

A light gray silhouette of a world map is centered in the background of the slide. The map shows the outlines of all continents.

Energy Historical Trends in ASEAN+3

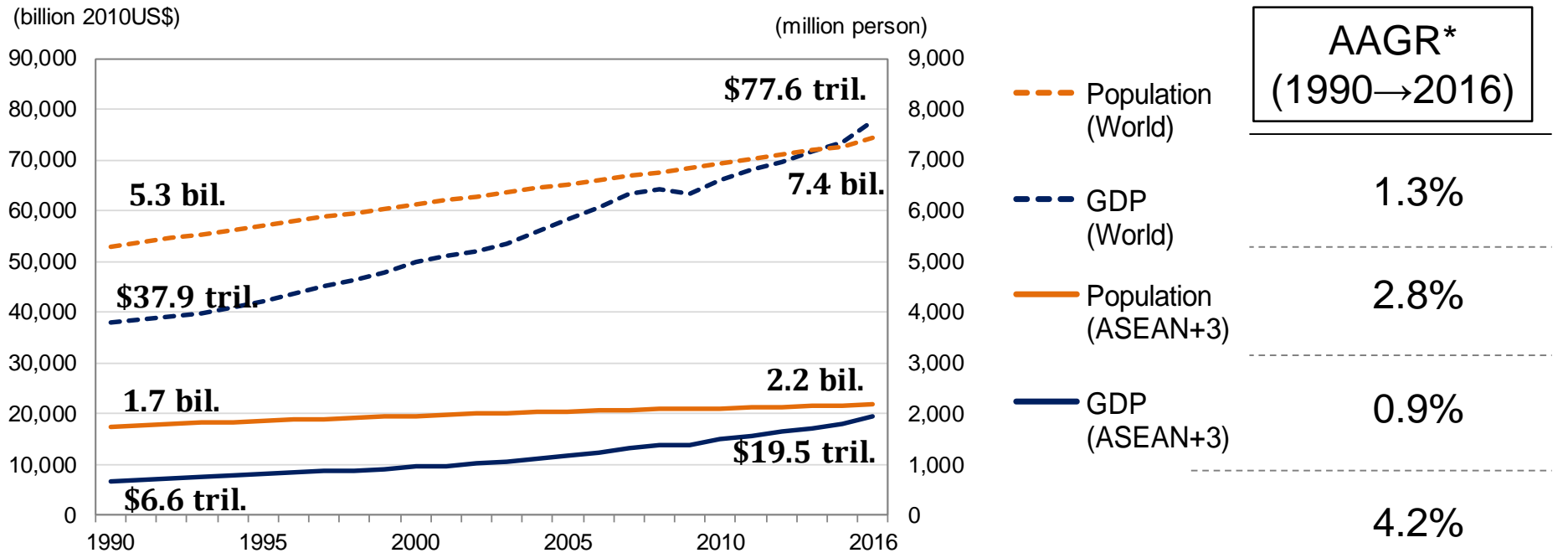
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- Introduction
- Overview of economic, energy situations
- Final energy consumption, power generation mix
- Energy self-sufficiency, energy and carbon intensity
- Key findings

- This presentation shows the path of energy demand and supply situations in ASEAN+3 between 1990 and 2015.
- ASEAN+3 countries have generally achieved stable economic growth over the period, and have faced the rapid growth of energy demand.
- In terms of energy, identifying some common challenges in this region is crucial for the further sustainable economic growth.

GDP and Population

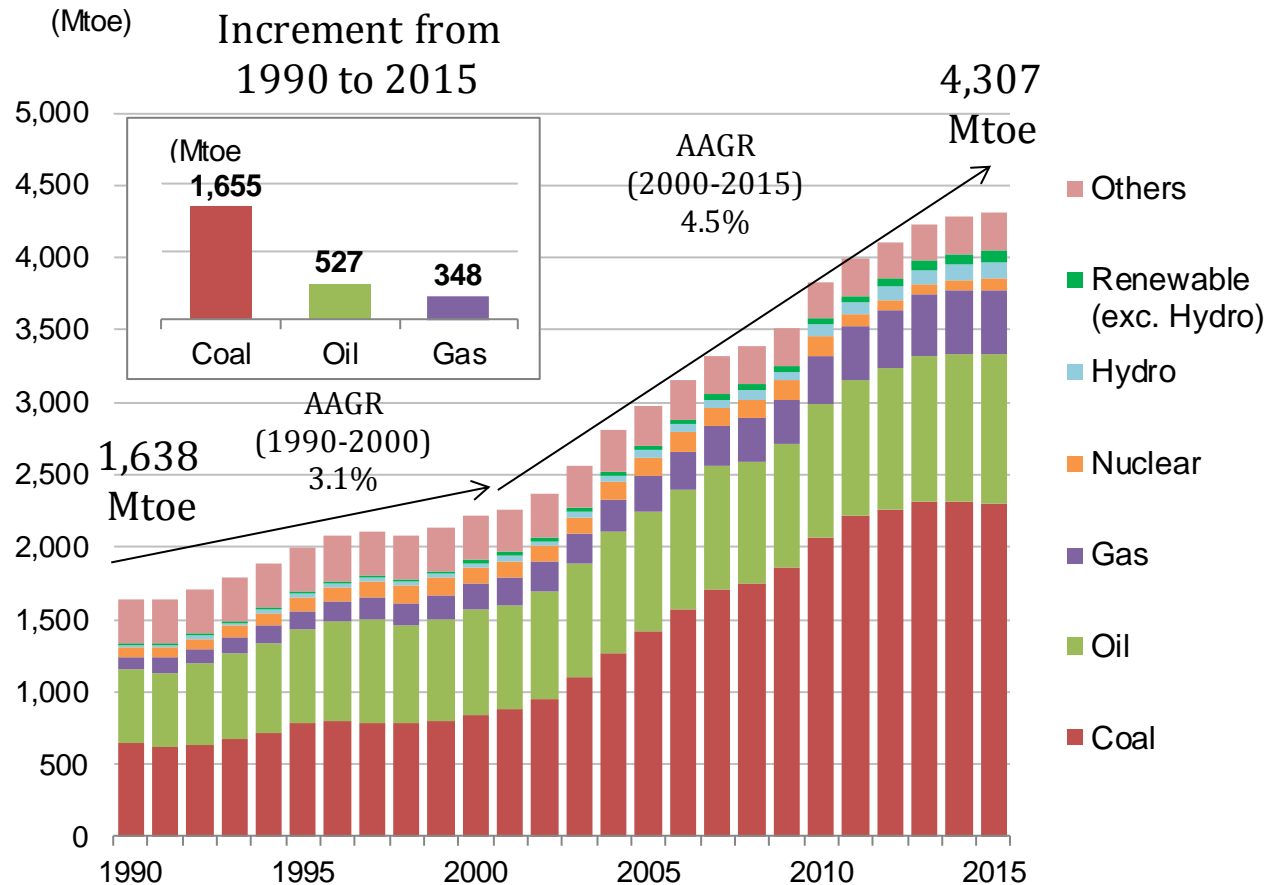


(Source : World Bank)

- GDP per capita in ASEAN+3 rose 2.3 fold in the 26 years compared with the world of 1.4 fold.

Total Primary energy Supply

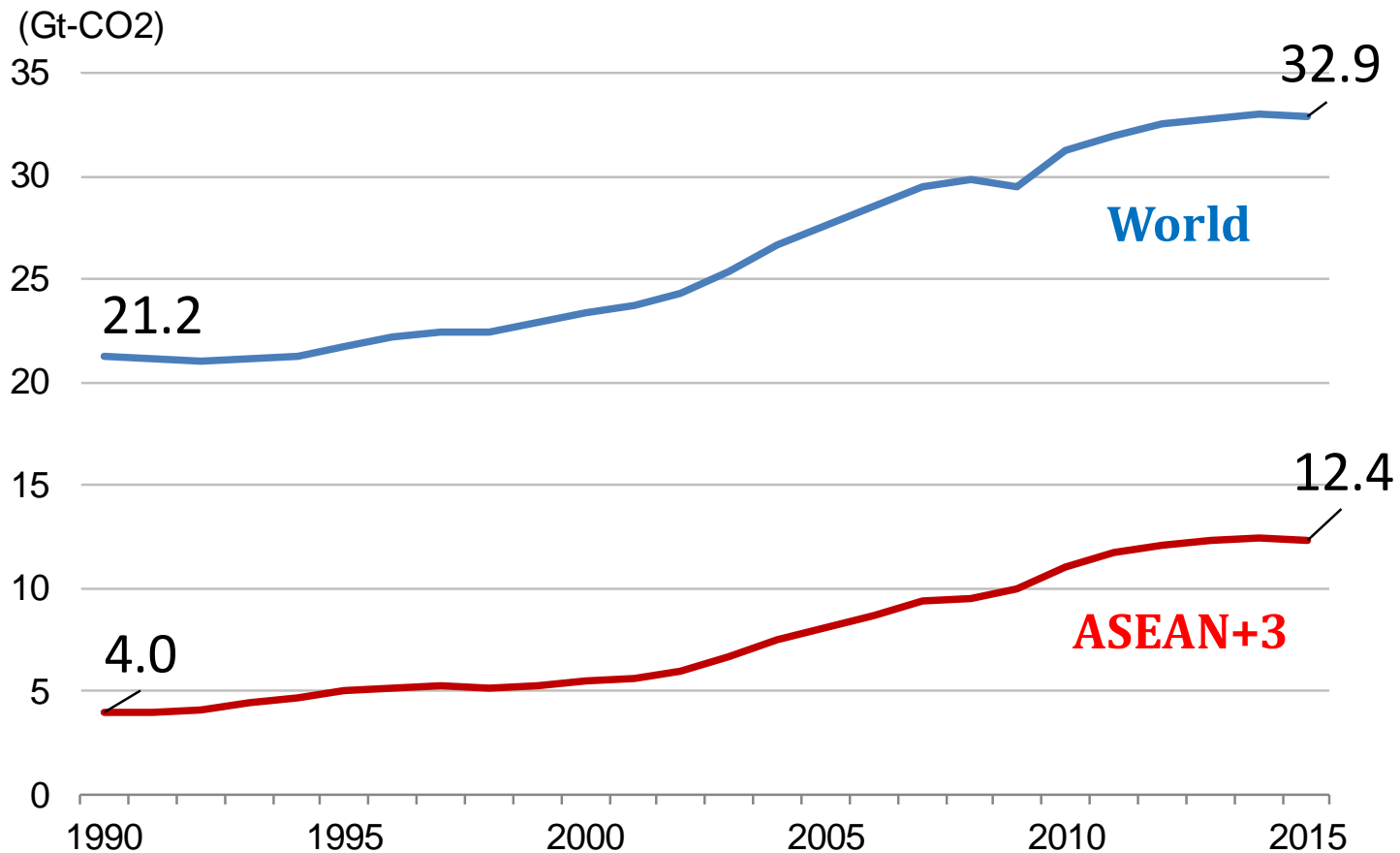
- TPES in ASEAN+3 has performed substantial increase from 2000.
- Share in the world: **19%** (1990) → **32%** (2015) .
- Coal accounts for 62% of the total increase. But recently its remains at a standstill.



(Source : IEA, IEEJ)

CO₂ emissions

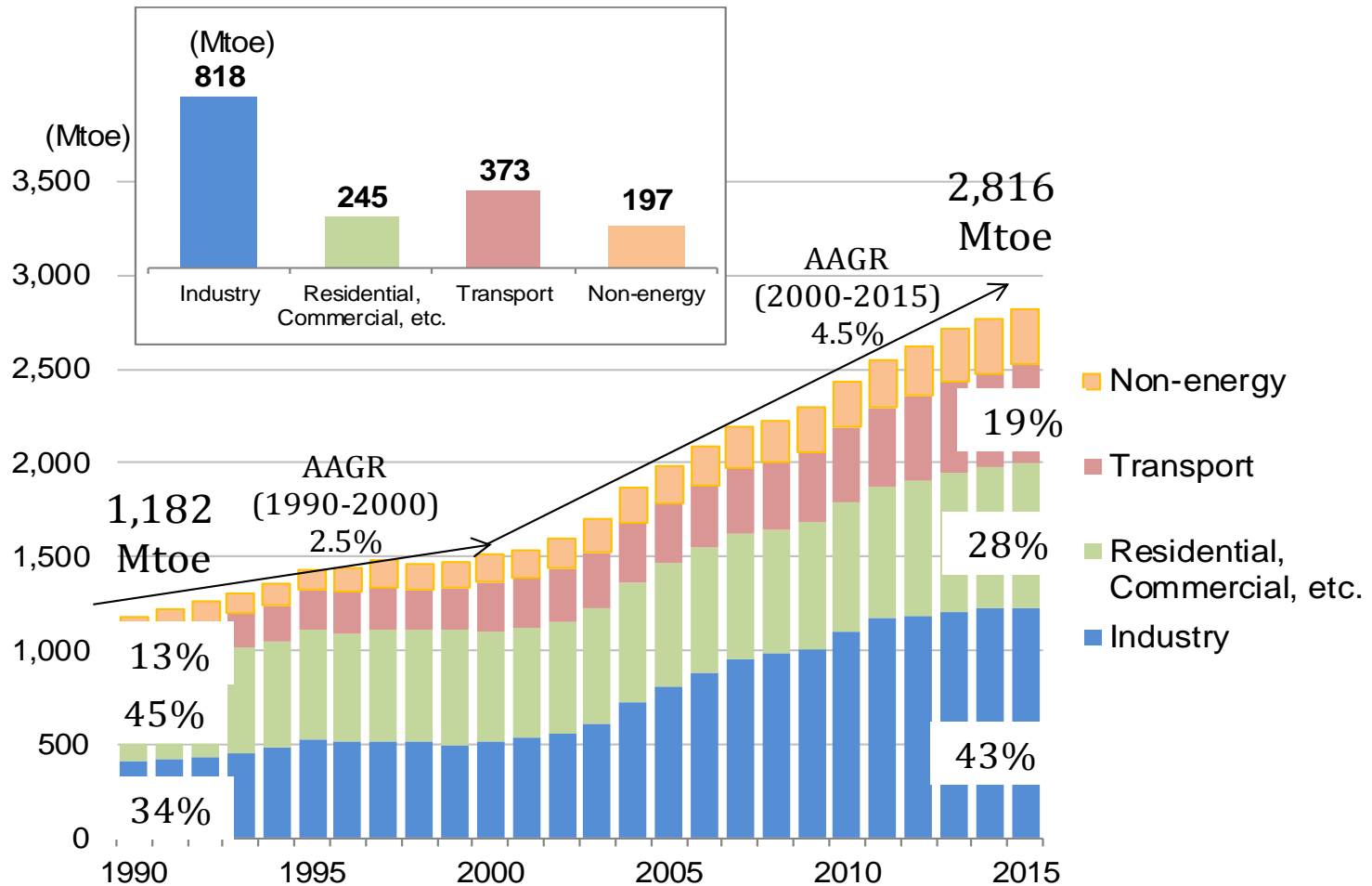
- ASEAN+3 : 4.0GtCO₂ in 1990 (share in the world: 19%) to 12.4GtCO₂ in 2015 (38%) : above the TPES share of 32% in 2015.
- Still highly depending on fossil fuels leads to the substantial increase.



(Source : IEA, IEEJ)

Final energy consumption by sector

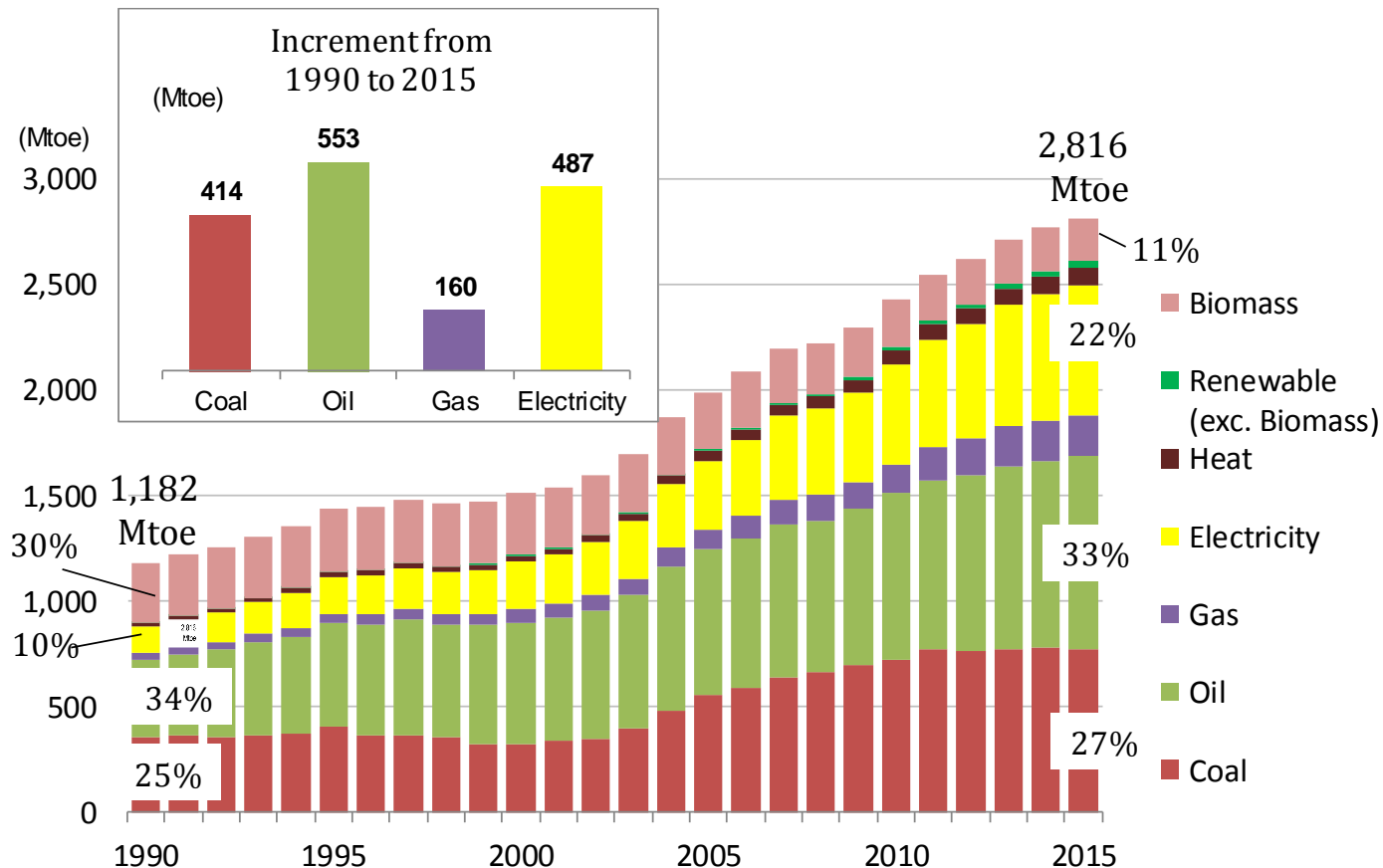
- The FEC growth has accelerated since the early 2000.
- About half of the increase was from Industry sector which increased 3.0-fold.



(Source : IEA, IEEJ)

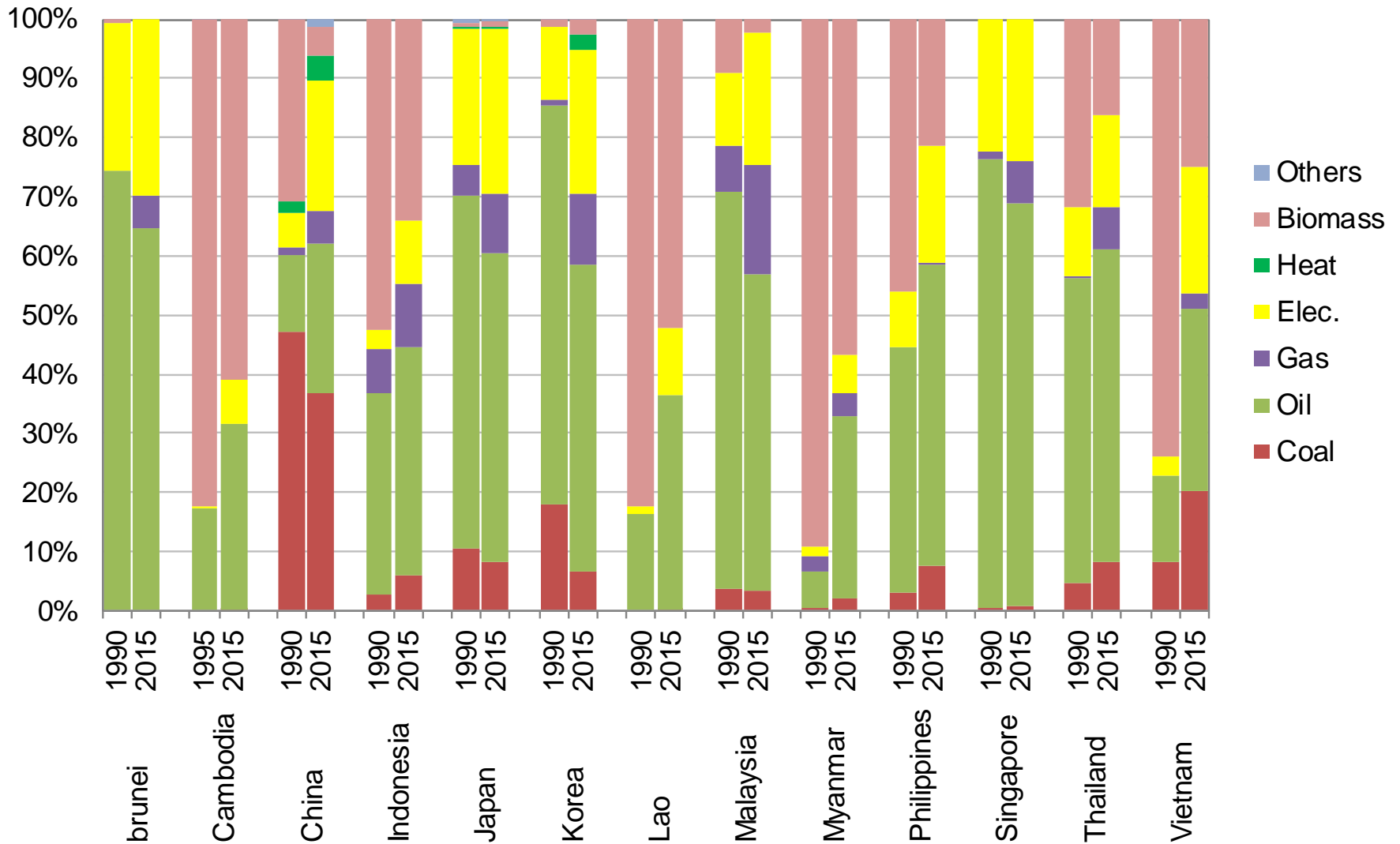
Final energy consumption by source

- 34% of the increase derived from Oil and 30% from Electricity.
- AAGR during 1990-2015 of natural gas has been 7.4% however, the share is still small.



(Source : IEA, IEEJ)

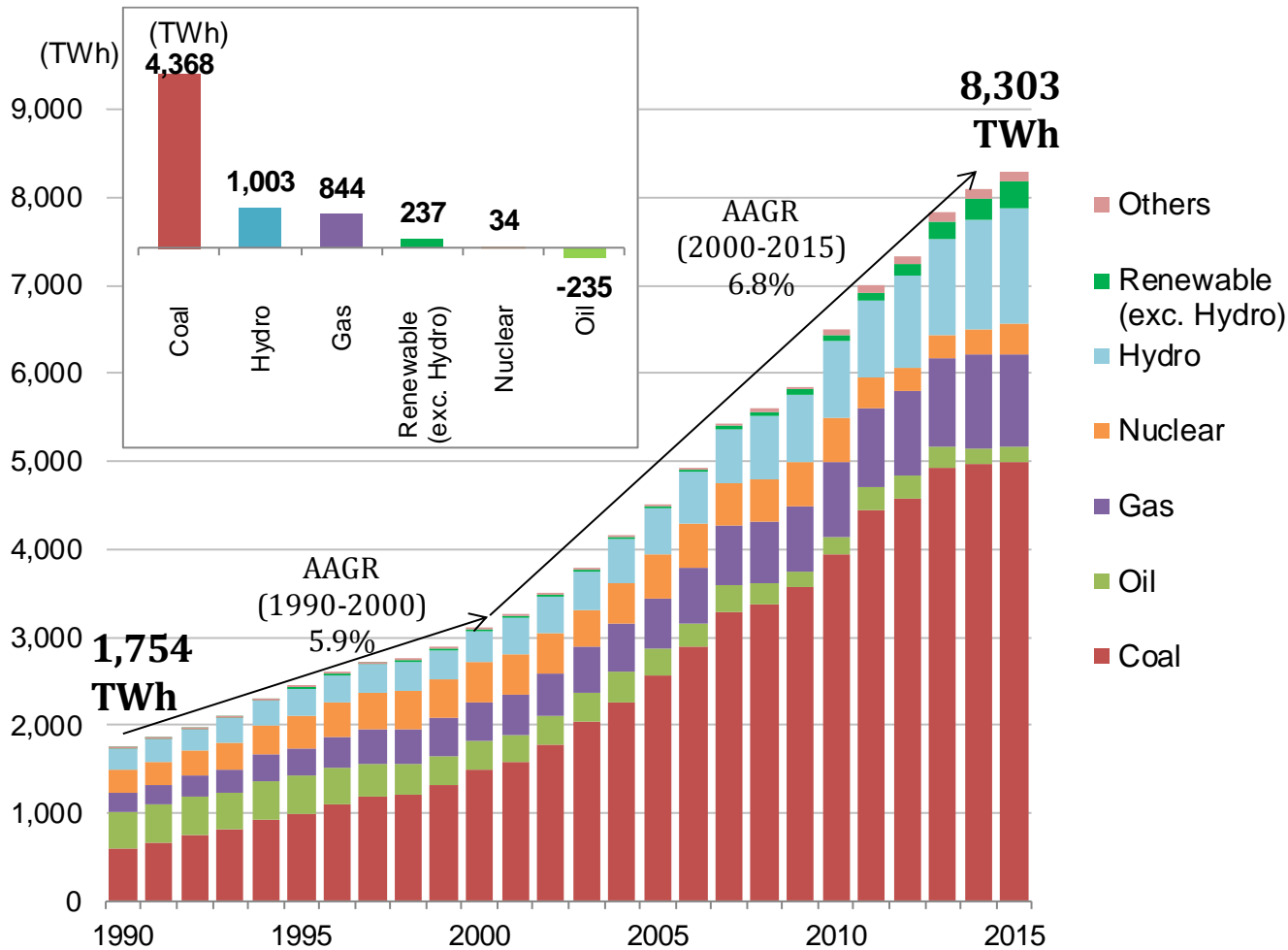
FEC Composition by energy & country



(Source : IEA, IEEJ)

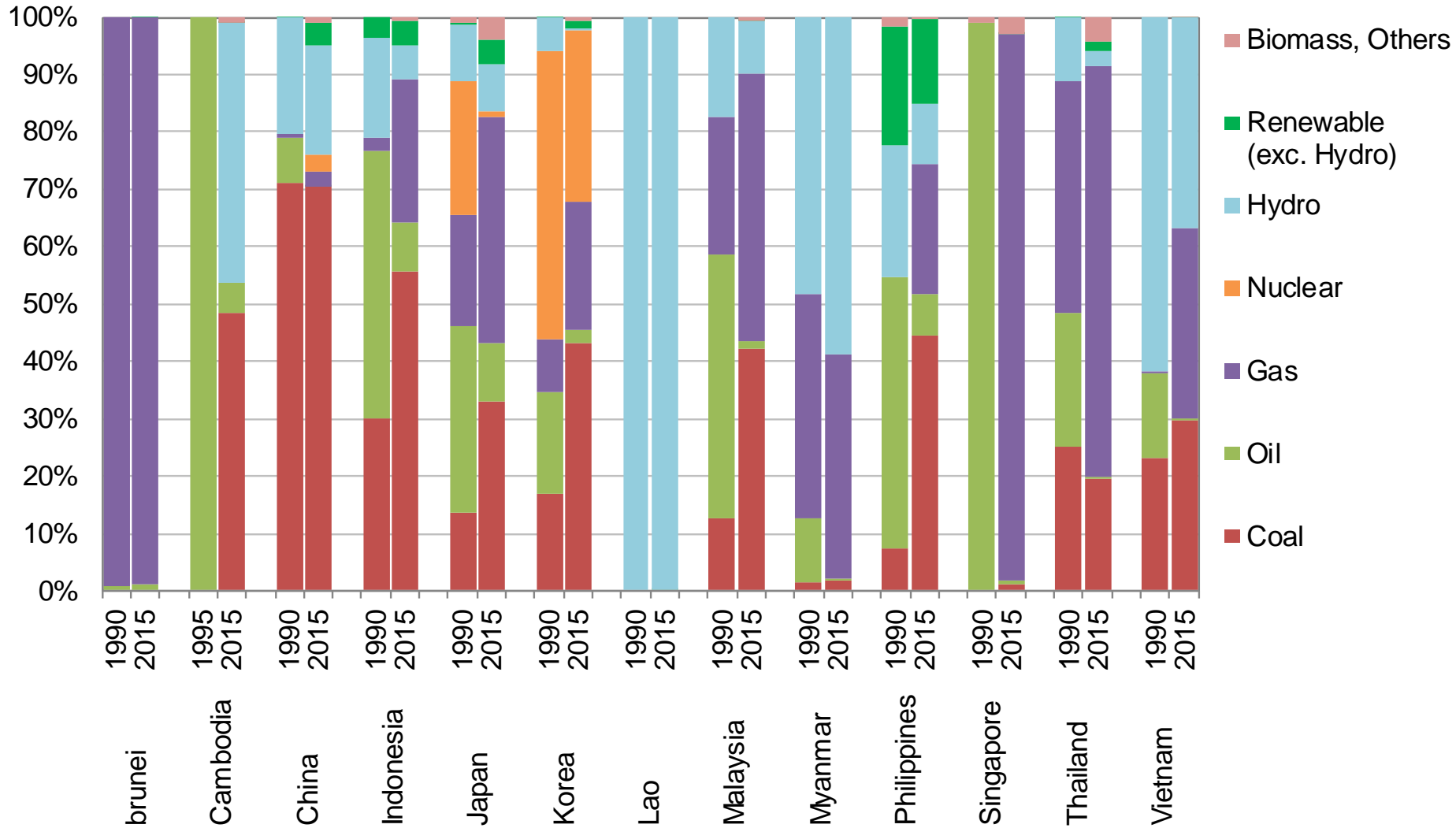
Power generation mix

- Generation AAGR has been 6.4% and the amount increased 4.7 fold during 1990-2015. Coal met 69% of the increase, 16% from Hydro, and 13% from Natural gas.



(Source : IEA, IEEJ)

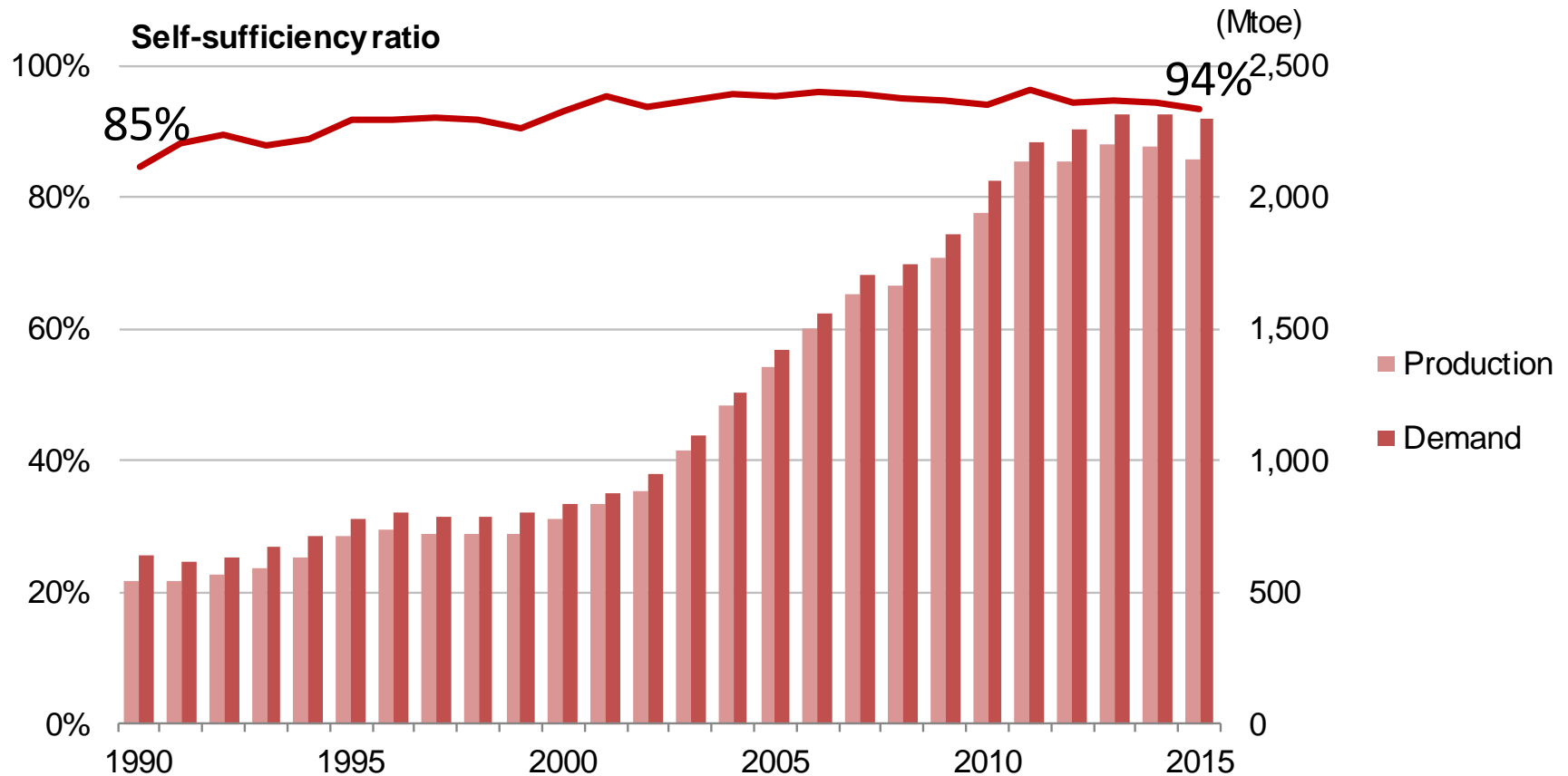
Power generation mix by country



(Source : IEA, IEEJ)

Self-sufficiency in Coal

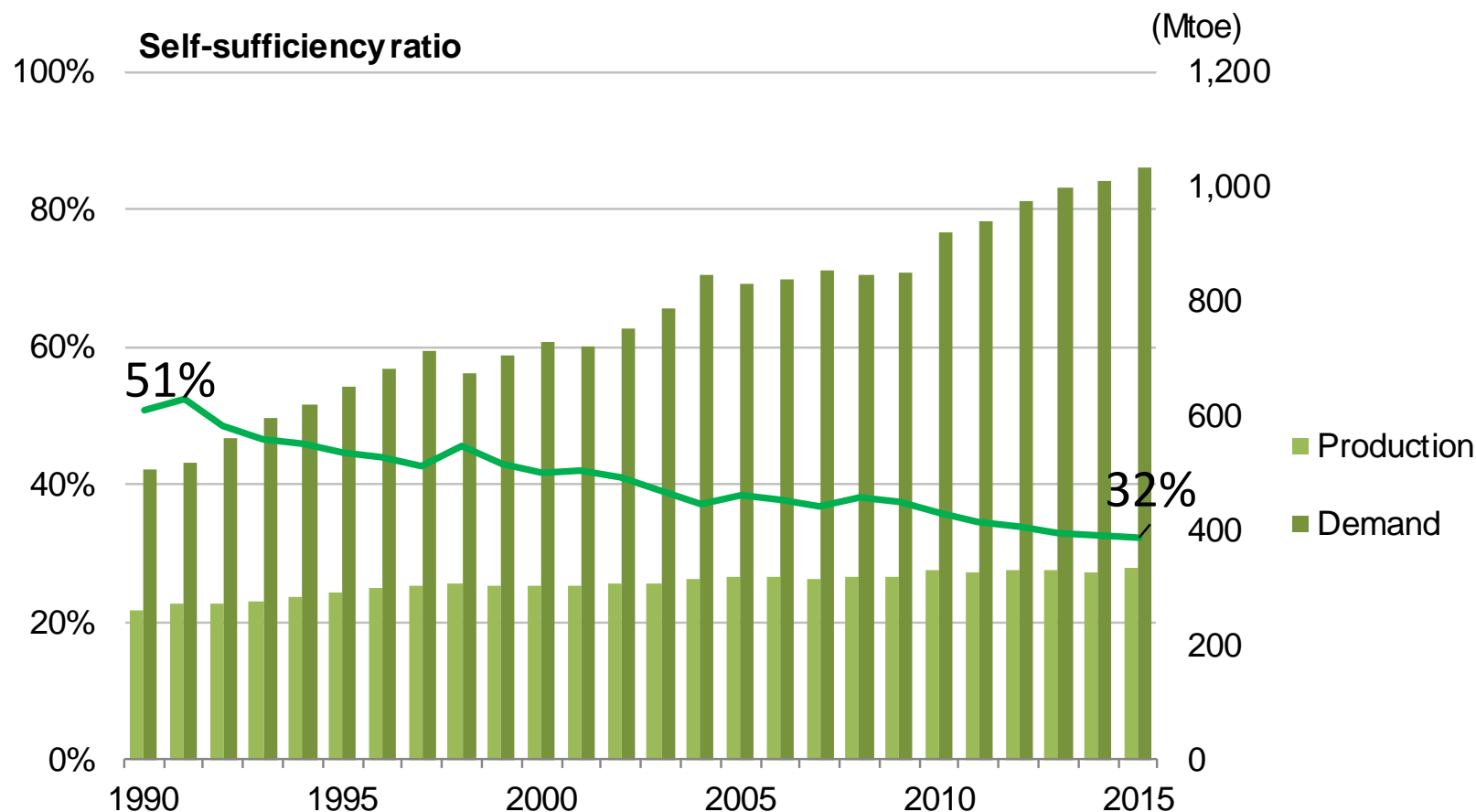
- Self-sufficiency rate in Coal has improved by the early 2010.
- Production has increased with AAGR 5.7%, and demand expanded with AAGR 5.2% during 1990-2015.



(Source : IEA, IEEJ)

Self-sufficiency in Oil

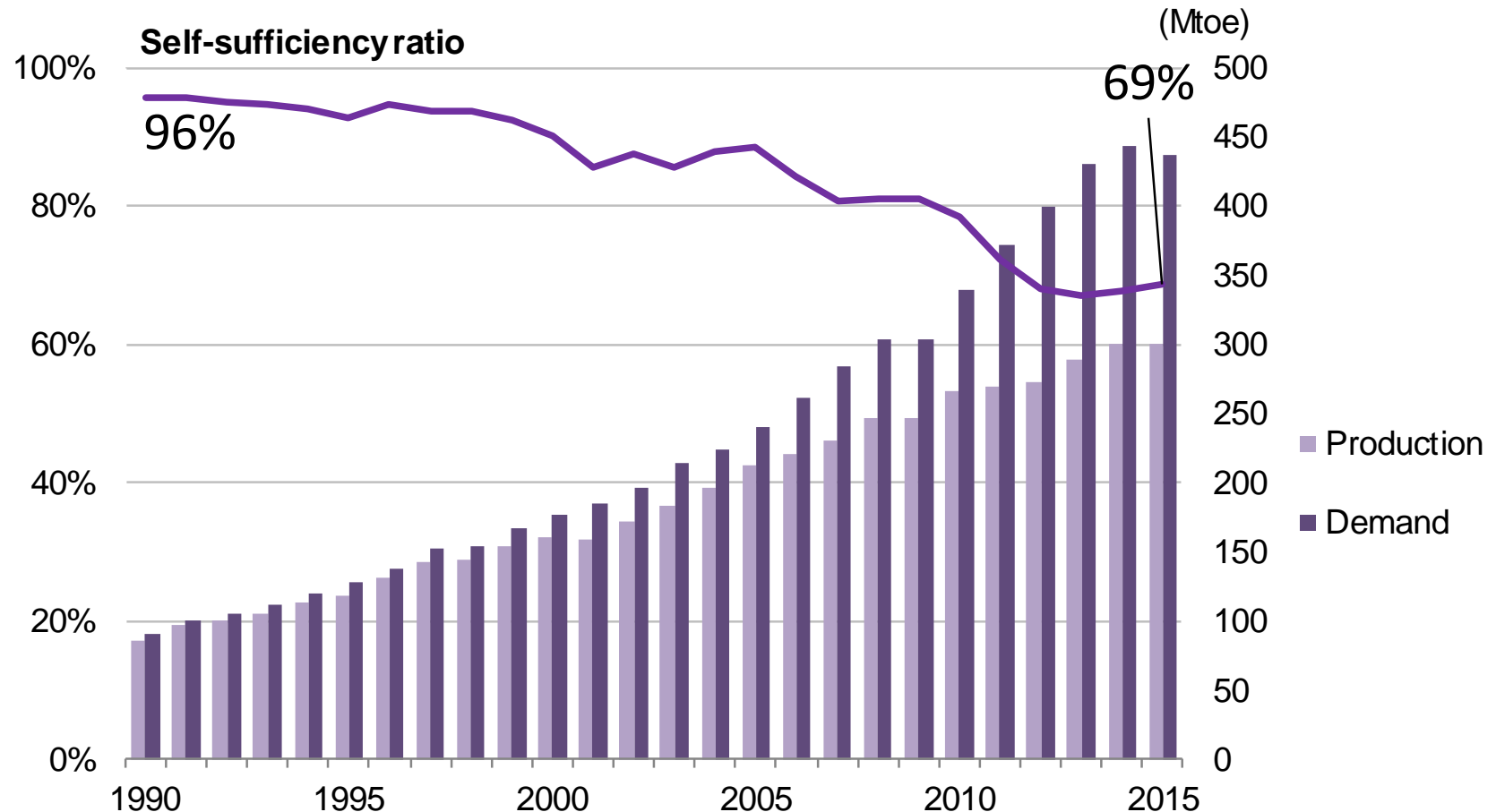
- Self-sufficiency rate in Oil has been decreasing: 51% in 1990 to 32% in 2015.
- Demand has steadily increased with AAGR 2.9% during 1990-2015, while the production is stable (AAGR 1.0%).



(Source : IEA, IEEJ)

Self-sufficiency in Natural gas

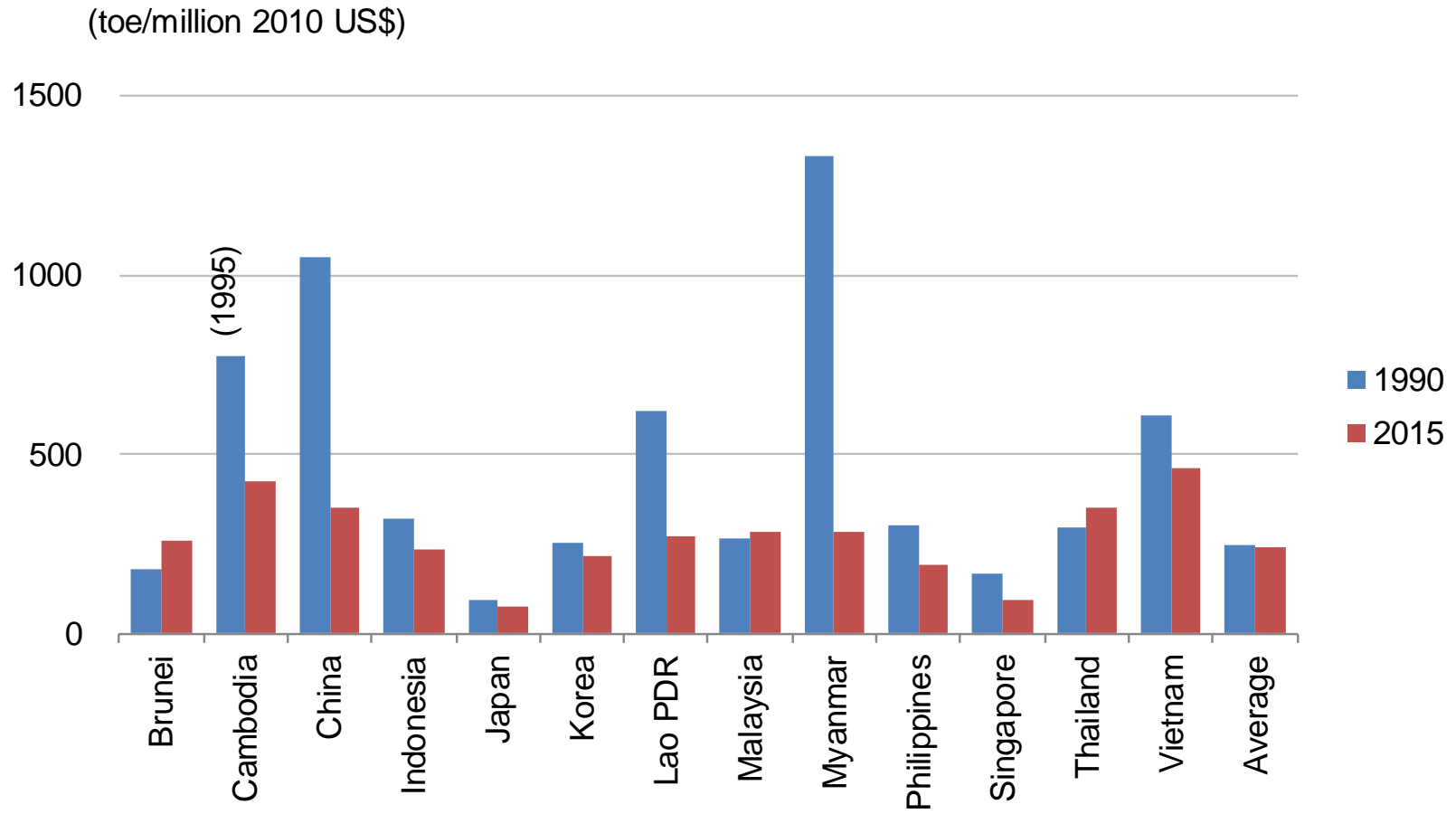
- Self-sufficiency rate in Natural Gas dropped from 96% in 1990 to 69% in 2015.
- Production has increased with AAGR 5.1%, but demand growth much stronger (AAGR 6.5%).



(Source : IEA, IEEJ)

Energy intensity

- Energy Intensity, (TPES / GDP) has improved in most of the countries of ASEAN+3. However, average Energy Intensity of total ASEAN+3 is unchanged.

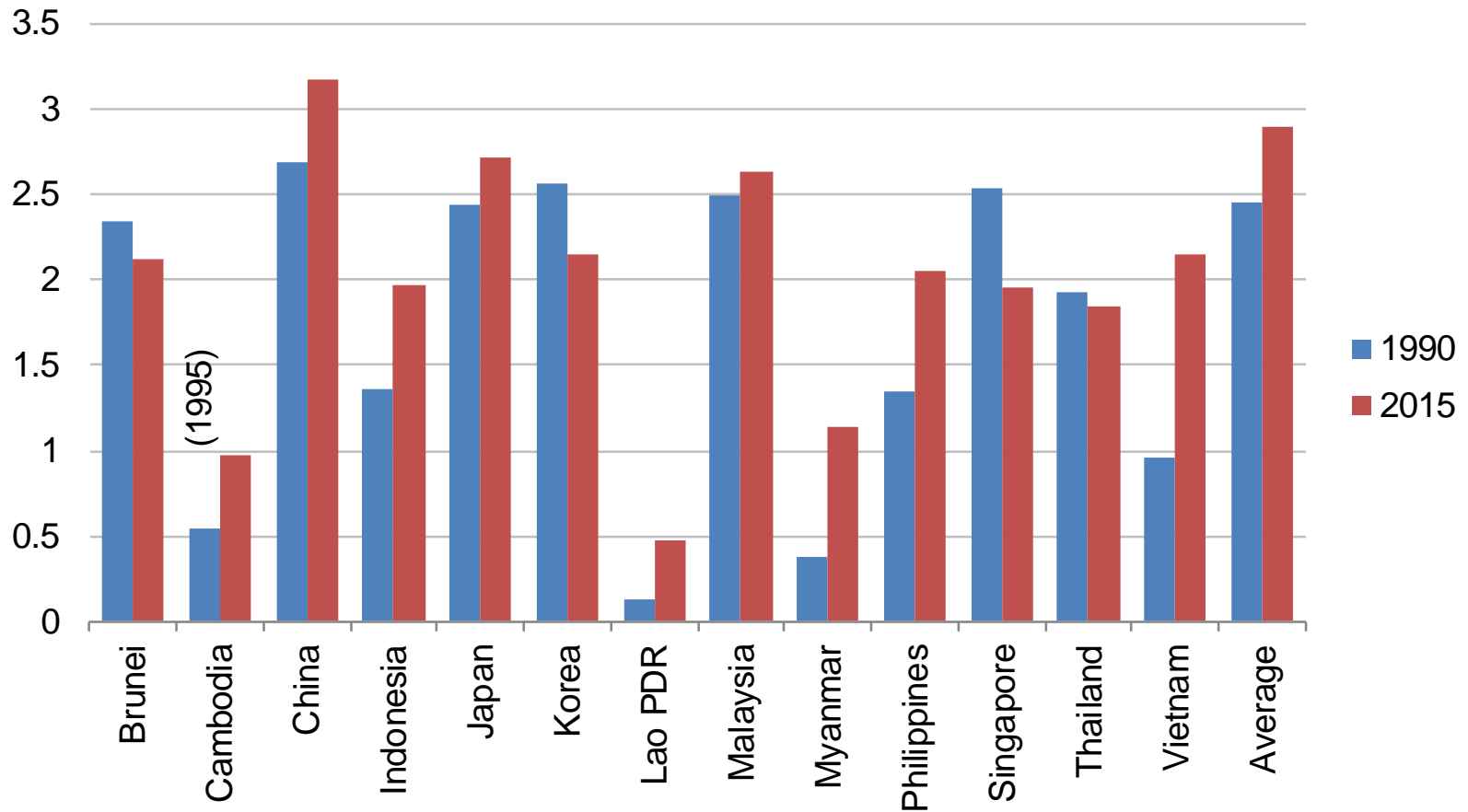


(Source : Calculated by IEEJ)

Carbon Intensity

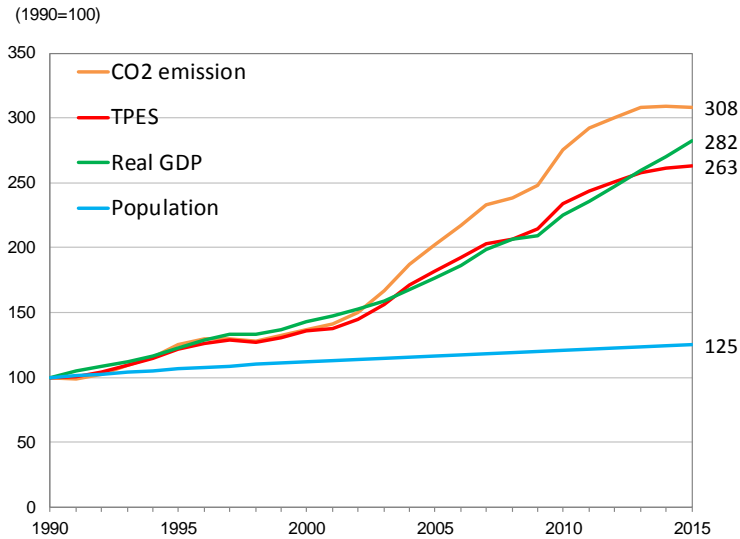
- Carbon Intensity, CO₂/TPES turned worse in some countries in ASEAN+3.
- This is one of the reasons of substantial CO₂ emission increase and indicates the situation being heavily dependent to fossil fuels.

(t-CO₂/toe)



(Source : IEA)

Path toward low carbon society



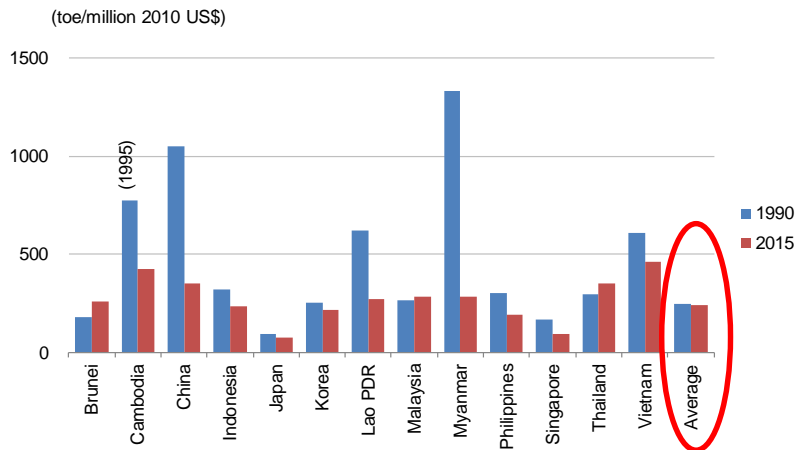
CO_2 / GDP

$$= (TPES / GDP) \times (CO_2 / TPES)$$

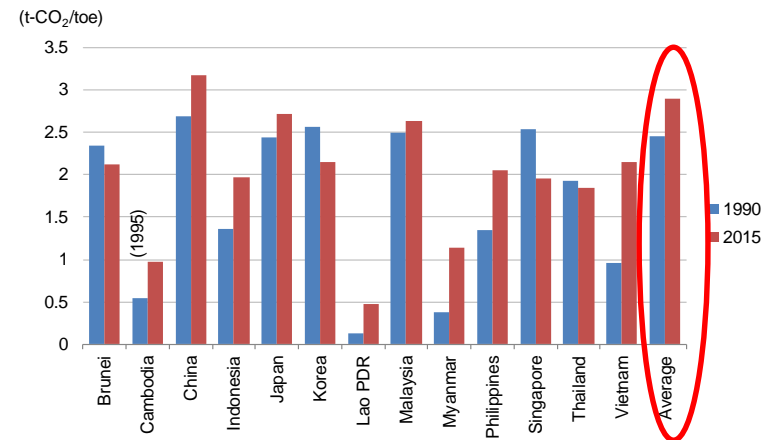
Energy Conservation

Energy Mix Change

Energy Intensity



Carbon Intensity



(Source : Calculated by IEEJ)

- GDP and TPES growth rates are much higher compared to population growth rate, so the living standards of the people in ASEAN+3 generally seems to get better in 2015 compared to that in 1990.
- According to historical data over TPES and FEC by source, Coal has been the dominant energy source in ASEAN+3. Fossil fuels (Coal, Oil, and Natural gas) are still crucial for our lives.
- Self-sufficiency rate in Oil and Natural gas has been dropping even though their production has been increasing, whereas Self-sufficiency in Coal has been keeping high for the period between 1990 and 2015.
- Energy Intensity has improved in most of the countries of ASEAN+3 during 1990 to 2015. However, average energy intensity remains at the same level. Meanwhile, carbon Intensity increased in most of the ASEAN+3 countries.



Thank you.