Energy Outlook – 2020

Insights from the Rapid, Net Zero and Business-as-usual scenarios – Brazil

Fast growth of renewables and a very high hydro base makes Brazil one of the regions with the lowest carbon energy mix

1. Under all three scenarios, Brazil's energy demand increases by around two-thirds
2. In **Rapid**, renewably sourced energy consumption almost quadruples by 2050 to reach 46% of the energy mix
3. Oil production in **Rapid** peaks in the late 2020s. In **BAU** growth continues in the 2030s peaking at 5 Mb/d by the late 30s

52% to 80%
Combined share of hydro and renewables in 2050

60% to 66%
Increase in energy demand between 2018 and 2050

4.3 to 5 Mb/d
Peak oil production in Brazil

-27% to -95%
Decline in carbon intensity between 2018 and 2050

- Brazil's economy expands at 1.7% p.a. between 2018 – 2050, down from 2.4% in the 1990 – 2018 period and significantly lower than the world GDP growth rate for the outlook (2.6% p.a.).
- Primary energy consumption in Brazil expands between 60% to 66% up to 2050, with energy use per capita increasing by around 50%.
- Most of the growth in primary energy demand comes from the Industry sector which expands by 83% in **BAU**, 101% in **Rapid** and 111% in **Net Zero**. Transport is the second source of sectoral energy demand growth.
- In all three scenarios renewables' share in the primary energy mix expands rapidly from 15% in 2018 to 32%, 46% and 54% in **BAU**, **Rapid** and **Net Zero**, respectively.
- Brazil remains one of the largest hydroelectric producers in the world. In 2018 hydro accounted for 28% of the national energy mix. In 2050 it reaches 21% in **BAU**, 24% in **Rapid** and 26% in **Net Zero**.
- Oil loses share in all three scenarios going from 39% in 2018 to 28%, 14% and 7% in **BAU**, **Rapid** and **Net Zero**, respectively.
- Nuclear is the second fastest growing fuel, increasing by 3.4% p.a., 4% p.a., and 4.8% p.a. in **BAU**, **Rapid** and **Net Zero**, respectively.
- Oil production expands rapidly during the first half of the outlook, so that the its share of non-OPEC oil supply increases from less than 5% in 2018 to almost 8% in the second half of 2030s in both **Rapid** and **BAU**.
- Biofuels production more than doubles between 2018 and 2035 in **Rapid**, reaching over 1.3 Mb/d. In **BAU**, production increases to almost 0.9 Mb/d in the 2040s.
- Power demand more than doubles in all scenarios by 2050. The share of renewables in power increases from 17% in 2018 to 45% in **BAU**, 47% in **Net Zero** and 51% in **Rapid**.
- Net CO2 emissions grow by 26% in **BAU**. Emissions decline by 41% in Rapid and by 92% in **Net Zero**.
- Carbon intensity drops by 27% in **BAU**, 66% in **Rapid** and 95% in **Net Zero** between 2018 and 2050.

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		Level in 2050				Shares in 2050 (%)			Change 2018-2050 (%)			Change 2018-2050 (% p.a.)		
	2018	Rapid	Net Zero	BAU	2018	Rapid	Net Zero	BAU	Rapid	Net Zero	BAU	Rapid	Net Zero	BAU
Primary energy consumption (EJ)														
Total	12	20	20	20	100	100	100	100	63	60	66	1.5	1.5	1.6
Oil†	4.8	2.8	1.3	5.7	39	14	7	28	-40	-73	19	-1.6	-4.0	0.6
Gas	1.3	2.4	2.0	3.0	11	12	10	15	90	54	>100	2.0	1.4	2.7
Coal	0.7	0.2	0.0	0.6	5	1	0	3	-65	-95	-11	-3.2	-8.7	-0.4
Nuclear	0.1	0.5	0.6	0.4	1	2	3	2	>100	>100	>100	4.0	4.8	3.4
Hydro	3.5	4.8	5.0	4.2	28	24	26	21	39	45	20	1.0	1.2	0.6
Renewables (incl. biofuels)	1.9	9.1	11	6.4	15	46	54	32	>100	>100	>100	5.1	5.6	3.9
Oil† (Mb/d)	2.4	1.5	0.7	2.9	39	14	7	28	-40	-73	19	-1.6	-4.0	0.6
Gas (Bcm)	36	68	55	85	11	12	10	15	90	54	>100	2.0	1.4	2.7
Transport^	4.0	6.1	6.5	6.4	33	31	33	31	54	62	-59	1.4	1.5	1.5
Non-combusted^	0.5	0.7	0.4	0.9	4	3	2	4	31	-21	64	0.8	-0.7	1.6
Buildings^	3.1	4.0	3.1	4.8	26	20	16	23	27	-1	52	0.7	0.0	1.3
Industry^	4.6	9.1	9.6	8.3	37	46	49	41	>100	>100	-18	2.2	2.4	1.9
Power	5.4	14	15	11	44	68	75	54	>100	>100	>100	3.0	3.2	2.2
Production														
Oil† (Mb/d)	2.7	1.5		3.7					-46		36	-1.9		1.0
Gas (Bcm)	25	34		57					34		>100	0.9		2.6
Coal	0.1	0.0		0.0					-75		-63	-4.2		-3.1
Emissions														
Net CO_2 (Gt)	0.4	0.2	0.0	0.5					-41	-92	26	-1.6	-7.5	0.7

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. ^ Includes electricity and hydrogen; and their associated conversion losses.