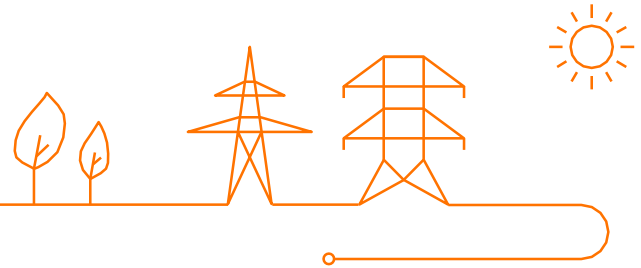
# Task Force Scenarios

## Closing meeting of the first year

26/01/2022

# Agenda

1. Approval of the minutes of the workshops
2. Summary of 2021
3. Overview of the received feedback
4. Looking forward
5. Room for feedback



# Formal approval of the minutes of the workshops

Workshop 1 “Scenario framework” Minutes:

- Feedback received from Febeliec, Siemens Energy, Fluxys, Engie

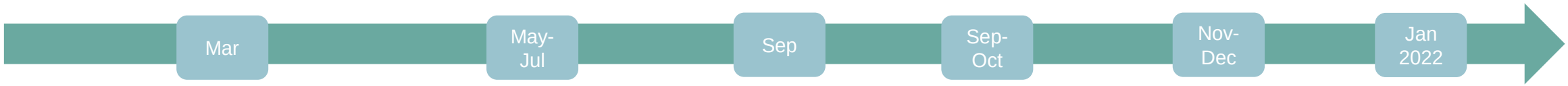
Workshop 2 “Flexibility in consumption” Minutes:

- Feedback received from Febeliec, Siemens Energy, Febeg

Publication of the reports in ‘*draft*’, that include these remarks, was already done on the TF Scenarios webpage.

Without additional comments these minutes will be put in ‘*final*’ status.

# Summary of 2021




**Orientation task force**

- Clarify what studies will benefit this year's scenario report
- Clarify the degrees of freedom with respect to the regulatory context of these studies

**Call for members**

- Gather stakeholders who will contribute in the co-creation

**Call for evidence**

- Collect insights, research and evidence

**Workshops Bilateral contacts**

- Engage in meaningful discussions with stakeholders on the topic of storyline definition and scenario quantification

**Consolidation**

- Consolidate the input received and the outcome of the discussions to finalize the quantification of the scenarios

**Public consultation**

- Allow for a public review of the proposed quantified scenarios

**Scenario report**

- Detail the scenario storylines, quantification & stakeholder opinions

**Initiation** | **Co-Creation** | **Consolidation**

# Overview of the received feedback

- Elia received non-confidential answers to the public consultation from the following parties:

Bond Beter Leefmilieu (BBL)

Federatie van de Belgische Elektriciteits- en Gasbedrijven (FEBEG)

Fluxys

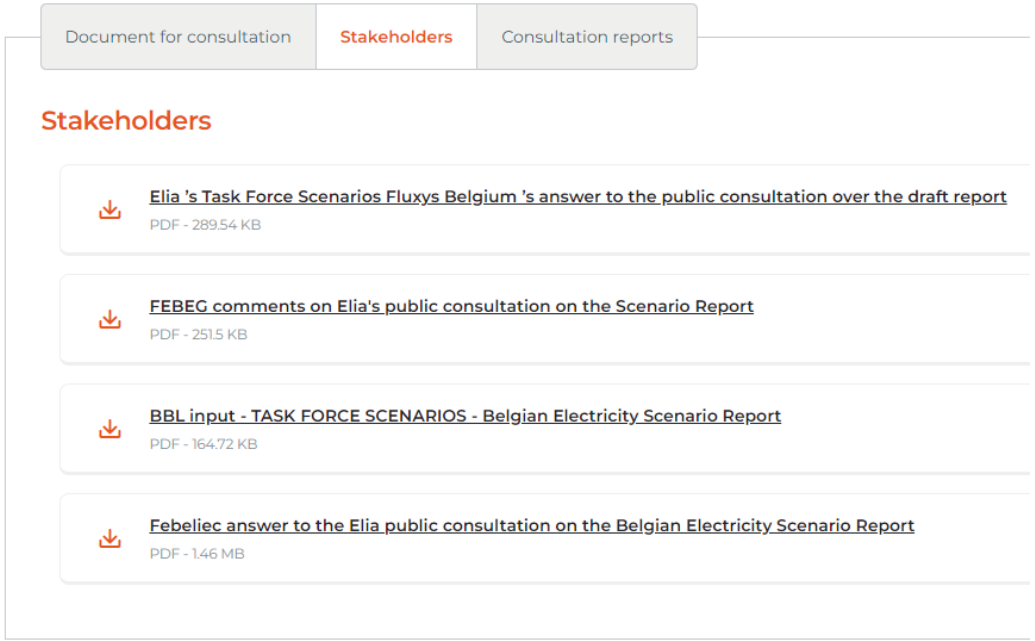
Federation of Belgian Industrial Energy Consumers (Febeliec)

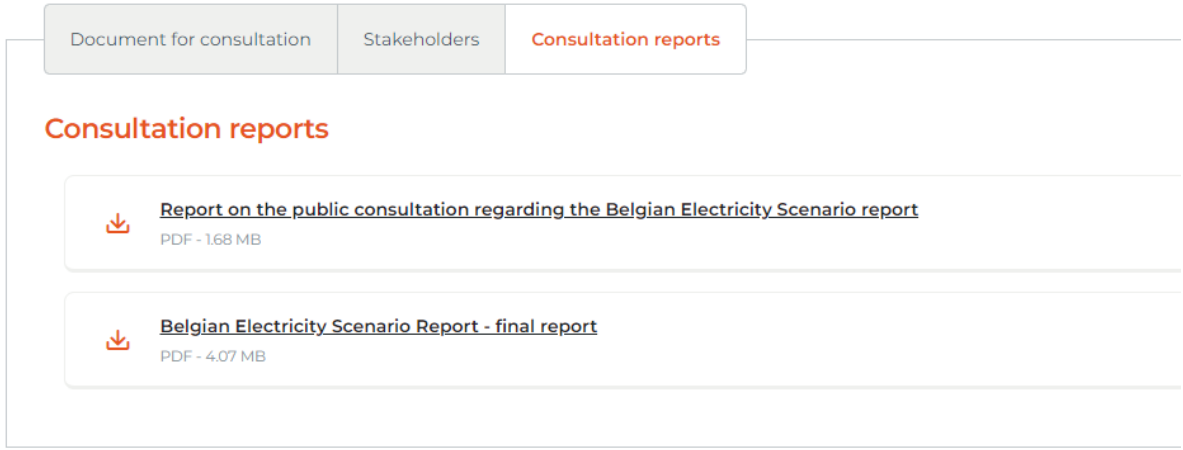
**Given the extent of the feedback, time was taken to ensure a good quality response to all questions – in response, Elia ensured:**

- Publication of all reactions from stakeholders on the Task Force Scenario website
- Summary of remarks in the next slides to address them here in this task force.
- Publication of the draft of an official response document on the website on the 24th of January
- Integration of remarks in the final version of the scenario report – published on the website

# Where can you find the documents?

Stakeholder feedback, Elia's consultation report & final scenario report can all be found on the Elia website
https://www.elia.be/en/public-consultation/20211115_public-consultation-on-the-scenario-report



# Overview of the received feedback

## 1. Link with the European framework

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Mention of sources to take into consideration |
| FEBEG | Mention of sources to take into consideration |

**Answer from Elia**

- **NECP and long term strategies** are the base for **the 'Expected Policies' scenarios** (National Trends scenario used by ENTSO-E/G) and the additional ambitions set in the 'FitFor55' and recent national announcements will be part of the **'FitFor55' scenario**;
- The **different references provided by stakeholders** will be **analyzed** to identify whether there are elements that could be inserted in the **scenario quantification**.
- The **4 reports/work mentioned by FEBEG will be taken into account** when defining assumptions for our neighboring countries in the longer run. In addition, **more updated ambitions** from German and NL , IE agreement will be used and reflected in the 'Fit-For55' compliant scenario and for the scenarios beyond 2030.
- Elia prefers to use the **reports published** by the **European Commission as the main reference** for constructing long term scenarios as they integrated the recent ambitions and are coherent with the geographical scope and needed granularity.

# Overview of the received feedback

## 2. Proposed storylines

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Limit the storylines to 2 axes: level of electrification & central/decentral nature of the energy system. All the proposed scenarios are quantified mainly for electricity |
| FEBEG | Scenarios developed “by TSOs for TSOs” is not ideal. Proposition to address pessimistic “what ifs. |
| Febeliec | Costs not taken into account as a main driver on investments. Absence of sanity check in terms of feasibility. |

### Answer from Elia

- **Completely changing the framework is not possible at this stage**. This is also the reason why early input was asked during the **first ‘call for evidence’** that was made in Q2 2021 or during the workshops. The **suggestions made by BBL** can be taken into account in a **future exercise**. It is important to mention that the scenarios are starting from multi-energy scenarios (made at TYNDP2022 level) but that the focus is then put on the electricity system (including the interfaces between the electricity system and the other energy vectors).
- Elia proposed to **start from the TYNDP2022** storylines as constructed and consulted upon at ENTSO-E and ENTSO-G level. The **uncertainties** could be tackled with **one or two additional variations**. A more conservative/pessimistic scenario called ‘Expected Policies’ will also be considered until 2040. Such scenario somehow reflects the reservations on NIMBY, costs of technologies and carbon prices.
- **Regarding flexibility options**, those are different depending on the scenario and the assumptions were also **reviewed downwards** taking into account the **comments made**
- Concerning the comments made on the **costs** and **‘sanity check’,** the proposed ranges are based on a **large amount of studies performed by Belgian** or **European entities**. In the longer term (post 2030), the proposed ranges are in-line with a large amount of studies. The idea of the scenarios is to have scenarios which reflect the possible futures. Some aspects are also the outcome of an investment model optimization (e.g: for back up capacities)

# Overview of the received feedback

## 3. Storylines to scenarios

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | The way heat is provided to end-consumers is a differentiator between Elia scenarios & the ones proposed by BBL. |
| FEBEG | Caution about factors to take into consideration such as the attitude of the consumers & the evolution of the market |

**Answer from Elia**

- In the scenario with the **highest degree of centralization** and **lowest degree of electrification**, **Global Import**, it is assumed that **decarbonized** molecules such as bio-gas, hydrogen & e-gases are **deployed at scale**. **Electric heat pumps** are installed where most **economically viable** and/or **where gas infrastructure is not available**, in the least insulated dwellings these are hybrid types with molecule-based back-up.
- In the scenario with **high decentralization** and **high electrification**, **E-prosumers** and **Flex+**, the main focus is on **large-scale electrification at the end-consumer side** in the form of electric heat pumps (mostly all-electric).
- In the more centralized (but high degree of electrification) **large scale e-RES** scenario, **district heating systems with large centralized heat pumps** and **cogeneration** units as back-up are also assumed widely installed in favor of more decentrally located heat pumps.

# Overview of the received feedback

## 4. Photovoltaic

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Proposed ranges are reasonable. Higher maxima proposed for the potential – 60 GW for solar PV |
| FEBEG | 20-30 GW by 2040-2050 is more realistic. No positive business case when looking at Belgian peak load & ambitious plans in neighbouring countries |

**Answer from Elia**

- The **trajectories** based on **various national studies** where the available surface is used as a basis to derive the penetration of solar panels (around 100 GW technical potential following the latest study by EnergyVille).
- The **penetration of solar capacity** remains **uncertain** and can be illustrated with the **comments provided by stakeholders** in the public consultation process going in opposite direction.
- The **range of 20-30 GW** as proposed by FEBEG for 2040-2050 seems **very pessimistic given the ambition foreseen in the FitFor55** package or the Belgian NECP where it is assumed to double the solar capacity in 10 years. On the other hand there might be other constraints that could limit the penetration of PV.
- **Most studies on Belgium** use a value of around **50 GW for their maximum PV installed capacity in 2050** Given both opinions provided during this public consultation providing arguments in **two opposite directions**, we propose to keep the value of **50 GW the maximum solar capacity** by 2050 for Belgium.

# Overview of the received feedback

## 5. Onshore & Offshore wind

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Proposed ranges are reasonable. Proposition to increase the potential of onshore wind to 16 GW (80% of theoretical potential) |
| FEBEG | FEBEG approves offshore scenario. NIMBY is considered as hindering and onshore wind potential is deemed at 5 GW. |

### Answer from Elia

- The **comments** received on the **ranges of wind offshore potentials**, going beyond the potential is acknowledged **as unreasonable** given the limited space available in the Belgian EEZ (this does not exclude additional wind from other countries to be connected to Belgium). **The proposed ranges are therefore kept**.
- **Concerning wind onshore**, the comments **go in both directions**. Most studies use a **maximum 'reasonable' potential of around 9 GW**. Such value would be reached in the most ambitious scenario for onshore wind but other scenarios would reach lower values.
- Regarding the development of **new offshore technologies in Belgium** such as floating solar panels, tidal energy… is **currently limited** due to the maturity of such technologies and the limited area available in Belgium compared to other countries. It is proposed to consider two new offshore technology that can be part of the mix in Belgium on long term:
  - **Floating solar panel:** a potential up to **100 MW for BE** but only as from 2040
  - **Tidal capacity:** it is proposed to include **maximum 100 MW** in Belgium in the most optimistic scenario regarding offshore RES development only as from 2040**.**

# Overview of the received feedback

## 6. Electricity demand

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | BBL invites to reconsider the ranges, especially on heat sources. BBL questions development of climate as a basis for scenarios and recommends to consider cold winters (such as in the 80's in North America) |
| FEBEG | Proposed ranges are reasonable. Regarding heat pump development, very high range is too optimistic whereas the lower range is too pessimistic. Regarding electric heavy trucks, the high range is also considered too optimistic |

**Answer from Elia**

- Elia proposes to use a **climate database** which is based on the renowned MéteoFrance institute which takes into account the climate evolution into account. In such database, there are both cold and warm winters and all the years in that database are equiprobable.
- **Elia reconsiders** the range for **heat pump penetration to 40%-90%** based on the feedback
- The **lower share of heat pumps** has been **revised** upwards to **40% (up from 35%)** based on the feedback**.** On the other hand, the **upper range of 95% might be considered too extreme** when taking into account stock inertia, protected buildings and the fact that a heat pump might not feasible in some buildings.
- For **road freight**, the **upper range** has been **revised** downwards from **90% to 80%** following the comment regarding the stock inertia, but keeping in mind that such value could be reached after 2050.

# Overview of the received feedback

## 7. Demand side response

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Flexibility of heating and cooling should be reviewed based on scenario framework proposed by BBL. |
| FEBEG | Assumption are rough and flexibility too high. Regarding 'Global import', 'Large-scale e-RES', 'e-Prosumers' and 'Flex+' scenarios – 65-80% are too optimistic. Also, 100% for V1G charging is too optimistic. |

## Answer from Elia

- **More prudent approach for flexible demand** will be considered given the feedback received.
- Regarding the **flexibility from appliances and industry after 2030**, it is proposed **to assume that the target fixed in the 'Belgian Energy Pact' for DSM shedding** in 2030 can be associated to **the total demand minus the demand from electric vehicles, heat pumps and air conditioning, as those are dealt with in an ad hoc section.** It is then proposed to keep the **same ratio** between the DSM installed capacity and the total demand minus the demand from electric vehicles, heat pumps and air conditioning **for the other scenarios**
- Regarding **the flexibility from heating and cooling,** it is proposed to add **an additional step** between the levels from **2030** and the target for 2050 as defined in the document submitted to public consultation

| Scenarios | 2030 | 2035 | 2040 | 2050 |
|---|---|---|---|---|
| Expected Policies | 1800 MWh (Fit for 55) | Linear Interpolation | 20% | - |
| Global Import | | | 20% | 35% |
| Large-scale e-RES | | | 30% | 50% |
| e-Prosumers | | | 45% | 65% |
| Flex + | | | 60% | 80% |

- Regarding the flexibility from mobility, we agree that considering 100% of optimized charging might be too optimistic. We therefore proposed to cap the percentage to 90% in the most extreme scenario in terms of flexibility.

# Overview of the received feedback

## 8. Storage

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Energy can be stored in the form of heated water – to include in scenarios |
| FEBEG | Uncertainties around the use of batteries.Too optimistic to assume 15-30 GW capacity by 2040-2050. V2G technology not developed enough yet and will depend on the number of EV in Belgium |

## Answer from Elia

- Regarding BBL comment, **water heating is not considered in the flexibility part**.
  - Its contribution on **annual basis is quite limited**
  - **it is proposed to not add additional potential** from hot water in the storage part as it would mean that this hot water is converted back to electricity and reinjected in the electricity net which has almost no potential regarding the low exergy associated (lot of energy but with limited temperature)
- Finally, it should be noted that **space heating is taken into account in the demand-side shifting from heating and air conditioning**. For the moment, it is considered that it contributes to level out only daily variations **but it is proposed to extend its contribution to also a part of weekly variations**
- For **batteries**, Elia agrees that the **associated potential might be a bit too ambitious** and **proposed some changes** summarized in the table below

| Scenarios | V2G [%] | | Residential batteries [%] | |
|---|---|---|---|---|
| | Previous values | Updated proposal | Previous values | Updated proposal |
| Expected Policies | 10 | 5 | 10 | 5 |
| Global Import | 10 | 5 | 10 | 5 |
| Large-scale e-RES | 15 | 10 | 15 | 5 |
| e-Prosumers | 20 | 15 | 20 | 10 |
| Flex + | 25 | 20 | 25 | 15 |

# Overview of the received feedback

## 9. Electrolyzers

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | No comments |
| FEBEG | No major issues or comments – mention of a study released by *Fuel Cells and Hydrogen Joint Undertaking*. FEBEG states that from 2030 onwards, green hydrogen demand will grow |
| Fluxys | Hydrogen will be essential to decarbonize hard-to-electrify sectors. Fluxys proposes to increase the electrolyzer range from 1 - 2.4 GW to 3.7 – 8 GW |
| Febeliec | The lack of cost focus will hinder Elia to validate values regarding electrolysis for hydrogen production. Massive losses and potential low load factors associated to this technology could lead to economically non-optimal capacities. |

- Elia **takes note of the proposal** from Fluxys, comments from Febeliec and studies referred by FEBEG
- The **feedback seems divided** between an **increase or a decrease** of the range regarding electrolyzers. Therefore, it is proposed to **keep the ranges** as proposed in the report, **leading to a final electrolyzers** volume of **minimum 1 GW** and **maximum 2.4 GW in 2050** and **between 750 MW and 1500 MW in 2040**.
- We refer also the **hydrogen strategy** that was approved by the Council of Ministers in October 2021 where it is clearly stated that Belgium would mostly rely on imports for its hydrogen requirements given the limited amount of RES potential in Belgium.

# Overview of the received feedback

## 10. Dispatchable generation

| STAKEHOLDER | FEEDBACK RECEIVED |
|---|---|
| BBL | Additional modes of carbon-free dispatchable generation, such as fuel cells, should be considered. Relevance of hydrogen would be impacted if imported from distant regions as synthetic methane would be generated from it to optimize the logistic chain |
| FEBEG | Only carbon-free dispatchable generation from 2030 onwards is not a good assumption. Natural gas & carbon capture & storage as an option. Biomass & gas technologies are relevant |
| Febeliec | All technology options are not considered and thus alternatives such as CCS, CCU & nuclear are waived |

- Based on the received comments, **Elia will consider more technologies** when filling the requirements of dispatchable generation capacity.
- **H2 turbines, synthetic methane and biogas turbines as well as natural gas fueled plants using CCS will be considered** for new generation in the **investment loop/economic viability assessment** (depending on the scenario, in-line with what is done at TYNDP2022 level).
- The **existing fleet will** be considered to use a **mixture of fossil and green gases** in the **transition period.**
- The **composition of this mixture will be varied between the scenarios**, as is done in TYNDP2022 scenarios.

# Looking forward

The original idea for the TF Scenarios was to create a bi-annual process: every odd year a long term scenario report is drafted, every even year a short term scenario is discussed.

However, short term studies are subject to **strict legal requirements** in terms of consultations, stakeholder interactions, roles & responsibilities, deadlines, ...

For 2022 CRM calibration reports & AdeqFlex 2023 consultations are required by law. These discussions cannot be held jointly. Therefore, Elia deems it best that each project continues with its own task force.

Task force scenario members are asked to join these project-specific task forces to facilitate those discussions.

The task force scenarios can pick up again, in preparation of the new long term report which will be due end of 2023. Elia is interested in **hearing from stakeholders which types of discussions** they want to engage in with Elia in preparation of that new report.

# Feedback from stakeholders

In 2021 we had a first co-creation of scenarios to be used for long term studies at Elia.

We are always open to feedback. Feel free to provide us with your remarks now and in the future:

- What went well?
- What can be improved?
- Is the communication clear?
- Are the expectations clear?
- What did you think of the interaction with your peers?
- How did you experience the balance between exposition & discussion?
- How can we improve co-creation and proactivity even further?

# Merci.