



bp Energy Outlook – 2023

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

China's emissions decrease significantly in all scenarios, driven by strong growth in low-carbon energy sources, the decarbonization of power and transport and a significant drop in coal demand

1. Renewables are the largest source of energy in all scenarios by 2050, reaching a 60% share in **Accelerated** and **Net Zero**
2. Coal consumption decreases sharply, with its share in primary energy falling to between 5% and 20% by 2050
3. Carbon emissions peak by 2030 and fall by over 50% in all scenarios by 2050

-6% to 9%

growth in primary energy in 2019-2050 under all scenarios

5% to 20%

share of coal in primary energy in 2050

38% to 62%

share of renewables in primary energy in 2050

99% to 55%

net change in CO₂ emissions by 2050

- ▶ By 2050, primary energy consumption increases by 9% in **New Momentum**, it stays relatively flat in **Accelerated** and it modestly declines in **Net Zero**. China accounts for over 20% of the world's primary energy in all scenarios.
- ▶ Renewables (inc. biofuels) are China's largest source of primary energy by 2050, reaching around a 40% share in **New Momentum** and around a 60% share in **Accelerated** and **Net Zero**.
- ▶ Nuclear energy increases at least four-fold by 2050, from ~3 EJ today to between 12 and 15 EJ in 2050, driven by investment in new nuclear power plants.
- ▶ The share of wind and solar in total electricity generation grows from less than 10% today to over 50% in **New Momentum** and over 65% in **Accelerated** and **Net Zero**.
- ▶ The growth in low-carbon energy sources displaces the use of coal, whose share in primary energy drops from 56% today to 20% in **New Momentum** and to around 5% in **Accelerated** and **Net Zero**.
- ▶ Oil consumption also declines in all scenarios by 2050, falling by around 30% in **New Momentum**, 60% in **Accelerated** and over 75% in **Net Zero** relative to 2019 levels.
- ▶ Over the rest of decade natural gas consumption grows in all scenarios, driven by continued coal-to-gas switching. Post-2030, natural gas demand almost doubles by 2050 relative to 2019 in **New Momentum**. In contrast, demand by 2050 falls by over 10% in **Accelerated** and by over 40% in **Net Zero** relative to 2019.
- ▶ Carbon capture, use and storage (CCUS) plays a key role in decarbonizing China's energy system, with over 1 Gt of CO₂ captured in 2050 in **Accelerated** and **Net Zero**.
- ▶ Carbon emissions peak by 2030 and fall by over 50% in all scenarios by 2050. In **Accelerated** and **Net Zero**, carbon emissions fall by 92% and 99% relative to 2019 levels respectively, reaching less than 1 Gt of CO₂. In **New Momentum**, emissions in 2050 are around 5Gt of CO₂ compared to around 12 Gt in 2019.



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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
Primary energy consumption by fuel (EJ)											
Total	147	149	138	160	100	100	100	100	0	-0.2	0.3
Oil†	29	12	6.3	20	20	7.8	4.6	13	-2.9	-4.8	-1.2
Natural gas	11	9.9	6.4	21	7.6	6.7	4.6	13	-0.4	-1.8	2.1
Coal	82	7.2	6.4	32	56	4.9	4.7	20	-7.5	-7.9	-3.0
Nuclear	3.1	14	15	12	2.1	9.7	11	7.8	5.1	5.3	4.6
Hydro	11	17	17	13	7.7	11	13	8.1	1.3	1.4	0.4
Renewables (incl. biofuels)	10	89	86	61	6.9	60	62	38	7.2	7.1	5.9
Primary energy consumption (native units)											
Oil† (Mb/d)	15	5.9	3.3	10							
Natural gas (Bcm)	308	275	177	592							
Total final consumption by sector (EJ)											
Total	105	80	69	98	100	100	100	100	-0.9	-1.4	-0.2
Transport	16	15	14	17	15	19	21	17	-0.2	-0.3	0.2
Feedstocks	7.8	9.0	7.0	11	7.4	11	10	11	0.5	-0.3	1.1
Buildings	22	20	18	25	21	25	26	26	-0.2	-0.7	0.4
Industry	60	36	30	46	57	45	43	46	-1.6	-2.2	-0.9
Generation											
Electricity (TWh)	7,679	14,537	14,408	12,870					2.1	2.1	1.7
Hydrogen (Mt)	19	73	93	46					4.5	5.3	3.0
Production											
Oil† (Mb/d)	4.3	1.9	1.5	2.8					-2.6	-3.3	-1.4
Natural gas (Bcm)	178	156	88	327					-0.4	-2.2	2.0
Coal (EJ)	80	5.2	2.4	21					-8.4	-11	-4.2
Emissions											
Carbon emissions (Gt of CO ₂ e) ^{††}	12	1.0	0.1	5.3					-7.7	-15	-2.5
CCUS (Mt of CO ₂)	0	1,021	1,319	447							

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 CO₂ emissions from energy use, industrial processes, natural gas flaring, and methane emissions from energy production.