



Energy Outlook – 2020

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

The rapid increase in renewables generation sharply reduces coal's share in the US power mix

1. Under **Business-as-usual (BAU)** oil demand in the US peaked in 2019, and under **Net Zero** it drops over 80% by 2050
2. Efficiency plays a key role in the US' s decarbonization, with primary energy declining 30% over the outlook under **Rapid**
3. The US becomes a major producer and consumer of hydrogen under **Rapid** and **Net Zero**

-4% to -30%

Decline in primary energy 2020-2050

15%

Share of global hydrogen consumption in 2050

56% to 69%

Share of renewables in power generation by 2050

35% to 98%

Net decline in CO₂ emissions by 2050

- ▶ The US economy grows at a rate of 1.7% per annum 2018-2050, down from 2.5% from 1990-2018. Primary energy consumption in the US declines by more than a quarter in **Rapid** and **Net Zero**, primarily reflecting efficiency measures in buildings and electrification in transport.
- ▶ Coal's share of the US power generation mix declines sharply, falling from 33% to 0% in **Rapid** and **Net Zero** and just 3% in 2050 in **BAU**.
- ▶ Nuclear's share in power falls from 20% to 16% in **Net Zero** and to 2% in **BAU**. It remains at 20% in **Net Zero**.
- ▶ Gas' share in primary energy falls slightly from 30% to 25% in **Rapid**, while it halves in **Net Zero** and grows to 36% in **BAU**. US LNG exports increase almost tenfold by 2050 in **BAU** and **Rapid**, and its share of global LNG exports increases from 10% to around 25%, respectively.
- ▶ These effects reduce net CO₂ emissions by 5.3% p.a. between 2018-50 in **Rapid** (to 1 GtCO₂). Emissions fall by 11% p.a. to reach 0.1 GtCO₂ by 2050 in **Net Zero**.
- ▶ In **BAU** the 1.3% yearly decline is on par with the trend of the last decade (1.1%).
- ▶ 15% (or 5 GtCO₂) of the decline to achieve the **Net Zero** scenario occurs in the US, second only to China.
- ▶ CCS technologies abate 10% of US carbon emissions reductions, falling by 450-590 Mt in **Rapid** and **Net Zero**.
- ▶ Hydrogen reaches 14% of primary energy in **Rapid**, almost 30% in **Net Zero**, but less than 1% in **BAU**. A quarter of the hydrogen consumed comes from natural gas in **Rapid**. The US accounts for around 15% of global hydrogen demand, behind China.



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	Level in 2050				2018	Shares in 2050 (%)			Change 2018-2050 (%)			Change 2018-2050 (% p.a.)		
	2018	Rapid	Net Zero	BAU		Rapid	Net Zero	BAU	Rapid	Net Zero	BAU	Rapid	Net Zero	BAU
Primary energy consumption (EJ)														
Total	95	67	69	92	100	100	100	100	-30	-27	-4	-1.1	-1.0	-0.1
Oil†	37	11	6	25	38	17	8	28	-69	-85	-31	-3.6	-5.7	-1.1
Gas	29	16	10	33	31	25	14	36	-44	-67	14	-1.8	-3.4	0.4
Coal	13	0	0	3	14	0	0	3	-100	-100	-81	-17.3	-17.9	-5.0
Nuclear	8	5	8	1	8	8	11	1	-30	2	-90	-1.1	0.1	-7.1
Hydro	3	3	3	2	3	4	4	3	-2	15	-5	0.0	0.4	-0.2
Renewables (incl. biofuels)	6	31	44	27	6	46	63	30	411	618	351	5.2	6.4	4.8
Oil† (Mb/d)	19	7	3	14	38	17	8	28	-66	-82	-28	-3.3	-5.2	-1.0
Gas (Bcm)	816	458	267	928	31	25	14	36	-44	-67	14	-1.8	-3.4	0.4
Transport^	28	21	22	23	29	32	31	25	-22	-22	-18	-0.8	-0.8	-0.6
Non-combusted^	6	6	4	7	7	9	5	8	-4	-42	14	-0.1	-1.7	0.4
Buildings^	36	18	21	38	38	27	30	42	-50	-42	7	-2.2	-1.7	0.2
Industry^	26	21	23	23	27	32	34	26	-16	-9	-9	-0.6	-0.3	-0.3
Power	37	40	52	45	39	60	75	49	7	40	19	0.2	1.1	0.6
Production														
Oil† (Mb/d)	16	9		14					-46		-16	-1.9		-0.5
Gas (Bcm)	836	770		1178					-8		41	-0.3		1.1
Coal	15	0		5					-100		-70	-17.3		-3.7
Emissions														
Net CO ₂ (Gt)	5.1	0.9	0.1	3.3					-83	-98	-35	-5.3%	-11%	-1.3%

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.