

Note: For a better visualization, the minimum scale of the graphs was raised to the level close to the lowest value of the curves.

Methodological Remarks

The purpose of this bulletin is to follow up a set of energy and non-energy variables that provide a reasonable estimate of the behavior both monthly as cumulative of the total energy demand in Brazil.

Total demand of natural gas = domestic production (+) import (-) unused (-) reinjection.

Apparent consumption of oil derivatives = distributors' sales (+) Petrobras' own consumption (including refinery gas) (+) Petrobras' direct sales (+) consumer imports. The monthly data published in the press and on the ANP's website considers only the sales of distributors (+ or - 80% of total).

¹ **Domestic Energy Supply (DES), or Total Energy Demand**, represents the energy necessary to move the economy of a country or region over a period of time, includes final energy consumption in the residential sector and in the other economic sectors, includes losses in transmission and distribution, losses on power transformation and the own consumption of the energy sector.

² The DES and DELS data from 2017 reflect the final position of the 2018 cycle of the Brazilian Energy Balance (BEN), prepared by Energy Research Office (EPE) in cooperation with MME and entities of the energy sector.

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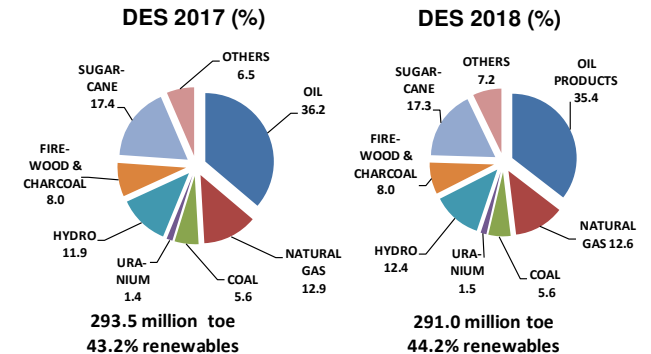
Reference Month: October 2018

Domestic Energy Supply

New information from the 2018 sugarcane harvest and 2019 reduced the growth expectations of the total energy demand in 2018, foreseen in previous newsletters. Sugar production is expected to decline by more than 20% and ethanol production is expected to grow by more than 10%. Oil products and natural gas will have a reduction in consumption. In industrial production, cellulose and pellets are at positive rates, close to 10%, but aluminum, alumina and cement will have negative rates.

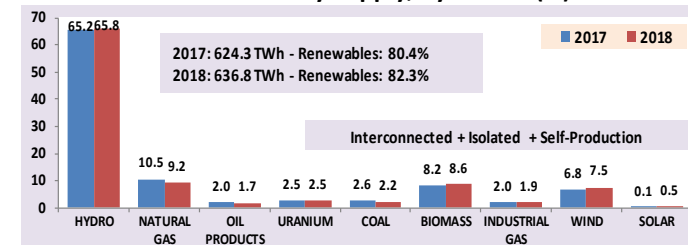
So, for the whole year of 2018 the Domestic Energy Supply (DES)¹ is expected to have a reduction near 1%.

Total energy demand for 2018 is expected to recoil by 1.0%



The Domestic Electricity Supply (DELS)² of 2018 was estimated at 636.8 TWh, showing an increase of 2.0% over 2017 (2.8% up to February). The share of renewables should remain somewhat above 80%. Wind energy continues to increase its share and solar PV energy starts a process of strong increase in the DELS matrix.

Domestic Electricity Supply, by Source (%)



Highlights until October 2018

Oil production is down in the year

Oil production fell 1.3% in October, compared to the same month of 2017, accumulating a 2.0% drop in the year. Natural gas production grew by 2.1% in October, and accumulated a rise of 2.3% in the year.

Steel production with a slight rise

Steel production grew by 3.5% in October, compared to the same month in 2017, and increased by 2.6% in the year (4.8% up to March). Exports of iron ore are stable in the year (-9.9% through March), and pellets are up 13.6% (0.9% through March)

Hydraulic supply upward

Hydraulic generation accumulated a high of 1.6% in the year. The good rainfall regime of October and November shows that the indicator can proceed with strong high.

Oil derivatives turn to fall

Apparent consumption of petroleum products fell by 7.4% in October, and accumulated a fall of 3.6% in the year (-3.4% until July and -4.6% until May). Diesel consumption (biodiesel included) accumulated a high of 3.5% in the year, and gasoline, a 13.7% drop. The decline in gasoline is partially offset by the increase in ethanol consumption, 15.4% in the year. The total demand for natural gas reversed the high trajectory, with a decline of 1.1% in the accumulated of the year (+ 6.7% until March).

Energy consumption in light vehicles of the Otto cycle (gasoline, ethanol and natural gas) decreased by 2.2% in the year (+ 1.7% in 2017, -1.1% in 2016, +0.8 % in 2015 and + 6.2% in 2014). It is an indicator that directly reflects the economy effects on the population purchasing power.

Electricity consumption with a slight increase

Electricity consumption - excluding autoproducers that do not use the public grid - accumulates a 1.8% increase in the year (0.9% in the whole of 2017 and a negative of 0.9% in 2016). In the year, industrial consumption expanded by 2.4%, residential by 2.0% and commercial by 0.6%.

Biodiesel production in a strong rise

Biodiesel production continued with a high of 22.2% in October, accumulating a rate of 24.9% in the year (12.9% in all 2017, -3.6% in 2016 and 15% in 2015).

Pulp production increased by 8.9% in the year (3.8% in 2017, 7.8% in 2016, 8.5% in 2015 and 9.2% in 2014). Paper production accumulated a high of 0.9% (+ 1.7% throughout 2017). Cement production fell by 1.5% in the year (-7% in 2017).

Electricity rates in high

The average domestic tariff for residential electricity grew by 12.3% in the year over the same period of 2017 (stable in 2017, 5.8% in 2016 and 42.5% in 2015). The commercial tariff increased 12.5% (0.7% in 2017, 5.7% in 2016 and 43.8% in 2015) and the industrial increased 13.5% (1.2% in 2017, 3.6% % in 2016 and 51.7% in 2015).

Basic Data

SPECIFICATION	OCTOBER							
	IN THE MONTH			ACCUMULATED IN THE YEAR				
	2018	2017	%18/17	2018	2017	%18/17	%2018	
OIL								
PRODUCTION - with Shale Oil and NGL(10 ³ b/d)	2,717	2,752	-1.3	2,687	2,741	-2.0	-	
IMPORTS AVERAGE PRICE (US\$/bbl FOB)	78	57	37.5	73	53	36.1	-	
OIL PRODUCTS								
TOTAL CONSUMPTION (10 ³ b/day)	2,398	2,590	-7.4	2,438	2,530	-3.6	100.0	
hereof: DIESEL with biodiesel - (10 ³ b/day)	1,074	1,043	3.0	1,011	978	3.5	0.0	
hereof: GASOLINE C (10 ³ b/day)	619	718	-13.7	659	763	-13.7	0.0	
CONSUMER PRICE - DIESEL (R\$/l)	3.52	3.22	9.2	3.45	3.07	12.4	-	
CONSUMER PRICE - GASOLINE C (R\$/l)	4.37	3.90	12.2	4.35	3.71	17.4	-	
CONSUMER PRICE - LPG (R\$/13 kg)	69.4	62.2	11.5	67.8	57.5	17.9	-	
NATURAL GAS								
PRODUCTION (10 ⁶ m ³ /dav)	117.0	114.6	2.1	111.7	109.2	2.3	-	
IMPORTS (10 ⁶ m ³ /dav)	34.1	37.3	-8.6	32.7	29.1	12.6	-	
NON-UTILIZED AND REINJECTION (10 ⁶ m ³ /dav)	39.4	32.0	22.9	38.2	30.9	23.6	-	
AVAILABILITY FOR CONSUMPTION (10 ⁶ m ³ /dav)	111.7	119.8	-6.7	106.2	107.3	-1.1	100.0	
INDUSTRIAL CONSUMPTION (10 ⁶ m ³ /dav)	40.0	40.8	-1.9	39.5	41.0	-3.8	37.2	
POWER GENERATION CONS. (10 ⁶ m ³ /dav)	34.5	45.2	-23.7	30.4	33.0	-8.0	28.6	
INDUSTRIAL PRICE SP*(*) (US\$/MMBtu)(a)	11.4	12.8	-10.8	12.0	11.8	1.4	-	
MOTOR PRICE SP (US\$/MMBtu)	13.9	18.7	-25.5	16.2	17.8	-9.0	-	
RESIDENTIAL PRICE SP (US\$/MMBtu)	29.6	39.2	-24.6	34.0	37.3	-9.0	-	
ELECTRICITY								
NATIONAL INTERCONNECTED SYSTEM	67,378	65,098	3.5	66,019	64,667	2.1	100.0	
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	39,390	37,666	4.6	38,577	37,342	3.3	58.4	
SOUTH POWER LOAD (MWavg)	11,129	11,069	0.5	11,369	11,329	0.4	17.2	
NORTHEAST POWER LOAD (MWavg)	11,364	10,977	3.5	10,672	10,505	1.6	16.2	
NORTH POWER LOAD (MWavg)	5,495	5,666	-3.0	5,401	5,543	-2.6	8.2	
TOTAL CONSUMPTION (TWh) (b)	39.7	39.1	1.6	39.25	38.57	1.8	100.0	
RESIDENTIAL	11.4	11.1	2.6	11.39	11.17	2.0	29.0	
INDUSTRIAL	14.3	14.2	1.0	14.10	13.77	2.4	35.9	
COMMERCIAL	7.4	7.3	1.1	7.35	7.30	0.6	18.7	
OTHER SECTORS	6.6	6.5	1.4	6.42	6.33	1.4	16.4	
PLANTS ENTRY INTO OPERATING (MW)	837	1,196	-30.1	4,195	5,888	-28.8	-	
RESIDENTIAL PRICE (R\$/MWh)	758	664	14.3	706	629	12.3	-	
COMMERCIAL PRICE (R\$/MWh)	686	598	14.6	635	564	12.5	-	
INDUSTRIAL PRICE (R\$/MWh)	655	572	14.4	606	534	13.5	-	
ETHANOL AND BIODIESEL								
BIODIESEL PRODUCTION (10 ³ b/d)	101	83	22.2	91	73	24.9	-	
MOTOR ETHANOL CONSUMPTION (10 ³ b/d)	603	492	22.5	514	446	15.4	-	
ETHANOL EXPORTS (10 ³ b/d)	57	31	81.4	30	25	18.0	-	
HYDRATED ETHANOL PRICE (R\$/l)	2.93	2.66	10.4	2.89	2.65	9.1	-	
COAL								
ELECTRICITY GENERATION (MWavg)	1,587	2,155	-26.4	1,550	1,637	-5.3	-	
IMPORT PRICE (US\$/t FOB/t)	131.2	143.6	-8.6	141.8	147.0	-3.6	-	
NUCLEAR ENERGY								
ELECTRICITY GENERATION - (GWh)	1,407	1,186	18.6	13,298	12,948	2.7	-	
INDUSTRIAL SECTORS								
STEEL PRODUCTION (10 ³ t/day)	102	98	3.5	96	94	2.6	-	
ALUMINIUM PRODUCTION (10 ³ t/day)	1.6	2.2	-25.6	1.8	2.2	-16.3	-	
IRON ORE EXPORTS (10 ³ t/day)	992	1,061	-6.4	953	959	-0.6	-	
PELLETS EXPORTS (10 ³ t/day)	107	77	39.8	93	82	13.6	-	
PAPER PRODUCTION (10 ³ t/day)	30.0	28.9	3.7	28.8	28.6	0.9	-	
PULP PRODUCTION (10 ³ t/day)	52.5	52.4	0.1	57.2	52.5	8.9	-	
SUGAR PRODUCTION (10 ³ t/day)	81	135	-40.2	84	123	-31.5	-	
SUGAR EXPORTS (10 ³ t/day)	66	93	-28.7	61	81	-24.4	-	

(*) SP is the acronym of the state of São Paulo.

(a) INDUSTRIAL PRICE SP*(*) (US\$/MMBtu) - consumption range of 20,000 m³/day;

(b) Self-producers, do not use public grid, is not included.

