



APERC Research Activities

Energy intensity in the APEC region

Juan Roberto Lozano Maya
(APERC)

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Asia-Pacific
Economic Cooperation



Outline

- APEC's energy intensity pledge
- APEC's trends
- Future considerations

APEC's energy intensity pledge: Background

- **2007, Sydney, APEC's Leaders' Declaration on Climate Change, Energy Security and Clean Development:**
 - *“We have decided to [...working] towards achieving an APEC-wide regional aspirational goal of a reduction in energy intensity of at least 25 per cent by 2030 (with 2005 as the base year)”*
- **2010, Yokohama, Ministerial Meeting:**
 - Energy intensity goal of 25 percent confirmed, but looked forward to further improvement on the basis of APERC research suggesting this goal would be easily outpaced under BAU and was still insufficient to deal with the issue of climate change.
 - See APERC, *Pathways to Energy Sustainability*, <http://www.ieej.or.jp/aperc/2010pdf/PES.pdf>

APEC's energy intensity pledge: Reduction of 45%



- **2007, Honolulu, APEC's Ministerial Meeting:**

- *"We aspire to meet a new APEC-wide regional goal of reducing energy intensity of our economies by at least 45 percent by 2035, using 2005 as a base year"*

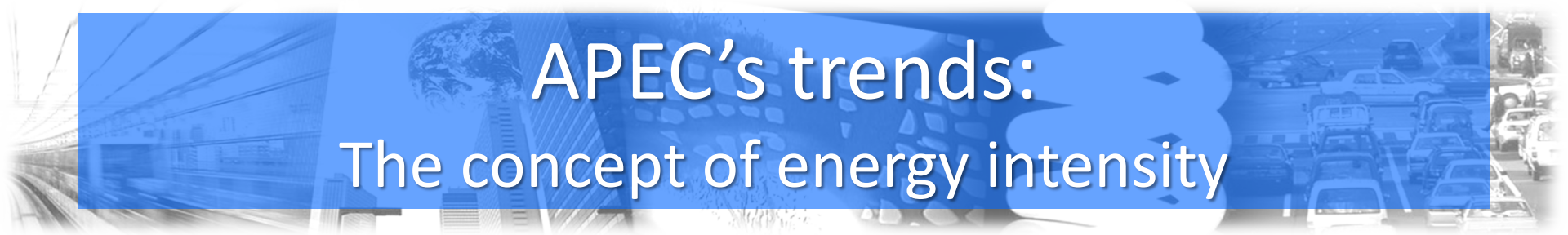


- **2011, Honolulu, APEC's Leaders' Declaration:**

- *"We will also take the following steps to promote our green growth goals: [... we] aspire to reduce APEC's aggregate energy intensity by 45 percent by 2035"*

APEC's energy intensity pledge: Implications

- APEC's energy intensity reduction is framed within a permanent commitment to reduce the effects of climate change, namely greenhouse gas emissions, while supporting economic growth and development.
- However, APEC's goal does not provide more specific information in connection to the type of energy intensity (primary, final) that should be used for assessing its goal.



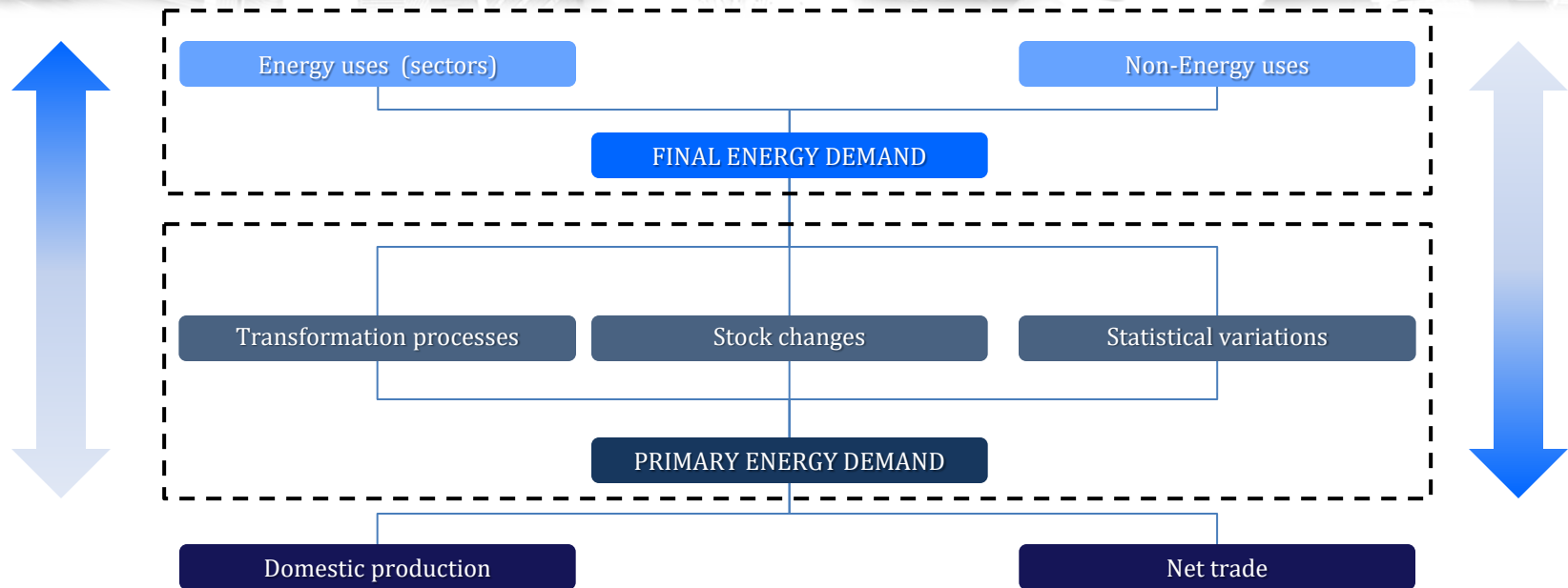
APEC's trends:

The concept of energy intensity

- Generally defined as the ratio on energy demand to produce one unit of economic output (GDP).
- To calculate energy intensities, APERC's economic variables are measured in PPP (power purchasing parity).
- Nonetheless, this ratio is particularly affected by the type of energy demand employed, with results that can differ significantly.

APEC's trends:

Energy demand input affects energy intensity



- **Final energy demand** includes the energy consumed directly by users in the final-end sectors (transport, industrial, residential, commercial and agriculture).
- **Primary energy demand** refers to the sum of the final energy demand minus the process of transformation. It is composed by domestic production and net trade of energy commodities.

APEC's trends:

Recent evolution of Primary energy intensity

Concept	2006	2007	2008	2009	2010	2005-2010 Total	2035 figure if trend followed
Change in Primary Energy	2.6%	2.6%	0.4%	-0.3%	5.3%	11.0%	
Change in GDP (US \$PPP)	5.1%	5.3%	2.6%	-0.6%	5.6%	19.1%	
Change in Primary Energy Intensity	-2.3%	-2.5%	-2.2%	0.4%	-0.3%	-6.8%	-34.5%

- **From the recent historic trends observed, primary energy intensity in APEC has fallen 6.8% from 2005 to 2010, which if sustained, would render a total reduction of 34.5% by 2035.**
- **In order to accomplish the 45% goal reduction from 2005 to 2035, an average growth rate of 2% per year or 9.5% every 5 years would be necessary.**

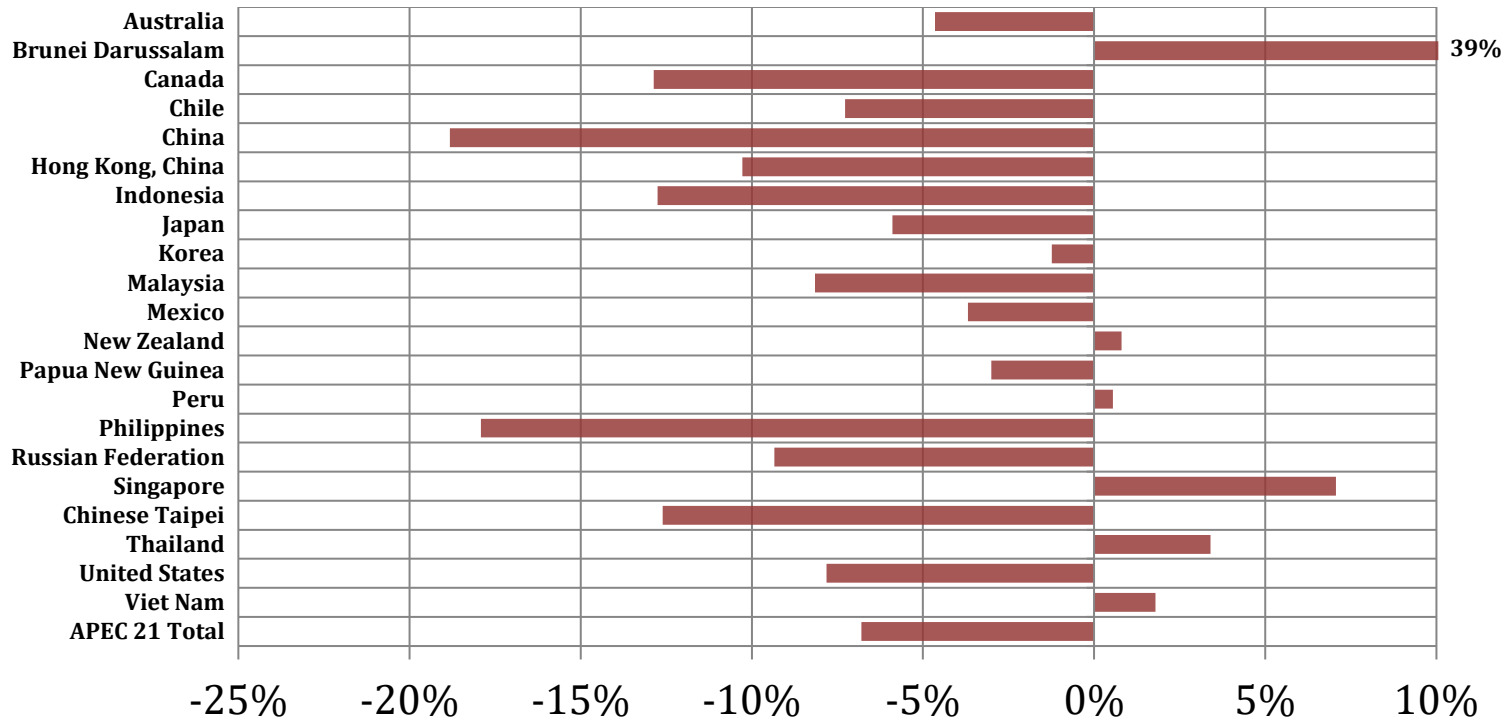
APEC's trends:

Recent evolution of Final energy intensity

Concept	2006	2007	2008	2009	2010	2005-2010 Total	2035 figure if trend followed
Change in Primary Energy	2.4%	2.9%	-0.3%	-0.8%	4.6%	8.8%	
Change in GDP (US \$PPP)	5.1%	5.3%	2.6%	-0.6%	5.6%	19.1%	
Change in Final Energy Intensity	-2.6%	-2.3%	-2.9%	-0.2%	-1.0%	-8.7%	-42.0%

- **From the recent historic trends observed, final energy intensity in APEC has fallen 8.7% from 2005 to 2010, which if sustained, would render a total reduction of 34.5% by 2035.**
- **In order to accomplish the 45% goal reduction from 2005 to 2035, an average growth rate of 2% per year or 9.5% every 5 years would be necessary.**

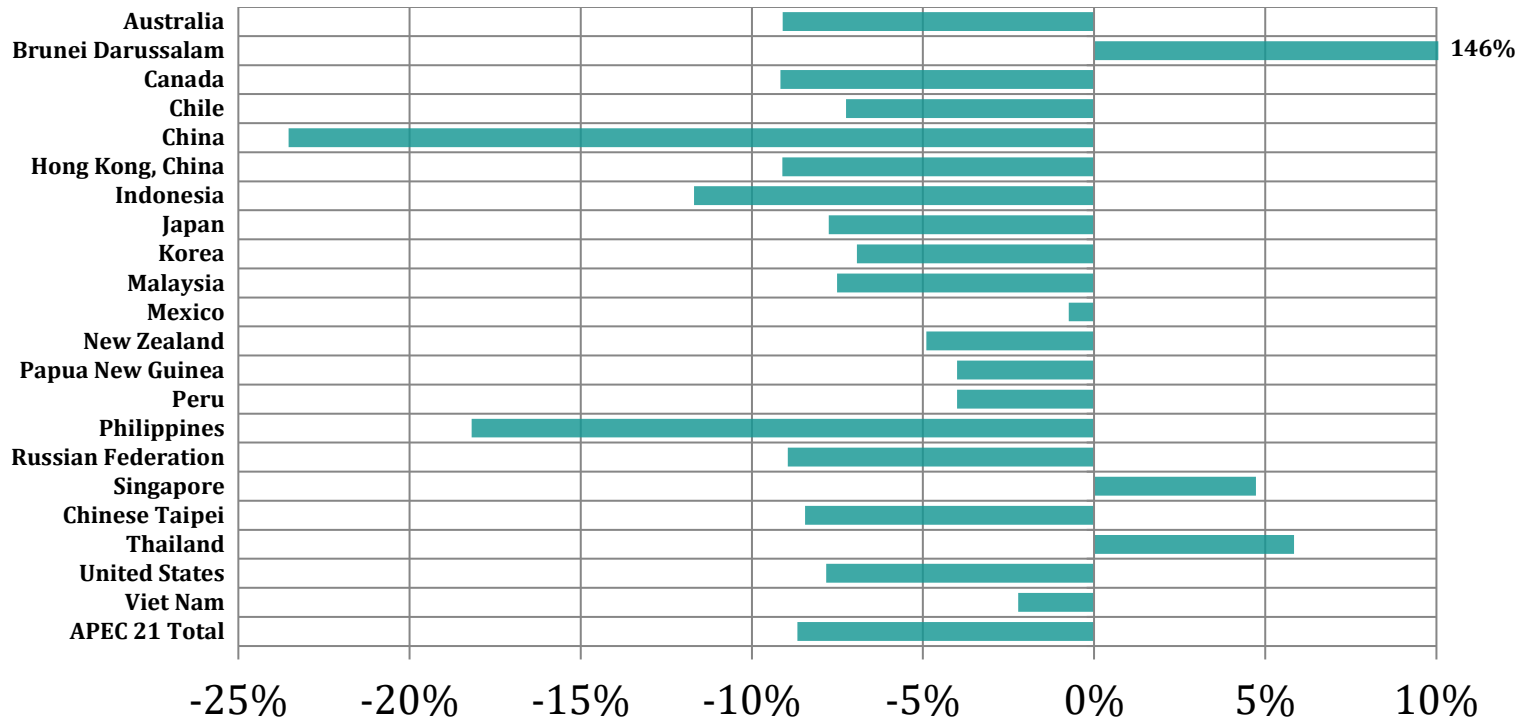
APEC's trends: Primary energy intensity reduction, 2005-2010



Source: IEA

- From 2005 to 2010, most APEC economies showed improvement of their primary energy intensities.

APEC's trends: Final energy intensity reduction, 2005-2010

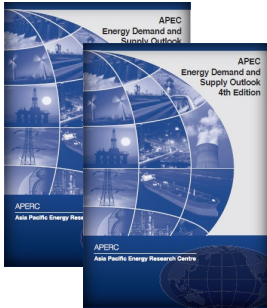


Source: IEA

- From 2005 to 2010, most APEC economies showed improvement of their final energy intensities and in general, outpaced their primary energy intensities.

APEC's trends:

APEC Energy Demand and Supply Outlook 5th Edition



- Work underway on the 5th edition of the ***APEC Energy Demand and Supply Outlook***, to be published in **late 2012**
- A 25 year projection (2010-2035) built upon APERC researchers' expertise and other expert advice

Volume 1:

Overall APEC Demand and Supply

- Summary of key trends
- Overview of APERC's model
- Overall APEC final energy demand by sector
- Overall APEC primary energy supply by fuel type
- APEC energy investment overview
- APEC carbon emissions

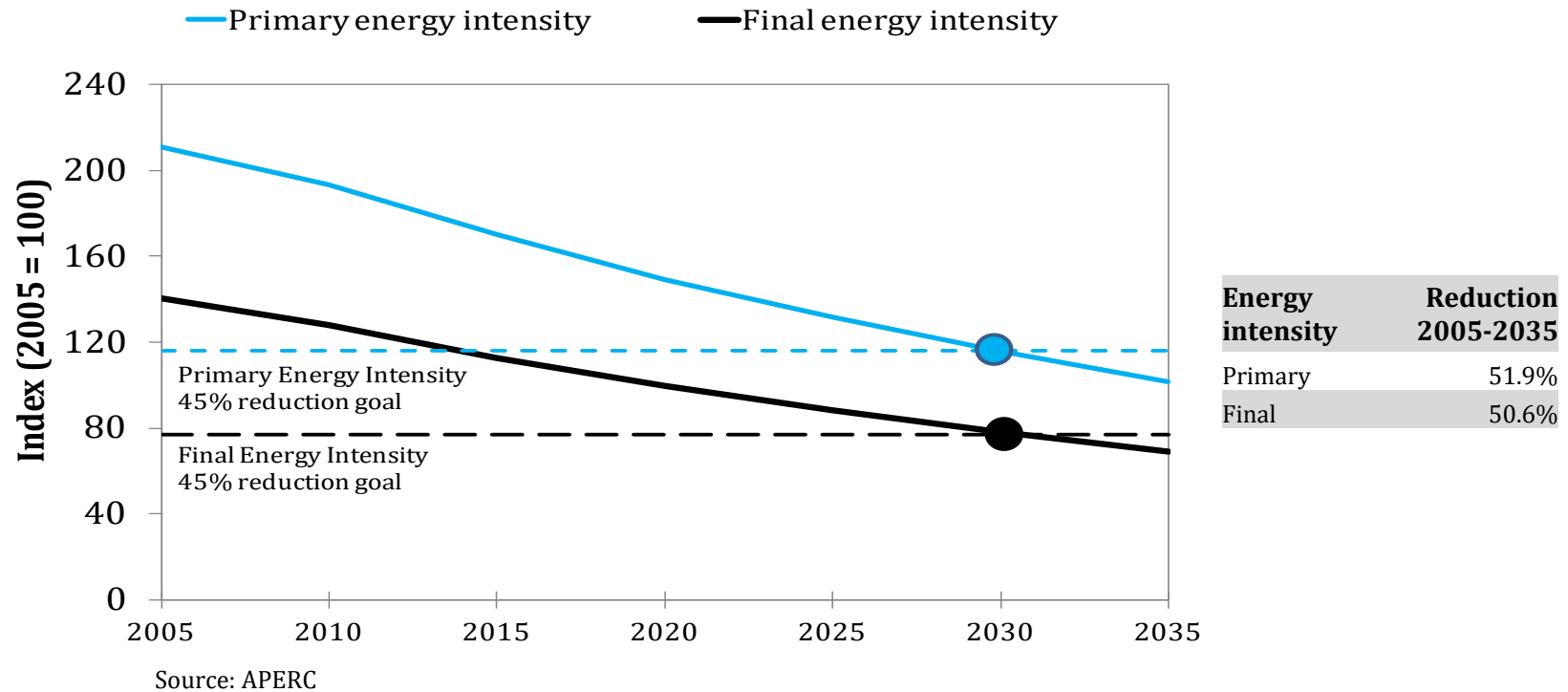
Volume 2:

Discussion of specific APEC economies

- Introduction to the economy's:
 - Energy demand
 - Energy resources
 - Energy policies
- Business-as-Usual (BAU) Scenario
- Alternative Scenarios
 - High Gas Scenario
 - Improved Urban Planning
 - Virtual Clean Car Race

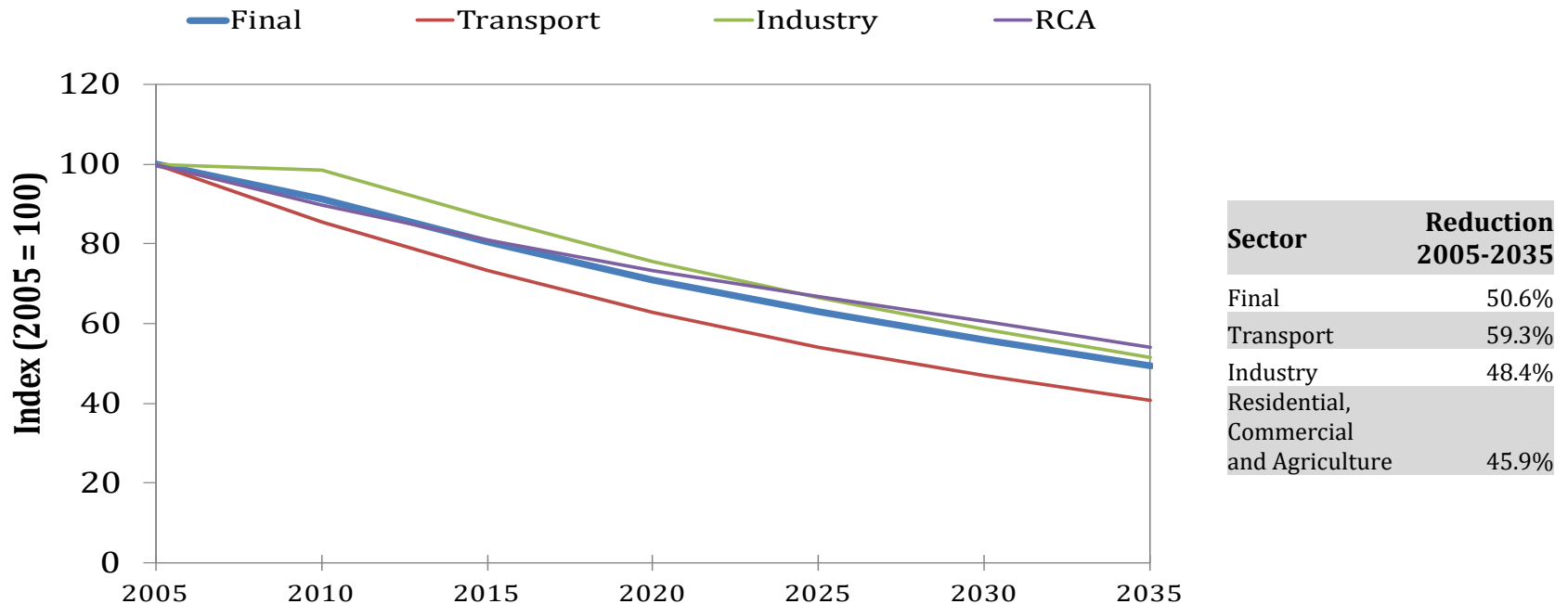
APEC's trends:

Projections suggest that goal might be met



- In a BAU scenario, and with 2005 as the base year, it is expected that **after 2030, APEC will have fulfilled its aspirational goal** of energy intensity reduction, both in terms of primary and final energy demand.
- **By 2035, APEC's total reduction is expected to amount to 51.9% for its primary energy intensity and 50.6% for its final energy intensity.**

APEC's trends: Final energy – Expected intensities by sector



Source: APERC

- With 2005 as a reference, it is expected that by 2035 energy intensity will have decreased **59.3% in the transport, 48.4% in the industry** and **45.9%** in the joint demand of the **residential, commercial and agriculture** sectors.

Future considerations

- APEC should be more specific as to the type of energy intensity required in its goal, in order to allow member economies to devise better energy efficiency policies.
- In addition to the different effects in energy intensity as a result of the type of energy demand used, historic figures from 2005 to 2010 show that energy intensity is highly sensitive to fluctuations in the economic activity.
- In spite of APERC's latest projections suggesting that it is possible that APEC can meet its goal of reducing energy intensity in 45% by 2035, the recent historic trend, indicates that it might still require further efforts to accomplish it.

Thank you for your attention

APERC looks forward to your further cooperation

<http://www.ieej.or.jp/aperc>

