TYNDP2018 Project assessment

Interaction in terms of PECI/PMI Process

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11 December, 2017

entsoe

The policy context

EU internal electricity market integration components

- Market rules (3rd package 2009 and follow up grid codes)
- Market integration (especially with large share of intermittent RES-E) requires high (cross-border) transmission capacity

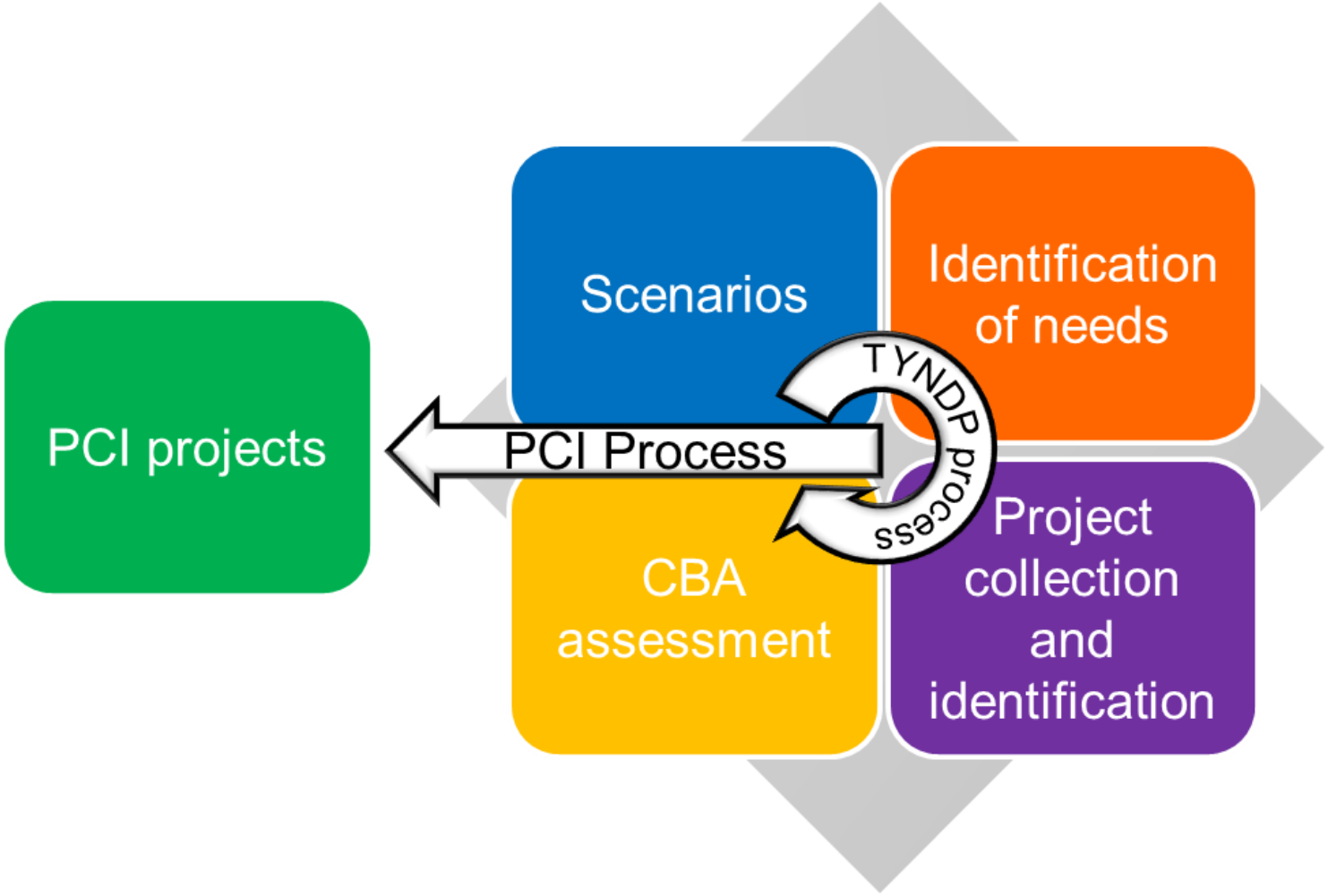
→ Regulation (EC) 347/2013 to develop trans-European energy infrastructure
→ ENTSO-E Ten-Year Network Development Plan - TYNDP

ENTSO-E responsibility to perform planning studies from perspective of market integration and security of supply (Reg 714)

Opportunity for **all project promoters** to propose projects in TYNDP and PCI list (Reg 347)

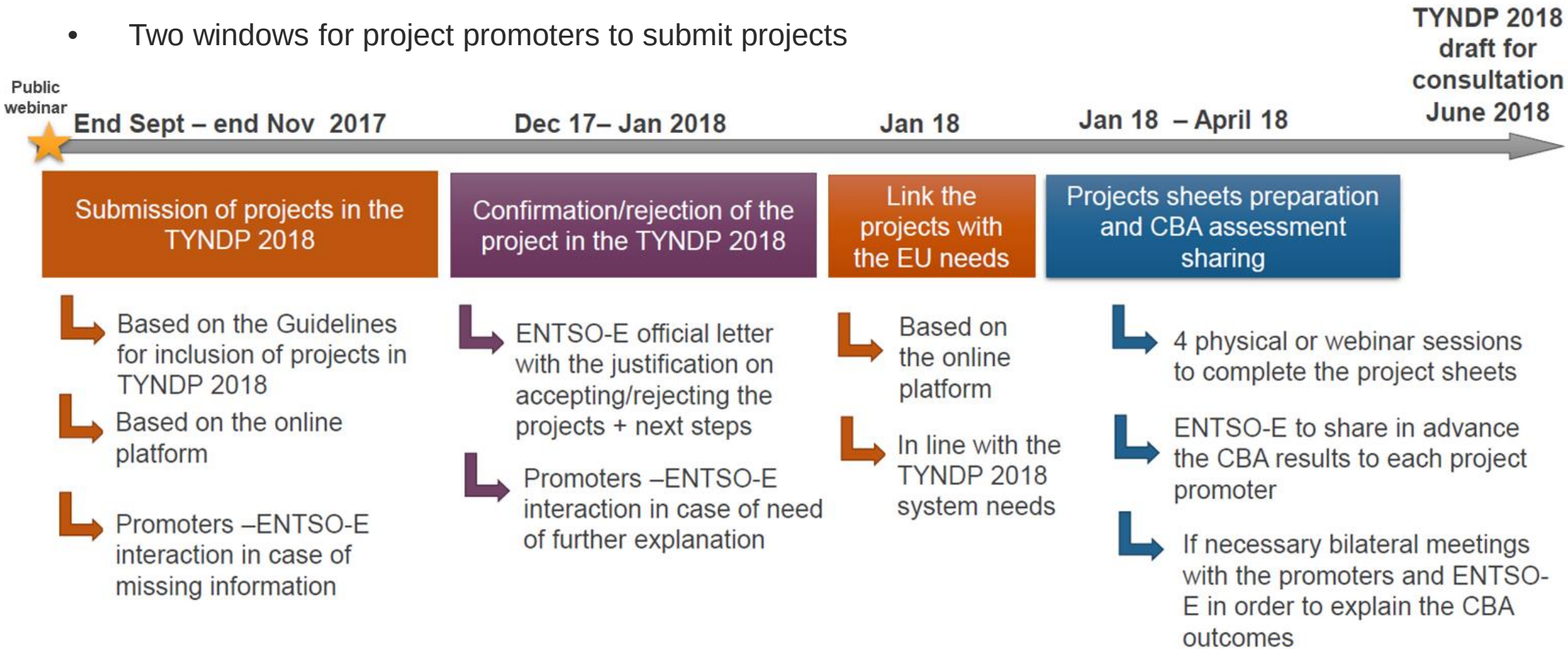
ENTSO-E responsibility to assess all projects, demonstrate planning value, and identify barriers (Reg 714)

Overview of the assessment process inside the TYNDP 2018



TYNDP 2018 Projects assessment preliminary process

- Two windows for project promoters to submit projects

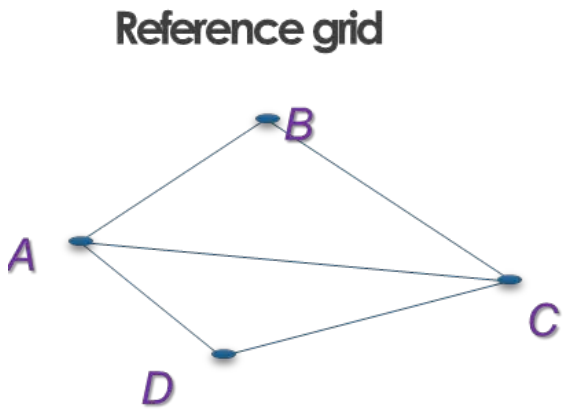


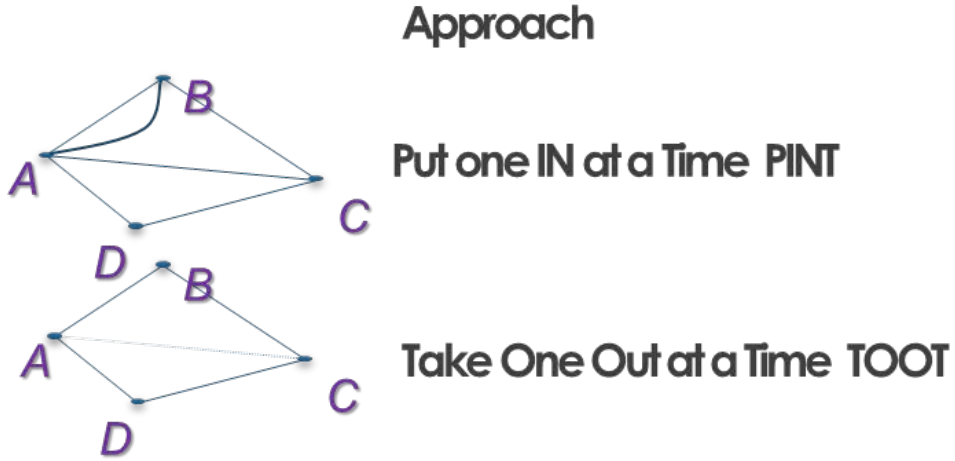
TYNDP2018 – Project assessment approach

Assessment based on

- Cost Benefit Analysis methodology (CBA “version 2.0”) – *expected to be approved by EC soon*
- Three 2030 Scenarios (ST, DG, EUCO) and one 2025 Scenario, different climate conditions
- Reference grid for both 2025 & 2030 is based on the present interconnection capacity and all ”mature” projects
- Reference for TOOT and PINT assessments

Assessment of individual projects





TYNDP2018 – Project assessment approach

Criteria to select projects in the reference grid

- Based on expected commissioning year and “maturity”
  - Commissioning date is =< 2027 and
  - Status is:
    - Commissioned
    - Under construction
    - Planned p[illegible] written ack[illegible] body that a[illegible] **phase** has started

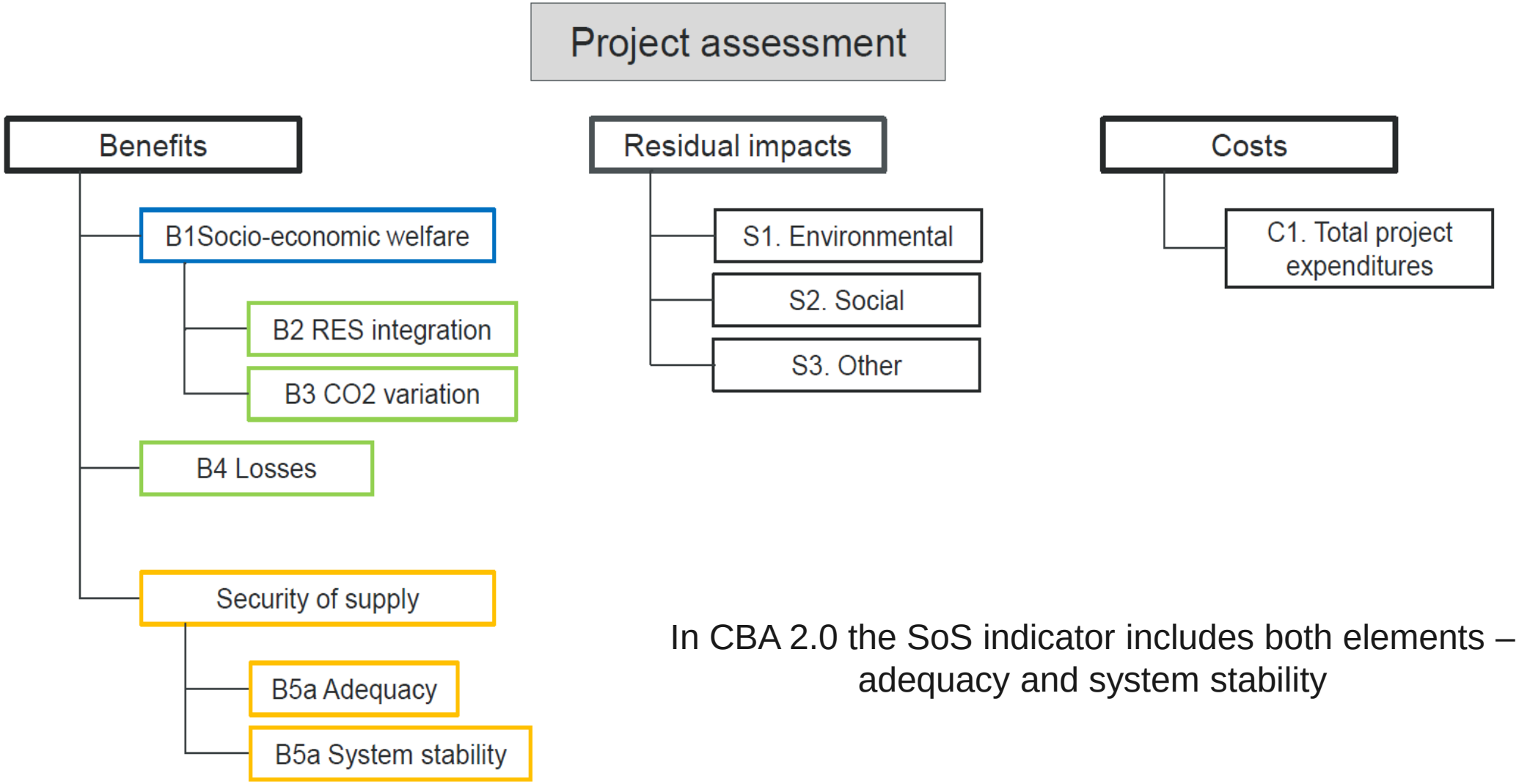
→*for all the main investments of each*

Reference capacity

- Expected/planned development of the grid
- Parameter for market modelling tools
- Confirmed by network studies
- Possibly different values per directions

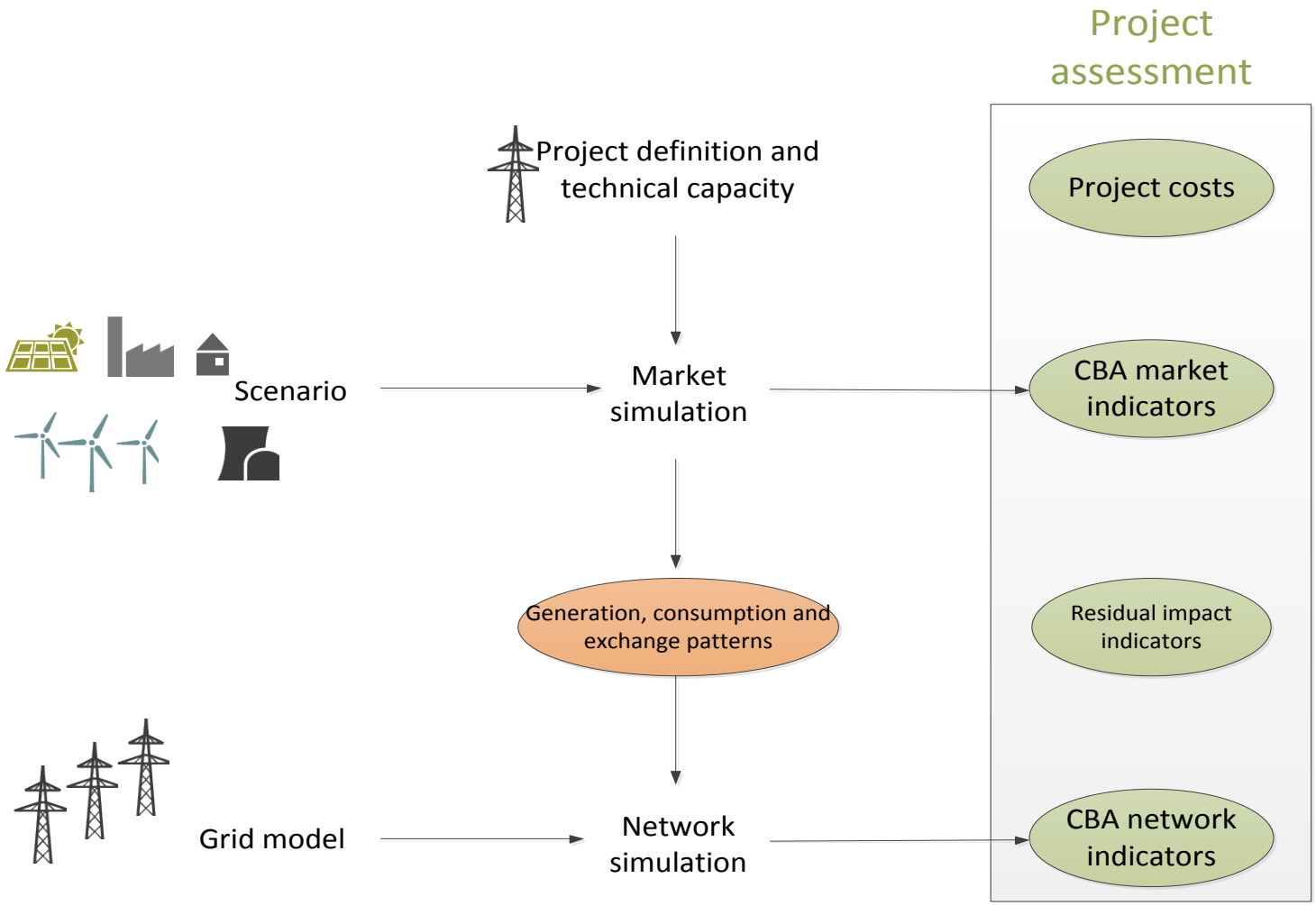
TYNDP2018 - Assessment of individual projects

2nd ENTSO-E CBA methodoloy with multi-criteria assessment

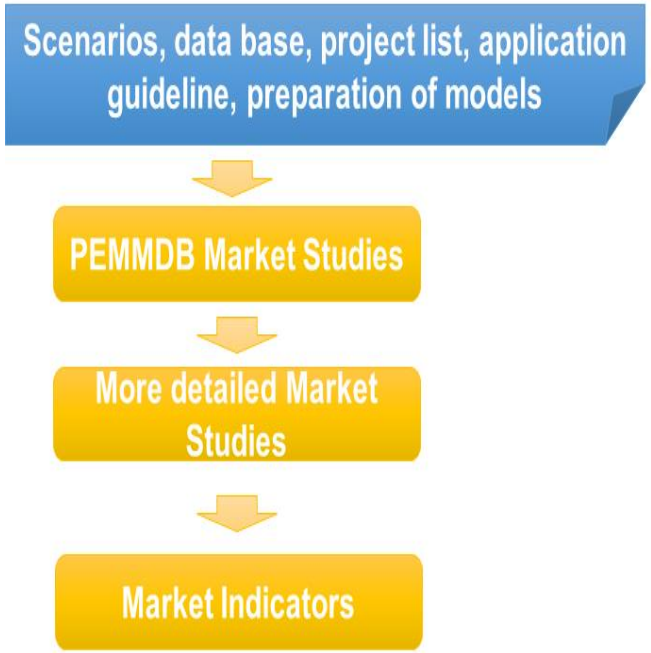


In CBA 2.0 the SoS indicator includes both elements – adequacy and system stability

Schematic project assessment process



Assessment of individual projects
CBA market indicators



- ***Socio-Economic Welfare – SEW*** **-** *or market integration*
  - Def: the ability of a project to reduce congestion and thus provide an increase in transmission capacity that makes it possible to increase commercial exchanges, so that electricity markets can trade power in an more economically efficient manner.
  - Method 1: Calculating total system cost, by market models or:
  - Method 2: Calculating consumer and producer surplus and congestion rents, by market models
  - Monetization: Market models provide monetary values - M€ / year

Assessment of individual projects
CBA market indicators

- ✓ ***RES integration***
  - ✓ Def: the ability of the system to allow the connection of new RES generation, unlock existing and future “renewable” generation, and minimize curtailment of electricity produced from RES
  - ✓ Method: avoided curtailment by market models
  - ✓ Monetization: savings in avoided curtailment included in generation cost savings (SEW)

  -> Socio-Economic Welfare increase resulting from RES integration (M€/year)

- ✓ ***variation in CO2 emissions***
  - ✓ Def: the change in CO2 emissions in the power system due to the project. It is a consequence of changes in generation dispatch and unlocking renewable potential.
  - ✓ Method: using market models
  - ✓ Monetization: SEW includes it already, accounting for emissions and CO2 cost

  -> ***Socio-Economic Welfare increase resulting from CO2 reduction (M€/year)***

Assessment of individual projects
CBA market indicators

- ✓ ***Security of Supply – Adequacy to meet demand***
  - ✓ Def: ability of a power system to provide an adequate supply of electricity to meet demand over an extended period of time.
  - ✓ Method: ENS calculation by market models (MWh/year)

    or, if ENS = 0 :

    Additional adequacy margin calculation by market models (MW)

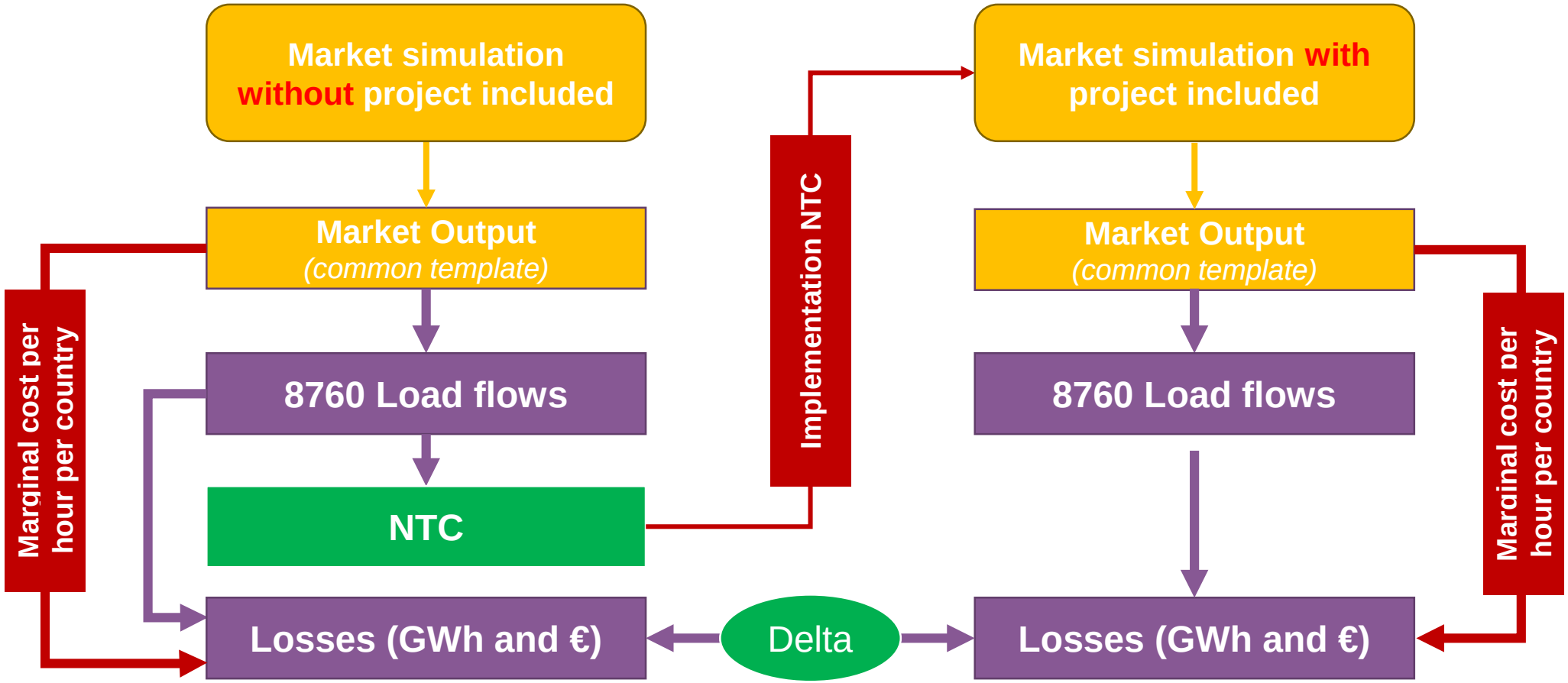
  - ✓ Monetization: savings in avoided ENS are excluded from SEW

    Project promoters may multiply the computed ENS with VOLL (in €/MWh).

Assessment of individual projects

CBA market indicators

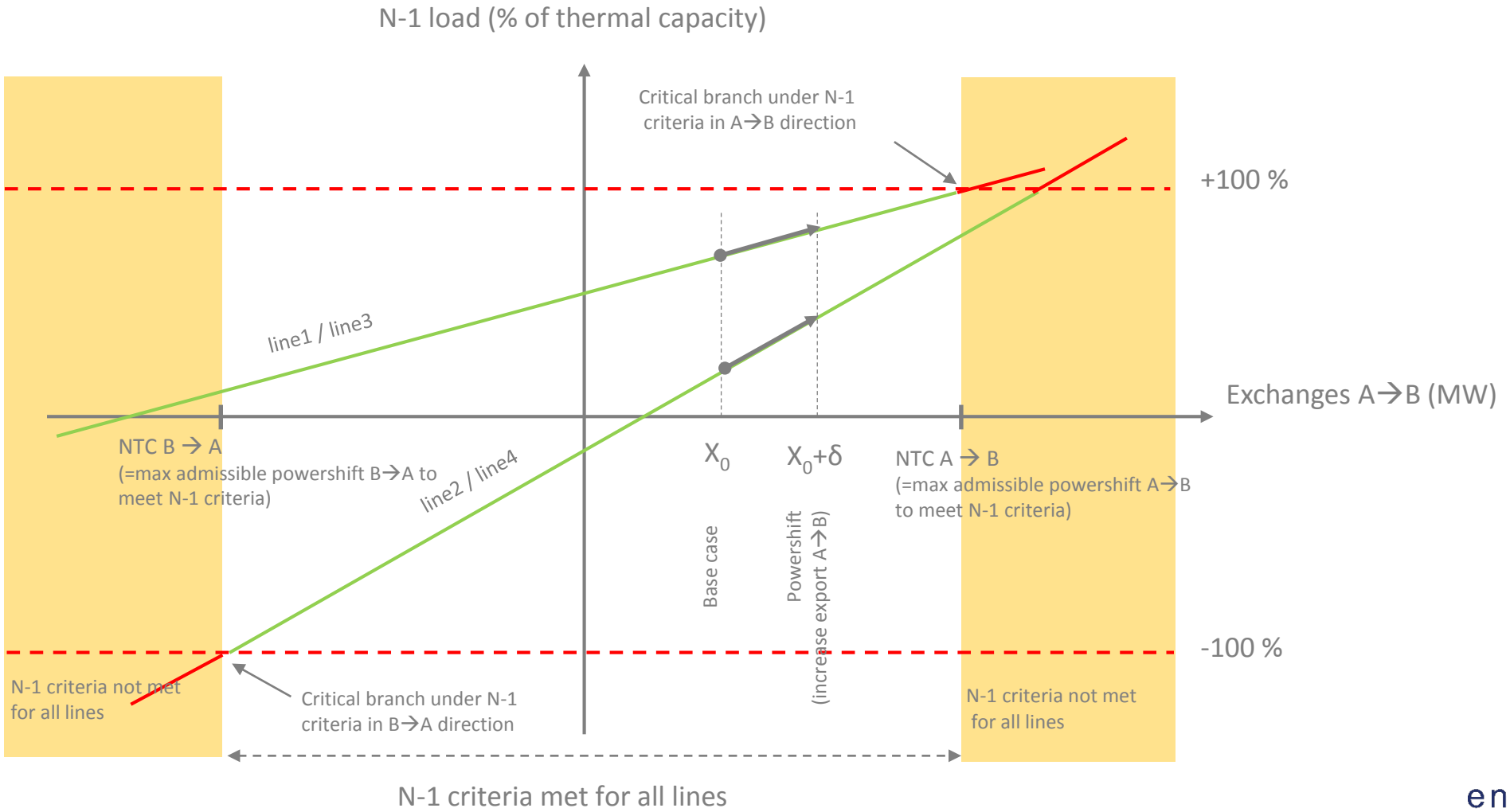
Network indicators – NTC and Losses



Assessment of individual projects

CBA market indicators

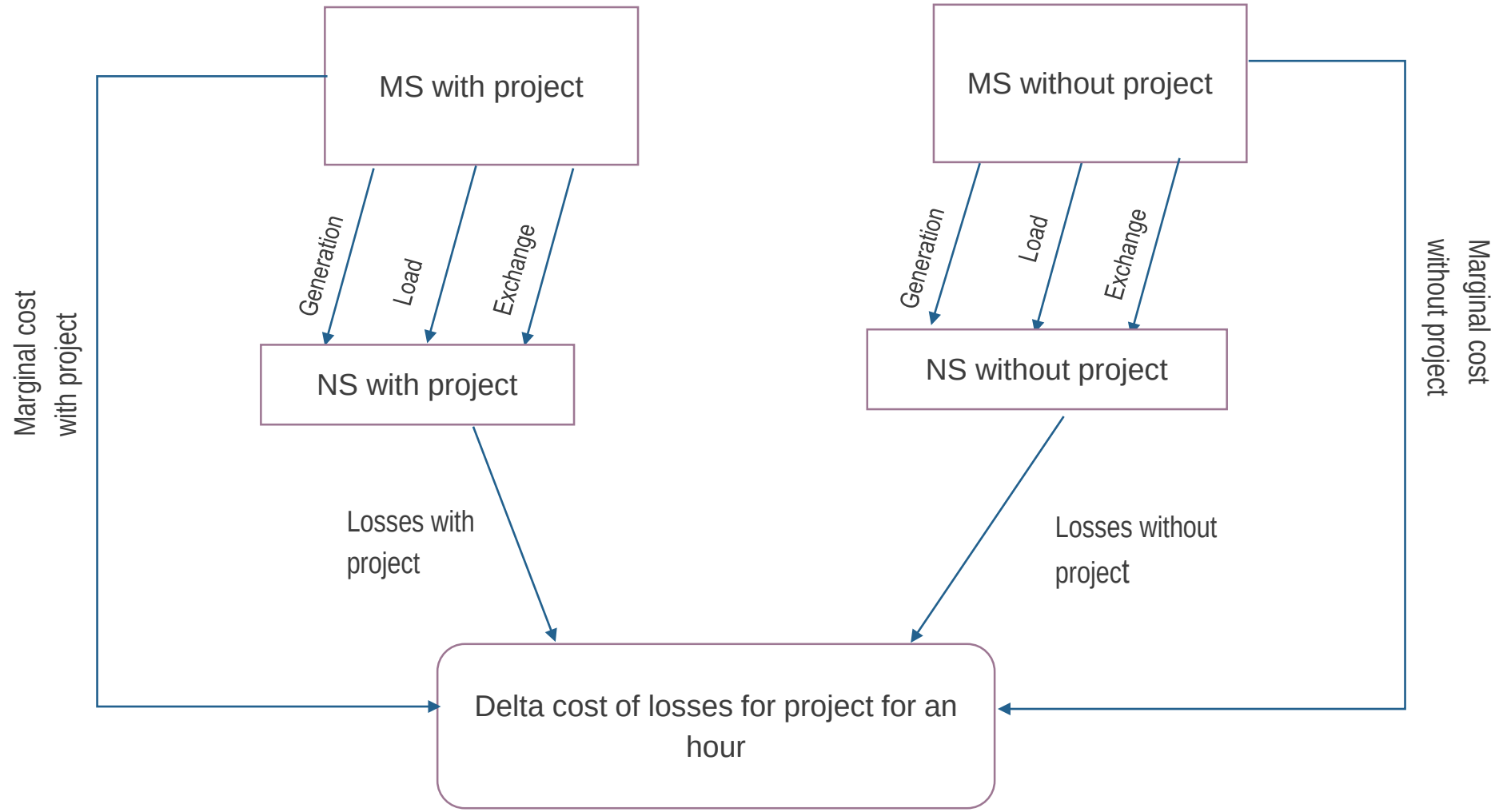
Network indicators – NTC computation



Assessment of individual projects

CBA market indicators

Network indicators – Losses computation



TYNDP Project platform

Introduction

The third stage of the ten year network development 2018 planning process is the collection of transmission and storage projects. Any interested promoter can apply to submit projects for inclusion in the TYNDP 2018 package, by submitting all the requested administrative and technical documentation/data. The timeline for this process is from the 30 September to the 30 November 2017. Once this window closes entsoe will review the projects, and inform project promotors whether their project has been accepted or rejected at this stage.

Before submitting any project we kindly invite you to read all the documents below which include a step by step description on how to submit your project, which administrative and technical criteria each type of promoter has fulfill including any possibility to update of the submitted data.

Any projects from the TYNDP 2016 must be resubmitted using this platform. All 2016 project data has been uploaded to this platform for maximum convenience, but it is up to the project promotor to submit these for the TYNDP 2018.

Relevant documents for inclusion of projects in the TYNDP 2018

- ENTSO-E Practical implementation document for inclusion of projects in the 10-year network development (TYNDP)2018
- Application step by step guidance
- ENTSO-E TSOs contact details
- National Regulatory Authorities contact details

What happens after the project is submitted?

After the submission window is closed ENTSO-E will assess all the administrative and technical material that was submitted through this online tool. In case of missing documentation ENTSO-E will contact the promoter requesting any missing information within an indicated time. In case of mistakes in the data submitted the promoter can contact ENTSO-E and update data as clarified in the ENTSO-E Practical implementation document above.
ENTSO-E aims to inform the promoters by mid of February of the acceptance/rejection of projects and will request any additional information necessary to complete the project sheets (more detail can be found in the ENTSO-E Practical implementation document above).
If accepted, projects will be assessed in line with the latest CBA methodology and promoters will be informed of their project assessment results. All the assessments are to be included in the TYNDP 2018.

In case of questions/further clarification you may contact ENTSO-E at:

- Email : TYNDP2018@entsoe.eu
- Phone: +32473810490 (Dante Powell)
- Phone: +32478632561 (Andriy Vovk)

Type of project for submission

Transmission | Storage

https://entsoe-projectsubscription.azurewebsites.net/

Project sheet summary table

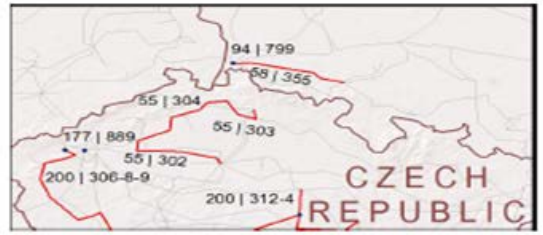
- Serves to highlight all benefits, costs and social assessment according to the multi-criteria framework applied

Illustrative example- TYNDP 2016

Proj lec

Description of the project

Construction of this project enables control of power flow on the border to support system security - in terms of N-1 security, effective utilization of the infrastructure and cross-border market exchanges. The target capacity of phase shifting transformers is 1700MVA per each circuit of tie-lines between CEPS and 50Hertz, that means 3400MVA of thermal capacity. Devices are located in 400kV substation Hradec.



Investment index	Substation 1	Substation 2	Description	GTC contribution (MW)	Present status	Expected date of commissioning	Evolution since TYNDP 2012	Evolution driver
889	Hradec		Construction of new PST in substation Hradec with target capacity 2x1700MVA	-	Design & Permitting	2016	Investment on time	Progress as planned

CBA results

The tables below summarize the Cost Benefits Analysis results of this project.

CBA results non scenario specific						
GTC direction 1 (MW)	GTC direction 2 (MW)	B6 Technical Resilience	B7 Flexibility	S1 - protected areas	S2 - urban areas	C1 Estimated cost (Meuros)
CZ=>DE: 0-500	DE=>CZ: 0-500	2	3	NA	NA	72-120

CBA results	for each scenario				
Scenario	B1 SoS (MWh/year)	B2 SEW (MEuros/year)	B3 RES integration	B4 Losses (MWh)	B5 CO2 Emissions (kT/year)
Scenario Vision 1 - 2030	-	[10;14]	0	[110;150]	[140;160]
Scenario Vision 2 - 2030	-	[79;99]	0	[110;160]	[170;210]
Scenario Vision 3 - 2030	-	[14;18]	[62000;76000] MWh	[130;230]	[-58;-78]
Scenario Vision 4 - 2030	-	[20;24]	[210000;250000] MWh	[190;320]	[-120;-140]

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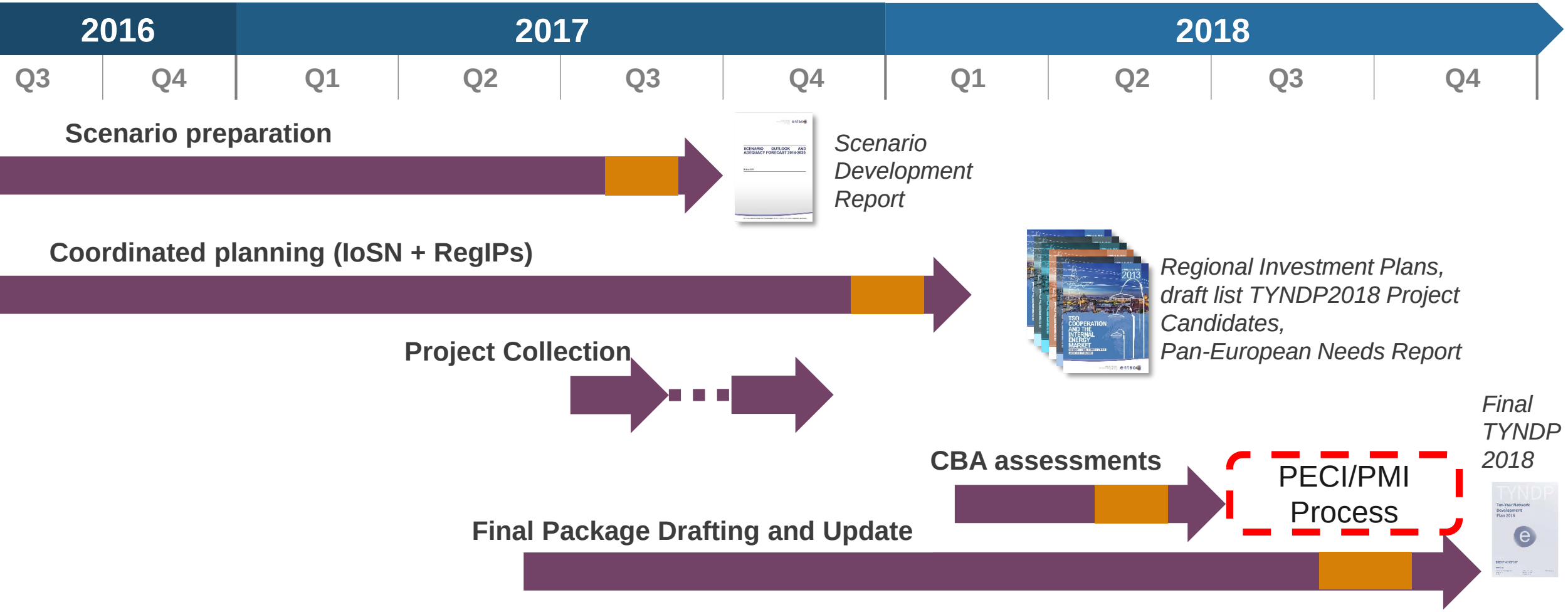
The advantages of being in the TYNDP list of projects

- Be part of the pan-European relevant projects list
- Increased visibility of the project at European and regional level
- Assessed using the common pan-EU CBA methodology
- Eligible for the PCI label application:
  - Financial instruments and possible grants for studies and work

TYNDP 2018 TIMELINE



Planned delivery of the assessment results to EnC by ENTSO-E

Network indicators:

- ✓ NTC for the projects of the same clustering as in PECI/PMI process – by end of December – January 2018;
- ✓ B4 - Losses – to be clarified after consolidation of the project list by ENTSO-E – expected – April – May 2018;

Market Indicators:

- ✓ Costs – expected – January 2018;
- ✓ The rest of market indicators – to be clarified after consolidation of the project list by ENTSO-E – April – May 2018;

Thank you for your attention !