Economic and Energy Outlook towards FY2014

Japan's economy gets back on track and energy demand starts to increase

7th August 2013

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Context

Background

Japanese economy is getting clear to recover thanks to the "Abenomics" and the global economy. On the other hand, Japanese energy policies such as power supply and demand balance, restarts of nuclear power plants, increases in renewables dominated by solar PV, and unstable situation in the Middle East, are still not clear.

This Outlook shows prospects of economy and energy supply and demand towards FY2014 of Japan facing these issues.

Outlook towards FY2014

- Macro economy and production activities
- Primary energy supply
- Final energy consumption
- Energy sales

Special topics

- Sensibility analysis of nuclear power generation
- Prospects for introduction of renewable power
- Sensibility analysis of depreciation of the yen

Major *preconditions* in the Reference Scenario

- **Global economy (real GDP growth rates)**
  - US: Less than 2% in FY2013
    More than 2.5% in FY2014.
  - EU: More than 0% (FY2013)
    Uptrend mildly (FY2013)
  - Asia : More than 6%
    (FY2013, FY2014)
    due to strong ASEAN Economy

- **CIF import prices of fossil fuels**
  Referring to Kobayashi and Morikawa (2013) "Outlook on the International Oil and Gas Situation," etc.
  June 2013 → FY2014
  - Crude oil: $105/bbl → 98
  - LNG: $843/t → 732
  - Steam coal: $110/t → 114

- **Taxation**
  - Consumption Tax (VAT): Raised to 8% in April 2014 from 5%
  - Petroleum and Coal Tax: Raised by JPY96/t-CO_2 in April 2014

- **Exchange rate**
  - JPY100/$ on average throughout FY2013 and FY2014

- **Nuclear power generation**
  - Assuming the Authority forms three teams and each assessment requires six months
  - Six reactors at most restart by the end of FY2013 with three months of operation on average generating 17 TWh of electricity
  - 16 reactors restart by the end of FY2014 with seven months of operation on average generating 73 TWh of electricity

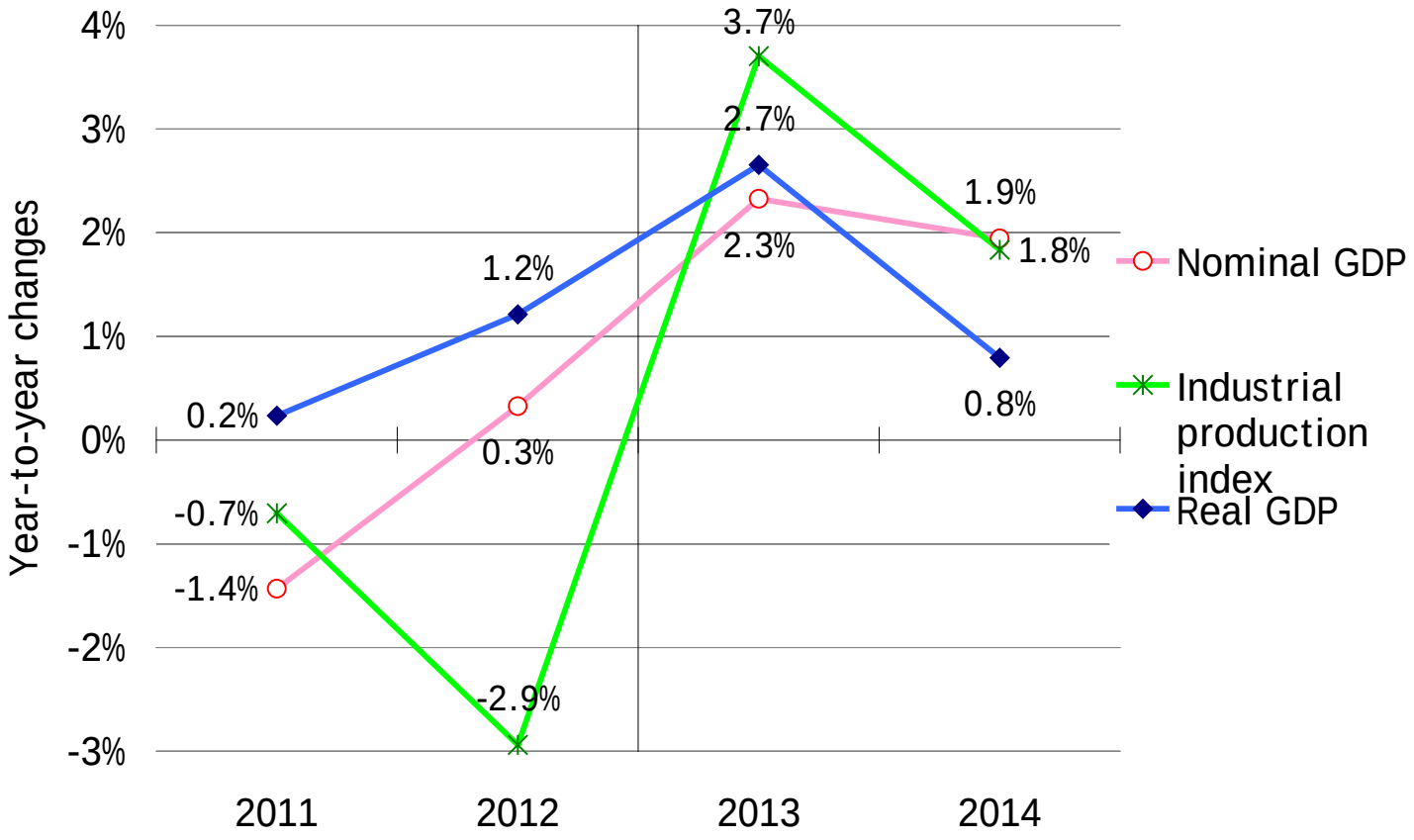
- **Electricity supply and demand**
  - Following to "More than 3% of supply margin is expected in each power company's area due to electricity savings, etc." by the Subcommittee of Inspecting Power Supply and Demand

- **Climate conditions**
  - Warmer summer than the average year but cooler than the previous year in FY2013
  - Warm winter in FY2013
  - Almost unchanged in summer and winter of FY2014 from FY2013

One of the fastest economic growth in the developed countries is expected for the Japanese economy

- GDP glows for the third consecutive year. Production activities also expand.

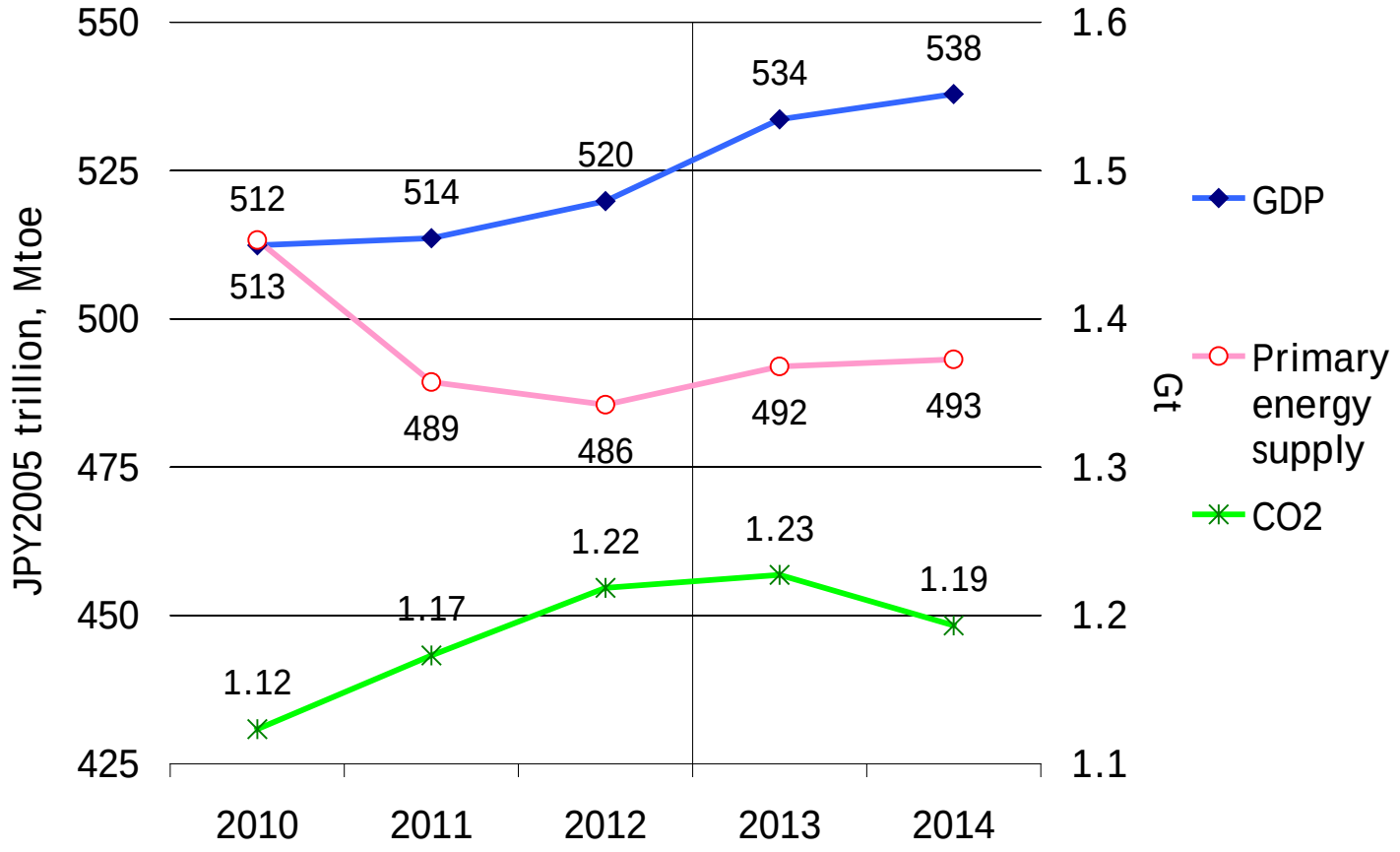
Real GDP, nominal GDP and IIP



Primary energy supply increases for the first time in three years

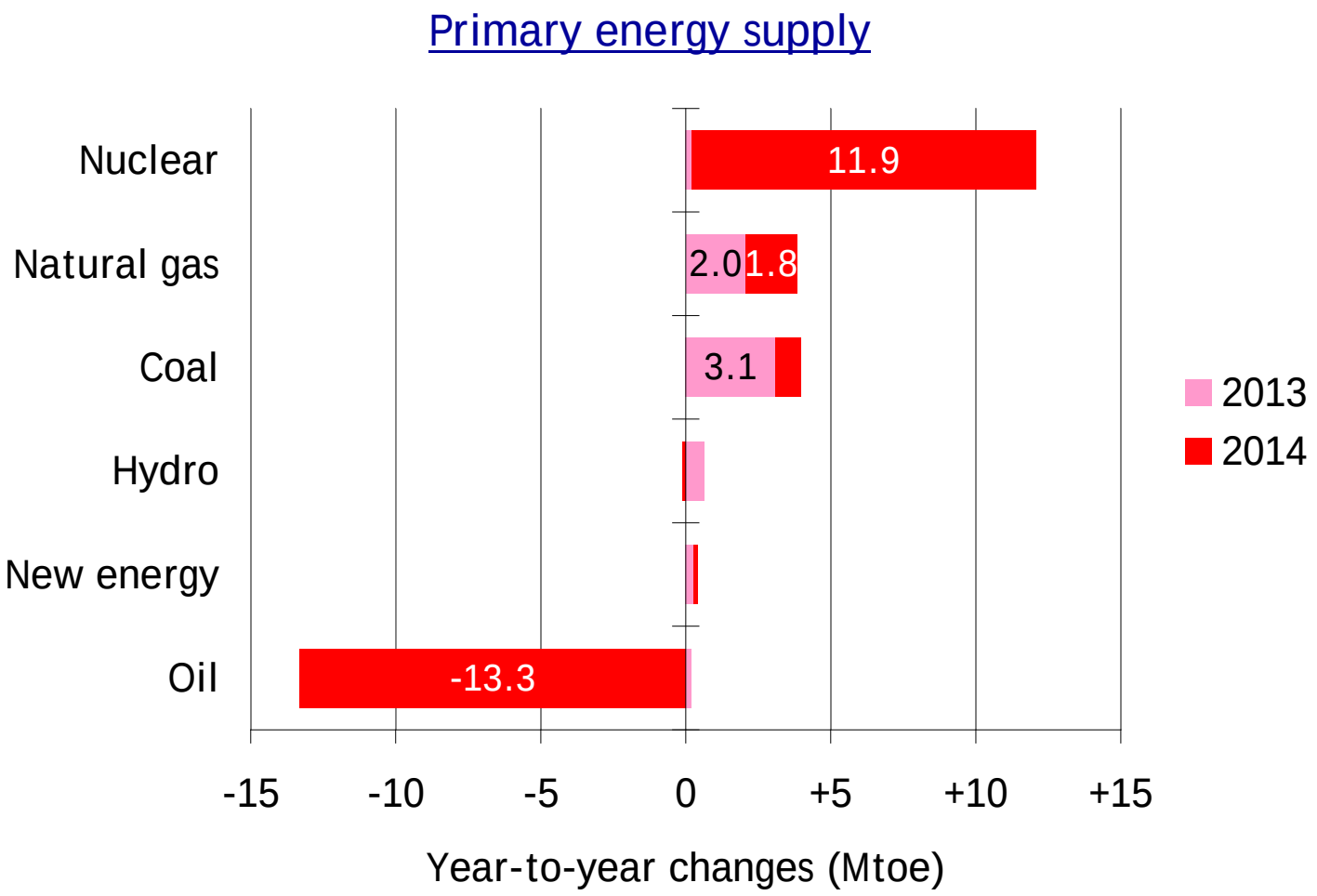
- Primary energy supply turns to increase due to the expansion of the economic activities though electricity savings and energy conservation exert downward pressure on demand.
- Energy-related CO_2 emissions record the historical high in FY2013.

Real GDP, primary energy supply and CO_2 emissions



Oil dips by restarting nuclear power generation in FY2014

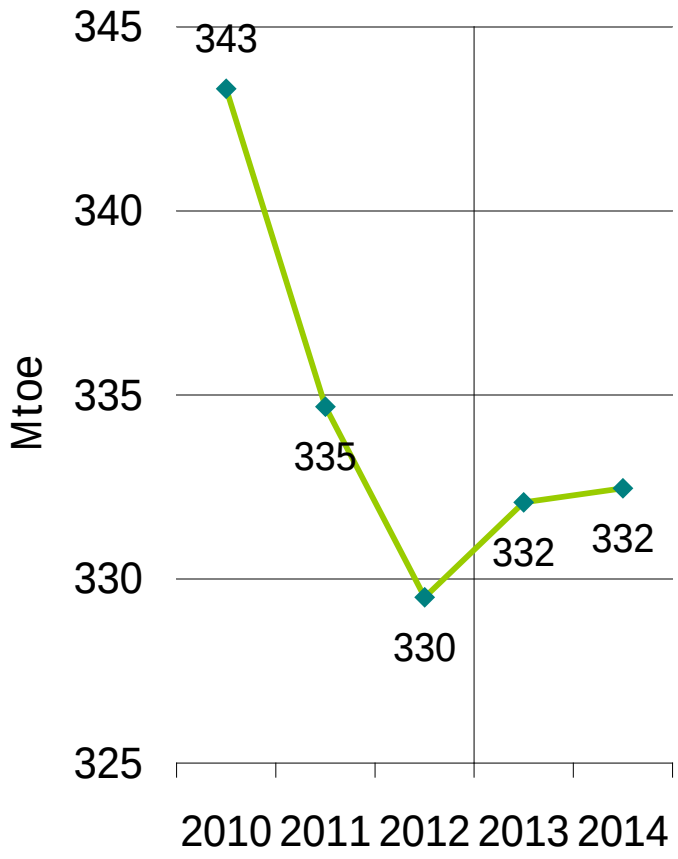
- Imports of LNG reaches about 90 Mt in FY2014.
- Coal increases driven by steam coal for power generation, etc.



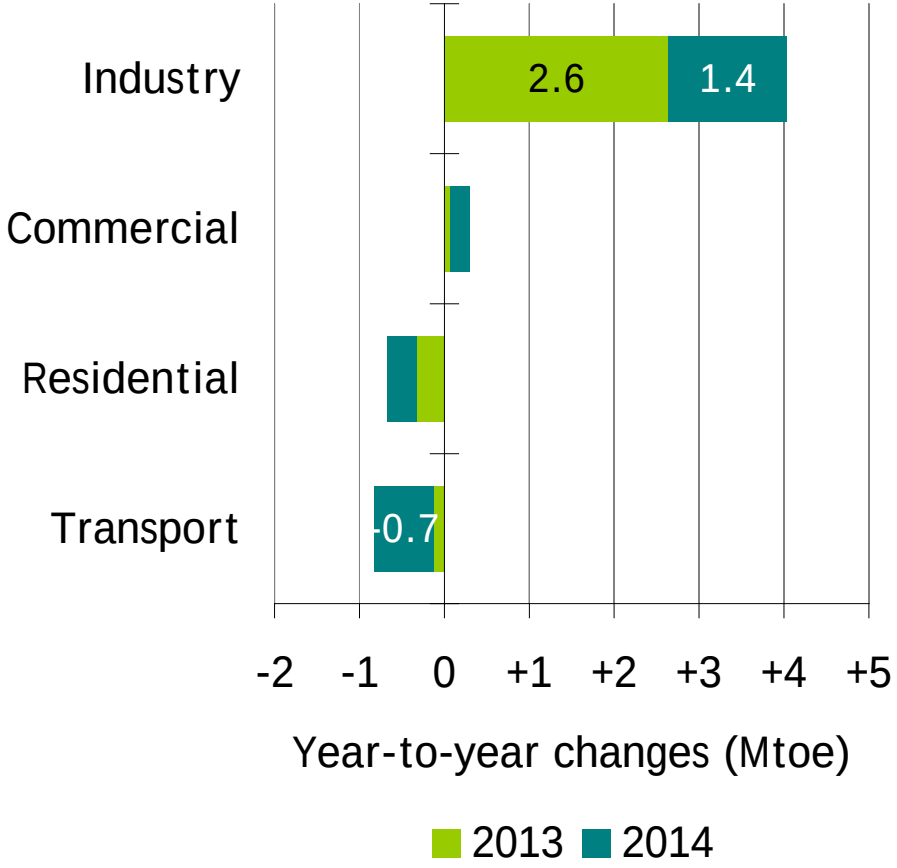
Final energy consumption also increases for the first time in three years

- Industry increases due to the expansion of production activities.
- Transport decreases due to improvement of fuel economy.

Final energy consumption



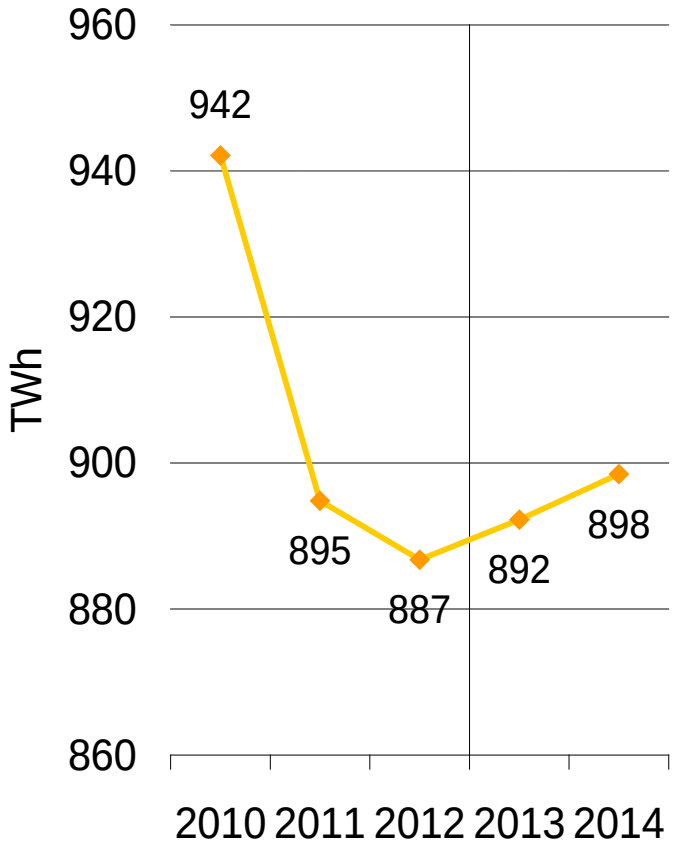
Final energy consumption by sector



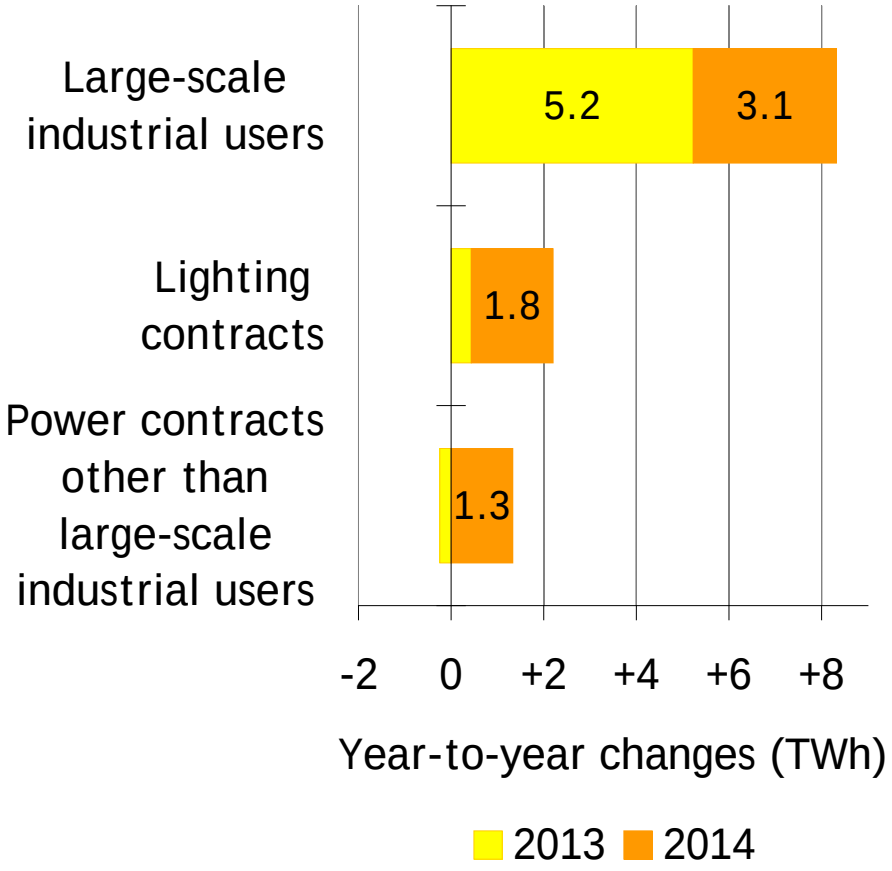
Electricity sales reverts to increase but does not recover the level before the earthquake in FY2010

- Electricity sales increase not only for large-scale industrial users but also for other users.

Electricity sales



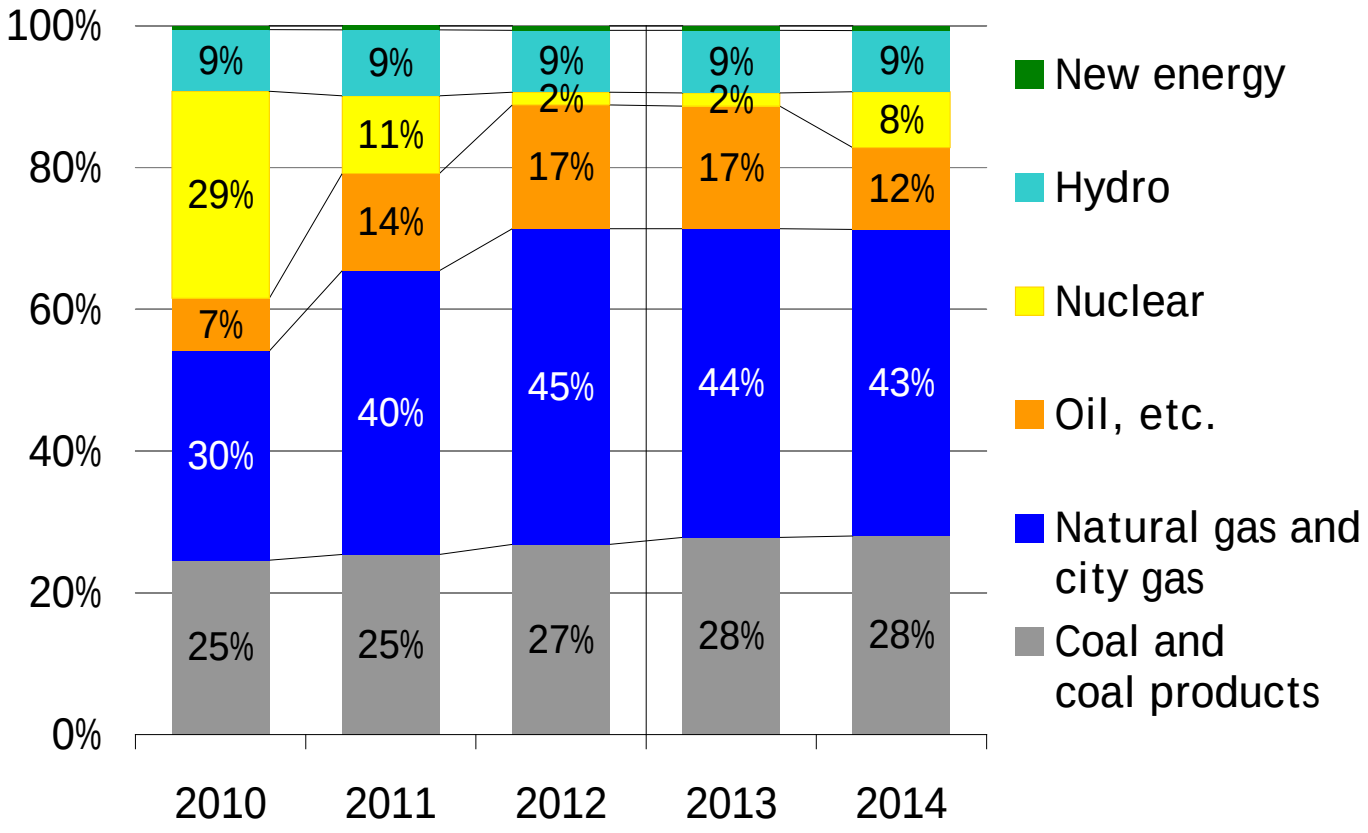
Electricity sales by use



Thermal power generation hits 810 TWh, an all-time high in FY2013

- Electricity generated by oil-fired thermal is greatly reduced in FY2014 as a consequence of restarting nuclear power generation.

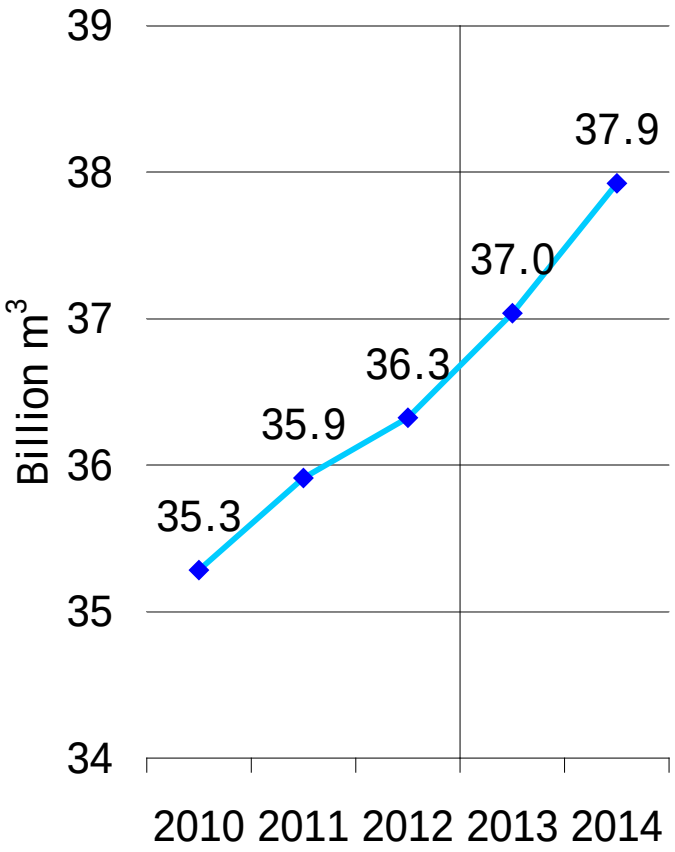
Power generation mix for utilities



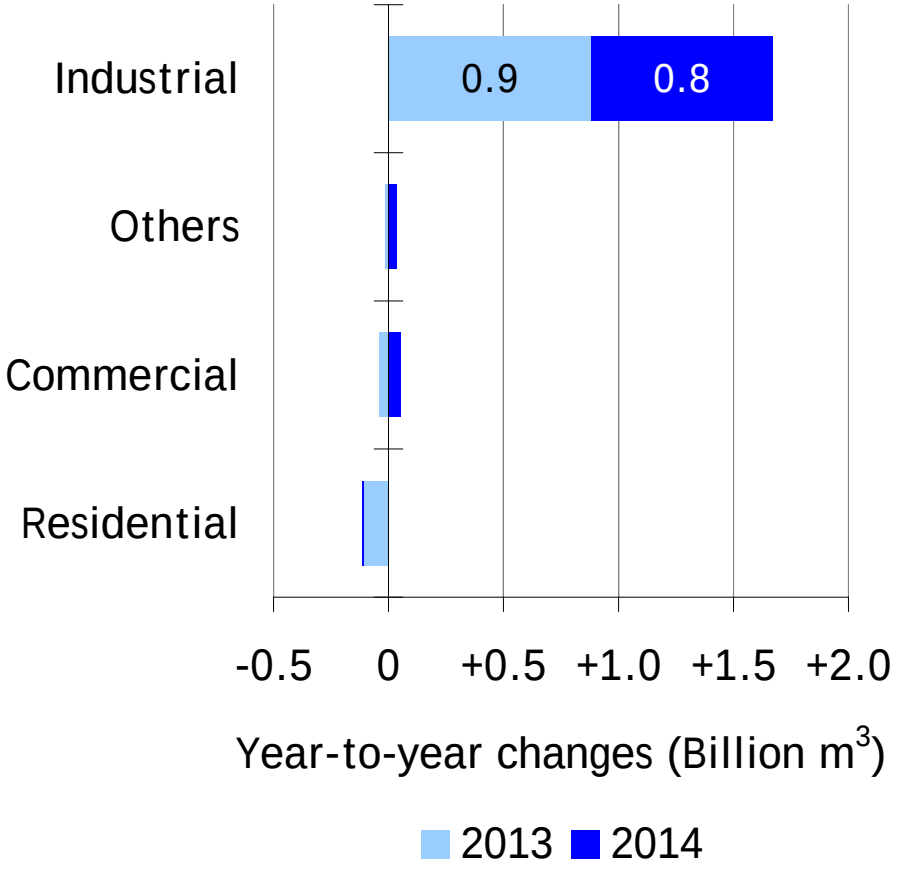
City gas sales increase steadily due to economic recovery

- Industrial sales exceed 20 billion m^3 in FY2014 for the first time.
- Residential sales decrease in FY2013 due to milder climate. It shows almost no change in FY2014 compared with FY2013.

City gas sales



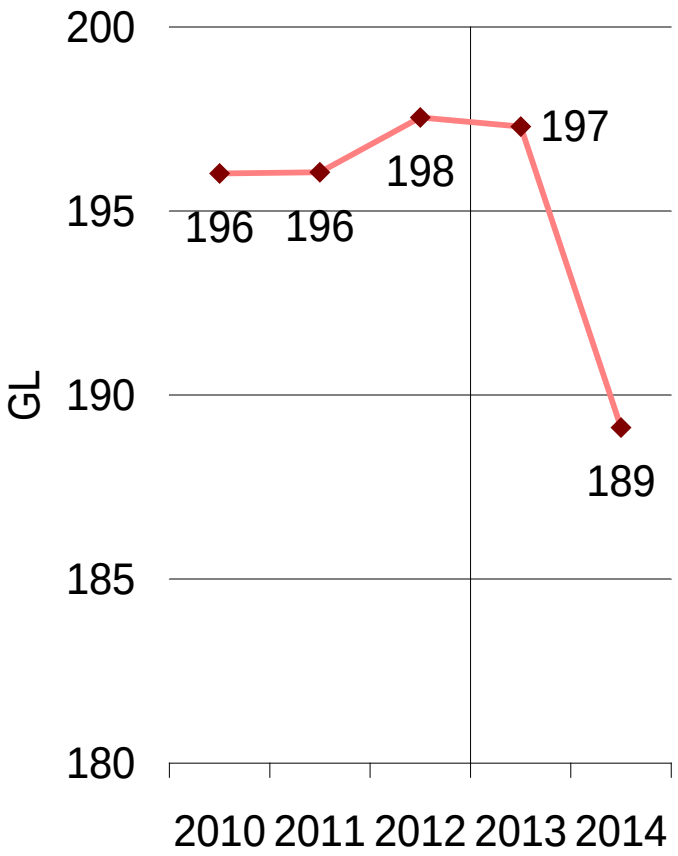
City gas sales by use



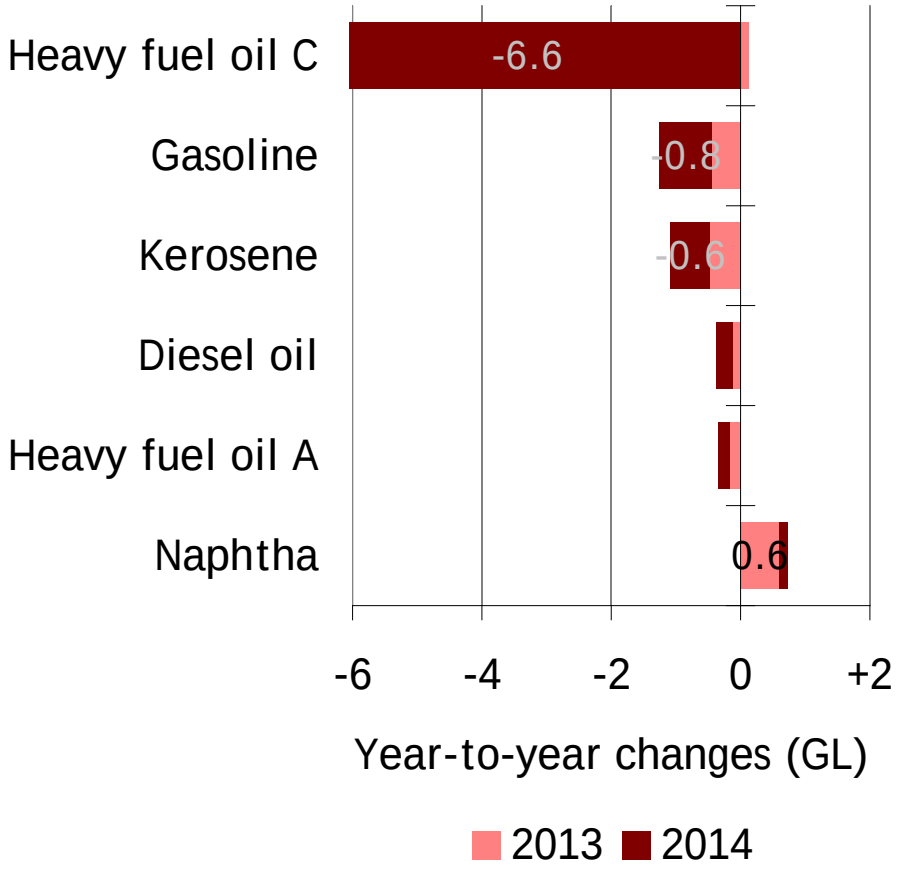
Fuel oil sales dip below 190 GL level for the first time in 28 years

- Sharp drop of heavy fuel oil C contributes to reduction in fuel oil sales.
- Naphtha sales start to increase due to increase in ethylene production.

Fuel oil sales



Fuel oil sales by product



Hoped more rigorous and better staffed safety inspection of nuclear power plants

- If the judgment proceeds smoothly (High-level Case), the sum of fossil fuel imports will decrease by around JPY800 billion, and real GDP in FY2014 will expand 0.12% compared to Mid-level Case.
- Power generation cost will decrease JPY0.8/kWh, which could prevent the already raised electricity price to go up again.

Influence of resumed nuclear reactors pace in FY2014

	FY2010	Low-level Case	Mid-level Case	High-level Case	Full Operation Case
Cumulative number of restarted nuclear reactors					
[By the end of FY2013]	—	[0]	[6 at most]	[10]	—
By the end of FY2014	—	6 at most	16	28	28
Average number of months for operation	—	9	7	7	12
Power generation by nuclear (TWh)	288.2	23.7	73.2	130.1	227.5

	FY2010	Difference from FY2010			
		Low-level Case	Mid-level Case	High-level Case	Full Operation Case
Real GDP (JPY2005 trillion)	512.4	+24.8	+25.5	+26.1	+27.0
Changes against FY2010		+4.84%	+4.97%	+5.09%	+5.26%
Power generation cost (JPY/kWh)	—	+4.0	+3.2	+2.4	+1.4
Fossil fuel imports (JPY trillion)	18.1	+7.8	+7.0	+6.2	+5.1
Trade balance (JPY trillion)	5.4	-7.1	-6.5	-5.9	-5.1
Energy-related CO_2 emissions (Mt)	1,123	+104	+70	+36	-17
Changes against FY2010		+9.2%	+6.2%	+3.2%	-1.5%

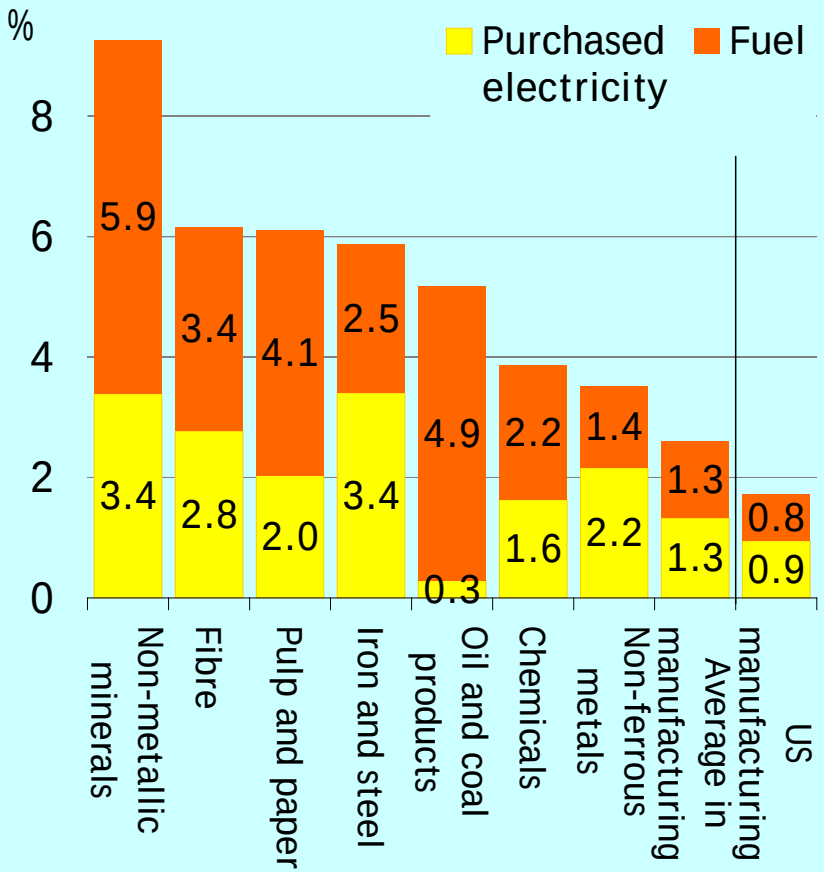
Note: 39 reactors operated at the end of FY2010

Note: Full Operation Case assumes full operation of the 28 reactors throughout FY2014.

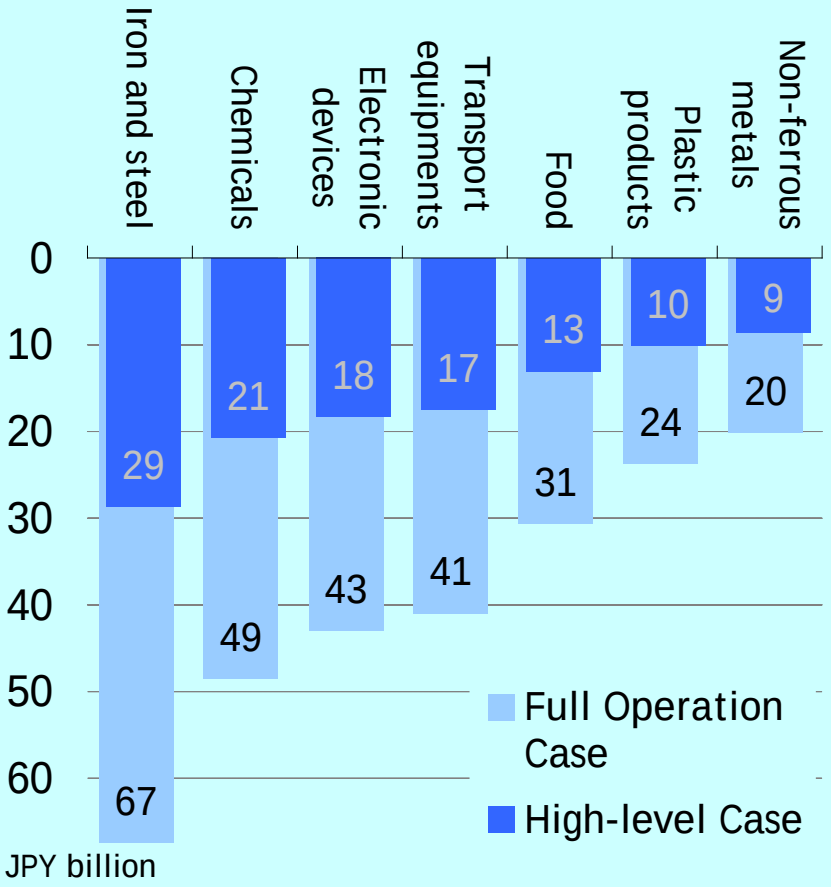
Smooth restarting of nuclear makes room of JPY170 billion for reducing costs in manufacturing, too

- If the judgement proceeds smoothly (High-level Case), it reduces JPY170 billion compared to Mid-level Case regarding the burden of manufacturing industry in FY2014. In Full Operation Case, it reduce JPY410 billion compared to Mid-level Case.

Ratio of energy cost (shipment value)



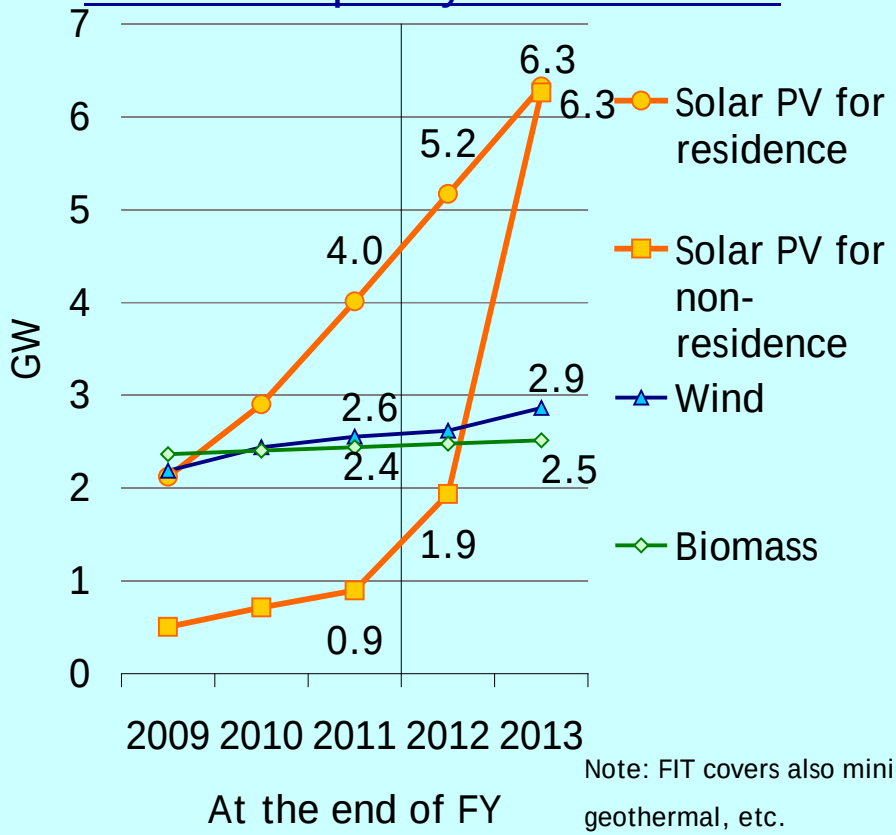
Room for restraining of electricity cost



FIT expands introduction of renewables and bloats their burden on consumers simultaneously

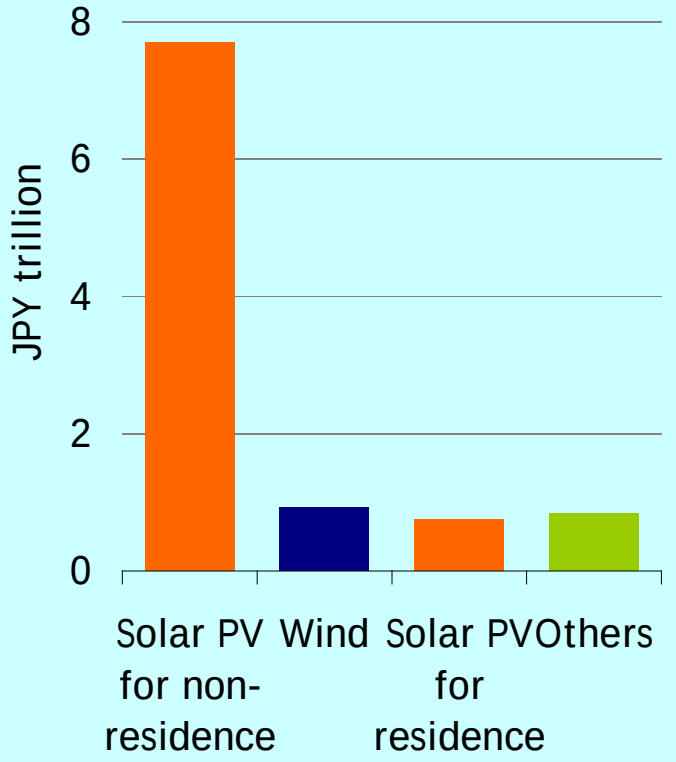
- Installed capacity of renewable power generation increases to 28.1 GW, equivalent to 10% of total capacity, by the end of FY2013.
- Cumulative burden of FIT amounts as much as JPY10 trillion over the next 20 years only for 33.3 GW of existing and authorised capacity in February 2013. It corresponds to JPY0.6/kWh.

Installed capacity of renewables



Note: FIT covers also mini-hydro, geothermal, etc.

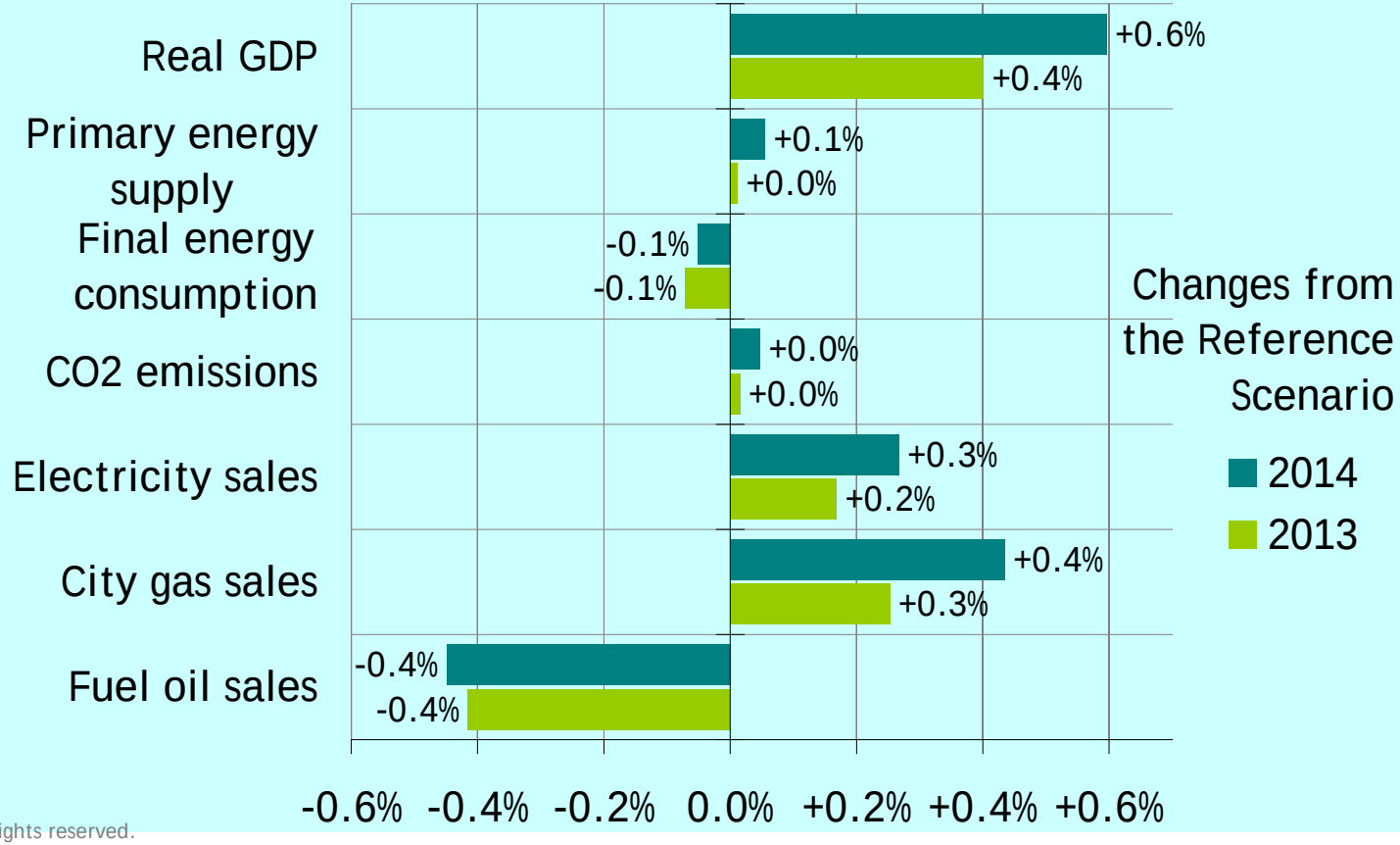
Cumulative burden by FIT (for approved as of February 2013)



Depreciation of the yen accelerates economic recovery but hardly changes energy demand

- Depreciation of the yen boosts production, exports and the economy.
- Primary energy supply shows almost no change as expansion of the economy and raises in energy prices offset each other.
- While sales of city gas and electricity increase, that fuel oil decreases because of rises in the retail prices.

Impacts by depreciation by JPY10/$ to JPY110/$



Summary

Outlook toward FY2014

- **Macro economy**

  GDP grows for the third consecutive year

- **Energy supply and demand**

  Energy demand increases for the first time in three years due to economic recovery

- **Energy sales**

  Electricity and city gas increase whilst fuel oil decreases

- **CO_2 emissions**

  Hit the historical high in FY2013 before decrease in FY2014

Special topics

- **Restart of nuclear power generation**

  Hoped more rigorous and better staffed safety inspections

- **Fast expansion of renewables**

  Required revision for more flexible systems and purchasing prices for sustainable introduction

- **Depreciation of the yen**

  While Japanese economy is boosted, energy consumption shows almost no change due to raises in energy prices

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