

# APEC Energy Outlook until 2030

The 7<sup>th</sup> APEC Energy Ministers' Meeting  
Gyeongju, Republic of Korea  
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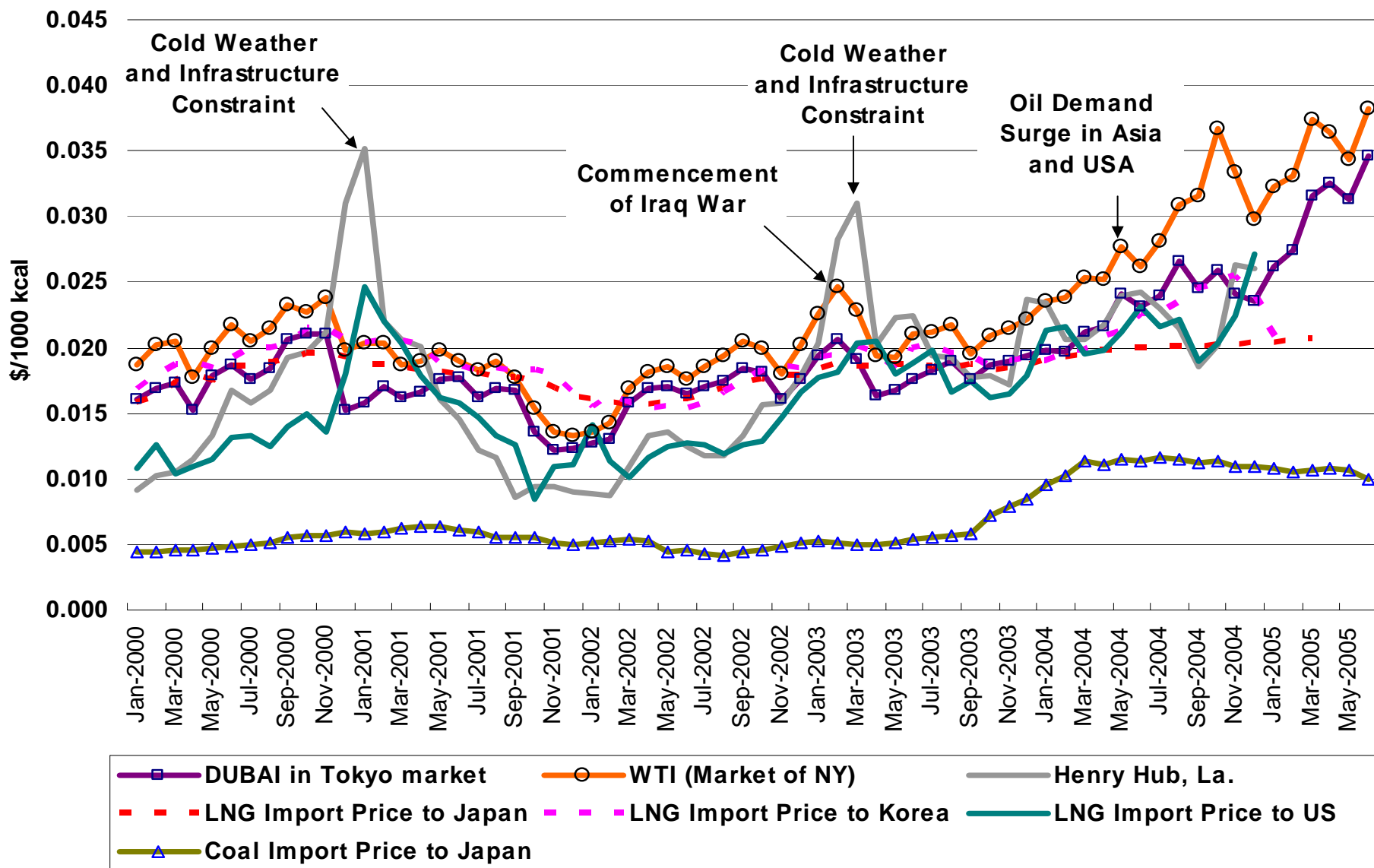
President

Asia Pacific Energy Research Centre

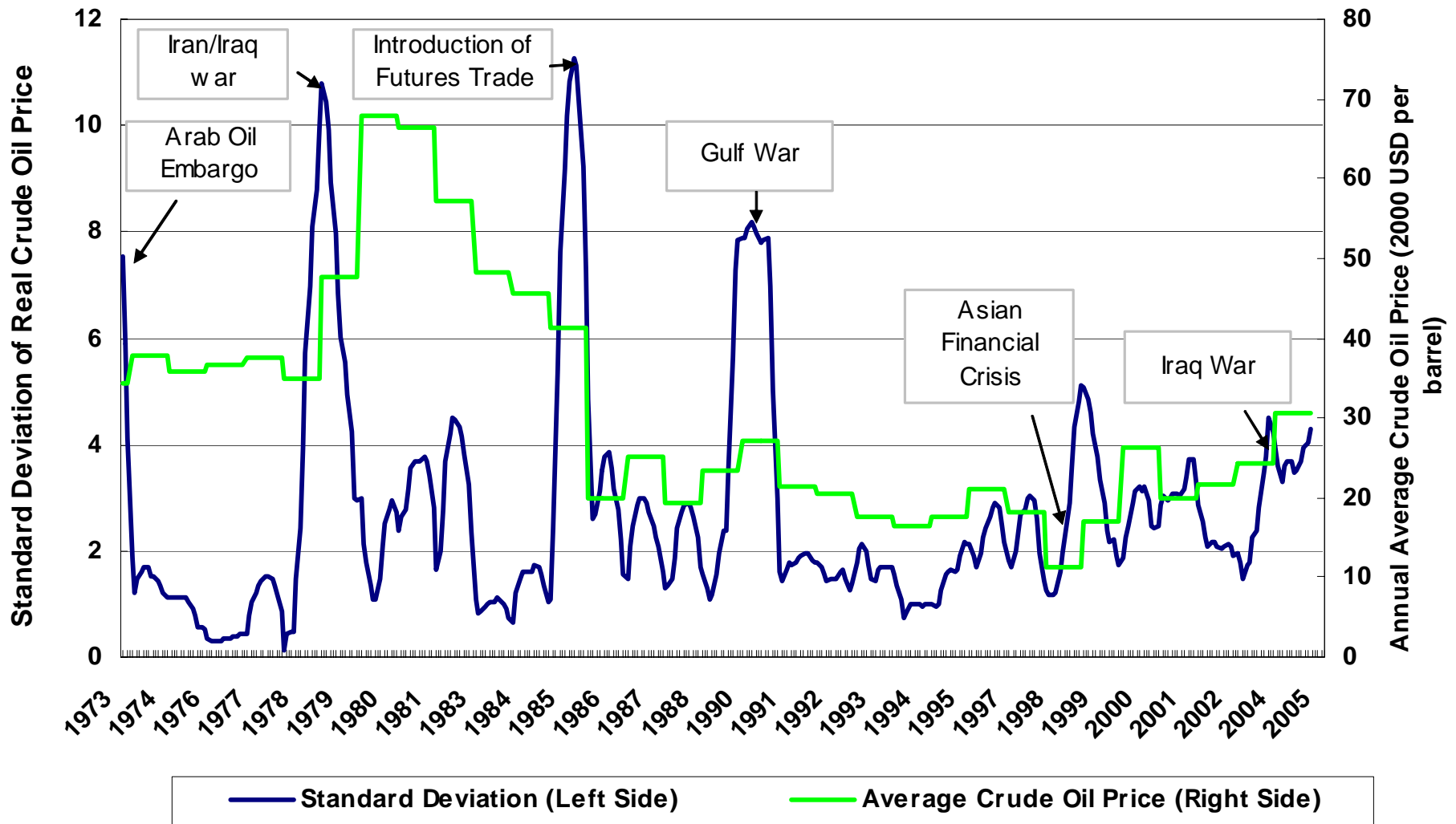
**APERC**  
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# Rising Energy Prices: Oil, Natural Gas and Coal



# Yearly Volatility of Crude Oil Price (1973-2005)



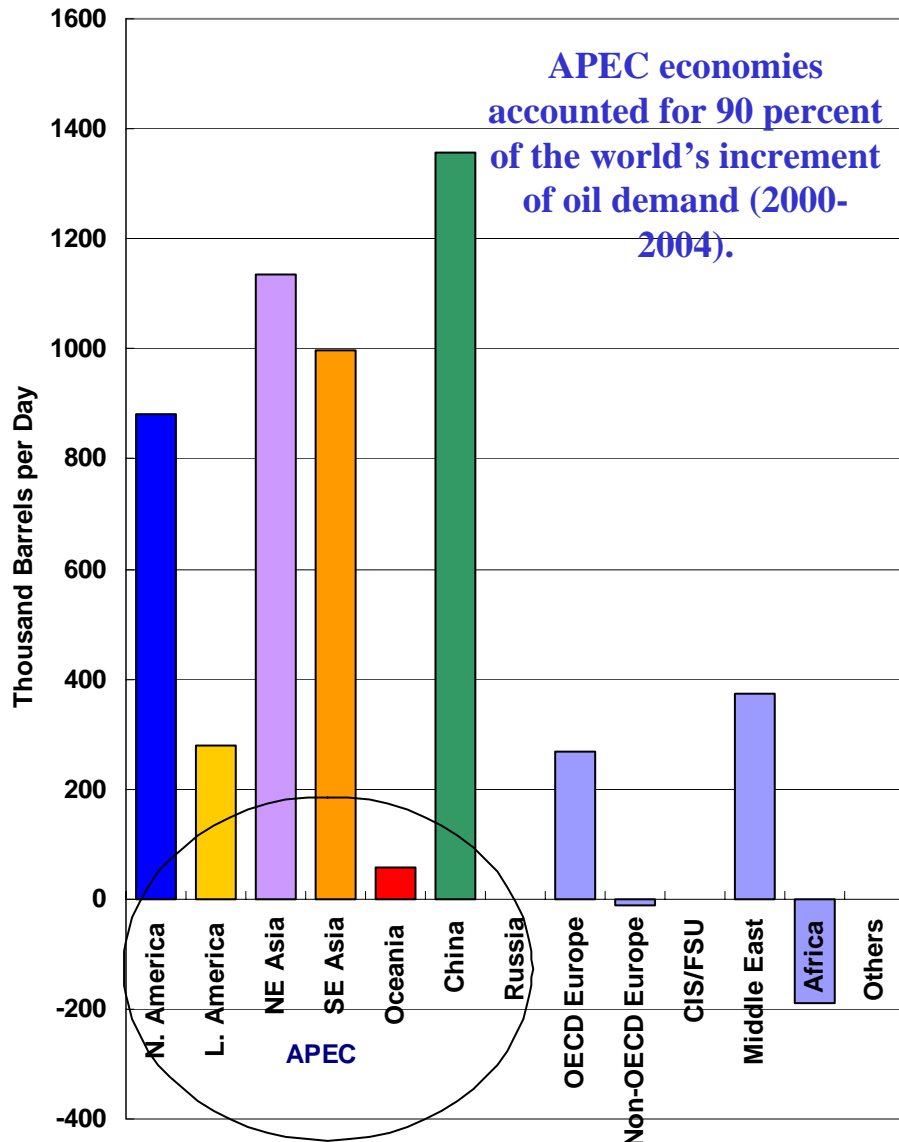
(Source) Asia Pacific Energy Research Centre (2005)

(Note) Yearly volatility represents standard deviation of one year mean value of US FOB crude oil price (2000 real value).



# Drivers for the APEC Energy Demand

## Growth of Oil Demand (2000-2004)



- **Income Growth**

- GDP per capita will grow at an annual rate of 3.5 percent.

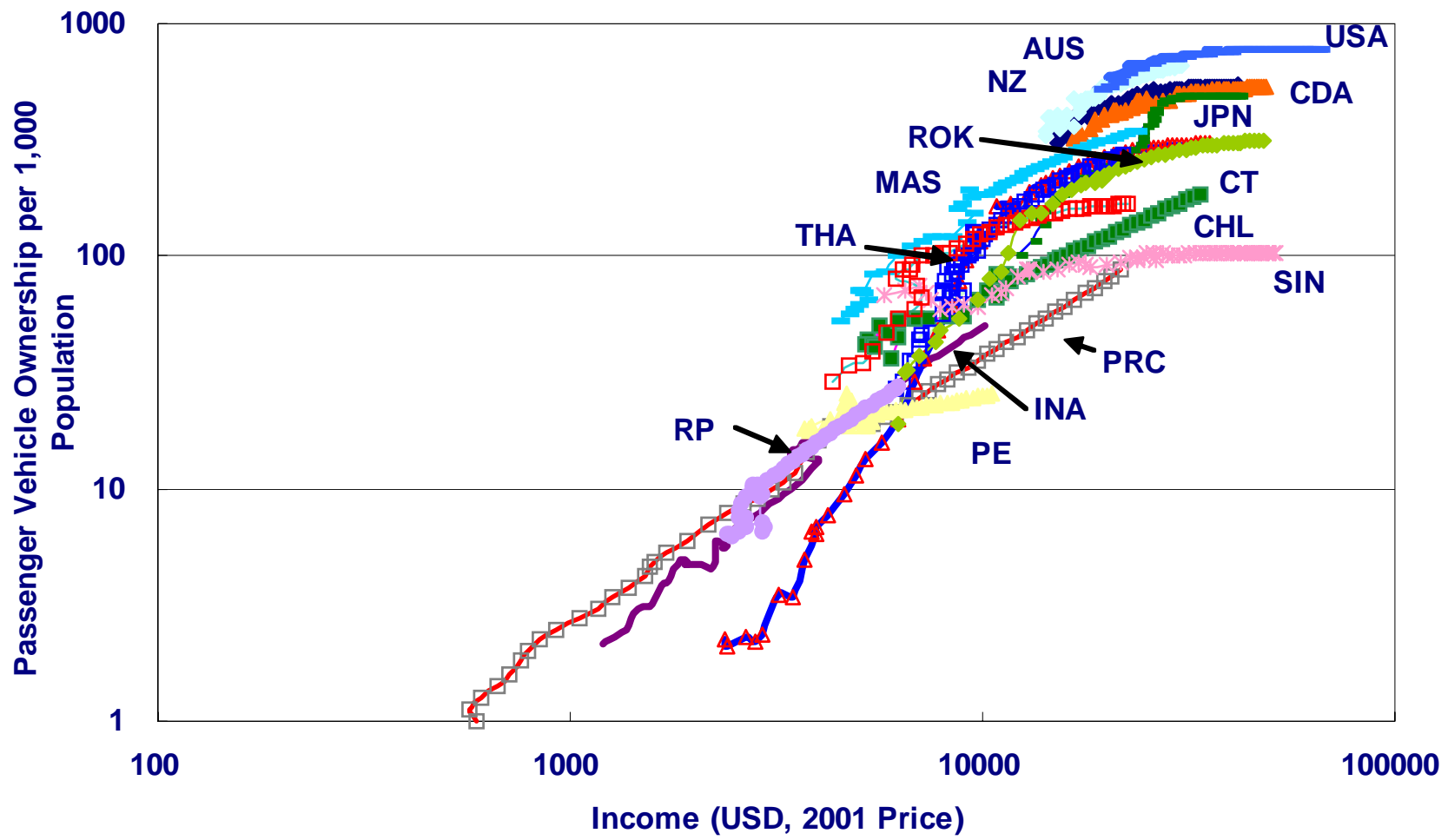
- **Urbanisation**

- By 2030, share of urban population will reach 68 percent of the total from 52 percent in 2003.
  - 26 million people per year will move from rural to urban cities.

- **Industrialisation**

- Industry value added will grow by 4.8 percent per year, while GDP will grow by 4.1 percent per year.

# Income Growth and Fast Pace of Motorisation (1980-2030)



◆ AUS	■ CHL	▲ CDA	□ PRC	— INA	△ ROK	— JPN
— MAS	◆ NZ	□ MEX	▲ PE	× PNG	× SIN	— RP
— RUS	— USA	□ THA	◆ CT			

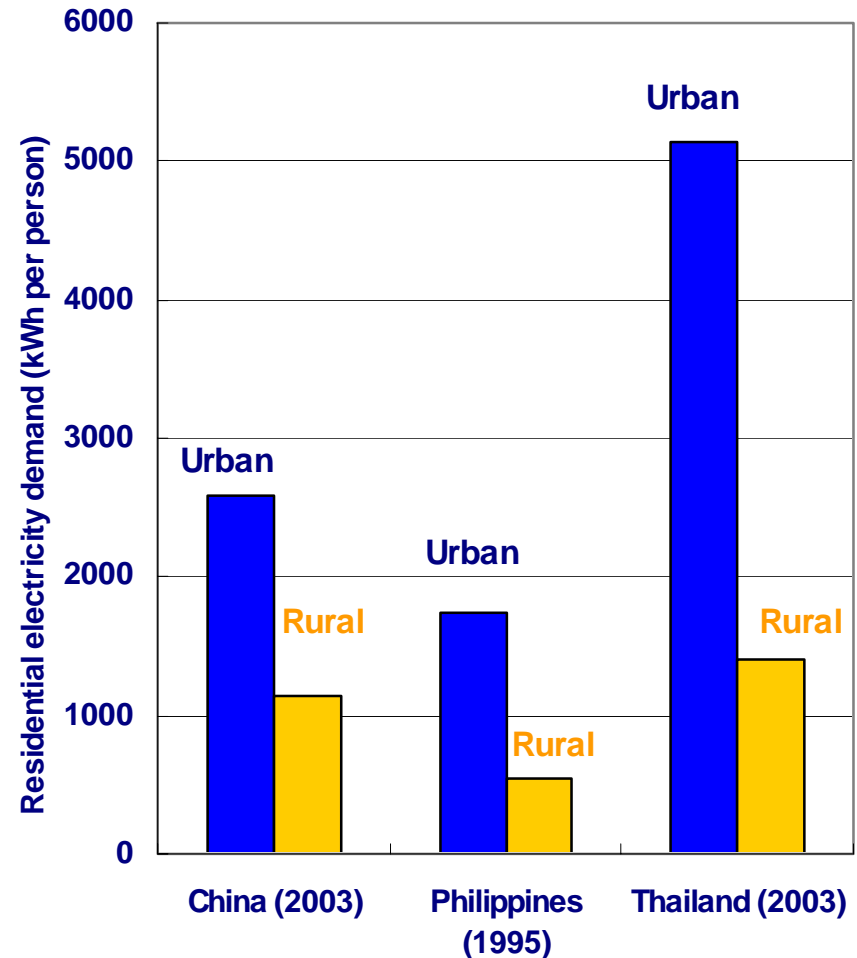
(Source) Asia Pacific Energy Research Centre (2005)

# Urbanisation and Residential Energy Demand in the Selected APEC Economies

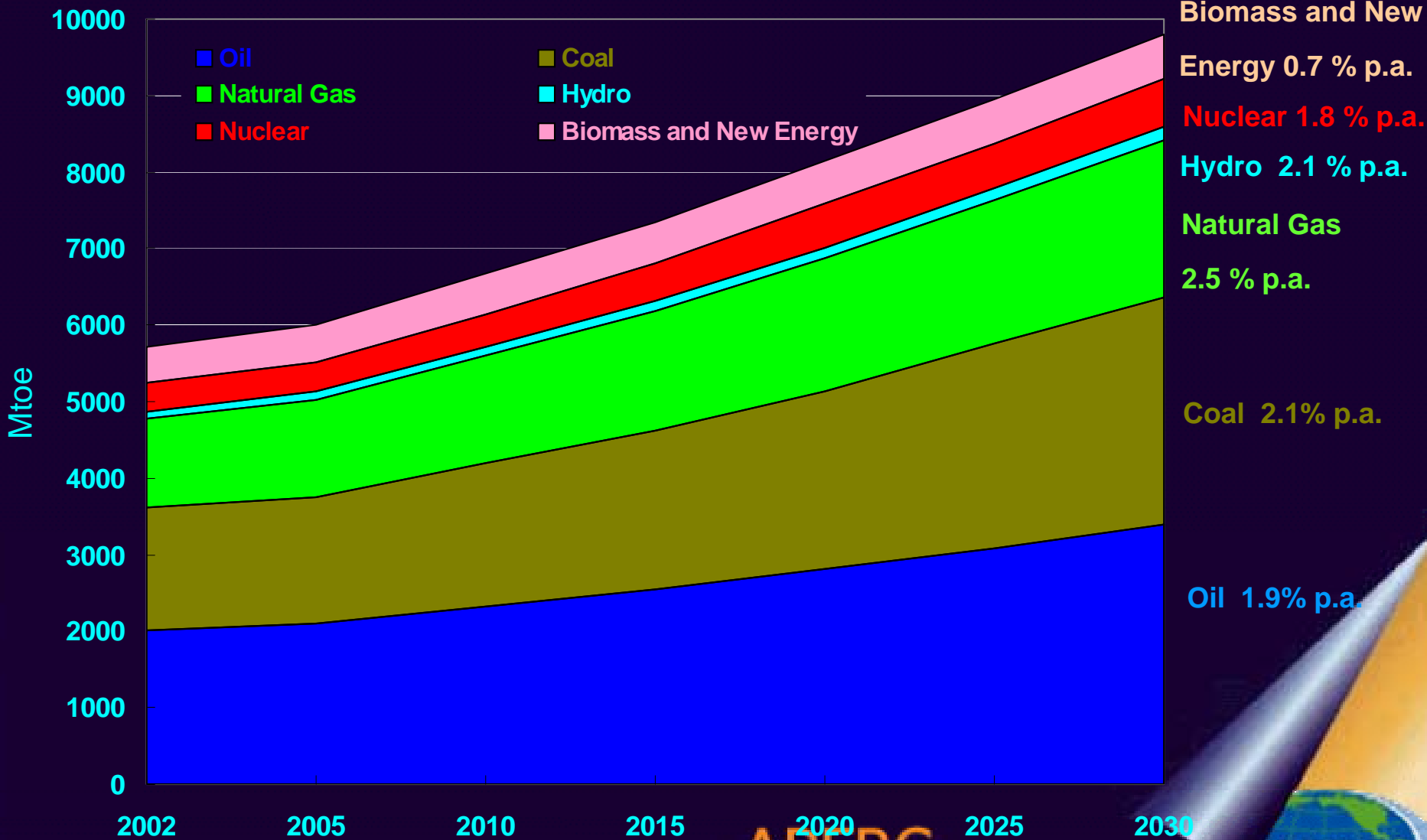
## Urbanisation

	Urban Population (Millions)		Share of Urban Population	
	2003	2030	2003	2030
N. America	261	354	80%	87%
L. America	112	160	76%	84%
NEA Asia	146	159	71%	78%
SEA Asia	210	389	44%	63%
Oceania	22	29	76%	77%
China	504	878	39%	61%
Russia	105	94	73%	78%
<b>APEC</b>	<b>1,360</b>	<b>2,063</b>	<b>52%</b>	<b>68%</b>

## Urban and Rural Residential Electricity Demand Per Person



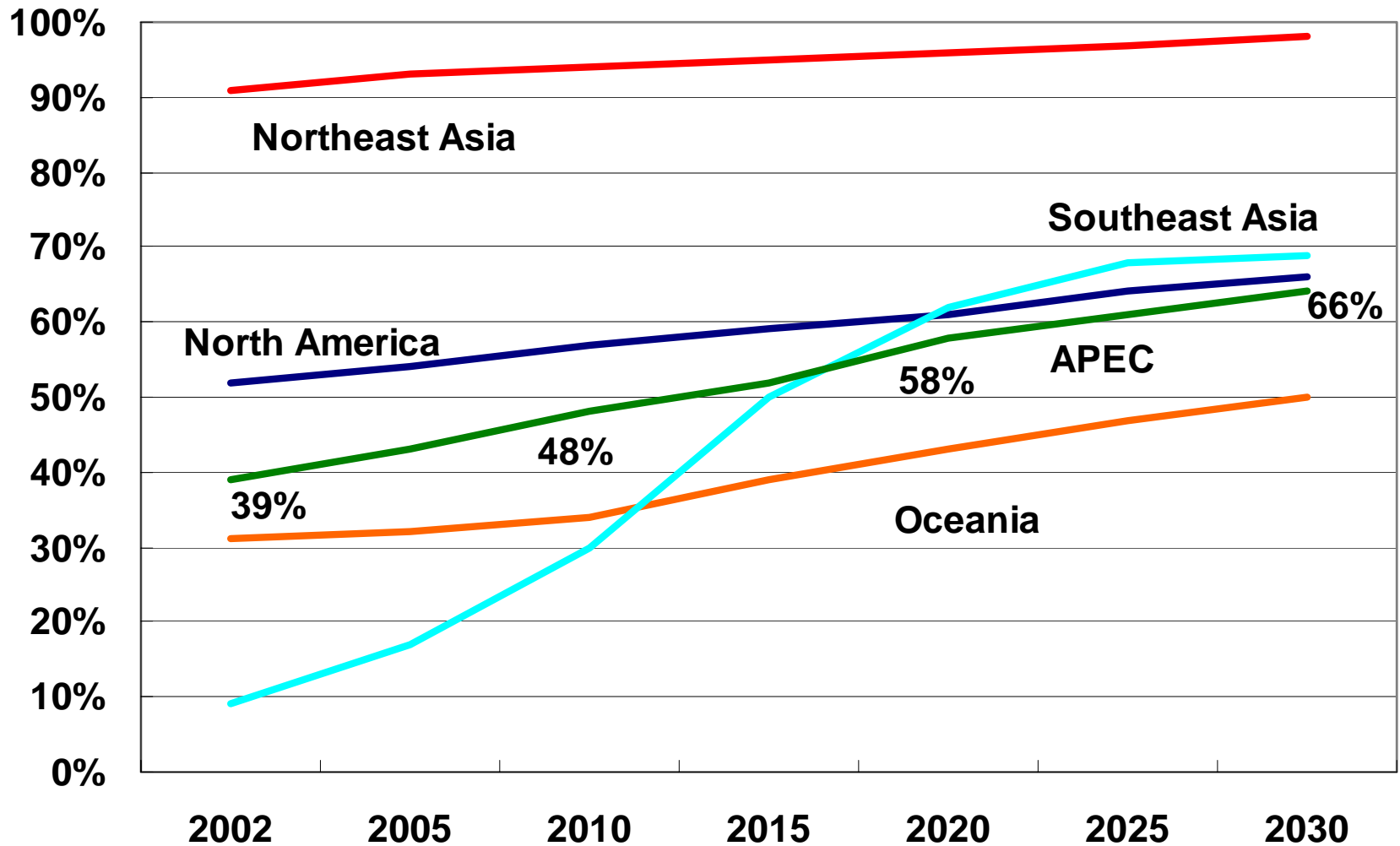
# Total Primary Energy Demand in APEC (2002-2030)



(Source) Asia Pacific Energy Research Centre (2005)

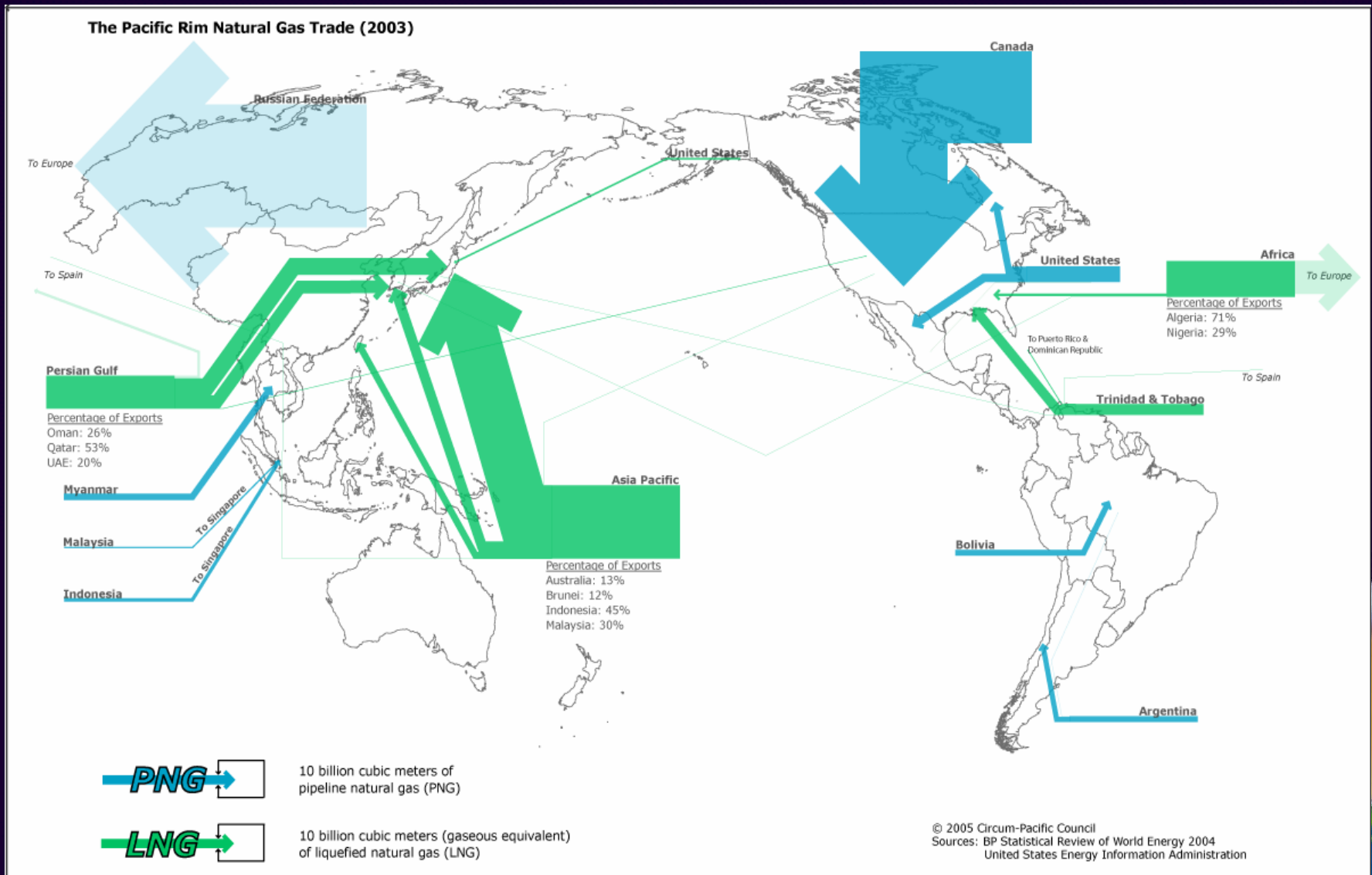


# Rising Oil Import Dependency



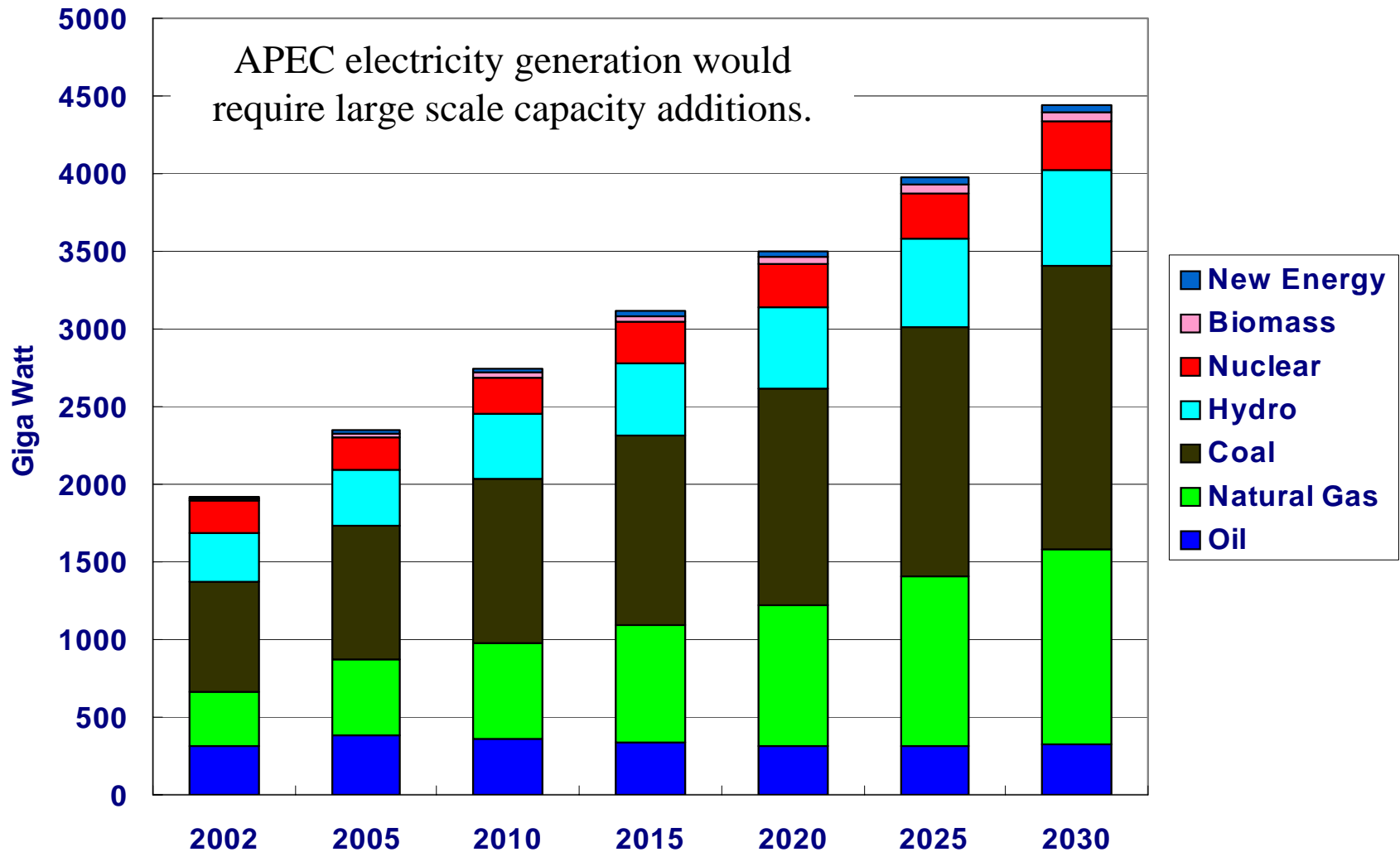


# Natural Gas Trade: LNG and PNG



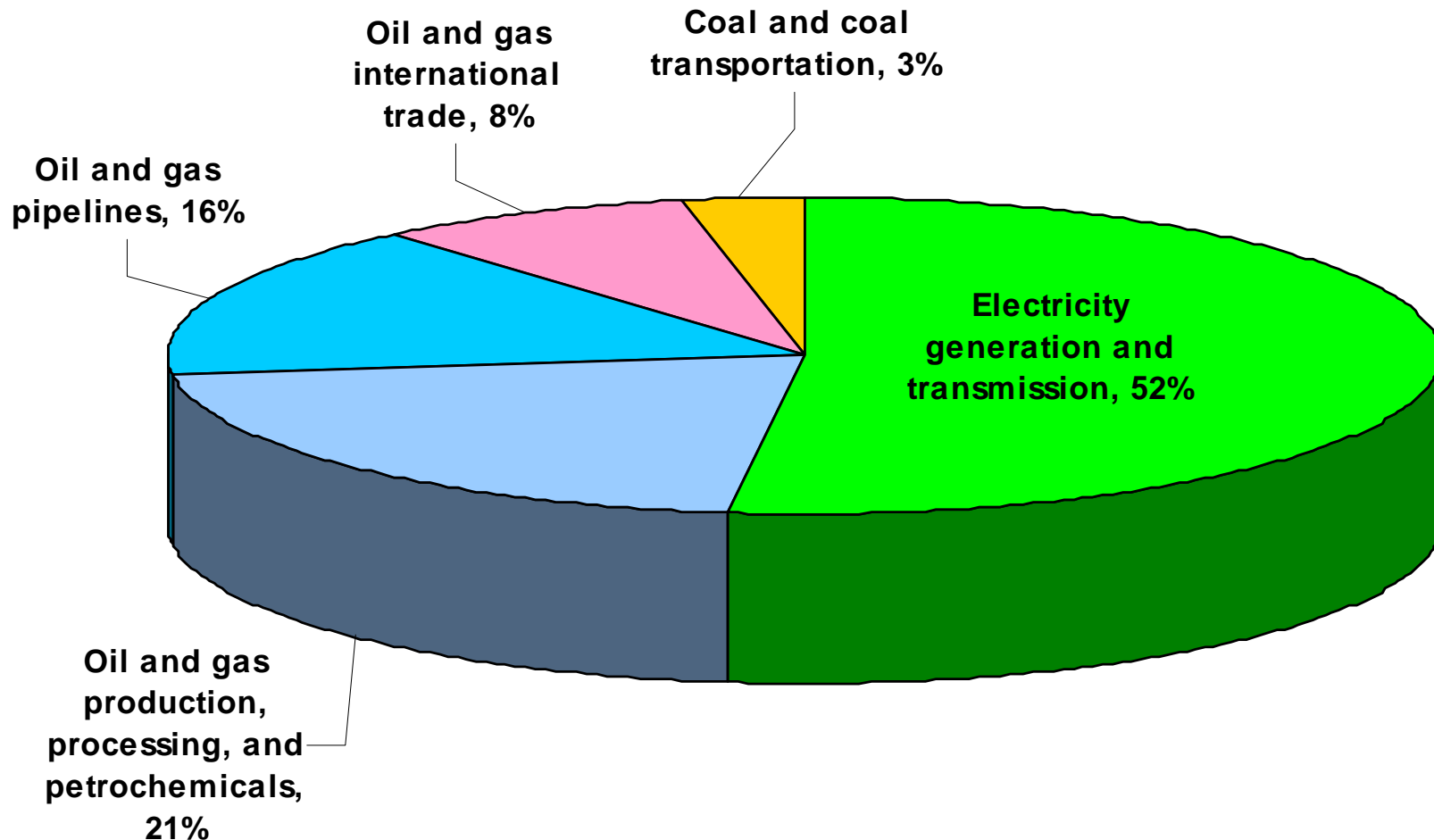
(Source) Circum-Pacific Council (2005)

# Required Capacity for Electricity Generation (2002-2030)



# Energy Investment Requirements in APEC: Between US\$5.3 Trillion to \$6.7 Trillion (2002-2030)

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# Challenges for the Energy Sector of APEC

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- **Energy Security**

- Increasing Import Dependency
  - Oil and Natural Gas
- Growing Need for Energy Infrastructure
  - Tankers, Pipeline, Refineries, Power Plants, and etc.
- Looming Shortage of Human Resources for Energy Sector
  - Engineers, Operators and Scientists
- Increasing Flow of Energy Transportation
  - Maritime Congestion, Sea-lane Security, Long Distance Pipeline Security

- **Investment**

- Substantial Investment Requirements
  - Upstream, Midstream and Downstream

- **Environment**

- Damaging Impact from Expansive Energy Use on Environment
  - Local and Global

# Options for the Future

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- **Enhancing Energy Efficiency Improvement**
  - Supply Side
    - CCGT, Clean Coal Technology, Fuel Cells
  - Demand Side
    - Electricity Appliances: Air Conditioner, Refrigerator, Washing Machine
    - Automobile: Fuel Efficient Automobile, Hybrid Vehicle
- **Developing Alternative Energy Sources**
  - New and Renewable Sources, Bio Fuels, Non-conventional Oil, LNG, and Advanced Nuclear
- **Promoting Cross-border Resource Allocation**
  - Power Interconnection
  - Oil Pipeline
  - Natural Gas Pipeline
  - Joint Stockpiling: Oil and Natural Gas