Minutes of Meeting: Task Force LRIO, Generation & Storage

Meeting

Date	June 24th, 2025
Duration	3 hours
Chairman	Maarten Konings
Secretary	Renaud Préat
Presenters	Maarten Konings, Jonathan Sprooten, Nicolas De Wael, Eva Ibarra Sicilia, Wim Clymans (VITO)

Participants	Organisation
Opsomer Jeroen (online)	Aspiravi
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1. Agenda

Section 1: Setting the scene and context
Section 2: Setting up the Scene
Section 3: Building the Injection Reference
Section 4: Decentralized RES
Section 5: Large Units
Section 6: Small Generation Units
Section 7: Batteries
Section 8: Next Steps

2. Report

This report will focus on the questions and remarks that have been asked by the audience during the presentation of the slide deck, that is available on the webpage dedicated to the workshop.

For the sake of clarity, the only slides that are mentioned in the present report are those for which questions have been asked.

Validation of the Minutes of Meeting of the Kick-Off Workshop

The Minutes have sent by email along with the invitation of the present workshop on June 2nd. No remark has been communicated by mail, and no additional remark have been made in session. The Minutes of Meeting will then be published on Elia's website.

Slide 5: Kick-Off Remaining Question: Capacities selection when the allocations and reservations exceed the foreseen growth potential

B-STOR, P. Bayart

Question: In what studies are all capacities considered, if reserved and allocated capacities exceed the macro-values?

The full explanation can be found in the slide 21 of the first workshop. To answer the specific question, no studies consider at the same time all reserved/allocated capacities if this sum of reserved and allocated capacity is higher than the expected capacity defined in the macro scenario. For infrastructure development studies at 400kV or interconnection level, the reference injection and offtake is considered as the best-estimate at national level. For local infrastructure development studies or connection studies, all capacities in the zone under investigation (or "zone of influence" in connection studies) are taken into account. Outside this zone the best estimate reference injection and offtake is considered.

Question: In the local reference context for zone a (the bar further at the right on the main chart), you consider 4a'+4b, but why not 4a'+4b'?

It is important the recall that the values 4a+4b+4c are equal to the expected growth at Belgium level (included in the best estimate reference injection) while 4a'+4b'+4c' correspond to the sum of all reserved and allocated capacity which are not yet in service, knowing that some of which will not materialize. When zone a is studied, all reserved and allocated capacity of zone a (therefore 4a') are considered as it represents the best estimate for zone *a*. However, when studying zone a, the best estimate for the rest of Belgium should remain the best estimate reference injection (i.e. 4b+4c) as it will result in realistic macro values, realistic Belgian import, export scenarios, ….

CREG, L. Declerck

Question: Can you clarify in which studies this selection of capacities is made and what is the impact of this selection?

The full explanation can be found in the slide 17 of the first workshop. This selection of capacities is made to define the best estimate reference injection and offtake at national level, that is used in all studies where this best-estimate at national level is needed: identification of system needs, arbitrage, best-estimate scenario of EHV grid reinforcement & interconnections studies. In local studies, no selection is done for the capacities inside the zone of influence. Therefore, the assumptions with relation to selection

of allocation & reservation in the framework of the reference context, have no influence on contractual agreements made with the clients, which remain valid.

CREG, L. Declerck

Question: If I apply for a connection for a technology inside its potential, I should have all capacity as firm? What if I apply for a connection outside of its potential?

In the zone of the connection study, we apply the grid connection study methodology. This methodology considered differently already reserved and allocated flex capacities depending on if they were within or outside their growth potential and depending on if the requested capacity falls within a growth potential. The grid connection methodology however does not pre-assume that results will be firm or flex. However, we can indeed expect that the chance that connection contract will be firm is much higher if the request capacity falls within a growth potential as the grid infrastructure before dynamic portfolio management was designed to host this growth potential.

Slide 6: Kick-Off Remaining Question: Batteries assumptions in market model simulations

B-STOR, P. Bayart

Comment: We would like to highlight that we still ask more transparency on how the macro-objectives are defined, and more specifically how the load management is used in the definition of these objectives.

The macro-objectives are determined in the framework of the Taskforce Multi-Energy Scenario's. Load management relates to offtake, whereas the current workshop focusses on Injection, this question will be addressed in the next workshop.

Slide 12: Reference Context Overview

FEBEG, C. Celis

Question: For static data, are rated capacity or peak injection considered?

Static data contains the technical characteristics of the different units. This relates to parameters such as the connection point, rated capacity, technology, short-circuit power injection, voltage control characteristics, … This not directly rated to the "peak injection" as the latter refers to the situation calculated after economic dispatch.

FEBEG, C. Celis

Question: Is the profile that is considered a calculated profile or measured profile?

The process is as follows:

- The capacity of existing (in operation for more than one year) consumption facilities or non-renewable non-market driven generation are represented by a realistic profile based on historical measurements and a projection of this profile for future years.
- The capacity of reserved, allocated or recently connected facilities (in operation for less than one year) consumption facilities or non-renewable non-market driven generation are represented by a profile that is representative of the sector of activity.
- The capacity of existing, reserved or allocated renewable generation are represented by a realistic specific profile.
- The capacity of existing, reserved or allocated conventional generation or storage facilities are represented by a profile generated as part of a simulation of the future functioning of the electricity market.

FEBEG, C. Celis

Question: We have different loads and injections happening at different moments, how is it modelled, only by considering peak or by considering flows?

The running values (Reference Offtake and Injection) are constructed for every hour of the considered horizon for each demand or injection. As will be shown further, these running values are calculated based on specific profiles (more information about profiles can found in the adequacy & flexibility study) or a simulated economic dispatch. These values are integrated in the grid simulation tool, together with the Reference Grid in order to create an Operated Grid Model, based on which a load flow can be performed for different expected operating points. Some operating points will lead to peak flows of some infrastructure elements and other operating points will create peak flows on other infrastructure elements.

FEBEG, C. Celis

Question: Are the calculated results matching the real values?

The grid model that Elia uses for long term infrastructure planning and for connection studies is, for the existing part of the infrastructure with the model used in real-time and enriched with the information provided by real-time measurement and with the state estimator running in real-time. For the future part of the infrastructure, the model is aligned with the infrastructure project information both in terms of technical parameters and expected timing of commissioning Calculated values are therefore expected to best represent the values to be measured in the future.

Slide 13: Injection Static Data

BOP, H. Canière

Question: In the case of overplanting capacity, where the installed capacity for a project exceeds the rated capacity of the grid connexion, how is it handled?

Today, the same wind production profile is used for all onshore wind farms and the same wind production profile is used for all offshore wind farms. This profile is created based on the measured wind speed and measured wind production on existing installations and on existing installed capacity. This model is then used to generate wind profile for other climate years and other total installed capacities. Therefore assumption is made that the same overplanting strategy or the same wind production efficiency is applied for future connection as for existing ones.

Slide 14: Economic dispatch model

COGEN Vlaanderen, S. Reyniers

Question: How do you simulate decentralised thermal generation (CHP, Incineration)?

Decentralised generation is simulated by applying a profile based on historical measurements.

Slide 15: Redistribution methodologies and unit types

B-STOR, P. Bayart

Question: We notice that on one hand, there is one category for all large-scale conventional, but storage has two specific categories (pumped hydro and batteries). A CCGT and an OCGT are not dispatched the same way, so it doesn't seem consistent as approach.

The focus of the current workshop is redistribution methodologies, not on the profile used in the simulations. From that point of view, a similar approach is used to assign a location, regardless of the type of conventional power plant. When creating the running values, as will be shown further, the conventional

power plants are modelled individually with different profiles per technology. The local redistribution of batteries and pumped hydro follow on the other hand different methodologies. This will be discussed further in the presentation.

B-STOR, P. Bayart

Question: And how are the profiles generated?

This is detailed in the upcoming slides. For some technologies, such as PV, Wind onshore, Wind Offshore, CHP… a profile based on measurements is being used. The profiles used by Elia are detailed in the Adequacy and Flexibility Study report. For dispatchable units such as OCGT, CCGT, battery storage the profile is calculated by means of an economic dispatch.

Slide 18: PV/Wind

ENGIE, R. Laleman

Question: Is the Bregilab the study that give the technical potential for PV and Wind per commune? What happens if the installed capacity in a zone exceeds the technical potential?

This study indeed gives the maximum technical potential per commune, in other words the greatest capacity that could be technically installed in a commune based on the available space. So far, this potential has not been reached in any commune. However, for the geographical redistribution, these values are only used to determine the repartition key. The macro-scenario's determine the capacity taken into account.

FEBEG, C. Cellis

Question: When was the Bregilab study performed?

The Bregilab study was published in 2022. But we should insist that the focus of this workshop is to present the methodologies that are being used, instead of the different outputs. We know for example that regulations have changed, with the introduction of a minimal distance between turbines and housing in Flanders, or that a new *Cadre de Référence* has been published in Wallonia, that authorises the construction of wind farms in some forest areas. This would invalidate the total technical potential, but not the methodology (e.g. repartition keys) itself. The applicable regulations at the moment where the study is realised. We are currently discussing with Vito to update the study to take into account the last regulations.

ENGIE, R. Laleman

Question: Do you use the same methodology for PV and wind onshore?

We do use the same methodology to determine the repartition keys for PV and wind onshore, the reason being that for these, Elia uses an external study, Bregilab, that provides a potential per commune and per technology. The output of the study being a potential per commune and per technology, the post-processing is the same for the two technologies. But the Bregilab study uses technology-specific methodologies.

ENGIE, R. Laleman

Question: How are the different regional difference in regulations (for example minimum distance requirements) or subsidies considered?

The regional differences in terms of regulations are taken into account through the Bregilab study, that uses the applicable regulations to estimate the potential of the different regions.

Bregilab Study Questions

CREG, L. Declerck

Question: Are the specifications of the existing substations considered when performing the local redistribution? For example, if the potential is redistributed and it appears that a substation that receive a potential is already at full capacity, can the potential be reallocated to substations where the existing connected capacity and allocated/reserved capacities represent a lower share?

The purpose of local redistribution is to define the future needs, in order to dimension the assets that will be needed to meet these needs. The purpose of creating a growth potential is indeed to ensure that, at a certain point in the future, the capacity is available without flexibility within the potential for that category, allocating the potential depending on the existing infrastructure is then in contradiction with the intent of the exercise.

CREG, L. Declerck

Question: But wouldn't be interesting to redistribute growth potentials in areas where the network can meet the future needs?

It's indeed a possible improvement point especially for certain technologies which have a lot of geographical degrees of freedom. It will be evaluated in the framework of the roadmap for improvement which will be developed based on the public consultation.

FEBEG, C. Cellis

Question: So we have a potential, that is then redistributed but is it in line with the NECP?

The NECPs are not directly taken into account in the local redistribution methodologies, as these methodologies only redistribute a target defined at national/regional level to different substations. The national/regional target however comply with the NECP as elaborated in the taskforce Multi-Energy Scenario's.

ENGIE, R. Laleman

Question: We know how long it takes for onshore wind projects to materialize, for reasons such as long and uncertain permitting processes, what if there's a huge gap between what will be built and the ambitions?

We consider all known projects at EDS phase when building the local reference context, and for the projects we don't know, we take them into account through potentials. Growth is taken into account with what is reserved/allocated.

ENGIE, R. Laleman

Question: But you might have relevant information through EOS requests. What can be used?

The insight provided by the EOS is a sensitive topic, as we know for example that we may receive several EOS for the same land, and we may also receive different EOS for a same project, when possible locations are being investigated. These examples show that it's then very sensitive for Elia to use that information. In the context of grid development studies, we take all reserved and allocated capacities, and growth potential. However, when we perform such a long-term study of a certain zone, we use all available information - thus also the EOS-studies - to determine the most robust solution. In the case of wind, we should however point out that we are still below the growth potentials.

BOP, H. Canière

Question: Orientation studies can provide more relevant information about the possible locations than the best methodologies, so why not consider them to inform grid development?

Orientation studies aim at orienting the project developer in one of the first phases of his project, where there are still many unknown variables also for the project developer. We consider that if the project becomes mature enough, an EDS will be ordered, and these are considered. The reference context is also updated regularly, so an EDS will be included after signature. See also the response on the previous question.

ENGIE, M. Deknukt

Question: Are the detailed studies at DSO level considered?

The EOS-EDS process is defined for connection to all networks. Elia receives information from the DSO about the existing, allocated and reserved capacities to the distribution grids and takes these capacities into account.

Slide 44: Offshore Wind

BOP, H. Canière

Question: It's a challenge to translate the political ambitions in the context of offshore wind. Should we however wait for the Federal Development Plan to foresee and approve projects for offshore wind? Can it be done at a faster pace?

The Federal Development Plan is the current framework in which the recognition of the need and subsequent potential takes place . If needed, ad hoc processes could be envisaged that would allow to accelerate the process. However, in the context of wind onshore, we should point out the development goes beyond only the recognition of the growth potential. A lot of internal grid reinforcement needs to be developed on the internal grid, and that development takes time as well. Elia doesn't then see the need for closer approval opportunities.

BOP, H. Canière

Question: Wouldn't it possible to have faster process than the federal development plan?

The reinforcement of the internal grid to support such capacities is a long-term exercise, that leads to heavy investments that go beyond the connection point. The backing of the authorities is critical in this process, and the Federal Development Plan is the current framework.

B-STOR, P. Bayart

Question: This may highlight why Elia may need different reference contexts for different assumptions, as it can impact flexibility. Blocking capacity for nuclear and wind offshore has significant impact on the available capacity for other technologies, and indirectly flexibility.

As explained, Elia uses a different reference context for different studies, which is however based on one macro-scenario which is considered as the "best-estimate" in this framework.

This question actually relates more to the general grid development methodology. For long term grid planning, we can indeed use different & diverging macro-scenarios. This approach allows to investigate different possible future and determine the most robust option and is especially relevant for the extra high voltage system (interconnectors, 380 kV backbone).

However, for regional studies and client connection studies, one best estimate is required as the results also impact contractual arrangements. This best estimate is reviews regularly to take the latest developments into account. It is true that capacity for some developments such as offshore renewables, interconnectors, new nuclear plants, can be taken into account in the reference grid as a growth potential. This is however necessary as this is the only way to allow for a balanced development of the transmission system. Some technologies and/or interconnectors and or the accompanying grid reinforcements can take a long to develop. If the capacity for which the grid reinforcements are not taken into account, this capacity will be taken up by other technologies with a much shorter realisation time, effectively inhibiting those other technologies to ever get access to the grid.

B-STOR, P. Bayart

Question: Boucle du Hainaut and Ventilus are different in the sense that they are linked to specific projects. By contrast, nuclear is different: some projects were granted some capacity because it was assumed that the nuclear reactors will be stopped and then this assumption was invalidated because the plans have changed.

Such decisions are out of Elia's span of control. Currently the methodology for the connection studies takes into account all reserved and allocated capacity.

BOP, H. Canière

Question: Could you clarify the difference in timing between the Federal Development Plan and the evaluation of the best estimate?

The best-estimate is ideally reviewed annually, the Federal Development Plan is updated every 4 years.

Slide 52: Next Steps

ENGIE, R. Laleman

Question: Should there not be a separate category for hydrogen/electrolysis?

Electrolysis can be included as a separate load category. For now, it's not significant so until now we didn't saw the need for a specific methodology. According to our projections, it will only start to be significant at the 2040-2050 horizon. If needed, we will create a specific methodology.

ENGIE, R. Laleman

Comment: if electrolysers are connected to the gas grid, this input can be used to narrow down the possible locations. Creating a specific methodology for data centers can be created as well, as this would allow to develop the grid in specific locations.

The proposal with relation to the creation of a specific category for data centers is a very relevant one. Elia will investigate on what horizon this could be realized.

B-STOR, P. Bayart

Question: Batteries don't have growth potentials now, because the EDS exceed the potential and a methodology is needed. But where would this growth potential be located if there was one?

For now, we don't have a methodology because it was not needed. But we would welcome any proposition from the sector.

FEBEG, C. Cellis

Question: Why are incineration plants and CHP plants modelled as must-run?

For these technologies, electricity generation is a by-product of their main activity and they don't participate to the dispatch.

Question: If an e-boiler is used on a way that it captures the low prices, how is it taken into account?

New assets will have different profiles than historical ones. At this stage, it's not taken into account. But it's also why we organise these consultations, the goal is to collect your input to improve the grid development process. We will in any case already note this as a potential improvement.