



# bp Energy Outlook – 2024

## Insights from Brazil

Brazil's primary energy consumption grows by 25% to 2050 in **Current Trajectory** but remains broadly stable in **Net Zero**; renewables become the dominant energy source by 2050

1. Brazil's primary energy consumption grows by 25% to 2050 in **Current Trajectory** but remains broadly stable in **Net Zero**
2. Renewable energy grows strongly in both scenarios, providing around half of primary energy in **Current Trajectory** and **Net Zero**
3. Electricity in total final energy consumption grows by over 50% by 2050 in both scenarios compared to 2022

**-2% to 25%**

growth in primary energy in 2022-50

**10% to 28%**

share of oil in primary energy in 2050

**48% to 66%**

share of renewables in primary energy in 2050

**-8% to -94%**

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

- ▶ Brazil's economy grows at a rate of 1.5% a year in 2022-50, down from 2.1% a year over the past 20 years.
- ▶ Primary energy grows by 25% in **Current Trajectory** but remains broadly stable in **Net Zero**. Average growth per year is between -0.1% and 0.8%.
- ▶ The share of oil in total primary energy over the past 30 years has been broadly stable at around 40%. However, by 2050, it declines in both scenarios, reaching between 11% and 29%.
- ▶ Renewable energy growth is strong in both scenarios, averaging 2% per year. As a result, renewable energy becomes the largest source of primary energy in 2050 in both scenarios. The second largest in **Current Trajectory** is oil while in **Net Zero** it is biomass.
- ▶ Electricity generation in 2050 is around two times of that in 2022 in both scenarios, with solar and wind power accounting for around 90% of that growth.
- ▶ The share of biofuels in total primary energy for transport grows in **Current Trajectory** from 20% in 2022 to 26% in 2050, and 40% in **Net Zero**.
- ▶ Brazil's biomethane production grows in both scenarios, up to 8 Bcm in 2050, from 0.35 Bcm in 2022.
- ▶ Brazil's hydrogen demand grows by a factor of six in **Current Trajectory** and 25 in **Net Zero**. In 2050, green hydrogen represents more than 80% of hydrogen demand in both scenarios.
- ▶ Carbon emissions fall by 2050 in both scenarios. In **Current Trajectory**, emissions fall by 8% relative to 2022. In **Net Zero**, they start to decline earlier and faster, decreasing by 94% by 2050.



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|   | Level in 2050 |                    |           | 2022        | Shares in 2050 (%) |             | Change 2022-2050 (% p.a.) |              |
|---|---------------|--------------------|-----------|-------------|--------------------|-------------|---------------------------|--------------|
|   | 2022          | Current Trajectory | Net Zero  |             | Current Trajectory | Net Zero    | Current Trajectory        | Net Zero     |
| <b>Primary energy consumption by energy type (EJ)</b> |               |                    |           |             |                    |             |                           |              |
| <b>Total</b>  | <b>13</b>     | <b>16</b>          | <b>13</b> | <b>100%</b> | <b>100%</b>        | <b>100%</b> | <b>0.8%</b>               | <b>-0.1%</b> |
| Oil†  | 5.0           | 4.5                | 1.3       | 39%         | 28%                | 10%         | -0.4%                     | -4.7%        |
| Natural gas   | 1.2           | 1.6                | 0.8       | 9.0%        | 10%                | 6.4%        | 1.2%                      | -1.3%        |
| Coal  | 0.6           | 0.6                | 0.2       | 4.9%        | 3.5%               | 1.5%        | -0.5%                     | -4.2%        |
| Nuclear   | 0.1           | 0.1                | 0.2       | 0.4%        | 0.8%               | 1.4%        | 3.3%                      | 4.6%         |
| Hydro   | 1.5           | 1.6                | 1.8       | 12%         | 10%                | 14%         | 0.2%                      | 0.6%         |
| Renewables (incl. biofuels)                           | 4.5           | 7.6                | 8.3       | 35%         | 48%                | 66%         | 1.9%                      | 2.3%         |
| <b>Primary energy consumption (native units)</b>      |               |                    |           |             |                    |             |                           |              |
| Oil† (Mb/d)   | 2.5           | 2.3                | 0.7       |             |                    |             |                           |              |
| Natural gas (Bcm)                                     | 32            | 45                 | 23        |             |                    |             |                           |              |
| <b>Total final consumption by sector (EJ)</b>         |               |                    |           |             |                    |             |                           |              |
| <b>Total</b>  | <b>12</b>     | <b>15</b>          | <b>10</b> | <b>100%</b> | <b>100%</b>        | <b>100%</b> | <b>0.8%</b>               | <b>-0.4%</b> |
| Transport   | 4.1           | 4.6                | 2.7       | 35%         | 31%                | 26%         | 0.4%                      | -1.4%        |
| Feedstocks  | 0.6           | 0.9                | 0.7       | 5.2%        | 5.8%               | 6.5%        | 1.2%                      | 0.4%         |
| Buildings   | 1.7           | 2.1                | 1.3       | 14%         | 14%                | 12%         | 0.8%                      | -1.0%        |
| Industry  | 5.4           | 7.2                | 5.8       | 46%         | 49%                | 55%         | 1.0%                      | 0.2%         |
| <b>Generation</b>                                     |               |                    |           |             |                    |             |                           |              |
| Power (TWh)   | 701           | 1,376              | 1,837     |             |                    |             | 2.4%                      | 3.5%         |
| Hydrogen (Mt)   | 0.4           | 2.3                | 9.9       |             |                    |             | 6.4%                      | 12%          |
| <b>Production</b>                                     |               |                    |           |             |                    |             |                           |              |
| Oil† (Mb/d)   | 3.1           | 1.8                | 0.8       |             |                    |             | -1.8%                     | -4.6%        |
| Natural gas (Bcm)                                     | 23            | 45                 | 23        |             |                    |             | 2.4%                      | 0%           |
| Coal (EJ)   | 0.1           | 0.8                | 0.3       |             |                    |             | 7.3%                      | 4.0%         |
| <b>Emissions</b>                                      |               |                    |           |             |                    |             |                           |              |
| Carbon emissions†† (Gt of CO <sub>2</sub> e)          | 0.5           | 0.5                | 0         |             |                    |             | -0.3%                     | -9.7%        |
| CCUS (Mt of CO <sub>2</sub> )                         | 0             | 0                  | -118      |             |                    |             |                           |              |

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.