



The 51<sup>st</sup> Meeting of the APEC EGEEC  
11-13 April, 2018  
Washington, DC

# Progress towards APEC's energy intensity reduction goal

**Tom Willcock**  
Researcher, APERC



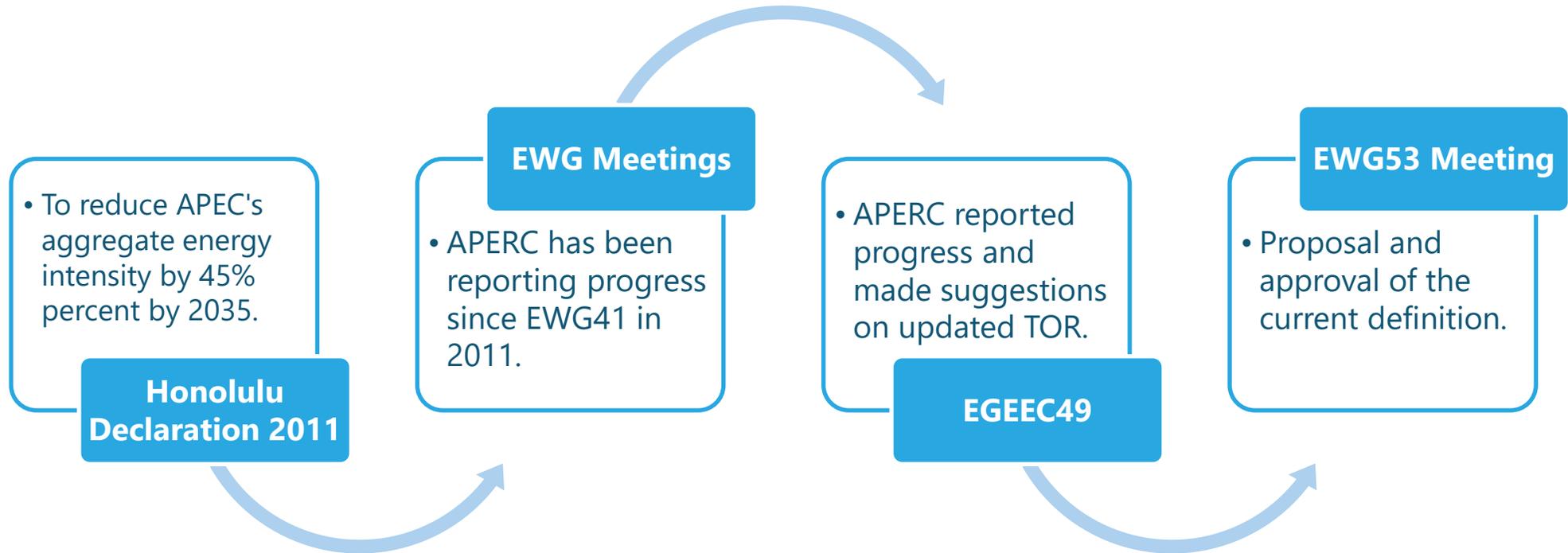
**Asia-Pacific  
Economic Cooperation**



# Background



# Milestones



After reporting three different energy intensity measures using IEA data, agreement was reached at EWG 53 to analyse final energy (excluding non-energy) intensity, using APEC data.

# Notes on data sources

- Energy data collected by ESTO with support from EGEDA (2015 is current but we should have 2016 in time for the next meeting).
- GDP data from the World Bank (constant 2011 USD PPP – available through 2016).
- Exceptions:
  - APERC/ESTO estimates for Papua New Guinea's (PNG) energy consumption.
  - Chinese Taipei and PNG's GDP data are estimates from the APEC Outlook 7<sup>th</sup> Edition.

# Updates since Moscow

- No new data, but very slight revisions to energy intensity.
  - Mostly due to GDP revisions by the World Bank (Malaysia, Mexico, New Zealand, PNG, Russia and the US).
  - Very slight energy consumption change for Chinese Taipei.
- Continuing work on the 7<sup>th</sup> edition of the APERC Energy Demand and Supply Outlook.



# Results



# What has happened to intensity since EWG54?

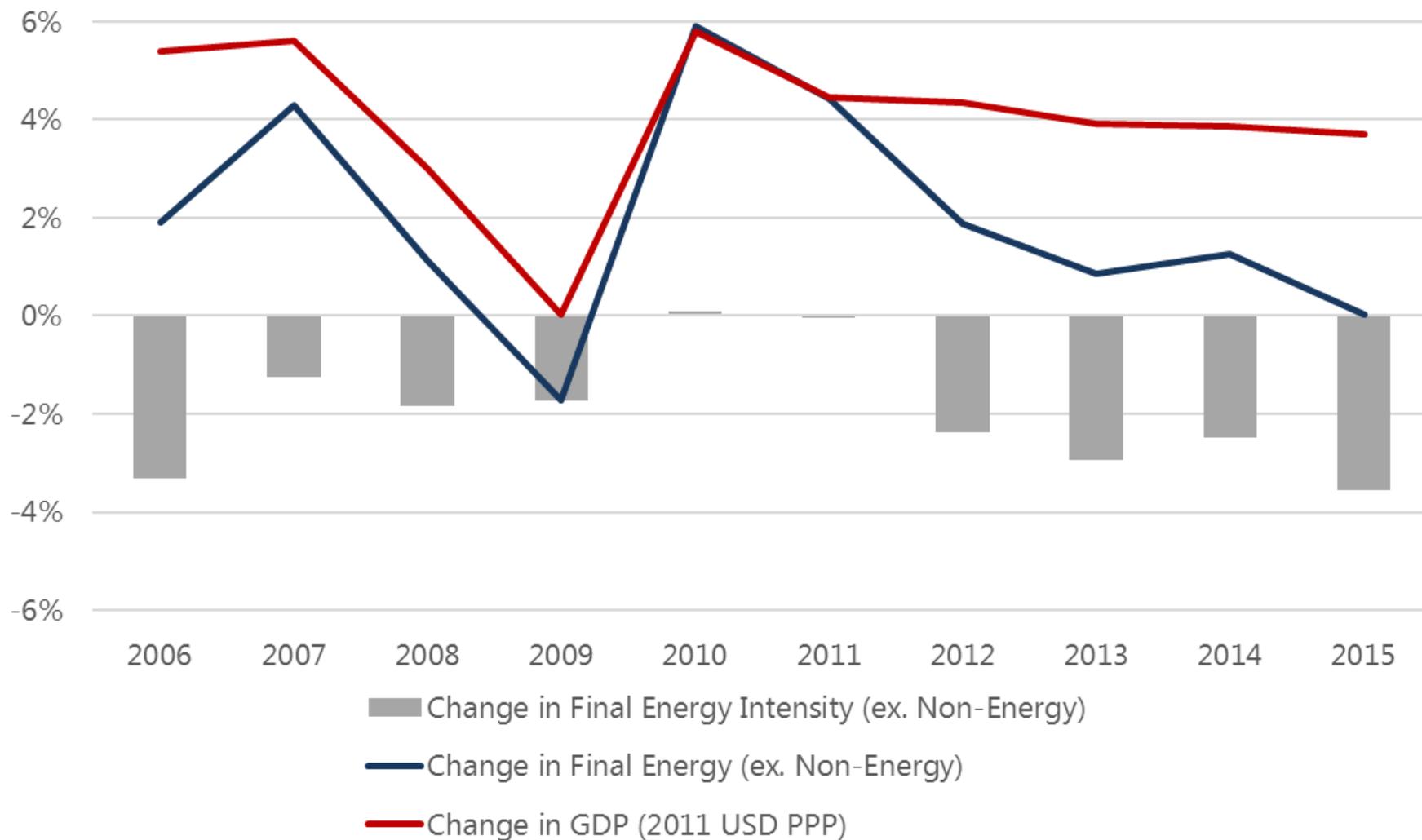
## APEC Final energy (excluding non-energy) consumption intensity

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2015	Trend to 2035
<b>Change in Final Energy (ex. non-energy)</b>	1.9%	4.3%	1.1%	-1.7%	5.9%	4.4%	1.9%	0.9%	1.3%	0.0%	21.5%	
<b>Change in GDP (2011 US \$PPP)</b>	5.4%	5.6%	3.0%	0.0%	5.8%	4.4%	4.3%	3.9%	3.8%	3.7%	47.9%	
<b>Change in Final Energy Intensity (ex. non-energy)</b>	-3.3%	-1.3%	-1.8%	-1.7%	0.1%	0.0%	-2.4%	-2.9%	-2.5%	-3.5%	-17.9%	-44.6%

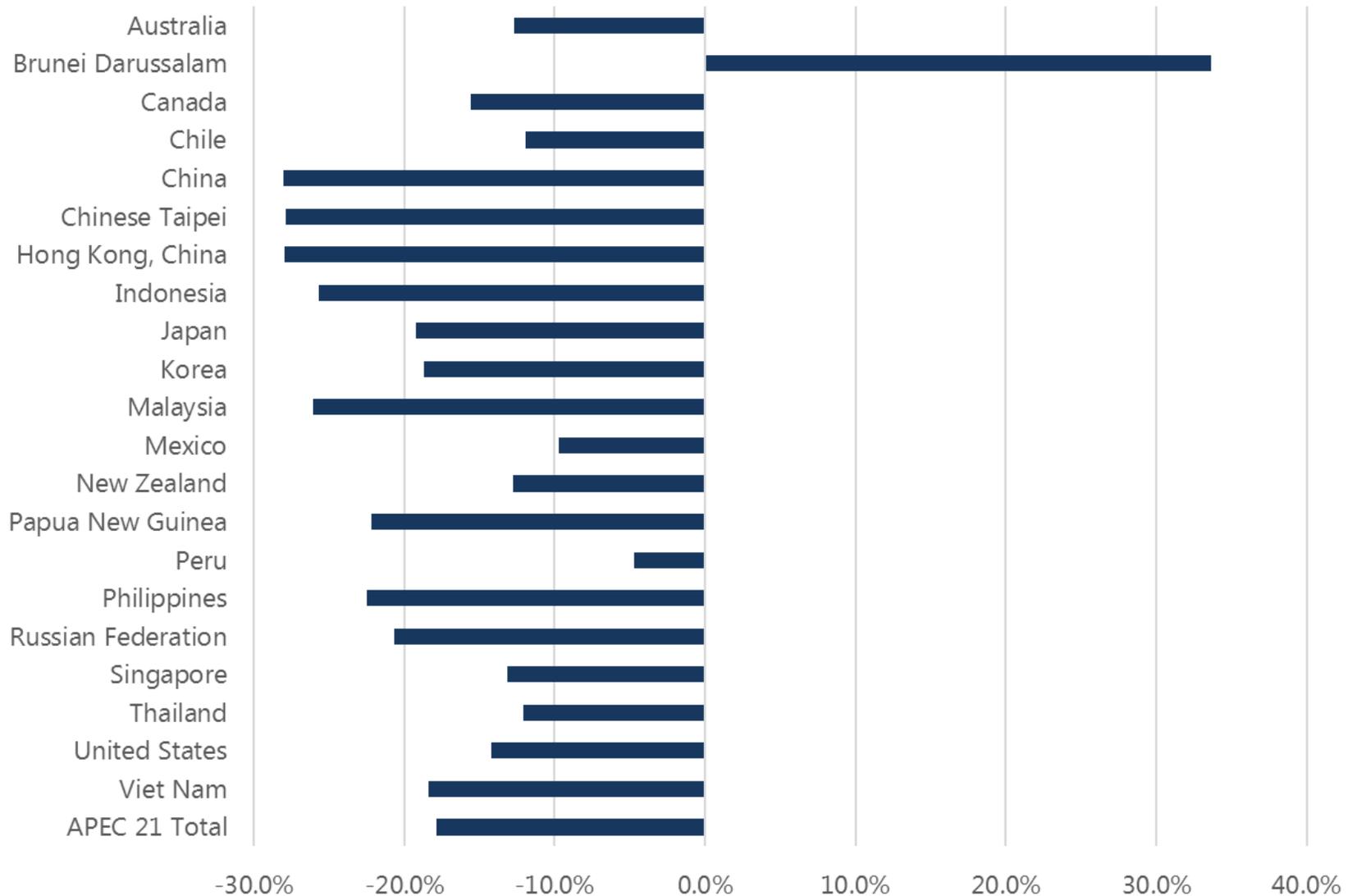
Source: APERC analysis of ESTO data.

- Final energy consumption intensity (ex. non-energy) has been improving reasonably consistently with the largest reduction from 2014 to 2015.
- Final energy consumption intensity (ex. non-energy) fell 17.9% between 2005 and 2015.
- If the current trend continues, final energy consumption intensity (ex. non-energy) reduction would fall just short of the APEC goal, reaching 44.6% in 2035 (the APEC goal would be reached the following year).

# YoY changes to intensity, energy demand and GDP



# Economy level results, 2005 to 2015



# What does this tell us?

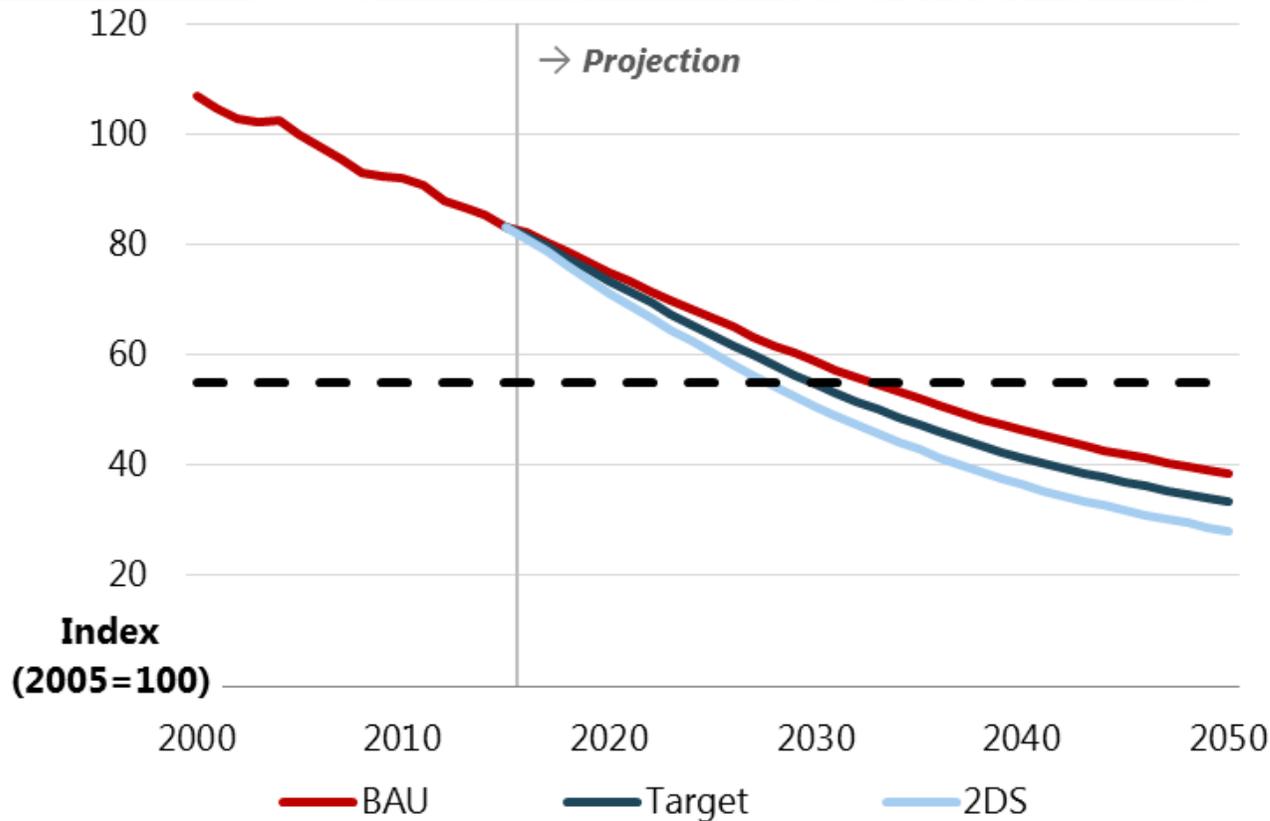
- Change in final energy consumption (excluding non-energy) in 2015 compared with the previous year is only 0.01%...
- ...and growth in GDP (PPP) has been stable for the last three years (3.9%, 3.8% and 3.6%, in 2013-14-15, respectively).
- So in 2015, GDP growth decoupled from energy consumption growth, resulting in a significant energy intensity reduction of 3.5%.
- These trends look encouraging, so how do we think APEC is tracking against the goal...



# Looking forward

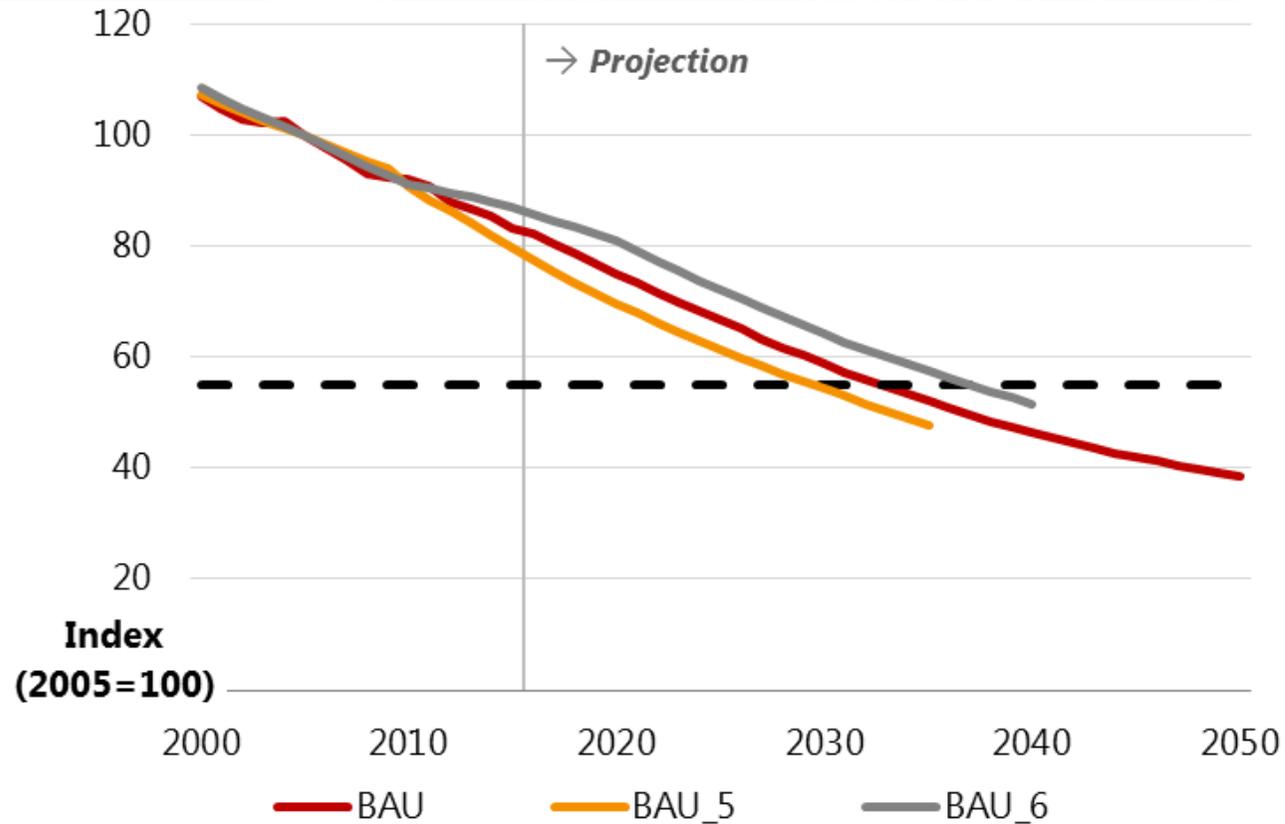


# 7<sup>th</sup> edition preliminary APERC results



- Currently finalising modelling for the 7<sup>th</sup> edition of the APERC Energy Demand and Supply Outlook.
- BAU achieves the 45% reduction goal in 2033, Target in 2030 and 2°C Scenario in 2028.

# 7<sup>th</sup> compared with past editions



- 5<sup>th</sup> edition BAU achieves goal in 2030, 6<sup>th</sup> edition in 2037.
- 6<sup>th</sup> edition probably reflects poor intensity improvements in 2010 and 2011. Much better since then.

# Closing Thoughts

- Similarly to last time, recent history looks good...
- And the 7<sup>th</sup> edition results are encouraging...
- But it raises the question: if the BAU scenario achieves the intensity goal two years ahead of schedule, do we need to think about making it more ambitious?
- This has already been done once. The original goal, set in 2007, was a 25% improvement by 2030 (with a 2005 base year).

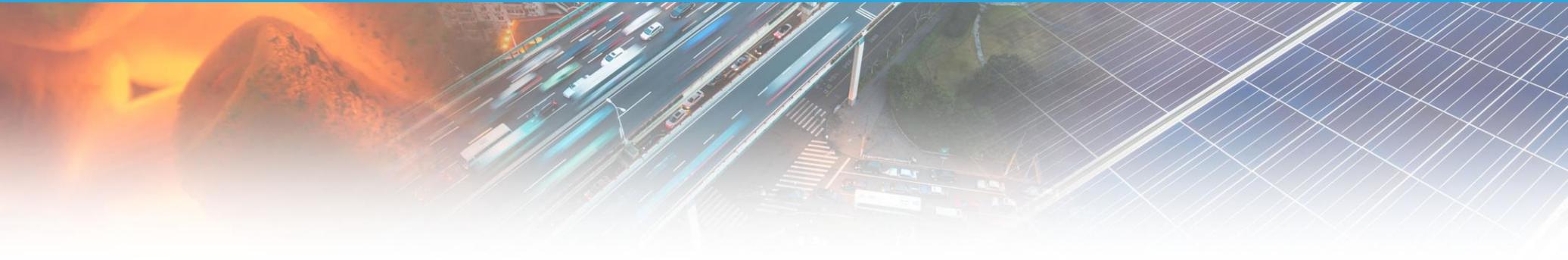


**Thomas.Willcock@aperc.ieej.or.jp**

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

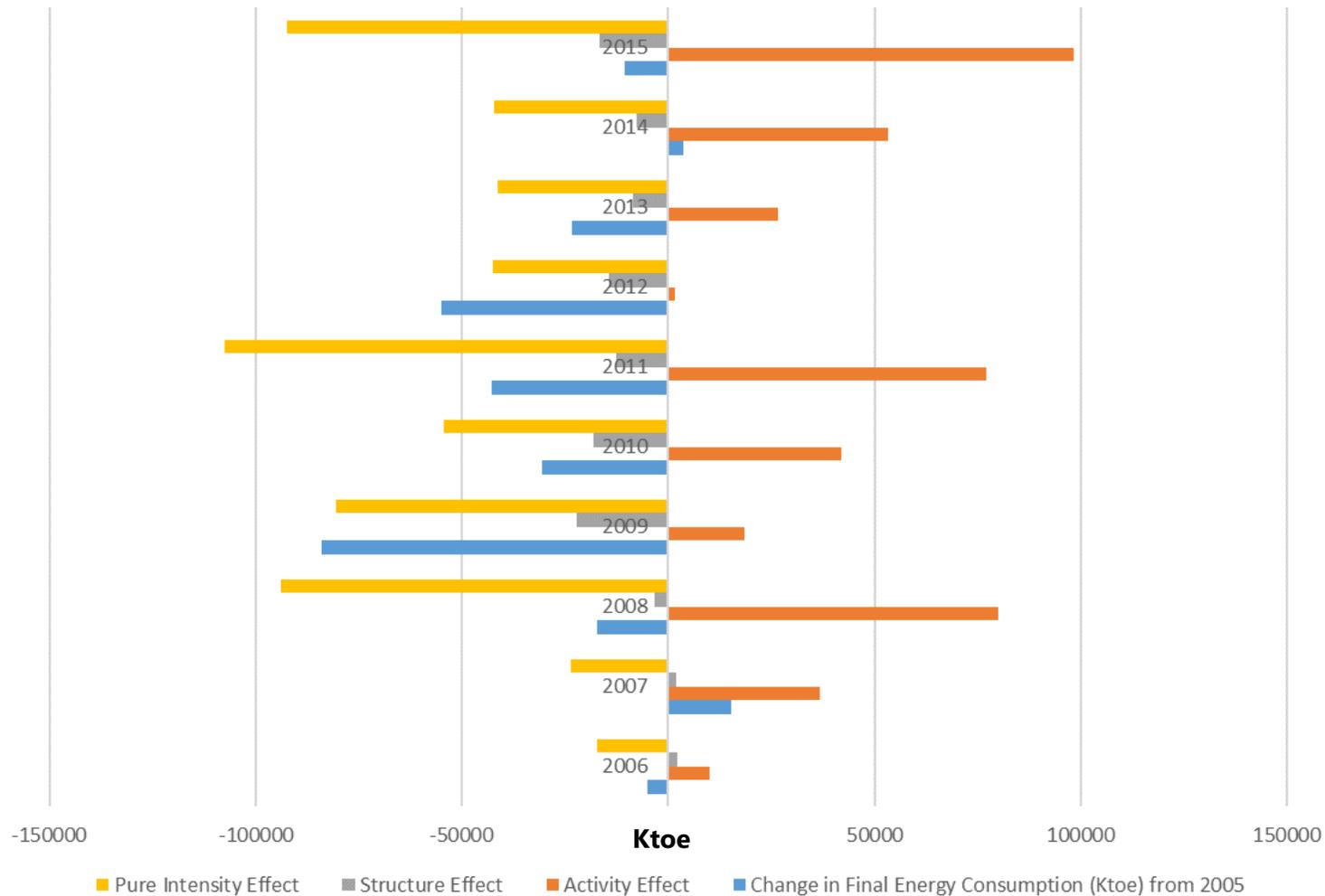


# Additional slides



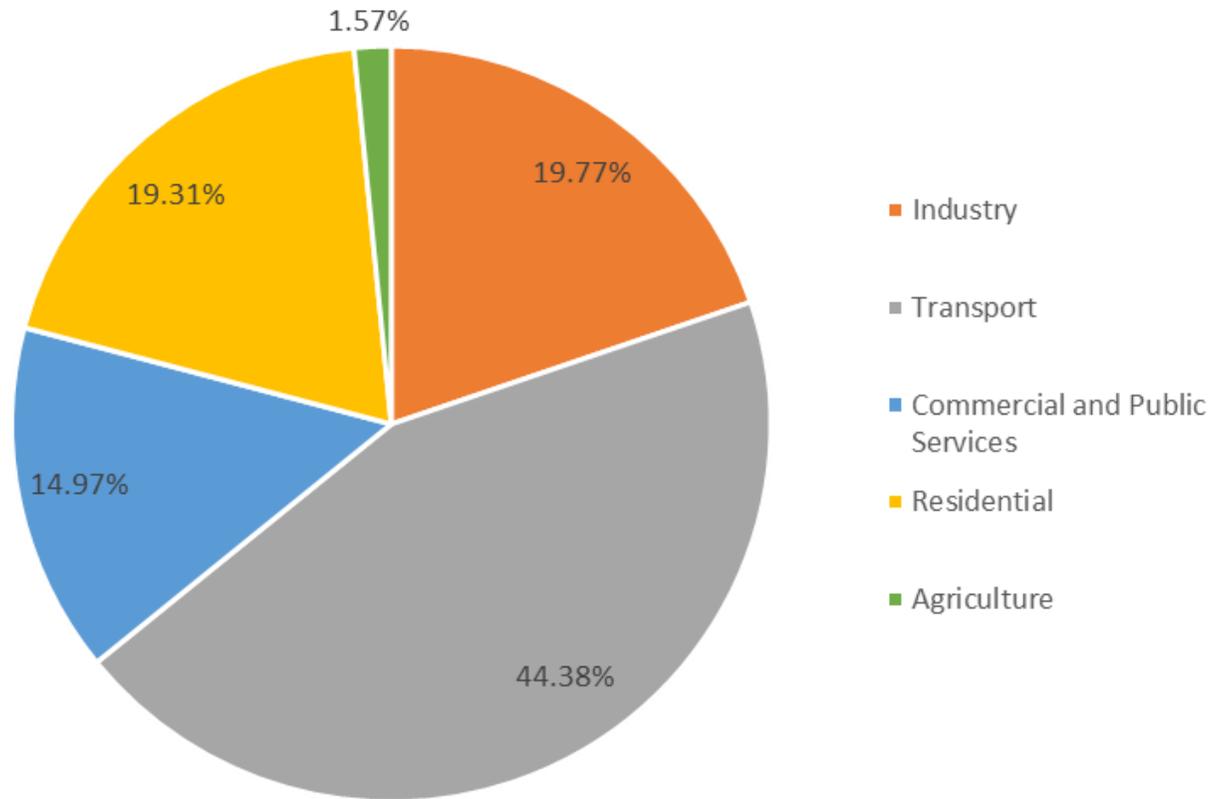
# Decomposition analysis – U.S.

## U.S. - Change in Final Energy Consumption from 2005



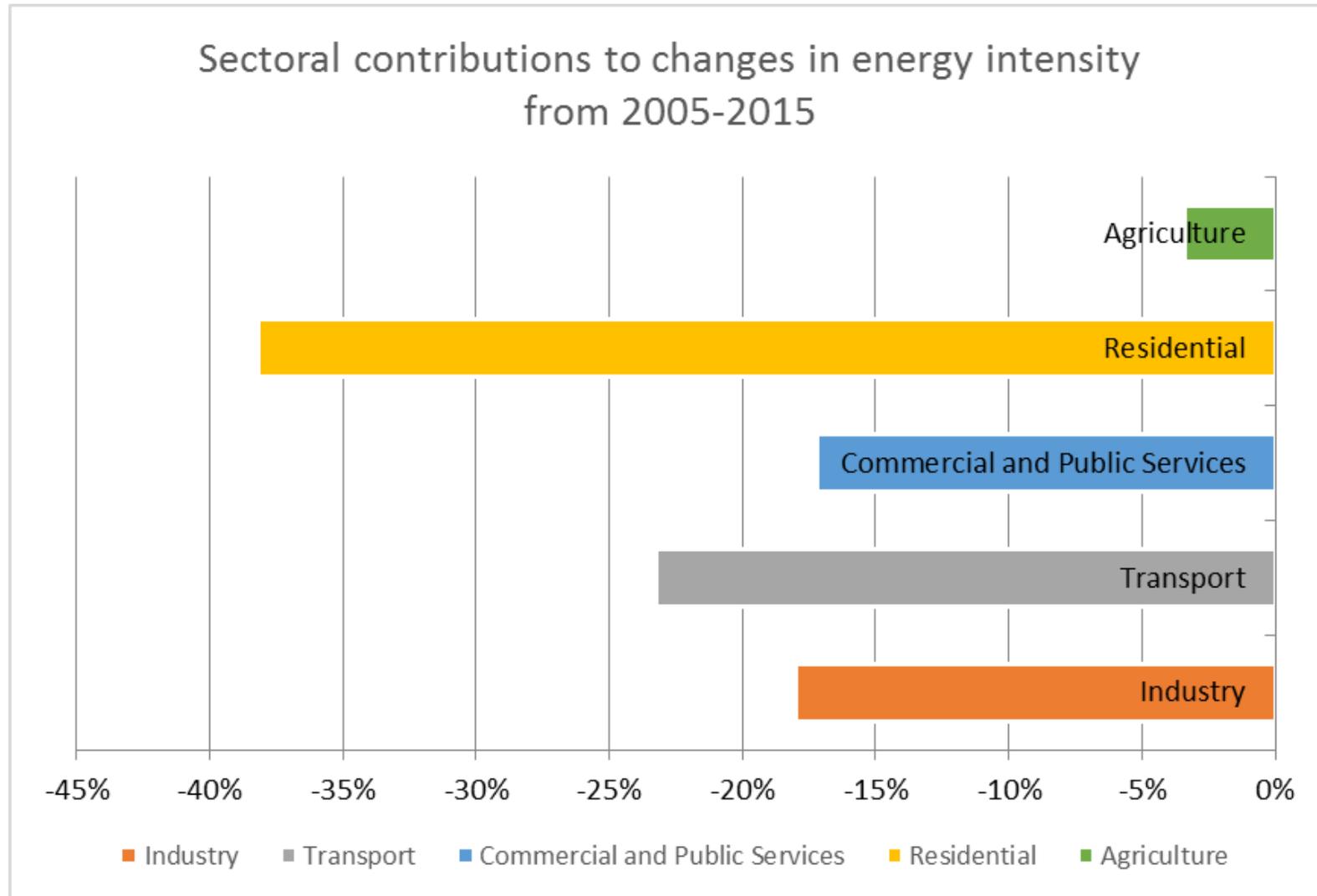
# Decomposition analysis – U.S.

Share of total energy consumption



2005-2015

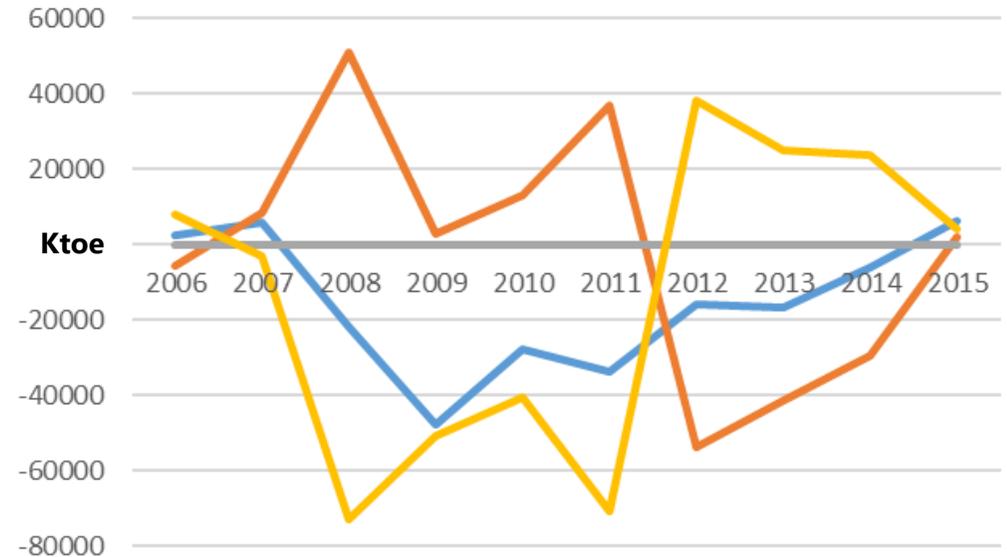
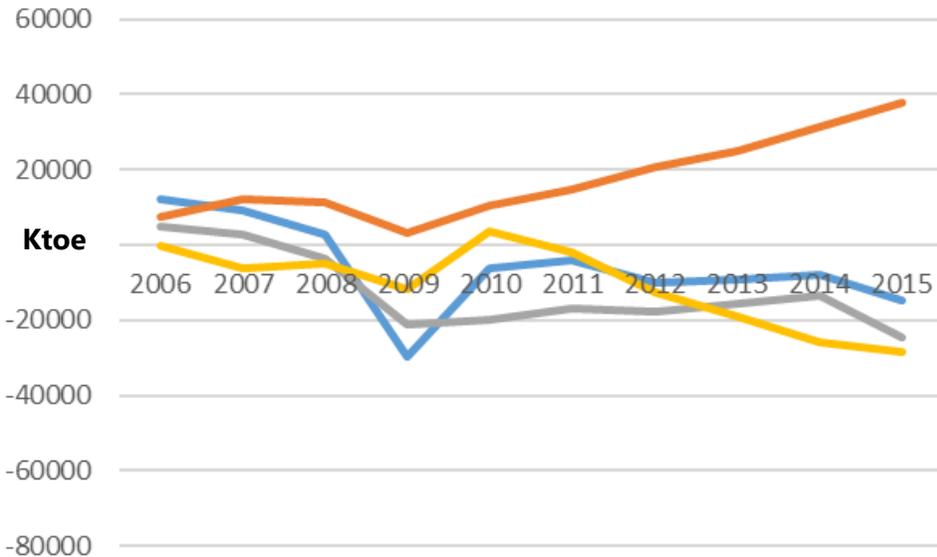
# Decomposition analysis – U.S.



# Decomposition analysis – U.S.

## Industry

## Transport

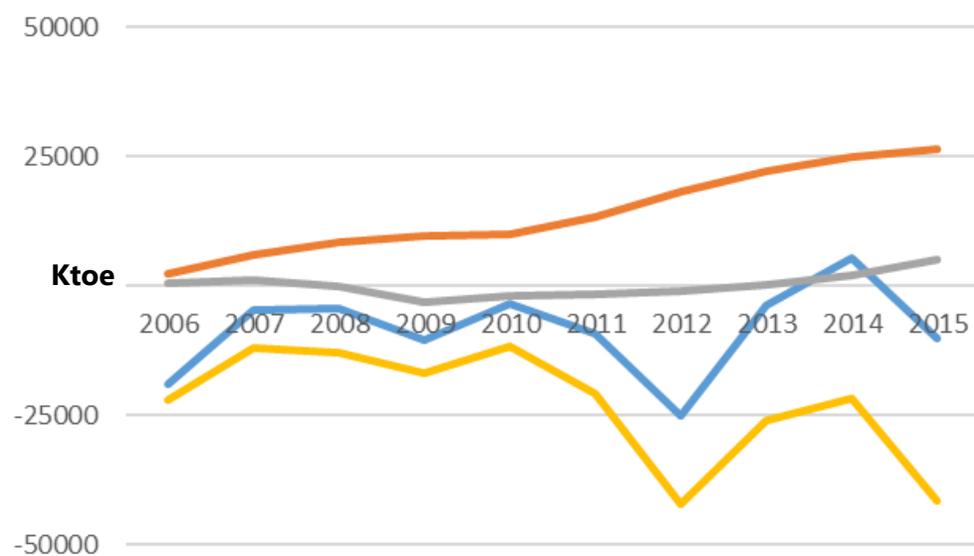
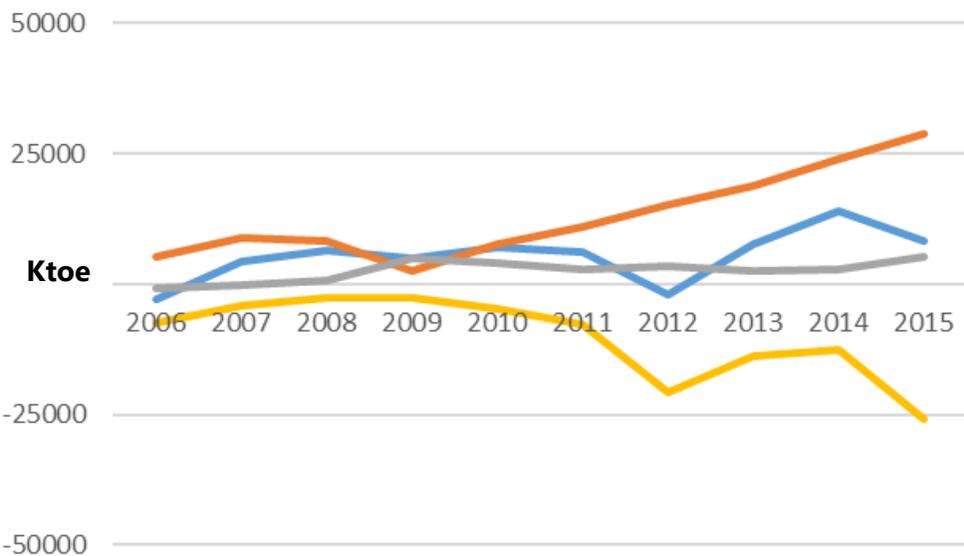


- Change in Final Energy Consumption (Ktoe) from 2005
- Activity Effect
- Structure Effect
- Pure Intensity Effect

# Decomposition analysis – U.S.

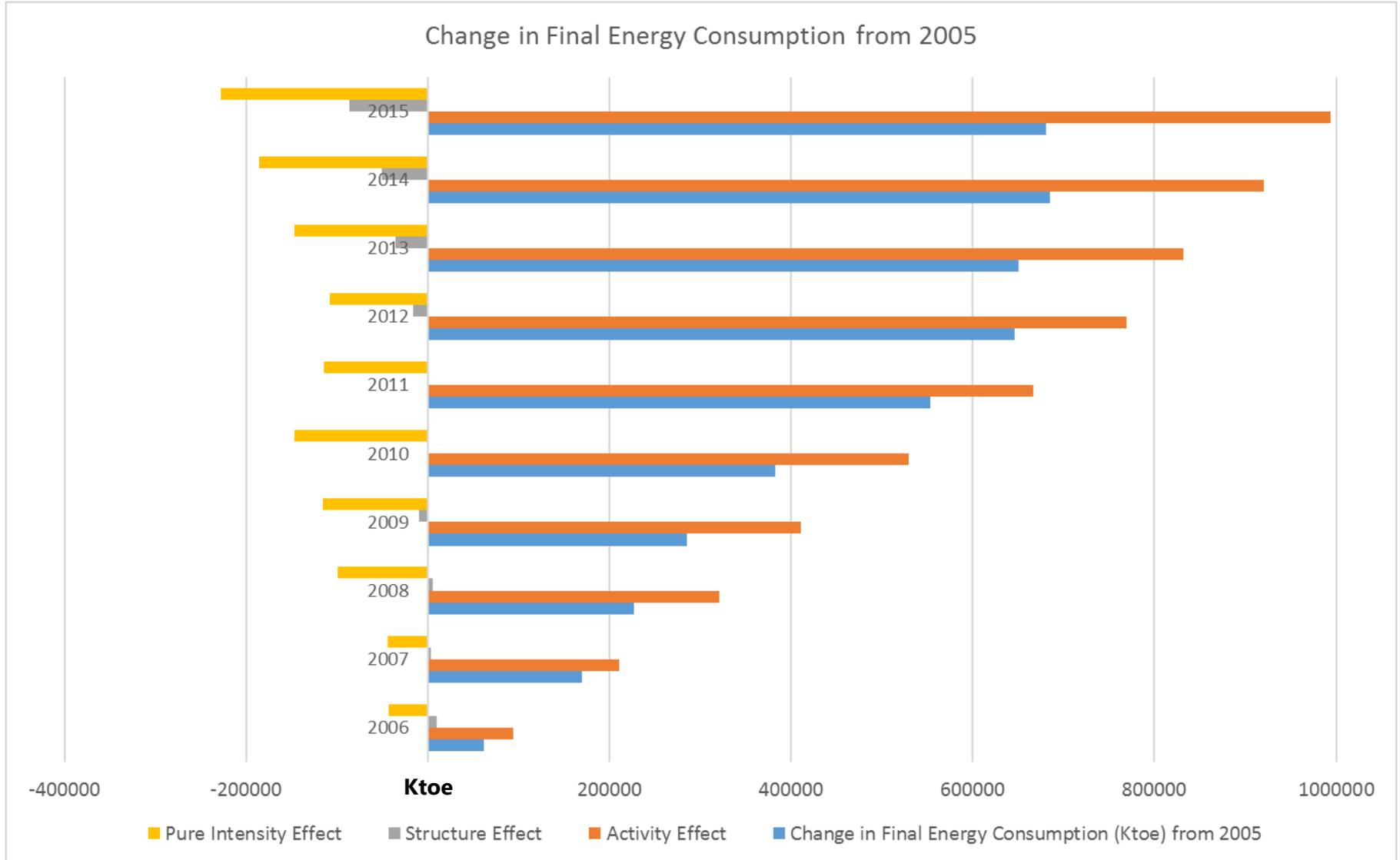
## Services

## Residential



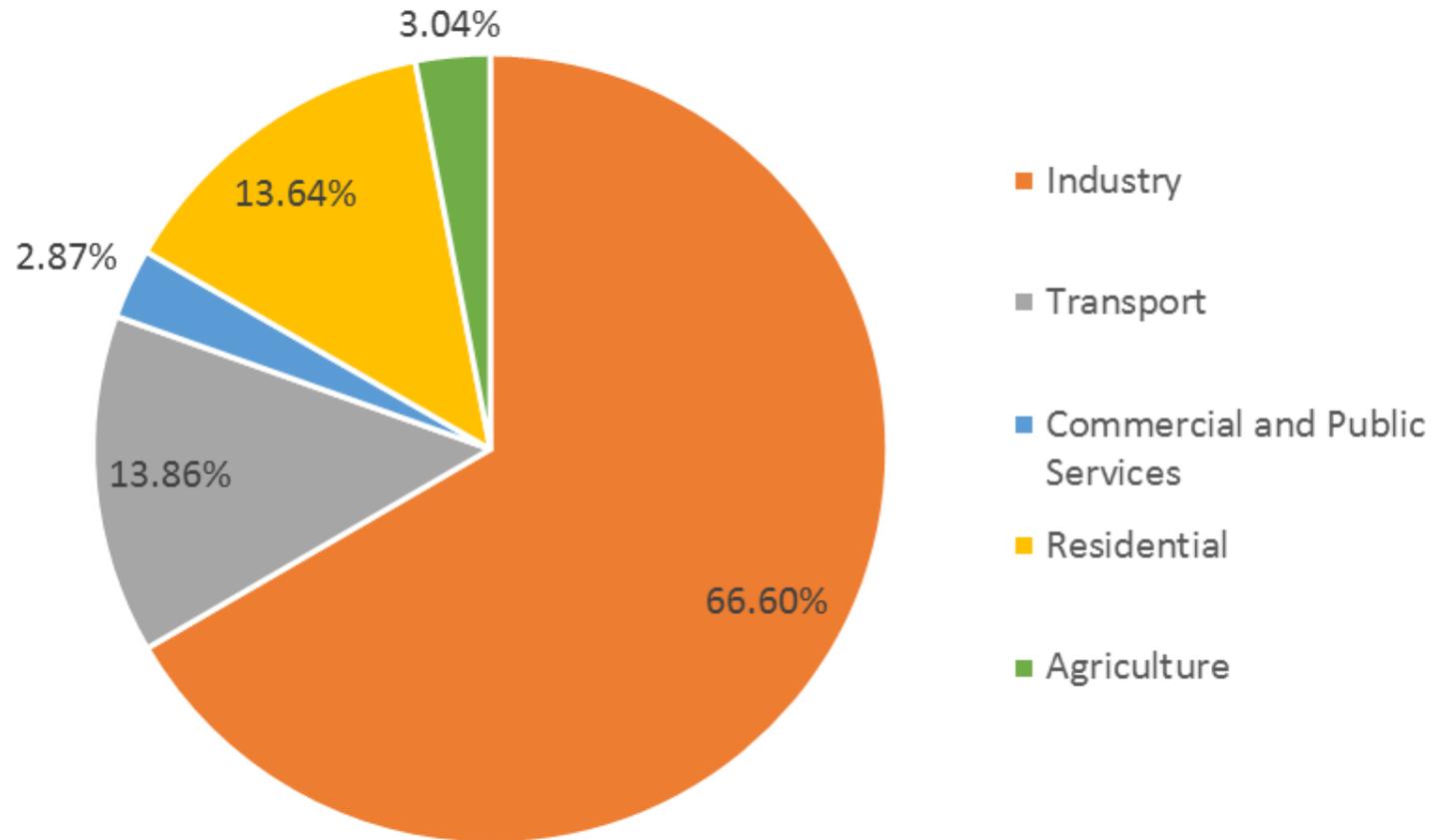
- Change in Final Energy Consumption (Ktoe) from 2005
- Activity Effect
- Structure Effect
- Pure Intensity Effect

# Decomposition analysis – China



# Decomposition analysis – China

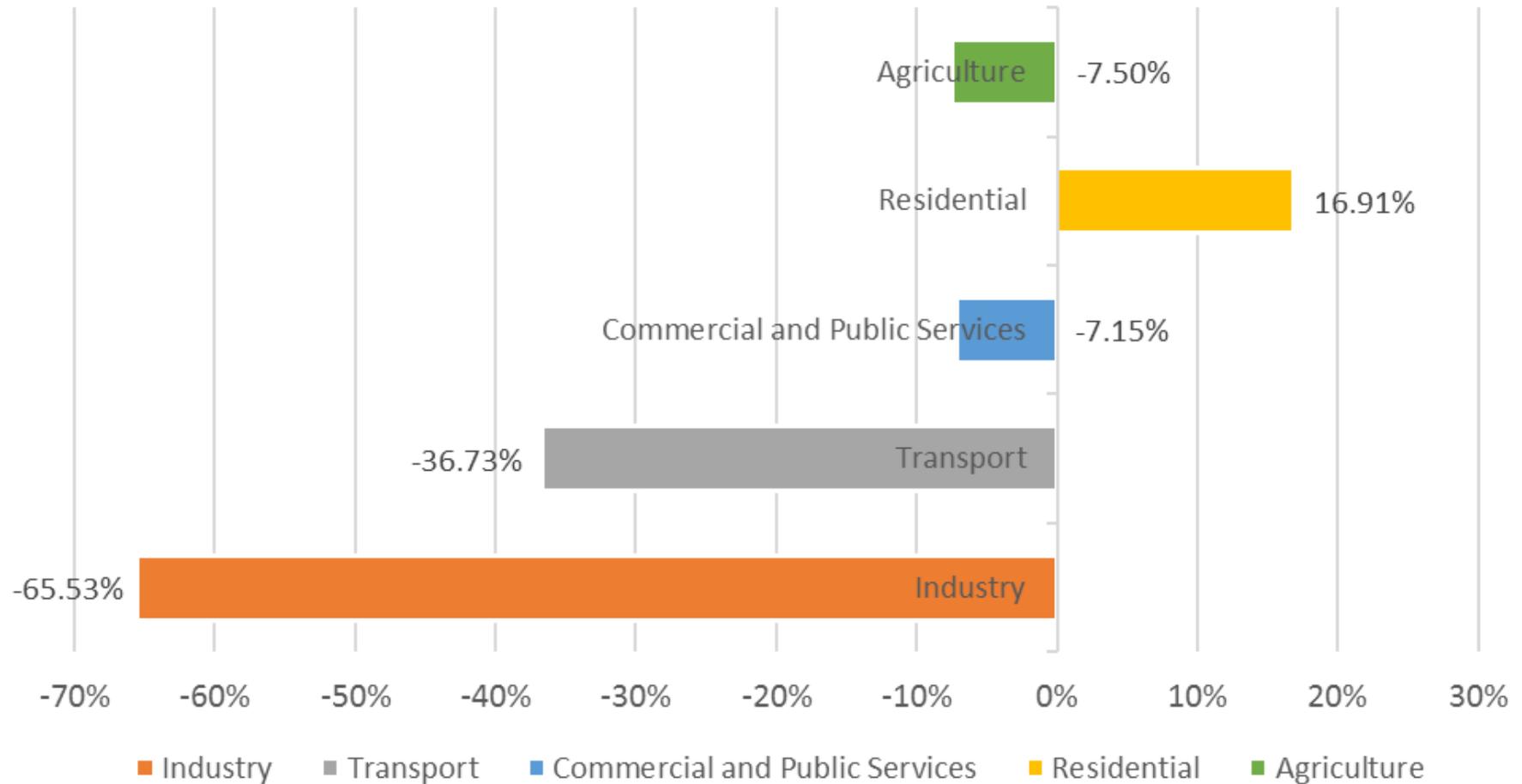
Share of total energy consumption



2005-2015

# Decomposition analysis – China

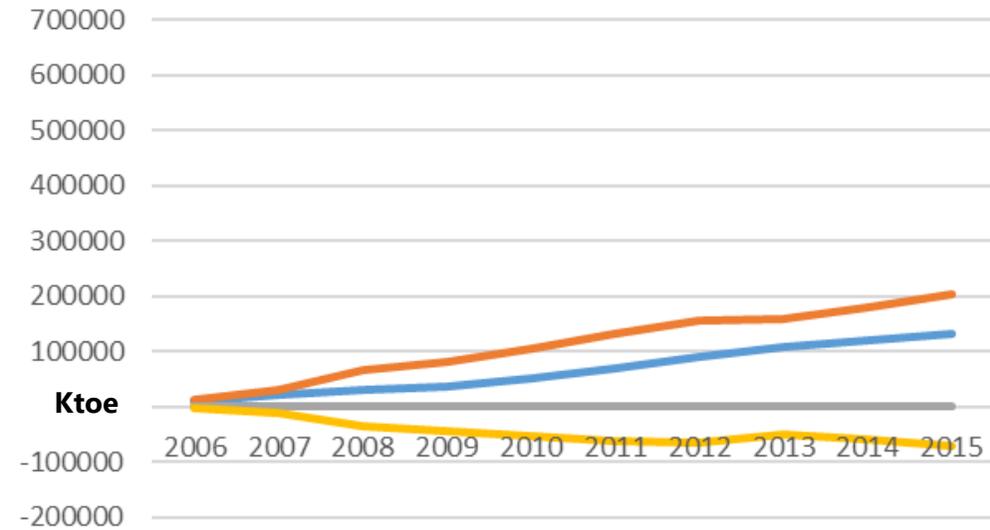
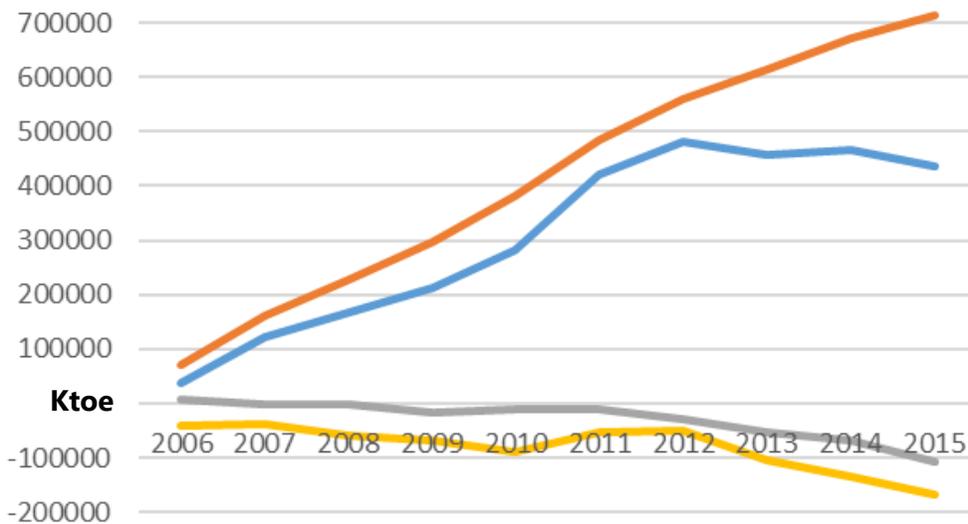
Contributions to reduction in energy intensity from 2005 - 2015



# Decomposition analysis – China

## Industry

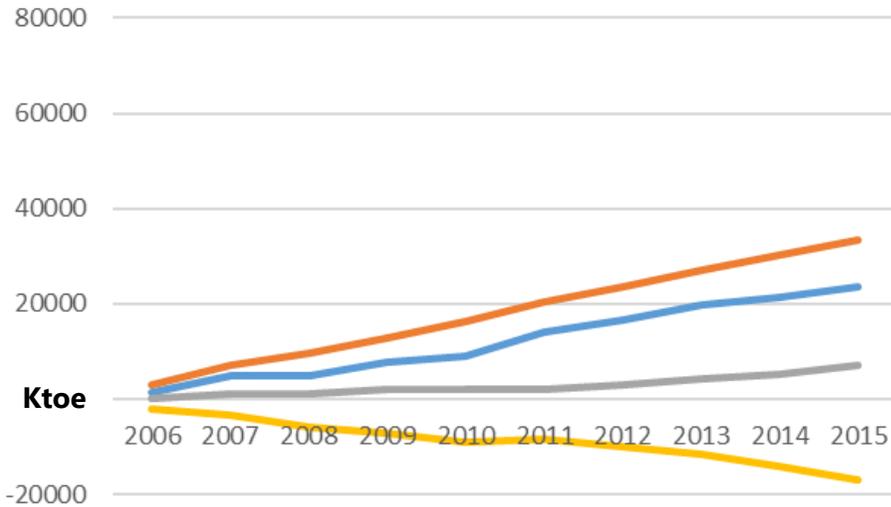
## Transport



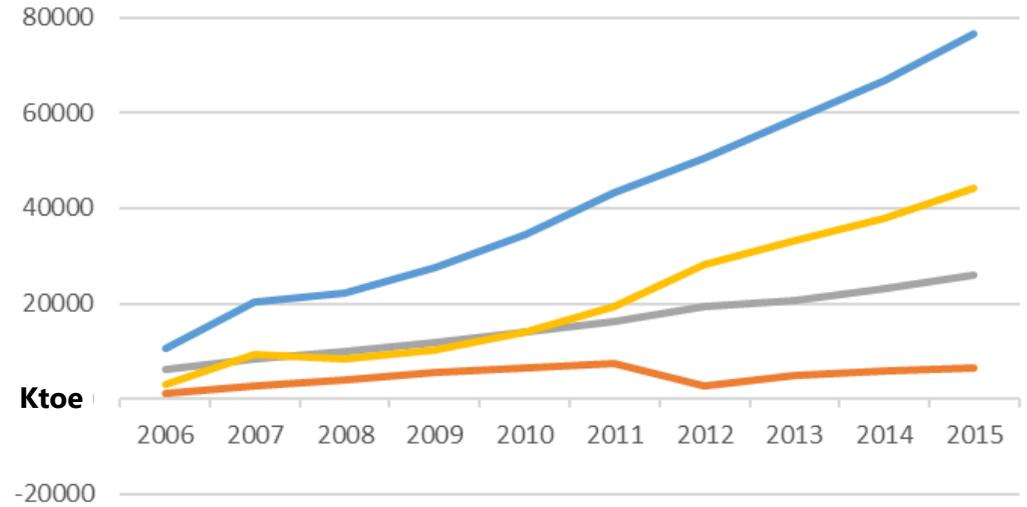
- Change in Final Energy Consumption (Ktoe) from 2005
- Activity Effect
- Structure Effect
- Pure Intensity Effect

# Decomposition analysis – China

## Services



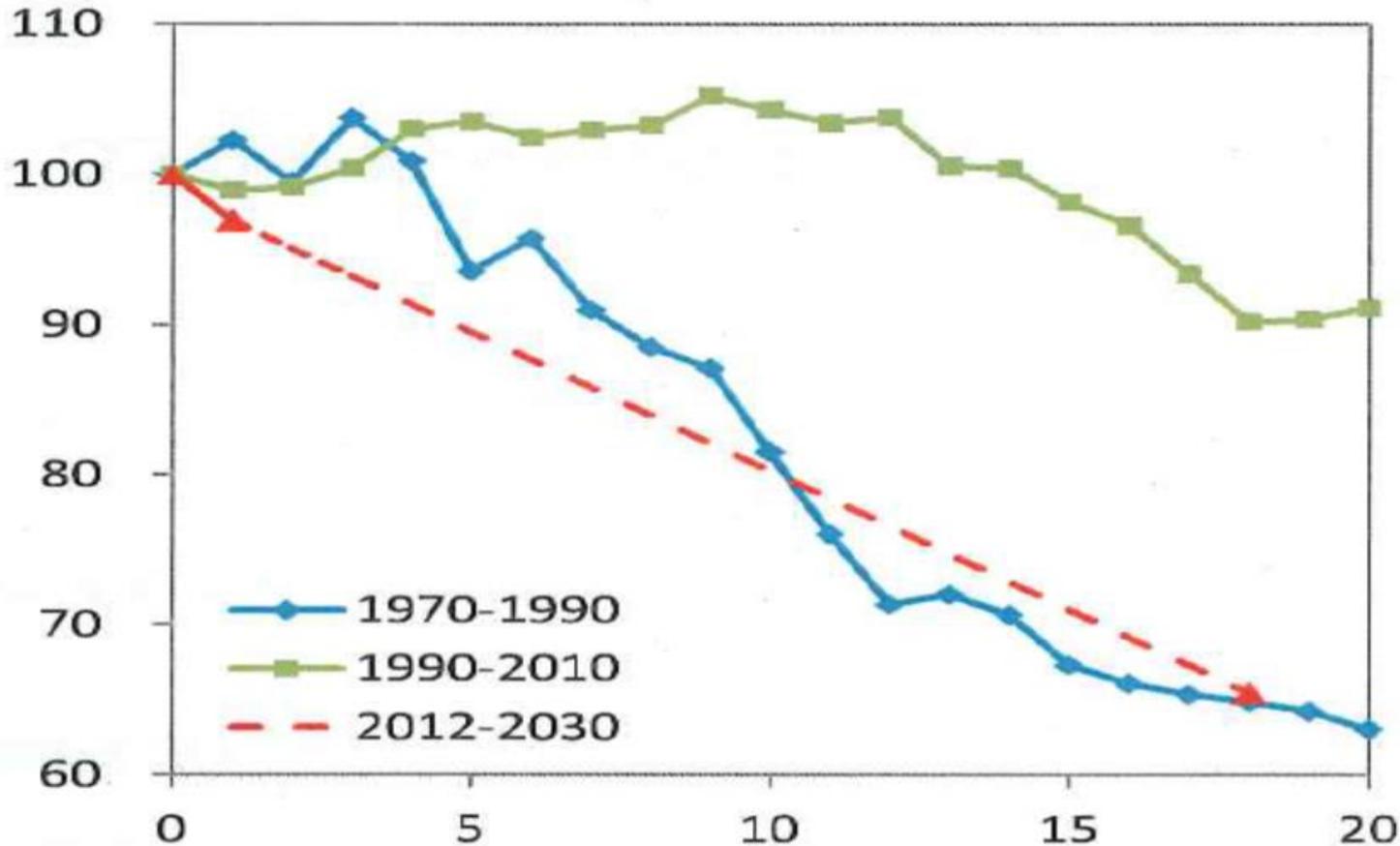
## Residential



- Change in Final Energy Consumption (Ktoe) from 2005
- Activity Effect
- Structure Effect
- Pure Intensity Effect

# Japan's experience

## Japan's energy intensity, 1970 to 2030



Source: Naoka Doi, IEEJ, "Current status of energy conservation policies in Japan," Sept. 19, 2017

- Very challenging to continually improve efficiency while GDP grows.