

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 ANP³ 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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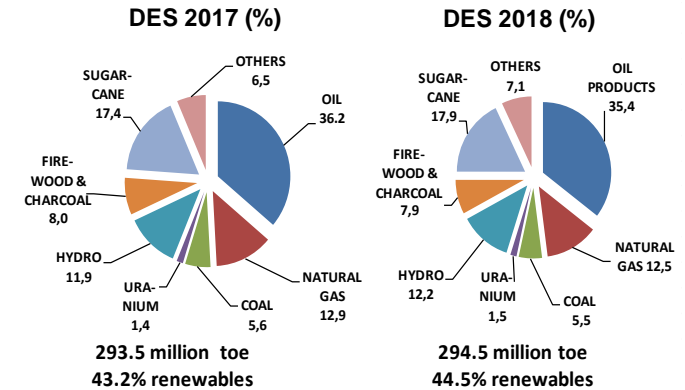
Reference Month: September 2018

Domestic Energy Supply

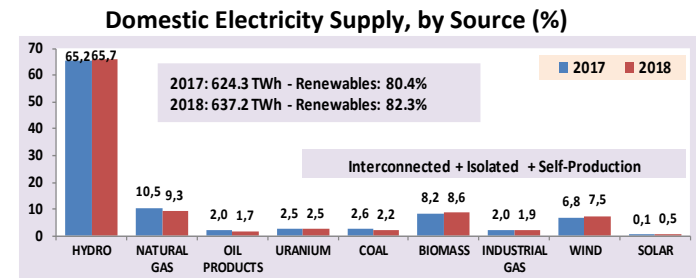
In September, economic signals lead to more modest forecasts for 2018 energy expansion. Natural gas and oil products are expected to have declines in demand between 2 and 3 percent. In industrial production, pulp and pellets have rates about 10%, contrasting with declines in the production of aluminum, alumina and cement.

Up to September 2018 the Domestic Energy Supply (DES)¹ was - 0,06% (+0.2% until July). For all 2018, a slightly better rate is expected, of 0.3% (0.7% until July, 1.1% until June and 2% until February).

Total energy demand for 2018 is expected to grow about 0.5%



The Domestic Electricity Supply (DELS)² of 2018 was estimated at 637.2 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.



Highlights until September 2018

Oil production is down in the year

Oil production fell by 7.2% in September, compared to the same month of 2017, accumulating a drop of 2.1% in the year. Natural gas production fell by 1.0% in September, but rose by 2.3% in the year.

Steel production with a slight rise

Steel production grew 2.5% in September, compared to the same month in 2017, and rose 2.5% in the year (4.8% until March). Iron ore exports are stable in the year (-9.9% until March), and pellet exports are up 10.9% (0.9% through March).

Hydraulic supply upward

Hydraulic generation accumulated a high of 0.3% in the year. The good rainfall regime of October and November show that the indicator tends to proceed with strong highs (hydraulics data have been revised).

Oil derivatives turn to fall

The apparent consumption of petroleum products fell by 5.7% in September and accumulates a drop of 3.2% in the year (-3.4% until July and -4.6% until May). Diesel consumption (including biodiesel) accumulated a high of 3.5% in the year and the gasoline consumption, a 13.7% drop. The gasoline recoil is partially offset by an increase of 14.5% in ethanol consumption in the year. The total demand for natural gas reversed the highs trajectory, with a decrease of 0.3% 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 2.3% 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 effects of the economy on the population purchasing power.

Electricity consumption with a slight increase

In the year, electricity consumption - excluding autoproducers that do not use the public grid - accumulates a high of 1.8% (0.9% in all of 2017 and a negative of 0.9% in 2016). In the year, industrial consumption is expanding by 2.5% and residential, with a high of 1.9% and commercial, with 0.6%.

Biodiesel production in a strong rise

Biodiesel production continued with a high of 21.0% in September, accumulating a rate of 25.3% in the year (12.9% in all 2017, -3.6% in 2016 and 15% in 2015).

Pulp production increased by 9.9% 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 0.5% (+1.7% throughout 2017). Cement production declined by 2.9% 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 12.4% (0.7% in 2017, 5.7% in 2016 and 43.8% in 2015) and the industrial increased 13.7% (1.2% in 2017, 3.6% % in 2016 and 51.7% in 2015).

Basic Data

SPECIFICATION	SEPTEMBER						
	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)	2.577	2.777	-7,2	2.684	2.740	-2,1	-
IMPORTS AVERAGE PRICE (US\$/bbl FOB)	79	51	55,2	72	53	35,9	-
OIL PRODUCTS							
TOTAL CONSUMPTION (10 ³ b/day)	2.410	2.556	-5,7	2.443	2.523	-3,2	100,0
hereof: DIESEL with biodiesel - (10 ³ b/day)	1.051	1.066	-1,4	1.004	970	3,5	0,0
hereof: GASOLINE C (10 ³ b/day)	606	733	-17,3	663	768	-13,7	0,0
CONSUMER PRICE - DIESEL (R\$/l)	3,61	3,17	13,6	3,44	3,05	12,8	-
CONSUMER PRICE - GASOLINE C (R\$/l)	4,63	3,88	19,2	4,35	3,69	18,0	-
CONSUMER PRICE - LPG (R\$/13 kg)	68,5	59,5	15,2	67,7	57,0	18,7	-
NATURAL GAS							
PRODUCTION (10 ⁶ m ³ /day)	112,9	114,0	-1,0	111,1	108,6	2,3	-
IMPORTS (10 ⁶ m ³ /day)	47,6	37,4	27,4	32,6	28,1	15,7	-
NON-UTILIZED AND REINJECTION (10 ⁶ m ³ /day)	42,7	33,8	26,4	38,1	30,8	23,7	-
AVAILABILITY FOR CONSUMPTION (10 ⁶ m ³ /day)	117,9	117,6	0,2	105,6	105,9	-0,3	100,0
INDUSTRIAL CONSUMPTION (10 ⁶ m ³ /day)	39,1	41,3	-5,3	39,4	41,1	-4,0	37,4
POWER GENERATION CONS. (10 ⁶ m ³ /day)	41,6	42,7	-2,7	29,9	31,7	-5,5	28,3
INDUSTRIAL PRICE SP(*) (US\$/MMBtu(a))	11,6	12,8	-9,5	12,1	11,7	2,9	-
MOTOR PRICE SP (US\$/MMBtu)	14,4	18,7	-23,2	16,4	17,7	-7,1	-
RESIDENTIAL PRICE SP (US\$/MMBtu)	29,9	39,2	-23,9	34,5	37,1	-7,2	-
ELECTRICITY							
NATIONAL INTERCONNECTED SYSTEM	65.233	64.407	1,3	65.868	64.619	1,9	100,0
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	38.112	37.328	2,1	38.487	37.306	3,2	58,4
SOUTH POWER LOAD (MWavg)	10.809	11.232	-3,8	11.396	11.358	0,3	17,3
NORTHEAST POWER LOAD (MWavg)	10.842	10.407	4,2	10.595	10.453	1,4	16,1
NORTH POWER LOAD (MWavg)	5.470	5.690	-3,9	5.391	5.529	-2,5	8,2
TOTAL CONSUMPTION (TWh) (b)	39,1	38,7	0,9	352,8	346,6	1,8	100,0
RESIDENTIAL	11,0	11,1	-0,5	102,5	100,5	1,9	29,0
INDUSTRIAL	14,4	14,1	2,0	126,7	123,6	2,5	35,9
COMMERCIAL	7,0	7,1	-1,2	66,1	65,7	0,6	18,7
OTHER SECTORS	6,6	6,4	3,2	57,6	56,8	1,4	16,3
PLANTS ENTRY INTO OPERATING (MW)	214	732	-70,7	3.358	4.691	-28,4	-
RESIDENTIAL PRICE (R\$/MWh)	782	647	20,9	701	625	12,3	-
COMMERCIAL PRICE (R\$/MWh)	704	584	20,5	630	560	12,4	-
INDUSTRIAL PRICE (R\$/MWh)	680	557	22,0	602	530	13,7	-
ETHANOL AND BIODIESEL							
BIODIESEL PRODUCTION (10 ³ b/d)	101	84	21,0	89	71	25,3	-
MOTOR ETHANOL CONSUMPTION (10 ³ b/d)	581	482	20,6	504	440	14,5	-
ETHANOL EXPORTS (10 ³ b/d)	30	30	-1,8	25	25	-0,7	-
HYDRATED ETHANOL PRICE (R\$/l)	2,80	2,63	6,3	2,89	2,65	9,0	-
COAL							
ELECTRICITY GENERATION (MWavg)	1.670	1.780	-6,2	1.545	1.579	-2,1	-
IMPORT PRICE (US\$/FOB/t)	132,8	119,8	10,9	143,0	147,4	-3,0	-
NUCLEAR ENERGY							
ELECTRICITY GENERATION - (GWh)	1.449	980	47,9	11.891	11.762	1,1	-
INDUSTRIAL SECTORS							
STEEL PRODUCTION (10 ³ t/day)	101	99	2,5	96	93	2,5	-
ALUMINIUM PRODUCTION (10 ³ t/day)	1,6	2,2	-25,8	1,9	2,2	-15,2	-
IRON ORE EXPORTS (10 ³ t/day)	1.033	969	6,6	949	948	0,1	-
PELLETS EXPORTS (10 ³ t/day)	98	95	2,2	92	83	10,9	-
PAPER PRODUCTION (10 ³ t/day)	29,7	29,5	0,5	28,7	28,6	0,5	-
PULP PRODUCTION (10 ³ t/day)	59,0	53,5	10,2	57,7	52,5	9,9	-
SUGAR PRODUCTION (10 ³ t/day)	130	202	-35,8	85	122	-30,4	-
SUGAR EXPORTS (10 ³ t/day)	85	117	-27,5	61	80	-23,8	-

(*) 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.

