

# **Selection of Projects of Energy Community Interest (PECI)s and Projects of Mutual Interest (PMI)s**

**1st Meeting of the Electricity and Gas Groups**

**Proposed Assessment Methodology and Data collection**

**Presentation REKK / DNV GL**

**Vienna 30.01.2020**

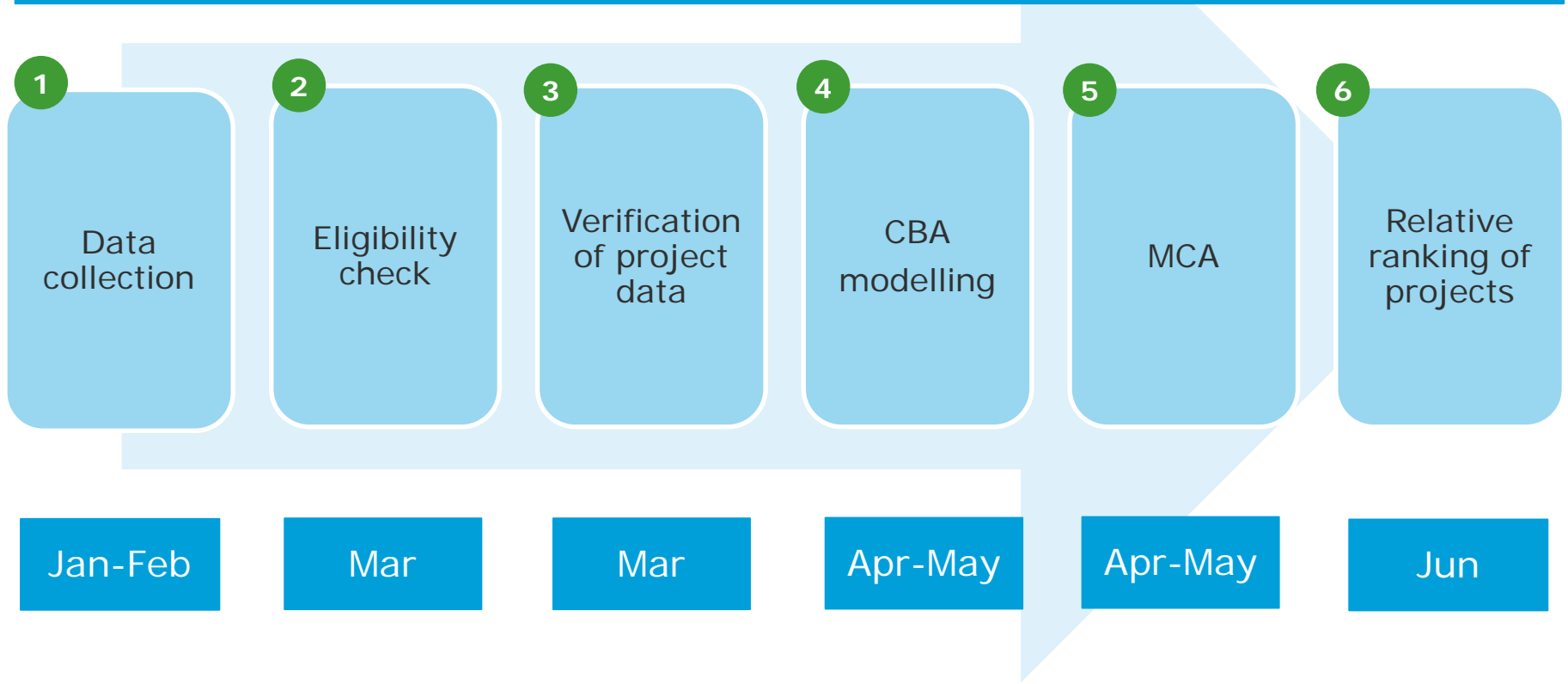
# Agenda

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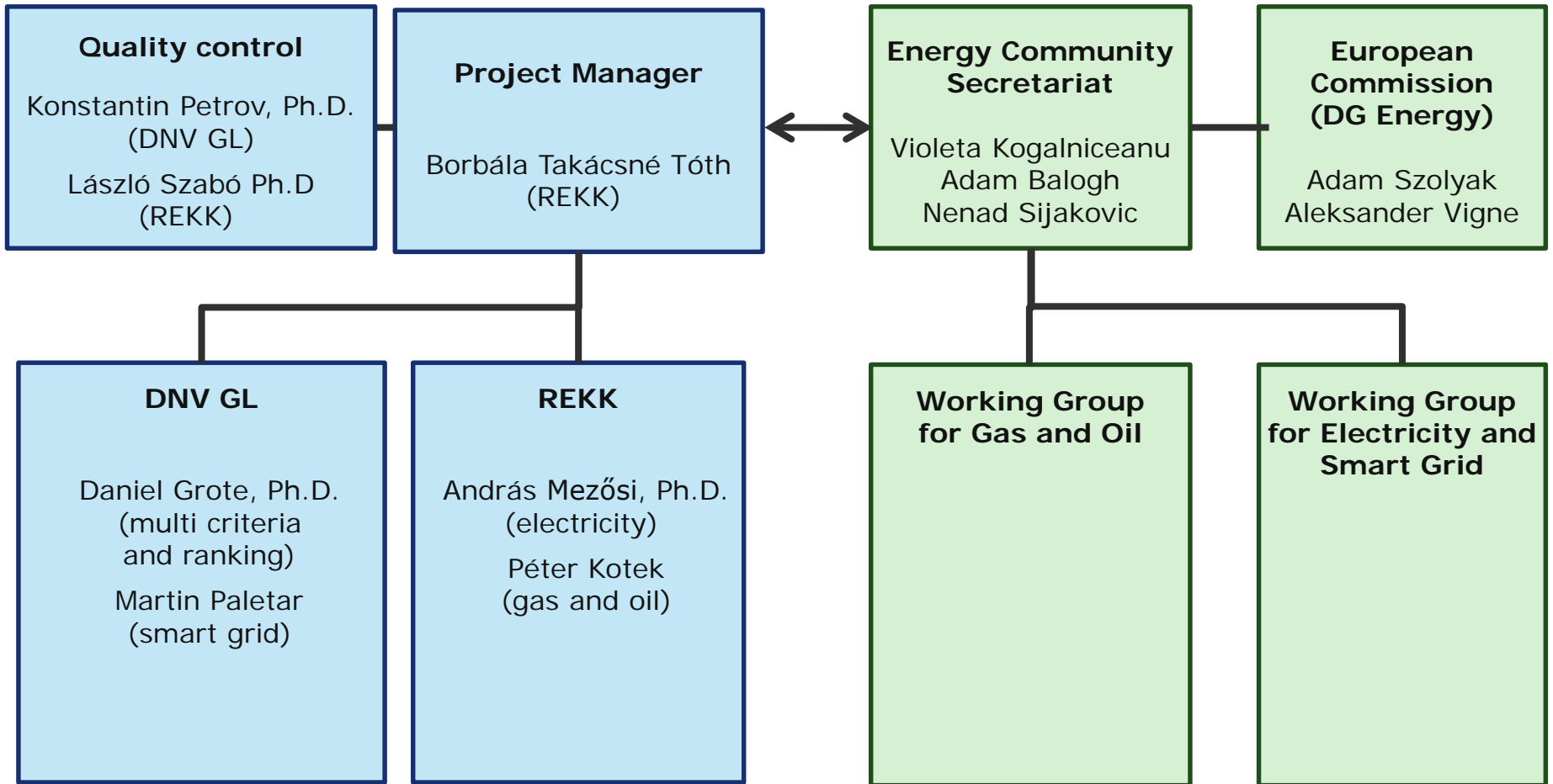
1. Overview of general project assessment methodology
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4. Scenarios & Country specific data

# Project Workflow

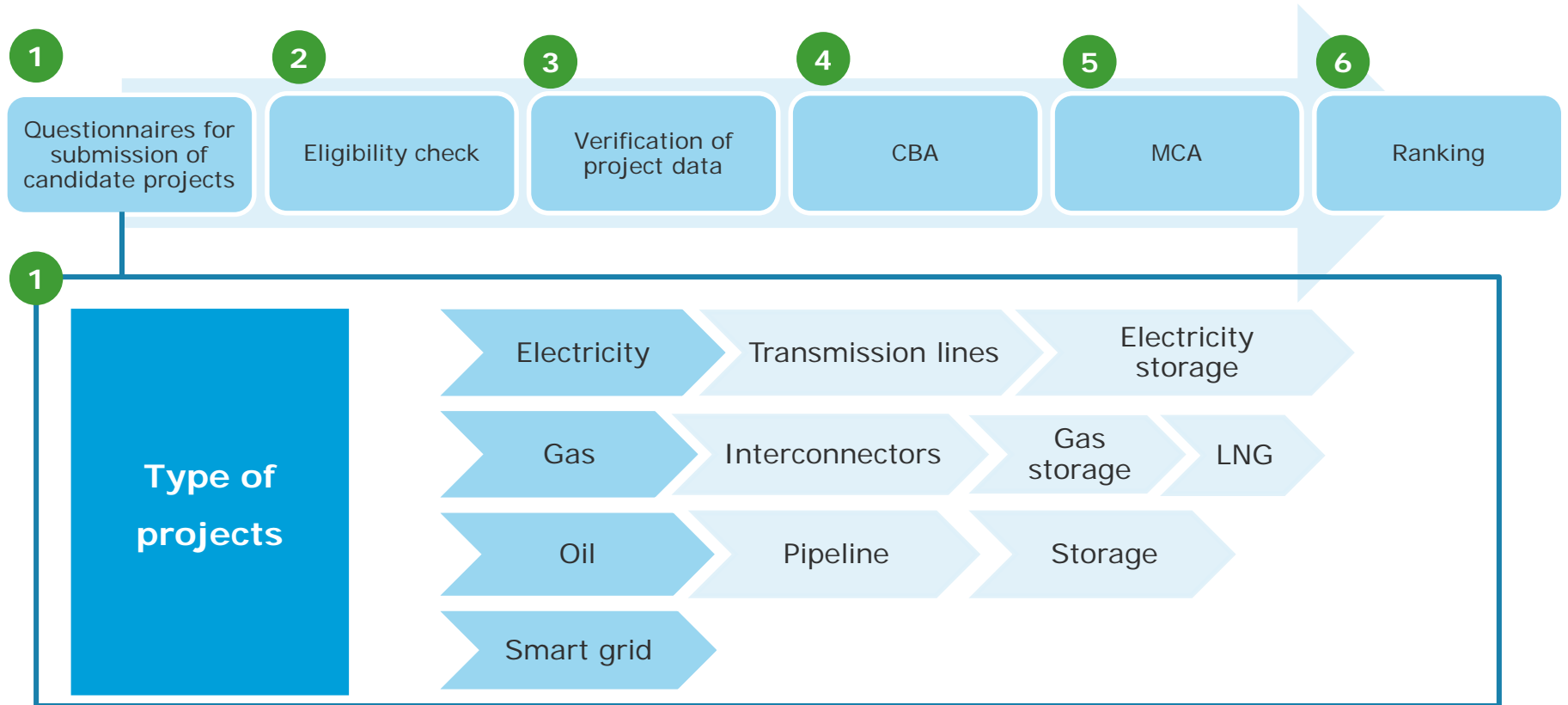
**Project Objective:** To assess the candidate projects for electricity, gas and oil infrastructure, as well as for smart grids, in order to be able to identify those which would bring the largest benefits for the Energy Community



# Project Team

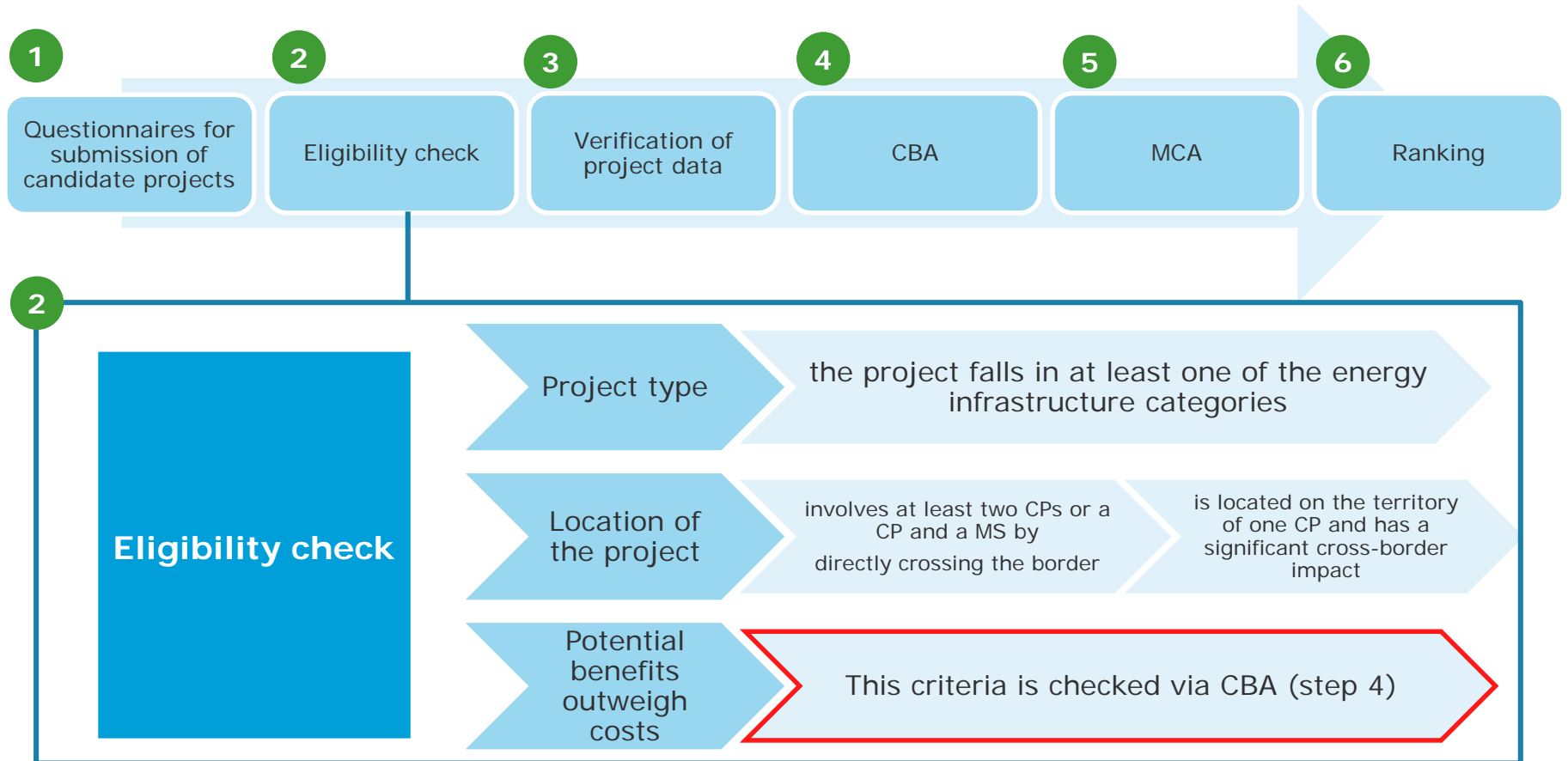


# Step 1 – Questionnaires for Submissions of Candidate Projects



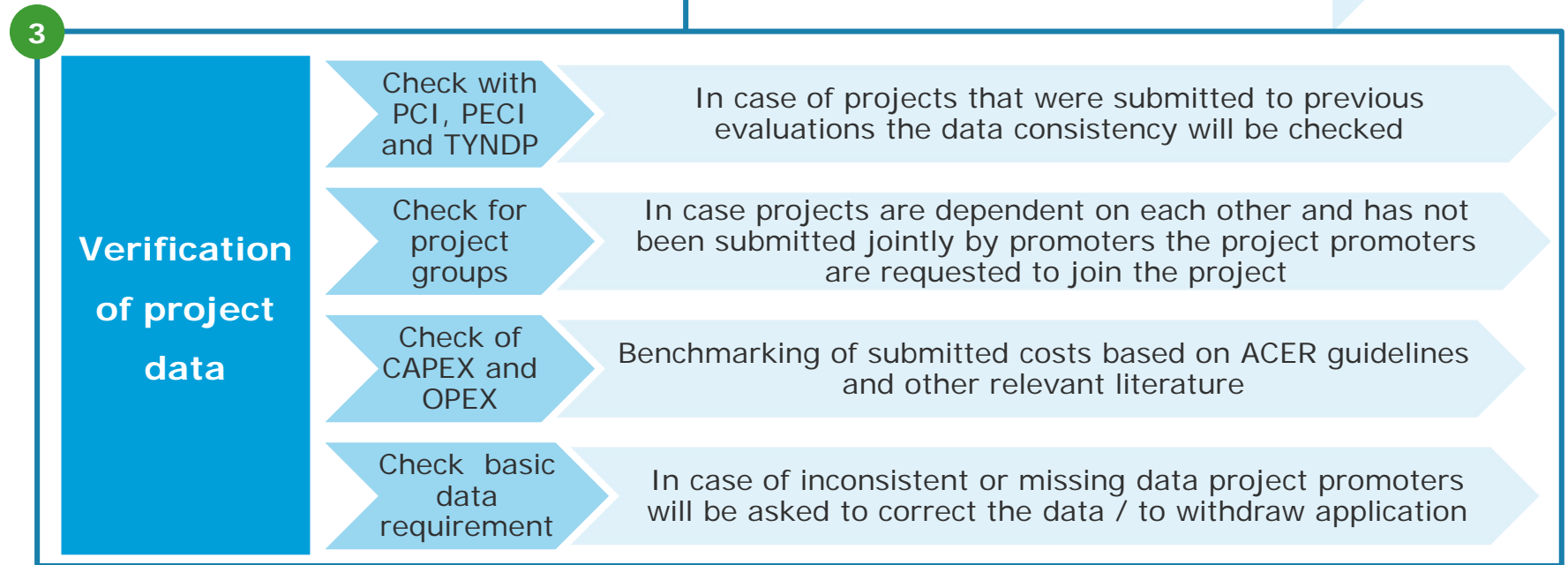
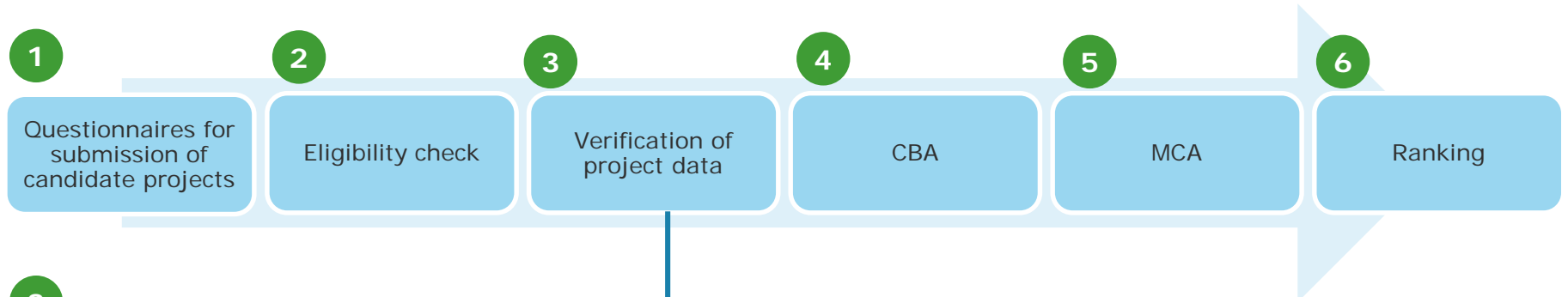
- Interconnector projects on the two side of the borders can only be modelled together
- Project promoters are hence requested to submit proposals jointly for the same project
- Without basic project data submission is not accepted

## Step 2 – Eligibility Check



All eligible projects will be evaluated according to the same approach. The project label will be decided on in the final step of the decision making: selected projects will qualify as a PECEI or as a Project of Mutual interest. (Art 4 para 5 and 6.)

# Step 3 – Verification of Project Data



Key data needed for project assessment: capacity, cost, commissioning date

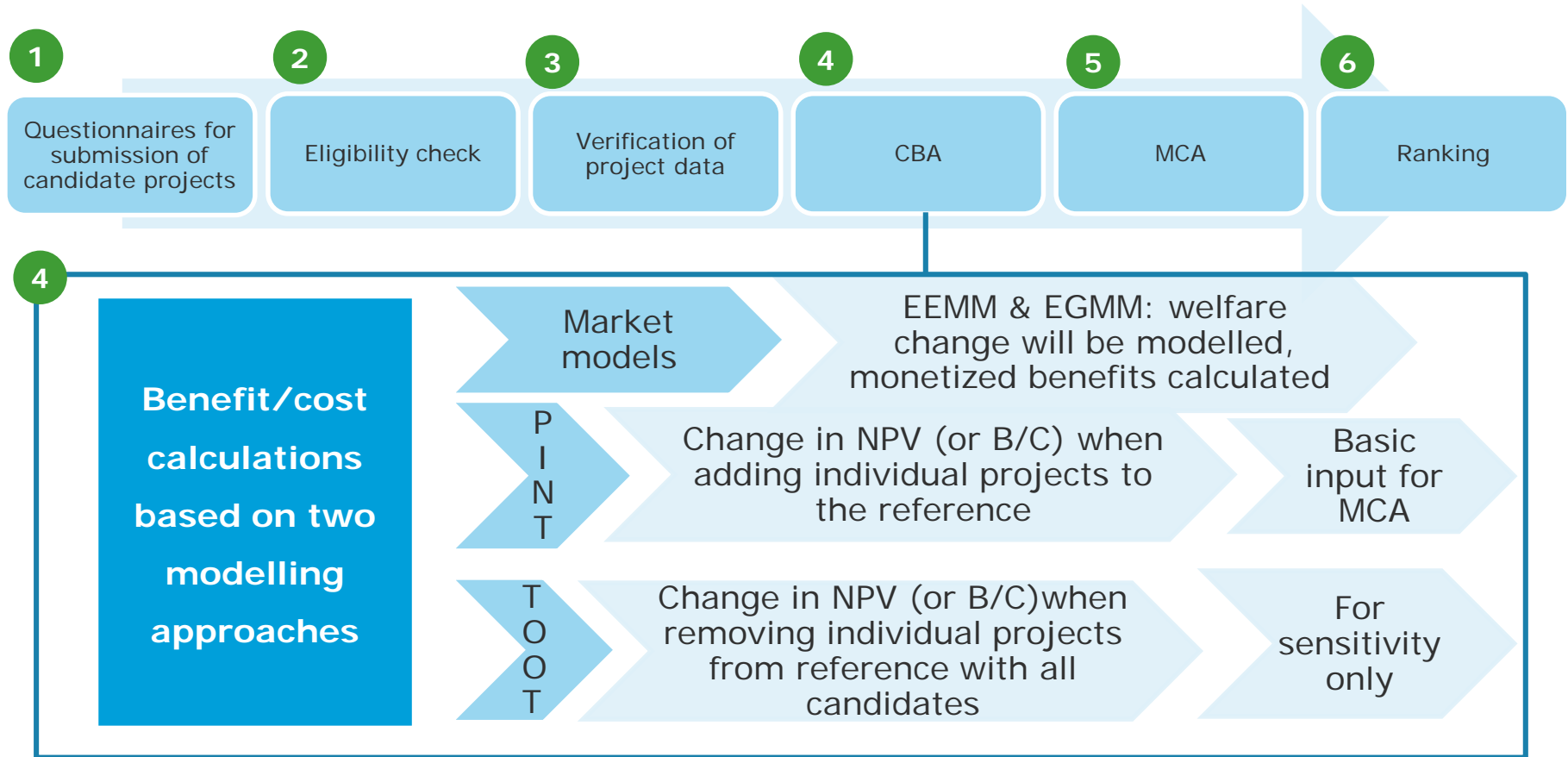
## Step 4 – Cost-Benefit Analysis

An investment project would be beneficial to the investigated stakeholder group if the cost-benefit analysis provides a positive net benefit (i.e.  $B/C > 1$ )

- Costs and benefits of a project are assessed in the economic analysis by the Net Present Value (NPV) OR Benefit/Cost (B/C) ratio
- Calculation of the Net Present Value (NPV) and Benefit/Cost ratio of economic costs and benefits includes
  - the monetary costs and benefits of the investor
  - the costs and benefits to other stakeholders and the society as a whole affected by an investment project
- (Economic) NPV is the difference between the discounted total social benefits and costs
- Economic assessment of a project is positive if the NPV is positive ( $NPV > 0$ ) OR if the  $B/C > 1$



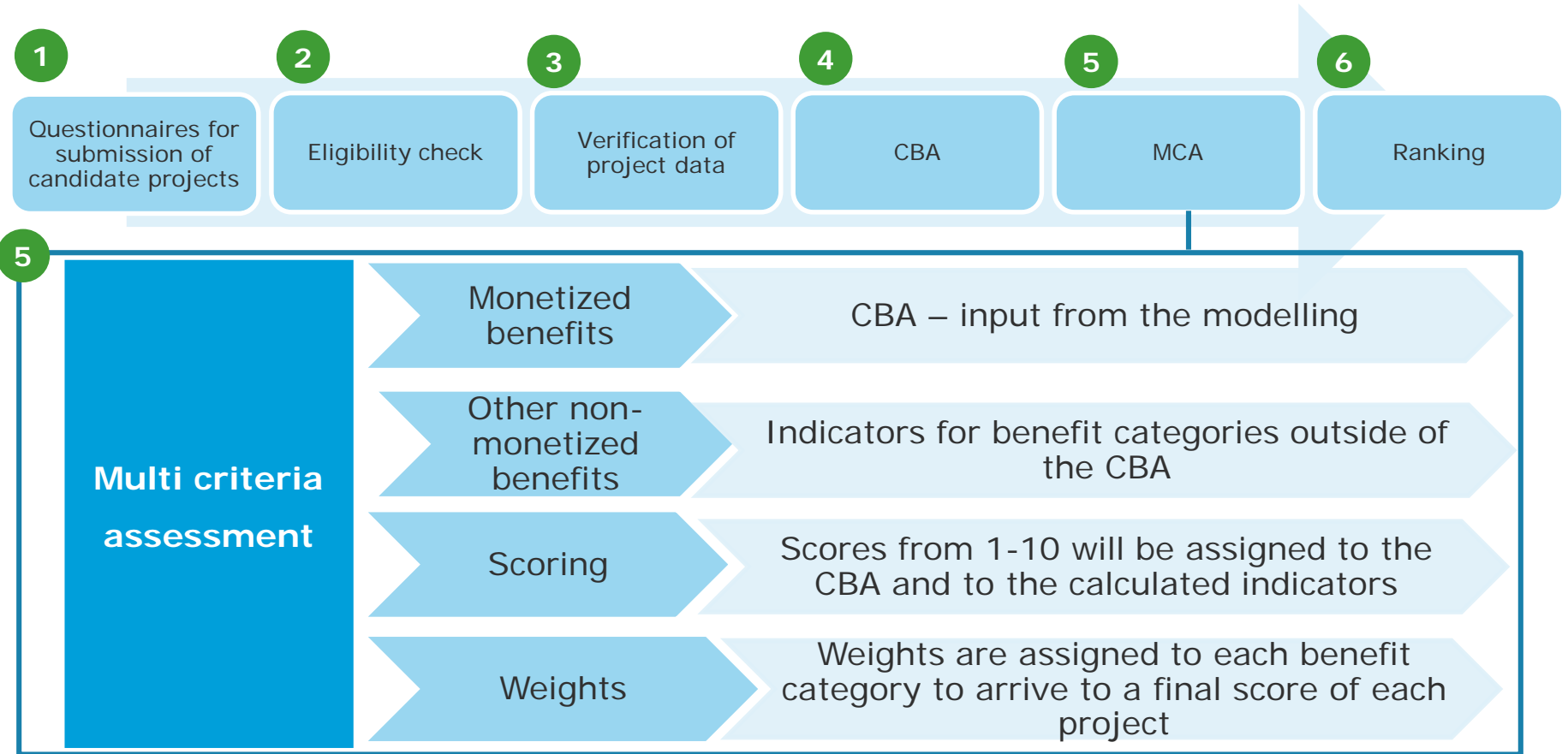
## Step 4 – Cost-Benefit Analysis



Cost-benefit analysis of the project: social NPV of the project calculated for the region

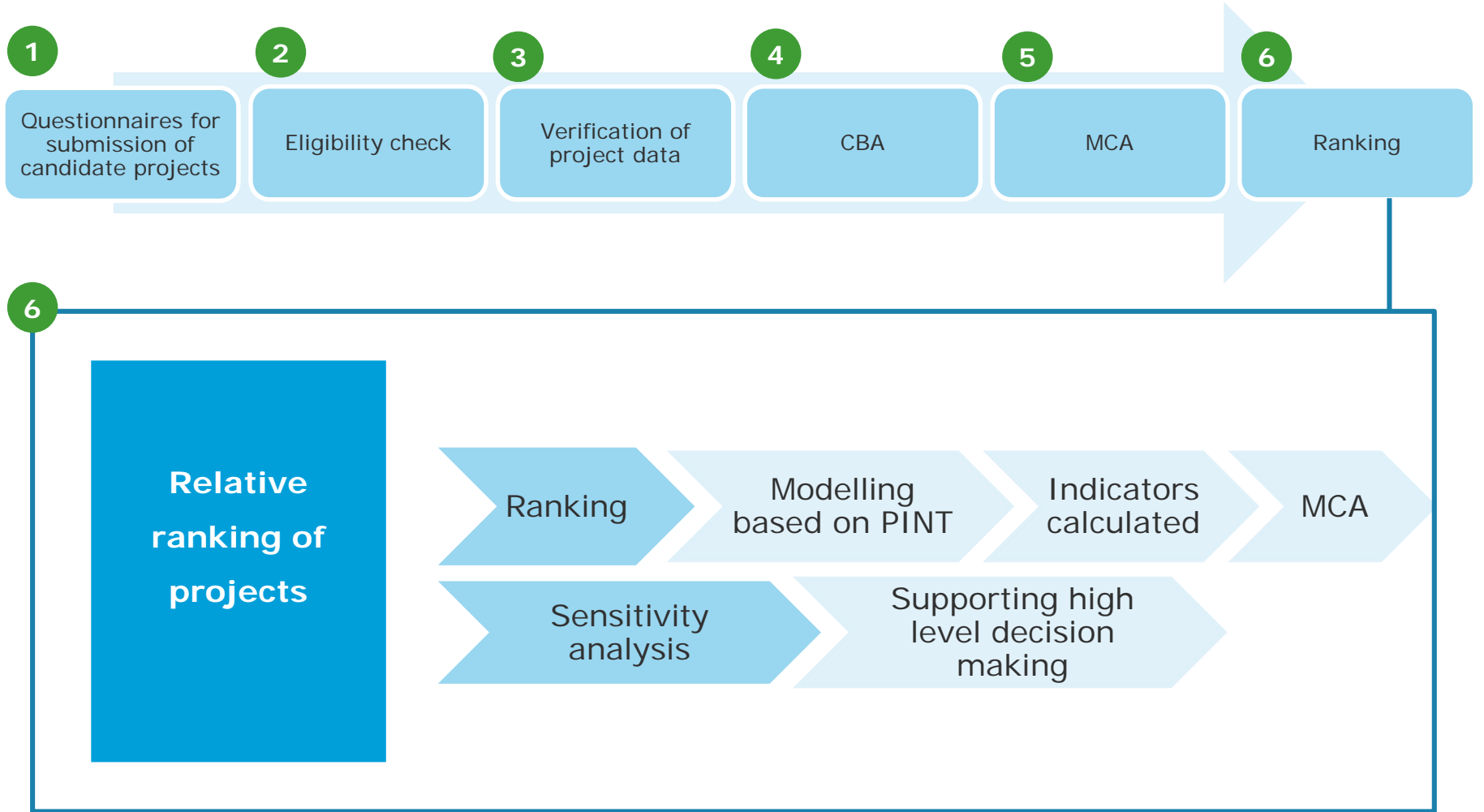
- PINT: put-in-one-at-a-time modelling
- TOOT: take-out-one-at-a-time modelling

## Step 5 – Multi Criteria Assessment



- MCA allows integration of monetized benefits (result of CBA) with non-monetized benefits (assessment of additional quantitative and qualitative criteria)
- Outcome will be a relative ranking of all eligible projects (separate for electricity and gas projects)

# Step 6 – Relative Ranking

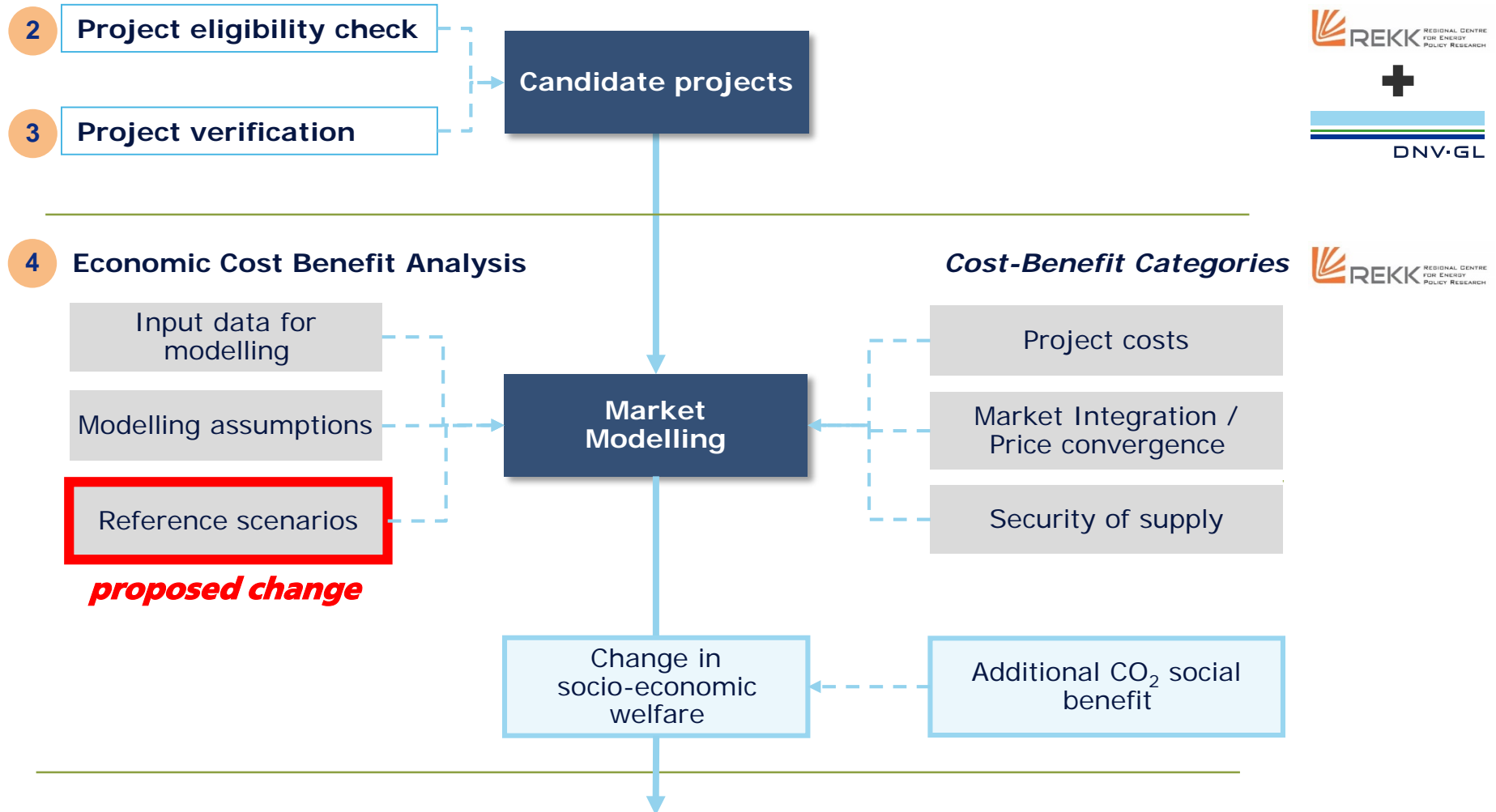


# Agenda

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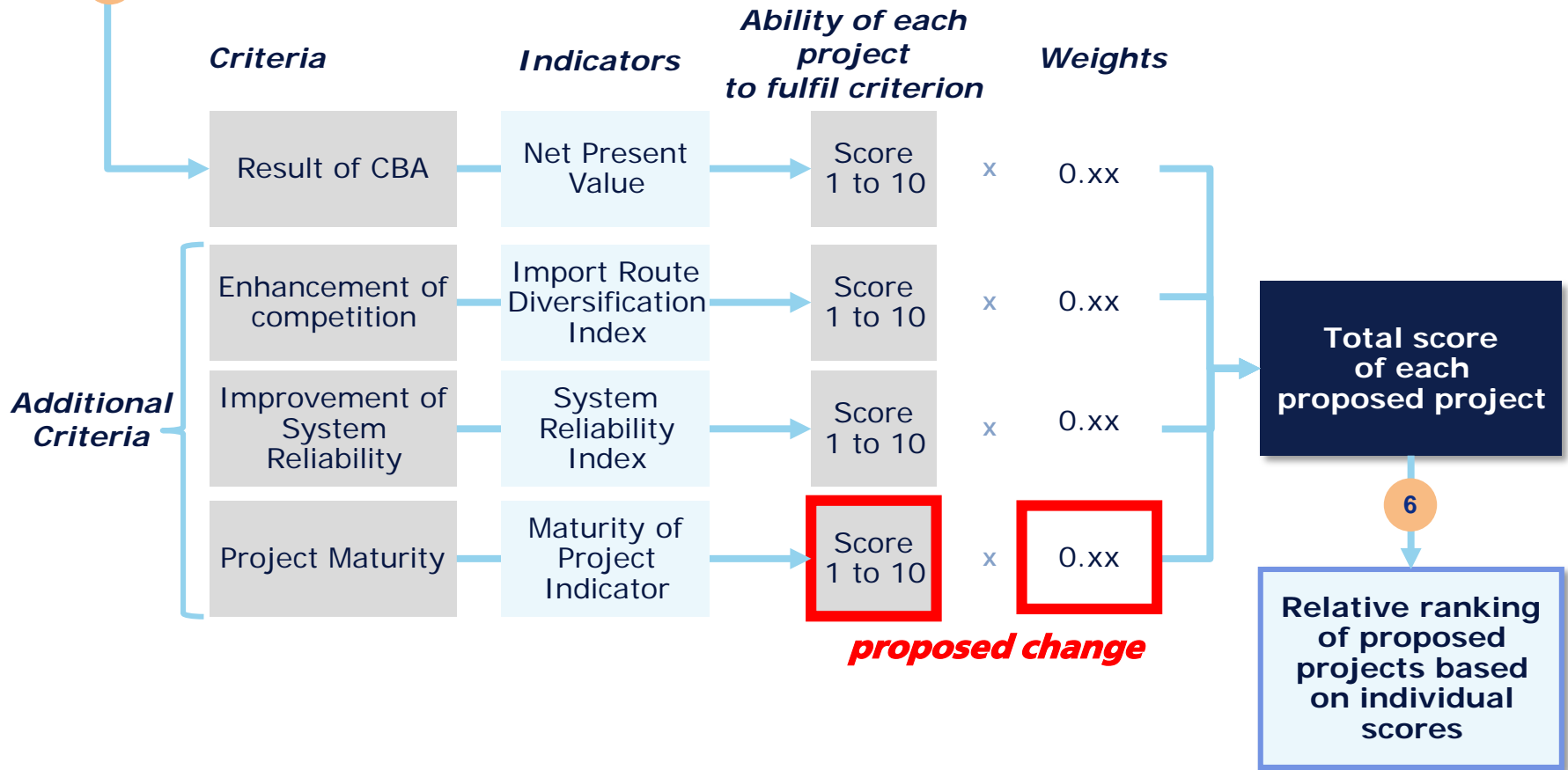
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# Overview of the Project Assessment Methodology for Gas



# Overview of the Project Assessment Methodology for Gas

## 5 Multi-Criteria Assessment



## Scenario assessment – What for?

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- To reflect that there are serious uncertainties in the future energy system developments
  - Technology
  - Policy
- A well defined shared vision is needed to design the scenarios
- To help decision making on the projects: if they perform well in all scenarios, no doubt that they are needed

## Challenges for the PECE/PMI scenario assessment

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- No top-down consistent modelling exists for the region that could provide us the input for the scenarios (Primes/ Times will come, but not available at the moment)
- ENTSOs storylines do not fit the Balcans (Distributed Energy and Global Ambition no GAS PECE shall be submitted)
- This project runs for 6 month and there is no time devoted for detailed story line building
- Data collection for even a „best estimate“ scenario was a challenge in the previous rounds – therefore we used more sensitivities on demand estimates
- GOAL: Try to assemble one BAU and additionally a more ambitious Green scenario
- What are the options?
  - Ask for input data on selected scenarios of the ENTSOs – in progress
  - Use available latest TYNDP 2018 data on EU and those contracted parties that are included
  - Try to fill up the gaps with primary data collection from the Groups



# Scenario assessment - GAS

*Weights*

*Scores*

*Weights*

0.50 x

Green Path (top down)

Region reduced  
Low I NG  
High I NG  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

0.50 x

Country estimate  
PECI/PMI data  
(Bottom up)

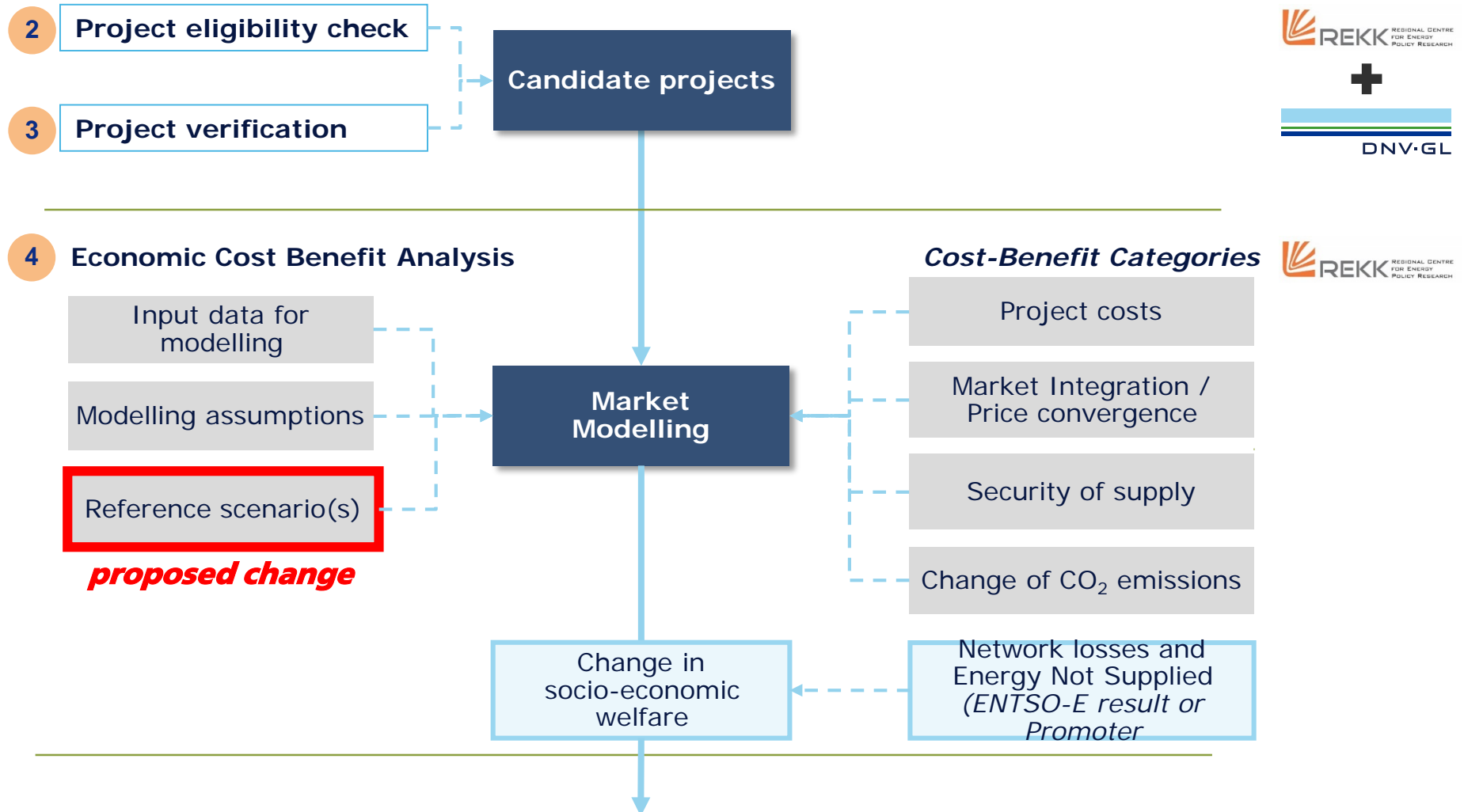
Region reduced  
Low I NG  
High I NG  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

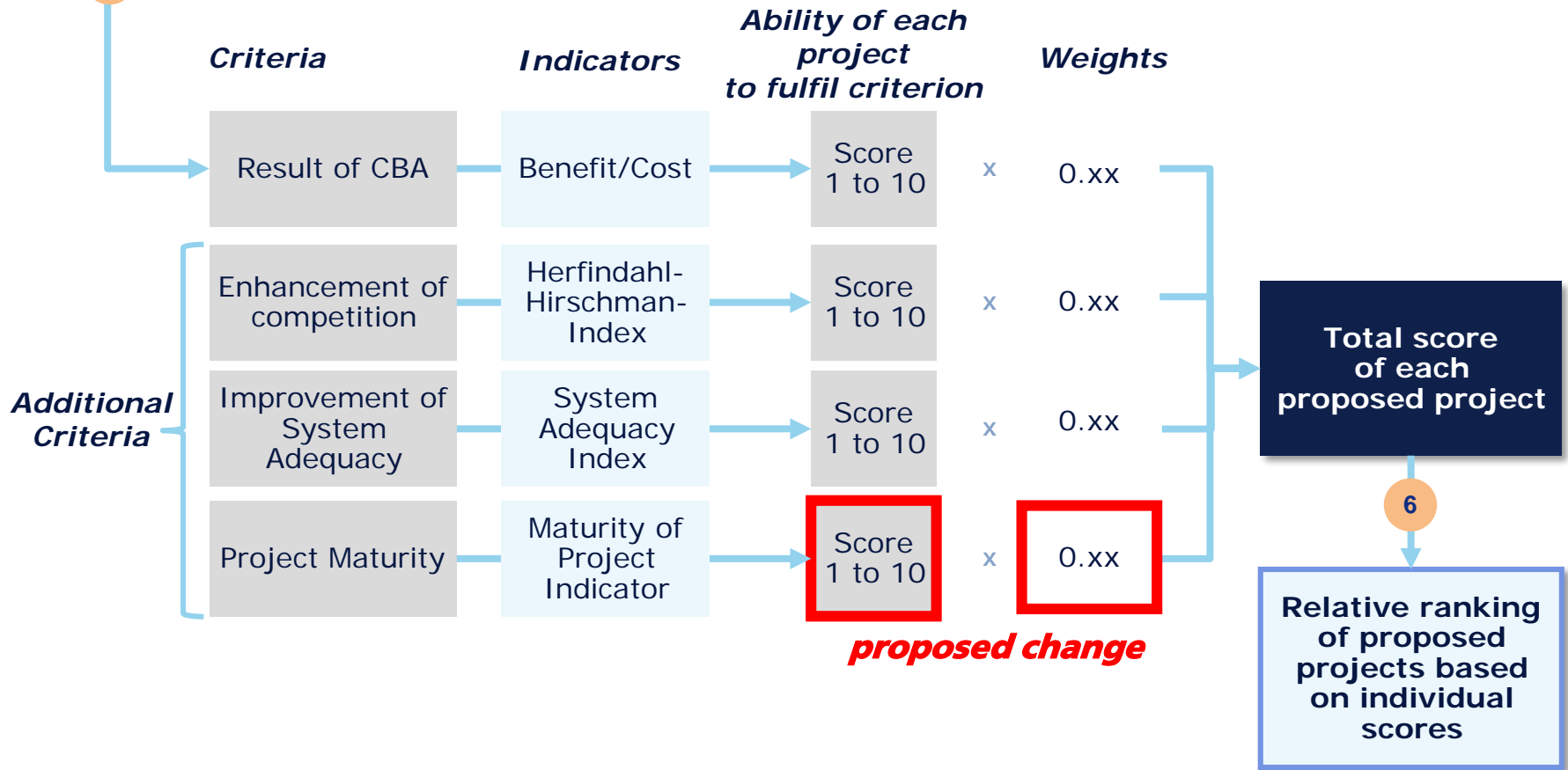
**Total score  
of each  
proposed  
project**

# Overview of the Project Assessment Methodology for Electricity



# Overview of the Project Assessment Methodology for Electricity

## 5 Multi-Criteria Assessment



# Scenario assessment - electricity

**Weights**

**Scores**

**Weights**

0.33 x

ENTSOs  
National Trends

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

0.33 x

SEERMAP

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

**Total score  
of each  
proposed  
project**

0.33 x

Country estimate  
PECI/PMI data  
(Bottom up)

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

# Scenario assessment - electricity

**Weights**

**Scores**

**Weights**

0.2 x

ENTSOs  
National Trends

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

0.6 x

SEERMAP

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

**Total score  
of each  
proposed  
project**

0.2 x

Country estimate  
PECI/PMI data  
(Bottom up)

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

# Adjustment to the Assessment of Project Maturity for Electricity (I)

Observation that several investment projects have been proposed for many years, but not made significant progress in implementation

- Hardly any PECE candidate project assessed in 2016 and/or 2018 has made significant progress (although slightly different evaluation of maturity in each assessment comparison)
- Many projects have dropped out altogether without any progress

## Adjustment of weights

<i>Indicators</i>	<i>Weights</i>	
	2018	2020
Net Present Value	60%	60%
System Adequacy Index	15%	15%
Herfindahl-Hirschman-Index	15%	10%
Implementation Progress Indicator	10%	15%

## Adjustment of scoring

- A score of 1 is assigned for each project implementation step already undertaken by a project in 2020 (i.e. IPI score between 1-10)
- IPI score is reduced by 10 points in case no progress is observed compared to previous assessment in 2018

## Adjustment to the Assessment of Project Maturity for Electricity (II)

### Example Calculation 2018 Assessment

Project	Indicators (Scores)				Weights				Total Score	Ranking
	B/C Ratio	SAI	HHI	IPI	B/C Ratio	SAI	HHI	IPI		
P 1	10	1	5.78	1	60%	15%	15%	10%	7.12	2
P 2	1	3.77	1	2	60%	15%	15%	10%	1.52	4
P 3	4.6	10	10	5	60%	15%	15%	10%	6.26	3
<b>P 4</b>	<b>8.6</b>	<b>6.5</b>	<b>4.9</b>	<b>5</b>	<b>60%</b>	<b>15%</b>	<b>15%</b>	<b>10%</b>	7.35	<b>1</b>

### Example Calculation 2020 Assessment (Proposal)

Project	Indicators (Scores)				Weights				Total Score	Ranking
	B/C Ratio	SAI	HHI	IPI	B/C Ratio	SAI	HHI	IPI		
P 5	10	1	5.78	1	60%	15%	10%	15%	6.88	1
P 6	1	3.77	1	2	60%	15%	10%	15%	1.57	4
P 7	4.6	10	10	5	60%	15%	10%	15%	6.01	2
<b>P 4</b>	<b>8.6</b>	<b>6.5</b>	<b>4.9</b>	<b>-5</b>	<b>60%</b>	<b>15%</b>	<b>10%</b>	<b>15%</b>	5.86	<b>3</b>

# Adjustment to the Assessment of Project Maturity for Gas (I)

Observation that several investment projects have been proposed for many years, but not made significant progress in implementation

- Hardly any PECE candidate project assessed in 2016 and/or 2018 has made significant progress (although slightly different evaluation of maturity in each assessment comparison)
- Many projects have dropped out altogether without any progress

## Adjustment of weights

<i>Indicators</i>	<i>Weights</i>	
	2018	2020
Net Present Value	60%	60%
System Reliability Index	18%	15%
Import Route Diversification Index	12%	10%
Implementation Progress Indicator	10%	15%

## Adjustment of scoring

- A score of 1 is assigned for each project implementation step already undertaken by a project in 2020 (i.e. IPI score between 1-10)
- IPI score is reduced by 10 points in case no progress is observed compared to previous assessment in 2018



## Adjustment to the Assessment of Project Maturity for Gas (II)

### Example Calculation 2018 Assessment

Project	Indicators (Scores)				Weights				Total Score	Ranking
	B/C Ratio	SRI	IRD	IPI	B/C Ratio	SRI	IRD	IPI		
P 1	10	1	5.78	2	60%	18%	12%	10%	7.07	1
P 2	1	3.77	1	3	60%	18%	12%	10%	1.7	4
P 3	5.6	10	10	4	60%	18%	12%	10%	6.76	3
<b>P 4</b>	<b>7.6</b>	<b>6.5</b>	<b>6.9</b>	<b>3</b>	<b>60%</b>	<b>18%</b>	<b>12%</b>	<b>10%</b>	6.84	<b>2</b>

### Example Calculation 2020 Assessment (Proposal)

Project	Indicators (Scores)				Weights				Total Score	Ranking
	B/C Ratio	SRI	IRD	IPI	B/C Ratio	SRI	IRD	IPI		
P 5	10	1	5.78	2	60%	15%	10%	15%	7.03	1
P 6	1	3.77	1	3	60%	15%	10%	15%	1.72	4
P 7	5.6	10	10	4	60%	15%	10%	15%	6.46	2
<b>P 4</b>	<b>7.6</b>	<b>6.5</b>	<b>6.9</b>	<b>-7</b>	<b>60%</b>	<b>15%</b>	<b>10%</b>	<b>15%</b>	5.16	<b>3</b>

# Agenda

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# Assessment of Smart Grid Projects – Eligibility Check (I)

In order to be considered as potential PECIs/PMIs, smart grid projects need to meet a number of criteria (Regulation 347/2013 as adopted for the Energy Community)

## Eligibility Criteria

**A** Cross-border project (directly crossing border)

or

**B** Has significant cross-border impact, which is given if project:

**1** Is implemented at a voltage level of 10kV or more

**2** Involves at least two Contracting Parties

**3** Involves transmission and distribution system operators

**4** Covers at least 50,000 users (producers, consumers and prosumers)

**5** Focuses on a consumption area of at least 300 GWh/year, of which at least 20% originate from non-dispatchable resources

## Assessment of Smart Grid Projects – Eligibility Check (II)

### Priority thematic area:

- ➔ efficiently integrate behaviour and actions of all users connected to electricity network, in particular generation of large amounts of electricity from renewable or distributed energy sources and demand response by consumers

Project also needs to show significant contribution to **all** of the following specific criteria:

### Specific Criteria

- 1 Integration and involvement of network users with new technical requirements with regard to their electricity supply and demand
- 2 Efficiency and interoperability of electricity transmission and distribution in day-to-day network operation
- 3 Network security, system control and quality of supply
- 4 Optimized planning of future cost-efficient network investments
- 5 Market functioning and customer services
- 6 Involvement of users in the management of their energy usage

## Assessment of Smart Grid Projects – Proposed Methodology

Proposed assessment methodology is based on:

- Regulation 347/2013 as adopted for the Energy Community
- the assessment framework of the EU Joint Research Center (JRC), applied for identification of Projects of Common Interest (PCIs) on EU level
- the approach of our previous PECE/PMI assessments

Evaluation of Key Performance Indicators (KPIs) reflecting various benefits associated with smart grid projects derived from evaluation criteria of Regulation 347/2013

- KPIs will cover the following dimensions:
  - level of sustainability (e.g. reduction of CO<sub>2</sub> emissions and environmental impact)
  - capacity of transmission and distribution grids (e.g. facilitate integration of renewables and reduction of congestion)
  - network connectivity (e.g. enabling time-dependent tariffs and charges)
  - security and quality of supply (e.g. higher reserve margin and reduction of interruptions)
  - efficiency and service quality (e.g. reduction of network losses, enabling demand side participation, improvement of energy efficiency)
  - contribution to cross-border electricity markets (e.g. alleviate loop-flows and increase interconnection capacities)
- based on specific smart grid questionnaire; up to project promoters to build a convincing case for their project according to specific criteria set by Regulation 347/2013 and availability of data

## Assessment of Oil Projects – eligibility check

### Evaluation

- The proposed methodology is based on our previous PEI project assessment and on the ministerial decision 2015/09/MC-EnC adopting 347/2013 Regulation
- We suggest to follow this approach and evaluate oil projects taking into account eligibility **and specific criteria**

### Eligible project categories

#### ANNEX I. (3)

1. Pipelines used to transport crude oil
2. Pumping stations and storage facilities necessary for the operation of crude oil pipelines;
3. Any equipment or installation essential for the system in question to operate properly, securely and efficiently, including protection, monitoring and control systems and reverse flow devices

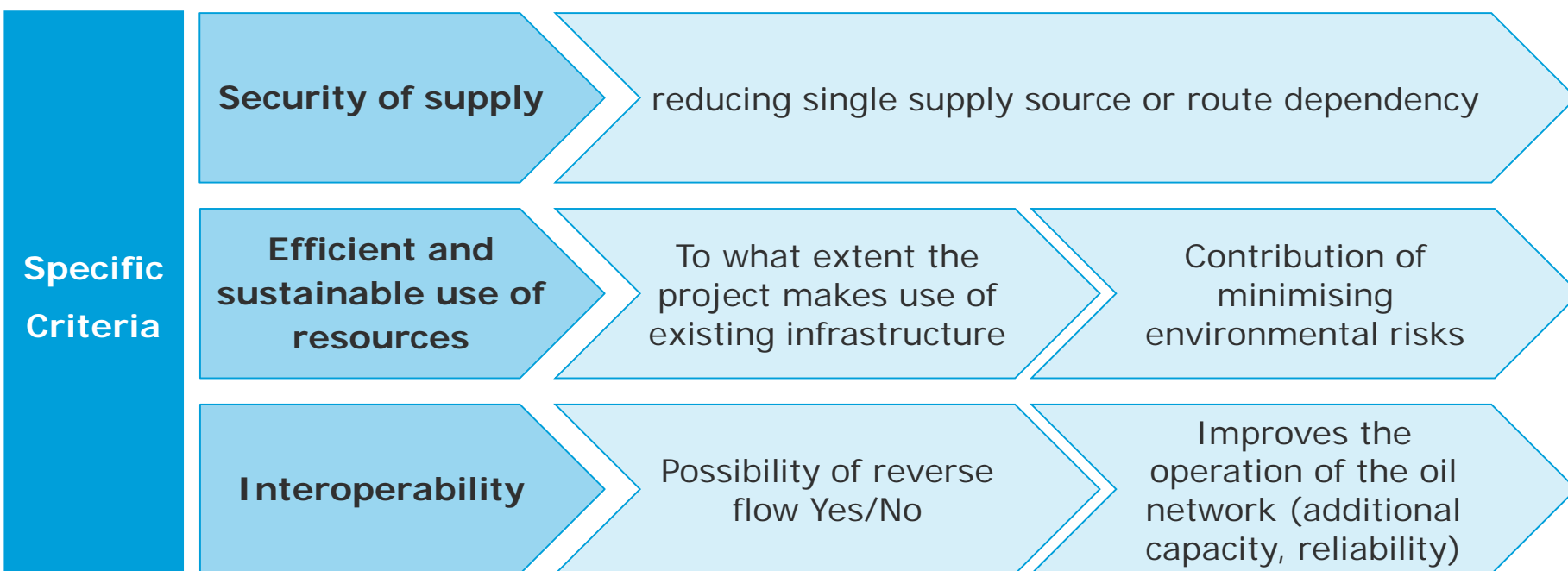
### Geographical eligibility criteria

#### Art. 4. 1(c )

1. Directly crossing the border: involves at least two CPs; or a CP and an MS or more
2. Located in one CP only, but has a significant cross-border impact

## Assessment of Oil Projects

Art. 4.2. (d) and ANNEX III (5) of Ministerial Decision 2015/09/MC-EnC adopting 347/2013 Regulation



# Introduction of the questionnaire

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- Electricity transmission



# Agenda

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# Scenario assessment - electricity

*Weights*

*Scores*

*Weights*

0.2 x

ENTSOs  
National Trends

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

0.6 x

SEERMAP

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

0.2 x

Country estimate  
PECI/PMI data  
(Bottom up)

Region reduced  
Low CO2  
High CO2  
Demand -  
Demand +  
Reference

x

0.10  
0.10  
0.10  
0.10  
0.50

**Total score  
of each  
proposed  
project**

# Scenario definitions

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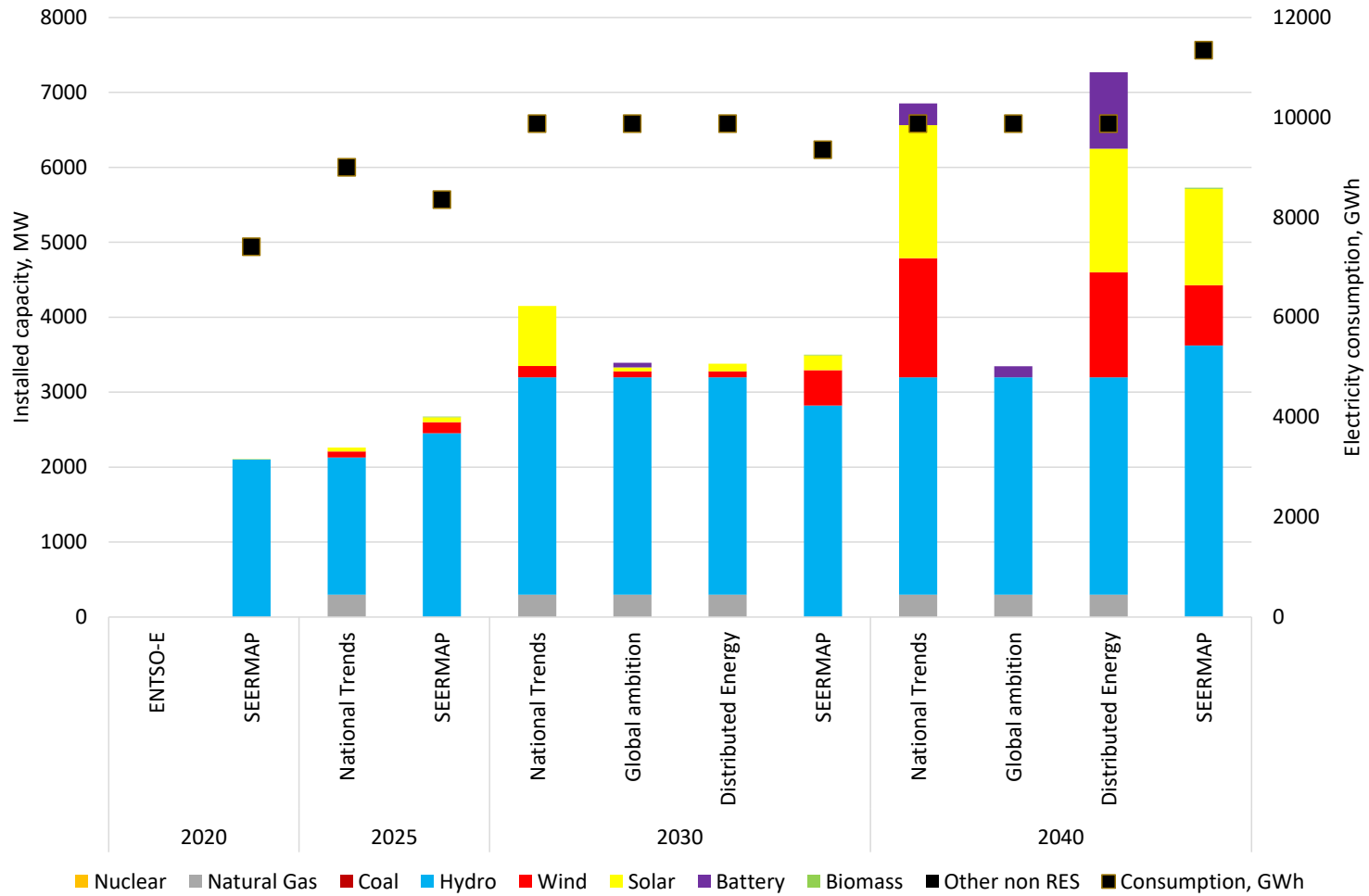
- Installed generation capacities and yearly electricity consumption -> two key input data
- Four main data source:
  - ENTSOs: three different ENTSOs vision
    - **National Trends (NT)** is the central scenario based on draft NECPs
    - Global Ambition (GA) is a scenario compliant with the 1.5° C target. It looks at a future that is led by development in centralised generation.
    - Distributed Energy (DE) is a scenario compliant with the 1.5° C target. It takes a de-centralised approach to the energy transition.
  - **SEERMAP**: South East European Electricity Roadmap -> some of the input data are updated
  - **PEPI data**: Project of Eastern Partnership Countries
  - **Country data**: Bottom-up input data based on primary data collection from the Group

## Data limitation

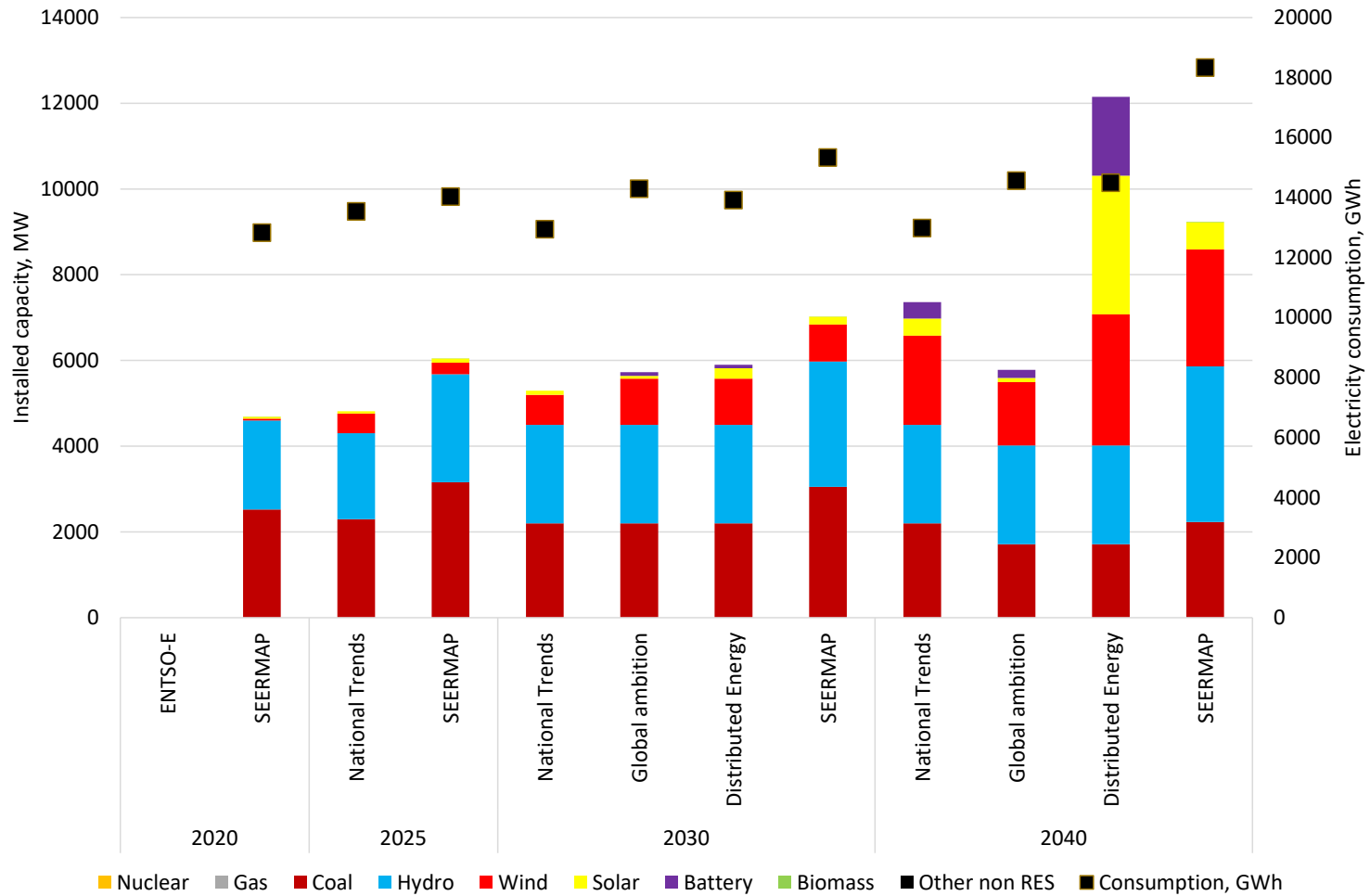
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- ENTSOe
  - ENTSOs data only from 2025
  - No data for GE, KO, MD and UA\_E
  - Only until 2040
- SEERMAP:
  - GE, MD and UA are not covered -> for these countries PEP data can be used

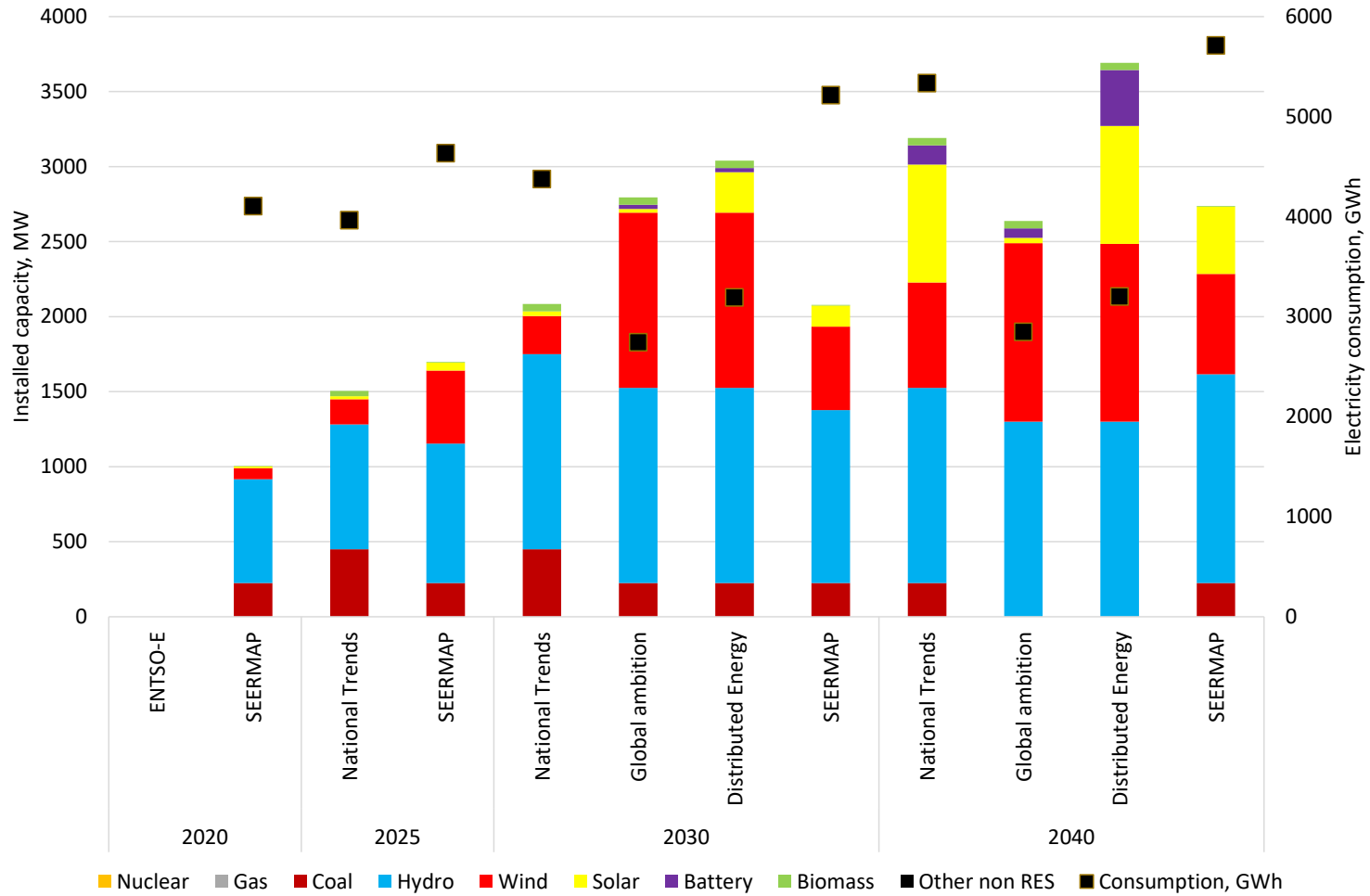
# Albania



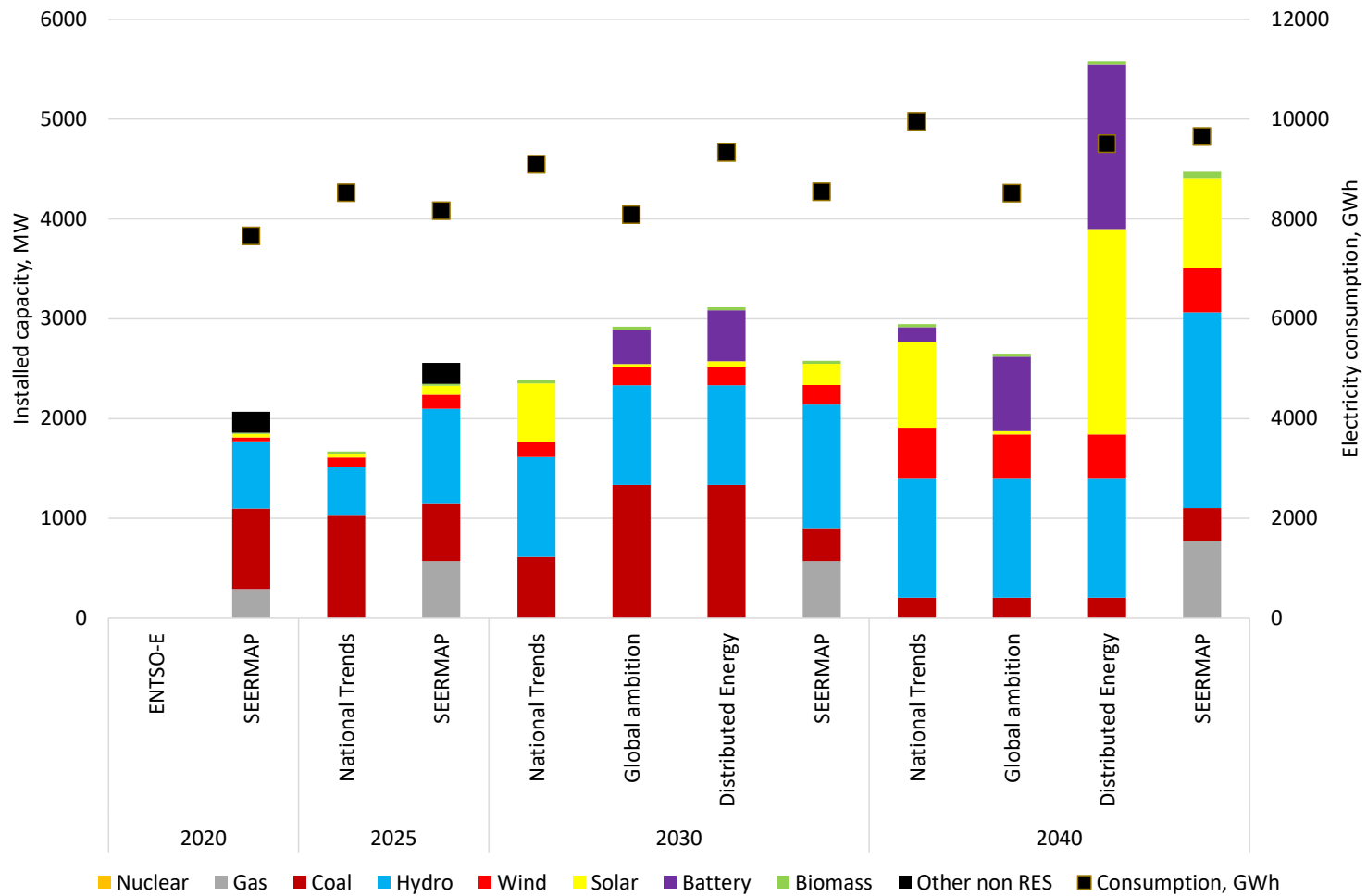
# Bosnia and Herzegovina



# Montenegro

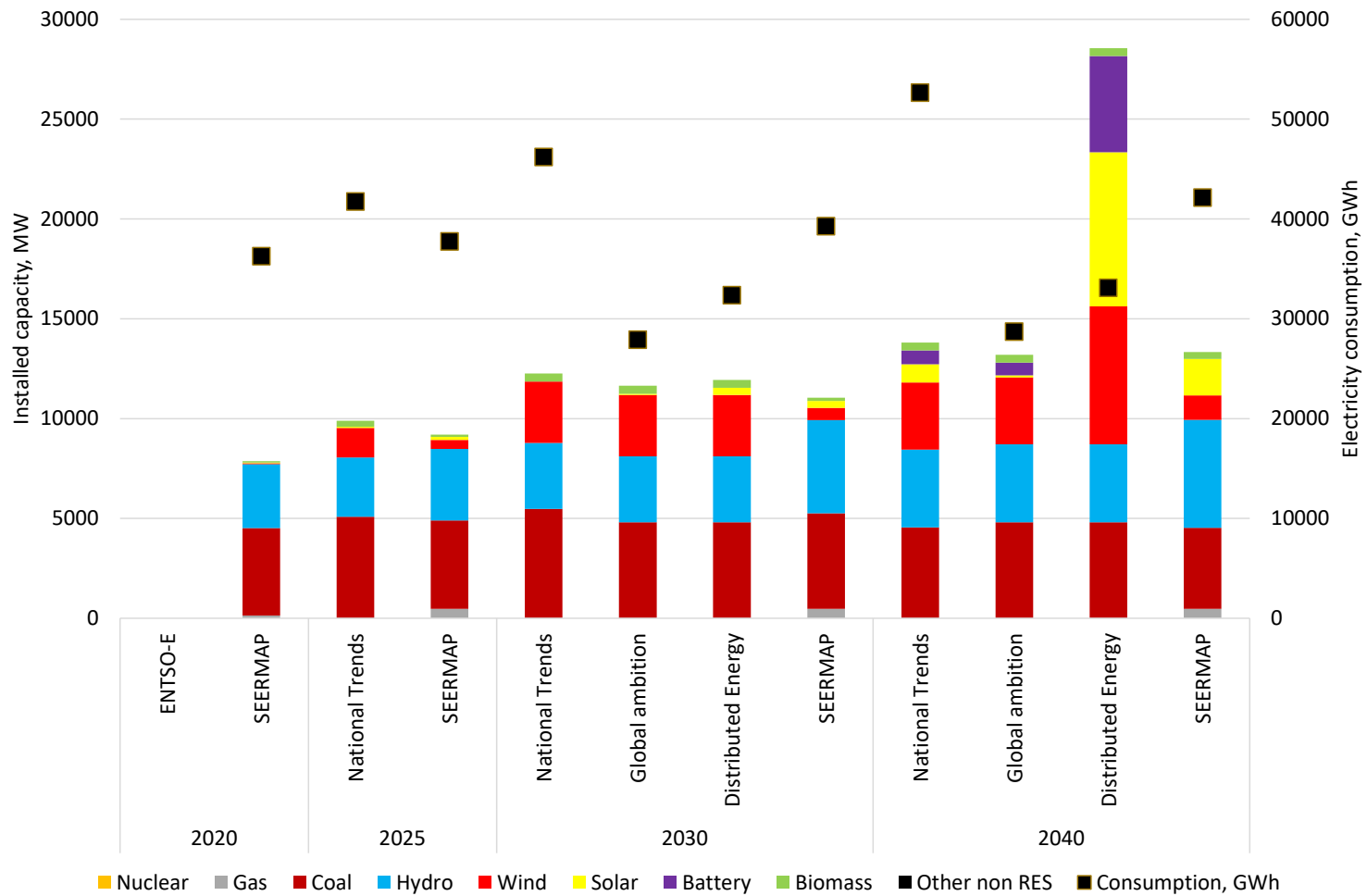


# North Macedonia





# Serbia



# Input data for modelling

Category	Data Unit	Source
<b>Consumption</b>	Annual Quantity Monthly distribution (% of annual quantity)	Questionnaires / ENTSOG
<b>Production</b>	Minimum and maximum production	Questionnaires / ENTSOG
<b>Pipeline infrastructures</b>	Daily maximum flow	ENTSO-G TYNDP 2018
<b>Storage infrastructures</b>	Injection, withdrawal, working gas capacity	GSE, ENTSO-G TYNDP 2018
<b>LNG infrastructures</b>	Capacity	GIE 2019, GIIGNL Annual Report 2019
<b>LTC contracts</b>	Yearly minimum maximum quantity, Seasonal minimum and maximum quantity	Gazprom, National Regulators Annual reports, Platts, Cedigaz (2019)
<b>Storage and transmission tariffs</b>	€/MWh	TSO, SSO webpages (2019)
<b>LNG tariffs</b>	€/MWh	CEER 2017

# Pipeline assumptions

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- Use ENTSOG Low infra level (pages 7-8 of [https://www.entsog.eu/sites/default/files/2019-02/entsog\\_tyndp\\_2018\\_System\\_Assessment\\_web.pdf](https://www.entsog.eu/sites/default/files/2019-02/entsog_tyndp_2018_System_Assessment_web.pdf))
- Add the so-called High Level Group Projects:
  - CESEC: all CESEC priority projects
  - TAP with 8 bcm to Italy, 1 bcm to Bulgaria, 1 bcm to Greece
- In addition:
  - Shannon LNG Terminal and connecting pipeline (IE)
  - NS2 with EUGAL
  - TS2 with BG-RS-HU connection
- Allowing for UA transit in function of NS2 and TS2 routes

## Gas demand, TWh/year

	2020				2025			
	National plans		ENTSOs	REKK	National plans		ENTSOs	REKK
	Reference	„Green Sc.“			Reference	„Green Sc.“		
AL			-	3.1			-	6.1
BA	1.5	2.0	1.8	2.2	1.5147	2.2	3.7	3.3
GE			-	29.6			-	32.9
KO*			-	0.0			-	0.0
MD			-	11.0			-	12.0
ME	0.1		-	0.0	1.7		-	0.0
MK	2.3	2.4	0.8	7.3	2.9	6.0	1.2	16.0
RS	17.9	16.5	24.0	24.0	20.9	19.3	28.0	28.0
UA			-	355.9			-	368.0

	2030				2040			
	National plans		ENTSOs	REKK	National plans		ENTSOs	REKK
	Reference	„Green Sc.“			Reference	„Green Sc.“		
AL			-	11.0			-	19.0
BA	1.5	2.6	5.9	6.1	-	-	13.1	7.4
GE			-	36.4			-	44.3
KO*			-	0.0			-	0.0
MD			-	13.0			-	14.0
ME	3.0		-	0.0	6.6		-	0.0
MK	2.9	5.2	2.0	16.5	3.8	5.3	4.3	18.4
RS	24.3	22.9	32.0	32.0	-		32.0	32.0
UA			-	371.0			-	393.8

## Gas production, TWh/year

	Yearly gas production (TWh/y)											
	2020			2025			2030			2040		
	Nation al plans	ENTSO G	REKK	Nation al plans	ENTSO G	REKK	Nation al plans	ENTSO G	REKK	Nation al plans	ENTSO G	REKK
AL		-	0.0		-	0.0		-	0.0		-	0.0
BA		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
GE		-	0.2		-	0.4		-	0.5		-	0.8
KO*		-	0.0		-	0.0		-	0.0		-	0.0
MD		-	0.0		-	0.0		-	0.0		-	0.0
ME		-	0.0		-	0.0		-	0.0		-	0.0
MK		0.0	0.0		0.0	0.0			0.0		0.0	0.0
RS		5.4	5.4		3.7	2.8		2.8	1.9		1.9	0.0
UA	223.7	-	323.5	268.7	-	344.0	330.2	-	348.5		-	348.5

## Assumptions on LTCs

- Current supply contracts in the EnC CPs are not expected to expire, but they will be recontracted.

Long term supply and transit contracts					
	Supply from ACQ		Price in 2020	contract expiry	Contract route
		TWh/year	€/MWh		
Bosnia	Russia	1.66	?	yearly	UA-HU-RS-BA
Georgia	Azerbaijan	3.2	?	2066	AZ-GE
	Azerbaijan	5.4	?	2026	AZ-GE
	Azerbaijan	65	?	2021	AZ-GE-TK
	Azerbaijan	3.8	?	2030	AZ-GE
	Russia	n.a	?	yearly	RU-GE-ARM
Moldova (supply)	Russia	11	?	2019	UA-MD
Moldova (tranzit)	Russia	176	?	2019	UA-MD
North Macedonia	Russia	1	?	yearly	UA-RO-BG-MK
Serbia	Russia	up to 50	?	2021	UA-HU-RS

## Assumptions on Daily Peak Demand for Gas

- Daily Peak Demand data is used to calculate System Reliability Index
- Peak Daily Demand is supposed to capture capability of gas system to cope with most challenging demand situation
- Should be simulated based on future system characteristics (supply, demand) and weather conditions; in EU, responsibility of TSO to simulate daily peak demand (however not simulated in all EU countries, in some cases based on historic peak from last 5 years)
- For EU countries, daily peak demand taken from ENTSOG TYNDP 2018 (Best Scenario)
- Contracting Parties report little or no daily peak demand data

Country (GWh/day)	2020	2025	2030
Bosnia and Herzegovina	13	13	13
Macedonia	23	23	23
Montenegro	1	1	1
Serbia	165	192	220
Kosovo	2	2	2
Albania	15	15	15
Ukraine	2337	2454	2454
Moldova	94	94	94
Georgia	156	175	194
Turkey	2586	2806	2806

# Consumption forecast for emerging gas markets

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- Consumption change in some countries is subject to infrastructure not in place yet
- Will be used only when the projects on the territory of the respective country is modelled
- This applies to:
  - Albania
  - Bosnia and Herzegovina
  - Kosovo\*
  - Montenegro
  - North Macedonia



# Thank you!

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