

Economic and Energy Outlook of Japan through FY2019

Decelerating growth and growing disquiets

YANAGISAWA Akira, M. Aoshima, H. Arimoto, Y. Yorita, D.M. Kim, T. Ohira, Y. Shibata, S. Suehiro and K. Ito

Summary of economic and energy outlook [Reference Scenario]

Macro economy and production activity | Japanese economic expansion is slowing down, and FY2019 will end four years of growth exceeding 1.0%

In FY2018, the Japanese economy will slow down its expansion of domestic and foreign demand and grow by only 1.1%. The increase in energy prices will work as a downward force. In the absence of drivers to accelerate development in both domestic and foreign demand, the GDP growth will further decelerate to 0.9% in FY2019. Although the index of industrial production will experience its highest level since the Lehman shock, its year over year expansion will diminish to about 1%. The trade balance will fall to a deficit of JPY1.2 trillion due to a rise in energy prices in FY2018.

Energy supply and demand | Total primary energy supply declines from the FY2017, and CO₂ emissions continue their decrease since FY2014

Total primary energy supply in FY2018 will decrease (-0.8%) due to a slowdown from the previous year's high economic growth and severe winter. Although FY2019 will not react to the previous year's winter weather, its supply will decline by 0.2%, due to a slight slowdown of the economic/production activities combined with continued energy conservation. Natural gas supply reaches its lowest level since the Great East Japan Earthquake, and for the first time declines for three consecutive years. The shift from oil and natural gas to nuclear and renewable energy continues.

The final energy consumption of FY2018 will turn to a decrease of 1.1%, updating the lowest level since the peak in FY2000, and the overall decline in consumption for FY2019 will be 0.4%. Consumption in all sectors for both years will decrease. The energy-related CO₂ emissions will drop to 1,074 Mt in FY2019, or 13.1% less than in FY2013. The three main contributors to the reduction are a decrease in energy consumption (-5.9%) and increases in renewable energy (-3.2%) as well as nuclear (-2.5%).

Energy sales | Electricity remains unchanged, city gas turns to a decrease, and the decrease in fuel oil sales further expands in FY2018

Following the previous year's electricity consumption growth, the sales for FY2018 remain unchanged. Sales for lighting services will decrease due to the previous year's severe winter, the penetration of solar photovoltaic power generation and the increase in energy efficient appliances for lighting and in household electric appliances. Although space cooling demand will increase, sales for power services will expand at a slower pace because of the moderate growth of production in machinery industries. Electricity sales for FY2019 also remain unchanged in total from the previous year. Sales for lighting services will decrease slightly in a reaction to the heat wave of the previous summer, while sales for power services increase in response to the moderate expansion of production activities.

Total city gas sales in FY2018 will turn to a decrease (-0.3%) for the first time in three years. Sales to industry will increase because of a moderate growth in production and economic activities and because of fuel switching of industrial furnaces and boilers. On the other hand, sales to households decline in reaction to the

previous year's severe winter. Led by growing sales to industry, total sales for FY2019 will turn to an increase (1.0%) and will update the record high. This increment will largely come from sales to electric utilities.

In FY2018, total fuel oil sales decrease by 3.1% due to a significant reduction in sales of heavy fuel oil C (mainly to oil-fired power generation), a decrease in sales of gasoline (due to the penetration of fuel-efficient vehicles) and a decrease in sales of naphtha (due to the periodic maintenance of more ethylene plants than the previous year). Although FY2019 will experience increased sales of naphtha with less ethylene plants conducting periodic maintenance and a steady increase of diesel oil, total fuel oil sales will decrease (-1.3%) for the seventh consecutive year. This is caused by a continuous larger decrease in sales for gasoline and heavy fuel oil C (for power generation).

Table 1 | Summary of Reference Scenario

	Historical				Projection		Year-to-year changes		
	FY2010	FY2015	FY2016	FY2017	FY2018	FY2019	FY2017	FY2018	FY2019
Primary energy supply (Mtoe) ¹	515.9	467.2	463.5	465.3	461.6	460.8	0.4%	-0.8%	-0.2%
Oil ² (GL)	232.2	211.6	205.1	202.6	196.3	193.6	-1.2%	-3.1%	-1.4%
Natural gas ² (Mt of LNG equiv.)	73.3	86.0	88.1	85.6	81.8	81.2	-2.8%	-4.4%	-0.7%
Coal ² (Mt)	184.7	190.1	188.0	190.7	189.8	190.1	1.4%	-0.4%	0.1%
Nuclear (TWh)	288.2	9.4	17.3	31.3	62.5	65.4	80.8%	99.8%	4.6%
Renewable electricity ³ (TWh)	111.1	149.0	149.5	165.0	171.8	179.9	10.4%	4.1%	4.7%
FIT generation (TWh)	63.9	99.2	108.7	118.3	127.0	135.1	8.9%	7.3%	6.4%
Final energy consumption ⁴ (Mtoe)	338.2	310.1	310.1	312.1	308.7	307.5	0.7%	-1.1%	-0.4%
Industry ⁵	158.7	146.9	146.4	147.5	145.9	145.7	0.8%	-1.1%	-0.1%
Buildings	97.1	86.4	87.8	89.2	87.8	87.4	1.5%	-1.5%	-0.5%
Transport	82.4	76.8	75.8	75.3	74.9	74.3	-0.7%	-0.6%	-0.8%
Petroleum products	176.0	157.9	156.2	156.3	153.0	151.7	0.1%	-2.1%	-0.8%
Natural gas and city gas	34.0	32.8	33.6	34.7	34.5	34.5	3.3%	-0.6%	0.1%
Electricity	88.2	82.1	83.4	84.1	84.0	84.0	0.8%	-0.1%	0.0%
Electricity sales ⁶ (TWh)	(926.6)	(837.5)	850.5	863.2	862.9	862.8	1.5%	0.0%	0.0%
City gas sales ⁷ (Billion m ³)	39.28	39.91	41.53	42.48	42.37	42.79	2.3%	-0.3%	1.0%
Fuel oil sales (GL)	196.0	180.5	176.9	174.7	169.3	167.2	-1.2%	-3.1%	-1.3%
Energy-related CO ₂ emissions ⁴ (Mt)	1,135	1,147	1,128	1,112	1,083	1,074	-1.4%	-2.6%	-0.8%
(FY2013=100)	91.9	92.9	91.3	90.0	87.7	86.9
Crude oil, import, CIF (\$/bbl)	84	49	48	57	72	69	19.6%	26.1%	-4.0%
LNG, import, CIF (\$/MBtu)	11.3	8.7	7.0	8.5	11.0	10.7	20.5%	29.9%	-2.7%
Steam coal, import, CIF (\$/t)	114	76	81	102	111	95	26.4%	8.1%	-14.4%
Coking coal, import, CIF (\$/t)	175	88	111	146	146	122	31.8%	-0.1%	-16.9%
Real GDP (JPY2011 trillion)	492.9	518.3	524.4	533.0	538.8	543.9	1.6%	1.1%	0.9%
Industrial production (CY2010=100)	99.4	97.5	98.5	102.5	103.7	104.8	4.1%	1.1%	1.0%
Exchange rate (JPY/\$)	86.1	120.4	108.4	111.1	111.5	114.8	2.4%	0.4%	2.9%
Cooling degree days	560	322	431	397	453	380	-7.7%	14.1%	-16.2%
Heating degree days	1,077	875	966	1,072	997	1,019	11.0%	-7.0%	2.2%

Notes:

1. Mtoe = 10¹³ kcal

2. Conversion factors for oil: 9,126 kcal/L; Natural gas: 13,043 kcal/kg; Steam coal: 6,139 kcal/kg; Coking coal: 6,928 kcal/kg until FY2012.

Conversion factors for oil: 9,145 kcal/L; Natural gas: 13,016 kcal/kg; Steam coal: 6,203 kcal/kg; Coking coal: 6,877 kcal/kg since FY2013.

3. Including large hydro 30 MW or more. 4. Estimated historical values for FY2017. 5. Industry includes non-energy use.

6. Figures in parentheses are old statistical figures. 7. Conversion factor: 1 m³ = 10,000 kcal

Renewable power generation | The FIT power generation capacity reaches 74 GW at the end of FY2019

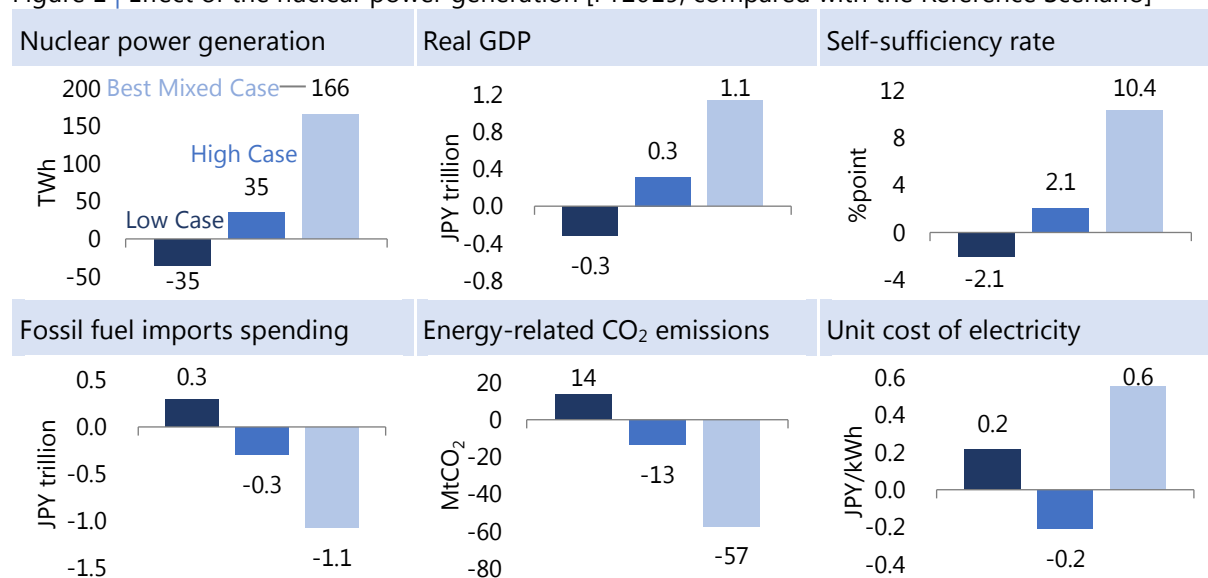
The revised FIT Act came into force in April 2017. As the act now seeks for promotion with more economic rationality, the amount of approved capacity in FIT system is not expected to increase substantially. However, the facilities under construction and expected to start operation by the end of FY2019 will reach 73.9 GW combined with existing ones, including 43.6 GW of non-residential solar PV. The power generation will expand to 135.1 TWh in FY2019, equivalent to 13% of Japan's total generation. The consumer burden expands in exchange for promoting renewable energy generation. Out of the total approved of 105 GW, 25 GW are assumed as expired capacities or capacities which are unlikely to start operation, leaving a maximum of 80 GW to become operational. The cumulative amount of consumer burden for the entire purchase period will reach JPY50 trillion, equivalent to a rise in electricity prices of JPY2,900/MWh – 12% for the residential and 17% for the industry sector.

Topic | The uncertainty factors

1/ Nuclear power generation | Nuclear contributes significantly to achieving the 3Es

We analyse the impact of the nuclear power generation using the 3Es approach – economy, energy (stable supply) and environment. In the Reference Scenario, we assume a total of eleven nuclear power plants to restart by the end of FY2019 and in the High Case we assume additional five nuclear power plants. Between the High Case and the Reference Scenario, total spending on fossil fuel imports decreases by about JPY0.3 trillion, the self-sufficiency rate improves by 2.1% point, and the energy-related CO₂ emissions decline by as much as 13 Mt. Thus, the degree of utilisation of nuclear power generation has a significant impact of the improvement of the 3Es.

Figure 1 | Effect of the nuclear power generation [FY2019, compared with the Reference Scenario]



2/ Oil Prices | A rise in oil prices is a headwind to the Japanese economy

If oil prices increase by \$10/bbl from the Reference Scenario and LNG prices increase accordingly, the growth of the Japanese economy would be held back by 0.2%. The additional payments for oil and natural gas imports could potentially amount to JPY2.7 trillion, which is larger than the tax revenue from a 1% VAT. Out of this amount, households would bear JPY600 billion, equivalent to an increased annual payment for each household of about JPY10,000; electricity (JPY5,000) and gasoline (JPY2,500).

Oil price increases cause economic slowdowns. A \$10/bbl rise in oil prices would decrease each sales of electricity, city gas, and fuel oils and total primary energy supply by 0.3% to 0.4%.

3/ U.S. Trade Policy | Japan is more concerned over the imposition of tariffs on imported cars than over a U.S.-China trade war

If the U.S. imposes a 45% tariff on imports from China, as in President Trump's statement during the presidential election, and if China imposes the same rate in retaliatory duties, this would drop the U.S. economy and the Chinese economy by 2.1% and 2.9% respectively. The U.S. and Chinese oil consumption would decrease by 0.2 Mb/d and 0.3 Mb/d, and natural gas would fall by 13 Bcm and 6 Bcm respectively. Although such actions would push down the global economy by 0.6%, they would induce an incremental growth of 0.4% to the Japanese economy. This is because Japan plays the role of a substitute for both the U.S. and China in international trade. Japanese overall energy demand would increase a little due to the economic expansion, but coal consumption would decline slightly due to lower steel production for the less exports to Asia.

On the other hand, if Washington imposes a 20% tariff on imported cars, the production of automobiles and parts in the U.S. would benefit, but the U.S. economy would shrink by 0.4%. This would negatively affect the global economy and the Japanese economy by 0.2% and 0.1% respectively. The drop also works as a decreasing pressure on the Japanese energy demand with electricity sales decreasing the most, because the automobile manufacturing would be the starting point for the negative shock. By region, the impact on Middle and West Japan could be the worse because of the importance of the automobile manufacturing and steel industry (which supplies the automobile manufacturing) in those regions.

Contact: report@tky.iej.or.jp