TYNDP 2017

Demand

ENTSOG System Development

Image Courtesy of Thyssengas

Introduction

- *Three scenarios for TYNDP 2017 / Introduction of storylines*

- *Power Generation Methodology*

- *Alignment ENTSOG-Scenarios / ENTSO-E-Visions*

- *Final Demand*

- *Default Data Provision*

- *Early Transparency Process*

Discussions are welcome.

Three Scenarios

Demand Scenarios

Scenarios are possible story lines for the EU energy sector in the future

> ENTSOG sees **3 scenarios**, no probability is attached to any scenario, they are not forecasts

> These scenarios will give ENTSOG the reasonable extremes within which to assess the European gas system infrastructure and development
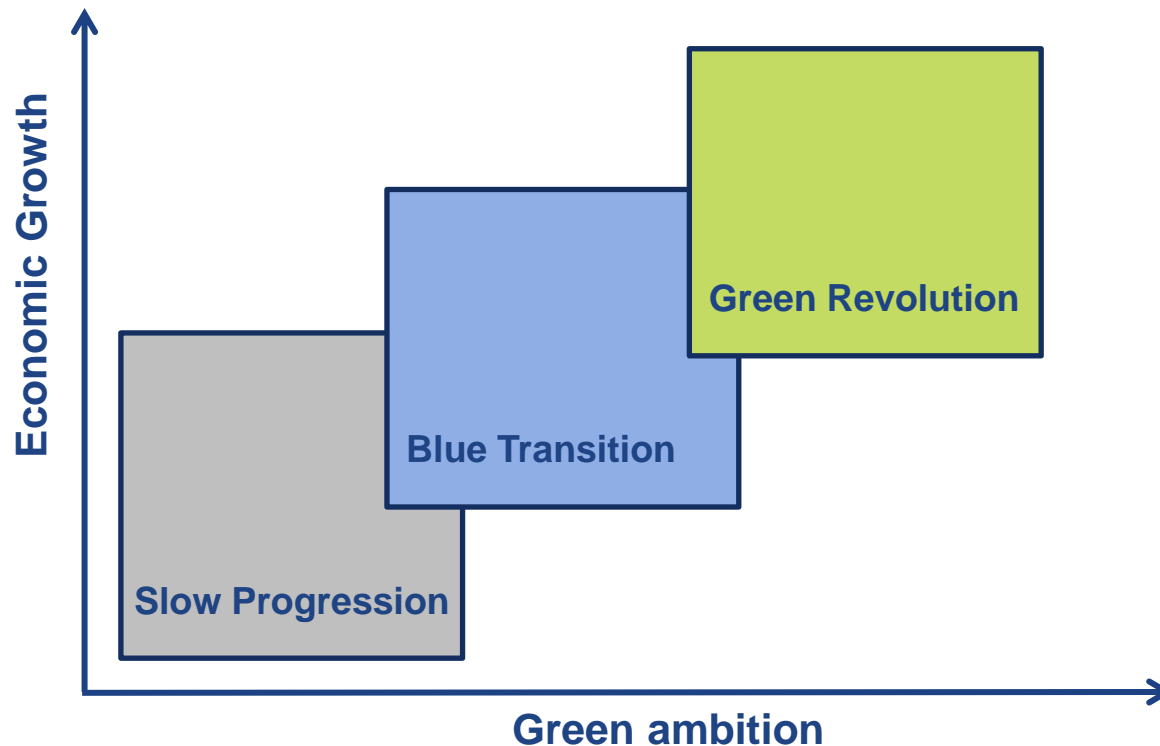
Demand Scenarios: the story lines

TYNDP 2017 Scenarios	Slow Progression	Blue Transition	Green Revolution
Energy Policies/ Regulation	2050 targets not realistically reachable	Mainly on track with 2050 targets [closure of coal-fired power plants (regulation)]	On track with 2050 targets
Economic conditions	Limited growth	Moderate growth	Strong growth
Green ambitions	Lowest	Moderate	Highest
CO2 price	Lowest CO2 price (limited spread of carbon taxes)	Moderate CO2 price (carbon taxes mainly spread)	Highest CO2 price (carbon taxes well spread)
Fuel prices	Highest fuel prices [expected gas price>coal price]	Moderate fuel prices [expected gas price>coal price]	Lowest fuel prices [expected gas price>coal price]
Internal energy market	Well functioning, low MS cooperation	Well functioning, moderate MS cooperation	Well functioning, strong MS cooperation
Renewables develop.	Lowest	Moderate	Highest
Gas in heating sector			
Energy Efficiency	Slowest improvement	Moderate improvement	Fastest improvement
Competition with electricity	Limited gas displacement by elec. (new buildings)	Limited gas displacement by elec. (new buildings)	Gas displaced by electricity (district heating, heat pumps)
Electrific. of heating	Lowest	Moderate	Highest
Gas in power sector			
Gas vs Coal	Coal before Gas	Gas before Coal (on regulatory basis)	Gas before Coal (on regulatory basis)
Gas in transport			
Gas in transport	Lowest penetration	Highest penetration	Moderate penetration
Electricity in transport	Lowest penetration	Moderate penetration	Highest penetration
Expectations regarding EU overall gas demand	Expected to remain stable	Expected to increase	Expected to decrease

Gas for Power Generation

Gas for Power Generation

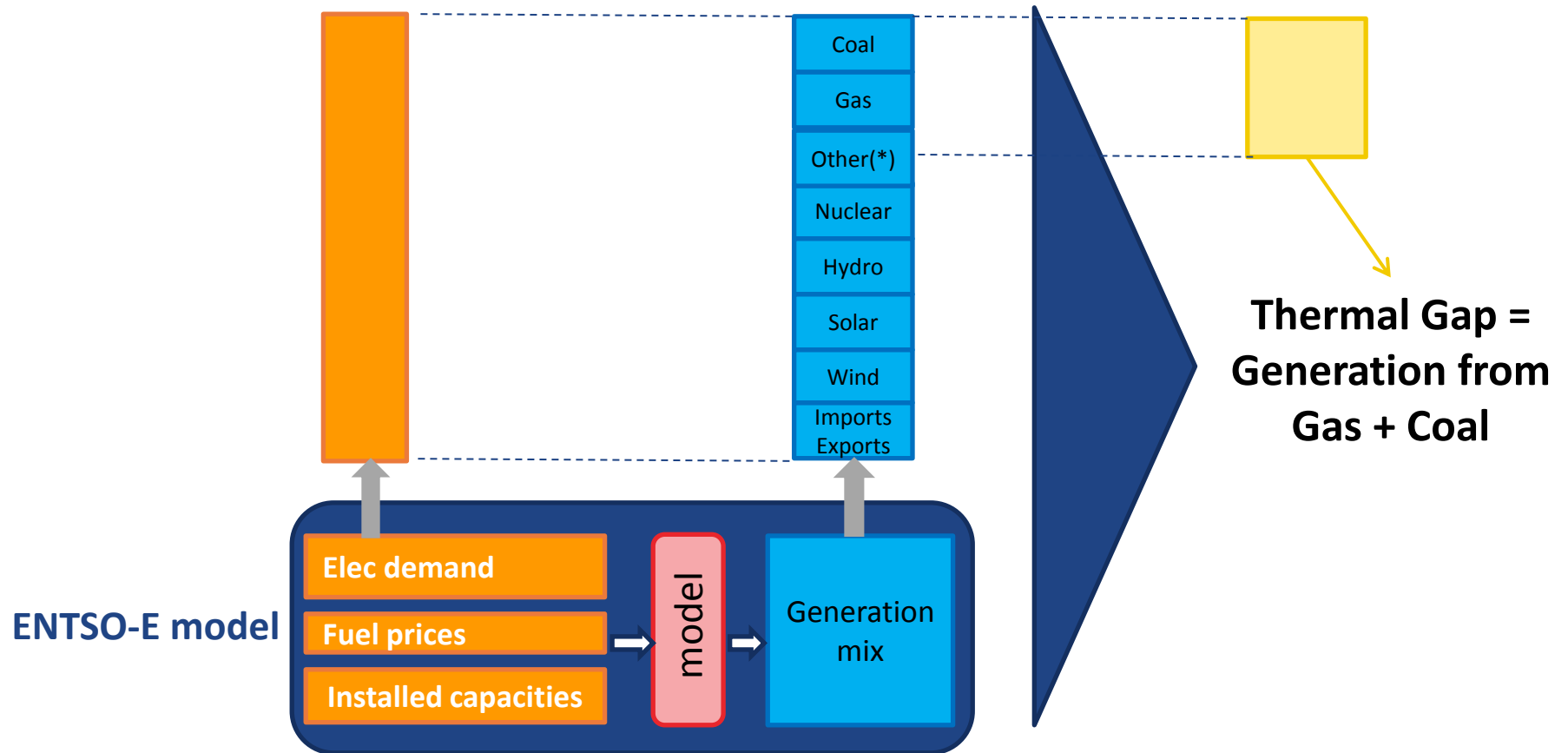*Using ENTSO-E TYNDP 2016 data to help create more consistent scenarios for power generation from gas*

> Electricity demand

> Installed capacities

> Thermal efficiency

> Hourly granularity of utilisation produced by ENTSO-E modelling

This data is used to calculate anticipated load factors, yearly demand average and incorporated into the power generation methodology produced by ENTSOG, which has been developed from that used in TYNDP 2015

Thermal Gap

Electricity Demand

Generation Mix

Coal

Gas

Other(*)

Nuclear

Hydro

Solar

Wind

Imports Exports

Thermal Gap = Generation from Gas + Coal

ENTSO-E model

Elec demand

Fuel prices

Installed capacities

model

Generation mix
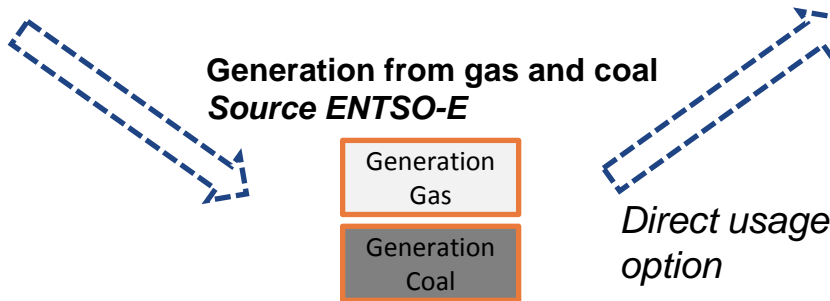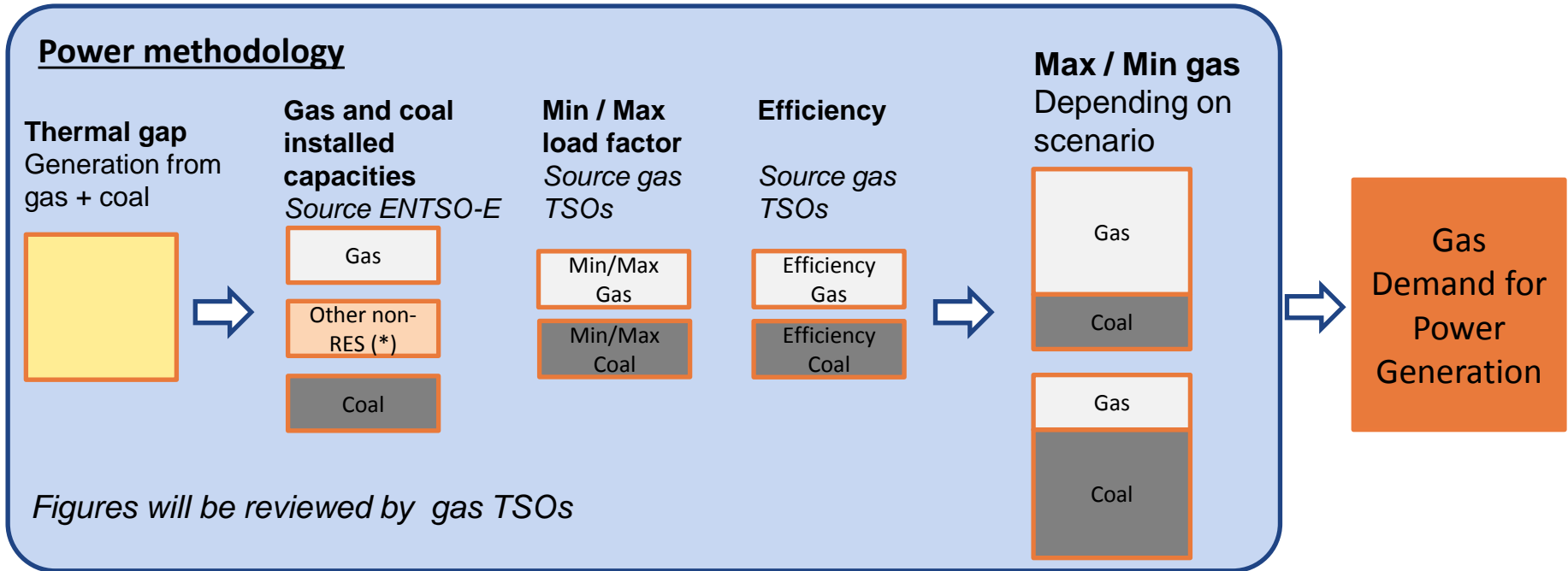
(*) Other non-RES installed capacities: can possibly include gas-fired generation

Power Methodology

Power methodology

Thermal gap
Generation from gas + coal

Gas and coal installed capacities
Source ENTSO-E

- Gas
- Other non-RES (*)
- Coal

Min / Max load factor
Source gas TSOs

- Min/Max Gas
- Min/Max Coal

Efficiency
Source gas TSOs

- Efficiency Gas
- Efficiency Coal

Max / Min gas
Depending on scenario

- Gas
- Coal

- Gas
- Coal

Gas Demand for Power Generation

Figures will be reviewed by gas TSOs

Generation from gas and coal
Source ENTSO-E

- Generation Gas
- Generation Coal

Direct usage option

(*) Other non-RES installed capacities can include gas-fired generation.
TSOs will be able to consider these capacities for gas generation where needed

Power Methodology

TSO can submit their own data if justification can be provided why the figures produced from the power methodology are not appropriate. This may be driven by country specific factors that the TSO's may not feel have been reflected appropriately

- ## *Time snapshots*

> ENTSO-E vision data provides values using the power generation methodology for 2030, but data is required for all the timeline snapshots assessed by TYNDP 2017. As a result TSO's can provide information to define this profile.
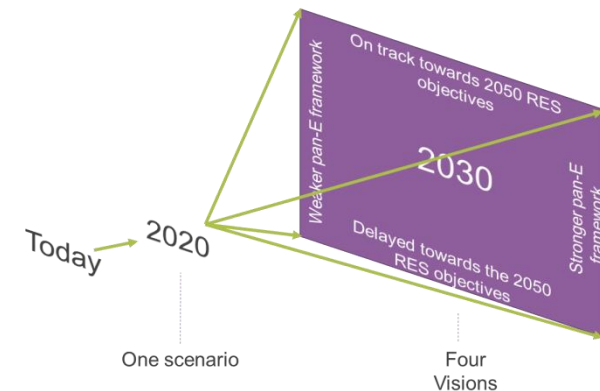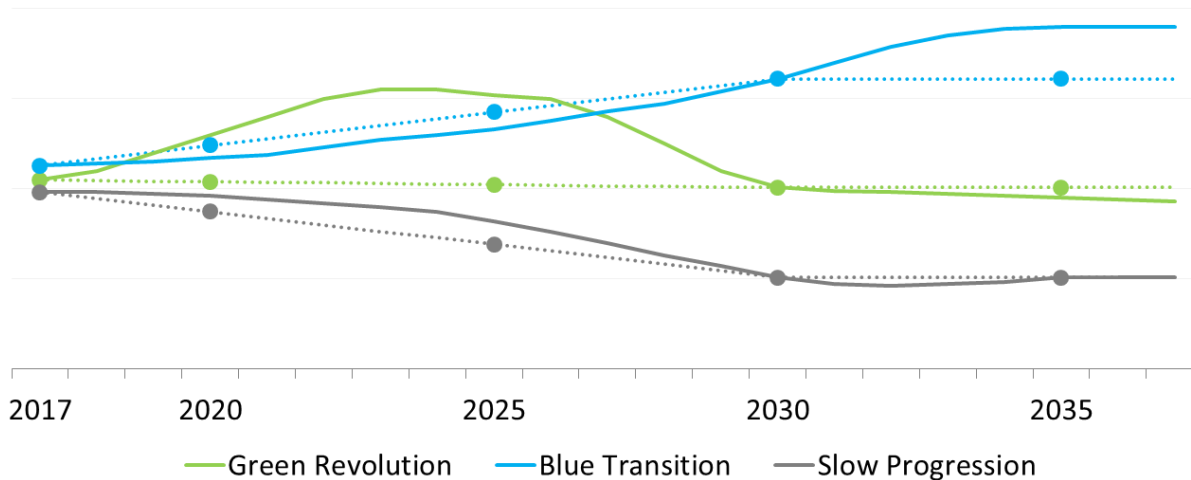
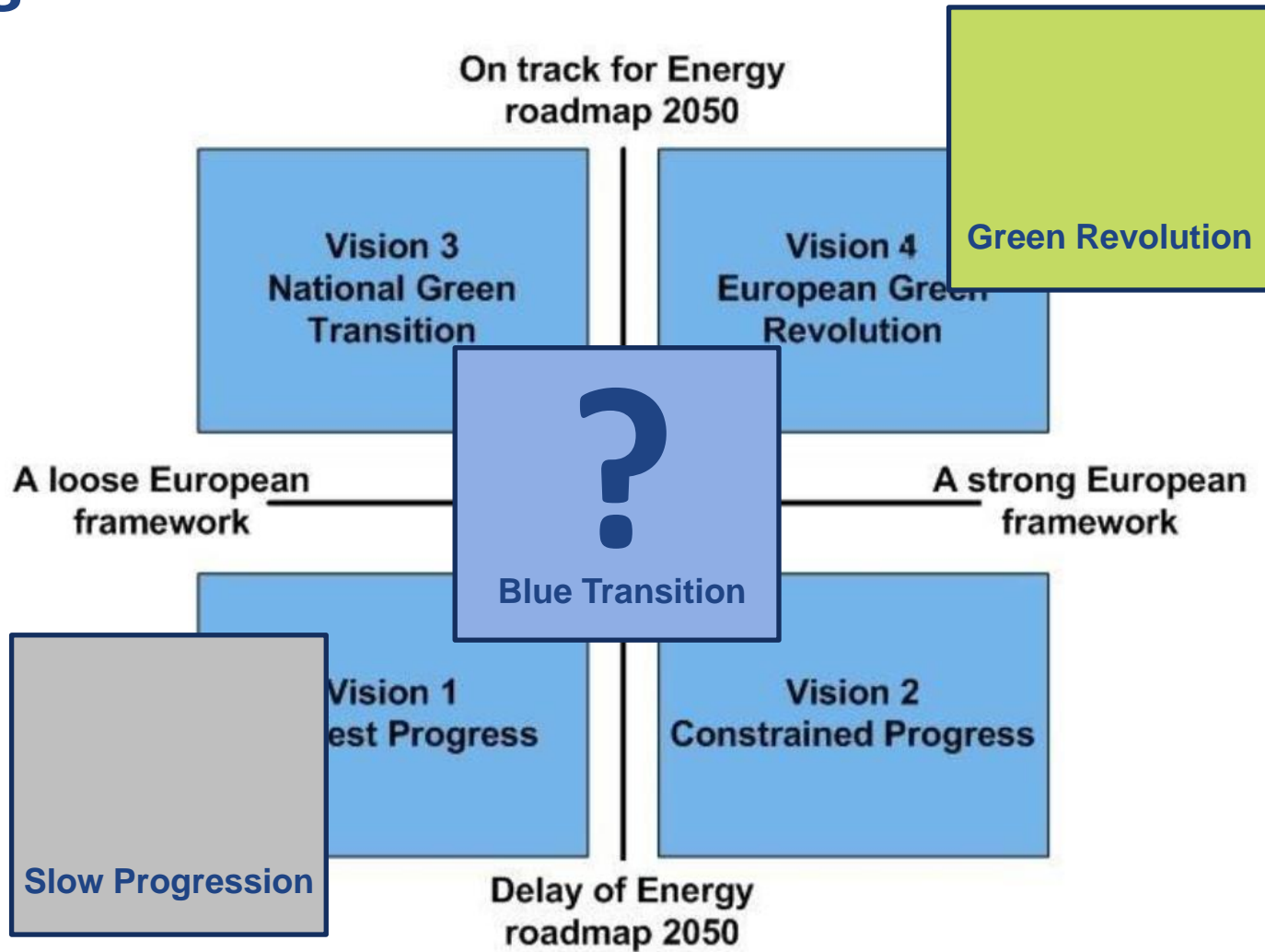Single scenario for 2020 does not fit ENTSOG timeline approach

- *Default data option proposed to be linear interpolation up to 2030 and extrapolation beyond this point*

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Alignment – Scenarios / Visions

Alignment with ENTSO-E

On track for Energy roadmap 2050

Vision 3
National Green Transition

Vision 4
European Green Revolution

Green Revolution

A loose European framework

? Blue Transition

A strong European framework

Vision 1
est Progress

Vision 2
Constrained Progress

Slow Progression

Delay of Energy roadmap 2050

Alignment with ENTSO-E

Blue Transition presents some difficulty in terms of alignment…

> This is due to the fact that blue transitions appears midway on the ENTSOG axes of **Economic Growth** / **Green Ambition** and sees a change in merit order

> ENTSO-E axes represent **On track to 2050 / European Framework**

Based on initial analysis involving expertise from TSO's, we have identified the best alignment between ENTSOG Scenarios and ENTSO-E Visions

ENTSOG Scenario	ENTSO-E Vision	Thermal Gap Input
Slow Progression	Vision 1	Min Gas
Blue Transition	Vision 3	Max Gas
Green Revolution	Vision 4	Max Gas

> There are some instances where Vision 2 reflected the expected storyline of Blue Transition better, this is another reason for offering the ability for TSO to provide their own data where appropriate

Commodity Price Alignment

Proposal:

1. To use WEO 2015 as data source for commodity (gas and coal) and CO_2 prices in the TYNDP 2017

2. To align our scenarios with the WEO scenarios on the following way:

ENTSOG Scenario	Short Description	ENTSOG Data Source
Slow Progression	Coal before gas; Not on path with EU Targets	WEO 2015 - Current Policies
Blue Transition	Gas before coal based on Regulation; Mainly on path with EU Targets	WEO 2015 - New Policies
Green Revolution	Gas before coal based on Regulation; On path with EU Targets	WEO 2015 - 450

Alignment with ENTSO-E and WEO

Combining all the elements together…

ENTSOG Scenario	ENTSO-E Vision	ENTSOG Data Source
Slow Progression	Vision 1	WEO 2015 Current Policies
Blue Transition	Vision 3	WEO 2015 New Policies
Green Revolution	Vision 4	WEO 2015 450

ENTSOE has described the data input for commodity prices for its TYNDP

> TYNDP 2016 - Scenario Development Report pg.41.

> The **Gas vs. Coal merit order is the same** as the ENTSO-E data source for the selected WEO Scenarios

Use of WEO 2015 ensures up-to-date data consistent with retained ENTSO-E Visions

Peak Demand

High demand situations

> Design case: 1-day level of demand used for the design of the network in each country

> 2-week case: average daily level of demand reached on 14 consecutive days once every twenty years in each country, considered to happen in February

| Peak | 2-week peak | Yearly | Summer | Winter |
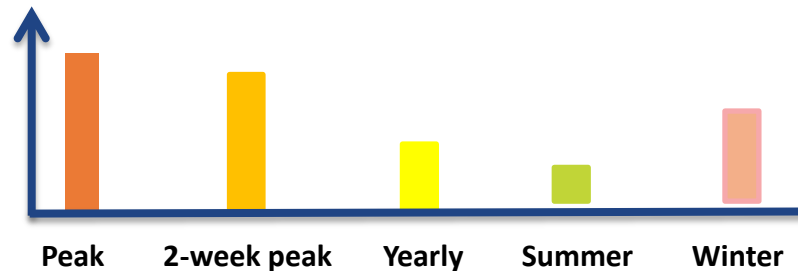
ENTSO-E model uses an non-extreme climatic year

> This means that ENTSO-E high demand cases for generation from gas do not represent ENTSOG Design Case and 2 Week requirements

TSO's will provide this high gas demand data for power generation, as they do for final demand, but will still be able to refer to ENTSO-E derived data
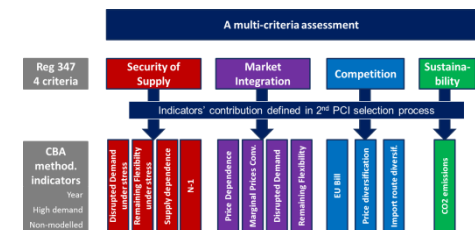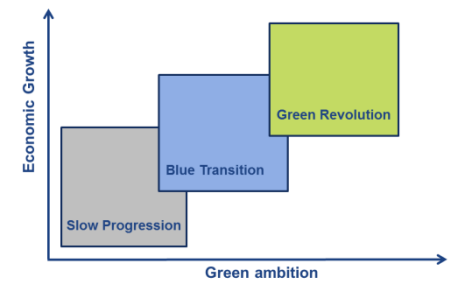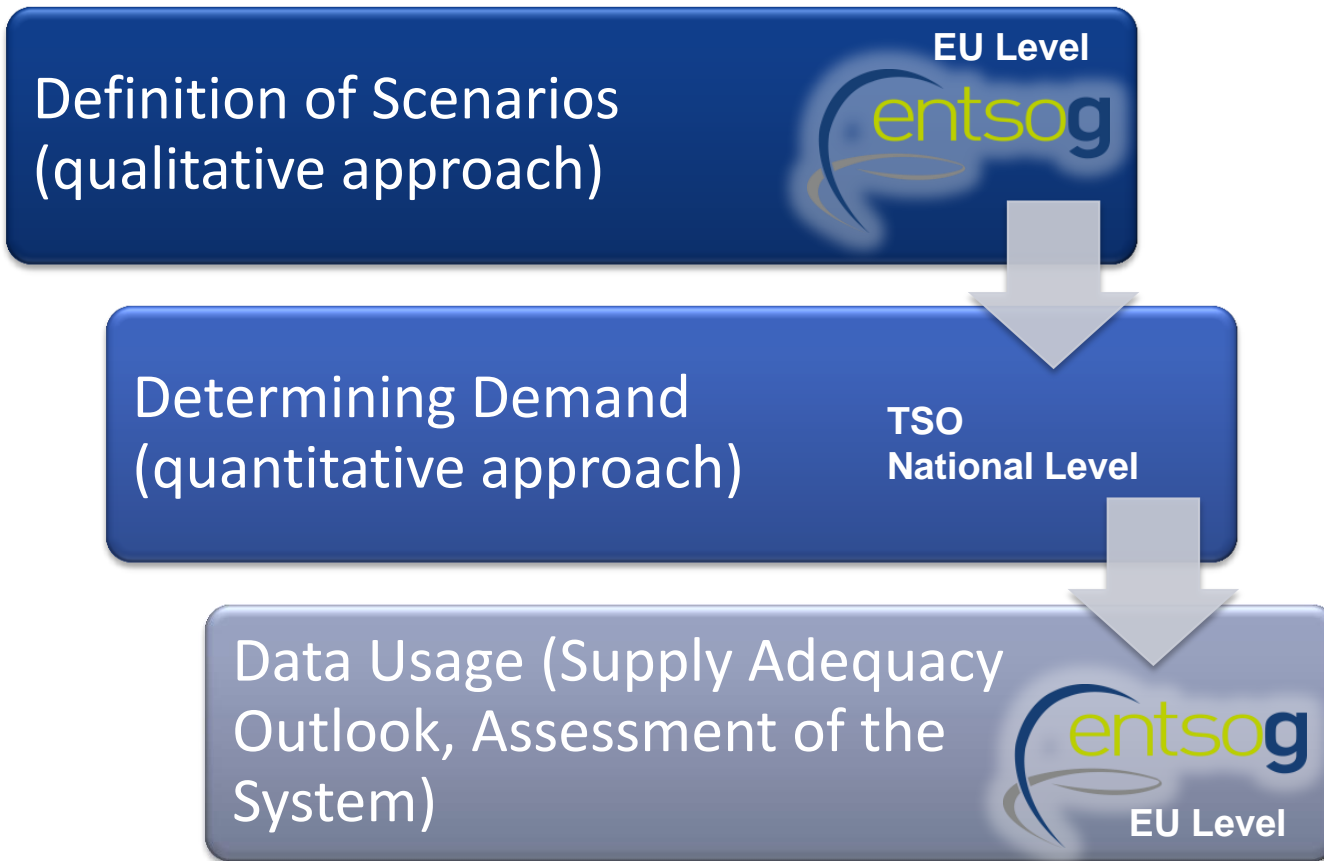
Final Demand

Final Demand

> Final Demand = Residential, commercial, industrial and transport demand

> Total Demand = Final Demand + Demand for Power Generation

Definition of Scenarios (qualitative approach)
EU Level

Determining Demand (quantitative approach)
TSO National Level

Data Usage (Supply Adequacy Outlook, Assessment of the System)
EU Level

Default Data

Default Data

For TSO's that cannot provide data for all three scenarios, ENTSOG will consider using default data sources. For TYNDP 2017 the following sources of default data are proposed...

- ***Final Demand***
  - Green Revolution – PRIMES 2016
  - Blue Transition - PRIMES 2016
  - Slow Progression – Historic Actual

- ***Power Generation***
  - Green Revolution – Vision 4 (Thermal Gap Max Gas)
  - Blue Transition – Vision 3 (Thermal Gap Max Gas)
  - Slow Progression – Vision 1 (Thermal Gap Min Gas)

Transparency

Transparency Process

- ***Public Workshop***

  - Presentation of the TYNDP Concept 2017

- ***Dedicated Demand Data SJWS in June/July***

  - Once the data collection has been completed and checked, EU and Country level data, plus the assumptions behind this data, will be presented to stakeholders

  - Data will then be available on the ENTSOG website

Thank You for Your Attention

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