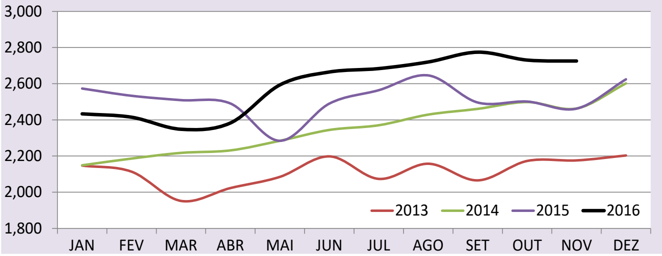
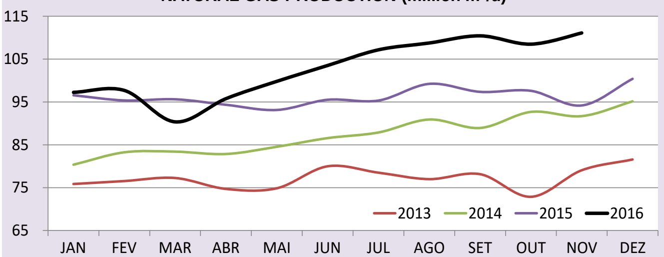
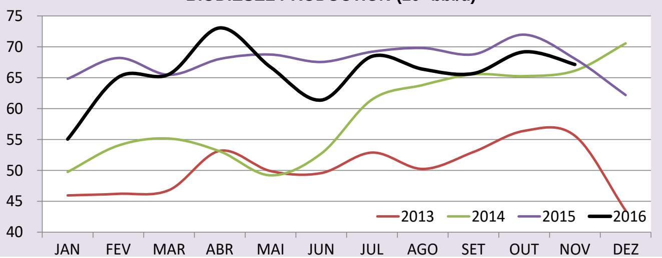
OIL PRODUCTION (10^3 bbl/d)



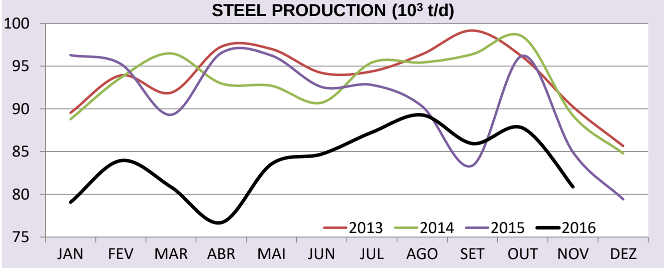
NATURAL GAS PRODUCTION (million m³/d)



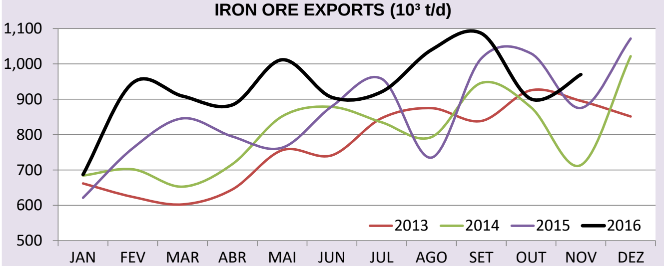
BIODIESEL PRODUCTION (10^3 bbl/d)



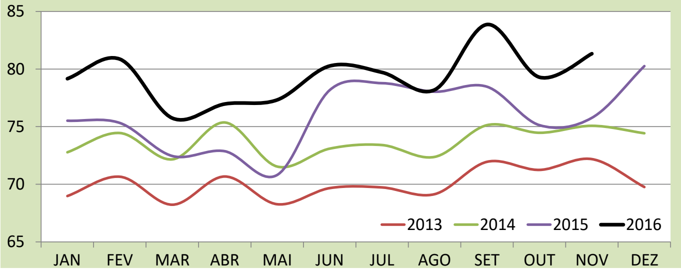
STEEL PRODUCTION (10^3 t/d)



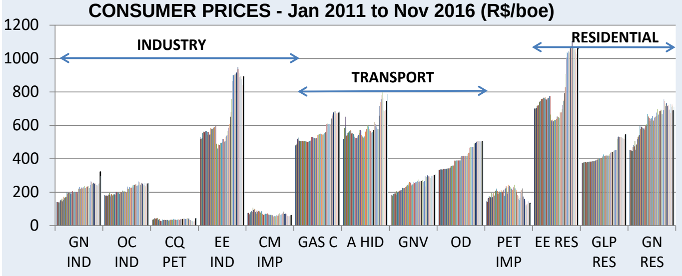
IRON ORE EXPORTS (10^3 t/d)



PAPER AND PULP PRODUCTION (10^3 t/d)



CONSUMER PRICES - Jan 2011 to Nov 2016 (R$/boe)



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 June by the Energy Research Company (EPE), with the support of MME and its institutions.

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Monthly Energy Bulletin - Brazil

Reference Month: **November 2016**

Domestic Energy Supply

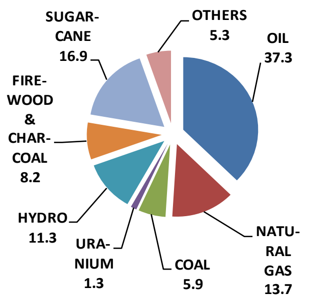
The indicators of industrial production and energy consumption of November 2016 do not change the recessionary predictions of the previous bulletin. The low performances of household consumption, services and much of durable goods persist.

The Domestic Energy Supply (DES*) estimated until November 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 products and transport.

For the full year 2016, the estimated rate for the DES is the same: -2.4% (-2.0% in the previous bulletin).

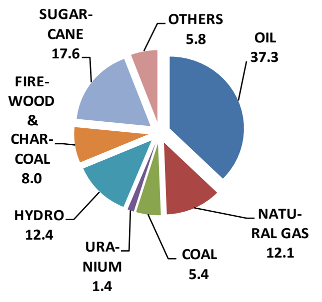
Total energy demand in 2016 may recede about 2.5%

DES 2015 (%)



299.2 million toe
41.2% renewables

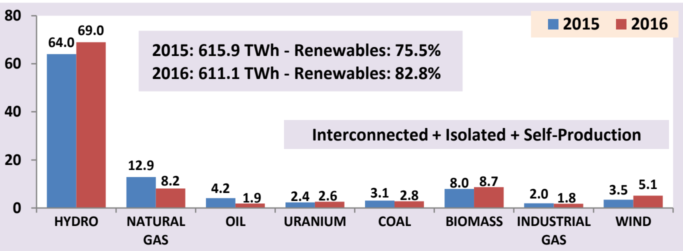
DES 2016 (%)



291.9 million toe
43.3% renewables

The Domestic Electricity Supply (DELS) in 2016 was estimated at 611.1 TWh (610.4 TWh of the previous bulletin), showing a decrease of 0.8% over 2015. Renewable sources should increase participation, due to good performances of hydro, wind and biomass generations.

Domestic Electricity Supply, by Source (%)



MME
MINISTRY OF MINES AND ENERGY - MME
SECRETARIAT OF ENERGY PLANNING AND DEVELOPMENT
OFFICE OF STRATEGIC ENERGY STUDIES

Highlights to November 2016

Oil production rises

Oil production in November 2016 rose 10.7% over the same month of 2015, accumulating an increase of 3.4% in the year (2.7% to October). Natural gas production grew by 18.0% in november, accumulating a positive rate of 7.2% in the year.

Steel production accumulates fall

Steel production recoiled 4.8% in November, over the same month of 2015, accumulating a 9.2% drop in the year. Exports of iron ore are positive at 10.5% in the year. On the other hand, pellets exports accumulated a drop of 41.2%.

Hydraulic supply is cumulatively rising up

The hydraulic energy supply increased by 0.6% in November, over the same month of 2015 and the import of Itaipu rose 23.0% (Paraguayan part). In the year, hydro supply was positive at 6.9% (6.2% up to October).

Oil derivatives is falling

Apparent consumption of petroleum products fell by 4.5% in November, accumulating a recoil of 2.4% in the year (-2.2% until October). Diesel oil fell 0.5% and gasoline C rose 14.1% in the month. In the year the diesel's indicator is negative by 3.5% (-3.8% until October), and gasoline's is positive by 4.0% (3.0% until October). The total demand for natural gas shows a drop of 14.3% in the year, with a strong influence on the 35.7% decrease in thermoelectric consumption.

The consumption in the Otto cycle transport (gasoline, ethanol and natural gas) accumulates a recoil of 1.3% in the year (-1.6% to October, -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-producers) dropped by 1.2% in November, and fell by 1.3% in the year (-1.3% to October). In November the commerce fell by 5.1% (-2.4% in the year), the residential consumption remained stable (+1.0% in the year) and industrial consumption recoiled 0.4% (-3.5% in the year).

Biodiesel production in low

Biodiesel production recoiled 1.4% in November and accumulates -3.6% in the year to date (-3.5 to October). In 2015, the rate was 15% positive.

Pulp production continues with good performance, showing an increase of 10.5% in November and accumulating 8.1% in this year. Throughout 2015, the expansion was 8.5% (9.2% in 2014).

Electricity rates in high

The national average residential electricity tariff accumulates a rise of 7.6% in the year, the commercial tariff, 7.4% and the industrial tariff, 5.8%.

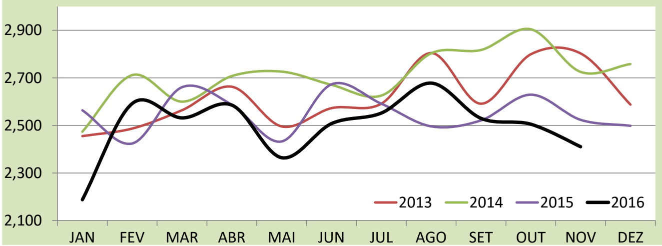
Basic data of 2015 and 2016

SPECIFICATION	NOVEMBER						
	IN THE MONTH			ACCUMULATED IN THE YEAR			
	2016	2015	%16/15	2016	2015	%16/15	%2015
OIL							
PRODUCTION - with Shale Oil and NGL(10^3 b/d)	2.725	2.462	10,7	2.589	2.504	3,4	-
IMPORTS AVERAGE PRICE (US$/bbl FOB)	44	52	-14,1	49	65	-24,7	-
OIL PRODUCTS							
TOTAL CONSUMPTION (10^3 b/day)	2.410	2.523	-4,5	2.494	2.556	-2,4	**100,0**
hereof: DIESEL with biodiesel - (10^3 b/day)	973	978	-0,5	989	1.025	-3,5	37,7
hereof: GASOLINE C (10^3 b/day)	777	681	14,1	728	700	4,0	23,3
CONSUMER PRICE - DIESEL (R$/l)	3,02	2,97	1,7	3,32	2,83	17,3	-
CONSUMER PRICE - GASOLINE C (R$/l)	3,73	3,58	4,2	4,05	3,35	21,0	-
CONSUMER PRICE - LPG (R$/13 kg)	55,6	54,2	2,6	53,9	47,8	12,9	-
NATURAL GAS							
PRODUCTION (10^6 m^3/day)	111,1	94,2	18,0	102,8	95,9	7,2	-
IMPORTS (10^6 m^3/day)	29,2	52,0	-43,8	33,3	51,2	-34,9	-
NON-UTILIZED AND REINJECTION (10^6 m^3/day)	30,6	33,2	-7,9	33,9	27,7	22,2	-
AVAILABILITY FOR CONSUMPTION (10^6 m^3/day)	109,8	113,0	-2,8	102,2	119,3	-14,3	**100,0**
INDUSTRIAL CONSUMPTION (10^6 m^3/day)	41,0	41,1	-0,3	40,9	44,0	-6,9	40,1
POWER GENERATION CONS. (10^6 m^3/day)	36,5	43,4	-15,9	29,7	46,2	-35,7	29,1
INDUSTRIAL PRICE SP(*) (US$/MMBtu) - consumption range of 20,000 m^3/day	15,6	11,9	31,9	13,9	13,3	4,5	-
MOTOR PRICE SP (US$/MMBtu)	16,2	13,9	16,7	15,7	14,9	5,4	-
RESIDENTIAL PRICE SP (US$/MMBtu)	37,1	33,8	9,8	37,4	38,4	-2,5	-
ELECTRICITY							
NATIONAL INTERCONNECTED SYSTEM	63.199	64.000	-1,3	63.378	63.751	-0,6	**100,0**
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	35.938	38.800	-7,4	36.525	37.211	-1,8	57,6
SOUTH POWER LOAD (MWavg)	10.968	10.329	6,2	11.019	10.827	1,8	17,4
NORTHEAST POWER LOAD (MWavg)	10.720	10.699	0,2	10.457	10.321	1,3	16,5
NORTH POWER LOAD (MWavg)	5.572	5.450	2,3	5.377	5.237	2,7	8,5
TOTAL CONSUMPTION (TWh) (**)	38,6	39,1	-1,2	420,9	426,4	-1,3	**100,0**
RESIDENTIAL	11,1	11,1	0,0	121,4	120,2	1,0	28,8
INDUSTRIAL	13,8	13,9	-0,4	150,6	156,1	-3,5	35,8
COMMERCIAL	7,4	7,8	-5,1	80,6	82,6	-2,4	19,1
OTHER SECTORS	6,3	6,3	-0,7	68,4	67,5	1,3	16,2
PLANTS ENTRY INTO OPERATING (MW)	1.376	649	112,1	9.162	5.134	78,5	-
RESIDENTIAL PRICE (R$/MWh)	640	648	-1,3	643	598	7,6	-
COMMERCIAL PRICE (R$/MWh)	570	576	-1,1	575	535	7,4	-
INDUSTRIAL PRICE (R$/MWh)	535	555	-3,7	543	513	5,8	-
ETHANOL AND BIODIESEL							
BIODIESEL PRODUCTION (10^3 b/d)	67	68	-1,4	66	68	-3,6	-
MOTOR ETHANOL CONSUMPTION (10^3 b/d)	493	594	-17,0	459	508	-9,6	-
ETHANOL EXPORTS (10^3 b/d)	7	41	-82,4	32	30	8,4	-
HYDRATED ETHANOL PRICE (R$/l)	2,83	2,58	9,7	2,64	2,19	20,5	-
COAL							
ELECTRICITY GENERATION (MWavg)	1.834	1.928	-4,9	1.823	2.050	-11,1	-
IMPORT PRICE (US$ FOB/t)	96,3	75,4	27,8	75,4	90,0	-16,2	-
NUCLEAR ENERGY							
ELECTRICITY GENERATION - (GWh)	865	1.425	-39,3	14.975	13.244	13,1	-
INDUSTRIAL SECTORS							
STEEL PRODUCTION (10^3 t/day)	81	85	-4,8	84	92	-9,2	-
ALUMINIUM PRODUCTION (10^3 t/day)	2,2	2,0	7,7	2,2	2,1	2,1	-
IRON ORE EXPORTS (10^3 t/day)	970	875	10,8	932	844	10,5	-
PELLETS EXPORTS (10^3 t/day)	78	58	34,4	79	134	-41,2	-
PAPER PRODUCTION (10^3 t/day)	28,6	28,0	2,0	28,3	28,4	-0,3	-
PULP PRODUCTION (10^3 t/day)	52,8	47,8	10,5	51,0	47,2	8,1	-
SUGAR PRODUCTION (10^3 t/daY)	124	118	5,5	113	97	16,3	-
SUGAR EXPORTS (10^3 t/day)	86	78	9,7	79	65	21,6	-

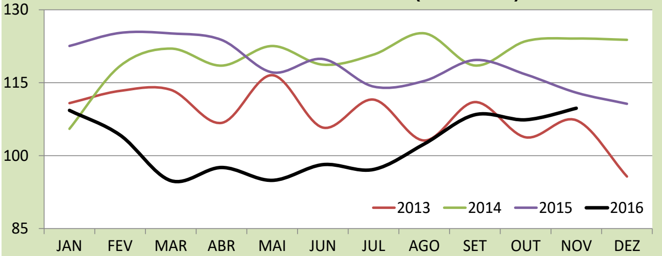
(*) SP is the acronym of the state of São Paulo.

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

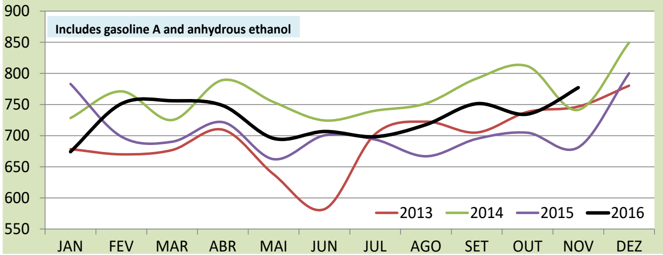
OIL PRODUCTS TOTAL CONSUMPTION (10^3 bbl/d)



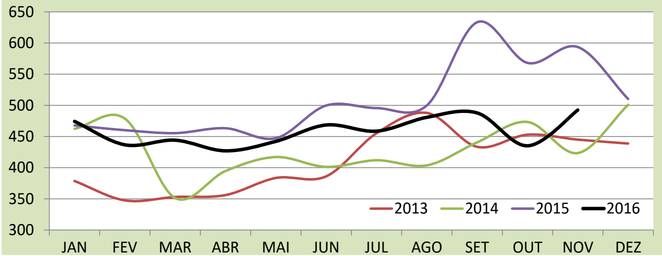
NATURAL GAS TOTAL DEMAND (million m^3/d)



C GASOLINE CONSUMPTION (10^3 bbl/d)



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



NATIONAL INTERCONNECTED SYSTEM POWER LOAD (GWavg)