#">link</a>
<b>National action plan to increase nearly-zero energy</b>	Existing and new constructions	<p>The Plan to increase of nearly-zero energy buildings (Panzeb) traces the national guidelines and development lines to increase their number, offering clarifications on the requirements, evaluating their energy performance, in the</p>	<a href="#">link</a>

Title:	Concerning:	Description:	Source:
<b>buildings</b>		different types of use and climatic zones, and estimating the over-costs necessary for their realization.	
<b>Reference schemes and methods for compiling the technical project report for the purpose of applying the prescriptions and minimum energy performance requirements in buildings</b>	Existing, new constructions, energy requalification and major renovations	<p>The decree defines three schemes for the technical project reports, referring to:</p> <ul style="list-style-type: none"> <li>- new constructions, major renovations and nearly zero energy buildings (Annex 1)</li> <li>- energy requalification and major second-level renovations, existing buildings with the redevelopment of the building envelope and thermal systems (Annex 2)</li> </ul> <p>energy requalification of technical systems (Annex 3).</p>	<p><a href="#">link</a> <a href="#">decree</a></p> <p><a href="#">link</a> <a href="#">Annex 1</a></p> <p><a href="#">link</a> <a href="#">Annex 2</a></p> <p><a href="#">link</a> <a href="#">Annex 3</a></p>

Source: Ministero dello Sviluppo Economico

### Support schemes

#### Tax deductions - Energy efficiency (Ecobonus)

The law 27 December 2017, n. 205 extended the tax deductions for the energy requalification of buildings. In fact, it is possible to benefit from the bonus:

- for expenses incurred by 31 December 2018, in the case of interventions on individual real estate units
- for expenses incurred by 31 December 2021, in the case of interventions on the common parts of the buildings.

For the energy requalification interventions carried out in the single real estate units, differentiated deduction rates are envisaged based on the intervention carried out, to better link the economic benefit to the achievable energy savings.

For energy redevelopment interventions carried out in the common parts of condominium buildings, the increase in the deduction rate to 70% is confirmed for interventions involving at least 25% of the building envelope and to 75% for interventions aimed at improving the winter and summer energy performance and that achieve the "average quality" of the envelope, with a maximum ceiling of 40,000 euros for each real estate unit.

#### The National Energy Efficiency Fund

The National Energy Efficiency Fund favours the interventions necessary to achieve national energy efficiency objectives, promoting the involvement of financial institutions, national and EU, and private investors on the basis of adequate risk sharing.

The Fund supports energy efficiency interventions carried out by companies, including ESCOs, and by the Public Administration, on buildings, plants and production processes.

Specifically, the supported interventions must concern:

- the reduction of energy consumption in industrial processes,

- the construction and expansion of district heating networks,
- the efficiency of public services and infrastructures, including public lighting
- the energy requalification of buildings.

### 6.3.3.2 (2) Industry

#### Regulations

Table 33: Overview of policy interventions in the industry sector

Title:	Concerning:	Description:	Source:
<b>Experts in Energy Management (EGE)</b>	Operators and certificates	The Expert in Energy Management (EGE) is a figure introduced by Legislative Decree 115/08, which identified him as a person who has the knowledge, experience, and skills necessary to manage the use of energy efficiently. The most recent Law Decree. 73/20 identifies the EGE as a "natural person certified according to UNI CEI 11339 issued by the accredited body that, among other things, performs energy diagnoses in accordance with UNI CEI EN 16247	<a href="#">link</a>
<b>Energy Service Company (ESCO)</b>	Operators and certificates	An Energy Service Company (ESCO) is defined by Legislative Decree 115/08 as "a natural or legal person who provides energy services or other energy efficiency improvement measures in the user's facilities or premises and, in so doing, accepts a certain margin of financial risk. Payment for the services provided is based, in whole or in part, on the energy efficiency improvement achieved and the attainment of the other performance criteria established.	<a href="#">link</a>
<b>Energy Manager</b>	Operators and certificates	An energy manager is a person who supports the decision-maker in making the best use of energy in the structure for which he is responsible. In large structures, this figure is equivalent to that of the person responsible for the energy management system and is configured as a managerial function or, in any case, at a level suitable for carrying out this role. The energy manager can be an external professional with adequate experience, if it is impossible to identify an internal figure with adequate skills or who has sufficient time availability to carry out the function of rational energy management. The collection of nominations, their management, the sensitization of the obliged parties and the publication of the list of obliged parties are entrusted to the Italian Federation for the Rational Use of Energy (FIRE).	<a href="#">link</a>
<b>ISO 50001</b>	Standard	The ISO 50001 standard (including its certification standard and procedure), which is dedicated to energy management systems, is based on the traditional continuous improvement model. This model is also used by other popular standards such as ISO 9001 or ISO 14001. The ISO 50001 standard, updated in 2018, provides organizations with a set of guidelines and requirements to comply with aimed at:	<a href="#">link</a>

Title:	Concerning:	Description:	Source:
		<ul style="list-style-type: none"> <li>• developing a policy for more efficient use of energy;</li> <li>• setting goals and objectives to meet the adopted policy;</li> <li>• using data to understand the organization's energy use and make knowledge-based decisions;</li> <li>• measuring the results achieved;</li> <li>• reviewing the operation of the adopted management policy;</li> <li>• continuously improving the organization's energy management.</li> </ul>	

### Support schemes

#### Piano Nazionale di Ripresa e Resilienza (PNRR)

The PNRR is an opportunity to accelerate the transition outlined, overcoming existing barriers which demonstrated criticism in the past. Mission 2, entitled Green Revolution and Ecological Transition, consists of 4 Components:

- C1. Circular economy and sustainable agriculture
- C2. Renewable energy, hydrogen, grid and sustainable mobility
- C3. Energy efficiency and building renovation
- C4 Protection of the territory and the water resource

As concerns industry, the first two components are the most relevant ones. Component 1 aims to pursue a dual path towards full environmental sustainability. On the one hand, improving waste management and the circular economy, strengthening the infrastructure for separate collection, modernizing or developing new waste treatment plants, filling the gap between the regions of the North and those of the Center-South (today about 1.3 million tons of waste come treated outside the regions of origin) and carrying out highly innovative flagship projects for supply chains strategic such as waste from electrical and electronic equipment (WEEE), paper and del cardboard, textiles, mechanical and chemical recycling of plastics. On the other hand, developing an agricultural supply chain/smart and sustainable food, reducing the environmental impact in one of the Italian excellences, through “green” supply chains.

To achieve the progressive decarbonisation of all sectors, Component 2 interventions - investments and reforms - have been envisaged to significantly increase the penetration of renewables, through decentralized solutions and utility scales (including innovative and offshore ones) and strengthening networks (smarter and more resilient) to accommodate and synchronize new renewable resources and decentralized flexibility, and to decarbonise end-uses in all other sectors, with particular focus on more sustainable mobility and on the decarbonisation of some industrial segments, including the start of the adoption of hydrogen-based solutions (in line with the EU Hydrogen Strategy).

Also, in Component 2, particular emphasis is given to the production chains. The goal is to develop an international industrial and knowledge leadership in the main supply chains of transition, promote the development in Italy of competitive supply chains in the fastest growing sectors, allow to reduce dependence on imported technologies and strengthen research and development in the most innovative

areas (photovoltaics, hydrolysers, batteries for the transport sector and electricity sector, means of transport).

### White certificates

White certificates<sup>118</sup>, also known as "Energy Efficiency Certificates", are negotiable securities that certify the achievement of energy savings in the final uses of energy through interventions and projects to increase energy efficiency.

Also called Energy Efficiency Certificates, white certificates are the main incentive mechanism for energy efficiency in the industrial sector, network infrastructures, services and transport, but also concern interventions carried out in the civil sector and behavioural measures.

The GSE (Gestore Servizi Energetici) recognizes a certificate for each TEP of savings achieved thanks to implementing the energy efficiency intervention. Upon indication of the GSE, the certificates are then issued by the Manager of Energy Markets (GME) on specific accounts.

White certificates can be exchanged and valued on the market platform managed by GME or through bilateral negotiations. To this end, all the subjects admitted to the mechanism are included in GME's Electronic Register of Energy Efficiency Certificates. The economic value of the securities is defined in the trading sessions on the market.

### **6.3.3.3 (3) Transportation**

No related sector-specific subsidy schemes or regulations concerning the transportation sector were identified in the Triple-A projects for Italy; hence there is nothing to be reported under this category.

### **6.3.3.4 (4) District Energy Networks**

#### Regulation

Table 34: Overview of policy interventions in the District Energy Networks sector

Title:	Concerning:	Description:	Source:
<b>Deliberazione 4 agosto 2010- ARG/elt 125/10</b>	Standard	Defines the technical and economic conditions, aimed at the distribution company and producer customer, for connection to the distribution networks of production plants.	<a href="#">link</a>
<b>Deliberazione 3 giugno 2008 - ARG/elt 74/08</b>	Standard	Structure the new regulation of on-site exchange and its integration into the electricity market, providing that a single subject provides the exchange on the spot on a national basis (the Energy Services Manager - GSE).	<a href="#">link</a>
<b>Deliberazione 25 marzo 2010 – ARG/elt 39/10</b>	Standard	The procedures and selection criteria are defined for some pilot projects to modernize and make more flexible and intelligent electricity distribution networks (to smart grids). In this context, Legislative Decree 5 May 2011 (Incentives to produce electricity from solar plants photovoltaic) and Legislative Decree 8 February 2007 n. 20 (Promotion of high cogeneration performance) identify measures to	<a href="#">link</a>

<sup>118</sup> <https://www.gse.it/servizi-per-te/efficienza-energetica/certificati-bianchi>

Title:	Concerning:	Description:	Source:
		promote the extensive use of such technologies.	

### Support schemes

#### Piano Nazionale di Ripresa e Resilienza (PNRR)

The Italian PNRR is one of the most extensive funding schemes for the green transition. For the District Energy Network, Component 2 of Mission 2 is directly related to Renewable energy, hydrogen, grid and sustainable mobility.

This line of investment (total funding of 5.90 billion €) aims to increase the share of renewable energy. The current Italian target for 2030 is 30% of final consumption, compared to the estimated 20 per cent preliminary for 2020. To achieve this goal, Italy can leverage the abundance of renewable resource available and on mainly mature technologies, and in the context of interventions of this component of the PNRR: i) unlocking the potential of utility-scale plants, in many cases already competitive in terms of cost compared to fossil fuels but which first of all require reforms of authorization mechanisms and market rules to reach full potential, and enhancing it developing agro-voltaic opportunities; ii) accelerating the development of energy communities and systems distributed of small size, particularly relevant in a country that suffers many limitations in availability and use of large land for energy purposes; iii) encouraging the development of solutions innovative, including integrated and offshore solutions; iv) strengthening the development of biomethane.

To enable and accommodate the increase in production from renewable sources, but also to increase its resilience to increasingly frequent extreme climatic phenomena, the second line of intervention (total funding of 4.11 billion €) has the objective to upgrade (increase in capacity for 6GW, improve the resilience of 4,000 km of the network electricity) and digitize network infrastructures.<sup>119</sup>

In the following, the main investments of PNRR related to District Energy Networks are explained in detail.

#### Promotion of renewables for energy communities and self-consumption (2.20 billion €)

The investment focuses on supporting the energy communities and collective structures of self-production and will allow for the extension of the experimentation already started with the anticipated implementation of the RED II Directive<sup>120</sup> to a more significant dimension and to focus on the areas where the greater socio-territorial impact. The investment, in fact, identifies Public Administrations, families and micro-enterprises in municipalities with less than 5,000 inhabitants, thus supporting the economy of small municipalities, often at risk of depopulation, and strengthening social cohesion.

In particular, this investment aims to guarantee the necessary resources to install approximately 2,000 MW of new electricity generation capacity in distributed configuration by the community of renewable energy and renewable energy self-consumers acting jointly.

The realization of these interventions, assuming that they concern photovoltaic systems with a production annual of 1,250 kWh per kW, which would produce about 2,500 GWh per year, will contribute to a reduction of greenhouse gas emissions estimated at around 1.5 million tons of CO<sub>2</sub> per year. To

<sup>119</sup> <https://www.governo.it/sites/governo.it/files/PNRR.pdf>

<sup>120</sup> [https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive\\_en](https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en)

get more odds of high self-consumption, these configurations can also be combined with energy storage systems.

### Smart grid strengthening (3.61 billion €)

Electricity distribution infrastructures are an enabling factor for the transition of energy, as they will have to be able to radically manage a generation system different from the past and flows of energy distributed by a multiplicity of plants. Achieving the ambitious decarbonisation goals requires a distribution network of fully resilient, digital and flexible electricity to ensure the optimised management of renewable energy and the consumption of transition energy towards the electric vector.

Therefore, the intervention aims to increase the degree of reliability, safety and flexibility of the system national energy, increase the amount of energy produced by RES fed into the grid distribution, and promote greater electrification of consumption. Specifically, it consists of two design lines.

The first aims to increase the network capacity to host and integrate further generation distributed from renewable sources for 4,000 MW; it also aims to implement smart grid interventions on 115 primary substations and their underlying network.

The second concerns the increase in capacity and power available to users to favour electrification of energy consumption (e.g. electric mobility, heating with heat pumps), with an impact on approximately 1,850,000 users who will therefore have greater connection capacity of the distributed generation in highly concentrated areas such as large metropolitan cities..

### **6.3.3.5 (5) Outdoor Lighting**

#### Regulation

Table 35: Overview of policy interventions in the outdoor lighting sector

Title:	Concerning:	Description:	Source:
<b>UNI11248</b>	Standard	This standard is a starting point that allows to correctly classify the municipal area according to specific parameters, such as: the complexity of the visual field, the ambient brightness, the light source used, the flow of traffic that must serve that road, etc. Within the standard, the criteria for dividing the study areas are reported, divided into vehicular traffic areas, cycle paths and pedestrian areas, conflict areas and areas for slow-motion devices and pedestrian crossings. In addition, UNI 11248 defines several recommendations for public lighting, paying attention to debilitating glare, atmospheric conditions, driving vision and compatible lighting categories between contiguous and adjacent areas.	<a href="#">link</a>
<b>UNI EN 13201</b>	Standard	The UNI EN 13201 standard "Street lighting, performance requirements, performance calculation, photometric performance measurement methods, energy performance indicators", released in 2016, is divided into 5 chapters, the first of which in Italy is replaced by the UNI standard 11248. The series of European standards CEN 13201 is composed as follows:	<a href="#">link</a>

Title:	Concerning:	Description:	Source:
		<ul style="list-style-type: none"> <li>UNI EN 13201-1 Guidelines in selection of lighting classes (replaced in Italy by UNI 11248)</li> <li>UNI EN 13201-2 Performance requirements</li> <li>UNI EN 13201-3 Calculation of performance</li> <li>UNI EN 13201-4 Methods of measuring lighting performance</li> <li>UNI EN 13201-5 Energy performance indicators</li> </ul>	
<b>Ecodesign” 2005/32/CE</b>	EU Directive	The Directive defines the general regulatory framework, establishing the rules for the definition of the technical requirements that are entrusted as competence to the EU Commission which then provides for the adoption of implementation measures (delegated acts), which are mainly constituted by Commission Regulations, to which product manufacturers must comply, already in the design phase, to increase energy efficiency and reduce the negative aspects of their products that could impact on the environment throughout their life cycle (production - use - end of life) .	<a href="#">link</a>

### Support schemes

#### White Certificates

An installation or retrofit of public lighting systems can benefit from the white certificates mechanism, an incentive that rewards, for 5 years, the energy savings achieved with an energy efficiency certificate (TEE) for each TOE (Ton of Oil Equivalent) saved.

#### Regional fundings

Regional municipalities are recently sponsoring the installation and requalification of outdoor lighting, particularly devoted to the improvement in terms of energy consumption and integration with smart technologies (i.e, traffic monitoring, cameras, etc.).

#### Piano Nazionale di Ripresa e Resilienza (PNRR) – M2C4

Also, as concerns the outdoor lighting, there are funds within the PNRR devoted to that. In particular, within Component 4 of Mission 2, there is an investment called “Interventions for resilience, enhancement of the territory and efficiency energy of the Municipalities”, for which 6 billion euros have been allocated. This investment aims to increase the territory's resilience through a heterogeneous set of interventions (of small and medium flow) to be carried out in urban areas. The works will concern the safety of the territory, safety and adaptation of buildings, energy efficiency and lighting systems public.

## 6.4 Triple-A partners in Italy



### About GFT – Shaping the future of digital business

As a pioneer for digital transformation GFT develops sustainable solutions across new technologies – from cloud engineering and

artificial intelligence to Blockchain/DLT. With its deep technological expertise, strong partnerships and comprehensive market know-how GFT offers advice to the financial and insurance sectors, as well as in the manufacturing industry. Through the intelligent use of IT solutions GFT increases productivity and creates added value for clients. Companies gain easy and safe access to scalable IT-applications and innovative business models. Founded in 1987 and located in more than 15 markets to ensure proximity to clients, the GFT team consists of over 8,000 determined talents. GFT provides them with career opportunities in all areas of software engineering and innovation.

**Web:** [www.gft.com/it/it](http://www.gft.com/it/it)

## 7 Lithuania

### 7.1 Country's Overview

The energy efficiency sector is of very high priority in Lithuania. There are numerous strategic documents shaping the future of Lithuania's energy sources and needs, the most important of which are the National Energy and Climate Action Plan for 2021 – 2030, National Energy Independence Strategy and Climate Change programme. Energy efficiency is also regulated by Lithuanian Laws such as the Law on Energy and the Law on Increasing Energy Efficiency.

The main strategic directions for achieving energy efficiency are increasing energy independence, transitioning to renewable energy sources, decreasing energy consumption by implementing modern low energy technologies etc.

Energy savings are supported by numerous funding opportunities such as grants and financial instruments provided by national as well as EU funds.

#### 7.1.1 Lithuanian stakeholder overview & Analysis

During the implementation of the project, VIPA was engaged in a number of activities directed at attracting the interested stakeholders into the process of identification of the potential projects through the Triple-A tool.

The Triple-A Capacity Building Webinar in Lithuania was held on the 14<sup>th</sup> of June 2021 by VIPA. The main aim of the webinar was to familiarize interested stakeholders/participants with the Standardised Triple-A Tools that help to evaluate of energy efficiency project ideas and what type of project could be financed. This webinar introduced Standardised Triple-A Tools and how tool users could find financing for projects and how financing authorities can find attractive investments in the field of energy efficiency.

**Table 36: Overview of Lithuanian Stakeholders' activity (webinar)**

Triple-A Capacity Building Webinar participants:	16
A - Financing bodies	0
B - Companies / Project developers	9
C - Policy makers and Policy support Institutes	1
D - Researchers and Academia	0
E - Other	6

On the 27<sup>th</sup> of January 2022, the Training workshop on Energy Efficiency Financing Assessment Tools was organised by VIPA, presenting the Triple-A financing method. The workshop was intended for financial institutions and other entities related to the implementation of energy efficiency projects. The following topics were covered during the training workshop: introduction of Triple-A assessment tools, key recommendations for the assessment process to enable realistic energy efficiency investments and feasible in the country context, means of financing the projects in practice in the short or medium term, financing methods and approaches, evaluation and verification of the results.

The targeted audience was mainly representatives of financial bodies, project developers, policy makers and academic institutions.

**Table 37: Overview of Lithuanian Stakeholders activity (regional workshop)**

Triple-A Country Training workshop participants:	29
A - Financing bodies	18
B - Companies / Project developers	1
C - Policy makers and Policy support Institutes	10
D - Researchers and Academia	-
E - Other	-

The main feedback provided by the participants during the event was the following:

- There is interest in the topic from different types of stakeholders and sectors;
- There is a need for such instruments on the market to facilitate the requests of project developers;
- Further investigation of the Tool is needed and the availability of the support and consultations on its use is welcomed;
- Additional Workshops were requested to gather more points of view from the different parties and create discussion forums about this topic.

## 7.1.2 Triple-A identified projects

Within the framework of the Triple-A project, **five (5) Lithuanian projects** have been identified, entered into the Triple-A Tools and benchmarked. The identified projects belong to the one particular sector determined by the Triple-A methodology, namely the Building Sector. This is because the large part of building stock in the Lithuanian building sector is in urgent need of renovation because of ageing resulting in poor or no insulation and consequently high energy consumption, while their contribution to the country's CO<sub>2</sub> emissions is substantial. For all the reasons mentioned above, plenty of actions and financing mechanisms are ongoing in Lithuania, described in the following sections of the present paper.

The implementations of only these identified projects will result in 1,1 GWh of energy savings per year in the form of heat and electricity and the reduction of CO<sub>2</sub> emissions of 360 tpa.

## 7.2 Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning the selected Triple-A projects' sectors in Lithuania.

### 7.2.1 The increase in energy efficiency

Increasing energy efficiency in Lithuania is considered crucial among the public policy priorities.

The Law on Increasing Efficiency of Energy Consumption was adopted on 3 November 2016. The law establishes the measures across all sectors of the economy for increasing energy efficiency and sets out the goals for implementing these measures and the values of saved energy to be achieved.

The law sets, among others, that by 2030 the total amount of energy saved as the result of all the energy efficiency measures provided by the law would be not less than 27,280 GWh. This energy is distributed among different economic sectors – industry, services and domestic, transport and agriculture.

The law also sets the goals for public building renovation. According to the law, each year, at least 3% of the space of the state-owned buildings has to be renovated to achieve at least minimum energy efficiency requirements.

### 7.2.2 National Inventory Entities

Aiming to increase institutional capacity for inventory preparation and continuity of the inventory preparation process in compliance with Guidelines for National systems under Article 5 paragraph 1 of the Kyoto Protocol (decision 19/CMP.1), the Government of Lithuania and the Minister of Environment have issued a number of key regulatory legal acts and assigned responsible institutions for GHG inventory preparation. The main entities participating in the GHG inventory preparation process are the Ministry of Environment, Environmental Protection Agency, State Forest Service, National Climate Change Committee, Permanent GHG inventory working group, Data providers, External consultants, etc.

The Ministry of Environment of the Republic of Lithuania<sup>121</sup> is a National Focal Point of the UNFCCC. The Ministry of Environment is designated as a single national entity responsible for the nationwide GHG inventory. It has overall responsibility for the national system of GHG inventory and is in charge of the legal, institutional and procedural arrangements for the national system and the strategic development of the national inventory.

Lithuanian Environmental Protection Agency (EPA)<sup>122</sup>, under the Ministry of Environment starting from 2011, was nominated as an entity responsible for GHG inventory preparation by the Order of the Minister of Environment No D1-1017 (repealed by the Order of the Minister of Environment No D1-61, 23-01-2014). EPA responsibilities inter alia include monitoring environmental quality, collection and storage of environmental data and information, and assessment and forecasting of environmental quality.

### 7.2.3 Methodology Reports

Since 2004, inventory has been prepared using a common reporting format (CRF). From 2006 inventory was being prepared using CRF Reporter software, developed by the UNFCCC secretariat. In 2006, the

<sup>121</sup> <https://enmin.lrv.lt/en/>

<sup>122</sup> <https://aaa.lrv.lt/lt/>

first-time complete time series 1990-2004 was developed and submitted to the European Commission and the UNFCCC secretariat together with Lithuania's Initial Report under the Kyoto protocol. In 2016 Lithuania submitted its Second Initial Report under the Kyoto protocol (Report to facilitate the calculation of the assigned amount for the second commitment period pursuant to Article 3, paragraphs 7bis, 8 and 8bis of the Kyoto Protocol).

The recent GHG inventory report<sup>123</sup> issued in 2020 contains information on anthropogenic emissions by sources and removals by sinks for the direct (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>) and indirect (CO, NO<sub>x</sub>, SO<sub>2</sub>, NMVOCs,) greenhouse gases. This report contains detailed information about Lithuania's GHG inventory from 1990 to 2018. NIR includes a description of the methodologies and data sources used for emissions estimation by sources and removals by sinks. Also, description of the trends, key categories analysis, uncertainty estimates, planned improvements, and description of QA/QC procedures. The report aims to ensure the transparency, consistency, comparability, completeness, and accuracy of GHG inventory. For inventory preparation, upgraded CRF Reporter v.6.0.7 is available as an online application.

## 7.3 Market Architecture & Policy Frameworks

A series of measures fostering sustainable investments are available in Lithuania for the public and business sectors. In this section, the most important of them are listed, focusing on the relevance to the Triple-A project and the identified Lithuanian cases. Generally speaking, the amount and scope of sustainability schemes available in Lithuania or are currently planned and targeted at the enhancement and uptake of energy efficiency investments is quite significant, and major financial benefits are available to businesses (and citizens).

In general, one of the highest priorities for the Government of Lithuania is increasing energy independence. For this purpose, the National Energy Independence Strategy<sup>124</sup> was adopted in 2018 by the Seimas of the Republic of Lithuania. The cornerstone of the Strategy in achieving its goals is enhancing energy efficiency and transitioning to Renewable Energy Sources (RES).

The main objective of the Strategy in the field of RES is to continue to increase the share of RES in domestic energy production and total final energy consumption, thus reducing the dependence on fossil fuel imports and rising local electricity generating capacities.

In pursuit of the strategic RES target, the aim will be to increase the share of RES in the total final energy consumption of the country. Eventually, RES will become the main energy source for electricity, heating and cooling, and transport sectors.

The main directions for achieving the target:

- to increase the share of electricity consumption from RES up to 45% in 2030 and 80% in 2050 compared to the final electricity consumption;
- to maximise the share of RES for district heat consumers, households with individual heating and non-household consumers with individual heating.

<sup>123</sup>[https://am.lrv.lt/uploads/am/documents/files/KLIMATO%20KAITA/%C5%A0ESD%20apskaitos%20ir%20kt%20ataskaitos/NIR\\_15%2004%202020%20final.pdf](https://am.lrv.lt/uploads/am/documents/files/KLIMATO%20KAITA/%C5%A0ESD%20apskaitos%20ir%20kt%20ataskaitos/NIR_15%2004%202020%20final.pdf)

<sup>124</sup>[https://enmin.lrv.lt/uploads/enmin/documents/files/Nacionaline%20energetines%20nepriklausomybes%20strategija\\_2018\\_EN.pdf](https://enmin.lrv.lt/uploads/enmin/documents/files/Nacionaline%20energetines%20nepriklausomybes%20strategija_2018_EN.pdf)

### 7.3.1 Lithuanian subsidy schemes fostering sustainable investments

The Lithuanian government offers several support measures to businesses and the public sector to foster energy efficiency investments. Typically, these come in the form of subsidies and government guarantees. In section 7.3.1, broadly applicable interventions apply to multiple (if not all) Triple-A sectors. Sections 7.3.2 describe schemes relevant to financial institutions, and section 7.3.3 to the Triple-A sectors specifically.

#### 7.3.1.1 Audit for industry LT <sup>125</sup>

The measure is intended for very small, small and medium enterprises to perform energy audits. The total budget for the measure is EUR 516 180. It is important to stress that the measure also attracts more than EUR 360 000 of private funds, i.e. funds of project implementers. It is estimated that by 2023 EUR 1000 investment in energy audits will save around 152,9 kg of oil equivalent and by the end of the measure it is expected to reach 130 tne or 1,51 GWh of energy savings.

#### 7.3.1.2 Renewable energy resources for industry LT+ <sup>126</sup>

The measure is intended for small, medium and large enterprises for installation of the equipment using renewable energy resources. The total budget for the measure is EUR 23 977 716. The support is provided if the energy produced is subject to own use and not for sale to the market of surplus energy.

It is estimated that by 2023 EUR 1000 invested in the enterprise's equipment will result in saving 152,9 kg of oil equivalent. At the end of the measure, it is expected to achieve around 3,179 tne or 40 – 42 GWh of energy saved.

#### 7.3.1.3 Partial compensation of interest rates <sup>127</sup>

The measure is directed to business entities that have loan or leasing transactions to modernise the equipment or technologies, including the ones ensuring more effective energy consumption. The measure provides a non-repayable subsidy and compensation of interest rates for the transaction.

The total budget for the measure is EUR 700 000. It is estimated that considering the volume of private investment attracted by the measure and the fact that measures of energy efficiency become more effective, at the end of the implementation period of the measure, 664 tne or 7,7 GWh of energy is expected to be saved.

### 7.3.2 Financing by international financial institutions

International financial institutions are a reliable source of funding for various sectors of the Lithuanian market. This funding is available only for investments made by large scale projects. The most prominent actors in this regard in the Lithuanian market are the European Investment bank, European Bank for Reconstruction and Development, Nordic Investment Bank and Council of Europe Development Bank.

Along with the considerable potential of those international financial institutions to finance energy efficiency projects, the scale of the single projects is often too small to fund directly. Besides, such

<sup>125</sup> [https://www.esinvesticijos.lt/lt/finansavimas/patvirtintos\\_priemones/auditas-pramonei-lt](https://www.esinvesticijos.lt/lt/finansavimas/patvirtintos_priemones/auditas-pramonei-lt)

<sup>126</sup> [https://www.esinvesticijos.lt/lt/finansavimas/patvirtintos\\_priemones/atsinaujinantys-energijos-istekliai-pramonei-lt](https://www.esinvesticijos.lt/lt/finansavimas/patvirtintos_priemones/atsinaujinantys-energijos-istekliai-pramonei-lt)

<sup>127</sup> <https://invega.lt/en/business/all-services/114/partial-financing-of-loan-interest-56>

funding does not cover 100% of the project's expenses, thus reducing the risk and attracting additional funding and competencies for project implementation.

The following financing is available on the Lithuanian market:

- European Bank for Reconstruction and Development – funding up to 50 percent of the project expenses, project minimum – EUR 2 million.
- European Investment bank - funding up to 50 percent of the project expenses, project minimum – EUR 25 million (in some cases – EUR 7,5 million).
- Nordic investment bank - funding up to 50 percent of the project expenses, project minimum – EUR 5 million.
- Council of Europe Development Bank – enhancing social cohesion and integration in Europe, as a rule provides loans for Governments or state enterprises with state guarantee.

### 7.3.3 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided.

Lithuania's most comprehensive scope of planned actions and interventions directed at achieving energy efficiency goals is adopted in the National Energy and Climate Action Plan for 2021 – 2030<sup>128</sup>. The plan was developed following the requirements set out in the Governance of the Energy Union Regulation<sup>129</sup>. The national plan has been prepared based on and integrates the provisions, objectives, targets and measures implemented and planned in Lithuanian national legislation, international commitments, strategies and other planning documents.

The National Energy and Climate Action Plan for 2021 – 2030 comprises the Annex II "Description of the Measures for the Increasing the Efficiency of Energy Consumption developed in accordance with the Directive 2012/27/EU"<sup>130</sup>.

The chapters below include the selected measures according to the Triple-A sectors from the abovementioned Description of the Measures for the Increasing the Efficiency of Energy Consumption. Some measures already supported by the concrete funding interventions contain references with links to the respective documents or information.

#### 7.3.3.1 (1) Buildings:

##### Regulation

There are many rules and regulations, or policy interventions, in the building sector impacting the renovation of old and construction of new buildings. A summary of the most impactful interventions is provided in Table 38.

<sup>128</sup> [https://ec.europa.eu/energy/sites/ener/files/documents/lt\\_final\\_necp\\_main\\_en.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/lt_final_necp_main_en.pdf)

<sup>129</sup> Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of Energy Union and Climate Action.

<sup>130</sup> [https://enmin.lrv.lt/uploads/enmin/documents/files/Teisin%C4%97%20informacija/Teis%C4%97s%20aktai/Bendrieji%20energetikos%20strateginiai%20dokumentai/NECP/Lietuvos\\_Respublikos\\_nacionalinis\\_energetikos\\_ir\\_klimato\\_srities\\_veiksmu\\_p\\_lanas\\_2priedas.pdf](https://enmin.lrv.lt/uploads/enmin/documents/files/Teisin%C4%97%20informacija/Teis%C4%97s%20aktai/Bendrieji%20energetikos%20strateginiai%20dokumentai/NECP/Lietuvos_Respublikos_nacionalinis_energetikos_ir_klimato_srities_veiksmu_p_lanas_2priedas.pdf).

Table 38: Overview of policy interventions in the building sector

Title:	Concerning:	Description:	Source:
<b>Renovation/modernisation of multi-apartment buildings</b>	2021–2023	To renovate a multi-apartment building to class C and save 40% of energy. By the end of 2030, around 5 000 multi-apartment buildings should be renovated, which means that nearly 500 multi-apartment buildings will be renovated each year	Ministry of the Environment, BETA
<b>Renovation of public buildings</b>	2021–2023	To renovate a public building to class C and to renovate about 960 000 m <sup>2</sup> of public building surface by 2030	Ministry of Energy, Ministry of the Environment
<b>Agreements with energy suppliers on consumer education and consulting</b>	2021–2030	Energy suppliers will ensure the implementation of the scope, and measures of consumer education and consulting provided for in agreements concluded between them or through other persons (including the introduction of smart metering)	Energy suppliers, Ministry of Energy
<b>Energy saving agreements with energy companies</b>	2021–2030	Energy companies will save energy according to the levels of energy specified in the energy savings agreements (either on their own or through others) by applying cost effective energy efficiency improvement measures at the final energy customers' facilities (installations, equipment, transport)	Ministry of Energy, energy companies

Source: Long-Term Renovation Strategy Of Lithuania<sup>131</sup>

### Support Schemes

The chapter below comprises the selected measures falling within the Triple-A sector Buildings from the abovementioned Description of the Measures for the Increasing the Efficiency of Energy Consumption.

#### The programme for modernization of multiapartment buildings

The programme's objective is to encourage the owners of the multiapartment buildings constructed according to technical requirements before 1993 to modernise these buildings to increase their energy efficiency.

The programme comprises providing preferential loans, grants and other support schemes to owners of the apartments and other premises and encouraging the owners to implement energy efficiency measures. It is expected that as a result of the programme – 100 GWh of energy will be saved annually.

In the programme's framework, these energy efficiency measures are envisaged: modernising heating, ventilation, and electrical engineering systems, modernising heat insulation conditions of the building and installing the heating equipment for the use of renewable energy sources. Energy efficiency

131 [https://energy.ec.europa.eu/system/files/2021-08/Lt\\_2020\\_ltrs\\_en\\_0.pdf](https://energy.ec.europa.eu/system/files/2021-08/Lt_2020_ltrs_en_0.pdf)

resulting from the programme is to be calculated based on the Directive 2012/27/EU requirements as the amount of energy saved per 1 square meter of modernised building area.

#### *Public buildings energy efficiency programme*

The programme's objective<sup>132</sup> is to increase energy efficiency for heating and lighting of public buildings, reduce greenhouse gases (CP2) released into the atmosphere, and ensure the conformity to the hygiene standards in public buildings' infrastructure.

The programme comprises providing preferential loans, grants and other support schemes. The essential requirement for the modernisation of the public building is that the building after modernisation has to reach energy efficiency, which corresponds to the efficiency not lower than class C. The programme is funded from state budgets, municipal budgets, EU structural funds, international organisations, private investors etc. It is expected that as a result of the programme – 20 GWh of energy will be saved annually.

In the programme's framework, these energy efficiency measures are envisaged: modernising heating, ventilation, electrical engineering systems, and modernising heat insulation conditions of the building.

#### *Heating boiler replacement with more effective technologies*

This financial programme aims to encourage private households to replace old and ineffective heat production equipment to the ones using more effective technologies producing energy from renewable sources.

The programme envisages a grant of 50 percent of the households' investments used for replacing ineffective heating boilers with modern ones using a more effective technology. It is expected that by 2030 50, 000 heating boilers will be replaced, and other measures of increasing energy efficiency will be implemented.

It is expected that as a result of measures undertaken, 200 GWh of energy will be saved annually, and 11 TWh of energy will be saved by 2030.

#### *Modernisation of heating and hot water systems of multiapartment buildings*

The measure is funded under the Climate change programme<sup>133</sup>. The measure's objective is to encourage the owners of the multiapartment buildings constructed according to technical requirements in force before 1993 to modernise heating and hot water systems. The programme envisages a grant to the owners of such buildings of 30 per cent of investment costs.

It is expected that as a result of the programme, 250 boiler stations of the multiapartment building will be renovated annually, 10 GWh of energy will be saved annually, and 0,55 TWh of energy will be saved by 2030.

#### *Renovation of single-family houses*

The measure is funded under the Climate change programme. The measure's objective is to encourage the owners of the single-family houses to renovate their houses to increase their energy efficiency. The programme envisages compensation of up to 30 per cent of renovation expenses contributing to increased energy efficiency.

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132 <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/f5a87b30793311e4a8a7b07c53dc637c/asr>

133 <https://www.apva.lt/en/national-investments/climate-change-program/>

It is expected that as a result of the programme, 1000 single-family houses will be renovated annually, 13,5 GWh of energy will be saved annually, and 0,74 TWh of energy will be saved by 2030.

### **7.3.3.2 (2) Industry:**

#### Regulation

All regulation related to the industry sector are included in the National Energy and Climate Action Plan for 2021 – 2030 comprises the Annex II “Description of the Measures for the Increasing the Efficiency of Energy Consumption developed in accordance with the Directive 2012/27/EU.”

#### Support Schemes

The chapter below comprises the selected measures falling within the Triple-A sector Industry from the abovementioned Description of the Measures for the Increasing the Efficiency of Energy Consumption.

#### Energy efficiency is increasing in business entities

The objective of the support mechanism envisages funding the implementation of energy efficiency measures in Lithuanian business entities by providing subsidies for energy savings achieved.

It is expected that as a result of the programme, 100 GWh of energy will be saved annually, and 5,5 TWh of energy will be saved by 2030.

The subsidies under the programme are provided for the implementation of the energy efficiency measures listed in the energy audits of the entities in the area of transport, technological processes and buildings (automation equipment, lighting modernisation, installation of air pressure systems, modernisation of cooling systems, installation of high-efficiency electric engines and other measures).

#### SPEI (services of public economic interest) relief for the industry

The objective of the support mechanism is to provide funding for the implementation of the energy efficiency measures in large industry entities where annual energy consumption exceeds 1 GWh.

It is expected that as a result of the programme, 100 GWh of energy will be saved annually, and 5,5 TWh of energy will be saved by 2030.

Under the programme, the measures provided in respectful energy audits will be implemented in transport, technological processes and buildings (automation equipment, lighting modernisation, installation of air pressure systems, modernisation of cooling systems, installation of high efficiency electric engines, other measures).

### **7.3.3.3 (3) Transportation:**

#### Regulation

All regulation related to the transportation sector are included in the National Energy and Climate Action Plan for 2021 – 2030 comprises the Annex II “Description of the Measures for the Increasing the Efficiency of Energy Consumption developed in accordance with the Directive 2012/27/EU.”

#### Support Schemes

The chapter below comprises the selected measures falling within the Triple-A sector Transport from the abovementioned Description of the Measures for the Increasing the Efficiency of Energy Consumption.

### *The renewal of urban and local area public transport vehicles*

Urban public transport modernisation aims to increase the energy efficiency of public transport vehicles by purchasing 150 electric powered urban and local area buses.

It is planned to procure electric-powered buses from 2023 – 2025 using the European Union funding.

As a result, it is expected that 0,393 TWh of energy will be saved.

### *Railway electrification*

The programme's objective – modernisation of the railway infrastructure - electrification of the 814 km of railway, which transports 70% of all railway cargo in the country. The programme envisages purchasing 30 new electric-powered trains and 50 electric powered locomotives, laying electrical lines and electric stations. The electric-powered trains will be purchased during 2023 – 2025 using EU funding.

It is expected that the measure 3,36 TWh of energy will be saved by 2030.

### *Influence of higher excise duty and taxes on the use of fuel*

The programme's objective is to reduce the use of gasoline, diesel, or Liquefied petroleum gas (LPG) by imposing higher than the minimal excise duties and taxes set by the EU.

Lithuanians use 21 per cent VAT for fuel, i.e. 6 per cent higher than the minimal VAT established by the EU. Gasoline also has a 21% higher excise duty than the minimal excise duty for gasoline set by the EU, and excise duty for LPG is 243 per cent higher than the minimum excise duty for LPG set by the EU.

Summarising the influence of the higher taxes and excise duty results in 14,7 per cent higher gasoline prices, 5,2% higher diesel prices and 64,7 higher LPG prices than they could be with the use of minimally allowed duties by the EU.

Regarding the amount of fuel sold in Lithuania, the elasticity of the demand and after evaluation of the experience of other countries in calculating the influence of the fiscal energy efficiency increasing measures on the use of fuel, it is estimated that as the result of the higher taxes and excise duties 600 GWt of energy will be saved annually and total amount on energy saved by 2030 will be 5 TWh.

### *Implementation of Urban sustainable mobility plans*

The Urban sustainable mobility plans aim to establish measures to reduce the use of personal vehicles and encourage walking, cycling, use of public transport, and vehicles powered by alternative fuel.

It is expected that the implementation of these plans will make it possible to save 2,95 TWh of energy by 2030.

The measures envisaged in Urban sustainable mobility plans will reduce the use of personal transport vehicles and increase the attractiveness, competitiveness, and the use of alternative means of transportation. The most important measures included are the modernisation of public transport, development of cycling and pedestrian infrastructure, implementation of mobility management systems, and implementation of alternative fuel infrastructure.

### Promotion of the use of electric powered vehicles

The measure is funded under the Climate change programme<sup>134</sup>. The measure's objective is to achieve that by 2025, 10% of annual transactions concerning purchasing personal vehicles (new registrations and secondary registrations) would be related to electric-powered vehicles, and by 2030 that number would reach 50%.

It is expected that the measure 6 TWh of energy will be saved by 2030.

The measure envisages subsidising of purchase of electric-powered vehicles: EUR 4000 for a new vehicle and EUR 2000 for a used vehicle up to 5 years old.

### Promotion of purchasing of vehicles with reduced pollution

The measure is funded under the Climate change programme. The measure's objective is to achieve that the energy efficiency of newly purchased vehicles during 2020 – 2030 would increase by 42%. The financial incentives will be proposed for 4,8% of the purchasing transactions. The amount of financial incentive – is EUR 1000.

It is expected that as a result of the measure, 0,9 TWh of energy will be saved by 2030.

## **7.3.3.4 (4) District Energy Networks:**

### Regulation

All regulation related to the District Energy Network sector are included in the National Energy and Climate Action Plan for 2021 – 2030 comprises the Annex II “Description of the Measures for the Increasing the Efficiency of Energy Consumption developed in accordance with the Directive 2012/27/EU.”

### Support Schemes

The chapter below comprises the selected measures falling within the Triple-A sector District Energy Networks from the abovementioned Description of the Measures for the Increasing the Efficiency of Energy Consumption.

### Agreements with energy suppliers on consumer education and consultation

The objective of the agreements is to educate and consult consumers on energy-saving measures and solutions and change consumer behaviour and habits, increasing energy efficiency.

Energy suppliers should ensure the implementation of consumer education and consultation scope and measures provided in the agreements.

It is expected that as a result of the measure, 300 GWh of energy will be saved annually, and 3 TWh of energy will be saved by 2030.

The education and consultation agreements provide that energy suppliers can use the following education and consultations measures: publication of information on the internet sites, project publicity events, e-mail, online or phone consultations after the consumer enquiry, consultations on consumer sites, lending of electricity and other measuring equipment, education on the effective exploitation of ventilation systems, publication of information in the press.

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134 <https://www.apva.lt/en/national-investments/climate-change-program/>

### Agreements with energy companies on energy saving

Energy companies are going to save energy according to energy levels set in the agreements on energy saving by using economically justified measures to increase energy efficiency in the devices of final energy consumers (devices, equipment of transport).

It is expected that as a result of the measure, energy companies will save at the site of final energy consumers 100 GWh annually and 5,5 TWh by 2030.

The programme requires implementing the measures provided in respectful energy audits in the area of transport, technological processes and buildings, i.e. automation equipment, lighting modernisation, installation of air pressure systems, modernisation of cooling systems, and installation of high-efficiency electric engines and other measures. Individual energy efficiency measures can also be implemented on-site for the final energy consumers.

#### **7.3.3.5 (5) Outdoor Lighting:**

##### Regulation

All regulation related to the outdoor lighting sector are included in the National Energy and Climate Action Plan for 2021 – 2030 comprises the Annex II “Description of the Measures for the Increasing the Efficiency of Energy Consumption developed in accordance with the Directive 2012/27/EU.”

##### Support Schemes

The chapter below comprises the selected measures falling within the Triple-A sector of Outdoor Lighting from the abovementioned Description of the Measures for Increasing the Efficiency of Energy Consumption.

The measure is aimed at municipalities and municipal entities implementing outdoor lighting modernisation projects. The programme's objective is to replace 25% of all outdoor lighting units, i.e., 65.000 units, by the year 2030. As a result of the programme, not less than 40% or 0,11 TWh of the electric energy used for outdoor lighting is expected to be saved by 2030. In the framework of the programme, it is envisaged to replace old outdoor lamps of low efficiency, cables and other equipment.

## **7.4 Triple-A partners in Lithuania**



Public Investment Development Agency (VIPA) is a state-owned National Promotional Institution (NPI) which provide loans, guarantees for repayable investments, implementation of similar measures for urban development, optimization of public infrastructure, and energy efficiency improvements. Our activities are financed by the European Union, national, and other financial assistance programs and financing sources.

**Web:** [www.vipa.lt](http://www.vipa.lt)

## 8 Spain

### 8.1 Country's Overview

Energy efficiency is an important part of the EU's ambition to achieve carbon neutrality by 2050. This ambition is reflected in the initiatives of the European Green Pact and Objective 55 of the Commission. For the EU, to reach this goal it will be necessary to further improve the energy efficiency objectives of each country.

The energy efficiency objectives<sup>135</sup> committed by Spain to the European Union are established by the National Integrated Energy and Climate Plan (PNIEC) 2021-2030, both in primary energy (PEC) and in final energy (FEC), less non-energy uses.

This document defines the objectives for the reduction of greenhouse gas emissions, the penetration of renewable energies and energy efficiency. It determines the lines of action and the path that, according to the models used, is the most appropriate and efficient, maximizing the opportunities and benefits for the economy, employment, health and the environment; minimizing costs and respecting the adaptation needs to the most CO<sub>2</sub>-intensive sectors. It is a programmatic document that must be presented to the European Commission for its evaluation and that will be debated with the different agents in Spain throughout 2019.

Flowing from this plan, more specific programmes are being launched in order to achieve a higher level of energy efficiency in specific sectors, such as MOVES<sup>136</sup> and PREE<sup>137</sup>. Further details about each one of these programmes will be provided throughout this document.

#### 8.1.1 Spanish stakeholder overview & Analysis

As a representative partner of this European project in Spain, CREARA aims to provide an overview of the financing instruments available to minimize risk and maximize investment expectations in energy efficiency projects. As part of this role an intense engagement with more than 300 stakeholders was undertaken through bilateral discussions, country meetings, webinars, training sessions and information request. Below there are some high-level numbers about the received feedback during the duration of the project:

**Table 39: Overview of Spanish Stakeholders activity**

What happened in the Spain?	#
No. of in Country meetings with stakeholders	21
External participants involved in bilateral discussions	19
Investor Preference Questionnaire responses	6
Stakeholder Questionnaire responses	6

<sup>135</sup> <https://www.eseficiencia.es/2022/01/10/espana-supera-objetivos-europeos-renovables-eficiencia-energetica-fijados-para-2020>

<sup>136</sup> <https://www.idae.es/ayudas-y-financiacion/para-movilidad-y-vehiculos/programa-moves-iii>

<sup>137</sup> <https://www.idae.es/ayudas-y-financiacion/para-la-rehabilitacion-de-edificios/convocatorias-cerradas/programa-pree>

What happened in the Spain?	#
General outreach to individual contacts	302

On May 2021, a series of webinars "Financing Energy Efficiency Projects" was held, within the framework of the Triple-A Project, in 8 European countries included Spain.

**Table 40: Activity in Capacity Building Webinar in Spain**

Triple-A Country Webinar participants in Spain:	27
A - Financing bodies	3
B - Companies / Project developers	15
C - Policy makers and Policy support Institutes	0
D - Researchers and Academia	4
E - Other	5

During this 1 hour and 30 min session and alongside CREARA team members, there were two main guests invited from the project developer field in Madrid and Barcelona, to present their projects and provide their views about the Triple A framework.

The main feedback provided during the event was the following:

- There was a general interest in innovative financing schemes by the audience.
- There was an observation about the restrictions of some types of energy contracts in order to be aligned with the European Regulations. The fact that needs to be compared with a threshold or target is considered a limitation.
- Both guest speakers agreed that even though their projects are technically robust it is very difficult to find new financing schemes. They confirmed the vision that the timeframes are in general too short, and they public funds are not enough so there is an agreement in the fact that private funding is required to further develop energy efficient projects.
- The project developer from Barcelona mentioned that based on their experience the typology to be financed has great impact in the interest of potential investors. Combining different types of energies and stakeholders is an issue for the investors.

On December 2021 a workshop called "Training on the Framework of Triple-A Financial Evaluation" was organised by CREARA. The objective of this training workshop was to present the project assessment process and the Tools developed within the framework of the Triple-A project, in order to facilitate the financing of energy efficiency investments in Europe.

This 1hour and 30 min session was accompanied by a presentation of risk assessment methods and risk mitigation strategies related to the financing of energy efficiency measures. In addition, a live and interactive demonstration of the Triple-A Tools was undertaken.

To conclude with, an open debate on the current situation of the energy efficiency sector at national and international level took place.

Table 41: Activity in Regional Training Workshop in Spain

Triple-A Training participants in Spain:	24
A - Financing bodies	13
B - Companies / Project developers	8
C - Policy makers and Policy support Institutes	2
D - Researchers and Academia	0
E - Other	1

The main feedback provided during the event was the following:

- There is interest in the topic from different types of stakeholders and professional backgrounds
- Additional Workshops were requested to gather more points of view from the different parties and create discussion forums about this topic
- More details on the potential financing bodies were suggested, in order to make the tool more appealing and reliable to the companies, in order to upload data in the platform
- Clearer information on the timelines and potential tracking of the projects once included in the Triple A tool was suggested.

### 8.1.2 Triple-A identified projects

During the last phase of the project, several energy efficiency projects in Spain were characterised, 4 of them were labelled as Triple-A by the platform. In addition, individual interviews were conducted for each project, where feedback about the energy efficiency sector in Spain and project needs were shared.

Following the trend in other countries, the projects are in the building sector and they are mainly dedicated to deep refurbishment of residential buildings. The distribution can be seen in the chart below:

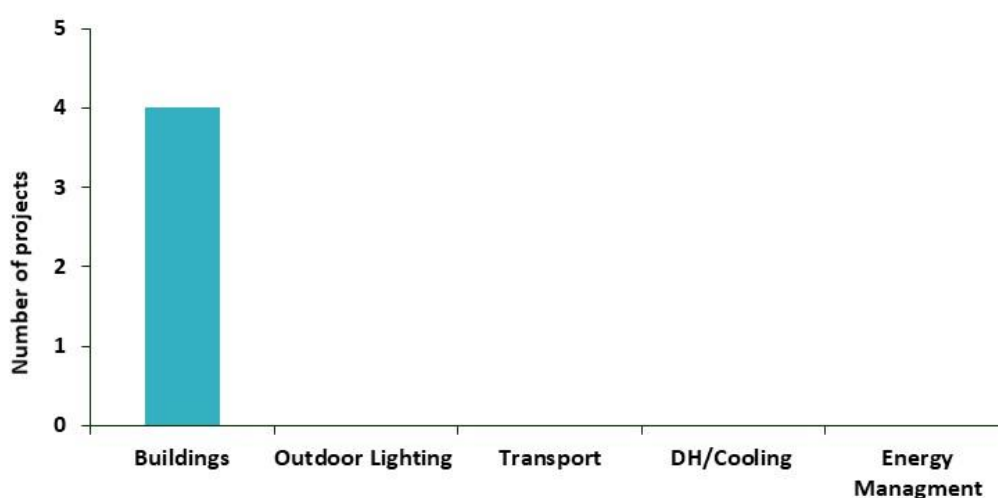
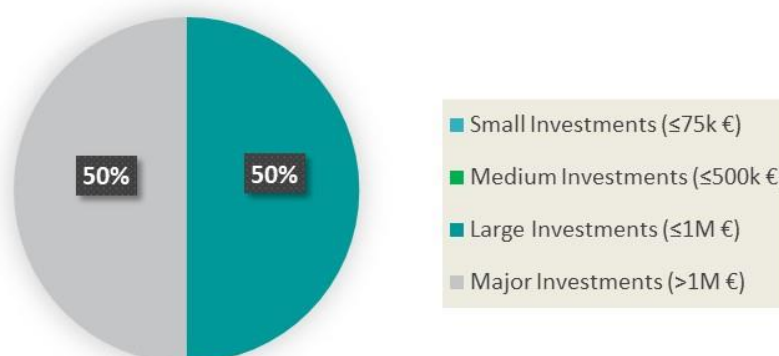


Figure 13: Distribution of Triple-A identified projects by sector in Spain

In line with the applied analysis structure, the volume invested in the implementation of these projects is analyzed. As these are renovations in large housing complexes, high budgets are recorded, with investments greater than 900k euros. The distribution of the required investments for the Spanish Triple-A projects is as follows:



**Figure 14: Projects by investment range in Spain**

Quantitative information that may help in understanding the above graph is provided below:

**Table 42: Quantitative investment data for Spain**

<b>Lowest Investment</b>	900,000 €
<b>Highest Investment</b>	1,500,000 €
<b>Average investment</b>	1,124,040 €
<b>Median Investment</b>	1,144,275 €

Extracting the mean and median payback periods of the investments gives a better picture of the trend, with a **mean of 14.1 years** and a **median payback period of 24 years**.

In terms of the robust financing programs most widely implemented in Spain, sector professionals highlighted soft loans, third-party financing and a certain presence of EPCs.

## 8.2 Monitoring & Regulation

The most important energy regulations and policies that affect the Triple-A projects identified in Spain are defined in this section.

### 8.2.1 The technical building code

The Technical Building Code (CTE<sup>138</sup>) approved by Royal Decree 314/2006 of 17 March, is the regulatory framework that establishes the basic quality requirements to be met by buildings and their installations.

In particular, it contains the Basic Document on Energy Saving, which establishes the basic energy efficiency and renewable energy requirements that must be met in new buildings and in interventions on existing buildings. Therefore, it is the reference regulation to be taken into account when carrying out energy efficiency projects in buildings, such as several of the Triple-A projects identified in Spain.

The Energy Saving section is divided into the following parts, each with its corresponding requirements and quality standards:

- Basic requirement HE0: Limitation of energy consumption
- Basic requirement HE1: Conditions for the control of energy demand
- Basic requirement HE2: Conditions of thermal installations
- Basic requirement HE3: Conditions for lighting installations
- Basic requirement HE4: Minimum contribution of renewable energy to cover domestic hot water demand
- Basic requirement HE5: Minimum electrical energy generation

### 8.2.2 Energy certification of buildings

Since 2013, there has been a national regulation that makes it compulsory to audit and certify the energy performance of any property before it is offered for sale or rent. The recently implemented Real Decreto 390/2021 repeals and replaces previous legislation in this area and becomes the current regulation on energy efficiency certification.

- Buildings or sections of buildings in which alterations or extensions are carried out that meet one of the following assumptions:
- Substitution, installation, or renovation of thermal installations
- Intervention in more than 25% of the total surface of the thermal envelope of the building.
- Expansion in which the surface area is increased by more than 10 % or when the total surface is increased exceeds 50 m<sup>2</sup>.
- Buildings or parts of buildings with a total useful floor area of more than 500 m<sup>2</sup> intended for the following uses: Administrative, sanitary, commercial, public residential (like hotels, hostels, etc.), educational, cultural, recreational activities, transport of persons, sports, and even places of worship.

Therefore, thanks to this regulation, the vast majority of building construction and renovation activities will have to have an energy analysis section, forcing the implementation of energy saving measures.

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<sup>138</sup> <https://www.codigotecnico.org/>

### 8.2.3 Regulation of self-consumption of energy

Since 2008, when the last legislative obstacles to energy self-consumption were removed, steps have been taken to facilitate and extend the implementation of renewable technologies, especially photovoltaic, to generate and consume energy on site. The latest document published by the government is the Roadmap for Self-consumption in Spain, according to the report's estimates, it is expected to reach between 9,000 and 14,000 MW of installed electricity capacity for self-consumption.

In this area, legislation is constantly being updated to facilitate procurement, grid connection, financing and many other factors related to these renewable energy projects.

Thanks to this constant updating, it is becoming easier and cheaper to take advantage of the abundant solar resource in Spain to generate and consume energy locally, thus reducing dependence on large energy companies, avoiding greenhouse gas emissions and saving money.

## 8.3 Market Architecture & Policy Frameworks

The framework of energy and climate policy in Spain is determined by the European Union (EU), which in turn responds to the requirements of the Paris Agreement reached in 2015 to provide an international and coordinated response to the challenge of the climate crisis.

On November 28, 2018, the European Commission updated its long-term strategic vision, so that the European Union achieves a prosperous, modern, competitive and climate-neutral economy by 2050. In order to achieve these objectives in a coordinated manner between all Member States of the EU the "winter package" includes a Governance Regulation. It establishes the planning procedure to meet the objectives and goals, guaranteeing the coherence, comparability and transparency of the information submitted to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.

The impact of the Covid-19 pandemic on Spanish society was sudden and paralysed the economy overnight. The reduction in emissions and other impacts related to the economic shutdown caused by the pandemic throughout 2020 has proved to be an illusion with the first data on environmental impacts related to the economic recovery in 2021.

Nevertheless, solid steps have been taken during this period, mainly aimed at reducing the carbon footprint and in line with the EU's environmental objectives. The most notorious effort, from which many smaller initiatives draw, is the **PNIEC** (Plan Nacional Integrado de Energía y Clima<sup>139</sup>), final version was approved in March 2021, and which will cover the period from 2021 to 2030 in terms of climate action. The main objectives are:

- A 23% reduction in greenhouse gas (GHG) emissions compared to 1990.
- Increase to 42% of renewables in the final use of energy.
- Improvement of energy efficiency by 39.5%.
- Increase up to 74% of renewable energy in electricity generation.

If we look at the expected trend for the PNIEC, using 2005 as the reference year for the estimates. A reduction of up to 39% in emissions from the "diffuse sectors", i.e. those that are not subject to the

<sup>139</sup> [https://www.miteco.gob.es/images/es/pnieccompleto\\_tcm30-508410.pdf](https://www.miteco.gob.es/images/es/pnieccompleto_tcm30-508410.pdf)

emission rights market, is foreseen. In contrast, a 61% reduction in GHG emissions is estimated for the sectors that apply to the emission rights markets. The data are shown in the graph below:

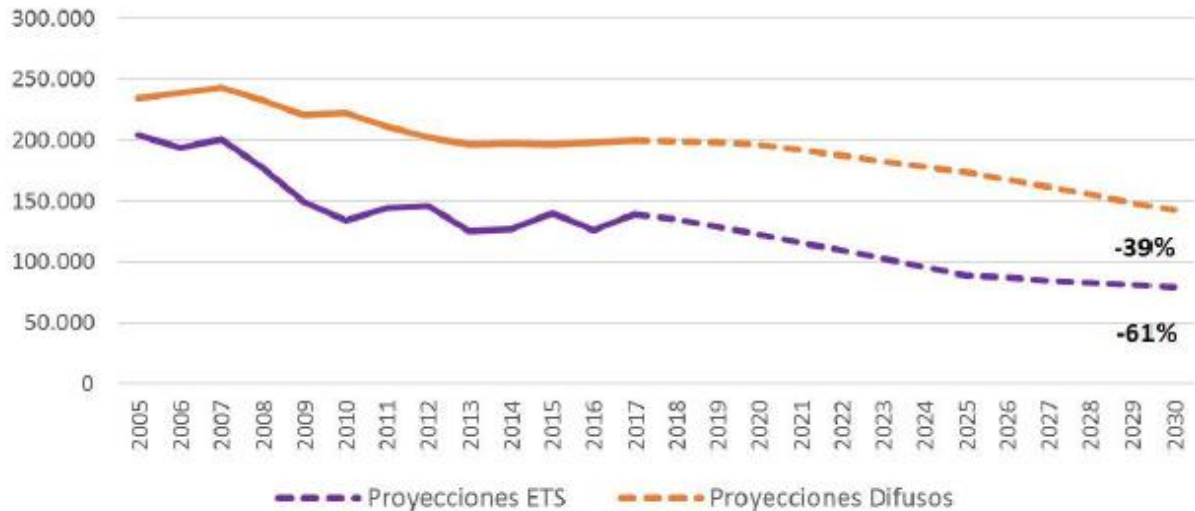


Figure 15: Trend of GHG emissions in Spain by sector

Flowing from this plan, more specific programmes are being launched in order to achieve a higher level of energy efficiency in specific sectors.

In the case of **sustainable mobility**, there are the **MOVES**<sup>140</sup> programmes, these programmes will finance the purchase of electric and plug-in hybrid vehicles such as cars, vans or motorbikes, as well as the purchase and installation of public and private access, charging infrastructures. The MOVES, which together consist of 4 different programmes targeting different sustainable mobility objectives, are financed with up to **850 million euros**.

In the **building energy renovation sector**, which due to its overall volume of energy consumption has a significant impact on the average energy efficiency level in Spain, the PREE<sup>141</sup> programmes have recently been started. These aids are arranged along two lines, one more generic and the other aimed at directing funding to areas considered to be of "demographic challenge", that is, highly depopulated areas with no industry or strong economic activities. Altogether, they have 350 million euros in funding.

The Ministry for Ecological Transition and the Demographic Challenge (MITECO) has opened two calls for pilot projects for **energy communities**<sup>142</sup>, with a budget of **40 million euros**, which will promote social innovation and citizen participation in renewables, energy efficiency and electric mobility. These are two of the first calls for proposals under the Strategic Project for the Recovery and Economic Transformation of Renewable Energies, Renewable Hydrogen and Storage (PERTE ERHA) and are expected to enable the implementation of around **40 renewable energy, electric mobility and demand-side management projects**.

The current Spanish government's approach is to combine environmentally sustainable energy initiatives with the fight against rural depopulation and other demographic challenges. In this way,

<sup>140</sup> <https://www.idae.es/ayudas-y-financiacion/para-movilidad-y-vehiculos/programa-moves-iii>

<sup>141</sup> <https://www.idae.es/ayudas-y-financiacion/para-la-rehabilitacion-de-edificios/convocatorias-cerradas/programa-pree>

<sup>142</sup> <https://www.idae.es/ayudas-y-financiacion/comunidades-energeticas>

several programmes have been developed to promote environmentally sustainable investments in areas considered to be of "demographic challenge".

This is the case of the **DUS 5000**<sup>143</sup> programme with a fund of **75 million euros**, which can be increased. This aid may cover up to 85% of the necessary investment in projects promoted by town councils and other public bodies in municipalities with less than 5,000 inhabitants. Subsidies will be granted for projects aimed to improving **energy efficiency** in public buildings and infrastructures, promoting green investments -in particular **self-consumption**-, or **charging infrastructures for EVs**, among others.

### 8.3.1 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided.

#### 8.3.1.1 (1) Buildings:

##### Regulation

In Spain, the climatic conditions prevailing in most of its territory mean that the insulation of buildings is not as high-priority as it may be in other European partners located in more northerly latitudes. Despite this, actions are being implemented at all levels (national, regional and municipal) to accelerate the energy retrofitting of existing buildings and to ensure that new buildings are built with full energy efficiency guarantees.

All new buildings are required to obtain a **New Building Energy Certificate**<sup>144</sup>, the document that contains an estimate of both primary energy consumption and CO<sub>2</sub> emissions of the building in question. This certificate is also required for major renovations of existing buildings and contains the following points:

- Identification of the building or part of the building that has been refurbished
- Procedure for obtaining energy ratings.
- Regulations on energy saving and efficiency that apply to the building.
- Energy characteristics: thermal and lighting installations, thermal envelope, indoor air quality, occupancy and operating conditions, and thermal and lighting comfort.
- Label expressing the energy performance rating.
- Recommendations for energy performance improvements (in the case of renovations).
- Verifications through testing.
- Compliance with environmental requirements for thermal installations.

##### Support Schemes

The rehabilitation programme for economic and social recovery in residential environments, included in investment 1 of component 2 of the Plan for Recovery, Transformation and Resilience (PRTR), aims to promote the rehabilitation of residential buildings, housing and neighbourhoods. The distribution of Next

<sup>143</sup> <https://www.idae.es/ayudas-y-financiacion/programa-dus-5000-ayudas-para-inversiones-proyectos-singulares-locales-de>

<sup>144</sup> <https://www.boe.es/boe/dias/2021/06/02/pdfs/BOE-A-2021-9176.pdf>

Generation EU funds among the final beneficiaries will be channelled through the Autonomous Communities and Cities, with which an agreement has been reached for the distribution of resources in proportion to the number of households in each region<sup>145</sup>.

The residential rehabilitation plan is divided into five programmes covering actions at neighbourhood, building and housing level; the creation of offices to provide support services and advice on rehabilitation, the distribution of aid for the preparation of the existing building book and the drafting of rehabilitation projects. The plan also includes a series of tax benefits to provide incentives for these actions. The list of programmes is shown below:

- Support programme for rehabilitation actions at the neighbourhood level<sup>146</sup>
- Support programme for rehabilitation offices<sup>147</sup>
- Programme of support for rehabilitation actions at building level<sup>148</sup>
- Programme of aid for actions to improve the energy efficiency of dwellings<sup>149</sup>
- Programme of aid for the preparation of the existing building book for refurbishment and the drafting of refurbishment projects<sup>150</sup>

In order to motivate refurbishments, many municipalities and autonomous communities are launching aid programmes that subsidise part of the interventions to be carried out. The overall objective of the actions is to reduce non-renewable energy consumption in households by at least 30% and to decarbonise and reduce heating and cooling demand by at least 7%. It is important to prove the reduction of consumption and for this purpose an expert has to issue an energy certificate for the house or building before and after the action.

Taking into account these financing channels, aid from European recovery funds can be applied for through direct subsidies, through deductions from personal income tax, and in cases of economic vulnerability, up to 100% funding of the project could be available<sup>151</sup>.

### 8.3.1.2 (2) Industry:

No related sector-specific subsidy schemes or regulations concerning the 'industry' sector were identified in the Triple-A project for Spain; hence there is nothing to be reported under this category.

### 8.3.1.3 (3) Transportation:

The Ministry of Transport, Mobility and Urban Agenda (MITMA) is leading an investment and reform strategy to promote sustainable, safe and connected mobility in urban, metropolitan and interurban

<sup>145</sup> INE continuous household survey 2020

<sup>146</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr/vivienda-y-agenda-urbana/programa-de-ayuda-las-actuaciones-de-rehabilitacion-nivel-de-barrio>

<sup>147</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr/vivienda-y-agenda-urbana/programa-de-apoyo-las-oficinas-de-rehabilitacion>

<sup>148</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr/vivienda-y-agenda-urbana/programa-de-ayuda-las-actuaciones-de-rehabilitacion-nivel-de-edificio>

<sup>149</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr/vivienda-y-agenda-urbana/programa-de-ayuda-las-actuaciones-de-mejora-de-la-eficiencia-energetica-en-viviendas>

<sup>150</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr/vivienda-y-agenda-urbana/programa-de-ayuda-la-elaboracion-del-libro-del-edificio-existente-para-la-rehabilitacion-y-la-redaccion-de-proyectos-de-rehabilitacion>

<sup>151</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr/vivienda-y-agenda-urbana/programa-de-ayudas-para-la-rehabilitacion-integral-de-edificios-residenciales-y-viviendas>

environments. The strategy<sup>152</sup> is included in two of the components (C1 and C6) of the Recovery, Transformation and Resilience Plan (PRTR) managed by the Ministry and falls under the umbrella of two of the lever policies on which the recovery plan pivots: "Urban and rural agenda, fight against depopulation and development of agriculture" and "Resilient infrastructures and ecosystems". There are currently no open calls for proposals.

#### 8.3.1.4 (4) District Energy Networks:

The sector-specific subsidy schemes or regulations concerning the 'District Energy Networks' sector that were identified in the Triple-A project for Spain, fall within the aid programme 'PREE Programa de ayudas para actuaciones de rehabilitación energética en edificios existentes'<sup>153</sup> regulated by Royal Decree 737/2020, which establishes the calls for applications in each autonomous community.

#### 8.3.1.5 (5) Outdoor Lighting:

In Spain there are different types of subsidy schemes for public lighting, to promote its renovation and adaption to the regulations, following at all times the established energy efficiency and sustainability criteria.

The potential beneficiary entities are the following:

- City councils
- Provincial Councils or equivalent local entities
- Associations or groups of municipalities in Spain
- Public entities that have the concession to manage public services in municipalities.

Any of them can apply, with objectives and an estimated budget, for the next calls for applications. In past editions that have already been called, the grants that have been awarded have amounted to nearly 50 million euros. These are granted to the beneficiary entities through the formula of reimbursable loans of up to 100% of the investment made. Moreover, the interest rate applied is 0.0 % and there is a maximum term of 10 years (including a 12-month grace period), which includes exemption from arrangement, study and guarantee cancellation fees.

The organisms that regularly call for these subsidies for public lighting are the following:

- Institute for Energy Diversification and Saving<sup>154</sup>
- European Regional Development Fund<sup>155</sup>

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<sup>152</sup> <https://www.mitma.gob.es/ministerio/proyectos-singulares/prtr>

<sup>153</sup> <https://www.idae.es/en/support-and-funding/renovation-buildings/calls-closed/pree-program-building-energy-rehabilitation>

<sup>154</sup> <https://www.idae.es/>

<sup>155</sup> <https://www.idae.es/ayudas-y-financiacion/fondo-europeo-de-desarrollo-regional-feder>

## 8.4 Triple-A partners in Spain



**CREARA** offers specialized engineering and consulting services in Energy Efficiency, Renewable Energy and Smart Cities & Grids. Since its foundation in Spain in 2005, Creara has become a national and international household name in the provision of high-value-added services in sustainable energy.

Through the different departments, Creara enables final consumers to increase their energy efficiency and reduce their energy bills. Additionally, their consulting department has a long tradition in supporting public institutions in regulatory and policy matters related to renewable energy technologies and energy efficiency.

**Web:** <https://www.creara.es>

## 9 The Netherlands

### 9.1 Country's Overview

The Dutch government stimulates sustainable energy uptake and investments and feels strongly about the transition towards a sustainable future. This is reflected in the scope and number of sustainability schemes that are already made available or in the process of being planned for Dutch businesses and citizens. Together, these schemes provide significant financial benefits and foster larger energy efficiency investments at an increased pace. These schemes are accompanied by increasingly stricter laws- and regulations beyond the EU regulations.

Fossil fuels, especially natural gas, are less available in the Netherlands, and the government is emphasizing this matter by transitioning towards fossil-fuel-free housing at a rapid pace while setting strict rules for industrial consumption. The overall strategy is to transition to 100% sustainable energy. By 2030, 70% of all electricity will be generated in a sustainable way. In 2050 almost all of the Dutch energy supply will be completely sustainable and CO<sub>2</sub> neutral.

#### 9.1.1 Dutch stakeholder overview & Analysis

A breakdown of the key figures of the Dutch involvement and stakeholder engagement regarding the Triple-A project is given. Throughout the Triple-A project's duration, **4 separate stakeholder questionnaires** were conducted. They were accompanied by 25 unique bilateral in-person or online peer-to-peer meetings discussing the topic of energy efficiency financing and providing at least an introduction to the Assess, Agree, and Assign tools. The underlying financial instruments, risk mitigation strategies extended by the EU taxonomy, and the online database are at the heart of the Triple-A project.

A breakdown of the Triple-A capacity building activities carried out in the Netherlands is also given. Two separate (online) events, were conducted; the first, [the capacity building webinar on April 21<sup>st</sup>, 2021](#) and secondly, [the regional training workshop on January 14<sup>th</sup>, 2022](#). A breakdown of the participants and their associated industry types is presented.

**Table 43: Overview of Dutch Stakeholders' activity**

What happened in the Netherlands?	#
No. of in Country meetings with stakeholders	25
External participants involved in bilateral discussions	38
Investor Preference Questionnaire responses	11
Stakeholder Questionnaire responses	10
Questionnaire for the categorization of mitigation strategies, financing instruments and financial schemes	4
General outreach to individual contacts	317

Apart from the general outreach figure presented above, a selective approach was used to engage with the Dutch stakeholder community, targeting specific 'experts in their field'. This is done purposefully as the long-term involvement and collaboration with the Triple-A project was the goal and to be able to

ensure a certain level of quality of the input and feedback gathered had to come from a place of trust for which a good relationship had to be developed. This process, although time-consuming, is one of the core approaches followed in the project as outlined in the project stakeholder engagement strategy report.

The 25 meetings conducted involved 38 external, non-project participants with varying roles across the 5 stakeholder types and within their organization. As the meetings often required a thorough understanding of the scope and goal of the Triple-A project, it was often difficult, in the typical hours length of the meeting, to go fully in-depth and walk participants through the materials available. Also, the materials were under development at times, which caused a slight mismatch in timeline planning. This never became a significant issue, however, as participants, due to the timeline, agreed to work with the materials available and come back to the country lead in case of any unclarities.

The general outreach figure reflects the no. of unique individuals who received information about the Triple-A project through the Dutch country lead. This includes disseminating general project updates such as newsletters, press releases, invitations to general events, briefing notes, etc. It is important to note that, although they are also included in the outreach figure, surveys were disseminated only to the participants involved in the bilateral discussions, as these contacts were vetted and proven to have the required level of insight into the topics investigated.

**Table 44: Activity in Capacity Building Webinar & Regional Training Workshop in The Netherlands**

Webinar participants:	29	Training Workshop:	14
A - Financing bodies	11	A - Financing bodies	4
B - Companies / Project developers	6	B - Companies / Project developers	5
C - Policy makers and Policy support Institutes	5	C - Policy makers and Policy support Institutes	4
D - Researchers and Academia	4	D - Researchers and Academia	1
E - Other	3	E - Other	0

The most noteworthy feedback received after the Dutch webinar and training workshop activities are summarized as follows:

- Participants appreciated the overview of the EU Taxonomy and risk/mitigation strategies that can be implemented when dealing with Energy efficiency financing at an early stage.
- Attendees indicated missing the practical application and/or need of the Triple-A tools offered for their day-to-day operation, indicating a potential participant mismatch. Issue was raised towards the fit with existing internal processes that cannot easily be adapted.
- There were concerns surrounding the privacy issues and validity of the information contained in the Triple-A database.
- The financial models presented were relevant and provided a good 'helicopter' perspective.
- The tools presented were intuitive and well received by the audience, indicating their relevance to the topic at hand.

### 9.1.2 Triple-A identified projects

Below is an overview of the Dutch Triple-A identified projects, including a per-project summary, the country's strategic context, and an introduction to the overall project governance structure.

Technical and financial details are not included here and are accessible through the Triple-A toolbox and associated database, where the information is updated as the projects develop.

All projects fall into Triple-A sector categories (1) Buildings, (2) Industry, and (3) Transportation, with the first also touching on (4) District Energy Networks. For all the Dutch cases, an intermediary was involved who provided the link to the project developers and assisted with monitoring the project's progress. In total, 23 Dutch projects were submitted to be considered for the Triple-A tools benchmarking, with 4 withstanding the stress test. For details on all the Dutch case projects, refer to the assign tool project database<sup>156</sup>; a summary overview is given below.

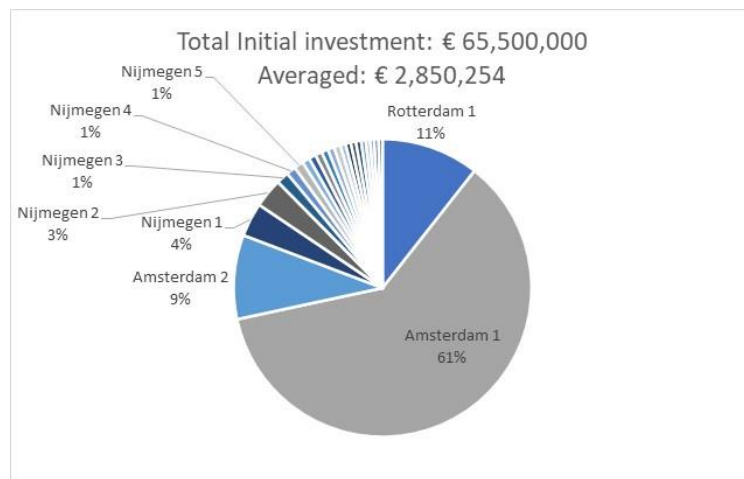


Figure 16: Dutch case projects' investments breakdown

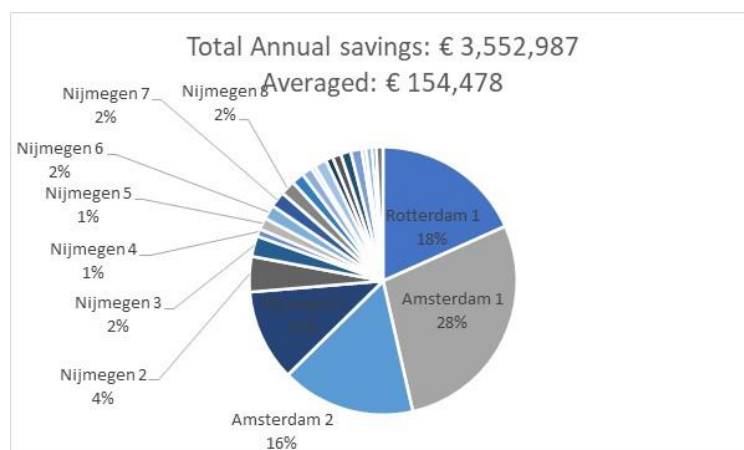


Figure 17: Dutch case projects' annual savings breakdown

<sup>156</sup> <https://toolbox.aaa-h2020.eu/assignHome/>

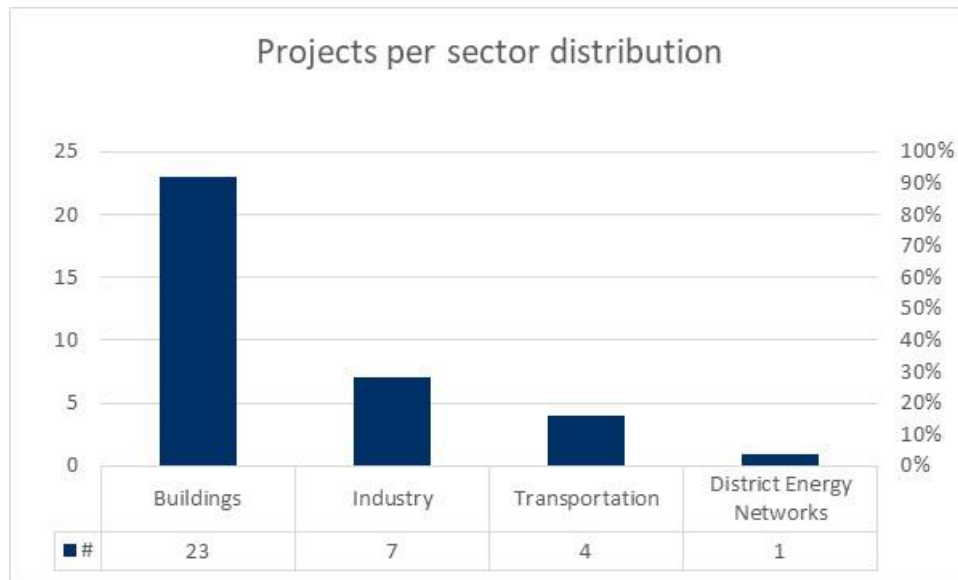


Figure 18: Dutch case projects per sector

## 9.2 Monitoring & Regulation

This section provides an overview of applicable and relevant laws and regulations concerning the selected Triple-A projects' sectors in the Netherlands.

### 9.2.1 The Energy efficiency notification obligation

Under the Dutch Environmental Management Activities Decree, organisations that use 50,000 kWh of electricity or 25,000 m<sup>3</sup> of natural gas (or an equivalent) per year are obliged to take energy-saving measures with a payback period of 5 years or less.

The Decree requires organisations in the Netherlands to save energy. The business community and the Dutch Government intend to accelerate energy efficiency through the notification obligation. The organisation had to report which energy efficiency measures they have taken by the 1<sup>st</sup> of July 2019, unless the organisation has an audit obligation under the Energy Efficiency Directive (EED) of the European Commission (EC)<sup>157</sup>. The Dutch government has issued a Recognised Energy Efficiency Measures List (EML) for 19 business sectors. This list contains energy efficiency measures that have a payback period of 5 years or less.

Monitoring and enforcement of this Decree happen, in principle, by the municipality in which the organisation is located. However, this task can also be delegated to an environmental agency or the province. Organisations that do not report on time may be penalised financially in the form of a non-compliance penalty.

More information on the Dutch Energy efficiency notification obligation is available through the website of the Rijksdienst Voor Ondernemend Nederland (RVO)<sup>158</sup>.

<sup>157</sup> [https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/energy-efficiency-directive\\_en](https://ec.europa.eu/energy/topics/energy-efficiency/targets-directive-and-rules/energy-efficiency-directive_en)

<sup>158</sup> <https://english.rvo.nl/information/laws-regulations/energy-efficiency-notification-obligation>

## 9.2.2 National Inventory Entity – NIE

The Netherlands has one National System for monitoring and reporting greenhouse gases for the United Nations Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the European Union (EU) monitoring obligations. The National System assures the quality of annual inventory reports to the UNFCCC and EU and ensures their suitability to demonstrate compliance with relevant requirements.

The core of the National System is the PRTR (in Dutch: emissieregistratie, ER). The PRTR holds one national dataset for emissions inventories covering some 350 air, water, and soil pollutants and is coordinated by RIVM. RVO maintains the National System as National Inventory Entity (NIE).

The Netherlands National System encompasses the following main elements:

- Definition and allocation of the specific roles, responsibilities and tasks, worked out in more detail in procedures and methodology reports
- Methodology reports describing methods for emission calculations (more on this below)
- Agreements on the basic institutional, legal, and organisational structure, including the 'single national entity' designation. These agreements have been laid down in contracts, legal arrangements and covenants. This also includes a legal basis for the monitoring of greenhouse gases<sup>159</sup>.
- Quality control and assurance (QA/QC) system and programme, including quality objectives, and QA/QC plan. Part of the quality assurance consists of regular (peer) reviews and audits, implemented to assure quality and to comply with UNFCCC and EU requirements

### 9.2.2.1 Methodology Reports

From 2015 onwards, five methodology reports documented the methods for estimating GHG emissions (including the activity data and emission factors).

These five reports are:

- Methodology report on the calculation of emissions to air from the sectors Energy, Industry and Waste (Triple-A Sectors: (2) Industry, (4) District Energy Networks)
- Methods for calculating the emissions of transport in the Netherlands (Triple-A Sector: (3) Transportation)
- Product usage by consumers, construction, and services (Triple-A Sector: (1) Buildings)
- Methodology for estimating emissions from agriculture in the Netherlands
- Greenhouse gas reporting of the LULUCF sector in the Netherlands

All reports are updated annually where necessary and are published by the NIE as part of the Dutch National System. The methodology reports ensure that the Greenhouse gas emissions are estimated according to the 2006 IPCC Guidelines, applicable KP Supplements and the UNFCCC and KP Reporting Guidelines, and the EU requirements. For more information, visit the RVO, the Dutch NIE<sup>160</sup>

<sup>159</sup> <https://english.rvo.nl/information/laws-regulations/national-inventory-entity/national-system/legal-basis>

<sup>160</sup> <https://english.rvo.nl/information/laws-regulations/national-inventory-entity/national-reports-unfccc>

## 9.3 Market Architecture & Policy Frameworks

A series of schemes fostering sustainable investments are available to the Dutch public and businesses. This section provides a general overview, listing the most relevant to the Triple-A project and the identified Dutch cases. Generally speaking, the amount and scope of sustainability schemes available in the Netherlands or are currently planned and targeted at the enhancement and uptake of energy efficiency investments is quite significant, and major financial benefits are available to businesses (and citizens).

The Dutch government generally stimulates sustainable energy uptake and feels very strongly about the transition to a more sustainable future. Fossil fuels, especially natural gas, are less available in the Netherlands. The government is planning to transition to sustainable energy step by step, and by 2030, 70% of all electricity will be generated in a sustainable way. In 2050, almost all the energy supply must be completely sustainable and CO<sub>2</sub> neutral.

The Dutch government offers a large amount of support to businesses to foster energy efficiency investments. Typically, these come in tax cuts, subsidies, and government guarantees. In section 9.3.1.1, broadly applicable interventions are described, which apply to multiple (if not all) Triple-A sectors. Sections 9.3.2 describe schemes relevant to financial institutions, and section 9.3.3 to the Triple-A sectors specifically.

### 9.3.1 Dutch subsidy schemes fostering sustainable investments

#### 9.3.1.1 Environmental investment deduction (MIA) and Arbitrary depreciation of sustainable investments (Vamil)

Through the MIA and Vamil schemes businesses can benefit from a tax deduction and/or arbitrary depreciation of their investments. Through the MIA, companies can deduct up to 36% of the investment costs for an environmentally friendly investment on top of their regular investment tax deductions, and with the Vamil, businesses can decide when to write off 75% of these costs. This provides owners with an advantage in liquidity and interest.

The investments that apply for this scheme are provided in the (Dutch) Environment list<sup>161</sup>. The investments listed there, called business assets, are proven to be minimally damaging to the environment and often have a broader scope than the obligations set and required by Dutch law.

The 2021 budget for MIA is €114 million and the budget for Vamil in 2021 is €25 million.

Visit the website of the RVO more information on the MIA and Vamil<sup>162</sup>

#### 9.3.1.2 Energy Investment Allowance (EIA)

The Energy Investment Allowance (EIA) is a tax deduction for energy-efficient technologies and sustainable energy investments. The calculated average tax reduction is 11% plus the reduction of the overall energy bill resulting from the investment. The EIA is a scheme targeted at companies, not at private individuals, associations or foundations. Businesses can receive a tax deduction on clearly defined investments (specific) and for tailor-made investments (generic) that result in substantial energy savings and can deduct 45.5% of the investment costs from the taxable profit. This is possible on top of their usual depreciation. These investments have to be described as 'company resources' and should

<sup>161</sup> <https://www.rvo.nl/subsidies-regelingen/milieulijst-en-energielijst/2021?type=all>

<sup>162</sup> <https://english.rvo.nl/subsidies-programmes/mia-and-vamil>

be listed in the 'Energy List 2021'<sup>163</sup>. Companies can also get a deduction for customised investments resulting in substantial energy savings but not on the Energy List. In this case, the investment must meet the savings standard.

The budget for the EIA (in Dutch: Energie-investeringsaftrek) in 2021 is € 149 million.<sup>164</sup>

### 9.3.1.3 Subsidy Scheme for the Sustainability of SMEs (SVM)

Small and Medium sized enterprises (SMEs) can, through the Subsidy Scheme for the Sustainability of SMEs (SVM) (Subsidieregeling Verduuzaming MKB), get an allowance for hiring an energy specialist to help businesses save energy and become more sustainable. The energy advice given should provide more insight to further the sustainability of your company and/or fleet. Additionally, as part of the SVM, companies are also compensated for implementing some of the sustainability measures recommended by the expert.

The energy advice contains an overview of energy-saving and sustainability measures. These can, for example, be adjustments, such as applying wall, floor or roof insulation or HR++ glass. Or the application of PV solar panels, solar boilers, heat pumps or other energy-efficient installations. But also, more minor adjustments, such as installing LED lighting. Or other energy-saving or sustainability measures for energy-efficient cooling, kitchen equipment and ICT equipment. In addition, it may involve adjustments to other parts of the business's operations, such as the use of electric delivery vans.

The scheme is available in the Netherlands from the 1<sup>st</sup> of October 2021 until the 30<sup>th</sup> of September 2022 and has a budget of € 28.2 million

More information is provided both in Dutch<sup>165</sup> and English<sup>166</sup> through the website of the RVO.

### 9.3.1.4 Demonstration Energy- & climate Innovation (DEI+)

The overall goal of the DEI+ is to support sustainable pilot projects and allow them to test new technology and improve it in a real-life environment. The projects must be innovative to be eligible for government support. The DEI+ is split into several themes detailed further in their related specific parts in section 3.3 of this paper. The DEI+ themes are:

- Natural gas-free homes, neighbourhoods and buildings
- Circular Economy
- CCUS
- Energy efficiency
- Renewable energy, including spatial integration
- Flexibility of the energy system, including hydrogen
- Local infrastructure
- Other CO2 reducing measures in the industry or electricity sector

<sup>163</sup><https://english.rvo.nl/sites/default/files/2021/04/EIA%20-%20Energylist%202021%20-%20English.pdf>

<sup>164</sup> <https://english.rvo.nl/subsidies-programmes/energy-investment-allowance-eia>

<sup>165</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/svm>

<sup>166</sup> <https://english.rvo.nl/subsidies-programmes/credit-guarantee-smes-bmkb>

A total budget of € 127 million is made available. <sup>167</sup>

## 9.3.2 Dutch subsidy schemes for financial institutions

### 9.3.2.1 Corporate Financing Guarantee (GO)

The Dutch government can help businesses get a loan through the Corporate Financing Guarantee (GO). This type of finance gives banks a state guarantee of 50% on medium-sized and large loans. In this way, the government aims to reduce the overall risk for the bank to provide financing to corporates. Through the GO scheme, credit continues to flow and keeps entrepreneurs in business. <sup>168</sup>

### 9.3.2.2 Growth Facility (Groeifaciliteit)

The Growth Facility scheme provides financial capital to high-risk investments for (rapid) company growth/expansion, takeovers, buy-outs or reorganisations. Through this scheme, financial institutions receive a guarantee on subordinated loans and on shares of venture capital companies to support high risk, high reward entrepreneurship. Financiers receive up to a 50% guarantee on their capital investments.

The budget for the growth facility (in Dutch Groeifaciliteit) in 2021 is € 85 million. <sup>169</sup>

### 9.3.2.3 Green Funds Scheme (Regeling Groenprojecten)

Banks can offer loans with a reduced interest rate for sustainable 'green' investments or savings by issuing a green statement. Through the Green Projects Scheme, the government encourages green investments in developments in environmental technology, the circular economy and sustainable and innovative (construction) projects. This requires cooperation between investors, banks and project managers.

Annually around € 800 million worth of financial support is provided through this scheme. <sup>170</sup>

## 9.3.3 Triple-A Sector Specific

In this section, sector-specific schemes and, where appropriate regulatory interventions that affected or even heavily impacted the implementation of the Triple-A identified projects are provided. The EE projects are linked to the schemes in the overview table at the end of the chapter.

### 9.3.3.1 (1) Buildings:

#### Regulation

There are many rules and regulations, or policy interventions, in the building sector impacting the renovation of old and construction of new buildings. A summary of the most impactful interventions related to the Triple-A projects is provided in Table 45.

<sup>167</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/demonstratie-energie-en-klimaatinnovatie-dei>

<sup>168</sup> <https://english.rvo.nl/subsidies-programmes/corporate-financing-guarantee-go>

<sup>169</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/groeifaciliteit>

<sup>170</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/regeling-groenprojecten>

Table 45: Overview of policy interventions in the building sector

Title:	Concerning:	Description:	Source:
<b>Energy efficiency notification obligation</b>	Existing	Companies and institutions are obliged to take energy-saving measures with a payback period of 5 years or less.	<a href="#">link</a>
<b>Energy Performance of Buildings Directive (EPBD III)</b>	Existing & New construction	<p>A broad number of interventions primarily concerning:</p> <ul style="list-style-type: none"> <li>- system requirements for technical building systems;</li> <li>- documenting the energy performance of technical building systems;</li> <li>- self-regulating equipment for controlling the temperature per room or zone;</li> <li>- charging infrastructure for electric cars;</li> <li>- inspections of heating and air-conditioning systems;</li> <li>- building automation and control systems.</li> </ul>	<a href="#">link</a>
<b>Energy label C for offices</b>	Existing	As of the 1st of January, 2023, every office building must have at least energy label C. This means a primary fossil energy consumption of a maximum of 225 kWh per m <sup>2</sup> per year. If the building does not meet the requirements, the building may no longer be used as an office.	<a href="#">link</a>
<b>Energy label utility buildings</b>	Existing	<p>An energy label is mandatory for the sale, rental or delivery of non-residential buildings.</p> <p>In addition, it is mandatory to display the energy performance indicator (the label class) of a valid energy label when a building is offered for sale or rent through advertisements in commercial media.</p>	<a href="#">link</a>
<b>Energy performance requirements for conversion and renovation</b>	Existing & New construction	The Building Decree sets requirements for: cultivation; renewal or replacement of insulation layers; dormer windows; major renovation and addition renovation with the adaptation of the technical building system (installation).	<a href="#">link</a>
<b>Energy performance - BENG</b>	New construction	For all new construction, both residential and non-residential, the permit applications must meet the requirements for Nearly Zero Energy Buildings (NZEB) from the 1st of January 2021. These requirements arise from the Energy Agreement for sustainable growth and the European Energy Performance of Buildings Directive (EPBD).	<a href="#">link</a>
<b>Environmental Performance of Buildings (MPG)</b>	New construction	The Environmental Performance of Buildings (MPG) is mandatory with every application for an environmental permit. The MPG indicates the environmental impact of the materials used in a building. This concerns new office buildings (larger than 100 m <sup>2</sup> ) and new-build homes.	<a href="#">link</a>

Source: Netherlands Enterprise Agency/Rijksdienst Voor Ondernemend Nederland (RVO)

## Support Schemes

### DEI+: natural gas-free homes, neighbourhoods and buildings

Sub-theme of the overall 'DEI+' scheme. Business and/or end-users that invest in innovative measures for natural gas-free homes, communities and buildings can receive financial support through the Demonstratie Energie- en Klimaatinnovatie (DEI+) scheme.

In the coming years, 30,000 to 50,000 existing homes must be made natural gas-free each year. In preparation for this, homes can already be made gas-free-ready. Natural gas-free-ready means that, in terms of construction and installation facilities for heating, hot tap water and cooking, homes are ready for disconnection from the natural gas network and connection to alternative energy infrastructure. This disconnection from the natural gas network and connection to the new energy infrastructure can occur later without great effort and inconvenience for residents.

The budget available for this DEI+ theme in particular: € 9 million and is separate from the overall DEI+ budget of € 127 million.

### Energy Investment Allowance (EIA) for buildings

Included and specified in the EIA are many interventions aimed explicitly at buildings (new construction & renovation)<sup>171</sup>.

### Subsidy for sustainable energy and energy saving (ISDE)

The ISDE is available to consumers and businesses and offers a range of support to increase the energy efficiency of (work) buildings or rental homes.

The ISDE has a budget of € 124 million.<sup>172</sup>

## **9.3.3.2 (2) Industry:**

### Regulation

Although there are many regulations for the Dutch industry sector specifically the 4 out of the 23 projects that were considered for Triple-A and that were classified as industry specific did not bare noteworthy environmental regulation which are not already mentioned in the section before. Most impactful regulations steer towards reduction of emissions in large scale industries, which were not part of the projects considered in this report.<sup>173</sup>

## Support Schemes

### DEI+ Circular Economy & Energy Efficiency

As per the previous section's DEI+ scheme, the 'circular economy' & 'Energy Efficiency' sub-themes are targeted at measures aimed at the industry sector, specific project proposals for recycling & waste, re-use and use of bio-based manufacturing sources in the Circular Economy theme and energy efficiency investments and implementations through the Energy Efficiency sub-theme.

<sup>171</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/energie-investeringsaftrek/ondernemers/branches-en-themas/duurzaam-bouwen>

<sup>172</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/isde/zakelijke-gebruikers>

<sup>173</sup> <https://ondernemersplein.kvk.nl/wetten-en-regels/industrie/milieu-en-omgeving-in-de-industrie/>

The budget available in the DEI+ circular economy theme is €19 million in 2021 (out of a total of € 127 million).

#### *Energy Investment Allowance for Industry*

For industry-related investments, the Energy Investment Allowance (EIA) additionally offers opportunities for business assets specifically and are included on the Energy List. A distinction is made between the specific investments, typically included on the energy list; generic investments are investments across the industry's specific value-chain<sup>174</sup>.

#### *Circular Value Chain*

Another scheme targeted at improving the overall value chain of industries is the circular value chain subsidy. SMEs currently developing a circular product, service, or a comprehensive business model can receive financial support for hiring a project manager and covering their own personal costs of up to a maximum of 50%. Only collaboration between 3 and 6 businesses are eligible to receive this funding (amongst other criteria)

For more information ([link](#))

#### *Accelerated Climate Investments (VEKI)*

(Versnelde Klimaatinvesteringen Industrie (VEKI) is a scheme designed to combat the high-upfront costs of proven, CO2 reducing, industry-specific technologies with payback periods longer than five years. Particularly large projects and process innovations are targeted.

The budget available for the VEKI is € 82 Million in 2021. <sup>175</sup>

For more information ([link](#))

### **9.3.3.3    (3) Transportation:**

#### *Regulations*

As the projects considered and identified as Triple-A typically fall in the first category there are no stand-out governmental regulations that affect the Triple-A identified projects considered in this report. This does however not mean that there isn't any environmental regulation associated to the transportation sector in the Netherlands.

#### *Support Schemes*

As with the other Triple-A sectors, the Dutch government offers many opportunities for the transportation sector. A good overview of what is available is given in figure 1 below. The EIA and the MIA/Vamil schemes provide a range of possibilities for energy efficiency investments in the transportation sector.

#### *Subsidy Scheme for Emission-free Commercial Vehicles (SEBA)*

Entrepreneurs/businesses that are in the process of buying or leasing a new, utterly emission-free company car can apply for the Subsidy Scheme for Emission-free Commercial Vehicles (SEBA). Eligibility for SEBA in an operational lease is available through the lease company by processing it in the operational lease contract to the end client. Up to € 5000 per company vehicle.

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174 <https://www.rvo.nl/subsidie-en-financieringswijzer/energie-investeringsaftrek/ondernemers/sectoren/industrie>

175 <https://www.rvo.nl/subsidie-en-financieringswijzer/klimaatinvesteringen-industrie>

The SEBA has a budget available in 2021 of € 22 million.

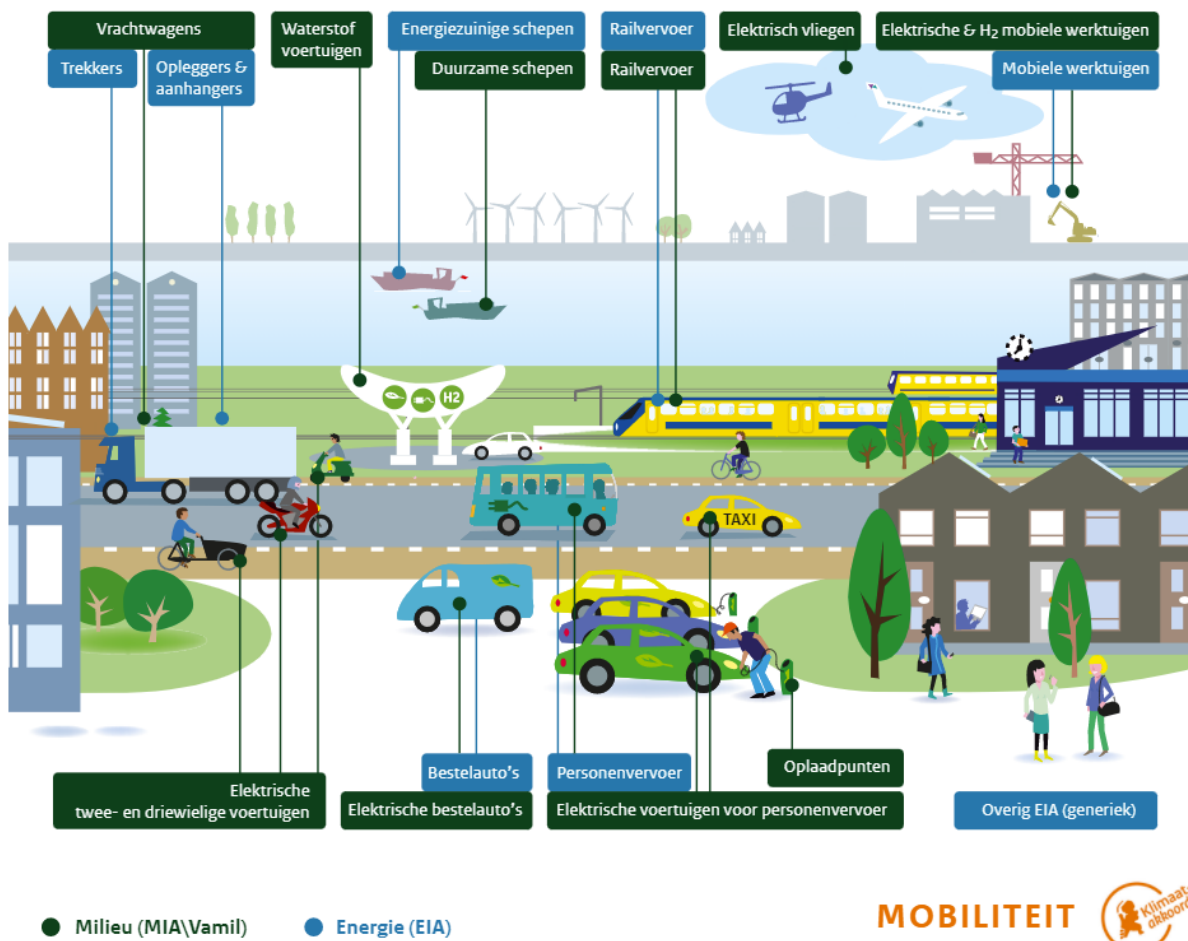


Figure 19: Infographic Mobility with an overview of available EIA and MIA\Vamil schemes in the Dutch transportation sector

Source: RVO, Infographic Mobility

### Energy Investment Allowance (EIA) Transport

The EIA also offers specific compensation for energy efficiency investments in the transport and mobility sector as per the other sectors mentioned previously. To not needlessly drag-on this report, refer to the previous section covering the EIA for more information or refer directly to the website of the RVO.<sup>176</sup>

#### 9.3.3.4 (4) District Energy Networks:

### Regulations

The one project associated with this sector is not directly affected by regulations surrounding district energy network, as per the previous sections, this does not mean there are no regulations impacting the sector in particular, just none that are within scope of the Triple-A identified projects analysed in this report.

<sup>176</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/energie-investeringsaftrek/ondernemers/branches-en-themas/transport>

## Support Schemes

### Stimulation of sustainable energy production (SDE++)

The SDE++ is an expansion to the former Stimulation of sustainable energy production (SDE+) and is new in that the scheme stimulates sustainable energy production and CO<sub>2</sub> reduction. In this way, the government wants to ensure that the energy transition in the Netherlands remains feasible and affordable. The SDE++ is one of the most extensive Dutch interventions and offers a budget of € 5 billion (!) to businesses and consumers.

The SDE++ offers subsidies for the use of techniques for generating renewable energy and other CO<sub>2</sub>-reducing techniques and have to fall in the categories: Renewable electricity, renewable heat and CHP, renewable gas, low-carbon heat or low-carbon production. For each category, several sub-categories are defined.

Companies granted SDE++ subsidy receive the awarded support over 12-15 years. The duration depends on which technology is used.

For more information and a complete overview of the conditions and process<sup>177</sup>

### Renewable Energy Transition (HER+)

Renewable Energy Transition, Hernieuwbare energietransitie (HER), takes an innovative approach to energy investments by not looking at your typical output indicators (such as energy consumption reductions, cost reductions, or raw materials, amongst others) the HER+ looks specifically at CO<sub>2</sub> reduction. The HER+ ties in with the previously mentioned SDE++ scheme and follows the same categorization. However, its similarities with the SDE++ scheme, the focus on CO<sub>2</sub> as main output offers additionalities to projects that would otherwise not be considered under the available support schemes.

The HER+ has a total budget of € 50 million<sup>178</sup>

### System solutions for large-scale renewable electricity generation (MOOI-SIGOHE)

Businesses working on systemic innovation that integrate large-scale renewable electricity generation are eligible to receive the MOOI-SIGOHE subsidy, which supports sector-transcending system solutions targeting more significant partnerships. Innovations must include the generation of renewable energy and at least 1 of 3 other energy sectors: 1. transport and distribution, 2. Storage and conversion, 3. Consumption. The MOOI scheme stimulates innovative solutions to reduce CO<sub>2</sub> emissions in the Netherlands, emphasizing cooperation with a clear connection between activities that deliver concrete results. With the assumption that in this way, innovations have a greater chance of success.

The budget for the MOOI-SIGOHE is € 13.8 million<sup>179</sup>.

### DEI+ renewable energy

As per the other DEI+ scheme sub-areas, a specific scheme is targeted at the renewable energy sector – for more information on the DEI+, refer to section 9.3.1 of this paper.

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<sup>177</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/sde>

<sup>178</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/hernieuwbare-energietransitie>

<sup>179</sup> <https://www.rvo.nl/subsidie-en-financieringswijzer/mooi/mooi-sigohe>

### *EIA load balancing and the energy transition*

The same applies to the EIA load balancing scheme targeting the energy transition. A subset with criteria targeting this sector is defined under the general Energy Investment Allowance. For more information on this, refer to Section 9.3.1 of this paper.<sup>180</sup>

#### 9.3.3.5 (5) Outdoor Lighting:

No related sector-specific subsidy schemes or regulations concerning the 'outdoor lighting' sector were identified in the Triple-A project for the Netherlands; hence there is nothing to be reported under this category.

## 9.4 Triple-A partners in The Netherlands



**ABN AMRO**

**ABN AMRO** serves Retail, Private and Corporate Banking clients focusing on the Netherlands (third-largest bank in the Netherlands) and selective operations internationally. Clients are offered a comprehensive and full range of products and

services through omnichannel distribution, including advanced mobile applications and internet banking. ABN AMRO offers in-depth financial expertise and extensive knowledge of numerous industry sectors. Internationally, the Group's operations are based on specific expertise and established market positions.

**Web:** <https://www.abnamro.nl/en>



**IEECP** is a non-profit international research institute that brings together top experts in energy efficiency and climate policy issues from various EU research organisations. The core team is comprised of

specialists working in advisory roles for energy and carbon policy and market since its inception, and their evaluation, and on stakeholder consultation management practices for energy and climate policy. The research members have a verifiable list of scientific publications (over 60) in scientific journals in energy and climate policy.

**Web:** <http://www.ieecp.org>

<sup>180</sup><https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/duurzame-energie-opwekken/verduurzaming-warmtevoorziening/wet-en-regelgeving>

## 10 Conclusions

Energy Efficiency actions, as technological changes that make energy consumption more efficient, thus lowering energy demand are playing a vital role in national economic recovery plans as posed by the current covid-19 pandemic crisis and the current energy crisis, which is getting worse and worse due to the recent war in Ukraine. External and internal factors triggered the current energy crisis leading in an increase of energy prices and a turmoil in energy sector. The energy sector is by default cyclical as market expansions followed by sudden contractions. However, the current energy crisis differs due to the transition to a low carbon energy sector which is not yet properly designed and stressed-tested against volatility. Increasing prices constrain post-covid-19 recovery plans and blocks the alleviation of the energy poverty that a significant number of Europeans are facing.

As EU accelerates its effort towards decarbonisation, policy decision making should focus on security, affordability, and sustainability in order to pursue the EU emissions target. It is imperative that governments should issue subsidies and cut taxes in an effort not only to protect consumers but to re-design the energy system to enable the green transition. Energy efficiency investments could boost economies and bring long-term benefits for consumers, businesses and environment, in particular, lower energy bills, reduced greenhouse gas emissions and improvements in energy systems. To reach these types of investments mobilisation of capital through public and private targeted use of funds, innovative support schemes are required.

This report presents eight (8) Synthesis papers from the Triple-A case study countries, namely Bulgaria, Czech Republic, Germany, Greece, Italy, Lithuania, Spain and The Netherlands. Each Synthesis paper summarises the policy framework and market architecture for the Triple-A specified sectors namely buildings, industry, transportation, district energy networks and outdoor lighting in order to show case the energy market and regulatory framework condition. The overview of each Synthesis paper derived from all Triple-A activities and especially fed by stakeholders' engagement in Triple-A and insights from Triple-A project fiches. The scope of this report is to provide information for already implemented practices and guide their maintenance or influence the creation of new ones in different countries. The set of the Triple-A case study countries enables the easy adaptability of the outcomes of the Synthesis papers to the majority of the EU countries but not limited due to the great diversity of Triple-A countries with different climates, legislative structures and economic conditions.

Germany as one of the leading European economies is undergoing a massive transformation. Besides the shift towards renewable energies in electricity generation and fuel substitution, energy efficiency plays a key part in the transformation towards a green energy economy. In the same pace is The Netherlands, as the Dutch government stimulates sustainable energy uptake and investments and feels strongly about the transition towards a sustainable future. The Dutch government is emphasizing on this matter by transitioning towards fossil fuel free housing at a rapid pace, while also setting strict rules to industrial consumption. The same applies for the Czech Republic where the energy efficiency sector is relatively advanced and ingrained in numerous public policies and laws on national level.

On the other hand, countries with slow economic recovery and prolonged severe recession (Greece and Italy) have recently starting to put more attention in energy efficiency and embracing the green and digital transition. This is mainly observed in building sector and renewable energy respectively. The plan includes investments to finance a large-scale renovation programme to increase the energy efficiency of buildings and provides measures to promote the use of renewable energy sources.

This is also happening due to the highly dependence on energy sources imports. This makes countries (such as among other but not limited, Greece, Lithuania and Bulgaria) to pay intense attention to the the energy efficiency. Their main strategic directions are increasing energy independence, transition to renewable energy sources, decreasing the energy consumption by implementing the modern low energy technologies etc.

According to data derived from the Triple-A web-based Database, the share of the energy efficiency investments per sector per country is as Figure 20. Therefore, the most numerous energy efficiency projects identified in Triple-A are from building sector as it is most widely supported by investments and consequently support schemes. In particularly, in the Czech Republic, Lithuania and The Netherlands, the majority of the Triple-A projects belong to the buildings sector. This should not be surprising since this is the most numerous energy efficiency project category in the country and also most widely supported by public funds. The same applies to Germany where the majority of German projects belong to the building and transport sector. Bulgaria, Greece, Spain and Italy are presenting a wider spectrum of sectors (buildings, industry, District Energy Network and outdoor lighting) where Triple-A projects have been identified. However, in the later countries, the projects from the building sector prevail.

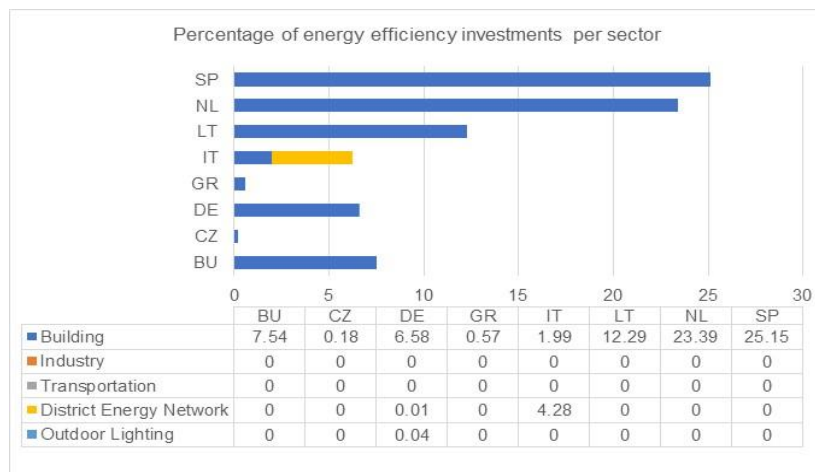


Figure 20: Percentage of energy efficiency investments per sector

The Figure below summarises (in percentage) the Triple-A identified projects per sector per case study country.

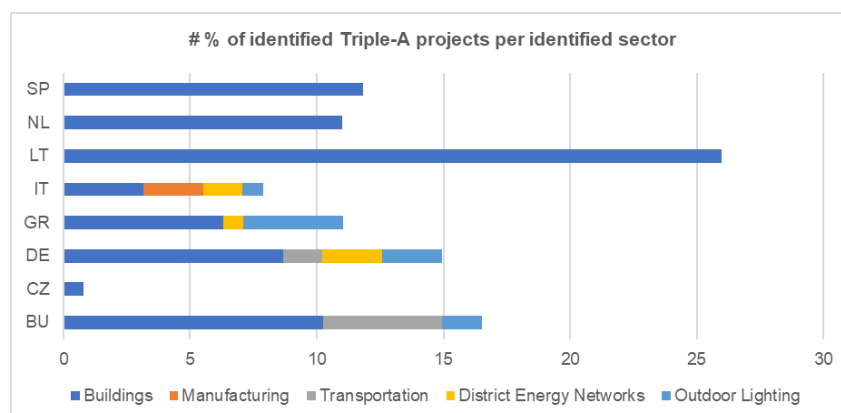


Figure 21: Number of identified Triple-A projects per sector

This sketch of energy sectors domination in energy efficiency projects is reflected in the supported schemes availability currently available in the Triple-A case study countries. Figure 22 shows that the

majority of the support schemes are focusing on the building sector, while leading countries in the economy or having a large share of the European firms (Germany, The Netherlands, Lithuania, Spain) are providing support schemes covering the majority of the Triple-A sectors. The same applies to Bulgaria as a country with significant ambition towards EU processes.

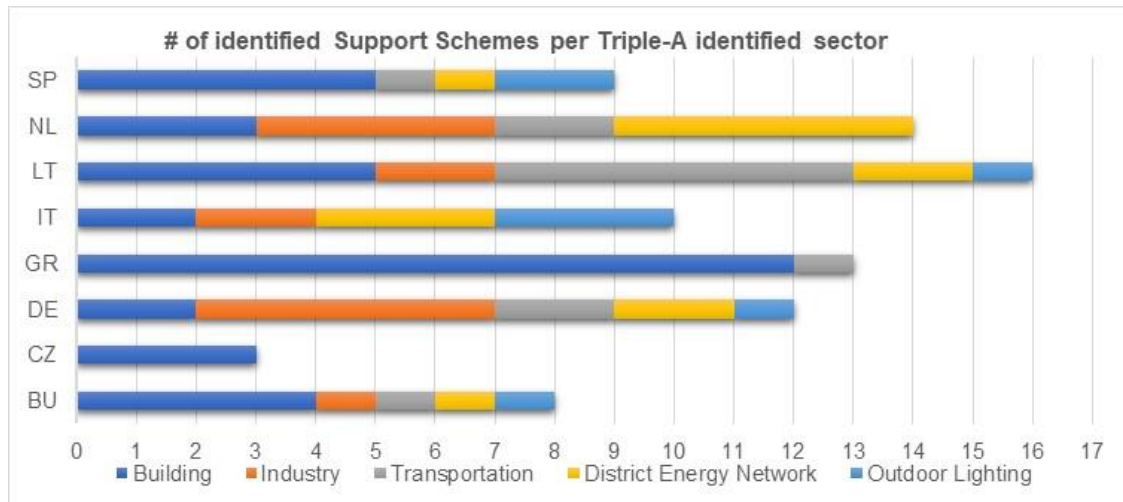


Figure 22: Number of identified support schemes per Triple-A identified sector

Finally, the policy framework and market architecture of each country could not be completed without the interest expressed of relevant stakeholders and their engagement in energy efficiency sector. Triple-A posed a remarkable effort to stakeholder engagement in order to derive useful insights. It was observed that financing bodies and project developers are the main stakeholder groups participated, while policy makers followed. It should be noted that financing bodies were more active in engagement activities (such as consultation processes, provide information via surveys and bilateral meetings, participation in events) in countries with stronger economy, while in countries with strong industry or in economic recovery, thus increase in energy efficiency projects, stakeholders from the target group of project developers were more active.

Outcomes and insights per Synthesis paper and as an overall are expected to be used so as to lead to a more detailed set of policies, or to guide ongoing maintenance of the already implemented. This can be followed from other EU Member States as well -neighbour countries, countries with similarities in policy frameworks, countries with similar economic condition- to enhance decision making towards fostering investibility of energy efficiency. To this end, Triple-A partners already proceed with activities on communicating findings gained within Triple-A and exchange with governmental bodies in Triple-A case study countries mainly where policy makers were more active in stakeholder engagement activities (i.e., Greece, The Netherlands, Czech Republic,) but other EU Member States as well.

## Appendix

Tables below provides a short overview of each case study country project fiches that are Triple-A identified, including a brief summary per project, the country's strategic context, and an introduction to the overall project governance structure.

**Table 46: Overview of the Bulgaria project fiches that are Triple-A Identified**

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Non-residential building, owned by the Ministry of Interior</b>	<p>The main goal of the project is to renovate the building centre in the upcoming years to be CO<sub>2</sub>-neutral, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Zero CO<sub>2</sub>-emission 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> <li>- Enhance comfort and quality of life for consumers</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- External Insulation (walls);</li> <li>- Replacement of window frames and doors;</li> <li>- Thermal insulation of roof;</li> <li>- Measures for internal heating installation;</li> <li>- Replacement of heating source and installation of Renewable Energy Sources (RES) for heating;</li> <li>- Lighting measures.</li> </ul>	<p>The renovation and the implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). Bulgarian Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction up to 0 emissions in 2030.</p>	<p>The facility 1 management department is responsible for the energy infrastructure of the building. Several people are responsible for the different targets.</p> <p>The future financial structure for the implementation of the project is in the possibilities of the Ministry to find a suitable form for a public competition with the participation of ESCO companies and large investment companies.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Hospital, Hissarya, owned by the Ministry of Interior</b>	<p>The main goal of the project is to renovate the building centre in the upcoming years to be CO<sub>2</sub>-neutral, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Zero CO<sub>2</sub>-emission 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact Enhance comfort and quality of life for consumers.</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- External Insulation (walls)</li> <li>- Replacement of window frames and doors</li> <li>- Thermal insulation of roof</li> <li>- Replacement of heating source</li> <li>- Lighting measures</li> <li>- Thermal insulation of floor</li> </ul>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). Bulgarian Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction up to 0 emissions in 2030.</p>	<p>The facility management department is responsible for the energy infrastructure of the building. Several people are responsible for the different targets. The future financial structure for the implementation of the project is in the possibilities of the Ministry to find a suitable form for a public competition with the participation of ESCO companies and large investment companies</p>	1
<b>Admin_building, Etropole</b>	<p>The main goal of the project is to renovate the building in the upcoming years to be energy-neutral in 2030, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Energy-neutral by 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> </ul> <p>The following measures and actions are selected and will</p>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). Bulgarian Government set goals in line with the Paris</p>	<p>The real estate department of the building owner is responsible for the building and the building installations. The future financial structure for the implementation of the project is in the possibilities of the Municipality to find a suitable form for a public competition with the participation of ESCO companies and large investment companies.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	<p>contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- External Insulation (walls);</li> <li>- Replacement of window frames and doors;</li> <li>- Thermal insulation of roof;</li> <li>- Measures for internal heating installation - Installation of HVAC (thermal pump system VRV/VRF); Upgrading of ventilation system.</li> <li>- Replacement of heating source and installation of Renewable Energy Sources (RES) for heating;</li> <li>- Thermal insulation of floor.</li> <li>- Installation of Photovoltaic Power Plant</li> </ul>	<p>Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction up to 0 emissions in 2030.</p>		

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>School, Liaskovets</b>	<p>The main goal of the project is to renovate the building in the upcoming years to be energy-neutral in 2030, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Energy-neutral by 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- Internal Insulation (walls);</li> <li>- Replacement of window frames and doors;</li> <li>- Thermal insulation of roof;</li> <li>- Replacement of heating source and installation of Renewable Energy Sources (RES) for heating;</li> <li>- Thermal insulation of floor.</li> </ul>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). Bulgarian Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO2 reduction up to 0 emissions in 2030.</p>	<p>The real estate department of the building owner is responsible for the building and the building installations. The future financial structure for the implementation of the project is in the possibilities of the Municipality to find a suitable form for a public competition with the participation of ESCO companies and large investment companies.</p>	1
<b>Primary School Slaveykov, Tarnovo</b>	<p>The main goal of the project is to renovate the building in the upcoming years to be energy-neutral in 2030, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Energy-neutral by 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> </ul> <p>The following measures and actions</p>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). Bulgarian Government set goals in line with</p>	<p>The real estate department of the building owner is responsible for the building and the building installations. The future financial structure for the implementation of the project is in the possibilities of the Municipality to find a suitable form for a public competition with the participation of ESCO companies and large</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	<p>are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- External Insulation (walls);</li> <li>- Replacement of window frames and doors;</li> <li>- Thermal insulation of roof;</li> <li>- Thermal insulation of floor.</li> <li>- Replacement of heating source</li> <li>- Lighting measures</li> </ul>	<p>the Paris Agreement. Therefore, all buildings must realise a CO2 reduction up to 0 emissions in 2030.</p>	investment companies.	

**Table 47: Overview of the Czech project fiches that are Triple-A Identified**

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Kindergarten in Písek</b>	<p>Technologies to be used:</p> <ul style="list-style-type: none"> <li>- Modernization of all windows with the fact that the front windows will respect the architectural character of the facade and will use wooden casement windows fitted in both wings with insulating double glazing (<math>\approx</math> quadruple), other windows will be modernized using multi-chamber plastic windows with insulating triple glazing</li> <li>- Insulation of all vertical structures of the building in the courtyard, insulation of the eastern gable of the original building, including insulation of the structure of unheated attic</li> <li>- Insulation of the ceiling structure to the attic of the new building</li> </ul> <p>Installation of a controlled ventilation system with</p>	<p>National law, EU Directives and other national policies on energy efficiency improvement supports renovation of buildings and projects of installation of renewable energy sources with the subsidies on implementation of innovative technical measures and increase of energy efficiency of buildings.</p>	<p>Client: The town of Písek Project developer/promoter: The town of Písek Financing body: Subsidies from the Operational programme Environment and The town of Písek Client of the energy efficiency project has initiated the project preparation to improve its energy efficiency. The project consultant has won the public tender and thus was contracted for project preparation and grant application processing. The town of Písek, through a consulting company, submitted an application for a subsidy from the Operational Program Environment in the amount of EUR 78,533. The project is supervised internally by project coordinator.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	recuperation (in all classes)			
<b>Czech Statistical Office</b>	<p>Technologies to be used:</p> <ul style="list-style-type: none"> <li>- Renovation of windows and addition of intelligent shading technology</li> <li>- Replacement of opaque outer cladding of perimeter walls</li> <li>- Modification of sunshades within the outer cladding of the perimeter walls</li> <li>- Increasing the thermal insulation of the roof</li> <li>- Green roof</li> <li>- Modernization of the control system</li> <li>- IRC installation</li> <li>- Installation of forced ventilation system</li> <li>- Installation of a system for the use of waste heat from data centre cooling, etc. technologies</li> <li>- Lighting modernization</li> <li>- PV system installation</li> <li>- Reduction of heat losses / gains by correct design of the ventilated facade on the south side of the building</li> </ul> <p>Expansion and performance reinforcement of the living space cooling system</p>	<p>National law, EU Directives and other national policies on energy efficiency improvement supports renovation of buildings and projects of installation of renewable energy sources with the subsidies on implementation of innovative technical measures and increase of energy efficiency of buildings.</p>	<p>Client: Czech Statistical Office</p> <p>Project developer/promoter: Czech Statistical Office</p> <p>Financing body: Subsidies from the Operational programme Environment and Czech Statistical Office</p> <p>Client of the energy efficiency project has initiated the project preparation to improve its energy efficiency. The project consultant has won the public tender and thus was contracted for project preparation, grant application processing and public tender administration. The Czech Statistical Office, through a consulting company, submitted an application for a subsidy from the Operational Program Environment in the amount of EUR 3,999,910 EUR. The project is supervised internally by project coordinator.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Elementary school in Písek</b>	<p>Technologies to be used:</p> <ul style="list-style-type: none"> <li>- thermal insulation of all other vertical structures and roofs of the building, which today do not have thermal insulation (beyond what is proposed for the gym pavilion);</li> <li>- installation of a controlled ventilation system with recuperation (in all classrooms);</li> <li>- reconstruction of the building's lighting system (by replacing the luminaires with new ones, with LED sources);</li> <li>- installation of a photovoltaic power plant of suitable size (up to 30 kWp)</li> </ul>	<p>National law, EU Directives and other national policies on energy efficiency improvement supports renovation of buildings and projects of installation of renewable energy sources with the subsidies on implementation of innovative technical measures and increase of energy efficiency of buildings.</p>	<p>Client: Písek municipality</p> <p>Project developer/promoter: The town of Písek</p> <p>Financing body: Subsidies from the Operational programme Environment and The town of Písek</p> <p>Client of the energy efficiency project has initiated the project preparation to improve its energy efficiency. The project consultant has won the public tender and thus was contracted for project preparation and grant application processing. The town of Písek, through a consulting company, submitted an application for a subsidy from the Operational Program Environment in the amount of EUR 467,061. The project is supervised internally by project coordinator.</p>	1
<b>Laundry and dry cleaning, MYVAL Zlín</b>	<ul style="list-style-type: none"> <li>- the use of waste energy in production processes; and</li> <li>- reducing energy intensity / increasing the energy efficiency of production and technological processes.</li> <li>- The current project status – the project has been completed</li> <li>- Technologies to be used:</li> <li>- Water filtration and recirculation system</li> <li>- Preheating of the drying air with low-pressure steam</li> <li>- Regulation of washing lines,</li> </ul>	<p>National law, EU Directives and other national policies on energy efficiency improvement supports renovation of buildings and projects of installation of renewable energy sources with the subsidies on implementation of innovative technical measures and increase of energy efficiency of buildings.</p>	<p>Client: Laundry and dry cleaning company</p> <p>Project developer/promoter: Laundry and dry cleaning company</p> <p>Financing body: Subsidies from the Operational Programme Enterprise and Innovation for Competitiveness and Laundry and dry cleaning company</p> <p>Client of the energy efficiency project has initiated the project preparation to improve its energy efficiency. The</p>	1 - buildings

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	energy use of condensate		project consultant has won the tender and thus was contracted for project preparation and grant application processing. The Laundry and dry cleaning company, through a consulting company, submitted an application for a subsidy from the Operational Programme Enterprise and Innovation for Competitiveness in the amount of EUR 97,400. Project coordinator supervised the project internally.	
<b>Elementary schools in Prague 13</b>	<p>The installation of a controlled ventilation system is designed to increase the quality of the indoor environment for teaching children and reduce heat consumption for heating thanks to heat recovery.</p> <p>The installation of the photovoltaic system is intended to cover part of its own electricity consumption from renewable sources.</p> <ul style="list-style-type: none"> <li>- The current project status – waiting for a decision on the allocation of subsidy</li> <li>- Technologies to be used:</li> <li>- Installation of mechanical ventilation system include the heat recovery system</li> <li>- Installation of the PV system (on the roofs)</li> </ul>	<p>National law, EU Directives and other national policies on energy efficiency improvement supports renovation of buildings and projects of installation of renewable energy sources with the subsidies on implementation of innovative technical measures and increase of energy efficiency of buildings.</p>	<p>Client: Municipal district Prague 13</p> <p>Project developer/promoter: Municipal district Prague 13</p> <p>Financing body: Subsidies from the Operational programme Environment, Capital City of Prague and Municipal district Prague 13</p> <p>Client of the energy efficiency project has initiated the project preparation to improve its energy efficiency. The project consultant has won the public tender and thus was contracted for project preparation and grant application processing. The Municipal district Prague 13, through a consulting company, submitted an application for a subsidy from the Operational Program Environment in the amount of EUR 1,596,616. The project is supervised internally by project coordinator.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Varnsdorf laundry</b>	<p>The project plan is in accordance with the specific conditions of the Call. In the Energy Saving Support Program, in particular in the following areas:</p> <p>Supported activity</p> <ul style="list-style-type: none"> <li>- (f) the use of waste energy in production processes; and</li> <li>- (g) reducing energy intensity / increasing the energy efficiency of production and technological processes.</li> </ul> <p>Technologies to be used:</p> <ul style="list-style-type: none"> <li>- Replacement of the steam source with a hot water boiler</li> <li>- Renewal of technological equipment of the laundry</li> <li>- Exchanger system for ironing line</li> <li>- Central heat exchanger system for batch washing machines</li> </ul>	<p>National law, EU Directives and other national policies on energy efficiency improvement supports renovation of buildings and projects of installation of renewable energy sources with the subsidies on implementation of innovative technical measures and increase of energy efficiency of buildings.</p>	<p>Client: Varnsdorf laundry, Ltd.</p> <p>Project developer/promoter: Varnsdorf laundry</p> <p>Financing body: Subsidies from the Operational Programme Enterprise and Innovation for Competitiveness and Varnsdorf laundry</p> <p>Client of the energy efficiency project has initiated the project preparation to improve its energy efficiency. The project consultant has won the tender and thus was contracted for project preparation and grant application processing. The Varnsdorf laundry, through a consulting company, submitted an application for a subsidy from the Operational Programme Enterprise and Innovation for Competitiveness in the amount of EUR 111,510. Project coordinator supervised the project internally.</p>	1

Table 48: Overview of the German project fiches that are Triple-A Identified

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>“Building 1”</b>	<p>New materials and components provide new properties for the building envelope and building technology. Current developments include high-performance insulation materials with foam pores on the nanometer scale, as well as insulation materials based on renewable raw materials.</p>	<ul style="list-style-type: none"> <li>- Coated films with selective, adaptive or switchable properties can expand the properties of the building envelope as a thin, taut membrane.</li> <li>- Innovative coating technologies provide component surfaces with new or improved properties.</li> <li>- Switchable modules are even being developed for opaque</li> </ul>	<p>The renovation/envelope will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings and Lighting.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
"Building 2"	<p>The "Non-residential buildings research database" project aims to answer various research questions by collecting primary data to record the structure and energy efficiency of non-residential buildings in Germany. The following measures and actions are selected:</p> <ul style="list-style-type: none"> <li>- Modernization trends and effectiveness of the instruments used are also required in the building sector</li> <li>- Relevant data for modernization such as the structure and condition of the buildings, their energy efficiency as well as influencing factors for decision-making processes will be surveyed</li> <li>- The no-residential building will achieve energy savings of at least 20% in comparison to the baseline performance with</li> </ul>	<p>elements in the building envelope so that, for example, heat can be dissipated from buildings in accordance with the needs.</p> <ul style="list-style-type: none"> <li>- Multifunctional facade modules assume several functions simultaneously, for example as daylight systems integrated into the glazing with solar-active modules and solar shading, or as prefabricated facade modules for minimally invasive refurbishments with integrated ventilation technology.</li> </ul>		
		<p>The change will be compliant with energy performance standards set in the applicable building regulations for major residential transposing the German Energy Saving Ordinance based on the Energy Conservation Act: energy efficiency standards for all types of buildings</p>	<p>The real estate department is responsible for the buildings research and the building installations. A facility manager organisation and a maintenance real estate are accountable for the exploitation of the building.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>“Building 3”</b>	<p>the residential buildings.</p> <p>The main goal of the project is the installation of solar photovoltaic modules on the roofs of rented apartments:</p> <ul style="list-style-type: none"> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> <li>- Increase Real-Estate value</li> <li>- Enhance comfort and quality of life for consumers</li> <li>- Foster tertiary and industry sectors competitiveness</li> <li>- Minimize investment costs</li> <li>- Increase households disposable income</li> <li>- Fund energy refurbishments by savings capitalization</li> <li>- Accessibility</li> </ul> <p>The following measures and actions are selected:</p> <ul style="list-style-type: none"> <li>- Implementation of an air-source heat pump</li> <li>- Addition solar panels</li> <li>- Installation of thermostatic valves</li> <li>- Roof insulation with rigid insulating panels of polyisocyanurate foam and new waterproofing</li> <li>- Energy management and care</li> </ul>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the German Energy Saving Ordinance - based on the Energy Conservation Act: energy efficiency standards for all types of buildings.</p>	<p>The start-up department of the building owner is responsible for the building and the building installations. A facility manager organisation and a maintenance start-up are accountable for the exploitation of the building.</p>	1
<b>Public Transport</b>	<p>The project aims to provide an energy-efficient and economical alternative. The aim is to develop an innovative series of self-starting</p>	<p>The development of transport will achieve energy savings of at least 20% in comparison to the baseline performance of</p>	<p>The Federal Government's aim is to make Germany a lead market and top provider in the field of electric mobility. Electric vehicles need to be able to compete, particularly on range and</p>	3

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	synchronous reluctance motors with an output of up to 1.5 kilowatts for industrial use. The characteristic feature of this type of motor, apart from the fact that it does not use rare earths, is that it also runs at a constant speed, but the torque to drive the rotor - unlike with conventional asynchronous motors - is not generated by repulsive electromagnetic fields.	the public transport before this new change.  Using the design tools now available, there is the prospect of significantly increasing the efficiency of these motors and thus their energy efficiency	price, with other propulsion concepts. This means that there is a continuing need for a high level of precompetitive research and development.	

Table 49: Overview of the Greek project fiches that are Triple-A Identified

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Renewal of the lighting system of a hotel</b>	Renewal of the indoor and outdoor lighting system of a hotel, located in the suburban area of Athens, Greece. The hotel has an extended outdoor area which is partly and occasionally used as a sitting area of the restaurant.	Installation of LED lamps. The general lighting of the outdoor areas foresees indirect luminaires recessed on medium height poles.	<b>Type of project:</b> Private project <b>Total CAPEX:</b> 95,000 EUR <b>Project simple payback period:</b> 5 years <b>Expected energy savings per fuel or source:</b> <i>Electricity:</i> 178,000 kWh/year <b>Expected reduction of CO<sub>2</sub> (eq.) emissions:</b> 176 tpa  <b>Simple payback time:</b> 6 years for the ESCO	1
<b>Renovation of a multi-storey residential building</b>	The project is related to a step-by-step renovation of a multi-storey residential building, constructed in early 1990s. The renovation foresees the implementation of different interventions which are focus on the improvement of the indoor conditions and the achievement of energy savings.	Installation of additional wall insulation (external insulation). Replacement of roof slab insulation, resulting in significantly higher thermal resistance. Replacement of fenestration (openings frame and glazing). Replacement of oil boiler with air to water heat pump. Replacement of radiators. Installation of thermostatic valves to radiators. Replacement of gravity thermal solar DWH with	<b>Type of project:</b> Private <b>Total CAPEX:</b> 145,000 EUR <b>Project simple payback period:</b> 54 years <b>Expected primary energy savings:</b> 33,000 kWh/year <b>Expected reduction of CO<sub>2</sub> (eq.) emissions:</b> 9 tpa	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Optimization of the lighting system of an industrial building</b>	Replacement of lamps with new high energy efficient LED lamps and optimization of the lighting system of an industrial building, located in the suburban area of Athens, Greece.	new ones, with selective coating plate and appropriate boiler thermal insulation Installation of LED lamps and associate equipment.	<b>Type of project:</b> 1 Renewal of indoor and outdoor luminaires and lamps <b>Total CAPEX:</b> 292,000 EUR <b>Expected energy savings per fuel or source:</b> <i>Electricity:</i> 535,000 kWh/year <b>Expected primary energy savings:</b> 1.550.000 kWh/year <b>Expected reduction of CO<sub>2</sub> (eq.) emissions:</b> 529 tpa <b>Internal Rate of Return (IRR):</b> 14% (6 years)	
<b>Energy Efficiency upgrade of a residential apartment</b>	HVAC& R upgrade of a Ground floor, 39.4 m <sup>2</sup> apartment.	Ground floor, 39.4 m <sup>2</sup> apartment HVAC& R upgrade. Installation of domestic solar hot water system.	<b>Type of project:</b> 1 Residential Building HVAC& R upgrade <b>Project simple payback period:</b> 1.78 years <b>Expected energy savings per fuel or source:</b> <i>Electricity:</i> 3,479.67 kWh/year <b>Expected reduction of CO<sub>2</sub> (eq.) emissions:</b> 2.2 tpa	

Table 50: Overview of the Italian project fiches that are Triple-A Identified

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>“PhotoVoltaic in Manufacturing Facility”</b>	SEACSUB is purchasing a second production building close to the one already existing, and the goal is installing PV panels on the rooftop of the new facility to decrease the energy expense and environmental impact of SEACSUB injection moulding production facilities, dedicated to produce diving equipment such as fins	With the installation of the PV system, the company aims to auto-produce up to the 35% of the overall energy consumed, thus amounting at around 100 kWh / year. This auto-production would result in a cost saving around 37 k€ / year for the company. Moreover, from an environmental point of view it is forecasted that 65 t/year of CO <sub>2</sub> emissions will be avoided thanks to	The project relies on a project board, consisting of technical and financial figures. Then a steering committee consisting of a project manager and other collaborators. The funds are administrated by an officer and distributed to the different areas. A facility manager organisation and a maintenance company	1, 2

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	via rubber and plastic injection moulding.	the use of RES by the company.	are accountable for the exploitation of the building.	
<b>“Smart Grid”</b>	<p>The goal of the project is, starting from the current scenario of the local grid in Benetutti municipality, to set up a Smart Grid with a co-generation of electricity and heat, to make the municipality full independent from the external energy supply and decrease the energy expense and environmental impact of the town. Building a smart grid with a co-generation concept takes the possibility to fully exploit the potentiality of the already existing PV energy production, by creating mid products like biogas that can be used when they are needed in cogeneration.</p>	<p>Talking about a public municipality, different typologies of energy are requested, for different purposes. The municipality needs large amounts of both electricity and heat, with very different demands along the day and the year. Then, installing a RES-based plant is important for the sustainability of the community, but it's not sufficient to guarantee the complete efficiency of the grid.</p> <p>With the design and installation of the smart grid with the co-generation system, the municipality aims to reach a sustainable self-consumption schema. To do this, the first data gathered was about the potential residual biomass in the surrounding. In particular, the municipality will focus on the cheese production sector, meat production, wine production, and livestock.</p> <p>With the implementation of this infrastructure to exchange data between the consumers and the energy distributor, the municipality aims to adopt a set of good practices and increase the awareness on energy good usage among the population. With the active involvement of inhabitants, then, the goal is optimizing energy consumption with a decrease around 20% of energy consumption. Preliminary analyses showed that even a higher reduction of energy loss and usage is possible</p>	<p>The municipality is responsible for the building and the building installations</p> <p>The project relies on a project board, consisting of technical and financial figures. Then a steering committee consisting of a project manager and other collaborators. The funds are administrated by an officer and distributed to the different areas.</p>	1, 2, 4
<b>“Energy Data Exchange”</b>	<p>The goal of the project is connecting the electricity network of Benetutti to the main energy provider. To do this, an optic fibre infrastructure was designed and shall be developed. The goal of connecting the grid to the energy provider is having a reliable infrastructure to exchange data on energy consumption and production in real time. These data will be then used to do predictions on the future energy-related scenarios, thus allowing to take useful</p>	<p>With the implementation of this infrastructure to exchange data between the consumers and the energy distributor, the municipality aims to adopt a set of good practices and increase the awareness on energy good usage among the population. With the active involvement of inhabitants, then, the goal is optimizing energy consumption with a decrease around 20% of energy consumption. Preliminary analyses showed that even a higher reduction of energy loss and usage is possible</p>	<p>The municipality is responsible for the building and the building installations</p> <p>The project relies on a project board, consisting of technical and financial figures. A project manager manages the activities. The funds are administrated by a financial officer and distributed to the different areas.</p>	1, 2, 4

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	countermeasures to optimize the consumptions themselves.	thanks to such an infrastructure.		
<b>“Smart platform for public illumination efficiency and flexible energy consumption”</b>	The project envisages the development of a software platform for the Smart Grid decision support and management, including public illumination. The investment for the development of the full-fledged platform for the Smart Grid management is higher compared to the declared investments needed for the development of the module related to the public lighting. It is interesting to explore the possibility to develop on-demand one or more modules of the smart platform.	The project has great potentialities for municipalities, public building and Smart Grid. The platform is very flexible and modular, able to manage different aspects of energy management and efficiency, including the outdoor lighting.	The project relies on a project board, consisting of technical and financial figures. Then a steering committee consisting of a project manager, a risk manager and a business analyst. The funds are administrated by a financial officer and distributed to the different areas.	5
<b>“Hospital project”</b>	The project focuses on the renovation of part of a hospital located near Milan. The goal is to improve comfort and regulate and reduce consumption through an Energy Cloud service applied to the existing HVAC system. Given the current period of the COVID-19 pandemic, the project will ensure the proper ventilation of hospital premises, in order to reduce the risk of infections.	Enerbrain would install wireless controllers to act on the components of the already in place HVAC system. These actions on HVAC components are dictated by Enerbrain cloud-based algorithm. Inputs for the algorithm are the desired settings for the building (e.g. temperature), a number of external variables (e.g. weather data) and the real-time monitored conditions by the Enerbrain monitoring hardware (e.g. indoor temperatures, humidity, etc.) Expected energy efficiency improvement is around 15%.	The project relies on a project board, consisting of technical and financial figures. Then a steering committee consisting of a project manager, a risk manager and a business analyst. The funds are administrated by a financial officer and distributed to the different areas.	1

Table 51: Overview of the Lithuanian project fiches that are Triple-A Identified

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Modernization of an administrative building Gedimino ave. 38, Vilnius</b>	<p>Administrative building located at Gedimino Ave. 38, Vilnius construction was completed in Vilnius in 1972. The energy audit of the building found that the building complies with energy performance class D. The energy audit report proposes a third package of energy saving measures. The implementation of all the planned works would achieve energy efficiency class B. Expected energy savings per fuel or source: heat and electricity energy 378 MWh/year, Expected reduction of CO<sub>2</sub>(eq.) emissions: 112 tpa. The following measures will be installed during the project:</p> <ul style="list-style-type: none"> <li>• Renovation (modernization) of the heating system</li> <li>• Installation of mechanical ventilation systems</li> <li>• Tin roof replacement</li> <li>• Insulation of external walls</li> <li>• Exterior door replacement</li> <li>• Replacement of windows and sunroofs</li> <li>• Insulation of external walls adjacent to the ground</li> <li>• Insulation of floor above unheated basement</li> <li>• Floor insulation on the ground</li> <li>• Renovation / modernization of lighting systems</li> </ul>	<p>Turto bankas, by centrally managing state-owned administrative real estate, seeks to make a significant contribution to the Government of the Republic of Lithuania in 2014. November 26 by resolution no. 1328 "On the Approval of the Program for Improving the Energy Efficiency of Public Buildings" The objective set in the Program for Improving the Energy Efficiency of Public Buildings is to increase the efficiency of energy consumption to increase the efficiency and operation of public buildings, to reduce greenhouse gas (CO<sub>2</sub>) emissions into the atmosphere, to ensure the compliance of the infrastructure of public buildings with the requirements of hygiene norms".</p>	<p>The project is implemented by Turto bankas. Principal activities of Turto bankas are:</p> <p>implementation of centralized management of the State-owned real estate, developing of State real estate project's, organization of privatization of State-owned enterprises, selling of State-owned real estate and collecting public debt.</p> <p>Turto bankas also manage the unified State-owned property informative online search system and prepares an annual report on State-owned property.</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Modernization of an administrative building Lukiškių str. 2, Vilnius</b>	<p>Administrative building located at Lukiškių str. 2, Vilnius construction was completed in 1978. Following an energy audit of the building, the building complies with energy performance class F. The energy audit report proposes the first package of a group of energy saving measures. The implementation of all the planned works would achieve energy efficiency class B, improve the thermal parameters of the building and the microclimate of the premises, and save energy and public funds. Expected energy savings per fuel or source: heat and electricity energy 507 MWh/year, Expected reduction of CO<sub>2</sub> (eq.) emissions: 132 tpa</p> <p>The following measures will be installed during the project:</p> <ul style="list-style-type: none"> <li>• Heating system upgrade</li> <li>• Overlapping roof insulation</li> <li>• Insulation of external walls</li> <li>• Replacing the exterior door</li> <li>• Replacing windows and skylights</li> <li>• Renovation / modernization of lighting systems</li> </ul>	<p>Turto bankas, by centrally managing state-owned administrative real estate, seeks to make a significant contribution to the Government of the Republic of Lithuania in 2014. November 26 by resolution no. 1328 "On the Approval of the Program for Improving the Energy Efficiency of Public Buildings" The objective set in the Program for Improving the Energy Efficiency of Public Buildings is to increase the efficiency of energy consumption to increase the efficiency and operation of public buildings, to reduce greenhouse gas (CO<sub>2</sub>) emissions into the atmosphere, to ensure the compliance of the infrastructure of public buildings with the requirements of hygiene norms".</p>	<p>The project is implemented by Turto bankas. Principal activities of Turto bankas are: implementation of centralized management of the State-owned real estate, developing of State real estate project's, organization of privatization of State-owned enterprises, selling of State-owned real estate and collecting public debt.</p> <p>Turto bankas also manage the unified State-owned property informative online search system and prepares an annual report on State-owned property.</p>	1
<b>Modernization of an administrative building P. Cvirkos str. 7, Rokiškis</b>	<p>Administrative building located at P. Cvirkos str. 7, Rokiškis Construction was completed in 1993. Following an energy audit of the building, the building complies with energy performance class F (according to NRG5, 5.2.3.0). The</p>	<p>Turto bankas, by centrally managing state-owned administrative real estate, seeks to make a significant contribution to the Government of the Republic of Lithuania in 2014. November 26 by resolution no. 1328 "On</p>	<p>The project is implemented by Turto bankas. Principal activities of Turto bankas are: implementation of centralized management of the State-owned real estate,</p>	1

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	<p>energy audit report proposes the first package of a group of energy saving measures. The implementation of all the planned works would achieve energy efficiency class B, improve the thermal parameters of the building and the microclimate of the premises, and save energy and public funds. Expected energy savings per fuel or source: heat and electricity energy 80 MWh/year, Expected reduction of CO<sub>2</sub> (eq.) emissions: 58 tpa. The following measures will be installed during the project:</p> <ul style="list-style-type: none"> <li>• Modernization of the heating system</li> <li>• Ventilation system modernization, installing heat recovery</li> <li>• Insulation of the overlapped roof</li> <li>• Exterior walls and plinth insulation</li> <li>• Replacement of exterior doors</li> <li>• Replacement of building windows</li> <li>• Modernization of the lighting system</li> <li>• Boiler house modernization and installation of renewable energy sources</li> </ul>	<p>the Approval of the Program for Improving the Energy Efficiency of Public Buildings” The objective set in the Program for Improving the Energy Efficiency of Public Buildings is to increase the efficiency of energy consumption to increase the efficiency and operation of public buildings, to reduce greenhouse gas (CO<sub>2</sub>) emissions into the atmosphere, to ensure the compliance of the infrastructure of public buildings with the requirements of hygiene norms”.</p>	<p>developing of State real estate project's, organization of privatization of State-owned enterprises, selling of State-owned real estate and collecting public debt.</p> <p>Turto bankas also manage the unified State-owned property informative online search system and prepares an annual report on State-owned property.</p>	
<b>Modernization of an administrative building V. Kudirkos str. 3, Radviliškis</b>	<p>Administrative building located at V. Kudirkos str. 3, Radviliškis construction was completed in 1958. The energy audit of the building found that the building complies with energy performance</p>	<p>Turto bankas, by centrally managing state-owned administrative real estate, seeks to make a significant contribution to the Government of the Republic of Lithuania in 2014. November 26 by resolution no. 1328 “On</p>	<p>The project is 1 implemented by Turto bankas. Principal activities of Turto bankas are: implementation of centralized management of the State-owned real estate,</p>	

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>Modernization of an administrative building Vytenio str. 7, Vilnius</b>	<p>class F. A package of the first set of energy saving measures is proposed. The implementation of all the planned works would achieve energy efficiency class B, improve the thermal parameters of the building and the microclimate of the premises, and save energy and public funds. Expected energy savings per fuel or source: heat and electricity energy 52 MWh/year, Expected reduction of CO<sub>2</sub> (eq.) emissions: 12 tpa.</p> <p>The following measures will be installed during the project:</p> <ul style="list-style-type: none"> <li>• Heating system modernization</li> <li>• Ventilation system modernization, installing heat recovery</li> <li>• Overlapping roof insulation</li> <li>• Exterior walls and plinth insulation</li> <li>• Exterior door replacement</li> <li>• Replacement of building windows</li> <li>• Lighting system modernization</li> <li>• Modernization of the heating station</li> </ul>	<p>the Approval of the Program for Improving the Energy Efficiency of Public Buildings” The objective set in the Program for Improving the Energy Efficiency of Public Buildings is to increase the efficiency of energy consumption to increase the efficiency and operation of public buildings, to reduce greenhouse gas (CO<sub>2</sub>) emissions into the atmosphere, to ensure the compliance of the infrastructure of public buildings with the requirements of hygiene norms”.</p>	<p>developing of State real estate project’s, organization of privatization of State-owned enterprises, selling of State-owned real estate and collecting public debt.</p> <p>Turto bankas also manage the unified State-owned property informative online search system and prepares an annual report on State-owned property.</p>	
	<p>Administrative building located at Vytenio str. 7, Vilnius the construction of which was completed in 1940. The energy audit of the building found that the building complies with energy performance class D. The energy audit report proposes a package of the first set of energy saving measures.</p>	<p>Turto bankas, by centrally managing state-owned administrative real estate, seeks to make a significant contribution to the Government of the Republic of Lithuania in 2014. November 26 by resolution no. 1328 “On the Approval of the Program for Improving the Energy Efficiency of</p>	<p>The project is 1 implemented by Turto bankas. Principal activities of Turto bankas are: implementation of centralized management of the State-owned real estate, developing of State real estate project’s, organization of</p>	

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	<p>Implementation of all planned works would achieve energy efficiency class B, improve the thermal parameters of the building and the microclimate of the premises, save energy. Expected energy savings per fuel or source: heat and electricity energy 76 MWh/year, Expected reduction of CO<sub>2</sub> (eq.) emissions: 46 tpa.</p> <p>The following measures will be installed during the project:</p> <ul style="list-style-type: none"> <li>• Installation of mechanical ventilation systems</li> <li>• Sloping roof insulation</li> <li>• Insulation of the floor under the unheated attic</li> <li>• Overlapping roof insulation</li> <li>• Insulation of external walls</li> <li>• Insulation of external floors</li> <li>• Insulation of floors above unheated garages</li> <li>• Replacing the exterior door</li> <li>• Replacing windows</li> <li>• Replacing the sunroof</li> <li>• Lighting system upgrade / modernization</li> </ul>	<p>Public Buildings” The objective set in the Program for Improving the Energy Efficiency of Public Buildings is to increase the efficiency of energy consumption to increase the efficiency and operation of public buildings, to reduce greenhouse gas (CO<sub>2</sub>) emissions into the atmosphere, to ensure the compliance of the infrastructure of public buildings with the requirements of hygiene norms”.</p>	<p>privatization of State-owned enterprises, selling of State-owned real estate and collecting public debt.</p> <p>Turto bankas also manage the unified State-owned property informative online search system and prepares an annual report on State-owned property.</p>	

Table 52: Overview of the Dutch project fiches that are Triple-A Identified

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>“Medical Centre 1”</b>	The main goal of the project is to renovate the medical centre in the upcoming years to be	The renovation and the implementation of energy-saving measures will be compliant with energy performance standards set	The housing and facility management department is responsible for the energy infrastructure of the medical centre.	1, 2, 3, 4

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
	<p>CO2-neutral, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Zero CO<sub>2</sub>-emission 2050</li> <li>- CO<sub>2</sub>- reduction of 49% 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> <li>- Enhance comfort and quality of life for consumers</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- Purchase green electricity</li> <li>- LED projects</li> <li>- Upgrade facades</li> <li>- Replace control boxes</li> <li>- Optimisation power plant</li> <li>- Intelligent ventilation with more sensors</li> <li>- Condenser net and free cooling</li> <li>- Solar panels</li> <li>- Maximise sensors on lighting</li> <li>- Recalibrate technical control settings</li> <li>- Demand-controlled ventilation</li> <li>- Looking for alternative energy source</li> </ul>	<p>in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD).</p> <p>In the Netherlands, the Dutch Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction of 49% in 2030 and 95% in 2050. Healthcare organisations are advised to create a route map to be compliant with these targets.</p>	<p>Several people are responsible for the different targets.</p> <p>The medical centre has its own power plant to generate electricity and heating. Currently, the plant is owned by the medical centre. The future funding structure will mainly depend on the choices made regarding the ownership of the power plant.</p>	

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>"Nijmegen 2"</b>	<p>The main goal of the project is to renovate the building in the upcoming years to be energy-neutral in 2030, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Energy-neutral by 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> <li>- Increase Real-Estate value</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- Implementation of an air-source heat pump</li> <li>- Implementation of HR++ glazing</li> <li>- Additional solar panels</li> <li>- Energy management and care</li> </ul>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). In the Netherlands, the Dutch Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction of 49% in 2030 and 95% in 2050. Furthermore, office buildings are mandatory to have an EPC rating of minimal C from 2023.</p>	<p>The real estate department of the building owner is responsible for the building and the building installations. A facility manager organisation and a maintenance company are accountable for the exploitation of the building.</p> <p>The building owner has two main targets for their building portfolio:</p> <ul style="list-style-type: none"> <li>- All buildings should have an EPC rating of A or better in 2030.</li> <li>- The portfolio should be energy neutral by 2040.</li> </ul> <p>The facility management company is responsible for the realisation of these targets.</p>	1, 2, 3,
<b>"Nijmegen 3"</b>	<p>The main goal of the project is to renovate the building in the upcoming years to be energy-neutral in 2030, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Energy-neutral by 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> <li>- Increase Real-Estate value</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- Implementation of an air-source heat pump</li> <li>- Addition solar panels</li> <li>- Installation of fluorescent LED-lighting</li> <li>- Replacement PL-lighting for LED-lighting</li> </ul>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD). In the Netherlands, the Dutch Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction of 49% in 2030 and 95% in 2050. Furthermore, office buildings are mandatory to have an EPC rating of minimal C from 2023.</p>	<p>The real estate department of the building owner is responsible for the building and the building installations. A facility manager organisation and a maintenance company are accountable for the exploitation of the building.</p> <p>The building owner has two main targets for their building portfolio:</p> <ul style="list-style-type: none"> <li>- All buildings should have an EPC rating of A or better in 2030.</li> <li>- The portfolio should be energy neutral by 2040.</li> </ul> <p>The facility management company is responsible for the realisation of these targets.</p>	1, 2, 3,

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>“Nijmegen 4”</b>	<ul style="list-style-type: none"> <li>- Energy management and care</li> <li>- Increase temperature server room</li> </ul> <p>The main goal of the project is to renovate the building in the upcoming years to be energy-neutral in 2030, with the following sub-targets:</p> <ul style="list-style-type: none"> <li>- Energy-neutral by 2030</li> <li>- Reduce energy consumption</li> <li>- Provide renewable energy</li> <li>- Reduce environmental impact</li> <li>- Increase Real-Estate value</li> </ul> <p>The following measures and actions are selected and will contribute to achieving the goals:</p> <ul style="list-style-type: none"> <li>- durable replacement of halogen outdoor lighting</li> <li>- Insulating cavity wall</li> <li>- Installation of fluorescent LED-lighting</li> <li>- Replacement PL-lighting for LED-lighting</li> <li>- Installation VRV-system</li> <li>- Implementation of HR++ glazing</li> <li>- Insulating roof</li> </ul>	<p>The implementation of energy-saving measures will be compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD).</p> <p>In the Netherlands, the Dutch Government set goals in line with the Paris Agreement. Therefore, all buildings must realise a CO<sub>2</sub> reduction of 49% in 2030 and 95% in 2050. Furthermore, office buildings are mandatory to have an EPC rating of minimal C from 2023.</p>	<p>The real estate department of the building owner is responsible for the building and the building installations. A facility manager organisation and a maintenance company are accountable for the exploitation of the building.</p> <p>The building owner has two main targets for their building portfolio:</p> <ul style="list-style-type: none"> <li>- All buildings should have an EPC rating of A or better in 2030.</li> <li>- The portfolio should be energy neutral by 2040.</li> </ul> <p>The facility management company is responsible for the realisation of these targets.</p>	1, 2, 3,

Table 53: Overview of Spanish project fiches that are Triple-A Identified

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>56 dwellings de San Ildefonso (Madrid)</b>	Refurbishment of the whole building: Aerothermal system Hybrid Solar Panels Thermal and cost control valves in the heaters Façade insulation Roof insulation and waterproofing Installation of led technology and presence detectors	The energy renovation of existing buildings is one of the pillars of the EE sector in Spain. As can be seen in this project, actions are proposed on very different parts of the building, lighting, energy self-consumption, domestic hot water and thermal insulation. This multidisciplinary approach ensures solid and compensated economic savings.	The commissioned company is an ESCO specialised in energy rehabilitation interventions in buildings. Its model is oriented to provide the maximum facilities to the owners' community by integrating technical interventions with maintenance services that maximise the results of the project. The community of owners is not obliged to make any disbursement until the end of the intervention and thanks to the savings guarantee presented by the ESCO, the financial outlay is reduced.	1, 2, 3, 4
<b>72 dwellings Fernando Palanca (Guadalajara)</b>	Refurbishment of the whole building: - Aerothermal system - Hybrid Solar Panels and batteries - New boiler room (no diesel oil) - Façade insulation - Thermal and cost control valves in the heaters - Installation of led technology and presence detectors	The energy renovation of existing buildings is one of the pillars of the EE sector in Spain. As can be seen in this project, actions are proposed on very different parts of the building, heating system, lighting, energy self-consumption, domestic hot water and thermal insulation. This multidisciplinary approach ensures solid and compensated economic savings.	The commissioned company is an ESCO specialised in energy rehabilitation interventions in buildings. Its model is oriented to provide the maximum facilities to the owners' community by integrating technical interventions with maintenance services that maximise the results of the project. The community of owners is not obliged to make any disbursement until the end of the intervention and thanks to the savings guarantee presented by the ESCO, the financial outlay is reduced.	1, 5

Project Title	Project summary	Strategic Context	Project Governance	Triple-A Sector(s)
<b>65 dwellings Castilla (Guadalajara)</b>	<p>Refurbishment of the whole building:</p> <ul style="list-style-type: none"> <li>- Hybrid Solar Panels and batteries</li> <li>- New boiler room (no diesel oil)</li> <li>- Roof insulation and waterproofing</li> <li>- Façade insulation</li> <li>- New windows</li> </ul> <p>Installation of led technology and presence detectors</p>	<p>The energy renovation of existing buildings is one of the pillars of the EE sector in Spain. As can be seen in this project, actions are proposed on very different parts of the building, lighting, energy self-consumption, domestic hot water and thermal insulation. This multidisciplinary approach ensures solid and compensated economic savings.</p>	<p>The commissioned company is an ESCO specialised in energy rehabilitation interventions in buildings. Its model is oriented to provide the maximum facilities to the owners' community by integrating technical interventions with maintenance services that maximise the results of the project. The community of owners is not obliged to make any disbursement until the end of the intervention and thanks to the savings guarantee presented by the ESCO, the financial outlay is reduced.</p>	
<b>PV Installation (Toledo)</b>	<p>Solar PV installation to be constructed on a new logistics warehouse facility; it will be entirely dedicated to electricity self-consumption, with no grid injection</p>	<p>In this project, a self-consumption photovoltaic plant is designed and built to power a logistics warehouse for food products. Thanks to this installation, it is expected to achieve energy savings of more than 25% and avoid emitting 875 tonnes of CO2 per year. Thanks to Spain's climatic conditions, photovoltaic projects are particularly interesting and in recent years great legislative advances have been made to include this type of installation in the Spanish electricity grid.</p>	<p>This is a turnkey project, which means that the owner of the facilities opened a tender and the most interesting offer got the project. Then, the PV plant was built and handed over to the client, who owns the equipment and the energy generated. Another approach that was studied was "energy as a service", which means that the company that builds the installation retains ownership of the equipment and sells the energy to the customer at a reduced price. In this way the customer does not have to make any initial outlay.</p>	4