

**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 is equal to domestic production (+) import (-) unused (-) reinjection.

Apparent consumption of oil derivatives is equal distributors' sales (+) Petrobras' own consumption (including refinery gas) (+) Petrobras' direct sales. The monthly data published in the press and on the ANP website do not consider the own consumption and direct sales of Petrobras, whose volume is about 20% of the total oil products consumption.

(\* Domestic Energy Supply (DES), or Total Energy Demand, includes final energy consumption in the residential sector and in the other economic sectors, includes losses in transmission and distribution, and losses on power transformation. 2015 data reflect the 2016 cycle of the National Energy Balance, elaborated in April by the Energy Research Company (EPE), with the support of MME and its institutions.

# Monthly Energy Bulletin - Brazil

Reference Month: October 2016

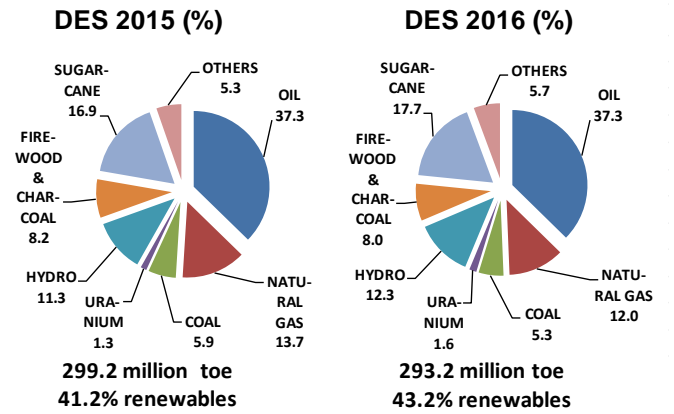
## Domestic Energy Supply

The industrial production and energy consumption indicators of October 2016 accentuate the recessive forecasts of the previous bulletin. The low performances of household consumption, services and much of durable goods persist.

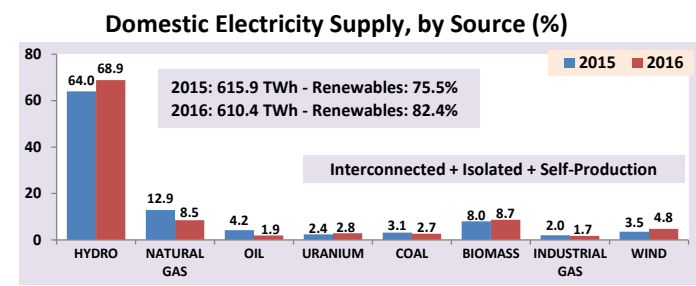
The Domestic Energy Supply (DES)\* estimated until October shows a recoil of 2.4% over the same period of 2015. There are sharp decreases on oil, natural gas and transports demands, as well as on the production of metallurgy and transport products.

For the full year 2016, the estimated rate for the DES is in the range of -2.5 to -1.5%. At the date of this report, the estimated rate was -2.0% (-1.6% of the previous bulletin).

**Total energy demand in 2016 may recede between 1.5 and 2.5%**



The Domestic Electricity Supply (DELS) in 2016 was estimated at 610.4 TWh (612.7 TWh of the previous bulletin), showing a decrease of 0.9% over 2015. Renewable sources should increase participation, due to good performances of hydro, wind and biomass generations.



## Highlights to October 2016

### Oil production rises

The oil production of October 2016 rose 9.2% over the same period of 2015 and accumulating an increase of 2.7% in the year (1.9% up to September). The natural gas production grew 11.2% in October and accumulates 6.2% in the year.

### Steel production is falling

Steel production fell 8.8% in October over the same month of 2015, accumulating a drop of 9.6% in the year. Iron ore exports are positive in 10.5% in the year. In contrast, pellets exports accumulate fall of 44.2%.

### Hydraulic supply is cumulatively rising up

The hydraulic energy supply recoiled 3.2% in October. The Itaipu imports (Paraguayan part) grew up 1.5%. In the year, the national hydro generation is 6.2% positive (4.2% to September).

### Falling oil derivatives consumption

The apparent consumption of petroleum products fell 4.7% in October, accumulating a fall of 2.2% in the year (-1.9% to September). The diesel recoiled 16.4% and the C gasoline grew by 4.2% in the month. In the year, the diesel indicator is negative 3.8% (-2.1% to September), and the C gasoline is 3.0% positive (2.9% to September). The total demand of natural gas decreased 15.4% in the year, exerting a strong influence on the thermoelectric consumption recoil (-37.6%).

The consumption in the Otto cycle transport (gasoline, ethanol and natural gas) accumulates a recoil of 1.6% in the year (-0.9% to September, -2.2% to April, +0.8% in the whole year of 2015 and +6.2% in 2014).

### Electricity consumption accumulates fall

Electricity consumption (excluding captive self-producer) fell 2.7% in October and accumulates a decrease in the year, of 1.3% (-1.1% to September). Commerce consumption reduced 7.0% in October (-2.1% in the year). Residential consumption grew by 1.1% in the year (1.5% to September) and industry consumption decreased 3.9% in the year (-4.1% to September).

### Biodiesel production in low

Biodiesel production recoiled 1.0% in October and accumulates -3.5% in the year to date (-3.8 to September). In 2015, the rate was 15% positive.

Pulp production continues with high performance, showing an increase of 8.2% in October and accumulating 7.9% in this year. Throughout 2015, the expansion was 8.5% (9.2% in 2014).

### Falling electricity rates

The national average residential electricity tariff accumulates a rise of 8.5% in the year, the commercial tariff, 8.4% and the industrial tariff, 6.9%.

### Basic data of 2015 and 2016

SPECIFICATION	OCTOBER				ACCUMULATED IN THE YEAR			
	2016	2015	%16/15	2016	2015	%16/15	%2015	
<b>OIL</b>								
PRODUCTION - with Shale Oil and NGL(10 <sup>3</sup> b/d)	2,731	2,501	9.2	2,575	2,509	2.7	-	
IMPORTS AVERAGE PRICE (US\$/bbl FOB)	48	66	-26.7	45	67	-32.9	-	
<b>OIL PRODUCTS</b>								
TOTAL CONSUMPTION (10 <sup>3</sup> b/day)	2,505	2,629	-4.7	2,502	2,559	-2.2	100.0	
hereof: DIESEL with biodiesel - (10 <sup>3</sup> b/day)	987	1,180	-16.4	991	1,030	-3.8	37.6	
hereof: GASOLINE C (10 <sup>3</sup> b/day)	735	705	4.2	723	702	3.0	23.1	
CONSUMER PRICE - DIESEL (R\$/l)	3.01	2.93	2.9	3.01	2.81	7.2	-	
CONSUMER PRICE - GASOLINE C (R\$/l)	3.66	3.48	5.2	3.68	3.29	11.7	-	
CONSUMER PRICE - LPG (R\$/13 kg)	55.3	53.9	2.7	53.8	47.1	14.1	-	
<b>NATURAL GAS</b>								
PRODUCTION (10 <sup>6</sup> m <sup>3</sup> /day)	108.5	97.6	11.2	101.9	96.0	6.2	-	
IMPORTS (10 <sup>6</sup> m <sup>3</sup> /day)	31.6	48.6	-34.9	33.7	51.1	-34.0	-	
NON-UTILIZED AND REINJECTION (10 <sup>6</sup> m <sup>3</sup> /day)	32.8	29.5	11.0	34.2	27.2	25.8	-	
AVAILABILITY FOR CONSUMPTION (10 <sup>6</sup> m <sup>3</sup> /day)	107.4	116.7	-8.0	101.4	119.9	-15.4	100.0	
INDUSTRIAL CONSUMPTION (10 <sup>6</sup> m <sup>3</sup> /day)	40.9	41.1	-0.5	40.9	44.2	-7.5	40.3	
POWER GENERATION CONS. (10 <sup>6</sup> m <sup>3</sup> /day)	31.2	44.2	-29.4	29.0	46.5	-37.6	28.6	
INDUSTRIAL PRICE SP(*) (US\$/MMBtu) - consumption range of 20,000 m <sup>3</sup> /day	18.0	11.5	56.1	13.4	13.4	-0.2	-	
MOTOR PRICE SP (US\$/MMBtu)	16.8	13.3	26.2	15.3	15.0	2.3	-	
RESIDENTIAL PRICE SP (US\$/MMBtu)	38.4	32.9	16.9	36.9	38.9	-5.1	-	
<b>ELECTRICITY</b>								
NATIONAL INTERCONNECTED SYSTEM	61,581	62,916	-2.1	63,791	63,726	0.1	100.0	
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	35,465	38,685	-8.3	36,911	37,180	-0.7	57.9	
SOUTH POWER LOAD (MWavg)	10,279	10,219	0.6	11,104	10,877	2.1	17.4	
NORTHEAST POWER LOAD (MWavg)	10,494	10,234	2.5	10,430	10,283	1.4	16.4	
NORTH POWER LOAD (MWavg)	5,343	5,418	-1.4	5,346	5,216	2.5	8.4	
TOTAL CONSUMPTION (TWh) (**)	38.1	39.2	-2.7	38.2	38.3	-1.3	100.0	
RESIDENTIAL	10.9	11.1	-2.5	110.3	109.1	1.1	28.9	
INDUSTRIAL	13.8	14.1	-1.8	136.7	142.2	-3.9	35.8	
COMMERCIAL	7.1	7.6	-7.0	73.2	74.8	-2.1	19.1	
OTHER SECTORS	6.3	6.3	-0.2	62.1	61.2	1.5	16.2	
PLANTS ENTRY INTO OPERATING (MW)	394	369	6.9	7,786	4,485	73.6	-	
RESIDENTIAL PRICE (R\$/MWh)	643	644	-0.1	644	593	8.5	-	
COMMERCIAL PRICE (R\$/MWh)	573	575	-0.4	575	531	8.4	-	
INDUSTRIAL PRICE (R\$/MWh)	540	552	-2.2	543	508	6.9	-	
<b>ETHANOL AND BIODIESEL</b>								
BIODIESEL PRODUCTION (10 <sup>3</sup> b/d)	71	72	-1.0	66	68	-3.5	-	
MOTOR ETHANOL CONSUMPTION (10 <sup>3</sup> b/d)	435	568	-23.4	456	499	-8.7	-	
ETHANOL EXPORTS (10 <sup>3</sup> b/d)	13	53	-74.5	35	29	21.2	-	
HYDRATED ETHANOL PRICE (R\$/l)	2.68	2.37	13.2	2.62	2.15	21.7	-	
<b>COAL</b>								
ELECTRICITY GENERATION (MWavg)	1,381	2,058	-32.9	1,811	2,062	-12.2	-	
IMPORT PRICE (US\$ FOB/t)	81.2	91.8	-11.5	73.3	91.5	-19.9	-	
<b>NUCLEAR ENERGY</b>								
ELECTRICITY GENERATION - (GWh)	1,495	514	190.9	14,110	11,820	19.4	-	
<b>INDUSTRIAL SECTORS</b>								
STEEL PRODUCTION (10 <sup>3</sup> t/day)	88	96	-8.8	84	93	-9.6	-	
ALUMINIUM PRODUCTION (10 <sup>3</sup> t/day)	2.2	2.0	7.1	2.2	2.1	1.5	-	
IRON ORE EXPORTS (10 <sup>3</sup> t/day)	901	1,029	-12.5	929	841	10.5	-	
PELLETS EXPORTS (10 <sup>3</sup> t/day)	67	72	-6.6	79	142	-44.2	-	
PAPER PRODUCTION (10 <sup>3</sup> t/day)	28.3	28.0	1.0	28.3	28.4	-0.6	-	
PULP PRODUCTION (10 <sup>3</sup> t/day)	51.0	47.1	8.2	50.8	47.1	7.9	-	
SUGAR PRODUCTION (10 <sup>3</sup> t/day)	157	144	8.7	112	95	17.6	-	
SUGAR EXPORTS (10 <sup>3</sup> t/day)	70	83	-14.7	78	63	23.1	-	

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

(\*\*) The traditional self-producers (consumers that do not use public grid) is not included.

