bp Energy Outlook – 2022

Insights from the Accelerated, Net Zero and New Momentum scenarios – US

US emissions fall by over half from 2019 levels by 2050 in all scenarios due to decarbonization of transport and power. Natural gas and coal's share of power generation declines in all scenarios by 2050

1. In all three scenarios US primary energy consumption grows in the short term but falls from 2025-2050
2. Renewable energy grows strongly in all the scenarios, becoming the largest energy source in **Accelerated** and **Net Zero**
3. The US becomes a major producer and consumer of hydrogen in the **Accelerated** and **Net Zero** scenarios

14% to 27%
decline in primary energy in 2019-2050

35% to 71%
share of renewables in primary energy in 2050

0.7% to 0.9%
annual growth in electricity consumption in 2019-2050

-28% to -51%
reduction in net CO_2e emissions by 2030 relative to 2005

- Primary energy grows in all three scenarios in the short term but by 2050 it falls across all scenarios by 14%-27%.
- Oil demand rises in the short term from almost 20 Mb/d in 2019 but falls to a range of 3-12 Mb/d by 2050. Biofuels increases its share in liquids demand from 5% in 2019 to over 30% by 2050 in Net Zero.
- Reductions in road transport and the power sector decrease US emissions by 28% and 43% by 2030 vs. 2005 in **New Momentum** and **Accelerated**, falling short of the US' NDC targets of a 50%-52% reduction. By 2050, net emissions fall below 0 in **Net Zero** and fall by 90% from 2019 levels in **Accelerated** and by 50% in **New Momentum**.
- The 5.7 Gt decline in net CO_2e emissions in Net Zero accounts for 15% of global reductions, which is the second largest by any country.
- Electricity demand increases from 21% of final consumption to reach 32% in **New Momentum**, and 48% and 57% in **Accelerated** and **Net Zero**, respectively.
- The share of wind and solar in total generation grows strongly in all scenarios from 9% in 2019 to 52%-70%.
- Gas accounts for a third of US primary energy today and stays stable in **New Momentum** but falls to 19% and 10% in **Accelerated** and **Net Zero**, respectively, by 2050. Gas is displaced by electricity in the residential sector, and renewables take a more prominent role in the power sector.
- The US remains a net oil and gas exporter, albeit more so in **New Momentum** and **Accelerated**. Oil supply peaks at around 20 Mb/d between 2025-30 in all scenarios, and the US share of global LNG trade doubles from around 10% in 2019 to over 20% by 2050.
- Hydrogen supply grows from around 8.8 Mt today to a range of 15-57 Mt by 2050. In the **Net Zero** scenario, US hydrogen accounts for 13% of global supply. CCUS grows strongly across all scenarios and reaches 0.7-0.8 Gt in **Accelerated** and **Net Zero**.

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	Level in 2050				Shares in 2050 (%)			Change 2019-2050 (% p.a.)		
	2019	Accelerated	Net Zero	New Momentum	2019	Accelerated	Net Zero	New Momentum	Accelerated	Net Zero	New Momentum
Primary energy consumption (EJ)											
Total	**97**	**73**	**71**	**83**	**100**	**100**	**100**	**100**	**-0.9**	**-1.0**	**-0.5**
Oil†	37	9.6	4.3	21	38	13	6.1	25	-4.3	-6.7	-1.9
Natural gas	31	13	7.2	27	32	19	10	33	-2.6	-4.5	-0.3
Coal	11	0.1	0.1	1.8	12	0.2	0.1	2.1	-13	-14	-5.8
Nuclear	7.6	4.5	6.0	1.7	7.8	6.2	8.4	2.0	-1.6	-0.8	-4.8
Hydro	2.5	2.6	2.6	2.4	2.6	3.5	3.7	2.9	0	0.1	-0.1
Renewables (incl. biofuels)	7.9	42	51	29	8.2	58	71	35	5.6	6.2	4.3
Primary energy consumption (native units)											
Oil† (Mb/d)	19	5.9	2.8	12							
Natural gas (Bcm)	848	373	201	764							
Total final consumption by sector (EJ)											
Total	**76**	**43**	**37**	**61**	**100**	**100**	**100**	**100**	**-1.8**	**0.9**	**2.6**
Transport	28	14	12	18	37	32	33	29	-2.2	-2.6	-1.4
Feedstocks	6.9	5.9	4.1	7.9	9.1	14	11	13	-0.5	-1.7	0.4
Buildings	22	14	13	19	29	32	34	31	-1.4	-1.8	-0.5
Industry	19	9.6	8.0	16	25	22	22	27	-2.2	-2.8	-0.5
Generation (native units)											
Power (TWh)	4,407	6,355	6,847	5,613					1.2	1.4	0.8
Hydrogen (Mt)	8.8	29	57	15					4.0	6.2	1.7
Production											
Oil† (Mb/d)	18	6.9	3.5	13					-3.1	-5.1	-1.2
Natural gas (Bcm)	930	493	292	1,138					-2.0	-3.7	0.7
Coal (EJ)	14	0.6	0.2	3.9					-9.7	-12	-4.1
Emissions											
Carbon emissions†† (Gt of CO_2e)	5.5	0.6	-0.2	2.7					-7.1	-190	-2.2
CCUS (Mt of CO_2)	0	661	773	182					61	62	54

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. †† Carbon emissions include CO_2 emissions from energy use, industrial processes, natural gas flaring, and methane emissions from energy production.