



Energy Security in PECC Region

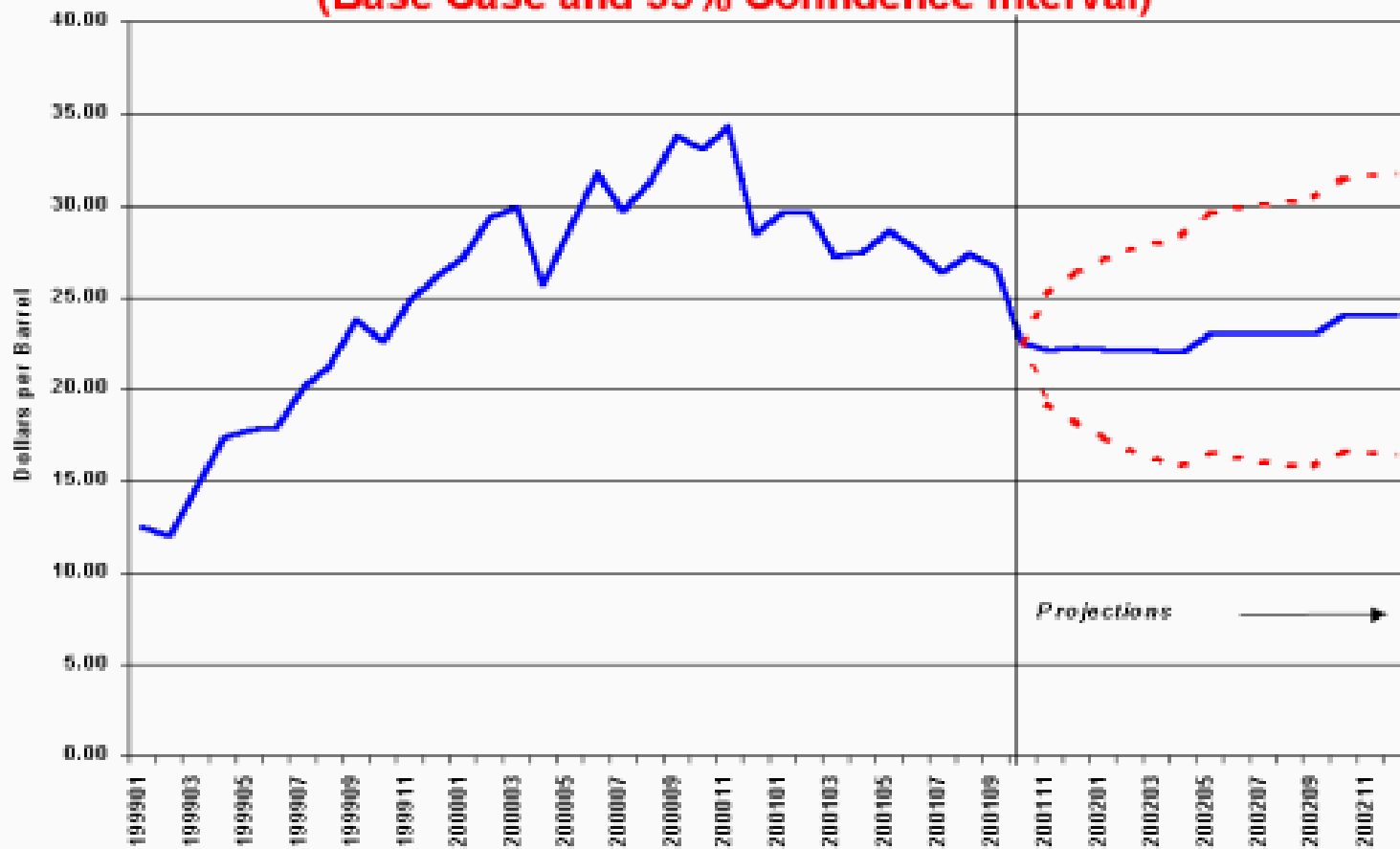
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Taiwan Institute of Economic Research

28-30 November 2001

**Figure 1. WTI Crude Oil Price
(Base Case and 95% Confidence Interval)**



Sources: History: EIA; Projections: Short-Term Energy Outlook, November 2001.



WTI: West Texas Intermediate

World Oil Markets

- ➔ World oil prices initially rose in September following the terrorist attack, but then fell sharply as OPEC reassured world markets that it would maintain plentiful supplies on world markets. Also enhanced by weakening world oil demand, then West Texas Intermediate(WTI) crude oil spot price averaged \$22.6 per barrel in October. Commercial oil stocks in OECD countries are expected to fall well within the average range throughout the forecast.

OIL MARKET VOLATILITY

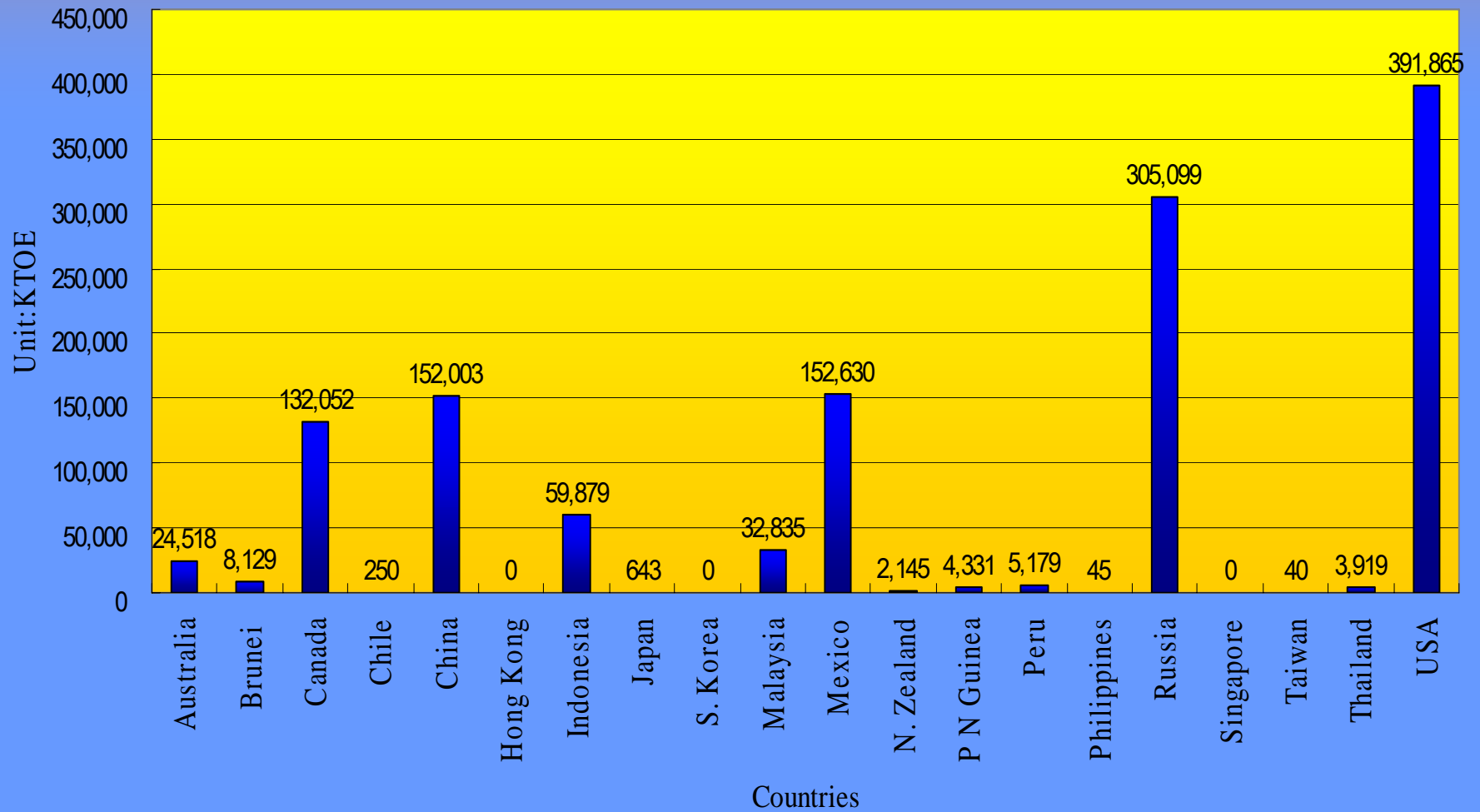
⇒ CONTINGENT CAUSES

- Oil suppliers' Politico-military factors
- Accidental occurrence (e.g. Sept. terrorist attack)
- Market psychology and over reaction

⇒ STRUCTURAL CAUSES

- Supply constraints and rapid growth of demand
- Supplier's targeted-price policy
- Side effect of market liberalization
- “Green Impacts” + “Dash for Gas”

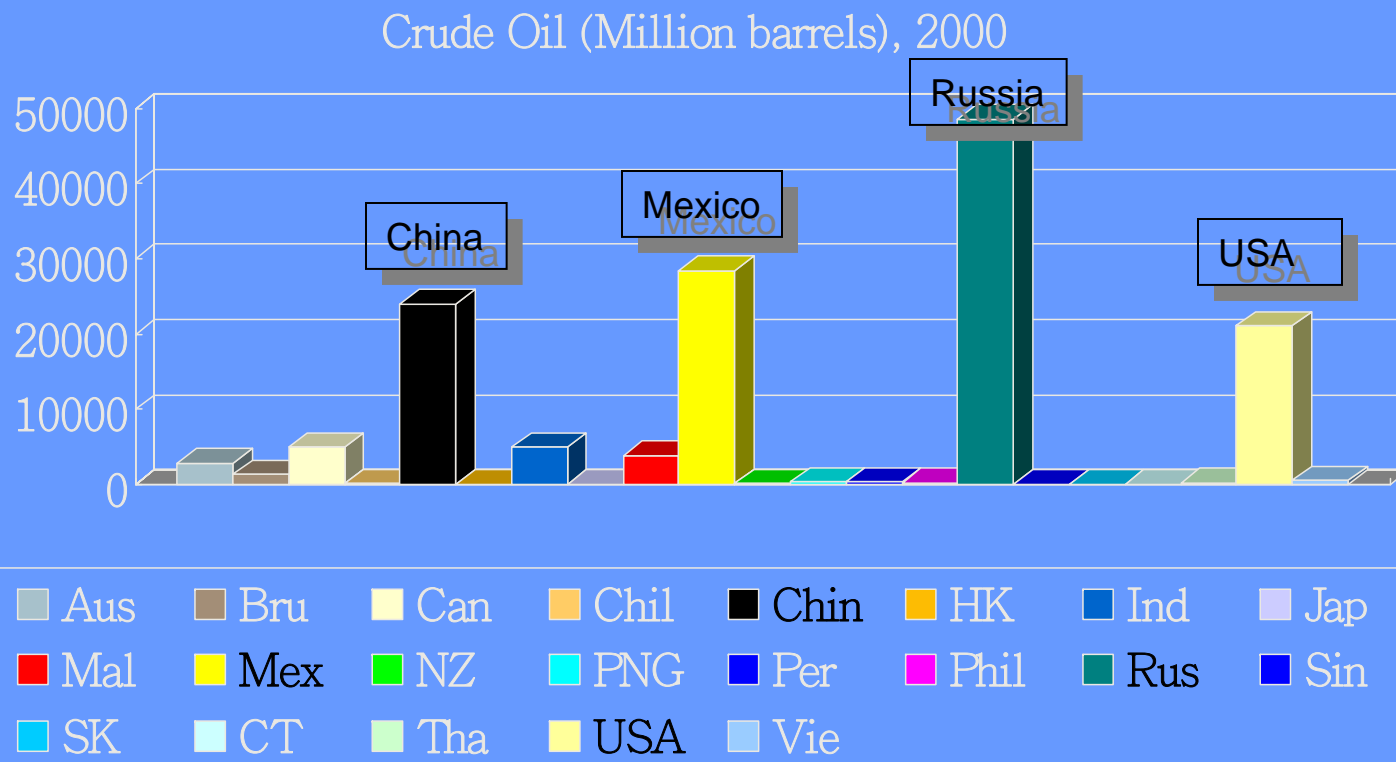
1999 Crude oil & Petroleum Indigenous Production in PECC Region



Source: TIER Calculation based in APEC Energy Data Base (IEEJ)

PECC Energy Supply Indicators

Crude Oil Proved Reserves



Source: Energy Information Administration/ APEC

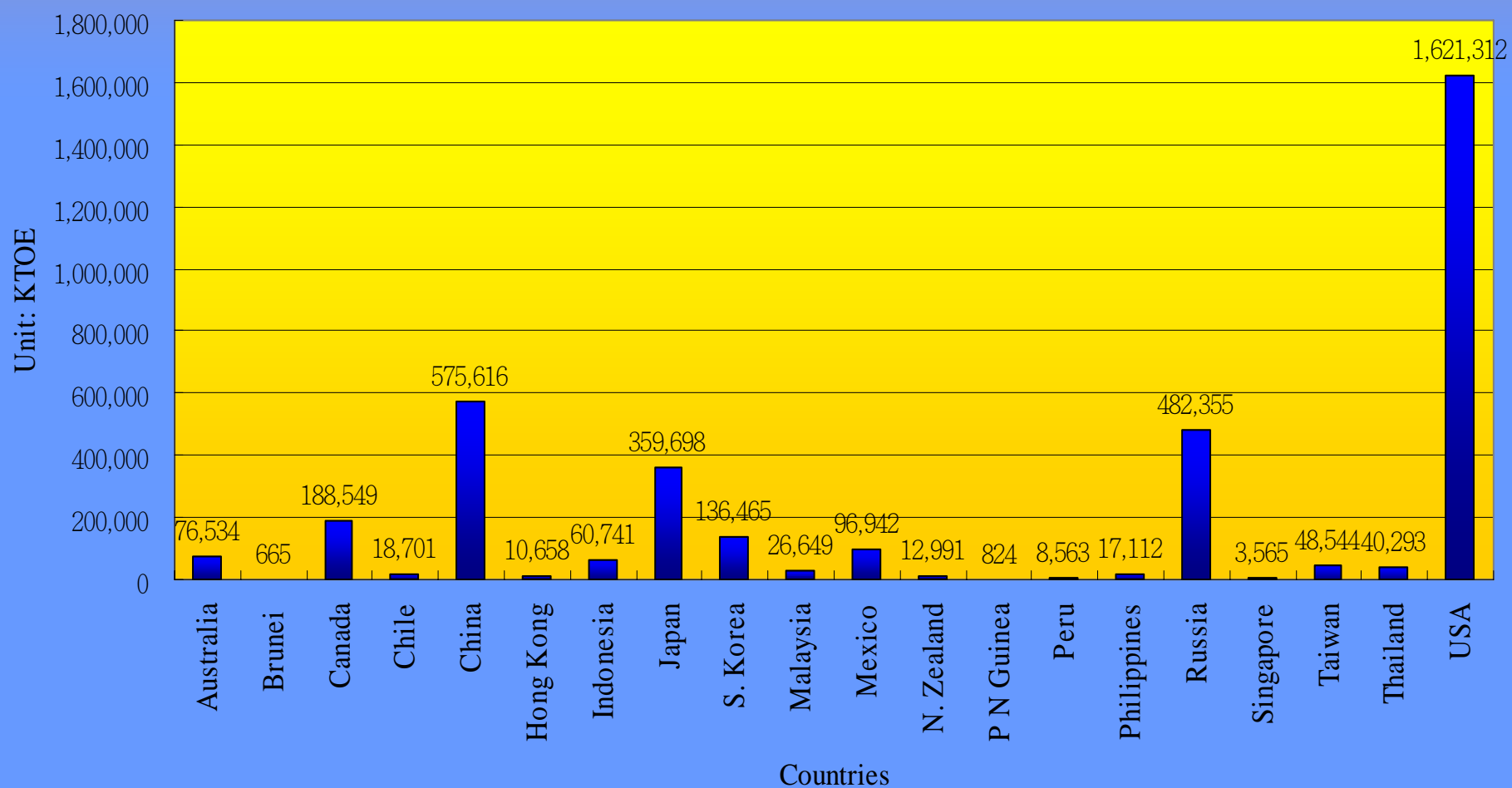
ECONOMIC AND SOCIAL IMPACTS OF OIL MARKET VOLATILITY

- ⇒ It is essential to secure the adequate oil supply at reasonable price for sound and sustainable economic growth and social development.
- ⇒ Yet, the recent oil market volatility is not resource-based. Supply cushion to deal with the fluctuation in supply-demand balance is difficult to work in the short term.



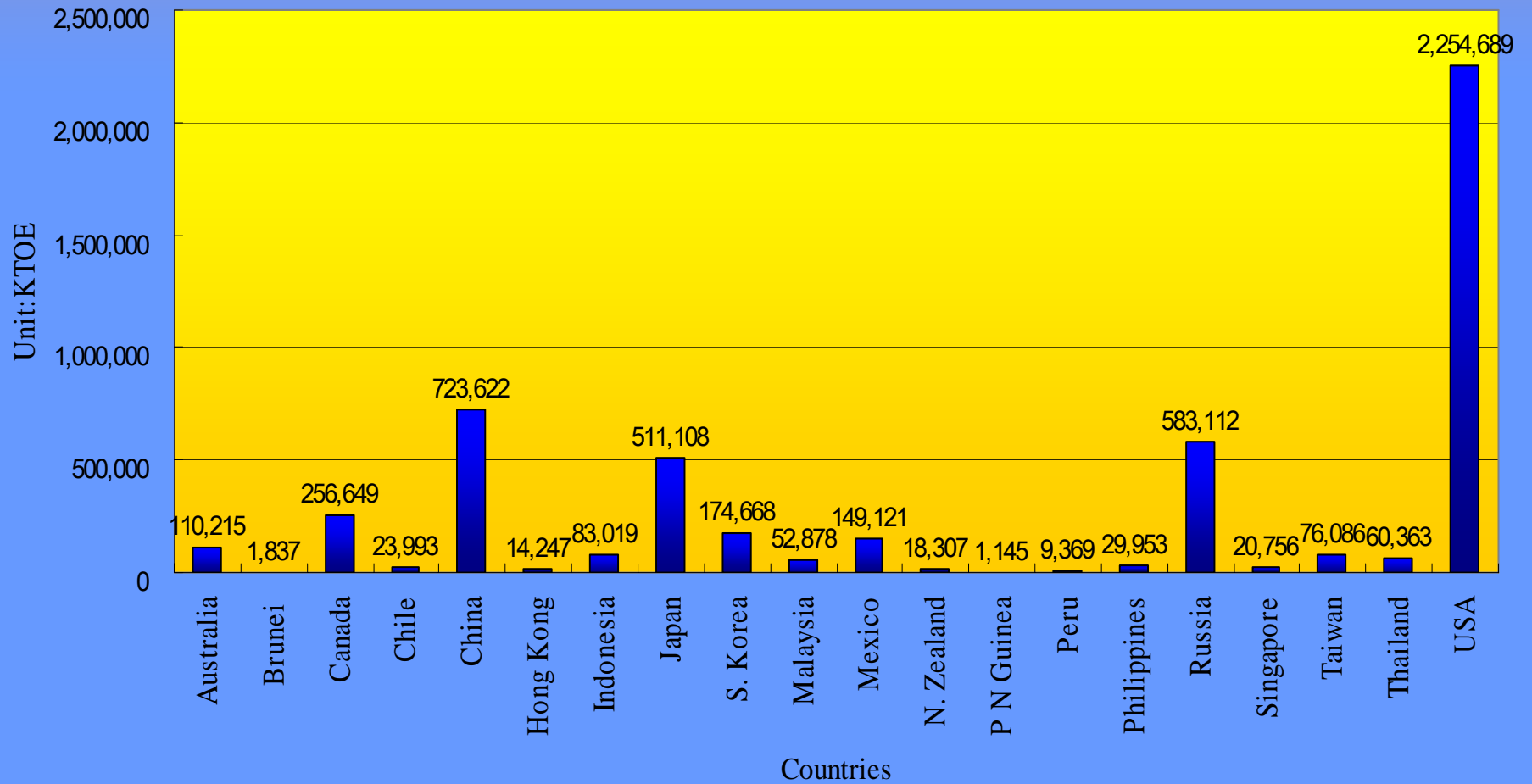
Energy Supply / Demand In PECC Region

1999 Final Energy Consumption of Asian-Pacific Countries



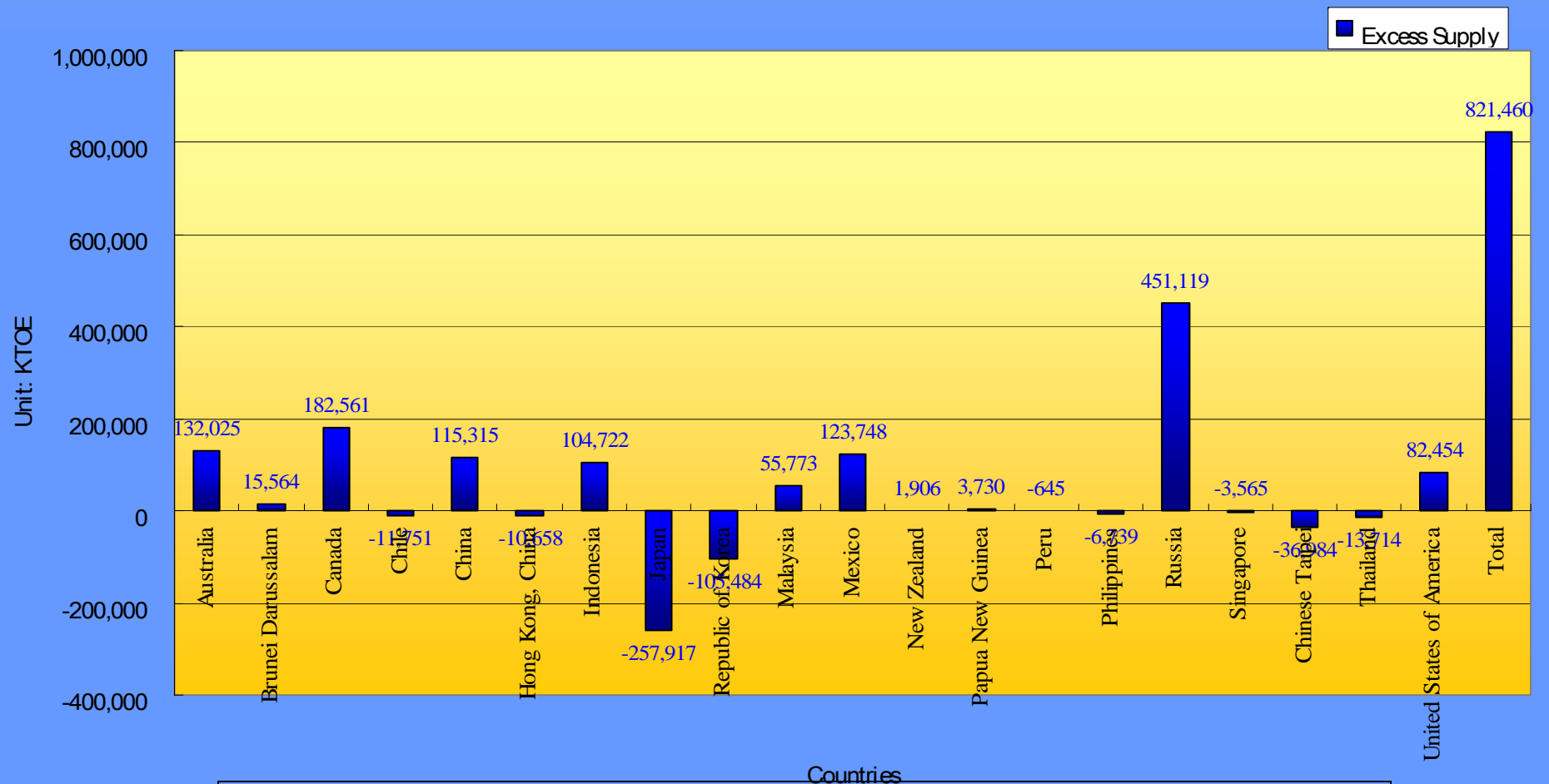
Source: TIER Calculation based in APEC Energy Data Base (IEEJ)

1999 Primary Energy Supply in PECC Region



Source: TIER Calculation based in APEC Energy Data Base (IEEJ)

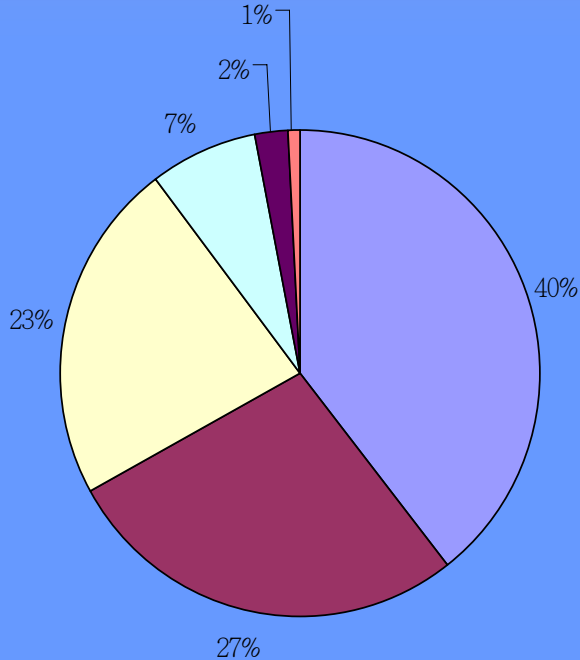
1999 Excess Energy Supply in PECC Region



Excess Supply means (Primary Energy Supply) – (Final Energy Consumption).

Source: TIER Calculation based in APEC Energy Data Base (IEEJ)

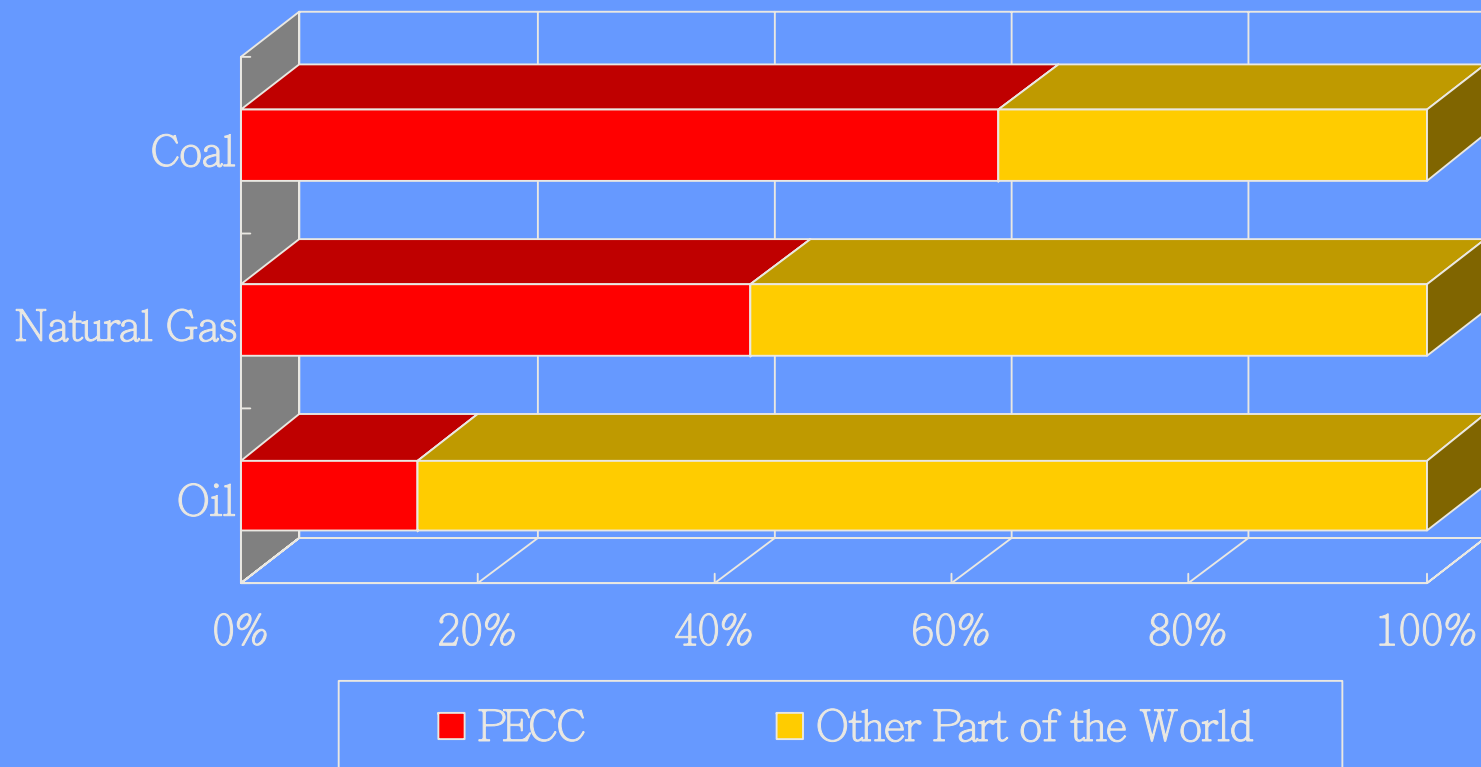
1999 Primary Energy Supply Sources in PECC Region



■ Crude oil & Petroleum ■ Coal ■ Natural Gas ■ Nuclear Power ■ Hydro Power ■ Geothermal, Solar, etc.

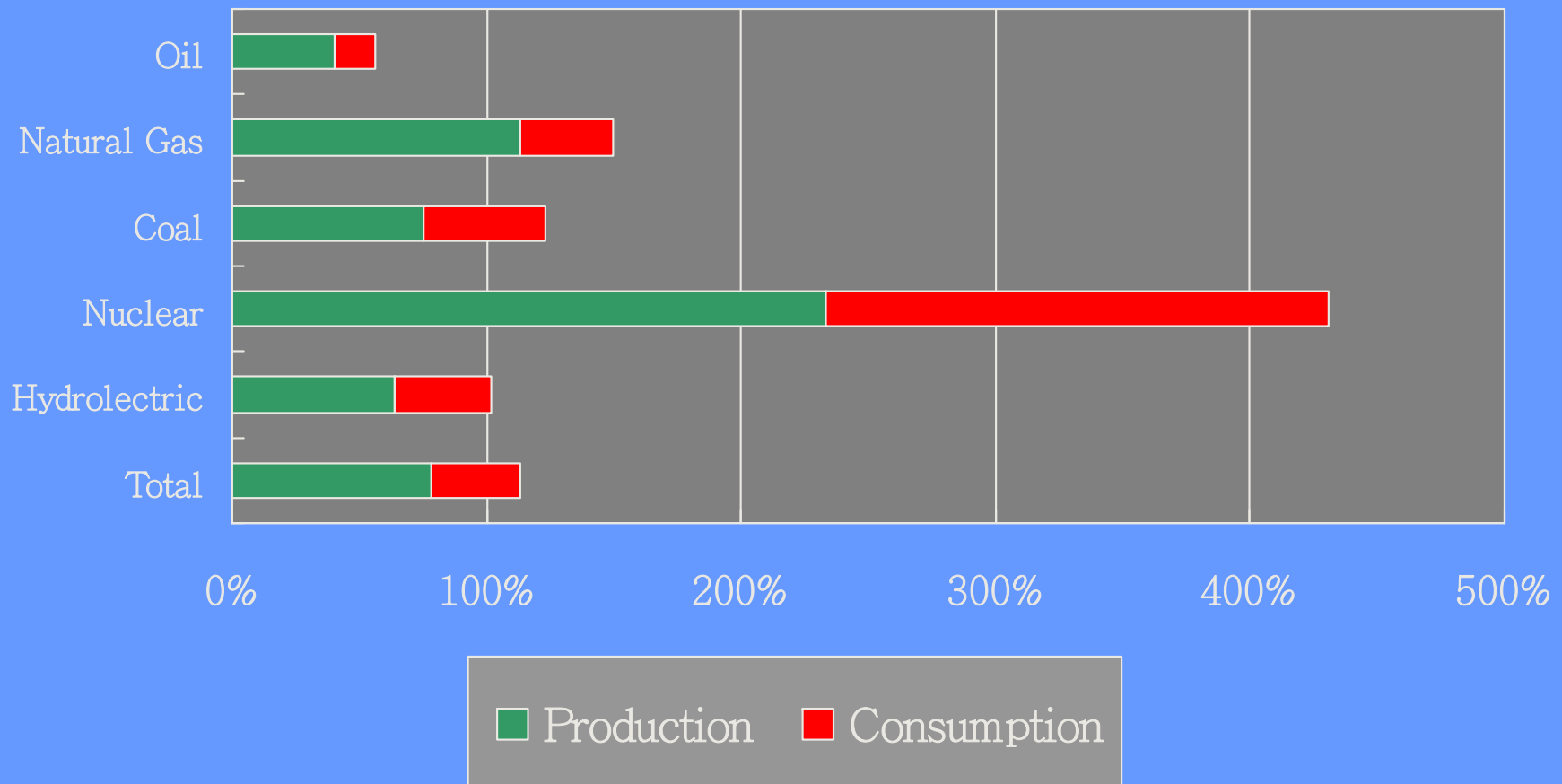
Source: TIER Calculation based in APEC Energy Data Base (IEEJ)

1999 PECC Energy Reserves



Source: TIER Calculation based on B P Amoco
Statistical Review of World Energy, 2000

PECC Energy Production/Consumption Increase in Past 20 years (1980-1999)



Source: APEC Report, EIA 2000

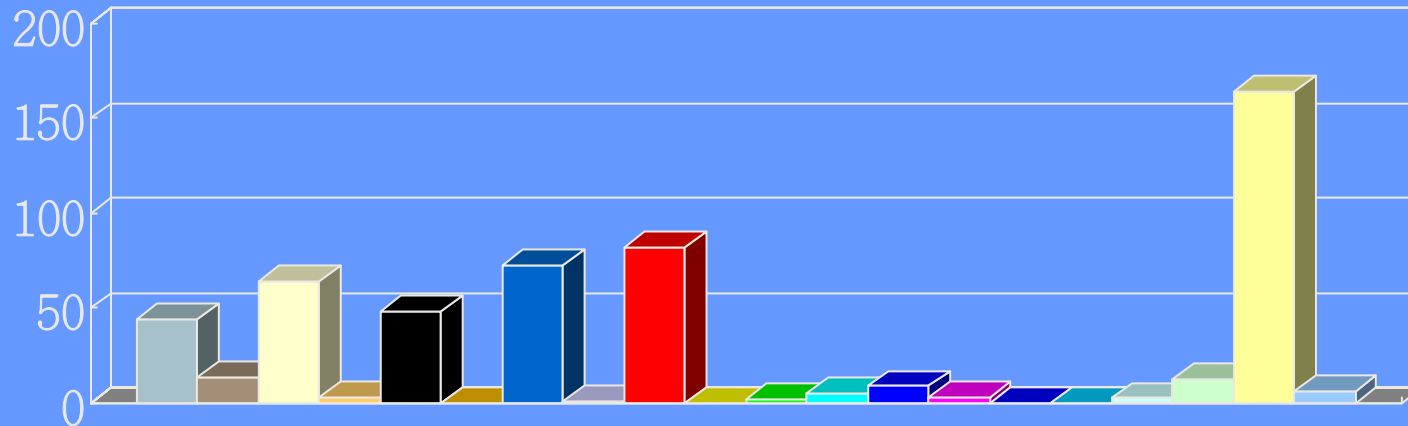
Promotion of Natural Gas

- ⇒ Resource Potential in PECC
- ⇒ Numbers of LNG, P/L projects being examined or implemented, eg. China, Korea, Taiwan, ASEAN countries.
- ⇒ Advanced Technologies
- ⇒ Advantage as a “Clean Fuel”
- ⇒ But constraints are: Price competitiveness, requirement for large-scale investment in infrastructure buildup.

PECC Energy Supply Indicators

Natural Gas Proved Reserves

Natural Gas (Trillion cubic feet), 2000



+ Russia: 1700



Source: Energy Information Administration/ APEC

TIER

16

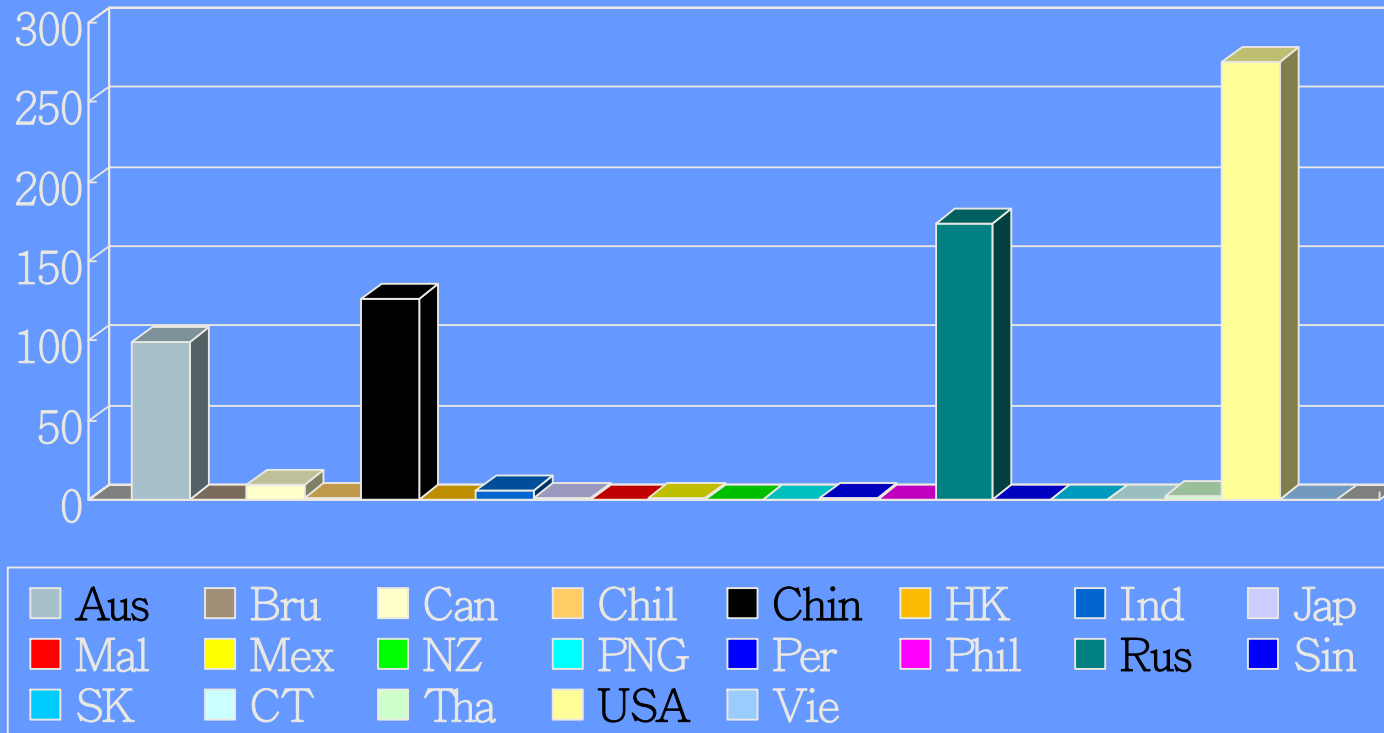
Promotion of Coal

- ⇒ Abundant resource potential, eg. China.
- ⇒ Top-class production capacity and record, eg. China: 2nd largest producer.
- ⇒ Availability of Australian coal (3rd largest producer) as regional resource.
- ⇒ Price competitiveness
- ⇒ Promoted as base-load power source in many economies.
- ⇒ But environmental constraints exist (Sox, Nox, Co2 emission). Importance of “clean technology” for further promotion on coal.

PECC Energy Supply Indicator

Coal Proved Reserves

Coal (Billion short tons), 1998



Source: Energy Information Administration/ APEC

Nuclear Power Development in PECC

- ⇒ New plants are constructed in Korea and China.
- ⇒ Stagnation in US.
- ⇒ In most Asia countries, nuclear power is promoted as:
 - ⇒ 1) *Quasi-domestic energy*
 - ⇒ 2) *Mainstream of oil alternative*
 - ⇒ 3) *Important source of base-load power*

Promotion of Energy Conservation

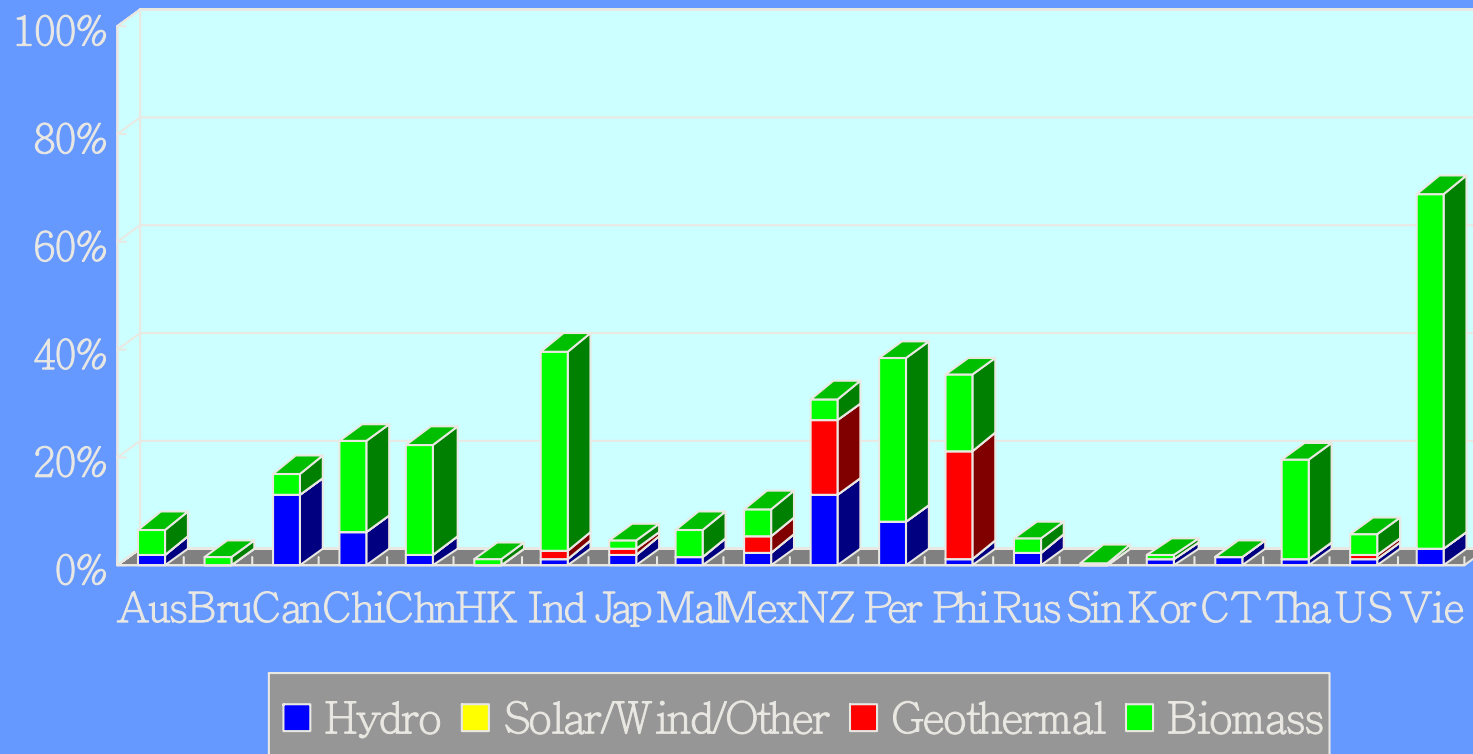
- ⇒ Energy conservation has benefits to:
 - ⇒ *Limit energy demand and imports*
 - ⇒ *Reduce environment load*
 - ⇒ *Enhance economic competitiveness*
- ⇒ Energy conservation is a top priority in many PECC economies. Governments set long-term target for energy conservation.
- ⇒ In reality, however, energy conservation is difficult to achieve due to the “income effect”. Energy intensity flattened out or increased in many economies.



Alternative Energy

Outlook of Renewable Energy

PECC Domestic Renewable Energy Share of the Primary Energy supply



Source: APEC Energy Data Base (IEEJ), 2000

CONSTRAINTS FOR RENEWABLE ENERGY

- ⇒ Relatively low price of fossil fuels
- ⇒ High initial investment costs
- ⇒ Lack of information dissemination
- ⇒ Ineffective distribution and marketing

Outlook of RENEWABLE ENERGY

- ⇒ The renewable portfolio is diversified geographically in response to available resources and technologies, and the level and structure of energy demand.
- ⇒ The portfolio is currently dominated by large-scale hydropower and biomass consumption.
- ⇒ But the development of large-scale hydropower will be limited in the future because of substantial environmental and social impacts.
- ⇒ Other renewable energies (solar, wind, geothermal, etc.) are growing rapidly (500-600% in the past two decades), but from a very small base.
- ⇒ Estimated total share continues to be around 2-8% in the next two decades.

Policies for Energy Security

- ⇒ Diversifying Energy Import Sources
- ⇒ Strengthening Ties with Oil Producers
- ⇒ Investing Overseas Upstream
- ⇒ Introducing Oil Producers' Capital into Domestic Downstream Market

- ➡ In principle, pursuit of energy security by each PECC economy can contribute to enhance energy security in whole PECC region.
- ➡ However, if initiatives to enhance energy security conducted too exclusively, tensions could be generated and escalated among PECC economies, thus damaging regional energy security.

International Strategic Alliance for Energy Security in PECC Region...

- ⇒ International Cooperation for Crude Oil Storage
- ⇒ International Cooperation for Crude Oil Exploration
- ⇒ International Cooperation for Energy Technology



Thank you very much!