1. PUBLISHABLE SUMMARY

Summary of the context and overall objectives of the project (For the final period, include the conclusions of the action)

Energy efficiency (EE) has given a staggering answer to addressing the impact on environmental equilibria due to climate change, providing solutions that reduce energy demand. Capital needs to be oriented to the EE market to boost the rate at which EE upgrades are realised.
The Triple-A scheme tries to mainstream EE investments focusing on the pre-screening process, supporting the identification of attractive projects and creating standardised tools and benchmarks.
The gap could be identified in the concept development phase of EE investments. Project developers do not have the expertise or resources to make a convincing case for investors, while investors often lack the knowledge to understand how project developers do business, especially at an early stage of project identification. The majority of financial institutions have not EE-based criteria for selecting the most attractive project, since the sole criterion remains the creditworthiness of the borrower.
Triple-A addresses this challenge by answering the following 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 includes three steps, answering each of the abovementioned questions respectively:
• Step 1 - Assess results in the Member States (MSs) risk profiles and Mitigation Policies, including a Web-based database that enables comparability per MS and sector, exchange of experiences on good practices among the MS and facilitation of the replicability, leading to fruitful policy analysis for scaling-up EE investments and reducing uncertainty for investors / financiers. Complete risk assessment of projects and incorporation of EU Taxonomy eligibility criteria are the main pillars of the Assess step.
• Step 2 - Agree results in Standardised Triple-A Tools with guidelines, templates, and procedures, accelerating and scaling up private Triple-A investments.
• Step 3 - Assign results in In-country Demonstrations, Replicability, and Overall Exploitation, including recommendations on what EE investments are feasible in the national and sectoral context, as well as on how they could be financed in practice.
Triple-A investments are being identified in 8 case study countries, namely Bulgaria, Czech Republic, Germany, Greece, Italy, Lithuania, Spain, the Netherlands, strategically selected to promote diversity considering economic conditions, energy challenges and geographical location.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far (For the final period please include an overview of the results and their exploitation and dissemination)

During the first reporting period, Triple-A partners have undertaken an important number of actions that enhance project impact in several dimensions.
Regarding the progress on stakeholder dialogue and capacity building, a plan was delivered with more than 500 stakeholders identified (project developers, financiers, investors, policymakers, academia) across 8 case study countries. 24 bilateral meetings were realized, with almost 60 stakeholders engaged, while 77 questionnaires on EE in the building sector were filled in. Triple-A Advisory Board was established consisting of 8 Members.

A risk matrix on EE financing was formulated and the risk of each type of EE investment was assessed. More than 15 financing instruments and risk mitigation strategies have been identified, while efforts towards collecting data of real EE projects are intensified.
A draft version of the Triple-A Web-based Database on EE Financing (https://aaa-h2020.eu/database) was developed, incorporating results from the status quo analysis and the categorization of the financing instruments and risk mitigation strategies per case study country.
The Triple-A scheme was defined and the steps Assess and Agree are materialised through the draft Standardised Triple-A Tools (https://toolbox.aaa-h2020.eu/). User guidelines are available, explaining Triple-A Tools functionalities and the user inputs required. The Assess Tool inspects the compliance of the candidate projects with EU Taxonomy, having a Go / No-Go character, while performing an assessment of the project's total risk. The Agree Tool benchmarks the candidate projects, considering major Financial, Risk and Environmental, Social, and Governance (ESG) criteria, making use of a multicriteria classification method. Similar platforms and tools were explored (EEFIG Underwriting toolkit, DEEP Platform, LAUNCH ESCO contract, EBRD ESG risk assessment) and interoperability with the DEEP platform was established.
Initial steps made on the identification of Triple-A EE projects and robust financing programs. In practice, 50 projects have been identified and 25 of them tested in the Triple-A Tools. A working document was developed with guidelines for the EE investments pipeline and a project fiche template was created.
The Triple-A communication and dissemination strategy was developed to engage stakeholders and promote results. The Triple-A website has more than 14,200 pageviews and 8,200 unique visitors (https://aaa-h2020.eu/), while Triple-A social media have more than 380 followers. It is estimated that more than 2,500 stakeholders were reached in the context of dissemination and stakeholders engagement activities.
Visual identity and templates, 1 Triple-A leaflet, 3 promotional brochures (English & Czech), 3 factsheets, 1 roll-up poster, 2 videos and 1 infographic are some of the dissemination materials produced. 4 Triple-A newsletters and 2 press releases have been circulated. 6 scientific publications were presented in conferences and journals, while the project has 21 articles and more than 50 references in relevant media. Triple-A partners co-organised a workshop at the EUSEW 2020 Policy Session, while also participated in 33 external events. Finally, synergies with 30 relevant EU projects have successfully been established.

Progress beyond the state of the art, expected results until the end of the project and potential impacts (including the socio-economic impact and the wider societal implications of the project so far)

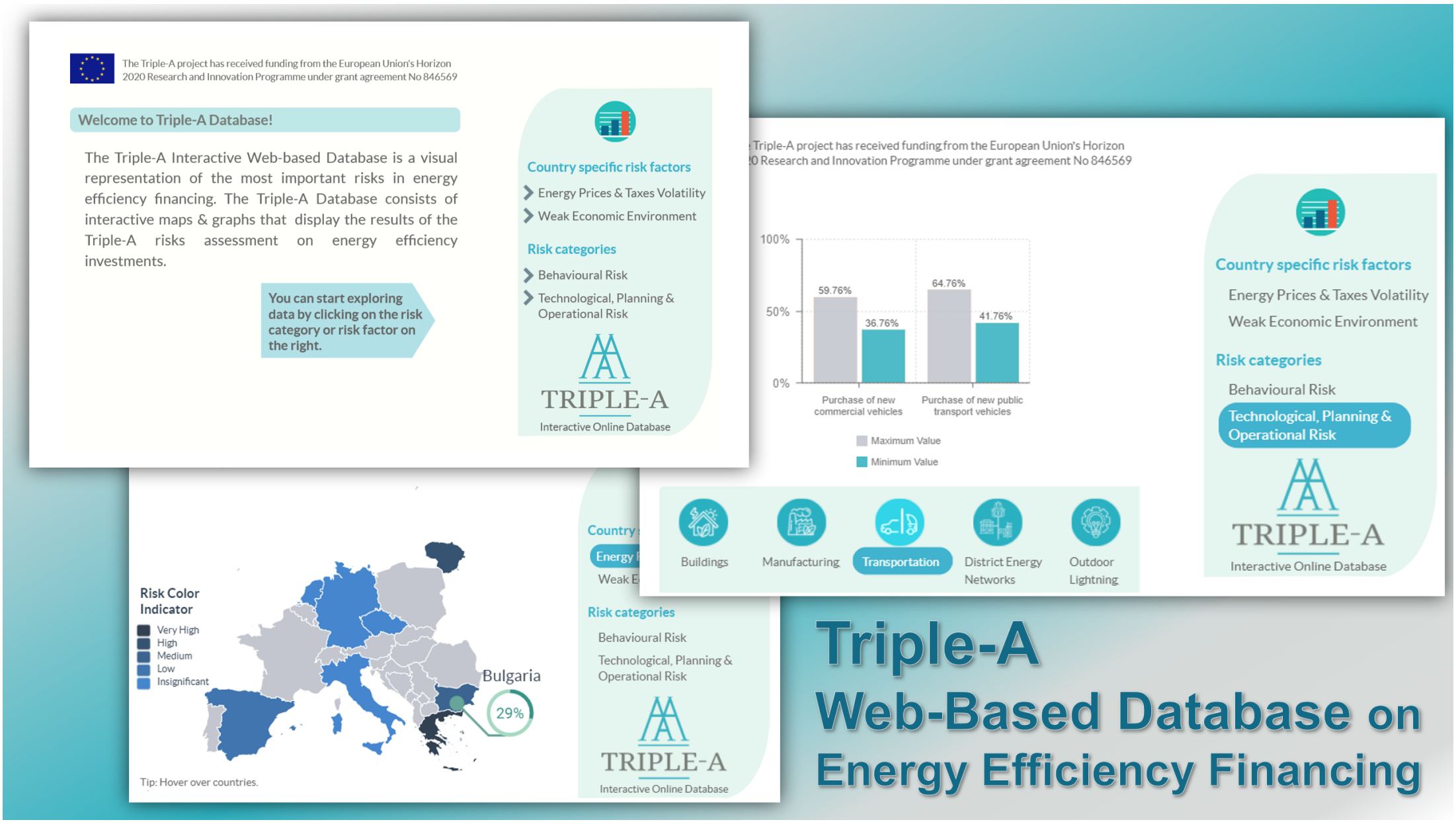
Triple-A will facilitate access to capital markets for EE investments by addressing the lack of standardisation of assets. Triple-A objective assessment, based on tested methodologies, is expected to reduce the uncertainty felt by financiers in the performance of EE investments and build their confidence that such investment could be attractive at low risk.
The final version of the Triple-A Tools will provide a standard rating to project ideas, which could be used to aggregate similar projects and create financial products that could be traded in secondary markets.
Online webinars series will be organised addressing asset owners and project developers, while bilateral meetings will be organised with stakeholders that wish to develop projects.
Substantial is the promotion of the Triple-A Tools among target groups, since almost 40 investors and project developers have already test them. The Agree Tool will be applied to at least 100 EE projects that will emerge from the Assess Tool, while 50-80 Triple-A investments and robust financing

programs will be identified in each case-study country. It is envisaged that at least 50 project fiches will be developed, ready for underwriting between financiers and project developers. Finally, Triple-A recommendations on supporting policy and legislative development and market architecture will be provided.
The primary energy savings triggered by the project up until now are 64.03 GWh/year, while the budget of the investments in sustainable energy triggered by the Triple-A amount to 27.68 million EUR.

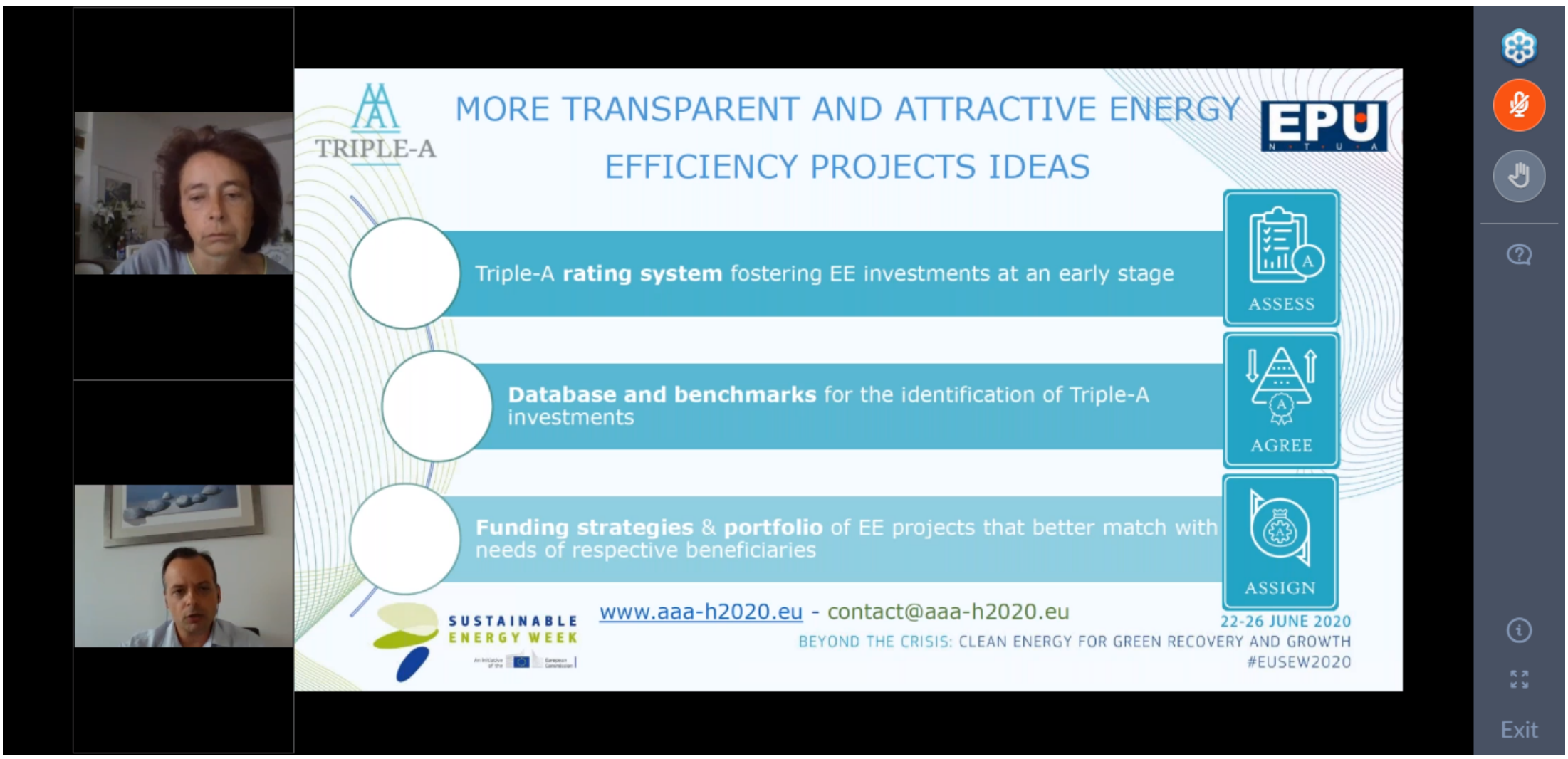
Address (URL) of the project's public website

https://aaa-h2020.eu/

The Triple-A Web-based database on Energy Efficiency Financing



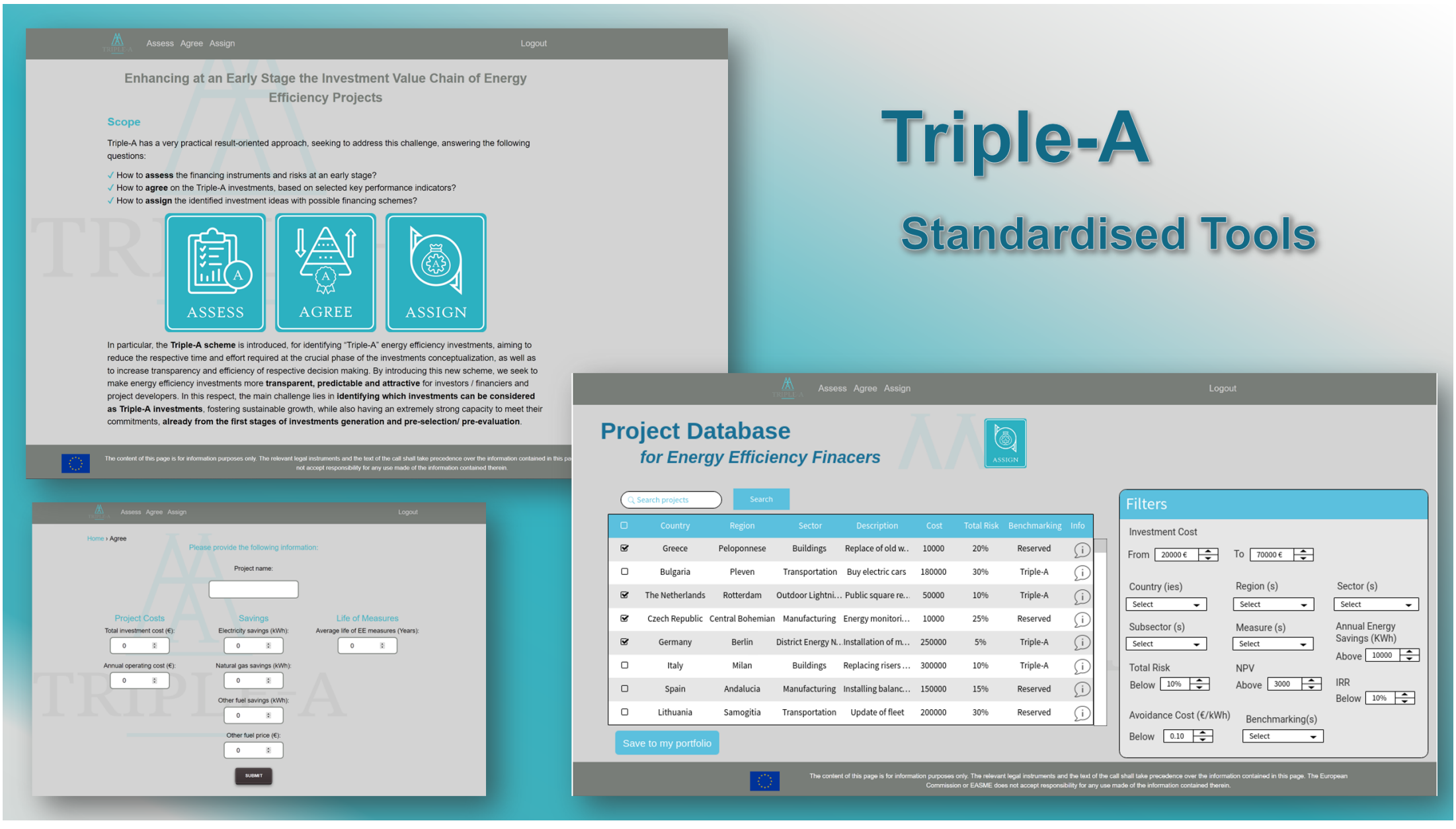
Triple-A EUSEW2020 Policy Conference Side Session_18.10.2020



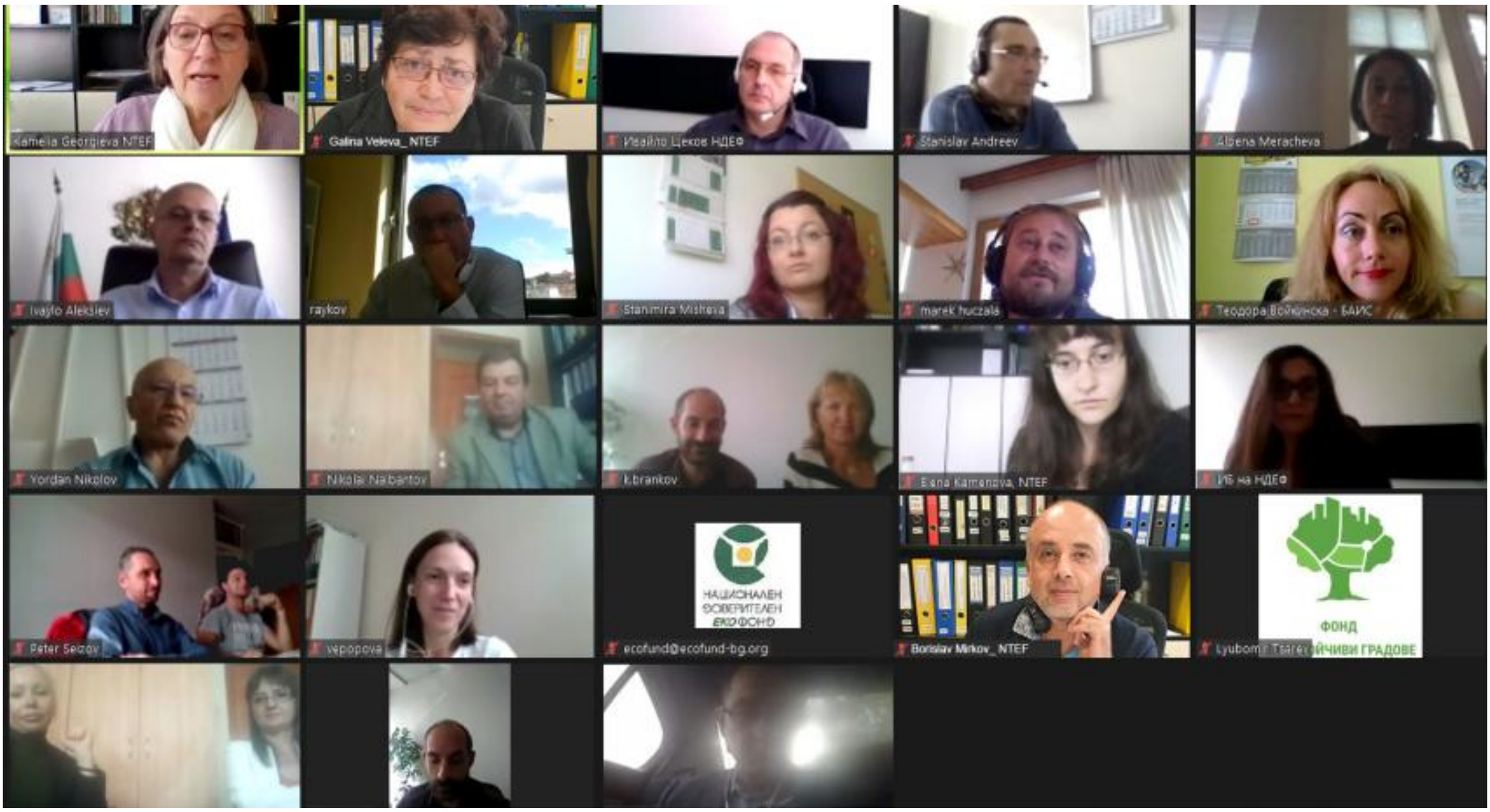
Indicative Triple-A Dissemination Material

Triple-A Dissemination Material

The Triple-A Standardised Tools



Triple-A Stakeholders Meeting_29 September 2020



Indicative Triple-A Publications

Publications

Web-based Application for Screening Energy Efficiency Investments: A MCDA Approach

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***Abstract*— Energy Efficiency (EE) has been identified as one of the most cost-effective means aiming at reducing energy consumption while maintaining an equivalent level of economic activity. Mainstreaming EE financing is considered a key priority to avert climate change. The lack of evidence on the performance, commonly agreed procedures and standards for EE investments, particularly during the first stages of investment generation and pre-selection/ pre-evaluation, are the key problems hampering EE investment financing. It is also true that often project developers do not have the expertise or resources to make a convincing financing case for investors. In order to boost EE investments, this paper proposes a Multi-Criteria Decision Analysis (MCDA) methodology intending to support financing institutions to identify attractive EE project ideas in the early development phase of project initiation and planning. The study implements the ELECTRE TRI method to benchmark EE project ideas in a standardized, investor recognizable credit rating form. A respective web-based tool facilitating the methodology and the screening of EE projects is also developed, supporting financing bodies and EE funds to rapidly detect and aggregate projects that meet the necessary criteria to be financed.**

***Keywords*— Energy; Energy Efficiency; Green Financing; Decision Making; Multi-Criteria Decision Analysis; Python.**

I. INTRODUCTION

Scientists, researchers and environmental institutes continuously [illegible] impacts of [illegible] [1]. The 20[illegible] (IPCC) repo[illegible] at all scales[illegible] urgent actio[illegible]

Energy Efficiency (EE) is one of the most cost-effective ways of reducing energy consumption while maintaining an equivalent level of economic activity [3]. Mainstreaming EE finance is considered a key priority to avert climate change [4], while the European Commission (EC) considers EE as a strategic priority for Europe [5]. The European Union (EU) EE target for 2030 is set at a minimum of 32.5%, which translates into final energy consumption of 956 million tones of oil equivalent (Mtoe) and/or primary energy consumption of 1,273 Mtoe in the EU-28 [6].

On the other hand, the fact that around two-thirds of the European economy are financed by banks, they play and will continue to play a crucial role in the transition to a more sustainable future. To this end, private investments are crucial in increasing EE, by updating building stock and industry processes [7]. However, current investments are below half of this requirement and five times lower than required to deliver 2050 decarbonisation targets [8]. One of the problems that hamper EE investments boost is the "gap" on the development phase, where plenty of EE project ideas exist, as well as available capital to realize EE projects, but somehow these projects tend to never get financed [9].

A report by the Energy Efficiency Financial Institutions Group (EEFIG) on EE financing underlined the lack of evidence on the performance of EE investments, as well as of commonly agreed procedures and standards [10]. In other

978-0-7381-23[illegible]

Energy Sources, Part B: Economics, Planning, and Policy

ISSN: 1556-7249 (Print) 1556-7257 (Online) Journal homepage: https://www.tandfonline.com/loi/uesb20

On the appraisal of "Triple-A" energy efficiency investments

Haris Doukas

To cite this article: Haris Doukas (2018) On the appraisal of "Triple-A" energy efficiency investments, Energy Sources, Part B: Economics, Planning, and Policy, 13:7, 320-327, DOI: 10.1080/15567249.2018.1494763

To link to this article: https://doi.org/10.1080/15567249.2018.1494763

Published online: 09 Jul 2018.

Financial Schemes for Energy Efficiency Projects:

Lessons Learnt from In-Country Demonstrations

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7th International Conference on "Energy, Sustainability and Climate Change" ESCC 2020
Skiathos, Greece, August 24-27, 2020

Benchmarking Energy Efficiency Projects: A Multicriteria Approach

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Keywords: Sustainable Energy; Benchmarking; Stakeholders Consultation; Decision Support Systems; Multi-criteria Analysis; Electre Tri

Nowadays, European Union (EU) considers Energy Efficiency (EE) as one of its main pillars in order to reduce pollution and energy imports. The recently released Technical Expert Group (TEG) report on EU Taxonomy is a guide to green development, in continuance to EU's focus on reducing carbon emissions, scale down energy consumption and secure European energy autarky.
However, to the best of our knowledge hardly any standardized or integrated method supporting investors and financing institutes to identify highly efficient economic activities at an early stage that can unambiguously be considered environmentally green exist. In addition, investment benchmarking contributes in pointing out cost-effective and highly efficient EE project proposals, making them more attractive to investors by following a standardized procedure.
In the above context, this paper presents a multi-criteria approach based on the Electre Tri method, which aims to benchmark EE investment ideas incorporating financial, environmental and risk criteria. The EE investments are classified into three classes: Triple-A, Reserved or Rejected, reflecting their capacity to achieve environmental and financial goals, while stakeholders engagement will play a crucial role in this proposed approach. The profiles of the benchmarking classes and the criteria thresholds will be formed through a stakeholder consultation process, in order to be harmonized with the requirements and the specifications of investors, financing institutes and green financing instruments. The benchmarks obtained by the multicriteria method could facilitate decision makers in reducing uncertainty involved with EE investments, and support investors and financing institutes to target their capital towards green financing.

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Seven Horizon2020 projects advise EU leaders how to prepare buildings for the energy transition

The purpose of the present briefing is to communicate to EU leaders, policy makers and the wider stakeholder ecosystem, the essential policy recommendations that will prepare buildings for the energy transition.

The contributing projects, funded by the Horizon 2020 programme, have been investigating ways to enable the mass adoption of energy efficiency measures and smartness supporting the uptake of more renewable energy sources. This is being done through the development of tools and methodologies that include: enabling ESCOs to develop demand response functionalities, improving and standardizing measurement and verification methods, de-risking and attracting private investments, creating new business models and expanding markets, and transforming energy efficiency and demand response into energy resources for TSOs and DSOs.

Behind the represented Horizon 2020 projects are over 240 experts from 22 research centers, 2 local authorities, 4 ESCOs, 2 Technology development SMEs, 1 Demand Response Aggregator, 3 financing institutions and investors, 3 asset management companies, 11 energy consultancies, 7 building professional associations and knowledge centers, and 39 Advisory Board Members. The represented projects and their goals are supported by over 93 Letters of Support and have collectively engaged, so far, directly more than 1585 stakeholders, out of which 405 are project developers, 32 are investors, 99 are financial institutions, 173 are buildings professionals, 167 are policy makers or national authorities, and 38 are researchers in business and techno-economic fields.

	SENSEI	Triple-A	NOVICE	QUEST	U-CERT	AmBIENCe	LAUNCH
Energy Efficiency	■	■	■	■	■	■	■
Renewables		■			■	■	
Demand Response	■		■			■	
Business models	■		■		■	■	
Financing		■	■	■		■	■
Standardisation		■			■		■
Digitalisation					■	■	
Measurement and Verification	■			■	■	■	
Energy Performance Contracts	■		■			■	■
Building Renovation	■	■	■		■		
Project Development		■			■	■	■
Smart Readiness	■				■		
Operational performance	■				■	■	

þÿ¤he 3rd Triple-A project meeting (online event)_16 October 20

Triple-A kick off meeting in Athens_1&2 October 2019

Triple-A EUSEW2020 Policy Conference Side Session_18.10.2020