APERC Workshop at EWG52
Moscow, Russia, 18 October, 2016

2-1. Energy and Economic Competitiveness

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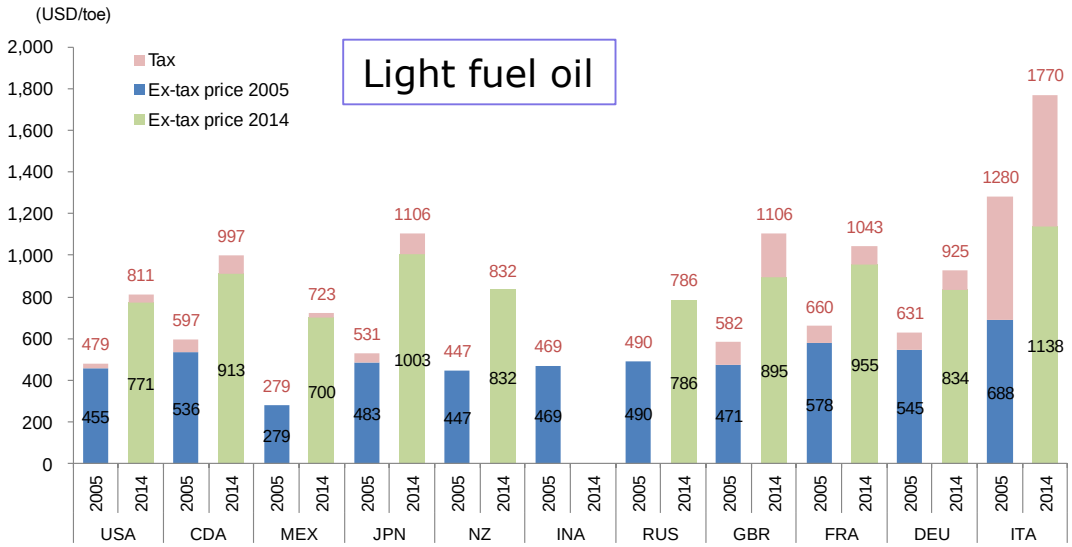
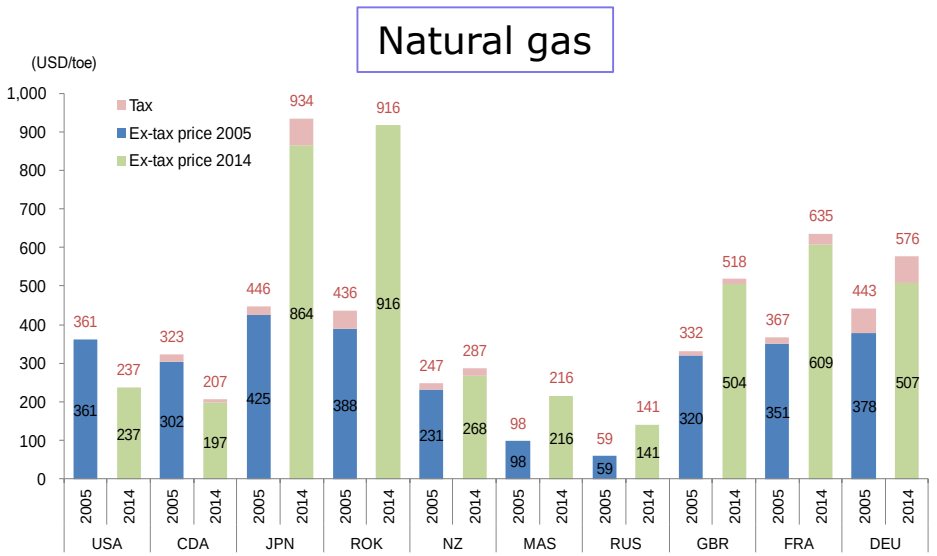
APERC
Asia Pacific Energy Research Centre

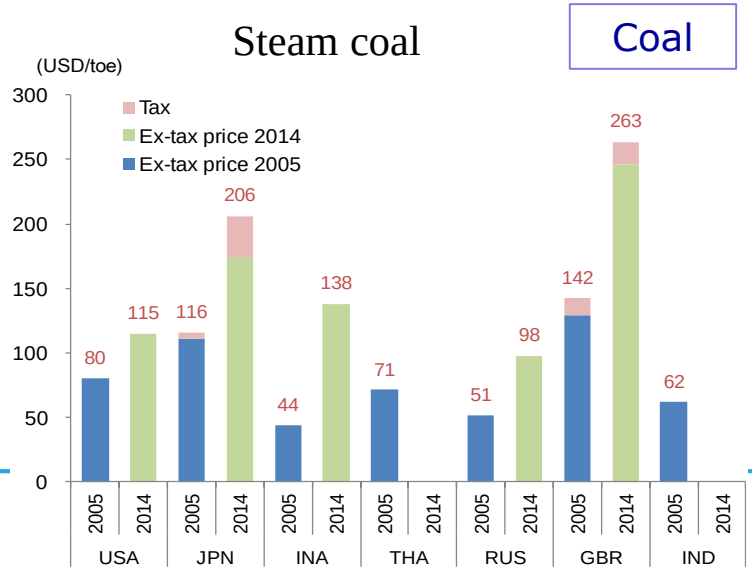
APEC
Asia-Pacific Economic Cooperation

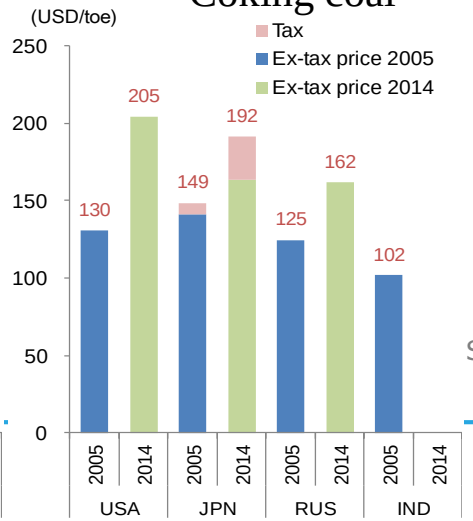
Energy price for industry: Fossil fuels

2005 to 2014 price changes for natural gas were greater than oil and coal.







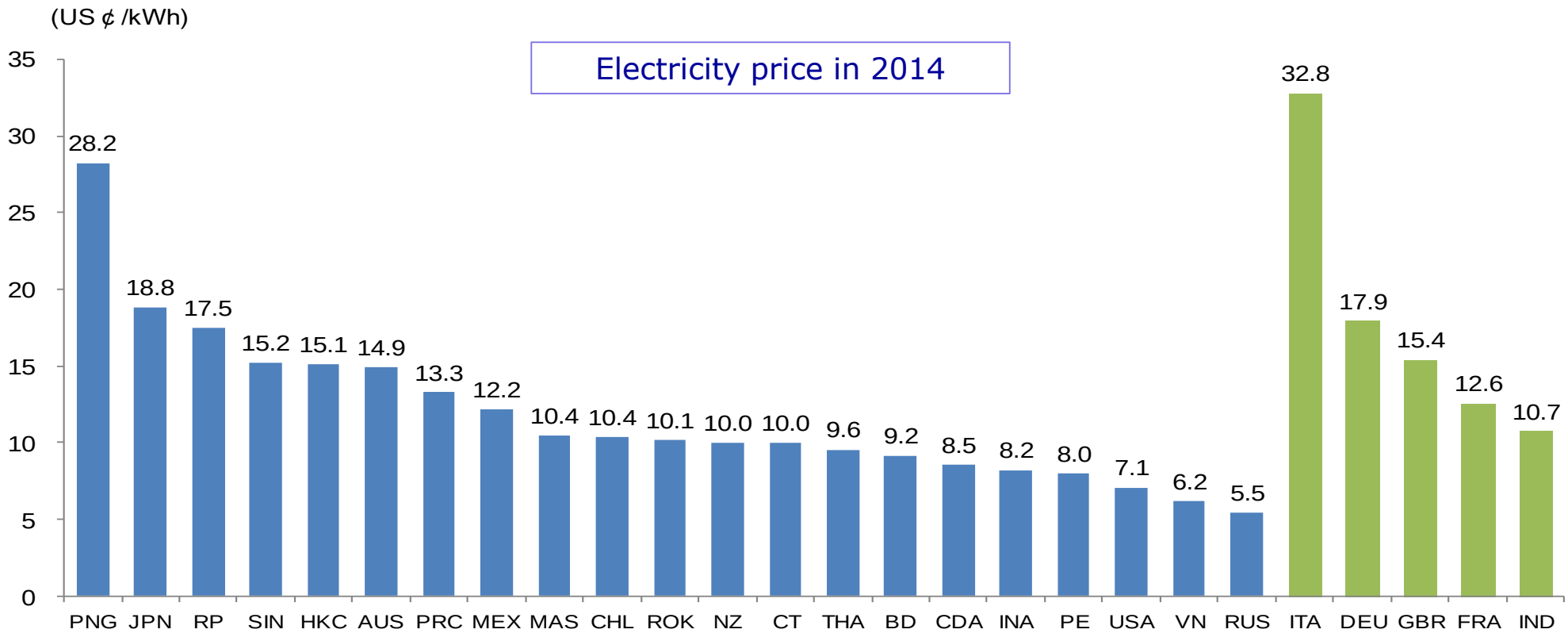


Source: IEA Energy Prices and Taxes, official statistics

Energy price for industry: Electricity

Prices of electricity for industrial use are influenced by the power generation mix, fuel prices, tariff structures, taxes/levies and subsidies.

In APEC, with a high share of coal consumption in the power generation sector, the rise in the electricity price was suppressed.

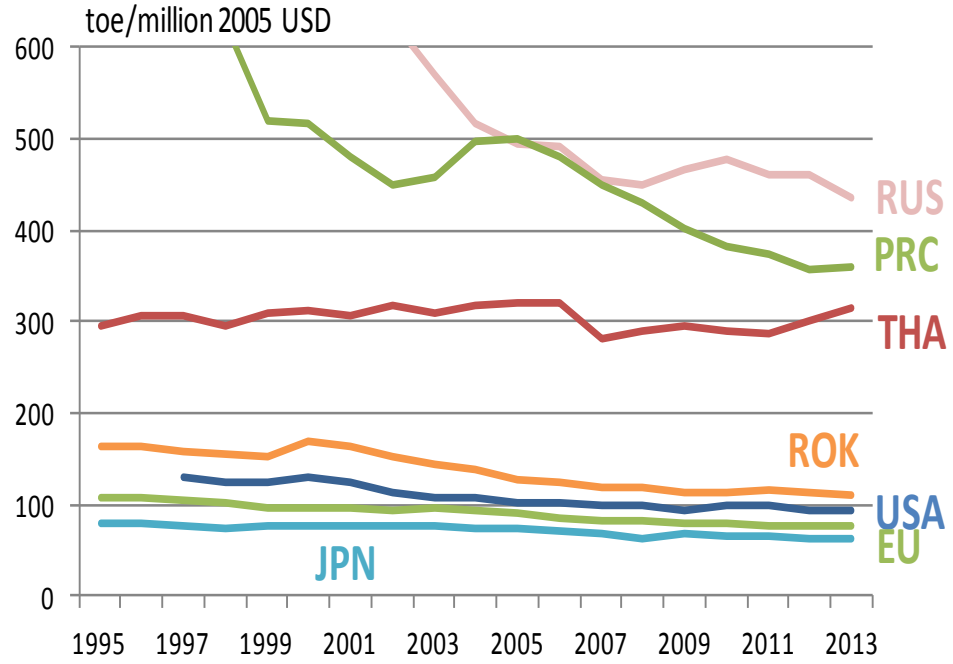


Source: IEA Energy Prices and Taxes, official statistics, and power company reports etc.

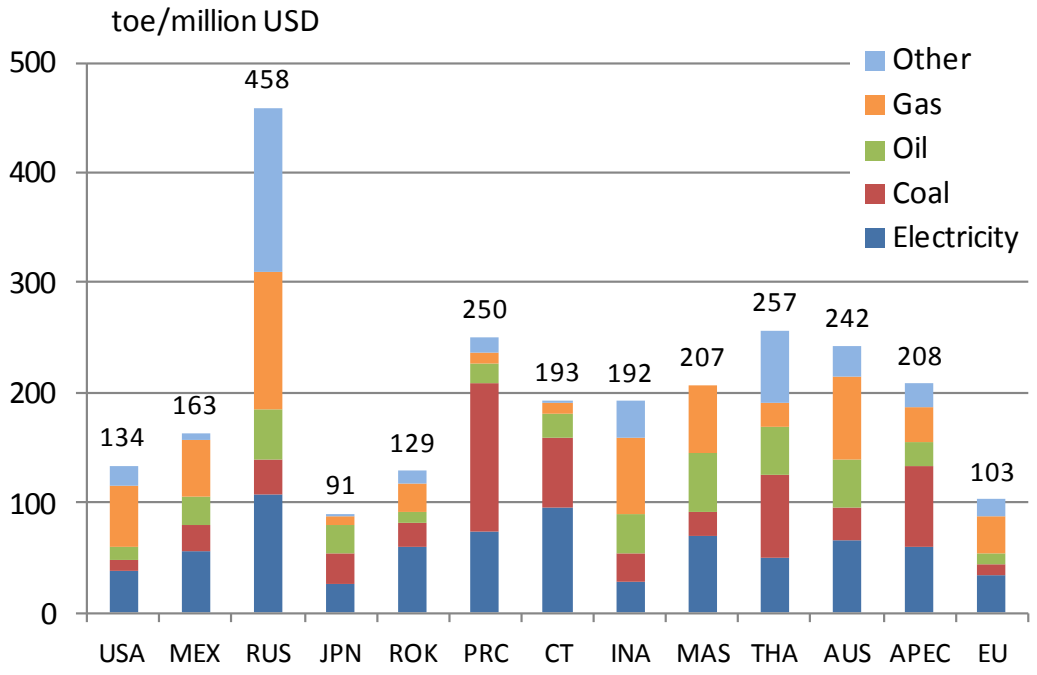
Energy intensity of manufacturing in APEC

With the energy efficiency improvements and structural change, energy consumption per unit of manufacturing production in APEC has steady decreased. However, APEC is still worse than EU. There is large energy saving potential in emerging economies.

Energy intensity of manufacturing, 1995-2013

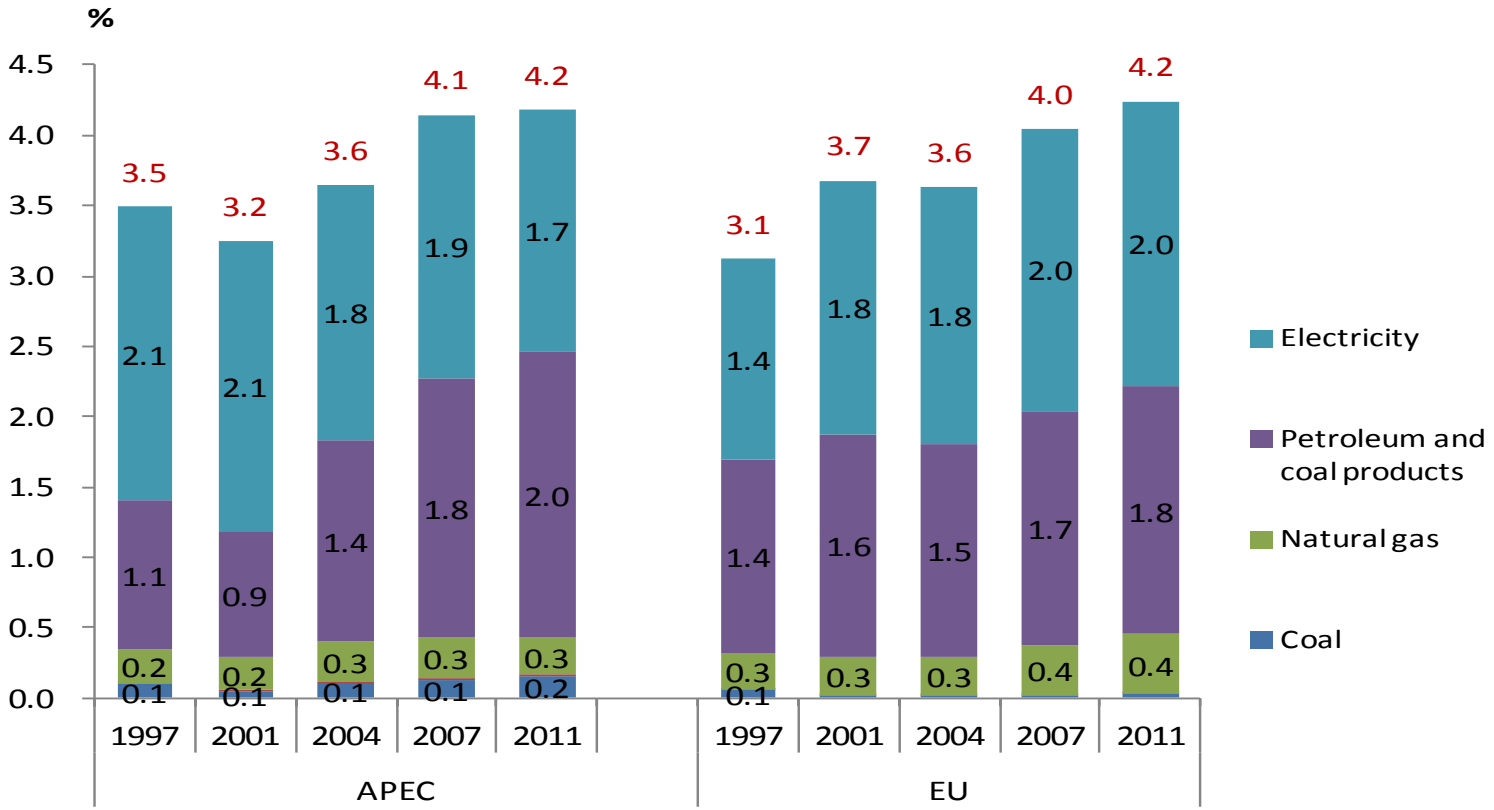


Energy intensity of manufacturing, 2013



Source: IEA Energy Balance, World Bank Development Indicators, National Development Council (Chinese Taipei) Statistical Data Book 2015.

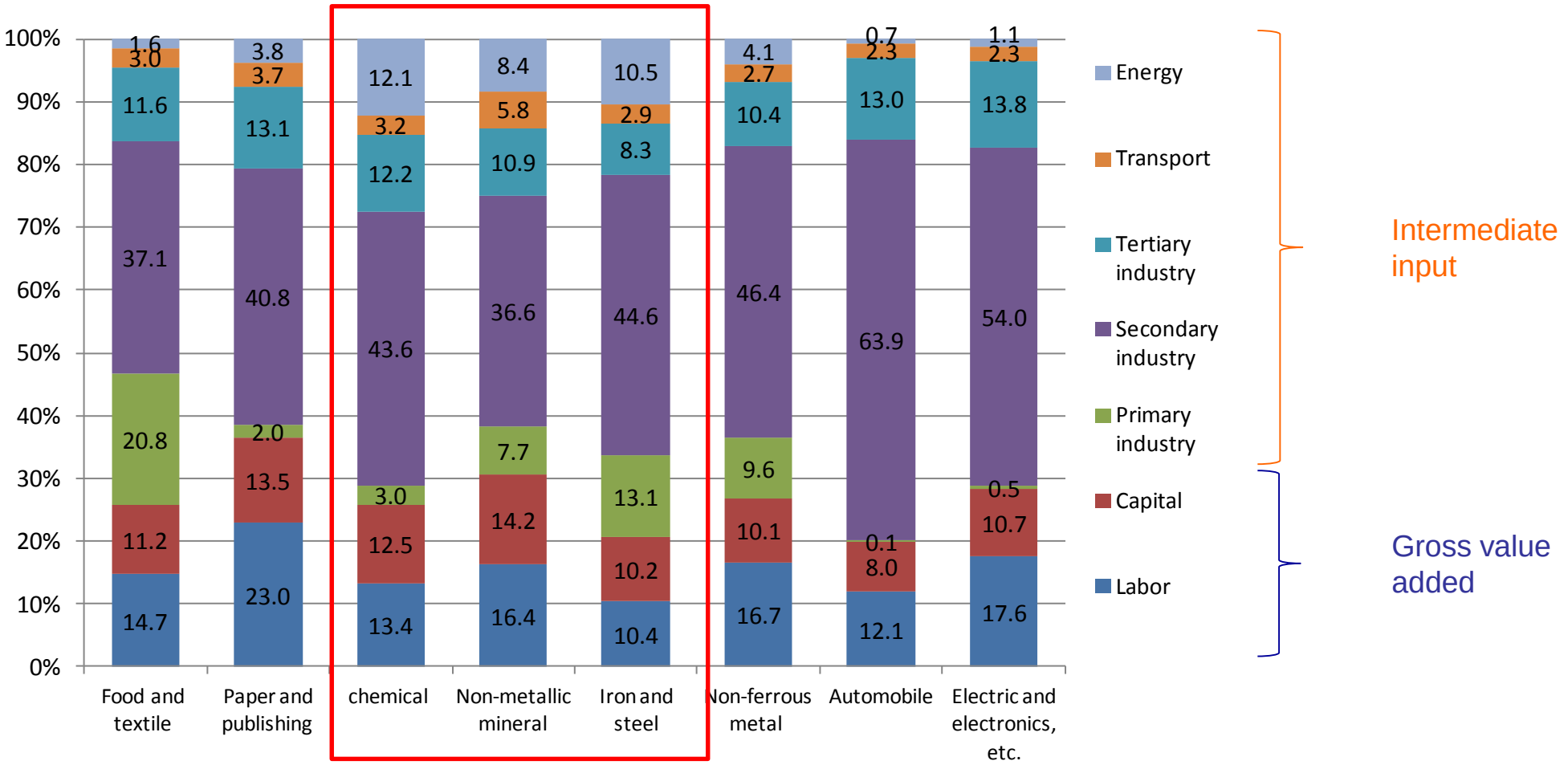
Energy cost of manufacturing in APEC (1)



Note: Manufacturing excludes the petroleum and coal products industry.
Source: Calculated from Global Trade Analysis Project (GTAP) data

Energy cost of manufacturing in APEC (2)

Cost Structure of major industries in APEC（2011）



Source: Calculated from Global Trade Analysis Project (GTAP) data

Competitiveness of APEC manufacturing

Indicators of Competitiveness

- Export value
- Global export share
- Relative Trade Balance（RTB)

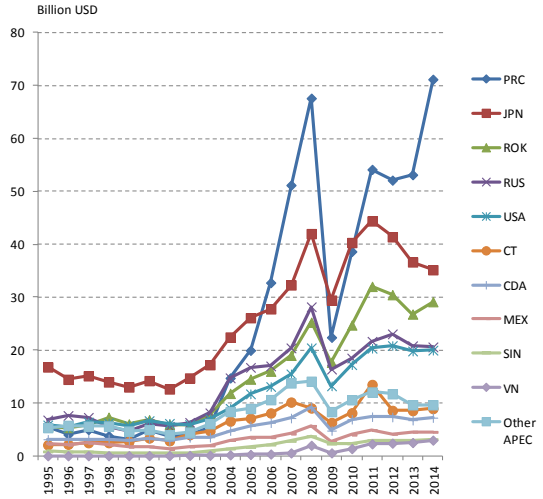
  (Export - Import)/(Export + Import). One of the indicators of exports competitiveness and the value is between -1~+1. As the value is the higher, the exports competitiveness is stronger.

- Revealed Comparative Advantage(RCA)

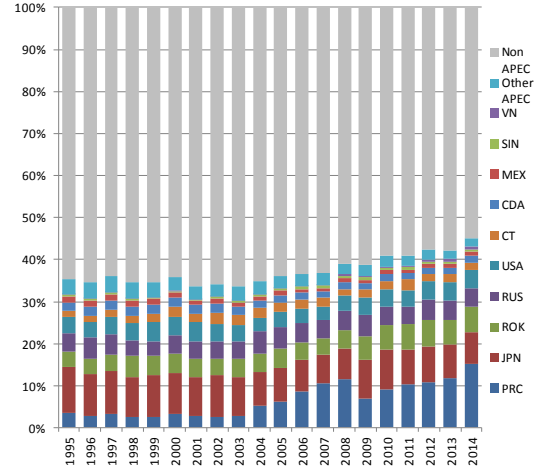
  The share of exports of a certain sector in total exports in an economy, relative to the share of this sector in overall world exports. One of the indicators to show the relative advantage of a sector on export in an economy.

Example: Competitiveness indicators of APEC manufacturing

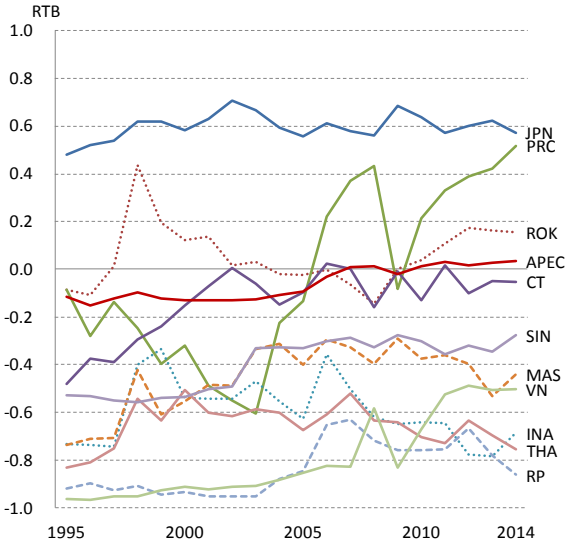
Export value



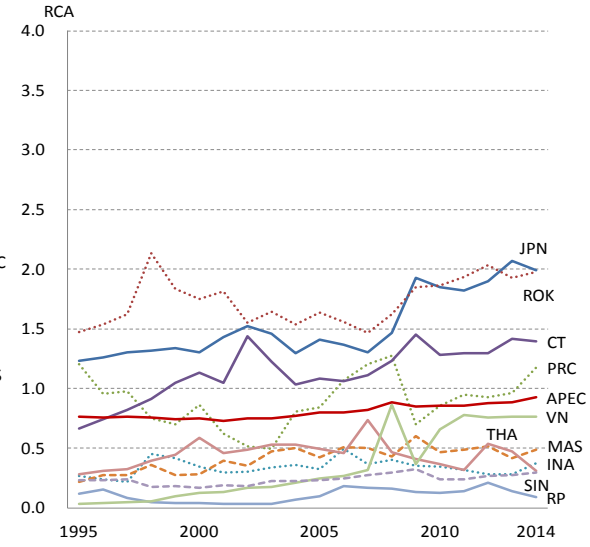
Global export share



Relative Trade Balance (RTB)



Revealed Comparative Advantage (RCA)



Source: APERC

Industrial competitiveness and energy

Regression analysis was used to assess the effect of three variables on the RTB and RCA of energy-intensive industries.

- Electricity price for industry--particularly the relative level of electricity price--has a significant impact on the competitiveness of energy-intensive industries.
- The relationship between energy efficiency and industrial competitiveness was not significant in major APEC economies.
- The relationship between the direct energy cost share and industrial competitiveness was also not significant in each economy during 1997 to 2011.

Impacts of energy on macroeconomy (1): Cases

Global Trade Analysis Project model cases

Case 1: Lower energy prices

Fossil fuel prices 40% to 50% lower than 2011.

Case 2: Low carbon power generation

Worldwide shift from coal-fired power generation, to advanced fossil fuel generation, nuclear and renewables

Case 3: High energy efficiency

Significant improvement of energy efficiency in the major energy-intensive industries in APEC, due to the enhanced investment in energy conservation.

Impacts of energy on macroeconomy (2): Results

- A drop in energy import prices helps increase GDP in economies that import energy. However, the GDP of economies that produce and export energy suffers a negative effect.
- Energy price declines and reduced energy costs increase competitiveness in manufacturing by lowering the price of products.
- A decline in energy costs might help all economies. By shifting labor and capital from energy industries to other industries, competitiveness in manufacturing may increase in economies that produce and export energy.
- Introducing low-carbon technology has different impacts on electricity prices, depending on the economic performance of the technologies and power generation mix.
- Introduction of low-carbon power generation and penetration of high energy efficiency technology will help reduce the demand for fossil fuels and lower the price of fossil fuels.

Policy implications of this study

Promoting the reduction of CO_2 emissions requires:

- Reducing the cost of renewable energy and constructing energy supply systems that allow introduction of large quantities of renewables.
- Use of nuclear power generation where possible.
- Highly efficient use of fossil energy.
- Reforming the international LNG market to make natural gas easily accessible.

Thank you for your kind attention

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