



# bp Energy Outlook – 2022

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

Strong growth in electrification supported by an increase in renewable power is the key driver of decarbonizing China's energy system

1. Under all three scenarios, China's primary energy rises in the short term before declining post 2040
2. Renewable energy grows strongly in all the scenarios, becoming the largest energy source in **Accelerated** and **Net Zero**
3. Coal declines dramatically, in **Accelerate** and **Net Zero** it falls to less than 5% of primary energy from over 50% now

**-1.8% to 13%**

growth in primary energy in 2019-2050 under all scenarios

**5% to 19%**

share of coal in primary energy in 2050

**37% to 62%**

share of renewables in primary energy in 2050

**98% to 52%**

net decline in CO<sub>2</sub> emissions by 2050

- ▶ Primary energy modestly declines in both in **Accelerated** and **Net Zero**, it increases by 13% in **New Momentum**. In all three scenarios China's share of primary energy remains at 23%.
- ▶ Renewable energy growth is intense in the three scenarios with average growth per year in the range of 6%-7%. As a result, renewable energy becomes the largest source of primary energy in 2050 in all three scenarios. Onshore wind accounts the largest share of renewable power generation in **Accelerated** and **Net Zero**.
- ▶ Carbon capture and storage plays a pivotal role in decarbonizing China's energy system. In **Accelerated** and **Net Zero** over 1 Gt CO<sub>2</sub> is captured from power, industrial and process emissions.
- ▶ Liquids demand continues to grow in the short term, but all three scenarios declines post 2030. In **Accelerated** liquids demand falls to 1.7 Mb/d and in **Net Zero** to 1.0 Mb/d from 4.3 Mb/d in 2019. primarily due to efficiency gains and electrification of the transport sector.
- ▶ Carbon emissions vary dramatically by scenario. In **New Momentum** emissions decrease by around 52% in 2050. In **Accelerated** and **Net Zero**, emissions decrease by 90% and 98%, respectively.
- ▶ In response to the increase renewables, coal production declines dramatically. In **Accelerated** and **Net Zero**, coal production declines by over 90% and even in **New Momentum** declines by 70%.
- ▶ China's nuclear power grows significantly across all three scenarios from 3 EJ now to between 13 EJ in **New Momentum** to 16 EJ in **Net Zero**.





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	Level in 2050			2019	Shares in 2050 (%)			Change 2019-2050 (% p.a.)			
	2019	Accelerated	Net Zero		New Momentum	2019	Accelerated	Net Zero	New Momentum	Accelerated	Net Zero
<b>Primary energy consumption (EJ)</b>											
<b>Total</b>	<b>147</b>	<b>156</b>	<b>144</b>	<b>166</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0.2</b>	<b>-0.1</b>	<b>0.4</b>
Oil†	29	13	7.3	23	20	8.5	5.1	14	-2.5	-4.4	-0.8
Natural gas	11	11	7.7	23	7.6	7.0	5.4	14	-0.1	-1.2	2.4
Coal	82	7.5	6.5	32	56	4.9	4.5	19	-7.4	-7.8	-2.9
Nuclear	3.1	15	16	13	2.1	9.5	11	7.8	5.2	5.5	4.7
Hydro	11	17	17	13	7.7	11	12	7.7	1.3	1.4	0.4
Renewables (incl. biofuels)	10	92	89	62	6.9	59	62	37	7.4	7.2	6.0
<b>Primary energy consumption (native units)</b>											
Oil† (Mb/d)	15	6.8	3.7	12							
Natural gas (Bcm)	308	301	215	648							
<b>Total final consumption by sector (EJ)</b>											
<b>Total</b>	<b>105</b>	<b>85</b>	<b>73</b>	<b>104</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>-0.7</b>	<b>5.1</b>	<b>6.3</b>
Transport	16	16	15	17	15	18	21	17	0	-0.1	0.3
Feedstocks	7.8	9.9	7.7	12	7.4	12	11	12	0.8	0	1.4
Buildings	22	21	19	26	21	25	25	25	-0.2	-0.6	0.5
Industry	60	39	32	49	57	45	43	47	-1.4	-2.0	-0.7
<b>Generation (native units)</b>											
Power (TWh)	7,679	14,996	14,783	13,192					2.2	2.1	1.8
Hydrogen (Mt)	19	74	93	43					4.6	5.3	2.8
<b>Production</b>											
Oil† (Mb/d)	4.3	1.7	1.0	2.8					-2.9	-4.4	-1.4
Natural gas (Bcm)	178	156	107	327					-0.4	-1.6	2.0
Coal (EJ)	80	4.5	2.5	22					-8.9	-11	-4.1
<b>Emissions</b>											
Carbon emissions†† (Gt of CO <sub>2</sub> e)	12	1.1	0.2	5.6					-7.3	-12	-2.4
CCUS (Mt of CO <sub>2</sub> )	0	1,031	1,319	438					63	65	59

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<sub>2</sub> emissions from energy use, industrial processes, natural gas flaring, and methane emissions from energy production.