

Energy Supply and Demand Trends in Asia and the Pacific (1990-2006)

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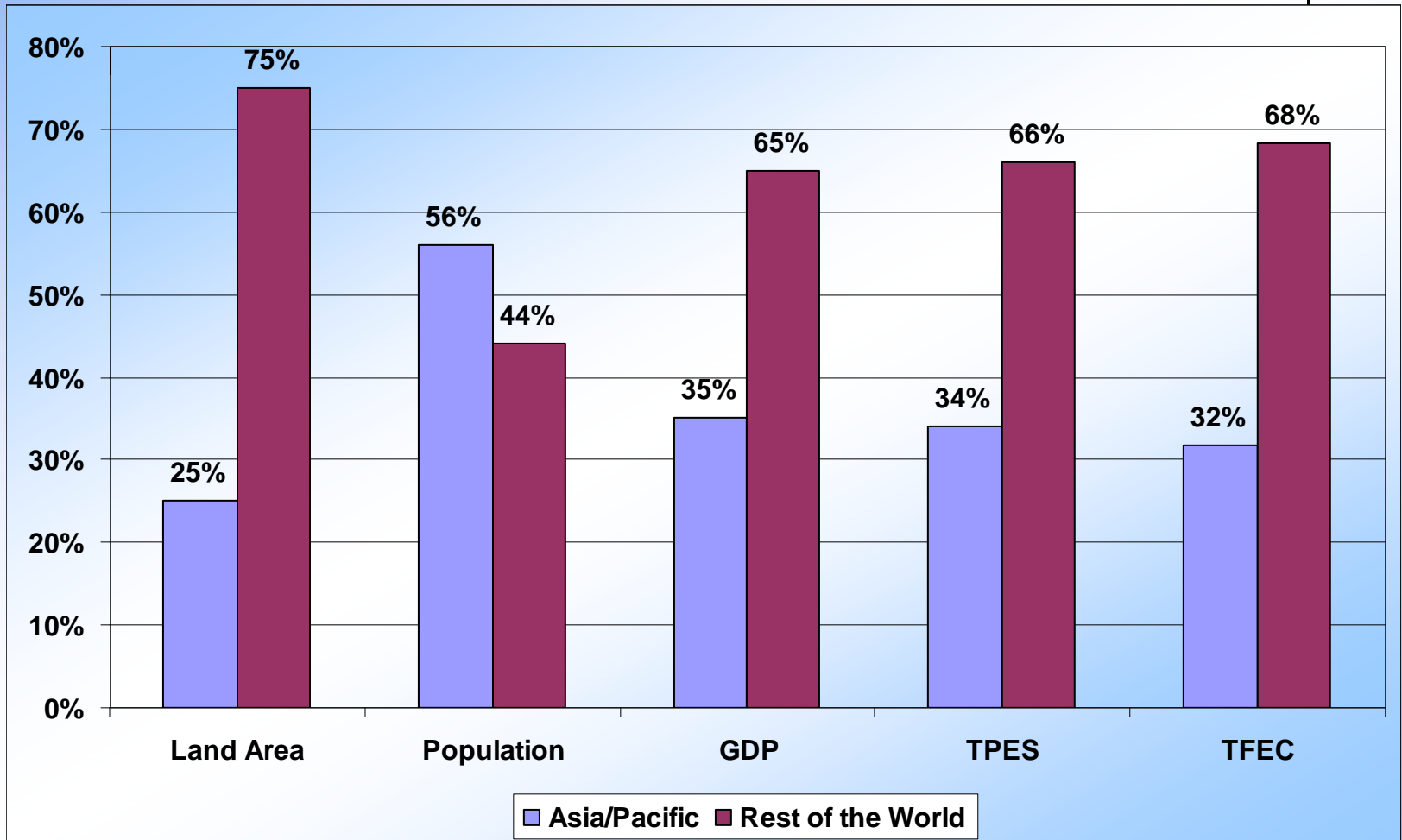
Scope of the Analysis

- **Central and West Asia**
 - Comprising Afghanistan, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan, Turkmenistan and Uzbekistan.
- **East Asia**
 - Comprising Hong Kong, China; Republic of Korea; Mongolia; People's Republic of China and Taipei, China.
- **The Pacific**
 - Comprising Cook Islands, Fiji Islands, Kiribati, Nauru, Papua New Guinea, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, Marshall Islands, Federated States of Micronesia and Tuvalu
 - and Vanuatu.
- **South Asia**
 - Comprising Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka.
- **Southeast Asia**
 - Comprising Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

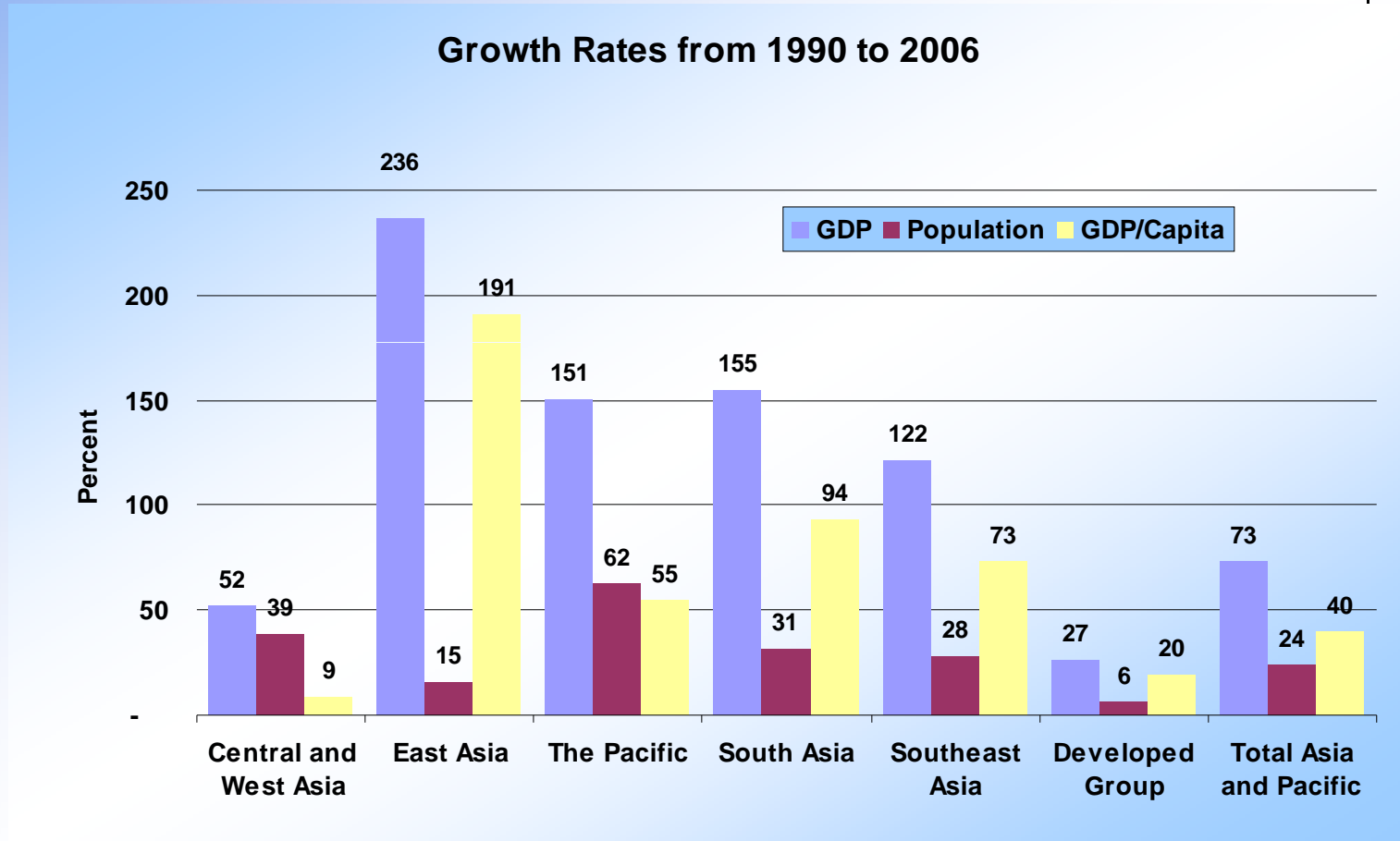
Sources of Data

- The [APEC](#) Energy Database of APERC being maintained by the Energy Data and Modelling Center of IEEJ
- Energy Balances on Non-OECD Countries of the International Energy Agency ([IEA](#))
- The Energy Database of the United Nations Statistics Division ([UNSD](#))
- Lao People's Democratic Republic ([Lao PDR](#)) Ministry of Energy and Mines
- [World Bank and UNSD](#) for economic and demographic data

Asia/Pacific and the World in (2006)

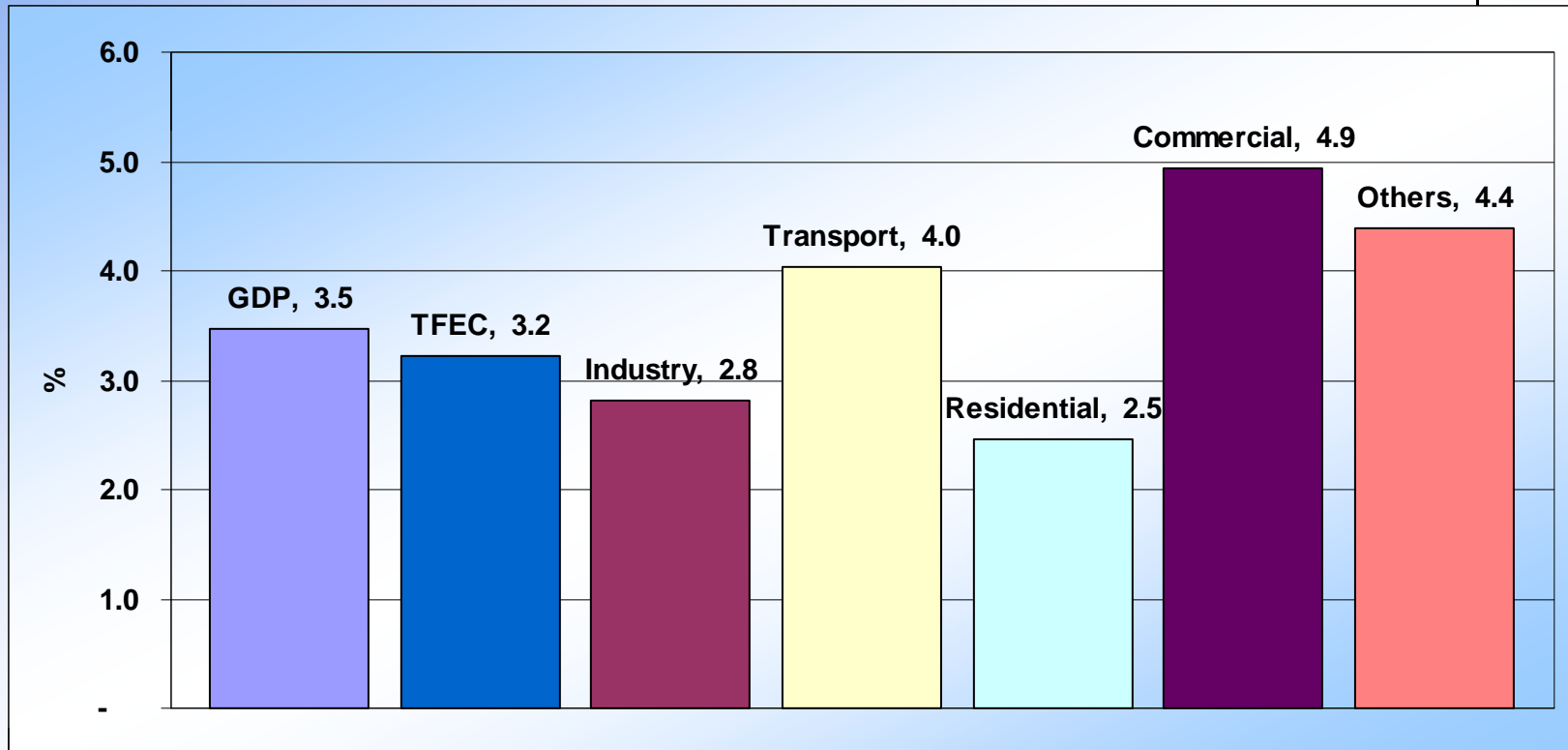


Drivers of Energy Consumption



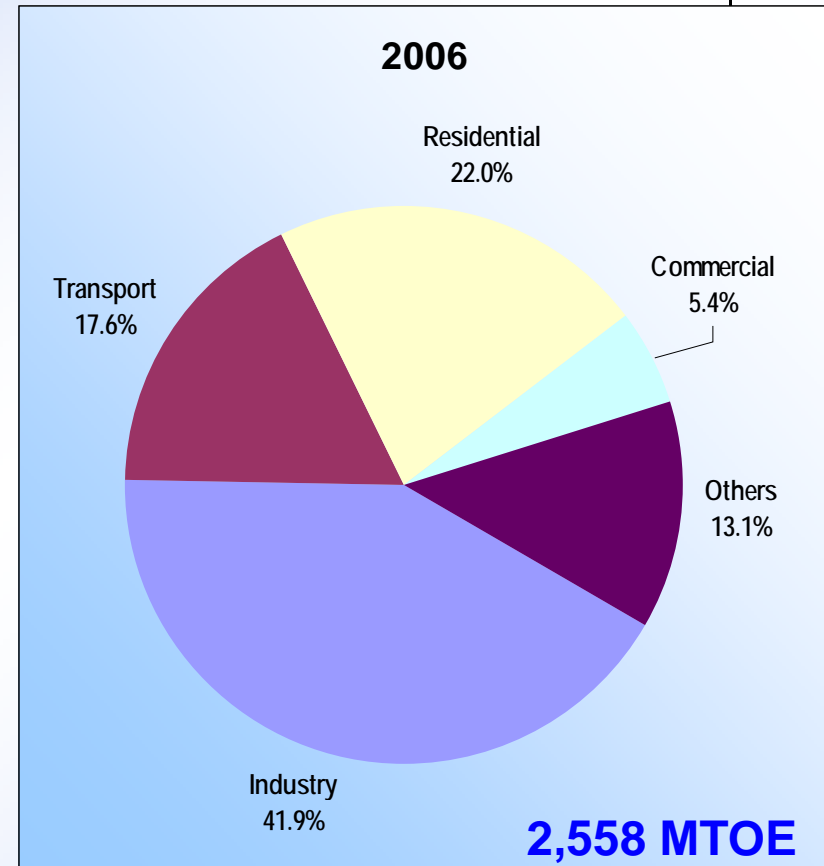
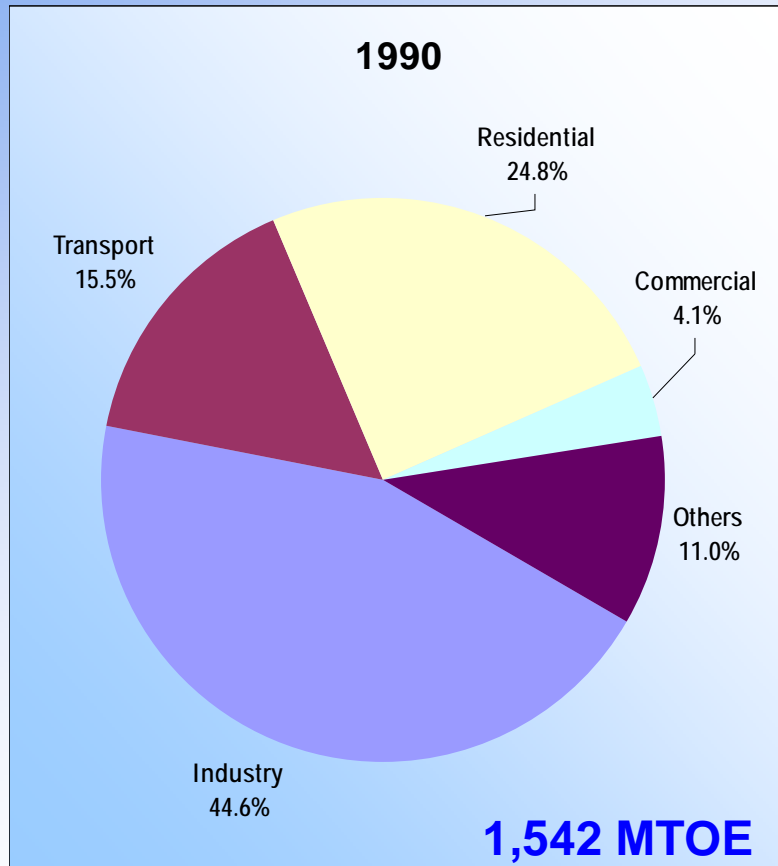
- In Asia and the Pacific, the growth in economic activities and population resulted to 66% and 91% increase in TFEC and TPES, respectively from 1990 to 2006**

Growth Rates of GDP and Sectoral Final Energy Consumption



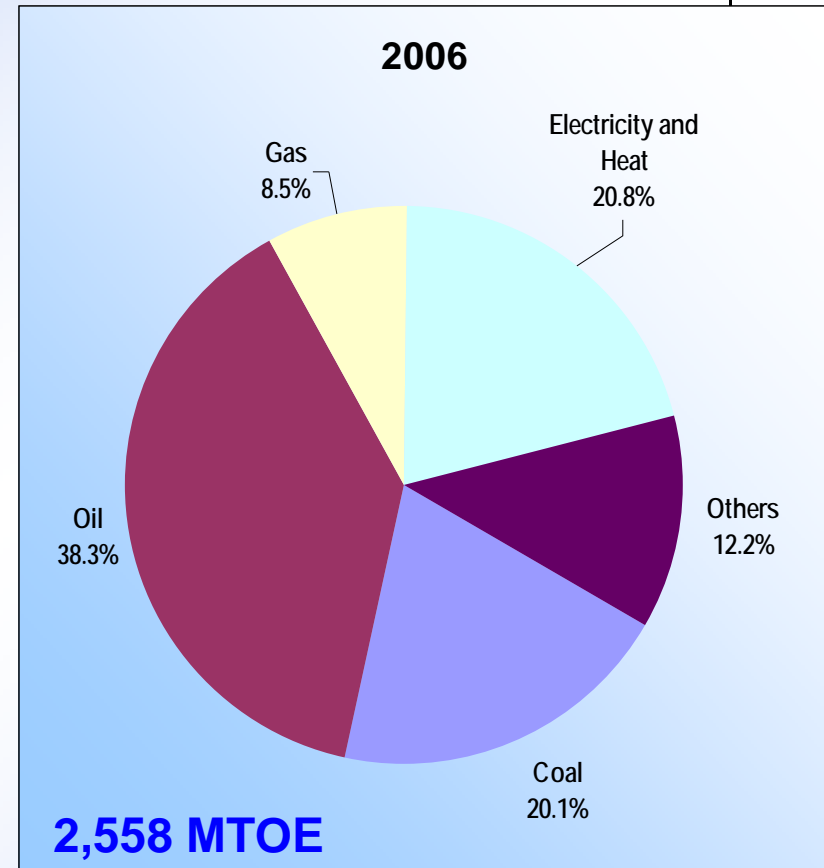
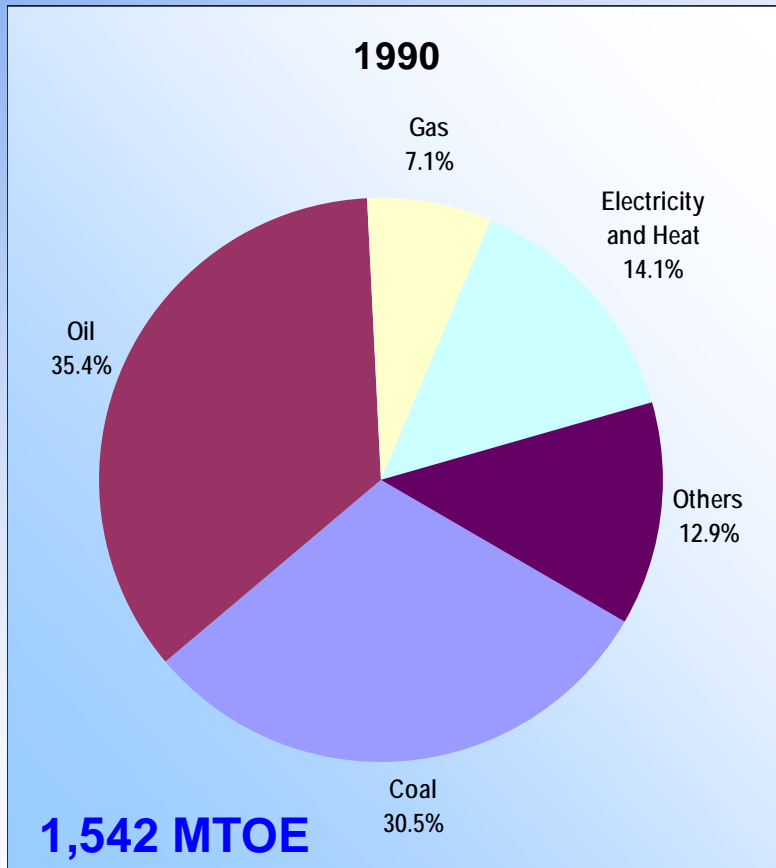
- **The 3.5% average annual growth in GDP in Asia and the Pacific from 1990 to 2006, resulted to a 3.2% annual growth rate in TFEC**
- **By sector, the consumption of the commercial and transports sector grow relatively faster at 4.9%/annum, and 4.0 per annum, respectively.**
- **The consumption of other sectors also grew at a fast rate of 4.4%. This consumption is mostly the consumption of energy products for non-energy purposes such as feedstock to petrochemical production**

Total Final Energy Consumption Asia and the Pacific (1990-2006)



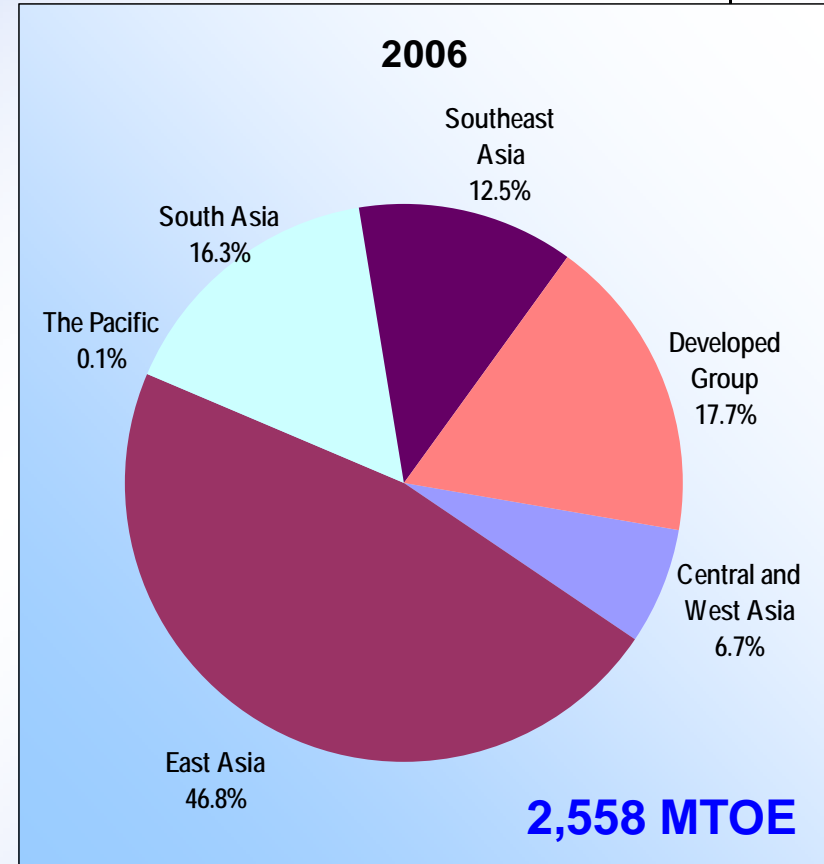
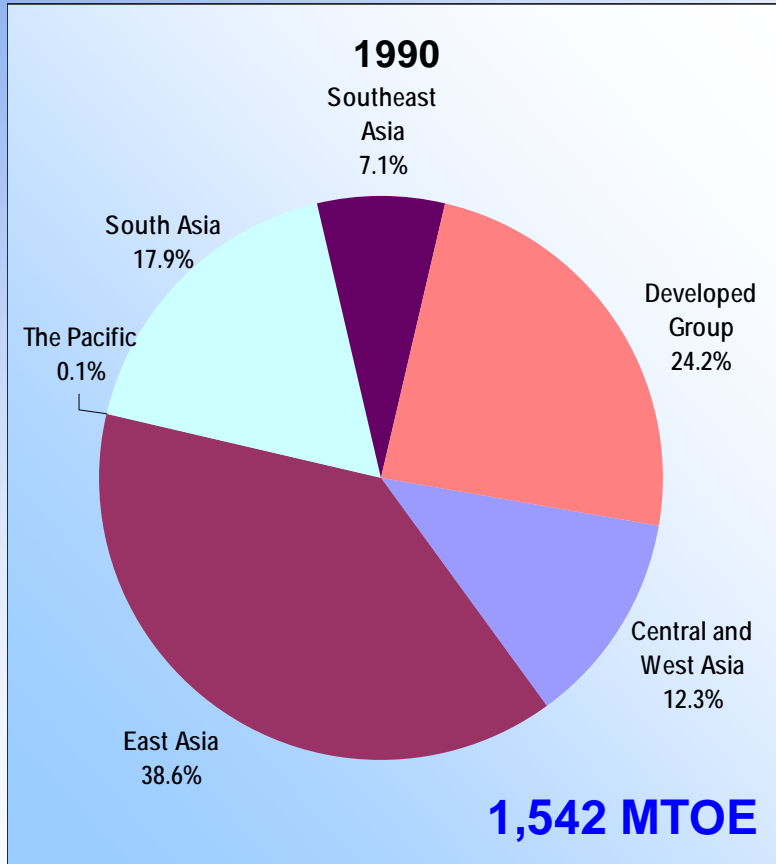
- From 1990 to 2006, the final energy consumption of the commercial and transportation sectors grew at average annual rates of 4.9% and 4.0%, respectively.
- This resulted to increases in the shares of these sectors to the TFEC

Total Final Energy Consumption by Type of Energy



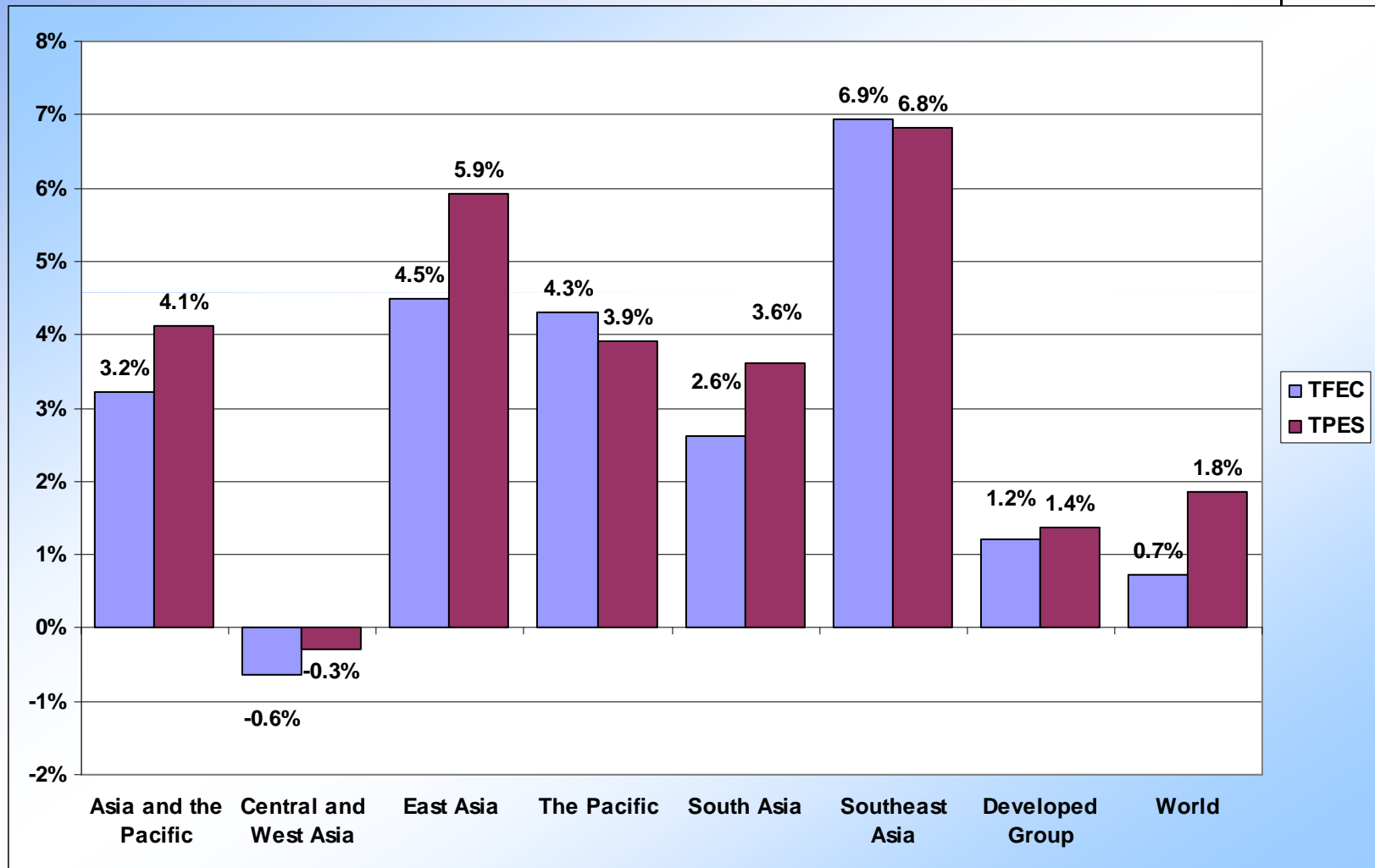
- **During the same period, electricity, heat, gas and oil consumption increased faster than the TFECE resulting to increases in their shares**
- **Heat and electricity consumption grew the fastest at 7.8% and 5.5%/annum, respectively. Gas consumption grew by 4.3%/annum while oil consumption grew by 3.7%/annum.**
- **Coal share had decreased due to the slower growth rate in consumption of 0.6%/annum.**

TFEC by Subregion

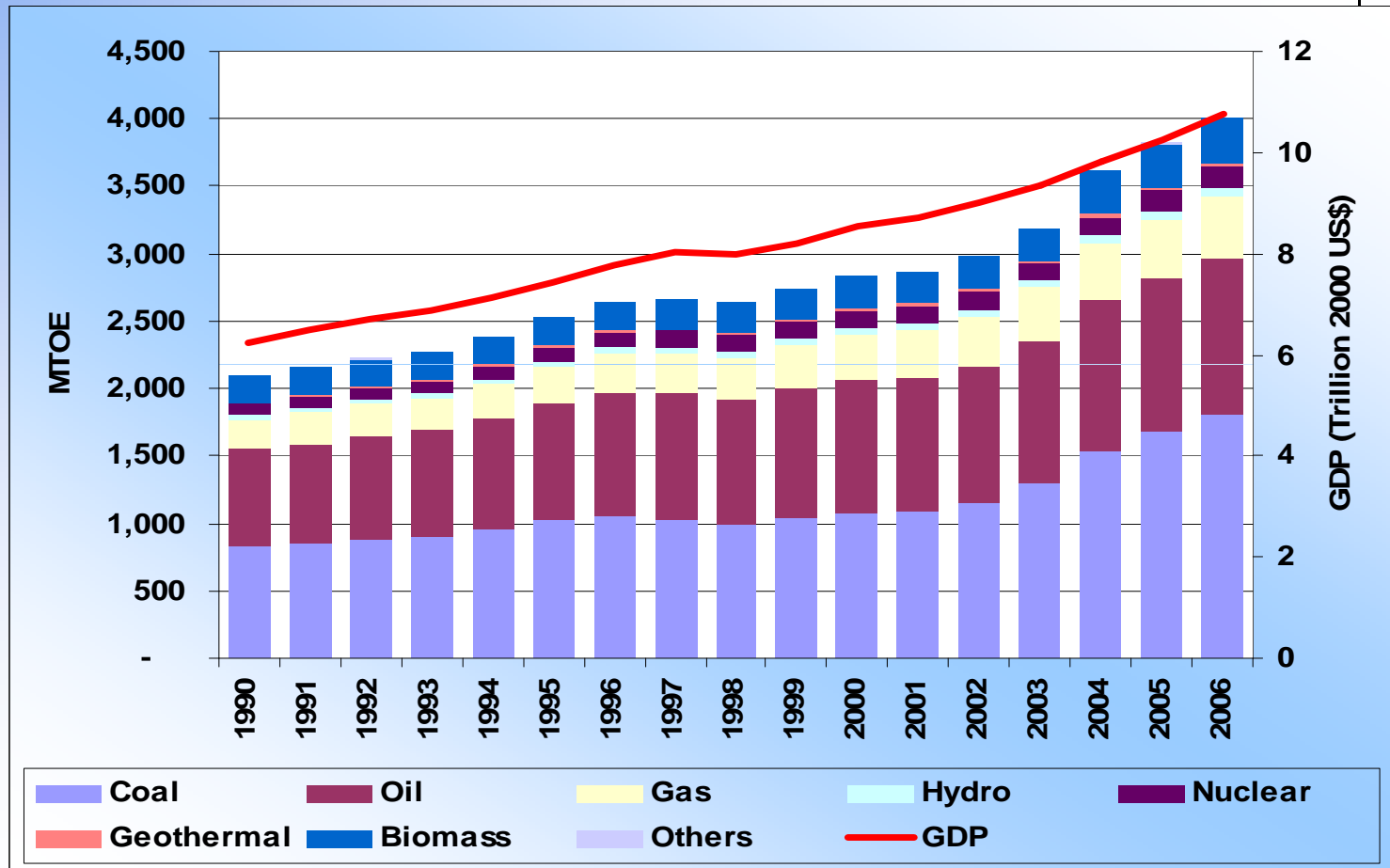


- **The shares of East Asia and Southeast Asia to the total regional TFEC increased from 1990 to 2006**
- **On the other hand, the shares of Central and West Asia, the Developed Group and South Asia decreased**

Average Annual Growth Rates of TFEC and TPES in Asia and the Pacific and the World (1990-2006)

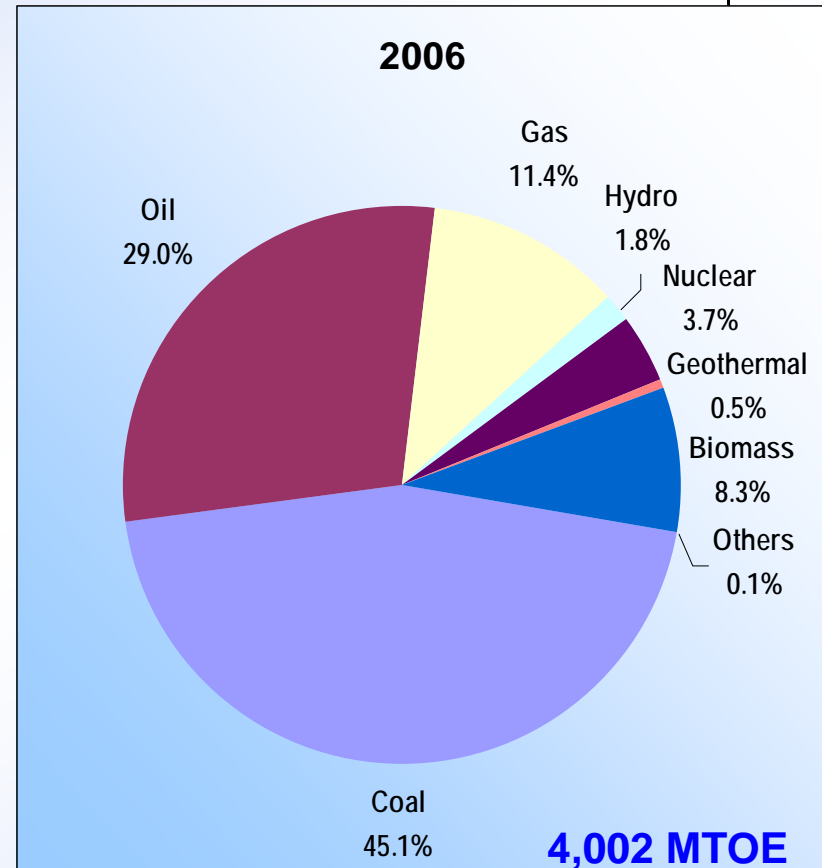
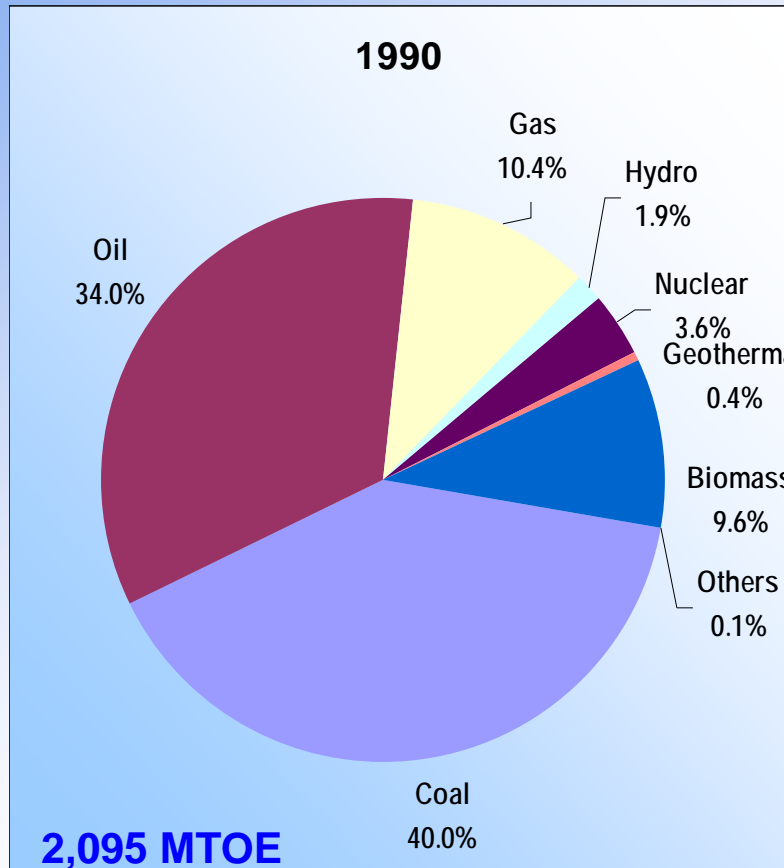


Total Primary Energy Supply Asia and the Pacific (1990-2006)



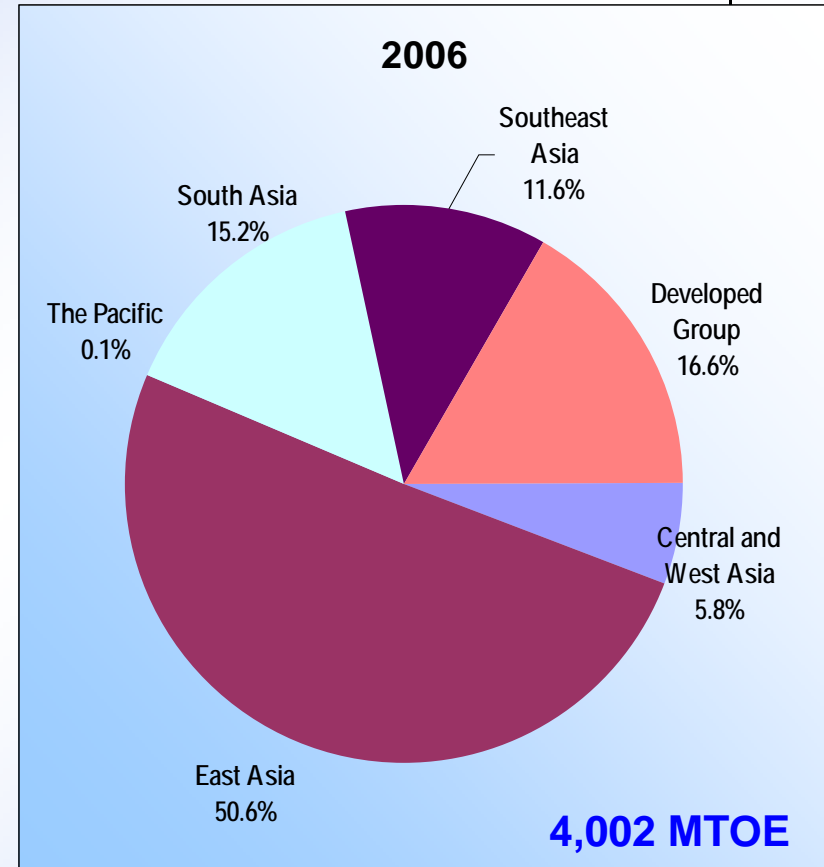
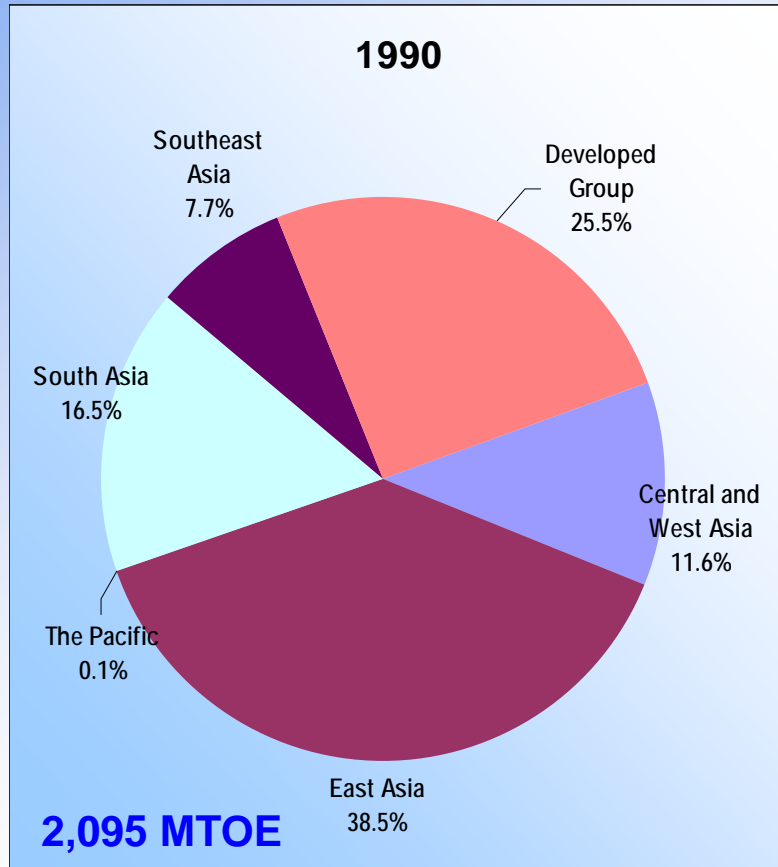
- The TPES grew at a faster rate of 4.1% per annum than the GDP and TPEC from 1990 to 2006
- Among the types of energy, geothermal had the fastest annual growth rate of 5.3% followed by coal at 4.9 percent.
- Gas was next at 4.7% while nuclear energy grew at 4.4%. Oil had a relatively slow growth rate of 3.1%.
- Biomass and other energy grew at 3.2% and 1.0%, respectively.

Total Primary Energy Supply



- **The faster growth rates of geothermal, coal, gas and nuclear energy supply resulted to increases in their shares of the TPES from 1990 to 2006**
- **Due to relatively slow growth rates, the shares of biomass and hydro decreased in 2006 as compared to their shares in 1990**

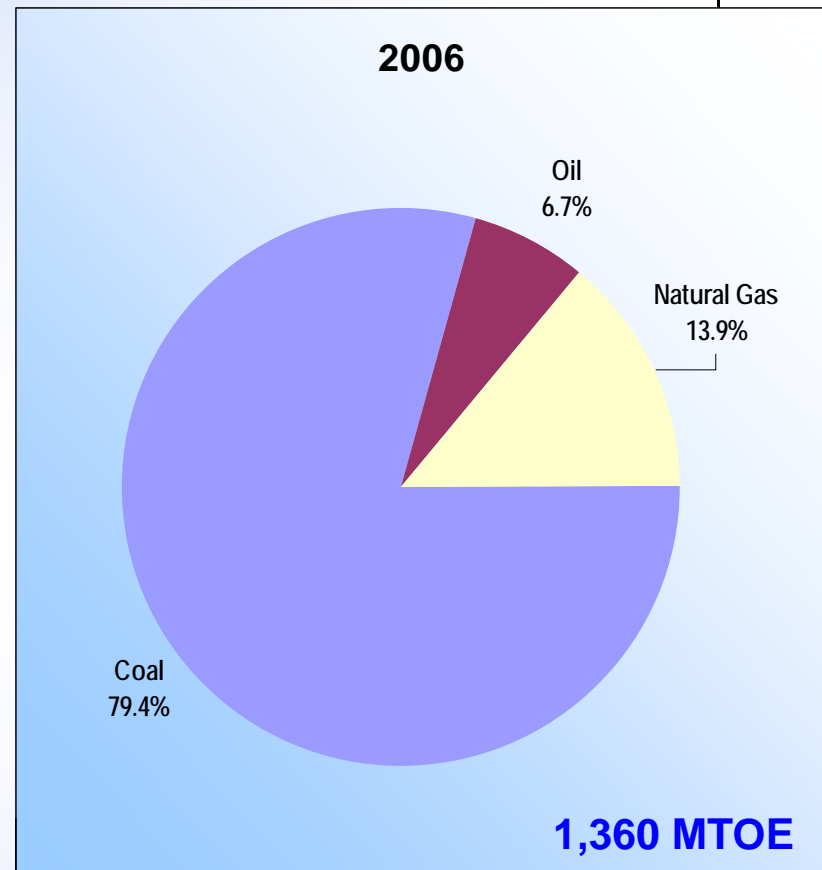
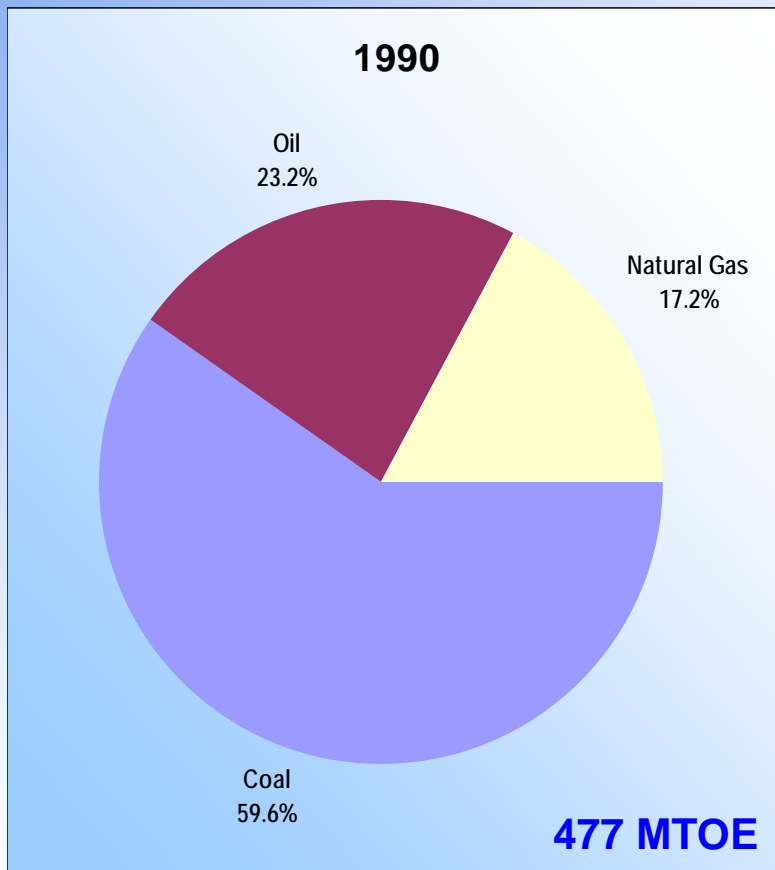
TPES by Region



- Like in TFEC, the shares of East Asia and Southeast Asia to the regional TFEC increased from 1990 to 2006
- Those of the Central and West Asia, the Developed Group and South Asia decreased.

Fuel Inputs for Electricity Generation

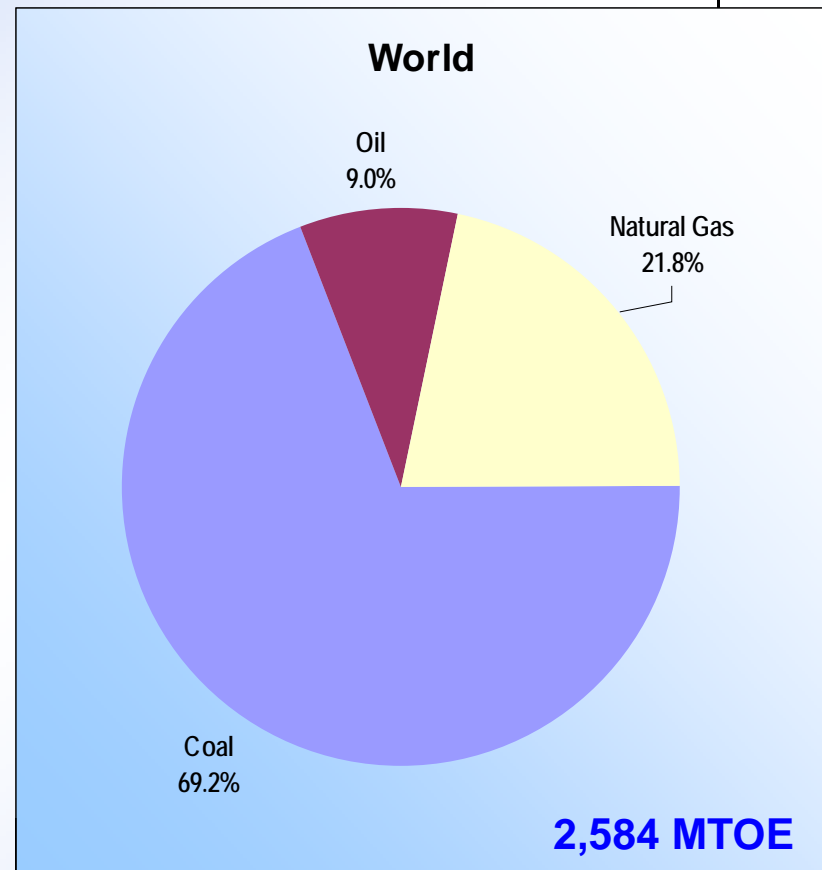
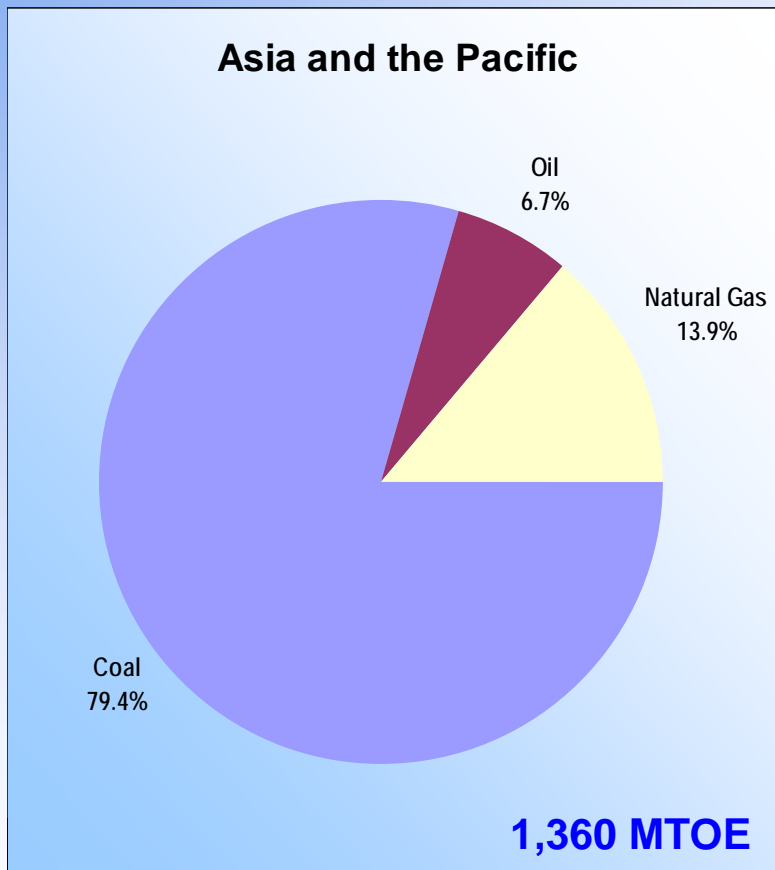
Asia and the Pacific



- **The rapid growth in electricity consumption was supplied largely by thermal electricity generation. In view of this, the share of thermal generation increased from 70.6% in 1990 to 77% in 2006.**
- **The share of coal to the fuel inputs for electricity generation increased from 59.6% in 1990 to 79.3% in 2006. This is due to the 280% increase in coal consumption for electricity generation from 1990 to 2006.**
- **The share of oil declined considerably from 23.2% in 1990 to 6.8% in 2006 in view of policies in many countries to switch from oil to other energy. Oil consumption for electricity generation decreased by 16% from 1990 to 2006.**
- **The share of gas also decreased from 17.2% to 13.9% although actual fuel inputs increased by 131% from 1990 to 2006.**

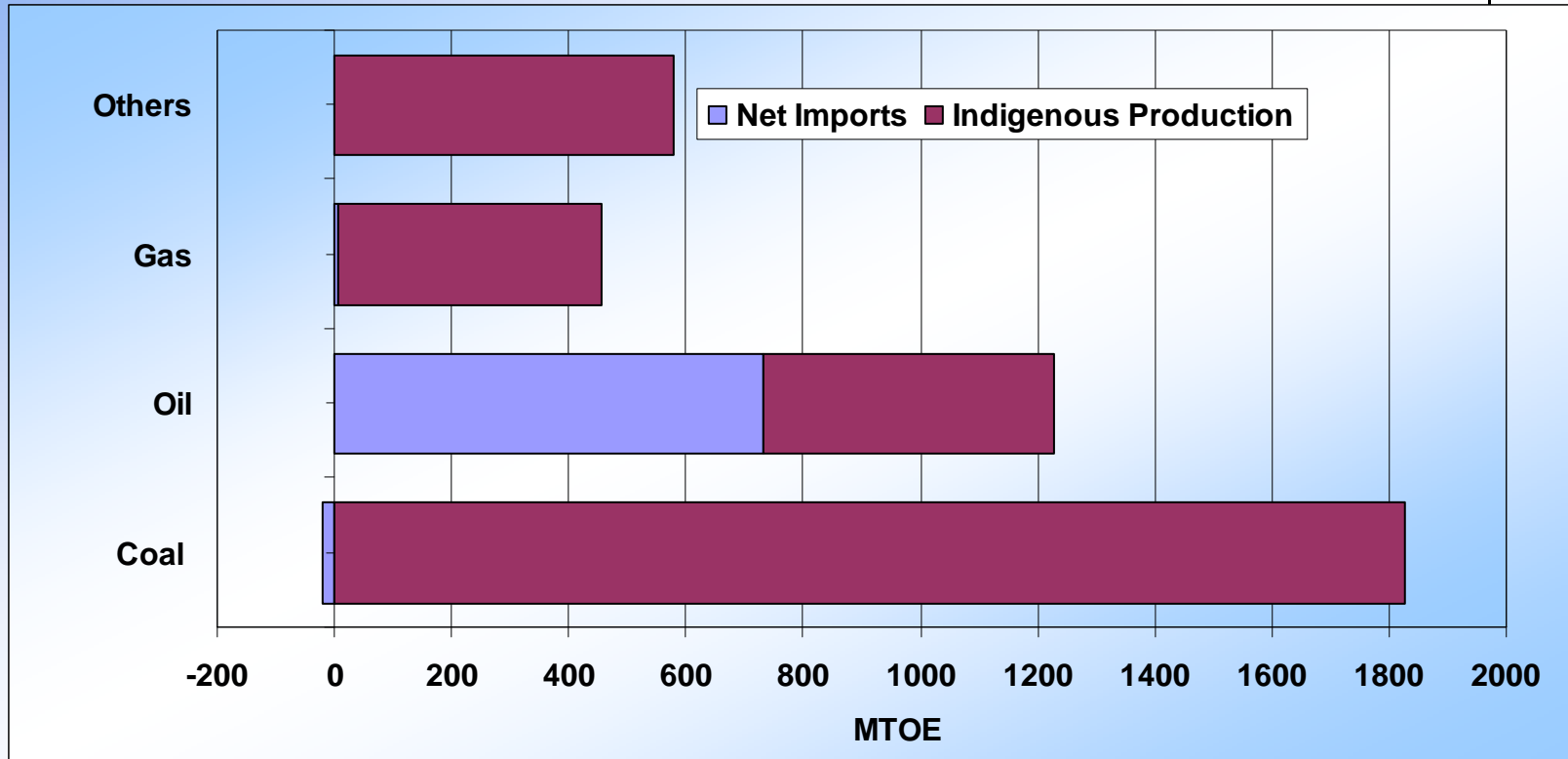
Fuel Inputs for Electricity Generation, 2006

Asia and the Pacific vs. the World



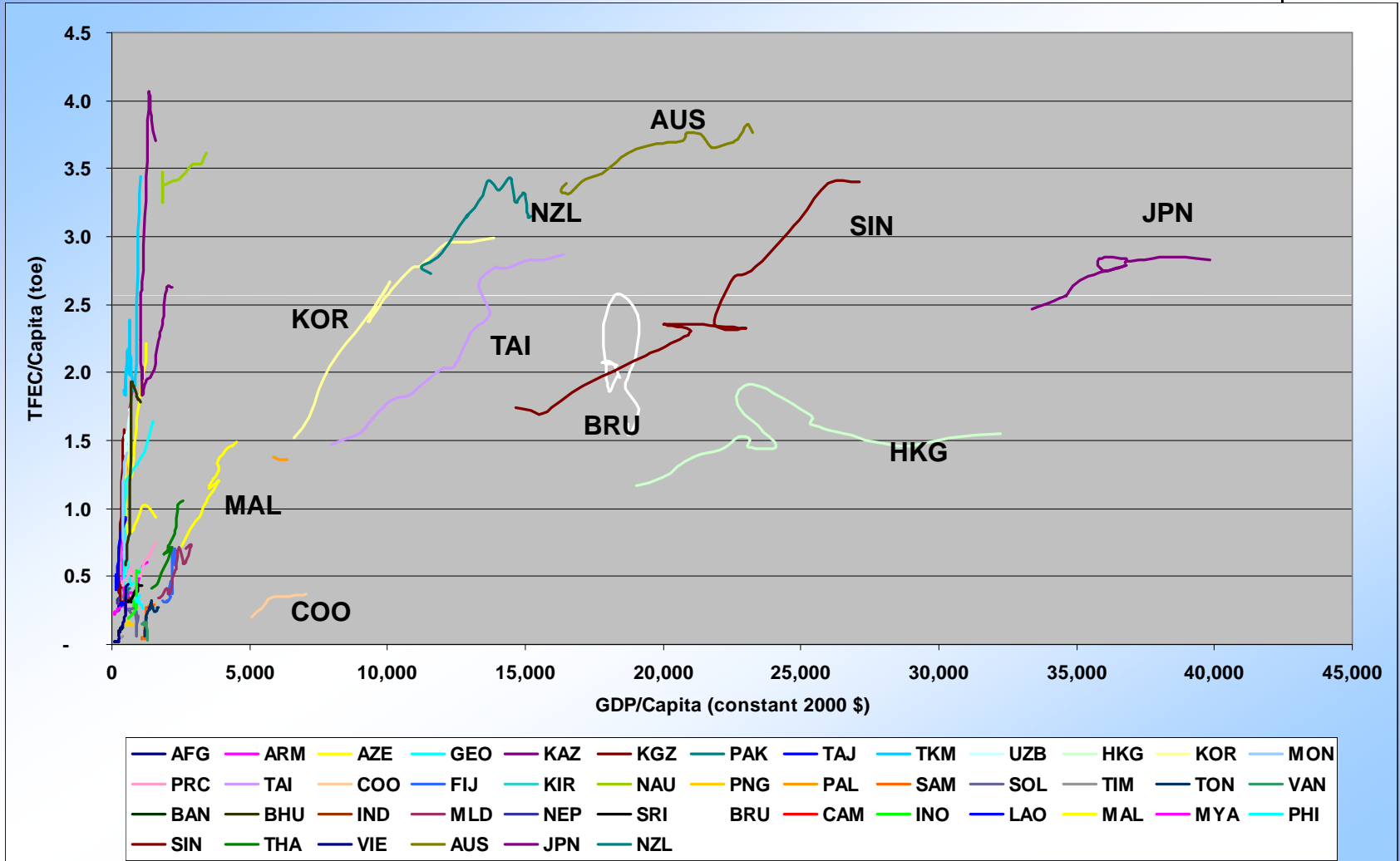
- When compared to the world total, the fuel mix for electricity generation in Asia and the Pacific has more coal than natural gas and oil
- In 1990, the share of coal to the total fuel mix in the world was 67%. In Asia and the Pacific, the share was only 60%.
- In 2006, the share of coal in Asia and the Pacific has increased to 76% while that of the World increased to a lower 69.
- The coal consumption of Asia and the Pacific for power generation has been increasing faster than the rest of the world

Sources of Energy Supply, 2006

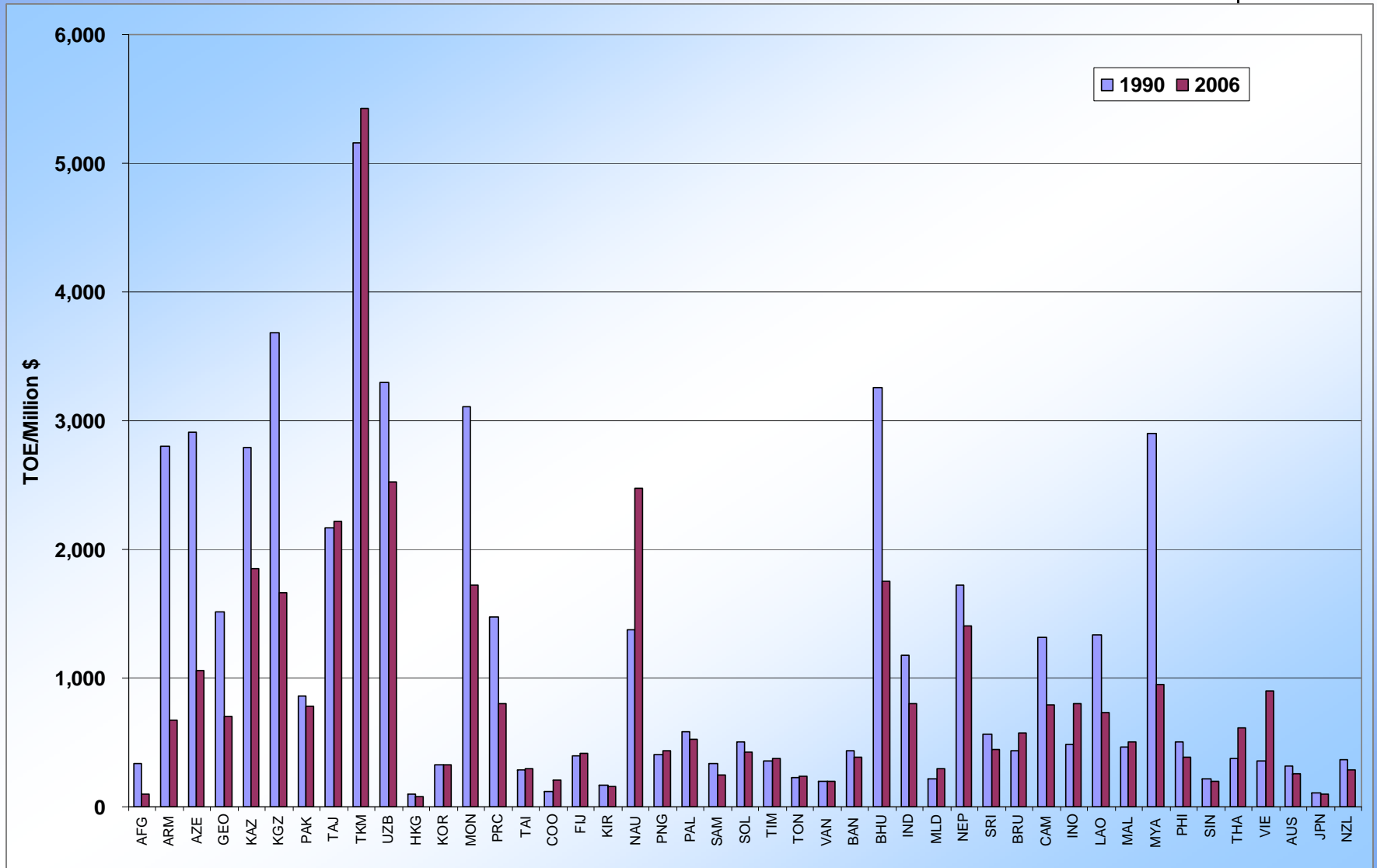


- **The Asia and the Pacific region is a net importer of energy having imported 16.2% of its total energy requirements in 2006. Import dependence for oil is even higher at 63% of its total oil requirements. It also imported 1.3% of its gas requirements.**
- **However, there was a net export of coal from the region.**
- **The amount of energy imported from outside the region could not be determined from available data.**

Per Capita GDP and Energy Consumption



Energy Intensity (1990 vs. 2006)



Data Problems

- The level of details vary widely among the ADB regional member countries
- Some countries have inconsistent data which could be due to the absence of a coherent data collection system
- Some countries do not collect data on non-commercial energy such as biomass, solar PV, etc.
- Some countries cannot disaggregate industry sector data into the various industrial subsector
- Unclassified data are lumped into the “Others” sector which overestimates the consumption of this sector while underestimating those of the residential and commercial sectors
- Probable inconsistencies in data definitions with the regional definitions (i.e. APEC definitions vs. national definitions)

Recommendations

- Establish ADB energy data definitions harmonized with those of existing international organizations that are collecting energy data, such as APEC, IEA and UNSD.
- Include energy data in the annual regular data collection of ADB from its member countries
- Build capacity of ADB statistical contacts in member countries in understanding and collecting energy statistics
- Establish an ADB Energy Database

Thank you for your attention.