

TURKISH ENERGY DEMAND PREDICTION FOR 2017

SUMMARY:

Technically speaking, electricity is a subcategory of energy. When we talk about Turkish energy consumption, all resources including electricity, diesel, natural gas and coal are covered. Energy balance table of Turkey, compatible with International Energy Agency (IEA), is published at 10:00 on the 15th of November every year according to official statistical calendar. News agencies expect the data to be available publicly on that day like employment statistics, that is why numbers in the balance tables are not announced before this date. However, it is possible to use open sources to predict the Turkish energy balance table. In this Q report, main parameters of the balance table, primary energy supply and final energy consumption will be predicted.

METHOD:

Two methods are used in the report. For the first method, a thumb rule based on last 8 years of data is used. For the second method, annual reports from EMRA, TEIAS as well as Solid Fuels statistics published by TUIK are used to calculate final energy demand. From these data, balance table for 2016 is simplified to get 2017 numbers. The main problem is the difference in the oil balance caused by the difference between the amount of fuel used in the planes and ships going abroad and the amount used domestically.

To get the final analysis, R-based approaches are used once again.

ANALYSIS:

The analysis looks into whether a relationship exists between gross electricity demand (electricity demand: generation + imports – exports), primary energy supply (energy supply) and final energy consumption (energy consumption) between 2010 and 2018. A robust correlation is observed. Almost half (0.48 times) of electricity consumption in terms of terawatt hours (TWh) is equivalent to energy supply in terms of million tonnes oil equivalent (mtoe). One third of this (0.37 times) is almost equivalent to energy consumption.

	a	b	c	b/a	c/a	b/c
	Electricity Gross Demand (TWh)	Primary Energy Supply (mtoe)	Final Energy Consumption (mtoe)	Energy Supply / Electricity	Energy Demand / Electricity	Energy Supply / Energy Consumption
2010	210.4	105.9	79.9	0.50	0.38	1.32
2011	230.3	113.4	84.9	0.49	0.37	1.34
2012	242.4	117.3	88.8	0.48	0.37	1.32
2013	246.4	116.3	88.1	0.47	0.36	1.32
2014	257.2	120.7	89.6	0.47	0.35	1.35
2015	265.7	129.1	99.6	0.49	0.37	1.30
2016	279.3	136.2	104.6	0.49	0.37	1.30
2017	295.6	143.4	108.5			
Coefficient Averages				0.48	0.37	1.32
max				0.50	0.38	1.35
min				0.47	0.35	1.30

One point to be careful about is that generation by unlicensed power plants are also included in electricity generation calculations for 2017. As a result of the calculations, Turkish primary energy supply and final energy consumption for 2017 is calculated to be 143.4 mtoe and 108.5 mtoe, respectively.

Second method is a bit more difficult. First, main fuels on the balance table are used and their corresponding increases between 2016 and 2017 from open sources are applied in thousand tonnes oil equivalent terms. The cells without data points are left as it is.

ENERGY SUPPLY DISTRIBUTION	Pit Coal	Lignite	Asphaltite	Coke	Petroleum Products	Natural Gas	Bioenergy and Waste	Electricity	Geo. Heat and Other Heat	Solar	Total
	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)	(Thousand Toe)
2016	8762.9	3141.4	116.4	3261.2	40765.4	21931.8	2480.1	19732.5	3099.6	826.9	104575.5
2017 (Prediction)	8889.1	3547.8	116.0	3642.0	43423.3	24344.3	2480.1	20975.6	3099.6	826.9	111802.1
Rate of increase (2016-2017)	1.4%	12.9%	0.0%	11.7%	6.5%	11.0%	0.0%	6.3%	0.0%	0.0%	6.9%
Source	TÜİK	TÜİK		TÜİK	EPDK	EPDK		EPDK			Account

When final energy consumption is calculated, for example, combined cycle and electricity sectors are excluded from natural gas report of EMRA. Similarly, thermal plants are excluded for coal since remaining parts of these resources which are not converted to electricity are shown in final consumption. Electricity is already included in final consumption. After energy consumption is calculated, primary energy supply is found by a simple regression model.

Therefore, according to two separate methods, Turkish primary energy supply and final energy consumption predictions for 2017 are as follows:

		Maximum	Average	Minimum
Method 1	Primary Energy Supply (mtoe)	148.7	143.4	138.8
	Final Energy Consumption (mtoe)	112.3	108.5	103.0
Method 2	Primary Energy Supply (mtoe)	150.7	147.7	145.0
	Final Energy Consumption (mtoe)	111.8	111.8	111.8

In the second method, energy consumption is directly calculated, that is why, it is left constant at 111.8 mtoe.

If it is necessary to provide a prediction:

- Final energy consumption is close to **111 mtoe** between 108-112 mtoe.
- Primary energy supply is close to **145 mtoe** between 138-150 mtoe.

Because, in the bottom up calculation, 111.8 mtoe was found for final energy demand. There might be a room for error due to methodological differences. 145 mtoe is a reasonable number for primary energy supply because in recent years ratio of energy supply to energy demand is around 1.3.

CONCLUSION:

Most of the data in the energy sector is confirmed by realizations taken from final consumers, hence, it takes time for countries to calculate their balance tables. IEA has a similar 3 month survey method for calculation. BP statistics bulletin which will probably be published next week, might be using numbers and statistics of IEA.

In this report, a thumb rule is presented first. Quantitatively, primary energy consumption is equivalent to half of gross electricity demand and final energy consumption is equivalent to one third of gross electricity demand. However, this is only in terms of quantitative relation since electricity is calculated in TWh and energy is calculated in mtoe.

To summarize:

- Around 0.48 times of gross electricity demand (TWh) is equal to primary energy supply (mtoe).
- Around 0.37 times of gross electricity demand (TWh) is equal to final energy demand (mtoe).
- Around 1.32 times of final energy demand is equal to primary energy supply (mtoe).

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