



# bp Energy Outlook – 2022

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

The EU is in a rapid process of decarbonization, even in the **New Momentum** scenario carbon emissions are reduced by over 50% while **Net Zero** achieves negative emissions by 2050

1. Energy efficiency plays a significant role in European policies, leading to a primary energy decline of around 1% per year
2. Renewables are the only source of energy that shows growth across all scenarios
3. Clean hydrogen emerges as a key energy carrier to decarbonize hard-to-abate sectors in industry and transport

### Over 20%

decline in primary energy in 2019-2050 in all scenarios

### 54% to 78%

share of renewables in primary energy in 2050

### 20% to 30%

growth in electricity generation in 2019-2050

### 0 to 1 GtCO<sub>2</sub>e

level of carbon emissions by 2050

- ▶ Total final consumption decreases in all three scenarios, showing the decisive role of energy efficiency policies. Total final consumption declines between 33% and 52% in 2019-2050.
- ▶ In this context, primary energy also decreases in all three scenarios, showing. Average decline per year is 0.7%-1.1%.
- ▶ Despite this decline in primary energy, renewables grow strongly in all scenarios, boosted by climate policies. In 2019-2050 average renewables growth is between 2.9% and 3.8%.
- ▶ The share of fossil fuels in primary energy shifts from 68% in 2019 to 35%, 12%, and 6% in **New Momentum**, **Accelerated** and **Net Zero** scenario in 2050, respectively.
- ▶ The rapid decarbonization of the European economy is supported by the strong growth of electricity and clean hydrogen production. Electricity generation grows 0.6%-0.8% per year in 2019-2050, supported by the rapid growth in renewable energy. The production of hydrogen increases twofold in the **New Momentum**, fivefold in **Accelerated**, and sixfold in the **Net Zero** scenario.
- ▶ Carbon emissions declines significantly in all three scenarios. In the **New Momentum** scenario, the level of emissions is around 1 GtCO<sub>2</sub> in 2050 from 3 GtCO<sub>2</sub> in 2019.
- ▶ In **Accelerated** and **Net Zero** scenarios, the energy system is deeply decarbonized. In the **Accelerated** scenario, the level of emissions is around 0.2 GtCO<sub>2</sub> and negative in **Net Zero**. Both scenarios have substantial CCUS (carbon capture, usage and storage) for hard-to-abate sectors.





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

	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>65</b>	<b>48</b>	<b>47</b>	<b>52</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>-1.0</b>	<b>-1.1</b>	<b>-0.7</b>
Oil†	23	3.6	1.5	7.6	35	7.4	3.2	15	-5.8	-8.5	-3.5
Natural gas	14	2.1	1.4	10	21	4.4	3.0	19	-5.9	-7.1	-1.0
Coal	7.3	0.2	0.1	0.8	11	0.3	0.3	1.4	-12	-12	-7.1
Nuclear	6.8	3.3	4.1	2.7	10	6.8	8.7	5.1	-2.3	-1.6	-3.0
Hydro	2.8	3.2	3.2	3.0	4.3	6.5	6.8	5.8	0.4	0.4	0.2
Renewables (incl. biofuels)	11	36	37	28	17	75	78	54	3.8	3.8	2.9
<b>Primary energy consumption (native units)</b>											
Oil† (Mb/d)	11	1.8	0.7	3.7							
Natural gas (Bcm)	389	59	39	282							
<b>Total final consumption by sector (EJ)</b>											
<b>Total</b>	<b>50</b>	<b>26</b>	<b>24</b>	<b>33</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>-2.1</b>	<b>1.3</b>	<b>2.4</b>
Transport	16	10	9.4	11	32	39	39	32	-1.4	-1.7	-1.3
Feedstocks	3.8	1.5	1.2	2.3	7.6	5.6	4.9	6.8	-3.0	-3.7	-1.7
Buildings	16	8.7	8.0	11	32	33	33	33	-2.0	-2.2	-1.2
Industry	14	6.0	5.4	9.6	29	23	23	29	-2.8	-3.1	-1.3
<b>Generation (native units)</b>											
Power (TWh)	2,880	4,486	4,636	4,178					1.4	1.5	1.2
Hydrogen (Mt)	5.7	26	36	11					5.0	6.1	2.2
<b>Production</b>											
Oil† (Mb/d)	0.7	0.5	0.3	0.6					-1.2	-3.1	-0.3
Natural gas (Bcm)	61	3.2	2.1	16					-9.1	-10	-4.2
Coal (EJ)	4.4	0.1	0.1	0.4					-12	-13	-7.5
<b>Emissions</b>											
Carbon emissionst†† (Gt of CO <sub>2</sub> e)	3.0	0.2	-0.1	1.0					-8.4	-191	-3.4
CCUS (Mt of CO <sub>2</sub> )	0	135	303	57					53	57	49

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.