TRIPLE-A

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

Deliverable 6.2: Final Briefing Notes

May 2022

The Triple-A project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 846569.

TRIPLE-A

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

GA#:846569

Topic: LC-SC3-EE-10-2018-2019-2020

Funding Scheme: CSA

Start Date: September 2019

Duration: 33 Months

Project Coordinator: NTUA

Deliverable Number (relative in WP)	**6.2**
Deliverable Title	**Final Briefing Notes**
Work Package Number	**6**
Task Number	**6.1**
Date of Delivery	**May 2022**
Dissemination Level	**Public**
Work Package Leader	**IEECP**
Task Leader	**NTUA**
Lead Beneficiary	**NTUA**
Author(s) (Organisation)	**BN5:** Diamantis Koutsandreas; Charikleia Karakosta; Aikaterini Papapostolou (NTUA) **BN6:** Erik Faassen (IEECP) **BN7:** Konstantina Tripodi; Petra Ristau (JRC) **BN8:** Václav Šebek; Jiří Karásek; Jakub Kvasnica (SEVEn) **BN9:** Maurizio Megliola; Andrea Giugno; Tommaso Zerbi (GFT Italia) **BN10:** Erik Faassen (IEECP) **BN11:** Zoe Mylona; Erik Faasen (IEECP), Katerina Papapostolou; Philip Mexis; Chara Karakosta (NTUA), Nikos Kleanthis (UPRC), Adrián Cañamares; Ruth Dominguez (CREARA) **BN12:** Nikos Kleanthis (UPRC), Philip Mexis; Katerina Papapostolou; Chara Karakosta (NTUA), Alexandros Flamos (UPRC) **BN13:** Adrián Cañamares; Pedro L. Espejo; Ruth Domínguez (CREARA) **Deliverable 6.2:** Aikaterini Papapostolou; Charikleia Karakosta; (NTUA)
Keywords	**Summary of Findings; Lessons Learnt; Information Packages; Recommendations;**

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	SEVEn, The Energy Efficiency Center	SEVEn	CZ	
11	Public Investment Development Agency	VIPA	LT	
12	National Trust Ecofund	NTEF	BG	

The Triple-A project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 846569.

Disclaimer

The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission is responsible for any use that may be made of the information contained therein.

Copyright Message

This report, if not confidential, is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0); a copy is available here: https://creativecommons.org/licenses/by/4.0/. You are free to share (copy and redistribute the material in any medium or format) and adapt (remix, transform, and build upon the material for any purpose, even commercially) under the following terms: (i) attribution (you must give appropriate credit, provide a link to the license, and indicate if changes were made; you may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use); (ii) no additional restrictions (you may not apply legal terms or technological measures that legally restrict others from doing anything the license permits).

Table of Contents

Figures

Tables

Executive Summary

The 2nd release of Triple-A Briefing Notes summarises the main directions and insights as derived from project outcomes for targeted stakeholder consultation as well as the policy framework and market architecture of several Triple-A case study countries. Triple-A recommendations across several sectors are also presented. The scope of the Briefing Notes is to provide and share knowledge, communicate conclusions and lessons learnt through Triple-A activities. Knowledge gathered via the implementation of stakeholder engagement and consultation process served as the main source of input for the preparation of the Briefing Notes but other activities, such as synergies with sister projects, provided significant outcomes.

Four (4) Briefing Notes have been prepared during the 1st reporting period (September 2019 – April 2021) while nine (9) Briefing Notes have been developed during the 2nd reporting period (May 2021 – May 2022) covering topics on Triple-A Tools and Database outcomes, added value and benefits, Triple-A recommendations, energy efficiency status and market in the Triple-A case study countries, capacity building activities and survey results.

1 Introduction

Triple-A project has published a series of Briefing Notes derived from actions undertaken throughout the project's implementation. Triple-A Briefing Notes aim to trigger cumulative actions on the field of energy efficiency investments by stakeholders in all levels (EU and national). They focus on increasing the financeability and attractiveness of energy efficiency investments and presenting societal views and benefits.

In total, thirteen (13) Briefing Notes have been published covering different topics. Knowledge and results gained by processing input stakeholder dialogue, capacity building, Triple-A Tools and Database outcomes, Triple-A recommendations and energy efficiency status and market in the Triple-A case study countries were exploited for the preparation of these second series of Briefing Notes. Table 1 presents the total list of the Briefing Notes as well as the targeted groups envisioned to reach.

Table 1: Briefing Notes List

#	Title	Responsible Triple-A partner	Targeted Stakeholders	Release Date
1	Seven Horizon 2020 projects advice EU leaders how to prepare buildings for the energy transition	NTUA[1]	Policymakers	December 2020
2	Triple-A Survey on Building Sector: The case of Greece	NTUA	Bankers, Investors, real estate professionals, policy makers	February 2021
3	Triple-A Survey on Investors Preferences on Energy Efficiency Investments	NTUA	Bankers, investors	March 2021
4	Integration of two standardised approached for transparency improving energy efficiency investments and confidence between owner and investor in building sector	NTEF	Investors, real estate professionals, building managers and owners, policy makers	April 2021
5	Triple-A Web-Based Database: Bridging the Transparency Gap in Energy Efficiency Financing	NTUA	Bankers, investors, energy associations, project developers	June 2021
6	Triple-A Webinar Series Financing Energy Efficiency Projects	IEECP	Bankers, investors, energy associations, project developers, policy makers	October 2021
7	Energy Efficiency Market and Policy Framework Status: The Case of Germany	JRC	Bankers, investors, project developers, policy makers	March 2022
8	Energy Efficiency Policy in the Czech Republic	SEVEn	Bankers, investors, project developers, policy makers	March 2022
9	Financing Energy Efficiency Projects: The Case of Italy	GFT Italy	Bankers, investors, project developers, policy makers	March 2022
10	Energy Efficiency Market Architecture & Policy Framework: The Dutch Case	IEECP	Bankers, investors, project developers, policy makers	March 2022
11	Triple-A Recommendations: & Lessons Learnt towards Enhancing Energy Efficiency Investments	IEECP, NTUA, UPRC, CREARA	Policy makers, Academia, bankers, investors, project developers,	May 2022
12	Triple-A Survey on the Categorisation of Risk Mitigation Strategies, Financing Instruments and Financial Schemes	UPRC, NTUA	Academia, bankers, investors, project developers,	May 2022
13	Energy Efficiency Market Architecture & Policy Framework: The Spanish Case	CREARA	Bankers, investors, project developers, policy makers	May 2022

[1] The contributing H2020 projects are SENSEI, Triple-A, NOVICE, QUEST, U-CERT, AmBIENCe and LAUNCH.

1.1 Briefing Notes preparation process

Triple-A Briefing Notes follow a uniform format using a title, summary, keywords and authors followed by detailed description of summarised lessons learnt and conclusions. A specific template and logo have been prepared by Task 6.1 leader (NTUA) which follows Triple-A visual identity guidelines and envisions to present in an appealing way the summarised knowledge package.

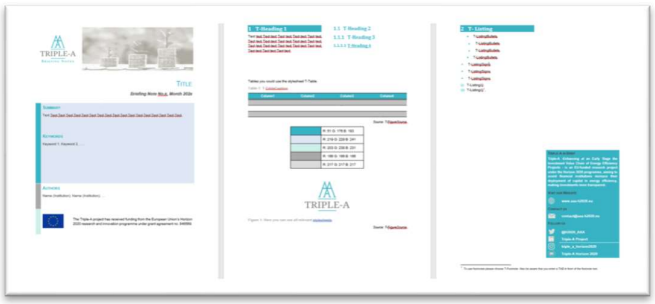

Figure 1: Triple-A Briefing Notes template

All Briefing Notes have been disseminated trough the Triple-A dedicated press releases, as well as posts at the project website and social media, so as to enlarge their outreach and enhance further their impact.

1.2 Briefing Notes series[2]

5th Briefing Note: In order to make Energy Efficiency Investments (EEIs) more transparent, Triple-A offers a Web-Based Database as an open-source online tool for a holistic reporting of the most significant aspects on Energy Efficiency Financing (EEF). The scope of the Web-Based Database is to set the ground for upscaling EEIs via collecting, storing, reporting and sharing data that serve an added value to relevant stakeholders and actors in EEF, such as financing bodies (e.g., investors), project developers (e.g., ESCOs), policy makers and researchers. Up to date, the regions covered under this database are the eight Triple-A case study countries, namely Czech Republic, Germany, Greece, Italy, Lithuania, The Netherlands, Republic of Bulgaria, and Spain.

The 5th Triple-A Briefing Note presents the data, specifications and functionalities of the Triple-A Web-based Database, as well as how this support each involved actor in EEF and contribute towards mainstreaming EEIs. Besides, the key insights that can be extracted from the information included in the Triple-A Web-based Database and enrich relevant stakeholders, are presented.

6th Briefing Note: A series of Capacity Building Webinars were hosted and organised by the eight Triple-A partner countries between the period from April to June 2021. The goal was to increase awareness of the project and disseminate the knowledge required to effectively use and implement the solutions provided by the Triple-A methodology, Standardised Tools and Database on Energy Efficiency Financing. Three topics stood central during the webinars: The impact and implications of the EU taxonomy regulations, relevant risk and mitigation strategies, and the availability of typical financial instruments. After the webinars participants are equipped with detailed knowledge that enhances their

[2] For the Briefing Notes No 1 to No 4 please refer to deliverable 6.1 Briefing Notes.

capability to effectively make use of the Triple-A Database and Tools further increasing the speed, identification, and financing of high potential Energy Efficiency investments. Triple-A Capacity Building Webinars reached in total 224 participates with more than 50% of the participants coming from financing bodies or were project developers.

The 6th Triple-A Briefing Note presents the key learnings and takeaways from the topics discussed and feedback collected during the webinar series.

7th Briefing Note: This briefing note presents the current situation in the German Energy Efficiency (EE) market, as well as the policy framework that supports EE investments in Germany. In particular, the briefing note describes operations in, and provides data on the German EE market in key EE target sectors such as buildings, transport and industry.

8th Briefing Note: Energy savings are an integral part of the national energy policy in the Czech Republic in accordance with EU climate action and energy policy objectives and legislation. There are numerous public support schemes channelling significant funds in subsidies and other supportive measures that may promote energy efficiency investments. However, despite the coordinated effort by numerous ministries and other state institutions, the goals set by Articles. 5 and 7 of the Energy Efficiency Directive have not been met yet. Therefore, increasing effectiveness of public support and facilitating financing and implementation of energy efficiency projects presents an opportunity to be sought after.

9th Briefing Note: This 9th Briefing Note provides an overview of the applicable regulatory forces, the market architecture, and policy framework related to the Energy Efficiency (EE) projects in Italy. Compared to some of the other Triple-A case study countries' governments, the Italian government is recently starting to put more attention in renewables and EE. With the launch of the Next Generation EU (NGEU) program in 2020 the EU provided an important number of financial resources to accelerate the growth. Amongst the applicable and relevant laws and regulation, EE policies and tax deductions, as well as National Inventory Report – ISPRA, are described. Details of the Italian market architecture and policy framework are provided, related to Italian subsidy schemes that foster sustainable investments and energy transition, and how these are applied to each of the Triple-A sectors: Buildings, Industry, Transportation, District Energy Networks and Outdoor Lighting.

10th Briefing Note: This bote gives an overview of the applicable regulatory forces, the market architecture, and policy framework related to the energy efficiency (EE) investments in the Netherlands. The Netherlands shows to be a favourable climate for EE investments shown through the number of (national) schemes which are available to enhance the uptake of EE investments. The Dutch identified Triple-A projects are put central and the applicable laws, regulation and subsidy schemes that are available to them are matched, in this way giving a hands-on example of EE in the Dutch context that is to be followed by comparative EE undertakings.

11th Briefing Note: This Briefing Note summarises all lessons recommendations and learnt from Triple-A activities towards enhancing energy efficiency investments. A series of 9 in total recommendation sets have been developed as integrating highlights from work conducted during the Triple-A project activities.

The fields covered in the recommendation sets are barriers and ways for boosting energy efficiency investments at EU and Member States level, risks to overcome, findings from the evaluation and benchmarking of energy efficiency investments, highlights from the development and implementation of Triple-A Web-based Database and the Triple-A Standardised Tools, stakeholder's outreach, and engagement outcomes, as well as lessons learnt from the exploitation strategy for the energy efficiency financing tools that was developed within the framework of the Triple-A project.

12th Briefing Note: The 12th Triple-A Briefing Note presents and analyses the results that emerged from the Triple-A stakeholder consultation on the categorisation of risk mitigation strategies, financing instruments and financial schemes for energy efficiency investments. The consultation took place from December 2021 until February 2022 and was based on a dedicated online questionnaire. Valuable results have emerged from the process, such as the importance of risk reduction through collateral, project aggregation, and proper project design to promote and mainstream energy efficiency measures throughout the case study countries, and the main financing instruments identified such as the green loans, the green bonds and the energy efficiency auctions.

13th Briefing Note: This briefing note provides the Spanish context on the path towards an environmentally sustainable economy and specifically in the field of energy efficiency. The Spanish energy efficiency market framework and the policy architecture are briefly presented in order to highlight the main aspects that promote the financing of sustainable investments in the country. Several aspects have come together to generate a favourable climate for investment in energy efficiency; public aid lines, the volatility of energy prices, concern about the climate crisis, and the need to reduce energy dependence on foreign countries, among other aspects, support the growth of this sector at the national level.

2 5th Briefing Note: *Triple-A Web-Based Database: Bridging the Transparency Gap in Energy Efficiency Financing*

2.1 Introduction

Triple-A supports capital providers, i.e., financiers and investors, in finding an attractive project idea that merits attention, providing, in parallel, a better understanding of the project's framework to those looking for capital (e.g., project developers).

In this effort, a knowledge-based platform on the basic aspects of Energy Efficiency Financing (EEF), such as entailed risks and mitigation strategies, is considered as critical to relevant stakeholders; while the country features should be taken into consideration to provide a cross-country analysis. On the one hand, project developers are supported to deliver attractive Energy Efficiency Investments (EEIs) proposals by grasping a deeper technical knowledge. On the other hand, financiers, bankers and investors are provided with an easy access to information concerning EEIs, such as their risk nature and financial performance, in order to facilitate their decision-making related to the implementation of EE projects.

To this end, Triple-A Web-based Database on EEF[3] has been developed in order to provide advanced functionalities and crucial information to relevant stakeholders. More particularly, it is a visual representation of the most important aspects on EEF, including the risks that could endanger the successful implementation of an EE project, factors that might reduce profitability, strategies that could mitigate risks, preferences of investors on EEIs, financial performance of EE projects, models and instruments usually used to finance EE projects and the performance of case study countries in terms of Sustainable Development Goals (SDG)[4].

Triple-A Web-based Database is an online open-source interactive application that incorporates the results from the status quo analysis per case-study country within the framework of the Triple-A project. The data reported within its context are based on agencies and other open-access repositories, and as a versatile instrument, Triple-A Web-based Database is updated on a regular basis, taking into account stakeholders' feedback either in the form of content's update or new functionalities.

This Briefing Note describes the functionalities and data included in the Triple-A Web-based Database, along with the added value that could be produced per key target group of Triple-A and the key insights that could be derived from the database's information. As a result, this document proves the necessity of knowledge-based information in an interoperable way to mainstream EEIs.

2.2 Triple-A Web-Based Database Content

Triple-A Web-based Database incorporates the results of the Triple-A methodology about the basic aspects on EEF. It is based on data gathering from other relevant databases (e.g., De-risking Energy

[3] Available online at: https://database.aaa-h2020.eu/

[4] Triple-A (2021). Updated Web-Based Database on Energy Efficiency Financing and Supporting Documentation, Deliverable 3.5, Horizon2020 Triple-A project, No. 846569.

Efficiency Platform (DEEP)[5]), information from project developers (i.e., risk calculation questionnaire[6]) and outcomes from the Triple-A stakeholders consultation processes (questionnaires, bilateral meetings, events, etc.[7]).

Particularly, the database includes the following aspects (Figure 2):

- The **country-specific risks** that endangers the successful implementation of an EE project, exploiting data from global organisations (e.g., Regulatory Indicators for Sustainable Energy (RISE)[8]) and credit rating agencies (e.g., Standard & Poor's (S&Ps)[9]; "***Country Risks***" menu).
- The **risk of failure** of various EE projects, indicating the minimum, maximum, and average values that it could take ("***Energy Efficiency Projects Risk***" menu).
- The proposed **risk mitigation strategies** per risk identified by the Triple-A methodology ("***Risk Mitigation Strategies***" menu).
- The projected **financial performance** of various EE projects as a function of the investment's holding period[10] ("***IRR: Project's Perspective***" menu).
- The **preferences of investors** on EEIs in terms of **minimum required return** and **holding period**, considering all the main investor profiles in EEF ("***IRR: Investor's Perspective***" menu).
- The **financing instruments** that are usually used to finance EE projects, along with the **financial models** that combine them in innovative ways ("***Financing Instruments*" & "*Financial Models***" menus).
- The necessity of boosting EE per case study country, with respect to their progress in terms of **SDG** ("***Sustainable Development Goals***" menu)).

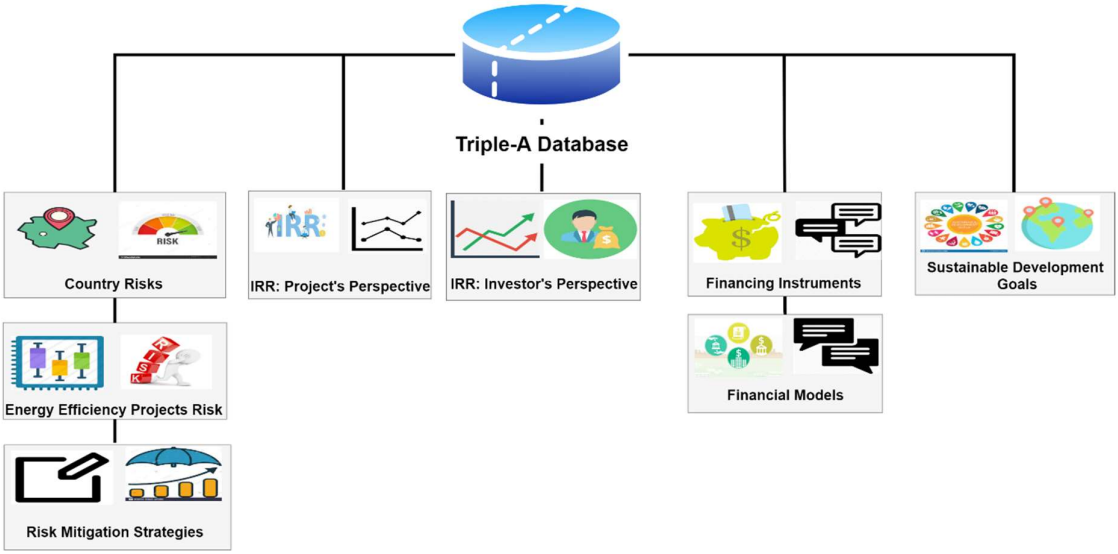

Figure 2:. Triple-A Web-based Database menus

[5] Available online at: http://deep.eefig.eu

[6] Available online at: https://toolbox.aaa-h2020.eu/assessHome/

[7] Triple-A (2021). Triple-A Survey on Investors Preferences on Energy Efficiency Investments, Briefing Note No.3, Horizon2020 Triple-A project, No. 846569.

[8] Available online at: https://rise.esmap.org/about-us

[9] Available online at: https://www.spglobal.com/ratings/en/

[10] Holding period is the time (years) that the investors accept to hold their money on an investment before earning the required return.

2.3 Added Value from different perspectives

2.3.1 Data Dimension & Functionalities

Triple-A Web-based Database contains information with respect to a wide range of countries and EE sectors, thus providing a cross-country and sectoral analysis to its users.

As regards the countries included up to date in the database, these are the eight Triple-A case study countries. These countries have been selected in view of incorporating countries of diverse characteristics, based on the following features: a leading European economy (**Germany**), an innovation front-runner in energy (**The Netherlands**), a weak economy that went through one of the longest 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 slightly moving 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**). All country related data reported by the Triple-A Database are classified per country, giving to users the chance of getting useful insights.

The Triple-A Database includes information data from different sectors. These are the main sectors of the EU Taxonomy, where each of these sectors is connected to several economic activities (Figure 3). Similarly, to the country analysis, the sector specific data are reported in reference to the EE sector under examination.

Moreover, Triple-A Web-Based Database includes all the main investor profiles in EEF, namely ***"Retail investor"***, ***"Institutional investor"***, ***"Impact investor"***, ***"ESCO"***, and ***"Fund"***.

It should be noted that Triple-A Web-based Database will be enhanced including more elements from the related components (e.g., countries) in order to depict the up-to-date scene in EEF.

Apart from the multidimensionality of the reported data that described above, Triple-A Web-based Database provides advanced functionalities to its users such as interactive maps and graphs. These functionalities substantially facilitate the comparison between reported countries and sectors. In addition, the open-source nature of the database enables its users to freely navigate themselves to its interface without any requirement, whereas the data reported within its context can be download in an excel format. Therefore, they can be easily stored, shared and analysed.

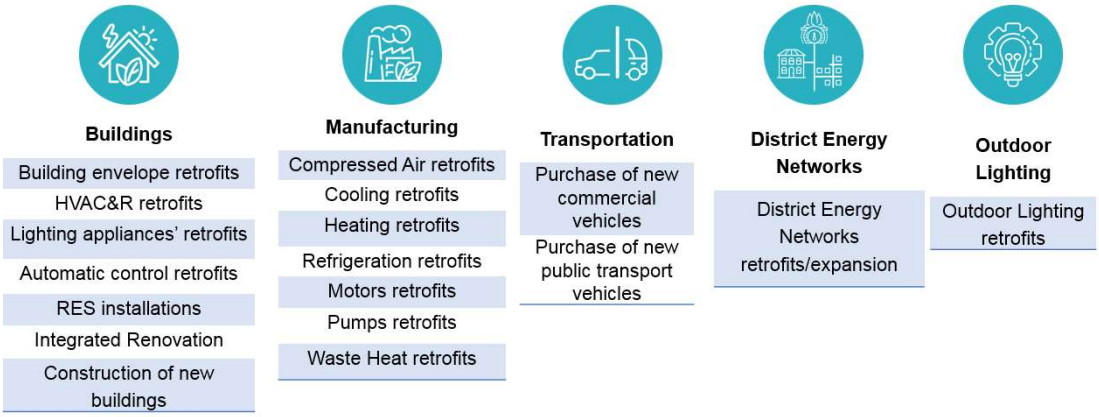

Figure 3: Triple-A Web-based Database sectors and economic activities

2.3.2 Stakeholders Capabilities Enhancement

In view of upscaling EEIs, it is of paramount importance that the key stakeholders that participate in the entire EEIs value chain gain access to the required knowledge towards taking reasoned decisions. In this procedure, they may be the ones that provide this knowledge to other relevant actors in EEF.

The key stakeholders in EEF comprise investors, project developers, policy makers and researchers. These profiles could derive significant added value from the information included in the Triple-A Web-based Database, which can be categorized per main target group as follows.

Investors

Investors constitute the key target group of Triple-A and the one that the project outcomes serve the most. Triple-A Web-based Database has been designed with a special focus on facilitating their decision-making and participation in EEF.

First, Triple-A Web-Based Database provides the opportunity to investors to get significant insights about the case study countries' characteristics, helping them substantially on the selection of the country of implementation for capital investments. In that regard, investors could harvest information on the case study countries' **macroeconomic risk, energy market's volatility** and **quality of governmental policies** on EE implementation.

Moreover, by inspecting the **risk value ranges** of each EE project type covered by the Triple-A Web-based Database, a better understanding is provided about their risk nature and the potential level of alleviation of their entailed risk.

Focusing on the **mitigation** of the entailed risk and the incorporation of appropriate measures, investors can take advantage of a detailed analysis via the Triple-A Web-Based Database. As a result, they could make better evaluations of EE projects, considering if **mitigation strategies** have been adopted within their context or not.

Finally, insights from **financial performance** of various EE project types, through the demonstration of their project IRR curves[11] and available **financial models** are provided. Investors have the opportunity via Triple-A Web-Based Database's functionalities, to identify the **optimal holding period** per case by

[11] IRR curves depict how the project IRRs vary over the different time horizons of the investments.

inspecting the turning point of the curves[12] and combine financing instruments in view of **maximising their profits**.

Project developers

Project developers comprise another key target group of Triple-A, by representing the other side of an EE project.

Project developers could leverage information on the **risk nature per EE project**, something that could lead to the analysis of the necessity of adopting appropriate mitigation measures. Besides, the projected performance of each project type could serve as evidence of the **EEIs profitability potential**. As such, it could be used by them to persuade capital providers to invest their money in their projects, thus performing better proposals to investors.

Moreover, Triple-A Web-Based Database provides project developers with the opportunity to inspect the minimum required returns by investors. Therefore, they could identify the minimum performance that the projects they are involved in must achieve to be considered as eligible per investor profile. This insight works as a **benchmark of the EE projects' performance**.

In this way, project developers could benefit in order to ensure the smooth operation of EE projects which consequently consists of a strong proof of evidence to persuade investors and capital providers in general. Finally, a whole **range of financing means** is provided.

Policy Makers

Policy makers, in spite of not being directly involved in EEF, could play an important role in upscaling EEIs by taking vital decisions, directly affecting EEIs implementation, such as the formulation of tax and regulatory policies.

Triple-A Web-Based Database includes information on the necessity of boosting EE implementation in each case study country and EE sector. By evaluating the progress of case study countries in terms of **SDG**, policy makers could ensure the quality of their decision making in order to get **higher benefits**. To this end, a more efficient prioritisation of investments could be performed focusing on social aspects in view of a **fair energy transition**[13].

Researchers/Academia

Apart from upscaling EEF, there is the need for mainstreaming EEF as well. Researcher and academia in general could enhance these actions. By developing appropriate methodological frameworks for evaluating and benchmarking EEIs, they work towards the **identification and categorisation of EE attractive project ideas** for the key actors of EEF (investors and project developers).

Triple-A Web-Based Database offers a variety of information per case study country, such as the risk factors, project IRR curves and EE necessity, which could be used for relevant methodologies development.

[12] The turning point of the project IRR curves is the point from which the projects' performance starts to improve at a negligible rate for an additional year of investment.

[13] Newell, P.; Mulvaney, D. The political economy of the 'just transition'. The Geographical Journal, 2013, 179, 132–140.

2.4 Conclusions

Triple-A Web-Based Database presents in an interactive way the key findings of the Triple-A methodology across the different case study countries and EE sectors. Thus, it generates added value in the whole value chain of EEF.

The added value points produced per target group can be summarised as follows.

Investors

- Selection of the **country of implementation** for EEIs.
- Understanding of EE projects' **risk nature**.
- Effective **EEIs evaluations**.
- Evaluation of EE projects' **financial performance** with respect to **investment horizon**.
- Identification of the **optimal holding period**.
- Identification of **innovative ways** of **combining financing instruments**.

Project developers

- Identification of the **de-risking potential** of various EEIs.
- Identification of **risk mitigation strategies**.
- **Evidence** acquisition of EE projects' **profitability potential**.
- Identification of the **minimum required performance** to be achieved for attracting investors.
- Identification of the **means of financing** for their projects.

Policy makers

- Identification of the **countries** and EE **sectors** that need to be **prioritized**.

Researchers

- Employment of the **risk assessment framework** adopted by the Triple-A methodology.
- **Inspiration** for performing further **research**.

3 6th Briefing Note: *Triple-A Webinar Series Financing Energy Efficiency Projects*

3.1 Introduction

The Triple-A project Capacity Building Webinar Series "Financing Energy Efficiency Projects" was organised in the 8 European Triple-A case study countries: Bulgaria, Czech Republic, Germany, Greece, Italy, Lithuania, Spain and the Netherlands. The aim of the Webinar Series was to share the knowledge, tools and methodology developed and utilised during the Triple-A project that are relevant to financing energy efficiency investments across the European Union. In addition, one of the series objectives was to prepare and raise interest for the Regional Training Workshops, and to nudge key stakeholders to use the Standardised Triple-A Tools[14] and Database[15].

In general, during the webinars the following topics were addressed:

1. *The* **EU Taxonomy** *Regulation, setting the stage and allowing us to discuss and compare projects through a uniform language.*
2. *The* **Risks and Mitigation strategies** *to assess potential future investments.*
3. *An overview of* **Financial Instruments** *available that minimise risks and maximize your projects potential.*

Figure 4: The Triple-A Webinar

The schedule of the webinar series is presented below. Full recordings are available through the dedicated webinar pages available in the official project website.[16] Here users can also find detailed descriptions on the contents, hosts, guest speakers, and information on (where applicable) any subsequent follow-up activities that are organised.

[14] https://toolbox.aaa-h2020.eu/
[15] https://database.aaa-h2020.eu/
[16] https://aaa-h2020.eu/capacity-building-webinars

Table 2: Webinars Schedule

Country	Webinar Date:
Netherlands	April 21 - 10:00-12:00
Czech Republic	May 18 - 14:00-16:00
Greece	May 26 - 14:00-16:00
Bulgaria	May 27 - 14:00-16:00
Spain	May 27 - 16:00-17:30
Lithuania	June 14 - 12:00-12:45
Bulgaria (follow-up)	June 18 - 09:00-10:30
Italy	June 29 - 14:00-15:00
Germany	June 30 - 14:00-16:00

The majority of events were held in their local languages, this is to further lower the barrier for uptake and dissemination of the insights provided in each.

3.2 Takeaways and learnings

Feedback across the partner countries has been quite positive. Participants enjoyed being presented with an introductory overview of the project and understood its relevance toward the goal at hand. The inclusion of the **EU Taxonomy** has been a hit-and-miss, and was deemed very relevant to some, and less-so relevant for others. This trend was expected, as the webinar format does not allow to go deep into one topic, therefore often keeping the content relatively generic as to cater for a large audience. Stakeholders that are familiar with, and make use of, the taxonomy in many cases have a better understanding of its innerworkings and complexities then could be conveyed as part of a 1-hour webinar. Nevertheless, its remarked as an absolute mandatory part of the series due to the fundamental connection with the **Assess, Agree,** and **Assign** Tools and the **Database**.

Participants of several sessions expressed the simple steps for evaluating EE projects are missing entirely in their respective countries (especially amongst Southern and Eastern European locations) and therefore represent a great opportunity for companies and financial institutions to improve their EE investment strategy through Triple-A implementation.

A clear consensus is reached about the presence of a major gap between theory and practice particularly when it comes to EE investments. Most tools and finance schemes available today are in some way or another very similar according to participants. What lacks is the room and flexibility to implement the innovative financing schemes and apply them to existing situations or to introduce new schemes into upcoming projects. Key reason behind this unwillingness to innovate is suggested to be due to financing institutions, especially in upper management, still being rather conservative.

3.3 Stakeholder Engagement

A total of **224 persons** participated in the Triple-A Capacity Building webinars, a breakdown per stakeholder type is presented in Table and Figure below.

With an overall response rate of 32%, we observed a relatively high interest at the side of the targeted stakeholders. A closer look into the per country statistics revealed that the strategy and effort for

stakeholder engagement varies significantly per country, both in terms of the number and type of stakeholders contacted. An effort is made to further homogenise the stakeholder groups within each country, as to ensure a representative and even distribution. However, due to the topic of the project, there is a natural tendency towards engagement with financiers, investors and project developers as they are the main groups of Triple-A.

Table 3: Webinar Participants per Stakeholder Group

All Webinar Participants:	224
A - Financing bodies	42
B - Companies / Project developers	76
C - Policy makers and Policy support Institutes	12
D - Researchers and Academia in Business and Techno – economic fields	34
E - Other	60

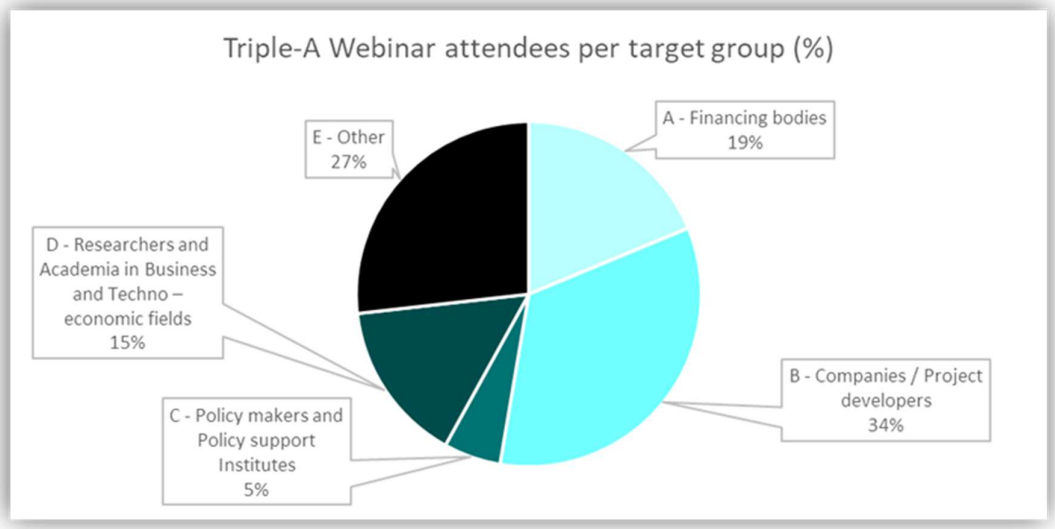

Figure 5: Stakeholder types participating in the webinars

The majority of participants (53%) fall in the projects two main target categories: Financing bodies (19%) and Companies or Project Developers (34%) which is a good result given the direction of the project. A lesser participation is seen in the engagement of policy makers and support institutes (5%) is observed. A large portion of participants (27%) opted for the 'other' category, which, upon closer inspection, is primarily represented by: technology suppliers, real estate agents, technical chambers, energy associations, and self-employed freelancers, not part of any major organizations. Although their input might be relevant these stakeholders are not part of the focus groups targeted in the Triple-A project and might not be best suited to help reach the project goals.

3.4 Feedback & Conclusions

Common topics and trends that emerged from the feedback collected after the webinar's completion are the following:

- It remains **very difficult to find and implement new financing schemes.** Timeframes are too short and public funds are not enough; private funding is mandatory to accelerator EE project developments.
- **The EU Taxonomy is only important for three groups**: 1. Financial market participants and issuers of financial products within the EU; 2. Large companies (>500 employees) that are already required to provide non-financial reporting under the EU Non-Financial Reporting Directive (NFRD); 3. EU and Member States when setting public measures, standards or labels for green financial products or green bonds.
- **Covid-19 acts as an accelerator** towards green energy recovery.
- 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.**
- 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 **ESCOs** and other EE companies.
- Triple-A Tools provide a **standardized way of projects' evaluation which could be integrated into banks' and financing institutions'** evaluation procedures, standards and policies.

Feedback to the content of the webinars has been positive, though many of the sessions exceeded the optimal duration for a webinar format.

The projects intended goals and the direction taken toward their achievement are deemed relevant and logical. Participants encouraged to continue down the current path, raising concerns about inclusion and awareness of developments in related topics, and for the Triple-A project leaders to remain aware about.

The description of the per-country activities and detailed analysis of the webinars are available in the Capacity Building Webinars Summary Report.[17]

[17] https://aaa-h2020.eu/results

4 7th Briefing Note: *Energy Efficiency Market and Policy Framework Status: The Case of Germany*

4.1 Energy Efficiency Strategy and Goals for 2030 & 2050[18]

Germany has set a comprehensive energy efficiency (EE) strategy effecting 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[19]. 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 that underlies the Climate Action Program 2030, initial financial support for the transition to climate-friendly technologies will gradually be replaced by incentives and rules.

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 is comprising targets and measures for EE in the key sectors:

1) buildings,
2) industry/commerce/trade and services,
3) transport and,
4) agriculture.

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, in particular 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 Policy Framework/ Instruments

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 EE. The NECP displays the current status of projects in all these areas.[20]

[18] https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffiezienzstrategie-2050.pdf?__blob=publicationFile&v=12
[19] https://www.bmuv.de/fileadmin/Daten_BMU/Pools/Broschueren/klimaschutzplan_2050_en_bf.pdf
[20] https://www.bmwi.de/Redaktion/DE/Textsammlungen/Energie/necp.html

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 focusses 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 EE, innovation and research programs and for updated legal frameworks, which match the current EE goals and technological standards.[21]

Since the building sector plays a vital role to reach the EE targets under the NAPE 2.0. Germany has published its Energy Efficiency Strategy for Buildings, which provides a detailed 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.[22]

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. Also, the standards for new buildings may be raised.

4.3 Energy Efficiency Status in Key Sectors

4.3.1 Building Sector[23]

The building sector has a key role to play in the energy transition and in 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, placing a particular focus on ensuring that energy consumption in the building sector is reduced in an affordable, economic, 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 a good example of how sector coupling helps raise EE in buildings in a significant way: heat pumps are very efficient because they generate three to four kilowatt hours of heat with 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 to quantify the progress of EE improvements, particular in the building sector, Germany has in 2020 prepared a so-called Long-term Renovation Strategy (LTRS) which every EU member state has to submit the EU.

4.3.2 Industry Sector[24]

EE in industry takes a big share of the EffSTRA. Since EE in the industry mainly goes along with the aim to reduce GHG there are various other initiatives which are 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.

https://www.bmwi.de/Redaktion/DE/Downloads/I/integrierter-nationaler-energie-klimaplan.pdf?__blob=publicationFile&v=4

[21] https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffiezienzstrategie-2050.pdf?__blob=publicationFile&v=12

[22] https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/energieeffizienzstrategie-gebaeude.html

[23] https://ec.europa.eu/energy/sites/default/files/documents/de_final_necp_main_en.pdf

[24] https://www.dena.de/en/topics-projects/energy-efficiency/buildings/#:~:text=Buildings%20account%20for%20around%2035,residential%20and%20non%2Dresidential%20buildings

Heat pumps are a key technology for the 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 special cases.

4.3.3 Transport Sector[25]

Transport is a sector with a wide range of development in various domains. The key starting points for stepping up EE and climate action in transport are to raise the efficiency of combustion engines, to utilise electrified drives, to use renewable energy for producing fuel and, not least, to restructure 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.

4.4 Energy Efficiency Incentives & Funding Schemes [26]

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. Already in 2011 Germany established the German Energy and Climate Fund (EKF)[27]. 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 transport, industry/trade/commerce, buildings and agriculture will be outlined in the following.

Measures in the industrial / commercial / service

1. **Federal Funding for Energy and Resources Efficiency in Industry and Commerce (Energie und Ressourceneffizienz in der Wirtschaft)[28]**

The funding is aimed at all sectors and consists of six modules, each linked to a subsidy. The subsidised investment fields are defined as:

- High efficiency cross-sectoral systems;
- Process heat from renewable energies;
- Smart energy and/or resource management systems;
- Individual energy and resource efficiency concepts;
- Decarbonisation;
- Funding competition for energy and resource efficient business processes.

[25] https://www.stiftung-klima.de/app/uploads/2021/08/2021-08-03_Policy-instruments-climate-neutral-Germany_WEB.pdf
[26] https://www.bundesfinanzministerium.de/Content/EN/Downloads/Climate-Action/immediate-climate-action-programme-for-2022.pdf?__blob=publicationFile&v=3
[27] https://www.bmwi-energiewende.de/EWD/Redaktion/Newsletter/2020/04/Meldung/direkt-erklaert.html
[28] https://www.deutschland-machts-effizient.de/KAENEF/Redaktion/DE/Dossier/anlagentechnik.html

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 huge variety of funding possibilities for corporates and municipalities in EE to fit their individual needs.

2. Federal Funding for Efficient Heating Networks (Wärmenetzsysteme 4.0.)[29]

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 mostly relevant for communities and communal companies. The scheme is structured in four modules along 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.

3. Federal grants for stationary cooling and air condition systems (commercial usage)[30]

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.

4. KfW Energy Efficiency Program for Production Facilities/Processes[31]

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 up to EUR 25,000,000 with a preferential interest rate.

5. Additional funds for the decarbonisation of industry program (carbon contracts for difference)

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.

[29] https://www.bafa.de/DE/Energie/Energieeffizienz/Waermenetze/waermenetze_node.html
[30] https://www.bafa.de/DE/Energie/Energieeffizienz/Klima_Kaeltetechnik/klima_kaeltetechnik_node.html;jsessionid=2F15F2E5A016802A659FFC6EE2F9086B.2_cid362
[31] https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-Umwelt/F%C3%B6rderprodukte/EE-Produktion-292/?redirect=601600

Measures in the buildings sector

Existing buildings are the greatest climate policy challenge in the buildings sector. Funding budgets for 2022 and 2023 will be increased to ensure sufficient federal funding for energy-efficient buildings. From 2023 onwards, no federal funds will be provided for heating systems that can only be operated using fossil fuels.

1. Federal Funding for Energy Efficient Buildings (Bundesförderung für effiziente Gebäude)[32]

This scheme promotes a wide range of funding opportunities and was set up to support the transition of the building sector towards a climate-neutral building stock by 2050. The scheme targets homeowners, corporates and municipalities where homeowners can apply for a subsidy for residential buildings, corporates for non-residential buildings and municipalities for both. The funding will be provided for single measures implemented in existing buildings and for the renovation or the construction of a new energy efficient building. The subsidies can be utilised in form of a low-interest KfW loan with repayment subsidy or directly as investment subsidy without loan.

Single measures must improve the energy level of the building. Those include the installation of efficient heating/cooling technologies and systems (e.g., renewable energies in heating systems, air-conditioning systems with heat/cold recovery, smart home systems) and measures on the building envelope (e.g., insulation of the building envelope, renewal of the windows/doors or thermal insulation). The subsides for single measures cover 20% to 50% of the eligible investment costs and to some extent also costs for energy consulting, energy audits, technical planning and construction supervision.

For the renovation or construction of new energy efficient buildings the subsidy volume depends on the EE category of the planned construction. It ranges from 20 % to 50 % of the investment costs, varying for residential and non-residential buildings. To some extent costs for energy consulting, energy audits, technical planning and construction supervision are also covered.

Measures in the transport sector

1. Federal Funding for Energy Efficiency in Electric Rail Transport (Energieeffizienz des elektrischen Eisenbahnverkehrs)[33]

Eligible for funding are railway companies which are investing in technologies and measures improving 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 50% of the eligible investment costs. The subsidies will cease to be available end of 2022.

2. Federal funding for sustainable modernisation of inland and coastal vessels[34]

The two funding schemes for inland vessels and coastal vessels both aim for the reduction of emissions and energy consumption relating to vessels. The modernisation of the vessels by replacing the engines, improvement of hydrodynamic or propulsion. Measures are eligible for funding if they reduce energy

[32] https://www.deutschland-machts-effizient.de/KAENEF/Redaktion/DE/Dossier/beg.html; https://www.kfw.de/inlandsfoerderung/Bundesf%C3%B6rderung-f%C3%BCr-effiziente-Geb%C3%A4ude/

[33] https://www.bav.bund.de/DE/4_Foerderprogramme/93_Energieeffizienz_Eisenbahnverkehr/Energieeffizienz_Eisenbahnverkehr_node.html

[34] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMVI/nachhaltige-modernisierung-von-binnenschiffen.html; https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMVI/nachhaltige-modernisierung-kuestenschiffe.html

consumption by minimum 10 %. For coastal vessels the subsidy covers up to 30 % of the investment costs, for inland vessels it covers up to 90 % of the eligible additional investment expenditure.

4.5 Energy Efficiency Necessity measured by SDG covered by Triple-A Database

The Triple-A Interactive Web-based Database[35] is a visual representation of the most important aspects in EE financing, including the risks that could endanger the successful implementation of an EE project, the strategies that could mitigate these risks, the preferences of investors on EE investments, the financial performance of EE projects, the models and instruments that are usually used to finance EE projects and the performance of case study countries in terms of Sustainable Development Goals (SDG)[36].

The need to enhance EE in the study countries is illustrated by assessing the progress of the study countries in relation to the sustainable development goals. In this context, relevant indicators such as the total population living in poorly insulated dwellings, the total population with overdue utility bills, the country's energy imports, etc. have been taken into account. The data have been aggregated and normalised, presenting them in percentages.

The main result, as shown in the pie graph below, is that the building sector occupies the first position among the three sectors with the biggest presence of 71%. It is important to note that the building sector includes both residential and non-residential buildings with measures of Automatic Control, building and shell construction, HVAC&R, integrated renovation, lighting devices and renewable energy installations. The industrial sector based on compressed air, heating and cooling, motors, pumps and refrigeration occupies 59% of the EE necessity measures. Finally, the transport sector with the purchase of new public and passenger vehicles occupies 42% of the sustainable development target.

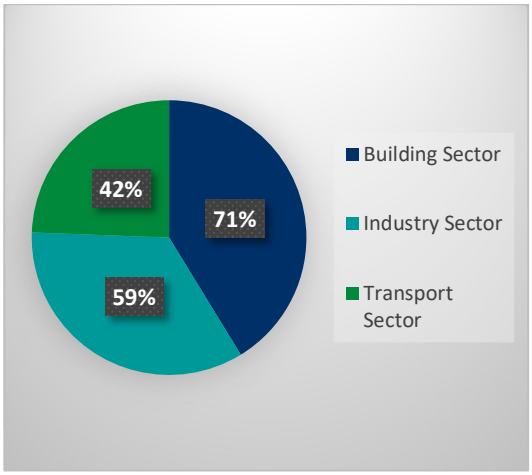

Figure 6: Energy Efficiency Necessity measured by the SDG

[35] https://aaa-h2020.eu/database
[36] https://database.aaa-h2020.eu/

4.6 Takeaways & Conclusion

Germany's energy system is currently undergoing a massive transformation. Besides the shift towards renewable energies in electricity generation and fuel substitution, EE plays a key part in the transformation towards a green energy economy. This briefing note outlined the contribution of EE policies as part of the green energy system transformation in Germany. The current EE policy framework in Germany was presented 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. EE is, therefore, an essential element in Germany in limiting energy demand and keeping it at a level for which the necessary generation and infrastructure can be provided.

5 8th Briefing Note: *Energy Efficiency Policy in the Czech Republic*

5.1 Energy Efficiency goals

Czech Republic seeks objectives in energy efficiency (EE) complementary to EU goals. They are embodied in the long run National Energy Policy[37] and further elaborated in the National Energy Efficiency Action Plans (NEEAP) by the Ministry of Industry and Trade (MIT). Action plans cover significant EE improvement measures and expected or achieved energy savings, including those in the supply, transmission and distribution of energy as well as energy end-use. First NEEAP of the Czech Republic was published in 2007.

Current fourth update of the NEEAP[38], published in 2017, was prepared after the final approval of the programs financed by the European Investment and Structural Funds. Cumulative energy savings target in final consumption under Article 7 of the Energy Efficiency Directive (EED) was recalculated according to the Eurostat methodology and was set at 50.67 PJ (14.08 TWh). After the assessment of the current measures of the alternative scheme an additional policy measures in household, industry, transport and agriculture sectors and on the level of local governments were added.

Since 2013, MIT issues a yearly report on meeting EE objectives according to the EED: set national non-obligatory energy saving target by the Article 3; renovate public buildings by Article 5; and generate cumulative savings that amount to 1.5 % of final energy consumption per year. The table below shows the status of the national EE objectives from the latest report.[39]

It can be concluded that the Czech Republic is lacking in achieving cumulative savings according to Article 7. Increasing the renovation rate and generally boosting EE projects is therefore necessary.

Table 4: Status of national EE objectives as of 2021

Targets and commitments, 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 98 %	Yearly energy savings: 44.5 PJ 87 %
Primary energy consumption: 1,679.5 PJ		Cumulated savings: 138.1 PJ
110 %		68 %

Source: SEVEn, 2022

[37] Available at: https://www.mpo.cz/dokument161030.html
[38] Available at: https://www.mpo.cz/en/energy/energy-efficiency/strategic-documents/national-energy-efficiency-action-plan-of-the-czech-republic--173843/
[39] The latest report 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/

5.2 Status in key sectors

In its yearly reports, MIT releases detailed specific consumption figures for four economy sectors: households, transportation, industry and services. Although an absolute yearly final energy consumption has risen back to 1,060 PJ in 2019, the level where it had stood in 2010, specific consumption in sectors decrease with improved EE.

Overall energy intensity of the Czech economy decreases over time. In 2019 it went down 3.4% year-on-year to 364 GJ per CZK 1 million GDP or around 9.1 GJ per EUR million (based on ex. rate).

Households have lowered specific energy consumption 1.6% y-o-y to 69.7 GJ per household per year with absolute figure decreasing 0.8 % to 297.6 PJ in 2019.

Transportation sector showed modest growth of 1.8% in absolute terms in 2019 and an increase of EE marked by decreases in specific indicators of energy consumed per person/km and per car.

The same trend can be seen in **industry** with both GDP specific and production specific energy consumptions decreasing by 3.5 and 1.7% respectively. At the same time, absolute consumption fell by 2%.

Lastly, in **service** sector, both absolute and GDP specific, per employee, consumption rose by 2.1 and 1.2% to 2.7 PJ in total and 42.5 GJ per employee respectively in 2019.

5.3 Policy framework

EE is framed in several Acts and Decrees. Most of them translate EU directives. **Act No. 406/2000 Coll. "Energy Act"**, last updated in 2020, includes foundations of all the concepts and themes related to energy consumption, viz. obligatory measures to increase the efficiency of energy use, requirements for reducing the energy performance of buildings, rules for the creation of the State Energy Concept, eco-design requirements for energy related products et al.

Decrees No. 78/2013 Coll. and No. 264/2020 Coll. on Energy Performance of Buildings is an implementing regulation for the Energy Act that includes cost-optimal level of energy performance requirements for buildings (including nearly zero energy buildings – nZEB); method of calculating the energy performance of the building; template for assessment of technical, economic and ecological feasibility of alternative energy supply systems and recommended measures and a template and content of the energy performance of building certificate along with requirements for its publication in the building.

Decrees No. 480/2012 Coll. and Decree No. 140/2021 Coll. on Energy Audit and Energy Assessment specify calculation of energy savings and stipulates the scope, content and processing method of the energy audit and energy assessment.

5.4 Incentives & Schemes

A series of scheme's fostering sustainable investments are available to the Czech public and businesses. In this section a general overview is provided listing the most relevant to the Triple-A project and the identified Czech cases. The amount and scope of sustainability schemes that are available or

are currently planned in the Czech Republic and are targeted at the enhancement and uptake of EE investments is quite significant and major financial benefits are available to businesses and citizens.

Various funds are funnelled towards increasing EE in the Czech Republic. Currently, the biggest allocations are in Operational Programmes (i.e. EU ESIF funds); EU ETS via Modernisation and Innovation Funds; COVID recovery fund; and various national sources.

5.4.1 Homeowners

5.4.1.1 New Green Savings Programme 2021-2030

New Green Savings Programme (NGS) is a follow up of a successful eponymous initiative. It adds the support for 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 the Czech Republic.

5.4.2 Public and commercial

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

5.4.2.1 State programme to promote energy savings

EFEKT programme administered by MIT 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 years 2022-2027, focuses on investment and noninvestment aid for EE support measures. The financial mechanism provides support for specific energy-saving measures with an emphasis on non-investment financial aid. EFEKT programme is financed solely by national funds.

5.4.2.2 Operational Programmes

In 2021 marked the end of the seven years' Operational Programme (OP)[40] Environment and, at the same time, 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 public sector in the country. Upcoming OP allocates CZK 3.3 billon (EUR 126 million).

The other grand **OP Technology and Applications for Competitiveness**[41] (OP TAC) is under auspices of MIT. Current OP design is still under being discussed. However, EE is one of the sub objectives with 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

[40] https://www.opzp.cz/opzp-2021-2027/
[41] https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/optak-2021-2027/

schemes, there is also a loan support in the form of interest rate discount, a programme in preparation with the National Development Bank.

5.4.3 Other schemes

5.4.3.1 Consultation Centres

EKIS Energy Consultation[42] is a free service for the public that serves to support the introduction of energy savings and renewables. Funds are provided through the EFEKT programme.

5.4.3.2 Modernisation Fund

Modernisation Fund[43], administered by the Environment Ministry, focuses generally on the generation and use of energy from renewable sources, EE 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.

5.4.3.3 National Recovery Plan

National Recovery Plan[44] 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.

5.4.3.4 Voluntary scheme

The voluntary scheme for improving EE 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 aimed at reducing final energy consumption. Individual stakeholders will implement individual energy saving measures.

5.4.4 Conclusions

Although the Czech economy gradually decreases its energy intensity, the country has not achieved the goals set by EU energy policy, in particular by EED. There is a functional legal framework setting EE standards and obligations and numerous public programmes providing financial support for the EE measures in every sector of the economy.

Despite available support, it is necessary to streamline support programmes in order to achieve set objectives. There is a significant potential of engaging private and mixed finance that is untapped for now.

[42] More information here: https://www.mpo-efekt.cz/cz/ekis/strediska-EKIS
[43] More information here: https://www.sfzp.cz/en/about-the-modernisation-fund/
[44] Dedicated web page: https://www.planobnovycr.cz/

6 9th Briefing Note: *Financing Energy Efficiency Projects: The Case of Italy*

6.1 Introduction

This briefing note gives an introductory overview of the applicable regulatory forces, the market architecture, and policy framework related to the projects and tools identified under the Triple-A project. The overview and recommendations presented in this report focus on the Italian situation and are based on the projects that were identified as Triple-A, which, in turn, are available through Standardised Triple-A Tools & Triple-A Database on Energy Efficiency (EE) Financing, and the project fiches that are made publicly available through the Triple-A website.

Compared to some of the other Triple-A case study countries' governments, the Italian government is recently starting to put more attention in renewables and EE. With the launch of the Next Generation EU (NGEU) program in 2020 the EU provided a huge number of financial resources to accelerate the 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[45]. These money are being used by Italian government within the PNRR (Piano Nazionale di Ripresa e Resilienza) to provide a financial aid to the entities which are 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 the EE of buildings. It also provides for measures to promote the use of renewable energy sources, including hydrogen. The plan places a special emphasis on reducing greenhouse gas emissions from transport, with investments in sustainable urban mobility and railway infrastructure.[46]

These briefing notes analyses the main Italian EE goals and the laws and incentives available. In particular, this document is divided in the following sections:

- EE goals for 2030 & 2050.
- Status in key sectors.
- Policy framework, incentives & schemes.

6.2 Energy Efficiency goals for 2030 and 2050

The Italian document related to the energy and climate transition is the *Piano nazionale integrato per l'energia e il clima per gli anni 2021-2030* (PNIEC), whose main goals regarding energy and climate for

[45] https://www.governo.it/sites/governo.it/files/PNRR.pdf
[46] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3126

2030 are reported in the following Table. Regarding the EE goals for 2030, there are several objectives to be achieved, all deriving from European legislation.

The first consists in the reduction by 2030, of the European primary energy requirement by 32.5%, calculated with respect to the projections drawn up by the EC in 2007 with the PRIMES scenario. It is expected that Italy will achieve a reduction of 43%, calculated in the same way[47].

The objective of reducing final energy consumption by a value equal to 0.8% of the average annual consumption of the three-year period 2016-18 is very demanding in each of the years from 2021 to 2030, through active policies. This objective is equivalent to a reduction of 0.93 Mtoe / year, and, compared with the final consumption of 115.9 Mtoe in 2016, highlights the great effort it will require, even in demanding sectors, including buildings and transport.

The penetration of electricity in transport will be very important: by 2030, the aim is to reach 1.6 million pure electric cars, 4.5 million hybrid cars, out of a fleet of 37 million vehicles in circulation in the same year, slightly lower than the current one.

Electricity generation will have to discontinue the use of coal by 2025, with 72% of electricity coming from renewable sources in 2030, and up to levels close to 95-100% in 2050.

The electrification of the primary energy system, in the perspective of total decarbonisation by 2050, will have to exceed 50%. It will therefore be necessary to aim for an acceleration of the development of the electricity carrier compared to the 22% share reached in 2018 (it was 17% in 1990) thanks to a marked growth in the transport sector and buildings, with a greater diffusion of heat pumps.

Table 5: Main goals on energy and climate of EU and Italy to 2030[48]

Sectors	2030 goals	
	EU	Italy
Renewable Energy Sources (RES)		
Share of energy from RES in gross final energy consumption	32%	30%
Share of energy from RES in gross energy consumption in transports	14%	22%
Share of energy from RES in gross energy consumption for cooling and heating	1.3 %/year	1.3%/year
Energy Efficiency		
Reduction of primary energy consumption in respect to 2007 PRIMES scenario	-32.5%	43%
Share of energy from RES in gross energy consumption in transports	14%	22%
GHG emissions		
Reduction of GHG vs 2005 for all non-ETS sectors	-30%	-33%

[47] https://temi.camera.it/leg18/post/la-proposta-italiana-di-piano-nazionale-per-l-energia-e-il-clima.html
[48] Piano Nazionale integrato per l'energia ed il clima, Ministero dello sviluppo economico, January 2020.

6.3 Status in key sectors

The analysis from the energy audits sent to ENEA (Italian public research body that operates in the energy, environment, and new technologies sectors in support of competitiveness and sustainable development policies) in December 2020[49] highlights the ability of the related measures to exploit the energy saving potential in industrial sectors as part of the obligation set out in the Energy Efficiency Directive. The following table shows the details of the interventions carried out recently and those proposed in the diagnoses: the energy saving potential is over 37 ktoe / year deriving from 321 interventions.

[49] La situazione energetica nazionale nel 2020, Ministero della transizione ecologica, Dipartimento per l'energia ed il clima, Luglio 2021.

Table 6: Energy audits in 2020

ATECO Sector	Number of interventions made	Annual savings on interventions carried out (toe / year)	Interventions identified (n)	Annual savings in interventions identified (toe / year)
Agriculture, forestry and fishing	2	113.3	23	42.9
Extraction of minerals from quarries and mines			6	25.6
Manufacturing activity	217	36316.7	998	14859.8
Supply of electricity, gas, steam and air conditioning	1	6.0	11	123.0
Water supply; sewerage networks, management of waste and remediation	11	16.2	76	1781.4
Construction	21	0.5	22	41.2
Wholesale and retail trade; repair of motor vehicles and motorcycles	13	160.4	109	755.8
Transport and storage	11	183.7	91	1903.3
Activities of accommodation and catering services			35	110
Information and communication services	2	0	63	534.8
Financial and insurance assets	10	68.4	33	152.5
Real estate activities			15	4322
Professional, scientific and technical activities	17	134.7	23	118.2
Rental, travel agencies, support services to businesses	9	20.9	56	536.8
Education	1	5.1	5	46
Health and social assistance	4	1.8	64	661.2
Artistic, sporting, entertainment and fun activities	1	0	3	9.9
Others	1	0	15	89.4
Total	**321**	**37027.6**	**1648**	**26113.6**

6.4 Policy frameworks, incentives & schemes

There are many laws and regulations, or policy interventions, in the Triple-A sectors, which are: (1) Buildings, (2) Industry, (3) Transportation, (4) District Energy Networks and (5) Outdoor Lighting.

6.4.1 National guidelines for the energy certification of buildings

The decree for the adaptation of the national guidelines for the energy certification of buildings[50]:

[50] https://www.mise.gov.it/images/stories/normativa/DM_Linee_guida_APE.pdf

- describes the Guidelines and the means of connection between the State and the Regions for the preparation of Energy Performance Certificates (APE);
- 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);
- introduces the constraint for the Regions and Provinces to establish control plans and procedures, to analyze at least 2% per year of the Energy Performance Analyses (EPAs) of their own territory.

6.4.2 White Certificates

White certificates[51], 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 EE.

White certificates are the main incentive mechanism for EE 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 TOE of savings achieved thanks to the implementation of the EE 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.

6.4.3 Conto Termico

The Conto Termico[52] encourages interventions to increase EE and the production of thermal energy from renewable sources for small plants. The beneficiaries are mainly public administrations, but also companies and individuals, who will be able to access funds for 900 million euros per year, of which 200 for public administrations.

Thanks to the Conto Termico it is possible to redevelop buildings to improve their energy performance, thus reducing consumption costs and quickly recovering part of the costs incurred.

6.4.4 Italian National Recovery and Resilience Plan (PNRR)

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 24th 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 EE parameter of at least two energy classes. EE 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

[51] https://www.gse.it/servizi-per-te/efficienza-energetica/certificati-bianchi
[52] https://www.gse.it/servizi-per-te/efficienza-energetica/conto-termico

measures are eligible for financing. Seismic adaptation interventions can also be financed, where functional to the project and to a maximum extent of 50% of the total value of the work.

Then, The Italian National Recovery and Resilience Plan (PNRR)[53] 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 (€ 6.97 billion).
- M2C2: Energy transition and sustainable mobility (€ 25.36 billion).
- M2C3: EE and buildings renovation (€ 22.24 billion).
- M2C4: Interventions for resilience, enhancement of the territory and efficiency energy of the Municipalities (€ 6 billion).
- M3: Infrastructure for sustainable mobility
- M3C1: Rail network and secure roads (€ 27.97 billion).

6.4.5 Energy Efficiency National Fund

Together with reforms Italy has introduced numerous financial incentives aimed at increasing the attractiveness of the country as a Foreign Direct Investments (FDIs) destination, encouraging R&D operations, supporting industrial crisis areas, and fostering the growth of new innovative enterprises. To increase the EE the Energy efficiency National Fund has been adopted[54]. The fund has a budget of € 310 MLN and supports EE investments on 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 the 80% of the investment, for a total amount between € 150K and € 2.5 MLN.

6.4.6 Superbonus

The Superbonus[55] is the tax relief governed by Article 119 of Law Decree no. 34/2020 (Relaunch decree), which consists of a 110% deduction of the expenses incurred starting from 1 July 2020 for the implementation of specific interventions aimed at EE and static consolidation or the reduction of the seismic risk of buildings. The facilitated interventions also include the installation of photovoltaic systems and infrastructures for charging electric vehicles in buildings.

The subsidy goes alongside the deductions, already in force for many years, due for the energy requalification of buildings (eco-bonus) and for those for the recovery of the building heritage, including anti-seismic ones (sismabonus), currently governed, respectively, by the articles 14 and 16 of the law decree n. 63/2013.

The 2022 budget law extended the facility, providing for different deadlines depending on the subjects who support the eligible expenses.

[53] https://www.governo.it/sites/governo.it/files/PNRR.pdf
[54] https://www.mise.gov.it/index.php/it/energia/efficienza-energetica/fondo-nazionale-efficienza-energetica
[55] https://www.agenziaentrate.gov.it/portale/web/guest/superbonus-110%25

In particular, the Superbonus is up to, until December 31, 2025, in the following sizes:

- 110% for expenses incurred up to 31 December 2023.
- 70% for expenses incurred in 2024.
- 65% for expenses incurred in 2025

for condominiums and individuals, outside the exercise of business, art and profession activities, for interventions on buildings consisting of 2 to 4 distinctly stacked real estate units, even if owned by a single owner or co-owned by several natural persons.

The following table directly links the five Triple-A sectors to the different policy frameworks, incentives and schemes described before.

Table 7: Policy frameworks, incentives and schemes relation to Triple-A sectors

Policy frameworks, incentives & schemes	Triple-A sectors
National guidelines for the energy certification of buildings	Buildings
White Certificates	Industry, Outdoor Lightning
Conto Termico	Industry
Italian National Recovery and Resilience Plan (PNRR)	Buildings, Industry, Transportation, District Energy Networks, Outdoor Lightning,
Energy Efficiency National Fund	Buildings, Industry
Superbonus	Buildings

6.5 Conclusions

To stay in line with European objectives towards 2030 and 2050 for EE and decarbonisation, Italy has set up different measures in terms of policy frameworks, incentives and schemes in different sectors.

The Italian plan proposes projects in the European flagship areas. These are specific investment projects, which address issues that are common to all Member States in areas that create jobs and growth and are needed for the twin transition. The most comprehensive form of financing provided by Italy is the National Recovery and Resilience Plan (PNRR), consisting of 191.5 billion euros to employ during the period 2021-2026. This plan is articulated in 6 missions, which cover different areas, as: digitalisation, innovation, competitiveness, culture and tourism; green and ecological transition; infrastructures for sustainable mobility; education and research; inclusion and cohesion; health. Alongside the PNRR Italy has provided other policy framework, incentives and schemes which directly relate to the Triple-A sectors, such as the White Certificates which allows to certify the energy savings and efficiency, the Conto Termico which aims to redevelop buildings to improve their energy performance, the Energy Efficiency National Fund which has a budget of € 310 MLN and supports EE investments on buildings, plants, and production processes and finally the Superbonus, which consists of a 110% deduction of the expenses incurred starting from 1 July 2020 for the implementation of specific interventions aimed at EE and static consolidation or the reduction of the seismic risk of buildings.

All the aforementioned measures will contribute to favour a green and just transition focus on integrated long-term goals and strategies for a more resilient and fairer economy.

7 10th Briefing Note: *Energy Efficiency Market Architecture & Policy Framework: The Dutch Case*

7.1 Introduction

Aim of this briefing note is to provide a brief overview of the applicable regulatory forces, the market architecture, and policy framework related to the energy efficiency (EE) projects that were explored and identified under the Triple-A project in the Netherlands.

Similar reports are prepared on a per country basis and aggregated in a European Synthesis Paper. The overview and recommendations presented in this report are the result of the research conducted to provide recommendations for policy frameworks and market architectures based on experiences gained from exploring and identifying Triple-A projects to be benchmarked by the Triple-A Tools[56], Database on Energy Efficiency Financing[57], and the project fiches that are made publicly available through the Triple-A website[58].

Compared to other Triple-A country's, the Dutch government stimulates sustainable energy uptake and investments, and acts strongly towards the transition to a sustainable future. This is clearly reflected in the scope and number of sustainability schemes that are already available 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 law- and regulations that, generally, go well and beyond EU regulation.

7.2 Monitoring & Regulation

Fossil fuels, especially natural gas, are less available in the Netherlands given current market forces and the government is emphasising on this matter by transitioning towards fossil fuel free housing at a rapid pace, while also setting strict rules to industrial consumption. The overall strategy[59] is to transition to 100% sustainable energy in a step-by-step process by 2030, and 70% of all electricity being generated in a sustainable way and in 2050 almost all the Dutch energy supply coming from sustainable sources and CO_2 neutral[60].

It is important to stress that by no means is the current briefing not, nor pretends to be, a holistic overview of the Dutch situation regarding rules and regulations impacting or fostering energy efficiency investments in the Netherlands. Its scope is to reflect the applicable laws and relevant regulations concerning the Dutch Triple-A projects and lay out the basis for the policy framework.

7.2.1 The Energy efficiency notification obligation

Under the Dutch Environmental Management Activities Decree[61], organisations that use 50,000 kWh of

[56] https://aaa-h2020.eu/tools
[57] https://database.aaa-h2020.eu/
[58] https://aaa-h2020.eu/
[59] https://www.rijksoverheid.nl/onderwerpen/klimaatverandering/klimaatbeleid
[60] https://energy.ec.europa.eu/system/files/2020-03/nl_final_necp_main_en_0.pdf
[61] https://www.government.nl/topics/environment/roles-and-responsibilities-of-central-government/environmental-management-act

electricity or 25,000 m³ of natural gas (or an equivalent) or more 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 EE through the notification obligation. The organisation had to report which EE measures they have taken by the 1st of July 2019, unless the organisation has an audit obligation under the Energy Efficiency Directive (EED) of the European Commission (EC). 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. This task can, however, 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.

7.2.2 National Inventory Entity - NIE

The Netherlands has one National System for monitoring and reporting greenhouse gases for the United Nations Convention of Climate Change (UNFCCC), the Kyoto Protocol (KP), 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[62].

The core of the National System is the PRTR and holds one national dataset for emissions inventories covering some 350 air, water, and soil pollutants and is coordinated by RIVM. The Dutch Enterprise Agency (RVO) maintains the National System in its role as National Inventory Entity (NIE).

The Netherlands National System encompasses the following four 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[63].
- Quality control and assurance (QA/QC) system and programme, including quality objectives, a 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.

To this end, as of 2015 onwards, five methodology reports documented the methods for estimating GHG emissions (including the activity data and emission factors). These are:

(1) 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*).

(2) Methods for calculating the emissions of transport in the Netherlands (Triple-A Sector: *(3) Transportation*).

(3) Product usage by consumers, construction, and services (Triple-A Sector: *(1) Buildings*).

[62] https://english.rvo.nl/information/laws-regulations/national-inventory-entity/national-system
[63] https://english.rvo.nl/information/laws-regulations/national-inventory-entity/national-system/legal-basis

(4) Methodology for estimating emissions from agriculture in the Netherlands.

(5) 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. More information is available at the RVO (Rijksdienst voor Ondernemend Nederland), the Dutch NIE[64].

7.3 Incentives & Schemes

A series of schemes fostering sustainable investments are available to the Dutch public and businesses. the most relevant to the identified Dutch cases are presented. The amount and scope of sustainability schemes available or currently planned is significant. Typically, these come in the form of tax cuts, subsidies, and government guarantees. In section 7.3.1 broadly applicable interventions are highlighted which apply to multiple (if not all) Triple-A sectors. Section 7.3.2 goes into schemes that are relevant to financial institutions and section 7.3.3 to the Triple-A sectors specifically[65].

7.3.1 Subsidy scheme's fostering sustainable investments

7.3.1.1 Environmental investment deduction (MIA) & 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. [66]

7.3.1.2 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 be listed in the "Energy List 2021"[67]. 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.

7.3.1.3 Subsidy Scheme for the Sustainability of SMEs (SVM)

Small and Medium sized enterprises (SMEs) can, through the Subsidy Scheme for the Sustainability of

[64] https://english.rvo.nl/information/laws-regulations/national-inventory-entity/national-reports-unfccc
[65] For a more detailed description of each section refer to the Dutch Synthesis paper available at: https://aaa-h2020.eu/results
[66] https://english.rvo.nl/subsidies-programmes/mia-and-vamil
[67] https://english.rvo.nl/sites/default/files/2021/04/EIA%20-%20Energylist%202021%20-%20English.pdf

SMEs (SVM) (Subsidieregeling Verduuzaming MKB)[68], 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.

7.3.1.4 Demonstration Energy- & climate Innovation (DEI+)

The overall goal of the DEI+[69] 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 7.3.3 of this paper. The DEI+ themes are: Natural gas-free homes, neighbourhoods, and buildings, Circular Economy, CCUS, Energy efficiency, Renewable energy, Flexibility of the energy system, Local infrastructure, and Other CO_2 reducing measures in the industry or electricity sector.

7.3.2 Dutch subsidy schemes for financial institutions

7.3.2.1 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.[70]

7.3.2.2 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.[71]

7.3.2.3 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.

7.3.3 Triple-A Sector Specific

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 Triple-A project defines five sectors in its outset: *(1) Buildings, (2) Industry, (3) Transportation, (4) District Energy Networks, (5) Outdoor Lighting.*

It is worth mentioning no sector-specific subsidy schemes or regulations concerning the “outdoor

[68] https://www.rvo.nl/subsidie-en-financieringswijzer/svm
[69] https://www.rvo.nl/subsidie-en-financieringswijzer/demonstratie-energie-en-klimaatinnovatie-dei
[70] https://english.rvo.nl/subsidies-programmes/corporate-financing-guarantee-go
[71] https://www.rvo.nl/subsidie-en-financieringswijzer/groeifaciliteit

lighting" sector were identified through the research.

7.3.3.1 Buildings

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 the Table below.

7.3.3.2 Industry

DEI+ Circular Economy & Energy Efficiency

As per the previous section's DEI+ scheme, the "circular economy" & "Energy Efficiency" sub-themes are targeted at the industry sector supporting proposals for recycling & waste, re-use, and use of bio-based manufacturing.

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.[72]

Table 8: Overview of policy interventions in the building sector

Title	Concerning	Description
Energy efficiency notification obligation	Existing	Companies and institutions are obliged to take energy-saving measures with a payback period of 5 years or less.
Energy Performance of Buildings Directive (EPBD III)	Existing & New construction	A broad number of interventions primarily concerning: - system requirements for technical building systems; - documenting the energy performance of technical building systems; - self-regulating equipment for controlling the temperature per room or zone; - charging infrastructure for electric cars; - inspections of heating and air-conditioning systems; - building automation and control systems.
Energy label C for offices	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^2 per year. If the building does not meet the requirements, the building may no longer be used as an office.
Energy label utility buildings	Existing	An energy label is mandatory for the sale, rental or delivery of non-residential buildings. 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.
Energy performance requirements for	Existing & New construction	The Building Decree sets requirements for:

[72] https://www.rvo.nl/subsidie-en-financieringswijzer/energie-investeringsaftrek/ondernemers/sectoren/industrie

Title	Concerning	Description
conversion and renovation		cultivation; renewal or replacement of insulation layers; dormer windows; major renovation and addition renovation with the adaptation of the technical building system (installation).
Energy performance - BENG	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).
Environmental Performance of Buildings (MPG)	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 m²) and new-build homes.

Circular Value Chain

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%.

Accelerated Climate Investments (VEKI)

Designed to combat the high-upfront cost of proven, CO_2 reducing, industry-specific technologies with payback periods longer than five years. Particularly large projects and process innovations are targeted.

7.3.3.3 Transportation

Both 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.

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.

7.3.3.4 District Energy Networks

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_2 reduction. In this way, the government wants to ensure that the energy transition in the Netherlands remains feasible and affordable.

Renewable Energy Transition (HER+)

Renewable Energy Transition 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_2 reduction.

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.

DEI+ renewable energy

As per the other DEI+ scheme sub-areas, a specific scheme is targeted at the renewable energy sector – for more information see section 7.3.1.4

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 refer to Section 7.3.1.2.[73]

7.3.4 Conclusions

From this brief analysis into the policy and regulation framework present and the subsequent analysis of available incentives and subsidy schemes in the Netherlands conclusions are drawn related to the Dutch EE investment projects identified as Triple-A:

1. The Netherlands proves to have ***a favourable climate for EE investments*** shown by the large number of schemes available to enhance the uptake of EE investments.
2. The policy and regulation framework that is put in place ***supports the introduction of EE measures*** through the alleviation of market barriers with new regulation being put in place to reflect this.
3. Further, it aims to ***smooth out the monitoring and reporting process*** of EE investments through the single entity approach for national, EU, and global reporting of sustainability figures. Taking adequate steps to make this process ***easier and more transparent***.

The Triple-A projects that were identified should act as a comparative starting point for similar EE projects in order to get a head start in the identification of related regulations and subsidy schemes that can enhance the adoption rate and overall financial viability of future investments.

Although not perfect, comparative to some of the Triple-A partner host countries, the Dutch EE investment climate is well developed and positioned to remain a front-runner with many incentives already in place and of significant scope, fitting the underlying goal of supporting, already from an early-stage onward, the uptake of EE measures in the Netherlands. A further comparison between the participating Triple-A countries is provided in the ***European Synthesis paper***[74].

[73] https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/duurzame-energie-opwekken/verduurzaming-warmtevoorziening/wet-en-regelgeving

[74] https://aaa-h2020.eu/results

8 11th Briefing Note: *Triple-A Recommendations: & Lessons Learnt towards Enhancing Energy Efficiency Investments*

8.1 Introduction

Energy Efficiency (EE) actions 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 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. As EU accelerates its effort towards decarbonisation, policy decision making should focus on security, affordability, and sustainability to pursuit the EU emissions target. EE investments could boost economies and bring long-term benefits for consumers, businesses and environment. To reach these types of investments mobilisation of capital through public and private targeted use of funds, innovative support schemes and decision support tools are required.

8.2 Barriers opposed to EE investments

The barriers found during the implementation of Triple-A project and should be overcome for the increase of EE investments, separated into 3 main categories. These categories are the regulatory framework, as it sets the basis for EE financing, the market framework which clearly depicts the situation of the EE projects financing and implementation and, finally, the key players including mainly financial institutions and SMEs with the role of project developers.

Regulatory Framework

- Unstable or misleading regulation can hinder the implementation of EE projects by the unstable energy prices volatility.
- Policy distortion by taxes, subsidies or other policy interventions discourages the implementation of EE interventions.
- Fluctuation of energy prices plays significant role on the profitability of EE investments.
- The main factor that implies the financial risk is the borrower's creditworthiness, although several instruments and mitigation strategies exist that could be deployed.

Market Framework

- SMEs focus on expanding their market size and product competitiveness, leaving behind other factors, such as energy efficiency upgrades.
- Investors do not perceive the profitability of EE measures to a great extent.
- The most numerous EE projects identified in Triple-A are from building sector. However, a more complete and multisectoral approach could have more significant results.

Key Players

- Financing bodies and project developers are the main stakeholder groups actively engaged and triggered in this field of energy EE while policy makers followed.

- Financing bodies are more active in countries with stronger economy while in countries with strong industry or in economic recovery project developers were more active.

8.3 Stakeholders' perspective

The Triple-A's stakeholder engagement activities are captured through specific actions, such as workshops, webinars, meetings, and questionnaires, with shared interdependencies in the field of EE investments and how to enhance them. Indicative highlights are:

- Most tools and finance schemes available are in some way or another very similar. What lacks is the room and flexibility to implement the innovative financing schemes and apply them to existing situations or to introduce new schemes into upcoming projects.
- Priority should be given to EE investments - in the industry and buildings - in support of the strategy for sustainable finance.
- Provide economic incentives, such as tax exemptions and grants for the implementation of EE interventions.
- Tools and databases provide benefits by building trust between EE investors and project developers.
- The inclusion of the EU Taxonomy has been a hit-and-miss, and was deemed very relevant to some, and less-so for others due to prior knowledge.
- Simple steps for evaluating EE projects are missing entirely in several countries (especially amongst Southern and Eastern European locations) and therefore represent a great opportunity for companies and financial institutions to improve their EE investment strategy through Triple-A implementation.

8.4 Policy framework and market architecture

A set of the 8 Triple-A case study countries Synthesis papers prepared to depict the overview of the applicable regulatory forces, the market architecture and policy framework related to projects in the sectors of buildings, industry, transportation, district energy networks and outdoor lighting. These insights enable a further enhancing of EE investments and inspire decision making in MS and EU level.

- The focus is to increase countries' energy independence, transition to renewable energy sources, decreasing the energy consumption by implementing the modern low energy technologies etc.
- Countries with leading economy provides a more complete and multisectoral approach with support schemes covering a variety of sectors.
- Countries with slow economic recovery and prolonged sever recession have starting to put more attention in EE and embracing the green and digital transition. This is mainly observed in building sector and renewable energy respectively.

8.5 Boosting actions towards EE investments

Taking into consideration all the above, the scope is to gather actions in different aspects and stages for fostering EE investments and increase their impact.

- The regulatory national framework should be prepared to comply with the EU Taxonomy standards.

- A rapid reflex to European Directives should be guaranteed so as they are embodied in the national legislation on time and in a manner that they could be easily applied by public and private sector.
- Relevant policies should be monitored and revised regularly to ensure their continued effectiveness to accelerate investments in energy efficiency.
- Partnerships with businesses on decarbonisation, such as voluntary agreements, to ensure they work towards meeting the long-term climate and energy objectives should be developed.
- Public grants and guarantees should be used to support project development, quality assurance, de-risking and insurance costs of multiple EE investments to trigger private sector investments instead of limiting the public funds to fewer wholly funded projects.
- Incentives should be provided to SMEs and industries in order to proceed with EE measures.
- A similar to renewable energy investments approach for boosting actions, should be adopted towards EE investments, since they are strongly related, and both can have a high positive impact both environmental and economic.
- An appropriate risk mitigation strategy for the financial risk is hedging with future (forward) energy contracts or agreements on long term fixed-price energy contracts and long-term fixed interest rates.
- EU and national policies and resources should work effectively to drive R&D for optimal EE outcomes.
- Industry benchmarks and technology maps should be further developed. A typical evaluation framework should be adopted when a company is regarded as ESG ready.
- Policymaking should stir towards the standardisation of project design, in order to make easier the energy efficiency projects replicability.
- Establishment of EU official tools and guidelines for standardised methods and procedures in benchmarking energy efficiency projects. Outcomes and products of H2020 projects (and other research projects) can be incorporated for a holistic approach of standardisation of EE projects.

8.6 Benchmarking of EE investments

The Triple-A activities towards the evaluation and benchmarking process of EE investments aim to resolve the main barriers to reliable evaluation and benchmarking of energy efficiency projects' financing. Highlights are summarised below:

- Building confidence between project developers and investors could be achieved by introducing standardised underwriting methods.
- Standardisation could be achieved by establishing a common (even pan-European) framework of EE project fiches.
- The Triple-A project has deployed a benchmarking procedure in close cooperation with targeted stakeholders, motivating them to draft their EE project ideas into project fiches, insert them into the Triple-A Tools for efficient benchmarking and initiating matchmaking with financing schemes. These projects could be used as best practice approach which in turn can minimise development costs.
- Replication of projects, either in terms of financing or/and technical solutions, is highly desired.
- Aggregation of EE projects seems to be more critical than other issues, as it has a positive impact on risk assessment and could provide economies of scale.

8.7 Triple-A Interactive Web-based Database

Another action to enhance trust between financiers and project developers is databases with relevant information. The Triple-A Web-based Database which contains information about EE financing for the 8 Triple-A case study countries and EE sectors includes data from the Triple-A methodology and risk assessment as well as bottom-up stakeholder consultations. The main highlights emerged for risk mitigation strategies, and financial data that assist EE key actors in their decision-making process are listed below:

- The creation of a unified creditworthiness system for green investments will facilitate banks and financing institutes that aim to finance green projects as it will drastically simplify and speed up the undertaking procedure.
- Policymakers should focus on well-structured subsidies for EE projects, taking in mind not to disrupt the private investments value chain of EE, as private financing is equally important.
- Policymakers should consider introducing campaigns and capacity building actions visioning to reduce behavioural risk.
- Another mitigation strategy related to the energy market is the establishment of a clear long-term government tax policy on energy.
- An applicable risk mitigation strategy for the energy market and regulatory risk is hedging with future (forward) energy contracts or agreements on long term fixed-price energy contracts and long-term fixed interest rates.
- Proper accreditation and certification of technology supplies and EE market solutions, mandatory insurances and standardised performance protocols could also play a significant role.

8.8 Exploitation of EE tools

Replication of projects is highly recommended. Similar projects allow project developers to demonstrate the proof of concept, promote them as a product, and minimise development costs. Therefore, a roadmap for the exploitation of EE efficiency financing tools, such as the Triple-A Tools, is important for their successful implementation, maintenance, and interoperability along with the update of the new trends' identification of the EE market. The following should be taken into consideration:

- Private and independent certification by a reputable company is necessary to gain market position.
- Within the integration strategy, various approaches should be considered on how EE financing tools have the potential to generate value within the European EE market.
- Making a controlled transition of dissemination and marketing efforts from the European project to commercial exploitation can help maintain the user base and give a sense of coherence

8.9 Conclusions

The unstable or misleading regulation along with the market's economic uncertainties creates bottlenecks that need to be overcome to boost EE financing. Therefore, countries need a steady flow of financing to meet their long-term energy and climate obligations with the financial institutions (both private and public) are central to the strategy. However, the lack of standardisation procedures creates difficulties and highlights that the building of confidence between project developers and investors is

mandatory. To this end, EE financing tools (such as the Triple-A Toolset) and finance schemes should be used widely with the room and flexibility to implement innovative financing schemes.

On top of that, the EU Taxonomy and the inclusion of the ESG criteria should work as the cornerstone of these investments and regulatory frameworks. Moreover, the regulatory frameworks should be ready for a rapid reflex to European Directives, so as to embody whatever required on time and in a manner to be easily applied both in public and private sector. Furthermore, introducing a governmental collateral system would be quite supportive along with a clear long-term government tax policy on energy.

Financing bodies and project developers are the main stakeholders actively engaged and triggered in this field, while policy makers and governmental actors follow. A combination of all of them might have more robust and efficient results as policy makers have the potential to introduce campaigns and capacity building actions vision to cover the abovementioned key issues.

Finally, the establishment of EU official tools and guidelines for standardised methods and procedures in benchmarking EE projects along with a unified creditworthiness system proved to be of great importance and will drastically simplify and speed up the undertaking procedures. Outcomes and products of Horizon 2020 projects (and other research projects) can be incorporated for a holistic approach of standardisation of energy efficiency projects. This could be supplemented by proper accreditation and certification of technologies.

9 12th Briefing Note: *Triple-A Survey on the Categorisation of Risk Mitigation Strategies, Financing Instruments and Financial Schemes*

9.1 Introduction

Energy efficiency investments involve multiple uncertainty factors, with their evaluation presenting high complexity[75]. De-risking energy efficiency investments by applying the appropriate risk mitigation strategies, as well as finding suitable public or private instruments for their financing are critical considerations for their upscaling[76]. Within Triple-A Task 3.1: Triple-A Risks and Mitigation Strategies, dedicated reviews in the energy efficiency financing literature were conducted for the identification of the main risk mitigation strategies to reduce the different types of risks and the main instruments and schemes for financing energy efficiency investments[77].

This Briefing Note analyses the results of the Triple-A questionnaire on the categorisation of risk mitigation strategies, financing instruments and financial schemes. This questionnaire is part of the Triple-A stakeholder consultation process and was conducted as a primary step towards identifying appropriate risk mitigation strategies and applicable and important financing instruments and financial schemes for energy efficiency investments across Triple-A case study countries. The survey took place from December 2021 to February 2022 and in total, thirty-three (33) responses were received from energy efficiency experts representing financing bodies, companies, policy support institutes, and academia. Due to the containment measures imposed to deal with the Covid-19 pandemic, the consultation process was implemented online, while the stakeholders were engaged mainly via e-mail and personal invitations.

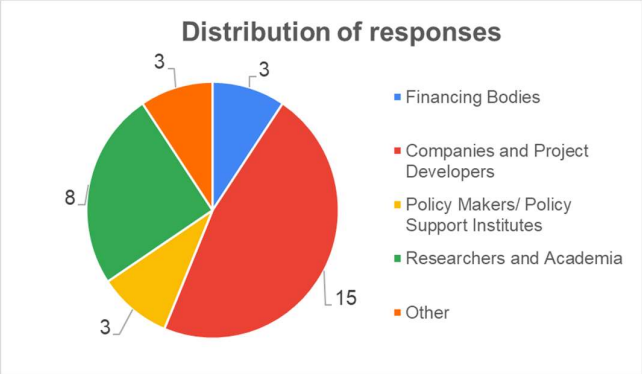

Figure 7: Distribution of responses per stakeholder profile

[75] Lee, P., Lam, P.T.I., Lee, W.L., Performance risks of lighting retrofit in energy performance contracting projects, Energy Sustain. Dev., 45 (2018), pp. 219-229, https://doi.org/10.1016/j.esd.2018.07.004

[76] Koutsandreas, D., Kleanthis, N., Flamos, A., Karakosta, C., Doukas, H., Risks and mitigation strategies in energy efficiency financing: A systematic literature review, Energy Reports, (2022), pp. 1789-1802, https://doi.org/10.1016/j.egyr.2022.01.006

[77] Kleanthis, N., Koutsandreas, D. Exintaveloni, D.S., Karakosta, C., Ristau, P., Flamos, A., 2020. Triple-A Deliverable 3.2: Final Report on Risks of Energy Efficiency Financing and Mitigation Strategies Typology.

9.2 Triple-A Questionnaire

The main objective of this online questionnaire is to categorise the financing instruments, financial schemes, and risk mitigation strategies identified through the literature review for the Triple-A case study countries based on the experience of related experts about their applicability and importance.

The main characteristics of the questionnaire are the following:

- Explorative, semi-quantitative online questionnaire.
- Different question formats, namely short answers, multiple choices, and checkboxes.
- Developed in Google Forms.

The main respondents' profiles Error! Reference source not found.include Financing Bodies (9.4%), Companies and Project Developers (46.9%), Policy Makers/ Policy Support Institutes (9.4%), Researchers and Academia (25.0%), and Other (9.4%).

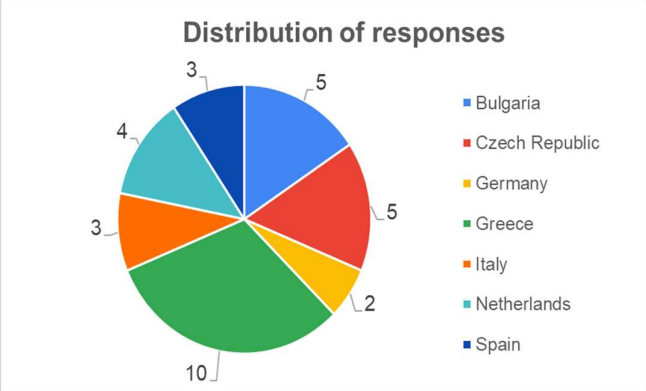

Figure 8: Distribution of responses per case study country

The "Other" category involves stakeholder profiles for which only one answer was provided, such as "Trader – Economist", "Network of Local Authorities", and "Real estate advisor".

In addition, responses were provided by stakeholders from all Triple-A case study countries except for Lithuania, while the majority emerged from stakeholders from Greece, the Czech Republic, and Bulgaria, covering 62.5% of the total sample of answers Error! Reference source not found.. In addition, some replies were collected by stakeholders from other countries apart from the Triple-A case studies, such as Switzerland.

9.3 Results Analysis

9.3.1 Risk mitigation strategies

The identified risk categories and the respective risk mitigation strategies that have been provided as options to the respondents emerged from the Triple-A's *Final Report on Risks of Energy Efficiency*

Financing and Mitigation Strategies Typology[78]. The respondents had to select the i) applicable and the ii) most important Risk Mitigation Strategies for their country. The options given are presented briefly in the following sections. Also, the respondents could provide their own comments and add more options, if needed.

Financial risk

The Risk Mitigation Strategies options provided to respondents were:

- Careful study of the creditworthiness of the borrower and/or the ESCO during the negotiation stage
- Collaterals
- Project aggregation
- Loan guarantee mechanisms
- Increase of registered capital to develop multiple financing channels
- Grants and subsidies
- Off-balance sheet financing
- Investigation of possible unnecessary costs
- Charging borrowers with high interest rates.

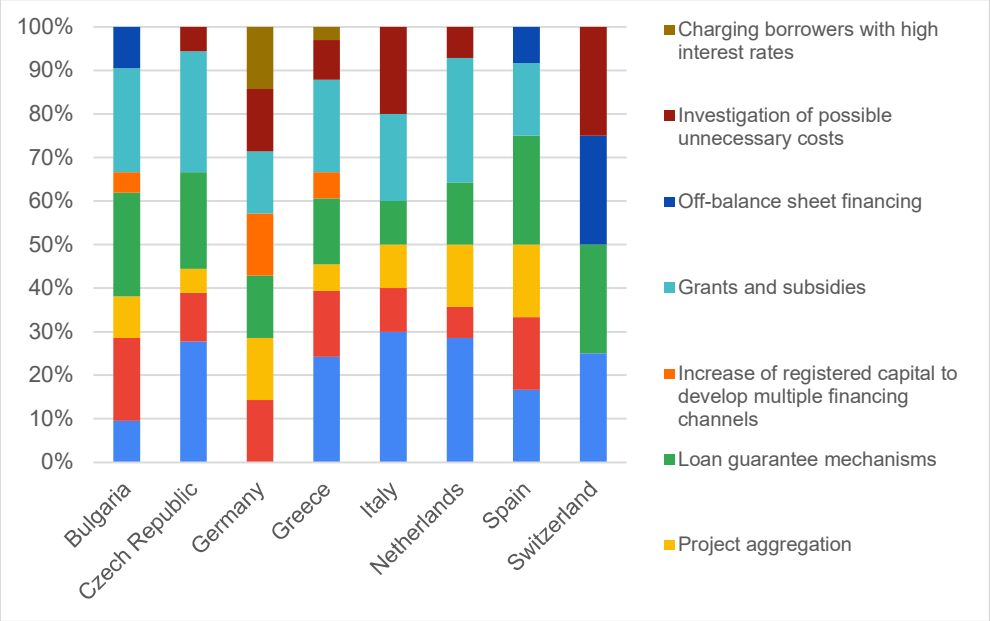

Figure 9: Appropriate financial risk mitigation strategies per case study country

The common financial risk mitigation strategies in all countries' responses are *grants and subsidies*, *loan guarantee mechanisms*, *collaterals*, and *project aggregation*. Another risk mitigation strategy with significant shares in all case study countries except for Germany is *careful study of the creditworthiness*

[78] Available here: https://aaa-h2020.eu/sites/default/files/reports/D3.2%20Final%20Report%20on%20Risks%20of%20EE%20Financing%20and%20Mitigation%20Strategies%20typology.pdf

of the borrower and/or the ESCO during the negotiation stage, while the strategy suggesting *charging borrowers with high interest rates* is observed mainly in Germany and slightly in Greece.

Behavioural risk

The Risk Mitigation Strategies options provided to respondents are:

- Following sustainable lifestyles and consumer behaviour
- Consuming more efficiently, differently, and less
- Raising awareness
- Information provision
- Subsidies
- Energy price regulation
- Tradable permits

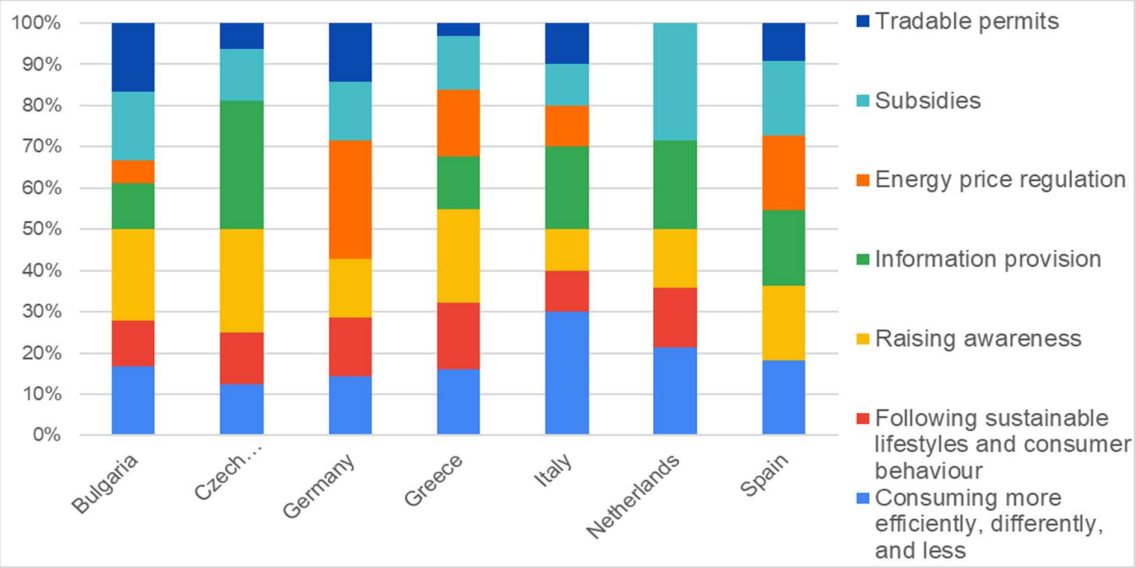

Figure 10: Appropriate behavioural risk mitigation strategies per case study country

The behavioural risk mitigation strategies that can be observed in the responses for all countries are *subsidies* and *raising awareness,* and *consuming more efficiently, differently, and less**Error! Reference source not found.*. Both *information provision* and *following sustainable lifestyles and consumer behaviour*, hold significant shares in all countries but are absent from Germany and Spain, respectively. *Energy price regulation* is also considered a significant risk mitigation strategy in Germany, Greece, and Spain.

Energy market and regulatory risk

The Risk Mitigation Strategies options provided to respondents were:

- Hedging with future contracts
- Clear long-term government tax policy on energy
- Fixed-price energy contracts
- Hedging with forward contracts
- No answer
- Hedging with option contracts

- Setting aside risk reserve
- Hedging with swaps
- Establishing caps and floors on the energy price

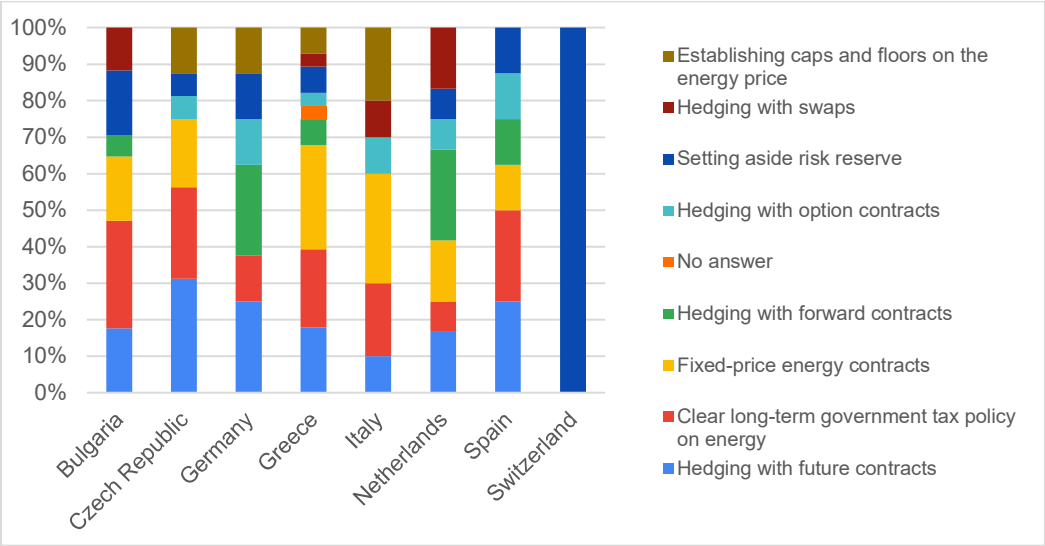

Figure 11: Appropriate energy market and regulatory risk mitigation strategies per case study country

The energy market and regulatory risk mitigation strategies that can be found in the responses for all countries are the *clear long-term government tax policy on energy* and *hedging with future contracts*Error! Reference source not found.. Another risk mitigation strategy, not observed in Germany but with significant shares in all other countries, are the *fixed-price energy contracts*. *Hedging with forward contracts* holds significant shares (25% of responses) in Netherlands and Germany, while *setting aside risk reserve* is significant (>15% of responses) only in Bulgaria and *establishing caps and floors on the energy price* is important mainly in Italy.

Economic risk

The Risk Mitigation Strategies options provided to respondents were:

- Hedging with option contracts
- Hedging with future contracts
- Long term fixed interest rates
- Hedging with forward contracts
- Hedging with swaps
- Setting aside risk reserve

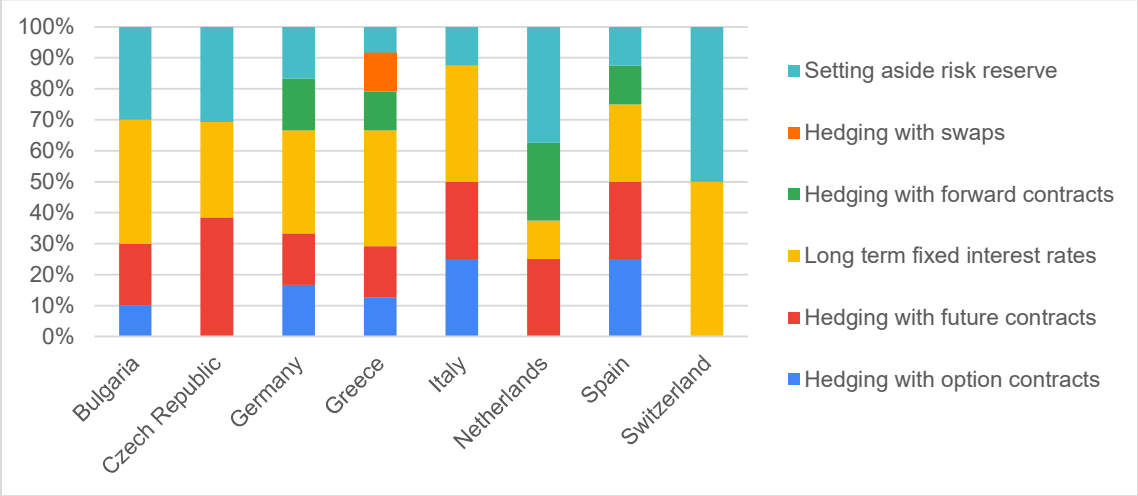

Figure 12: Appropriate economic risk mitigation strategies per case study country

The economic risk mitigation strategies that can be found in the responses across all countries are the *long-term fixed interest rates*, *hedging with future contracts* and *setting aside risk reserve*Error! Reference source not found.. *Hedging with option contracts* holds significant shares (>15% of responses) in Italy, Spain, and Germany, while *hedging with forward contracts* overcomes 20% of responses only in Germany.

Technological, planning, & operational risk

The Risk Mitigation Strategies options provided to respondents were:

- Diagnostics
- Energy savings guarantees or insurances
- Performance bonds
- Standards in project development and documentation
- Maximum visibility into operational behaviour
- Following the guidelines of operations manual
- Standardised and transparent M&V processes
- Insurances required by the law
- Equipment insurances
- Accreditation and certification of suppliers
- Efficiency as a Service models
- Adopting advanced and mature technology
- Reduction of delays caused by poor communication
- Selection of subcontractors with high reputation and good technology
- Standardised performance protocols
- Detailing risk and loss bearing in the contract
- Proper metering
- Model validation

The technological, planning, and operational risk mitigation strategies that are observed across all countries are the *energy savings guarantees or insurances*, the *accreditation and certification of suppliers*, *standards in project development and documentation* and *adopting advanced and mature*

technology (*Hedging with option contracts* holds significant shares (>15% of responses) in Netherlands, Spain and Germany, while the strategy suggesting *selection of subcontractors with high reputation and good technology* is significant only in Italy.

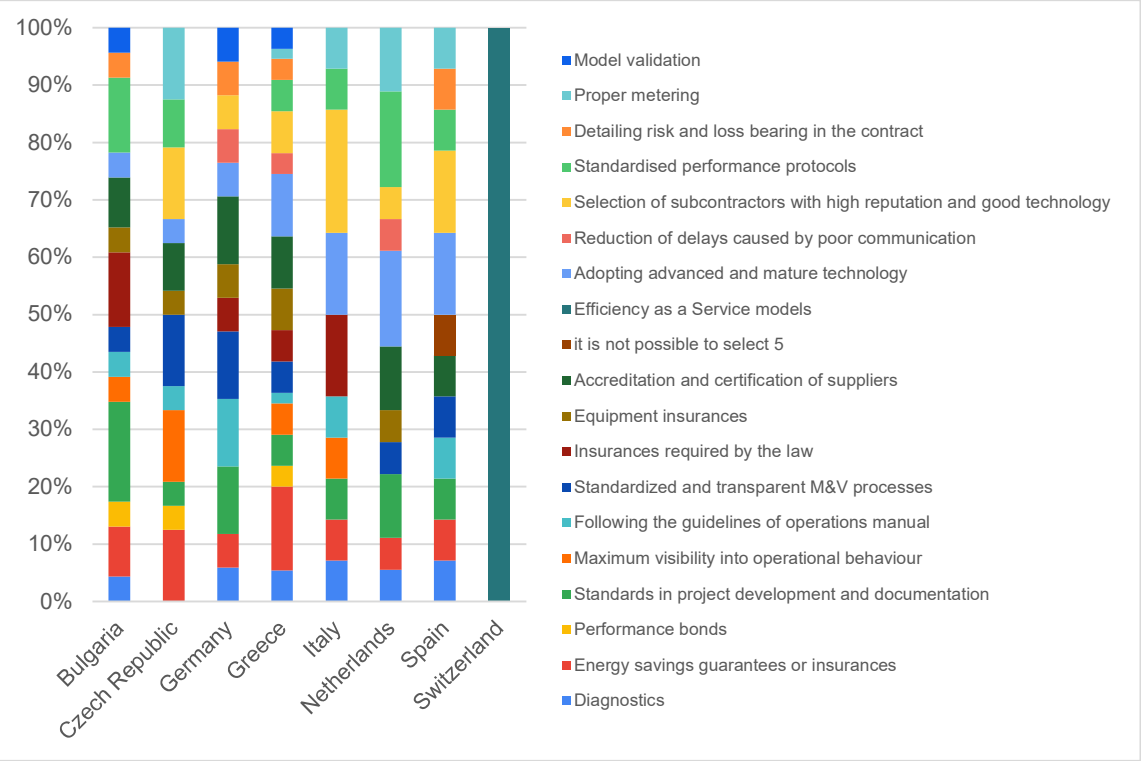

Figure 14: Appropriate technological, planning, and operational risk mitigation strategies per case study country

9.3.2 Financing instruments

The identified financing instruments that have been provided as options to the respondents emerged from the "Triple-A's Final Report on Risks of Energy Efficiency Financing and Mitigation Strategies Typology"[79]. The respondents had to select the i) applicable and the ii) most important financing instruments for their country. The options given were:

- Energy Performance Contracting
- Third party financing
- Efficiency-as-a-Service
- Revolving Funds
- Guarantee Funds
- On-bill financing
- Energy Efficiency Mortgages
- Crowdfunding
- Energy cooperatives

[79] Available here: https://aaa-h2020.eu/sites/default/files/reports/D3.2%20Final%20Report%20on%20Risks%20of%20EE%20Financing%20and%20Mitigation%20Strategies%20typology.pdf

- Property Assessed Clean Energy

Also, the respondents could provide their own comments and add more options, if needed.

According to the questionnaire responses, the most applicable financing instruments for implementing energy efficiency investments across the case study countries are *loans, soft loans, green bonds, grants/subsidies, and project financing.* Based on this outcome, a cross-case comparison was made on the importance of each of these financing instruments.

Experts from Netherlands and Spain highlight the importance of *loans,* all providing "High" or "Very High" responses, while the percentage for the respective responses in Bulgaria, Czech Republic, Germany, and Greece ranges from 50% to a bit more than 70%. On the contrary, more than 30% of Bulgarian and Italian stakeholders consider loans to have low or very low importance.

All Spanish experts value *soft loans* as a financing instrument of high or very high importance, while in all the other case study countries this percentage drops to 50-60%. The rest of the experts from Germany, Greece, Italy, and Netherlands label *soft loans* as of medium importance, while half of Bulgarian stakeholders consider this financing instrument not that important.

With regards to *green bonds*, more than half the of Bulgarian, Czech, Italian, and Dutch experts categorise this financing instrument in the "Low" or "Very Low" scales of importance and more than 20% from each country, apart from Czech Republic, consider it as being of medium importance. On the contrary, more than half of the German, Greek and Spanish stakeholders deem *green bonds* as highly or extremely important.

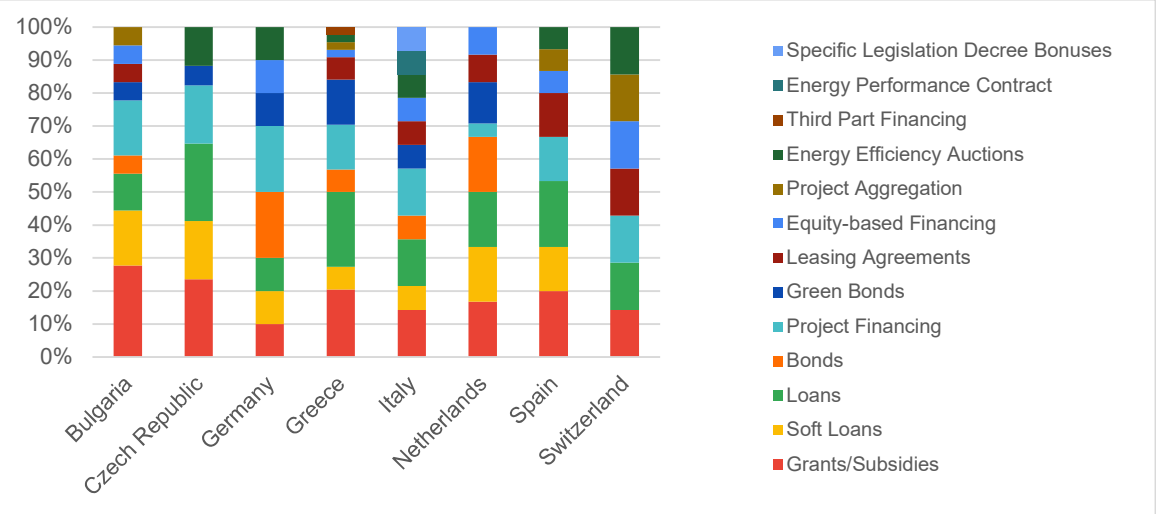

Figure 15: Applicable financing instruments per case study country

All Bulgarian and Spanish stakeholders consider *grants/subsidies* as a financing instrument of very high or high importance, while the respective percentage for Czech Republic, Italy, and Netherlands is 65-80%. The responses of German experts are balanced between "Very High" or "High" and "Medium", while 50% of the responses from Greek stakeholders is "Low" or "Very Low".

All Bulgarian and Italian experts consider *project financing* as an instrument with very high or high importance. 50-66% of stakeholders from the Czech Republic, Germany, and Spain rated *project financing* in the "Very High" or "High" importance scales, while the rest of the stakeholders from these countries indicated medium importance. For Greece and Netherlands, 25% of the responses for this

instrument are “Low” or “Very Low”, while 37% and 50% of the stakeholders, respectively, suggest medium importance.

9.3.3 Financial schemes

The identified financing instruments that have been provided as options to the respondents emerged from the “Triple-A’s Final Report on Risks of Energy Efficiency Financing and Mitigation Strategies Typology”[80]. The respondents had to select the i) applicable and the ii) most important financing instruments for their country. The options given were:

- Energy Performance Contracting
- Third party financing
- Efficiency-as-a-Service
- Revolving Funds
- Guarantee Funds
- On-bill financing
- Energy Efficiency Mortgages
- Crowdfunding
- Energy cooperatives
- Property Assessed Clean Energy

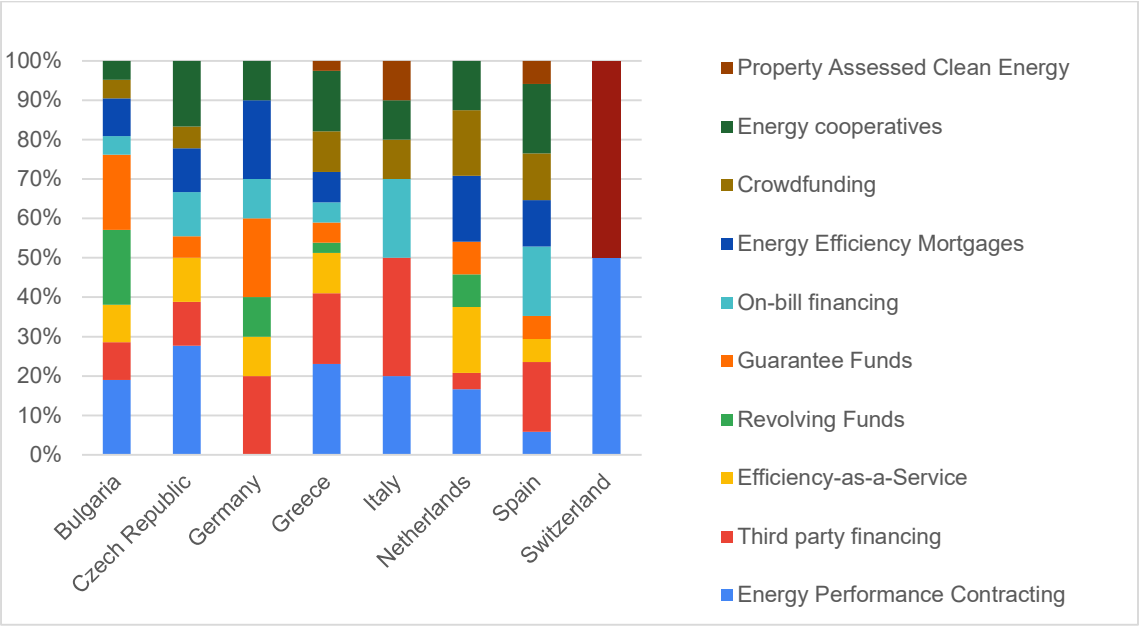

Figure 16: Applicable financial schemes per case study country

[80] Available here: https://aaa-h2020.eu/sites/default/files/reports/D3.2%20Final%20Report%20on%20Risks%20of%20EE%20Financing%20and%20Mitigation%20Strategies%20typology.pdf

Also, the respondents could provide their own comments and add more options, if needed.

According to the questionnaire responses, the most applicable financial schemes for implementing energy efficiency projects across the case study countries are *energy performance contracting*, *efficiency-as-a-service*, *third-party financing*, *energy efficiency mortgages*, and *energy cooperatives*. Given this result, we compare the importance of each of these financial schemes across case studies.

All Czech, Italian, Dutch, and Spanish experts as well as the vast majority (90%) of Greek stakeholders consider *energy performance contracting* as a very or extremely important financial scheme for energy efficiency. This percentage drops to 60% for Bulgaria, while all German experts categorised the importance of this scheme to the "Low" or "Very Low" scales.

While Bulgarian stakeholders ranked *efficiency-as-a-service* in the "Very High" or "High" importance scales, the Italian experts' responses were equally spread across the "Medium" and "Low" or "Very Low" importance scales. Half of the German and Greek stakeholders consider that this scheme has average importance.

All Bulgarian stakeholders consider *third-party financing* as a financial scheme that is of high or very high importance. At least half of the responses coming from German, Dutch, and Italian stakeholders rated this scheme in the "Very High" or "High" importance scale. Conversely, Greek and Czech experts put the lowest emphasis in *third-party financing*.

Most of the Bulgarian and Spanish experts value the importance of *energy efficiency mortgages*, while this is not the case for Italian and the majority of Czech, Greek, and Dutch stakeholders.

Finally, with regards to *energy cooperatives*, at least half of the Czech, German, Italian, and Dutch experts find this scheme very or extremely important. On the contrary, the responses of Greek and Spanish stakeholders are almost equally spread across the importance scales, while all Bulgarian stakeholders rate the importance of this scheme in the "Medium" scale.

9.4 Conclusions

Key conclusions regarding the categorisation of risk mitigation strategies, financing instruments and financial schemes for energy efficiency investments are summarised below:

- Common strategies for mitigating different types of energy efficiency investment risks have been identified across the Triple-A case study countries, such as *subsidies, raising awareness regarding energy consumption, clear long-term tax legislation, energy savings guarantees*, etc. Of course, these strategies may need to be properly adapted to account for the specificities of each geographical context in relation to the implementation of energy efficiency investments.
- *Loans, soft loans, green bonds, grants/subsidies, and project financing* are the most applicable financing instruments for implementing energy efficiency investments across the case study countries, according to questionnaire responses. However, significant differences regarding the importance of *green bonds* can be observed from country to country.
- *Energy performance contracting, efficiency-as-a-service, third-party financing, energy efficiency mortgages, and energy cooperatives* are the most relevant financial schemes for implementing energy efficiency projects across the case study countries, according to the questionnaire replies. *Energy performance contracting* is considered a key financial scheme by the most of participating

experts, while *third-party financing* can also be considered as another promising scheme for EU member states.

10 13th Briefing Note: *Energy Efficiency Market Architecture & Policy Framework: The Spanish Case*

10.1 Introduction

This document aims to provide an overview of the energy efficiency market in Spain, its regulatory forces, its market architecture, and current trends. The findings presented in this briefing note have been drawn from the various tasks carried out during the two and a half years of the Triple-A project.

All the available information can be found through the **Standardised Triple-A Tools** & **Triple-A Database on Energy Efficiency Financing**, and the **Results** section that are made publicly available through the Triple-A website.

The energy efficiency sector in Spain has been revolutionised in recent years from a position of irrelevance within the energy sector to one of the central axes of national climate policy.

A high level of energy efficiency is essential if we intend to maintain the standard of living associated with our current energy consumption, without further contributing to the worsening of the climate crisis. Energy efficiency is also an essential ally in reducing external energy dependence in Europe, a problem that has proved pressing at the start of 2022, with Russia's invasion of Ukraine.

The Spanish public authorities have begun to understand this situation and are making extensive efforts to take advantage of Spain's potential for sustainable investment.

10.2 PNIEC

Following the 2015 Paris Agreements and the various programmes and initiatives stemming from the EU's adoption of these agreements, each member state was required to draw up a specific plan covering climate action in the period 2021-2030.

In addition, member states are required to submit progress reports every two years and updates of the plan every 5 years.

In the Spanish case this was defined in the PNIEC[81], the final version was approved in March 2021, and it will cover the period from 2021 to 2030 in terms of climate action for Spain.

The main objectives of the PNIEC are:

- A 23% reduction in greenhouse gas (GHG) emissions compared to 1990 scenario.
- 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.
- Achieve 15% electricity interconnection with the rest of Europe

[81] PNIEC: Plan Nacional Integrado de Energía y Clima

In addition, it is foreseen that, through the promotion of other activities such as self-consumption, distributed generation, demand management, local energy communities, etc. It is expected to increase opportunities and involve new stakeholders in the energy sector.

The ultimate goal, and the one on which each of the previously defined specific objectives is focused, is that Spain should have a carbon-neutral economy by 2050.

10.3 ERESSE

The "Long-term Strategy for Energy Rehabilitation in the Building Sector in Spain[82]" is a plan to improve the energy efficiency of Spanish buildings in the long term.

Taking into account that almost 50 % of EU final energy consumption is used for heating and cooling, of which 80 % is used in buildings[83], the achievement of the EU energy and climate goals is linked to the Union's efforts to renovate its building stock by giving priority to energy efficiency.

The measurement of the results is done based on the percentage reduction in consumption over the 2020 scenario. The cumulative target for the residential sector in the period 2020-2050 is equivalent to a reduction of 37.3% compared to consumption in 2020. The savings accumulate significantly in the first part of the period, with 41.1% of the total savings occurring between 2020 and 2030, 34.1% between 2030 and 2040 and, finally, 24.8% between 2040 and 2050.

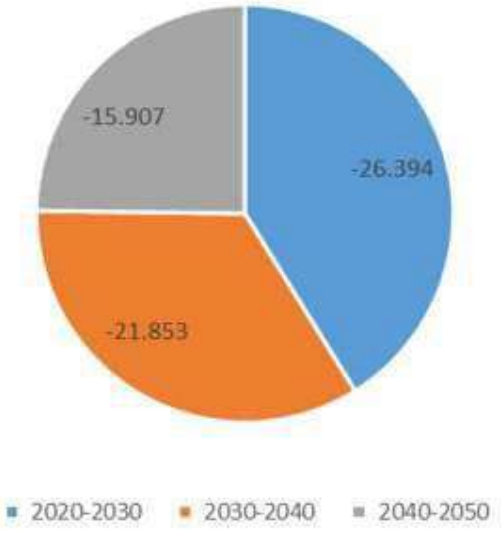

Figure 17: Residential sector planned savings over decades (GWh)

SOURCE: ERESSE 2020 Update[10.3]

The final energy consumption target for the tertiary sector established for 2050 is equivalent to a reduction of 36% compared to consumption in 2020, the fall in consumption is intense in the first and, especially, the second decade, with 36% occurring between 2020 and 2030 (-17 069 GWh), 49% between 2030 and 2040 (-23.085 GWh) and, finally, 15% between 2040 and 2050.

[82] ERESSE: Estrategia a largo plazo para la rehabilitación en el sector de la edificación en España
[83] DIRECTIVE (EU) 2018/844 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018

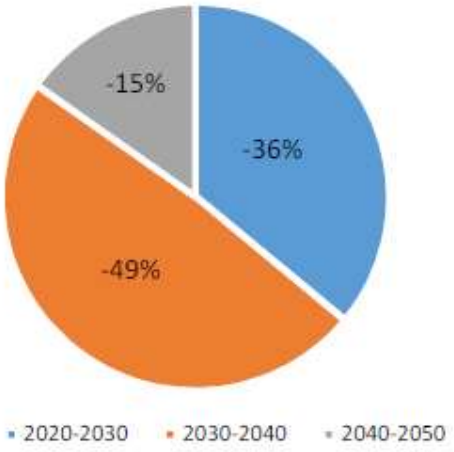

Figure 18: Tertiary sector planned savings over decades (% over the total savings)

SOURCE: ERESSE 2020 Update[10.3]

This national planning demonstrates the commitment to the energy efficiency sector as one of the pillars in the response to the climate crisis. In addition, the economic impact generated by the large number of investments to be made in this field and the subsequent economic savings to be received by end users is expected to act as a major driver of the economy.

10.4 Financing Incentives

Flowing from the PNIEC, 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**, it is worth mentioning the MOVES programme[84], these 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.

The **building sector**, which, as was mentioned before, due to its overall volume of energy consumption has a significant impact on the average energy efficiency level in Spain. The PREE programme[85] have recently been started; these grants are intended to partially cover investments in the energy renovation of buildings. These aids are arranged along two lines, one more generic and the other aimed specifically 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**, with a budget of 40 million euros, which will promote social innovation and citizen participation in renewables, energy efficiency, and electric mobility. These are

[84] MOVES Programme

[85] PREE Programme: Programa de Rehabilitación Energética de Edificios

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 for local communities.

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, 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 programme with a fund of 75 million euros. 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 at improving energy efficiency in public buildings and infrastructures, promoting green investments -in particular self-consumption-, or charging infrastructures for EVs, among others.

10.5 Covid-19 Impact on Spanish economy & climate actions

As was the case for most of the countries, the impact of the Covid-19 pandemic on Spanish society was sudden and paralysed the economy overnight.

The first months of full lockdown delayed the publication and implementation of many of the national and regional climate action plans emanating from the Paris Agreements.

However, the situation was reversed from the summer of 2020 onwards when the situation stabilised. Furthermore, the funds raised by Europe to combat the negative impacts of the pandemic, which is considered to be the largest European aid package ever approved, have been partly directed towards transforming the economy into a more environmentally sustainable one.

The effects of the implementation of these measures are yet to be felt, but given their ambitious scope and intense funding, it is expected that they will progressively put the Spanish economy on a sustainable path.

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.

10.6 Conclusions

The main conclusions drawn about the national architecture of the energy efficiency market in Spain are detailed below:

- Spain has **great potential to develop investments** in sustainability.
- Energy efficiency has rapidly become a **top priority** both in climate action and in reducing external energy dependence.
- The **objectives** of the different administrative levels (EU, national, regional, and municipal) **are aligned**, and initiatives are being implemented at all levels.

- At the Spanish level, **highly ambitious goals** have been set, but they are backed by massive funding lines and strong support from the public sector.

A further comparison between the participating Triple-A countries is provided in the European Synthesis paper[86], while the Spanish Synthesis paper[87] details the regulation, market architecture, and policy framework applicable to the identified cases.

[86] https://aaa-h2020.eu/sites/default/files/reports/D6.4%20Triple-A%20European%20Synthesis%20Paper.pdf
[87] https://aaa-h2020.eu/sites/default/files/reports/D6.3%20Triple-A%20Synthesis%20Paper%20for%20each%20case%20study.pdf

11 Key Takeaways and Conclusions

In total, thirteen (13) Briefing Notes have been published throughout the whole project duration, with 9 of the being developed during the 2nd reporting period. They cover different topics related to the field of energy efficiency financing. The 2nd package of the briefing note series covers mainly the energy market and policy framework of the Triple-A case studies, however important feedback has been gathered and presented that derived from stakeholder engagement and capacity building activities (surveys, webinars). Triple-A recommendations in different axis are also presented promoting also the key exploitable assets of the project such as the Triple-A Tools and Database.

Triple-A Briefing Note series intent to present in an appealing and consistent way the summarised knowledge package and outcomes of the project. All Briefing Notes have been disseminated trough the Triple-A dedicated press releases, newsletters, as well as posts at the project website and social media, so as to enlarge their outreach and enhance further their impact. A dedicated page “Briefing Notes”[88] has been created under the “Library” section in the Triple-A website in order for all the reports to be easily accessible and downloadable.

[88] https://aaa-h2020.eu/briefing-notes