European Commission

Energy prices

in EU Member States and main trading partners

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Introduction

The findings presented in this brochure are derived from Task 1 of the Study on energy prices, costs and their impact on industry and households conducted by Trinomics in association with Enerdata, Cambridge Econometrics and LBST.

The study presents an analysis of the evolution and drivers of wholesale and retail electricity, natural gas, petroleum products, biofuels and other alternative fuels prices in the EU and with comparisons to major trading partners and the G20.

This analysis covers:

- Electricity
- Gas
- Petroleum products
- Electric Vehicle charging

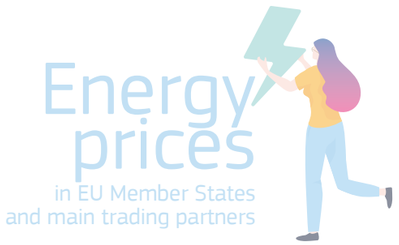
For the markets:

- Wholesale
- Household
- Industry

For the EU Member States and non-EU G20 countries (including the UK), for years 2008 to 2019.

EU price averages are weighted by final energy consumption and based on prices for the consumption band with the highest share within a country, typically for electricity household: Band DC (annual consumption of 2 500 – 5 000 kWh), electricity industrial: Band ID (annual consumption of 2 000 – 20 000 MWh); natural gas household: Band D2 (annual consumption of 20-200 GJ) and, natural gas industrial: Band I4 (annual consumption of 100 000-1 000 000 GJ). All EU industrial prices exclude all recoverable taxes and levies.

The detailed methodology and complete findings can be found in the final report available **here**.



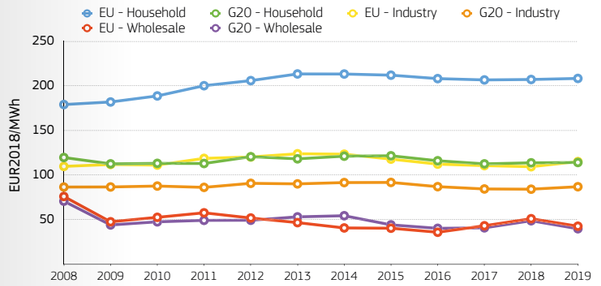
Overview EU vs G20 average

Headline findings

- EU wholesale and industrial prices for both gas and electricity are comparable to G20 prices, but household electricity and gas prices are substantially higher.
- Average EU prices for transport fuels (petrol and diesel) are higher than the average for G20 countries. This is mainly due to higher tax rates in the EU
- EU and G20 prices have not varied substantially, with the exception of household electricity prices and, to a lesser extent, household gas prices, where the gap has widened.

Electricity

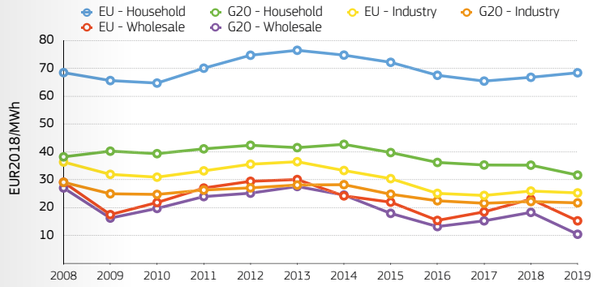
EU and G20 average electricity prices by market



- EU wholesale electricity prices are in line with G20 average.
- EU industrial electricity prices are slightly higher than the G20 average, the gap is quite stable over time.
- EU household electricity prices are substantially higher than the G20 average.

Gas

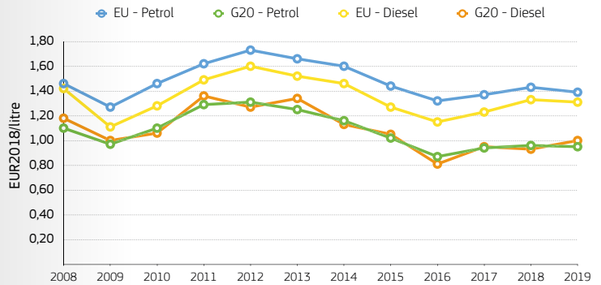
EU and G20 average gas prices by market



- EU wholesale gas prices are broadly in line with G20 average.
- EU industrial gas prices are higher but have converged towards the G20 average compared to 2008.
- EU household prices are substantially higher than G20 household prices.

Petroleum products

Average fuel prices (including taxes)



- Petrol and diesel are more expensive in the EU compared to G20 average prices.
- Over time, petrol and diesel prices have evolved in a similar way.

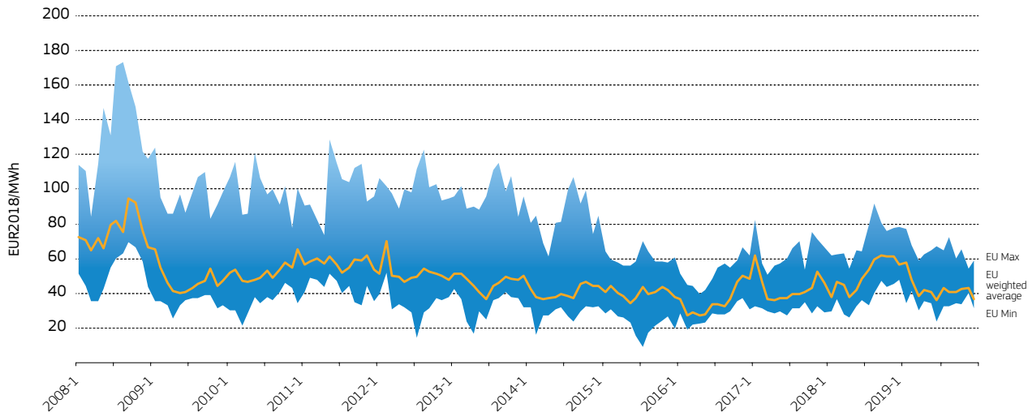
Electricity prices in the EU

Headline findings

- Wholesale, household and industrial prices have been relatively stable since 2009
- While the difference between the highest and lowest wholesale prices across EU Member States has been narrowing close to the EU average, the range has remained wide for household and industrial prices.

Wholesale

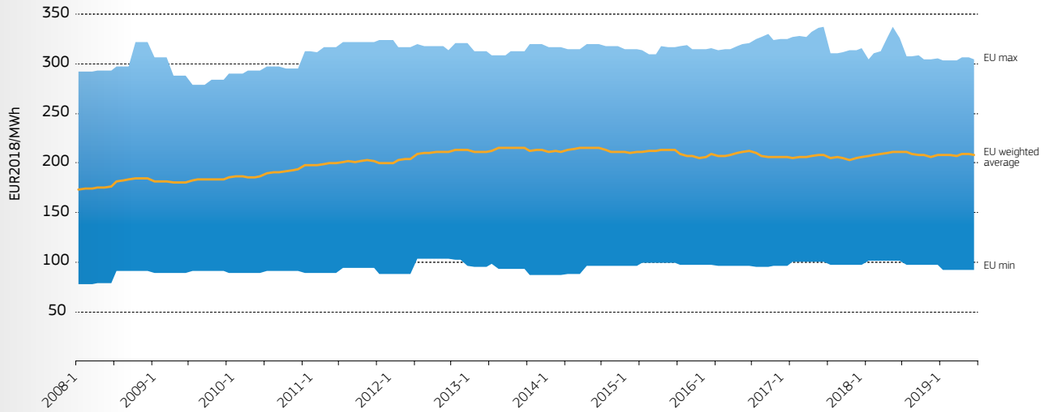
EU consumption weighted average wholesale electricity prices*



- Wholesale prices have been relatively stable since 2009, but after 2017 volatility increased
- Several factors affected the prices:
- ▼Downwards: low gas prices, increased renewable electricity output
- ▲Upwards: increase in cost of EU-ETS allowances, increasing the price of power from coal, oil and, to a lesser extent, natural gas

Household

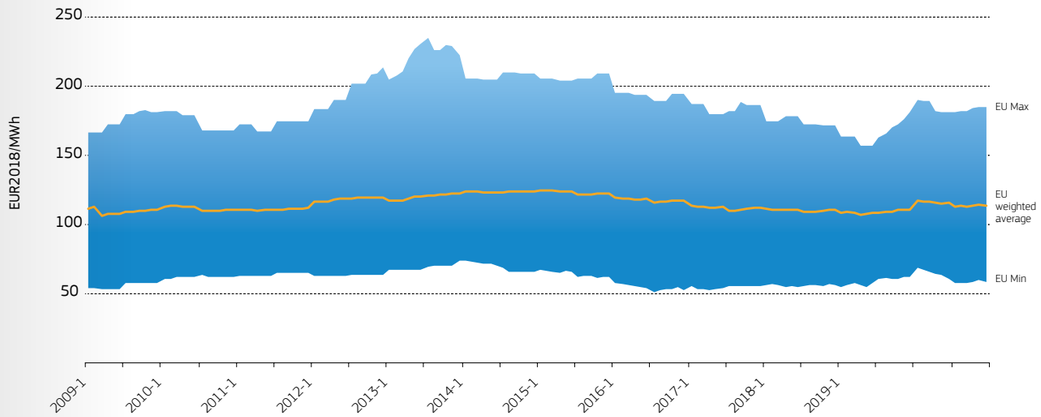
EU consumption weighted average household electricity prices*



- EU average household prices have been quite stable since 2013 – at around 210 EUR/MWh.
- The breadth of the price range between Member States has also remained similar – household prices varying between plus and minus 100 EUR/MWh compared to the average

Industrial

EU consumption weighted average industrial electricity prices*



- EU average industrial prices have been quite stable over time at around 100-120 EUR/MWh.
- The breadth of the price range between Member States has spanned from 50 EUR/MWh to 220 EUR/MWh between 2008 and 2019

** The blue ranges represent the range between the highest and lowest prices in any EU Member State at that moment in time*

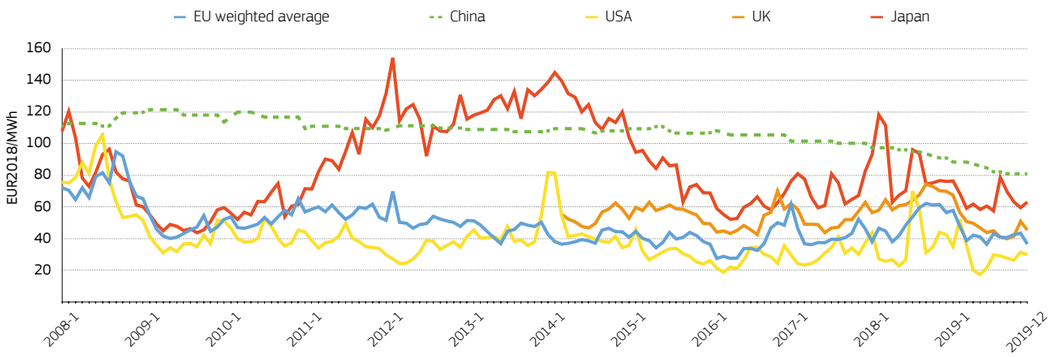
Electricity prices in the EU and rest of the world

Headline findings

- EU wholesale prices have been comparable to the prices in USA, China, UK and Japan between 2008 and 2019.
- EU household prices have been among the highest together with Japanese and UK prices.
- EU industrial prices have been comparable to UK prices, lower than Japanese prices but higher than US and Chinese prices.

Wholesale

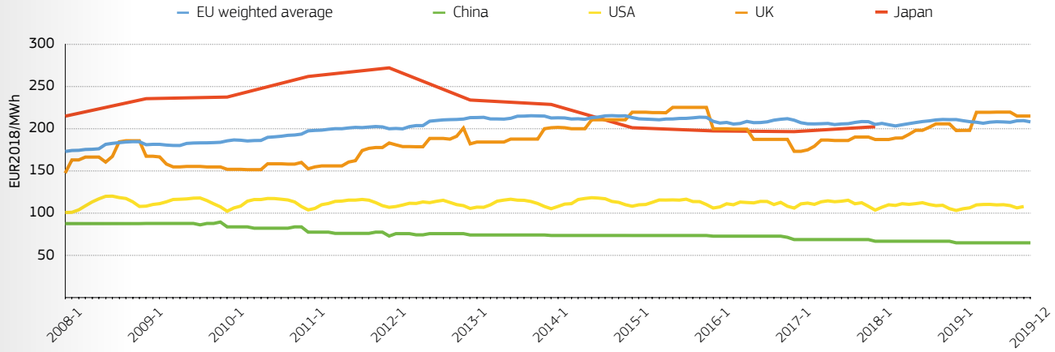
Average wholesale electricity prices in EU, US, China, UK and Japan



- US prices are generally below EU prices, although the relative position have swapped a few times in occasion of US peaks.
- Chinese prices are consistently higher than EU prices, although these are now converging.
- Prices in UK are in general higher than in EU, but the gap has been closing.
- Japanese prices are higher than those in the EU, especially since the Fukushima disaster, but have converged somewhat since a peak in 2014. Japanese prices are still subject to high seasonal fluctuations.

Household

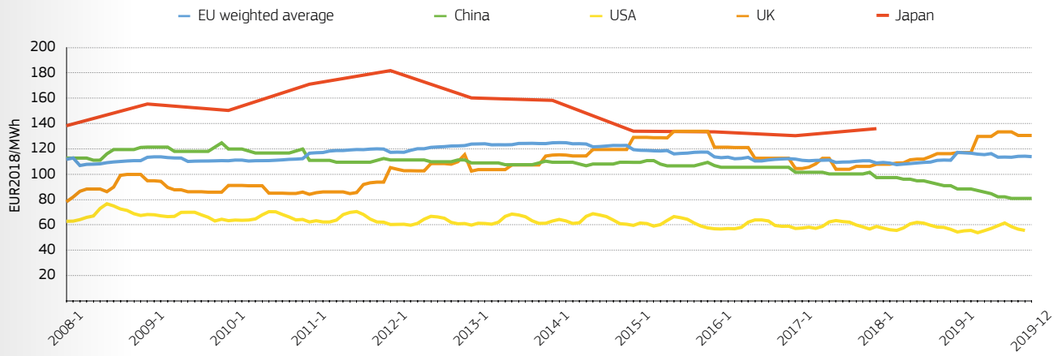
Average household electricity prices in EU, US, China, UK and Japan



- US prices are around half of the EU average price. US prices have, subject to seasonal variations, remained at around the same level between 2008 and 2019
- Chinese prices are around one third of the EU average price
- UK prices have been increasing over time and since 2014 are very close to the EU average price
- Prices in Japan started higher than the EU average but since 2012 have declined significantly and were in line with the EU27 average up to the start of 2018

Industrial

Average industrial electricity prices in EU, US, China, UK and Japan



- US prices are around half the EU average price and have been slowly drifting lower between 2008 and 2019
- Prices in China were at a comparable level to the EU average between 2015 and 2018 but have diverged since as they continued declining until 2019. They have been declining since 2011
- UK prices have been increasing over time and since 2014 are very close to the EU average price
- Prices in Japan have been higher than the EU average, but converged to a level around 10-20% higher than the EU average in 2015-2016

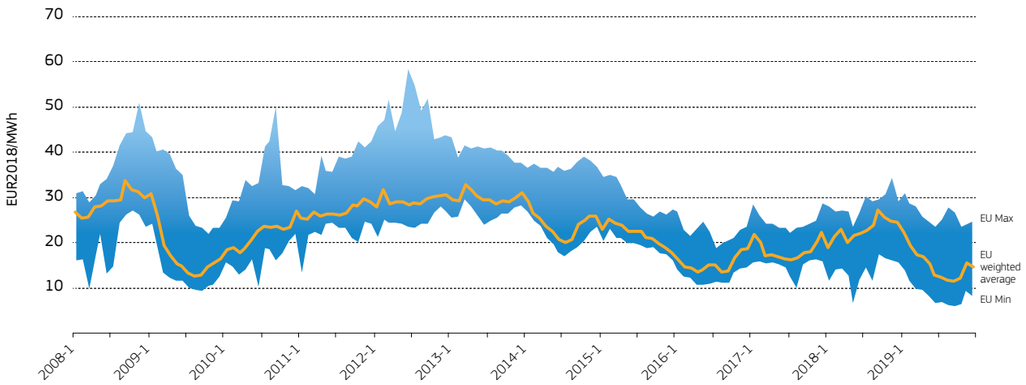
Natural gas prices in the EU

Headline findings

- Wholesale and industrial natural gas prices have fluctuated considerably since 2009.
- Household prices have experienced regular seasonal variations.
- Industrial prices have decreased since a peak in 2014, and the differences across EU states have reduced substantially.

Wholesale

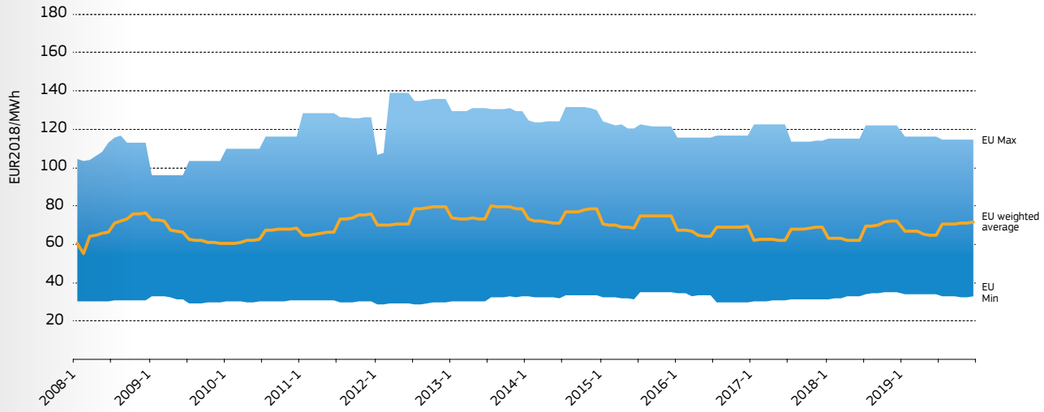
Average wholesale gas prices in EU*



- EU gas prices are influenced by crude oil prices and global trends.
- Prices in 2019 were the lowest since 2009.
- Some peaks at the top or bottom of the range signal short term shortages in some Member States.

Household

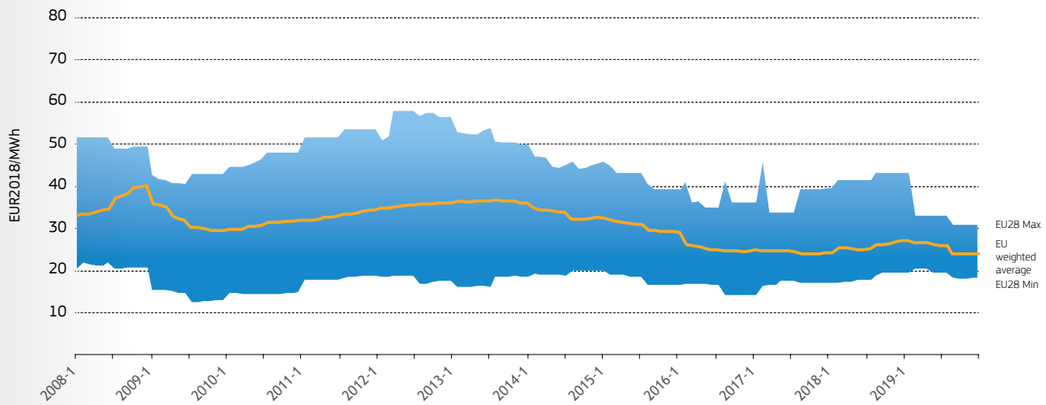
Average household gas prices in EU*



- EU average household prices have fluctuated seasonally but remained relatively stable, around 60-70 EUR/MWh, between 2008-2019.
- There is a wide price spread across Member States, with prices in the most expensive countries being as much as three times higher than in the least expensive ones.

Industrial

Average industrial gas prices in EU*



- Industrial prices have been decreasing since 2014 and differences between Member States have been reducing.
- Industrial prices show a similar trend to wholesale prices, but with less short term variability.

** The blue ranges represent the range between the highest and lowest prices in any EU Member State at that moment in time*

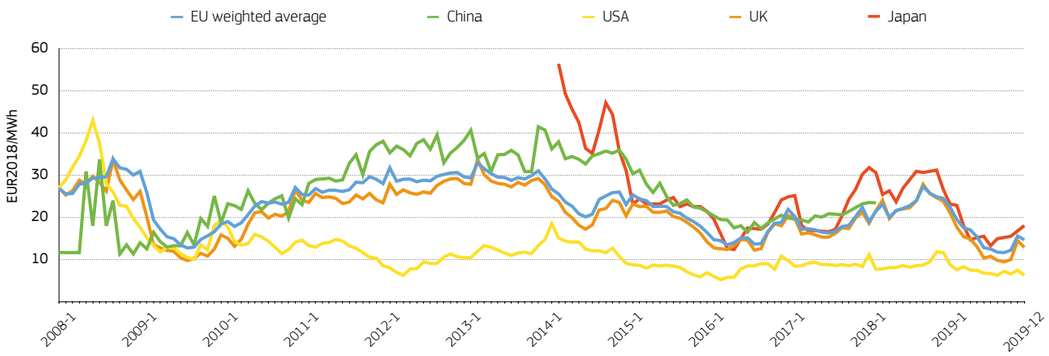
Gas prices in the EU and rest of the world

Headline findings

- EU average wholesale prices have been comparable to prices in China, the UK and Japan but higher than US prices between 2008-2019.
- EU average household prices have been among the highest globally, only Japanese prices are higher.
- EU average industrial prices have been higher than US and UK prices but lower than Chinese prices.

Wholesale

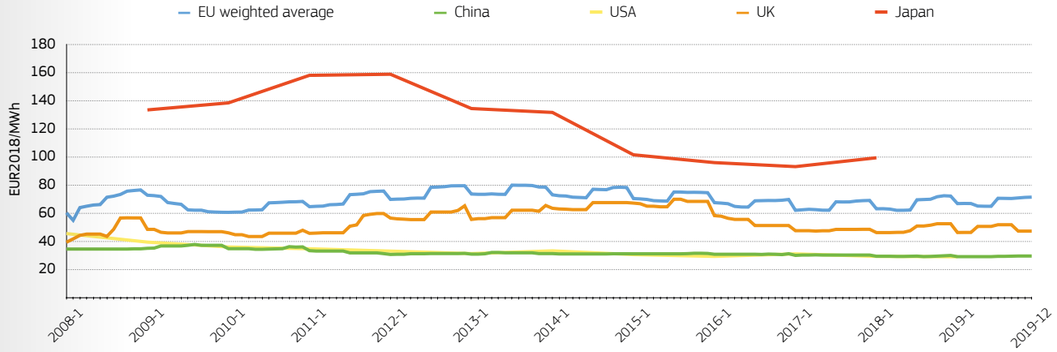
Average wholesale gas prices in EU, US, China, UK and Japan



- US wholesale gas prices have historically been much lower than EU prices, but EU prices are recently converging.
- Since 2015, Chinese and Japanese prices have converged towards EU prices.
- UK prices are slightly lower than EU prices.

Household

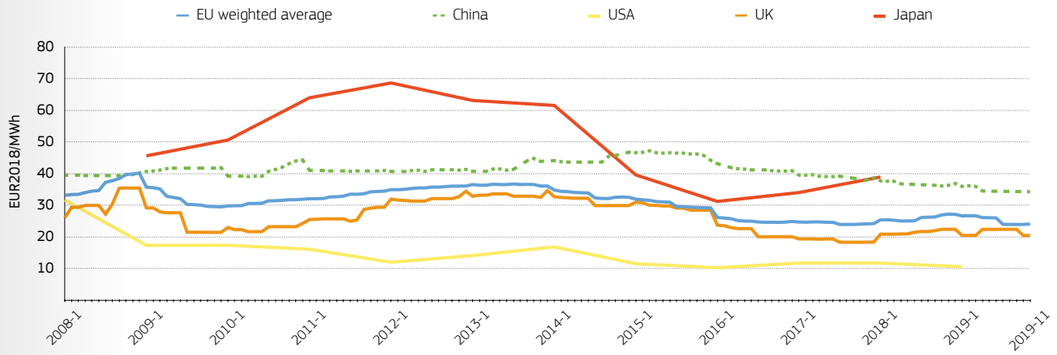
Average household gas prices in EU, US, China, UK and Japan



- EU average household prices have historically been higher than prices in US, and the gap is stable over time.
- Chinese prices are very similar to US prices, and substantially lower than EU average prices.
- UK prices are lower than the EU average price, but closely track its variation.
- Prices in Japan are highest of all, but since 2012 have decreased and are now closer to EU prices, although still higher.

Industrial

Average industrial gas prices in EU, US, China, UK and Japan



- US industrial prices have historically been lower than EU average prices, and are still less than half (10 EUR/MWh compared to 25 EUR/MWh in 2019).
- Chinese prices are higher than EU prices, and since 2015 follow a similar downwards trends.
- UK prices are slightly lower than the EU average, and closely follow its variations.
- Japanese prices dipped close to the EU average price in 2016, since a peak in 2012, but have diverged higher again since 2016.

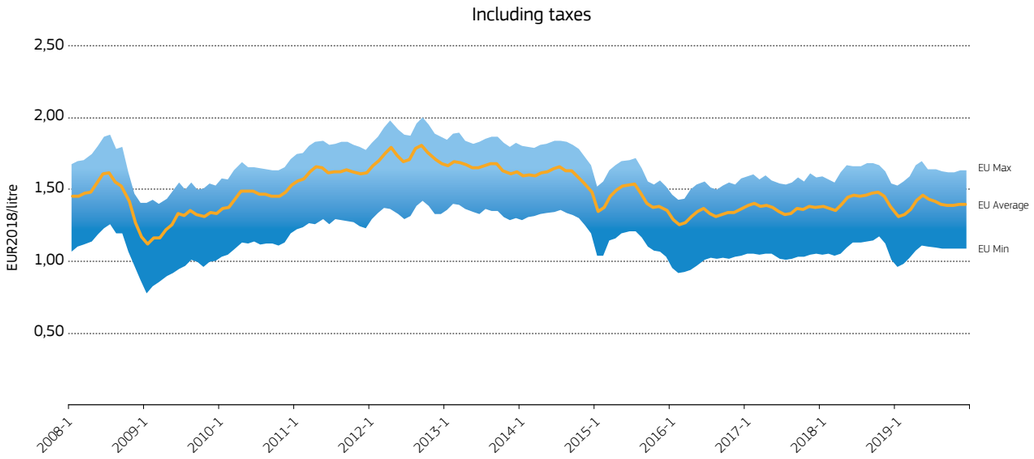
Petroleum products in the EU and rest of the world

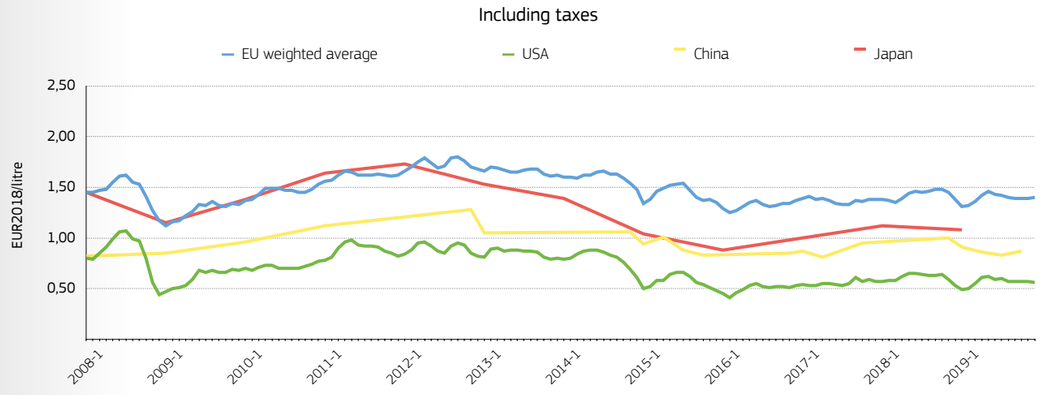
Headline findings

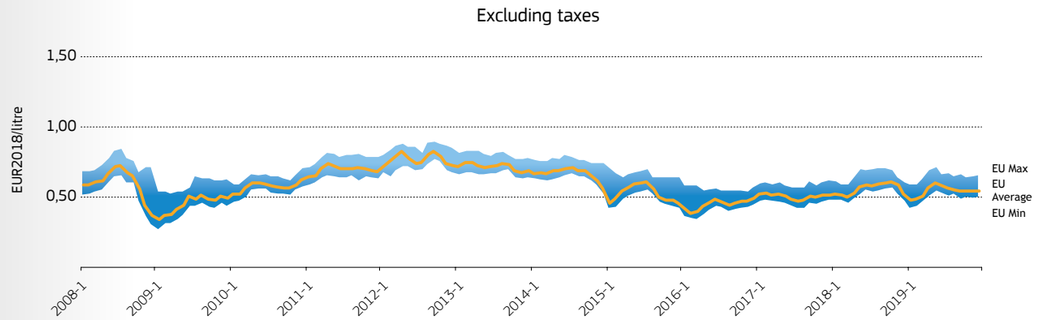
- Prices for petrol and diesel follow international crude oil price trends.
- EU average petrol and diesel prices (including taxes) are higher than in other G20 economies while the EU average price (excluding taxes) is comparable to prices in the G20.
- However, EU average heating oil prices (including taxes) are similar to other G20 prices

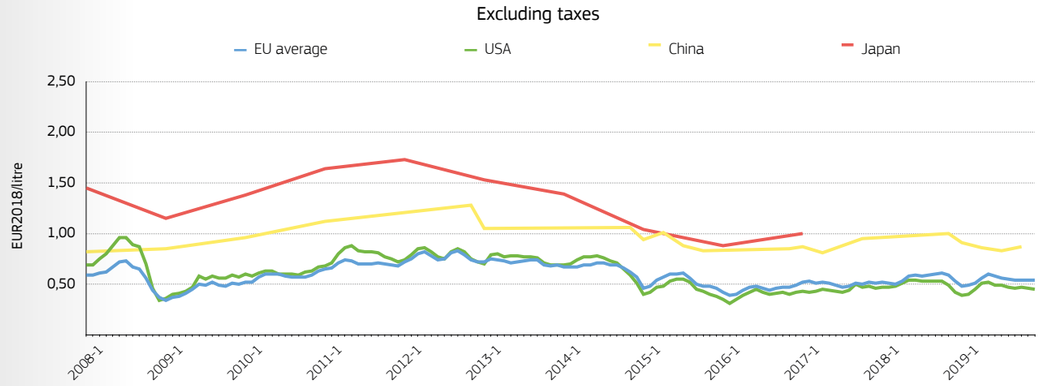
Petrol

Average petrol prices in EU# and major G20 countries*









- The EU average price for petrol has remained relatively stable since 2015, after it declined from a peak in 2012. The price ranges observed have also remained relatively constant over time.
- Compared to the main G20 economies, the effect of taxation on petrol is much higher in Europe than in China and the US, making EU average prices much higher.
- Excluding taxes, petrol prices in the EU are similar to US prices, and lower than prices in China and Japan.

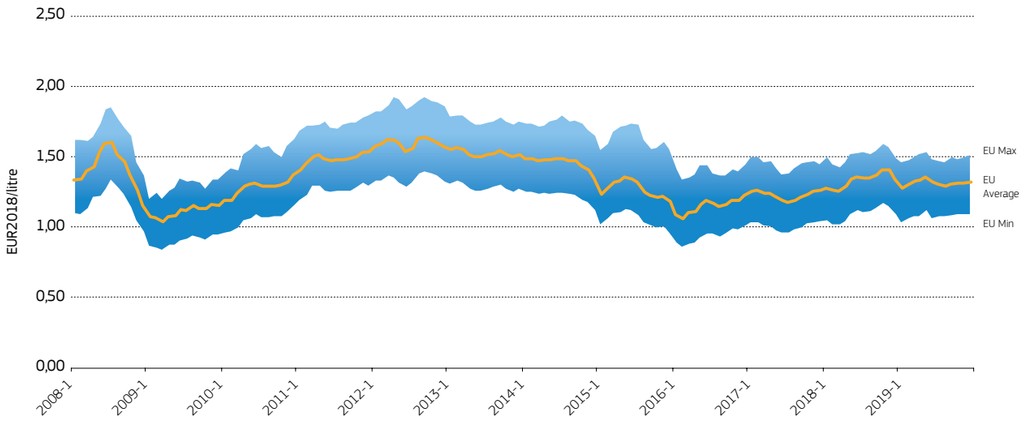
** The blue ranges represent the range between the highest and lowest prices in any EU Member State at that moment in time.*

 # The EU averages on this page represent the average of the countries constituting the EU at that moment in time, therefore including the UK prior to 2020, and excluding Croatia prior to 2013. This is in contrast to earlier pages of electricity and natural gas which represent the current EU27, excluding the UK.

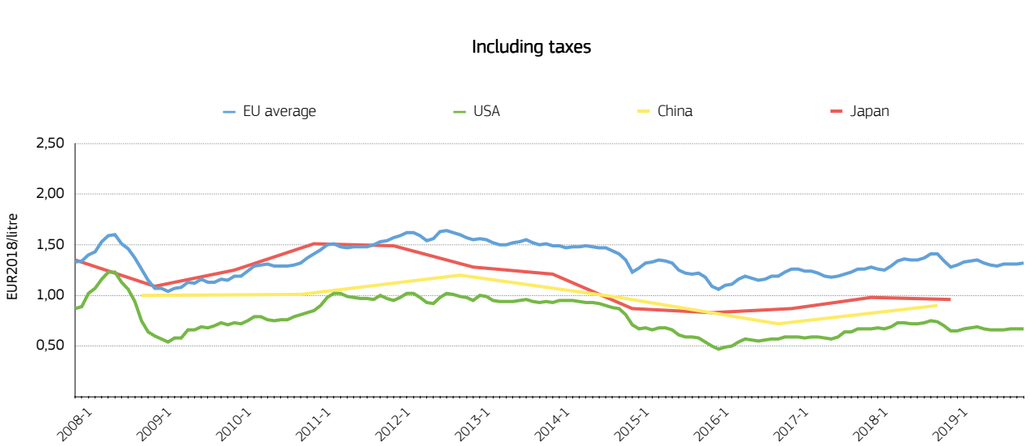
Diesel

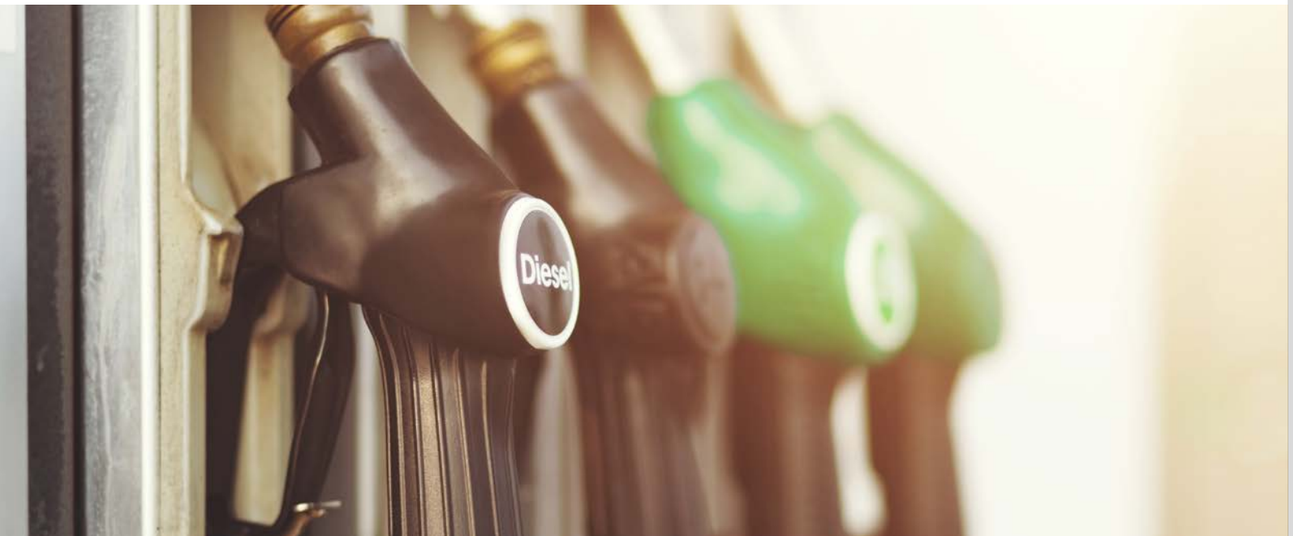
Average diesel prices in EU# and major G20 countries*

Including taxes

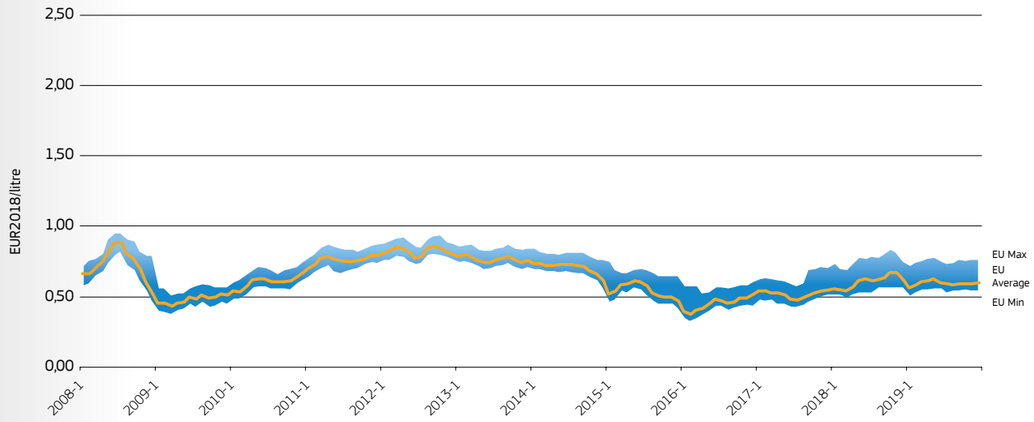


Including taxes

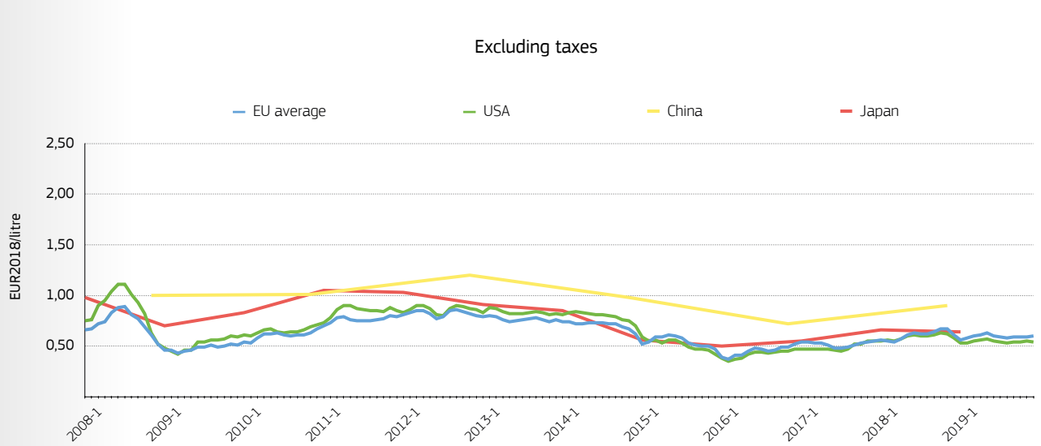




Excluding taxes



Excluding taxes



- The EU average price for diesel has seen increased since 2016, after it declined from a peak in 2012. The price ranges observed have remained relatively constant.
- Compared to the main G20 economies, the effect of taxation on diesel is much higher in the EU than in China and US, making EU prices the highest.
- Excluding taxes, petrol prices in the EU are similar to US prices, and lower than prices in China and Japan.

** The blue ranges represent the range between the highest and lowest prices in any EU Member State at that moment in time.*

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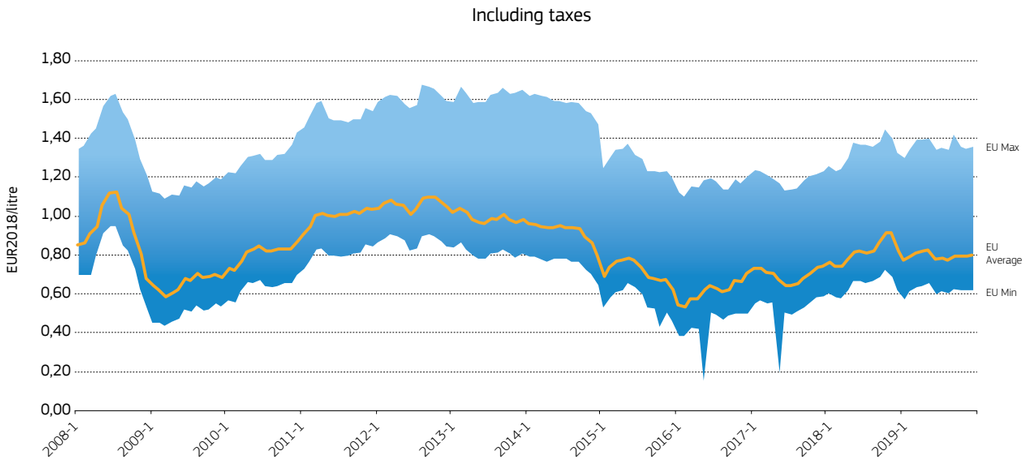
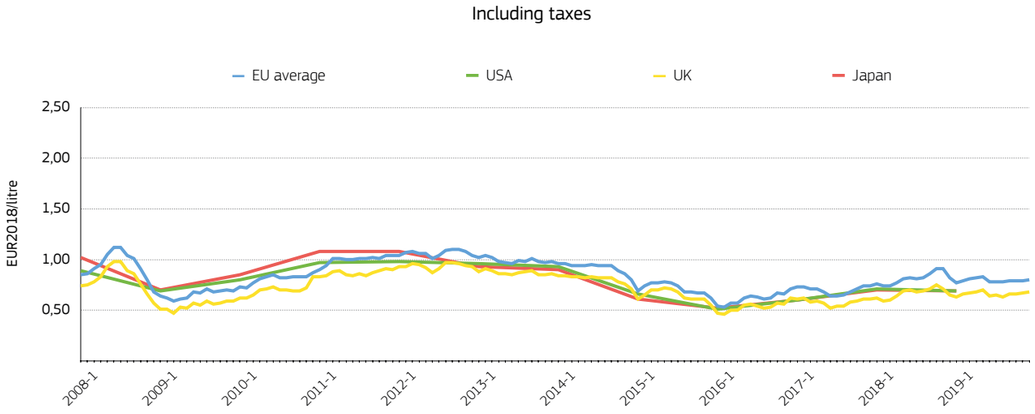
Heating oil

Average heating oil prices in EU# and major G20 countries*





- The EU average heating oil price increased between 2016 and 2018 before remaining relatively stable in 2019.
- The EU average is very close to the bottom of the observed range of values, which suggests that countries which consume the most heating oil in the EU have lower EU prices.
- EU Prices including taxes are in line with prices observed in other G20 countries and evolve similarly.

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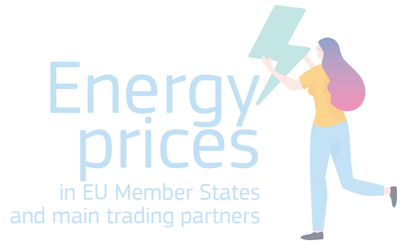


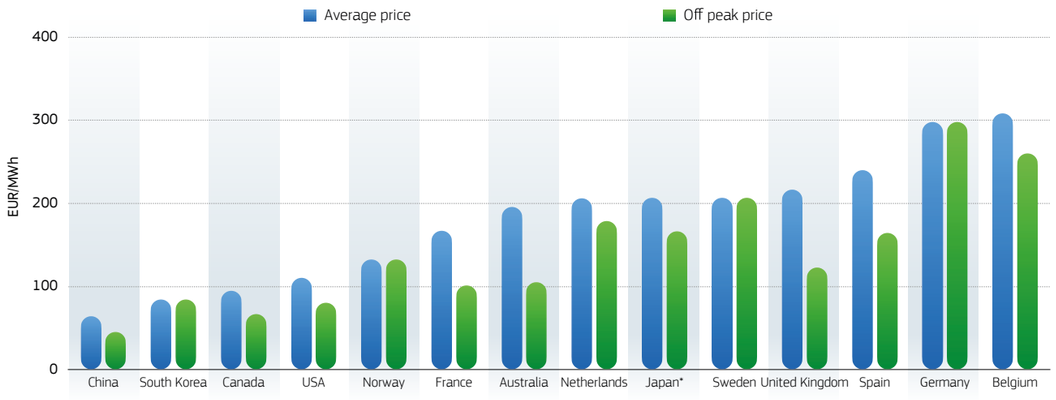
Electric Vehicle charging

Headline findings

- Data on electricity prices for vehicle charging is scarce and heterogenous
- Prices vary widely between and within countries.
- Within a country, prices vary considerably depending on the charging location (home or public spaces), the time the vehicle is charged (peak or off-peak) and on the speed of the charging station

Electricity prices for charging vehicles at home

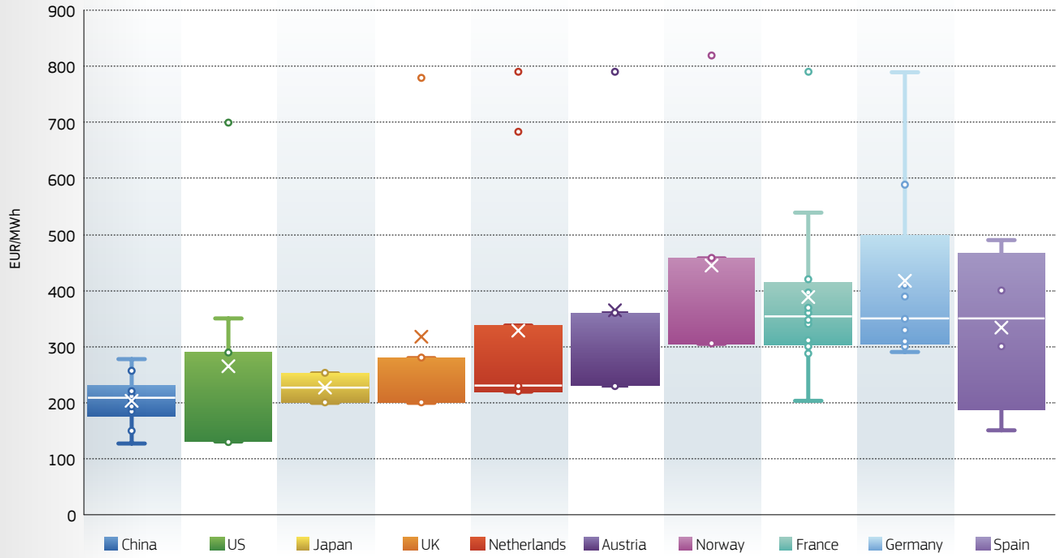
Electricity prices for households in EUR/MWh (2019)



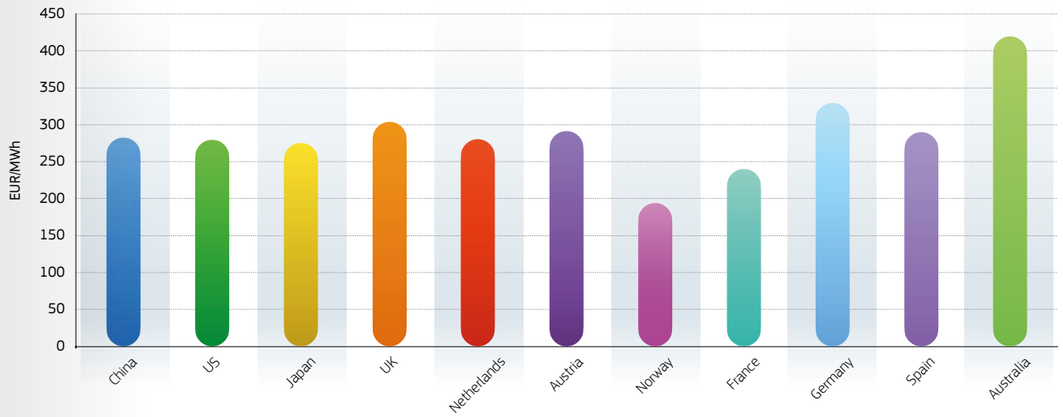
- As shown earlier in this brochure, household electricity prices tend to be higher in Europe than in the G20, with the exceptions of Japan and Australia
- Charging at home at peak times typically costs 150-300 EUR/MWh in Europe
- Off peak prices can be considerably lower with 50-100 EUR/MWh discounts observed in many countries

Electricity prices for charging vehicles at public charging points

Representative sample of EV public charging prices in EUR/MWh (calculation based on several sources covering UK, USA China, The Netherlands, France, Austria, Norway, Japan, Germany)



EV fast and superfast public charging prices in Tesla network (EUR/MWh).



- In Europe public charging prices vary between the 200-350 EUR/MWh observed in the UK, Austria and Netherlands, and the highest prices of 250-450 EUR/MWh observed in Norway, France, Germany and Spain.
- Public charging prices in United States, China and Japan of 150-250 EUR/MWh appear to be lower than in Europe
- Public fast charging prices fall into a similar range 200-300 EUR/MWh in most countries globally, the lowest prices of just under 200 EUR/MWh can be found in Norway

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