Deloitte.

Newsletter

Power & Utilities in Europe

May 2021

Newsletter
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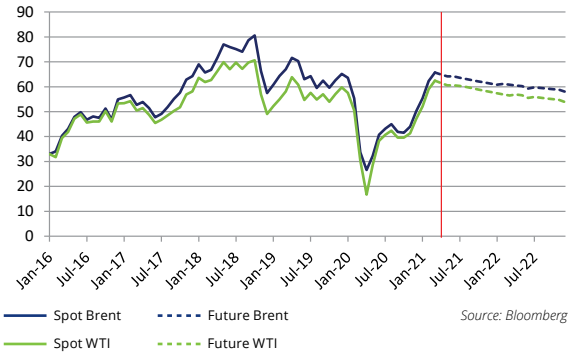
Commodities

Crude oil ($/bbl)



Source: Bloomberg

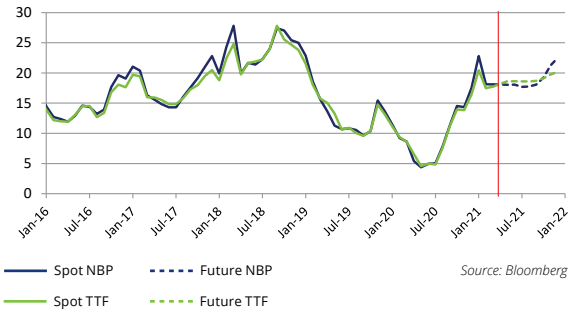
Oil prices continued to rebound in Q1 2021, driven by both demand and supply side drivers. The price of both WTI and Brent reached $65.73/bbl and $62.43/bbl respectively on average across March 2021, underlying an approximate 60% price rise since October 2020. A combination of factors led to the reversal of the downward trend, pushing prices to their highest level in a year.

Demand for oil has surged on the belief that countries will pursue a consumption-led recovery to offset the effects of the COVID-19 pandemic. Countries with the most successful mitigation measures against COVID-19 such as China, one of the biggest oil consumers, observed returns to near-normal levels of economic activity. Chinese imports of crude oil have risen sharply as the country continues to recover, fuelling expectations of higher oil demand. Mass vaccination programmes in Europe and the US have raised confidence and optimism further fuelling demand, with further upward pressures expected as these programmes mature. Further adding to the price surge, the Biden administration's stimulus package of $1.9tn was introduced in March 2021 in an attempt to reduce industry pollution whilst boosting employment in oil producing states where the number of oil production projects have increased significantly in the last six months.

Nevertheless, the rally has been eased towards the end of Q1 2021 as a number of European countries introduced new restrictions to tackle the COVID-19 pandemic, signalling that demand remains unstable. Moreover, rising US treasury yields driven by optimism around vaccination programmes have led to a shift in investor sentiment towards bond markets, which was reflected in the slightly lower oil prices in March 2021, though this may also signal an expansionary sentiment for oil as macroeconomic fundamentals improve.

The rally has been intensified by a variety of supply-side factors. In March 2021, the Opec+ oil alliance announced a cut of 500,000 barrels per day to maintain prices as COVID-19 related uncertainty remains persistent, reducing supply expectations. Moreover, freezing temperatures in Texas in February 2021, significantly slowed production leading to higher prices. Furthermore, industry investment is kept at a very low level as oil companies remain focused on maintaining liquidity amid COVID-19 uncertainty.

Gas (€/MWh)



Source: Bloomberg

Gas prices have increased overall in Q1 2021 with both the UK's NBP gas benchmark and the Dutch TTF equivalent rising modestly relative to the last quarter, reaching an average of €18.11/MWh and €17.76/MWh respectively in March 2021.

There have been prominent drivers towards rising gas prices observed across the quarter on both the demand- and supply-side of the market. On the demand-side, the most significant was the impact of a widespread cold snap in East Asia, which resulted to a surge in demand for LNG, with an indirect impact on the pipeline gas NBP and TTF benchmarks. The seriousness of the cold snap, and hence the indirect relevance for NBP and TTF, is underlined by the action observed in Japan, with both the government and power companies having called on consumers to limit their energy consumption as the electricity systems in some areas approached maximum demand.

Similarly, low temperatures in Europe resulted in direct price impacts, with gas reserves being withdrawn from storage. This boost in demand mitigated a more persistent gas oversupply observed in recent months. Consequently, the need to replenish gas storage levels following the period of elevated demand may have provided further upward price pressure.

On the supply-side, production interruptions in Norway, Malaysia, Australia and Qatar combined with a lack of tankers and delays in shipping, especially at the Panama Canal, led to a significant supply crunch of LNG, as well as for pipeline gas in the case of Norway, causing prices to increase.

Coal ($/metric ton)

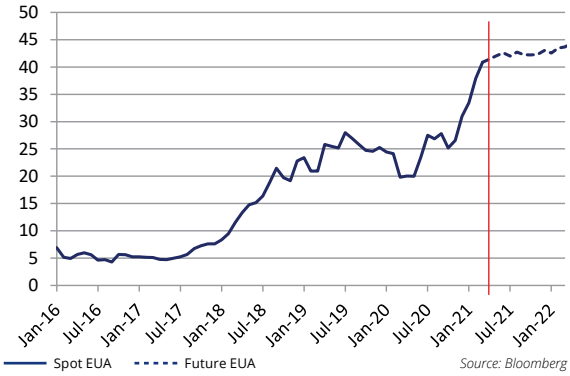
Source: Bloomberg

The price of coal continued to rise in the last quarter, with the Amsterdam-Rotterdam-Antwerp (ARA) index reaching $67.12/metric tonne at the end of March 2021, a 40% increase compared to last year. Despite the ongoing shift towards renewable energy and the impact of the COVID-19 pandemic, a combination of surging demand and restricted supply triggered a trend of consistently high coal prices across the quarter.

A cold snap across east Asia across the quarter fuelled global demand for thermal coal, with major buyers in India, China, South Korea and Japan rushing to secure supplies. China's coal imports in the first quarter were three times higher relative to the volume of coal imported in November 2020, with import restrictions eased to fulfil higher demand for electricity. Freezing temperatures coupled with economic recovery from lockdown measures drove demand upwards, contributing to the ongoing elevation of coal prices observed.

Coupling the bullish demand dynamics observed in coal markets, supply has proven largely unresponsive to demand shocks due to ongoing trends toward mine closure driven by the global policy shift away from the use of coal and towards cleaner alternatives, thereby reducing incentives for new projects. Coal production in many countries including China failed to meet higher demand, contributing towards increased imports from coal exporting countries such as Australia.

Carbon (€/ton)

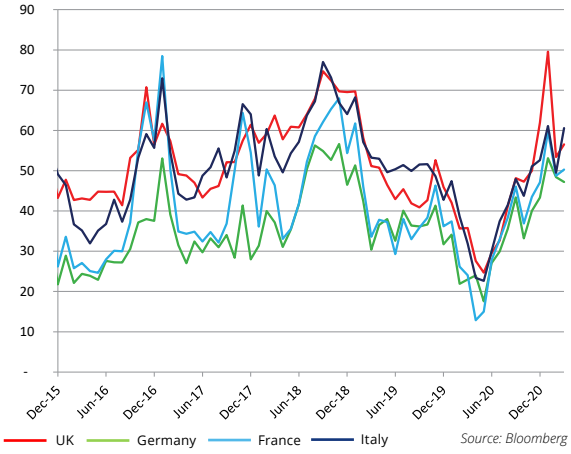


Carbon prices in Europe soared to more than €40.00 per tonne for the first time in Q1 2021 - an all-time high following the sharpest surge since August 2020. The rally observed over the quarter was primarily driven by the ongoing development of European decarbonisation policies and the systematic increase in credit prices per the design of the EU ETS scheme. The cost of EU carbon allowances hit a record high of €40.87 on average across March 2021 versus an average of €30.98 in December 2020, signifying a substantial increase in the price of emitting one tonne of carbon for companies in Europe.

A combination of opposing factors contributed towards the price rises observed in EUA prices. Ongoing restrictions on industrial and travel activity, driven by COVID-19, led to limited demand for carbon-emitting fuels across the quarter with an underlying suppressive effect on carbon prices. However, strong household demand for heating across the final months of winter led to elevated demand for carbon permits among utility companies.

Furthermore, speculative pressures on carbon prices may have continued over the first quarter amid ongoing uncertainty as to whether and how EU and UK carbon trading schemes will be linked following the UK's exit from the European Union. Though the UK government has imposed a £22 price floor per tonne of carbon emitted, the volume of carbon credits available for buyers in the first post-Brexit UK ETS auction in May 2021 has not been announced, further fuelling uncertainty among traders who are expected to respond quickly to secure supply of credits.

Baseload Spot Day Ahead (€/MWh)



Baseload power prices have fluctuated across the first quarter of 2021 for the four European countries monitored, as well as reflecting seasonal variations in the period January to March 2021.

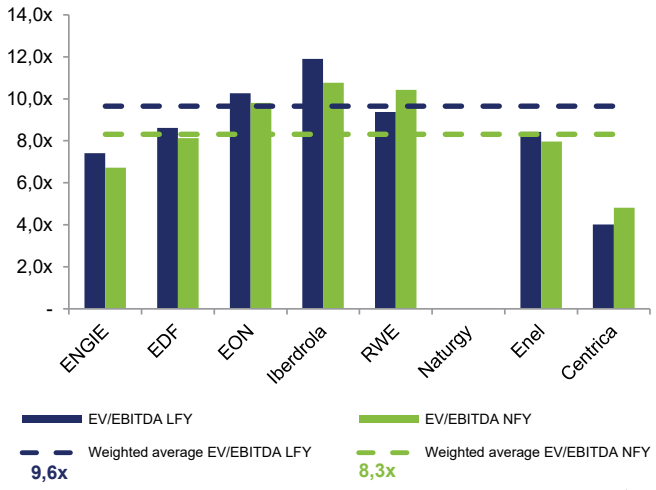
In January 2021, prices soared across the four countries reflecting slightly lower renewable generation, together with growing demand for power following the end of the Christmas and New Year holiday season. Higher carbon permit cost and oil prices contributed to rising prices, while offline nuclear plants in France fuelled the price increases. Prices followed the same upward trend in early February 2021 as renewable generation remained suppressed, with German wind power supply remaining low and French nuclear production falling against expectation.

This outlook reversed briefly towards the end of February as warmer weather in Europe raised expectations for solar generation and decreased household heating demand. A return to seasonal trends led to a gradual price increase across March for the UK, France and Italy, though Germany's baseload price continued to fall.

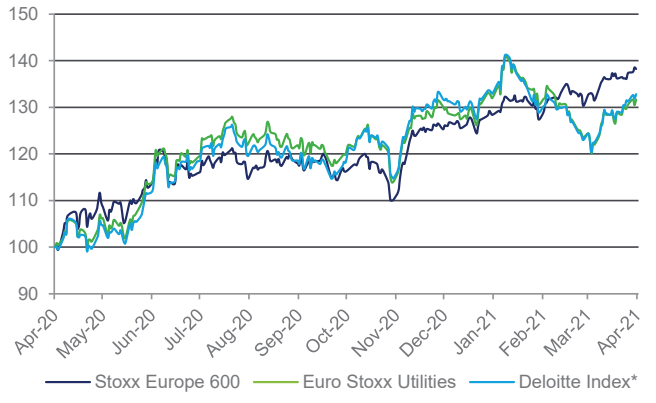
Spotlight on Power and Utilities market

Capital market overview

	Deloitte Index (1)	Enel	Iberdrola	ENGIE	EDF	EON	RWE	Naturgy	Centrica
Market cap. ratios									
Currency		EUR	EUR	EUR	EUR	EUR	EUR	EUR	GBP
Market Cap (March 21)		**83 000**	67 686	28 856	33 234	23 429	21 502	20 200	**3 121**
3m stock price performance	**1%**	1%	-6%	-4%	**-12%**	11%	-5%	10%	**13%**
YoY stock price performance	**33%**	40%	25%	35%	**67%**	**11%**	49%	34%	46%
Market multiples (2)									
EV/EBITDA 2020	**9,7x**	8,4x	**11,9x**	7,4x	8,6x	10,3x	9,4x	n/m (2)	**4,0x**
EV/EBITDA 2021	**8,4x**	8,0x	**10,8x**	6,7x	8,1x	9,8x	10,4x	n/m (2)	**4,8x**
P/E 2020	**8,8x**	n/m	**18,7x**	n/m	n/m	**23,0x**	21,6x	n/m (2)	n/m
P/E 2021	**13,9x**	15,3x	18,0x	**11,8x**	13,9x	12,6x	**19,6x**	n/m (2)	13,8x
Price/book value 2020	**1,6x**	2,9x	1,9x	1,0x	**0,7x**	n/m	1,3x	n/m (2)	**3,3x**
Profitability ratios (2)									
ROE forward 12m	**14%**	19%	11%	**8%**	**5%**	**38%**	6%	15%	24%
ROCE forward 12m	**7%**	**10%**	6%	6%	**4%**	7%	7%	9%	**18%**
EBITDA margin 2020	**23%**	23%	**30%**	17%	23%	**11%**	23%	22%	**13%**
EBITDA margin 2021	**23%**	24%	**30%**	17%	24%	11%	21%	21%	**9%**
EBIT margin 2020	**11%**	9%	**17%**	8%	6%	6%	13%	**3%**	6%
EBIT margin 2021	**14%**	15%	**17%**	9%	8%	6%	10%	13%	**4%**



Source: Capital IQ



Source: Capital IQ

(1) Deloitte Index is composed of Engie, EDF, EON, Iberdrola, RWE, Naturgy, Enel, SSE and Centrica

(2) Due to the takeover bid on Naturgy shares multiples are irrelevant

Key messages from brokers and analysts

"After a 27% rally YTD, and 145% over 12M, we see upside risk >€50 into mi d-year in anticipation of positive system changes to align the ETS with the EU Climate Plan." **(Morgan Stanley - March 28, 2021)**

"European Gas: Prices may moderate from recent peaks into the summer seasonally and as one-off factors fade. But we believe upsiderisks will persist. We raise our 2021 demand and price assumptions and expect even tighter global and European gas markets in 2022-25." **(Morgan Stanley – January 25, 2021)**

"Renewables overtook fossil fuels for the first time: In 2020, renewables became the main source of EU-27's power generation mix with wind and solar combined accounting for a c20% share." **(Crédit Suisse – March 5, 2021)**

"Power markets: some strength in power prices" **(Deutsche Bank – January 22, 2021)**

In 2020, utilities stocks at the upper half of the Taxonomy rankings outperformed stocks at the bottom half by ~40%. **(Exane BNP Paribas Research – January 19, 2021)**

M&A Trends

Transactions involving power and utilities companies

Total, the French energy company, acquired a 20% stake in **Adani Green Energy,** an Indian solar developer, and 50% stake in its 2.35GW portfolio of operating solar assets for a total investment of **$2.5 billion.** (See Reuters – January 18, 2021)

Total, the French energy company, acquired **Fonroche Biogaz,** a French anaerobic digestion unit builder and operator, and its close to **500GWh** of installed capacity. (See Manifold Publishing Pte Ltd – January 14, 2021)

Orano SA, French nuclear fuel-focused firm, acquired the domestic aerostructures and industrial components of the **Daher's,** French aircraft manufacturer and an industrial and service equipment manufacturer, nuclear material transport and packaging engineering operations in Germany and North America. (See SeeNews – March 8, 2021)

Lightsource Renewable Energy, the English solar developer, purchased a **1.06GW** pipeline of Spanish solar projects from **RIC Energy,** a Spanish developer of PV projects. (See S&P Global Market Intelligence – January 22, 2021)

Lightsource Renewable Energy, the English solar developer, acquired an **845MW** solar portfolio from **Iberia Solar,** Spanish solar developer. (See MarketLine – February 16, 2021)

NBT AS, a Nowegian wind developer, and **WindVision International,** French renewable energy company, invested in the construction and development of portfolio of wind projects located in Serbia for a combined installed capacity of **800MW.** (See MarketLine – January 19, 2021)

Eni SpA, Italian natural gas and oil company, acquired 20% stake in Dogger Bank A and B offshore wind farms of a combined installed capacity of **2,400MW** from **Equinor ASA,** Norwegian oil and wind company, and **SSE Plc,** Scottish energy company, for **£405 million.** (See MarketLine – March 4, 2021)

OX2, Swedish renewable energy and circular waste company, acquired wind project project located in Lestijarvi, Finland, from **YIT Copr,** a Finnish urban developer and construction company, with an expected total installed capacity of **400MW.** (See MarketLine – February 16, 2021)

Shell has agreed to take a 51% stake in the **300MW** Emerald floating offshore wind project of **Simply Blue Energy,** an Irish developer of transformative and sustainable floating wind. (See McGraw Hill – February 8, 2021)

Solarcentury Holding Ltd., an English renewable energy company, invested **€210 million** in the construction and development of Arada Solar and Tendetes solar projects located in Castellon, Spain, for an expected installed capacity of **320MW**. (See MarketLine – February 19, 2021)

VSB Group, German specialist for renewable energy, acquired **300MW** of projects in a milestone transaction for the Polish wind onshore market, located in the Wielkopolska Voivodeship. (See EE Online – February 2, 2021)

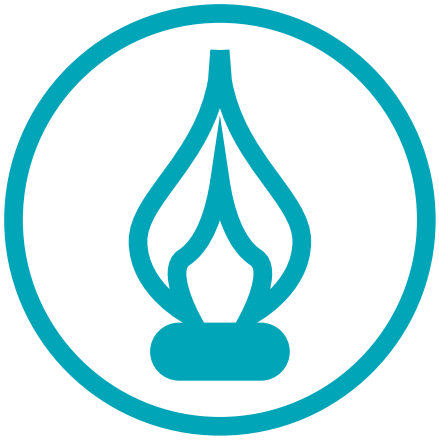
Terna Energy SA, Greek renewable energy company, invested **€170 million** in the construction and of three floating photovoltaic power plants located in Greece for a combined installed capacity of the projects expected of **265 MW**. (See MarketLine – January 19, 2021)

Tokyo Gas Co Ltd, Japanese natural gas supplier, invested about **€164.1 million** for a 9.7% stake in **Octopus Energy Ltd,** UK challenger electricity and gas provider to supply electricity, ahead of establishing a joint venture with them the to the Japanese market. (See SeeNews – December 23, 2020)

SSE, UK power generator, sold its portfolio of UK gas exploration and production assets to **Viaro Energy,** British energy company, for **£120 million** as it looks to focus on its net-zero emissions ambitions. (See Platts – Decembre 23, 2020)

Greencoat Renewables PLC, an Irish renewable energy company, acquired the Cloghan and Taghart wind farms in Ireland for a combined total of **€123 million** from **Statkraft AS,** Norwegian hydropower company. (See Alliance News – December 21, 2020)

Eni, Italian energy supplier, has signed an agreement with **X-Elio,** Spanish renewable energy company, for the acquisition of three photovoltaic projects in southern Spain for a total capacity of **140 MW.** (See Electronic News Publishing – February 19, 2021)



Transaction involving equity funds

Bruc Energy, Spanish investment funds, acquired a **2GW** portfolio of solar photovoltaic projects in Spain from **Forestalia,** Spanish renewables developer. (See Thomson Reuters – January 20, 2021)

EDP (Energias de Portugal), Portugese energy company, sold 6 large hydropower plants totalling **1.7 GW** in the Douro river basin in Portugal to a consortium of **Engie** (40%), French electricy and gas supplier, **Credit Agricole Assurances** (35%), French bank, and **Mirova Natixis Group** (25%), French renewable specialized fund, for **€2.2 billion.** (See SyndiGate Media – December 19, 2020)

Snam, Italian gas infrastructure operator, acquired a 33% stake in **De Nora,** Italian green hydrogen specialist, from **Blackstone,** American investment company, for **€1.2 billion** as it looks to build its hydrogen capabilities. (See S&P Global – January 12 2021)

Renewables Infrastructure Group (TRIG), a British renewable energy infrastructure investment company, and **Equitix Investment Management Limited,** a British investment company, has agreed to acquire 35% stake in in Beatrice offshore wind farm situated in Scotland with a total installed capacity of the wind farm is **588 MW,** from **Copenhagen Infrastructure Partners (CIP),** Danish investment fund specialized in wind power.
(See MarketLine - January 19, 2021)

Scatec, Norwegian renewable energy company, has signed a binding agreement to acquire 100% of the shares in **SN Power,** Norwegian clean and renewable energy investment fund, from **Norfund,** Norwegian Investment Fund, for a total equity value of $1,166 million. (See EE Online – February 1, 2021)

Bruc Energy, Spanish investment funds, has agreed to acquire 55% stake in portfolio of 12 solar power plants of an installed capacity of **550MW** situated in Andalusia and Extremadura, Spain, from **Alter Enersun SA,** a Spanish renewable energy company. (See MarketLine – January 4, 2021)

Vestas Wind Systems, Danish wind turbine maker, acquired a stake of 25% in **Copenhagen Infrastructure Partners,** Danish investment fund specialized in wind power, for a total of €500 million including earnout. (See SeeNews – December 18, 2020)

China Three Gorges, the Chinese state-owned power group, signed an agreement with a consortium led by **Corporacion Masaveu,** Spanish private fund, to acquire a **330 MW** portfolio of wind power plants in Spain for **€500m.** (See Enerdata S.A.S. – February 24, 2021)

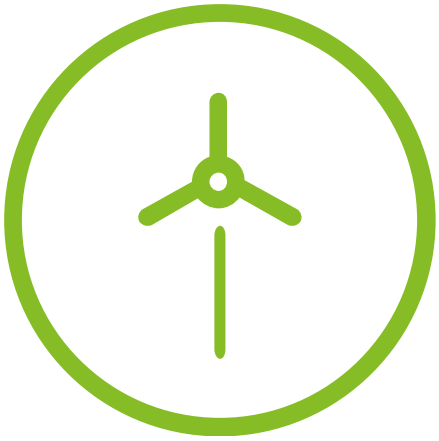
Eurohold, Spanish corporate finance company, signed an agreement to acquire the assets of **CEZ,** Czech electricity producer and supplier, in Bulgaria for **€335 million.**
(See SeeNews – January 19, 2021)

Total Quadran, Total's 100% renewable electricity production French subsidiary, farms down respectively to **Banque des Territoires** French bank, and **Crédit Agricole Assurances,** French bank, half of its equity in two portfolios of renewable projects of **340MW** at an enterprise value of around **$600 million** for 100%.

Renewable Power Capital (RPC), a Canadian renewable energy investment platform backed by **Canada Pension Plan Investment Board (CPP Investments),** Canadian investment fund, has made its first investment by committing to the acquisition for **€245 million** of a 100% ownership interest in a portfolio of onshore wind projects from **OX2,** Swedish renewable energy and circular waste company. (See MarketLine – January 9, 2021)

Drax, British electricity producer, sold four combined cycle gas turbine power stations with a total **2GW** capacity to **Vitol's,** an energy and commodities trader, holding **VPI Generation** for £193.3 million. (See McGraw Hill – February 8, 2021)

SEEIT, British investment fund, acquired U.S.-based commercial and industrial on-site solar energy projects from **Blackstone,** American investment company, and a 50 percent stake in Onyx Renewables, an American renewable energy development company, and for a purchase price of **$150 million.**



European Power and Utilities companies wrap-up

Unsurprisingly revenue and EBITDA of utilies are down compared to 2019 because of Covid crisis.

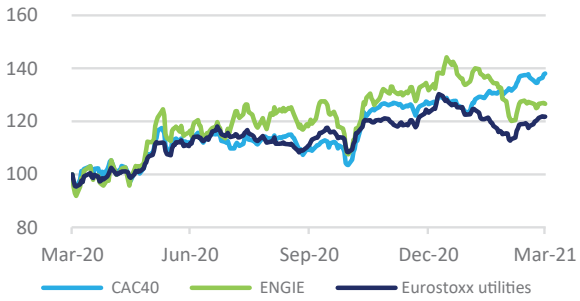
On demand side. European electricity and gas demand declined by c.6% in 2020 compared to 2019 especially in the UK and in Italy for Electricity and in Spain for Gas.

On production side nuclear production declined in FY 2020 especially due extended outages due to Covid-19. In the meantime, renewable energies were during the first semester 2020 the leading source of electricity in Europe.

However Stock Utilities at the upper half of the Taxonomy rankings outperformed stocks.

European Power Utilities achieved their guidance for FY20.

Share Price Perf. Dec. 2019 Dec. 2020



Key Reported Financials

In billion of €	2020*	2019*	Var.
Sales	69.0	71.3	-3%
EBITDA	**16.2**	**16.7**	**-3%**
Operating Income	3.9	6.8	-43%
Recurring net income Gr	**2.0**	**3.9**	-49%
Net Income Gr Share	**0.7**	**5.2**	-87%
Operating CF	3.2	4.1	-22%
Net Capex	-16.0	-16.8	-5%
Net debt	-42.3	-41.1	+3%

* E&P disposal business classified as discontinued operation

In billion of €	2020	2019	Var.
Sales	55.8	60.1	-7%
EBITDA	**9.3**	**10.4**	**-11%**
Operating Income	4.6	5.8	-21%
Recurring net income Gr	**1.7**	**2.7**	-37%
Net Income Gr Share	**-1.5**	**1.0**	**n.m**
Operating CF	7.1	7.6	-7%
Net Capex	7.7	10.0	-23%
Net debt	-22.5	-25,9	-13%

FY20 Highlights

- **2020 adjusted guidance slightly exceeded.**
- **Revenues amounted to €69.0bn, -3% vs FY19:**
  - **Drop of Nuclear output** in France (-44.1 TWh) and in the UK (-5.3 TWh), due to extend outages notably linked to health restrictions due to Covid Crisis;
  - Partly offset by an **increase in French Hydro output** (+5.0 TWh) and in **EDF Renewables output** (+6.3%).
- **Ebitda amounted to €16.2bn, -3% vs FY19, due to:**
  - **Covid crisis impact of -€1.5bn;**
  - Less "Structured Asset Development and Sales" activity in 2020 after an exceptional year in 2019;
  - Impact of drop in nuclear output partly offset by better price and hydrological conditions.
- **Net income totalled €0.7bn, compared to €5.2bn in FY19,** notably due to:
  - **Impairment charge of €0.8bn in total notably on the UK Nuclear assets;**
  - Negative impact of volatility in commodities;
  - Lower performance of dedicated assets portfolio (-€1.3bn) after exceptional performance in FY19;
  - **Increase in discount expenses** charges for nuclear provisions in France (€0.6bn);
  - Negative exceptional items (-€0.9bn) linked to (i) tax litigation in France, (ii) unfavourable change in UK corporate tax rate and (iii) additional costs related to the penetration welds of Flamanville 3.
- **Operating cash flow of €3.2bn, -22% vs FY19,** mainly due to working capital deterioration (-€1.7bn).
- **Hinkley Point C project update: start of electricity generation from Unit 1 expected in June 2026 and project completion costs estimated in the range of £2015 22 to 23bn.**
- **Stakeholder advisory committee set up pertaining to the Group's social responsibility commitments**
- **UK government** decision to open discussion with EDF on the funding of **two new EPRs** on Sizewell
- **SPA signed with Rolls-Royce** to acquire its Instrumentation and Control business.

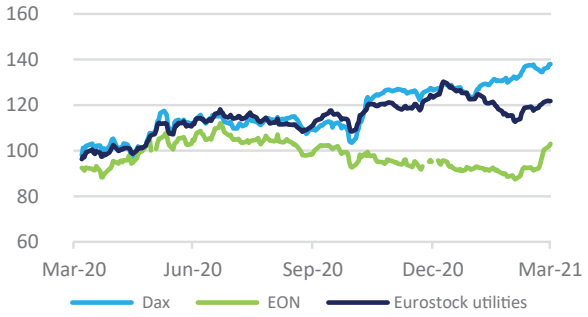
- **2020 adjusted guidance achieved.**
- **Revenues amounted to €55.8bn, -7% vs FY19 due to:**
  - (i) **Covid-19 crisis impacting mainly Supply and Client Solutions** activities across all geographies, (ii) negative foreign exchange effect mainly due to the depreciation of the Brazilian real, the US dollar, and the Mexican and Argentinian peso (iii) the **disposals of the stake in Glow** in Thailand, the B2C Supply activities in the UK and the coal assets in Germany and the Netherlands, (iv) mild temperature weighered on revenue from Supply across Europ and Australia,
  - These impacts were partly offset by (i) a **positive scope effect,** (ii) the acquisitions in Client Solution in Europe and in the US, (iii) higher revenue in Brazil and volume and price effects on sales in France.
- **Operating income reached €4.6bn -21% on an organic basis vs FY19, due to:**
  - Negative impacts of the above-mentioned items with an estimated impact of Covid-19 health crisis of €1.2bn;
  - Partly offset by (i) strong thermal performances in Europe and Middle East, (ii) better wind production, and (iii) better prices for hydro power production.
- **Net income Group Share amounted to -€1.5bn due to:** the decrease in net recurring income Group share, higher net impairment losses (€3.6bn in total) due to **change in lifetime assumption for Belgian nuclear reactors and changes in the commodity price scenario for nuclear assets** (€2.9bn), and the extension of fair value accounting to an European gas contract and its related assets (€0.5bn).
- **Net debt stood at €22.5bn,** down €3,4bn vs FY19, mainly due to the impact of the portfolio rotation program and the **sale of part of the Group's interest in SUEZ.**
- **New Group Executive Committee,** which reflects our intention to organize ENGIE around its four strategic businesses.
- **Energy offtake contracts with Amazon** for a renewable energy portfolio of wind and solar projects totaling 650 MW
- Discussion on the **carve-out of Engie service activities**

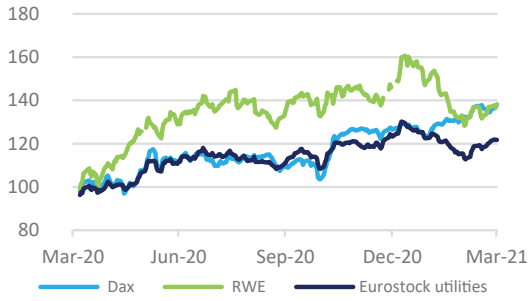
FY 2021 Outlook

- **FY 2021 guidance** (subject to additional reinforced sanitary restrictions impacts):
  - EBITDA above €17bn
  - Net financial debt/EBITDA below 3x in 2021

- **FY 2021 guidance:**
  - Net recurring income group share between €2.3bn and €2.5bn based on an indicative EBITDA between €9.9bn and €10.3bn and a COI range of €5.2bn - 5.6bn.
  - Net financial debt/EBITDA below or equal to 4x over long term

Share Price Perf. Dec. 2019 Dec. 2020





Key Reported Financials

In billion of €	2020	2019*	Var.
Sales	60.9	41.3	+47%
EBITDA	**6.9**	**5.6**	**+23%**
Operating Income	2.9	1.4	+107%
Recurring net income Gr	**1.3**	**0.7**	**+86%**
Net Income Gr Share	**1.0**	**1.5**	**-33%**
Operating CF	5.3	3.0	+77%
Net Capex	-4.2	-5.5	-24%
Net debt	-40.7	-38.9	+5%

*Includes until September 18, 2019, the discontinued operations in the Renewables segment

In billion of €	2020	2019*	Var.
Sales	13.7	13.1	+5%
EBITDA	**3.2**	**2.5**	**+28%**
Operating Income	1.8	1.3	+38%
Recurring net income Gr	**0.8**	**-0.7**	**n.m**
Net Income Gr Share	**1.0**	**8.5**	**-88%**
Operating CF	4,2	-1.5	n.m
Net Capex	1.1	0.0	n.m
Net debt	4,4	6.9	-36%

* Figures restated due to retroactive adjustments to the first-time consolidation of the acquired E.ON operations.

FY20 Highlights

- **2020 adjusted guidance achieved**
- **Sales amounted to €60.9bn, +47% vs 2019** due to
  - **Innogy contribution** on (i) Energy Network's sales, especially in Germany (+€5.4bn) and (ii) Customer Solutions' in Germany (+€9.6 billion), the UK (+€4.5 bn), and the Netherlands/Belgium (+€2 bn)
  - Increasing sales in **Non-Core Business with PreussenElektra** benefitted from higher sales prices.
  - Partly offset by a **decline in sales resulting from the transfer of stakes in power stations to RWE** in September 2019.
- **Operating income increased by 107% to 2.9bn** due to:
  - (i) **contribution of innogy's operations in Germany,** (ii) CEE and Turkey stong performance in Energy Network activity, and (iii) retruscturing benefits in the UK's Customer Services activity
  - Partly offset by (i) a lower regulated return in Sweden (ii) lower volumes weather-related in Germany, and (iii) Covid-19 impact on volume and, sell-back and bad debt.
- **Recurring net income totaled €1.3bn** partly offset by the rise of interest expenses by €0.4bn.
- **Transfer of approximately €11.5bn of innogy bonds** with E.ON as new debtor or guarantor
- **€600m bonds issue** maturing in December 2028 intended to refinance upcoming bond maturity in April.
- **Disposal of Essent's Belgian commodity supply business** from to Luminus which is 69% owned by sells remaining 20 percent stake to RWE EDF.
- Disposal of remaining 20 percent stake in Rampion offshore wind farm to RWE

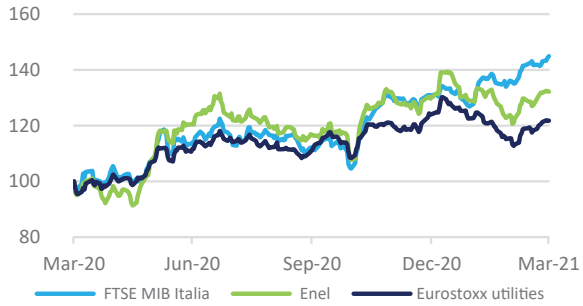
- **2020 adjusted guidance achieved**
- **Sales increased by 5% to €13.7bn vs 2019 due to** (i) **increased capacity of onshore wind/solar** in Europe and US following the **acquisition of E.ON's renewable energy business,** (ii) **higher market prices** for the electricity generation for conventional power stations and (iii) benefit from the **shift in production to renewables** with payments above market level.
- **EBITDA amounted to €3.2m, +28% vs 2019.** This is due to (i) a very good energy trading performance, and (ii) full consolidation of operations transferred from E.ON to RWE in 2019 and (iii) increased utilisation of wind farms.
- **The net income group share decreased by 88% to €1.0bn due to the positive one-off effect due to** asset swap with E.ON., a €8.3bn book gain on the deconsolidation of innogy's grid.
- **RWE** has acquired the controlling stake in the **Rampion offshore wind farm** from British energy supplier E.On
- **Hard coal phase-out:** Closure of power stations in Hamm and Ibbenbüren representing a net capacity of 1,560 MWh
- Agreement with Federal authorities on **compensation for accelerated phase-out of nuclear** energy in Germany with 33.22 euros/MWh for the nonproduced electricity volumes
- **UK capacity auction** for delivery in 2024/25: 6,544.1 MW of capacity agreements secured at £18/kW/year

FY 2021 Outlook

- **FY 2021 guidance:**
  - Adjusted EBIT: €3.8bn to €4.0bn
  - Adjusted net income: between €1.7bn to €1.9bn
  - Net investment: around €4.9bn

- **FY 2021 guidance:**
  - EBITDA: €2.6bn to €3bn
  - Adjusted net income: € 0.7bn to € 1.1bn

Share Price Perf. Dec. 2019 Dec. 2020



Key Reported Financials

In billion of €	2020	2019	Var.
Sales	65.0	80.3	-19%
EBITDA	**16.8**	**17.7**	**-5%**
Operating Income	8.4	**6.9**	+21%
Recurring net income Gr	**5.2**	**4.8**	**+8%**
Net Income Gr Share	**2.6**	**2.2**	**+18%**
Operating CF	11.5	11.3	**+2%**
Net Capex	10.2	10.0	+2%
Net debt	-45.4	-45.2	+0.4%

In billion of €	2020*	2019*	Var.
Sales	12.2	13.0	-6%
EBITDA	**1.4**	**1.8**	**-23%**
Operating Income	0.4	0.7	-43%
Recurring net income Gr	0.4	0.4	-
Net Income Gr Share	0.0	-1.0	n.m
Operating CF	1.1	1.0	+10%
Net Capex	-0.5	-0.6	-17%
Net debt	-2.8	-3.2	-13%

* Group's North American Direct Energy business classified as discontinued operation

FY20 Highlights

- 2020 adjusted guidance achieved.
- Sales amounted to €65.0bn, -19% vs 2019, the change is primarily attributable to the End-user Markets as a result of the decline of gas and electricity sales in Italy and Spain, mainly reflecting the impact of the COVID-19 outbreak, to the activities of Thermal Generation and Trading in Italy due to a decrease in trading activities and to the adverse exchange rate developments in Latin America
- EBITDA decreased to €16.8bn, -5% vs 2019 due to:
  - **a slight increase compared to 2019 thanks to the positive change in Generation, mainly Enel Green Power, which more than offset the negative changes in Infrastructure and Networks and End-user markets**
- Operating income amounted to €8.4bn, +21% vs 2019.
  - **the increase is mainly attributable to higher value adjustments carried out in 2019 compared to 2020, whose effects were partially offset by higher writedowns on trade receivables in 2020**
- Non-recurring expenses due to (i) impairment (€2.1bn) notably on the sale of the interest in Slovenské Elektrame (€0.8bn) and Coal fired plants (€0.6bn) and (ii) Restructuring plans for decarbonization and digitalization processes (€0.4bn).
- Increase of the net debt of €0.2bn compared to 2019
  - **a slight increase due to investments in the period and the acquisition of additional interests in Enel Américas and Enel Chile**
- Opening of discussion aimed at **selling a minimum of 40% and a maximum of 50% of Open Fiber to Macquarie Infrastructure & Real Assets ("MIRA")** representing **€2.6bn for 50%.**
- **Issue of a €2.25bn perpetual hybrid non-convertible** subordinated multitranche
- **Agreement on the largest sustainability-linked revolving credit facility for an amount of 10 billion euros.**

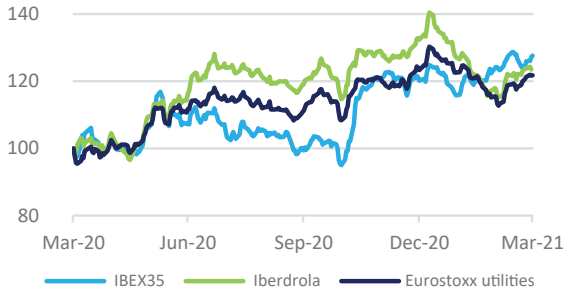
- **2020 guidance removed on Q3.**
- On January 5, 2021 Centrica completed the **disposal of North American Direct Energy business to to NRG Energy for $3.6bn** leading to the classification of Direct Energy as a discontinued operation and restatement of comparive figures.
- **EBITDA amounted to 1.4bn, -23% vs FY19 due to:**
  - A (i) **Covid-19 impact on demand and prices (£0.3bn),** (ii) **falling of commodity prices and lower nuclear volumes** which has impacted the Upstream Division (£0.1bn) and (iii) a warmer than normal weather impacted the energy supply business
  - Partly offset by (i) mitigation actions (£0.2bn) such as not to pay senior management bonuses relating to 2019 performance, discretionary cost savings and the use of government job retention scheme, (ii) lower E&P depreciation and field write-off costs and (iii) efficiency initiatives in all business units and strong trading and optimisation performance, in particular in LNG.
- **Net income Groupe share increased by £1.0bn:**
  - Re-measurement, notably a profit of £0.7bn vs a loss of -£0.3bn in 2019 due to net positive revaluation of commodity contracts due for delivery in future periods as commodity prices rose over the second half of 2020;
  - Partly offset by exceptional charges relating to (i) E&P assets and goodwill and power assets impairment (£1.2bn), and (ii) retrusturing charges (£0.3bn).
- **Net debt is down by 13% to £2.8bn,** reflecting lower capital expenditure reflecting ongoing capital discipline during the Covid-19 pandemic which contributes to increase cash and cash equivalent by +£0.7bn.

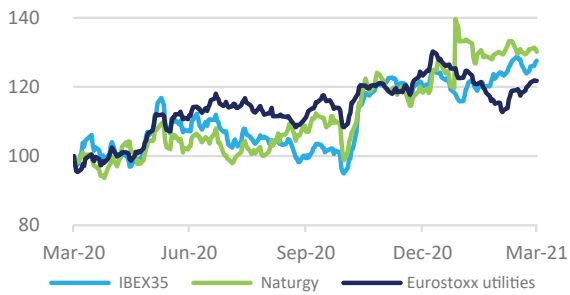
FY 2021 Outlook

- **FY 2021 guidance:**
  - Ordinary EBITDA: €18.7bn - €19.3bn
  - Net ordinary income: €5.4bn-€5.6bn

No guidance disclosed for 2021.

Share Price Perf. Dec. 2019 Dec. 2020





Key Reported Financials

In billion of €	2020	2019	Var.
Sales	33.1	36.4	-9%
EBITDA	**10.0**	**10.1**	**-1%**
Operating Income	5.5	5.9	-7%
Recurring net income Gr	**3.2**	**3.1**	**+3%**
Net Income Gr Share	**3.6**	**3.4**	**+6%**
Operating CF	8.2	8.1	**+1%**
Net Capex	-8.4	-7.2	+17%
Net debt	-35.1	-37.5	-6%

In billion of €	2020	2019	Var.
Sales	15.3	20.8	-26%
EBITDA	**3.4**	**4.2**	**-19%**
Operating Income	0.5	2.6	-81%
Recurring net income Gr	**0.9**	**1.4**	-36%
Net Income Gr Share	**-0.3**	**1.4**	**n.m**
Operating CF	3.4	4.0	-15%
Net Capex	-1.3	-1.7	-24%
Net debt	-13.6	-15.3	-11%

* CGE classified as discontinued operation

FY20 Highlights

- **2020 guidance achieved**
- **The revenue decreased by 9% to €33.1bn due to**
  - Negative impact of (i) **the COVID-19 crisis with a lower electricity demand especially in Spain, UK and US,** (ii) depreciation of main reference currency USD, GBP and BRL, and (iii) **adverse new regulatoriy framework in Spain**
  - Partly offset by **better production performance in the Renewable** activity in Spain, UK and US.
- **EBITDA remains stable at €10.0bn vs €10.1 in FY19** mainly thanks to the following positive impact (i) cost control measures and efficiency plans implemented in 2019, (ii) **improvement of gross margin in Renewable and Generation and supply,** (iii) reduction of tax and other income tax.
- **The variation in net income increased by +6% to €3.6bn vs FY19 due to** gain from the capital gain of €485mn arising from the **sale of Iberdrola's stake in Siemens Gamesa** and lower interest costs and one-off foreign exchange hedges partly offset by the increase of bad debt provisons and the impact of the health crisis (-€0.2bn).
- **Net investment in the period amounted to €8.4bn** mainly in the Renewable businesses with 2,890MW of new capacity installed over FY20 among a total of almost 4,000MW new capacity installed.
- **Iberdrola** signed an agreement to acquire majority stake in **DP Energy's offshore wind pipeline** consisting of three projects in Ireland with total installed capacity of **3000 MW.**
- **Iberdrola** agreed to invest **€220 million** in the construction and development of **Otero solar power** plant situated in Spain for a total installed capacity of 505MW

- **Agreement to sell Compañía General de Electricidad S.A. in Chile (CGE) to State Grid International Development Limited (SGID) for €2.6bn** leading to the classification of CGE as discontinued operation and restatement of comparive figures.
- At constant perimeter, the ordinary EBITDA would have reached €4.0bn hence **meeting the guidance for 2020 of €4.0bn.**
- **Group revenue decreased by 26% to €15.3bn** mainly due to COVID-19 impact such as (i) lower energy demand, (ii) lower energy prices, and (iii) relevant foreign exchange depreciation in key latin American regions.
- **Operating income amounted to €0.5bn, -81% in respect to FY19** due to impacts above and mainly due to the impairment of Spain conventional generation (-€1.1bn) due to structural change in energy scenario and gas activity in Argentina (-€0.2bn) to reflect macro scenario and inflation)
- **Net income amounted to -€0.3bn vs €1.4bn in FY19** despite the slight improvement of financial result.
- **Net debt has decreased by -11% to €13.6bn** and does not reflect the pre-tax **proceeds of €2.6bn expected with completion CGE Chile disposal.**
- On January 26, 2021, Global InfraCo, a company from **Australian fund IFM, announced a takeover bid on Naturgy shares** (c. 22.7% of share capital) at €22.37 per share.

FY 2021 Outlook

- **FY 2021 guidance:**
  - Net profit : €3.7bn - €3.8bn

No guidance disclosed for FY 2021

The future of power – scenarios for the evolution of the European electricity sector

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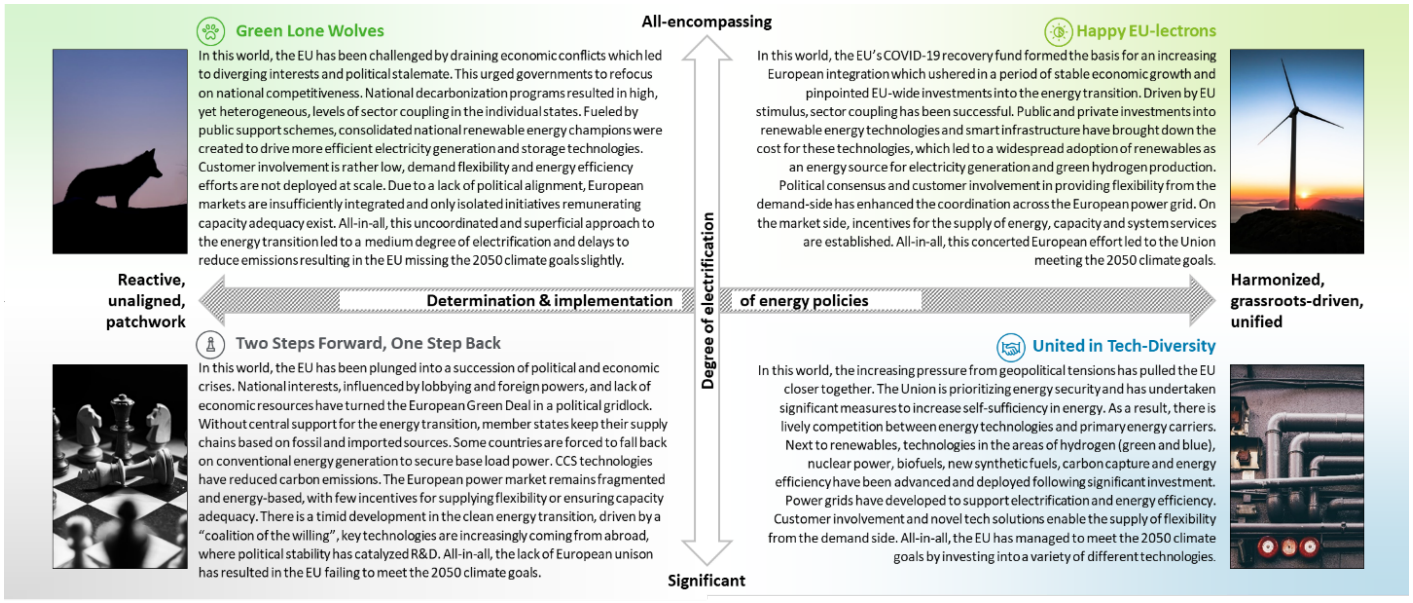
The European power sector is at a crossroads today. In December 2019, the announcement of the European Green Deal has reinforced the European Union's commitment to the Paris agreement on Climate Change and set the ambitious target of becoming the world's first climate neutral continent by 2050. Although emissions from power generation have dropped by nearly 30% over the last ten years, the sector still accounts for almost one third of the direct CO_2 emissions in the EU. Rapidly falling costs for a wide range of clean technologies and the promises of wide-spread electrification place power generation at the heart of the energy transition.

However, the future does not only bring opportunities for utilities and power generators but also a set of formidable challenges. The European generation fleet is ageing: many nuclear and thermal power plants, but also the first wind mills near the end of their initially envisaged lifetime and need to be replaced or refurbished. Continued coal use, the backbone of power generation in a number of countries, is no longer consistent with environmental objectives and the variability of rapidly growing solar and wind output poses threats to system stability and reliability.

Moreover, the turbulent 2010s have left deep scars on the balance sheets of many European power companies; and, possibly, also a new sense of risk aversion, manifested in very low investment activity over the past few years. Policy-makers need to strike a careful balance between fostering clean technologies with the necessary support and keeping electricity affordable for households and industry alike. As for all major challenges – dealing with mass migration or fighting Covid-19 are obvious examples – our diversity-rich European societies fiercely debate a multitude of competing views. The energy transition is no exception to this and the dominating mindset in society will have a huge impact on how the energy transition is shaping up.

Against this backdrop, we have assessed four distinct scenarios. Each of the four scenarios presented in this article depicts an alternative future, described in figure 1, a pathway along which the European power sector could travel if its underlying economic, societal, technological and regulatory drivers unfold in a certain way. They should not be misinterpreted as forecasts. Forecasts are particularly useful for the short to medium term, when investment pipelines and existing or planned policy measures provide visibility and technology breakthroughs are unlikely to change the game. In our opinion, in the long-term, there are simply too many variables in play to create a single, robust forecast. The objective of our scenarios is to stimulate debate and illuminate strategic decision-making, not to predict the future correctly.

Figure 1: Figure 1. Presentation of the four scenarios

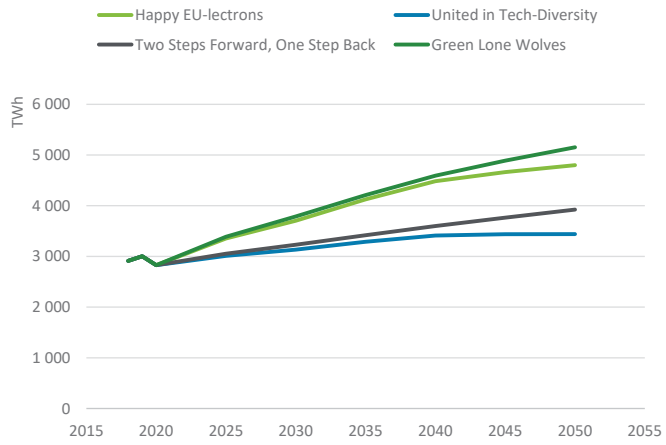


Source: DEEM scenario-based modelling results.

Our scenarios are centred around two key uncertainties: the determination and implementation of energy policies reflects policy-makers' balancing of economic realities, societal mindset and environmental objectives. The degree of electrification reflects the role of electricity in decarbonizing energy end uses. What might sound more like a finding than an assumption at first glance, is in fact a bundle of policy choices and societal preferences that put electricity in the pole position – or not.

Electrification never plays a walk-on part – it features prominently in all scenarios – but it only takes an undisputed lead role in the Happy EU-lectrons and Green Lone Wolves scenarios. As such, electricity demand is set to grow by at least 10% and possibly by up to three quarters over the next three decades (figure 2). Electricity demand evolution is therefore one of the biggest uncertainties for the power sector. This is due to the interplay of a multitude of drivers: new end-uses like electric vehicles, the production of hydrogen via electrolysis or the deployment of heat-pumps and other electric heating solutions put upward pressure on power demand. However, fuel-cells will fight for market share in the transport sector, hydrogen could possibly be produced at a lower cost from fossil-fuels with CCS and huge energy efficiency potentials are untapped today. These drivers could tame power demand growth significantly.

Figure 2. Evolution of the electricity demand per scenario, 2018 to 2050

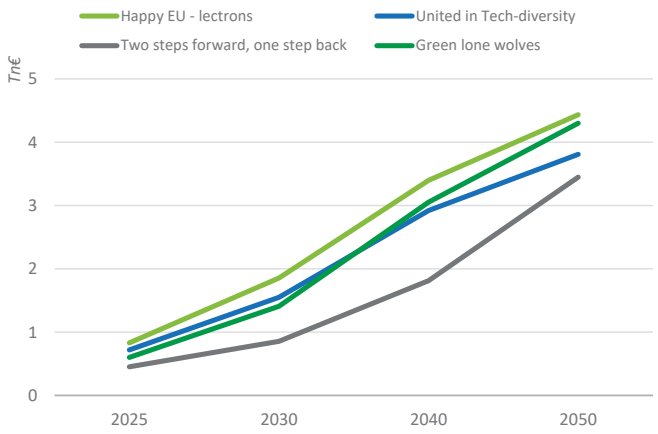


Source: DEEM scenario-based modelling results.

There are currently around 950 GW of power generation capacity operational in the EU. By 2050, installed capacity could top 2200 GW – this is the outcome of the Happy EU-lectrons scenario – if a combination of strong electricity demand and supportive environment for renewables prevails. A more technology-neutral future – a guiding principle of our United in Tech-Diversity scenario – could still see installed capacity growing by one third over the next thirty years. In other words, the uncertainty range for power generation capacities in the period to 2050 is to the tune of 1000 GW. However, the bottom line is also that all signs point towards growth.

When it comes to investments, the industry needs to prepare itself for a triple whammy: catering for growing power demand, countering plant closures (either due to ageing or for environmental reasons like the European coal exit) and continuously replacing (or repowering) wind mills and PV panels that have shorter technical lifetimes than the bulk of today's fleet. Cost degression for renewables have not yet reached the end of the road and some other new technologies – like batteries – are still very much at the beginning of their learning curve. Falling capital cost for new installations should therefore take some strain off the investment needs. Yet, in our outlook, between EUR 3.5 and EUR 4.5 trillion need to be cumulatively mobilized over the next thirty years for power generation alone as depicted in figure 3. Add to this the investment needs in network infrastructure, easily a similar amount, to grasp the full scope of the challenge.

Figure 3. Cumulative power generation investment, 2025 to 2050



Source: DEEM scenario-based modelling results.

Renewables are the undisputed winner of the transition. Power generation from solar PV grows at least 5-fold – the outcome of the Two steps forward, one step back scenario, which features the least favourable environment for renewables – and could soar 11-fold, reaching over 1200 TWh by 2050 in the Happy EU-lectrons scenario, painting a world in which renewables thrive. Wind onshore also grows strongly, with output reaching between 340 TWh in the Two steps scenario, where notably NIMBY concerns put the brakes on deployment, and 1000 TWh in the Happy EU-lectrons scenario, where society has a benign view on widespread wind mill roll-out. Wind offshore faces the biggest uncertainty, as the most capital-intensive of the key renewable energy technologies, it is naturally more exposed to the economic environment. Output varies between 1100 TWh (corresponding to over 400 GW of capacity) in the Green lone Wolves and Happy EU-lectrons and 200 TWh (80 GW of capacity) in the Two steps forward, one step back scenario.

Box 1.From scenario design to market model summary of the methodology

Methodology

Scenario creation: A Center for Long View methodology

We have identified the main economic, policy, technological, social and environmental trends. They are clustered with respect to their relative importance and level of uncertainty. Some relevant trends feature in all scenarios, such as cost-efficiency of renewables, prevalence of externality taxes etc. The relevant, but uncertain trends, though, define differences between the future scenarios like investments into the network structure, political coordination and ambition among different European states, electrification of different end-use demands and the regulatory push for the energy transition overall and are condensed into two defining axes: Degree of Electrification and Determination of Energy Policy.

Based on these trends and their uncertainty level, we built four different but equally consistent trends. Therefore, each represents a plausible future of the European power system: 1) Happy EU-lectrons, 2) United in Tech-Diversity, 3) Two Steps Forward, One Step Back and 4) Green Lone Wolves.

Deloitte European Electricity Market model

Deloitte European Electricity Market (DEEM) model is an optimisation tool that minimises the cost of both investment in new generation and flexibility capacities, and the operation of each technology. This optimisation is based on linear programming, and it is subject to several constraints; the most important one is the hourly electricity supply and demand equilibrium. Therefore, the hourly variability of renewable power generation and electricity demand are accounted for and the required operation and capacity of flexibility options such as storage options and thermal plants are sized correctly.

Weather-dependence of renewables, functioning of storage options taking into account their associated losses, operational and technical constraints of different power plants, interconnections between different regions and inter-regional power flow, operational reserve requirements, resource and land-use related maximal potentials and dynamic capacity investment and decommissioning are some of the main other constraints that the DEEM optimisation tool is subject to.

The power market is modelled based on marginal pricing of each technology, and the merit-order prioritization of different technologies. Therefore, perfect competition, full information and a single-buyer market model with no monopolistic behaviour are some of the most important economic assumptions in the representation of the power market.

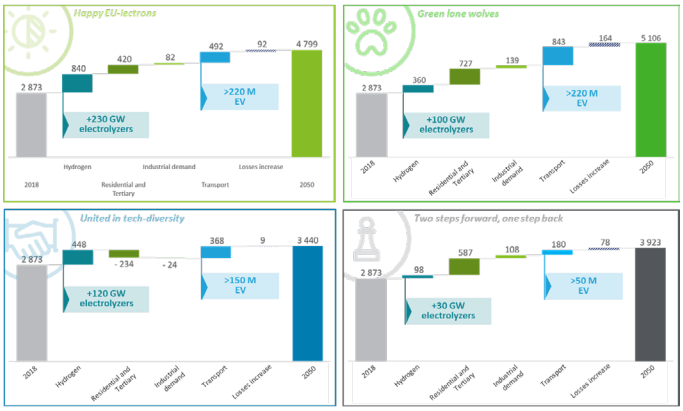
Power generation from natural gas-fired power plants increases over time in all but one scenario (Happy EU-lectrons) underscoring the important role of gas as a transition fuel. Natural gas faces a 'golden decade' through the early 2030s, as it fills the void left by the coal phase out. Although the least carbon intensive of all the fossil fuels, the long-term future of natural gas is closely tied to the availability of carbon capture and storage technologies, which make inroads – in certain countries – in all scenarios, except the Happy EU-lectrons scenario. Many nuclear power plants in Europe were built in the 1970s and 1980s and reach the end of their lifetime over the outlook period. In addition, some countries (e.g. Germany, Belgium or Switzerland) have announced phase out plans for their nuclear capacity. This decline of nuclear capacity is, to a certain degree, countered by new nuclear programmes in some countries, notably in Central and Eastern Europe. As such, power generation from nuclear declines in all our scenarios but the policy support that nuclear enjoys from some governments, and the possibility to produce large amounts of low-carbon electricity, render the technology relatively resilient at a European scale. Another important commonality of our four power sector futures is the terminal decline of coal-fired power generation in Europe. After coal phase out plans announced all over Western Europe, coal now faces policy headwinds also in Central and Eastern European countries that have not yet mandated a formal coal exit. Hence, even in a scenario with modest climate ambitions, new coal is not on the cards.

As the contribution from variable renewables grows over time, the system needs to deal with greater flexibility needs. There is a large variety of technologies that can deal with (net) load fluctuations and provide system services, for example gas turbines, batteries, demand side management or vehicle-to-grid. Which set of technologies is best suited depends on the context of the scenario: in the scenarios with a high degree of electrification – Lone Green Wolves and Happy EU-lectrons – wind and solar combined become the largest source of power generation after 2035 and there remains relatively little gas capacity in the system to provide flexibility. Utility-scale batteries thrive in this environment. By 2050, in the Happy Eu-lectrons scenario, some 100 GW of battery installations – more than nuclear capacity today – are scattered all over Europe and help balancing the grid. In contrast, our United in Tech-Diversity scenario leaves little room for batteries. Fast-ramping gas turbines, supported by a range of flexible technologies on the demand side, ensure the reliability of electricity supply at times of fluctuating renewable power production.

Electric vehicles (EV) are gradually moving to the pole position in the transport sector (at least for passenger cars). A number of European governments have announced to ban the sales of passenger vehicles with internal combustion engines from a certain year. For example, the Netherlands from 2030 and France from 2040 onwards. Roll-out of charging infrastructure is also well underway with various national subsidy schemes for the installation of home chargers in place. As such, e-mobility adds between 180 TWh and 840 TWh to electricity demand in our outlook (see figure 4), depending on how quickly EVs gain market share and what type of EVs customers prefer. This means that, by 2050, more than 220 million EVs could be on Europe's roads (e.g. in the Green Lone Wolves). Even under cautious assumptions on EV uptake – as illustrated by the Two Steps forward, one step back scenario – EVs exceed the 50 million mark by 2050.

Figure 4. Sectoral evolution of the electricity demand per scenario, 2050 compared to 2018 level

All numbers in TWh



Source: DEEM scenario-based modelling results.

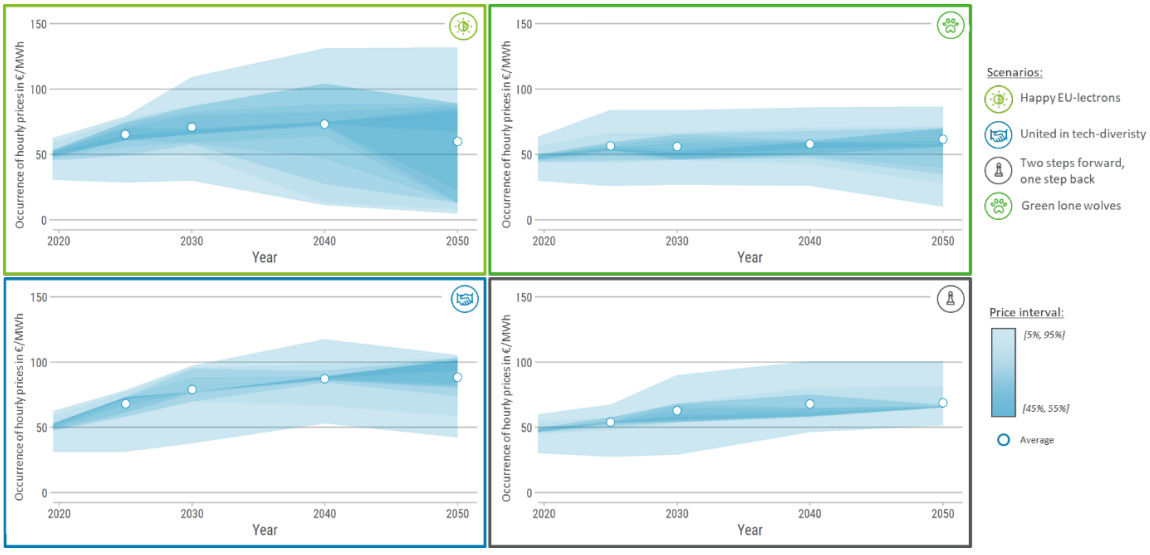
Another technology that we see burgeoning today and that features prominently in our scenarios is the production of hydrogen via electrolysis. Electrolysers, powered predominately by renewable electricity, could add up to 840 TWh to electricity demand over the next three decades. Some 230 GW of electrolyser capacity produce renewable hydrogen for the end-uses that are particularly hard to decarbonise in the Happy EU-lectrons scenario.

Low-carbon hydrogen can also be produced from fossil fuels in combination with CCS. Unlike the Happy EU-lectrons scenario, our United in Tech Diversity scenario combines low-carbon and renewable hydrogen to decarbonise end uses more comprehensively with hydrogen and limit the call on electrification. Only the Two Steps Forward, One Step back scenario sees sluggish uptake of electrolysis (around 30 GW by 2050). Hydrogen remains a relatively expensive decarbonisation option and this scenario underscores that the development of this technology hinges on a clear and conscious and policy decision to establish the necessary support.

CO2 prices reflect the climate ambitions in the four scenarios. They are, with EUR 170/tonne in 2050 highest in the Happy EU-lectrons scenario, followed by the United in Tech Diversity Scenario with EUR 150/tonne. These two scenarios rely on the EU-ETS as the key mechanism to provide decarbonisation incentives. Success of the EU-ETS as an EU-wide scheme depends however on a strong European cohesion and coordinated approach to continue strengthening the mechanism. This support is missing in the Green Lone Wolves and Two Steps scenarios. CO2 prices reach EUR 100/tonne by 2050 in the Green Lone Wolves scenario as a "coalition of the willing" support the mechanism while others refrain from its use. Similarly, CO2 prices of EUR 50/tonne – as reached in the Two Steps scenario by 2050 – provide limited incentives for decarbonisation but also keep distortions of industrial competitiveness to a minimum in a globalized economy.

Prices in today's electricity market are determined by the interplay of a relatively price-responsive supply side (a power plant is not dispatched if the electricity price does not cover its variable cost) and a very inelastic demand side (most electricity consumers cannot observe real-time power prices). Our scenarios suggest that the relative price responsiveness of demand and supply are set to invert. Especially in the scenarios with strong expansion of variable renewables – where generation becomes largely weather-dependent – it is the demand side that increasingly reacts to changes in the value of electricity. Demand-side response, smart grids and vehicle-to-grid are all called upon when the classic supply side flexibility (gas turbines and batteries) has reached its limits.

Figure 5. Electricity market price per scenario, 2020 to 2050.



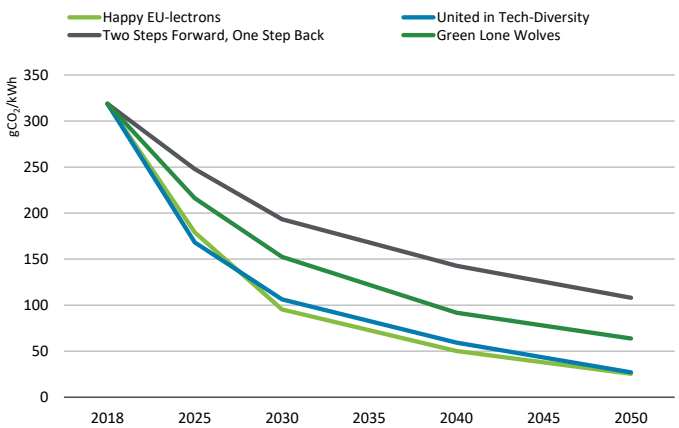
Source: DEEM scenario-based modelling results.

In practice, this means the volatility of hourly electricity prices continues to rise. This basic finding holds true for all scenarios although the magnitude of price swings varies considerably (figure 5). Keeping a significant amount of gas-fired capacity in the system – as is the case in the United in Tech Diversity and Two Steps scenarios – acts as an effective volatility brake. The successful electricity trader of the future is therefore not only versed in quantitative methods but also an expert in meteorology. As the coal exit progresses, the average price level in our scenarios is largely determined by the combination of natural gas price, CO2 price and the call on gas-fired power plant to serve power demand.

None of our scenarios should be interpreted as an obituary for the energy-only market as we know it today. However, whether the energy-only market is able to deliver the necessary investment incentives is not clear either; this depends less on the market fundamentals and more on the ability of power companies to hedge extreme volatility and exposure to potentially long periods of low prices. Although the energy-only market is not inconsistent with the future of power, our modelling also points to a greater reliance on remuneration for a range of system services.

So, how do our four power sector futures fare in terms of deep decarbonisation and delivering on the European Green Deal? The good news is that all scenarios project a marked drop in the CO2 emissions intensity of power generation in Europe as shown in the figure 6. Even in the Two Steps scenario, in which tackling climate change is not a priority, the emissions intensity falls by two thirds, to just over 100 gCO2/kWh by 2050. Phasing out coal plants – either due to ageing or mandated by policy – essentially allows the power sector to decarbonise 'by default'. However, this is no reason for complacency: even 100 gCO2/kWh is four times too high for reaching the EU's climate ambitions. An emissions intensity to the tune of 25 gCO2/kWh is a widely accepted benchmark for Paris Agreement-compliant power sector decarbonisation. This level is reached in both, the Happy EU-lectrons and the United in Tech-diversity scenarios, albeit with very different means, emphasising that many roads lead to Paris.

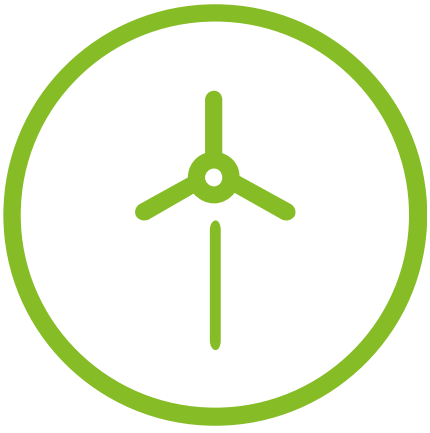
Figure 6. CO2 emissions per kilowatt-hour of electricity unit generated in the different scenarios, 2018 to 2050



Source: DEEM scenario-based modelling results.

We explicitly refrain from putting probabilities on our scenarios. All four futures presented here plausible, coherent and realistic – depending on the angle from which you look at them. This is how they are best used: as stress test, a devil's advocate or an inspiration for strategic decision-making. As such, our objective was also to conceive scenarios that cover the bulk of the uncertainty cone. What are key take-aways from comparing these four very different power sector prospects?

- The classic utility is back: investment needs over the next three decades are formidable and the capital intensity of the sector increases. Cash-flows from existing assets and robust balance sheets ease access to financing.
- Wind and solar PV, underpinned by falling cost, thrive even under modest climate ambitions and take the lead role in European power generation.
- Coal disappears from the European power landscape either via policy mandates or through a combination of ageing and lack of financial viability.
- Natural gas is set for a 'golden decade' as it accompanies the coal exit. However, every silver lining has a cloud, and the long-term future of the fuel is tied to the availability of carbon capture and storage technologies.
- The excitement around electric mobility is not an aberration but a harbinger of change. Electric vehicles become mainstream in Europe – how long the internal combustion engine coexists depends on how quickly road blocks for electric mobility are removed.
- Prospects for renewable hydrogen from electrolysis are bright but widespread deployment cannot be taken for granted. The technology needs clear climate commitments and support that tilts the economic calculation in its favour vis-à-vis other options.
- Electricity trading faces growing price volatility and price swings that are increasingly determined by sunshine, wind and temperature. Accurate weather forecasts hold the key to a treasure in trading.
- There is no silver bullet solution for the energy transition. Different pathways, in terms of technology, societal mindset and macroeconomic environment, can spur deep decarbonisation.
- Cooperation and concerted policy-making lead to a more successful navigation of the challenges of a very uncertain Future of Power in Europe.



Policy and Regulation Radar

This section summarizes the key changes respectively in the EU or in the country regulation that may significantly affect the power and utilities companies.

What is changing in the EU regulation?

The European Commission adopts a new EU Strategy on Adaptation to Climate Change

Key features	Insights
The European Commission adopted its new EU Strategy on adaptation to climate change on **24 February 2021.**	The Strategy has four principle objectives: **to make adaptation smarter, swifter and more systemic, and to step up international action on adaptation to climate change.**
The new Strategy sets out how the European Union **can adapt to the unavoidable impacts of climate change and become climate resilient by 2050.**	• **Smarter adaptation:** adaptation actions must be informed by robust data and risk assessment tools that are **available to all.** To achieve this, **the Strategy proposes actions that push the frontiers of knowledge on adaptation** so that people can gather more and better data on climate-related risks and losses and **enhance Climate-ADAPT as the European platform for adaptation knowledge.** • **Faster adaptation:** the Strategy focuses on developing and rolling out **adaptation solutions to help reduce climate-related risk, increase climate protection and safeguard the availability of fresh water.** • **More systemic adaptation:** as climate change will have impacts at all levels of society and across all sectors of the economy, **adaptation actions must also be systemic.** In this regard, the European Commission **will continue to actively mainstream climate resilience considerations in all relevant policy fields.** It will support the further **development and implementation of adaptation strategies and plans at all levels of governance** with three cross-cutting priorities: integrating adaptation into macro-fiscal policy, nature-based solutions for adaptation and local adaptation action. • **Stepping up international action for climate resilience:** the EU will increase support for international **climate resilience and preparedness through the provision of resources, by prioritizing action and increasing effectiveness,** through the scaling up of international finance and through stronger global engagement and exchanges on adaptation. The Strategy's four objectives are underpinned by **14 actions and the steps to be taken to deliver them.**

Next steps

The Commission will discuss the Strategy with the Member States in the **Environmental Council.** The Council is expected to agree to conclusions on the new Strategy when it meets in June 2021.

Link: *The European Commission adopts a new EU Strategy on Adaptation to Climate change*

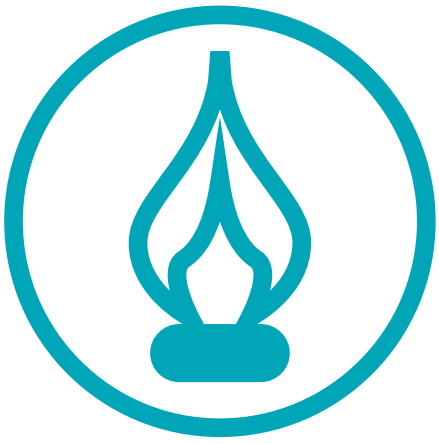
EU recovery package: Council adopts Recovery and Resilience Facility (RRF)

Key features	Insights
On 11 February 2021, the **European Council adopted a regulation establishing the Recovery and Resilience Facility,** which lies at the heart of the EU's recovery plan. Through this decision, **€672.5 billion in grants and loans will be available for public investment and reforms in the 27 member states** to help them address the impact of the COVID-19 pandemic, to foster the green and digital transitions and to build resilient and inclusive societies.	Under the new regulation, **member states will need to set out in their national recovery and resilience plans a coherent package of reforms and investment projects,** covering **six policy areas** of European relevance: **the green transition;** digital transformation; smart, sustainable and inclusive growth and jobs; social and territorial cohesion; health and resilience; and policies for the next generation, children and youth, including education and skills. **Support will be linked to country-specific recommendations under the European Semester,** which identify **central challenges for each member state** to address to strengthen competitiveness as well as social and economic cohesion. It will also contribute to the implementation of the **European Pillar of Social Rights.** Some of the **key requirements concern the EU's green and digital objectives.** At least **37% of each plan's allocation has to support the green transition** and at least **20% the digital transformation.** In addition, all measures included in member states' plans should respect the 'do no significant harm' principle, to protect the EU's environmental goals.

Next steps

Member states have until **30 April 2021, as a rule, to submit their recovery and resilience plans to the Commission.** Then, generally, the Commission will have up to two months to assess the plans and subsequently the Council will have four weeks to adopt its decision on the final approval of each plan.

Link: *EU recovery package: Council adopts Recovery and Resilience Facility*



The European Parliament and the Council reach an agreement on the Connecting Europe Facility (CEF) proposal

Key features

On 11 March 2021, negotiators from the Council and the European Parliament reached a **provisional agreement on the second edition of the EU's flagship programme the Connecting Europe Facility (CEF).** CEF 2.0 is **part of the multiannual financial framework (MFF) for 2021-2027.** It will continue to fund key projects in the areas of transport, digital and energy. It will run **from 2021 to 2027, with an overall budget of €33.71 billion (in current prices).**

Insights

As a result of the agreement, the budgets for each sector will be (in current prices): **transport** (€25.81 billion -including €11.29 billion for cohesion countries), energy (€5.84 billion) and **digital** (€2.06 billion).

Specifically, in the **energy sector,** the Programme aims at **contributing to further integration of the European energy market, improving the interoperability of energy networks across borders and sectors, facilitating decarbonization,** and **ensuring security of supply.** Funding will also be available for cross-border projects in the field of **renewable energy generation.** When defining award criteria, consistency with EU and national energy and climate plans, including the principle of 'energy efficiency first', will be taken into account.

CEF 2.0 emphasizes **synergies between the transport, energy and digital sectors,** to enhance the effectiveness of EU action and minimize implementation costs. It will promote **cross-sectoral work** in areas such as **connected and automated mobility and alternative fuels.** The Programme focus on mainstream **climate action,** taking into account the EU's long-term decarbonization commitments such as the Paris Agreement.

Regarding the specific aspects concerning the other two sectors (transport and digital), as a result of the agreement:

- In the field of **transport,** CEF 2.0 will **promote interconnected and multimodal networks** to develop and modernize railway, road, inland waterway and maritime infrastructure, as well as safe and secure mobility.
- In the area of **digital connectivity,** the scope of the Programme has been broadened to reflect the fact that the **digital transformation of the economy and society at large depends on universal access to reliable and affordable high and very high capacity networks.**

Next steps

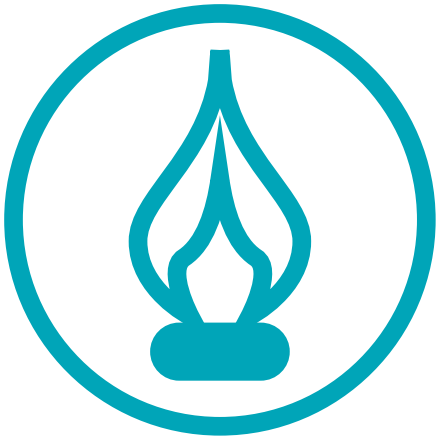
The provisional agreement reached on 11 March 2021 is subject to approval by the European Council. Once adopted by both the Council and the European Parliament, **the CEF regulation will enter into force the day after its publication in the EU Official Journal. It will apply retroactively from 1 January 2021.**

Link: *The European Parliament and the Council reach an agreement on the Connecting Europe Facility (CEF) proposal*

Germany			
Topic	**Key features**	**Insights**	**Next Steps**
Fuel Emissions Trading Act	• In order to achieve the climate targets, the German Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz – BEHG) was promulgated on December 19th 2019 as part of the German Climate Action Programm 2030. The German Fuel Emissions Trading Act establishes an Emission Trading System in the sectors heating and transport, started in January 2021. • The CO_2 pricing of emissions is a key climate protection instrument, particularly in the fields of heating and transport, which came into force with the national emissions trading scheme and the Fuel Emissions Trading Act (BEHG) on 20/12/2019. • Based on the BEHG, a national emissions trading scheme (in German "nationales Emissionshandelssystem" – hereinafter referred to by the abbreviation nEHS) will be introduced in Germany from 2021. The obligations of BEHG apply to those companies that place fuels on the market. These 'distributors' are normally fuel wholesalers, fuel producers with wholesale distribution and businesses that import fuels into Germany in the sense of energy tax. The businesses can be natural or legal persons or entities or partnerships. • As in the EU ETS, the nEHS also sets a budget for emission allowances. While direct emissions from participating installations are determined in the EU ETS, emissions in the nEHS are determined indirectly via fuel quantities put on the market. In contrast to the EU ETS, there is no free allocation of allowances to participants in the nEHS.	• The introduction of a national emissions trading scheme (nEHS) poses an organisational challenge to all players. First of all, the rules of the BEHG for the further structural development of national emissions trading must be implemented; corresponding ordinances (see below) entered into force on 24/12/2020. The German Emissions Trading Authority (DEHSt) at the German Environment Agency is responsible for the implementation of the nEHS. DEHSt has been implementing the EU ETS in Germany since 2005. Together with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) DEHSt is currently preparing the implementation of the BEHG in terms of organisation and expertise. • In the fixed-price phase (2021–2025) DEHSt or a body commissioned by DEHSt will sell the certificates under BEHG at a fixed price in the 2021 – 2025 period. The fixed price per emission certificate will be: – 2021: €25.00 – 2022: €30.00 – 2023: €35.00 – 2024: €45.00 – 2025: €55.00.	• In the auction phase Auctioning emission certificates will start in 2026. Auctions will run within a price corridor with a minimum price of €55 and a maximum price of €65 per emission certificate for 2026. Starting in 2027, the price will be freely created on the market, unless a decision is made in 2025 to carry on with the price corridor for 2027. The certificates are generally valid for each year of the trading period within the auction phase.
Emissions Reporting Ordinance	• All fuels whose combustion can cause CO_2 emissions, especially petrol, diesel, fuel oil, natural gas, liquefied gas and coal, are included in the nEHS (cf. Annex 1 of BEHG). Biomass also falls within the scope of the Act. • However, there should be no obligation to surrender certificates for emissions from biogenic fuels that meet the sustainability criteria.	• Distributors in principle have two main obligations laid down in the ordinance: – A monitoring plan must be drawn up and submitted to DEHSt for each trading period (Section 6 BEHG). – Distributors must prepare an emissions report based on their monitoring plan, which reports on the fuels placed on the market and the resulting emission volumes of the previous year (Section 7 BEHG) by the 31st of July each year.	• There will be some relief in 2021 and 2022: – reporting obligations will be limited to the main fuels such as petrol, diesel, fuel oils, natural gas and liquefied • gases for 2021 and 2022 (cf. Annex 2 of BEHG).

Germany			
Topic	**Key features**	**Insights**	**Next Steps**
Renewable Energy Act	Germany's landmark Renewable Energy Act (EEG) - credited with making solar and wind power two of the most important electricity sources in the country - is undergoing another reform. Renewables shall grow faster, become cheaper and more accepted by neighbouring citizens so that climate and clean energy targets can be reached. This factsheet shows the projected renewables growth and lists the changes proposed in the the EEG 2021 which was passed by parliament on 17 December 2020 and came into effect on 1 January 2021. The main goal of EEG 2021 is a significant increase of renewables capacity Overarching climate goals of EEG 2021: • 2050 goal: Emission neutrality by 2050 for all electricity generated and consumed in Germany • 2030 goal: 65% of electricity consumption stems from renewable electricity generation Capacity goals are translated into capacity and production expansion tracks • Capacity expansion track–Wind onshore: 71 GW in 2030 + 34 GW–Wind offshore: 20 GW in 2030 + 9 GW–Solar: 100 GW in 2030 + 50 GW–Biomass: 8.4 GW in 2030+ 4 GW • Production expansion track –376 TWh in 2029– Comparison: In 2018, only ~210 TWh renewable production Changes to the renewables levy on the power price Newer installations, in particular those whose feed-in payments have been determined through auctions, receive little more than the average wholesale power price on the market. But a big bulk of older installations are entitled to payments that exceed the market price. Depending on the wholesale power price and the amount of renewable electricity produced, the EEG surcharge changes every year. In 2020, the surcharge amounted to 6.76 cents which is around 20 percent of the price per kilowatt-hour that an average household pays. The reformed EEG 2021 makes an important change: The EEG levy will now partially be funded from the federal budget. The government's climate package, agreed in autumn 2019, stipulated that the surcharge will fall by 0.25 cents per kWh in 2021, by 0.5 ct/kWh in 2022 and by 0.625 ct/kWh in 2023. Initially the government will use 11 billion euros towards this power price reduction and as of 2021, the revenue from the new CO2 pricing of transport and heating fuels will also be used. The levy has been set at 6.5 ct/kWh for 2021.	• Increase of tender volumes: More market premium to more beneficiaries –Market premium follows from applicable value (anlegbarer Wert) minus average monthly market value (Monatsmarktwert) or average yearly market value (Jahresmarktwert) (for new projects as of 2023)–Applicable value for calculation of market premium and beneficiaries of market premium (RES operators) are established by tenders held by Federal Network Agency–EEG 2021 significantly increases tender volume –Increased tender volumes remain below required capacity expansion track– In particular with regard to solar energy, legislator expects that solar facilities will be increasingly realised without specific remuneration • The new EEG plans increasing solar PV capacity to 100 GW (~52 GW today), onshore wind to 71 GW (55 GW today), biomass to 8.4 GW, and offshore wind to 20 GW - targets that slightly exceed those from the Climate Action Programme 2030, which was decided in late 2019. The law sticks to annual deployment targets to make sure that capacity addition is compatible with the 65-percent-renewables target and allows for the adjustment of the power grid to incorporate the growing output from fluctuating renewables. • An additional 500-850 MW per year will be tendered in so called "innovation auctions" that are not technology-specific and where a combination of onshore wind, solar PV, biomass and/or power storage devices work together to stabilise the power system. Agri- and floating PV solutions can also participate in these auctions.	• Germany's goal to become greenhouse gas neutral by the middle of the century is officially made the guiding principle of the EEG 2021. "The aim of this law is also to ensure that before 2050 all electricity generated or consumed in the territory of the Federal Republic of Germany [...] is generated in a greenhouse gas-neutral manner", the latest draft reads. Both the electricity generated in Germany and the power imported to the country will have to meet this requirement, which implies the European Union is expected to stay on track to its corresponding 2050 neutrality target as well.

France			
Topic	**Key features**	**Insights**	**Next Steps**
Discussions on ARENH	• **The Energy and Climate law aims to modify the calculation of the price supplements in the ARENH (Access to historic nuclear power) to ensure that demand from suppliers for ARENH is commensurate with their requirements, and to avoid effects that are detrimental to the public interest. In addition, the ARENH ceiling was raised to 150TWh from January 1st, 2020.** Price is kept at €42/MWh. • EDF assess ARENH regulation as detrimental to its profitability and ability to finance future investments. • A first decision favorable to EDF was reached with the stability of ARENH volumes for 2020 and 2021 at 100 TWh instead of 150 TWh as initially contemplated by the French Energy Régulatory Commission (CRE). • ARENH requests from alternative electricity suppliers for 2021 amount to 146 TWh almost identical to that of 2020 (147 TWh). Since the ceiling for the supply of historic nuclear electricity at a guaranteed price is set at 100 TWh per year, EDF will only meet 68.39% of the demand from each supplier.	• With regard to future regulations: a comprehensive negotiation on the framework of the future regulation of existing nuclear power is currently underway between the French State and the European Commission in order to grant EDF with sufficient terms of compensation. • It requires an overall reform of the conditions for obtaining a fair return on nuclear assets. In this context, the French government launched a consultation on adopting a new regulatory framework to replace the ARENH and has requested the Group's Executive Management to reflect on a new organisation in connection with this reform. • This possible change in the Group's organisation, which is envisaged only if the regulatory framework reform projects are carried out, could lead in particular to a spin-off of the downstream and services activities, grouped together in a structure (called "VERT"). VERT would also cover the Group's renewables and distribution business, in particular by holding securities in EDF Renewables and Enedis. The parent company (known as "BLEU") is aiming to retain ownership and control of the majority of VERT's share capital; the rest would be put to public offering. The French State would own a majority stake in BLEU, which would cover all nuclear and termal capacities. The organisation of EDF's hydropower business is also being reviewed at present.	To date, the reorganisation project and the accompanying regulatory framework (known as the "HERCULE" project) are still being discussed by the French State and the European Commission. The outcome of these discussions cannot be predicted at this stage.



United Kingdom			
Topic	**Key features**	**Insights**	**Next Steps**
Ofgem publishes Forward Work Programme to protect consumers	• Ofgem published the Forward Work Programme for 2021/22 in an attempt to tackle climate change and protect consumers. The programme underlines the need for decarbonisation during a period when the country emerges from the impact of Covid-19. Ofgem's Forward Plan consists of 5 strategic change programmes: 01. Enable investment in low carbon infrastructure 02. Full chain flexibility to keep costs low as the level of renewables rises 03. Deliver a future retail market with innovative and flexible retail products that benefit and protect consumers 04. Realise the benefits of data and digitalisation to introduce the changes at the lowest cost possible 05. Provide forward-looking arrangements for energy system governance.	• The Forward Work Programme aligns with Ofgem's commitments in the Customer Vulnerability Strategy 2025 and Decarbonisation Action Plan. The programme comes into effect to supplement previous Ofgem's plans to protect consumers who struggle to pay their energy bills, by making sure that safeguards are in place for vulnerable consumers. • As well as providing protections for consumers, the Forward Plan may also generate opportunities for entrants into energy markets.	2021-2022
Energy price cap to increase in April	• Price caps rose by £96 for default tariff customers, reaching pre-pandemic levels. This resulted from increases in energy prices driven by higher demand. Price caps for pre-payment meter customers rose by £87, while support remains available for vulnerable customers. • Ofgem allows suppliers to claim £23 from the default tariff caps to recover some of the losses incurred from rising levels of bad debts.	• The cap is adjusted by Ofgem twice a year to account for the cost to supply electricity and gas. Consumers who want to avoid being charged a higher price should switch to a cheaper supplier. This encourages competition among suppliers to set a low and fair price, generating opportunities among competitors though a threat to dominant incumbents.	1 April 2021
UK ETS	• The EU Emissions Trading Scheme (ETS) was replaced by the equivalent UK ETS on 1 January 2021 to address the UK's decarbonisation plan and to protect the competitiveness of UK businesses. The framework of the UK ETS is set out in the Greenhouse Gas Emissions Trading Scheme Order 2020 and applies to all energy intensive industries, the power generation sector and aviation. Allowances will continue to enter the market through auctioning, with the first UK ETS auction held on 19 May 2021 with an Auction Reserve Prise (ARP) of £22 set by auctioning regulations. Allowances can also be traded in a secondary market.	• HMT will appoint BEIS as the UK Auctioneer for the UK ETS auctions. • UK ETS are subject to a Cost Containment Mechanism (CCM), allowing the government to address price rallies in the market. In the first two years of the UK ETS, the CCM will have a lower price than the equivalent European programme, to allow for quick interventions. Properly governed, this should facilitate a balance of opportunities for participants and progression towards Net Zero.	• 1 January 2021

Italy			
Topic	**Key features**	**Insights**	**Next Steps**
Extensions of legal deadlines to End of "Protected energy market"	**End of "Protected energy market"** • The law has postponed from 1 January 2022 to 1 January 2023 the termination of: – the price protection regime for domestic customers in the gas market; – the price protection regime in the electricity market for micro enterprises and domestic customers. • Accordingly, the final customers have time until 1 January 2023 for using the protected power and gas price tariffs regulated by the Authority for Energy, Networks and Environment **(ARERA)** every three months under the "Protected energy market". The "Free electricity and gas market", with price tariffs agreed between clients and operators, will be the only available market from 1 January 2023. **Incentives for biogas** • The law has extended from 2020 to 2021 the incentives introduced by the 2019 Budget Law for small biogas plants with a power capacity not exceeding 300 kW and part of the production cycle of an agricultural/farming companies. • We remind that such incentives are addressed to the biogas plants above operated by farming companies with agricultural works carried out by famers, also in consortium form, and whose revenues derive at least: 80 per cent from wastewater and materials derived from the agricultural enterprises; the remaining 20 per cent from their second crop. The access to the incentives is subject to the on-site self-consumption of the thermic power produced to the benefit of industrial/business production processes.	• The conversion law of the Milleproroghe Decree contains several provisions extending several legislative deadlines among which the extension of incentives for biogas plants, the end of the "Protected energy market", as well as a list of measures due to the continuing of the health emergency status. – In the next months, ARERA will increase the information and data available for final clients about the functioning of the "Free electricity market" so that they will be in the position to clearly evaluate and select their energy and gas suppliers in the free market by the end of 2022.	• The Energy Services Manager ("**GSE**") will publish by the end of 31 of September 2021 new call for tenders concerning incentives for biogas plants.

Italy			
Topic	**Key features**	**Insights**	**Next Steps**
Tax deductions for energy efficiency interventions	**Ecobonus and Superbonus for energy efficiency interventions** • The benefits introduced provided for the extension of the tax deductions for the expenses relating to energy efficiency works and the 110% tax deduction for specific interventions of energy efficiency or reduction of seismic risk. The Revenue Agency is publishing guidelines and resolutions in relation to the access to Superbonus and Ecobonus for giving more information and explanations on the requirements for accessing the tax benefits and specifying the typology of eligible interventions	The new tax deductions aim at promoting energy efficiency interventions on buildings and anti-seismic measures in order to increase the energy efficiency capacity of the Italian buildings.	• The Revenue Agency is monitoring the application filed for the access to such tax deductions. • ENEA, the National Agency for New Technologies, Energy and Sustainable Economic Development, is going to execute controls and inspections on the works executed for the interventions that requested and obtained the access to the tax deductions for energy savings.

Spain			
Topic	**Key features**	**Insights**	**Next Steps**
Approval of the Energy Storage Strategy	• On 9 February 2021, the Spanish Government approved the **Energy Storage Strategy** as part of the development of and compliance with the targets set in the **National Integrated Energy and Climate Plan** and the **Long-term Decarbonization Strategy.** The Strategy sets the **target for 20 gigawatts of storage to be available by the year 2030 and 30 gigawatts by 2050.** Currently, **the amount of available storage capacity** in the Spanish system is **8.3 gigawatts** (mainly pumped storage).	• The Strategy defines 10 action lines and 66 specific measures that deal with aspects such as the following: – The **role of storage technologies** in the energy sector. – The **significance of circular economy** concerning storage devices. – The **boost of renewable hydrogen.** – The **development of new business models.** – The **need of training for the workforce** (with special focus on the Just Transition). – The special relevance that storage will have for **isolated systems.** • Additionally, the Strategy considers other suitable effects caused by the promotion of storage technologies. In this sense, it identifies significant opportunities for the **economic recovery and development as well as implementation of key developments for the energy transition (i.e. aggregators or energy communities).**	• The Energy Storage Strategy is the result of a long process that involved public participation. Once approved, it will serve as a reference for future efforts towards the country's decarbonization.

Spain			
Topic	**Key features**	**Insights**	**Next Steps**
Launch of several public consultation processes in the context of the National Recovery and Resilience Plan (Next Generation EU)	• Following the consultation processes initiated in the last quarter of 2020, the **Spanish Government has launched several new public consultation processes in the first three months of 2021.** • By launching these consultation processes, the Spanish Government aims at identifying both quantitative and qualitative industries' needs and claims. As a result of the consultation, **the Spanish Government will design future recovery programmes and public aids schemes within the National Recovery and Resilience Plan.**	• The Spanish National Recovery and Resilience Plan defines within its four core principles the **ecological transition** and the **digital transformation.** Thus, there are several consultation processes occurred in the first quarter of 2021 that are directly related with the green and digital transitions: – Through the Ministry for the Ecological Transition and the Demographic Challenge: **Local energy communities; Circular economy; Sustainable energy in island territories; Flexibility in the energy system, electrical infrastructure, smart grids and energy storage deployment** and **Renewable energies.** – Through the Ministry of Transport, Mobility and Urban Agenda: **Sustainable and Digital Transport Support Program; Low emission zones and urban transport transformation; Design of the Public Buildings Renovation Impulse Program; and Program of Renovation for the economic and social recovery of residential areas.** – Through the Ministry of economic affairs and Digital Transformation: **Identification of mechanisms to integrate Artificial Intelligence in the supply chains and Cybersecurity Skills Strengthening for small and medium enterprises and Promotion of the Cybersecurity Industry.**	• These consultation processes have provided the Spanish Government the grounding for the design and definition of the detailed National Recovery and Resilience Plan that shall be presented to the European Commission before 30 April 2021.

Belgium			
Topic	**Key features**	**Insights**	**Next Steps**
The law on the organization of the electricity market, with the goal to install a capacity remuneration mechanism	• The regulation was in the pipeline for quite a while, though now finally voted and approved. • The CRM regulation introduces the remuneration for energy providers, not only for supplied energy, but also for reserved capacity. • The regulation serves to ensure enough capacity is kept available, especially in preparation for the nuclear phase-out by 2025, and the added variability introduced by increasing supply from renewable energy resources. • Estimates of the associated costs vary depending on the party, though a recent study estimates a cost of 253M EUR.	• The regulation serves to keep existing energy providers from decreasing capacity as their market share goes down. When the nuclear phase-out takes place, this capacity might still be leveraged. • Additionally, by auctioning capacity to be called on by 2025, other players get the chance to plan ahead for capacity they can get remunerations for. This allows opportunities for companies who still need to build/upgrade the capacity.	• For the government, the next step is to define the parameters of the capacity auction by the end of March '21. • The auction starts in May, and capacity should be awarded by September.
Carbon border adjustment mechanism	• A Carbon Border Adjustment Mechanism (CBAM) would ensure that the price of imports reflects more accurately their carbon content. • This measure will be designed to comply with World Trade Organization rules and other international obligations of the EU.	• The objective are: – To reduce the risk of carbon leakage if the differences in levels of ambition towards climate neutrality worldwide persist. – To create an equal level playing field	The proposal for a directive is planned for the second quarter of 2021.
Flexibility on the electricity market	• A framework is created for flexibility on the electricity distribution network and the local transmission grid of electricity. • It additionally involves the transposition of the concepts of "active customer" and "energy communities of citizens" from Directive (EU) 2019/944 and the concepts of "self-consumer of renewable energy", "jointly acting self-consumers of energy" and "renewable energy community" from Directive (EU) 2018/2001. • Finally, provisions are included in the Energy Decree of May 8, 2009 regarding free choice of supplier, basic contractual rights, the right to switch to another supplier, aggregator or flexibility service provider, and comparison tools.	• This Decree introduces in Belgium new European concepts such as "renewable energy community", "self-consumer of renewable energy", "energy communities of citizens" etc., offers additional ways in which to structure renewable energy projects and will create new business opportunities.	The draft decree was filed and amendments are currently being formulated – draft decree to be discussed in plenary session

Snapshot on surveys and publications

Deloitte

Digital utility asset management: Building the backbone of the energy transition – February 2021
This paper presents a framework to help electric power companies develop data-driven, risk-informed digital asset management strategies that balance risk, cost, and performance.
Link to the survey

Sparking utility connections: Electrifying the customer experience – January 2021
Electric utilities in developing countries should shine a light on customer experience beyond national connection mandates. A quantitative framework for CX investments can help them strengthen revenue streams and prioritize projects while adding a spark to the customer experience.
Link to the survey

2021 power and utilities industry outlook – December 2020
In 2020, the US power and utilities (P&U) industry led the clean energy transition despite federal policy headwinds - and COVID-19 helped solidify the urgency. How will the energy industry converge as players seek to serve a growing clean power industry in an economy moving toward electrification? Explore five P&U trends as we enter a new landscape.
Link to the survey

2021 renewable energy industry outlook – December 2020
While short-term decision-making in the coming months is expected to focus on recovery from market disruption, Deloitte's recent energy transition survey results suggest that the energy transition will likely continue to be a priority for companies in the longer term. The COVID-19 crisis seems to have highlighted many attributes that could accelerate the energy transition.
Link to the survey

Navigating the energy transition from disruption to growth: Energy and industrial companies are positioned for a lower-carbon future – December 2020
Energy-as-a-Service (EaaS) is a delivery model that combines hardware, software and services. Solutions should combine demand management and energy efficiency services, facilitate the adoption of renewables and other decentralized supply sources and also optimize the balance between demand and supply. The attached document provides a summary of EaaS and explains how it can help.
Link to the survey

Venture Capitalists and Corporates turn to Hydrogen – Decembre 2020
Hydrogen has been talked about for decades, but recently there has been an increase in investments by venture capitalists and corporates. This report highlights on the below topics: Role of Hydrogen in the energy transition, Ways to mitigate risk in an emerging technology market, Venture capital funding received and Potential areas for Hydrogen application
Link to the survey

Agencies or research institutes

International Energy Agency

Energy Efficiency 2020 – December 2020

Energy Efficiency 2020 is the latest edition of the IEA's annual update on global developments in energy efficiency. Through analysis of energy data, policies and technology trends, it provides a comprehensive view of energy efficiency trends worldwide.
Link to the survey

Electricity Market Report – December 2020

This report focuses on developments in the world's electricity markets amid the Covid-19 pandemic. It includes an assessment of 2020 trends and 2021 forecasts for electricity demand, supply, capacity and emissions – both globally and by country.
Link to the survey

Coal 2020 – December 2020

This report provides recent global and regional trends in coal demand, supply and trade, and an outlook to 2025. In addition, it includes forecasts of coal demand, production and trade by region and coal grade, and a compilation of coal mining projects in the main exporting countries in its annexes.
Link to the survey

Projected Costs of Generating Electricity – December 2020

This report includes cost data on power generation from natural gas, coal, nuclear, and a broad range of renewable technologies. It provides information on storage costs by technologies, long-term operation of nuclear power plants and fuel cells.
Link to the survey

Clean Energy Investment Trends 2020 – November 2020

This report examines the appeal of utility-scale solar PV and onshore wind energy in India by analyzing project-level equity returns over 2019 and into the first half of 2020. It looks at the key sensitivities in regard to returns and challenges to attracting capital.
Link to the survey

Renewable Energy Policies in a Time of Transition: Heating and Cooling – November 2020

This report outlines the infrastructure and policies needed with each transition pathway. This edition, focused on renewable-based heating and cooling, follows a broader initial study, Renewable Energy Policies in a Time of Transition (IRENA, IEA and REN21, 2018).
Link to the survey

Tracking clean energy innovation – November 2020

This report aims to support public and private decision makers' efforts to accelerate clean energy innovation. Strategies for tracking progress and embedding innovation policy within energy policy are long-term commitments, and data collection can be challenging.
Link to the survey

Renewables 2020 – November 2020

The report provides detailed analysis and forecasts for the electricity, heat and transport sectors through 2025 with a focus on the impact of the Covid-19 crisis.
Link to the survey

World Energy Outlook 2020 – October 2020

This publication provides a comprehensive view of how the global energy system could develop in the coming decades. The usual long-term modelling horizons are kept but the focus for the World Energy Outlook 2020 is firmly on the next 10 years, exploring in detail the impacts of the Covid-19 pandemic.
Link to the survey

Power systems in transition – October 2020

This report surveys the ongoing multiple transformations in the electricity sector. Three key aspects of electricity security are addressed in one report: energy transitions with more variable renewables, cyber risks, and climate impacts.
Link to the survey

Global Gas Security Review 2020 – October 2020

This report offers a detailed analysis of recent LNG contracting developments and assesses the role of flexibility in gas supply adjustment during the Covid-19 crisis. It also provides updates on the latest developments in global gas markets and on the near-term outlook.
Link to the survey

In order to gain access to studies and analysis from IEA you have to create an account to be able to download the above publications.

European Commission

Social innovations for the energy transition – December 2020

This report reflects upon the concept of social innovation and the way it is used in the energy sector. It does so by bringing together theoretical investigations and empirical knowledge.

Link to the survey

EU gas transmission network facilities review – December 2020

This report addresses a review of main EU natural gas transmission network facilities with a focus on Liquefied Natural Gas (LNG) regasification terminals, Underground Gas Storage (UGS) facilities, Compressor Stations (CS) and pipelines.

Link to the survey

National energy and climate plans for 2021 – 2030 under the EU energy union – December 2020

This report explains This report is the first of the series of reports assessing the energy efficiency dimension of the national energy and climate plans of EU Member States submitted under the Energy Union Governance. Tthe report provides an evaluation of the national contributions towards the EU energy efficiency target in 2030.

Link to the survey

Energy outlook analysis – December 2020

The study looks into assumptions and results of different deep decarbonization outlooks that stem from entirely independent studies, frameworks and storylines. The study outlines the directions of investment both in technological development and infrastructure.

Link to the survey

Research and innovation in transport electrification in Europe – November 2020

This report provides a comprehensive analysis of R&I in transport electrification. The assessment follows the methodology developed by the European Commission's Transport Research and Innovation Monitoring and Information System (TRIMIS).

Link to the survey

Energy, transport and environment statistics – November 2020

This publication presents a selection of topical data. Most data cover the European Union and its Member States, while some indicators are provided for other countries, such as members of EFTA, and candidate countries and potential candidates to the European Union.

Link to the survey

Networks costs – October 2020

This report presents electricity and gas network cost data split into three components (investments, operation & maintenance – O&M, and system service costs) for the EU27 Member States and non-EU G20 countries, for 2010, 2014 and 2018 (chapter 1) with a high-level analysis of regulatory frameworks.

Link to the survey

Study on energy prices, costs and their impact on industry and households – October 2020

This study updates and extend the analysis of international comparisons on the evolution and drivers of energy, update and extend the analysis on how energy costs influence industrial competitiveness and provide both insights on the impact of prices and the price formation framework.

Link to the survey

Energy subsidies – October 2020

The report provides a detailed inventory that will be used for methodological support to the EC in future reporting on energy subsidy accounting and Member States' policy measures addressing the phasing-out of inefficient fossil fuel subsidies.

Link to the survey

Energy taxes – October 2020

The report develops a detailed inventory and analysis of energy-related taxes, levies and other fiscal measures in European Union ('EU') Member States ('MS') and G20 countries. Tax data was collected from national sources (e.g., finance and energy ministries) and assembled into a database.

Link to the survey

Eurelectric

Distribution Grids in Europe – Fact and figures 2020 – December 2020

This article deals with Distribution System Operators (DSO) challenges regarding (i) access to new tools to manage grids more efficiently with increasing integration of variable renewables in the system, and (ii) transformation of the energy world with changing customer needs.

Link to the survey

Guide on EU financing and funding instruments for DSO projects – December 2020

This guide aims to inform Eurelectric members on the EU available funding for their projects, to identify the type of financing tools and the conditions of eligibility. The objective is also to raise awareness on the need for better funding of smart distribution grids to achieve the transition towards a net-zero economy.

Link to the survey

Oxford institute for Energy

Methane Emissions from Natural Gas and LNG Imports: an increasingly urgent issue for the future of gas in Europe – November 2020

This paper provides an overview of the key themes, discusses the issues surrounding the measurement, reporting and verification of methane emissions, looks at the specific emissions associated with the key exporters of gas to Europe and then concludes with the key implications of the new EU Methane Strategy.

Link to the survey

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