

# A CBA methodology for a MOG

Carmen Wouters (DNV GL), PROMOTioN workshop Wind Europe, 27 September 2018

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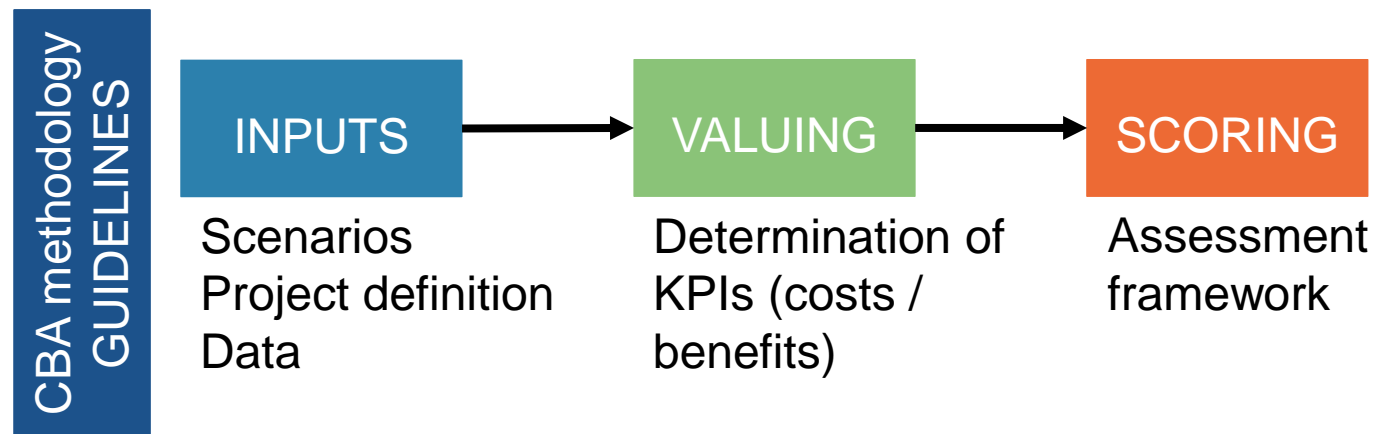
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- **CBA methodology for offshore grids**
- Challenges in comparing offshore grid solutions
- Key performance indicators (KPIs)
- Assessment framework
- Interaction with system development
- Conclusions

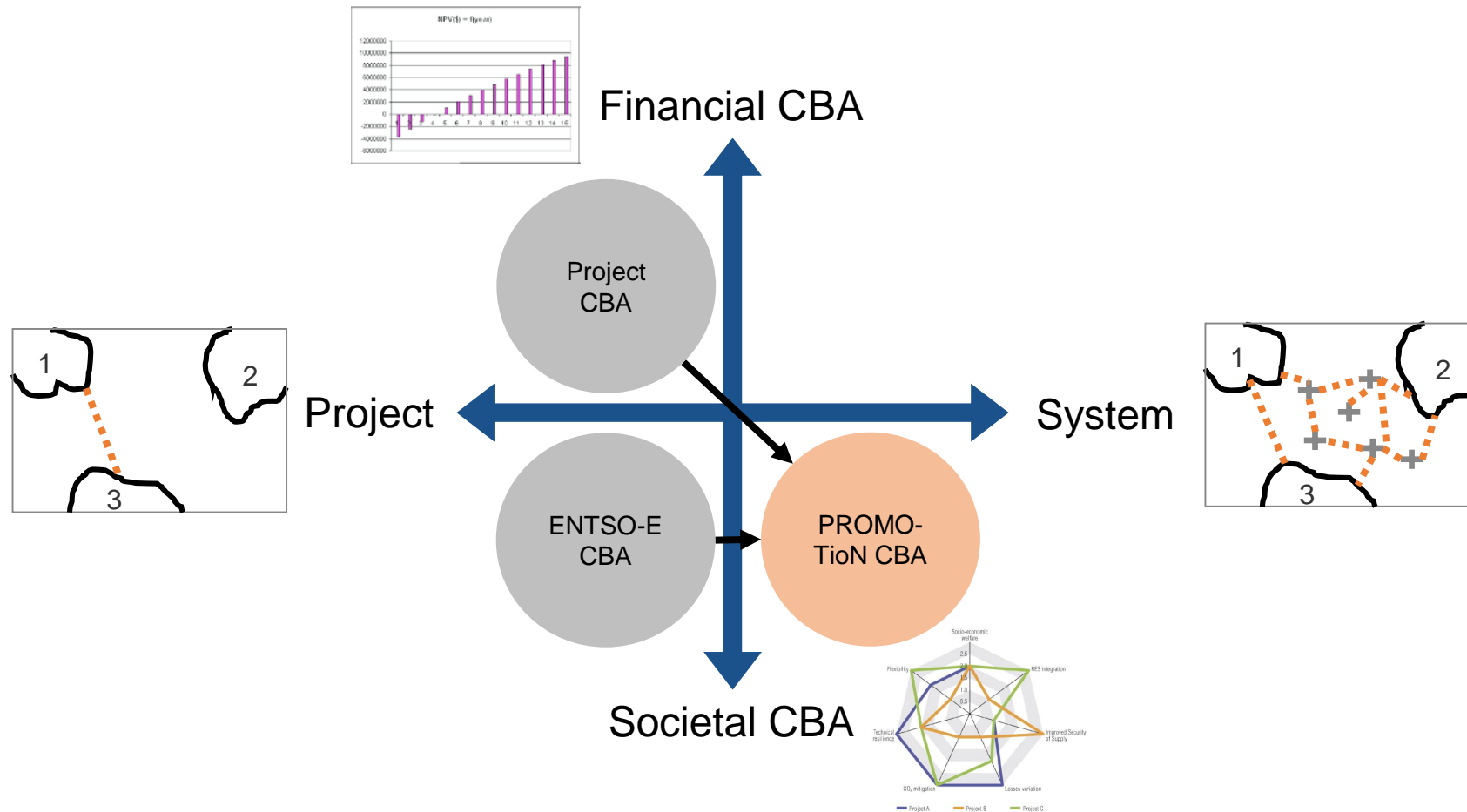


# Aim of the CBA methodology

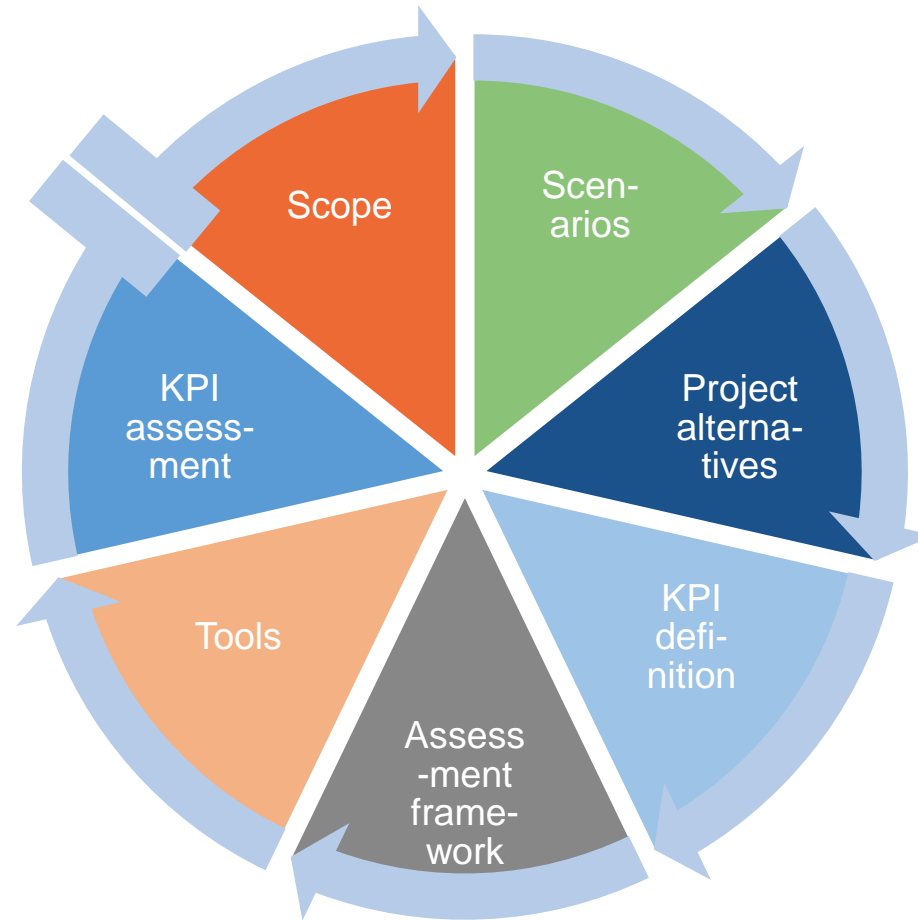
- To develop a CBA methodology able to identify the “best” offshore grid design
- Compare different project alternatives (offshore grid topologies)



# Scope of a CBA methodology for offshore grids



# Dimensions of a CBA methodology



# Approach methodology

- Develop a cost-benefit analysis methodology that assesses
  - the value to society
  - systems
- Departing from ENTSO-E Guideline for cost benefit analysis
  - **Ideal methodology** with great level of detail and complexity →
  - distilled in **practical methodology** for execution







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- How to evaluate project alternatives?

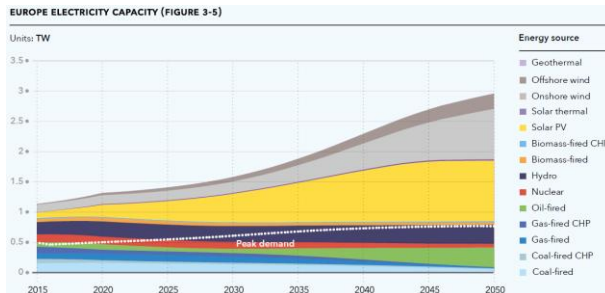
Onshore  
scenarios

Offshore  
scenarios

Technologies

Market  
design

Grid  
development



Source: ETO, DNV GL

AC

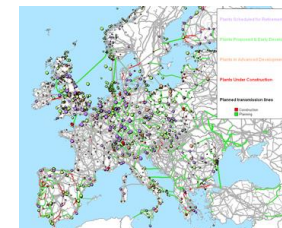
HVDC



Source: DNV GL



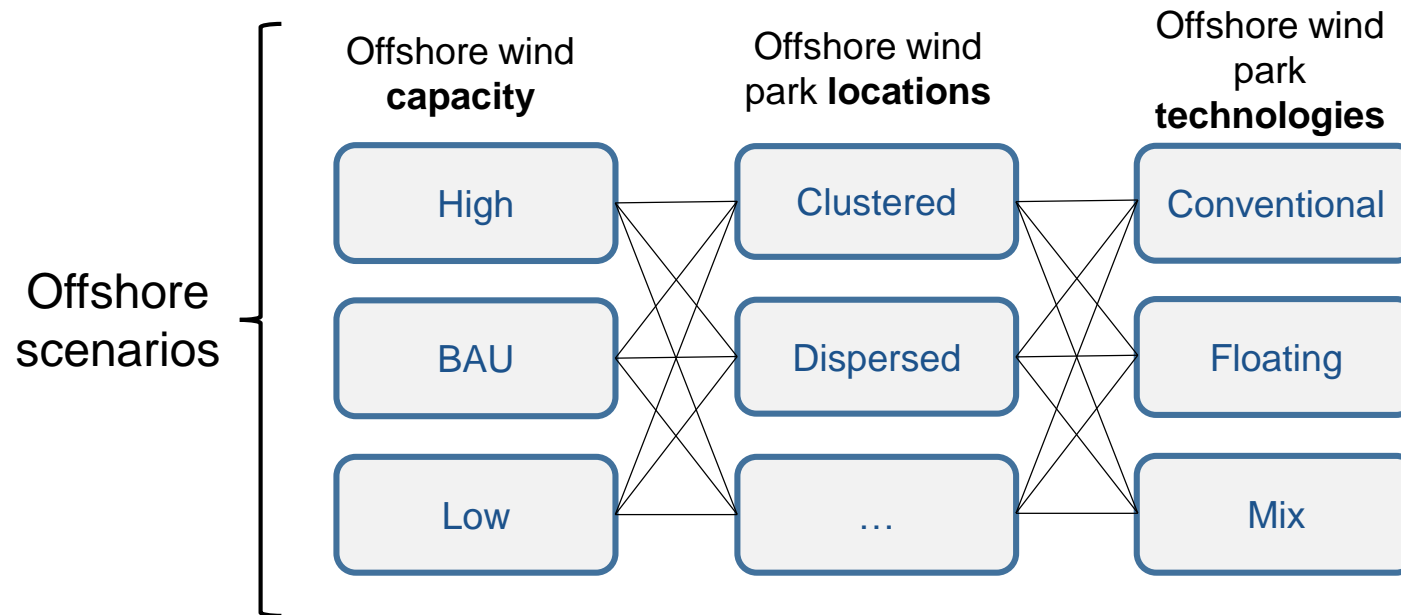
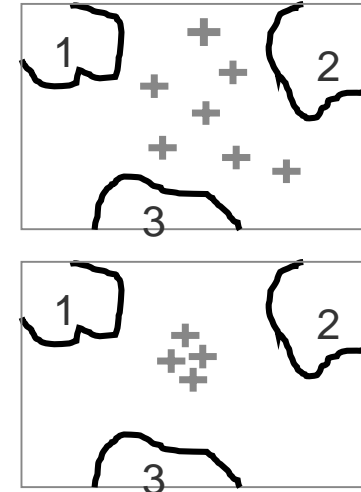
Source: TenneT



Source: Platts

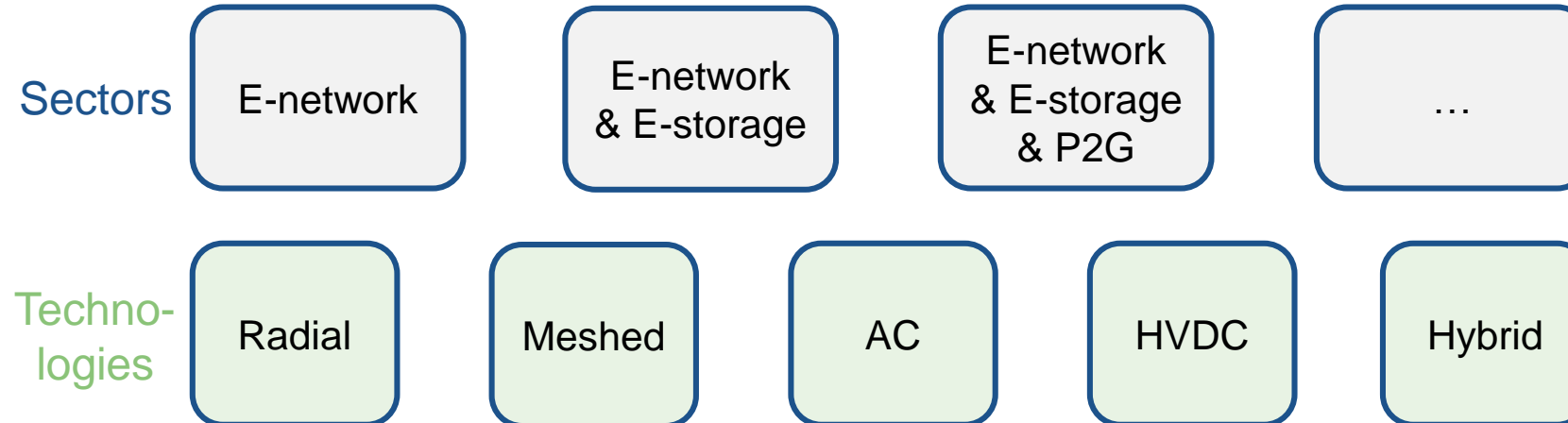
# Scenarios

- Guidelines on scope of scenarios to avoid bias
- On - and offshore scenarios
- Ideal vs practical



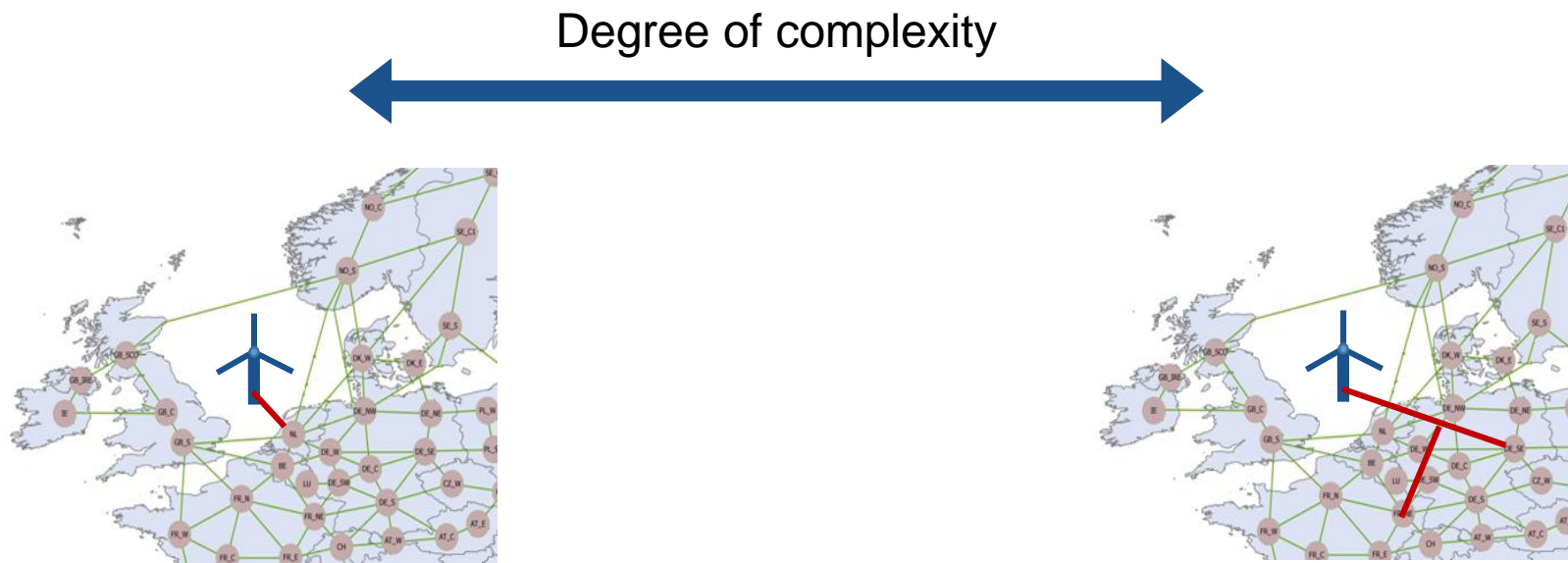
# Project alternatives - scope

- Purpose of the project
- Sectors/technologies where project alternatives can draw from
- Ideal vs practical



# Project alternatives - boundaries

- How to deal with the onshore grid?
- Connection points
- Ideal vs practical





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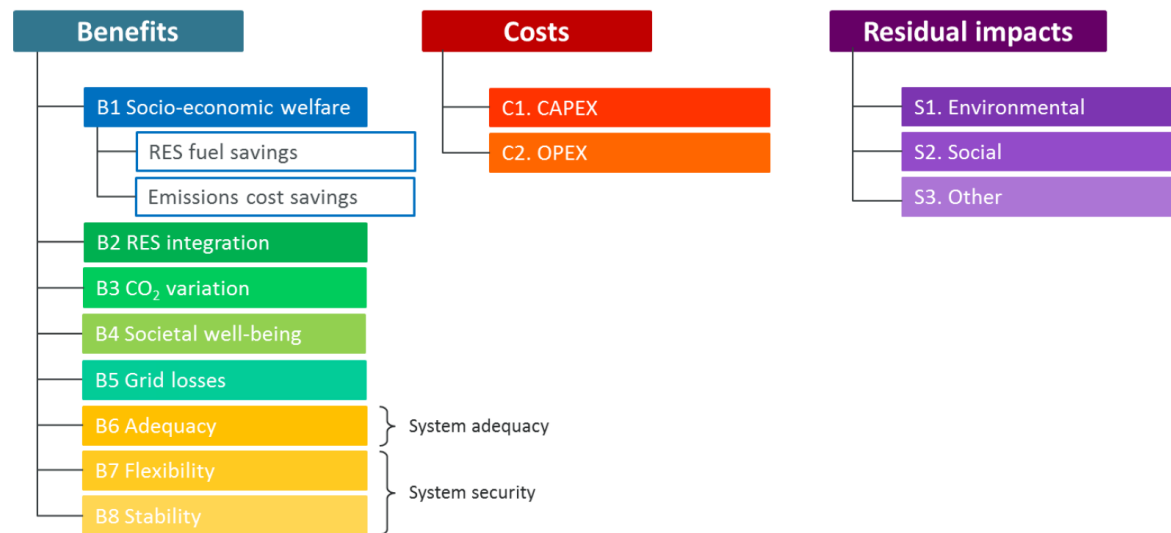
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# KPIs

- ENTSO-E Guideline V2.0
- Relevance for offshore grid
- Degree of quantification/monetisation



Source: ENTSO-E, 2017

## Benefits:

- B1 Socio-economic welfare
- B2 RES integration
- B3 CO<sub>2</sub> variations
- B4 Societal well-being
- B5 Grid losses
- Security of supply
  - B6 Security of supply: adequacy
  - B7 Security of supply: flexibility
  - Security of supply: security
  - Security of supply: resilience

## Costs:

- C1: CAPEX
- C2: OPEX

## Residual impacts:

- S1 Environmental
- S2 Social
- S3 Other



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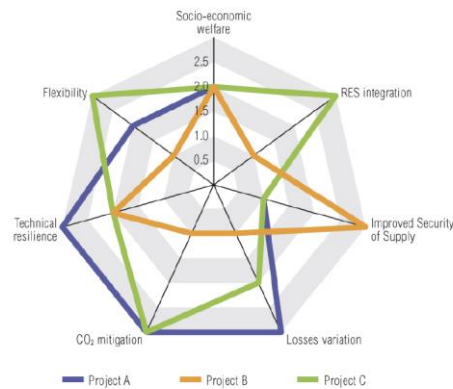
# Reference for comparing grid configurations

- PINT vs TOOT
- Reference for project assessment
  - Null-alternative = base-case = BAU

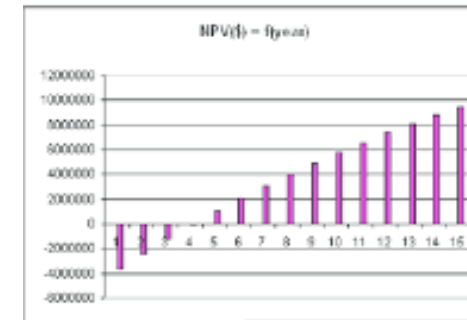


# Project comparison

- Project comparison
- Limits on full monetisation of KPIs
- Objective KPIs and weights
- Ideal vs practical



Degree of  
quantification and monetisation





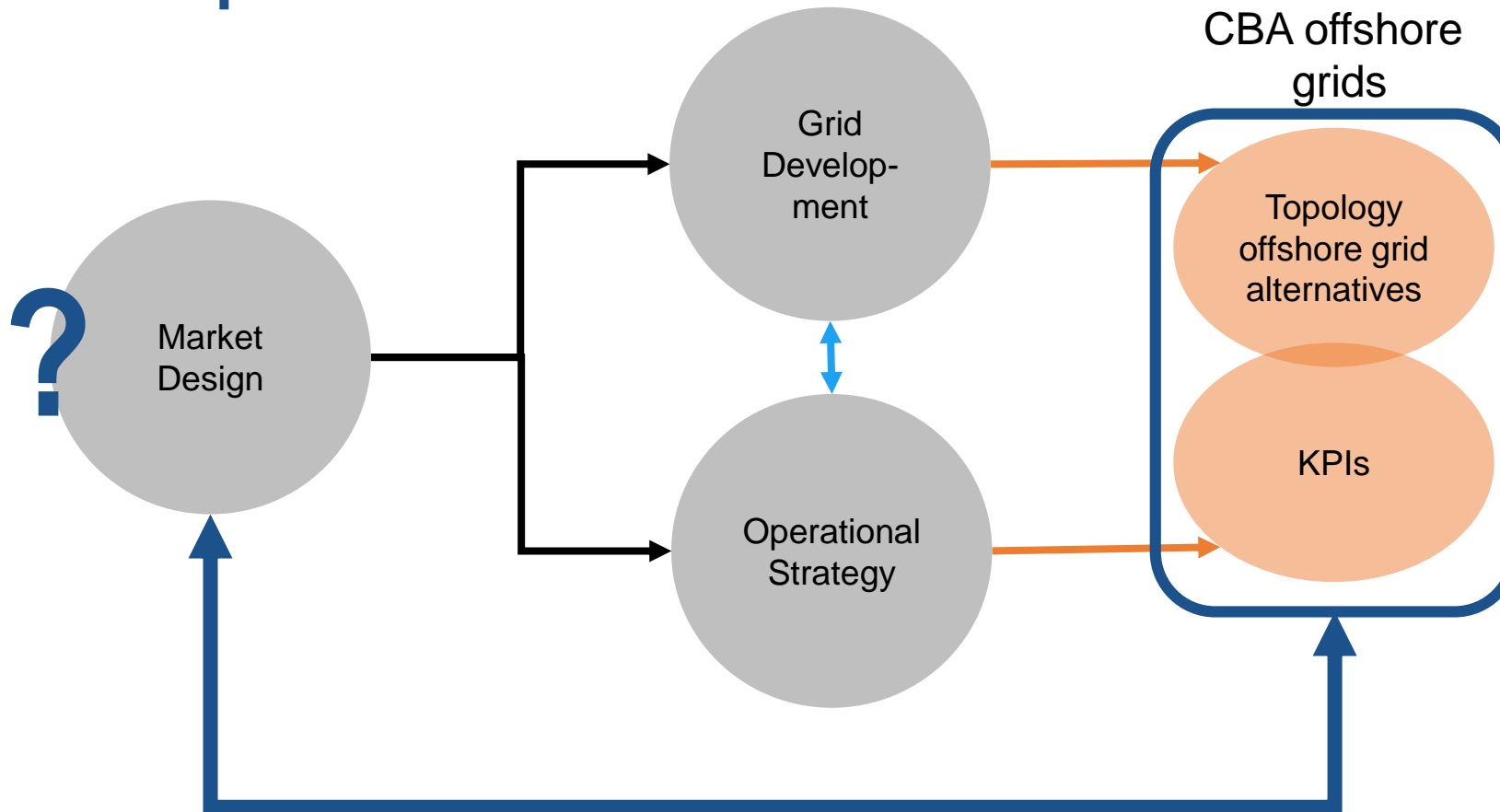
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# System development



CBA methodology might differ  
depending on concept



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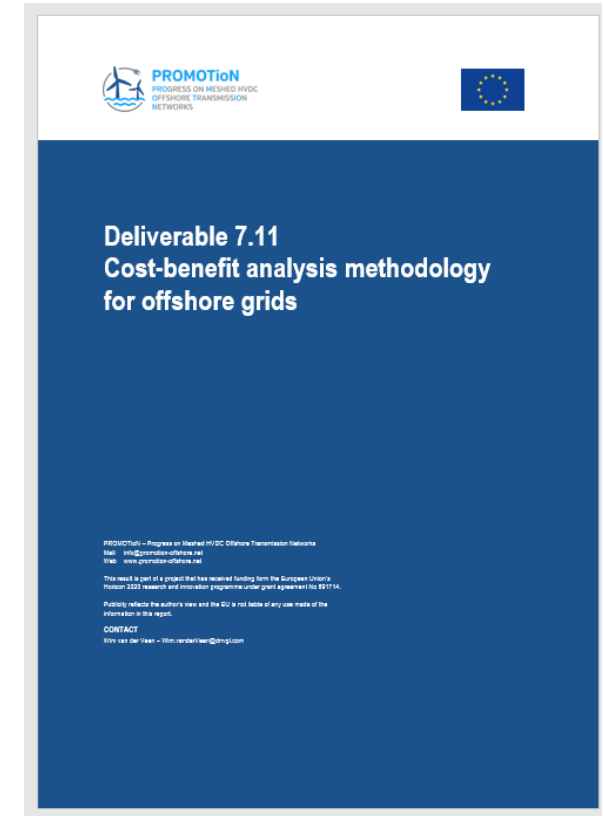
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# CBA methodology for offshore grids

- Finalisation of CBA methodology
- Complexity in CBA dimensions
  - Single project vs system
  - Financial vs societal CBA
  - Ideal vs practical methodology
- Deliverable finalised



## APPENDIX

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PROMOTioN – Progress on Meshed HVDC Offshore Transmission Networks  
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*The opinions in this presentation are those of the author and do not commit in any way the European Commission*

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## PARTNERS

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