Energy Outlook – 2020

Insights from the Rapid, Net Zero and Business-as-usual scenarios – EU

Ambitious renewables and efficiency targets mean the EU leads the transition towards a carbon-free economy

1. Under all three scenarios, the EU has the world's largest share of renewables in primary energy, throughout the outlook
2. Oil demand in the EU peaks before 2025 in all three scenarios. Under **Net Zero**, consumption drops 90% by 2050
3. Efficiency plays a key role in the EU's decarbonization, with primary energy declining 24% over the outlook under **Rapid**

-24% to -30%
Decline in primary energy 2020-2050

9% to 16%
Share of global hydrogen consumption in 2050

57% to 64%
Share of renewables in power generation by 2050

-56% to -100%
Net decline in CO_2 emissions by 2050

- The EU's economy grows at a rate of 1.0% per annum 2018-2050, down from 1.8% 1990-2018.
- Primary energy consumption in the EU declines steeply in all three scenarios, primarily reflecting ambitious efficiency mandates in buildings and industry.
- At the same time, renewables' share of the primary energy mix increases sharply, reaching 58%, 63% and 39% in **Rapid**, **Net Zero** and **Business-as-usual** (**BAU**) respectively.
- The growth in renewables is principally underpinned by wind power, which exceeds 12 EJ in all three scenarios by 2050. **Rapid** and **Net Zero** see similar levels of growth in solar at over 9 EJ.
- Coal's share of the EU power generation mix declines sharply under all scenarios, falling to zero in **Rapid** and **Net Zero** and just 5% by 2050 in **BAU**.
- Nuclear output remains relatively stable under **Net Zero**, increasing its share in power generation slightly to 28% by 2050 from 26% today. Under **Rapid** this share falls to 15% and 10% under **BAU**.
- Conversely, hydrogen's share of the primary energy mix increases markedly under **Rapid** and **Net Zero**, growing to 7 EJ and 13 EJ respectively by 2050. The EU accounts for between 9% – 16% of global hydrogen demand by the end of the outlook, behind China and the US.
- Production of all fossil fuels declines across all three scenarios in the EU, dropping by 93% in **Rapid**, and 82% under **BAU**.
- Under all three scenarios demand for oil in the EU has already peaked. Biofuels demand continues to grow however, reaching 0.4 Mb/d by 2050 in **BAU**, 0.7 Mb/d in **Rapid** and 0.8 Mb/d in **Net Zero**.
- These effects combine to reduce net CO_2 emissions by 100% in the **Net Zero** scenario, 86% under **Rapid** and 56% under **BAU**.

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	Level in 2050				Shares in 2050 (%)				Change 2018-2050 (%)			Change 2018-2050 (% p.a.)		
	2018	Rapid	Net Zero	BAU	2018	Rapid	Net Zero	BAU	Rapid	Net Zero	BAU	Rapid	Net Zero	BAU
Primary energy consumption (EJ)														
Total	70	49	49	53	100	100	100	100	-30	-30	-24	-1.1	-1.1	-0.8
Oil†	26	5	2	12	38	11	5	23	-80	-91	-54	-4.9	-7.2	-2.4
Gas	16	7	4	12	24	14	7	23	-58	-78	-24	-2.7	-4.7	-0.9
Coal	9	0	0	2	13	0	0	3	-99	-100	-83	-13	-17	-5.4
Nuclear	7	5	8	3	11	10	17	6	-37	14	-58	-1.4	0.4	-2.7
Hydro	3	3	4	3	4	7	8	6	9	24	0	0.3	0.7	0.0
Renewables (incl. biofuels)	7	28	31	21	10	58	63	39	>100	>100	>100	4.4	4.6	3.3
Oil† (Mb/d)	13	3	1	6	38	11	5	23	-80	-90	-54	-4.9	-7.1	-2.4
Gas (Bcm)	457	191	99	346	24	14	7	23	-58	-78	-24	-2.7	-4.7	-0.9
Transport^	18	19	20	17	26	39	41	31	4	9	-9	0.1	0.3	-0.3
Non-combusted^	4	2	1	2	5	3	2	4	-57	-74	-44	-2.6	-4.2	-1.8
Buildings^	25	17	18	19	35	34	36	36	-33	-28	-22	-1.2	-1.0	-0.8
Industry^	23	12	11	15	33	24	21	29	-50	-55	-35	-2.1	-2.4	-1.3
Power	29	37	40	32	41	76	82	59	29	40	10	0.8	1.1	0.3
Production														
Oil† (Mb/d)	2	1		1					-72		-40	-3.9		-1.6
Gas (Bcm)	109	3		3					-98		-98	-11		-11
Coal	5	0		0					-99		-92	-14		-7.6
Emissions														
Net CO_2 (Gt)	3.5	0.5	0.0	1.5					-86	-100	-56	-6	-16	-3

EJ = exajoules

† Oil supply includes crude oil, shale oil, oil sands, natural gas liquids, liquid fuels derived from coal and gas, and refinery gains, but excludes biofuels. Oil demand includes consumption of all liquid hydrocarbons but excludes biofuels. ^ Includes electricity and the associated conversion losses in power generation. * United Kingdom included in the EU