# Economic and Energy Outlook of Japan for FY2023

## Energy prices keep remaining high and energy policies keep remaining difficult to implement

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# Major “assumptions”

## COVID-19

- FY2022: Gradual improvement up to the end of the year
- FY2023: Limitations of activity by governments will not be implemented

## Global economy

- 2022: +3.2%, 2023: +2.7%* *PPP based
- 2022 growth is slowing down mainly due to inflation and 2023 will be the weakest growth after 2001 except during the Lehman shock and pandemic.

## Import CIF prices, Foreign exchange rate

FY2021 → FY2022 → FY2023

- Crude oil: $77/bbl → 100 → 91
- LNG: $12.1/MBtu → 17.8 → 16.7
  ($626/t → 924 → 863)
- Steam coal : $161/t → 366 → 340
- Foreign exchange rate : JPY111.9/$ → 137.1 → 135.0

Morikawa from IEEJ “Oil Market Outlook for 2023”,
Hashimoto from IEEJ “Gas Market Outlook for 2023”, and
Sagawa from IEEJ “Coal Market Outlook for 2023”

## Subsidy program for energy sales

- Fuel oil prices will gradually be cut down from January and be cut down in incremental steps after June. City gas and Electricity will be cut down in incremental steps in September.

## Nuclear power generation

- A total of ten nuclear power plants have restarted.
- In FY2022, they will operate for an average of eight months, generating 54.1 TWh (-20.2% from the previous year). Three will be stopped due to delays in the completion of counterterrorism facilities.
- In FY2023, five nuclear power plants will restart bringing the cumulative number of restarted plants to 15. They will operate for an average of ten months, generating 100.2 TWh (+85.1%).

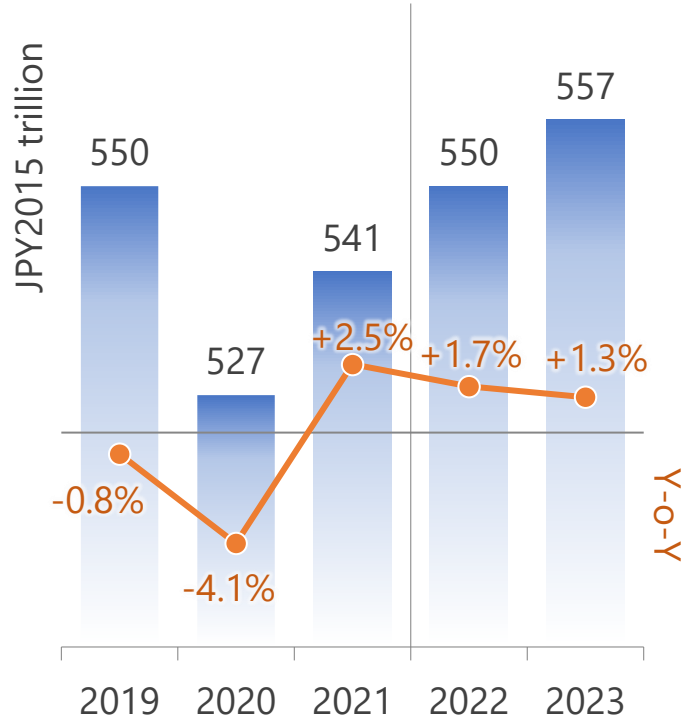
## Air temperature

- According to the Japan Meteorological Agency’s forecast, the winter in FY2022 is assumed warmer than the previous year (+0.3℃). The temperature in FY2023 will be normal. Summer in FY2023 will be cooler (-0.8℃) and winter will be colder (-0.3℃) than FY2022.

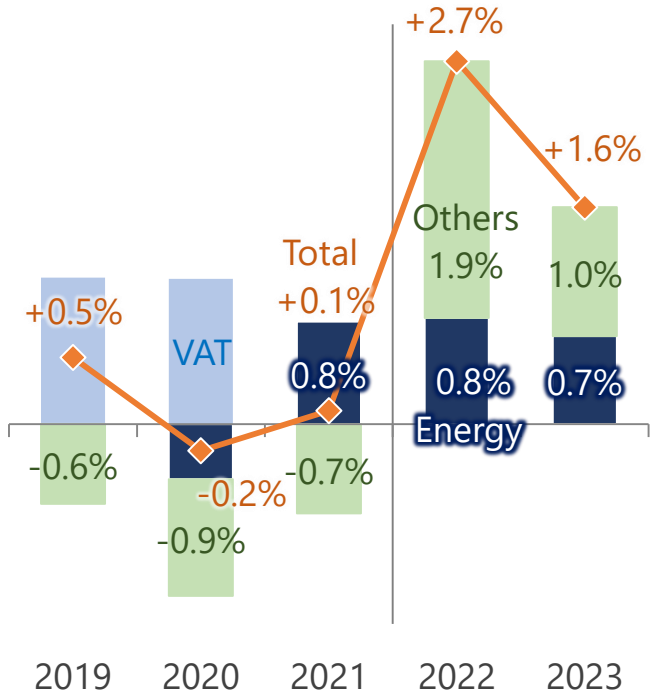
# GDP will rise for a third year, but at a slower pace

- With increased people's mobility, private demand will increase in face-to-face services, such as accommodations. Private investment will increase with improvements of revenue.
- Lower consumption, due to inflation in western countries, will decrease foreign demand which will decrease exports.
- Despite the subsidy program, energy will contribute almost as much as in FY2022 to the rise in the CPI.
- Except for FY2022 and the impacts of the VAT, the CPI increase of less than 2% (1.6%) will be the highest since FY1992.

## Real GDP



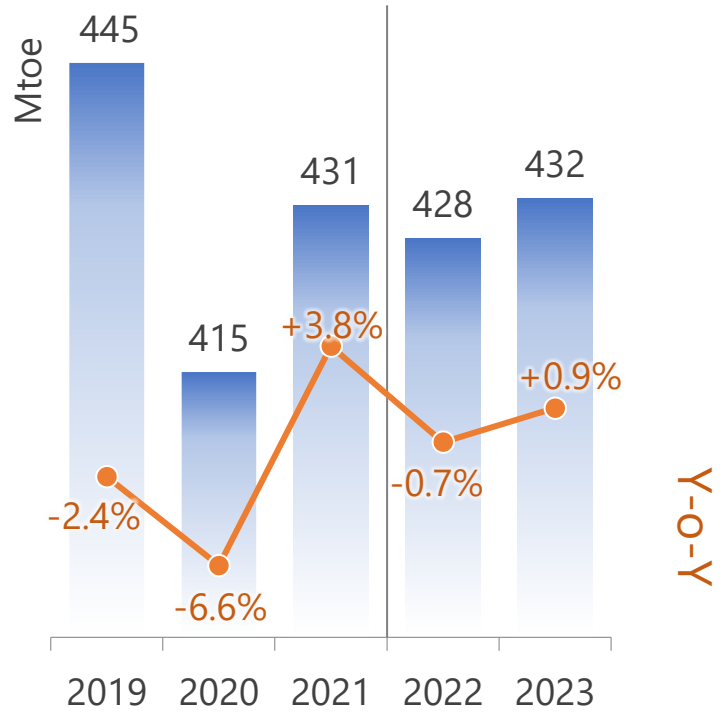

## CPI change rate and contribution



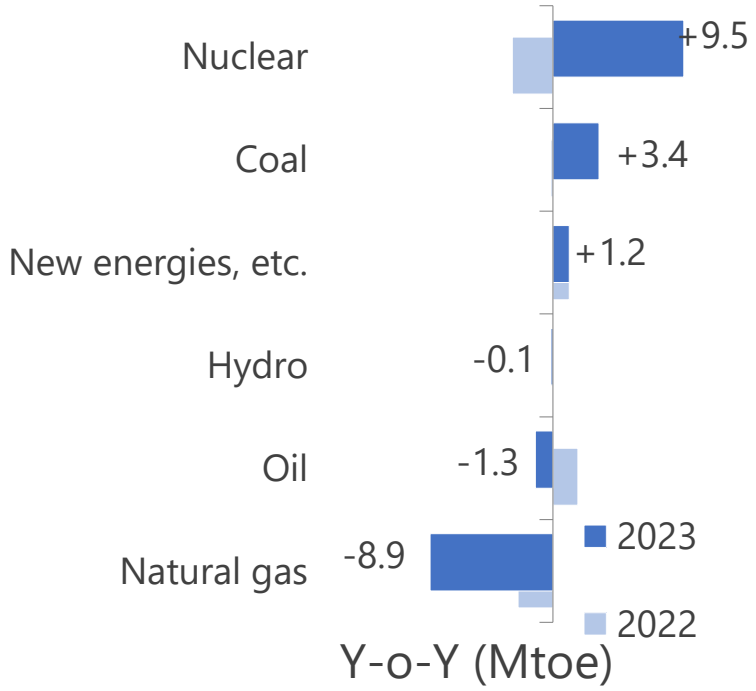
# Total energy consumption will increase with a recovery in transportation and an increase in industrial production

- Total energy consumption will increase with a recovery of transportation in addition to increase in machinery production.
- With the progress of energy savings led by higher energy prices, total energy consumption per GDP will decline very slightly due to an increase production by the energy intensive industries.
- Coal will increase with higher iron and steel production and newly installed coal power generation.
- Oil will decrease with a decline of oil-fired power generation, fuel switching and energy saving despite increases in fuels for transportation and feedstock of ethylene.

## Primary energy supply



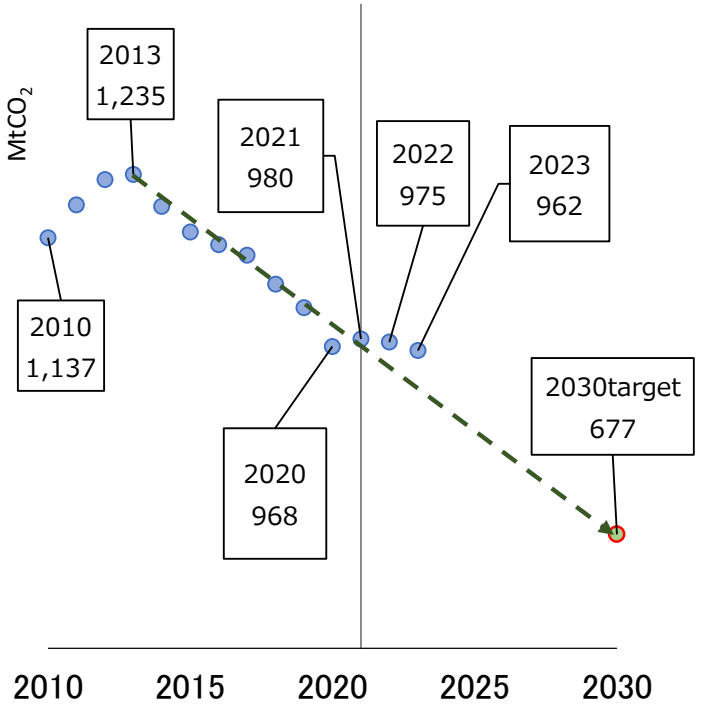

## Primary energy supply changes



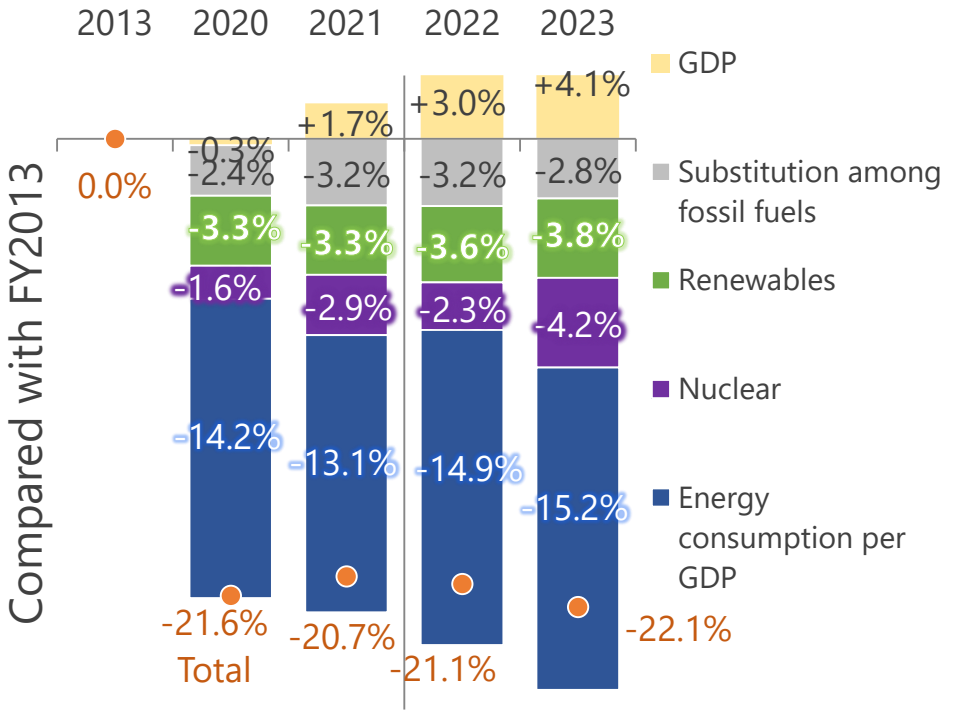
# $CO_2$ reduction will continue but at a reduced pace

- $CO_2$ emissions will decrease due to a large increase in the use of nuclear. The $CO_2$ reduction will continue for two years in a row.
- The reduction pace is not sufficient to reach the halfway point of the Paris agreement target (cut by 45% by FY2030 from FY2013).
- The largest contribution to the overall decrease will be from nuclear, followed by energy consumption per GDP and renewables which will contribute less. GDP and substitution among fossil fuels will contribute to an increase.
- It will be difficult to achieve efficient reductions with one measure while GDP growth is expected to increase in the future.

## Energy-related $CO_2$ emissions



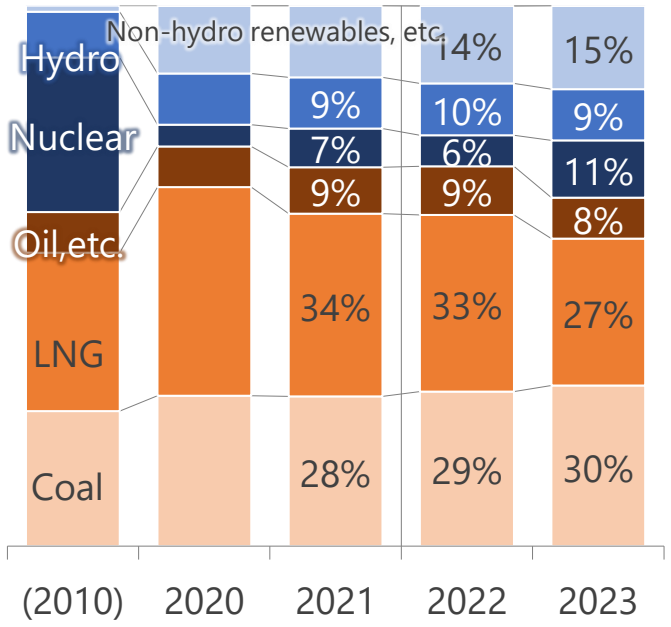

## $CO_2$ emissions change and contribution



# Zero-emission power sources and coal will continue to increase and LNG will largely fall

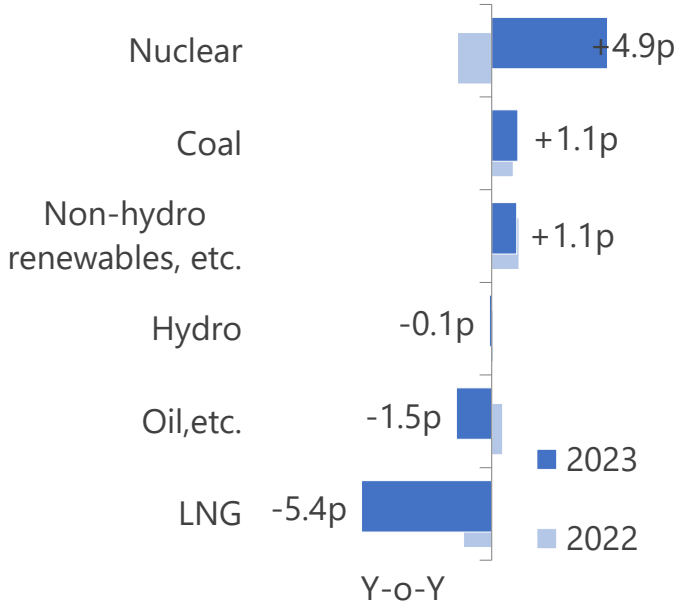
- Zero-emission power sources (renewables and nuclear) will expand and exceed 30% in FY2023 for the first time since the Great East Japan earthquake.
- LNG share will fall significantly with increases in other sources, and will be lower than FY2010(29%) for the first time.

## Electric utilities' power generation mix




- Nuclear will largely increase with the progression of restart.
- Coal and non-hydro renewables will increase with newly installed plants.
- Oil will decrease with a relaxation of supply and demand in the electricity market.

## Power generation mix changes



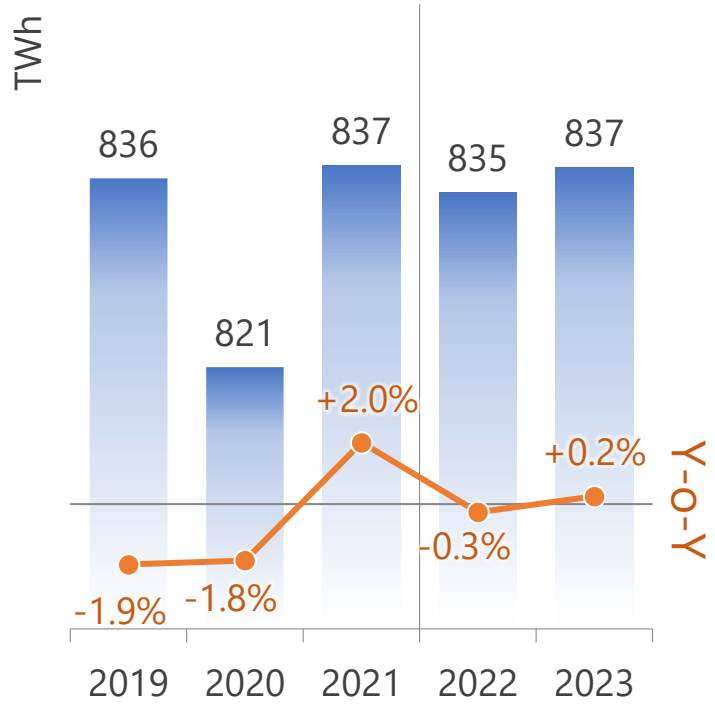

Note 1: FY2010 data are for general electric utilities under a former classification. Data lose continuity as data in FY2015 are based on old standards.
Note 2: Hydro includes pumped storage and oil, etc. includes city gas, coal products and others.

# Electricity sales and city gas sales will slightly increase

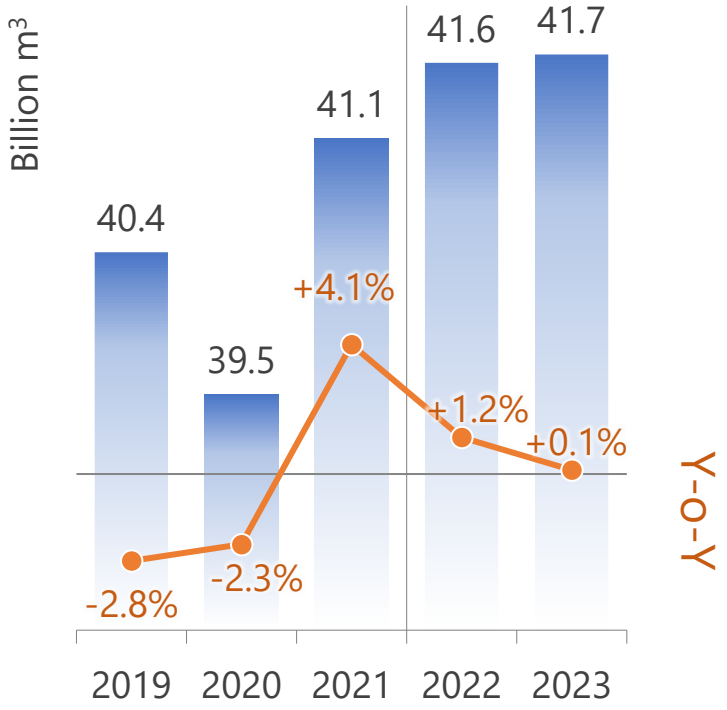
- Electricity sales will slightly increase with production recovery in automobile and service industries despite energy savings resulting from higher electricity prices.
- Note that lighting services will continue to decrease due to a declining of stay-home rate and cooler summer.

- Overall gas sales will slightly increase with a recovery of industry activities and be the second highest after FY2017.
- Sales for commercial will decrease due to cooler summer and progress in energy efficiencies brought by high prices despite the recovery of service industries.
- Sales for residential will decrease due to a lower stay-home rate.

## Electricity sales



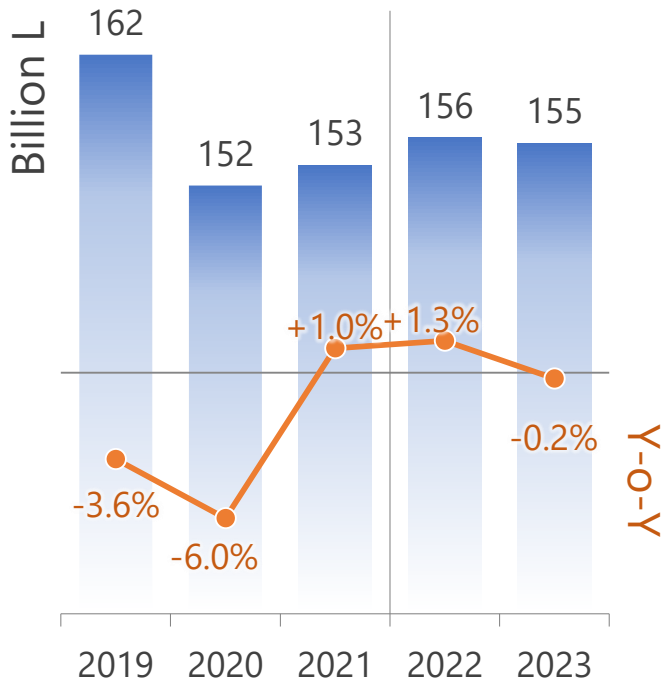

## City gas sales



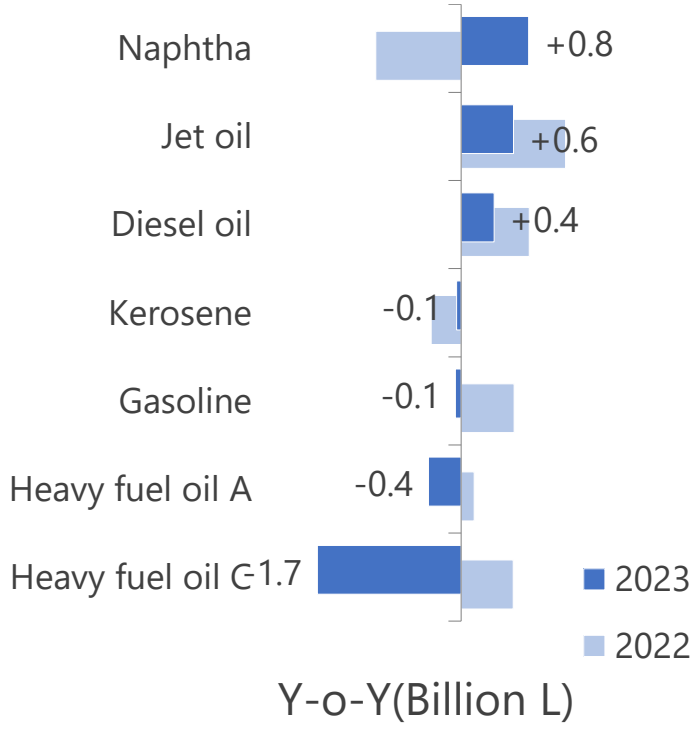
# Total fuel oil sales will decrease for the first time in three years

- Total fuel oil sales will slightly decrease mainly due to a decrease in fuel use for power generation, fuel switching and energy saving which was partly counter-balanced by increases in feedstock of ethylene.
- Despite improved fuel efficiency, diesel oil and jet fuel oil will increase for a third year in a row with the recovery of transportation demand.
- Gasoline will slightly fall with improved fuel efficiency and diffusion of HV despite the recovery of transportation demand.
- Heavy fuel oil C will fall largely due to decline of oil-fired power generation with a restart of nuclear and newly installed solar PV and coal-fired power generation in addition to fuel switching and energy saving accelerated by higher oil prices.

## Fuel oil sales



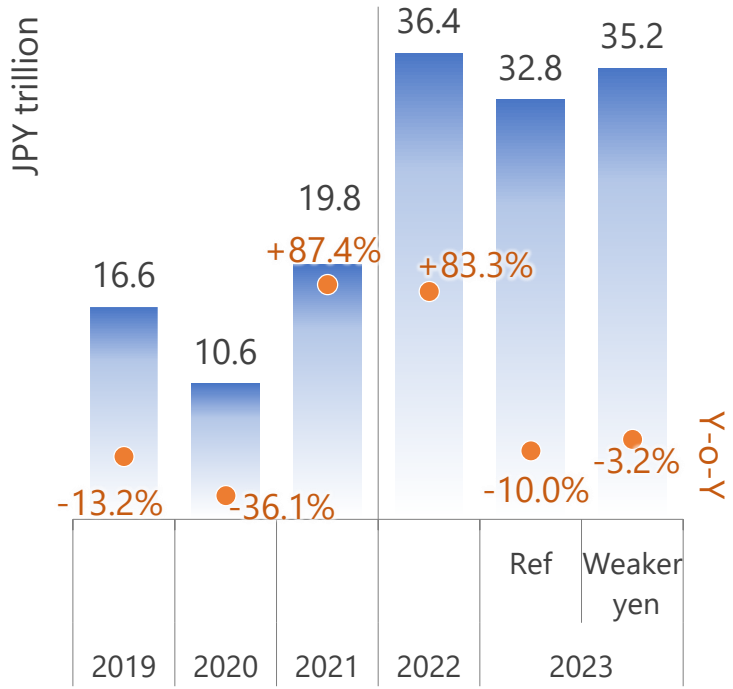

## Fuel oil sales change



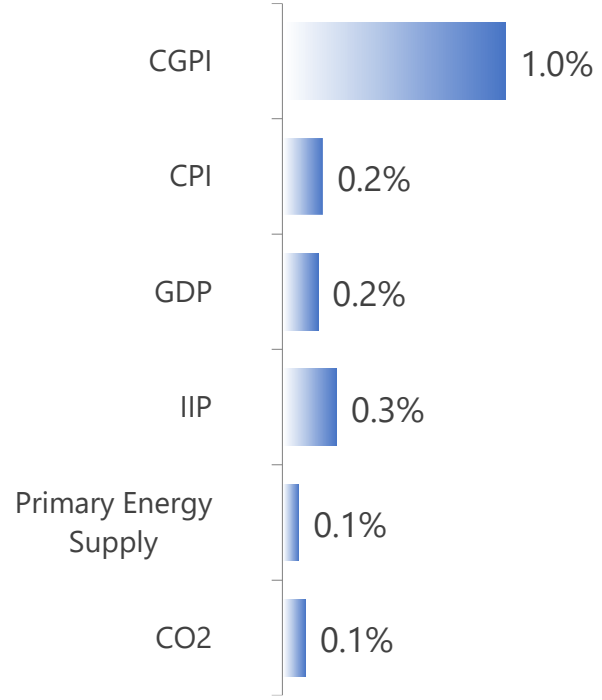
# Impacts on the economy and the energy situation of a weaker yen (+JPY10/$)

- If the yen is weaker by JPY10/$ in comparison with the reference scenario, fossil fuel imports will increase.
- While GDP and IIP will increase with the increments of exports, the increase rate is limited due to a downturn of the world economy, inflation brought by higher energy prices and production capacity of industry.
- Because a weaker yen will not contribute to manufacturing, thus, increasing inbound foreign demand is important from an economic point of view.
- Reducing import dependency of energy with lowering costs of renewable and smoothing the restart of nuclear power will be important from an energy view.

## Fossil fuel imports



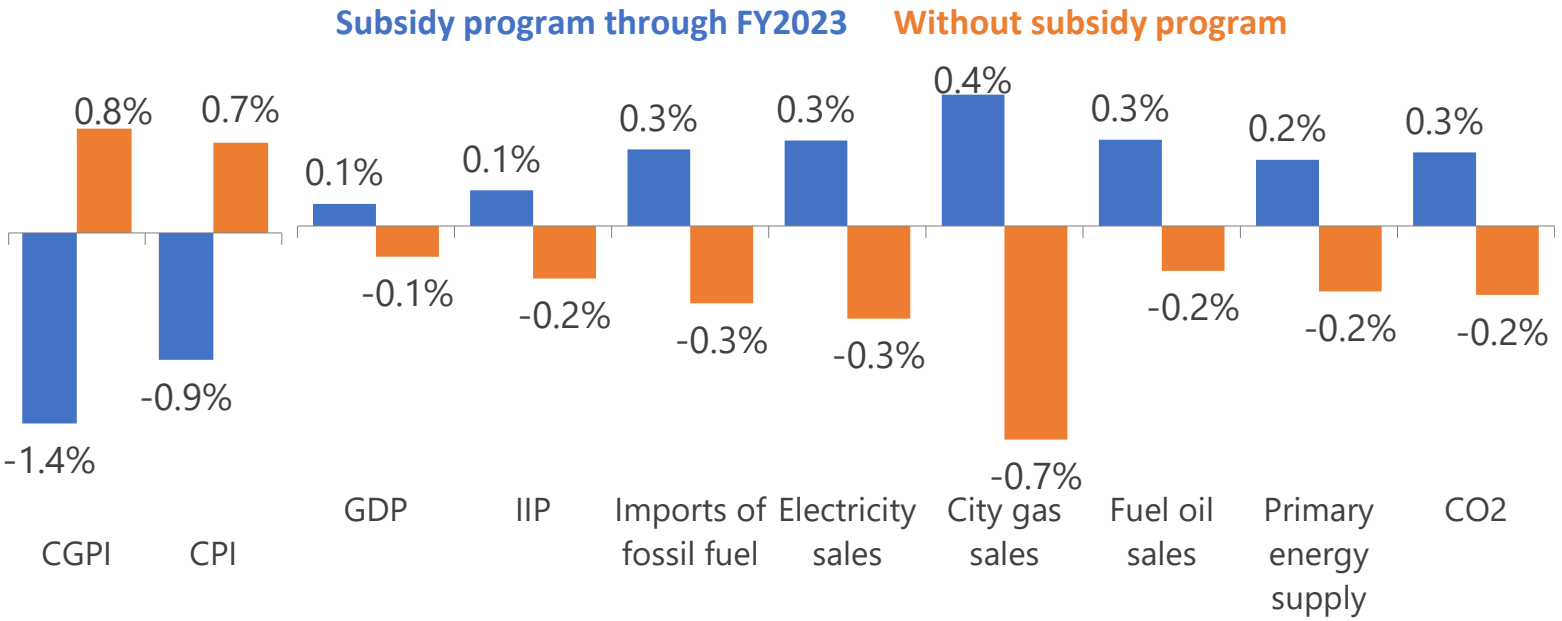

## Impacts of weaker yen in FY2023



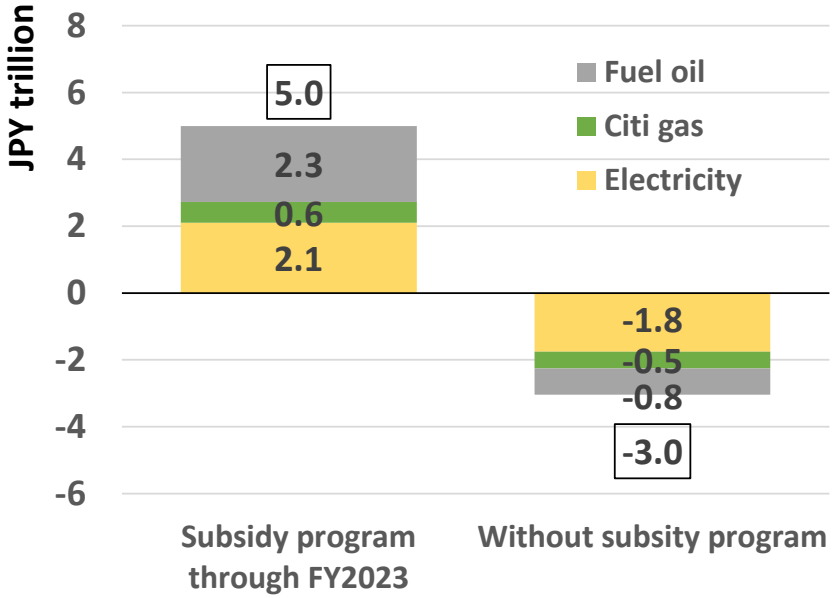
# Impacts of the subsidy program for energy

- Without the subsidy program for energy, higher energy prices would hold back economic growth while, on the other hand, they would have had a downward impact on energy consumption and $CO_2$ emissions.
- Without the subsidy program for energy, government spendings would be substantially reduced.
- Along with the introduction of the subsidy program for energy, appropriate phase-out actions to minimize the negative effects should be announced.
- Reducing energy expenditures by enhancing efficiencies through energy saving assistance programs, in harmony with energy and environmental policies would be important.

## Impacts of the subsidy program for energy [FY2023]




## Change of subsidies [FY2023]

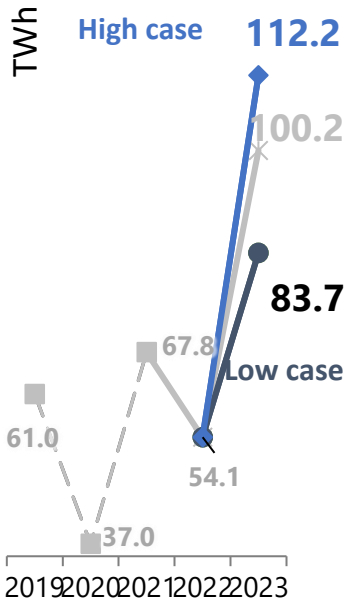


# Impacts of the completion of counterterrorism facilities and delays in nuclear plant restart

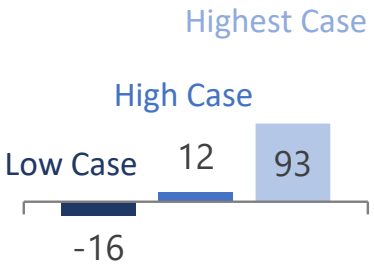
- Nuclear power generation growth would boost the economy through lower fossil fuel imports and electricity costs, reduce $CO_2$ emissions in a manner to help mitigating climate change and contribute to energy security by improving the energy self-sufficiency rate.
- The government announced the restart of seven reactors by the summer of 2023. Smoothing the restart of the nuclear power generation with the consideration of each power plant contributes to achieving 3Es.

## Effects of nuclear power generation changes (compared with Reference Scenario) [FY2023]

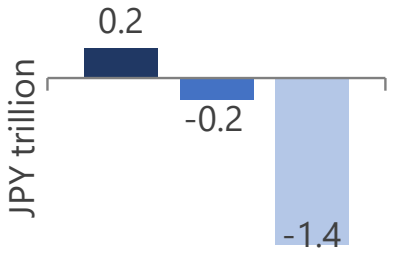
### Nuclear power generation

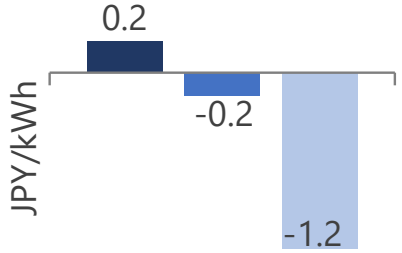



### Fossil fuel imports

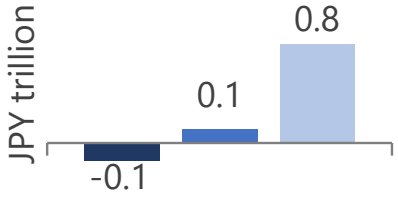



### Unit electricity cost

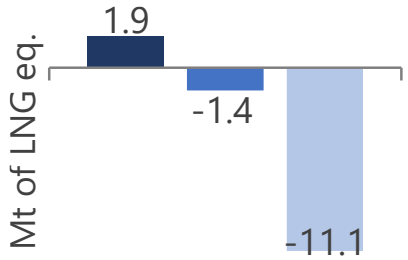


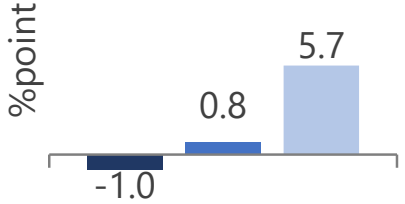

### Real GDP



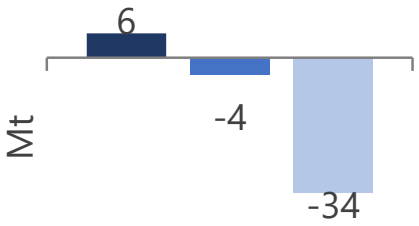

### LNG imports




### Energy self-sufficiency rate




### $CO_2$ emissions




Note: See the report for definitions of the Reference Scenario and each case. The Highest Case covers 27 plants in operation with 80% capacity factor.



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