Asia-Pacific Economic Cooperation

APERC Asia Pacific Energy Research Centre

Tracking Energy Efficiency in APEC

19th APEC Energy Statistic Workshop: APEC-IEA Joint Workshop on Energy Efficiency Indicators

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1. Introduction

APERC
Asia Pacific Energy Research Centre

Objectives of the workshop

- Learn the fundamentals of energy efficiency indicators;
- Where and how to collect the indicators;
- How indicators help in policy making;
- Improve collection and compilation of energy efficiency indicators.

Theme: Importance of energy efficiency indicators for energy policy analysis and sharing of experiences on end-use energy consumption data collection/estimation

What do we know about energy efficiency?

Using less energy?

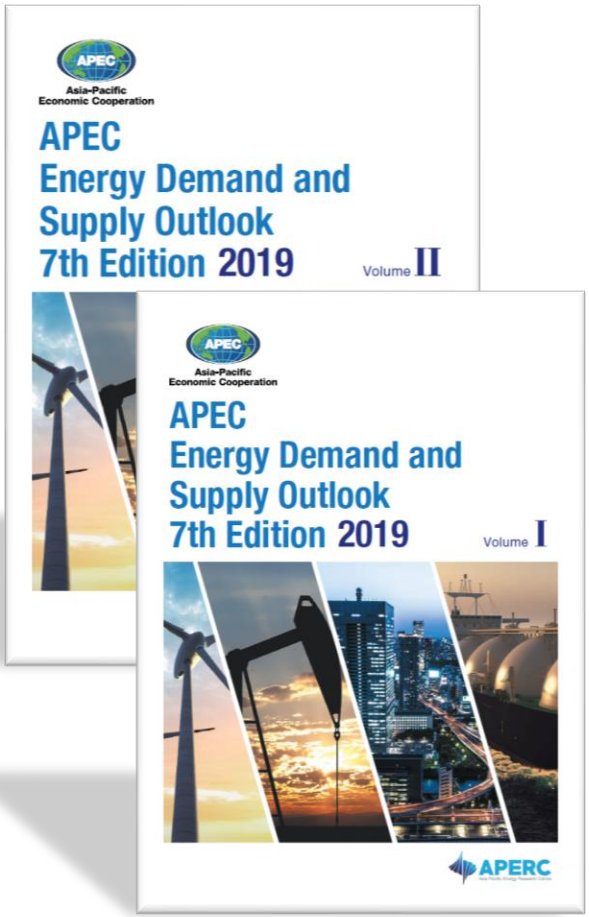
Or more energy?

What particular indicator? How to measure? What trends?

2. APEC analysis

How? What?

APEC Energy Outlook



https://aperc.or.jp/publications/reports/outlook.php

- The '**APEC Energy Demand and Supply Outlook**' project is a priority task for APERC
- APERC has previously produced seven editions of the APEC Energy Demand and Supply Outlook

  - 7th edition published in May 2019. Work on 8th Edition Outlook is in progress.

What?

- **5th Edition**
  - part of analysis in APEC Energy Demand Supply Overview;
- **6th Edition**
  - BAU
  - Improved Efficiency Scenario
- **7th Edition**
  - Achieving APEC Targets
- **8th Edition**

APEC Energy Overview

- The '**APEC Energy Overview**' series started in 2000 with the approval of EWG19, in order to help policymakers to share useful information and deepen understanding on energy issues in the APEC region.
- The Overview is an annual publication, which contains **updated energy demand/supply data** as well as descriptions of energy policy and 'Notable Energy Developments' of the 21 APEC member economies

- Progress of **APEC goals** on **energy intensity** and **renewable share** has been tracked and analysed in each year.

PREE, CEEDS and EEP

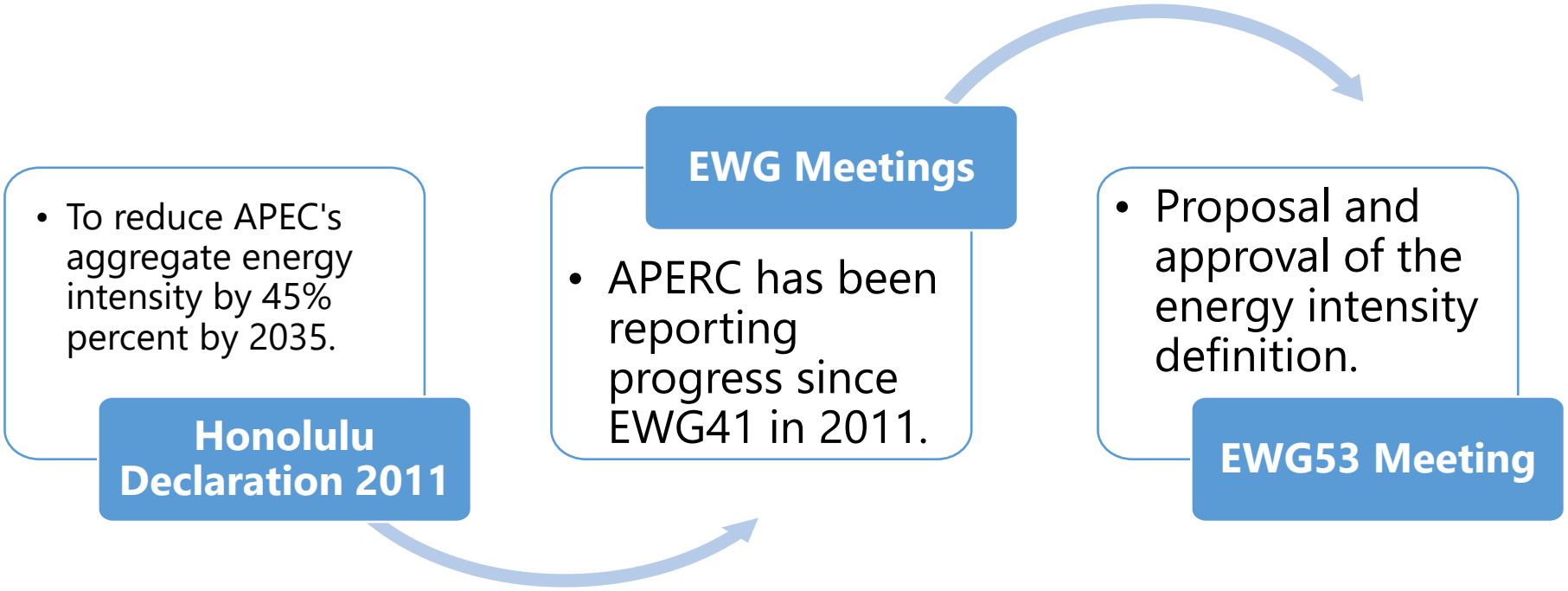
Peer Review on Energy Efficiency (PREE) Broad review of energy efficiency policies and measures by visiting experts to provide recommendations on potential improvements.

PREE also incorporates the following activities

- **Cooperative Energy Efficiency Design for Sustainability** (CEEDS) was a program that ran for four phases from 2010 to 2013.
- Aimed at promoting high-performance energy efficiency policies in the APEC region, especially in developing economies.
- The **Energy Efficiency Policy** (EEP) Workshop, which operates under the PREE banner, is the spiritual successor to CEEDS.

Progress on APEC goals

Energy intensity reduction goal



APEC accounted for more than 50% of global final energy demand in 2018

How do we measure?

Data and data sources

- Energy data from ESTO
- GDP data from the World Bank (PPP, constant 2018 US dollars)
- Exceptions:
  - APERC/ESTO estimates Papua New Guinea energy consumption.
  - APERC estimates Chinese Taipei GDP PPP data.

Definitions

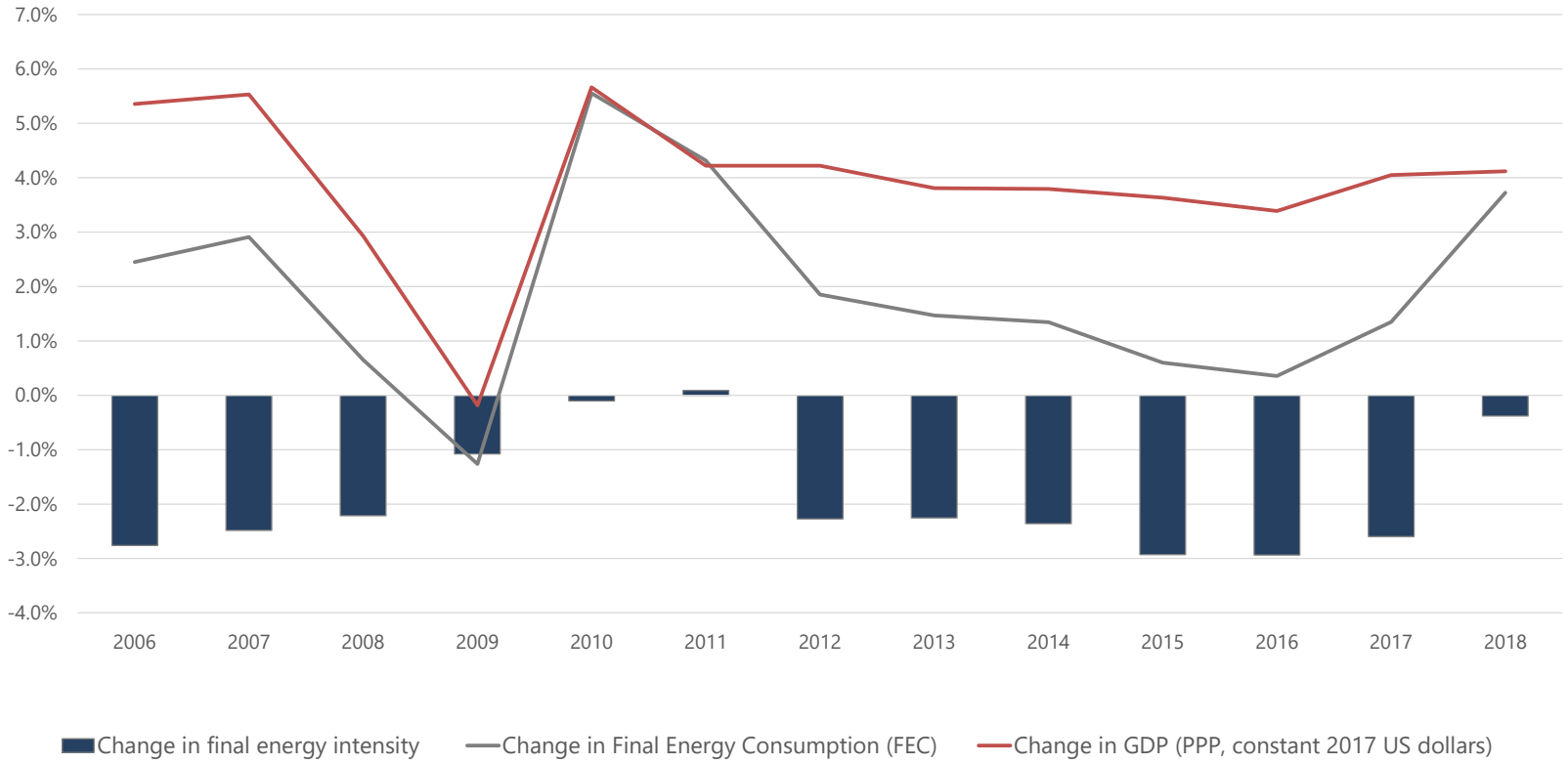
- Final energy consumption (FEC) includes industry, transport, commercial, residential and agriculture (forestry and fishery)
- Final energy intensity

$$FEI = \frac{FEC\ (Mtoe)}{GDP\ (million\ USD,\ PPP)}$$

- Energy intensity indicators are generally calculated as a ratio of energy consumption to the corresponding activity.
- Energy intensity is often used as a proxy to analyse energy efficiency improvements in an economy.

GDP and energy consumption remain decoupled

Annual changes to intensity, energy demand and GDP, 2006-18



Sources: APEC data, WB, APERC analysis

Is this energy efficiency?

Decomposition will illuminate intensity measure

…but data intensive

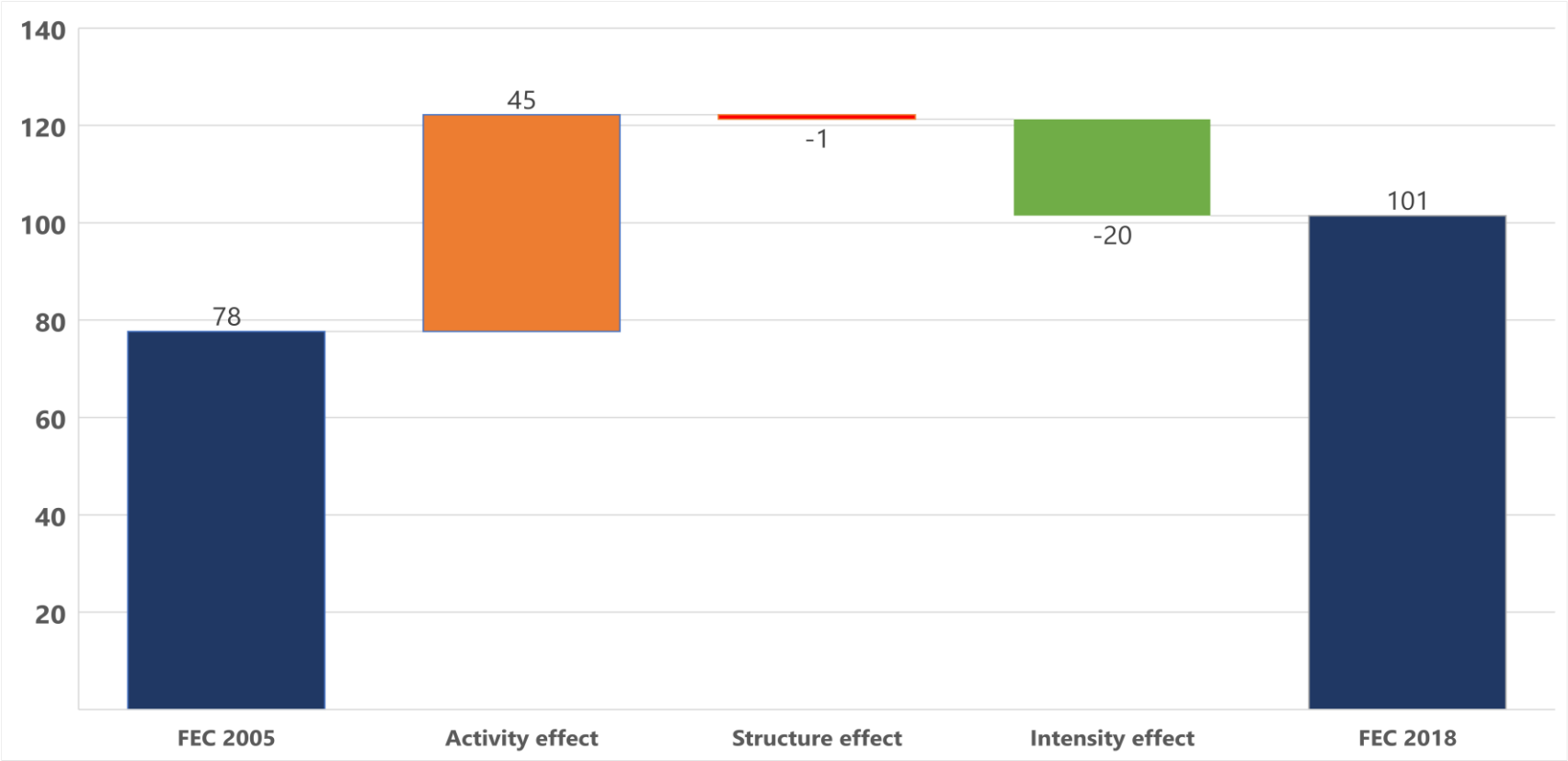
- ❑ Energy data from ESTO
- ❑ GDP by sector data from the World Bank (PPP, constant 2018 US dollars)
  - — oftentimes disaggregated GDP or gross value added (GVA) are not available in WB database, GVA may need to be sourced from each economy.

- ❑ Sectoral energy consumption includes industry, commercial, and agriculture (forestry and fishery)
- ❑ Decomposition method represented by Logarithmic Mean Divisia Index (LMDI)-I Formula by B.W. Ang

- $\Delta E_{tot}=E_T- E_0=\Delta E_{act}+ \Delta E_{str}+\Delta E_{int}$

- GVA (of the three sectors indicated) is the measure of the level of activity of energy consumption associated with each sector.
- GVA is not a good proxy to measure activity in other sectors such as the transport or the residential.

Intensity effect offset consumption increases



Sources: APEC data, WB, APERC analysis

Energy intensity declines offset increases in final energy consumption brought about by activity and structural effects

Just a tip of the iceberg…..

Better data = better analysis

- These three sectors represented only about 70% of APEC total final energy consumption:
- Aggregate indicators can only provide a general idea of the reasons behind trends in energy consumption in a sector.
- What about transport? Residential sectors? 30% of the energy consumption?

- *challenge (or opportunity…) for the members…….*

Thank you for your kind attention.

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