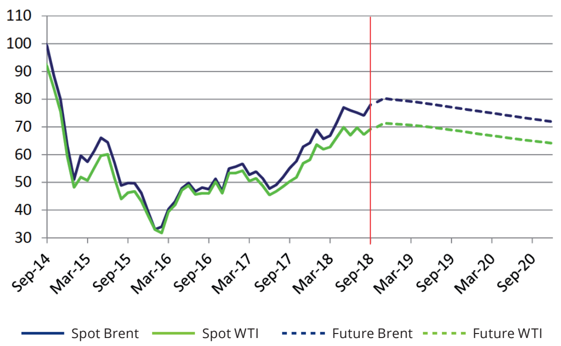
Power & Utilities
October 2018

Newsletter
Power & Utilities in Europe

Commodities

Crude oil ($/bbl)



Source Capital IQ

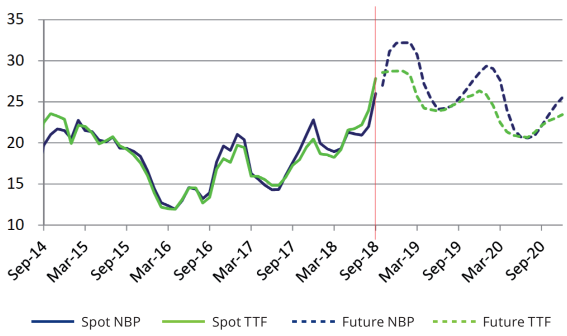
During the last trading week of Q3 2018, Brent crude oil prices peaked at **$82 a barrel** after softening in July and August 2018 from the highs in Q2. This is the highest level of Brent crude oil prices since November 2014, and may be attributed to geopolitical risks which could potentially cause supply shocks.

The main supply risk came from the **market preparing for US sanctions on Iran**. These sanctions are scheduled to come into force in Q4 2018. The re-imposition of sanctions following the withdrawal by the US from the 2015 nuclear deal is estimated to cut Iranian oil exports by 1 million barrels per day. In addition, the US has threatened secondary sanctions on countries that buy Iranian oil which may further reduce oil exports from Iran.

Iran was the world's fifth largest producer of crude oil last year, accounting for c.5% of the world's crude oil supplies. If Iranian oil exports are affected, **Saudi Arabia is expected to fill the gap in production** from Iran. However, there are concerns over the spare capacity the Kingdom possesses to be able to offset any declines in output.

Global supply risks were compounded by **falling output in Venezuela's oil by as much as 14% in September to 1.1 million barrels per day** and **ongoing supply disruptions in Libya.** The upward pressure on oil prices have been offset by rising shale output from the US, attributed to improvements in hydraulic fracturing and horizontal drilling techniques which have brought down production costs. In addition, the weakening of emerging market currencies may soften economic growth, which in turn may feed into lower oil demand and prices. Overall, the forward suggests that the market expects some softening in oil prices in 2019.

Gas (€/MWh)



Source Capital IQ

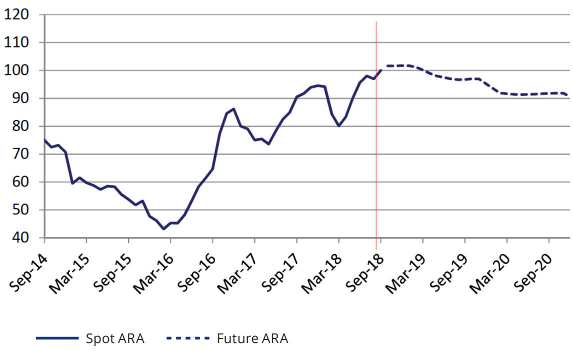
The third quarter of 2018 saw an increase in gas prices compared to the previous quarter barring a dip in July. The rise in prices may be attributed to **unplanned outages** at the Asgard and Gullfaks gas fields in Norway, as well as **planned outages** at the Kollsnes gas processing plant. These outages led to a reduced gas outflow from Norway which pushed up gas prices.

Additionally, the gas industry witnessed a **slow recovery of storage levels owing to the cold winter in Q1 2018**. The previous winter saw sharp increases in gas prices because of higher demand for heating which, combined with the outages in Norway, led to gas prices not returning to their Q3 2017 levels.

Normally, the third quarter is a period of low demand owing to warm weather reducing the demand for heating load, together with summer holidays in July and August, which limits industrial use of gas. However, **demand was higher than in a typical summer** due to the ongoing need to inject gas into storage sites which hold less storage compared to the previous years as a result of the previous winter.

Norway exported a record high volume of gas to Europe in Q3 2018 and this is expected to continue until the end of the year. The increase in gas supply, combined with more sales from Russia's Gazprom to Europe, is expected to ease pressure on building gas supplies for this coming winter. Gazprom currently accounts for 60% of German gas imports and is setting up a new pipeline named Nord Stream 2 which will link Russia and Germany. In its press release, Gazprom estimates that Nord Stream 2 will be able to supply 55 billion cubic meters of gas per year, which will be sufficient to provide 26 million households with heat and electricity every year starting from 2019.

Coal ($/metric ton)



Source Capital IQ

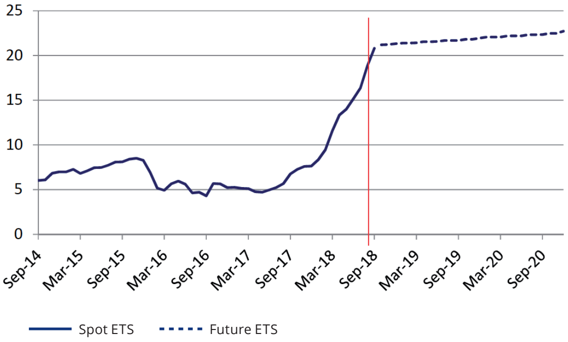
Coal prices rose in Q3, continuing the upward trend which began in Q2. The **price surged to $100/t** which is the highest level in nearly seven years. The third quarter was also a period of strong coal-fired power generation in Europe as compared to other sources of power generation.

Indonesia is the world's top thermal coal exporter but the exports were lower than usual in Q3 due to higher than average rainfall in early July 2018 which pushed prices upwards. Coal loading was disrupted after the heavy rainfall impacted transportation of coal shipments from the coal-producing regions of Indonesia.

China's supply side reforms which include restrictions on output at domestic mines to curb air pollution has led to an increase in imports which has driven up prices of coal and higher quality iron ore. The demand for coal from China also increased in Q3 due to a greater air conditioning demand arising from seasonally hot weather in the summer.

India's coal imports rose steadily even when prices have gradually increased. Usually, India's demand is considered to be sensitive to prices but higher electricity demand and increasing difficulty of transporting coal from the pits to power plants by the state miner Coal India led to the sharp rise in imports. In addition, South Korea and Japan also experienced an increase in coal imports, which provided upward pressure on prices in Q3.

CO_2 (€/ton) Carbon



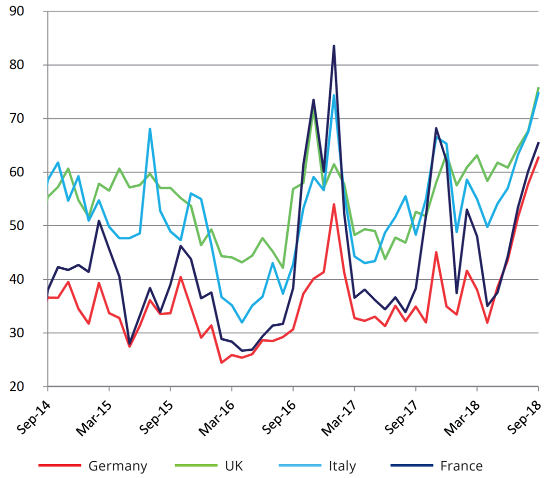
Source Capital IQ

EUA (EU carbon allowance) **prices quadrupled in the past 15 months**, rising from around €5/t in May last year to over €20/t at the end of Q3 2018.

The uplift in prices was based on **market expectations that the oversupply of carbon allowances will start to subside once MSR (Market Stability Reserve) starts operations** in January 2019. MSR has been designed to reduce the excess supply of EUAs by 24% each year from 2019 to 2023 in order to balance the market. The carbon emissions allowance market has suffered from excess supply since the financial crisis when the decline in industrial emissions (due to a fall in industrial output) created a surplus of EUAs that grew to as much as 2bn tonnes which was more than a year's supply for the entire market.

The anticipation of a tighter market and higher prices is already reflected in current market prices. Looking ahead, the forward curve suggests that the market will fluctuate less in the next quarter once the MSR is implemented.

Baseload Electricity Baseload Spot Day Ahead (€/MWh)



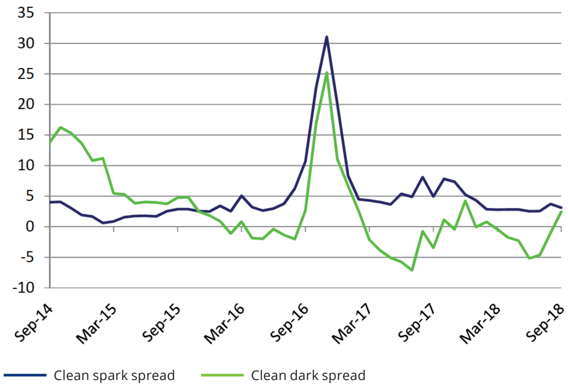
Source Bloomberg

In the third quarter, baseload spot electricity prices for Germany, UK, Italy and France **continued the upward trend** that started in Q2 2018.

In France, the rise in electricity prices was largely attributed to **planned outages** in various nuclear power plants which turned France into a net importer of electricity. This raised **concerns of reduced power availability in Italy** as well since Italy imports electricity from France. **A prolonged heatwave** in August led to power prices hitting record highs as power exports from France fell further which in turn increased electricity generation requirements in Italy. The reduction in exports from France tightened the Italian power market and pushed prices upwards.

German prices observed multiple-year highs because of **falling output from wind turbines** and reduced power supply from France. In the UK, **electricity prices remained strongly driven by gas prices** despite the recent commissioning of new wind generation capacity. As such, higher coal and EUA prices led to a spike in electricity prices to levels not observed since September 2016.

UK Clean dark & spark spreads (£/MWh)



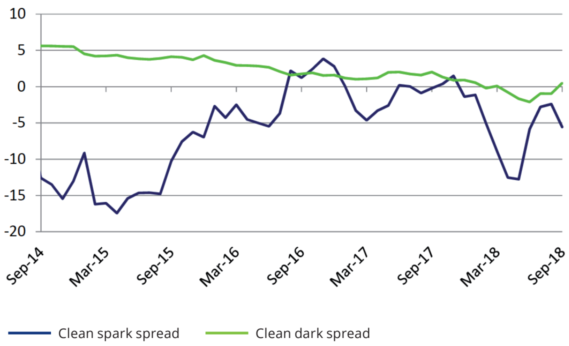
Source Bloomberg

The UK clean dark spreads rose rapidly in Q3 2018 to **close the gap** between gas and coal margins to less than a pound per MWh. Coal-fired power generation became increasingly profitable over Q3 compared to gas-fired plants due to rising NBP (National Balancing Point) gas contracts hitting a ten year high in Q3.

The country's dependence on gas imports came into focus following the absence of long-term storage after the **closure of the Rough facility** which accounted for more than 70% of the UK's gas storage. The option for storing gas in continental Europe has been raised since the **Interconnector transportation contracts came to an end** in September and the UK is experiencing higher gas transportation costs in both directions.

The narrowing gap between clean spark and dark spreads indicates that heating demand may increase the proportion of **coal-fired electricity this winter** despite a strong uplift in carbon prices. This may be expected due to rising gas prices coupled with higher demand in winter. The British and European markets **may also meet higher energy demands by increasing imports of LNG** (Liquefied Natural Gas) from Asian countries.

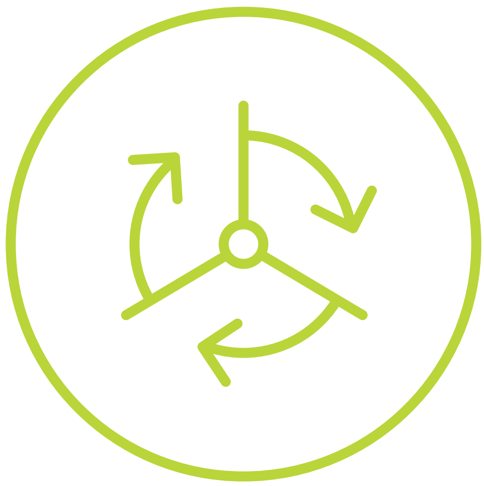
German Clean dark & spark spreads (€/MWh)



Source Bloomberg

After hitting a low in June, German coal margins rebounded to profitable levels, simultaneously widening the gap to gas margins. Coal margins reached their highest level since December 2018, indicating that the rise in electricity prices offset the slower rise in coal prices. Conversely, clean spark spreads for modern gas units fell by c.€3/MWh after it spent the previous quarter and most of Q3 recovering from low levels.

Germany has **the highest installed power capacity in Europe** and also generates and consumes the most electricity. Steps are being taken to phase out coal powered power generation and to actively raise renewable electricity generation in the country. Hard coal (highest rank of coal containing a high percentage of fixed carbon) plants have already been struggling in an environment characterized by low baseload power prices. Hence, it is expected that the share of gas and coal power generation will likely shrink with the rise in wind and solar power generation.



Spotlight on Power and Utilities market

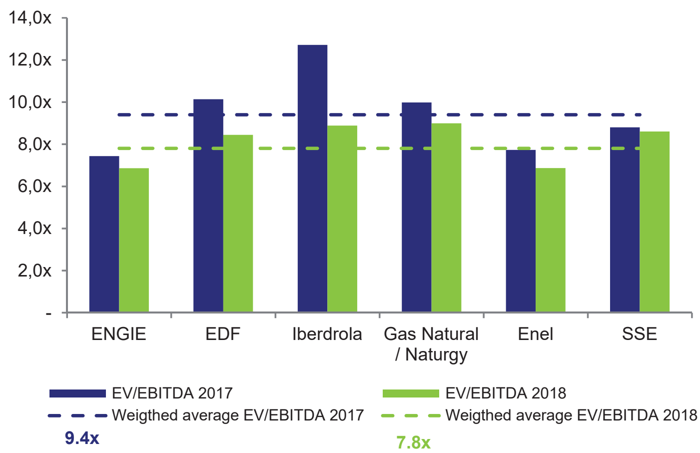
Capital market overview

	Deloitte Index [1]	Enel	EDF	Iberdrola	ENGIE	Naturgy	EON	RWE	Centrica
Market cap. ratios									
Currency		EUR	EUR	EUR	EUR	EUR	EUR	EUR	GBP
Market cap. (June 18)		**45 720**	44 454	40 168	29 764	23 377	19 233	13 296	**8 348**
3m stock price performance	**+1.3%**	**-7.0%**	**+28.1%**	-4.3%	-3.7%	+3.0%	-5.0%	+7.6%	-2.5%
YoY stock price performance	**+2.9%**	-13.7%	**+46.5%**	-3.3%	-12.3%	+26.7%	-9.1%	+9.1%	**-19.7%**
Market multiples									
EV/EBITDA 2017	**8.3x**	7.7x	10.1x	**12.7x**	7.4x	10.0x	n/m [3]	n/m [3]	**7.0x**
EV/EBITDA 2018	**6.9x**	6.9x	8.4x	8.9x	6.9x	**9.0x**	n/m [3]	n/m [3]	**5.6x**
P/E 2017	**12.4x**	**12.1x**	14.0x	14.3x	20.9x	17.2x	n/m [3]	n/m [3]	**25.1x**
P/E 2018	**12.6x**	**11.1x**	**21.3x**	13.7x	12.4x	18.5x	n/m [3]	n/m [3]	11.6x
Price/book value 2018	**1.2x**	1.5x	1.0x	1.1x	**0.8x**	2.0x	n/m [3]	n/m [3]	**2.5x**
Profitability ratios									
ROE forward 12m	**8.2%**	**11.8%**	**5.0%**	7.9%	6.5%	8.6%	n/m [3]	n/m [3]	n/m [2]
ROCE forward 12m	**5.9%**	**8.9%**	**4.5%**	5.4%	5.4%	7.2%	n/m [3]	n/m [3]	n/m [2]
EBITDA margin 2017	**16.4%**	19.7%	18.2%	**20.3%**	13.1%	16.6%	n/m [3]	n/m [3]	**6.9%**
EBITDA margin 2018	**18.0%**	21.3%	21.7%	**26.1%**	14.7%	18.0%	n/m [3]	n/m [3]	**8.6%**

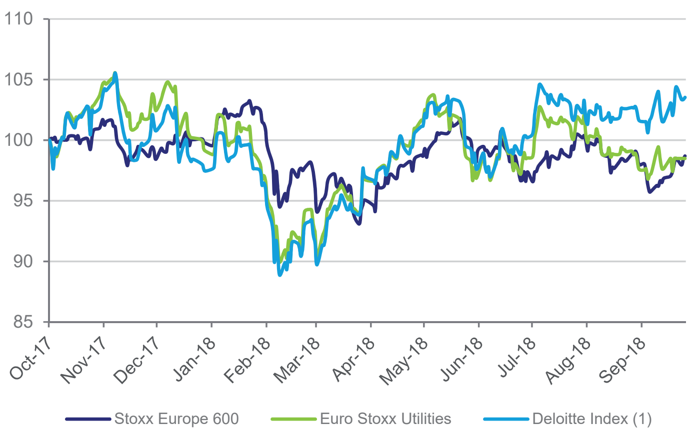
(1) Deloitte Index is composed of Engie, EDF, EON, Iberdrola, RWE, Gas Naturgy, Enel, SSE and Centrica

(2) Ratio linked to the expected level of non recurring income resulting from disposals program by Centrica

(3) Due to the large asset swap between E.On and RWE, financials and multiples are irrelevant



Source Capital IQ



Source Capital IQ

Key messages from brokers and analysts

"Power generation was up around 2% yoy ... this should give an overall backdrop to the Q3 reporting season, although surging commodity prices make earnings particularly sensitive to hedging"
(Deutsche Bank - October 8, 2018)

"Forward curve increase by c.€20/MVh for winter 2018-19... materially more than in later years: risk premium related to recent nuclear outage extensions newsflow"
(JP Morgan Cazenove - October 1, 2018)

"We still see upside to CO_2 with switching level of c.€30MWh and risk of political intervention as limited for now"
(JP Morgan Cazenove - October 1, 2018)

"The energy transition remains limited to the electricity sector: Could new entrants benefit from the energy transition before utilities?"
(Morgan Stanley - September 24, 2018)

"With demand exceeding supply by around 360mt in 2019, EU-ETS could find itself short in 2019"
(Société Générale - September 19, 2018)

M&A Trends

Transactions involving Power & Utilities companies

EDF SA and Total SA agreed to sell their 75% stake in Dunkerque LNG SAS to a consortium led by **Fluxys**, a Belgian natural gas transmission grid and storage company, **and two equity funds of IPM Group for $2.8bn.**
(*Financial Deal Tracker* - July 1, 2018)

TerraForm Power, owner and operator of a 2.600 MW portfolio of wind and solar, **acquired Saeta Yield** owning approx. 778MW of onshore wind and 250MW of solar in Spain, for **$650m**.
(*Energey M&A Review* – July 1, 2018)

Enel sold its biomass portfolio in Italy **to F2I**, an infrastructure fund, **for €335m**. The deal involves 5 plants with total capacity of 108MW.
(*Reuters News*- June 28, 2018)

Integrated energy group **Sembcorp Industries has agreed to buy UK Power Reserve**, Britain's largest flexible power generator, for an equity value of **£216m**.
(*Reuters* – May 31, 2018)

Repsol, bought a solar power project in Spain, which will generate up to 264MW of renewable energy, from **Valdesolar Hive**, a renewable energy producer, for €210m.
(*Expansion* - September 11, 2018)

Fluxys SA, a Belgian natural gas transmission grid and storage company, and **Enagas SA**, a Spanish natural gas transmission company, **jointly sell 100% stake in Swedegas**, a Swedish gas company, to **FS Gas transport AB**, an investor in gas distribution, for **$223m**.
(*Financial Deal Tracker* - September 8, 2018)

Enel acquired an additional **12**% stake in **Electropaulo**, a Brazilian power distributor, for **€193m**, this acquisition will hikes Enel's stake up to 87.8%.
(*See News Deals*- July 9, 2018)

DEPA, Greece's state-controlled gas supply company, **bought 49% of Shell's stake** in the **Attiki Gas Supply Company** (EPA Attiki) and the **Attiki Natural Gas Distribution Company** (EDA Attiki), for **€150m**.
(*EUROGAS* - July 17, 2018)

Severn Trent PLC (SVT LN), a water utility company, **acquired Agrivert Holdings Ltd**, specialist in renewable generation from food waste, representing 106 GWH of generation, for **£120m**.
(*Dow Jones Institutional News* – August 30, 2018)

Innogy Renewables UK Limited **invested in Brechfa Forest West Wind Farm in UK**, representing a 57.4 MW capacity, for **$140m**.
(*Financial Deal Tracker* - August 25, 2018)

Bouygues Construction and Colas Rail, subsidiaries of the French industrial group Bouygues, jointly acquired **Alpiq Intec and Kraftanlagen Munchen from Alpiq Holding**, a Swiss energy company, for **$896m**.
(*Financial Deal Tracker* - August 2, 2018)

Transactions involving equity funds

Dalmore Capital Limited and **Pensions Infrastructure Platform, two equity funds**, acquired a 49% stake in 24 wind farms in UK, representing 550MW of capacity, **from EDF Renewables** for **£701m**.
(*Financial Deal Tracker* - July 4, 2018)

Sumitomo Corp., through its infrastructure fund, **acquired a 30% stake in 2 windfarms in Belgium**, with expected generation of 219MW. The project should cost around **€700m**.
(*Financial Deal Tracker* - August 30, 2018)

Ardian, a private equity fund, sold **a 25% stake in Encevo**, a Luxembourg energy utility company to **China Southern Power Grid International**, a distributor company, for **€400m**.
(*Financial Deal Tracker*- August 1, 2018)

Hellenic Republic Asset Development Fund (HRADF), a Greek sovereign wealth fund, and **Hellenic Petroleum SA**, a Greek oil company, agreed to **sell 66% stake of Desfa SA**, a Greek natural transmission system operator, **to a consortium of Snam Spa**, an Italian gas infrastructure company, **Enegas and Fluxys SA**, two natural gas transmission companies, for **€535m**.
(*Financial Deal Tracker*- July 25, 2018)

Boralex Inc, a renewable energy developer, **acquired the French wind energy company Kallista Energy Investment SAS for €129m from Ardian**, a private equity fund.
(*SNL Energy M&A Review* - July 1,2018)

European Power and Utilities companies wrap-up

Utilities delivered better HY performance than in 2017, except German companies due to the one-off profit recorded in 2017 on the nuclear tax refund.

It is largely attributable to improved economic fundamentals: higher prices, increase in energy demand, except UK, and better generation from hydro and renewables.

The rise in electricity prices is closely linked to surging commodities prices notably CO_2 prices.

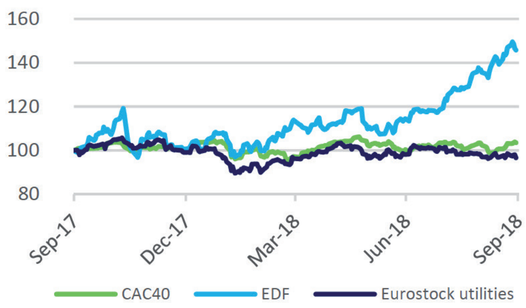
Strategic review are still going-on leading to significant disposal (EDF, Naturgy) or triggering material impairment charge (Naturgy).

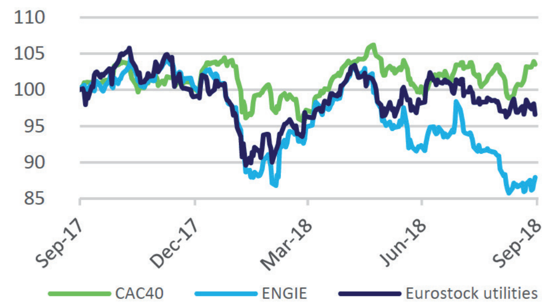
Utilities operating nuclear power plants are still underpressure in respect with recent nuclear outage extensions, especially in the context of the coming winter.

FY18 outlooks confirmed.

	EDF	ENGIE

Share Price Perf. Sep. 2017 Sep. 2018





Key Reported Financials

EDF

In billion of €	HY18	HY17 **	Var.
Sales	35.2	33.3	+6%
EBITDA	**8.2**	**7.0**	**+18%**
Operating Income	3.7	3.9	-6%
Recurring net income Gr	**1.7**	**1.4**	**+21%**
Net Income Gr Share	**1.7**	**2.0**	**-14%**
Operating CF	7.0	4.1	+71%
Net Capex	-6.3	-5.8	+8%
Net debt	-31.3	-33.0*	-5%

* as of Dec. 31, 2017
** Figures restated of IFRS15 impacts

ENGIE

In billion of €	HY18	HY17 **	Var.
Sales	30.2	30.2	-
EBITDA	**5.1**	**5.0**	**+1%**
Operating Income	3.1	3.0	+3%
Recurring net income Gr	**1.5**	**1.3**	**+15%**
Net Income Gr Share	**0.9**	**1.2**	**n.m**
Operating CF	3.3	3.8	-13%
Net Capex	-2.6	-2.3	+14%
Net debt	-20.5	-22.5*	-9%

* as of Dec. 31, 2017
** Figures restated of IFRS15 impacts

HY18 Highlights

EDF

- **Ebitda amounted to €8.2bn, +18% vs HY17, due to:**
  - A 50% organic growth in Generation and Supply in France thanks to (i) a sharp increase in hydropower (+8TWH) and nuclear generation in France (+5.4TWH) and (ii) improved price conditions on the wholesale markets.
  - A 80.9% organic increase (+€190m) in energy trading activities driven by the return of volatility in commodities markets.
  - An organic increase in French regulated activities due to (i) impact of TURPE 5 indexation (+€64m) and (ii) a positive weather impact (+€67m).
- **The net income totalled €1.7bn, -14% vs HY17**, due primarily to the positive effect of the €1.3bn capital gain recorded for the sale of 49.9% of CTE in 2017, without equivalent in 2018.
- **Operating cash flow amounted to €7.0bn, +71% vs HY17** mainly (i) the result of the increase in Ebitda, (ii) the drop in the income taxes paid and (iii) a decrease in net financial expenses disbursed.
- **Net capex are increasing by €0.5bn** due to acceleration in strategic programms (Linky smartmetring systems and HPC EPR)
- **Disposal of a 49% minority stake in twenty-four of its wind farms** (approx. 550MW) in the UK.
- **Acquisition of Zephyra** in Energy services in Italy
- **Welds of the main secondary system of the Flamanville EPR**: EDF set up corrective actions and adjusted the schedule and target construction costs.
- **Sale of the stake in LNG Dunkerque.**
- **Issue of €1.25bn hybrid bonds, €1.0bn senior bonds and $3.75bn senior bonds**

ENGIE

- **Revenues amounted to €30.2bn, +0.1% vs HY17 due to:**
  - A (i) sharp increase in renewable generation, mainly on hydropower, (ii) the introduction of gas storage regulation in France and (iii) a positive scope impact.
  - These impacts were partly offset by (i) an adverse exchange rate, mainly US dollar and Brazilian real and (ii) the new accounting treatment of long-term gas supply contracts in Europe since the end of 2017, with no impact on EBITDA.
- **Ebitda reached €5.1bn, +1% vs HY17 and + 6.2% on an organic basis, due to :**
  - Positive impacts of (i) the excellent performance from the energy management activities explained by the favourable market conditions in Europe, (ii) the impact of the change on GEM Business Unit's long-term contract and (iii) the impacts of the Lean 2018 performance program.
  - These positive factors are partly offset by (i) the outages at the Belgian nuclear power plants during the period, (ii) depreciation of the US dollar and Brazilian real against the euro and (iii) an overall slightly negative scope effect.
- **The net income Group Share amounted to €0.9bn, compared to €1.2bn in HY17**. It includes a loss of €0.2bn related to the upstream and midstream LNG business classified as "Discontinued operations".
- **Net debt stood at €20.5bn, down €2.0bn vs FY 2017 mainly due to**
  - Positive impacts of (i) cash flow from operations, (ii) impacts of the portfolio rotation program with the closing of the sale of the exploration and production business of the Loy Yang B coal-fired power plant and (iii) the distribution business in Hungary
  - These factors are partly offset by gross investments in the period and by dividends paid.

Upgrade of S&P outlook: negative to stable with A-rating.

FY 2018 Outlook

EDF

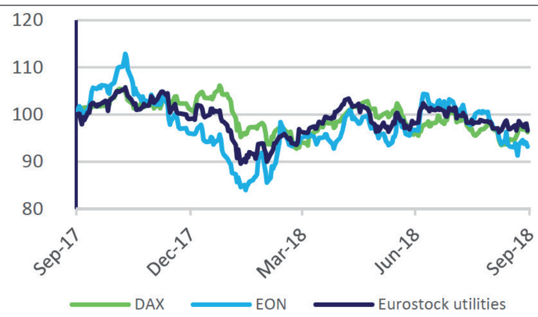
FY 2018 targets for Ebitda and debt ratio upgraded :
- Ebitda: €14.8-15.3bn vs €14.6 – 15.3bn previously
- Debt ratio: <2.5x vs <2.7x previously

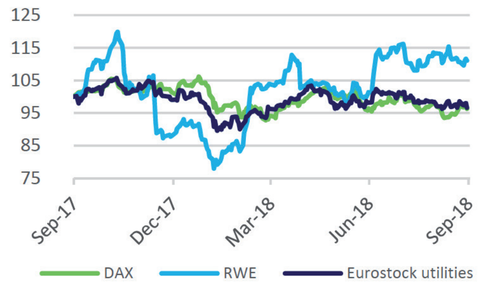
ENGIE

FY 2018 guidance confirmed

	e·on	RWE

Share Price Perf. Sep. 2017 Sep. 2018





Key Reported Financials

E.ON

In billion of €	HY18	HY17 **	Var.
Sales	17.0	19.6	-13%
EBITDA	**2.8**	**2.7**	**+3%**
Operating Income	1.9	1.8	+6%
Recurring net income Gr	**1.0**	**0.9**	**+11%**
Net Income Gr Share	**2.7**	**3.9**	**-30%**
Operating CF	1.4	4.9	-71%
Net Capex	-1.4	-1.3	+8%
Net debt	-15.9	-19.2*	-18%

* as of Dec. 31, 2017

** Figures NOT restated of IFRS15 impacts

RWE

In billion of €	HY18	HY17 **	Var.
Sales	6.7	7.4	-9%
EBITDA	**0.8**	**1.1**	**-27%**
Operating Income	0.4	0.7	-43%
Recurring net income Gr	**0.1**	**n.m**	**n.m**
Net Income Gr Share	**0.2**	**2.7**	**-93%**
Operating CF	1.9	1.7	+12%
Net Capex	0.4	0.3	+33%
Net debt	-5.4	-4.5***	+20%

** Figures NOT restated of IFRS15 impacts

*** Figures NOT restated of IFRS15 impacts and presenting assets to be transferred to E.ON as 'discontinued operations'

HY18 Highlights

E.ON

- **Sales amounted to €17bn, -13% vs HY17 due to :**
  - A (i) €2.5bn in Energy Networks' sales primarily attributable to netting effects in conjunction with IFRS 15 in Germany and the Czech Republic, (ii) a decline in Customer's solution in Germany offsetting increase in the United Kingdom and (iii) a significant decline in Non-Core Business sales because of lower sales prices and non-recurring item recorded in 2017 on PreussenElektra.
  - Partly offset by an increase in Renewables' output due to the commissioning of new onshore and offshore wind farms.
- **First-half operating income improved by €0.1bn.** The principal factor is a wider gross margin in the power and gas sales business in Germany. By contrast, adjusted EBIT in the UK declined because price increases were more than offset by higher procurement costs, regulatory effects, and lower power sales volume.
- **The decline in net income and operating cash flow comes from the refund of €2.9bn in nuclear-fuel taxes recorded in the prior- year period.**
- **Decrease of the net debt of €3.4bn** principally attributable to the proceeds from the sale of the company's stake in Uniper and gas network in Hamburg.

RWE

- **Sales decreased by 9 % to €6,8bn vs HY17:**
  - This drop is largely attributable to the method retained by RWE for the first-time application of IFRS 15 leading to not restated prior year figure. In addition, electricity sales amount to €5.0bn, suffering from a 16 % decrease in generation namely due to nuclear power plant shutdown (-5.1 TWh).
  - By contrast, gas sales amount to €770m with deliveries being 3 % higher than in 2017.
- **EBITDA amounted to €825m, 27 % lower than in HY17.** This is due to (i) shrinking margins because of lower prices on both wholesale and forward markets and (ii) lower volumes sold. It has been partly offset by a very good trading performance in the second quarter.
- **The decrease in net income is attributable to the nuclear fuel tax refund recorded in 2017.**
- **UK capacity market**: RWE power stations secured payments for 6.6 GW in auction for 2021/2022 **at £8.40/kW**.
- **RWE ends its rating by Standard & Poor's**
- **UK competition authority gave the go-ahead for a merger between the SSE and Npower**, innogy subsidiary energy groups, which could give birth to the UK's largest electricity company.

Asset swap agreed: E.ON will acquire Innogy's prized regulated energy networks and customer operations, while RWE will take on the renewables businesses of both E.ON and Innogy

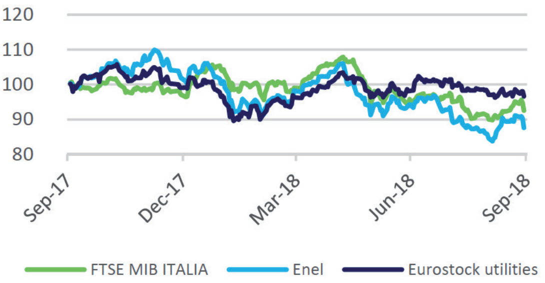
- After a voluntary public offer on innogy's minority shareholders, E.ON acquired 9.4 % of innogy. In the next step, E.ON will acquire the 76.8 % stake in innogy after antitrust and regulatory authorities' approval (expected mid- 2019).
- At the same time, RWE will make the agreed payment of €1.5bn and receive the 16.67 % stake in E.ON as well as the minority interests in two nuclear power plants.
- Lastly, E.ON will transfer to RWE its own and innogy's renewables activities, innogy's gas storage business and its shareholding in Kelag.

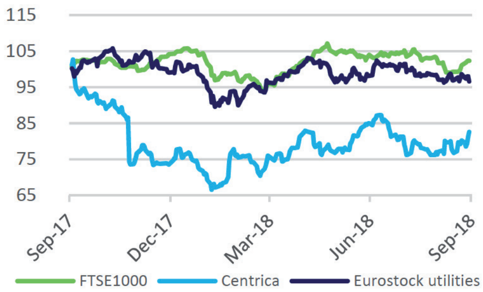
FY 2018 Outlook

	E.ON	RWE
FY 2018 Outlook	2018 guidance confirmed	2018 guidance confirmed

enel	centrica

Share Price Perf. Sep. 2017 Sep. 2018





Key Reported Financials

Enel

In billion of €	HY18	HY17 **	Var.
Sales	36.0	36.3	-1%
EBITDA	**7.9**	**7.7**	**+2%**
Operating Income	4.9	4.9	0%
Recurring net income Gr	**1.9**	**1.8**	**+5%**
Net Income Gr Share	**2.0**	**1.8**	**+11%**
Operating CF	4.4	4.0	+10%
Net Capex	-3.1	-3.5	-11%
Net debt	-41.6	-37.4*	+11%

* as of Dec. 31, 2017

** Figures restated of IFRS15 impacts

Centrica

In billion of €	HY18	HY17 **	Var.
Sales	15.3	14.3	+7%
EBITDA	**1.3**	**1.3**	**-**
Operating Income	0.7	0.3	+133%
Recurring net income Gr	**0.4**	**0.4**	**-**
Net Income Gr Share	**0.2**	**0.0**	**n.m**
Operating CF	1.1	1.2	-8%
Net Capex	-0.5	-0.1	n.m
Net debt	-2.9	-2.9	-

* as of Dec. 31, 2017

** Figures restated of IFRS15 impacts

HY18 Highlights

Enel

- **Sales amounted to €36bn, -1% vs HY17, due to :**
  - Adverse exchange rate in South-America (€1.0bn), (i) a reduction in electricity sales especially in Spain, (ii) a decrease in electricity trading in Italia due to lower volumes and prices (-€0.5bn) and (iii) a reduction in the revenue from Chilean subsidiaries ;
  - These factors are partly offset by (i) a €1.3bn increase in the distribution sectors in Argentina and Brazil attributable to rate increase and the acquisition of Electropaulo, (ii) the positive impact of EnerMoc and eMotorwerks acquisition in end of 2017, (iii) an increase in revenue related to gas and electricity transport and (iv) an increase in Renewables generation and prices.
- **Ebitda increased to €7.9bn, +2% vs HY17 due to:**
  - (i) organic growth in renewables, distribution tariff increases in Argentina and Spain and (ii) the improvement in margins from final customers in Spain and Romania,
  - Partly offset by exchange rate losses in South America.
- **Operating income amounted to €4.9bn,** stable compared to 2017. The increase in Ebitda is more the offset by the increase in depreciation.
- **Group net income amounted to €2.0bn, an increase of €0.2bn (+11%)** compared to HY17 due to a decline in net financial expenses.
- **Increase of the net debt of €4.2bn compared to HY17** principally attributable to acquisitions in the period: specifically the Brazilian company Eletropaulo, and the public tender offer for Enel Generacion Chile shares.
- **Finalization of the acquisition of 93.3% of Eletropaulo.**

Centrica

- **EBITDA amounted to €1.3bn, stable compared to the HY17 due to :**
  - A (i) backdrop of rapidly rising commodity prices, (ii) extreme weather patterns, (iii) continued competitive pressures, and (iv) ongoing political and regulatory uncertainty ;
  - This impact being balanced by increases in E&P EBITDA amountin to $1.3bn.
- **Operating income increased by €0.4bn to €0.7bn** due to the non-recurring impairment on Canadian E&P and gas storage assets recorded in 2017.
- **Operating cash flow is down by 8% to £1.1bn**, including approximately £200m year-on-year impact of net working capital outflows due to cold weather and wholesale commodity increases.
- **In July 2018, Centrica acquired a 50% stake in Barrow Green Gas, the UK's leading green gas shipper.** Centrica expanded its solar engineering, procurement and construction (EPC) footprint on the west coast of the US with the **acquisition of Vista Solar**.

FY 2018 Outlook

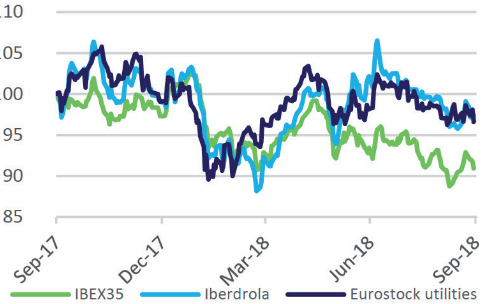
Enel: **2018 guidance confirmed**

Centrica: **2018 guidance confirmed**

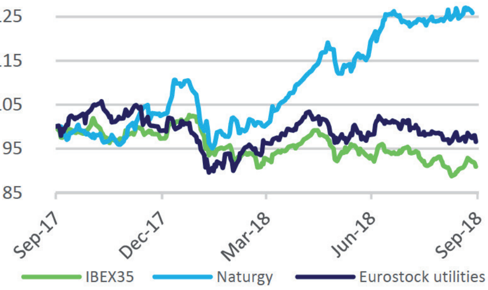
IBERDROLA | Naturgy

Share Price Perf. Sep. 2017 Sep. 2018

Iberdrola



Naturgy



Key Reported Financials

Iberdrola

In billion of €	HY18	HY17 **	Var.
Sales	17.6	15.0	+18%
EBITDA	**4.4**	**3.8**	**+17%**
Operating Income	2.5	2.2	+17%
Recurring net income Gr	**1.4**	**1.1**	**-27%**
Net Income Gr Share	**1.4**	**1.5**	**-7%**
Operating CF	3.5	3.3	+6%
Net Capex	-2.5	-2.6	-3%
Net debt	-34.0	-32.9*	+3%

* as of Dec. 31, 2017

** Figures restated of IFRS15 impacts

Naturgy

In billion of €	HY18	HY17 **	Var.
Sales	12.2	11.6	+5%
EBITDA	**2.1**	**2.0**	**-5%**
Operating Income	-3.2	1.2	n.m
Recurring net income Gr	**0.5**	**0.4**	**+23%**
Net Income Gr Share	**-3.3**	**0.6**	**n.m**
Operating CF	1.2	1.1	+9%
Net Capex	-1.0	-1.0	+55%
Net debt	-12.4	-15.1*	-18%

* as of Dec. 31, 2017

** Figures restated of IFRS15 impacts

HY18 Highlights

Iberdrola

- **The revenue increased by 18% to €17.6bn broadly due to rise in both demand and generation:**
  - In Spain, (i) the demand increased by 1.2% and in the same time (ii) hydroelectric output rose by 68% due to higher rainfalls and (iii) other renewables increased by 5% linked to major wind production, partly offset by (iv) a 31% reduction in coal fired-plant generation.
  - In the UK the electricity demand increased by 1.0% and clients' gas demand (excluding the consumption of generation) rose by 10.6%.
  - Regarding Avangrid's area (east coast of the United States), the electrical and gas demand rose by 2.2% and 8.4%, respectively.
- **Ebitda** amounted to **€4.4bn, an increase of +17% vs HY17**, mainly due to above mentioned impacts and:
  - Neoenergia's consolidation for €0.4bn;
  - The tariff improvements in Brazil and the United States;
  - An overall negative impact of exchange rate of €0.3bn.
  - The variation in net income comes from non-recurring items recorded **in 2017 with a €0.3bn capital gain on the disposal of Gamesa.**
- **Net investment in the period amounted to €2.5bn:** 78% was focused on the Networks and Renewables businesses.

Naturgy

- **Group revenue increased by 5% to €12.2bn** namely due to business growth in Gas & Power Division.
- **EBITDA amounted to €2.1bn**, +5% in respect to HY17 due to an improvement of recurrent activity, namely Gas & Power business. It is partly offset by a negative exchange rate impact of €0.1bn.
- **Following the approval of the new Strategic Plan 2018-2022, assets were impaired for €4.8bn**: €4.3bn on generation assets (Spanish conventional power generation) and €0.5 linked to gas activities.
- **Net recurrent profit in the first half of 2018 amounted to €532m and increases a 23%** in respect of the first half of 2017, driven by the recurrent activity improvement and lower financial costs.
- **Net free consolidated cash flow of the Group of the first half of the year reached €2.6bn pushed by divestments of the period:** (i) 41.9% of the gas distribution business in Colombia (€0.4bn), (ii) the gas distribution and supply business in Italy (€0.8bn) and (iii) a 20% minority stake in the gas distribution business in Spain (€1.5bn).
  On May 18, 2018, Repsol sold its 20% stake in the capital of Naturgy Energy Group, S.A. to Rioja Bidco Shareholdings, S.L.U., a company controlled by funds.

FY 2018 Outlook

Iberdrola: **2018 guidance confirmed**

Naturgy: **2018 guidance confirmed**

Talking points

1. Coal - a rock in a hard place

Mitigating climate change has made it to the top of policy-makers agendas. In 2016, the Paris Agreement was concluded, the overarching goal of which is, to limit the global temperature increase in 2100 to well below 2° C. Although 174 countries from around the world have joined this agreement each individual country's climate commitment varies in practice (these commitments are the so-called Nationally Determined Contributions). The European Union's pledge is among the most ambitious ones, underpinned by the EU's 2030 framework for climate and energy, which targets to cut greenhouse-gas emissions by 40% by 2030 (compared to 1990) and to expand renewables to 27% of total final energy consumption and by the EU's 2050 Roadmap, which aims for a reduction in CO_2 emissions by 80-95% by 2050.

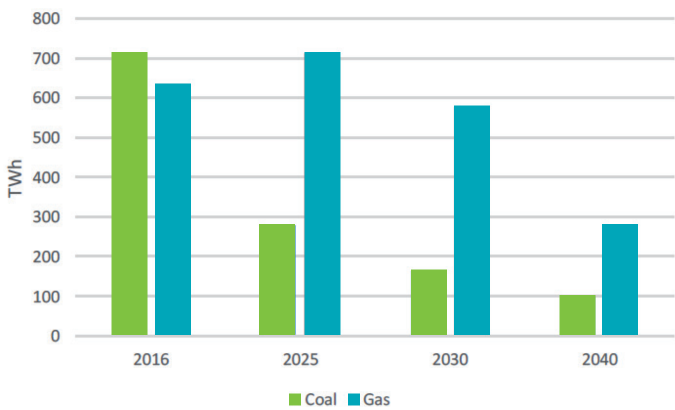
Numerous energy scenarios analysing the Paris Agreement have been presented by various organisations. Among the most prominent analyses is the IEA's Sustainable Development Scenario which suggests that the EU's CO_2 emissions would need to fall from 3.1 Gt today to 1.8 Gt in 2030 and then further to 1.1 Gt in 2040 to remain on track for the Paris climate goals. **While the various energy scenarios that have been published recently differ in their long-term outlook, a common element is a rapid phase out of coal from power generation (at least in Europe) over the next 25 to 2030 years**. There are currently around 175 GW of coal plant installed in the European Union. They account for 22% of the EU's power generation but, with some 750 million tonnes of CO_2 emitted in 2016, for 70% of the EU power sector's CO_2 emissions. Reducing coal fired power generation and replacing it with natural gas or low carbon generation from renewables is, from a technical, political and economic perspective, a low-hanging fruit in terms of CO_2 emissions reduction.

Various EU countries have put plans in place to close all their coal-fired power plants over the coming decades, including France (by 2023; 3 GW), the United Kingdom (by 2025; 14 GW), Italy (by 2025; 8 GW), Finland (by 2030; 2.6 GW) and the Netherlands by (2030; 4.7 GW). In the grand scheme of things, some of the closure decisions are rather symbolic but the UK's tough stance on coal-fired power has already led to a significant drop in the country's coal-fired capacity (from 20 GW in 2013 to just under 14 GW in 2017). **Germany's newly established Coal Commission which is supposed to evaluate a phase out from coal, after all 46 GW** (a quarter of the installed coal capacity in the EU), **is a clear sign that coal's days in Europe may be counted**. Moreover, the Polish energy minister's announcement in 2017 that the country will not invest in new coal plants (beyond those in the immediate pipeline) is harbinger for the tide also gradually turning against coal in Europe's most coal-heavy electricity system.

Why are the governments of these countries pushing for an administered national coal phase out rather than relying on an economically efficient solution via the emission caps of the EU-ETS? The answer is probably that, in practice, national greenhouse gas emissions accounting supersedes the EU's accounting, i.e., no government wants to rely on others to achieve the EU's reduction targets even if it was the most cost-efficient solution. Recent reform (phase IV) of the EU-ETS has incorporated measures to deal with unilateral attempts to reduce CO_2 emissions: the implementation of a market stability reserve (from January 2019) allows withdrawing allowances in case of surplus. **Hence, administered closure of coal plants would lead to an equivalent withdrawal of allowances, ensuring that the reduced emissions from these coal plants are not offset by higher emissions elsewhere in the system**. Economically speaking, this is not the 'first-best solution' but it is a critical fix, allowing administered phase-out decisions to become a true 'second-best solution' rather than being a costly solution that has no impact, whatsoever, on the climate.

Apart from actually reducing the EU's CO_2 emissions and improving the national GHG balance – what would be the economic implications of an administered transition away from coal? Despite a steep ramp up in CO_2 prices in recent months and coal prices still hovering above the 100$ per tonne mark, clean dark spreads remain advantageous to coal, as prices of natural gas have risen even more sharply. This confirms coal's role as a base and mid-load power source in Europe (the EU's coal fleet, which is relatively old, has been running at an average load factor of 46% in 2016, while the gas fleet, considerably newer and more efficient, achieved a load factor of a third). So, displacing coal plants that are in the money, increases the utilisation of other power plants. In practice, this almost exclusively concerns combined-cycle gas turbines (CCGT) as nuclear power plants are essentially running flat out and wind and solar plants cannot be economically dispatched. **Closing coal plants thus increases reliance on gas-fired power plants with higher variable cost, leading to an increase in wholesale electricity prices.**

Fig. 1 Coal and gas fired electricity generation in the EU in the IEA's sustainalble Development Scenario



Source: World Energy outlook 2017

There are winners and losers: unsurprisingly, on the losing side would be those companies with coal-heavy generation portfolios, as hitherto profitable plants are taken out of the market. On the winning side would be those companies that predominately operate modern combined-cycle plants as, at least over the coming 10 years, these plants are likely to fill most of the gap left by closing coal plants (see figure 1). This effect could clearly be witnessed in the United Kingdom where first measures to phase out coal, most notably the introduction of a carbon price floor (around 20 Euros per tonne in 2018) in 2013, resulted in an unprecedented switch away from coal to gas. Between 2013 and 2017 some 6.3 GW (over 30% of the UK's coal fleet) closed down with the last plant expected to close in 2025. Similar effects are thus likely to occur in Germany – once there is clarity about the phase-out trajectory – where the gas-fired fleet remains under-utilised (33% load factor for gas plants vs. 59% for coal plants in 2017) and, also to a degree, in the Netherlands.

However, distributional effects range far beyond higher utilisation (and thus improved income) of gas plants in the countries that phase out coal. The UK is relatively weakly interconnected with the continental European power system and as such the carbon price floor has had limited impact on other countries. In contrast, Germany is highly interconnected and therefore, administered closure of coal plant has implications also for the neighbouring power systems. An obvious effect are windfall profits for other generators through higher electricity prices; especially nuclear power plants in France. A less obvious effect is the partial offsetting of CO_2 reduction from the closure of coal plants (e.g. in Germany) through higher utilisation of less efficient coal plants elsewhere (e.g. in Poland) – the magnitude of this effect depends on the availability of interconnector capacity.

While the economic implications for generators are ambiguous and depend on the power plant portfolio of each company, electricity consumers are generally worse-off due to the increase in wholesale power prices. The magnitude of this effect is hard to judge without a systematic model-based analysis but it will primarily be felt by the energy-intensive industry whose exposure to the wholesale price is typically much higher than that of households and light industry.

How can electricity market stakeholders navigate the disruptions from a potential coal phase out in the EU?

- Those with coal-heavy generation portfolios need to minimise losses i.e. demonstrate the system-relevance of certain power plants to obtain longer lifetimes, showcase the negative economic implications for consumers and for security of supply from unorderly phase-out trajectories and policy back-and-forth and, finally, prepare for litigation, having a sound understanding of their losses to underpin the claims for compensation. The last point is particularly obvious for the Netherlands where three coal plants went online in 2015 that will have run for less than fifteen years when they are closed.
- Those with other thermal plant (especially CCGT) need to maximise gains i.e. review operations of their plants and analyse in which markets profitability is highest. Premature closure of coal plants creates space for generation from other sources but it also tightens the capacity balance and as such the potential revenues from capacity markets or similar mechanisms. Investment in new plants promises to be particularly profitable if the decisions are timely. Expansion of interconnector capacity potentially allows to increase windfall gains.
- Those who administer the coal phase out need to minimise its economic disruptions and maximise its environmental gains. Generators should be flexible to decide how to operate their plants e.g. generation budgets that, once exhausted, result in a closure are preferable over hard closure dates. Companies, workers and entire regions that are adversely affected, need to be adequately compensated. Finally, European coordination is essential to ensure the desired environmental benefits are fully realised.

2. How to invest profitably in wind power: the answer is not just blowin' in the wind

When wind power investment took off in the mid-2000s in Europe, rapid growth was underpinned by feed-in tariffs that provided a fixed remuneration for every kilowatt-hour generated by wind turbines no matter where or when the electricity was produced. Installed wind power capacity in Europe quadrupled over the last 12 years, reaching just under 170 GW in 2017. In the 2000s the investment logic was simple: find the locations with maximum wind yield so that wind turbines reach the highest possible number of full load hours. Unsurprisingly, this has resulted in clusters of wind power development. Germany is a case in point: early development was concentrated on the windy regions along the coastlines of the North Sea and the Baltic Sea and then gradually expanded from the Northern Plains into central Germany.

However, rapidly, another effect became apparent: during windy times, power output from wind turbines soared, causing electricity prices to plummet. Clustered development of wind parks implies a high correlation of power generation among the various turbines that make up the wind fleet of a power system. Consequently, during windy times, electricity prices are low and, as such, the market value of each kilowatt-hour generated at that time is low too. With every new turbine (whose output is positively correlated with that of the fleet) added to a power system, the market value of wind power drops a little further. In other words, from an economic perspective, wind turbines cannibalise each others value.

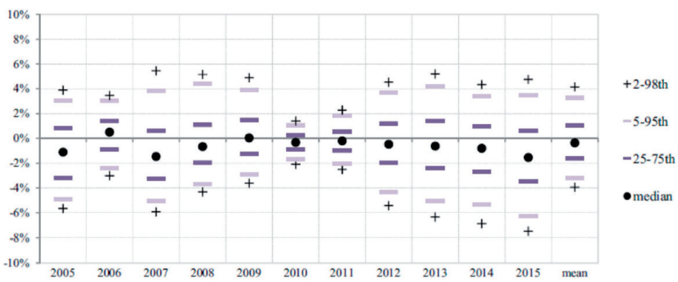
In an effort to raise economic efficiency and expose wind turbine investment more to market principles, policy-makers introduced a new system of remuneration called 'market premium' or 'feed in premium' model (e.g. Germany in 2012, UK in 2014 and France in 2015). Under this model, a regulatory authority calculates the market value, i.e. the weighted average price of a technology in the spot market, over a given period (typically one month). The subsidy paid to wind power generators then amounts to the difference between the calculated market value of wind, e.g. 40 EUR/MWh, and a predetermined fixed value, e.g. 70 EUR/MWh. **Today, each individual turbine's remuneration depends thus on how it performs vis-à-vis the entire wind fleet. A turbine that generates power predominately when power prices are**

high is more profitable than a turbine that produces mostly at times of low power prices. Moreover, the duration of financial support has been considerably shortened, in countries like France, down to fifteen years. After financial support ends, the revenues of wind power generators are entirely dependent on the prices their turbines can achieve on the market.

So, what does this mean for those who want to buy wind parks or for those who want to install new turbines? Investors are now exposed to a dynamic set of problems. **The income of an individual turbine depends on two major drivers: the power price evolution and the evolution of the technology's market value**. Each of those depend on a number of subordinate drivers, e.g. interconnector capacity expansion, fuel and CO_2 prices for electricity prices and locational choice of competing wind park developers for market values.

With growing exposure to market risks, the need for analytical insight to support investment decisions has increased significantly. Academic research has started tackling the question of how to estimate performance of individual turbines compared to the fleet. Interesting results were obtained for Germany where researchers found that, even aggregated on an annual level, differences in relative performance between individual wind turbines could vary by 10 percentage points or more (in larger countries, with exposure to larger set of meteorological systems, like France the variance can be expected to be much higher). As can be seen in figure 1, over the period 2005-2015, the best-performing 2% of the installed wind turbines in Germany achieved market values that were around 5% higher than the fleet's average market value while the worst-performing turbines achieved market values that were around 4% below those of the fleet. **In other words, the difference between a good and a bad investment amounts to some 10 percentage points on average and much more in individual years.**

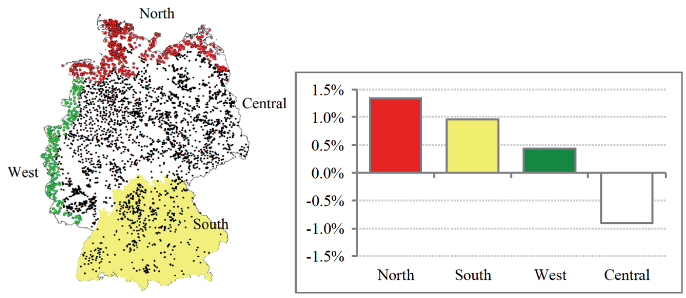
Fig. 1 Percentiles of relative performance of wind turbines in Germany, 2005-2015



Source: Engelhorn and Müsgens (2018)

Looking at spatial patterns of market values of wind turbines reveals significant regional differences in Germany. Wind turbines along the coast outperform all other locations (Figure 2). The reason for this is intuitive: wind fronts typically hit Germany from the North or the Baltic Sea implying that the turbines located near the shores start generating electricity a few hours before the wind reaches other parts of the country and wind output ramps up there. This competitive advantage might well be dissolved in the future as more and more offshore wind parks are built. The South, not a very windy part of Germany, has comparably little installed wind capacity but the turbines in this part of the country are among the top performers. The reason for this is that the meteorological system in the South is distinctly different from other parts of Germany i.e. the turbines there benefit from relatively low correlation with the output from turbines elsewhere. **The turbines in the South make it clear: it's not just about harvesting maximum amounts of wind but also finding locations that are only weakly correlated with the bulk of the wind power production.** This allows to generate power at times when prices are high and avoid (to a degree) the self-cannibalisation effect. The turbines in the West, are shielded from high correlation with turbines in the Netherlands and Belgium by interconnector capacity constraints. An advantage that could easily be lost as the European Union pushes towards greater market integration. So, what about those turbines located in the centre? They suffer from high correlation with everything around them; no matter whether the wind comes from the north, the south or the west, it reaches the tubines in the centre only after output has ramped up elsewhere (and power prices have gone down).

Fig. 2 Regional patterns of relative average performance of wind turbines



Source: Engelhorn and Müsgens (2018)

Therefore, when investing in wind power today, looking at power yield alone is not enough anymore. Investors need to analyse historical market values of the targeted assets and stress-test their future performance based on scenario analyses, varying all critical parameters that can impact the future market value.

Various modelling approaches have been published in the economic literature (most notably Lamont, 2008; Hirth, 2013; Hirth and Müller, 2016 and Engelhorn and Müsgens, 2018) to assess the historical and future performance of wind power and other variable renewable energy sources. Critical elements of such models are:

- Wind speeds at different hub heights (e.g. 80m or 140m) on a high spatial (e.g. 3km x 3km) and temporal resolution (e.g. 15, 30 or 60 mins)
- Detailed technical data (e.g. location, capacity, hub height, power curve) on all installed wind turbines in the analysed country
- Hourly spot market electricity prices (historical and forecast)

But, the need for a systematic model-based analyses in the wind power sector does not only extend to investors. Such analyses are also critical in valuation or damage claim procedures and can underpin bidding strategies for wind energy auctions (e.g. building up of a supply curve).

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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?

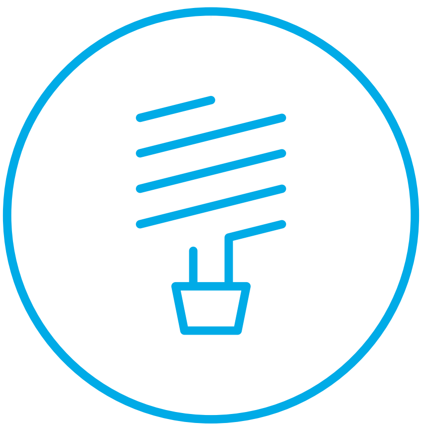
EU investment in priority energy infrastructure

Key features	Insights
On July 16th, EU Member States agreed on a Commission proposal to **invest** in several key **European energy infrastructure projects**. The EU funding **(€48.4 million)** comes from the Connecting Europe Facility (CEF), the European support program for trans-European infrastructure. A fully interconnected market will improve Europe's security of supply, reduce the dependence on single suppliers and give consumers more choice. The decision grants financial **aid to 8 proposals to undertake studies**, of which 4 are in the electricity sector, 2 in the gas sector, 1 for smart grids, and 1 for carbon capture technology.	The allocated grants will cover, among others: • In the **electricity sector**, a grant for studies was awarded to an internal **electricity line between Stanisławów and Ostrołęka in Poland**, which enables the doubling of the capacity of LitPol Link1 and increases the participation of the Baltic States in the internal energy market relevant for the synchronization project. • On **smart grids**, support was approved for the **Smart Border Initiative between France and Germany**. The project will enable the Saarland and Lorraine regions to develop joint solutions by making better use of the region's energy efficiency and renewable energy potential. • In the **gas sector**, the Connecting Europe Facility will support the **reinforcement the Poland/Denmark gas interconnection** which will bring gas from the North Sea directly to Poland and beyond to Central and South Eastern Europe. • Finally, funding will also be allocated to a **study for Carbon Capture and Storage (CCS) project** in the United Kingdom.

Next steps

Under the Connecting Europe Facility-Energy, a total of €5.35 billion has been allocated to trans-European energy infrastructure for the period 2014-2020. In the next long-term EU budget 2021-2027, the European Commission has proposed to renew the Connecting Europe Facility, allocating €42.3 billion to support investments in European infrastructure networks. Out of these, **€8.7 billion will be for energy**.

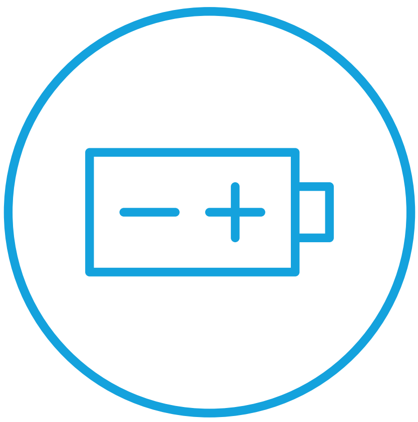
Link: *EU investment in priority energy infrastructure*



What is changing in country regulation?

United Kingdom			
Topic	**Key features**	**Insights**	**Next Steps**
Introduction of a temporary default tariff cap for customers	• On **19 July 2018**, the **Domestic Gas and Electricity (Tariff Cap) Act** came into force. This legislation requires Ofgem to **design** and **implement** a **temporary cap on Standard Variable Tariffs** (SVTs). The cap aims to **protect customers** who pay SVTs and **default rates**. • Ofgem is currently consulting on its design and implementation. Ofgem proposes setting the cap at around **£1,136 for dual fuel customers** who pay by **direct debit** and **£1,219** for those who pay by **standard credit.** • Under the cap, total savings for SVT customers are estimated at £1 billion (assuming suppliers' prices remain constant). • The cap level is proposed to be set **after assessing efficient levels of costs and a normal profit level** (1.9%) for the **electricity suppliers**.	• The proposed cap level aims to **protect customers on SVTs** from overpaying for their energy by virtue of not switching and from frequent price rises. • The **cap still incentivises** customers **to switch contracts as there are tariffs** being offered in the market **below the proposed cap**, therefore continuing to incentivise competition between domestic energy suppliers. • As long as a **supplier is operating efficiently**, the **cap still allows its activities to remain financeable**. The cap also creates strong **incentives** for the firms to **reduce inefficiencies**.	Consultation is ongoing and **the cap** is expected to be i**n force at the end of 2018** and could be in place for f**ive years**. The temporary cap is proposed to be **updated every six months** in April and October **until 2020** with a provision for extension for a further 12 months.
ECO3 (Energy Company Obligation) scheme: 2018 to 2022	• The UK government recently invited **consultations on** the future of the **ECO3 scheme**. This scheme delivers **energy efficiency and heating measures** to homes. Some of the **proposed changes** include: - This scheme will focus entirely on **low income and vulnerable households**. There are an estimated 6.6m eligible households. - The government decided to **reduce the obligation threshold** to **200,000 customer accounts in 2019** and further decrease it to **150,000 in 2020** to protect new market entrants. This measure would apportion a **smaller share of the obligation to smaller suppliers**. - The main **obligations** that **suppliers** are required to meet are CERO **(Carbon Emissions Reduction Obligation)**, HHCRO **(Home Heating Cost Reduction Obligation)** and CSCO **(Carbon Saving Community Obligation)**. - All energy suppliers would be entitled to the same 'supplier allowance' (equal to the threshold), after which their obligations would be calculated on a 'per unit of supply basis' - In order to protect rural households, the government will require **suppliers to meet** at least **15% of their obligations** by delivering energy efficiency and heating measures **in rural areas.**	• The government believes that a focus on Affordable Warmth would be a **cost-effective way of tackling fuel poverty**. • The ECO3 scheme is designed to **encourage innovation** by creating incentives for devising new, cost effective measures by small innovation companies. • A greater diversity of products and installations is expected to be supported by allowing up to **10% of the supplier's obligation to be met through innovation**.	The government response will now be presented for Parliamentary approval and in Scotland for approval by Scottish ministers.

United Kingdom			
Topic	**Key features**	**Insights**	**Next Steps**
Proposed closure of the FIT (Feed-in Tariffs) scheme	• The UK government has proposed to **close the FIT scheme by 1 April 2019**. This scheme was introduced to provide **support for small-scale low-carbon generation** (generation tariff) and a route to market (export tariff). • This proposal intends to close the FIT scheme to new applicants and more specifically, to **limit the impact of FIT on consumer bills** since the scheme is funded through levies on suppliers which in turn is passed onto consumers in the form of higher bills. • Consumer bills are estimated to reach £1,600m per year in 2020 – this amount is much higher than the original prediction of £440m per year. It is in this context that the government is closing the scheme to new applicants, subject to certain exceptions such as **Renewables Obligation Order (ROO)-FIT scale (>50kW) installations** that apply for pre-accreditation on or before 31 March 2019.	• The closure of the scheme is expected to amount to a NPV (Net Present Value) of £1.3bn – £1.8bn and would help ensure that undue costs are not levied on consumers. • The government seeks to move away from schemes which involve driving deployment (number of installations and installed capacity of electricity generation technologies) with direct subsidies to better support **sustainable growth** of the sector **through competition and innovation**. • The cost reductions resulting from the deployment and implementation of schemes supported by FITs means that deployment without direct subsidy can occur for certain technologies.	The consultation is now closed and the government's response is pending.



Germany			
Topic	**Key features**	**Insights**	**Next Steps**
Approval by the European Commission of amendments to the EEG law **EEG (German: Erneuerbare-Energien-Gesetz) is a serie of laws to encourage the generation of electricity from Renewable Energy Sources**	• **The EEG law namely targets to reduce the costs of the energy supply and to promote renewable energy sources**. It aims to increase the proportion of electricity generated from **renewable energy sources** as a percentage of gross electricity consumption to : - 40 to 45 percent by 2025, - 55 to 60 percent by 2035 and - at least **80 percent by 2050**. • The scheme is **funded by a surcharge on electricity consumers** (6.88 euro cents per kilowatt hour in 2017). However it was stipulated that until end of 2017 the **surcharge shall be reduced to 40% for self-suppliers if the electricity has been generated in a highly efficient CHP plant.** • In May, the German government reached an agreement with the **European Commission in order to prorogate the reduction** for CHP plants into **permanent operation after 1 August 2014**. • On August 2018, the European Commission has published its **approval on this State Aid mechanism**. • Following the approval, a **new reimbursement mechanism** will be introduced but now restricted to CHP plants with a capacity from 1 MW up to 10 MW. It should lead to a **gradual increase in the surcharge applied**. • The new approval under state aid law **will expire in July 2022**.	• The amendments to the EEG law are very important and long awaited by the energy intensive industry: CHP plants were relieved from paying the full surcharge until December 31, 2017. However 100% of the surcharge was paid for FY18 until now. • **The new scheme will have retroactive effect as from January 1st, 2018**. • **The new relief scheme will be similar to the old while more restrictive with a negative impact for certain industries and certain plant sizes.**	The German government plans to adapt the new amendment most likely in November 2018 before Christmas break of the parliament.

Spain			
Topic	**Key features**	**Insights**	**Next Steps**
Change of brand image for several companies of the main integrated energy groups	• The CNMC is a public organism that monitors and controls the correct functioning of the energy sector among others. • Last September, the CNMC passed a **legally binding decision** requiring several companies of the main integrated energy groups to **change their brand image**. The objective is that **consumers can clearly identify each company**. • This measure is for gas and electricity distribution companies (in the electricity sector, those with more than 100,000 customers) and last resort and referral retailers.	• In order to avoid consumer confusion, affected companies will have to make **changes in the information, brand presentation and brand image**. • In this way, consumers will be able to correctly identify in their invoices **which retailer offers the service** and know whether they are in the **free or regulated market**. • In three months, the affected companies will have to provide to the CNMC the measures that they are going to carry out in order to assess whether they adjust to the required changes. • The main energy groups affected are: Iberdrola, Endesa, Viesgo, EDP and CHC.	The deadline for making the changes is six months.

Package of measures proposed by the Spanish government to reform the energy system	• Last September, the Spanish government announced a **package of measures** that will be approved in the **coming months**.
	• The package consists of:
	- **Proposals for immediate reaction:**
	  - Suspension of the 7% tax on electricity generation.
	  - Improvement of the coverage of **vulnerable consumers**: improved protection and access to the social electricity tariff; creation of a new social gas tariff; development of a national strategy to reduce energy poverty within six months.
	  - Adoption of **instrumental measures** to accelerate the change of energy model.
	- **Shock measures for the electrification and decarbonization of the economy:**
	  - Promotion of self-consumption by eliminating the cost of the electrical system that now self-consumers connected to the network have to pay.
	  - **Reinfocement of consumer protection**: Adjust the contracted power to the actual consumption power and improve consumer information.
	  - **Promotion of renewable energies**: Facilitate bilateral contracts, remove barriers, promote the repowering of existing plants, etc.
	  - **Promotion of energy savings and energy efficiency**: Transpose Directive on the energy efficiency of buildings, revise regulations on public lighting, etc.
	  - **Promotion of recharging infrastructure** in the field of sustainable mobility.
	- **Reforms of key aspects in the system:**
	  - Improve the functioning of the market.
	  - Improve coherence of the tax system.
	  - Regulate energy storage.
		• This package of measures has been announced at a time of **escalating electricity prices**. Electricity prices of the wholesale market are causing great **concern and uncertainty** among citizens and companies in Spain.
		• The suspension of the 7% tax on electricity generation is a first measure that will have an immediate effect on the reduction of consumer bills.
		• This measure will be accompanied by a reform of the electricity market in the coming months.
			The proposals for immediate reaction will be passed in the coming days.
			The objective of the Spanish Government is to present the proposal for reform the key aspects in the system before the end of the year.

France			
Topic	**Key features**	**Insights**	**Next Steps**
Project of electricity storage in French islands	• **Major French islands (Corsica, Guadeloupe, Guyana, Martinique and Réunion) are almost not connected to the continental electricity network**. Their climatic and geographical characteristics lead to significant electricity generation costs and a highly carbonated mixes. • In addition to a better integration of RES, **the development of storage appears as a strong solution to reduce costs and avoid significant investment in grids.** • To organize the development and select appropriate storage projects, the French Energy Regulator defined a methodology to select most efficient projects. This methodology also foresees that the network operator indicates the technical requirements necessary to optimize the dimensioning of the storage with regard to the needs.	• **The remuneration rate on projects should varies in the range 6% - 16% on the basis of premium or penalty determined in connection with project risks and efficiency:** - The discount rate is 8% when contract is less than or equal to 5 years, 4% if greater than or equal to 15 years, and it is obtained by linear interpolation between 5 and 15 years. A 50% mark-up on the discount rate is applied in case significant risks - Project benefit from a premium when savings on the electricity system are higher than storage cost • **The remuneration of capital rate should be 7.5% before tax**. An increase of the rate, which will not exceed 1.5%, will be applied to (i) technologies other than Lithium-ion batteries and similar, (ii) or territories with a specific risk (Guyana, Mayotte and Wallis and Futuna).	Selected projects should provide a bank guarantee to the State. New tenders should arrive namely for Mayotte (April 2019)
End of gas regulated tariffs for households	• Currently French households could buy gas at a regulated tariff representing **43% of residential sites out of a total of 10.7 million in 2018.** • **In May 2018, the State court ruled that regulated gas sales tariffs are contrary to European law,** based on (i) the absence of a periodic review mechanism and (ii) a too broad application embracing both private customers and business customers. The other residential are in a market offer.	• **The Fench Parliament adopted in September 2018 an amendment, which programs the extinction of regulated tariff for gas on July 1, 2023**. • Until this deadline regulated tariffs for gas are still applicable covering natural gas supply costs and non-supply costs. They include a variable part linked to the actual consumption and a fixed part calculated from the fixed costs of supplying natural gas. **In October 2018 the regulated tariff increased by +1.90 € / MWh. (+3.25%)**.	The final conditions to end of regulated tariffs for gas are awaited

Snapshot on surveys and publications

Deloitte

Global renewable energy trends: Solar and wind move from mainstream to preferred – 2018

Technological innovation, cost efficiencies, and increasing consumer demand are driving renewables—particularly wind and solar—to be preferred energy sources. This paper examines seven trends that are driving this transformation.
Link to the survey

Powered by blockchain: Reimagining emerging market electric grids – 2018

The world's least technologically advanced areas may be ideal to study how blockchain can aid energy grids. Emerging markets are attractive testing grounds, letting developers bridge financing gaps, enable transactions, and increase transparency.
Link to the survey

Agencies or research institutes

International Energy Agency

20 Renewable Energy Policy Recommendations – October 2018

Renewables need to increase further and faster to bring about an energy transition that achieves climate targets, ensures energy access for all, reduces air pollution and improves energy security. This paper provides guiding principles for policy-making, based on best practice observed across IEA member states and partner countries. They can be adapted to suit specific national and local circumstances.
Link to the survey

Key World Energy Statistics 2018 - September 2018

This documents contains timely, clearly presented data on the supply, transformation and consumption of all major energy sources for the main regions of the world, in addition to energy indicators, energy balances, prices, RDD and CO_2 emissions as well as energy forecasts.
Link to the survey

Status of Power System Transformation 2018 – September 2018

This paper provides details of the technical considerations and options for improving the flexibility of thermal power plants. The main goal of increasing power plant flexibility is to improve short-, medium- and long-term flexibility.
Link to the survey

World Energy Investment 2018 – July 2018

This study provides a critical benchmark to set policy frameworks, implement business strategies, finance new projects, and develop new technologies. It highlights the ways in which investment decisions taken today are determining how energy supply and demand will unfold tomorrow.
Link to the survey

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

European Commission

Cheap renewable energy : Glimpses of the future from the BOHEMIA study – June 2018

This study imagines the renewable energy sector in 2040. More than half the electricity used for transport, housing and industry comes from renewable sources. A pan-European smart grid coupled with local micro-grids, with adequate storage facilities, ensures reliability of electricity supply.
Link to the survey

EU coal regions : opportunities and challenges ahead – July 2018

The European coal sector currently employs nearly half million people. By 2030, it is estimated that around 160 000 direct jobs may be lost. This paper presents opportunities linked to employment opportunities from renewable energy and challenges from restructuring process.

Link to the survey

Design of a Horizon 2020 inducement prize for the promotion of renewable fuels in retrofitted container ships – August 2018

The study proposes a design for a potential Horizon 2020 inducement prize to promote the use of renewable fuels by retrofitting existing maritime ships.

Link to the survey

Eurelectric

Brexit: EU-UK future energy and climate relationship – June 2018

The development of the EU's Internal Electricity Market (IEM) has had significant benefits for consumers in both the European Union (EU) and the wider European Economic Area (EEA), including those in the UK. The main aim of this paper is to set out the electricity industry's position on the priorities of the future framework agreement between the EU and the UK on energy and climate change.

Link to the survey

Oxford institute for Energy

Quarterly Gas Review – Analysis of Prices and Recent Events – June 2018

In this presentation, the author provides his insights and analysis on recent regional and global pricing issues while also commenting on relevant questions concerning policy and market-related matters.

Link to the survey

A review of demand prospects for LNG as a marine fuel – June 2018

The growing level of interest displayed in LNG as a marine fuel, driven by both environmental restrictions and economic attractiveness means usage is certain to grow. This rapport focus on the evolution of the demand and the offer for LNG in marine sector.

Link to the survey

Electric vehicles and electricity – June 2018

There is a broad consensus that penetration of electric vehicles (EVs) will rise throughout the world, but great uncertainty as to the timing and extent. The central questions addressed here are: what will determine the speed and nature of EV deployment; what barriers could slow the process; and, more specifically, could the electricity system and its regulatory regime be barriers to EV penetration, or rather assist that penetration.

Link to the survey

Let's not exaggerate – Southern Gas Corridor prospects to 2030 – July 2018

A new round of political activity to promote the Southern Gas Corridor from the Caspian to Europe has begun. This paper argues that, up to 2030, the corridor will most likely remain an insubstantial contributor to Europe's gas balance. This document considers also the potential sources of supply for the Southern Corrido; demand and transport issues; and the conditions under which Southern Corridor gas will compete with other supply in the European market.

Link to the survey

Building New Gas Transportation Infrastructure in the EU – what are the rules of the game? – July 2018

Although the EU has called over the past decade for gas pipeline promoters to 'respect EU rules', these rules had either not been established or were not clear. It was not until March 2017 that a legally binding regulatory framework for the development of incremental (new) pipeline capacity was established, in the form of the Capacity Allocation Mechanisms Network Code (CAM NC). This paper examines the rules and their boundaries concerning pipeline projects.

Link to the survey

The Development of Natural Gas Demand in the Russian Electricity and Heat Sectors – August 2018

The objective of the paper is to define the most important factors shaping natural gas demand in Russia's electricity and heat sectors, to analyse the extent of their impact, and to reach conclusions on long-term natural gas demand for electricity and heat production up to 2035, taking different power demand and supply scenarios into consideration.

Link to the survey

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