



Comparison of electricity tariffs for EV charging in Europe

Final Report

JUNE 2024

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Glossary

| Acronym | Definition |
|----------------|---|
| CP | Charging Point |
| FUE | «Fattore di Utilizzo Elettrico», that is «electric utilisation factor», equal to the percentage ratio between the number of equivalent operating hours of a POD (at available power) and 8,760 hours/year (source: ARERA) |
| LV | Low Voltage |
| MV | Medium Voltage |
| POD | Point Of Delivery |
| | |
| | |
| | |



















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| 2. Scope and approach of the study | 8 |
| 3. Overview of country energy tariffs | 11 |
| 4. Individual configuration assessment | 26 |



1. EXECUTIVE SUMMARY

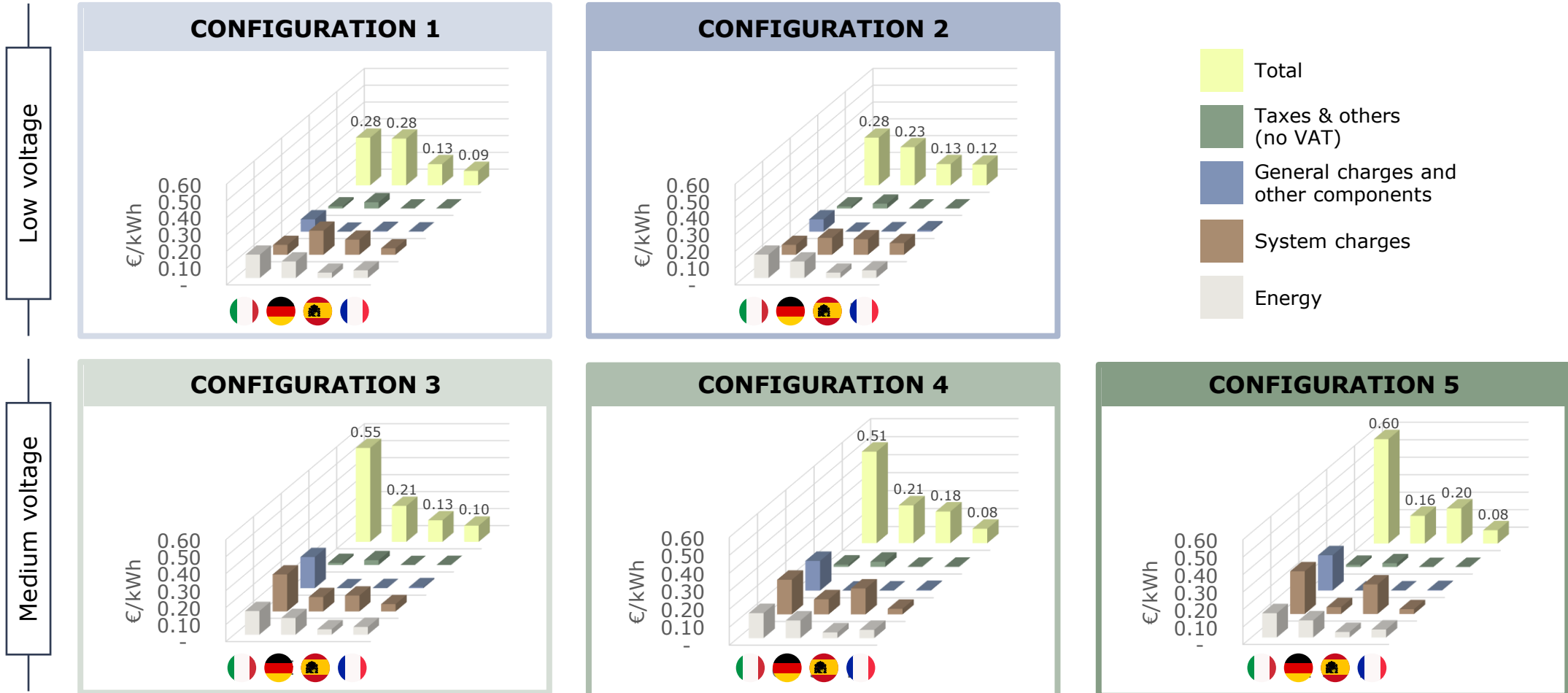
Five typical EV charging configurations have been considered in the analysis to identify and evaluate differences between the related electricity tariffs

| | LOW VOLTAGE | | MEDIUM VOLTAGE | | |
|-------------------------------|--|---|--|--|---|
| | CONFIGURATION 1 | CONFIGURATION 2 | CONFIGURATION 3 | CONFIGURATION 4 | CONFIGURATION 5 |
| |  50 kW  QUICK  QUICK |  99 kW  QUICK  FAST |  250 kW   ·  MULTIFAST |  600 kW   ·  MULTIFAST |  1200 kW   ·  MULTIFAST |
| Consumption [kWh/year] | 8,000 | 15,000 | 37,000 | 85,000 | 130,000 |
| Power [kW] | 50 | 99 | 250 | 600 | 1,200 |
| FUE [%] | 1.83% | 1.73% | 1.69% | 1.62% | 1.24% |
| Italian tariff | BTVE | BTVE | MTA2 | MTA3 | MTA3 |

Notes: values agreed with Motus-E. No storage systems and/or secondary energy sources in addition to the electricity grid

1. EXECUTIVE SUMMARY

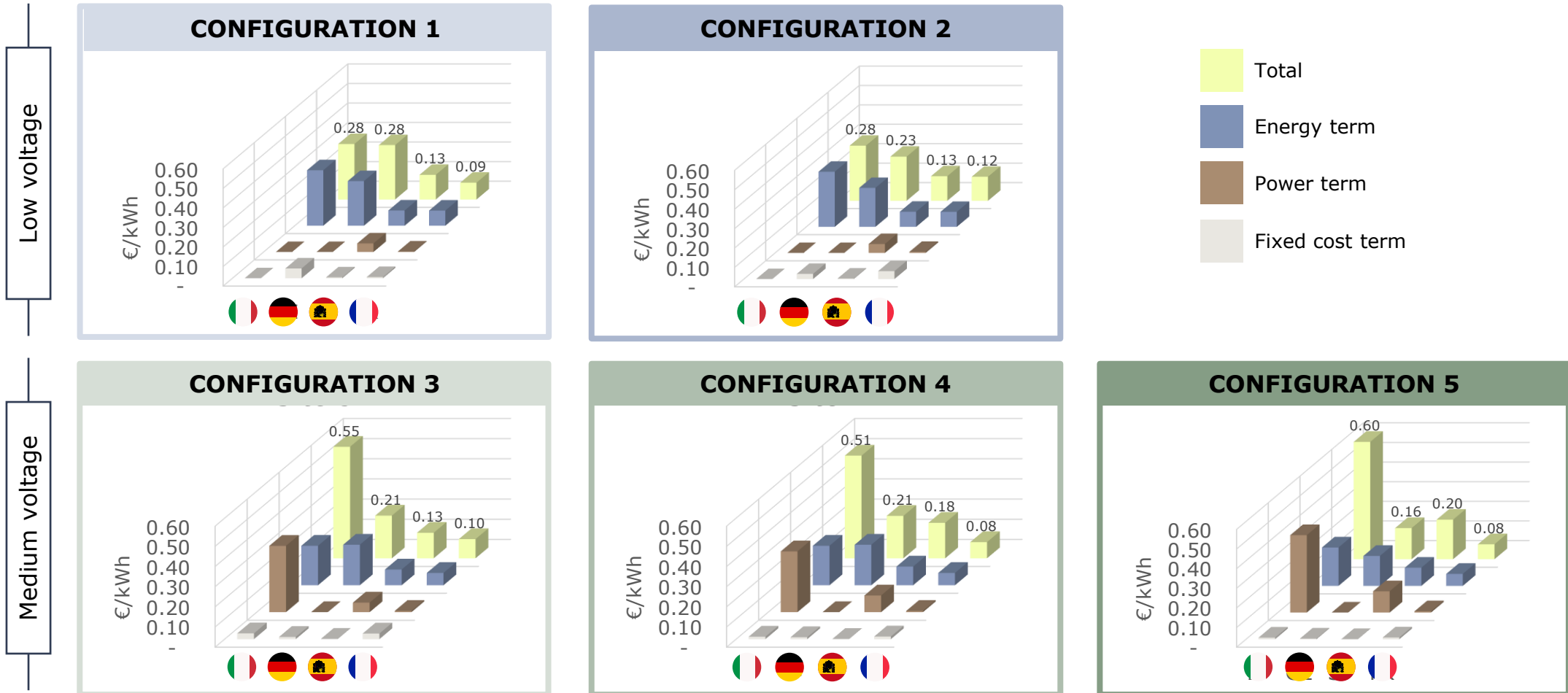
The Italian electricity tariff is the highest for all configurations, especially at medium voltage where system and general charges account for the bulk of it...



Notes: values referring to year 2023

1. EXECUTIVE SUMMARY

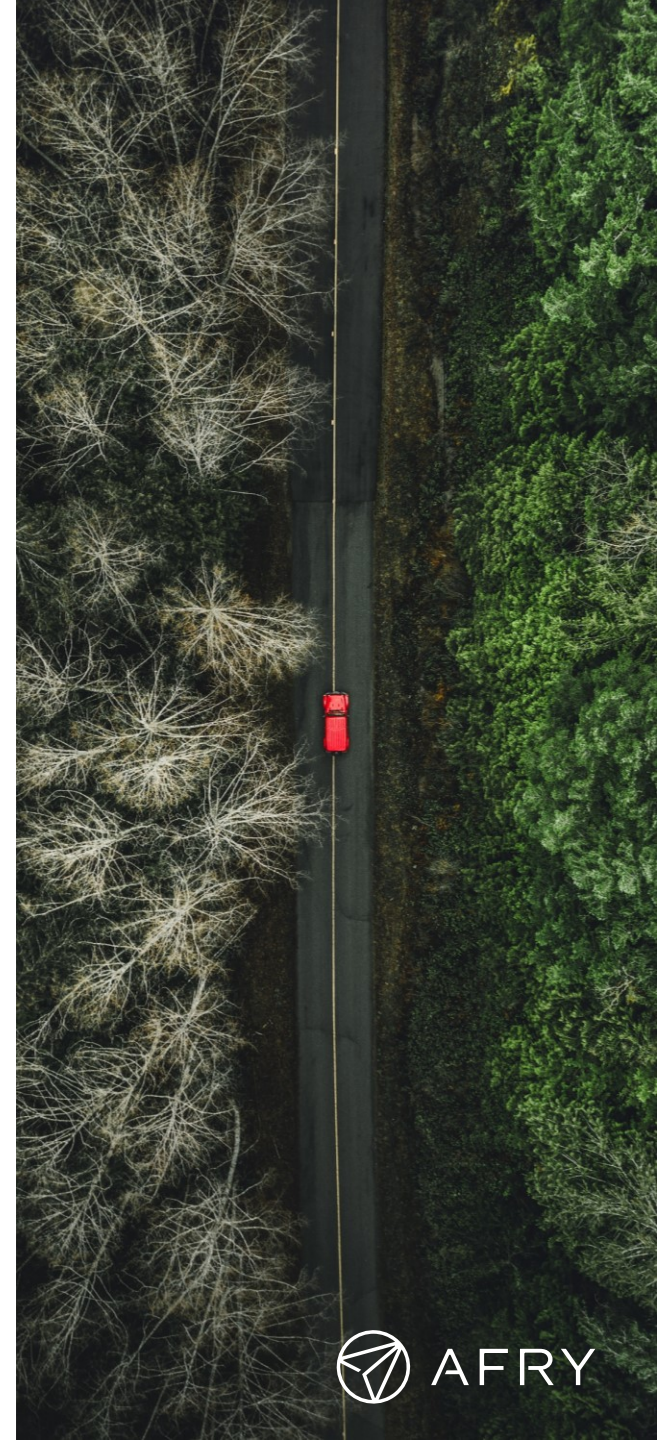
... while power-dependent components generate most of the costs in medium voltage configurations, especially when the utilisation factor is low



Notes: values referring to year 2023

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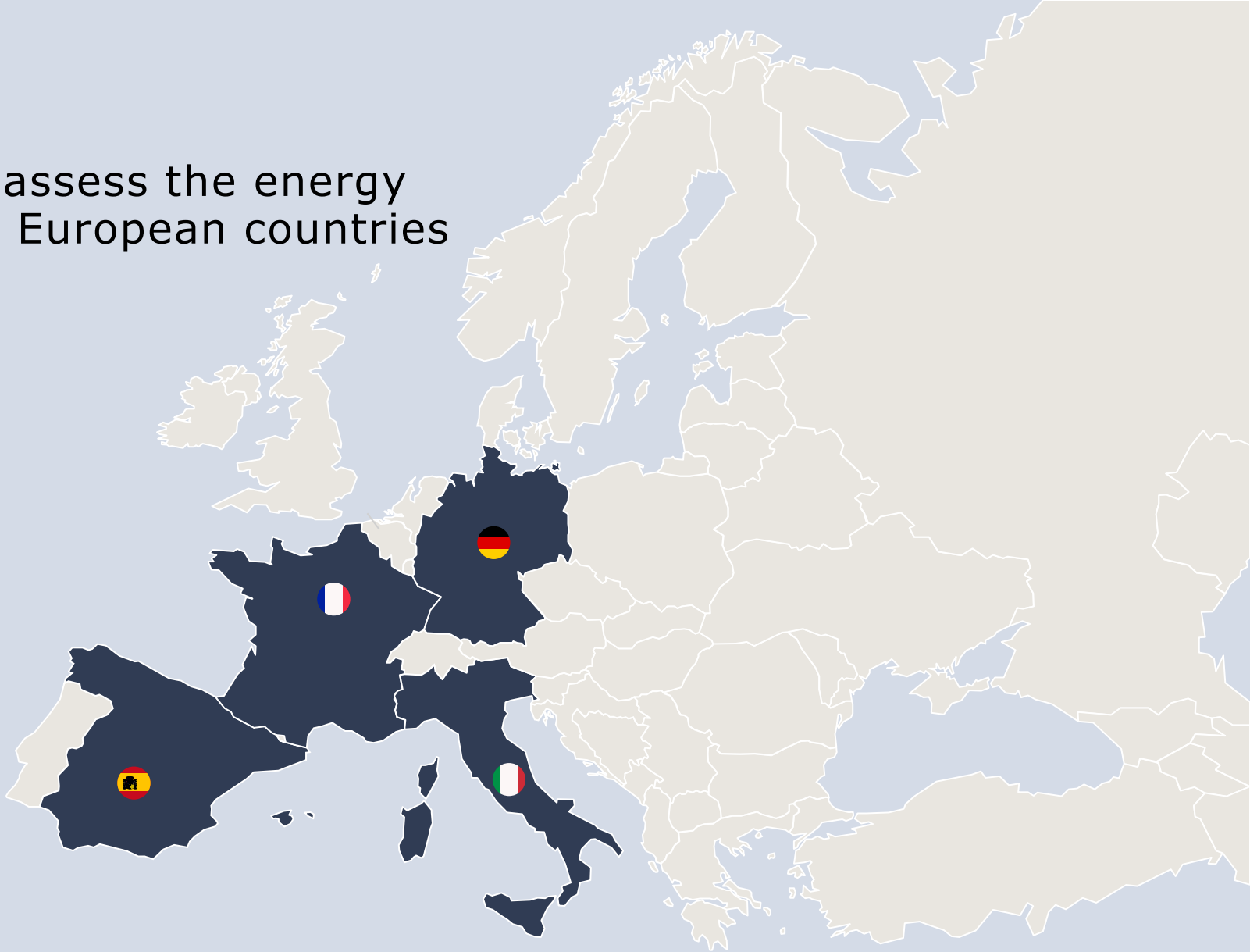
Motus-E appointed AFRY to assess the energy tariff for EV charging in key European countries

Context of the study

- In the public EV charging sector, energy represents a significant operational expenditure that operators must manage, particularly with low utilization of charging infrastructure
- To support the energy transition and promote the decarbonization of transport, some European countries have applied measures to reduce the total energy cost
- Motus-E, the Italian association for electric mobility, has commissioned AFRY to conduct a study on this topic

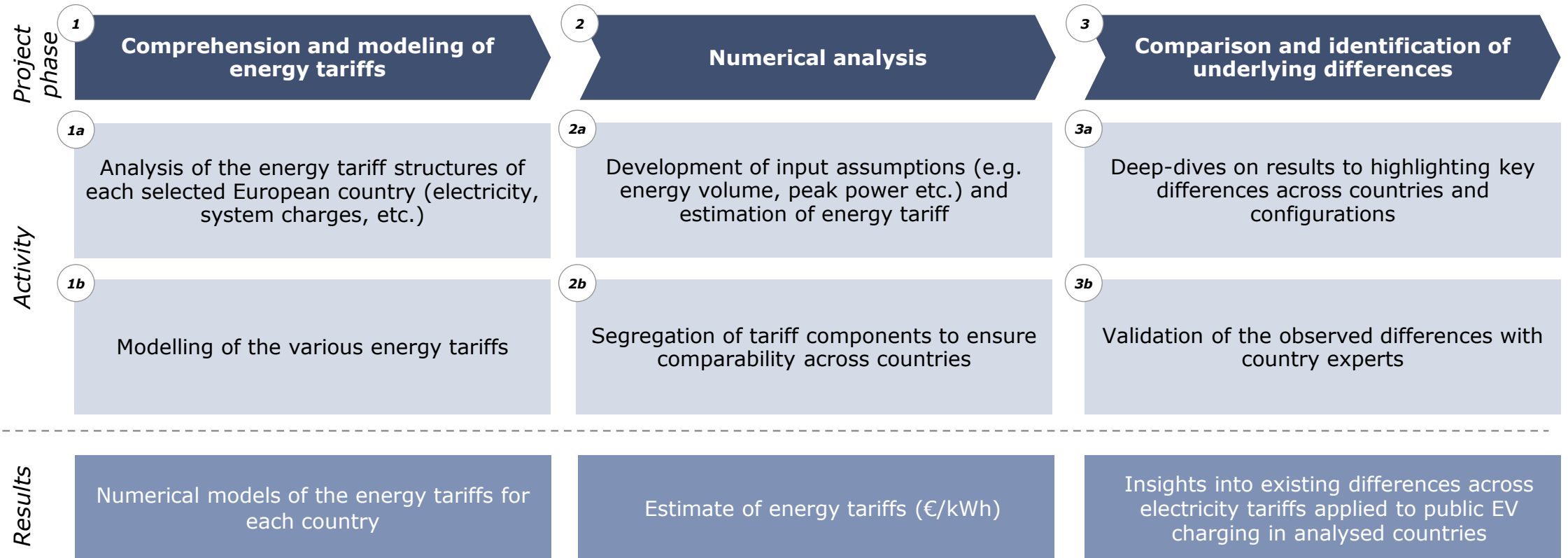
Scope of the study

- AFRY modelled and quantified the electricity tariffs that public CPO are most likely to incur in Italy, France, Germany and Spain, to identify the underlying difference
- The analysis focused on selected types of charging configurations that are representative of the current market practice



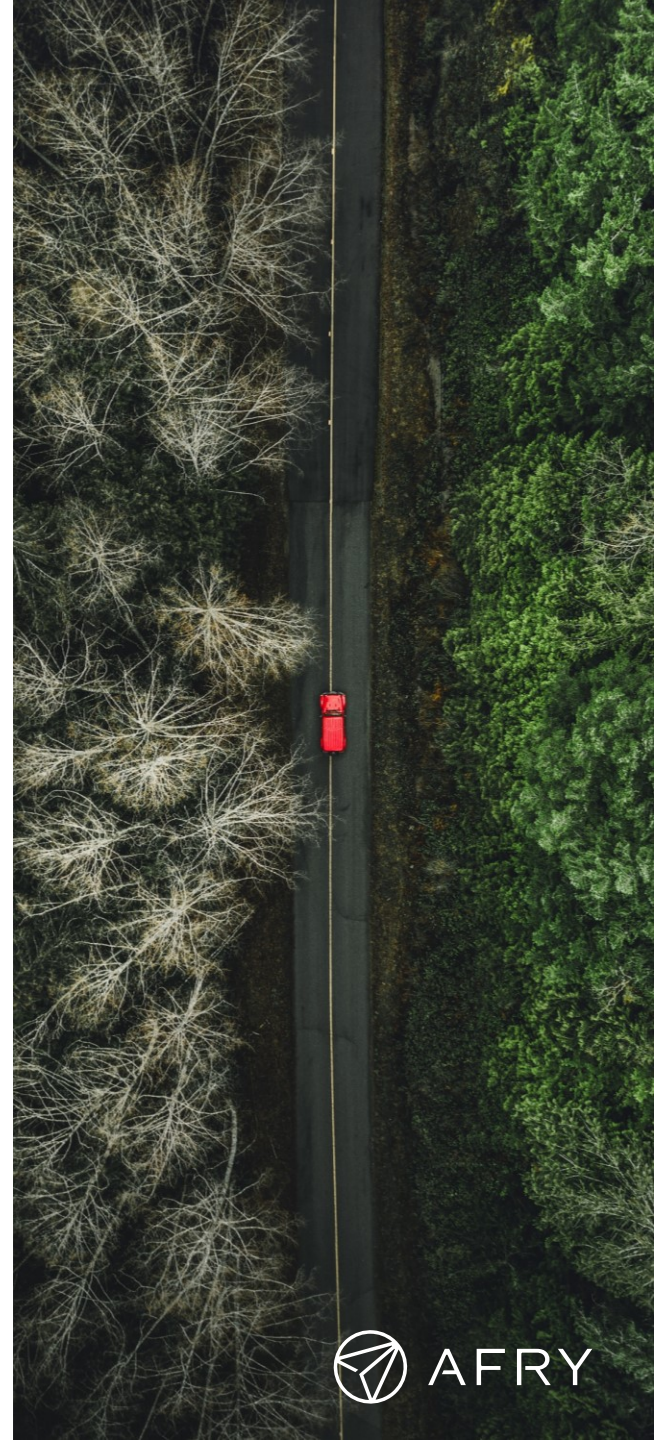
2. SCOPE AND APPROACH OF THE STUDY - APPROACH

A three-steps approach consisting of tariff modelling, numerical analysis and comparison was applied to achieve the project goal



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3. OVERVIEW OF COUNTRY ENERGY TARIFFS – ITALY

The electricity tariff consists of four macro cost-items related to fixed costs, power and energy volume, hence with variable materiality on the final cost

| Tariff components | | Fixed cost term [€/POD/year] | Power term [€/kW/year] | Energy term [€/kWh] | Time based | Materiality on final cost ⁴ | Covering... | Special EV tariff | Time-of-use tariff |
|--------------------------------------|------------------------------------|---------------------------------|---------------------------|------------------------|------------|--|---|-------------------|--------------------|
| Energy | Electricity | | | ✓ | ✓ | ● | Electricity from the either the Italian wholesale market or bilateral agreements with energy providers ⁵ . Losses included | | |
| | Supplier margin ¹ | | | | | | Margin added by the energy supplier for its service (including green energy preference) | | |
| | Dispatching | | | ✓ | ✓ | 🕒 | Dispatching incurred by TSO (e.g. MSD, wind modulation, capacity market at peak and off-peak, system safety etc.) | | |
| System charges | Transmission | | ✓ | ✓ | | 🕒 | Transport of electricity on the national transmission grid | | |
| | Distribution | ✓ | ✓ | ✓ | | 🕒 | Transport of electricity on distribution networks | | |
| | Metering | ✓ | | ✓ | | 🕒 | Installation and maintenance of the meter (meter), as well as the costs of taking and recording measurements | | |
| General charges and other components | ASOS | ✓ | ✓ | ✓ | | 🕒 | General charges relating to the support of renewable energies and cogeneration | | |
| | ARIM | ✓ | ✓ | ✓ | | 🕒 | Remaining general charges (e.g. nuclear decommissioning and R&D costs) | | |
| | UC3 | | | ✓ | | 🕒 | Imbalances in electricity transport cost equalisation systems on transmission and distribution networks, and integration mechanisms | | |
| | UC6 | ✓ | ✓ | ✓ | | 🕒 | Recovery of service quality | | |
| Taxes & others | Excise duty | ✓ ³ | | ✓ | | 🕒 | Indirect tax with immediate collection levied on the amount of energy consumed | | |
| | Value Added Tax (VAT) ² | | | | | 🕒 | Indirect tax on supplies of goods and services effected within the territory of the State in the exercise of trade or profession and on imports by any person | | |

Sources: [Prezzi e Tariffe \(ARERA\)](#) | Notes: 1) Excluded, as dependant on the actual agreement with the supplier, 2) Excluded, 3) If energy volume is larger than 1.2 GWh/month, 4) Qualitative assessment for EV charging use, 5) Wholesale market considered, hence dependant on (yearly) market dynamics

Not relevant for the analysis

High ● Medium 🕒 Low ○





3. OVERVIEW OF COUNTRY ENERGY TARIFFS – ITALY

The macro costs-items depend on the tariff type, which apply upon compliance with certain requirements, including the EV charging end use

TARIFF TYPES AS OF ARTICLE 2, COMMA 2.2 TIT

| Letter | User type | Tariff code |
|--------|---|-------------|
| a) | Domestic in low voltage | TD |
| b) | Public lighting in low voltage | BTIP |
| c) | Public charging points for electric vehicles in low voltage | BTVE |
| d) | Users different from a), b) and c) in low voltage | BTAU |
| e) | Public lighting in medium voltage | MTIP |
| f) | Users different from e) in medium voltage | MTAU |
| g) | High voltage | ALTA |
| h) | Very high voltage, lower than 380 kV | AAT1 |
| h) | Very high voltage, equal of higher than 380 kV | AAT1 |

COMMENTARY

It is a 'favourable' energy tariff for EV charging provided in publicly accessible places through low voltage grid connection. It was introduced in 2011 ([ARG/elt 242/10](#)) to foster the growth of public EV charging and extended since then until today (full 2024)

The MTAU tariffs are meant to serve loads above 100kW with medium voltage grid connection, with no specific use (e.g. public lighting). These tariffs are often utilized for high-power public EV charging when the installed charging capacity is larger than 150-200 kW (e.g. multiple fast chargers at the same location)

The MTAU tariffs do not introduce any favourable condition for public EV charging to support the business

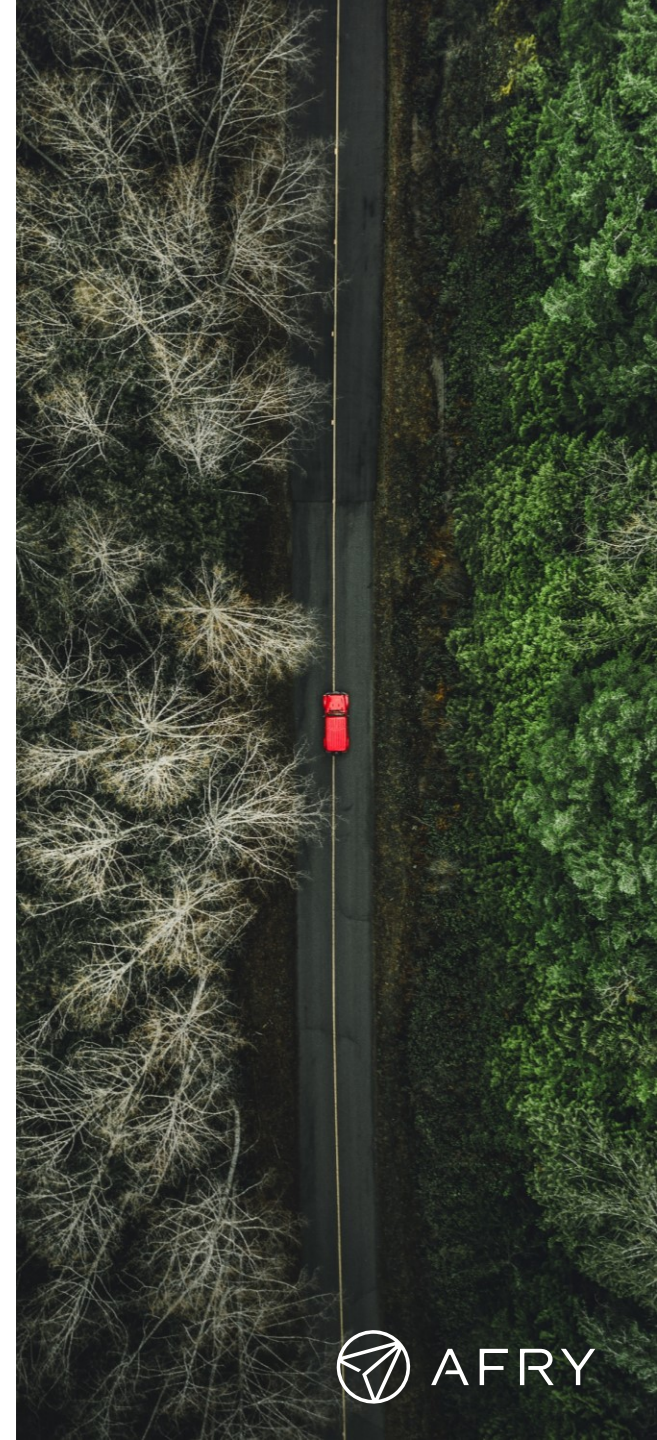


'Time-of-use tariffs' for the specific use case of EV charging are under discussion. Such tariffs basically make tariff components time dependant

Sources: [Delibera 616/2023/R/eel](#), [Consultazione 540/2023/R/eel](#)

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3. OVERVIEW OF COUNTRY ENERGY TARIFFS – GERMANY

The electricity tariff consists of four macro cost-items mostly related to energy volume

| Tariff components | | Fixed cost term [€/POD/year] | Power term [€/kW/year] | Energy term [€/kWh] | Time based | Materiality on final cost ⁴ | Covering... | Special EV tariff | Time-of-use tariff |
|--------------------------------------|------------------------------------|---------------------------------|---------------------------|------------------------|-------------------|---|--|----------------------|-----------------------|
| Energy | Electricity | | | ✓ | (✓ ¹) | ● | Electricity procurement from the wholesale market or bilateral agreements with energy providers. Losses included | | |
| | Supplier margin ¹ | | | | | ● | Distribution costs for electricity producers | | |
| System charges (grid fees) | Transmission (TSO) | | | ✓ | (✓ ²) | ◐ | Transport of electricity in the four national transmissions grids (incl. dispatching) | | |
| | Distribution (DSO) | | | ✓ | (✓ ²) | ◐ | Transport of electricity in local distribution networks | | |
| | Metering | ✓ | ✓ ³ | | | ○ | Installation and maintenance of the meter, as well as the costs of taking and recording measurements | | |
| General charges and other components | Offshore levy | | | | | | Costs for the construction and operation of the connection lines between offshore wind parks and the national grid | | |
| | CHP levy | | | | | | Surcharge to the plant operator for the electricity generated by CHP | | |
| | Relief of companies | | | | | | Compensation for the lost revenue resulting from reduced grid fees in the context of special forms of grid use | | |
| Taxes & others | Electricity tax | | | ✓ | | ◐ | Electricity consumption tax regulated by federal law | | |
| | Concession fee | | | ✓ | | ◐ | General value added tax on energy-related services | | |
| | Value Added Tax (VAT) ² | | | | | | Municipalities receive money in return for the use of public roads and paths to lay electricity (and gas) lines | | |

Currently EV charging is exempted from levies

Sources: BNetzA, BMWK | Notes: 1) Time-based contracts are optional, usually energy is sold at fixed terms, 2) Time-based grid fees will be enabled starting in 2025 with exact details to be confirmed, 3) Different meters have to be used depending on power, 4) Qualitative assessment for EV charging use

Not relevant for the analysis

High ● Medium ◐ Low ○





3. OVERVIEW OF COUNTRY ENERGY TARIFFS – GERMANY

German tariffs are dependent on the yearly offtake as regulations allow for reliefs and prices scale with volume

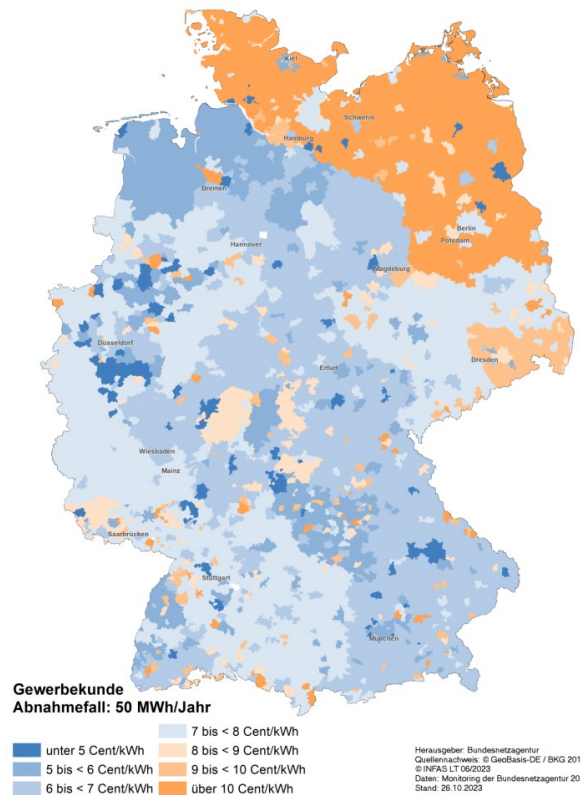
| Tariff components | | Household-equivalent tariff (<10 MWh) | Public EV-charging | | Special tariffs |
|----------------------------|-----------------------|--|--|--|--|
| | | | Commercial (10-100 MWh) | Industry (>100 MWh) | |
| Energy | Procurement | Energy procurement on the wholesale market or within private agreements for costumers with high offtake | | | |
| | Distribution | Reduction in distribution cost scaled by volume (~50% reduction from household to industry) | | | Individual distribution agreements |
| System charges (grid fees) | Transmission (TSO) | Offtake on lowest voltage level and thus payment cover cost on all level (9.8 ct/kWh in 2023) | Offtake on medium voltage level (7.4 ct/kWh in 2023) | Offtake on high voltage level thus only cost for high voltage transmission to be paid (3.3 ct/kWh in 2023) | Individual agreements with transport and distribution system operators for special offtake |
| | Distribution (DSO) | | | | |
| | Metering | | | | |
| General charges and other | Offshore levy | Levies are paid on top of all regular power demand pulled from grid (~1 ct/kWh in 2023) – Exemption in place for public EV charging (paragraph 21, EnFG) | | | Reliefs can be obtained under certain circumstances |
| | CHP levy | | | | |
| | Relief of companies | | | | |
| Taxes & others | Electricity tax | Electricity tax is generally paid by all offtakers (~2 ct/kWh in 2023) | | Industry companies pay the European minimum in 24/25 (~0.05 ct/kWh) | |
| | Value Added Tax (VAT) | End-consumer (19%) | Forwarded to end consumer (19%) | | |
| | Concession fee | Highest fees according to federal law (1.6 ct/kWh) | Medium fees according to federal law (0.8 ct/kWh) | Lowest fees according to federal law (0.1 ct/kWh) | |



3. OVERVIEW OF COUNTRY ENERGY TARIFFS – GERMANY

German grid fees are highly dependent on location as they are dependent on local network operators and oftakers

GRID FEES FOR COMMERCIAL CUSTOMERS IN 2023¹



CALCULATION OF GRID FEES

- Grid fees are derived in three steps:
 - 1. Determination of grid costs:** The cost basis for grid fees is determined in regulatory periods of five years
 - 2. Determination of permissible revenues:** The recognized grid costs are converted into a revenue cap in accordance with the regulations
 - 3. Formation of grid charges:** The grid operators determine the grid charges based on the principles of the StromNEV
- This results in location-dependent grid fees
- For commercial customers with 50 MWh offtake, grid fees varied from 1.39 to 31.99 cent/kWh with an overall average of 7.42 cent/kWh in 2023¹
- Key factor for regional differences are:
 - **Population density:** In sparsely populated areas, the grid costs are distributed among a small number of grid users
 - Varying costs for **bottleneck management**
 - **Age of the grids:** Older grids with low residual values lead to lower grid costs than new grids
 - **Grid quality:** This has a direct influence on the revenue cap via the Q element
- Starting in 2024 variable grid fees will be in place for oftakers in turn for adjustment of power output (mostly relevant for households)

Notes: 1. Bundesnetzagentur

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3. OVERVIEW OF COUNTRY ENERGY TARIFFS – SPAIN

The electricity tariff consists of four macro cost-items related to fixed costs, power and energy volume, hence with variable materiality on the final cost

| Tariff components | | Fixed cost term [€/POD/year] | Power term [€/kW/year] | Energy term [€/kWh] | Time based | Materiality on final cost ⁴ | Covering... | Special EV tariff | Time-of-use tariff |
|-------------------|--------------------------------------|---------------------------------|---------------------------|------------------------|------------|--|--|-------------------|--------------------|
| Energy | Electricity | | | ✓ | ✓ | Low | Electricity from the either the Spanish wholesale market or bilateral agreements with energy providers. Losses included | | |
| | Supplier margin ¹ | | | | | | Margin added by the energy supplier for its service (including green energy preference) | | |
| Tolls & Charges | Transmission tolls | | ✓ | ✓ | ✓ | Medium | Transport of electricity on the national transmission grid | | |
| | Distribution tolls | | ✓ | ✓ | ✓ | Medium | Transport of electricity on distribution networks | | |
| | Grid charges | | ✓ ³ | ✓ | ✓ | Low | General system charges relating to the support of renewable energies and cogeneration, as well as non-mainland price adjustment | | |
| Other charges | Metering equipment and rental | ✓ | | | | Low | Installation and maintenance of the meter (meter), as well as the costs of taking and recording measurements | | |
| | Social Bond | ✓ | | ✓ | ✓ | Low | Transitory measure aimed to support vulnerable consumers | | |
| Taxes & others | Impuesto Especial Electricidad (IEE) | | | | ✓ | Low | Special tax levied on the amount of energy consumed but proportional to economic value | | |
| | Value Added Tax (VAT) ² | | | | ✓ | Medium | Indirect tax on supplies of goods and services effected within the territory of the State in the exercise of trade or profession and on imports by any person. Usual levels at 21%, however has been as low as 5% depending on price context and government measures | | |

Sources: REE, CNMC, [Charges](#), [Tolls](#) | Notes: 1) Excluded, as dependant on the actual agreement with the supplier, 2) Excluded, 3) As of now no dependency on power term, grid charges are aimed to be paid fully via the energy term but could potentially change, 4) Qualitative assessment for EV charging use



3. OVERVIEW OF COUNTRY ENERGY TARIFFS – SPAIN

In recent years, EV-specific regulated tariffs 3.0TDVE/6.1TDVE were released to support the sector. Hourly periods have an impact on end-prices

REGULATED TARIFF GROUPS

| | Group | Voltage Level | Contracted Power | Constraints |
|---------------------------|----------------|----------------|--------------------------------------|--|
| | Grid Charges | 2.0TD | ≤ 1kV | ≤ 15kW in all periods |
| 3.0TD | | ≤ 1kV | >15kW in any hourly period | Contracted power $P_{n+1} \geq P_n^1$ |
| 6.1TD | | (1, 30kV) | Any | Contracted power $P_{n+1} \geq P_n^1$ |
| 6.2TD | | [30, 72.5kV) | Any | Contracted power $P_{n+1} \geq P_n^1$ |
| 6.3TD | | [72.5, 145kV) | Any | Contracted power $P_{n+1} \geq P_n^1$ |
| 6.4TD | | ≥ 145kV | Any | Contracted power $P_{n+1} \geq P_n^1$ |
| 2.0TDA | | Same as above | Same as above | Applied to the self-consumed energy of installations in which generation and consumption are not connected directly but through the grid |
| 3.0TDA | | | | |
| 6.1TDA | | | | |
| 6.2TDA | | | | |
| 6.3TDA | | | | |
| 6.4TDA | | | | |
| EV-Specific tariff groups | 3.0TDVE | <1kV | >15kW in any hourly period | Supply point of exclusive usage for EV charging² & CP must be public |
| | 6.1TDVE | ≥1kV | >15kW in any period | |

| | Charges Tariff Group | Tolls Tariff Group |
|---------------------------|----------------------|--------------------|
| | Grid Tolls | 1 |
| 2 | | 3.0TD & 3.0TDA |
| 3 | | 6.1TD & 6.1TDA |
| 4 | | 6.2TD & 6.2TDA |
| 5 | | 6.3TD & 6.3TDA |
| 6 | | 6.4TD & 6.4TDA |
| EV/specific tariff groups | 2VE | 3.0TDVE |
| | 3VE | 6.1TDVE |

HOURLY PERIOD DISCRIMINATION

- **Grid tolls and charges** are set for each tariff group and each of the 6 hourly periods (1, 2, 3, 4, 5 & 6) or "time bands", hence defined "**time-of-use**" tariff
- Hourly periods depend on:
 - The electricity season (High, Medium-high, Medium and Low) which changes every month
 - The day-type (Type A, Type B, Type B1, Type C and Type D) which depends on the day of the week and bank holidays
 - The hour within each day-type
- Contracted power can be different for each hourly period but always increasing, not decreasing: Hourly period 1 must have the lowest contracted power and increasing thereafter ($P_{n+1} \geq P_n$)

| Hour of day | Month | | | | | | | | | | | |
|-------------|-------|---|---|---|---|---|---|---|---|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 8 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| 9 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 10 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 11 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 12 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 13 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 14 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| 15 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| 16 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| 17 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| 18 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 19 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 20 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 21 | 1 | 1 | 2 | 4 | 4 | 3 | 1 | 3 | 3 | 4 | 2 | 1 |
| 22 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| 23 | 2 | 2 | 3 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 3 | 2 |
| Weekends | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |

Sources: Circular 3/2020, Charges, Tolls | (1) Contracted power can be different for each hourly period, (2) Not complying with this incurs in 20% cost penalty. TD stands for 'Tablero Distribución'; 'A' for "Autoconsumo" (self-consumption) and 'VE' for Electric vehicle



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3. OVERVIEW OF COUNTRY ENERGY TARIFFS – FRANCE

The French electricity retail tariff structure is built on four main components comprising energy costs, system charges, general charges, levies and taxes

| Tariff components | | Fixed cost term [€/POD/year] | Power term [€/kW/year] | Energy term [€/kWh] | Time based | Materiality on final cost ¹ | Covering... | Special EV tariff | Time-of-use tariff |
|--------------------------------------|------------------------------------|---------------------------------|---------------------------|------------------------|------------|--|---|--|--------------------|
| Energy | Electricity | | | ✓ | ✓ | ● | Electricity from the either the French wholesale market or bilateral agreements with energy providers. Losses included | | |
| | Supplier margin | | | | | ◐ | Margin added by the energy supplier for its service (including green energy preference) | | |
| System charges | Transmission & Distribution | | ✓ | ✓ | ✓ | ◑ | Tariffs to access the transmission and distribution networks (TURPE) are regulated. The weights of energy/capacity components in the total tariff vary from a voltage category to the other. Transport of electricity on the national transmission & distribution grids. Installation and maintenance of the meter (meter), of taking and recording measurements. Dispatching is included | | |
| | Administrative charges | ✓ | | | | ◑ | | | |
| | Capacity payment | | | ✓ | | | ◑ | Installation and maintenance of the meter (meter), as well as the costs of taking and recording measurements | |
| General charges and other components | CTA levy | ✓ | ✓ | | | ◑ | Transmission tariff contribution (CTA), helps fund the specific pension rights of employees covered by the electricity and gas industries scheme. Indexed on the fixed elements of the grid tariff (TURPE). A stable TURPE results in a stable CTA | | |
| Taxes & others | "Accise" on electricity | | | ✓ | | ◑ | Merged 2 former taxes: CSPE and TICFE. Initially financed the extra-costs of the RES support mechanisms and transition of the non-interconnected zones or specific social mechanisms. Steadily increasing since 2003. In 2021, it was decided to un-index its value from the real cost of support mechanisms: it is now set in the Finance Law | | |
| | Value Added Tax (VAT) ² | | | | | ◑ | Indirect tax on supplies of goods and services effected within the territory of the State in the exercise of trade or profession and on imports by any person | | |

Sources: CRE, AFRY Analysis | Notes: 1. Qualitative assessment for EV charging use, 2. Excluded



3. OVERVIEW OF COUNTRY ENERGY TARIFFS – FRANCE – GRID CHARGES

Grid tariffs are paid to the TSO/DSO, directly or via the retailer, and are regulated by the CRE

FOUR PRINCIPLES FOR THE GRID TARIFFS

Main principles



Postage stamp principle:

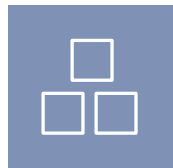
The tariff is independent of the distance travelled by the electricity between the site where it was generated and the site where it is consumed



Principle of tariff equalisation:

In a spirit of solidarity between territories, the TURPE is applied in the same way throughout mainland France territory

Additional principles



Principle of a dual tariff component (binomial tariff):

Excluding HTB3 and injection, the tariff comprises a power and an energy component, to take account of the different consumption patterns of the customers



Time-of-use principle:

Variation of the withdrawal component according to the time of use of the network to account for the stress level of the system

INDEXATION OF THE TARIFF SCHEDULE

- Every 4-6 years, the whole tariff structure is revised by the CRE: TURPE 7 application will start in 2025 (for the 2025-29 period) to account for structural changes in investment and operational costs incurred by the TSO
- During each period, annual update on August 1st, based on:
 - The consumer price index (CPI) excluding tobacco
 - The *ex-post* correction of deviations in revenue and expenditure in relation to authorised income (+/-2%)

Regulator & TSO

The Energy Regulation Commission (CRE)



CRE, the French Energy Regulatory Commission, was created on 24 March 2000. Its role is to ensure that the electricity and gas markets in France operate smoothly, for the benefit of end consumers and in line with energy policy objectives.

RTE (Réseau de Transmission d'Électricité)



Public company (owned by EDF at 50.1%) in charge of operating and managing the electricity transmission grid in the country, namely designed as the Transmission System Operator (TSO).



3. OVERVIEW OF COUNTRY ENERGY TARIFFS – FRANCE – GRID TARIFF

The choice of voltage range and the consumption profiles highly impact grid costs

APPLICABLE GRID TARIFFS

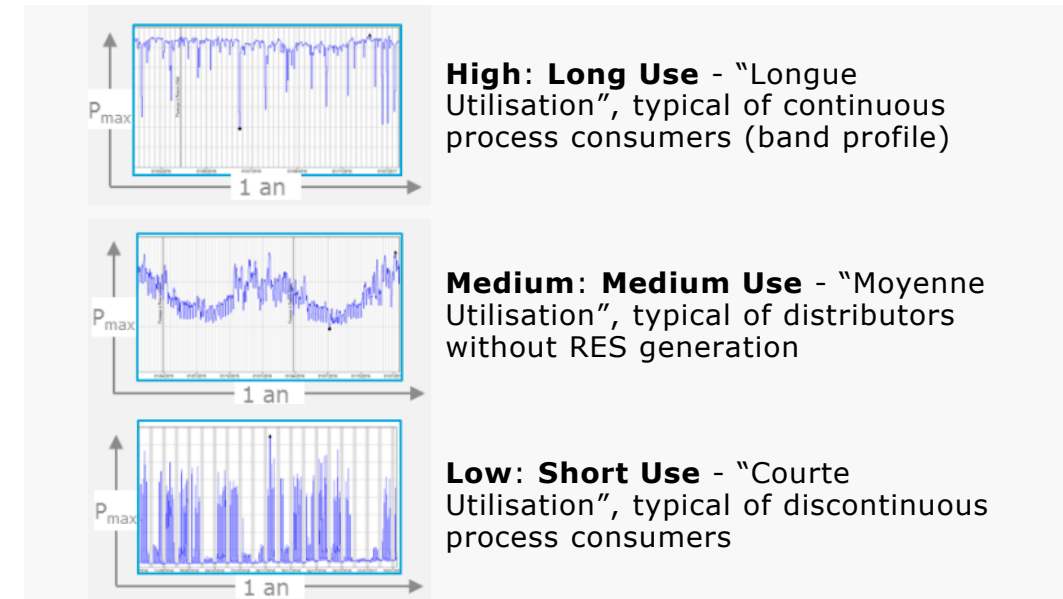
Depends on connection's intensity level (In)

| Connection Voltage | Applicable tariff |
|----------------------|-------------------|
| 0 kV < Un ≤ 1 kV | BT ≤ 36 kVA |
| | BT > 36 kVA |
| 1 kV < Un ≤ 50 kV | HTA |
| 50 kV < Un ≤ 130 kV | HTB1 |
| 130 kV < Un ≤ 350 kV | HTB2 |
| 350 kV < Un ≤ 500 kV | HTB3 |

– Low and Medium voltage tariffs cover Enedis's costs, while High voltage tariffs cover RTE's costs

CONSUMPTION PROFILES & TARIFF VERSIONS

- There are three tariff versions: Short Use (SU), Medium Use (MU) and Long Use (LU), according which the withdrawal component factors vary to adapt to the consumption profiles
- The Customer chooses which one to apply:



Sources: AFRY analysis, CRE, RTE



Agenda

| | |
|--|----|
| 1. Executive summary | 4 |
| 2. Scope and approach of the study | 8 |
| 3. Overview of country energy tariffs | 11 |
| 4. Individual configuration assessment | 26 |



4. INDIVIDUAL CONFIGURATION ASSESSMENT





Five typical EV charging configurations have been considered in the analysis to identify and evaluate differences between the related electricity tariffs

| | LOW VOLTAGE | | MEDIUM VOLTAGE | | |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | CONFIGURATION 1 | CONFIGURATION 2 | CONFIGURATION 3 | CONFIGURATION 4 | CONFIGURATION 5 |
| | | | | | |
| Consumption [kWh/year] | 8,000 | 15,000 | 37,000 | 85,000 | 130,000 |
| Power [kW] | 50 | 99 | 250 | 600 | 1,200 |
| FUE [%] | 1.83% | 1.73% | 1.69% | 1.62% | 1.24% |
| Italian tariff | BTVE | BTVE | MTA2 | MTA3 | MTA3 |

Notes: values agreed with Motus-E. No storage systems and/or secondary energy sources in addition to the electricity grid

4. INDIVIDUAL CONFIGURATION ASSESSMENT





Configuration 1

| |  |  |  |  |
|--------------------------------------|---|---|---|---|
| Applied tariff | BTVE | Household-equivalent | 3.0 TDVE | BT ≤36 kVA |
| Components [€/kWh] | | | | |
| Energy | 0.14 | 0.10 | 0.03 | 0.05 |
| System charges | 0.06 | 0.14 | 0.09 | 0.04 |
| General charges and other components | 0.07 | 0.00 | 0.00 | 0.00 |
| Takes & others (no VAT) | 0.01 | 0.04 | 0.00 | 0.00 |
| Total | 0.28 | 0.28 | 0.13 | 0.09 |
| Fixed cost term | 0.00 | 0.05 | 0.00 | 0.01 |
| Power term | 0.00 | 0.00 | 0.04 | 0.00 |
| Energy term | 0.28 | 0.23 | 0.08 | 0.08 |

| |
|--------------------------------|
| Configuration specifics |
| Consumption [kWh/year] |
| 8,000 |
| Power [kW] |
| 50 |
| FUE [%] |
| 1.83% |
| Italian tariff |
| BTVE |

4. INDIVIDUAL CONFIGURATION ASSESSMENT





Configuration 2

| |  |  |  |  |
|--------------------------------------|---|---|---|---|
| Applied tariff | BTVE | Commercial | 3.0 TDVE | BT ≤36 kVA |
| Components [€/kWh] | | | | |
| Energy | 0.14 | 0.10 | 0.03 | 0.05 |
| System charges | 0.06 | 0.10 | 0.09 | 0.07 |
| General charges and other components | 0.07 | 0.00 | 0.00 | 0.01 |
| Takes & others (no VAT) | 0.01 | 0.03 | 0.00 | 0.00 |
| Total | 0.28 | 0.23 | 0.13 | 0.12 |
| Fixed cost term | 0.00 | 0.03 | 0.00 | 0.04 |
| Power term | 0.00 | 0.00 | 0.05 | 0.01 |
| Energy term | 0.28 | 0.20 | 0.08 | 0.08 |

| |
|--------------------------------|
| Configuration specifics |
| Consumption [kWh/year] |
| 15,000 |
| Power [kW] |
| 99 |
| FUE [%] |
| 1.73% |
| Italian tariff |
| BTVE |

4. INDIVIDUAL CONFIGURATION ASSESSMENT





Configuration 3

| |  |  |  |  |
|--------------------------------------|---|---|---|---|
| Applied tariff | MTA2 | Commercial | 3.0 TDVE | HTA |
| Components [€/kWh] | | | | |
| Energy | 0.14 | 0.10 | 0.03 | 0.05 |
| System charges | 0.22 | 0.09 | 0.09 | 0.04 |
| General charges and other components | 0.18 | 0.00 | 0.00 | 0.01 |
| Takes & others (no VAT) | 0.01 | 0.03 | 0.00 | 0.00 |
| Total | 0.55 | 0.21 | 0.13 | 0.10 |
| Fixed cost term | 0.03 | 0.01 | 0.00 | 0.03 |
| Power term | 0.33 | 0.00 | 0.05 | 0.01 |
| Energy term | 0.20 | 0.20 | 0.08 | 0.06 |

| |
|--------------------------------|
| Configuration specifics |
| Consumption [kWh/year] |
| 37,000 |
| Power [kW] |
| 250 |
| FUE [%] |
| 1.69% |
| Italian tariff |
| MTA2 |

4. INDIVIDUAL CONFIGURATION ASSESSMENT





Configuration 4

| |  |  |  |  |
|--------------------------------------|---|---|---|---|
| Applied tariff | MTA3 | Commercial | 6.1 TDVE | HTA |
| Components [€/kWh] | | | | |
| Energy | 0.14 | 0.10 | 0.03 | 0.05 |
| System charges | 0.19 | 0.08 | 0.14 | 0.03 |
| General charges and other components | 0.17 | 0.00 | 0.00 | 0.00 |
| Takes & others (no VAT) | 0.01 | 0.03 | 0.00 | 0.00 |
| Total | 0.51 | 0.21 | 0.18 | 0.08 |
| Fixed cost term | 0.01 | 0.01 | 0.00 | 0.01 |
| Power term | 0.30 | 0.00 | 0.08 | 0.01 |
| Energy term | 0.20 | 0.20 | 0.09 | 0.06 |

| |
|--------------------------------|
| Configuration specifics |
| Consumption [kWh/year] |
| 85,000 |
| Power [kW] |
| 600 |
| FUE [%] |
| 1.62% |
| Italian tariff |
| MTA3 |

4. INDIVIDUAL CONFIGURATION ASSESSMENT

Configuration 5

| |  |  |  |  |
|--------------------------------------|---|---|---|---|
| Applied tariff | MTA3 | Industrial | 6.1 TDVE | HTA |
| Components [€/kWh] | | | | |
| Energy | 0.14 | 0.10 | 0.03 | 0.05 |
| System charges | 0.24 | 0.04 | 0.17 | 0.03 |
| General charges and other components | 0.20 | 0.00 | 0.00 | 0.00 |
| Takes & others (no VAT) | 0.01 | 0.02 | 0.00 | 0.00 |
| Total | 0.60 | 0.16 | 0.20 | 0.08 |
| Fixed cost term | 0.01 | 0.00 | 0.00 | 0.01 |
| Power term | 0.39 | 0.00 | 0.11 | 0.01 |
| Energy term | 0.20 | 0.15 | 0.09 | 0.06 |

| |
|--------------------------------|
| Configuration specifics |
| Consumption [kWh/year] |
| 130,000 |
| Power [kW] |
| 1,200 |
| FUE [%] |
| 1.24% |
| Italian tariff |
| MTA3 |

The AFRY team brings together expert knowledge of electric mobility and energy markets



ORAZIO CORVA

Principal Future Cities & Mobility

Milan office

Orazio is a senior expert of mobility services operated through BEV fleets. Before joining AFRY he led car2go (Share Now) Iberia operating the car sharing business through a BEV fleet of 800 Smart EV; he oversaw business development for Acciona Mobility operating a fleet of 8,000 electric mopeds in Europe; as consultant he led projects on EV charging, fleet management, among others. Orazio was also involved in UI design and system integration projects



PAOLO PACCIARINI

Principal Energy Markets

Milan office

Paolo has been part of the Milan office since 2015 and is responsible for forward looking market analysis projects in Italy. Paolo has led a large number of projects focused on the assessment of power price evolution at both wholesale and retail level. In parallel, he has also been responsible for valuation activities on power generation assets including RES, storages, thermal and hydro



CLAUDIO MOLTENI

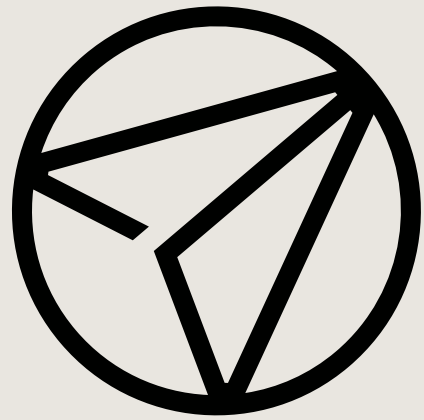
Consultant Future Cities & Mobility

Milan office

Claudio is core member of the Future Cities and Mobility expertise cluster of AFRY. He has supported companies worldwide in their transition towards sustainable cities and transport, both at strategic and technical level. Claudio completed several projects in the mobility field, especially on EV charging and urban transport, as consultant, project manager and expert, in Italy and abroad. He holds a degree in engineering and management

A futuristic white electric car is shown from a rear three-quarter view, plugged into a modern, sleek charging station. The station has a glowing blue lightning bolt icon. The scene is set in a futuristic, open landscape with a large wind turbine in the background under a bright, hazy sky. The overall aesthetic is clean and high-tech.

Making Future



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