Technical support to the Energy Community and its Secretariat to assess the candidate Projects of Energy Community Interest in electricity, smart gas grids, hydrogen, electrolysers, and carbon dioxide transport and storage, in line with the EU Regulation 2022/869

Analysis Techniques' Guidance Document

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Contents

Abbreviations and acronyms

AL	Albania
AZ	Azerbaijan
BA	Bosnia and Herzegovina
CAPEX	Capital Expenditures
CBA	Cost Benefit Analysis
CP	Contracting Party
DE	Distributed Energy
DSO	Distribution System Operator
EC	Energy Community
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
EU	European Union
GA	Global Ambition
GE	Georgia
HPP	Hydro Power Plant
JRC	Joint Research Centre
MCA	Multi criteria analysis
MD	Moldova
ME	Montenegro
MK	North Macedonia
MS	Member State
NOSBiH	Independent System Operator in Bosnia and Herzegovina
NPP	Nuclear Power Plant
NPV	Net Present Value
NT	National Trends
OHL	Overhead Line
OPEX	Operating Expenditures
OT	Operational Technology
PECD	Pan European Climate Database

PECI	Projects of Energy Community Interest
PINT	Put In one at the Time
PMI	Projects of Mutual Interest
PSHPP	Pump Storage Hydro Power Plant
RES	Renewable Energy Sources
RO	Romania
RS	Serbia
RU	Russia
SEW	Socio-economic Welfare
SK	Slovakia
SS	Substation
TEN-E	Trans-European Networks for Energy
TOOT	Take Out One at a Time
TR	Turkey
TSO	Transmission System Operator
TYNDP	Ten Year Network Development Plan
UA	Ukraine
VOLL	Value of Lost Load
XK	Kosovo*

Tables

Figures

1 Project objectives

In order to create conditions for an integrated energy market of the European Union (EU) and neighbouring countries, it is necessary to create appropriate regulatory and market framework that would attract investments in energy infrastructure and enhance stability and sustainability of energy supply. Integrated energy market is one of the basic conditions for increasing security of supply.

In 2013 **Trans-European Networks for Energy (TEN-E)** was adopted through Regulation (EU) No 347/2013 of the European Parliament and of the Council on guidelines for trans-European energy infrastructure. The TEN-E policy focuses on linking the energy infrastructure of EU countries and defines eleven priority corridors and three priority thematic areas. Regulation 347/2013 was also adopted by the Ministerial Council Decision in the Energy Community in 2015.

The new **Regulation (EU) No 2022/869** (further in text: the Regulation), i.e. the revised TEN-E was adopted in the EU in June 2022, because of the need to ensure consistency with climate neutrality objectives. The Regulation contributes to EU emissions reduction objectives by promoting integration of renewable energy sources and new clean energy technologies into the energy system. It identifies eligible categories for energy infrastructure development projects and promotes better cooperation between countries, with the main objective **to ensure market and system integration** that benefits EU Member States with respect to the original regulation and EnC CPs with respect to the adopted version in the Energy Community. The same is valid for the Energy Community Contracting Parties (CPs), since revised TEN-E was adopted in the EnC by the Ministerial Council Decision 2023/02/MC-EnC of 14 December 2023.

Eligible energy infrastructure categories, with respect to the EnC adaptation of the original regulation, may be divided into two broader categories, **electricity-related and gas-related projects**, with the following specific eligible sub-categories:

- **Electricity-related energy infrastructure**
  - high and extra-high voltage overhead transmission lines, crossing a border or within a Member State territory including the exclusive economic zone, if they have been designed for a voltage of 220 kV or more, and underground and submarine transmission cables, if they have been designed for a voltage of 150 kV or more;
  - energy infrastructure for offshore renewable electricity;
  - energy storage facilities, provided they are directly connected to high-voltage transmission lines and distribution lines designed for a voltage of 110 kV or more;
  - any equipment or installation essential for the previous categories to operate safely, securely and efficiently, including protection, monitoring and control systems at all voltage levels and substations;
  - smart electricity grids involving at least two Member States;

    - any equipment or installation essential for the high and extra-high voltage overhead transmission lines having dual functionality: interconnection and offshore grid connection system from the offshore renewable generation sites to two or more Member States;
- **Gas(es)-related energy infrastructure**
    - smart gas grids aiming to enable and facilitate the integration of a plurality of low-carbon and particularly renewable gases, including biomethane or hydrogen, into the gas network;
    - hydrogen systems, including pipelines for the transport of hydrogen, including repurposed natural gas infrastructure, reception/storage/regasification/decompression facilities for liquefied hydrogen or hydrogen embedded in other chemical substances with the objective of injecting the hydrogen into the grid, any equipment or installation essential for the hydrogen system to operate safely, securely and efficiently or to enable bi-directional capacity, including compressor stations, any equipment or installation allowing for hydrogen or hydrogen-derived fuels use in the transport sector within the TEN-T core network;
    - electrolysers of at least 50 MW capacity;
    - carbon dioxide pipelines, fixed facilities for liquefaction, buffer storage and converters of carbon dioxide, surface and injection facilities for the permanent geological storage of carbon dioxide, any equipment or installation essential for the CO_2 system to operate properly, securely and efficiently, including protection, monitoring and control systems;

Based on the old TEN-E Regulation, three processes of the **Projects of Energy Community Interest (PECI)** and Projects of Mutual Interest (PMI)[1] were conducted in 2016, 2018 and 2020. These processes resulted in recommendations on the establishment of the list of PECI and list of PMI between Contracting Parties, within themselves and with the Member States of the European Union.

In line with the revised TEN-E, the new selection process for PECI projects started in February 2024. Potential eligible projects must involve **at least two Energy Community Contracting Parties** by directly or indirectly crossing the border thereof or be located on the territory of one Energy Community Contracting Party having a significant cross-border impact on at least another.

The overall objective of the project is to enhance market integration, security of supply, sustainability and competition of the electricity and hydrogen/gas markets of the Energy Community Contracting Parties.

The Consultant's task is **to assist Energy Community Secretariat (ECS) and the two Groups (related to electricity and gas(es)) in compiling the preliminary list of PECI projects to be approved by the Ministerial Council**. The main output of the entire process is the list of PECI projects to be submitted to the Ministerial Council for adoption in December 2024.

[1] *PMI projects are under EU process now, according to the revised TEN-E.*

To this end, the Consultant has developed **a project-assessment methodology** which will be used to evaluate the impact of proposed projects on the Contracting Parties and the Energy Community as a whole. The methodology consists of **cost-benefit analysis (CBA)** to assess socio-economic dimensions of the projects (monetization) in line with the methodologies published by the European Network of Transmission System Operators (ENTSO) for Electricity and the ENTSO for Gas or developed by the European Commission, and of a **multi-criteria analysis (MCA)** to evaluate other important contributions of the projects (non-monetary component) in line with the indicators defined in the Regulation and primarily used for projects prioritisation. Both analyses and project impacts evaluation will cover a time horizon until 2050 and they shall be done in a manner that enables results comparison between individual projects and **relative ranking of the projects** in the different project categories.

1.1 Main project activities

In order to reach the final goal of the project, namely to draft the list of PECI, the Consultant carried out (*italic*) or will carry out the following **tasks/activities**:

1. ***Create candidate project questionnaires*** *– preparation of the project-specific questionnaires for collection of the relevant input data (technical, economic, status and progress) for candidate projects;*
2. ***Create country-specific questionnaires*** *– preparation of the country-specific data questionnaires for collection of the relevant country input data for CPs;*
3. ***Validate collected data*** *– validation of the collected input data in terms of techno-economic consistency;*
4. ***Carry-out a project eligibility verification*** *- project eligibility verification based on the criteria defined in the Regulation, prior to modelling activities;*
5. **Apply ENTSO-E and ENTSOG scenarios using modelling tool/s** – development of electricity and gas sector models and scenarios using appropriate modelling tools that enable project assessment considering regional market conditions and existing energy infrastructure of the CPs;
6. **Perform socio-economic cost-benefit analysis** – assessment of socio-economic monetary and non-monetary project benefits and costs, based on the methodologies defined in the Regulation;
7. Assess the **individual project candidates and compose relative rankings** - individual project assessment for each of the eligible project categories based on the results under previous activity and creation of relative rankings of all eligible projects.

The flowchart of the aforementioned tasks/activities is depicted in the following figure.

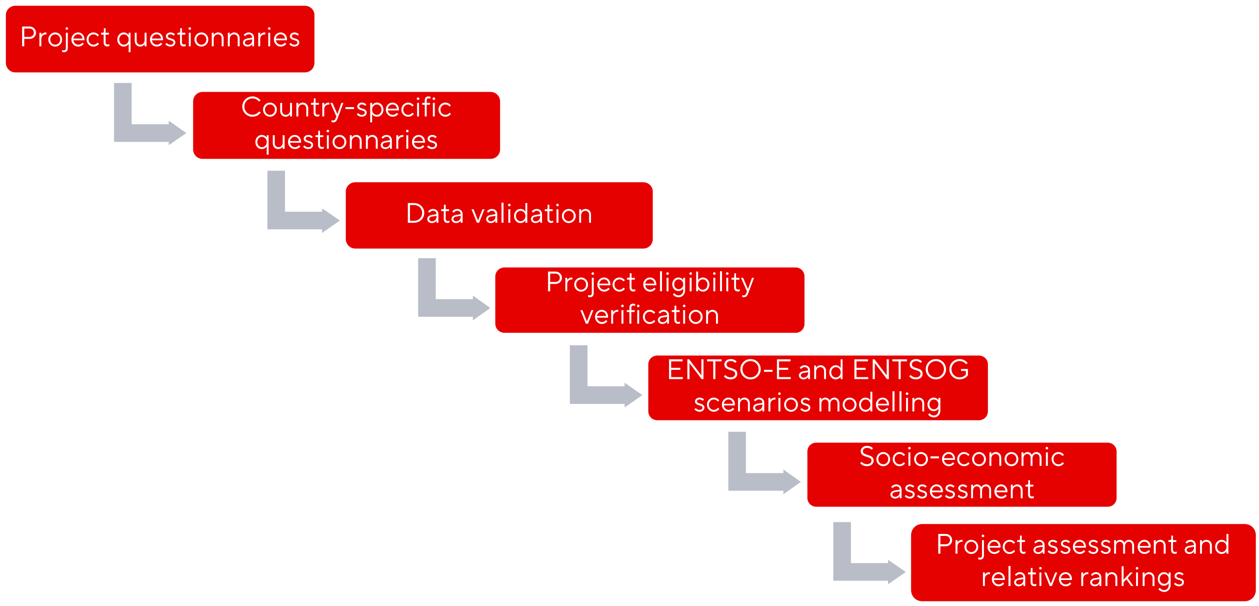

Figure 1 Activities to be carried out during the project implementation

1.2 Work plan and deliverables

The project started 15th of February 2024, and the planned finalization of all project activities is envisaged for 28th of June 2024. A detailed work plan with the main project activities and deliverables is presented in Figure 2.

No	Activity	Begining	End	Duration (days)	February 2024 W1	W2	March 2024 W3	W4	W5	W6	April 2024 W7	W8	W9	W10	W11	May 2024 W12	W13	W14	W15	June 2024 W16	W17	W18	W19
1	Kick-off meeting	16/02/2024	16/02/2024	1	◆ (M)																		
2	**Inception Report** preparation and submission	16/02/2024	29/02/2024	10	■	■ ◆ (D)																	
3	1st Groups' meetings	07/03/2024	07/03/2024	1			◆ (M)																
4	Data Collection	26/02/2024	08/04/2024	31		■	■	■	■														
5	**Data Validation and Scenario Report**	18/03/2024	15/04/2024	21					■	■	■	■ ◆ (D)											
6	2nd Groups' meetings	18/04/2024	19/04/2024	2									◆ (M)										
7	Data and Scenario Finalization	19/04/2024	03/05/2024	11										■	■								
8	**Analysis Techniques' Guidance Document**	19/04/2024	10/05/2024	16										■	■	■ ◆ (D)							
9	3rd Groups' meetings	15/05/2024	16/05/2024	2													◆ (M)						
10	Project Assessment	17/05/2024	14/06/2024	21														■	■	■	■		
11	Assessment Results Consultation with the Secretariat	12/06/2024	17/06/2024	4																	■ ◆ (M)		
12	4th Groups' meetings	19/06/2024	20/06/2024	2																		◆ (M)	
13	**Final Report** preparation and submission	22/04/2024	28/06/2024	50									■	■	■	■	■	■	■	■	■	■	■ ◆ (D)

◆ (D) Deliverables ◆ (M) Meetings

Figure 2 Work plan of project activities and deliverables

The creation of project questionnaires and country-specific questionnaires was implemented during the inception phase of the project. The questionnaires were used for the **data collection process**, which can be considered as the **first phase of the project**.

The **second phase of the project** is implemented after the data collection process. The initial data set for candidate projects and countries was used for **data validation and project**

eligibility verification. The results of these activities are presented in ***Data Validation and Scenario Report***.

After data clarification/revision, collecting feedback on methodology, scenarios, data and assumptions, ***Analysis Techniques' Guidance Document*** is prepared and presented in the following sections of this document containing a final description of the data, scenarios, applied methodologies and techniques, sensitivities to be carried out, and structure of the results and indicators.

The **third and the last phase of the project** will be the **project assessment** process. Based on the defined methodology, data, assumptions, scenarios and sensitivities, a project specific socio-economic assessment will be made. In this phase, and for the purposes of projects' assessment, regional market and network models will be developed using appropriate modelling tools. Project-specific, aggregated assessment results and sectoral relative rankings will be presented to the groups. This phase of the project will be finalized with the delivery of the ***Final Report*** containing a summary of the applied methodology, scenarios, data and assumptions and detailed presentation and interpretation of the results for each analysed project in all scenarios and sensitivities.

2 Eligible projects for CBA and MCA

2.1 Eligibility assessment overview

In order for project to be found eligible, it must comply with the eligibility criteria described in the TEN-E Regulation. There are several categories of criteria that are mentioned in the TEN-E Regulation. The first category that projects must comply with in order to be further assessed is the following **general eligibility criteria**:

- the project falls in at least one of the **energy infrastructure priority interconnection corridors** and areas set out in Annex I of the TEN-E Regulation;
- the potential **overall benefits of the project outweigh its costs**, including in the longer term (will be calculated later through the CBA);
- the project meets any of the following criteria:
    - o it involves at least two Contracting Parties by directly or indirectly, via interconnection with a third country, crossing the border of two or more Contracting Parties;
    - o it is located on the territory of one Contracting Parties, either inland or offshore, including islands, and has a significant cross-border impact.

The following specific criteria shall apply to PECI falling within **specific energy infrastructure categories**:

(a) **for electricity transmission**, distribution and storage projects the project contributes significantly to sustainability through the integration of renewable energy into the grid, the transmission or distribution of renewable generation to major consumption centres and storage sites, and to reducing energy curtailment, where applicable, and contributes to at least one of the following specific criteria:

(i) market integration, including through lifting the energy isolation of at least one Contracting Party and reducing energy infrastructure bottlenecks, competition, interoperability and system flexibility;

(ii) security of supply, including through interoperability, system flexibility, cybersecurity, appropriate connections and secure and reliable system operation;

(b) **for smart electricity grid projects**, the project contributes significantly to sustainability through the integration of renewable energy into the grid, and contributes to at least two of the following specific criteria:

(i) security of supply, including through efficiency and interoperability of electricity transmission and distribution in day-to-day network operation, avoidance of congestion, and integration and involvement of network users;

(ii) market integration, including through efficient system operation and use of interconnectors;

(iii) network security, flexibility and quality of supply, including through higher uptake of innovation in balancing, flexibility markets, cybersecurity, monitoring, system control and error correction;

(iv) smart sector integration, either in the energy system through linking various energy carriers and sectors, or in a wider way, favouring synergies and coordination between the energy, transport and telecommunication sectors;

(c) **for carbon dioxide transport and storage projects** the project contributes significantly to sustainability through the reduction of carbon dioxide emissions in the connected industrial installations and contributes to all of the following specific criteria:

(i) avoiding carbon dioxide emissions while maintaining security of supply;

(ii) increasing the resilience and security of transport and storage of carbon dioxide;

(iii) the efficient use of resources, by enabling the connection of multiple carbon dioxide sources and storage sites via common infrastructure and minimising environmental burden and risks;

(d) **for hydrogen**, the project contributes significantly to sustainability, including by reducing greenhouse gas emissions, by enhancing the deployment of renewable or low carbon hydrogen, with an emphasis on hydrogen from renewable sources in particular in end-use applications, such as hard-to-abate sectors, in which more energy efficient solutions are not feasible, and supporting variable renewable power generation by offering flexibility, storage solutions, or both, and the project contributes significantly to at least one of the following specific criteria:

(i) market integration, including by connecting existing or emerging hydrogen networks of Contracting Parties, or otherwise contributing to the emergence of an Energy Community-wide network for the transport and storage of hydrogen, and ensuring interoperability of connected systems;

(ii) security of supply and flexibility, including through appropriate connections and facilitating secure and reliable system operation;

(iii) competition, including by allowing access to multiple supply sources and network users on a transparent and non-discriminatory basis;

(e) **for electrolysers**, the project contributes significantly to all of the following specific criteria:

(i) sustainability, including by reducing greenhouse gas emissions and enhancing the deployment of renewable or low-carbon hydrogen in particular from renewable sources, as well as synthetic fuels of those origins;

(ii) security of supply, including by contributing to secure, efficient and reliable system operation, or by offering storage, flexibility solutions, or both, such as demand side response and balancing services;

(iii) enabling flexibility services such as demand response and storage by facilitating smart energy sector integration through the creation of links to other energy carriers and sectors;

(f) **for smart gas grid projects**, the project contributes significantly to sustainability by ensuring the integration of a plurality of low-carbon and particularly renewable gases, including where they are locally sourced, such as biomethane or renewable hydrogen, into the gas transmission, distribution or storage systems in order to reduce greenhouse gas emissions, and that project contributes significantly to at least one of the following specific criteria:

(i) network security and quality of supply by improving the efficiency and interoperability of gas transmission, distribution or storage systems in day-to-day network operation by, inter alia, addressing challenges arising from the injection of gases of various qualities;

(ii) market functioning and customer services;

(iii) facilitating smart energy sector integration through the creation of links to other energy carriers and sectors and enabling demand response.

The projects that satisfy general and specific eligibility criteria can then be further assessed for **additional specific (technical) criteria** per different energy infrastructure categories based on the TEN-E Regulation:

- for **electricity transmission**: the project increases the grid transfer capacity, or the capacity available for commercial flows, at the border of that CP with one or several other CPs, or at any other relevant cross-section of the same transmission corridor having the effect of increasing this cross-border grid transfer capacity, by at least 500 MW compared to the situation without commissioning of the project;
- for **electricity storage**: the project provides at least 225 MW installed capacity and has a storage capacity that allows a net annual electricity generation of 250 GWh/year;
- for **smart electricity grids**: the project is designed for equipment and installations at high-voltage and medium voltage level, and involves TSOs, TSOs and DSOs, or DSOs from at least two CPs; the project should satisfy at least two of the following criteria: it involves 50 000 users, generators, consumers or prosumers of electricity, it captures a consumption area of at least 300 GW hours/year, at least 20% of the electricity consumption linked to the project originates from variable renewable resources, or it decreases energy isolation of non-interconnected systems in one or more CPs;
- for **smart gas grids**: the project involves TSOs, TSOs and DSOs, or DSOs from at least two CPs. DSOs may be involved, but only with the support of the TSOs of at least two CPs that are closely associated to the project and ensure interoperability;
- for **hydrogen**: hydrogen transmission - the project enables the transmission of hydrogen across the borders of the CPs concerned, or increases existing cross-border hydrogen transport capacity at a border between two CPs by at least 10% compared to the situation prior to the commissioning of the project, and the project sufficiently demonstrates that it is an essential part of a planned cross-border hydrogen network and provides sufficient proof of existing plans and cooperation with neighbouring countries and network operators or, for projects decreasing energy isolation of non-interconnected systems in one or more CPs, the project aims to supply, directly or indirectly, at least two CPs; hydrogen storage or hydrogen reception facilities - the project aims to supply, directly or indirectly, at least two CPs;
- for **electrolysers**: the project provides at least 50 MW installed capacity provided by a single electrolyser or by a set of electrolysers that form a single, coordinated project and brings benefits directly or indirectly to at least two CPs,

- for **carbon dioxide** projects: the project is used to transport and, where applicable, store anthropogenic carbon dioxide originating from at least two CPs.

The results of the general (except CBA which will be performed later) and specific project eligibility verification for each project are given below. If the general criterion was not satisfied, the specific criteria were not assessed since compliance with the general criteria is the first mandatory condition of project's eligibility:

E01: Increasing the capacity of existing 220 kV interconnection between Bosnia and Herzegovina and Montenegro, 220 kV OHL Trebinje – Perućica

- *General criteria:* E01 **complies with the general criteria (except economic criterion[2] which will be evaluated in a later stage)**, since it is a cross-border project connecting two CPs.
- *Specific criteria:* E01 **complies with the specific criteria,** with GTC increase ME-BA 500 MW, BA-ME 500 MW, as declared and verified by the project promoters[3].

E02: New 400 kV interconnection between Bosnia and Herzegovina and Montenegro, 400 kV OHL Gacko – Brezna

- *General criteria:* E02 **complies with the general criteria (except economic criterion)**, since it is a cross-border project connecting two CPs.
- *Specific criteria:* E02 **complies with the specific criteria,** with GTC increase larger than 500 MW at the ME-BA border, as declared and verified by the project promoters[4].

E03: New 400 kV interconnection between Montenegro and Bosnia and Herzegovina, 400 kV overhead line Brezna-Sarajevo with construction 400/220 kV substation Piva's mountain

- *General criteria:* E03 **complies with the general criteria (except economic criterion)**, since it is a cross-border project connecting two CPs.
- *Specific criteria:* E03 **complies with the specific criteria,** with GTC increase larger than 500 MW at the ME-BA border, as declared and verified by the project promoters[5].

E04: Trans Balkan Corridor: Double OHL 400 kV Bajina Basta (RS) – Visegrad (BA)/Pljevlja (ME) (BA section)

- *General criteria:* E04 **complies with the general criteria (except economic criterion)**, since it is a cross-border project connecting three CPs.

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[2] *Cost-benefit analysis will show eligibility according to the criterion that the potential overall benefits of the project outweigh its costs, including in the longer term (Article 4(b) of the revised TEN-E regulation). This is valid for all projects listed in this chapter.*

[3] *The project promoters initially submitted data on the GTC increase ME-BA 600 MW, BA-ME 800 MW but after verification these values were decreased to 500 MW in both directions.*

[4] *The project promoters initially submitted data on the GTC increase ME-BA 550 MW, BA-ME 1650 MW but after verification these values were changed to 876 MW for ME-BA and 567 MW for BA-ME direction.*

[5] *The project promoters initially submitted data on the GTC increase ME-BA 600 MW, BA-ME 1475 MW but after verification these values were changed to 725 MW for ME-BA and 584 MW for BA-ME direction.*

- *Specific criteria:* E04 **complies with the specific criteria,** with GTC increase ME-RS 600 MW, ME-RS 600 MW, and BA-RS 300 MW and RS-BA 500 MW as declared by the project promoters.

E05: Internal transmission line 400 kV Banja Luka 6 - Mostar 4

- *General criteria:* E05 **complies with the general criteria (except economic criterion)**, since there is a cross-border impact from this internal project on two neighbouring CPs.
- *Specific criteria:* E05 **complies with the specific criteria,** with GTC increase BA-ME 400 MW, ME-BA 350 MW, BA-RS 200 MW, RS-BA 200 MW, as declared by the project promoters.

E06: Reconfiguration of 400 kV grid and new 400 kV interconnection Albania-Kosovo

- *General criteria:* E06 **complies with the general criteria (except economic criterion)**, since it is a cross-border project connecting three CPs.
- *Specific criteria:* E06 **complies with the specific criteria,** with GTC increase AL-XK 500 MW, XK-AL 500 MW, as declared by the project promoters.

E07: Closing the 400 kV Albanian internal ring

- *General criteria:* E07 **complies with the general criteria (except economic criterion)**, since there is a cross-border impact from this internal project on three neighbouring CPs.
- *Specific criteria:* E07 **complies with the specific criteria,** with GTC increase AL-ME 100 MW, AL-XK 200 MW, AL-MK 200 MW, which equals to the total GTC increase of 500 MW, as declared and verified by the project promoters.

E08: 330 kV OHL Balti (MD) - Dnestrovsk HPP-2 (UA)

- *General criteria:* E08 **complies with the general criteria (except economic criterion)**, since it is a cross-border project connecting two CPs.
- *Specific criteria:* E08 **complies with the specific criteria,** with GTC increase UA-MD 500 MW and MD-UA 500 MW, as declared by the project promoters.

E09: Rehabilitation of 400 kV OHL Mukacheve (UA) – Veľké Kapušany (SK)

- *General criteria:* E09 does **not comply with the general criteria** since it connects one CP to non-CP and does not have a cross-border impact on any other CP.

E10: The reconstruction of the 400 kV transmission line Pivdennoukrainska NPP (Ukraine)-Isaccea (RO)

- *General criteria:* E10 does **not comply with the general criteria** since it connects one CP to non-CP and does not have a cross-border impact on any other CP.

E11: Construction of smart 110 kV grid in "Ukraine Bessarabia" region

- *General criteria:* E11 **complies with the general criteria (except economic criterion)**, since it has a cross-border impact on a neighbouring CP (Moldova) by affecting the electricity supply of the border region and loading of the Ukraine-Moldova interstate connection.

- *Specific criteria:* E11 does **not comply with the specific criteria** since it does not include two TSOs, DSOs or TSO and DSO from two CPs.

E12: Cybersecurity management system for protection grids assets from cyber threats

- *General criteria:* E12 **complies with the general criteria (except economic criterion)**, since it is a cross-border project influencing two CPs.
- *Specific criteria:* E12 does **not comply with the specific criteria** since it does not have any positive impact on sustainability via enabling an increase of RES connections and does not fulfil at least two out of four specific criteria for smart electricity grid projects.

E13: DTEK STORAGE 225 MW

- *General criteria:* E13 **complies with the general criteria (except economic criterion)**, since it has a cross-border effect on a neighbouring CP (Moldova) by improving frequency control in UA/MD control block.
- *Specific criteria:* E13 **complies with the specific criteria,** since it provides 225 MW installed capacity and has a storage capacity that allows a net annual electricity generation of over 250 GWh/year (315 GWh/year as estimated by the project promoter).

E14: Pump Storage Plant Koman and Fierza

- *General criteria:* E14 **complies with the general criteria (except economic criterion)**, since it has a cross-border effect on a neighbouring CP (Kosovo) by decreasing the fossil fuel dependency of Kosovo by exporting the generated electricity from the PSHPP.
- *Specific criteria:* E14 **complies with the specific criteria,** since it provides over 225 MW installed capacity (250 MW) and has a storage capacity that allows a net annual electricity generation of over 250 GWh/year.

  However, since the project-specific questionnaire in the project submission did not provide sufficient data (the compulsory fields were not filled out) and additional data were not received after several requests to the project promoters, this project cannot be further analysed due to insufficient data crucial for modelling and calculations of potential benefits in the CBA.

G01: Internal hydrogen infrastructure in Federation of BiH in connection with H2T Southern Interconnection BiH/CRO

- *General criteria:* G01 does **not comply with the general criteria** since it is an internal project that does not have a cross-border effect on any other CP.

G02: Gas interconnection Serbia – North Macedonia

- *General criteria:* G02 does **not comply with the general criteria** since it is not proven that the project is hydrogen ready infrastructure from its commissioning, by which it cannot enter into further eligibility analysis.

G03: Increasing capacities on the Trans-Balkan route with the integration of the hydrogen element

- *General criteria:* G03 does **not comply with the general criteria** since this is in fact a natural gas project and therefore is not eligible under the revised TEN-E Regulation. It also only involves one project promoter.

2.2 Final list of eligible projects for CBA and MCA

After the project eligibility verification is completed, **nine projects** are concluded to be eligible and will go into further analysis, i.e. CBA and MCA analyses (Figure 3). All the projects refer to electricity infrastructure, 8 to overhead lines and one to energy storage.

E01: Increasing the capacity of existing 220 kV interconnection between Bosnia and Herzegovina and Montenegro, 220 kV OHL Trebinje – Perućica

E02: New 400 kV interconnection between Bosnia and Herzegovina and Montenegro, 400 kV OHL Gacko – Brezna

E03: New 400 kV interconnection between Montenegro and Bosnia and Herzegovina, 400kV overhead line Brezna-Sarajevo with construction 400/220 kV substation Piva's mountain

E04: Trans Balkan Corridor: Double OHL 400 kV Bajina Basta (RS) – Visegrad (BA)/Pljevlja (ME) (BA section)

E05: Internal transmission line 400 kV Banja Luka 6 - Mostar 4

E06: Reconfiguration of 400 kV grid and new 400 kV interconnection Albania-Kosovo

E07: Closing the 400 kV Albanian internal ring

E08: 330 kV OHL Balti (MD) - Dnestrovsk HPP-2 (UA)

E13: DTEK STORAGE 225 MW

Figure 3 Eligible projects for CBA and MCA analyses

Eligible projects' locations are given hereinafter, including the main projects' data.

E01: Increasing the capacity of existing 220 kV interconnection between Bosnia and Herzegovina and Montenegro, 220 kV OHL Trebinje – Perućica

Project promoter(s): CGES (ME), NOSBiH/Elektroprijenos BiH (BA)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2028

Figure 4 Location of E01

E02: New 400 kV interconnection between Bosnia and Herzegovina and Montenegro, 400 kV OHL Gacko - Brezna

Project promoter(s): CGES (ME), NOSBiH/Elektroprijenos BiH (BA)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2035

Figure 5 Location of E02

E03: New 400 kV interconnection between Montenegro and Bosnia and Herzegovina, 400 kV overhead line Brezna-Sarajevo with construction 400/220 kV substation Piva's mountain

Project promoter(s): CGES (ME), NOSBiH/Elektroprijenos BiH (BA)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2033

Figure 6 Location of E03

E04: Trans Balkan Corridor: Double OHL 400 kV Bajina Bašta (RS) – Višegrad (BA)/Pljevlja (ME) (BA section)

Project promoter(s): NOSBiH/Elektroprijenos BiH (BA), CGES (ME)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2027

Figure 7   Location of E04

E05: Internal transmission line 400 kV Banja Luka 6 - Mostar 4

Project promoter(s): NOSBiH/Elektroprijenos BiH (BA)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2034

Figure 8   Location of E05

E06: Reconfiguration of 400 kV grid and new 400 kV interconnection Albania-Kosovo*

Project promoter(s): KOSTT (XK), OST(AL)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2030

Figure 9 Location of E06

E07: Closing the 400 kV Albanian internal ring

Project promoter(s): OST(AL)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2030

Figure 10 Location of E07

E08: 330 kV OHL Balti (MD) - Dnestrovsk HPP-2 (UA)

Project promoter(s): Moldelectrica (MD), Ukrenergo (UA)

Infrastructure category: High and extra high voltage overhead transmission lines

Commissioning year: 2032

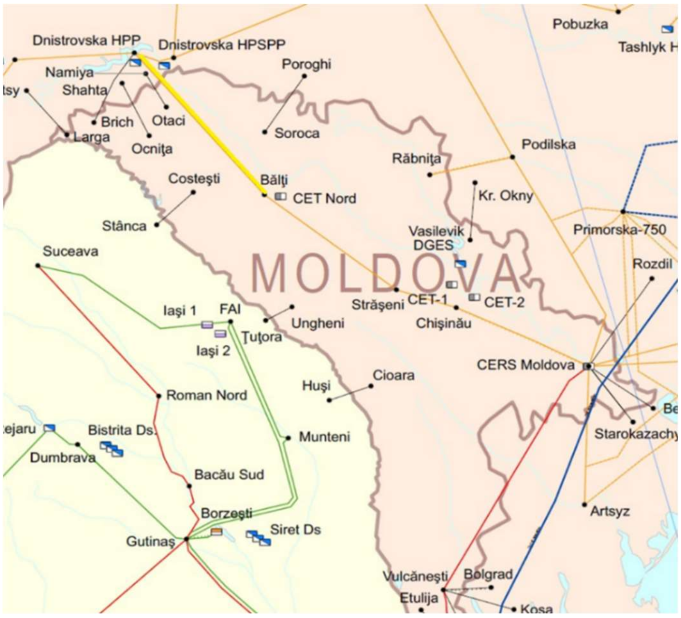

Figure 11 Location of E08

E13: DTEK STORAGE 225 MW

Project promoter(s): JSC DTEK WESTENERGY (UA)

Infrastructure category: Electricity storage

Commissioning year: 2025-2028 (3 phases, 25 MW in 2026, 100 MW in 2027, 100 MW in 2029)

Figure 12 Location of E13

3 Approach and methodologies for project assessment

A general approach for project assessment is presented in this section, with the focus on the relevant provisions of the TEN-E Regulation related to the project assessment and other relevant methodologies (published by ENTSO-E and European Commission) that will be applied in the project assessment process, namely CBA and MCA analyses.

Input data and main modelling assumptions are given based on the collected country-specific data and ENTSO-E and ENTSOG TYNDP scenarios. Proposed indicators and approach for relative project ranking are also presented.

3.1 Project assessment approach

A graphical presentation of the approach for project assessment is presented in Figure 13. After the **data collection process** during which the project-related data and country-specific data were collected, **data validation and verification** were carried out. Several iterations were made to clarify delivered data or to submit additional data by project promoters.

The next step was **projects' eligibility verification** which was made according to the general, specific and technical criteria as described in section 2. Eligibility verification resulted with the final list of eligible projects for further project assessment, i.e. CBA and MCA that includes modelling activities based on the relevant methodologies.

The input data for project assessment is primarily based on the collected data regarding candidate projects (delivered by the project promoters) and regarding country-specific data of the Contracting Parties. Country-specific data of the Contracting Parties were delivered by the ministries or TSOs, assuming that the data are in line with 2030 energy and climate targets for the EnC CPs (https://www.energy-community.org/implementation/package/CEP.html). For other input data, ENTSO-E and ENTSOG TYNDP 2022 data are primarily used as the relevant source because data for TYNDP 2024 were not available at the time when modelling activities were initiated (more details in section 3.2). However, since TYNDP 2024 scenario report was published in the second half of May 2024 (https://2024.entsos-tyndp-scenarios.eu/), some data important for the analyses are going to be used from this plan (explained later in the document).

In terms of the modelling phase and project assessment based on the modelling results, general approach consists of the following steps:

- **Development of** the **reference scenario (without any of the candidate projects)**, against which all projects will be assessed,
    - Each project will be added to the reference scenario to determine its benefits

(*PINT modelling approach*[6]) until 2050,

- **Determination of socio-economic monetary and non-monetary benefits and costs** for each project (project-specific CBA and MCA),
- **Comparison of individual project** assessment results between projects in the same project category and proposition of **relative project rankings.**

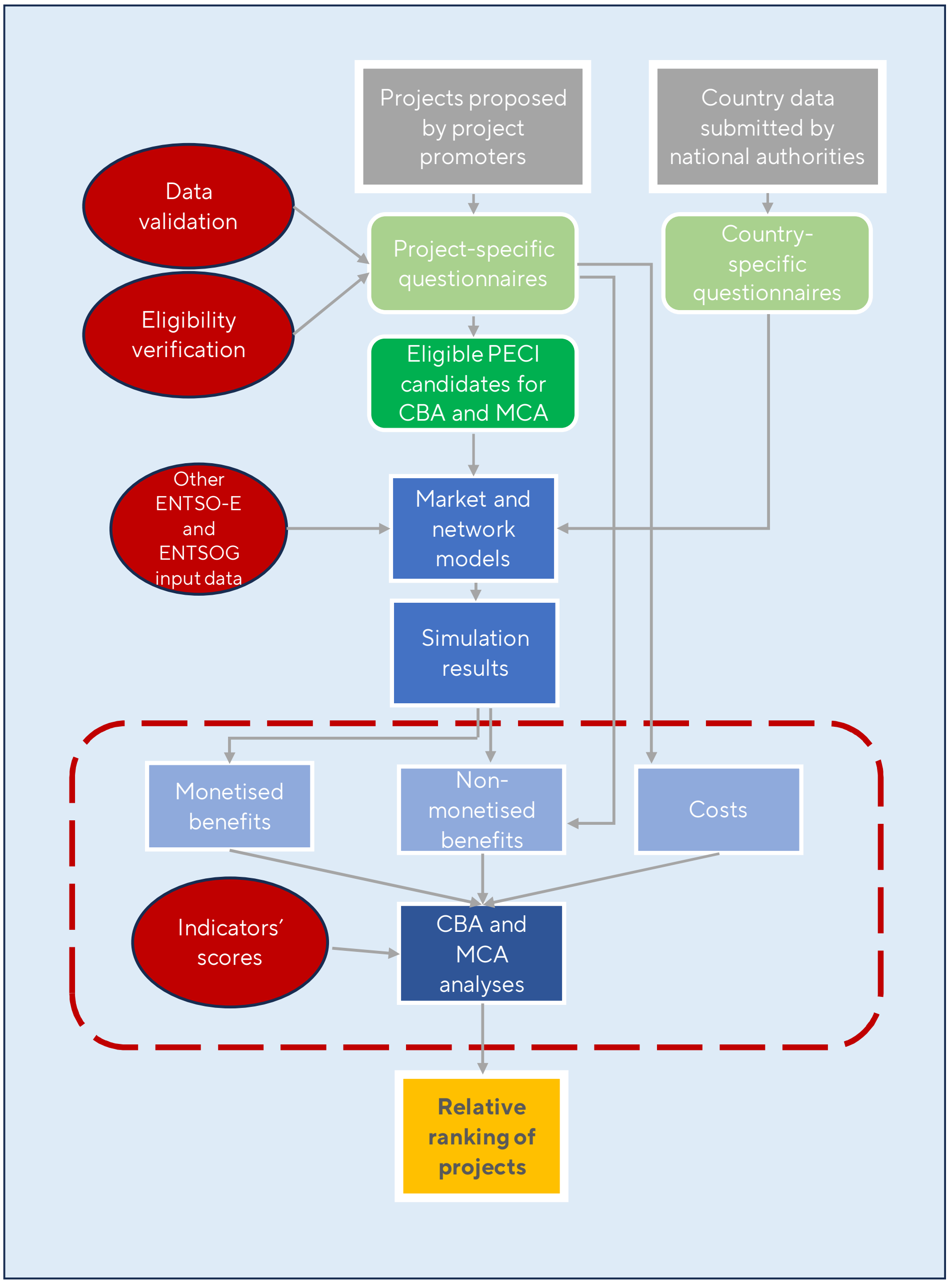

Figure 13 Project assessment approach

[6] *Put IN one at the Time (PINT) is a methodology that considers each new investment/project on the given network structure one-by-one and evaluates the results with and without the examined network investment/project reinforcement.*

Since there are three potentially competing projects over the same border ME-BA (E01, E02, E03) there is a large probability that the realisation of one project may influence the economic viability of the other two projects. Such risk will not be analysed because it asks for a more detail analysis of these three projects regarding possible combinations of their commissioning and their cumulative effect on the NTC values over different borders.

The main objective of the assessment is to determine **if the potential overall benefits of the project outweigh its costs**, which is one of the general eligibility criteria determined by the TEN-E Regulation. The compliance with this criterion requires to apply project assessment methodology that considers modelling of the system in which the new project should be incorporated[7].

In order to apply methodology for project assessment it is necessary to develop electricity sector model using appropriate modelling tools that enable project assessment considering **regional market conditions** and energy infrastructure of the Contracting Parties. In the eligibility verification process (more details in section 2), all the gas(es) candidate projects were declared as not eligible. Thus, only modelling of the electricity sector will be considered in the modelling phase of the project. The Consultant shall develop a regional model of the electricity systems of CPs using **PLEXOS Energy Modelling software**[8] (further in text: PLEXOS).

PLEXOS enables modelling of many different parts of the energy sector, including electricity, gas, storages, hydrogen and other. The model simulates the behaviour of the system and market by trying to meet the demand at least cost over the planning horizon, respecting all the imposed constraints. In other words, **the objective of the optimization function is to minimize the total system cost** by taking into account various characteristics and constraints of the system and market.

To determine costs and benefits of the project, a **reference case, i.e. reference scenario** has to be established (against which all projects will be assessed). Reference case assumes energy system without any of the project candidates, and simulation results for this case will be used for comparison with scenario with the project, to calculate the benefits of adding a certain project into the system.

In addition to the PLEXOS model, for electricity sector candidates, **PSS/E model** that enables detailed electricity network modelling, will be used to determine benefits such as impact of the project on network losses.

While some benefits of the projects will be determined based on the modelling results, there will also be benefits that will be assessed based on the data sent by the project promoters, depending on specific assessment criteria set out in the respective methodologies. The

[7] At the EU level this assessment is made by the ENTSO-E while preparing the TYNDPs, at the EnC level this is done separately by conducting market and network simulations for relevant scenarios and time frames.

[8] Detailed characteristics of all production units and fundamentals in the market can be modelled. The model accounts for both the technical and economic operation of the system characteristics. In addition to the techno-economic input data, energy demand forecasts, RE production profiles, fuel prices, etc. can also be provided as inputs to the model.

methodologies that will serve as the basis for electricity project assessment are described in section 3.3.

Based on the results of quantitative as well as qualitative analysis, individual project assessment will be made for each of the eligible projects. Each benefit evaluated in a specific project category will be scored based on the approach described in section 3.4. Based on the calculated total scores of each individual project **a relative ranking of all eligible projects** will be provided as the final output of the assessment.

The Consultant, in cooperation with the Energy Community Secretariat, will also consider whether the energy efficiency first principle is applied as regards the establishment of the regional infrastructure needs and as regards each of the candidate projects, and share its opinion with the PECI Groups. This will be assessed by taking into account the Distributed Energy scenario in 2050 defined under TYNDP by the ENTSO-E, through the sensitivity analysis including -20% of the forecasted demand and by calculating network losses for each eligible project (decrease of losses contributes to the energy efficiency).

3.2 Input data and modelling assumptions

In this section, input data and the main modelling assumptions for **modelling the reference scenario** based on which the projects will be assessed for their benefits are presented. Input data are based on the collected country-specific data from national authorities and on the relevant TYNDP scenarios.

3.2.1 Modelling scenarios

Scenarios that will be modelled have to be in line with the latest joint ENTSO-E and ENTSOG scenarios developed under Ten Year Network Development Plan 2024 or 2022 (depending on the data availability of TYNDP 2024). Given that final report and datasets for the TYNDP 2024 have not been published during the first and the second phase of the project, the data from the **TYNDP 2022 is mostly used**. This primarily refers to the scenarios that will be modelled as the reference cases for the period until 2050. Exceptions are CO_2 prices and wholesale electricity prices on the distant spot markets in relation to the EnC CPs (modelled in a simplified way than EnC CPs and their neighbouring EU MS as described in Chapter 3.2.2) which were taken from the latest TYNDP 2024 Draft Scenarios Report that was published in May 2024[9].

Under the TYNDP 2022, the **National Trends (NT)** scenario reflects national energy and climate policies (NECPs, national long-term strategies, hydrogen strategies…) based on the joint European targets. NT scenario will be used for modelling of 2030 and 2040 time horizons (agreed at the 1st joint meeting of the Electricity and Gases Groups on 7 March 2024), while

[9] *Since the PECI selection process is not fully synchronised with the ENTSO-E TYNDP process (the newest TYNDP data lag to PECI process), the Energy Community Secretariat expresses its request to synchronise better with the ENTSO-E and TYNDP process in the next rounds of PECI selection processes (2026, 2028…).*

for the later period, i.e. 2050, **Distributed Energy (DE)**[10] scenario will be used to properly reflect EnC Contracting Parties dedication to fully decarbonise until 2050, as is defined in the core of the revised TEN-E regulation. The decision to use National Trends scenarios for 2030 and 2040 is mainly based on the present conditions in the Energy Community CPs, especially by taking into account their distribution networks which are in general not ready to accept distributed energy sources on a large scale, which makes Distributed Energy scenarios for 2030 and 2040 practically not feasible for CPs due to their general lagging to the EU MSs in a technical, economic, regulatory and policy aspects. This assumption is also in line with the study made for the Energy Community Secretariat "Modernization, Decarbonization and Resilience - A Regional Transition Roadmap for the Western Balkans Study" (E3modelling, 2024), proposing gradual carbon pricing implementation with free allowances in the CPs to achieve carbon neutrality until 2050.

Country-specific data collected in the period from March 2024 until May 2024 are adjusted to the analysed scenarios, assumed to be in line with the Clean Energy Package targets, adopted in the Energy Community by the Ministerial Council Decision 2022/02/MC-EnC. This decision does not define specific electricity-related targets but just the sectorial ones (electricity, heating and cooling and transport) regarding greenhouse gas emissions, renewable energy and energy efficiency in relation to 1990 emissions, share of RES in gross final consumption of energy, and headline targets for energy efficiency. However, based on data delivered by the EnC CPs ministries and TSOs with respect to total installed capacities of hydro power plants, wind and solar power plants, and other RES, it was roughly estimated that delivered data is largely adjusted with the legally binding energy and climate targets[11].

The TYNDP scenarios and related data for modelled countries that shall be considered in the model refer to:

- total conventional (thermal and hydro) generation capacities per fuel/technology type,
- total wind and solar capacities and renewable energy time series (available in PECD) based on the selected climate year,
- batteries capacities,
- total electricity demand and demand time series,
- NTC values between CPs and between CPs and neighbouring EU member states,
- fuel and CO_2 prices.

Once the **reference case** is implemented based on the TYNDP 2022 scenarios, the PINT modelling approach will be used to assess the impacts of each project to the system costs and benefits.

[10] DE is the top-down scenario under the TYNDP 2022, that pictures a pathway achieving EU-27 carbon neutrality by 2050 and at least 55 % emission reduction in 2030.

[11] There were few countries which delivered data not fully in line with decarbonisation targets, regarding operation of coal-fired and gas-fired power plants in 2050 and this was adjusted by correcting the data by assuming phase-out of coal-fired power plants and possible operation of gas-fired ones but only equipped with Carbon Capture Storage (CCS), as described in section 3.2.4.

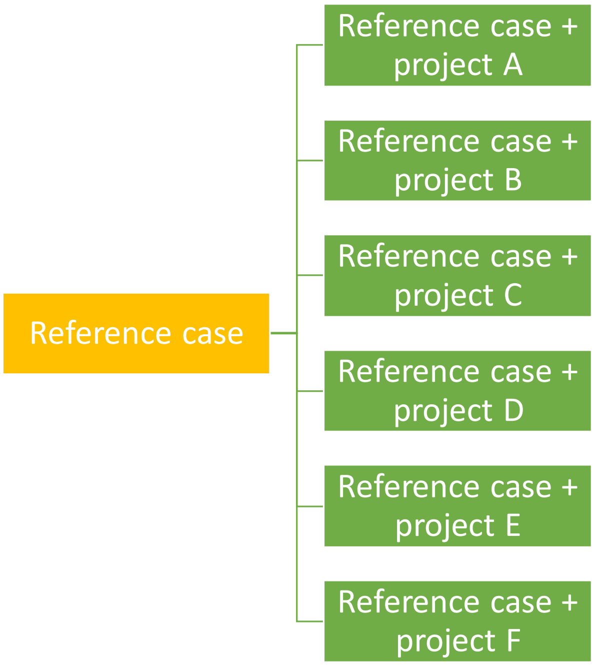

Figure 14 Modelling approach - the reference case without and with the projects

3.2.2 Geographical scope

The developed market model will include systems of Contracting Parties: Albania, Bosnia and Herzegovina, Georgia, Kosovo*, Moldova, Montenegro, North Macedonia, Serbia and Ukraine.

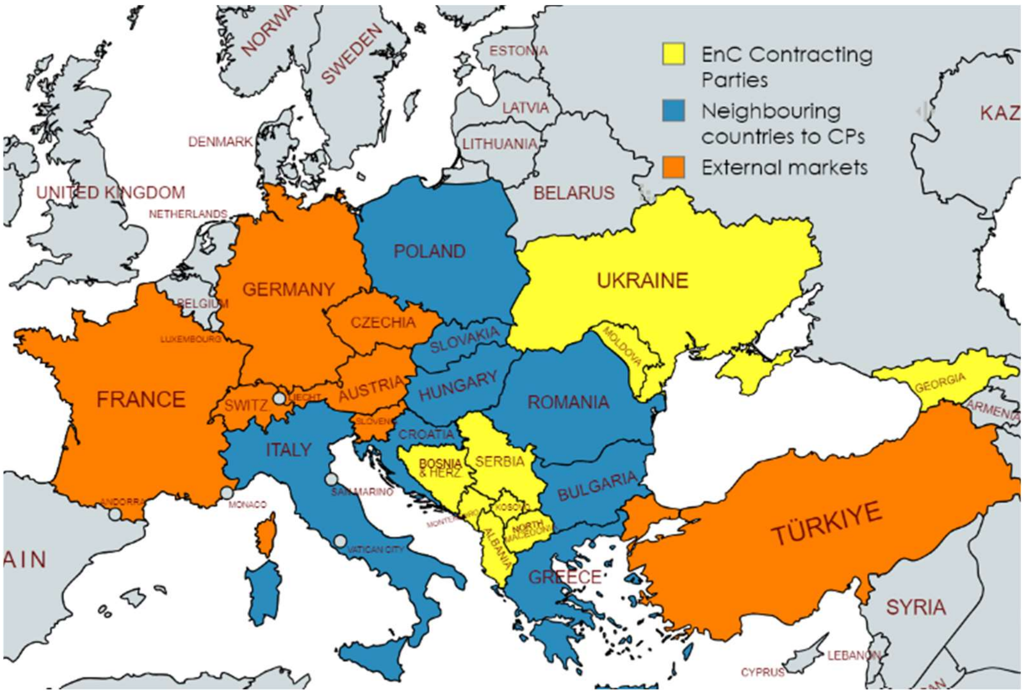

Figure 15 Geographical scope of regional market model in PLEXOS

These countries will be modelled based on the collected input data through country-specific questionnaires and based on the previous experience of the Consultant in modelling these countries. The approach for modelling of generation systems can be **unit-by-unit** meaning that each power plant will be modelled separately, or generation capacities can be clustered on a fuel/technology level. Based on the available data, all countries can be modelled on a unit-by unit level.

In addition to the Contracting Parties, their neighbouring countries/markets (as presented in Figure 15) shall also be considered based on the best available data (primarily ENTSO-E) and extensive experience of the Consultant in modelling these countries. Depending on the data availability, some countries will be presented on a unit-by-unit level (e.g. Croatia, Bulgaria, Romania, Greece), while others will be modelled on a technology level (e.g. Hungary, Italy, Slovakia and Poland).

Power systems of other countries, that have borders with neighbouring countries of CPs, such as Austria, shall be considered in regional PLEXOS model as spot markets. Hourly market prices are supposed to be insensitive to price fluctuations in the CPs region and its neighbouring countries. Electricity exchanges between external spot markets and the CPs region and their neighbouring market areas will be modelled to be constrained with transmission capacities based on the NTC values in TYNDP 2022.

3.2.3 Time horizon

The time horizon will cover period until 2050, analysing in particular three time-frames: 2030, 2040 and 2050. For the periods between selected years, linear interpolation will be used for CBA.

3.2.4 Generation capacities

Data on generation capacities for CPs are collected from relevant authorities (ministries and TSOs). Given that there are some differences in the collected data and the data based on the TYNDP 2022 scenarios, it has been agreed between the Secretariat and the Consultant[12], that the data provided by relevant national authorities will be used in market model development. The modifications of the provided input data are made where necessary to assume carbon neutrality in 2050 (DE scenario) by decommissioning all coal-fired thermal power plants without any exception, and by eventually assuming the application of carbon capture technology on gas-fired power plants or their usage of clean gases[13].

Table 1 - Table 3 contain data on generation capacities in CPs based on the collected data in the three years, 2030, 2040 and 2050. Cells marked in green signify the data that is taken from TYNDP 2022 since no other data has been provided/revised from the initial TYNDP 2022 data set, while the rest of the data is provided by the national authorities.

[12] *Confirmed by the electricity group at the meeting on 16 May 2024.*

[13] *Gas-fired power plants in some EnC CPs (Ukraine, Serbia, Albania, Georgia and Moldova) are assumed to be operational in 2050 but operating in line with the carbon neutrality target.*

Table 1 Generation capacities in 2030 in Contracting Parties (MW)

Country	Nuclear	Thermal-gas	Thermal-lignite/coal	Hydro	Wind	Solar	Batteries
AL	-	300	-	2623	300	700	-
BA	-	-	1418	2323.8	798	1514	50
GE	-	1598.2	22.3	4065	750	700	200
XK	-	-	904	100.7	677	550	170
MD	-	1720	47.2[14]	64.5	442	470	10
ME	-	49[15]	225	961.4	250	750	28
MK	-	760	31[16]	938.1	443	580	-
RS	-	400.9	4584	3244.2	3844	235	-
UA	13 940	4772.3	15855	2572.9	580	7350	258

Table 2 Generation capacities in 2040 in Contracting Parties (MW)

Country	Nuclear	Thermal-gas	Thermal-lignite/coal	Hydro	Wind	Solar	Batteries
AL	-	300	-	2633	700	1300	-
BA	-	-	1418	2480.3	1500	3000	381
GE	-	1598.2	22.3	5805	1700	1650	200
XK	-	-	904	100.7	1275	1340	170
MD	-	1720	47.2	64.5	960	750	10
ME	-	49	225	961.4	600	2400	28
MK	-	-	31	1480.5	723	998	-
RS	-	400.9	3899	3848.3	3246	950	-
UA	13 940	4772.3	15 855	2572.9	2580	11 120	258

[14] *In Moldova thermal is not lignite/coal but other non-renewable thermal capacity*

[15] *In Montenegro thermal is not natural gas but other renewable thermal capacity*

[16] *In North Macedonia thermal is not natural gas but other renewable thermal capacity*

Table 3 Generation capacities in 2050 in Contracting Parties (MW)

Country	Nuclear	Thermal-gas*	Thermal-lignite/coal	Hydro	Wind	Solar	Batteries
AL	-	300	-	2633	1650	1650	-
BA	-	-	-	2480.3	2500	5000	500
GE	-	1598.2	-	8350	2900	2600	200
XK	-	-	-	100.7	1873	1938	170
MD	-	1720	-	64.5	1120	880	10
ME	-	-	-	961.4	700	4300	28
MK	-	-	-	1480.5	605	11553	105
RS	-	400.9	-	3848.3	2968	725	-
UA	13 940	4772.3	-	2572.9	6750	21220	258

* CCS applied

3.2.5 Electricity demand

Data on electricity demand for CPs are collected from relevant authorities. Given that there are some differences in the collected data and the data based on the TYNDP 2022 scenarios, it has been agreed between the Secretariat and the Consultant, that the data provided by relevant national authorities will be used in market model development. In cases where data were not provided, TYNDP 2022 data will be used. Cells marked green signify that the data is used from TYNDP since no other data has been provided by the authorities.

Table 4 Electricity demand in Contracting Parties (GWh)

Country	2030	2040	2050
AL	8900	9400	12 116
BA	11 158	12 681	13 457
GE	19 111	23 907	29 071
XK	6802	7998	10 180
MD	7002	8417	9993
ME	4539	5534	6281
MK	8879	10 147	10 759
RS	36 498	37 240	37 218
UA	151 840	208 500	296 600

3.2.6 Fuel and CO_2 prices

Fuel and CO_2 prices are important input parameters in market models. These parameters have impact on the marginal generation costs of thermal units, and thus affect the optimal dispatch of all units in the system. They have impact on total generation costs, as well as on the level of CO_2 emissions, which are the parameters directly related to determination of socio-economic welfare in the project assessment process.

For the reference case, it is proposed to use the TYNDP 2022 values for fuel prices, as presented in Table 5 and Table 6, i.e. values for NT scenario in 2030 and 2040, and values for DE scenario in 2050. During the project execution, TYNDP 2024 was published (mid May 2024) and it was agreed with the EnC Secretariat to use the CO_2 prices based on the new available data in the TYNDP 2024 report. This also includes wholesale electricity prices for the spot markets outside of EnC CPs and their neighbouring EU MS.

Table 5 Fuel prices common to all scenarios in TYNDP 2022

€/GJ	2030	2040	2050
Nuclear	0.47		
Biomethane	20.74	16.94	13.97
Shale Oil	1.86	2.71	3.93
Lignite:			
- Group 1 (BG, MK and CZ)	1.40		N.a.
- Group 2 (SK, DE, RS, PL, ME, UK, IE and BA)	1.80		N.a.
- Group 3 (SI, RO and HU)	2.37		N.a.
- Group 4 (GR and TR)	3.10		N.a.

Source: TYNDP Scenario Building Guidelines, April 2022

Table 6 Fuel prices in TYNDP 2022 and CO_2 prices in TYNDP 2024 per scenarios and horizons

	Unit	Scenarios	2030	2040	2050
CO_2	€/tonne	-	**113.4**	**147.0**	**168.0**
Hard coal	€/GJ	**NT**	**2.48**	**2.41**	N.a.
		DE and GA[17]	1.97	1.92	**1.87**
Light oil		**NT**	**13.78**	**15.41**	N.a.
		DE and GA	10.09	9.61	**9.12**
Natural gas		**NT**	**6.23**	**6.90**	N.a.
		DE and GA	**4.02**	**4.07**	**4.07**
Biomethane		**NT**	20.74	16.94	N.a.
		DE and GA	**20.74**	**16.94**	**13.97**
Synthetic methane		**NT**	28.09	23.35	N.a.
		DE and GA	**28.96**	**23.35**	**18.09**
Renewable H2 imports		**NT**	20.25	16.08	N.a.
		DE and GA	**20.63**	**16.08**	**12.52**
Decarbonised H2 imports		**NT**	20.25	16.08	N.a.
		DE and GA	**17.11**	**17.55**	**17.91**

Source: TYNDP Scenario Building Guidelines, April 2022; TYNDP 2024 Scenarios Methodology Report, May 2024

3.2.7 Selection of climatic year

Electricity demand will be used as input data in the form of hourly load profiles for each country and each analysed year. In the TYNDP 2022, hourly demand profiles are available for 35 climatic years (from 1982 to 2016). Given that the **year 2009** is selected as the most representative year in TYNDP 2022, the Consultant proposed to use load profiles for this year.

The same year is proposed for the hourly profiles of the RES generation, available in PECD (Pan European Climate Database) that are also used as input data to PLEXOS model for wind and solar power plants.

3.2.8 NTC values

Data on NTC values between CPs and CPs and neighbouring countries are collected from relevant authorities and initially presented in *Data Validation and Scenario Report*. Given that there were some differences in the collected data and the data based on the TYNDP 2022

[17] *Global Ambition – another ENTSO-E scenario in 2050 that will not be analysed.*

scenarios, the final input data set regarding NTC values is determined by using the following principles:

- based on the data provided by relevant CPs authorities in cases where there are no differences between the provided data by the two national authorities for the same border,
- based on the TYNDP 2022 data if the provided data by relevant CPs authorities differs from each other and from the TYNDP 2022 data,
- in cases where TYNDP 2022 doesn't provide data for specific border, values provided by relevant CPs authorities are used. If values provided by relevant CPs authorities differ for the same border, a lower NTC value is used.

Regarding the MONITA HVDC link between Montenegro and Italy, NTC value of 1200 MW will be finally applied starting from 2030 according to confirmation received by TERNA about their intentions to have the second cable operational until this time frame.

Table 7 NTC values between CPs and CPs and neighbouring countries

Final NTCs for the model					
Interconnection	**From:**	**To:**	**Year**	**NTC (MW)**	**Remark**
AL00-GR00	AL00	GR00	2030	**400**	Data provided by AL and TYNDP 2022 differ. TYNDP 2022 data are used.
			2040	**400**	
			2050	**400**	
	GR00	AL00	2030	**400**	
			2040	**400**	
			2050	**400**	
AL00-ME00	AL00	ME00	2030	**350**	Data provided by AL and ME differ from each other and from TYNDP 2022 data. Data from TYNDP 2022 are used.
			2040	**350**	
			2050	**350**	
	ME00	AL00	2030	**350**	
			2040	**350**	
			2050	**350**	
AL00-MK00	AL00	MK00	2030	**500**	Data provided by AL and MK are the same as in TYNDP 2022.
			2040	**500**	
			2050	**500**	
	MK00	AL00	2030	**500**	
			2040	**500**	
			2050	**500**	

AL00-XK00	AL00	XK00	2030	**400**	Data provided by AL and XK differ in 2040 and 2050. TYNDP 2022 doesn't provide data for this border. The latest data provided by AL are used.
			2040	**400**	
			2050	**400**	
	XK00	AL00	2030	**400**	
			2040	**400**	
			2050	**400**	
BA00-HR00	BA00	HR00	2030	**750**	Data provided by BA are the same as in TYNDP 2022.
			2040	**750**	
			2050	**750**	
	HR00	BA00	2030	**700**	
			2040	**700**	
			2050	**700**	
BA00-ME00	BA00	ME00	2030	**800**	Data provided by BA and ME differ. Data provided by BA will be used as it is the same as the data in TYNDP 2022.
			2040	**800**	
			2050	**800**	
	ME00	BA00	2030	**750**	
			2040	**750**	
			2050	**750**	
BA00-RS00	BA00	RS00	2030	**530**	Data provided by BA is the same as in TYNDP 2022.
			2040	**530**	
			2050	**530**	
	RS00	BA00	2030	**510**	
			2040	**510**	
			2050	**510**	
ME00-IT00	ME00	IT00	2030	**1200**	Based on data provided by ME and
			2040	**1200**	
			2050	**1200**	
	IT00	ME00	2030	**1200**	

			2040	**1200**	TERNA for 2030.
			2050	**1200**	
ME00-RS00	ME00	RS00	2030	**580**	Data provided by ME and TYNDP 2022 differ. EMS did not provide data. Data from TYNDP 2022 are used.
			2040	**580**	
			2050	**580**	
	RS00	ME00	2030	**550**	
			2040	**550**	
			2050	**550**	
ME00-XK00	ME00	XK00	2030	**300**	Based on the data provided by XK and ME.
			2040	**300**	
			2050	**300**	
	XK00	ME00	2030	**300**	
			2040	**300**	
			2050	**300**	
GE00-AZ00	GE00	AZ00	2030	**2000**	Based on data provided by GE.
			2040	**2000**	
			2050	**2000**	
	AZ00	GE00	2030	**2000**	
			2040	**2000**	
			2050	**2000**	
GE00-TR00	GE00	TR00	2030	**1050**	
			2040	**1050**	
			2050	**1050**	
	TR00	GE00	2030	**1050**	
			2040	**1050**	
			2050	**1050**	
GE00-ARM00	GE00	ARM00	2030	**700**	
			2040	**700**	
			2050	**700**	
	ARM00	GE00	2030	**700**	
			2040	**700**	
			2050	**700**	
GE00-RU00	GE00	RU00	2030	**1600**	

			2040	**1600**	
			2050	**1600**	
	RU00	GE00	2030	**1600**	
			2040	**1600**	
			2050	**1600**	
GE00-ROM00	GE00	ROM00	2030	**1300**	
			2040	**1300**	
			2050	**1300**	
	ROM00	GE00	2030	**1300**	
			2040	**1300**	
			2050	**1300**	
MK00-BG00	MK00	BG00	2030	**400**	Data provided by MK are the same as in TYNDP 2022.
			2040	**400**	
			2050	**400**	
	BG00	MK00	2030	**500**	
			2040	**500**	
			2050	**500**	
MK00-GR00	MK00	GR00	2030	**850**	Data provided by MK are the same as in TYNDP 2022.
			2040	**850**	
			2050	**850**	
	GR00	MK00	2030	**1100**	
			2040	**1100**	
			2050	**1100**	
MK00-RS00	MK00	RS00	2030	**450**	Data provided by MK and TYNDP 2022 differ. EMS did not provide data. Data from TYNDP 2022 are used.
			2040	**450**	
			2050	**450**	
	RS00	MK00	2030	**540**	
			2040	**540**	
			2050	**540**	
MK00-XK00	MK00	XK00	2030	**270**	Data provided by MK and XK differ in all
			2040	**270**	

			2050	**270**	years. TYNDP 2022 doesn't provide data for this border. Lower values are used.
	XK00	MK00	2030	**300**	
			2040	**300**	
			2050	**300**	
XK00-RS00	XK00	RS00	2030	**400**	Based on data provided by XK. EMS did not provide data. TYNDP 2022 does not recognise this border. At the moment, there is no capacity allocation because NTC has not been defined and agreed between EMS and KOSTT.
			2040	**400**	
			2050	**400**	
	RS00	XK00	2030	**400**	
			2040	**400**	
			2050	**400**	
UA00-HU00	HU00	UA00	2030	**1420**	Based on data provided by UA. TYNDP 2022 does not recognise these borders.
			2040	**1420**	
			2050	**1420**	
	UA00	HU00	2030	**1420**	
			2040	**1420**	
			2050	**1420**	
UA00-SK00	SK00	UA00	2030	**1000**	
			2040	**1000**	
			2050	**1000**	
	UA00	SK00	2030	**1000**	
			2040	**1000**	

			2050	**1000**	
UA00-'RO00	RO00	UA00	2030	**1740**	
			2040	**1740**	
			2050	**1740**	
	UA00	RO00	2030	**1740**	
			2040	**1740**	
			2050	**1740**	
UA00-'PL00	PL00	UA00	2030	**600**	
			2040	**600**	
			2050	**600**	
	UA00	PL00	2030	**820**	
			2040	**820**	
			2050	**820**	
UA00-MD00	MD00	UA00	2030	**600**	Based on data provided by UA and MD. TYNDP 2022 does not recognise this border.
			2040	**1100**	
			2050	**1600**	
	UA00	MD00	2030	**600**	
			2040	**1100**	
			2050	**1600**	
MD00-RO00	MD00	RO00	2030	**300**	Based on data provided by MD. TYNDP 2022 does not recognise this border.
			2040	**750**	
			2050	**1600**	
	RO00	MD00	2030	**450**	
			2040	**750**	
			2050	**1600**	

3.2.9 Sensitivity analysis

According to the TEN-E Regulation, each cost-benefit analysis shall include **sensitivity analyses concerning the input data set**, possibly related to the cost of generation and greenhouse gases as well as the expected development of demand and supply, expected development of renewable energy sources, and including the flexibility of both, and the availability of storage, the commissioning date of various projects in the same area of analysis, climate impacts and other relevant parameters.

4th ENTSO-E Guideline for Cost-Benefit Analysis of Grid Development Projects also points out the importance of conducting sensitivity analysis in the CBA, in order to increase the validity of the CBA results.

Sensitivity analysis can be performed to observe how the variation of parameters, either one parameter or a set of interlinked parameters, affects the model results, whereas aim is not to define complete new sets of scenarios but quick insights in the system behaviour with respect to single (few) changes in specific parameters.

In general, a sensitivity analysis **must be performed on a uniform level**, i.e. the sensitivity needs to be applied to all projects under assessment in the respective study. Some of the sensitivities conducted under the previous TYNDP processes are related to: fuel and CO_2 price, long-term societal cost of CO_2 emissions, climate year, load, technology phase-out/phase-in, must-run, installed generation capacity (including storage and RES), flexibility of demand and generation, availability of storage and the commissioning date of various projects.

Under the CBA of the ongoing PECI process, the Consultant proposes the following parameters to be variated in the sensitivity analysis:

- **Load** – it is expected that an increasing number of applications and different sectors like transport and heating will be electrified in the future (e.g. e-mobility, heat pumps, etc.), which would cause an increase in load and the necessary generation and therefore possibly affect several CBA indicators such as SEW. On the other hand, energy efficiency measures will lead to decreasing load.
- **RES** – amendments to the national RES goals, which could occur frequently in the observed horizon, could lead to dominant impacts on the results of the CBA assessment.

The Consultant proposes to **increase and decrease load for 20%, and increase solar capacity for 20%** in each of the analysed years in the horizon. The proposed variations have to be applied to reference scenario without and with each of the analysed projects, as graphically represented in the following figure.

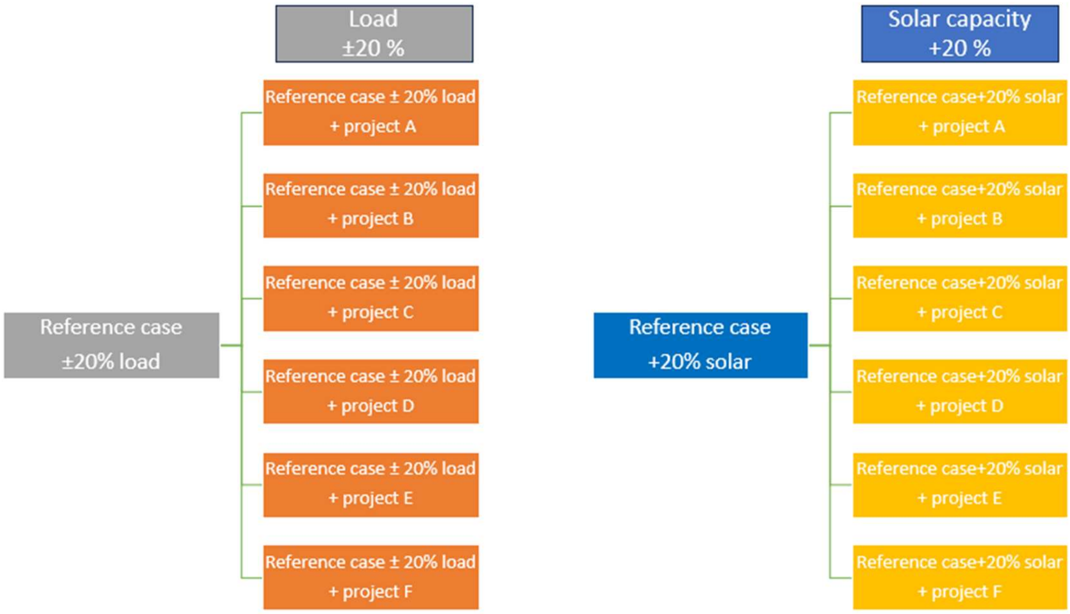

Figure 16 Proposed sensitivities under the PECI project assessment process

3.3 Methodologies for project assessment

Projects that are preliminary found eligible according to the general, specific and technical criteria set out in the TEN-E Regulation, which is described in detail in the previous section of this report, must be further assessed in line with appropriate methodologies. Methodologies for the assessment of benefits and costs of different categories of projects are written also in line with the TEN-E Regulation, as adopted in the Energy Community, and will be described in the following sections for each of the categories of projects that were found eligible.

Eligibility verification resulted with the projects for CBA and MCA analyses in the following electricity infrastructure categories:

- High and extra-high voltage overhead transmission lines.
- Energy storage.

Thus, the methodologies that will be applied in the project assessment phase are (according to Article 11(1) and Article 11(8) of the TEN-E Regulation as adopted in the Energy Community):

- **CBA Methodology of the ENTSO-E** (to be applied for the overhead transmission lines projects)
    - o 4th ENTSO-E Guideline for Cost-Benefit Analysis of Grid Development Projects, *April 2024.*

- **Methodology developed by the European Commission** (to be applied to the energy storage project)

- Harmonised system-wide cost-benefit analysis for candidate energy storage projects*, May 2023.*

The methodology which is also considered[18] in the PECI selection process is the one developed by the EU Commission and agreed/used by the respective groups in the 2023 PCI/PMI process at the EU level:

- *Methodology for assessing the electricity and offshore infrastructure candidate PCI and PMI 1st Union PCI-PMI list 2023, June 2023.*

The ***TYNDP-specific CBA Implementation Guidelines*** as an accompanying document of the *4th ENTSO-E CBA Guideline,* will also be used for project assessment calculations.

One additional condition set out in the TEN-E Regulation that is common for all project categories is that in assessing projects, in order to ensure a consistent assessment approach among the projects, due consideration must be given to:

- the urgency and the contribution of each proposed project in order to meet the Energy Community 2030 targets for energy and climate and the 2050 climate neutrality objective, market integration, competition, sustainability, and security of supply,
- the complementarity of each proposed project with other proposed projects, including competing or potentially competing projects,
- for proposed projects that are, at the time of the assessment, projects on the Energy Community list, the progress of their implementation and their compliance with the reporting and transparency obligations (not applicable at the moment since this is the 1st PECI selection process under the revised/new TEN-E Regulation).

3.3.1 High and extra-high voltage overhead transmission lines

According to the TEN-E Regulation, the PECI eligible candidates falling under electricity transmission, distribution and energy storage infrastructure categories shall contribute:

- **significantly to sustainability** through the integration of renewable energy into the grid, the transmission or distribution of renewable generation to major consumption centers and storage sites, and to reducing energy curtailment, where applicable,

and to **at least one** of the specific criteria:

- **market integration**, including through lifting the isolation of at least one CPs and reducing energy infrastructure bottlenecks, competition, interoperability and system flexibility,
- **security of supply**, including through interoperability, system flexibility, cybersecurity, appropriate connections and secure and reliable system operation.

According to the Annex IV in the TEN-E Regulation, these criteria must be measured in the following manner:

- **transmission of renewable energy generation** to major consumption centres and storage sites, by estimating the amount of generation capacity from renewable energy

[18] *But not necessarily strictly followed.*

sources (by technology, in MW), which is connected and transmitted due to the project, compared to the amount of planned total generation capacity from those types of renewable energy sources without the project,

- **market integration, competition and system flexibility**, in particular by:
    - calculating, for cross-border projects, including reinvestment projects, the impact on the grid transfer capability in both power flow directions, measured in terms of amount of power (in MW), and their contribution to reaching the minimum 15 % interconnection target[19], and for projects with significant cross-border impact, the impact on grid transfer capability at borders between relevant Contracting Parties, and on demand-supply balancing and network operations in relevant Contracting Parties,
    - assessing the impact, in terms of energy system-wide generation and transmission costs and evolution and convergence of market prices provided by a project under various planning scenarios, in particular taking into account the variations induced on the merit order,
- **security of supply, interoperability and secure system operation**, in particular by assessing the impact of the project on the loss of load expectation in terms of generation and transmission adequacy for a set of characteristic load periods, taking into account expected changes in climate- related extreme weather events and their impact on infrastructure resilience. Where applicable, the impact of the project on independent and reliable control of system operation and services shall be measured.

In order to determine whether the abovementioned criteria are satisfied, specific methodologies have to be used for each project category. According to the TEN-E Regulation, the single sector draft methodologies published by the ENTSO-E and ENTSOG respectively under Article 11 of Regulation shall be applied to the projects of high and extra-high voltage overhead transmission lines. Since in this PECI process only electricity projects are eligible, that means that only ENTSO-E Methodology must be used.

The ***4th ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects*** defines nine categories of possible benefits that the construction of overhead transmission line can obtain. They are shown in Figure 17.

[19] *According to the EnC Secretariat's study "Electricity interconnection targets in the Energy Community Contracting parties" all EnC CPs satisfy 15% interconnection target except Ukraine.*

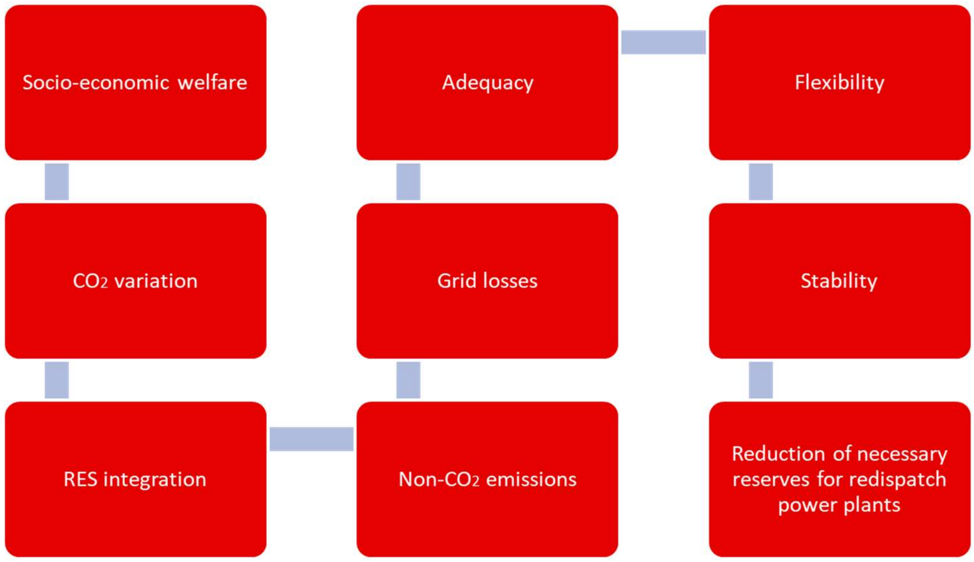

Figure 17 Project benefits for grid development projects

Out of these project benefits, some can be quantified and monetised, while others can only be qualitatively described. Through the use of synchronized market and network models, the following indicators will be monetised:

- **Socio – economic welfare (SEW)** – this will be assessed through the contribution of the project in increasing transmission capacity(ies) over the borders of the EnC CPs (excluding the EU Member States), making an increase in commercial exchanges possible so that electricity markets can trade power in a more economically efficient manner. The monetisation of SEW is done in EUR/yr. For this indicator, **generation cost method will be used to monetize the increase in SEW**, by determining a difference between the total generation costs in the power systems of EnC countries with and without the project.
- **Additional Societal benefit due to CO_2 variation** – this indicator is used to properly reflect the EU objectives of CO_2 emissions reduction. To avoid double accounting with the CO_2 variation already monetised into the SEW (B1) and the losses (B5), changes in CO_2 emission (without and with a project) are multiplied by the difference between the CO_2 societal cost[20] and the ETS price used in the scenario.
- **Security of supply (SoS)** – this indicator is calculated in case there is an occurrence of unserved energy in the modelling results and is then monetised by multiplying that unserved energy with the value of lost load (VoLL).
- **Grid losses** – shall be assessed through the cost of compensating for thermal losses in the power system due to the project. For the grid losses calculation, both market and network models will be used – in the network model the amount of losses (GWh) will be calculated and then multiplied by marginal prices acquired from the market model in order to fully monetize this benefit.

Other benefits will not be monetized but can be qualitatively described.

[20] CO_2 societal cost is assumed according to the high levels in the TYNDP 2024: 189 EUR/t in 2030 and 498 EUR/t in 2040.

To determine whether each project complies with the specific TEN-E Regulation criteria, specific indicators identified below will be presented for each project:

- **Market integration**: increase in Annual Socio-Economic Welfare (**B1 ΔSEW** indicator, M €/year)
- **Sustainability:** additional societal benefit due to CO_2 variation (**B2 ΔCO_2** indicator, monetised by using societal costs of CO_2 (M €/year))
- **Security of supply**: adequacy to meet demand (**B6 ΔSoS**, M €/year) and system stability (**B8 Stability** (Transient, Voltage and Frequency Stability))
- **Grid losses:** (**B5 ΔLosses** indicator, M €/year).

Figure below shows benefits that will be evaluated, as well as the costs that will be used to calculate benefit-cost ratio.

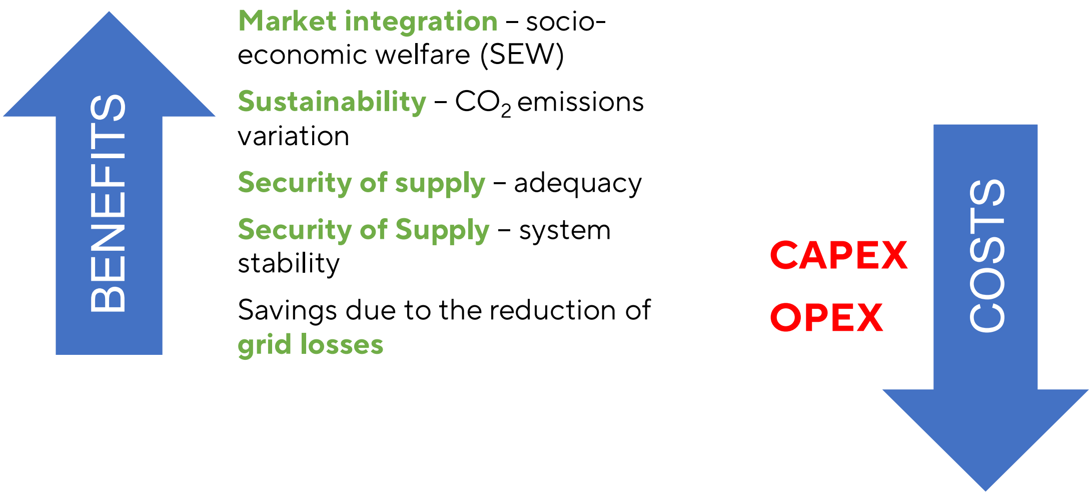

Figure 18 Benefits and costs for high and extra high voltage overhead line projects according to the relevant methodologies

3.3.2 Energy storage

For energy storage projects, the TEN-E Regulation prescribes the same contributions as in the case of overhead transmission lines, i.e. the project must contribute:

- **significantly to sustainability** through the integration of renewable energy into the grid, the transmission or distribution of renewable generation to major consumption centers and storage sites, and to reducing energy curtailment, where applicable,

and to **at least one** of the specific criteria:

- **market integration**, including through lifting the isolation of at least one CPs and reducing energy infrastructure bottlenecks, competition, interoperability and system flexibility;
- **security of supply**, including through interoperability, system flexibility, cybersecurity, appropriate connections and secure and reliable system operation.

According to the Annex IV from the TEN-E Regulation, these criteria must be measured in the following manner:

- **transmission of renewable energy generation** to major consumption centres and storage sites, by comparing new capacity provided by the energy storage project with total existing capacity for the same storage technology in the area of the analysis,
- **market integration, competition and system flexibility**, in particular by:
  - calculating, for cross-border projects, including reinvestment projects, the impact on the grid transfer capability in both power flow directions, measured in terms of amount of power (in MW), and their contribution to reaching the minimum 15 % interconnection target, and for projects with significant cross-border impact, the impact on grid transfer capability at borders between relevant Contracting Parties, and on demand-supply balancing and network operations in relevant Contracting Parties,
  - assessing the impact, in terms of energy system-wide generation and transmission costs and evolution and convergence of market prices provided by a project under various planning scenarios, in particular taking into account the variations induced on the merit order,
- **security of supply, interoperability and secure system operation**, in particular by assessing the impact of the project on the loss of load expectation in terms of generation and transmission adequacy for a set of characteristic load periods, taking into account expected changes in climate- related extreme weather events and their impact on infrastructure resilience. Where applicable, the impact of the project on independent and reliable control of system operation and services shall be measured.

For energy storage projects, *Harmonised system-wide cost-benefit analysis for candidate energy storage projects, May 2023*, shall be applied. This methodology defines monetised, non-monetised (quantified) and qualitative benefits for energy storage projects.

CBA methodology for energy storage projects is similar to the ENTSO-E CBA methodology and recognises the following main benefits that must be calculated:

- **Market integration**: increase in Annual Socio-Economic Welfare (**B1 ΔSEW** indicator, M €/year)
- **Sustainability:** additional societal benefit due to CO_2 variation (**B2 ΔCO_2** indicator, monetised by using societal costs of CO_2 (M €/year))
- **Security of supply:** adequacy to meet demand (**B8 ΔSoS** indicator, M €/year)
- **Grid losses:** (**B5 ΔLosses** indicator, M €/year).

Along with these indicators, some indicators are given in the methodology as non-monetized that can be described qualitatively or quantified, or possibly monetised but under special conditions (available models and data) like RES integration (B3), Variation of non-CO_2 emissions (B4), Variation of electricity balancing markets services (B6), Variation in other ancillary services markets (B7), Generation capacity deferral (B8), Transmission capacity deferral (B10), and Variation of redispatch services (B11). These will be described only if there is enough information in the project application on those indicators. The figure below shows the benefits and costs that will be taken into account when doing the analysis of energy storage projects.

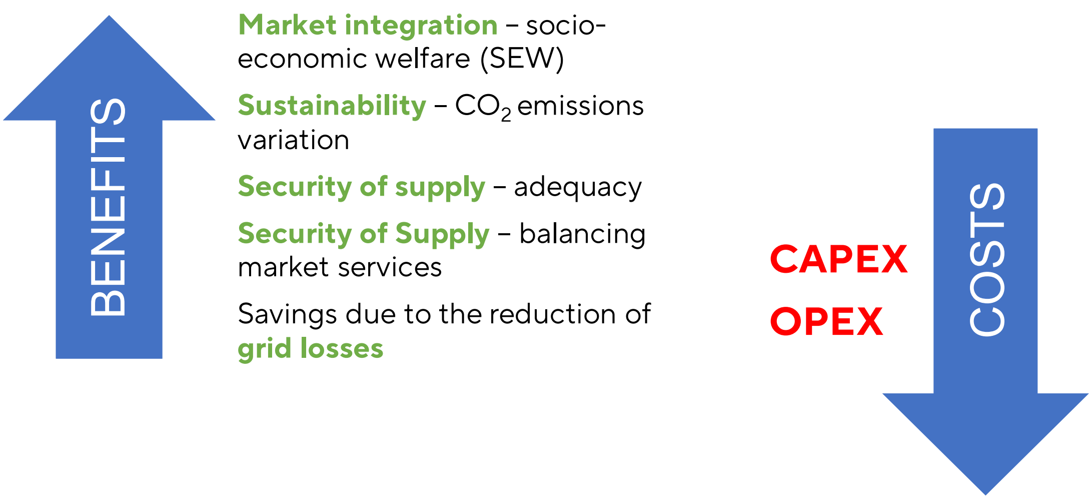

Figure 19 Benefits and costs for energy storage projects according to the relevant methodologies

3.4 Structure of results

This section represents the main indicators that will be determined under the CBA and MCA analyses for each PECI candidate project within the relevant infrastructure category, based on the methodologies presented in section 3.3 and simulations that will be carried out using market and network tolls and input data set described in section 3.2.

3.4.1 High and extra high voltage overhead transmission lines

When determining the benefits of each candidate OHL project, market and network simulations will be carried out with and without the proposed project. Positive impact of the proposed project will be analysed within the benefits defined by the relevant methodologies as presented in Figure 20. The benefits, i.e. indicators that will be calculated in the project assessment process refer to monetised, and non-monetised.

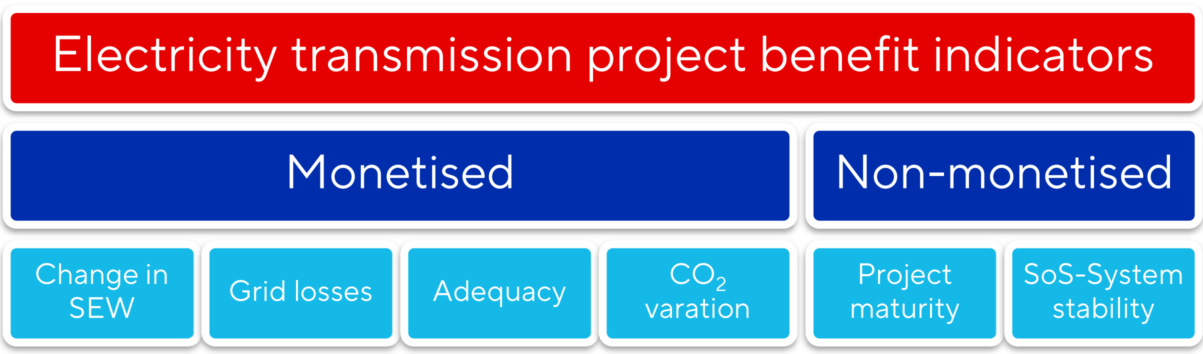

Figure 20 Monetised and non-monetised project assessment indicators – electricity transmission lines

Benefit/Cost ratio

The monetised part of the project assessment is composed of all the monetised project benefits mentioned in section 3.3 and presented in Figure 20 and project costs (CAPEX and OPEX). Monetised benefits (change in SEW, CO_2 variation, grid losses and adequacy) for each project will be determined based on the comparison of modelling results for the reference scenario (without the project) and for the scenario with the project. Data on CAPEX and OPEX are delivered by the project promoters and verified by the Consultants. Although significant deviations in unit investment costs were found between different projects, no crucial deviations from expected values were found, i.e., unit costs are within the expected range.

Monetised benefits and verified costs of the proposed projects serve as a basis for the Net Present Value (NPV) or for the **Benefit/Cost ratio (B/C)** calculation. In general, the cost-benefit analysis selects the projects with the highest NPV or highest Benefit/Cost ratio.

The **B/C ratio** will be determined as the present value of all monetised benefits divided by the present value of all costs. The present value of the monetised benefits and costs will be calculated using the **discount rate of 4%**, in line with the ENTSO-E CBA 4.0 methodology. The higher the B/C ratio the larger the net benefit of an implementation of the individual project is expected to be. If the costs exceed associated project benefits, i.e. **the B/C ratio is lower than one**, then **the project will be considered non-compliant** with the general eligibility criterion set out by the TEN-E Regulation, in line with the practice in the Energy Community during the previous PECI selection processes. A residual value of the project under consideration is considered zero after 25 years of exploitation, also in line with ENTSO-E CBA 4.0 methodology.

For projects **with B/C ratio higher than one**, points will be allocated to enable project ranking under the same infrastructure category. Namely, it is expected that only projects with a B/C ratio above one (or a positive NPV) are expected to generate a net benefit for the CPs. The maximum points that a project can receive based on **the B/C ratio is 20**, as presented in the following table.

Table 8 Possible points for B/C ratio of the project

Range of B/C ratio value	Points
1	10
1-2	11
2-3	12
3-4	13
4-5	14
5-6	15
6-7	16
7-8	17
8-9	18
9-10	19
>10	20

System stability

System stability refers to non-monetized indicator which shows quantitatively how much the project supports the voltage stability, transient stability and frequency stability. It is presented with the following values:

- '0' – no change: the technology/project has no (or just marginal) impact on the respective indicator,
- '+' - small to moderate improvement: the technology/project has only a small impact on the respective indicator,
- '++' - significant improvement: the technology/project has a large impact on the respective indicator.

Project promoters had to fill in the specified data regarding the system stability for electricity transmission projects in project questionnaires. Where there is no change in the indicator, there will be no assigned points. According to the 4th ENTSO-E Guideline for Cost-Benefit Analysis of Grid Development Projects, qualitative indicators specified for impact on system stability show that a maximum of five '+' can be assigned to a certain technology. Thus, for small to moderate impact on system's stability ('+'), a 0.4 points will be assigned, and for significant impact ('++'), 0.8. points will be assigned. Thus, theoretically, a project that has a maximum impact of 5 '+' can be assigned with maximum of **2 points** (5*0.4).

Project maturity

Project maturity will also participate in the final scoring of each eligible project. Project maturity will be determined based on the data about the status/completion of project development phases delivered by the project promoters through project questionnaires. All project development phases are presented in Table 9. For the completion of each project development phase a score of 0.5 point is assigned. **A maximum of 5 points** can be received for completion of all project phases before the construction. This indicator serves the more mature projects to be additionally awarded and prioritised comparing with less mature projects.

Table 9 Project development phases and possible points based on the phase completion

Project development phase	Possible points for phase completion
Prefeasibility study	0.5
Technical feasibility study	0.5
Economic feasibility study (Cost-benefit analysis)	0.5
Environmental impact assessment	0.5
Detailed design study	0.5
Resloved financing	0.5
Obtained approvals/permits	0.5
Approval by regulatory authority	0.5
Final investment decision	0.5
Tendering procedure	0.5

3.4.2 Energy storage

The benefits that will be calculated in the project assessment process for one eligible energy storage project refer to monetised, and non-monetised indicators presented in Figure 21.

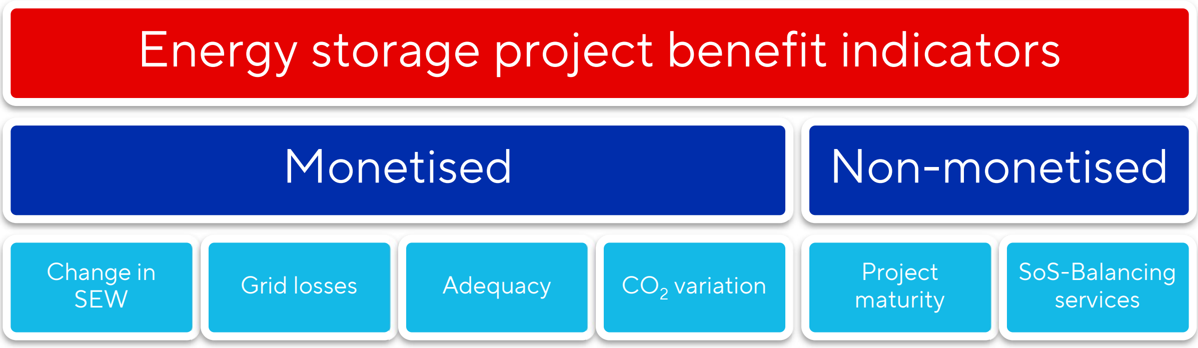

Figure 21 Monetised and non-monetised project assessment indicators – energy storage

All the monetised indicators (change in SEW, grid losses, CO_2 variation, adequacy) are the same as in the case of electricity transmission lines described in previous section. With regard to non-monetised indicators, project maturity will also be determined in the same manner as for the transmission projects. The only difference in project assessment is the Security of Supply indicator which is measured for energy storage projects through provision of balancing services. This indicator will be scored with a **maximum of 2 points**.

3.5 Relative ranking of projects

Based on the calculated total scores of each individual project **a relative ranking of all eligible projects** will be provided as the final output of the assessment. The candidate project will be ranked if it proves that its overall benefits outweigh its costs. For electricity transmission overhead lines and energy storage projects, a maximum of **27 points** can be assigned based on the indicator scoring presented in previous sections and summarized in the table below. The projects will be ranked from top to bottom in line with the total score, e.g. from 27 points to 10 points (which is a threshold for a project to be economically viable, e.g. to have B/C > 1). The ranking should be done separately for the transmission and storage projects. However, there is only one energy storage project eligible for CBA and MCA, thus the scores will be assigned to this project but there will be no ranking in this infrastructure category.

Table 10 Maximum points per each benefit indicator for ranking of electricity transmission and energy storage projects

Indicator	Maximum points
B/C ratio	20
SoS - System stability (OHL) or Balancing services (Storage)	2
Project maturity	5
TOTAL	**27**

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