



Tariff Structure for Low Voltage Electricity Network

Explanation Guide

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Introduction

The current tariff structure, defined by the Luxembourg Regulatory Institute (ILR) together with all network operators, has been in effect since January 1, 2025.

The objective was to align the tariff framework with the evolving use of the electricity network in the context of the energy transition. The gradual phase-out of fossil fuels will drive increased electrification, particularly in mobility and heating, as well as a decentralization of electricity generation, all of which create new challenges for the grid. The resulting tariff structure is equitable and is expected, over time, to encourage consumers to adopt greater flexibility in their network usage. This will help optimize system utilization and limit required investments, ultimately benefiting all stakeholders.

What does the price of electricity consist of?

Firstly, it is important to distinguish between the **price of electricity** and the **electricity network use tariff** which, together with **taxes**, make up the final price paid by the consumer. The price of electricity itself is the main variable in the final price paid by consumers.

What is the central element of the network use tariff?

The network use tariff places emphasis on the concept of power. Please note that power is expressed in watts (W) or, more commonly, in kilowatts (kW, 1 kW = 1,000 W). It is an instantaneous value representing the intensity of the action, comparable to the speed of a vehicle or the flow of a river.

Each network user is assigned a **reference power among 10 categories** (3 kW, 7 kW, 12 kW, 17 kW, 27 kW, 43 kW, 70 kW, 100 kW, 150 kW and 200 kW), calibrated based on the most common usages and profiles. The network operator assigns the **reference power level based on the customer's consumption history** with the aim of identifying the financially optimal category for each customer and thus optimizing his/her network costs.

Why is the network use tariff placing more importance on power

In the first instance, **network power flows are increasing due to electrification, as is simultaneous use** (oven, washing machine, electric vehicle charging, heat pump, etc.). This increases the risk of peak loads or even network congestion.

In the second instance, **a system purely based on energy, e.g. kWh is unfair** to users with a flat consumption profile, because it does not reflect actual network use costs, as these are a function of peak load. That's why the tariff structure is **a fair response to these challenges**.

How do I know my category, my reference power level?

Each consumer's reference power level is displayed on their bill. In addition, the reference power levels can be consulted on the Luxembourg energy platform **LENEDA** as well as on **my.creos.net**.

The reference power levels are reviewed monthly by an automated mechanism. In exceptional cases, a customer's request to change categories may be justified, particularly when significant changes in consumption behavior occur, such as following the installation of an electric vehicle charging point or a heat pump.

Which best practices should be adopted?

All network users, regardless of their reference power level, can contribute to a more efficient network usage, help optimize the use of existing infrastructure, and support tariff stability. Here are two simple tips: be flexible in your consumption by spreading it over time and limit simultaneous use of multiple appliances

For the remainder of the document, it is important to distinguish between electrical power and electrical energy:

Power is expressed in Watts (W) or, more commonly, in kilowatts (kW, $1 \text{ kW} = 1,000 \text{ W}$). It is an instantaneous value representing the intensity of action, comparable to the speed of a vehicle or the flow rate of a river.

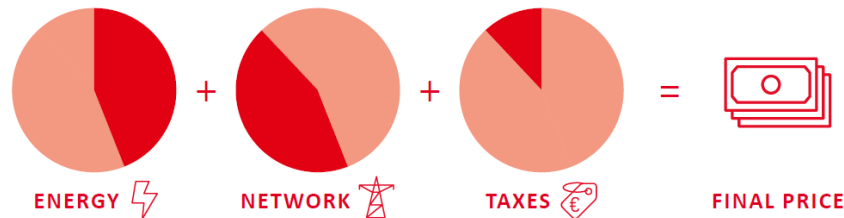
Energy is expressed in Watt-hours (Wh) or kilowatt-hours (kWh, $1 \text{ kWh} = 1,000 \text{ Wh}$). It results from applying power over a certain period (power x duration). It accumulates over time, like the distance travelled by car (speed x time) or the amount of water flowing (flow rate x time). The longer the duration, the greater the quantity. Therefore, both the duration and the intensity of action determine the amount of energy.

Example: A LED bulb has a power rating of 5 W (compared to a 50 W halogen bulb that produces the same light intensity). If this LED bulb operates for 10 hours, it will consume 50 Wh of electrical energy (the halogen bulb will consume 500 Wh).

In this guide, "drawn energy" refers to the energy consumed and taken from the network, as opposed to "self-consumed energy," which refers to the consumption of energy produced on-site.

Components of the Network Usage Tariff

In the electricity market, it is important to distinguish between the price of electrical energy (paid for the supply of energy) and the network usage tariff (paid for the use of the energy distribution infrastructure), which, together with taxes, make up the final electricity price paid by the consumer.



This guide focuses solely on the aspect of the network usage tariff. Electricity metering tariffs are also not included in this document.

The low-voltage network usage tariff, applicable to low-voltage clients with a smart and communicating meter, consists of the following elements:

- A fixed component:
 - **Fixed charge (in €/month)**: It varies depending on the reference power category assigned to the customer and is defined by the network operator based on the customer's behavior over the past 12 months, thus depending on their consumption behavior.
- A variable component:
 - **Volumetric charge (in €/kWh)**: Applied to the total volume of electricity drawn from the network.
 - **Exceedance charge (in €/kWh)**: An additional charge for electricity drawn above the reference power¹.

The rates for the fixed and variable components for the tariff year 2026 are the following:

Reference power	3 kW	7 kW	12 kW	17 kW	27 kW	43 kW	70 kW	100 kW	150 kW	200 kW
Fixed Charge (€/month)	7.42	12.84	19.61	26.39	39.94	61.62	98.20	138.85	206.60	274.35
Volumetric Charge (€/kWh)*	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510
Exceedance charge (€/kWh)**	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765

The reference power categories 150 kW and 200 kW are only applicable to existing clients.

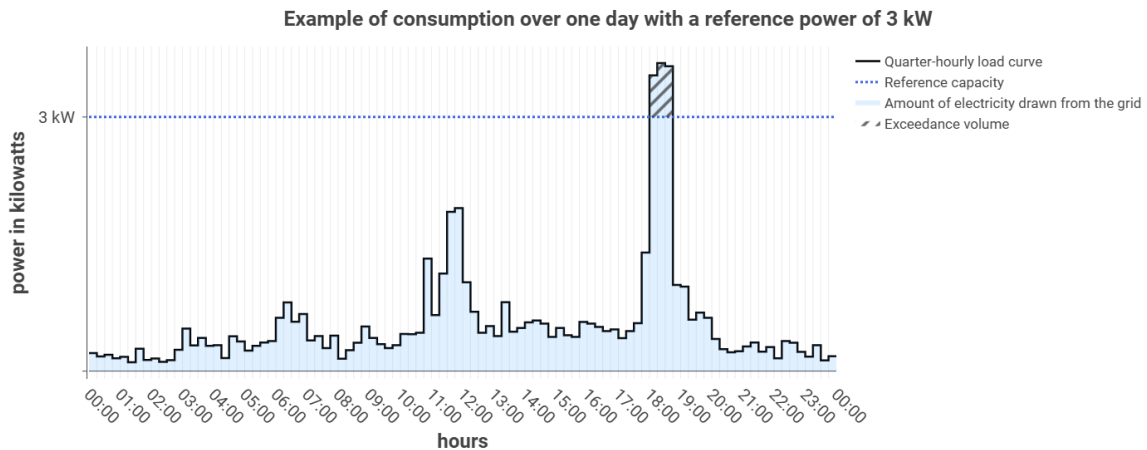
* applied to the total volume

** additionally applied to the volume that exceeds the reference power

Clients with an analog meter or with a smart, but non-communicating meter will continue to be billed according to the classic network usage tariff structure.

¹ The smart meter records the average power consumption every fifteen minutes. Therefore, if the user exceeds their reference power for a few minutes, but the average power over the 15-minute interval remains below this reference power, no surcharge for exceeding the limit will be applied.

The diagram below shows the components used to calculate network usage costs under the new low-voltage tariff structure, applied to one day's consumption.



What is the reference power?

The reference power, expressed in kilowatts (kW), is a threshold, above which a surcharge applies. This surcharge is applied to the amount of energy in kilowatt-hours (kWh) exceeding this limit. Energy-related costs are made up of the following:

- **All kilowatt-hours drawn** are billed at the volumetric rate.
- **All kilowatt-hours drawn above the reference power**, i.e., above the blue line, are billed additionally at the surcharge rate for exceeding.

The client is therefore encouraged to limit exceedances above their reference power, in other words, to limit the simultaneous use of electrical devices.

However, it is perfectly normal to temporarily exceed the reference power. It is not to be understood as the maximum allowed power.

The available reference power levels are: 3 kW, 7 kW, 12 kW, 17 kW, 27 kW, 43 kW, 70 kW, 100 kW, 150 kW and 200 kW. A higher level entails a higher fixed charge but allows for reduced excess volume.

In the example from the previous graph, the client has their financial optimum with a reference power of 3 kW. The fixed charge to be paid is €89.04/year compared to €154.08/year in the 7 kW category. The amount billed under the volumetric charge is the same regardless of the power category; however, the amount billed for the surcharge applied in the event of an exceedance varies depending on the power category.

Calculation of reference power and automatic adjustment

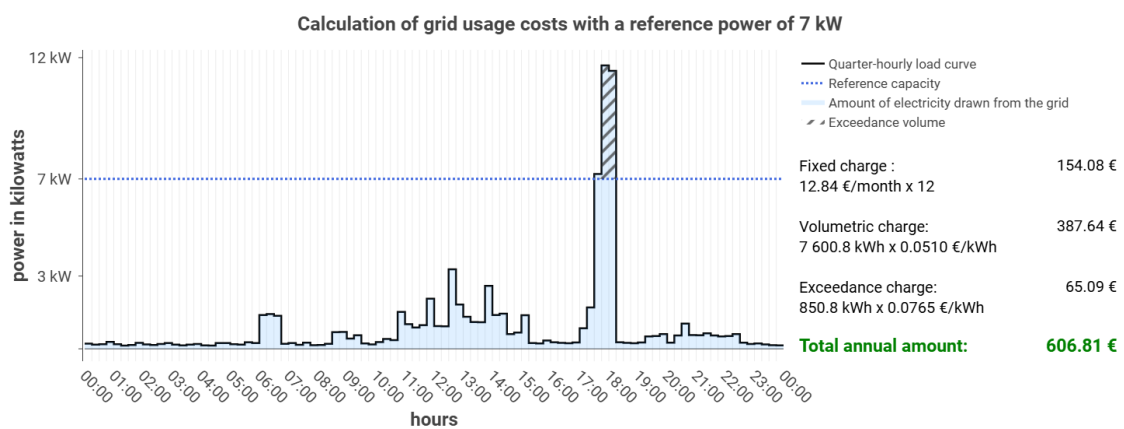
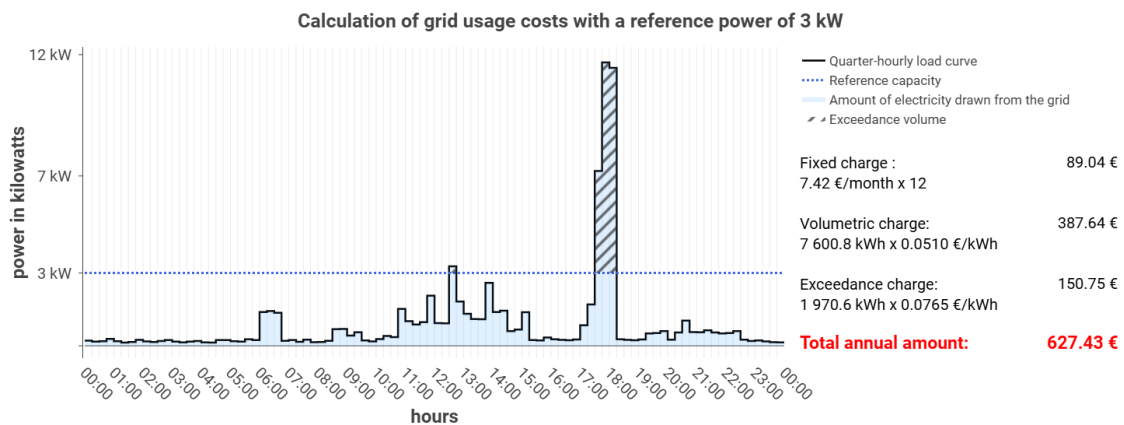
The reference power is calculated monthly based on the customer's consumption data over the previous 12 months, to best reflect their withdrawal behavior. This involves a calculation using the client's quarter-hourly load curves over a maximum period of 12 months. In this process the network usage costs are calculated for each reference power level to determine the most financially advantageous reference power category for the client.

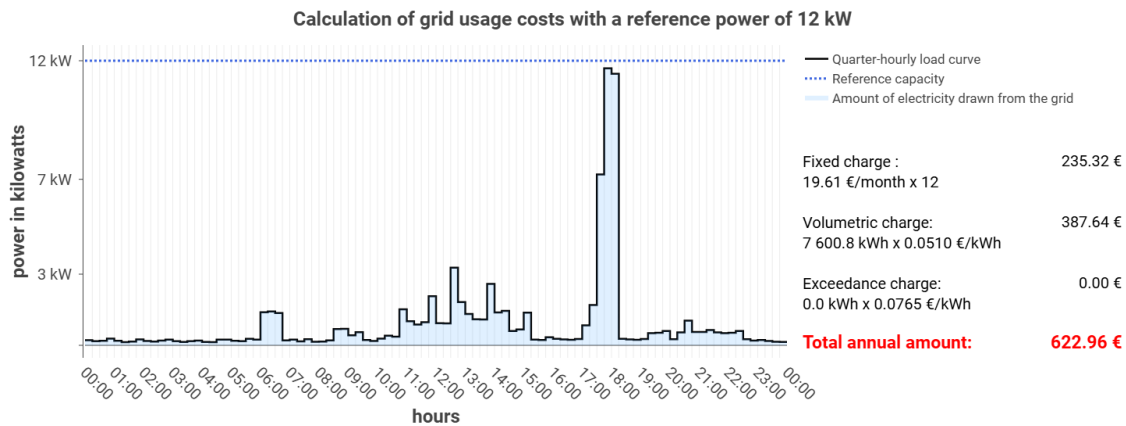
If historical data is not available for at least three full days, for example because it is a new client, a standard reference power is assigned and will be used until the next calculation (see Table 1: Standard reference power level in the absence of load curve on page 8).

The reference power considers the volume of electricity withdrawn and the client's consumption behavior. It therefore depends both on the amount of electricity withdrawn as well as the usage pattern (simultaneously operating several appliances potentially creating consumption peaks).

The network operator determines the reference power for any one client according to the following principles: For clients with consumption data for a period between three days and twelve months, the reference power level applied is the one that minimizes the customer's costs. The network operator continuously recalculates the reference power level through a monthly recalculation based on the most recent 12 months of consumption data, in order to reflect any changes in the client's consumption and behavior. The 12-month calculation period allows seasonal variations to be considered, such as heat pumps or air conditioning units.

The following diagrams illustrate the process for determining a client's reference power. To simplify the graphical representation and the explanation, only one day of a client's consumption is represented, assuming that the client maintains the same behavior throughout the year. The total annual consumption is calculated by multiplying the daily consumption by 365. In practice, the actual calculation uses real consumption from the past 12 months and thus includes fluctuations in real consumption behavior.





The different reference power categories are then applied to this total consumption to calculate the annual network usage costs. The client in this example has an optimized cost in the 7 kW reference power category. Indeed, the total cost in this category amounts to €606.81. This is the lowest amount compared to those load calculated for the other reference powers (3 kW and 12 kW). It is unnecessary to calculate the total amount for higher levels, as these levels would result in a total cost higher than that of the 7 kW category.

- For clients without at least three days of consumption data², a standard reference power is determined based on the connection capacity³. The table below shows the statistically most likely reference power for the different categories:

Connection Capacity	Standard Reference Power
40 A	3 kW
50 A	7 kW
63 A	7 kW
80 A	12 kW
100 A	12 kW
120 A	27 kW
> 120 A	43 kW

Table 1: Standard reference power level in the absence of a load curve

It should be noted that this standard reference power is only used for billing during the period for which actual data is not available.

- As part of the automatic adjustment process, the reference power level for the following month is calculated no later than the 25th of the current month, based on load curve data available up to the 20th of that same month.

If the result corresponds to the same reference power level as applied in the current month, no change is made. However, if the result differs from the reference power level applied in the current month, the new reference power level becomes effective on the 1st day of the following month. The customer will be notified of the new reference power

² A customer has no consumption data available when moving into a new home. It is worth noting that the consumption history is retained in the event of a change of electricity supplier. However, it is not possible to transfer another customer's consumption history when a new contract is created, even if that person lives in the same household.

³ The vast majority of households are connected with a 40 A supply.

level via their Leneda account (a push notification is sent in case of change). They can also view the new reference power level in the myCreos portal.

A customer who wishes to select a reference power level different from the automatically assigned one may submit a request. The conditions for such a request are described in the following section.

Manual adjustment of the reference power level

The network user can request an increase or decrease in the reference power on the myCreos website. Such a change request can only be submitted **once per calendar year** unless **justified** by a modification of the user's electrical installation that leads to a permanent change in consumption behaviour.

Such a modification may involve one or more of the following installations:

- Installation of a charging station
- Installation of a generation unit
- Installation of a battery storage system
- Installation of a heat pump
- Modification of the installed capacity

If a user adjusts their reference capacity manually, they are excluded from the automatic reassessment until a new network usage tariff is introduced – generally until the end of the current calendar year. When applying for a change to the reference capacity, the following points must be taken into consideration:

- The month in which the new reference capacity becomes effective can be scheduled up to three months in advance.
- Applications submitted after the 25th of a given month will only be considered as of the following month.
- The customer may request cancellation of the change request until the 25th of the first month in which the new reference capacity is to take effect.

A manual adjustment of the reference capacity is recommended if the customer does not want their historical consumption of the last 12 months (maximum) to be used. In the case of a new connection, the user may also request a change in the reference capacity if they do not wish the standard reference capacity to apply.

Creos provides access to a simulation tool on its customer portal to guide the user in making their choice (the myCreos site is also available for customers of the Ettelbruck and Diekirch networks)⁴.

This tool uses the customer's actual load curve (if available) and adds a synthetic ("artificial" but representative) curve of the added installation to simulate the impact of a behavioral change:

⁴ The simulation tool can be accessed via the following link: <https://my.creos.net/>

Clients of the Sudstrom network can also perform simulations on the myCreos website but only using synthetic load curves.

Scenario 1: The client has a load curve:

- The client has the option to view the details of the current calculation that determines their reference capacity. To do so, it is sufficient not to add any synthetic load profiles.
- The client can simulate their future situation by superimposing one or more of the following available synthetic load curves:
 - PV installation (up to 30kWp) in self-consumption mode (no full injection)
 - One or two electric vehicles, with or without a reduction in charging power
 - Heat pump in a well or less well insulated house/apartment.

Synthetic load profiles are tailored to typical characteristics of a household: a family (2 adults and 2 children), 2 adults working part-time, 2 adults working full-time, 2 adults working from home, or a retired person. It is therefore necessary to choose the category that best matches one's situation. If the reference capacity determined for the customer differs from their current reference capacity, the customer may choose to anticipate the automatic adjustment by submitting a request to modify their reference capacity via myCreos.

- The customer can select a start and end date for the load curve period to be considered. This feature makes it possible, for example, to calculate a reference power over a period during which new equipment is in use.

Scenario 2: The client does not have a load curve:

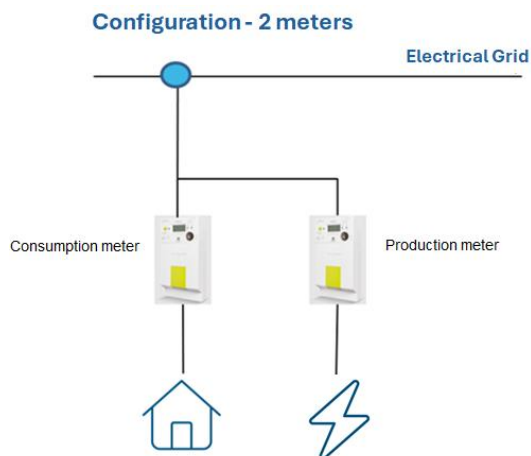
The customer can consult the reference capacity calculation for several typical household customers: a family (a household with 2 adults and 2 children), 2 adults working part-time, 2 adults working full-time, 2 adults working remotely, 1 retired person.

- The client can simulate a situation by superimposing one or more of the available synthetic load profiles on the load profile of a typical household customer. The available synthetic profiles are described in scenario 1. Customers without historic consumption data can use the result to choose their reference capacity.

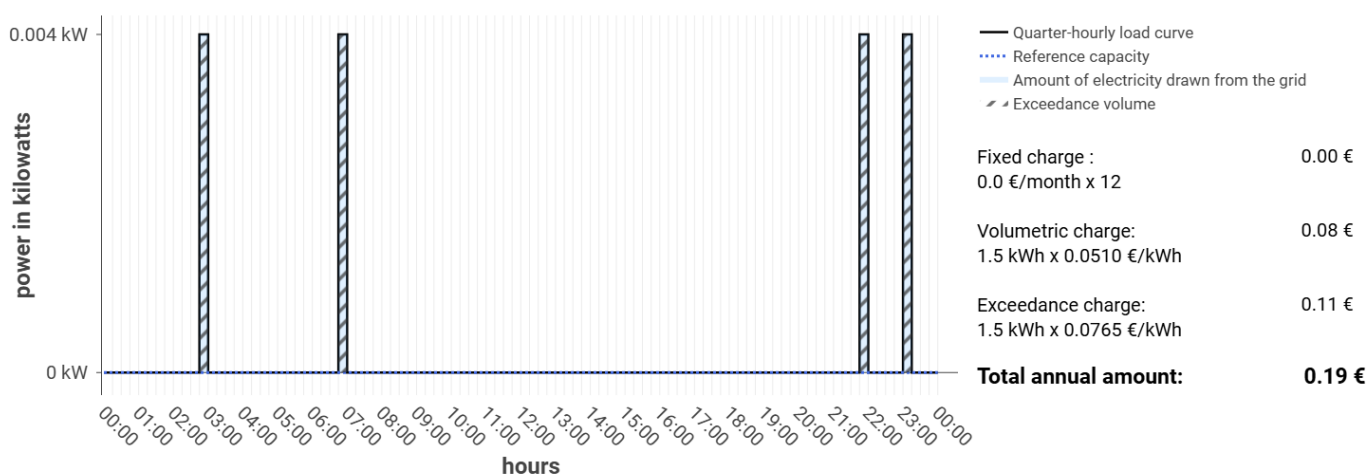
Exceptions

A **first exception** concerns clients with two meters connected in parallel to the same network connection point (see illustration below), where the 1st meter measures the electrical energy drawn from the network (consumption) and the 2nd meter measures both the injection and consumption of the production installation. The meter concerned by this exception is the 2nd meter related to the production installation, which is located on the right in the illustration below.

When the exception is applied, the 0 kW power level is included in the calculation of the reference power. If the production meter is optimised at the 0 kW power level, the fixed charge will be €0. The volume withdrawn by the production installation (for example, the inverter's consumption in the case of a photovoltaic system) will be billed according to the volumetric charge, to which the exceedance charge will be added. The example below illustrates this situation.



Calculation of grid usage costs with a reference power of 0 kW



However, if the production meter has an optimized network usage cost in a higher power category (3 kW, 7 kW, 12 kW, 17 kW, etc.), the exception no longer applies, and the client will pay the fixed fee corresponding to their reference power.

This exception does not apply to a configuration with a single smart meter, which can be used for photovoltaic installations intended for self-consumption. Since the publication of the Grand-Ducal regulation dated 30 June 2023, it has become possible, under certain conditions⁵, to connect a production installation without a separate meter. This single-meter solution offers an additional advantage under the tariff structure, particularly for customers who withdraw significant volumes of electricity via the second meter associated with the production installation. However, with only one meter, the customer will have a single⁶ load curve and therefore a single reference power, which is strictly greater than 0 kW. Network usage costs are thus optimized.

The **second exception** applies to clients equipped with a night storage heating system and a smart meter with a schedule or receiver. These clients are required to use their heating system between 10:00 PM and 6:00 AM, when the necessary power is available. For these clients, the night-time exceedance charge will be applied from 10:00 PM to 6:00 AM instead of the standard exceedance charge, as indicated in the following table.

⁵ The conditions and benefits of this configuration are detailed in an information note available on the Creos website, accessible via the following link: [Installation de systèmes photovoltaïques](#)

⁶ The new network consumption load curve is equivalent to the sum of the network consumption load curves in a configuration with two meters

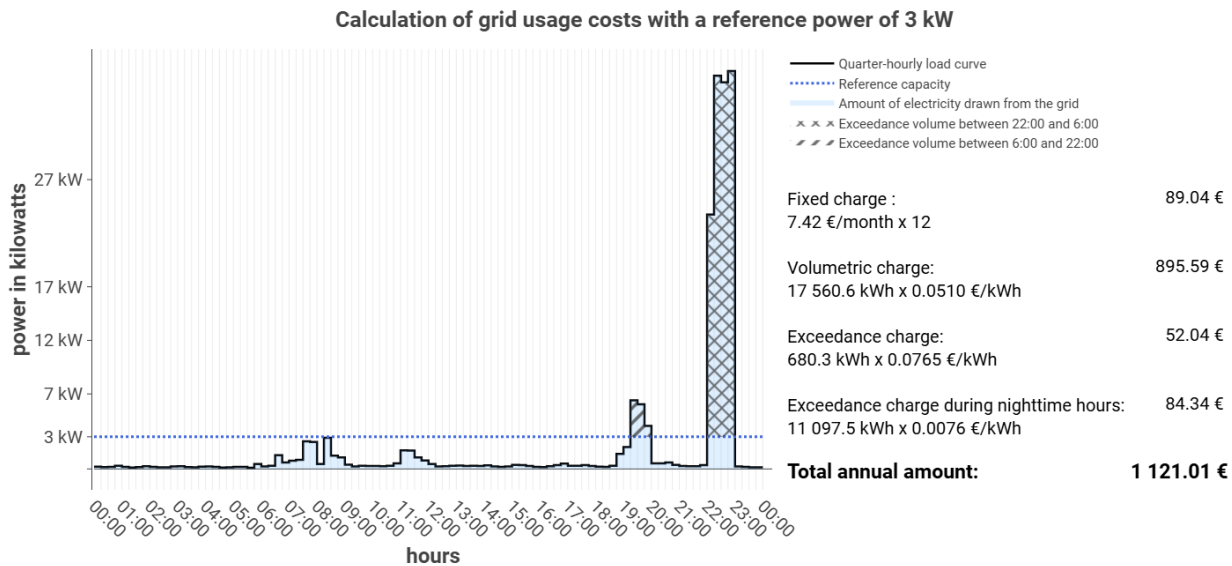
Reference power	3 kW	7 kW	12 kW	17 kW	27 kW	43 kW	70 kW	100 kW	150 kW	200 kW
Fixed Charge (€/month)	7.42	12.84	19.61	26.39	39.94	61.62	98.20	138.85	206.60	274.35
Volumetric Charge (€/kWh)*	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510
Exceedance charge between 6:00 et 22:00 (€/kWh)**	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765
Exceedance charge between 22:00 et 6:00 (€/kWh)**	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076

The reference power categories 150 kW and 200 kW are only applicable to existing clients.

* applied to the total volume

** additionally applied to the volume that exceeds the reference power

The reference power is therefore determined by including an additional component: exceedance during nighttime hours. The calculation principle explained in the section "Calculation of reference power and automatic adjustment" remains unchanged for these clients. The diagram below illustrates the components considered in the calculation for this exception. The consumption peak above 35 kW in the following figure corresponds to the use of a storage heating system.

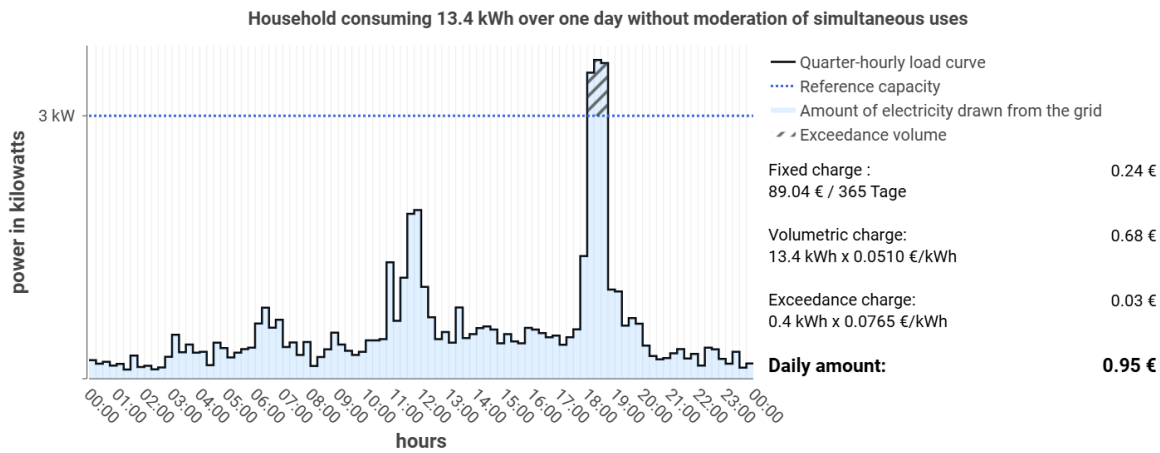


A **third exception** concerns meters that have not transmitted load curve values for a certain period. In such cases, the missing load curve is replaced with a reconstructed load curve. Any exceedances above the reference power calculated from the reconstructed curve are not considered for billing purposes, nor for the automatic calculation of the reference power. Once the missing actual data are received by the network operator, the reference power and the invoices are automatically corrected based on these actual values.

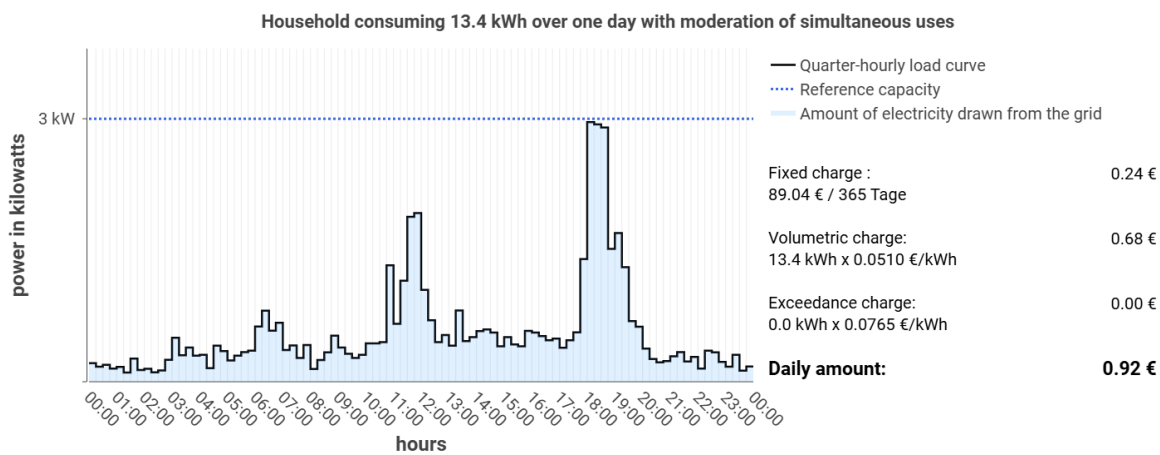
Influence of user behavior on the billed amount

Reducing consumption peaks (i.e. usage exceeding the reference power), while maintaining the same overall consumption volume, will always have a positive impact on the total bill. This can be achieved by limiting the simultaneous use of electrical devices, for example, by scheduling household appliances to operate at different times.

Smoothing energy usage can indeed reduce, or even eliminate, the volume consumed above the reference power, which would otherwise be subject to an exceedance charge. To illustrate this, consider the example of a household consuming 13.4 kWh in a day with a reference power of 3 kW. This household has no photovoltaic installation or electric vehicle and uses several household appliances simultaneously between 6:00 PM and 7:00 PM.

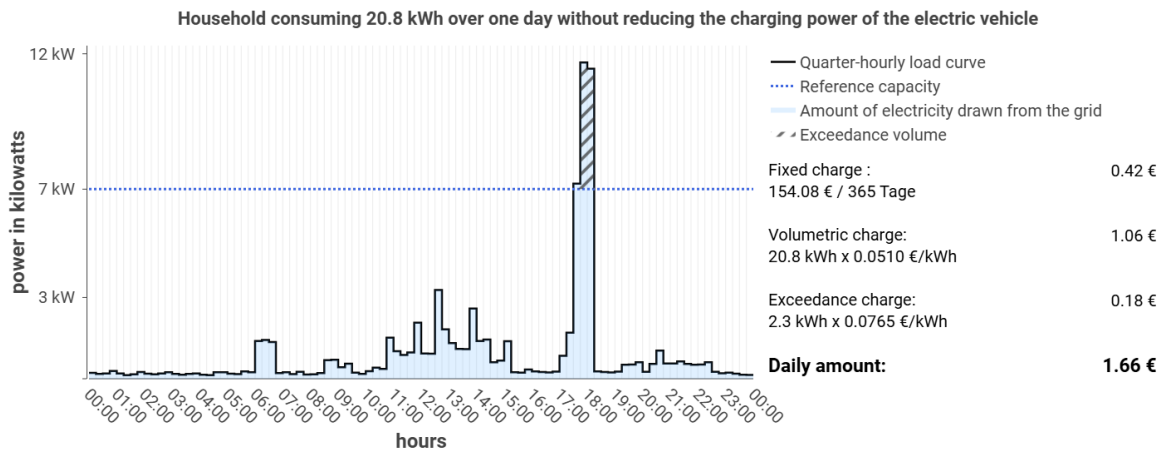


The cost of network usage amounts to €0.95. A reduction in simultaneous use could be achieved by delaying some activities until after 7:00 PM. This behavioral adjustment is illustrated in the figure below.

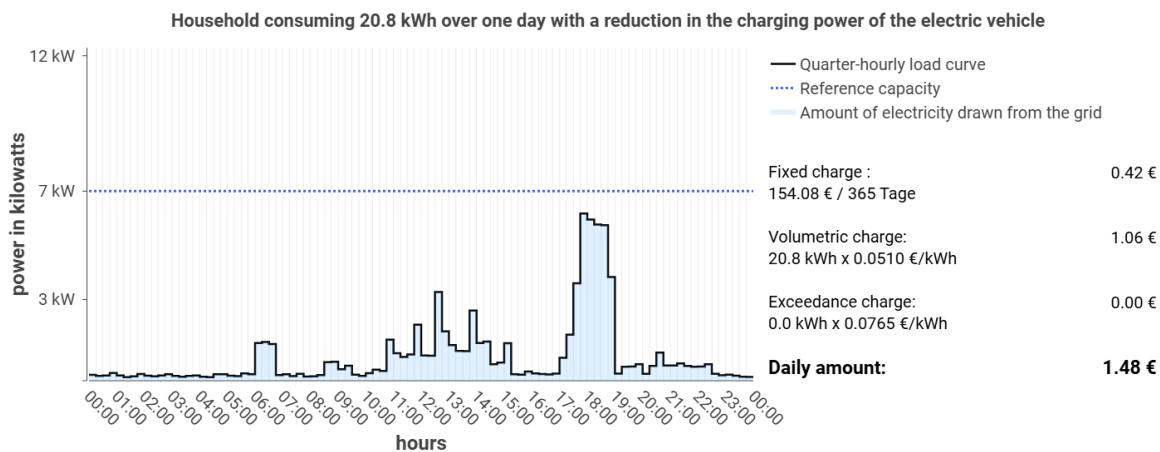


The exceedance electricity volume is reduced from 0.4 kWh to 0 kWh. This behavioral change is beneficial for the grid and allows the user to save €0.03, representing 3.2% of the daily network usage costs.

Let's now consider the example of a household within the 7 kW reference power category, consuming 20.8 kWh in a day. This household does not have a photovoltaic installation and uses a charging station between 5:30 PM and 6:15 PM, with a charging power of 11 kW.



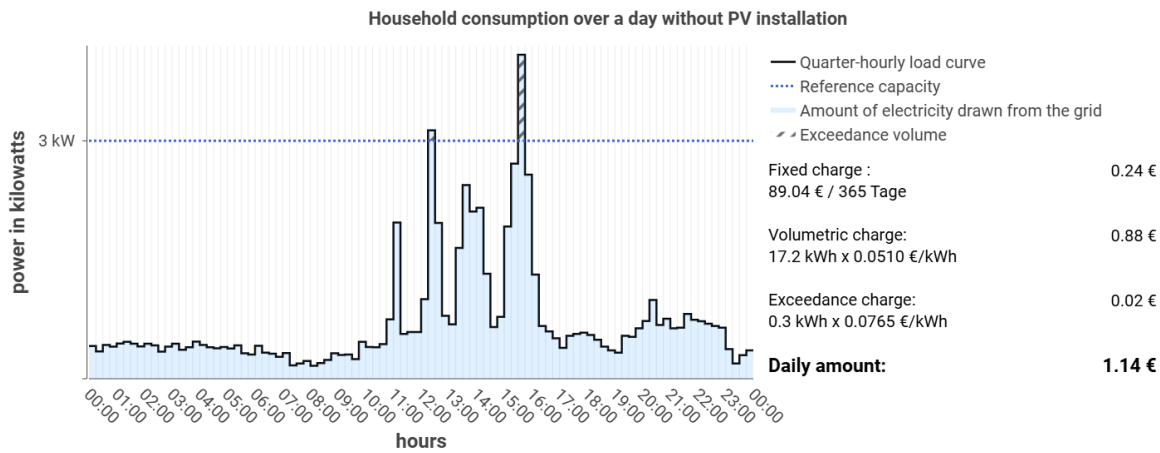
The cost of network usage amounts to €1.66. The excess electricity volume is entirely attributable to charging the electric vehicle. A change in behavior that would benefit both the grid and the customer financially is reducing the vehicle's charging power. This adjustment can be made either through the car's settings or via the charging station, depending on the specific capabilities of the station and the vehicle. In this example, the vehicle is charging at a reduced power of 5.5 kW, extending the charging time with the process now finishing at 7:00 PM instead of 6:15 PM.



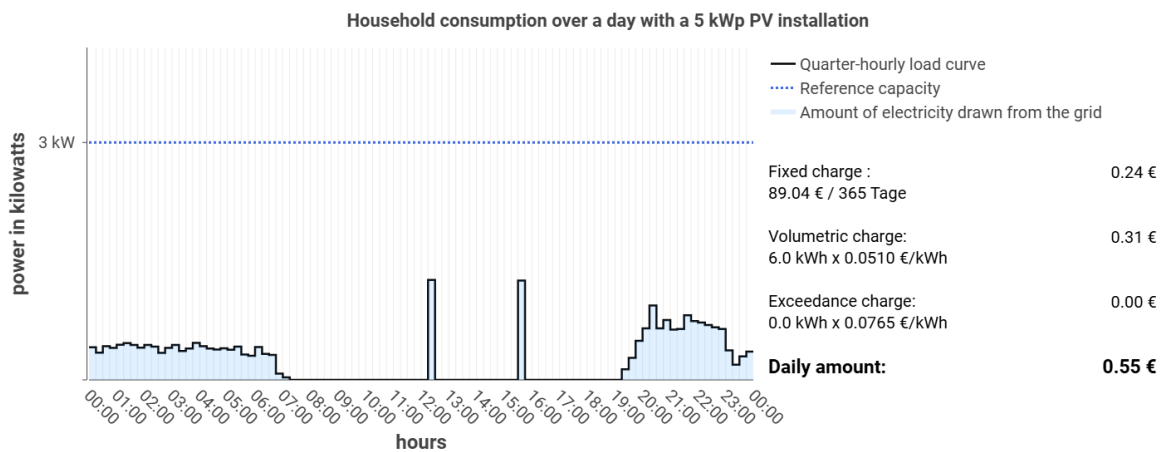
The excess electricity volume has been reduced from 2.3 kWh to 0 kWh. This behavioral change benefits the grid and allows the user to save €0.18, representing 10.8% of the daily network usage costs.

Another way for customers to reduce network usage costs is through self-consumption using a photovoltaic installation. Indeed, self-consumed energy is not billed as part of network usage costs.

The graph below illustrates the daily load curve of a household without a photovoltaic installation.



By adding a small 5 kWp photovoltaic (PV) installation to this household, the amount of electricity drawn from the grid decreases. The following example illustrates a sunny summer day :



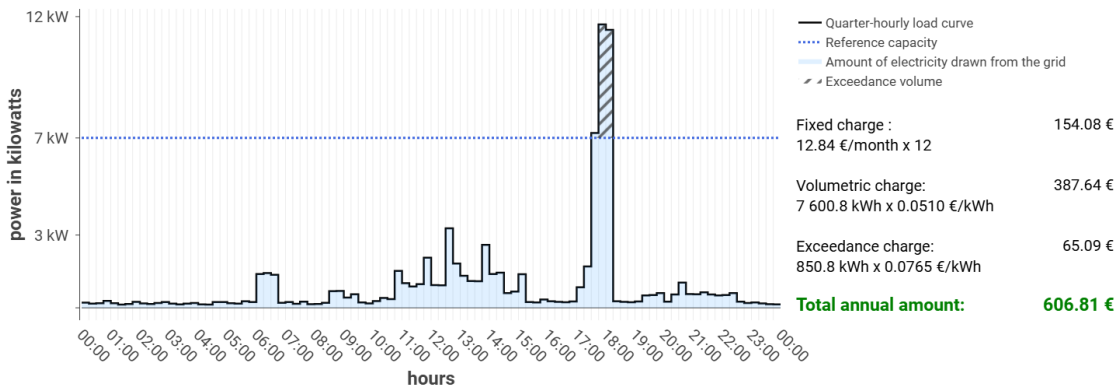
The volume of electricity drawn from the grid decreased by 11.2 kWh, leading to a reduction in network usage costs of €0.59, representing a 51.8% decrease.

Influence of user behavior on the future reference power

The reference power is recalculated monthly based on the consumption history of the past 12 months (if available). The following example illustrates how user behavior can influence the future reference power. To simplify the graphical representation and explanation, only one day of consumption for a fictional customer exhibiting the same behavior throughout the year is shown. The daily volume illustrated below is multiplied by 365 to calculate the total annual volume.

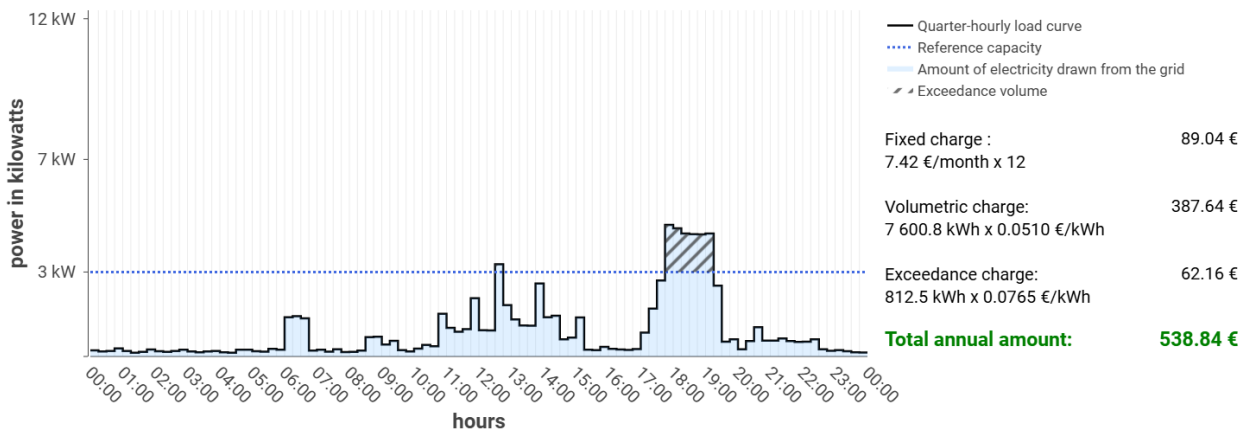
We refer to the load curve example from the section "Calculation of reference power and automatic adjustment". In this example, the electric vehicle was charged at a power of 11 kW, resulting in a reference power of 7 kW being assigned.

Calculation of grid usage costs with a reference power of 7 kW

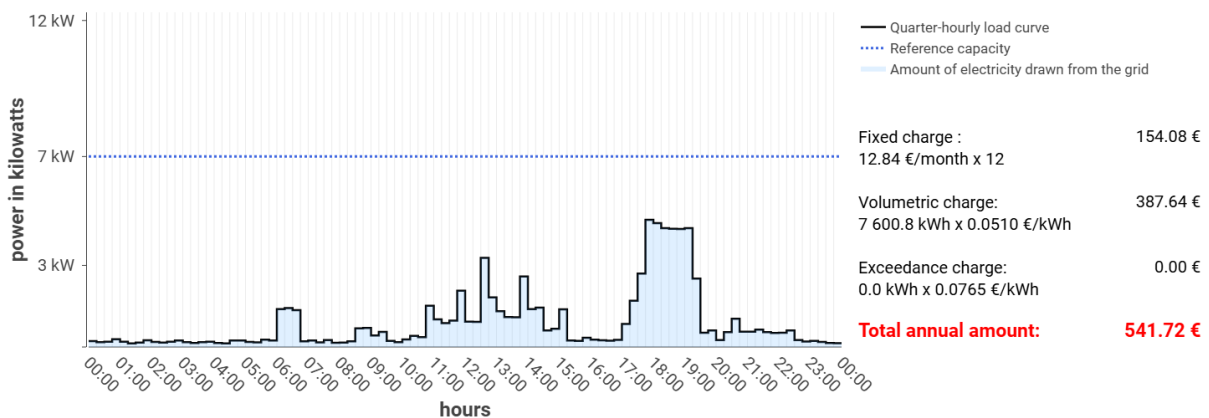


This same fictional client will now charge their vehicle at a power⁷ of 4.1 kW. After a full year with this new behaviour, while maintaining the same total electricity consumption volume, the calculation for determining the reference power yields the following result:

Calculation of grid usage costs with a reference power of 3 kW



Calculation of grid usage costs with a reference power of 7 kW



The household is now optimized with a reference power of 3 kW, resulting in an annual network usage cost of €538.84.

In summary, consumption habits play a key role in determining the reference power, as an identical annual consumption volume of 7,600.8 kWh in the two previous cases resulted in different reference powers: 3 kW and 7 kW.

⁷ The IEC 61851 standard sets the minimum current required for charging an electric vehicle at 6 amperes. In the case of three-phase charging, the corresponding minimum power is 4.1 kW, calculated as follows: 6A x 230 V x 3 phases = 4140 W, approximately 4.1 kW.

Conclusion

The network operator assigns each customer a reference power that is financially optimal. This reference power may vary depending on the power drawn and the client's consumption behavior, but it is always calculated to minimize the client's network usage costs.

Changes in consumption behavior, especially for high-power consumers, can lead to savings in network usage costs. The same applies to self-consumption of electricity produced by the customer's photovoltaic installation.

Feel free to test the simulation tool and adjust your consumption accordingly. Sign up at <https://my.creos.net> for more information.