entsog
european network
of transmission system operators
for gas

Regional Group meetings
23-24-27 Feb & 2 Mar 2015

# Cost-Benefit Analysis

## Status and upcoming steps

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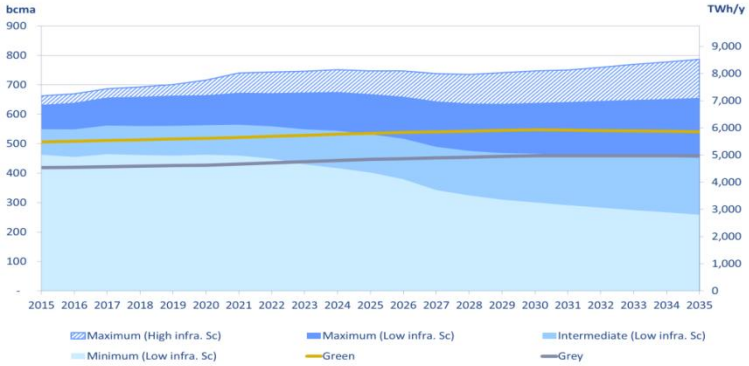
Image Courtesy of Thyssengas

# State of play of TYNDP 2015

***TYNDP report to be publicly released mid-March***

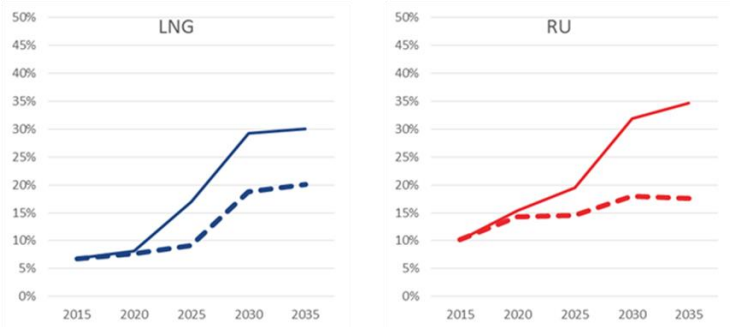
## *Key findings*

> Moderate evolution of demand under both green and grey scenarios




> Under current status, Europe faces a decrease of indigenous production and Norwegian supply on the long run, that could result in an increased dependence on Russian gas and LNG imports

> New infrastructures and connections to new supplies could improve this situation




**Evolution of the supply share of Russian gas and LNG**

with Existing and FID projects
with all TYNDP projects

# TYNDP provides measurement of…

## *Level of infrastructure resilience*

> Ability to meet high demand
> Level of Remaining Flexibility
> Resilience to route disruption
> Route diversification
> N-1

## *Level of influence of import sources*

> Physical and price dependence on supply sources
> Price diversification to supply sources

## *Infrastructure impact in monetary term*

> EU bill
> Proxy for country gas bill
> Price convergence with neighbouring countries

# …and Regional Groups set target

## *Definition of priorities to be addressed*

> Once priorities are defined, Regional Groups can focus on associated indicators

## *Definition of level to be achieved*

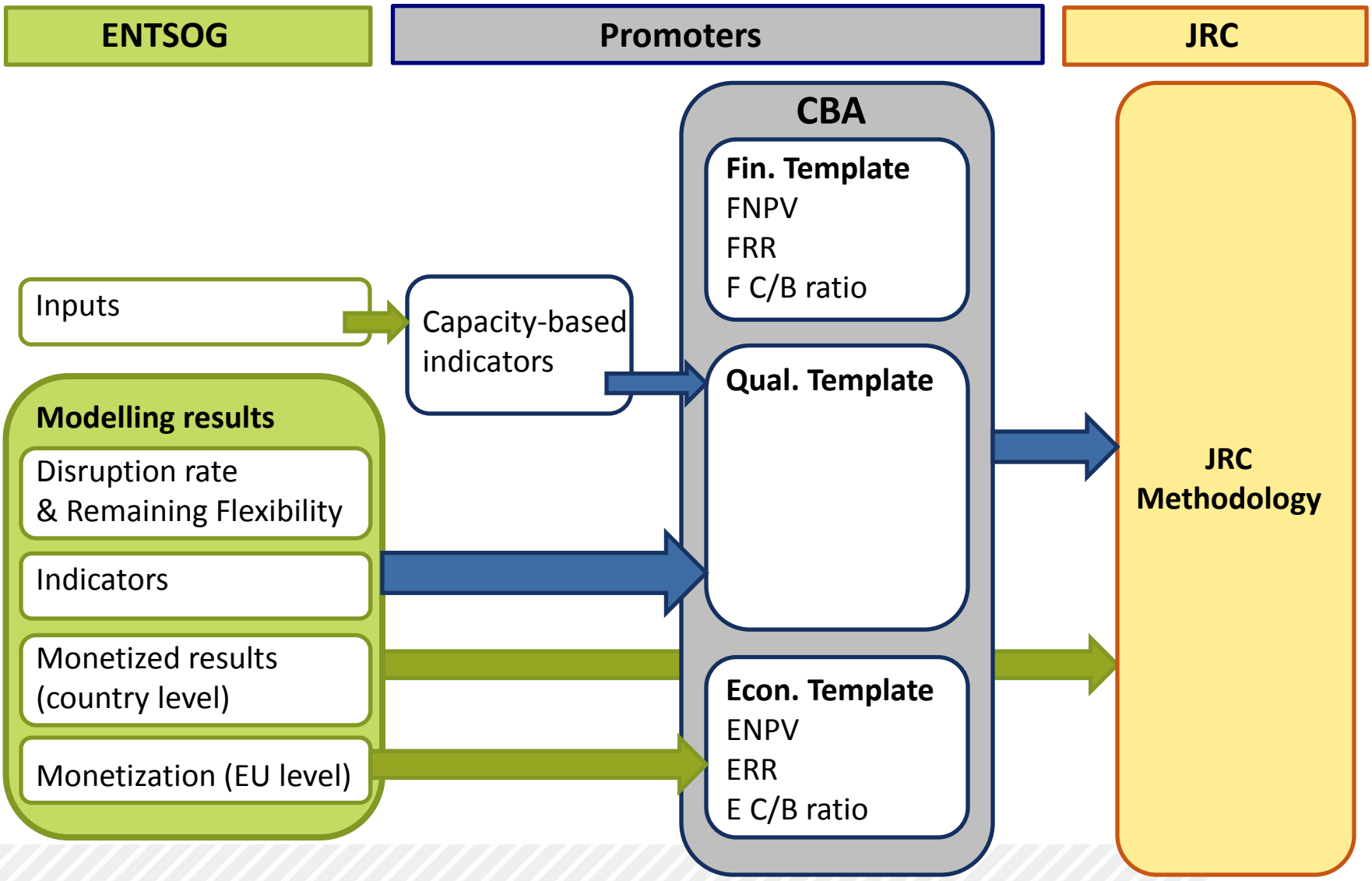
> Eg. Supply dependence only need to be addressed if initially higher than X%

> Impact of a Group should always be considered **referring to the initial situation**

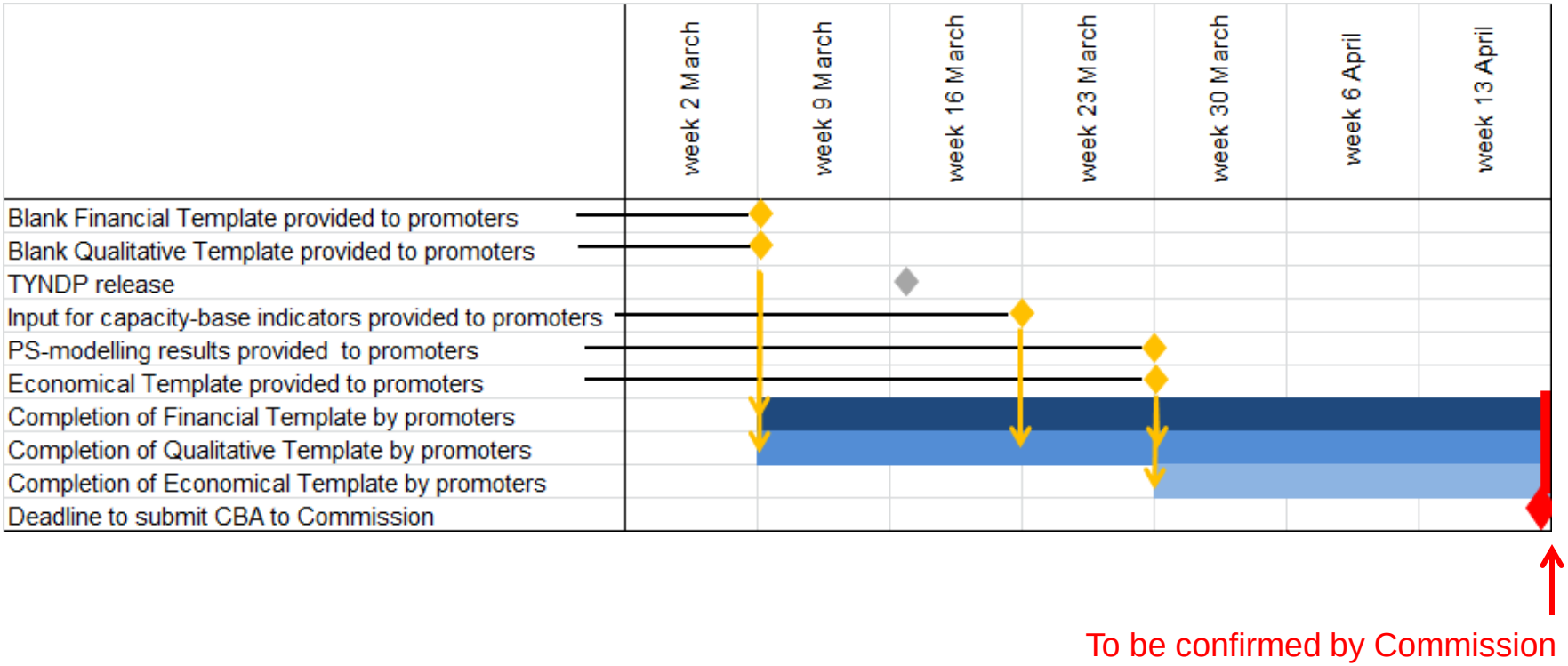
- Eg. For a Group allowing a 20% decrease of dependence on Russian gas, there is a difference between
  - A case where initial situation is 100% dependence (high dependence), and Group allow to decrease it to 80%
  - And a case where initial situation is 20% dependence (already low dependence), and Group allow to decrease it to 0%

***These issues have to be addressed in JRC methodology***

# Overview of CBA



# Indicative timeline




To be confirmed by Commission

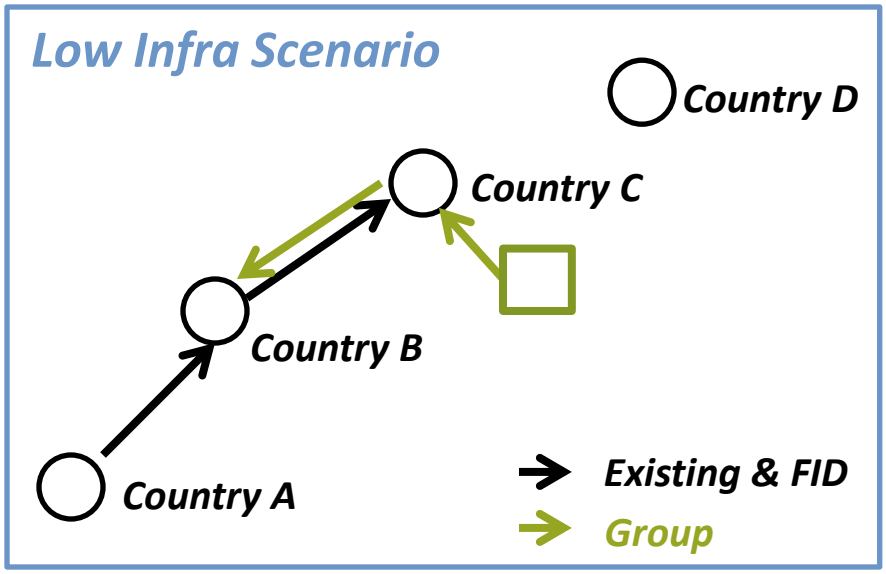
***Start soon and get in contact with the other promoters of your Group***

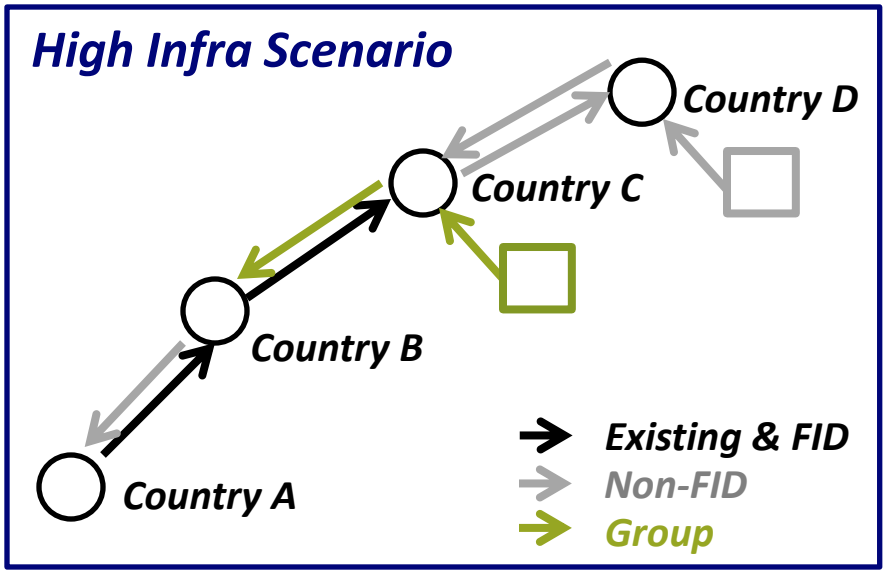
# CBAs

***CBAs will allow to assess the impact of each Group of projects on the situation identified in TYNDP***

> The assessment will be done at Group level (if a Group includes several project, no assessment at each project's level)

> incremental approach under both LOW and HIGH Infrastructure scenarios



# Initial Guidelines to Regional Groups - 1

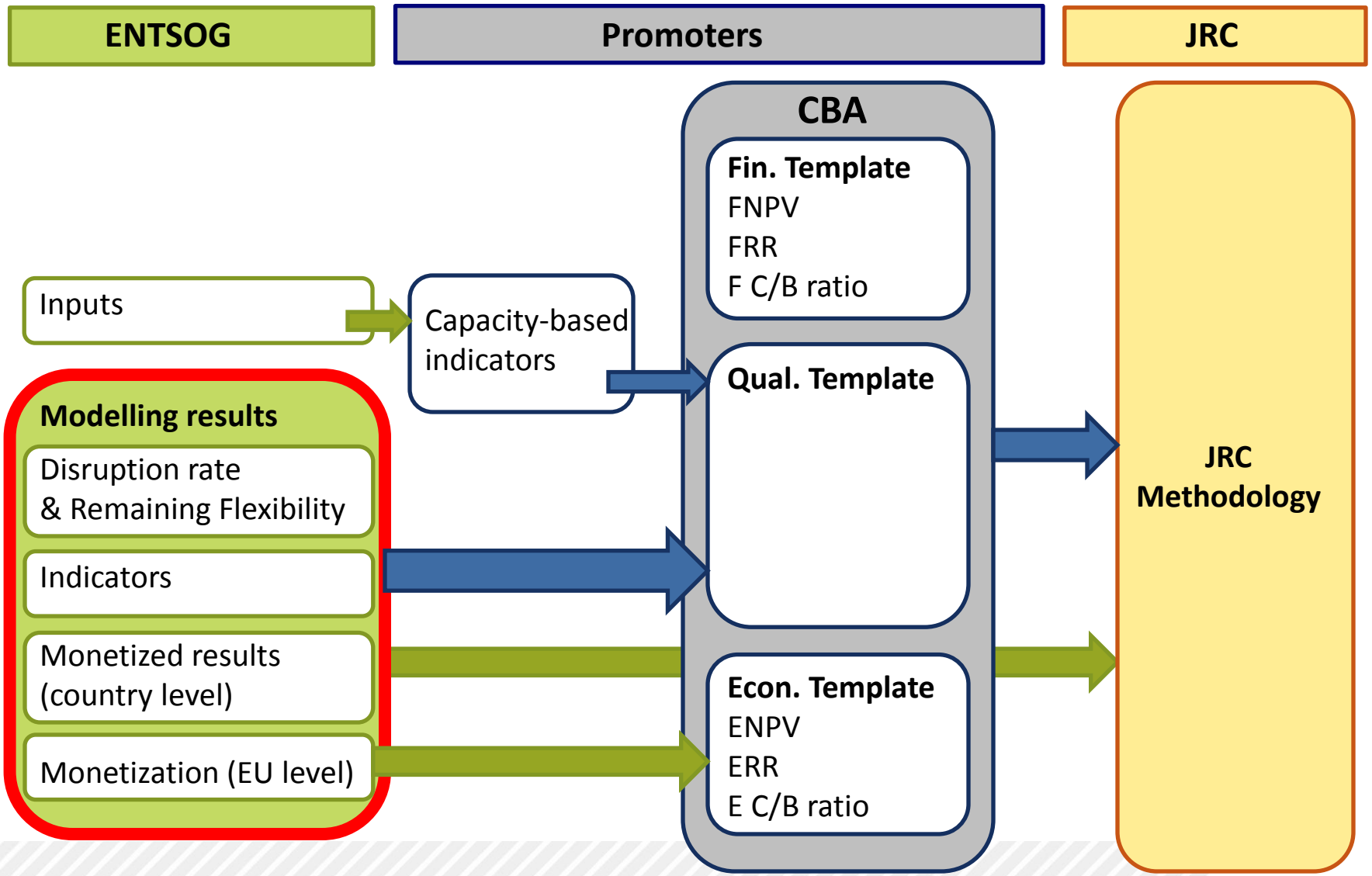
***Results need to be considered both in LOW and HIGH Infrastructure scenarios***

- A Group showing small impact in LOW and high impact in HIGH reflects that the Group has to be combined with other projects to produce maximum impact

- A Group showing high impact in LOW and low impact in HIGH reflects that the Group is in competition with projects having the roughly the same impact

- Depending on indicators, maximum impact could be either in LOW or HIGH

# Overview of CBA



# PS-Modelling results - 1

## *Disruption and Remaining Flexibility*

- No supply price configurations for these indicators

- Calculated at country (or BZ) level under high demand situations

- **Disruption Rate**: measures the share of country's demand which cannot be supplied
  - A 0% disruption rate means the country is not facing disruption
  - A 10% disruption on peak day means that the country's infrastructures only allow to supply 90% of its peak demand

- **Remaining Flexibility**: measures the additional demand the country could cope with, expressed as share of the country's actual demand
  - A 20% remaining flexibility means the country could cope with a 20% increase of its demand

- Above indicators are also calculated under several **route disruption scenarios** (eg. Ukraine or Belarus transit disruption, …)

# PS-Modelling results - 2

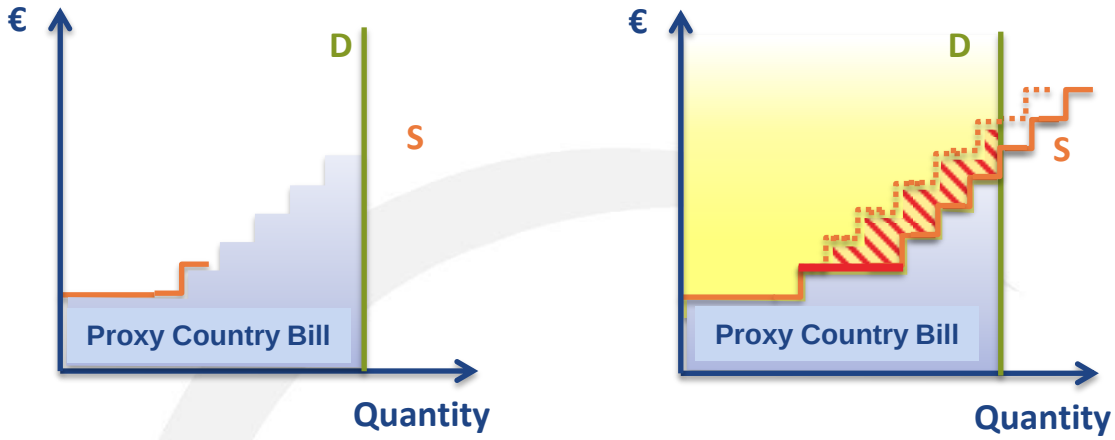
## *Monetized results*

> Monetized results are calculated under the 13 price configurations

> **EU Bill**

> **Marginal Price**: by country (even by balancing zone)

> **GPI (Gas Price Index):** proxy for the country gas Bills, calculated by country



# Initial Guidelines to Regional Groups - 2

## *Monetization*

- Monetization is calculated at EU level
- The model considers a well-functioning market and a single price per source
- The model aims at minimizing the EU Bill as a whole
  - Components of the bill should not be considered independently from each other
    - An increase in the gas bill can reflect a decrease of demand curtailment
  - Evolution of components of the EU bill only make sense if EU bill evolves
- Over-emphasis of monetization should be avoided
  - Some projects may show very low impact on EU Bill…
  - … but impact on GPI (reallocation of costs between countries)
  - … and/or impact on indicators

## *Price related indicators (GPI, SSPDe, SSPDi)*

- Discreet approach in price related indicators modelling may induce step effect in the results
- IT development already considered to mitigate this effect in the future

# PS-Modelling results - 3

## *Indicators*

- Indicators are calculated for each of the 6 sources. They are calculated at country level

- **Supply source dependence** measures the share of country's demand that cannot be supplied if EU faces a total absence of this source. It is calculated both under **uncooperative (USSD)** and **cooperative (CSSD)** behaviour between countries
  - A country's uncooperative dependence of 40% to LNG means that this country needs at least 40% of LNG to supply its demand, if not supported by other countries

- **Supply price dependence (SSPDe)** measures the dependence of country gas bill on that source
  - A country's price dependence of 40% to Norwegian gas means that an increase of 10% of Norwegian price would induce a 4% increase of the country's gas bill

- **Supply price diversification (SSPDi)** measures the ability of each country to take advantage on a cheap source in its gas bill
  - A country's price diversification of 30% to Algerian gas means that a decrease of 10% of Algerian price would be reflected in a 3% decrease of the country's gas bill

# Initial Guidelines to Regional Groups - 3

## *Guidance for Groups mitigating demand curtailment*

- In the modelling, a mathematical value has been attached to disruption
- Mitigating demand curtailment will be **mathematically reflected** in the EU bill as a decrease of mathematical disruption costs and increase of gas bill
- These Groups may have specific impact on indicators that will be further explained

## *LNG terminals modelisation*

- Definition of a minimum flow: 10% of the daily send-out capacity
- Level on send-out on average winter day influences the terminal availability under two-week cold spell
  - Projects or price configurations inducing reduction of winter send-out may affect terminal availability under two-week cold spell

# Initial Guidelines to Regional Groups

**Demand curtailment & Rem Flex**

| Ref case | | RU transit disruption | NO transit disruption | Alg transit disruption | LY transit disruption | AZ transit disruption |
|---|---|---|---|---|---|---|
| | | Ukraine | Langeled | Transmed | Greenstr | TANAP |
| | | Belarus | Franpipe | MEG | | |

Focus on transit disruption to which Region is **most exposed**

**Supply dependence**

| To LNG | To RU | To NO | To Alg | To LY | To AZ |
|---|---|---|---|---|---|

Focus on sources to which Region is currently **most dependent**

| | Ref case | LNG | | RU | | NO | | Alg | | LY | | AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ch | exp | ch | exp | ch | exp | ch | exp | ch | exp | ch | exp |
| **Monetized results** | | | | | | | | | | | | | |
| **Price dependence** | | | | | | | | | | | | | |
| **Price diversification** | | | | | | | | | | | | | |

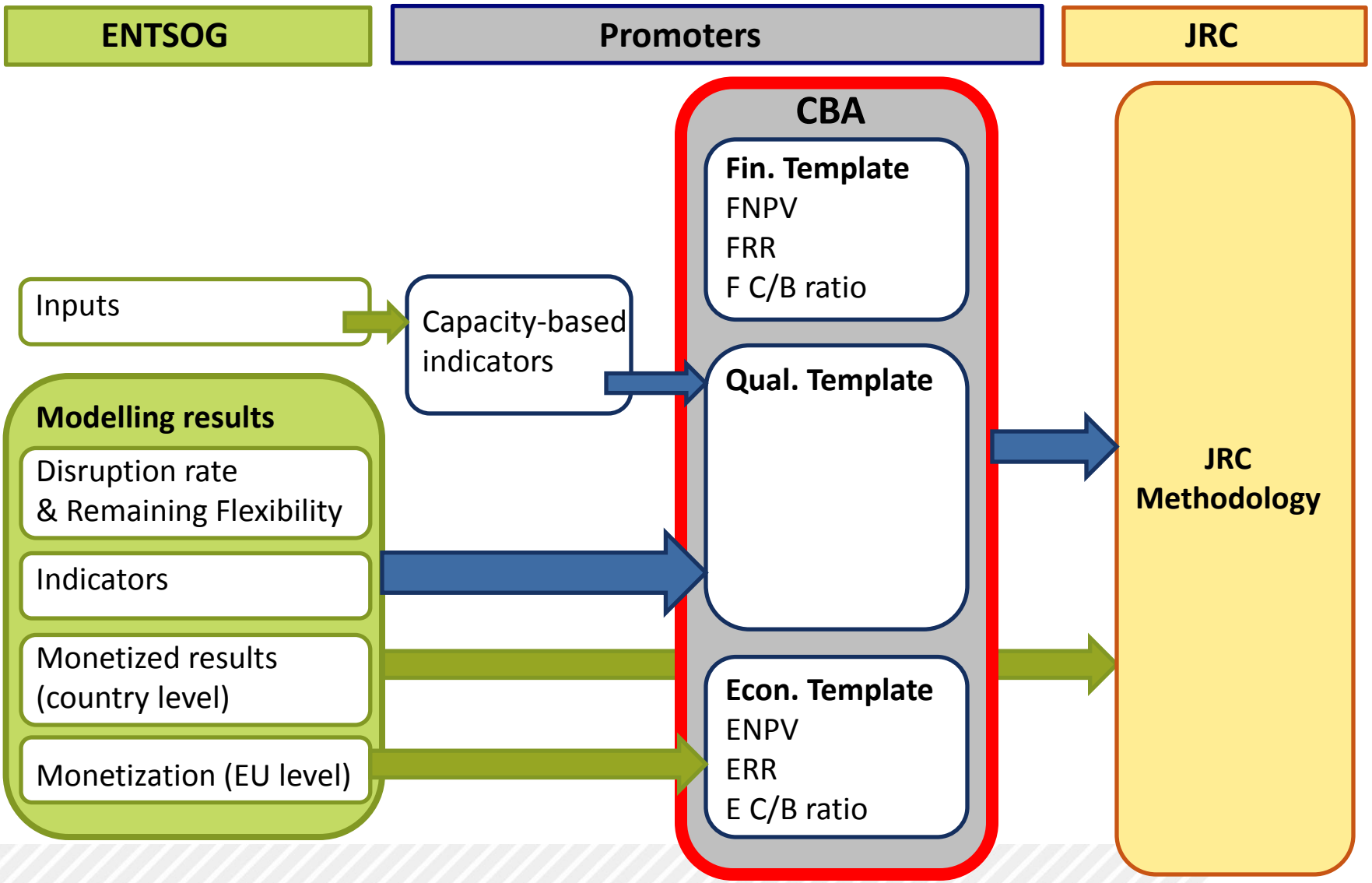
Focus on **expensive configuration** for sources to which Region is **most dependent**
Focus on **cheap configuration** for sources to which Region wants to **diversify**

# Regional Groups Specificities

## *Southern Gas Corridor*

- Still geographically isolated
- Strong influence of historical Russian supply
- Still strongly exposed to potential disruption of Russian transit through Ukraine
- Possible significant gas demand increase
- Significant potential for new supply: Caspian, Cyprus, Romanian Black Sea production are considered in TYNDP and are of particular importance to counter-balance the growing influence of LNG and Russian gas at EU level
- Integration of Energy Community will improve the European integration

# Overview of CBA



# CBA Templates: summary of comments

## *Overview*

> Comments have been collected via Telco open for all promoters

> Comments received in written form by the deadline communicated via COM

> Summarized and presented here

> Groups of comments:

- Technical/ Clarification
- Input related
- Methodological – generally late comments for CBA methodology
- Others

*Thanks for the comments, some of them were really useful !*

# CBA Templates

## *Technical, Clarification Comments*

> Identify projects in the Financial Template by name and ENTSOG code

| Project Name - Project 1 | | | | | | | | | ENTSOG Project # | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Enter exactly 20 yrs of revenue flow | Enter exactly 20 yrs of OPEX after operation | | | | | | | | |
| CAPEX Project | Revenues Project | OPEX Project | Residual Value Project | Operational Cash Flow | Investment Cash Flow | Net Cash flow | PV | NPV | Discounted Costs | Discounted Benefits |
| | *0,00* | *0,00* | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| | *0,00* | *0,00* | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| | *0,00* | *0,00* | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |

> Increase the Financial Template for 12 projects

> Neighbouring country definition clarification in the Qualitative template Based on the Reg. 347/2013

*"The methodology shall define the analysis to be carried out, based on the relevant input data set, by determining the impacts with and without each project.* ***The area for the analysis of an individual project shall cover all Member States and third countries, on whose territory the project shall be built, all directly neighbouring Member States and all other Member States significantly impacted by the project."*** Annex V.10

> Align text in Qualitative Template 4.2 to be in line with the input tables

# CBA templates: Input related Comments I.

- 20 years of time horizon in operation, not 21 years as in the draft templates
- 60 years of time horizon is not possible - methodology is set - TYNDP time horizon is 21 yrs.
- Residual value calculation for multi-staged projects
- CAPEX input before 2015 related to the project; discounted to 2015 value (Future Value Calculation)
- How to treat extraordinary maintenance, re-investment? CAPEX or OPEX?
  - 2 CAPEX columns; 1 investment CAPEX and 1 re-investment CAPEX
  - For simple solution treat them in OPEX, consistently for everyone
- CAPEX, OPEX, Revenue tax content:
  - VAT free estimates for the 3 inputs
  - No filtering with Corporate Tax effects –
    - Project financing is not wide-spread, thus Corporate Tax effects are company operation dependent and not project dependent – consistency and comparability
- FDR tax content:
  - No inclusion of Corporate Tax assumptions in FDR estimate – consistency with above point

# CBA templates: Input related Comments II.

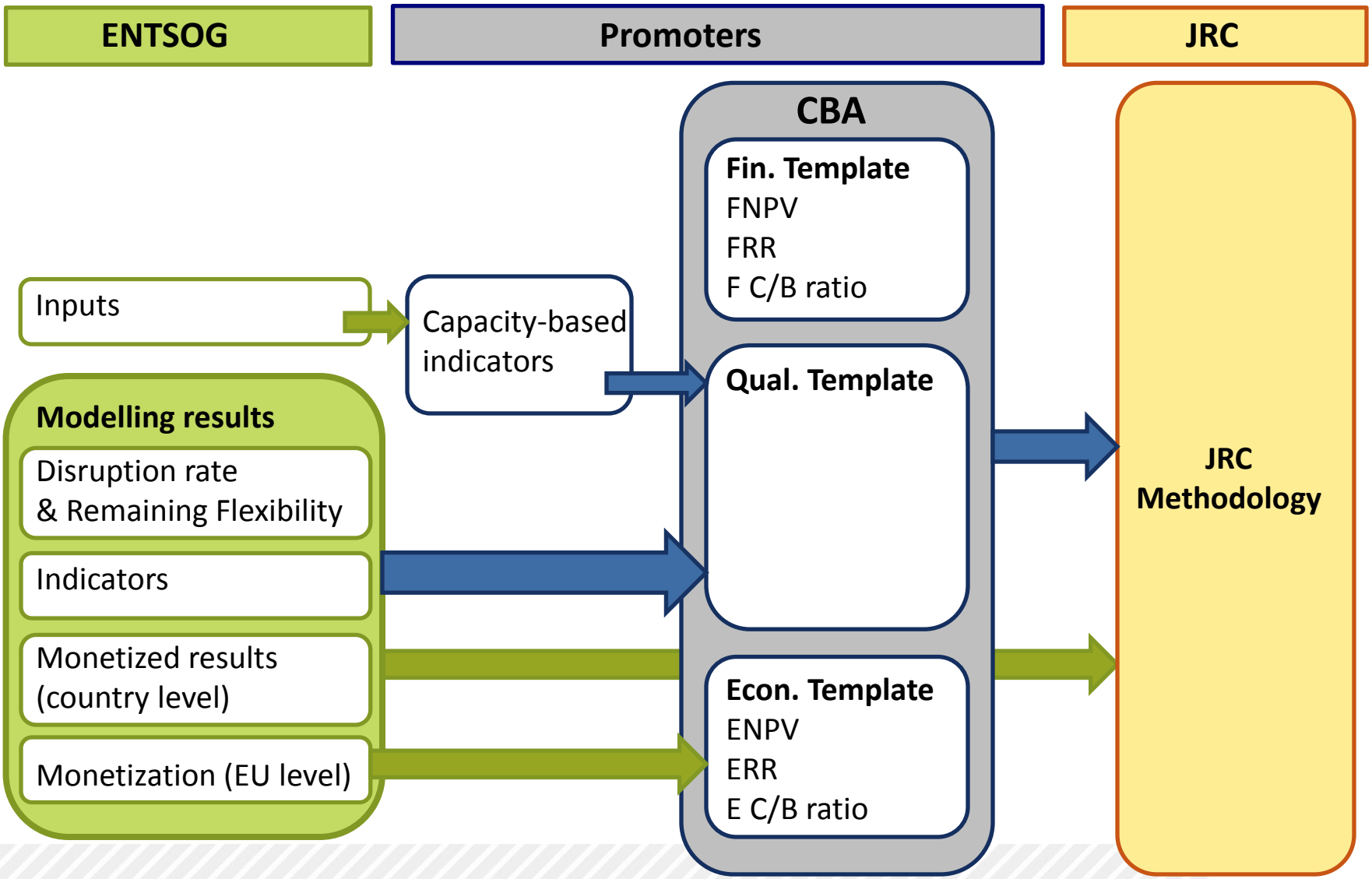
- CAPEX, OPEX, Revenues to be estimated in constant terms for each year (Cash Flow approach), as they will be discounted to 2015 NPV within the templates
- It is recommended to use consistent Flow Assumptions  along promoters at least in a project group to ensure OPEX consistency among them ( e.g. fuel gas impact)
- It is recommended to use consistent tariff impact assumptions based on national regulations to ensure Revenue concistency at least in a project group (e.g. RAB impact, tariff increase assumption)
- Explanation on Gas Price Indicator to be provided, to understand its usage as a proxy for per country benefit

# CBA Templates

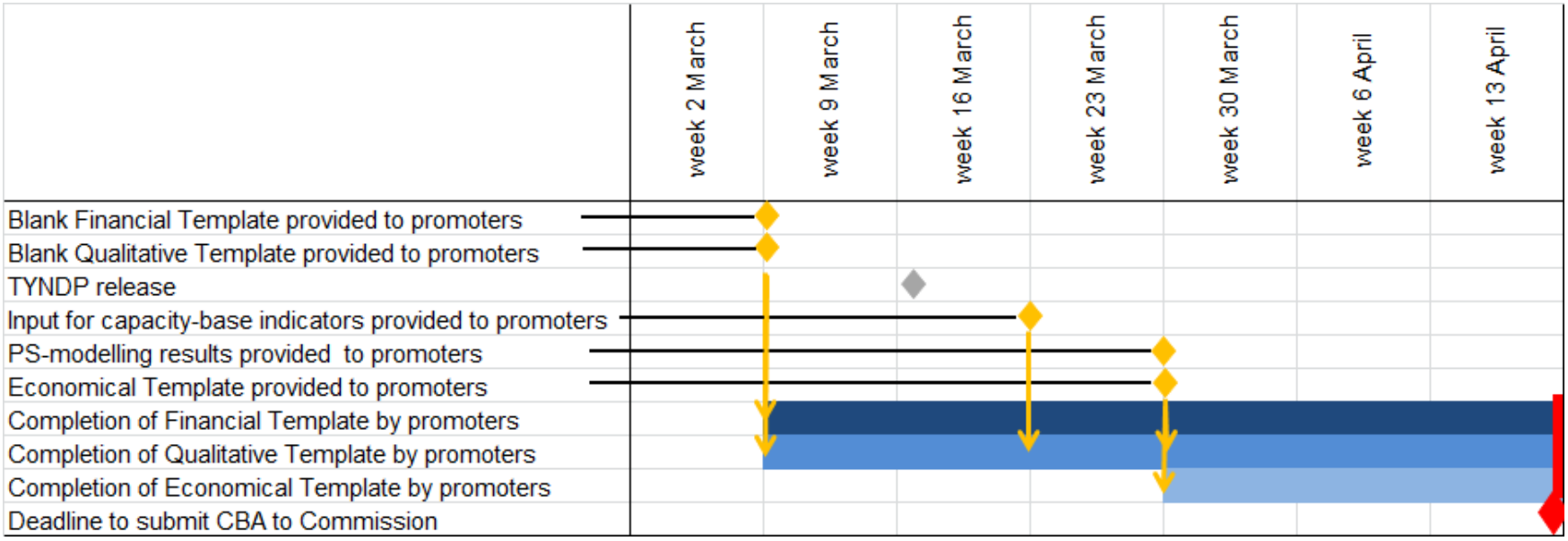
## *Methodological and Other Comments*

- Include quantitative and qualitative benchmarks
  - The project results are not absolute but relative. Project are not 'competing' against an absolute benchmark, but against each other
- Include quantitative indicator on the benefits of bunkering
  - Methodology development is closed, methodology is approved
- Include shadow price analysis for CO2 decrease due to fuel substitution for shipping
  - Promoter can estimate this effect in Qualitative Template/ Additional Benefits 4.5
- Data variables and estimates to be communicated to promoter from early on
  - Project-specific Simulation Results to be distributed to all promoters at the same time to ensure neutrality
  - Model and TYNDP assumptions have been thoroughly consulted during methodology development phase
- ENTSOG cannot confirm the non-maturity of any project
  - ENTSOG needed minimum set of data to enable PS simulation

# To summarize: overview of CBA



# To summarize: indicative timeline




To be confirmed by Commission

***Start soon and get in contact with the other promoters of your Group***

# Thank You for Your Attention

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