Grid tariffs – More than a Cost Recovery Mechanism

FEDIL's Input on the Future Tariff Structure for MT, HT, and THT Levels

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Content

1 Grid Tariff Reform as a Strategic Lever for Industrial Decarbonisation and Competitiveness

A Timely Reform for a Fairer, More Predictable Grid Cost Structure

FEDIL welcomes the public consultation on the reform of Luxembourg's electricity grid tariffs for medium, high, and very high voltage users. This reform presents a vital opportunity to improve the transparency, predictability, and simplicity of the current tariff structure, while ensuring that the costs of grid development are fairly and efficiently allocated in a system undergoing rapid transformation due to the energy transition.

Industrial Electrification Depends on Competitive Grid Access

For industrial consumers, the structure of grid tariffs plays a decisive role in determining whether switching from fossil fuels to electricity is economically viable. Grid fees must contribute to **delivering competitive electricity costs**, both to support the electrification of existing industrial processes and to attract new industrial investments to Luxembourg. In sectors where electrification is the most effective decarbonisation pathway, unaffordable or unpredictable grid costs can act as a strong disincentive, undermining both climate and industrial policy goals.

While electricity prices are largely determined by global energy markets and shaped by factors beyond national control, **grid costs — together with taxes and levies — represent one of the few cost components that remain entirely within the remit of local or national authorities**. In this context, the design of grid tariffs becomes a strategic industrial policy tool. Ensuring that grid fees remain predictable, fair, and competitive is not only essential to support the electrification of industry but also to position Luxembourg as an attractive location for future-oriented industrial activity in a decarbonising global economy.

Tariffs as an Instrument of Industrial Policy

Grid tariffs are more than a cost recovery mechanism — they are a **strategic tool of industrial policy**. When well designed, they can actively support Luxembourg's and Europe's ambitions for strategic autonomy by attracting electricity-intensive businesses active **in clean technologies, data infrastructure, and net-zero manufacturing**. Moreover, improving grid affordability through broader usage is not only logical, it is essential: the more users connected to the grid, the lower the cost per user, reinforcing the need for tariffs that are inclusive and **supportive of industrial growth**.

Integrating Recent EU Guidance: Special Regimes and Public Support

The recent European Commission Recommendation of 2 July 2025 provides timely guidance that should inform Luxembourg's grid tariff reform, even though it was published after the consultation was launched. One of its key messages is the need to modernize tariff structures to **reflect the realities** of a decarbonised, flexible, and cost-conscious energy system. In the grid tariff structure, capacity and time-of-use elements, as well as local price signals, are recommended to foster active resilience behaviour. It also emphasises the introduction of **special tariff regimes** for specific categories of users — such as **energy-intensive industries** — where objective criteria show that their consumption profiles and ability to offer system flexibility result in a lower overall impact on network costs. Luxembourg's reform must therefore ensure that tariff design recognises and rewards the **positive role that industrial consumers can play**, particularly when they reduce peak demand or contribute to system stability. This role becomes increasingly important as decentralised power generation grows.

Triggering a Virtuous Cycle through Public Funding

Notably, the Commission also confirms that Member States may allocate general government funds to support the network charges budget, within the limits of the applicable legal framework. Such public support for Luxembourg's grid has already been announced by the Prime Minister during his State of the Nation address on 13 May 2025. This new flexibility should be **used strategically in Luxembourg** to ease the tariff burden at higher voltage levels. By doing so, a virtuous cycle can be initiated: more consumers may be attracted to connect at medium, high, or very high voltage, which in turn would spread fixed costs more broadly and reduce the average cost per user. This would also reduce the volume of costs cascading down to lower voltage levels, directly benefiting households and small businesses. Enhancing cost-competitiveness for industrial users would further drive investment, support decarbonisation, and deliver concrete economic benefits in the form of job creation.

FEDIL's responses to this consultation aim to ensure that the future grid tariff structure strikes a fair **balance** between cost recovery, system efficiency, and competitiveness, while enabling the long-term decarbonisation of the industrial sector.

2 Questions for Stakeholders

2.1 Question 1

How far do you share Consentec report's assessment of the current tariff system's strengths and weaknesses, particularly regarding the tension between incentivizing flexibility and ensuring cost recovery? Which issues do you see as the most urgent to address?

FEDIL broadly agrees with the Consentec report's evaluation of the current grid tariff system. We particularly share its concerns about the lack of transparency and predictability, which **complicates long-term energy and investment planning** for industrial consumers. In an economic context where electrification is a key lever for decarbonisation, companies must be able to understand, forecast, and manage their electricity-related costs over a multi-year horizon. This is not the case under the current system.

The report also highlights that the existing tariff structure does not sufficiently reward demand-side flexibility. Today's model charges capacity based on a single annual peak, even if that peak occurs outside system stress and lasts only 15 minutes. In addition, the use of a fixed simultaneity function — which assigns higher cost weights to continuous users — **penalises industrial consumers** with stable loads, even if they can shift demand or respond to price signals. Moreover, the absence of any time-of-use differentiation in the tariff structure means that users, including households, are not encouraged to shift consumption to hours of surplus renewable generation or low grid utilisation. This results in **a missed opportunity to activate flexibility** that would benefit both the electricity system and the environment.

At the same time, FEDIL recognises that the grid tariff system must always ensure full cost recovery for the grid operator. That principle is not in question. However, as FEDIL has outlined in its paper "Industrial Power Grid Fees in the Age of the Energy Transition", the current structure does not reflect actual cost causation. In particular, it has led to a **disproportionate increase in grid costs** at the medium and high voltage levels, even though most of the new load growth is occurring at the low-voltage level, driven by residential PV, EV charging, and heat pumps. This structural imbalance leads to an unjustified transfer of grid **cost burden towards industrial users** who are connected to voltage levels that are less affected by this growth.

Looking ahead, it is essential to **address this imbalance** and ensure that grid tariffs become a tool that **supports, rather than hinders**, Luxembourg's decarbonisation and industrial policy goals. Grid costs must be seen as an enabling factor — not a barrier — for electrification. They should contribute to **delivering competitive electricity prices**, not only to support existing industry, but also to attract new strategic investment to Luxembourg. In this sense, grid tariff design is not just a technical issue — it is a critical component of the **country's economic, energy, and industrial strategy**.

2.2 Question 2

Do you support replacing the current cost cascade based on maximum annual load with a simpler model based on gross annual consumption considering the *expected benefits for stability, transparency and fairness as described in chapter 3 of the Consentec report? Why or why not?*

FEDIL acknowledges the reasoning presented in the Consentec report in favour of replacing the current cost cascade mechanism, which is based on annual peak loads, with a simpler and more stable alternative. We agree that the current system introduces significant volatility and lacks transparency, particularly at voltage levels with a limited number of consumers, such as 65 kV. However, we **do not support a shift toward a model based on (gross) annual consumption** away from the current cost cascade model. From an industrial standpoint, a volume-based allocation would unfairly penalise large consumers with high and constant energy needs, regardless of their actual contribution to grid peak loads or infrastructure use. Such an approach **would risk undermining the decarbonization** of the industrial sector by discouraging the adoption of electrification. It could weaken Luxembourg's attractiveness for new electricity-intensive activities, especially those linked to data, digitalization, and the green transition. **More fundamentally, it ignores the fact that the primary driver of grid development is not the volume of energy transported, but the peak loads that the infrastructure must be designed to withstand.** A volume-based allocation would thus create a persistent disconnect between cost responsibility and cost causation, resulting in a tariff structure that fails to reflect the real drivers of grid investment. Instead, FEDIL advocates for a transition toward a more cost-reflective model based on **reserved or subscribed capacities,** as represented in Variant 4 of the Consentec study. This approach would ground the allocation of upstream grid costs in the capacity explicitly reserved by users at each network level, including all lower levels. While we acknowledge that the variants 4.1 and 4.2, as presented in the report[1], would likely entail excessive and abrupt shifts in cost allocation between voltage levels — making them politically and operationally unrealistic in the short term, **the underlying principle remains sound**.

A more practical and balanced option would be **to combine** the reference capacities introduced in 2025 for low-voltage consumers with reserved connection capacities at medium and high voltage levels. In this model, the **aggregated sum of all these non-abundant (non-foisonné) capacities** would be used to define the peak demand at each grid voltage level. This method would not only provide a **stable and transparent cost base** but also enable a more **equitable allocation** of costs by accurately reflecting the actual infrastructure requirements imposed by each level. It fulfils the three central criteria of stability, transparency, and fairness far more effectively than any volume-based alternative.

Moreover, this model supports **behavioral optimization without penalizing** specific categories of consumers. Each user retains the freedom to adjust their consumption and reserved capacity according to their needs, including the level of risk they are willing to bear for occasional peak overruns, i.e., when the peak exceeds the contracted capacity. Industrial users, whose load profiles are already largely predictable and stable, would no longer be penalized for short, non-structural peaks that have little impact on the actual grid dimensioning. Finally, **large autoconsumers** would more equitably contribute to covering grid costs for their "back-up" connection to the grid.

By anchoring cost allocation in the actual infrastructure dimensioning signals — namely, the connection capacities needed and declared by users — this model aligns much more closely with the **proper cost drivers** of grid development. Unlike purely energy-based models, which fail to distinguish between users who rely heavily on the grid and those who do not, **a reserved/reference capacity-based model** using non-abondant (non-foisonné) peak values offers a more accurate and fairer basis for tariff design in a transforming energy system.

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[1] We believe that a key limitation of Consentec's Variant 4 lies in the comparative calculation model's choice of technical capacities — specifically, 27 kVA as a maximum for low-voltage (LV) users and 1 kVA as a minimal baseline. These values do not reflect realistic consumption patterns. We recommend using more representative capacities of at least 3 kVA, the minimum reference capacity as of 2025 in the model for LV consumers, considering the growing uptake of heat pumps and electric vehicles, where capacities of 7-12 kVA and much more are more accurate.

2.3 Question 3

What is your view on the shift from tariffs based on actual peak load to a reference capacity? In this model, users subscribe to a capacity and face surcharges when they exceed it, like the new tariff structure applicable to low voltage customers since Jan 1, 2025.

FEDIL supports the principle of moving from a tariff model based on actual measured peak load to one based on a **contractually defined reference capacity**, as introduced for low-voltage consumers in January 2025. We consider this shift particularly appropriate for medium- and high-voltage users, provided that the reference capacity is **not** derived from historical consumption data but instead **selected or contractually agreed upon** by the user based on their operational needs and strategic planning.

Such a model enhances both transparency and flexibility, allowing industrial consumers to better plan and manage their energy usage without the unpredictability associated with single, occasionally non-representative peak events. It also opens the door to more efficient demand-side behaviour by enabling users to balance cost, risk, and operational priorities when selecting their capacity.

The surcharge mechanism for exceeding the reference capacity is acceptable from an industrial perspective, as long as it remains predictable, proportionate, **and does not prohibit overruns entirely**. Designing the system in a way that deters all deviations from the contracted value — for example, through punitive surcharges — would run counter to the very objective of enabling greater flexibility. To ensure that the model remains both adaptable and investment-friendly, it is essential that higher voltage consumers retain the option to adjust the contracted capacity value annually to reflect operational needs and changes in consumption patterns. This flexibility is essential to align capacity planning with the realities of industrial production cycles.

A more forward-looking approach could provide for **full exemption from surcharges** under certain system conditions, such as during hours of negative electricity prices or in areas experiencing local grid congestion, where the grid operator may actively wish to encourage higher consumption to relieve pressure elsewhere on the system. The rationale behind such exemptions is to create a clear incentive for industrial users to invest in flexibility technologies — for example, in larger heating or cooling units combined with storage capacity — so that such energy-intensive equipment can be operated preferentially during midday hours and used to cover thermal needs over a whole 24-hour period.

The model of surcharges must remain compatible with the **operational realities** of industrial processes, where flexibility may need to be mobilised in unexpected ways. Therefore, while the model can take inspiration from the one already introduced at the low-voltage level, it must leave **greater room for contractual freedom**. This includes options for differentiated surcharge ceilings, such as tolerance bands that allow occasional overruns within a buffer without penalty, for example, to accommodate the cold start of a major consumer. Furthermore, consider capped surcharges that apply only beyond a certain threshold, or reduced surcharges during off-peak hours, such as weekends. In addition, more dynamic models could enable contractual agreements whereby industrial users provide demand-side response services to the grid operator in exchange for surcharge exemptions, tariff incentives, or remuneration. Taken together, these contractual options would allow industrial users to better **align** their subscribed capacities with operational constraints and investment cycles, without undermining the stability and predictability of the tariff model.

Overall, a reference capacity model that preserves these degrees of freedom and is calibrated appropriately offers a promising path forward. It recognises the importance of giving users the ability to act — and react — within a transparent and fair framework, while ensuring the long-term cost recovery and stability of the grid system. It should, however, be supported by services that allow the identification of optimal contractual capacity.

2.4 Question 4

What is your opinion on the proposal to remove the simultaneity function and instead apply fixed shares on the repartition between capacity and volumetric tariff components, given the operational and conceptual challenges highlighted in the Consentec study (see Consentec report 5.4)? Should the tariff still consider usage hours? In your opinion, what balance between capacity in €/kW and consumption in €/kWh would you consider most fair and effective in encouraging efficient and flexible use of the electricity grid? Would a 40% capacity / 60% commodity split be appropriate (see Consentec report 5.4.1)?

FEDIL acknowledges the conceptual and practical challenges of the current simultaneity function as described in the Consentec study. While we recognize that the simultaneity function was initially introduced to better align tariff design with actual grid usage, its implementation has led to volatility, a lack of transparency, and unjustified discontinuities, particularly around the 3,000-hour usage threshold. These effects have become increasingly difficult to justify in light of the evolving energy landscape.

That said, FEDIL advocates **not to dismiss too quickly the concepts of the post stamp and the simultaneity function** in the formation of tariffs. We recommend exploring whether these elements could be simplified and improved in terms of transparency and cost reflectiveness. Specifically, we propose replacing the current non-linear and segmented simultaneity function with a **fully linearised model**. Rather than maintaining the current step change at 3,000 usage hours, FEDIL supports introducing a **continuous linear relationship between annual usage hours and the allocation of costs between the capacity and energy components**. This would eliminate the artificial divide between consumers with fewer than 3,000 hours and those with more, providing a more predictable and transparent framework for cost allocation.

Such a linear function would not aim to represent actual simultaneity in grid usage. Still, it would serve as a **pragmatic and transparent cost allocation mechanism**, inspired by the logic of simultaneity. It would be based on the underlying assumption that higher annual usage hours correspond to a greater overall burden on the grid.

To calibrate this linear model for each voltage level, **only two anchor points need to be defined**: the share of costs attributed to capacity at zero usage hours (i.e., the y-intercept or g(T=0)), and the share at 8,760 hours, which is conventionally set to 1. This enables the determination of the curve's slope and intercept in a straightforward and reproducible manner. The y-intercept should be set in a way that ensures **consumers with low annual volumes — such as prosumers or partial self-consumers — contribute more equitably to cost recovery** than they do under the current regime[2]. To avoid an abrupt impact at introduction, the value of g(T=0) could be gradually adjusted over a predefined period, allowing all consumer groups to adapt progressively to the new model.

The **impact of raising the y-intercept** (g(T=0)) must be carefully assessed, particularly in combination with any reform of (1) the cost allocation per voltage level — e.g. cascading — and (2) the postage stamp model based on subscribed or reference capacities rather than measured peak loads (see our response to Question 2). FEDIL lacks access to sufficient data or accurate models to fully evaluate these interactions. We therefore call on the authorities to conduct a comprehensive analysis of the effects of increasing the y-intercept, taking into account its potential to shift cost burdens between consumer categories. For FEDIL, the final validation of this approach must be whether it avoids creating undue disruptions and ensures a fair and stable framework for energy consumers. Crucially, it must also guarantee that all grid users — including those with low usage hours — contribute equitably to overall grid cost recovery.

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[2] Under the current tariff model, users with very low usage hours — such as self-consumers (autoconsommateurs) — benefit from a disproportionately low contribution to capacity-based grid costs, as the value of g(0) is set at a very low level, e.g. at 0,1 which is 10% of the post stamp. At the same time, they continue to enjoy full, i.e., 100%, access to the grid whenever needed. In other words, the cost of maintaining grid availability as a back-up for these users is effectively borne by other consumers.

Regarding the **specific balance between capacity and energy charges** — such as the 40/60 split proposed in the Consentec study — FEDIL **cannot endorse a single value** that would be optimal for all its members on all voltage levels. The diversity of consumption profiles across sectors and voltage levels suggests that a flexible model would be more appropriate, one that allows the split to vary according to the slope of the linear curve and the characteristics of each voltage level.

We do agree, however, that a fixed-ratio model could enhance transparency and make it easier for consumers to understand their cost structure. Depending on the calibration, it may also promote more flexible use of the grid. Yet such benefits will only be meaningful if the overall outcome is a reduction — or at least a stabilisation — of electricity costs for industrial users.

Any tariff methodology, regardless of its internal logic, must ultimately be assessed against its ability to support industrial electrification, decarbonization, and preserve the long-term competitiveness of businesses. **Cost structure matters, but cost level remains decisive.**

Finally, FEDIL believes that transparency would be significantly improved if consumers had access to a **simulation tool** allowing them to test different consumption and flexibility profiles under the proposed tariff structure. Such a tool would enable them to assess their cost exposure and better adapt their operations, thereby making the tariff reform not only fairer but also more actionable.

2.5 Question 5

What approach should be considered for self-consumption from renewable and non-renewable production in the future tariff structure, ensuring that all users contribute fairly to network costs?
How should the tariff structure address electricity injection into the grid from renewable and nonrenewable production without creating distortions in investment decisions or in the dispatch of generation units (Consentec report chapter 4)?

FEDIL believes that all consumers, including those who engage in self-consumption — whether from renewable or non-renewable sources — should **contribute fairly** to the costs of maintaining and operating the electricity grid. In Luxembourg, virtually all self-consumers remain physically connected to the network and rely on it for backup supply, exporting excess generation, or maintaining operational stability. As such, even if their net annual consumption from the grid is low, their presence imposes infrastructure requirements that must be reflected in the tariff structure.

We have consistently advocated, particularly in our response to Question 2, for a cost cascade model based on non-abundant subscribed or reference capacities. In this model, each user — including self-consumers — declares the level of capacity they require from the grid, even if it is only used occasionally or in exceptional circumstances. This ensures that all users pay a fair share based on the grid services they expect to receive, not merely on the volume of energy they consume.

Additionally, as outlined in our response to Question 4, we support the use of a linearised function to split capacity and energy components in the tariff. The **key design parameter** in this approach is the y-intercept of the curve, which should be set in such a way that even users with very low usage hours, such as self-consumers, make a meaningful contribution to overall cost recovery at their voltage level. This is essential to maintain both fairness and financial stability within the system.

From a fairness standpoint, exempting self-consumption from grid charges would place an increased burden on fully grid-dependent users, many of whom cannot reduce their reliance on the network for structural or economic reasons. Such an outcome would distort the cost allocation and **undermine confidence** in the tariff system's equity. It could also create undesirable incentives for partial disconnection that ultimately do not reduce system costs, but only redistribute them in an opaque and socially regressive way.

In short, self-consumption must be welcomed as a tool for efficiency and decarbonisation, but it must **not become a means to bypass** the shared responsibility of maintaining a robust and resilient electricity grid.

As for injection tariffs, FEDIL does **not support the introduction of an injection tariff** — whether for renewable or non-renewable generation — into the Luxembourgish grid. As the Consentec report rightly highlights, Luxembourg operates within an integrated electricity market, particularly with neighbouring Germany, where producers currently do not face injection-based grid fees. Introducing such a charge locally would immediately place Luxembourg-based generators at a competitive disadvantage, discouraging investment and distorting cross-border competition.

Moreover, an injection fee — especially one based on energy injected (€/MWh) — would risk distorting dispatch decisions. Even in the case of renewable generation, which typically has near-zero marginal costs, the addition of a grid injection tariff could shift dispatch away from the most efficient or cleanest option toward more expensive or less sustainable alternatives. This could undermine the price formation process on wholesale markets and ultimately **transfer the cost burden back to end consumers** in the form of higher electricity prices, particularly problematic for industrial users.

While FEDIL acknowledges that some form of **fixed, connection-based** contribution could be considered to reflect the infrastructure costs associated with generation connections, this should only be envisaged if and when similar rules are applied in neighbouring countries, particularly Germany. Without regulatory alignment at the cross-border level, any unilateral introduction of injection-related tariffs would risk damaging Luxembourg's attractiveness for generation projects, particularly those operating on narrow profit margins such as storage-backed renewables or small-scale CHP units.

In this light, any departure from cross-border alignment — such as the unilateral introduction of generation-side injection tariffs, whether based on injected volumes or fixed connection fees — would only be justifiable if Luxembourg can offer a more attractive overall framework than neighbouring countries, particularly Germany. This could take the form of a compelling **overall package** with compensating measures, combining significantly faster and **less costly permitting procedures**, targeted **tax or depreciation-based incentives**, or other structural advantages that strengthen investment certainty. Additionally, **public subsidies could be used to neutralise a substantial share of grid-related costs for generators**, redistributing those costs more broadly across taxpayers rather than concentrating them solely on electricity consumers. Such a model would help maintain Luxembourg's competitiveness as a host country for new generation assets, even in the presence of moderate injection-side tariffs.

In the long term, however, we believe that the **current German model is unsustainable, as renewable energy producers — particularly those with variable and disruptive profiles —** incur significant grid-related costs and cannot remain exempt from contributing on the **grounds of fairness**. These producers often require substantial and flexible grid capacities and are a key driver of redispatch measures and reserve energy procurement by transmission system operators. As the share of variable renewables continues to grow, maintaining a system where such actors contribute little or nothing to the cost of grid operation becomes increasingly difficult to justify, especially when those costs are borne entirely by electricity consumers.

Germany's approach will likely have to evolve in the direction of other European countries that are already introducing more balanced cost-sharing arrangements. **If such changes occur in the German context, then Luxembourg should also engage in a similar debate.** In that case, FEDIL would support a measured and investment-compatible model that includes:

- **Project-specific participation in connection costs**,
- **A low but adaptable annual capacity charge**, and
- **A volume-based charge for deviations between forecasted and delivered electricity** ("Bilanzkreisabweichung") for generators above a defined capacity threshold.

This approach would promote system responsibility among producers, ensure a more equitable allocation of grid costs, and prevent shifting an ever-larger financial burden onto end-users, while preserving conditions for continued investment in clean and flexible generation.

In conclusion, FEDIL recognises the need to secure adequate grid financing without undermining investment in clean and flexible generation. As long as Germany exempts producers from injection-based tariffs, Luxembourg should refrain from taking unilateral measures without compensation that risk harming its competitiveness. However, if the German model evolves, Luxembourg should be ready to follow with a fair and investment-compatible approach, including project-based connection costs, a moderate capacity charge, and targeted incentives for system responsibility among larger producers.

2.6 Question 6

Should specific tariffs be introduced for storage facilities to better reflect their ability to withdraw and inject electricity flexibly? What design principles would you propose?

FEDIL supports the introduction of a dedicated and appropriately structured tariff treatment for storage facilities. As storage becomes a key enabler of both decarbonisation and industrial cost optimisation, it is essential that the future tariff structure reflects the distinct nature of these assets and **removes the structural disincentives** that currently hinder their deployment.

One of the most critical issues is **the double charging** of grid fees — once for electricity withdrawal from the grid and again for injection back into the grid, borne by the consumer. This treatment renders the economics of storage investments, particularly those involving batteries, extremely fragile. From an industrial perspective, storage is not merely a market tool for arbitrage, but a vital instrument for **managing exposure** to volatile electricity prices, reducing peak consumption, and strategically shifting load to lower-cost hours. Charging grid fees on both ends of the storage cycle contradicts the very purpose of using storage to flatten demand and align industrial consumption with system conditions.

From a design principles perspective, **FEDIL does not support a rigid distinction** between "commercial" and "system-serving" storage, as both roles can be performed by the same asset depending on operational context. However, it is clear that storage used to reduce grid congestion, absorb renewable surpluses, or relieve system stress should benefit from **complete or partial exemption from grid fees**. The same applies to behind-the-meter storage deployed by industrial users to optimise electricity procurement and contribute indirectly to grid stability. In both cases, the tariff system must acknowledge the net system benefit created by flexible storage operation.

Furthermore, to provide investors with the long-term certainty they need, such exemptions must also be guaranteed over a fixed horizon, as is the case in Germany, where exemptions can be applied for up to 20 years. Without this investment visibility, few projects will materialise — especially those with narrow margins or operating in sectors with high capital costs.

The tariff treatment of storage must shift from penalising flexibility to **enabling it**. If correctly designed, it will enable the industry to take a more active role in optimizing grid usage and electricity procurement, and contribute meaningfully to a more resilient, affordable, and decarbonized electricity system.

2.7 Question 7

Which key elements should be included in a new network tariff structure to effectively incentivize demand-side flexibility (time-shifted consumption or injection) in a way that is cost-reflective and grid-friendly?

FEDIL believes that the future network tariff structure must play an active role in **enabling and rewarding demand-side flexibility**, not merely as a secondary effect, but as a core feature of system design. Flexibility, both in consumption and injection, is becoming increasingly essential for integrating renewable energy, managing system peaks, and reducing overall infrastructure costs. To achieve this in a way that is cost-reflective and supportive of industrial activity, several key design elements must be considered.

First, tariff structures must **differentiate clearly between capacity needs and energy consumption**, allowing consumers to manage each component independently. The shift from measured peak load to **contractually defined reference or subscribed capacities**, as advocated in our previous responses, creates a framework in which each user can determine their level of reliance on the grid, while also preserving the integrity of cost recovery through the cascade model. Consumers must be free to choose their capacity reservation based on operational and economic risk assessments, knowing that occasional short-term deviations will not be penalised disproportionately. This requires a **surcharge model** that is proportionate, predictable, and calibrated, **that avoids discouraging legitimate flexibility**.

In this context, FEDIL also supports the possibility of **entirely exempting surcharges under certain system conditions**, for example, during **hours of negative electricity prices** or in **areas experiencing local grid congestion**. These dynamic signals would offer industrial users the opportunity to operate flexible processes — such as thermal or battery storage — in a way that benefits both the system and their own cost structures. By targeting flexibility where and when it is most valuable, this approach enhances efficiency without undermining the tariff's core cost-recovery function.

Second, we support a **linearised function for distributing capacity and energy-based components** in the tariff, replacing the current discontinuous simultaneity function. This approach eliminates arbitrary thresholds (such as the 3,000 usage hour rule), enhances transparency, and enables users to more accurately model and anticipate the financial implications of their load management decisions. It also enables a more refined calibration of the cost split, adjusted by voltage level, to reflect different user profiles and grid realities.

Third, **time-dependent tariff signals** should be introduced. Tariffs that remain flat throughout the day and year fail to encourage consumption at times when renewable generation is abundant or the grid is underutilised. Introducing time windows with differentiated price signals — for example, lower energy-related charges during midday hours with high PV output — would incentivise flexible loads such as thermal and battery storage, electric vehicle charging, or production rescheduling, without distorting energy prices or undermining wholesale market signals. However, to avoid creating a tariff system that is overly complex or stressful for users, FEDIL recommends limiting such time-dependent signals to high-voltage (220 kV and 65 kV) consumers. In the medium-voltage segment, where the consumer base is broader and more heterogeneous, such a model would likely be challenging to understand, implement, and adopt effectively. These time signals must, in any case, remain complementary to, not stronger than, the spot market price signal, to avoid investment distortions.

Fourth, **battery storage must be recognised as a flexibility tool and treated accordingly in the tariff framework**. As outlined in our response to Question 6, industrial storage operated behind the meter to optimise electricity procurement should be **fully exempted** from grid charges on the stored electricity. Likewise, assets that respond to grid needs or help integrate excess renewable energy should not be penalised by tariffs designed for passive consumption. If well integrated, storage enables time-shifting of load and injection, improves self-balancing at the site level, and reduces structural stress on the grid.

Finally, transparency and user empowerment are crucial. The future tariff system should be supported by **simulation tools that enable industrial consumers to model various scenarios — such as changing reference capacities, consumption profiles, or flexibility behaviors — and assess their impact** on total grid charges. This will support better decision-making and increase participation in system optimisation.

To effectively incentivise demand-side flexibility in a grid-friendly and cost-reflective way, the tariff model must align (1.) economic incentives with the (2.) actual drivers of grid costs — such as peak demand, system congestion, and infrastructure use — while (3.) supporting user optimisation and (4.) providing the stability and transparency needed for long-term planning and investments. **Flexibility will not emerge spontaneously** — it must be enabled by the very structure of the tariffs that govern the system.

2.8 Question 8

What practical considerations should be considered for implementing time-of-use network charges?

FEDIL supports the careful introduction of time-of-use (ToU) network charges as part of a broader strategy to incentivise demand-side flexibility and improve system efficiency. However, the design and implementation of ToU tariffs must be guided by practical realities and industrial needs, ensuring that the system remains transparent, predictable, and cost-reflective.

To begin with, FEDIL recommends that ToU charges be applied only to the energy-based component of the tariff, without affecting the capacity-based charges. Varying — i.e., lowering — the energy charge over defined time windows can effectively encourage consumers to shift flexible processes to periods of lower grid stress or higher renewable availability. However, **higher consumption during such incentivised time windows must not impact the reference or subscribed capacity**, nor should it trigger penalties for exceeding the contracted capacity or influence the setting of capacity levels for the following tariff period. This is especially important for industrial consumers who already plan around predictable operational cycles and require stable long-term cost frameworks. Penalising the timing of peak capacity use — which is often driven by industrial constraints — could undermine the business case for electrification and process optimisation.

Regarding the timing structure of ToU tariffs, FEDIL supports the use of **static time blocks**, such as predefined peak, shoulder, and off-peak periods published annually, which depend on both the time of day (peak/off-peak), the status of the day (Sunday, holiday), and the season (winter/summer). Static windows are easier to understand and integrate into industrial scheduling, investment planning, and energy management systems. **Full dynamic ToU** signals — which vary hourly based on real-time or day-ahead conditions — may offer greater precision but pose significant implementation challenges for most industrial users, increasing the risk of erratic cost exposure. **Limited dynamic mechanisms**, such as time-limited surcharge exemptions during hours of negative prices or system stress, are thus preferable. They could complement a primarily static structure.

FEDIL also considers it essential that ToU tariffs be **differentiated by voltage level and consumer type**. The physical and operational realities differ considerably between low-voltage (LV) and medium/high-voltage (MV/HT) users. LV consumers, such as households and small businesses, often display coinciding peak demand patterns and can significantly benefit from time-based signals. In contrast, MV and HT industrial consumers typically exhibit stable and predictable load profiles, and many already contribute to grid stability through subscribed capacity and grid-friendly consumption behaviours. Applying the same ToU logic across all levels would either over-penalise large users or fail to influence household behaviour meaningfully. While a **straightforward and easy-to-understand model is essential at the LV level**, ToU signals at MV and HT levels can be **more elaborate and tailored**, provided they remain compatible with the long-term planning and process-driven nature of industrial activity.

2.9 Question 9

How can industrial customers be incentivised to increase their consumption during peak generation hours, mainly during high PV generation at noon (weekday and weekend)? Do you think there is a potential, and if so, for which type of assets?

It is **not immediately apparent** that industrial consumers can easily adjust their electricity consumption to match peak generation hours, particularly around midday during periods of high PV output. Many industrial processes are long, continuous, and technically constrained, limiting immediate flexibility. However, the **key principles** that enable and incentivize demand-side flexibility — including tariff design, surcharge exemptions, and reference capacity models — have already been detailed in our responses to Questions 7 and 8.

There is **potential**, particularly through the use of thermal storage units and batteries, which allow companies to increase consumption when renewable generation is high and use that energy later. These solutions require upfront investment, and their viability depends on whether savings or remuneration are sufficient to justify the costs. This makes it essential to have adapted **tariff models** and simple, attractive **flexibility contracts** that reward behaviour aligned with system needs.

2.10 Question 10

> *Do you foresee technical or operational challenges for consumers and producers in adapting to a new tariff model based on reference capacities?*

One key challenge is that not all industrial consumers, particularly SMEs, have the necessary r**eal-time monitoring and energy management systems** to measure and control their electricity usage at the level of granularity needed. To fully leverage the reference capacity model — particularly to avoid unnecessary surcharges for exceeding the subscribed limit — companies must be able to track the consumption of individual equipment or production lines in real-time and adjust their usage accordingly. This may require new investment in smart metering, automated load control, and energy optimisation tools, especially for smaller or older facilities.

To support this transition, a **comprehensive and user-friendly simulation tool** will be essential. Such a tool should enable companies to model various consumption scenarios and test the implications of different reference capacity choices, based on historical data and expected flexibility. Without this kind of support, many industrial users may either over-subscribe and pay more than necessary, or under-subscribe and risk frequent surcharges.

To further ease the transition, the authorities should provide financial incentives to support business investments in sub-metering, energy management systems, storage, and related equipment, following a model similar to Luxembourg's e-mobility incentive schemes. Such an initiative would lower the entry barriers for many smaller industrial players and help accelerate their integration into a new era of rational, data-driven energy management.

2.11 Question 11

> *What kind of transition measures (e.g. gradual implementation, timing, communication, customer guidance or support (e.g. simulation tools)) would you consider necessary to ensure a smooth and equitable implementation of the new tariff structure?*

FEDIL considers that the successful implementation of a new tariff structure based on non-abundant subscribed or reference capacities will depend not only on its technical design, but also on the quality of its transition process. A well-managed rollout is crucial to ensure that all consumers, particularly industrial users, have the necessary time and tools to adapt without disruption.

The new model should not be applied in full, from day one. Instead, it should be introduced gradually, with a clearly structured transition phase **over two to three years.** During this period, core elements **such as surcharges for exceeding reference capacity or increased capacity charges at low usage hours** should be phased in progressively. This approach would enable companies to adjust their operational practices and refine their capacity planning strategies without incurring immediate financial penalties.

A key requirement for a smooth transition is the availability of a **comprehensive simulation tool**, made available to all consumers as part of the regulatory rollout. This tool should allow companies to model different consumption and flexibility scenarios and assess the financial implications of various reference capacity choices. In parallel, **targeted support** — including workshops, one-to-one guidance, and explanatory materials — should be provided to help consumers interpret the model and make informed decisions.

FEDIL also stresses the need for transparent and early communication, and encourages the authorities to launch a second consultation once cost allocation principles and tariff models have been more clearly defined. A detailed roadmap of the transition phases should be shared with users well in advance, clearly explaining how the tariff structure will evolve and what impacts can be expected at each stage. Industrial companies should be given **at least 12 months' notice** before any new obligations take effect, to ensure complete cost visibility and allow sufficient time for internal planning, technical adaptation, or necessary investment.

In short, the transition must be designed to ensure **predictability, fairness, and adequate support**, so that all users — regardless of their current capabilities — can adapt to the new system under stable and transparent conditions.

3 Closing Note

FEDIL remains committed to actively contributing to the design of a future-proof grid tariff structure that supports Luxembourg's industrial competitiveness and decarbonisation goals. Given the complexity and long-term implications of the proposed reforms, we believe that continuous dialogue between the authorities, the grid operator, and industrial stakeholders is essential.

We therefore express our complete openness to engage in structured discussions to co-develop tariff models that are fair, transparent, and compatible with the operational realities of industry. Such a collaborative approach will be essential in ensuring that the reform achieves its intended objectives: safeguarding cost recovery for the grid operator, while facilitating industrial electrification, attracting new investment, and supporting the broader energy transition.

FEDIL stands ready to assist in this process and remains available to contribute further with technical, economic, or operational input.

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