

Plenary Meeting

of the Elia Users' Group

September 2025

Agenda

1. **Goedkeuring verslag 06/06/2025** (verzonden 10/09/2025)
2. **BCG – Mind the Queue - hoogtepunten**
3. **Federaal en regionale ontwikkelingsplannen**
4. **Aansluitingen – stand van zaken en vervolg**
5. **Feedback Werkgroepen**
6. **AOB**



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- 1. Goedkeuring verslag 06/06/2025** (verzonden 10/09/2025)
- 2. BCG – Mind the Queue - hoogtepunten**
- 3. Federaal en regionale ontwikkelingsplannen**
- 4. Aansluitingen – stand van zaken en vervolg**
- 5. Feedback Werkgroepen**
- 6. AOB**



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CENTER FOR
Energy Impact

Mind the Queue:

Connection Reform for the Electricity Grid

SUMMARY PRESENTATION - SEPTEMBER 26, 2025

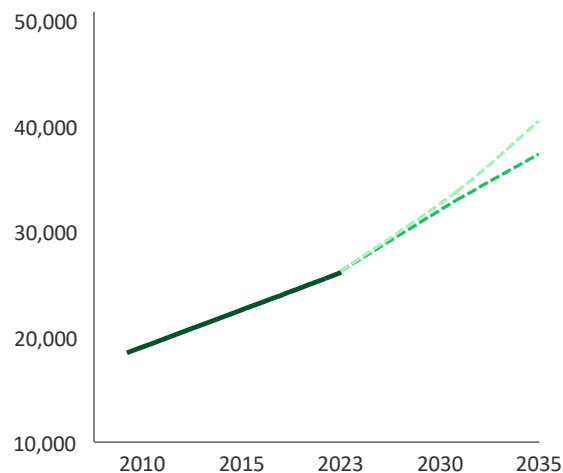




Power systems are in full transformation, with these changes translating into a large set of new offtake and injection points requesting grid connection

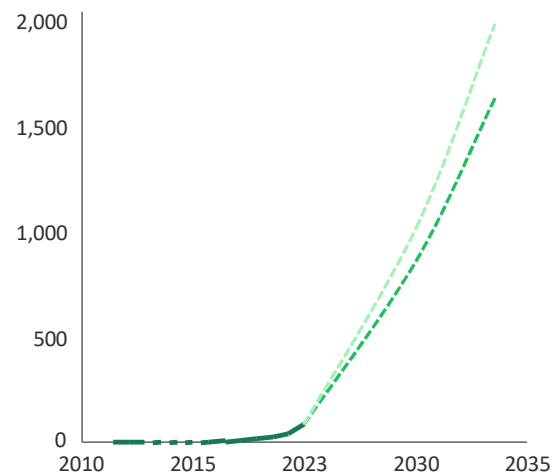
Global electricity demand expected to rise by 25-30% from 2023 to 2030

Global electricity demand in TWh



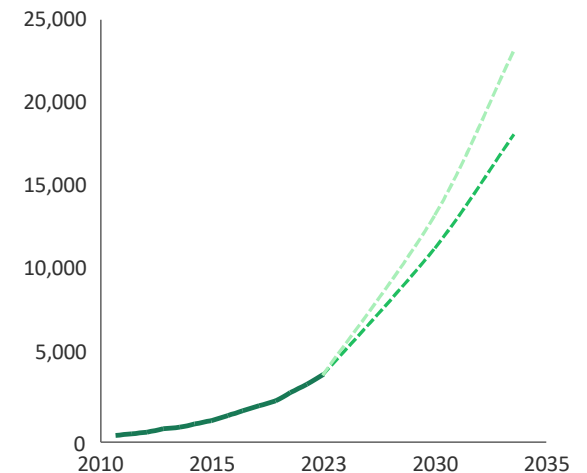
Battery storage expected to grow at a CAGR of 35-45% through 2030

Battery storage in GW



Solar & wind expected to grow at a CAGR of 15-20% through 2030

Global solar and wind generation in TWh

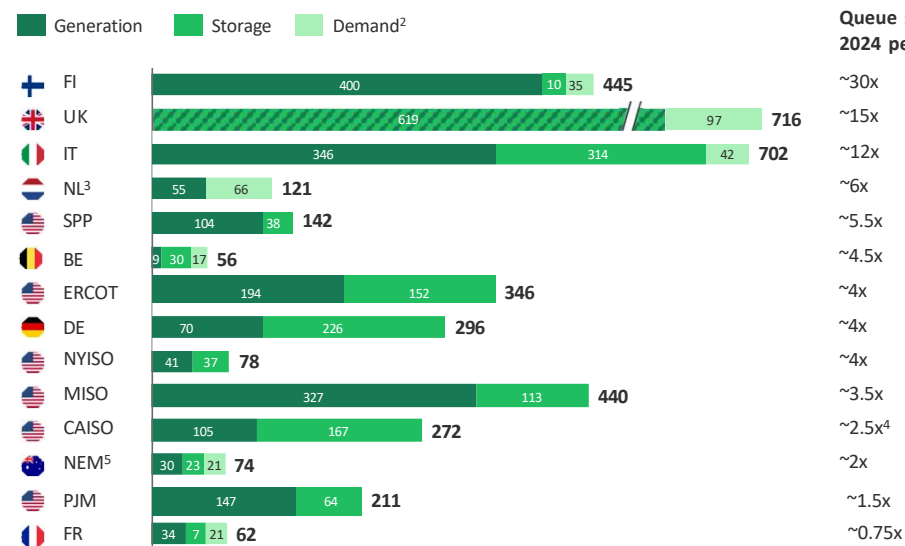


--- APS scenario STEPS scenario

Note: STEPS = "Stated Policies Scenario" (outlook based on today's enacted policies), APS = "Announced Pledges Scenario" (outlook assuming all government pledges are met), CAGR = Compound Annual Growth Rate
Source: Ember, Yearly Electricity Data; IEA World Energy Outlook 2024 (includes actuals up until 2023, and forecasts as of 2024); BCG analysis

However, large queue sizes and long lead times delay new grid connections

Queue sizes (GW)¹



Lead times (Years)



1. Queue size for the transmission grid (distribution grid connection queues are also significant in most markets), with “queue” containing everything that is at the stage of connection inquiry / initial grid study up to physical connection delivery, hence also including projects that have highly uncertain business cases and may never be realized 2. Demand-side parts of the interconnection queues, which are estimated to be in the hundreds of GW already alone for data center projects in the US, are not included in the US data as they are (generally) managed by utilities 3. 70 GW of (battery) storage is included in the data for Generation and Demand 4. Queue size vs 5' peak load 5. Combined transmission and distribution queue size due to data availability for generation and storage, while for demand it only represents the transmission-level queue; Source: Queue size: US: Berkeley Lab (2024); UK: ENA Connections Databook (2025); FI: Euronews (2025), Fingrid (2024); IT: Terna (2025), Reuters (2025); NL: Netbeheerder NL (2025), PV magazine (2025); BE: Elia (2025), DE: CleanEnergyWire (2025), Euronews (2025); NEM: AEMO Connections Scorecard (Q2 2025); for the demand-side queue sources incl. Transgrid, Ausnet, Electranet, no demand-side queue data included for Tasmania and Queensland; FR: StatInfo Energie (2025), CDE (2025), RTE (2025); Peak hourly load (2024): ENTSO-E; CREG; AEMO; NESO; Regional US authority websites and reports; BCG analysis

Significant cost of inaction when actors fail to perform grid connection reforms



Industrials

Pain point

- Electrification projects stall, potentially forcing industrials to defer or cancel investments
- Power prices rise, threatening regional competitiveness and jobs



Example

Close to 12,000 Dutch businesses are on the grid waiting list; leading tech cluster in Eindhoven warns that lack of capacity is blocking new investments



Project developers

- Capital sits idle for years, impacting returns
- Large delays push developers to less congested regions



Average interconnection wait time in the US has risen 70% since 2010; and about 78% of queued projects withdraw before construction, resulting in lost effort and capital



Regulators and Public sector

- National climate and industrialization goals risk slipping
- Public and political pressure mounts as policy targets are missed



UK regulator Ofgem labels grid delays the biggest risk to decarbonizing the power system



Grid operators

- Operational overload put pressure on internal teams and processes
- Reputation takes a hit as industrials and politicians blame the grid and its operators for lost growth



PJM Interconnection froze new grid connection requests for 2023-2025 to clear its 250+ GW backlog. The pause defers roughly \$3B of network upgrade spending by 3-4 years



Two types of connection bottlenecks are causing this:

1. Connection Studies and 2. Connection Delivery

1



Connection Studies

1.1 Backlog in grid connection studies

When grid users request a new connection, grid operators perform simulations on what is possible, as well as when and where

1.2 First-come first-serve not leading to optimal outcomes

In many markets, historically, in a world with less connection requests, a “first come first served” principle was applied

1.3 Inflated queues driven by speculative or duplicative requests

In many markets, a significant share of connection requests are speculative, duplicative, or unrealistic. These distort the true size of the connection queue

2



Connection Delivery

2.1 Increasing lead times for the physical delivery of connections

Grid operators are massively scaling up their CAPEX plans, but delivery models and supply chains are not keeping pace

2.2 Insufficient available grid capacity to accommodate all requests

In several regions, current and planned grid infrastructure is proving insufficient to accommodate requests in the queue, requiring even more backbone upgrades

Source: BCG analysis

Queues are new to the grid, but not new to life: lessons learned from the airline industry



- 1 Entry to aircraft by boarding group
- 2 Passengers with pre-check-in allowed to skip the queue
- 3 Different security lanes for families, business travelers, and crew
- 4 Passengers trading tickets with those willing to pay in case of overbooking
- 5 Families and disabled people boarding first
- 6 Airlines bidding for scarce runway slots, with highest-paying winning
- 7 Passengers without boarding passes asked to leave the line
- 8 Automated passport gates to speed up passenger processing
- 9 More efficient processes for crew-specific security line
- 10 Ticket classes with known conditions: Economy, Business, First
- 11 If the plane is not ready to depart, take-off slot lost
- 12 Incentives for airlines to operate from less busy terminals
- 13 Faster turnaround through shorter time between take-offs/landings
- 14 Fast track passengers with short connection at security
- 15 Private operators adding check-in desks beyond airport authority
- 16 Extra security lines to be added before the holidays
- 17 Early-morning or late-night flights to ease pressure on peaks



Resolving Bottleneck #1: Connection Studies | Nine levers to mitigate the connection study bottleneck, across queue management and queue efficiency

Queue management levers



Batch study processing

Connection requests grouped into coordinated batches, typically by region and submission window, and studied jointly to streamline network planning, optimize reinforcement needs, and reduce duplication vs. sequential, project-by-project reviews



First-ready, first-served

Only projects that have a certain maturity (e.g., with permits and financing) get prioritized, helping to speed up the development of "real" projects



Segments per project type

Grid capacity pre-divided across project types (e.g., industry, renewable generation, data centers) to ensure balance across the energy system



Queue tradability

Enable trading of queue positions so access flows to the most ready or highest willingness-to-pay projects. A missing market today, and potentially a frontier idea, but one that requires safeguards and new regulation



Value-based prioritization

Projects ranked based on how much they support pre-defined goals, like reducing emissions or contributing to industrial growth/competitiveness, or any other policy goal



Market-based allocation

Developers compete for grid access through auctions or tenders, with the projects that are most cost-effective, or have the highest willingness-to-pay, win the right to connect to the grid

Queue efficiency levers



Queue hygiene measures

Inactive or speculative projects removed from the queue based on milestones (e.g., permitting, financing), with periodic reviews to keep queue credible



Increased study throughput

Increase study throughput by ramping up resources, streamlining the study process (e.g., standardized methods, adapted granularity, use of automation), or reinventing it by using (gen)AI and digital twins



Faster path for certain assets

Fast-track studies for specific assets (e.g., storage), treated differently from generators or load, recognizing their unique system value and benefit to grid operations

Airline industry analogy

Entry to aircraft by boarding group

Passengers with pre-check-in allowed to skip the queue

Different security lanes for families, business travelers, and crew

Passengers trading tickets with those willing to pay in case of overbooking

Families and disabled people boarding first

Airlines bidding for scarce runway slots, with highest-paying winning

Passengers without boarding passes asked to leave the line

Automated passport gates to speed up passenger processing

More efficient processes for crew-specific security lines

Resolving Bottleneck #1: Connection Studies | Multiple examples of grid operators implementing them

Queue management levers



Batch study processing



"Open season" windows only in highly saturated grid areas: connection requests are collected over 3 months and jointly assessed post-window; in addition, the country is split into 76 microzones, evaluated in location-based batches
– implemented in 2025



Enduring Connection Policy processing grid applications in batches, with single annual application window until 2024, now shifted to bi-annual batch windows
– implemented in 2018, reviewed in 2024



First-ready, first-served



"First Ready and Needed, First Connected": Under the approved TMO4+ reforms, projects that demonstrate readiness (e.g., secured land rights, and planning consent progress) will leapfrog others
– to be implemented in 2025



Midcontinent ISO's interconnection process embodies a first-ready approach as part of its cluster studies; projects must meet strict readiness milestones (e.g. site control, higher deposits) to enter phases
– implemented in 2017



Segments per project type



NESO introduced a special queue segment for battery storage in 2023 as part of a "five-point plan." Storage projects can connect faster by bypassing certain enabling works and accessing non-firm arrangements
– implemented in 2023



In Germany, renewable energy projects have priority connection status by law, with operators to expedite renewable generation connections, effectively ranking renewable generators ahead of conventional plants for access
– implemented in 2000



Queue tradability

The idea that access rights can be treated as a tradable asset is not yet mainstream in policymakers or TSOs, but represents a potential next frontier. To our knowledge, no grid operator has yet officially implemented tradable queue models, but market sources claim that in some geographies queue slots are (or could be) traded bilaterally already today (with consent)



Value-based prioritization



Dutch regulator allows grid operators to grant priority "fast lanes" for projects with exceptional societal or strategic value
– currently not (yet) implemented, being reviewed by 2026¹



Projects screened against Readiness and Strategic Alignment criteria; NESO runs the process, while Ofgem provides regulatory oversight. Strategic alignment considers system value, e.g. net zero contribution, technology mix, or supporting government priorities
– expected to be implemented in 2025



Market-based allocation



Spain's Royal Decree enables connection capacity tenders at certain nodes of the transmission grid; When capacity is freed up (or a new node is built), the government solicits bids for those slots with award based on a multi-criteria basis (bid timing, socio-economic and environmental benefits, technology mix, etc.)
– implemented in 2020



Developers competitively bid for guaranteed access capacity in pre-defined zones in Australia's South West REZ (New South Wales)
– bid organized in 2024

Queue efficiency levers



Queue hygiene measures



ERCOT's Milestone Tracker clears inactive projects by enforcing strict progress checks: projects not meeting deadlines for land rights, permits, or interconnection studies are automatically removed from the queue
– implemented in 2023



Ofgem raised the TIA threshold in England & Wales from 1 to 5 MW to accelerate distribution-scale projects by reducing number of small projects requiring detailed transmission studies
– decided in May 2025



Increased study throughput



PJM overhauled the interconnection process and hired more staff to clear backlog, cutting pending queue from ~200 GW to ~67 GW
– implemented in 2022/23



PJM partnered with Google AI (Tapestry) to automate study data processing and modeling for faster approvals
– implemented in 2025



MISO introduced automation tools (with Pearl Street Tech) for studies and set annual queue caps; goal to cut study timeline to ~1 year
– implemented in 2025



Faster path for certain assets



Australian Energy Market Commission's IESS reforms created a separate participation category for storage and hybrids, with specific study/assessment needs, bespoke tariffs and negotiated connection agreements
– implemented in 2021 and 2023

1. Court struck down ACM's prioritization framework due to insufficient legal basis and omission of key societal services (e.g., telecom). ACM must re-assess and re-justify criteria by 2026

Note: TSO = Transmission System Operator, ISO = Independent System Operator, NESO = National Energy System Operator, Ofgem = Office of Gas and Electricity Markets, IESS = Integrating Energy Storage System, TIA = Transmission Impact Assessment, AEMC = Australian Energy Market Commission, REZ = Renewable Energy Zone, ACM = Authority for Consumers and Markets (Netherlands), TMO4 = Transmission Modernization Order 4 (UK); Source: BCG analysis



Resolving Bottleneck #2: Connection Delivery | Eight levers to mitigate the connection delivery bottleneck, across commercial and infrastructure

Commercial levers



Tiered connections

Also known as “flexible connections”. Opportunity for projects to connect sooner by accepting ramped, interruptible or time-restricted access (e.g., during peak demand times, high solar generation, overnight) for both new and existing grid users; options vary based on curtailment duration/notice and whether the solution is temporary or permanent



Scrutiny on contracted capacity

Check use of contracted capacity of current grid users, and if un-used (or not needed within a certain timeframe), it must be returned (“use-it-or-lose-it”). If users need that headroom in a number of years then it might be temporarily used to enable another connection (but introduces a “CAPEX delivery commitment” for the TSO)



Location steering through signals

Steer customers to areas with available grid capacity (e.g., data centers close to the coast in case of offshore wind), either through “soft” signals such as publishing capacity hosting maps or differentiated connection times per zone, or through more formal signals such as differentiated grid fees, dedicated data center, RES, or battery zones with superior connection speeds, or even locational or zonal pricing reforms

Infrastructure levers



Getting more out of existing assets

Adjust historical operational/risk thresholds, especially in non-critical or easy-to-replace assets, accepting potentially reduced asset lifespan or higher asset failure risk in exchange for faster connections. Performing such practices not only on the transmission level, but also on the distribution level, can help free up additional transmission capacity



CAPEX project acceleration

Fast-track permitting as a mission-critical item, review current delivery models (e.g., use of contractors vs. in-house, optimization of the stage-gate process), ramp up resources, and engage strategically with the supply chain to avoid bottlenecks. Our project experience shows there is up to 20-50% acceleration potential for new projects



Independent connection delivery

Enable third parties to deliver grid connections or support self-build options for customers at pre-identified connection points. This approach can speed up connections, by expanding delivery capacity beyond the grid operator’s capacity, but requires changes in regulation related to regulatory quality standards and activity perimeters



Anticipatory investments

Design and build infrastructure with excess capacity upfront in areas of strategic interest to accommodate future grid users. However, this might make the CAPEX delivery constraint initially worse before making it better, and might raise affordability questions for grid users in case that headroom is never used (risk of stranded assets)



Flexible asset deployment

Directly use flexible assets at congested areas of the grid, or incentivize market participants to invest in those front-of-the-meter flexibility assets or in behind-the-meter flexibility assets—such as batteries and smart EV chargers—to flatten peak use of the grid. These assets can help free up capacity and ease pressure on constrained parts of the network

Airline industry analogy

Ticket classes with known conditions: Economy, Business, First

If the plane is not ready to depart, take off slot lost

Incentives for airlines to operate from less busy terminals

Faster turnaround through shorter time between take-offs/landings

Fast track passengers with short connection at security

Private operators adding check-in desks beyond airport authority

Extra security lines to be added before the holidays

Early-morning or late-night flights to ease pressure on peak slots

Resolving Bottleneck #2: Connection Delivery | Multiple examples of grid operators implementing them

Commercial levers



Tiered connections



Interruptible connection contracts for large loads as flexibility option; under this tiered offer, a transmission-connected customer can opt for reduced tariffs in exchange for being interruptible
– implemented in 2023



Time-dependent transmission contracts guaranteeing grid access ~85% of the time while allowing curtailment during peak periods notified at least one day in advance
– announced in 2025



"Connect & Manage" (ERCOT), with fast grid connection for new generators with congestion managed through new lines planning and upgrades but with (temporary) curtailment risk for generators connected via this scheme
– implemented in 2021



Scrutiny on contracted capacity



ACM policy requires grid users to prove that reserved capacity will be used within 2 years or risk losing it
– rule adopted in 2023



Location steering through signals



Regional connection fee structure to steer projects to grid-favorable areas; it adds a power-based tariff by region on top of standard connection fees, imposing extra charges for new generation in already generation-heavy zones
– decision expected in 2025 (pending regulatory approval)



Even if dating from before the queue issues, in the UK this lever has been applied with regionally differentiated grid tariffs to generators, creating locational price signals to steer project development, shaping where new generation connects
– implemented in 2005



Getting more out of existing assets



Real-time monitoring and AI to dynamically update line capacity. This boosts transmission in ~90% of hours vs. static limits, increasing throughput on existing lines
– implemented in 2020



In New York, utilities installed DLR systems on select congested transmission lines. Results have been striking – for 94–97% of operational hours, dynamic ratings exceeded the old static ratings, yielding on average a 47% increase in usable line capacity
– implemented in 2015



CAPEX project acceleration



Long-term supplier partnerships with multi-year frame contracts to cable and converter manufacturers for 2GW offshore grid programs to secure long-term supply capacity, accelerate delivery and hedge price increase
– implemented in 2022-2023



Germany amended its Grid Expansion Acceleration Act (NABEG) to designate key transmission projects as "overriding public interest", enabling faster permitting by streamlining environmental reviews, limiting legal appeals, and prioritizing administrative capacity
– implemented in 2019



Independent connection delivery



Open connection delivery on the transmission level to independent players, based on the iDNOs (Independent Distribution Network Operators) model, increasing competition in grid delivery and accelerating connection of renewables and new loads
– approval pending



Governed by the AEMC's TCAPA Rule, certain transmission connection assets can be designed, constructed, and owned by third parties rather than only by grid operators, as long as they follow the functional specifications from the TNSP
– implemented in 2017



Anticipatory investments



Overbuilt grid node for future offshore wind, with federal support to construct a major switching station in Connecticut sized for 2.4 GW of offshore wind injection vs. current projects that are only a fraction of that capacity, and rest is reserved for anticipated lease areas
– announced in Aug 2024



Right-sized distribution grid replacements to get ahead of EV and solar growth. When aging overhead lines in suburbs are due for renewal, Western Power is now installing higher-capacity cables than what the current load requires
– implemented in 2023



Flexible asset deployment



Terna's pilot storage portfolio totals ~50 MW, entirely owned and operated by the TSO, located at strategic HV nodes in Sicily and Sardinia to cut congestion and provide ancillary services – first units commissioned in 2014 (35MW) and expanded in 2018-21 (15MW)

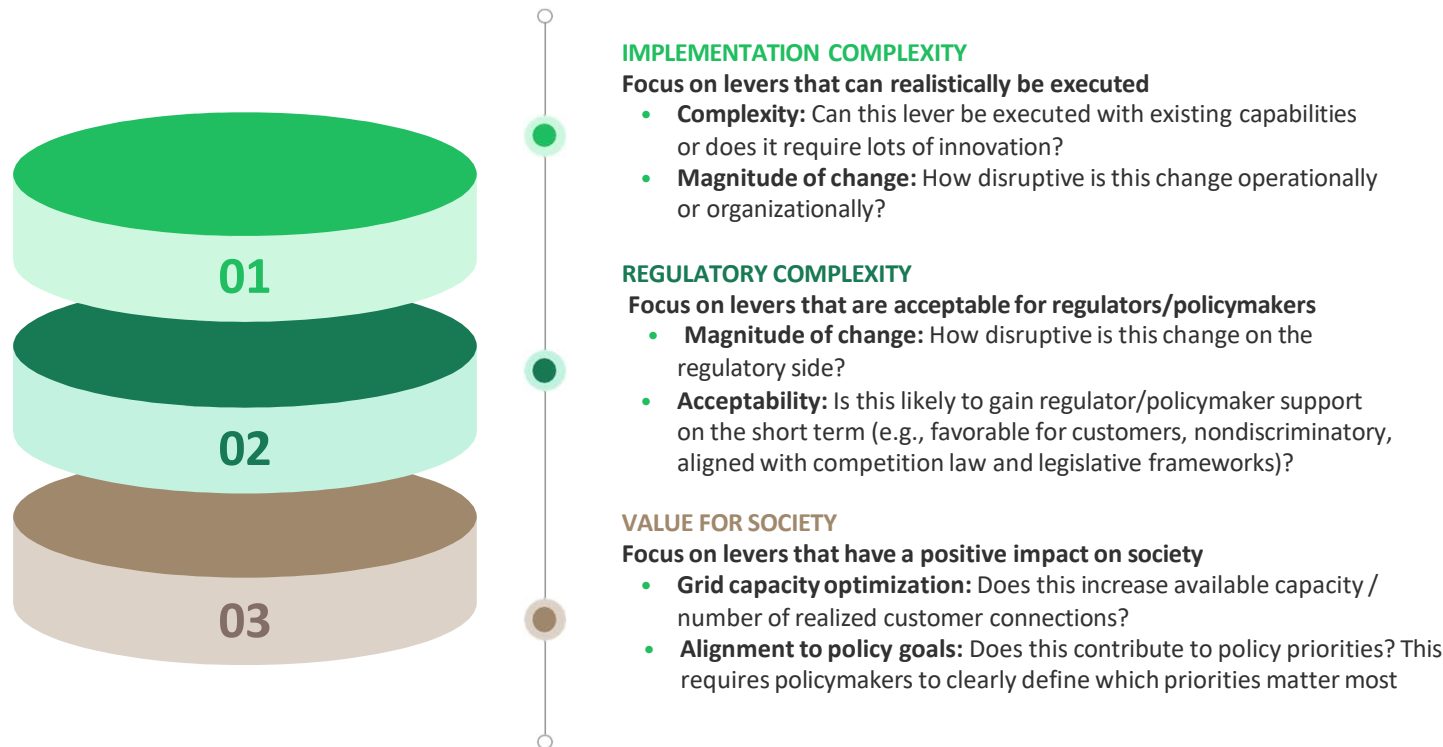


New Large-Energy-User connection policy will oblige data center applicants to install on-site batteries (or equivalent dispatchable resource) equal to their peak demand, enabling load-shedding or export during system stress – expected implementation in 2025

Note: ACM = Authority for Consumers and Markets (Netherlands), DLR = Dynamic Line Rating, iDNOs = Independent Distribution Network Operators, DNO = Distribution Network Operator, AEMC = Australian Energy Market Commission, TCAPA = Transmission Connection and Planning Arrangements, TNSP = Transmission Network Service Provider, HV = High Voltage; Source: BCG analysis



Three dimensions are important in assessing which of these levers to implement



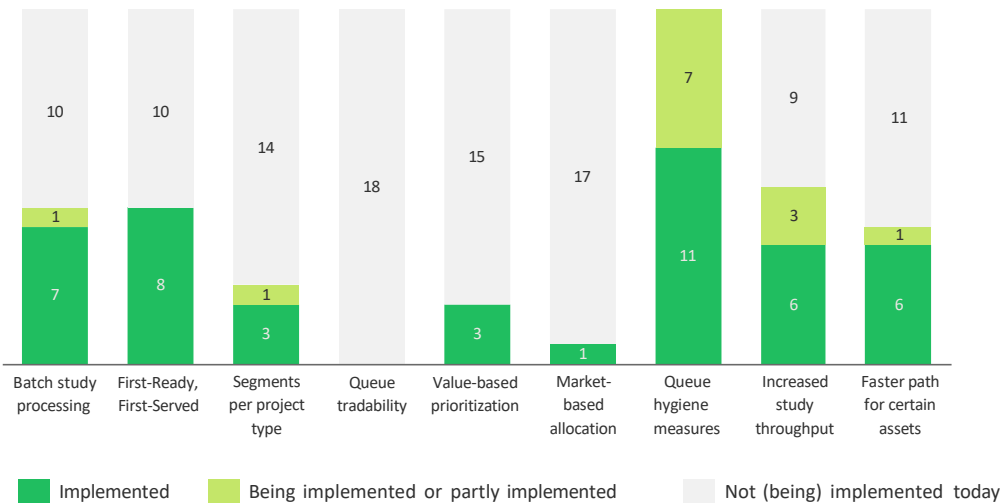
How do the identified levers score on these 3 dimensions?



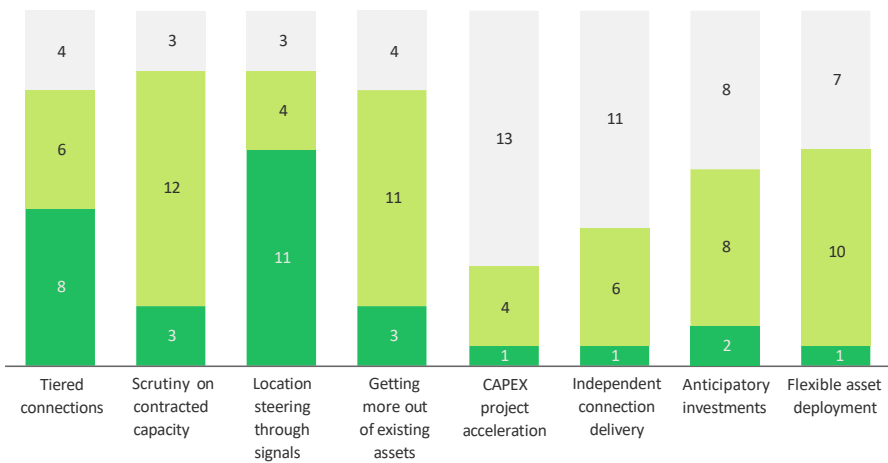
Lever implementation varies across markets—so far only the UK engaged in holistic connection reform, impact still to be proven

Number of markets that have implemented the different levers (18 markets analyzed: 6 in the US, 1 in Australia, and 11 in Europe)

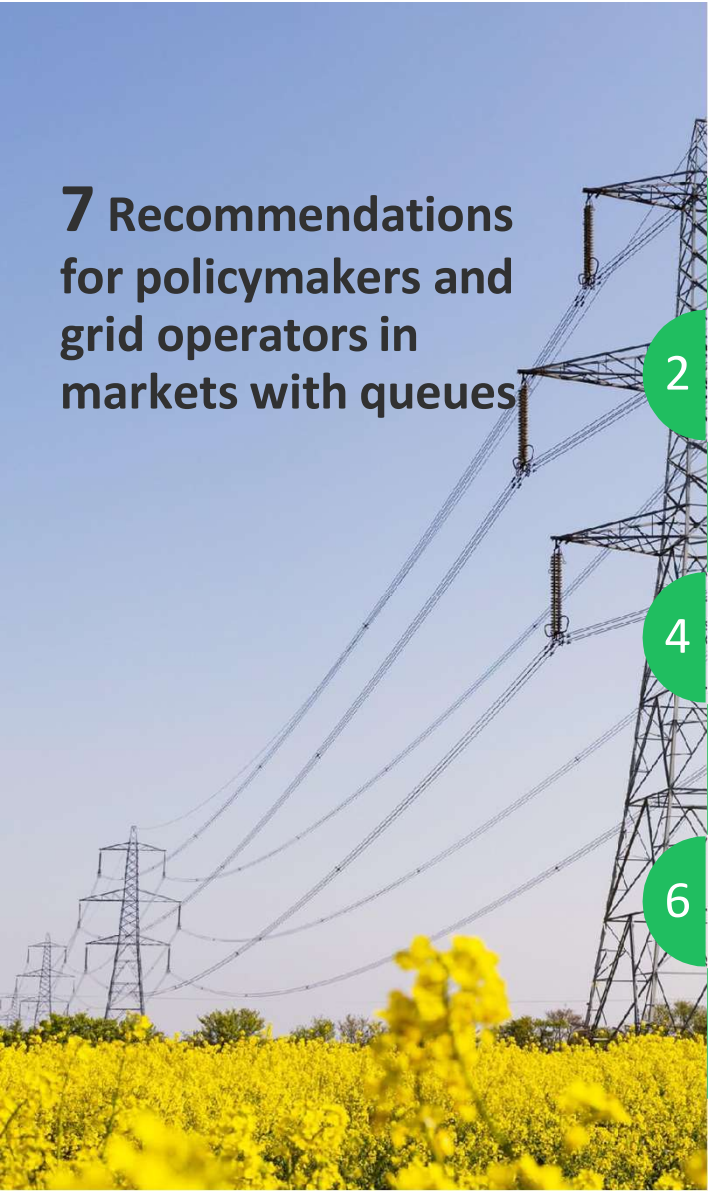
1 Levers to mitigate connection study bottlenecks



2 Levers to mitigate connection delivery bottlenecks



Note: US: PJM, ERCOT, CAISO, SPP, MISO, NYISO. Europe: UK, Germany, France, the Netherlands, Belgium, Denmark, Spain, Italy, Finland, Norway, Ireland. AU: NEM.
Source: BCG analysis



7 Recommendations for policymakers and grid operators in markets with queues

1

Re-imagine how grid connection studies are performed today: Streamline the study process, by standardizing methods, adapting granularity to the right level through the connection funneling process, using automation and AI, and grouping connection requests in time-based batches to be able to process more and optimize grid studies

2

Get more out of existing assets and accelerate delivery: Understand true asset limits and unlock headroom through advanced analytics, modernized risk frameworks, and dynamic operating practices. For new assets, leverage standardized designs, strategically engage with suppliers, improve project controls, and treat permitting as a mission-critical item

3

Develop grid capacity in line with policy choices: Work with policymakers to understand for what type of capacity and for how much capacity to prepare the grid for—and allocate study and grid capacity to those choices

4

Prepare implementation of no-regret and near-term impact levers: Apply stricter queue hygiene to minimize risk of speculative applications clogging the system, and, together with the regulator, design high-value levers that require regulatory changes, including for example grid/study slots by project type, flexible connections, “use-it-or-lose it” logics

5

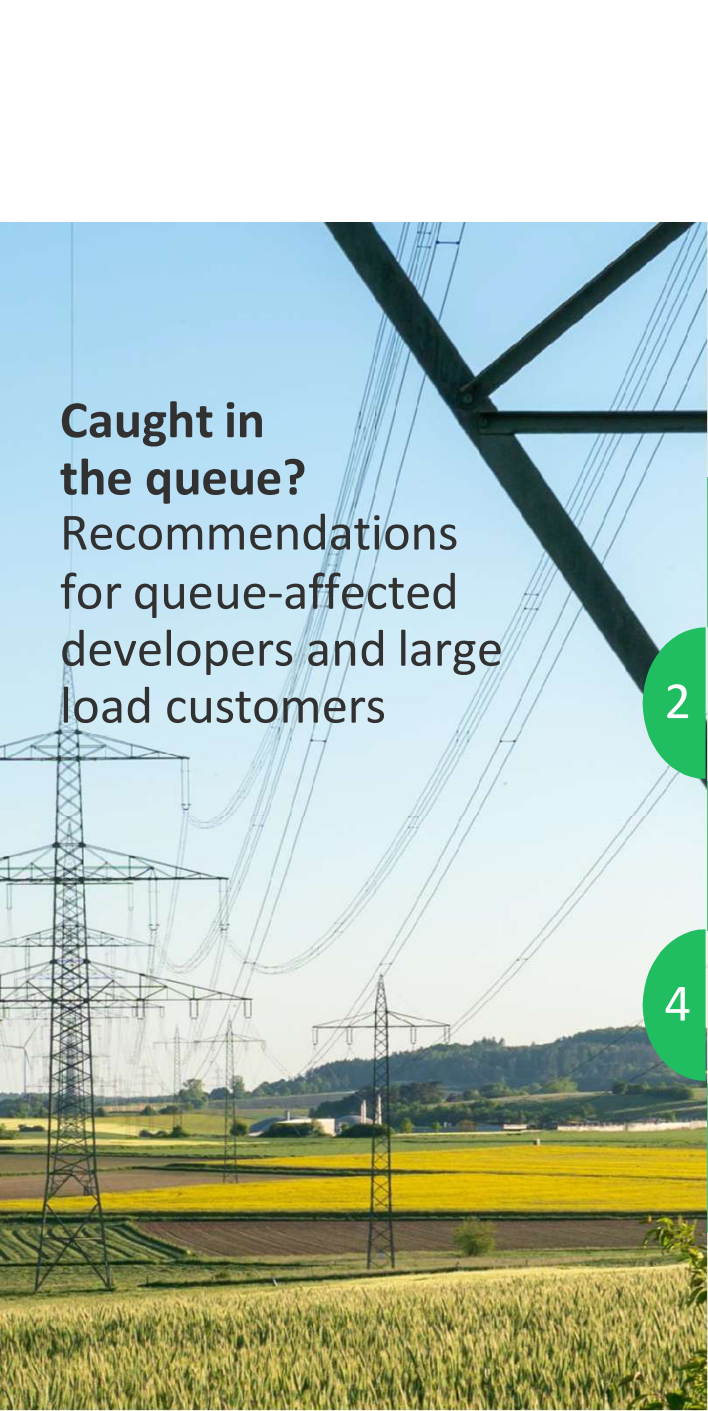
Assess value and practical feasibility of identified longer-term levers: Conduct a structured evaluation of the medium-to-long-term levers (for example, prioritization within user categories, flexibility market mechanisms, etc.). Prioritize those that offer high societal value, but consider pilots to derisk uncertain concepts for at-scale delivery

6

Learn from other sectors that have tackled similar challenges at scale: Grid connection queues may be relatively new, but the underlying dynamics are not. Lessons from sectors like aviation, public transport, telecom, gas, and the entertainment industry, where capacity constraints and access prioritization are routine, can offer valuable playbooks

7

Design reforms to evolve over time: Queues are dynamic: project volumes fluctuate, behaviors shift, and policy priorities evolve. Reform frameworks must be adaptable, capable of being updated as conditions change, rather than assuming today’s solution will hold indefinitely. Build in review cycles to ensure continued relevance and effectiveness



Caught in the queue?

Recommendations for queue-affected developers and large load customers

1

Sharpen your readiness profile: With reforms, projects that show maturity are far more likely to retain position or accelerate. This includes securing and demonstrating key permits early, aligning financing with connection application phases, and engaging with TSOs on transparency around milestones to stay “queue-credible”. But be strategic: increased readiness comes at a cost, so consider the trade-offs based on project risk, timing, and competitiveness

2

Prepare for flexible connection offers: Several regions are introducing flexible or non-firm access as default. Projects that are ready to operate under curtailment or staggered commissioning may get connected sooner. This includes exploring business model viability under partial or interruptible access, and optimizing asset design for modular or flexible operations. And be ready to flag that flexibility in discussions with the system operator

3

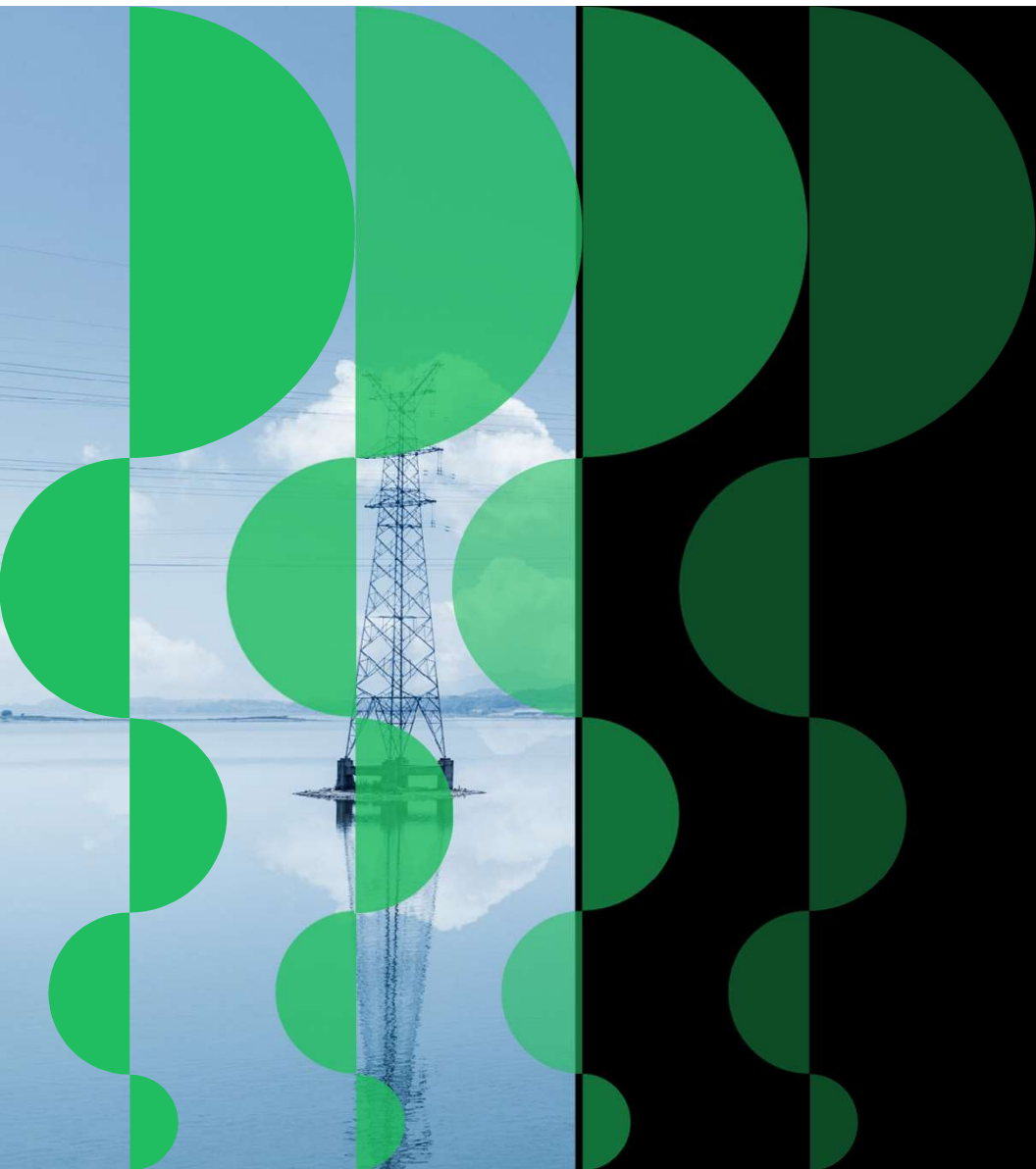
Rethink behind-the-meter and co-location strategies: Unlimited connections can no longer be taken for granted. Evaluate how pairing with load or on-site generation can improve the favorability and feasibility of your grid request. Consider co-location, storage integration, or behind-the-meter assets as ways to strengthen your connection case

4

Understand the politics of coalitions and reform: Forming coalitions can amplify your voice in shaping reforms, but be mindful of diverging interests. Not every player shares your urgency, technology type, or risk tolerance. Focus your collaboration efforts where alignment is strong, and avoid over-investing in consensus that will not materialize

5

Track reform in your region, and beyond: Our benchmark shows wide divergence in reform speed and approach. Learning from other markets can inform lobbying efforts, but equally important for international developers is to use this intelligence to prioritize regions where queues are short or reforms will be in your favour



Thank You.



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Elia's Grid Development Plans

Status update for User Group

Joachim Goovaerts | Plenary Session September 26th, 2025

Elia's development plans for the Belgian grid



Federal Development Plan (FDP)

Elia publishes an update of its Federal Development Plan every 4 years

Horizon: +10 years

Scope: Belgian federal electricity transmission grid (110 → 380 kV + HVDC)

Approved by: Federal Energy Minister (Mathieu Bihet)

Most recent version: FDP 2024-2034, approved on 5 May 2023

Next version: FDP 2028-2038



Scenarios: projections assessed up until **2050**



System needs: identification of new system needs



Investments: planned grid investments, at federal level



Environmental impact: through Strategic Environmental Analysis (SEA)

Roadmap

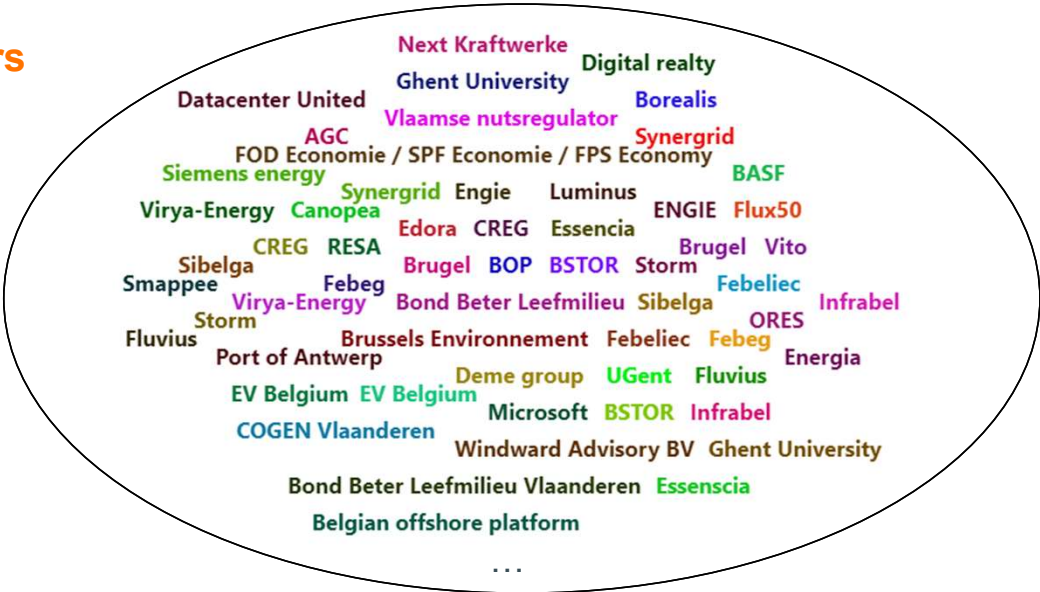


Federal Development Plan (FDP)

The scenarios are jointly created with stakeholders



>60 external stakeholders/organisations



** Special attention was made to invite and share all information with all regional authorities, cabinets, SPF/FOD, regulators. All DSO's are in addition closely involved through Synergrid.*

Dedicated workshops

Bilateral exchanges

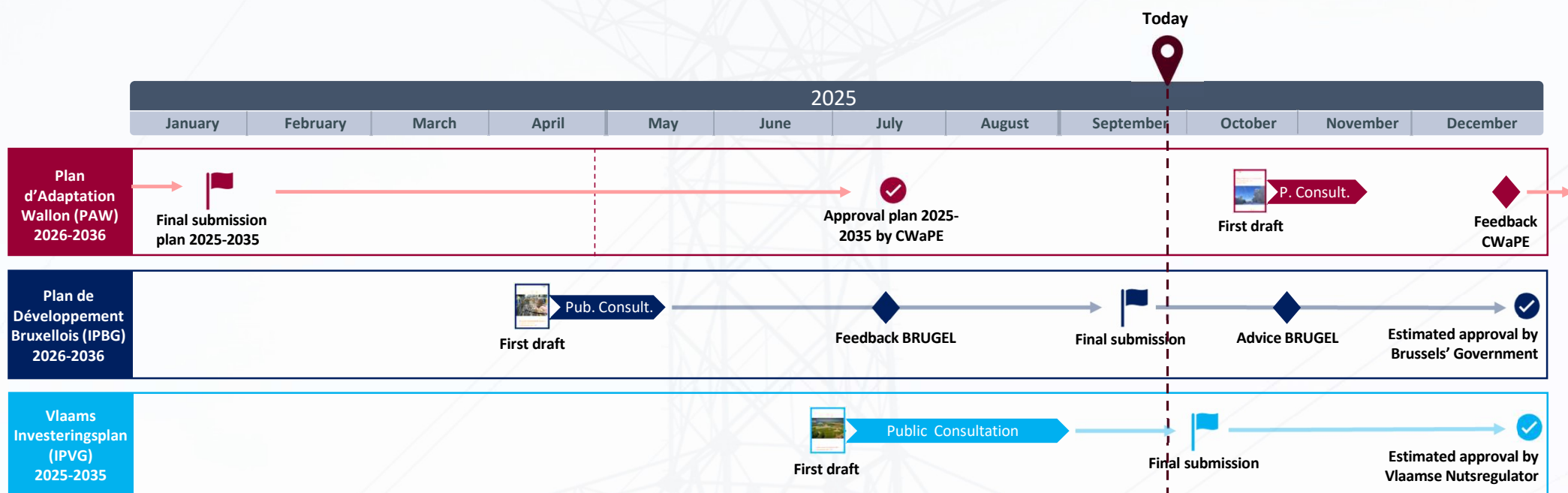
Public consultation

18 July to 12 September

~30 reactions captured

Dedicated TF session on public consultation results will be organized on 28 October

Regional development plans : 2025 roadmap



Thank you !



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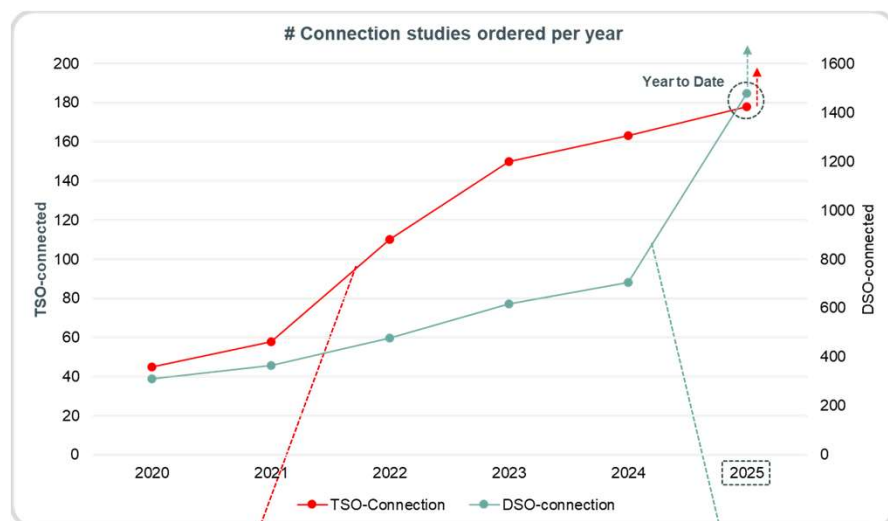


Status connection study requests and capacity reservation / allocation

Plenary User Group

26/09/2025

Unprecedented amounts of connection studies ordered both at TSO and DSO

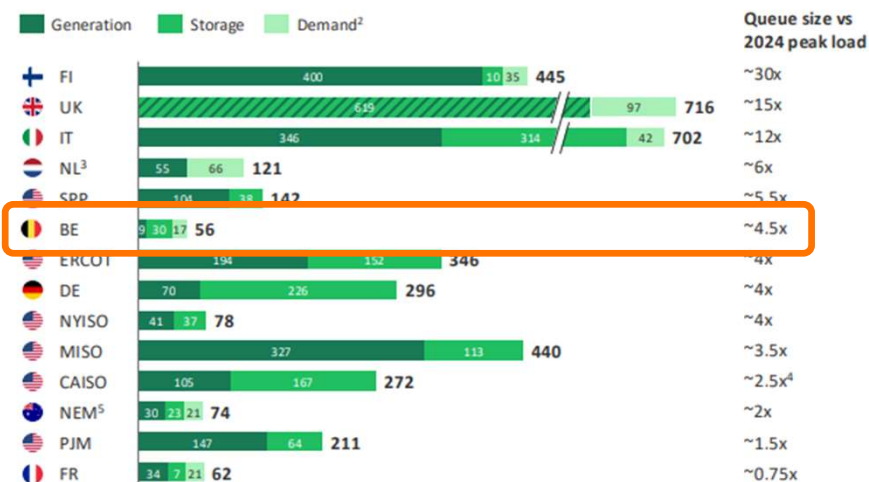


- Transmission system connection requests have increased 4-fold since 2020
- Received demands in 2025 are already exceeding those of 2024

- Distribution system connection requests have increased 2-fold between 2022 and 2024
- Explosion of connection requests in 2025!

The situation in Belgium is not unique. Neighboring countries show similar (more acute) trends

Queue sizes (GW)¹



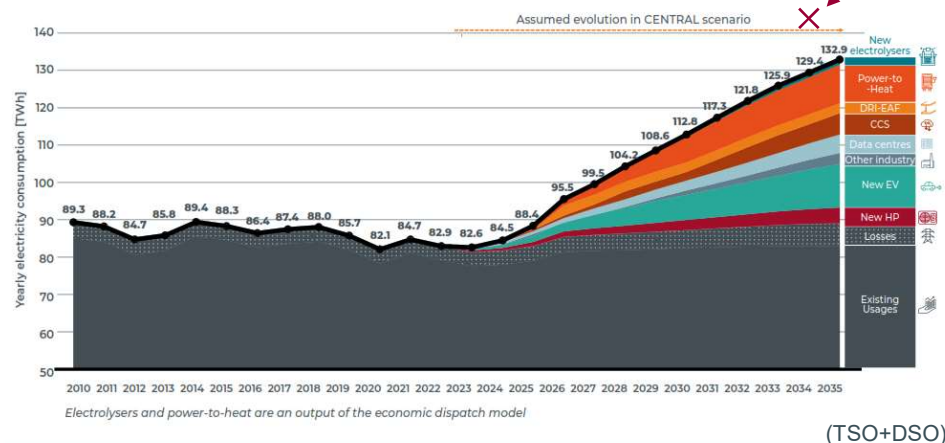
BCG study, "Mind the Queue" September 4, 2025

Elia is facing much more connection requests than for which the grid was developed

Requests for demand facilities (excl. data centers and residential (EVs and HP)) are higher than expected

FIGURE 3-13 — NORMALISED HISTORICAL AND ASSUMED FUTURE YEARLY ELECTRICITY CONSUMPTION IN THE CENTRAL SCENARIO FOR BELGIUM [TWh]

Total volume taken into account today



+ 35 %

Demand facilities (excl. DC and res EV+HP) in scenario 2023:

— Growth of 25,9 TWh expected by 2034 (TSO+DSO)

Demand facilities (excl. DC and res EV+HP) today:

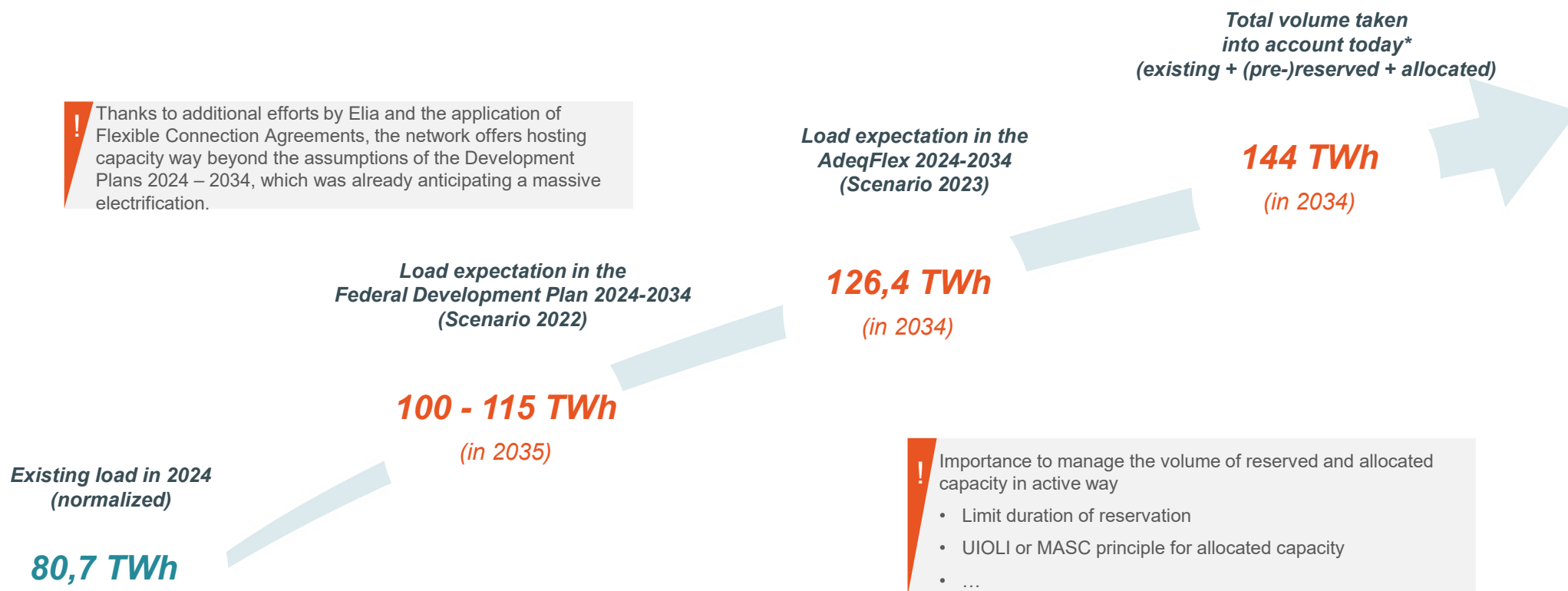
— Addition of 34,9 TWh expected by 2034 (reserved & allocated capacity, TSO+DSO⁽¹⁾)



135% of the assumed growth for Demand Facilities (excl. data centers, EVs and heat pumps) has materialized today in allocated and reserved capacities.

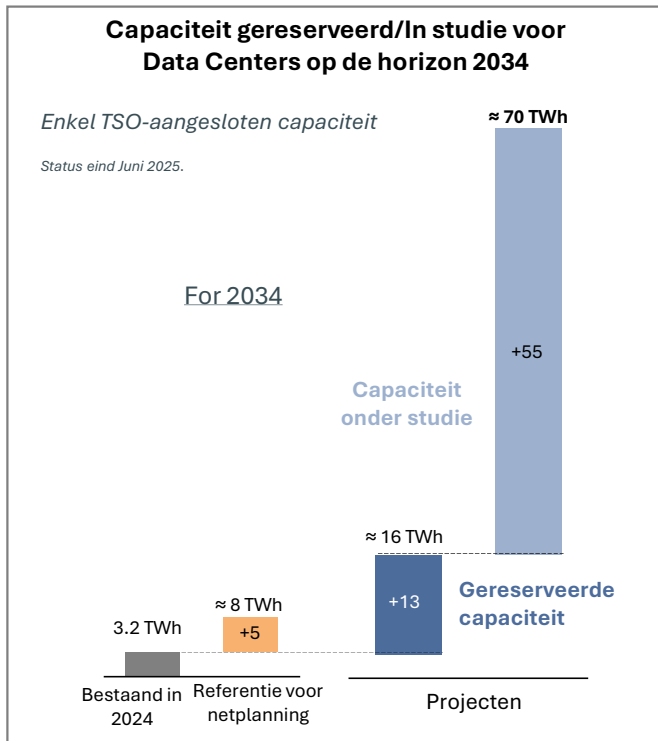
(1) Capacity reservations granted at DSO level since June 2024 are not accounted for in this volume. Source: Hosting Capacity Map – end of July.

Reference Framework: the development plans

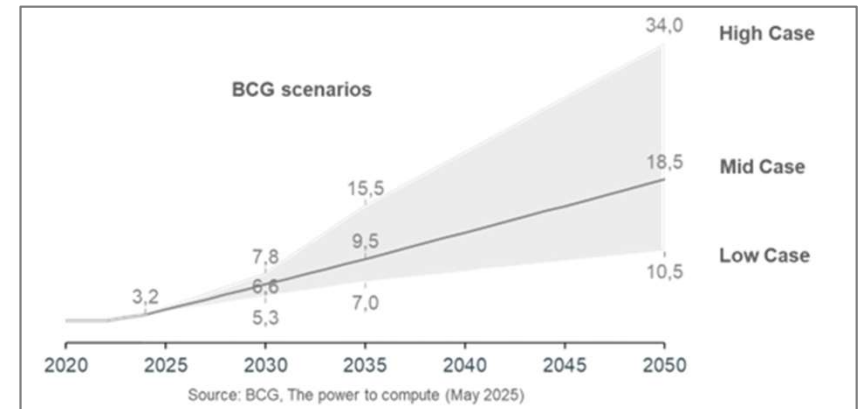


* This volume does not reflect capacity reservations granted at DSO level since June 2024. Source: Hosting Capacity Map – end of July.

Impact datacenters

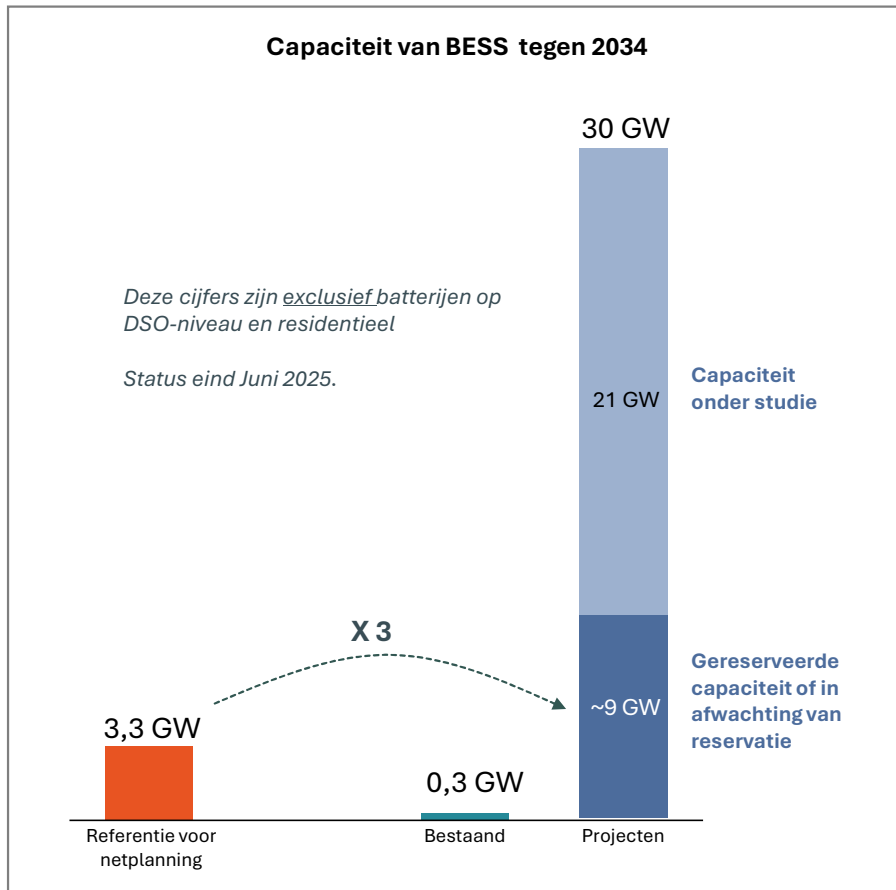


De hoeveelheid aanvragen overstijgt vele malen de verwachte toename aan data centers in België



- Maatregelen ter beperking van de enorme groei in het aantal aangesloten datacenters werden al doorgevoerd in [Ierland](#), [Nederland](#) en [Frankfurt](#). De stijging in ons land wordt mede hierdoor aangedreven.
- De capaciteit gereserveerd of gealloceerd voor datacenters overstijgt de ingeschatte noden. De gereserveerde capaciteit is niet meer beschikbaar voor andere doeleinden.

Impact batterijen



EnergyVille:
By **2050** the model
invests in 6 – 7,3 GW of
battery storage.⁽²⁾



(1) EnergyVille Paths2050 – April 2025

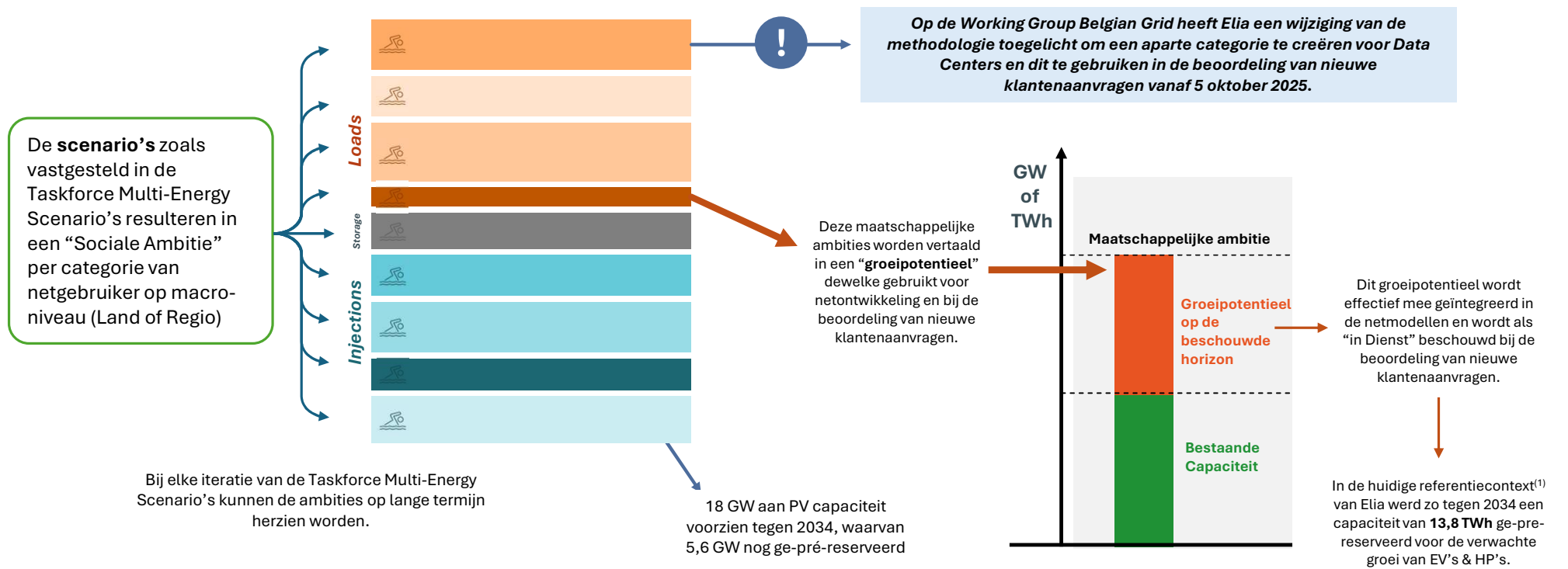


De Capaciteit gereserveerd of Gealloceerd voor grote batterijprojecten op het transmissienet is reeds **3x hoger dan voorzien op de horizon van 2034** en overschrijdt reeds de ingeschatte nood op de horizon van 2050. Dit geeft aanleiding tot twee effecten:

1. In de huidige context zijn batterijen vooral actief op de energie en balancingmarkten, en werken ze dus niet standaard als congestieverlichtend.
2. De gereserveerde capaciteit is niet meer beschikbaar voor andere doeleinden.

Principle of pre-reservation of potential at Elia

Enabling societal ambitions for which grid was developed

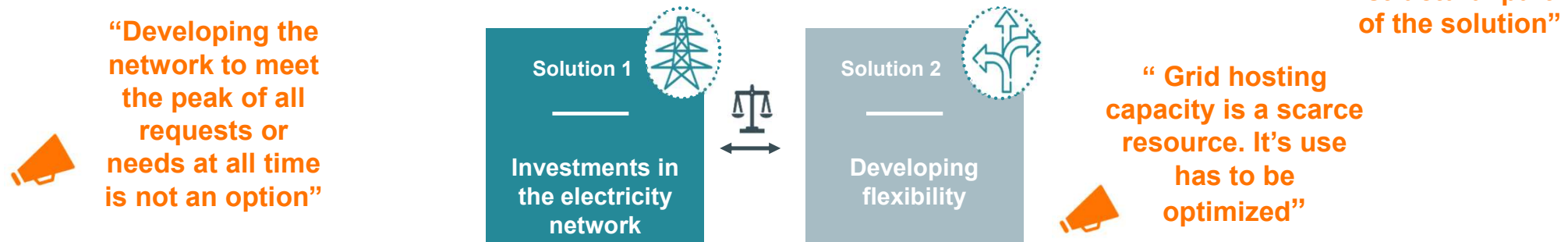


(1). Source: [Hosting Capacity Map](#)

Short term measure: creation of a specific category for the data centers

- **Objective:** Ensure access to grid capacity aligns with planned growth for demand facilities.
- **Concrete measures:**
 - ✓ Via the hosting capacity map, the capacity reserved and allocated to the data centers on the transmission network will be communicated and updated regularly.
 - ✓ For a new grid connection request, if a local growth potential is available, a pre-check (see next slide) will be performed to determine whether or not the connection request corresponds to a capacity identified in this local growth potential.
- **Effective Date:** In accordance with Article 22 §1 bis of the Code of Conduct, this measure applies to new grid users' connection requests one month after notification and will enter into force beginning of October (after consultation);
- **Validity:** This approach remains in place until the updated reference context based on the FDP28-38 scenarios is implemented. After that, evaluations will be performed within each category and aligned with the foreseen growth potential (100%).
- **Impact:** No immediate structural effect expected (yet, there might be an impact on local level), as most zones have allocated or reserved capacity for demand facilities beyond their local growth potential for demand facilities
- **Methodological Consistency:** This approach is coherent with the current connection methodology, which already foresees the categorization of grid users (+ link to CoC).
- **Reminder:** No access to a growth potential simply means the connection is processed outside the reserved development margins. It remains fully eligible for connection, typically with flexible access.

Levers to facilitate electrification and RES integration at the least cost for society?



Short/Medium Term

- Realize planned investments and more dynamic capex portfolio
- Maximising access to the (scarce) network capacity:
 - Offering **flexible connections** (+ investigate PPAD Flex,...)
 - **Rethinking the capacity reservation system** (FCFS, maturity, swimming lanes), **avoid “paper” congestions** and make sure that capacity is allocated in a way **to meet societal objectives** (for which grid was built)
 - **Limit reservation duration & free up unused allocated capacity**
- Accelerate development of flexibility to “flatten” the curve

Long Term

- Scenario-driven planning:
 - What mix of generation (nuclear, offshore, interconnectors)?
 - What ambition for new technologies (batteries, data centers)?
 - Industrial site development: location, type, and strategic importance.
 - *Plan de Puissance, EnergyGrip, Load management*
- Towards a TOTEX approach (CAPEX + OPEX optimization)
- Better alignment between industrial policy, spatial planning and grid planning

Balancing the different options is a societal choice, not only a choice of the grid operator.



Reflections on more fundamental reforms required

For discussion

How to evolve the connection process to a well-thought **target model** ensuring a timely treatment of connection requests in line with **societal priorities**?

Key solution elements



How to ensure a societal justifiable Capacity Management?

Ensure that not all capacity is being used by one technology or by certain fast-movers but that on federal and regional level clear ambitions or targets are set for the **allowed capacity for each category of grid users**



How to ensure an efficient Queue Management?

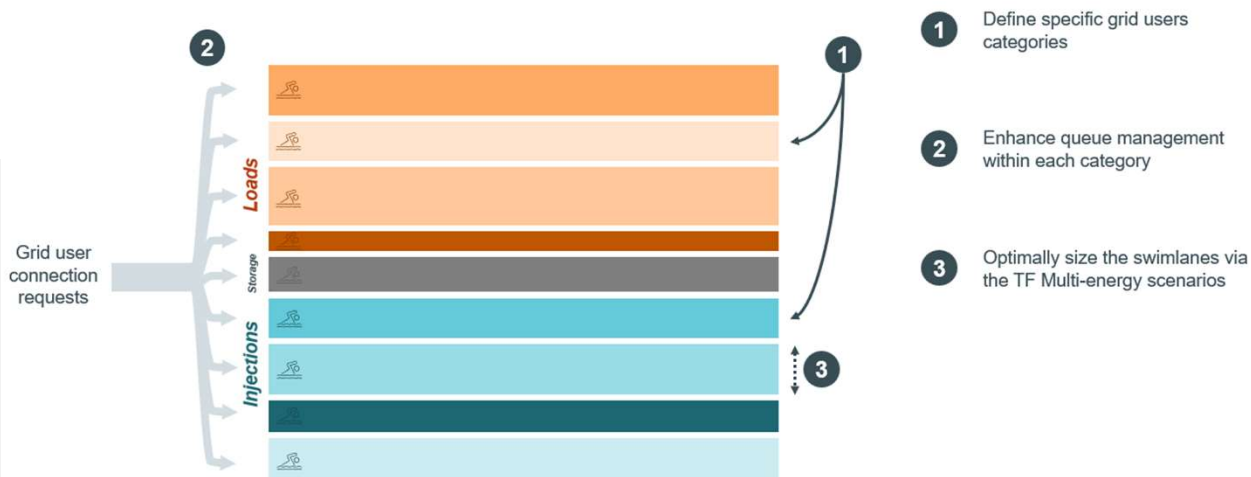
- Include **maturity criteria for client projects** throughout the connection process in order to avoid reserving and allocation capacity for very immature projects and ensure unused capacity is given back to the market.
- Evolution towards an “**Window-based application intake**”, to assess grid connection requests in batch, in stead of one by one and apply the Maturity Criteria.



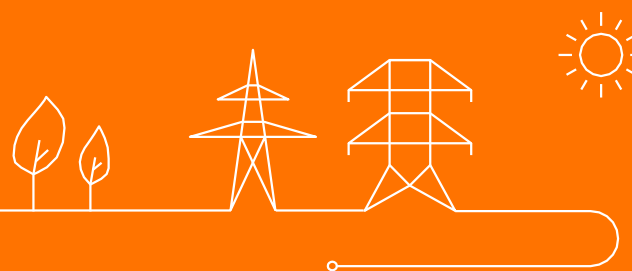
One **coordinated harmonized process** across the grid levels to avoid shifting problems to other voltage levels



High-level approach to revise the First-Come First-Serve process



Questions?



Agenda

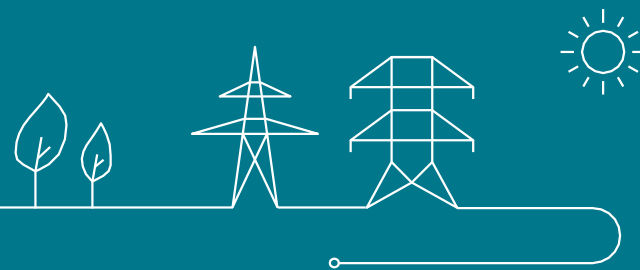
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5. Feedback Werkgroepen
6. AOB



Working Group: Adequacy

President: Jan Voet

Date of the Plenary meeting: 29/09/2025



1. Most important developments

- Capacity Contract V5 finalized and published.

2. Progress on ongoing projects

- **CRM Design:**

- Update on MRV estimation methodology ongoing.
- Roadmap for Functioning Rules V6.

- **CRM Calibration:**

- 30/09 decision of the Minister on the CRM scenario
- 1/12 publication of the calibration report by Elia

- **CRM Implementation:**

- Organization of bilateral sessions with CRM actors and organisation of general Q&A sessions.
- Go-live of Ademar tool Availability Monitoring & Payback Obligation on 15/9.

- **CRM operations:**

- Notification of PQ results for '25 auctions : 15/9.



4. Future actions and planning/key dates

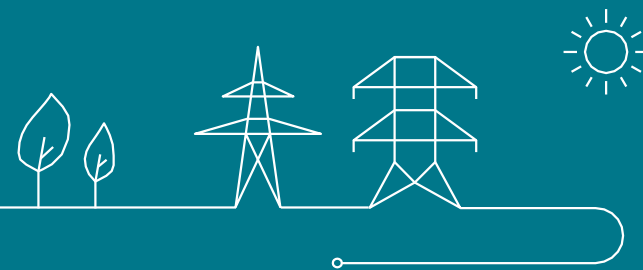
- CRM Auctions (Y-4 / Y-2 / Y-1) :
 - Bid submission: 16/9 – 30/9
 - Auction results publication : 31/10 at the latest.
- Next Working Group:
 - Working Group of 13/10 : design evolutions FR V6
 - **Additional WG of 21/11** : design evolutions FR V6 + auction results
- Public Consultation on Functioning Rules V6: 25/11/25 - 05/01/26



Werkgroep: Belgian Grid

Voorzitter: Jan Voet

Datum van de Plenaire Vergadering: 29 september 2025



1. Belangrijkste ontwikkelingen

- **Societal Electrification** –aanpassing van de methodologie (consultatie loopt)
- Proposal for GFM **BESS** Technical Requirements Connected at Elia Grid

2. Voortgang lopende projecten

- **Aansluitingscontract**: eind september/midden oktober indienen bij regulatoren
- **Toegangscontract**: ingetrokken – geen wettelijke basis Multiple BRP

3. Uitdagingen en knelpunten

- **MASC**: EOS / EDS / REA vs. Systeem CREG rond verlies en beheer van gereserveerde, maar ongebruikte capaciteit
- Goedkeuring contracten



4. Mededeling

- UG Tevredenheidsenquête

5. Afgesloten onderwerpen

- Development EPIC/Traxes
- Ramping Rate Limieten batterijen
- Nieuwe BRP% voor de compensatie van de federale netverliezen
- Communicatie bij overstap van koper naar fiber

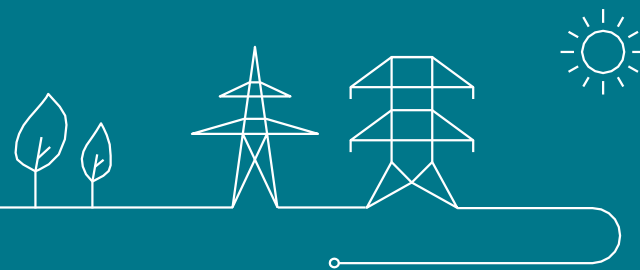
6. Toekomstige acties en planning

- Werkgroep Belgian Grid 2 december
- Mixed sites visie
- GFM BESS – plan van aanpak



Working Group: Energy Solutions

President: Alexandre Torreele



1. Most important developments

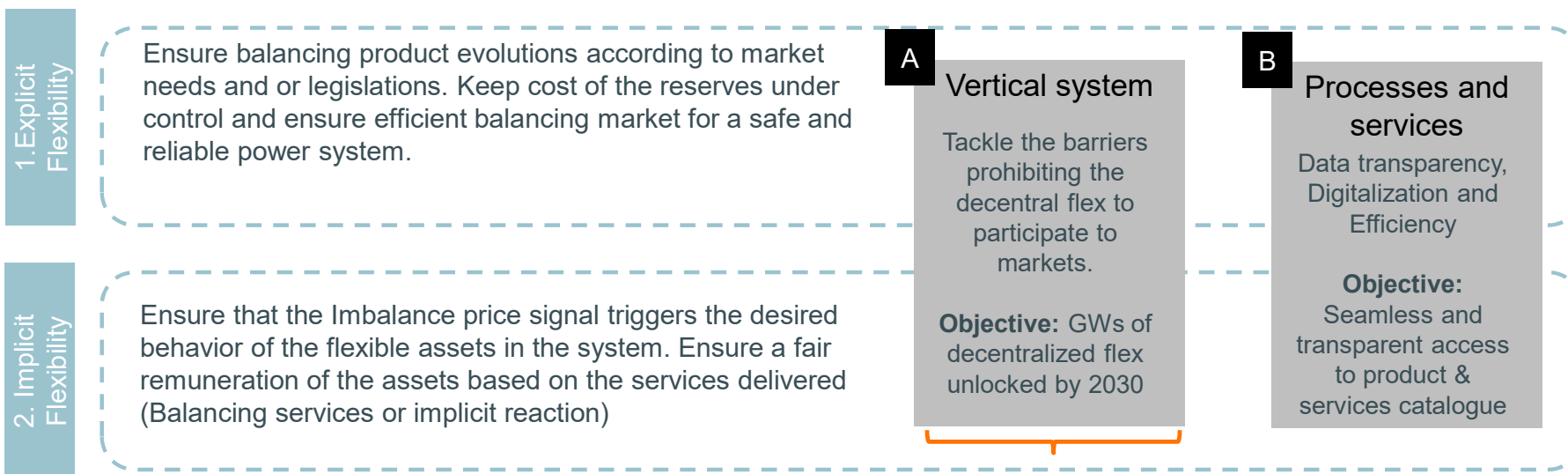
- T&C BRP & LFCBOA entered into force, in the frame of incompressibility
- T&C BSP FCR approved by CREG on 15/05, entered into force on 18/06
 - Amendments regarding the **Additional Properties**:
 - Derogation
 - Reserve Mode
 - System Split Requirements
 - Amendments regarding **third-party data providers**
- Elia launched a public consultation on the ToE rules (18/06 – 01/08)



1. Most important developments

- Presentation of the Roadmap 2025-2028. Proposed framework:
One **balancing philosophy**, **Two core activities** and two focus areas

Elia's Balancing philosophy



In strong collaboration with DSOs



2. Collaboration and coordination

➤ Finetuning of System Balance Philosophy

- Elia's System Balance Philosophy defines the **balancing model** we apply in Belgium to **resolve imbalances in real time**. It also outlines how balancing means should be secured in advance, notably through balancing capacity reservation.
- The philosophy aims to ensure **system reliability**, while supporting the integration of **renewable energy** and enabling **electrification** in an **affordable way**.
- It is meant to be an **overarching document**, which **provides direction and frames roadmaps** for the years to come in terms of studies, product & market design evolutions.
- Taking time to discuss and **align this philosophy as far as possible** with regulators and market participants seem essential to ensure the **right focus** for the years to come.
 - **Elia organized an interactive workshop** on 8th September, including presentations from:
 - CREG
 - YUSO on the BSP perspective,
 - FEBEG on the BRP perspective,
 - FEBELIEC on the Grid User perspective



3. Future actions and planning

- Evolution of the WG ES
- Adapt the name and format considering the feedback from market parties

WG Balancing Design & Solutions (WG BD&S)

Plenary session

Plenary session in the morning:

- **Decisions by the WG** on incentives, design proposals etc. Design details will have been discussed in an earlier bi-directional session.
 - Presentation of **roadmaps**
 - **Status** updates on programs
- Slides will be sent upfront with **executive summary and decision points**.

Lunch

Exchange session

Afternoon sessions are expert focused and bi-directional:

- **Deep-dive on design** proposals with room for discussion on specifics
 - Details on **implementation** technicalities, financial implications etc.
- Elia will share the **agenda** with an indication of the **relevant expertise required** upfront (e.g. design, IT...). These discussions shape the decision moments in the next plenary session.
- Time for open floor for market parties, federations. Market parties invited to bring topics for discussion, questions etc.

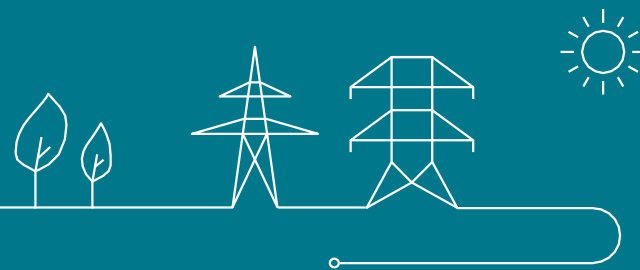


Working Group: WG MIGO

President: Benjamin Genêt and Walter Geelen

Date of the last WG MIGO meetings:

- 16/06/2025
- 12/09/2025



1. Most important developments

- LT: First June yearly auction BE – FR took place with 124MW allocated
 - Last year with the possibility to have an individual early auction considering the regional implementation of a flow-based approach in 2026
- ID: Core IDCC(c) went live on 25th of June. The performances show
 - A further reduction in BE bidding zone isolation
 - A reduction in the frequency of negative and zero capacities (with as trade-off the average of positive capacities slightly decreasing)
- Successful go-live for improved grid model (GLSK approach). Key for the improvement of the flow-based domain
- NCC report 2025 Q1-Q2 was presented with as highlight the positive impact of Picasso go-live on balancing activations & ACE



2. Progress on ongoing projects

European markets

- DA: 15' MTU in SDAC is planned to go-live on 30th September
- Core LT CCM amendment is being prepared to accommodate flow-based calculation process
 - Moving to a fully financial paradigm by removing LTA inclusion in day-ahead – change of philosophy introducing coordinated auction
- Core DA CCM 4th amendment is being prepared
- Core ID CCM 5th amendment process is being prepared
 - Public consultation from mid-September until mid-October
 - Content and Elia position have been presented
- Shortening of the intraday cross-zonal gate closure time: as publicly consulted, Elia requested a derogation and plan to be ready by 31/03/2027



2. Progress on ongoing projects

System Services Design

- Study on future grid restoration (CREG incentive): intermediate conclusions were presented, public consultation from 14/10/2025 and 21/11/2025
- Long term outage planning agent: go-live period: 14/10/25 9am - 20/10/2025 3pm
 - The regulatory approvals were obtained.
 - Testing progressing in line with planning
- TF Grid Flex took place, with a focus on:
 - Implementation of the code of conduct at federal level, with a go-live planned for Q2 2027
 - Presentation of the envisioned design for grid user contribution and settlement beyond contractual limits
 - Update on the developments in the regions



3. Challenges and bottlenecks



4. Decisions and advice

- Change of the name of the WG: from WG grid to WG MIGO (Market Integration, Grid & Operations)
 - The agenda remains organised to allow a participation only to the part of interest
- The TF Grid Flex was created on a permanent basis, in the continuity of the workshops that were organised since early 2025



5. Collaboration and coordination

- Workshop iCAROS TF - LT OPA - Transparency aspects took place on 9/9/2025
- On-going informal public consultation organized by Synergrid regarding extension of OPA design to all relevant grid user assets (TSO & DSO) : end date of the informal consultation 10 October 2025 & information session is organized by Synergrid 3 October 2025
- Consultation by CREG on evolution of the Code of Conduct and feedback Elia on MVAr and black start took place between 17th July 2025 to 28th August 2025

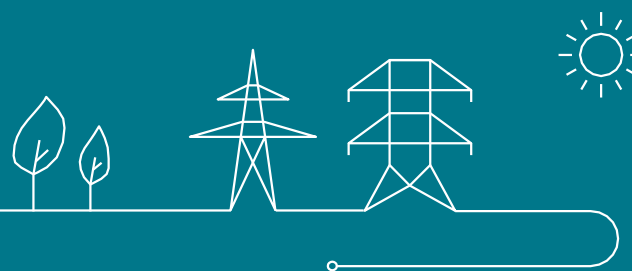


6. Future actions and planning

- Dedicated discussion on the 28 April 2025 blackout in Spain and Portugal [online]: 21/10
- Summer Review and preliminary Winter Outlook results [online]: 24/10
- Confirmation of go-live LT OPA based on market party readiness to be confirmed at the latest before 7/10
- Next TF Grid Flex: 04/11, 11/12
- Next WG MIGO: 17/12

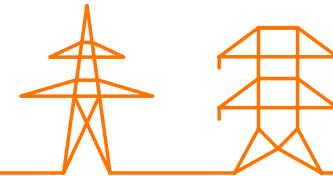


Questions?

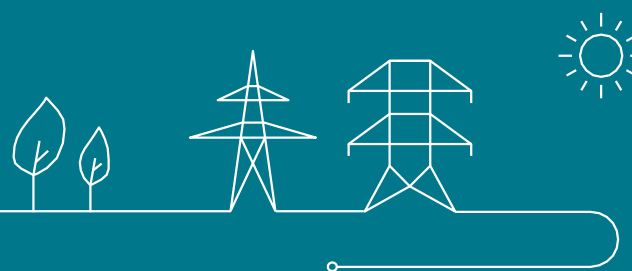


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AOB



Announcement Users' Group Survey – 16 September 2025 (herinnering!)

Elia hecht bijzonder veel waarde aan de feedback van haar stakeholders

- Algemene klantentevredenheidsenquête = even jaren
- Tevredenheidsenquête van de Users' Group = oneven jaren
 - ⇒ Timing: 16 september 2025
 - ⇒ Online enquête = e-mail
 - ⇒ Extern communicatiebureau
 - ⇒ Incentive CREG

Incentive CREG

- Effectieve ledenlijst UG/WG/TF ⇒ CREG
- Vragenlijst mailen naar de effectieve leden met kopie aan CREG
- 4 “schaal”-vragen met score 1 (slecht) tot 5 (uitstekend) over:
 - **praktische organisatie**
 - pertinente documenten
 - termijn
 - proces-verbaal
 - consultatieverslagen
 - **impact** die het lid heeft op het gerealiseerde werk door Elia



Thank you

Next meeting: 08/12/2025, 9:30 – 12u

