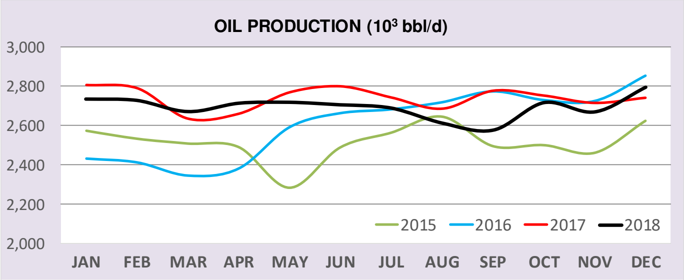
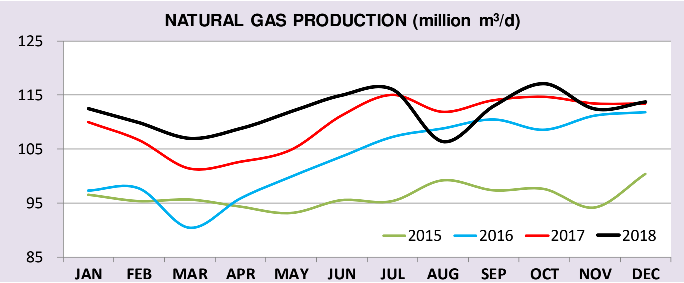
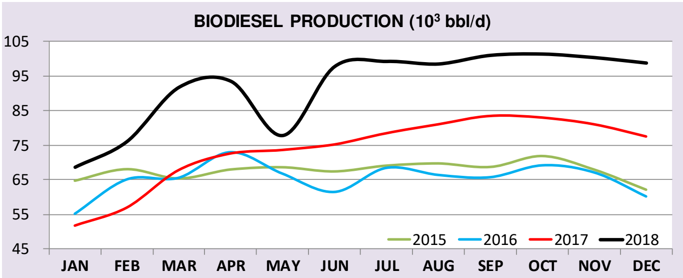
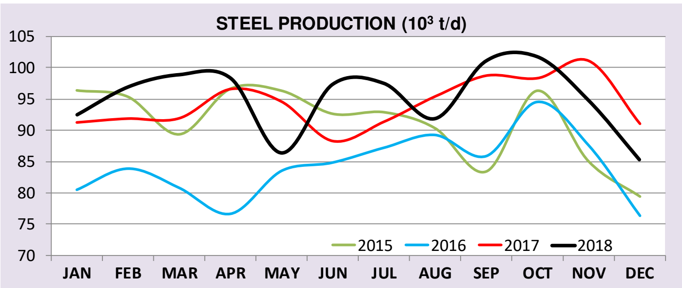
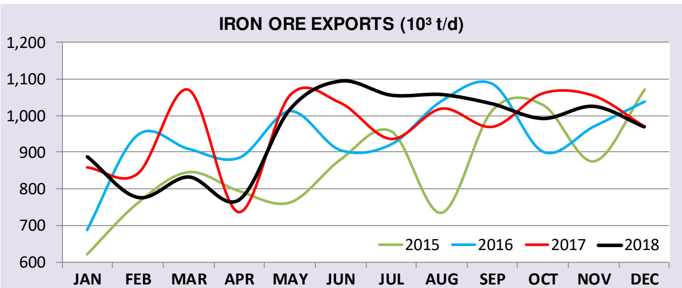
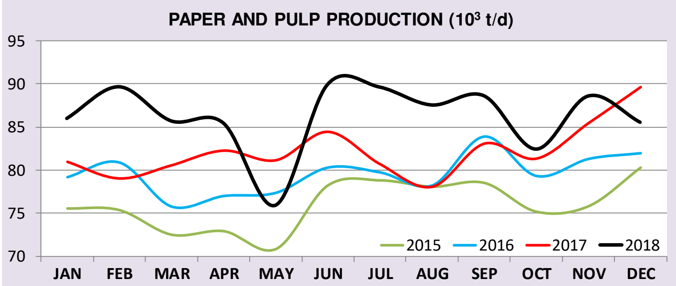


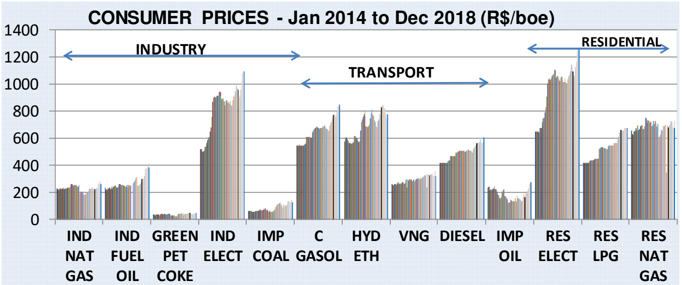












Note: For a better visualization, the minimum scale of the graphs was raised to the level close to the lowest value of the curves.

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[3] 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.

Department of Information and Studies on Energy – DIE/SPE/MME
www.mme.gov.br / die@mme.gov.br
(55 61) 2032 5986/2032 5764

Monthly Energy Bulletin - Brazil

Reference Month: December 2018

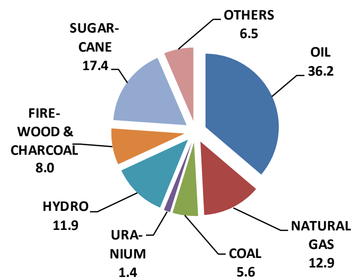
Domestic Energy Supply

By 2018, the Internal Domestic Energy Supply (DES)[1] should retreat near 1.4%, when the definitive data of the National Energy Balance will be determined. The negative performances of some variables contribute to this rate: a) reductions of 3.5% in the consumption of oil derivatives and 5.4% in natural gas consumption; b) decreases of 16 to 27% in coal-fired generation, aluminum & alumina production, sugar production and pig iron exports.

The positive performance of renewable energy sources (hydropower, wind, solar, ethanol and biodiesel) and some industrial products (steel, pellets and pulp) contribute to attenuate the decline in OIE.

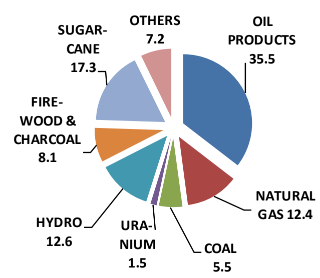
Total energy demand for 2018 is expected to decline near 1.4%

DES 2017 (%)



293.5 million toe
43.2% renewables

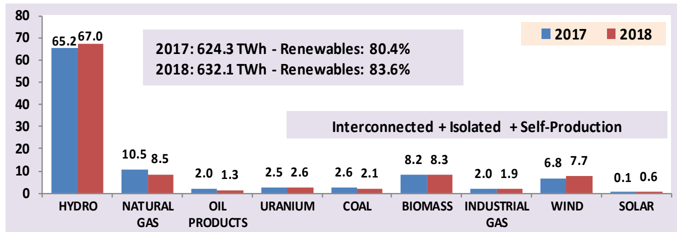
DES 2018 (%)



289.3 million toe
44.5% renewables

The Domestic Electricity Supply (DELS)[2] of 2018 was estimated at 632.1 TWh, showing an increase of 1.3% over 2017 (2.8% up to February and 2% to October). The share of renewables should remain somewhat above 84%. 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 (%)



MINISTRY OF MINES AND ENERGY - MME
SECRETARIAT OF ENERGY PLANNING AND DEVELOPMENT
Department of Information and Studies on Energy

Highlights until December 2018

Oil production is down in the year

Oil production rose by 1.9% in December, compared to the same month of 2017, but accumulated a 1.6% drop in the year. Natural gas production accumulated a rise of 1.8% in the year.

Steel production with a slight rise this year

Steel production recoiled 6.3% in December, compared to the same month in 2017, but endend the year with a rise of 1.1% (4.8% up to March). Exports of iron ore show a drop of 0.7% in 2018 (-9.9% to March), and those of pellets are up 14.8%.

Hydraulic grows up in this year

Hydraulic generation grew 14.5% in December, accumulating a rise of 4.1% in 2018. Itaipu generation recoiled 1.7 in this year.

Oil derivatives decrease in 2018

Apparent consumption of petroleum products fell by 1.8% in December, accumulating a 3.5% drop in the year. Diesel consumption (biodiesel included) accumulated a high of 3.4% in the year, and gasoline consumption, down 13.1%. The decline in gasoline was partially offset by the 15.6% increase in ethanol consumption in the year. Total natural gas demand, in recent months, reversed the upward trajectory, with a 5.4% drop in the year to date (+ 6.7% through March).

Energy consumption in light vehicles of the Otto cycle (gasoline, ethanol and natural gas) decreased by 1.2% 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 purchasing power of the population.

Electricity consumption grows little in the year

Electricity consumption - excluding self-producers that do not use the public grid - ended the year with an increase of 1.1% (0.9% in the whole of 2017 and a negative of 0.9% in 2016). In the year, industrial consumption grew 1.3%, residential 1.2% and commercial 0.6%.

Biodiesel production in a strong rise

Biodiesel production continued to rise in December, with a significant 27.4%, accumulating a rate of 25.0% in the year (12.9% in all 2017, -3.6% in 2016 and 15% in 2015).

Pulp production grew by 7.1% in 2018 (3.8% in 2017, 7.8% in 2016, 8.5% in 2015 and 9.2% in 2014). Paper production grew by 0.8% in the year (+ 1.7% throughout 2017). Cement production fell by 1.3% in the year (-7% in 2017).

Electricity tariffs in high

The average domestic tariff for residential electricity grew by 12.6% 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 13.4% (1.2% in 2017, 3.6% % in 2016 and 51.7% in 2015).

Basic Data

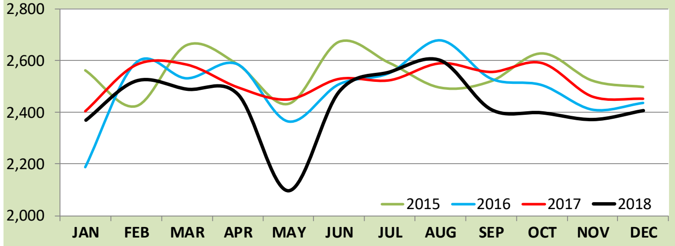
SPECIFICATION	DECEMBER						
	IN THE MONTH			ACCUMULATED IN THE YEAR			
	2018	2017	%18/17	2018	2017	%18/17	%2018
OIL							
PRODUCTION - with Shale Oil and NGL(10^3 b/d)	2,794	2,742	1.9	2,695	2,739	-1.6	-
IMPORTS AVERAGE PRICE (US$/bbl FOB)	79	66	19.6	76	56	36.7	-
OIL PRODUCTS							
TOTAL CONSUMPTION (10^3 b/day)	2,407	2,451	-1.8	2,430	2,518	-3.5	**100.0**
hereof: DIESEL with biodiesel - (10^3 b/day)	943	908	3.8	1,008	975	3.4	0.0
hereof: GASOLINE C (10^3 b/day)	701	782	-10.4	662	761	-13.1	0.0
CONSUMER PRICE - DIESEL (R$/l)	3.50	3.32	5.3	3.47	3.11	11.7	-
CONSUMER PRICE - GASOLINE C (R$/l)	4.37	4.09	6.9	4.37	3.76	16.2	-
CONSUMER PRICE - LPG (R$/13 kg)	69.4	66.5	4.2	68.1	58.9	15.5	-
NATURAL GAS							
PRODUCTION (10^6 m^3/day)	113.7	113.4	0.3	111.9	109.9	1.8	-
IMPORTS (10^6 m^3/day)	14.1	27.0	-47.9	29.6	29.4	0.7	-
NON-UTILIZED AND REINJECTION (10^6 m^3/day)	42.1	29.4	43.2	38.5	30.5	26.4	-
AVAILABILITY FOR CONSUMPTION (10^6 m^3/day)	85.7	111.0	-22.8	103.0	108.8	-5.4	**100.0**
INDUSTRIAL CONSUMPTION (10^6 m^3/day)	35.2	38.1	-7.4	39.2	40.8	-4.0	38.0
POWER GENERATION CONS. (10^6 m^3/day)	13.4	38.4	-65.1	27.7	34.3	-19.2	26.9
INDUSTRIAL PRICE SP(*) (US$/MMBtu)(a)	12.2	12.2	0.4	12.2	11.9	2.3	-
MOTOR PRICE SP (US$/MMBtu)	15.9	18.0	-11.8	16.4	17.8	-8.3	-
RESIDENTIAL PRICE SP (US$/MMBtu)	31.6	37.3	-15.3	33.9	37.4	-9.2	-
ELECTRICITY							
NATIONAL INTERCONNECTED SYSTEM	66,819	63,461	5.3	65,569	64,576	1.5	**100.0**
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	39,095	37,697	3.7	38,130	37,447	1.8	58.2
SOUTH POWER LOAD (MWavg)	11,814	11,388	3.7	11,365	11,363	0.0	17.3
NORTHEAST POWER LOAD (MWavg)	10,992	9,418	16.7	10,714	10,347	3.5	16.3
NORTH POWER LOAD (MWavg)	5,168	5,208	-0.8	5,381	5,507	-2.3	8.2
TOTAL CONSUMPTION (TWh) (b)	39.8	39.6	0.5	472.2	467.2	1.1	**100.0**
RESIDENTIAL	11.5	11.4	0.7	136.0	134.4	1.2	28.8
INDUSTRIAL	14.0	14.1	-0.9	169.5	167.4	1.3	35.9
COMMERCIAL	7.7	7.6	1.0	88.8	88.3	0.6	18.8
OTHER SECTORS	6.6	6.4	2.6	77.9	77.1	1.0	16.5
PLANTS ENTRY INTO OPERATING (MW)	1,718	1,179	45.8	7,175	7,361	-2.5	-
RESIDENTIAL PRICE (R$/MWh)	751	686	9.5	721	641	12.6	-
COMMERCIAL PRICE (R$/MWh)	664	619	7.3	647	576	12.4	-
INDUSTRIAL PRICE (R$/MWh)	639	590	8.2	619	546	13.4	-
ETHANOL AND BIODIESEL							
BIODIESEL PRODUCTION (10^3 b/d)	99	78	27.4	92	74	25.0	-
MOTOR ETHANOL CONSUMPTION (10^3 b/d)	596	509	17.0	526	455	15.6	-
ETHANOL EXPORTS (10^3 b/d)	17	13	30.3	31	25	25.0	-
HYDRATED ETHANOL PRICE (R$/l)	2.83	2.87	-1.5	2.89	2.68	7.8	-
COAL							
ELECTRICITY GENERATION (MWavg)	704	1,941	-63.7	1,282	1,605	-20.1	-
IMPORT PRICE (US$ FOB/t)	139.4	131.4	6.1	141.7	144.6	-2.0	-
NUCLEAR ENERGY							
ELECTRICITY GENERATION - (GWh)	1,871	1,346	39.0	16,153	15,737	2.6	-
INDUSTRIAL SECTORS							
STEEL PRODUCTION (10^3 t/day)	85	91	-6.3	95	94	1.1	-
ALUMINIUM PRODUCTION (10^3 t/day)	1.5	2.1	-27.5	1.8	2.2	-18.1	-
IRON ORE EXPORTS (10^3 t/day)	970	969	0.1	961	968	-0.7	-
PELLETS EXPORTS (10^3 t/day)	101	88	14.9	95	83	14.8	-
PAPER PRODUCTION (10^3 t/day)	29.1	29.1	-0.2	28.9	28.7	0.8	-
PULP PRODUCTION (10^3 t/day)	56.5	60.5	-6.6	57.3	53.5	7.1	-
SUGAR PRODUCTION (10^3 t/daY)	32	37	-14.6	78	107	-27.0	-
SUGAR EXPORTS (10^3 t/day)	52	61	-15.0	60	79	-23.1	-

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

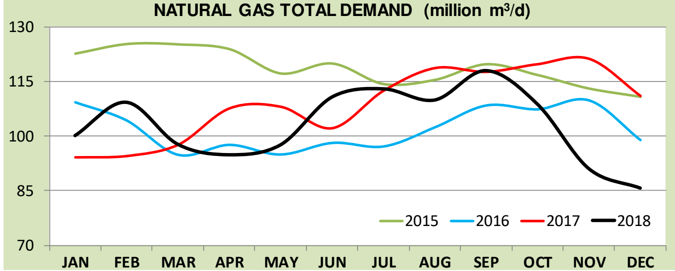
(a) INDUSTRIAL PRICE SP(*) (US$/MMBtu) - consumption range of 20,000 m^3/day;

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

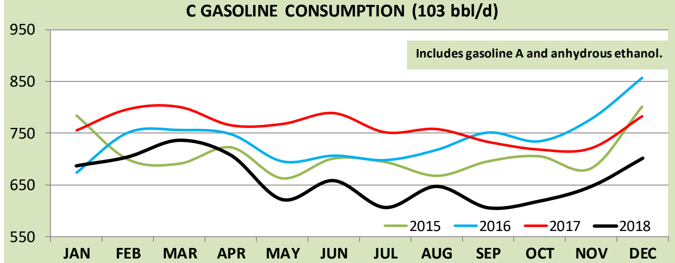
OIL PRODUCTS TOTAL CONSUMPTION (10^3 bbl/d)



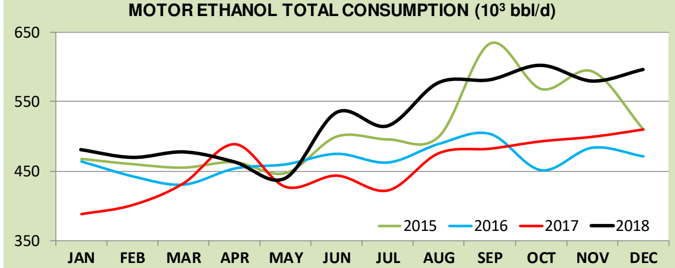
NATURAL GAS TOTAL DEMAND (million m^3/d)



C GASOLINE CONSUMPTION (103 bbl/d)



MOTOR ETHANOL TOTAL CONSUMPTION (10^3 bbl/d)



NATIONAL INTERCONNECTED SYSTEM POWER LOAD (GWavg)