eurelectric

# Powering the energy transition through efficient network tariffs

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# Introduction

- Electricity grids are key assets for enabling cost-effective decarbonisation with electrification at its core, facilitating transport of distributed, fluctuating, renewable energy, and serving millions of electric vehicles

- Pricing grid services in the right way will be critical to optimising the value of the grid for network customers and ensuring sufficient revenues and the right incentives for grid owners

- The entire Eurelectric Structure of Expertise contributed to this analysis through a horizontal drafting team with representatives from DSO, Retail, Generation and others

- The report means to provide a meaningful balance between key tariff principles (e.g., cost recovery, cost reflection, non-discrimination) and economic signals capable of driving electrification and efficient use of network services

# Key messages: network tariffs fit for the energy transition

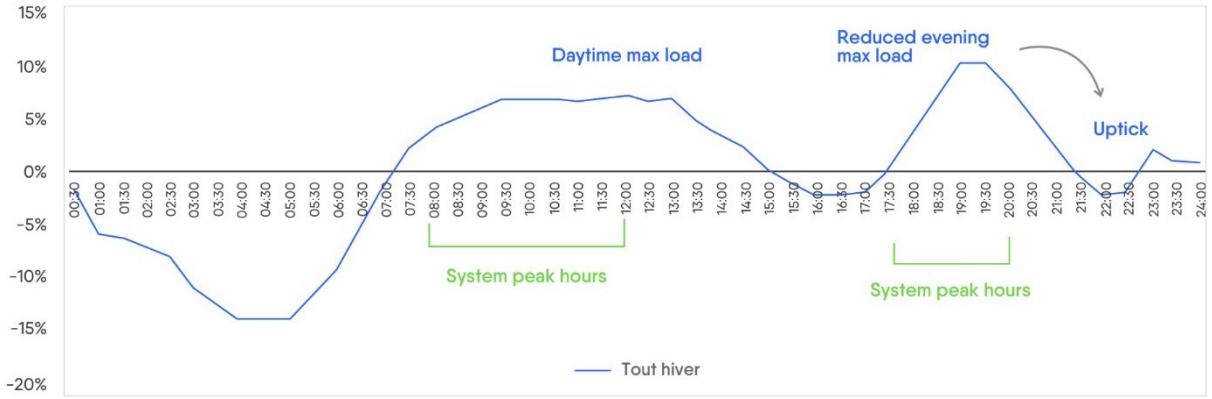
- Network tariffs, complementing energy prices, should incentivise an efficient use of the grid and allow non-distorted market access
  - Tariff design must be adjusted to the energy transition: technology provides a wealth of information about consumers and gives them the possibility to react to prices; electricity competes with other energy carriers
  - Challenge: providing the right economic signals to new uses of electricity such as self-generation, energy communities, electric vehicle charging, heat pumps, storage, etc.
- Cost-reflective network tariffs, together with well functioning markets, will help to promote a sustainable and efficient electricity system, thus facilitating electrification
- The supplier should decide how to include the network grid incentive in its retail price
- The energy transition will require review and subsequent modification of existing network tariffs. The involvement of DSOs and market parties in this process is of paramount importance

# Key messages: structure of tariffs & time-differentiation

- Cost-reflectiveness: Network tariffs with significant capacity charges are more aligned with the structure of incremental costs
- Static ToU tariffs improve cost-reflectiveness and provide better price signals than flat tariffs
  - They could help reduce grid losses and defer investment costs
  - They help promote innovation in retail markets and demand response
  - They facilitate electrification and are a promising cost-reflective solution for pricing new energy uses, avoiding specific tariffs
- Flexibility markets, combined with static ToU network tariffs, manage congestion and optimise network expansion
  - Dynamic ToU tariffs are excessively complex
- Requirement; a proper framework in terms of smart-metering and access to data
- Changes in network tariff structure should be well publicised in advance, so customers have full information when making investment decisions

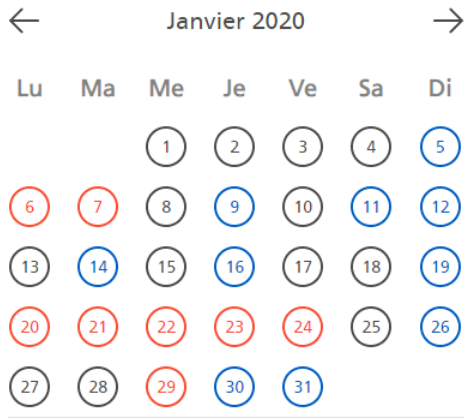
# ToU LV tariff in France

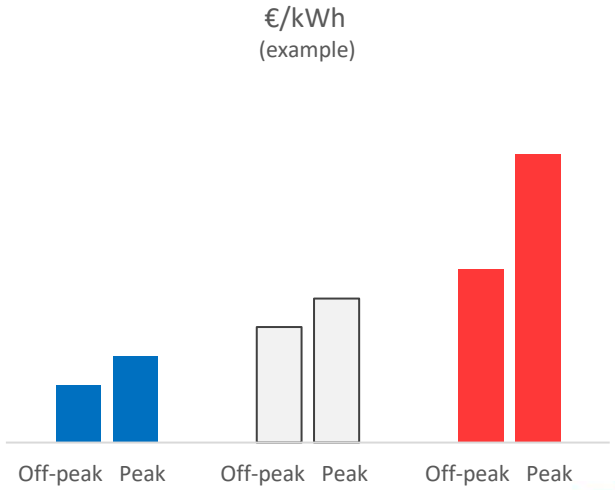
- 10 million LV users with ToU network tariffs with time differentiation in the energy charge
  - Suppliers are free to pass-through to the end customers. Most do
  - Different off-peak time windows for each MV circuit.
  - The meter sends a signal to clients' water heaters based on the schedule
  - This reduces the evening peak load, moving part of that demand to 22:00-23:00




# Critical peak pricing in France

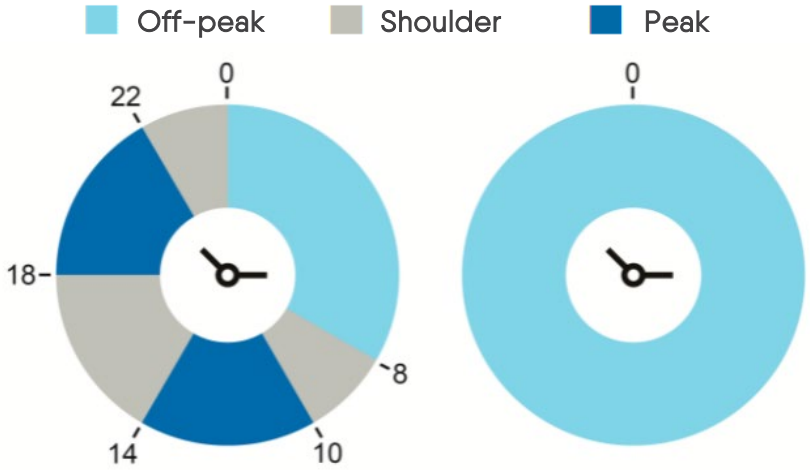
- Tempo Tariff – France, a regulated retail tariff for LV consumers with 9 kW contracted capacity or more
  - The colour of the day is determined by the TSO (RTE) based on demand forecast net from PV and wind generation
  - The energy price is differentiated in peak and off-peak hours
  - Daily, the TSO sends a message at 20:00 with the colour for the next day



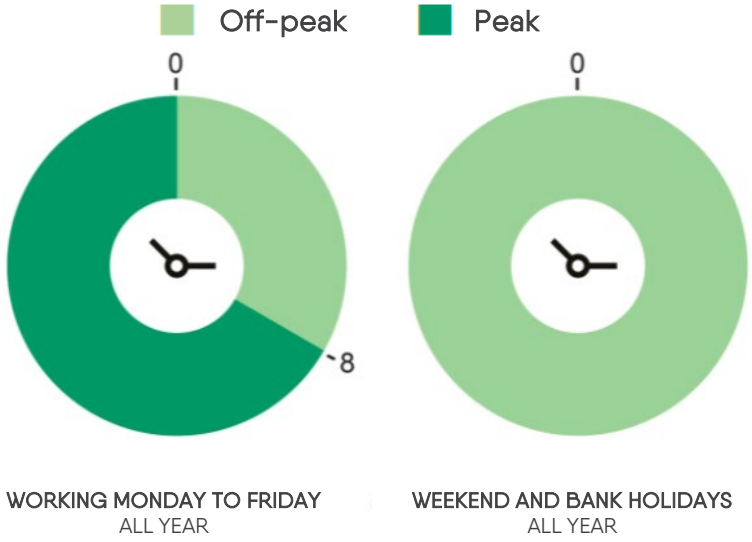



# New network tariff in Spain

Energy charge

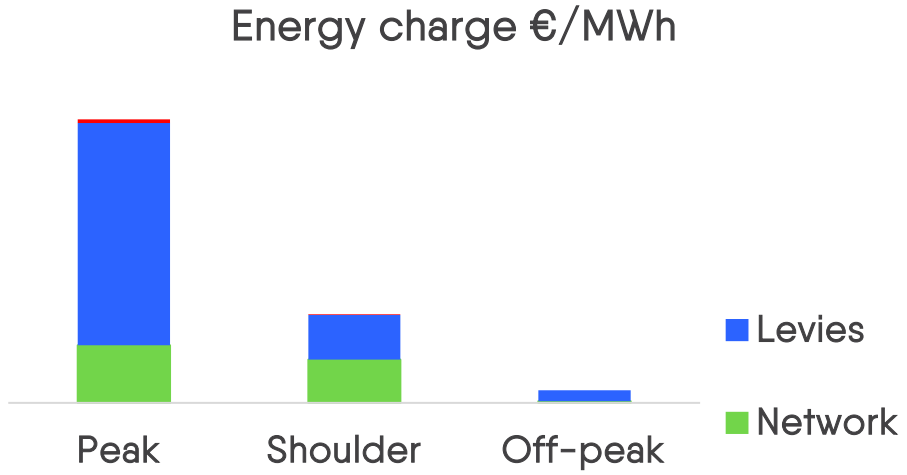


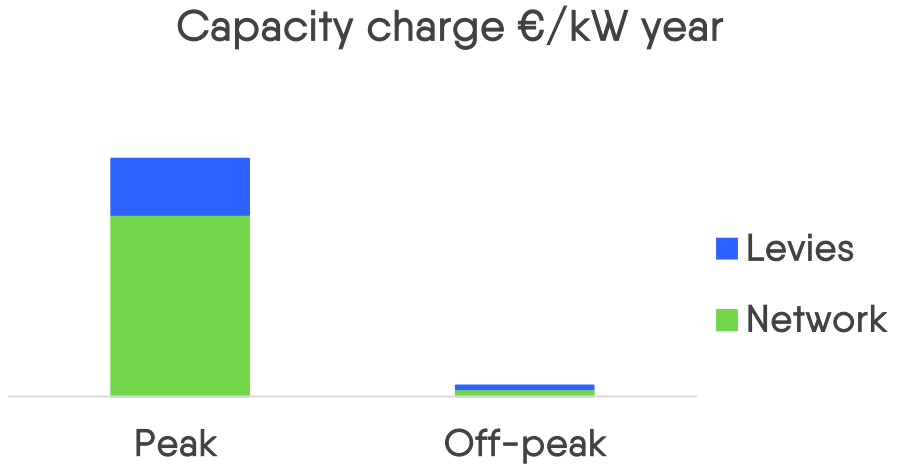

Capacity charge




WORKING MONDAY TO FRIDAY
ALL YEAR

WEEKEND AND BANK HOLIDAYS
ALL YEAR



# New network tariff in the Spanish daily life

## Washing machines and dishwashers

- Costs considered: Energy charge of network tariff and levies, capacity payments and energy cost
- Costs not considered: Capacity charge of network tariff and levies, and taxes

| | |
|---|---|
| Annual consumption | 245 kWh/year |
| Old grid tariff | 27 €/year |
| New grid tariff-peak | 48 €/year |
| New grid tariff-shoulder | 25 €/year |
| New grid tariff-off peak | 16 €/year |

| | |
|---|---|
| Annual consumption | 254 kWh/year |
| Old grid tariff | 28 €/year |
| New grid tariff-peak | 50 €/year |
| New grid tariff-shoulder | 26 €/year |
| New grid tariff-off peak | 17 €/year |

Even if consumers maintain their habits, new grid tariffs and levies have low individual economic impact. A positive impact can be caused because of the substantial increase in the number of off-peak hours

# New network tariff in Spain


# Key messages: out of the scope of network tariffs

- Impact of taxes and levies. Not directly related to electricity supply, penalise electricity use and create a barrier to electrification.
- Support to customers affected by energy poverty should not be implemented through discounts in network tariffs, but by direct public support to the customers and funded by the state budget, as this is a matter of social policy

- Network tariffs should be sustainable and cost-reflective and not be used as support tools of energy policy to kick-start the development of emerging technologies
  - If exemptions to those principles are introduced, they should be temporary and be accompanied by a clear phase-out roadmap

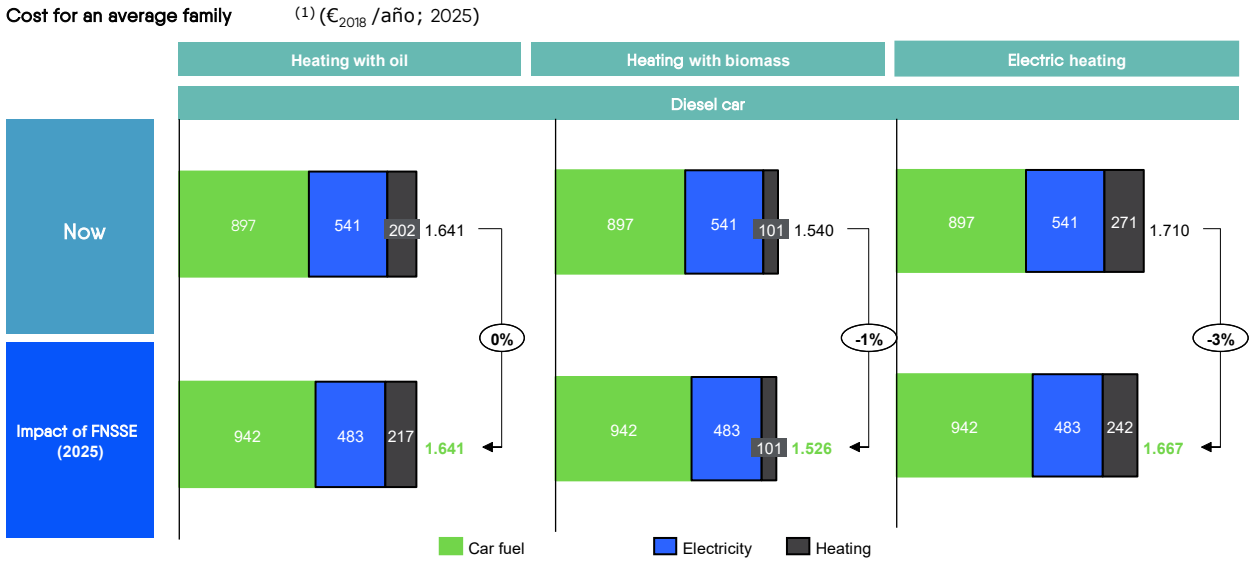
# Energy taxes in France

- Until 2015, electricity bills included the «Contribution au service public de l'électricité» (CSPE), which covered RES and cogeneration support costs, subsidy to non-mainland territories, etc.
- In 2016 these costs were integrated in the State budget, divided into two components

| | Costs covered |
|---|---|
| CAS TE **«compte d'affectation spécial (CAS) «Transition énergétique»»** | • RES support costs<br>• Demand side management costs<br>• Deficit compensation |
| Programme 345 **«Service public de l'énergie»** | • Non-mainland territories<br>• Cogeneration<br>• Social discounts |

# Sharing levies across energy carriers in Spain

- Proposal of National Fund for the Sustainability of the Electricity Sector (FNSSE), that will be used to share the cost of historic RES and cogeneration subsidies across electricity, gas and oil consumers




(1) 2MWh de consumo de calefacción; 1MWh de consumo de ACS; 3,0MWh de consumo eléctrico para otros usos; 12.000km/año de coche; 6l/100km de consumo
(2) Estimaciones de incremento de coste final de producto petrolífero y reducción de precio de electricidad de acuerdo al Informe sobre el anteproyecto de Ley de la CNMC: producto petrolífero +6,2 c€/l; electricidad17 €/MWh
Fuente: CNMC; IDAE; análisis propio

# Key messages: focus on specific users of the network

- With a more decentralised electricity system, discussion about the application of network tariffs to generators may arise
  - Network charges applied to generators may distort wholesale and retail markets
  - Network cost allocation to generators must be assessed together with connection charges and flexibility markets, which are the appropriate mechanisms to give price signals to generators
  - A well-designed network tariff should result in a small fraction of the cost, if any, being charged to generators
- Storage is not developing at the expected pace, possibly because of the current market signals and distortions caused by taxes and network tariffs in some countries
  - Need for a detailed assessment of the costs induced by the different types of storage business models on the grid
  - Network cost allocation to storage must be assessed together with connection charges and flexibility markets
  - Cost-reflectiveness and efficient price signals will incentivise efficient development of storage

# Key messages: focus on specific users of the network

- A ToU network tariff adapts very well to electric vehicle charging at home.
  - Public chargers still have low utilisation and do not benefit from ToU tariffs, since they are often used in peak hours
  - Some countries have introduced specific network tariffs for public charging points, with higher energy charges and lower capacity charges,
  - As the use of public EV chargers increases, specific network tariffs, if properly designed, will naturally be abandoned
  - Still, any exemptions or specific network tariffs, should be monitored and accompanied by a phase-out plan
- Network tariffs are a relevant cost for electrolysers, so the temptation to support this activity by introducing exemptions in network tariffs will exist
  - Beyond being non cost reflective, these exemptions would be unsustainable
  - Any exemption should be carefully designed and monitored, and should be accompanied by plan for its gradual removal

# Electric vehicle chargers – Spain

## The new tariffs make private and public charging competitive

### Private charging point

**Old Tariffs**

Tarifa 2.0DHS until 31/05/2021

- kW charge: 5 kW x 38 €/kW = 190 €/year
- kWh charge: 1,5 MWh x 1,5 €/MWh= 2,25 €/year

192 €/year

**New Tariffs**

New 2.0TD + Charges

- kW charge : 5 kW x 1,4 € = 7,2 €/year
- kWh charge: 1,5 MWh x 6,0 €/MWh= 9,0 €/year

16,2 €/year

92%

Considering the need to sign a new contract in a different building. 15kWh/100km, 10.000 km/year

### Public charging point > 15 kW

Tarifa 3.0A until 31/05/2021

- 400 hours: 4,9 €/Charging
- 1.000 hours: 2,2 €/Charging

New 3.0TD + Charges

- 400 hours: 3,6 €/Charging
- 1.000 hours: 1,8 €/Charging

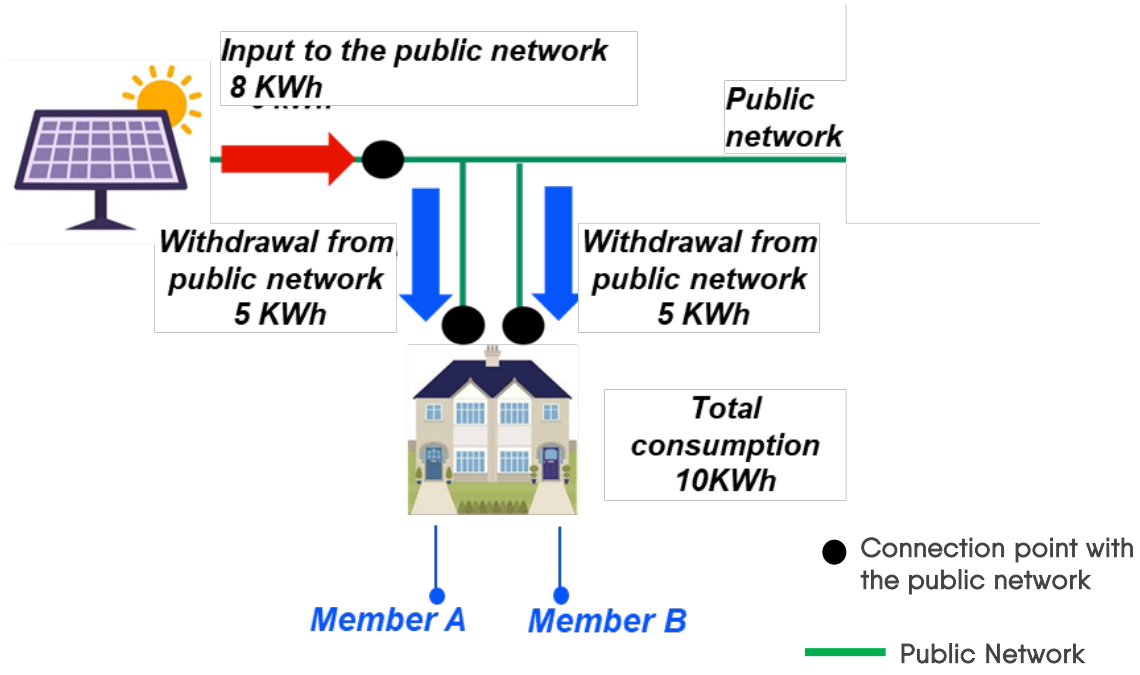
New 3.0VE + Charges

1,9 €/Charging 61%

1,7 €/Charging 23%

Considering one hour charging at a 22 kW point

# Renewable energy communities in Italy




Total "shared" energy equal to 8 kWh of this community calculated as the minimum value between inputs (8 kWh) and withdrawals (10 kWh)

ca. 50 €/MWh — *on energy input to the grid* → market valorization of all the energy fed into the network

\+

100 -110 €/MWh* — *on «shared» energy* → Explicit incentives for the diffusion of RES plants

\+

10 €/MWh** — *on «shared» energy* → grid tariff refunds (enhancement of system benefits)

=

Total 160 -170 €/MWh

* 100 € / MWh for collective self -consumption, 110 € / MWh for energy communities; ** mainly attributable to the variable part of the TRAS (grid) component