



29<sup>th</sup> APEC Expert Group on Energy Data and Analysis (EGEDA) Meeting  
Canberra, Australia, 7-9 November 2017

# 6. APERC's Research and Other Activities

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Asia Pacific Energy Research Centre



**Asia-Pacific  
Economic Cooperation**

## APERC's research and other activities

- Overview of APERC activities since April 2017
- Independent research projects

APEC Energy Outlook 7th edition

APEC Energy Overview

An aerial composite image showing a volcanic eruption on the left, a city with a complex highway interchange in the center, and a large solar farm on the right. A blue banner with white text is overlaid across the middle.

# APERC's research and other activities

# Overview of APERC Events Since April 2017

## ● May

- APERC Annual Conference and Joint Symposium with IEEJ (Tokyo)

## ● June

- 3<sup>rd</sup> Oil & Gas Security Network (OGSN) Forum (Irkutsk)

## ● August

- Peer Review on Low Carbon Energy Policies (PRLCE) in Papua New Guinea (Port Moresby)

## ● September

- 1<sup>st</sup> Low-Carbon Model Town Symposium (Jakarta)

## ● October

- 6<sup>th</sup> LNG Producer-Consumer Conference, co-hosted with METI with more than 1,400 participants (Tokyo)



# APERC Publications Since April 2017 (1)

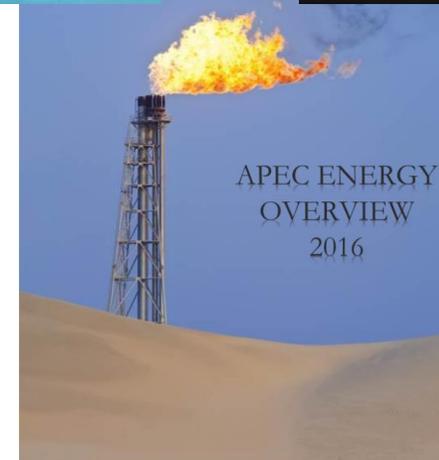
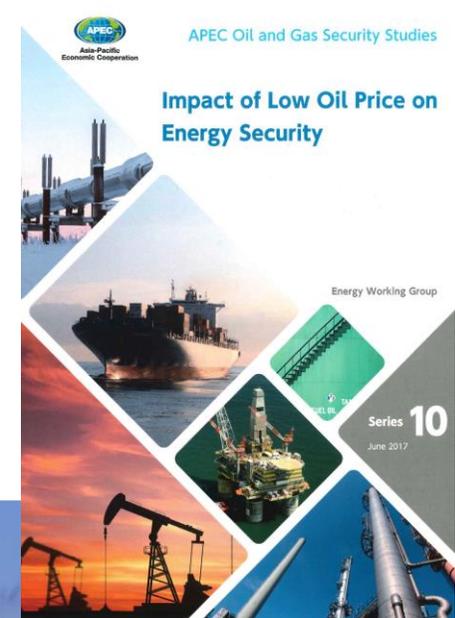
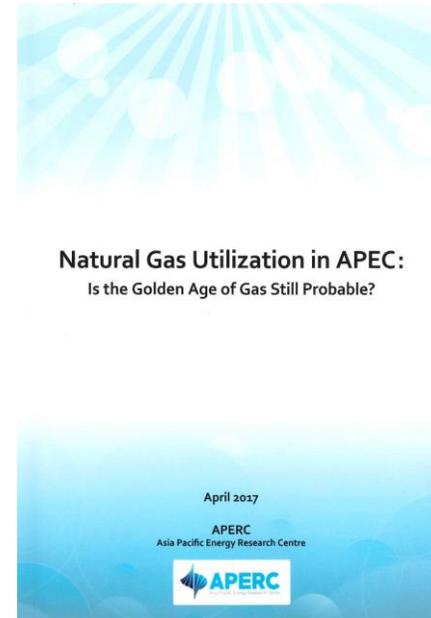
## ● Publications

### ■ April

- Natural Gas Utilization in APEC: Is the Golden Age of Gas Still Probable?

### ■ May

- APEC Energy Overview 2016
- Superiority of LPG - A Disaster-Resistant Energy Source (APEC Oil and Gas Security Studies Series 9)
- Geopolitical Implication of Iran Nuclear Agreement



# APERC Publications Since April 2017 (2)

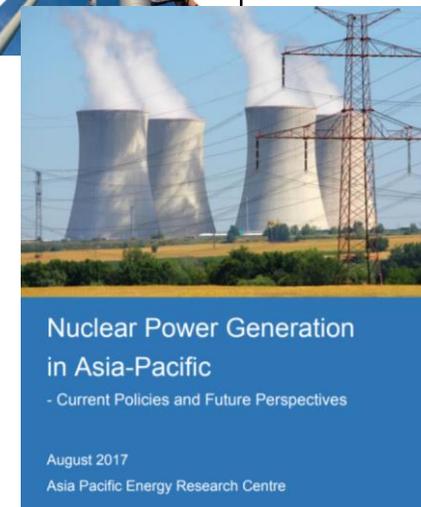
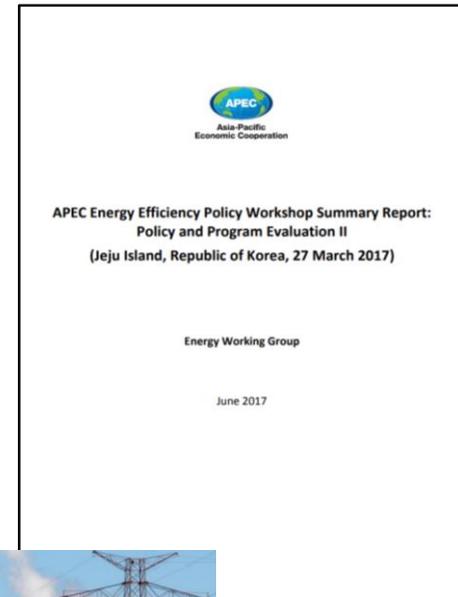
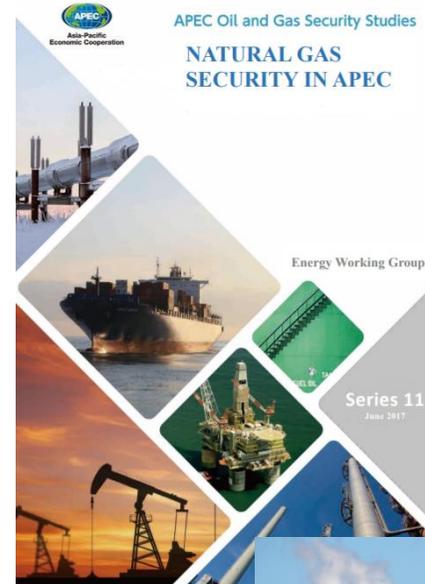
## ● Publications (continued...)

### ■ June

- Impact of Low Oil Price on Energy Security (APEC Oil and Gas Security Studies Series 10)
- Natural Gas Security in APEC (APEC Oil and Gas Security Studies 11)
- APEC Energy Efficiency Policy Workshop Summary Report: Policy and Program Evaluation II

### ■ August

- Nuclear Power Generation in Asia-Pacific



# The Outlook and other publications are available on the APERC website

**APEC** Asia-Pacific Economic Cooperation

**APERC** Asia Pacific Energy Research Centre

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APEC Secretariat APEC Expert Group on Energy Data and Analysis Institute for Energy Economics, Japan

## About us

## APERC brochure

## Activities

## Publications

### Reports

- ▶ APEC Energy Demand and Supply Outlook
- ▶ APEC Energy Overview
- ▶ PREE
- ▶ CEEDS
- ▶ PRLCE
- ▶ LCMT
- ▶ OGSJ
- ▶ Other research reports

### Papers

## APEC Energy Demand and Supply Outlook

The APEC Energy Demand and Supply Outlook is designed to provide a basic point of reference for anyone wishing to become more informed about the energy choices facing the APEC region. The business-as-usual projections illustrate the risks of the development path the APEC region is now on. Alternative scenarios examine options for improving sustainability. APERC normally prepares a new version of the Outlook every 2 or 3 years.

Recent editions of the Outlook have been published in two volumes. Volume 1 discusses the outlook for the APEC region as a whole, and compares the outlook for the various APEC economies. Volume 2 has provides an 'Economy Review' (chapter) discussing the outlook for each APEC economy.

### ▶ APEC Energy Demand and Supply Outlook 6th Edition

#### Contents

	text in pdf	tables in pdf
Outlook Volume 1		
Outlook Volume 2		
Annex I		
Annex II		

<http://aperc.iecej.or.jp/publications/reports/outlook.php>

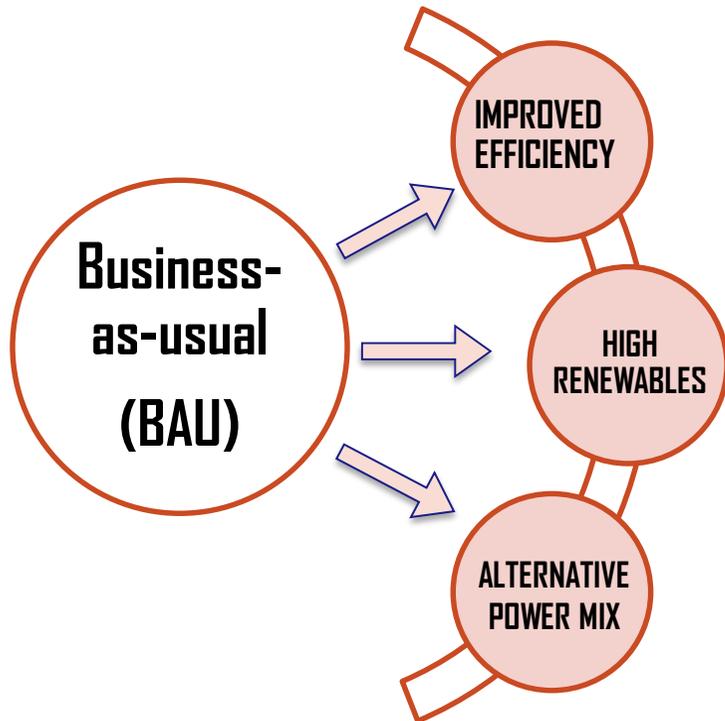


# 7<sup>th</sup> Outlook Modelling Approach & Timeline

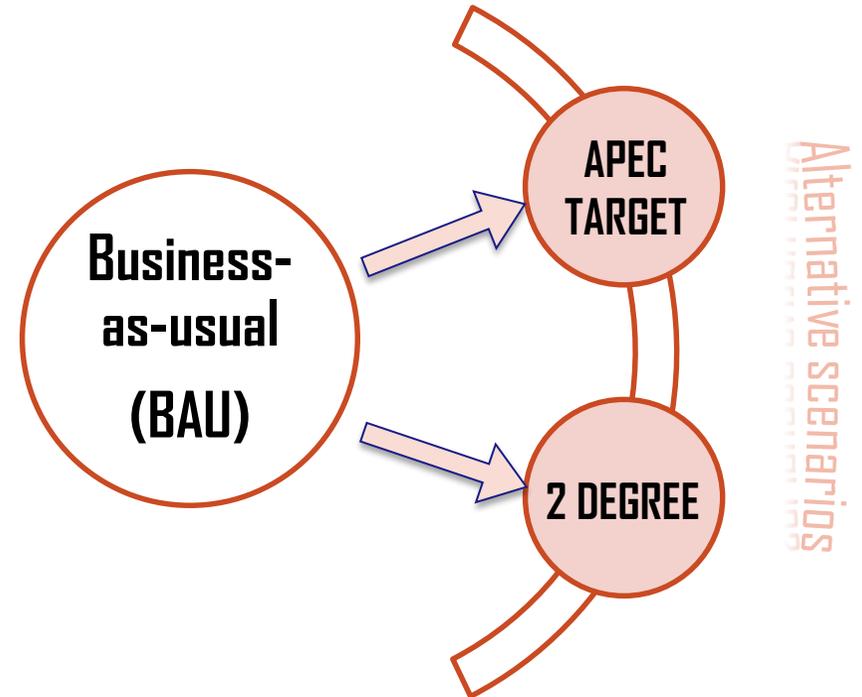
- Extended the outlook period to 2050
- Integrated renewable energy analysis with the demand and electricity models
- Added a supply model and an integrating module
- Increased collaboration with economies, for instance modelling assumptions review process
- 2 alternative scenarios
  - **APEC Target**: integrates APEC energy efficiency and renewables aspirational goals
  - **2-Degree Scenario (2DS)**: investigates technology transition pathways to reduce carbon dioxide emissions

# 7<sup>th</sup> edition of the Outlook will produce two alternative scenarios through 2050

## Outlook 6<sup>th</sup> edition scenarios (to 2040)



## Outlook 7th edition scenarios (to 2050)



# Assumptions for the APEC Target Scenario

This scenario focuses on **simultaneously** achieving the APEC energy intensity and renewables capacity goals.

- whereas 6<sup>th</sup> Edition looked at the two goals separately

## For the **energy efficiency goal**

- In 2007, APEC Leaders agreed to a regional aspirational goal of reducing energy intensity by at least 25 percent by 2030 (with a 2005 base year). This goal was updated in 2011 to a 45 percent reduction of regional aggregate energy intensity by 2035.

## As for **renewables**

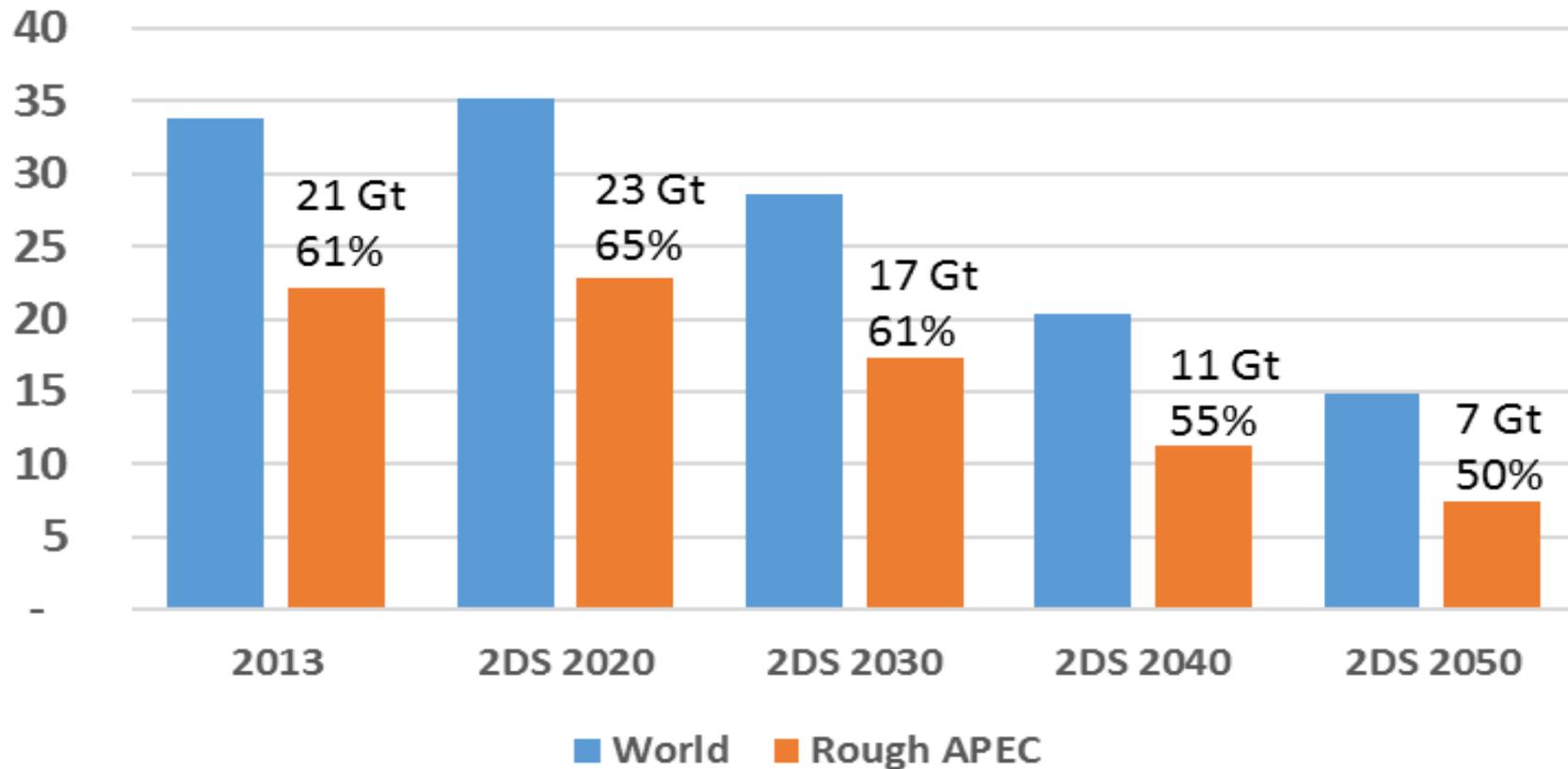
- in 2014, APEC Leaders endorsed a new aspirational goal to double the share of renewable energy in APEC's overall energy mix by 2030 (over 2010 levels) and increase cooperation to achieve it.
- goal is applied to final energy demand and includes energy sources such as large-scale hydropower, but not traditional biomass (i.e. following the UN's

# Emissions Boundary and CO<sub>2</sub> Emissions Factors

- Will consider CO<sub>2</sub> emissions from fuel combustion + industrial process emissions
- If possible, will also calculate fugitive emissions and include these values in the discussion (but no figures)
- Agriculture: excluded although represents more than 15% of total GHG emissions for 7 economies
- LULUCF: excluded – large variations year on year which are either negative or positive
- CO<sub>2</sub> Factors: Use global factors for coal, oil and gas instead of economy specific factors (6th edition)

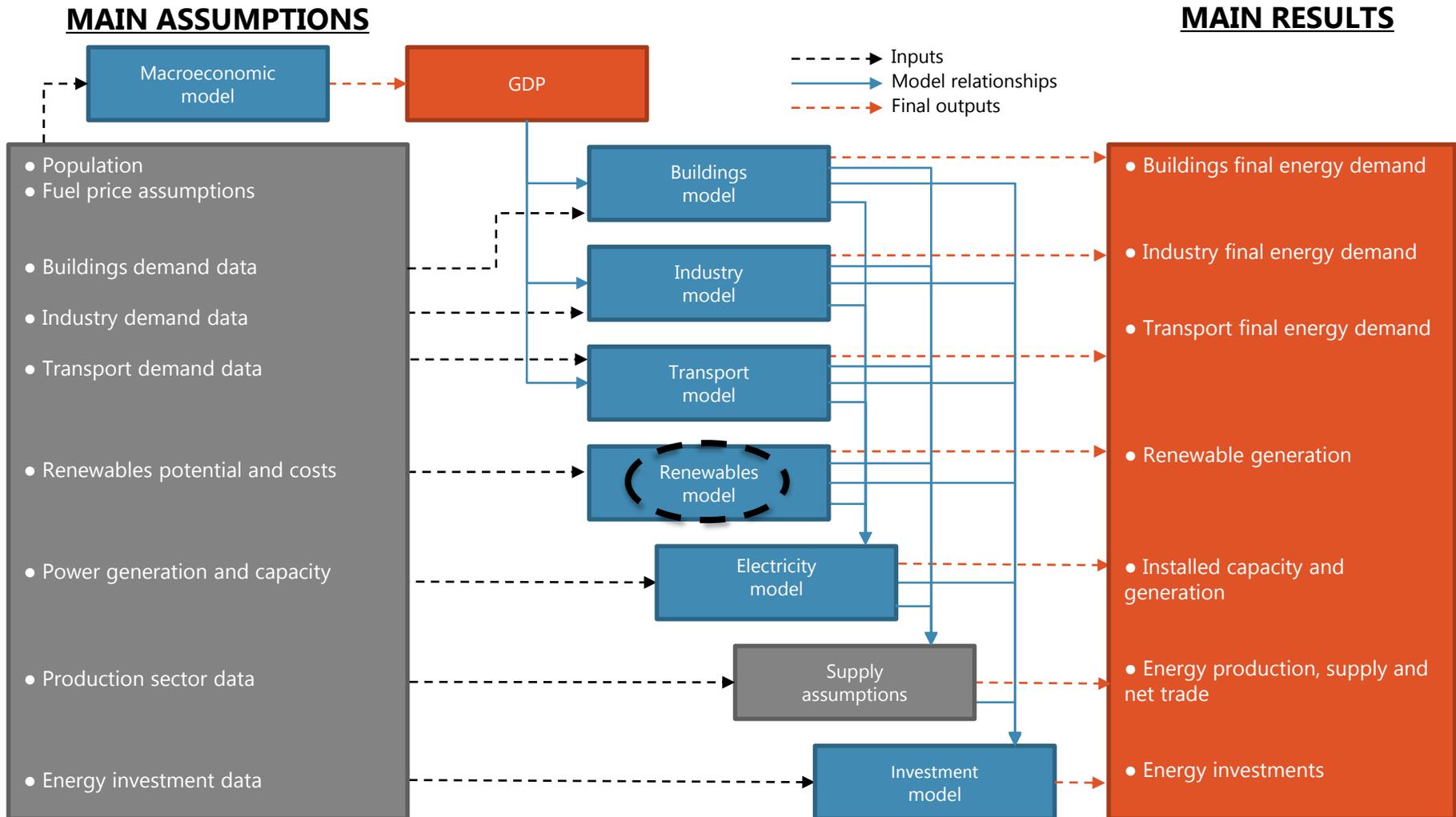
# Assumptions for the 2-Degree Scenario (2DS)

## 2DS GHG Trajectories - World vs. APEC (Rough)

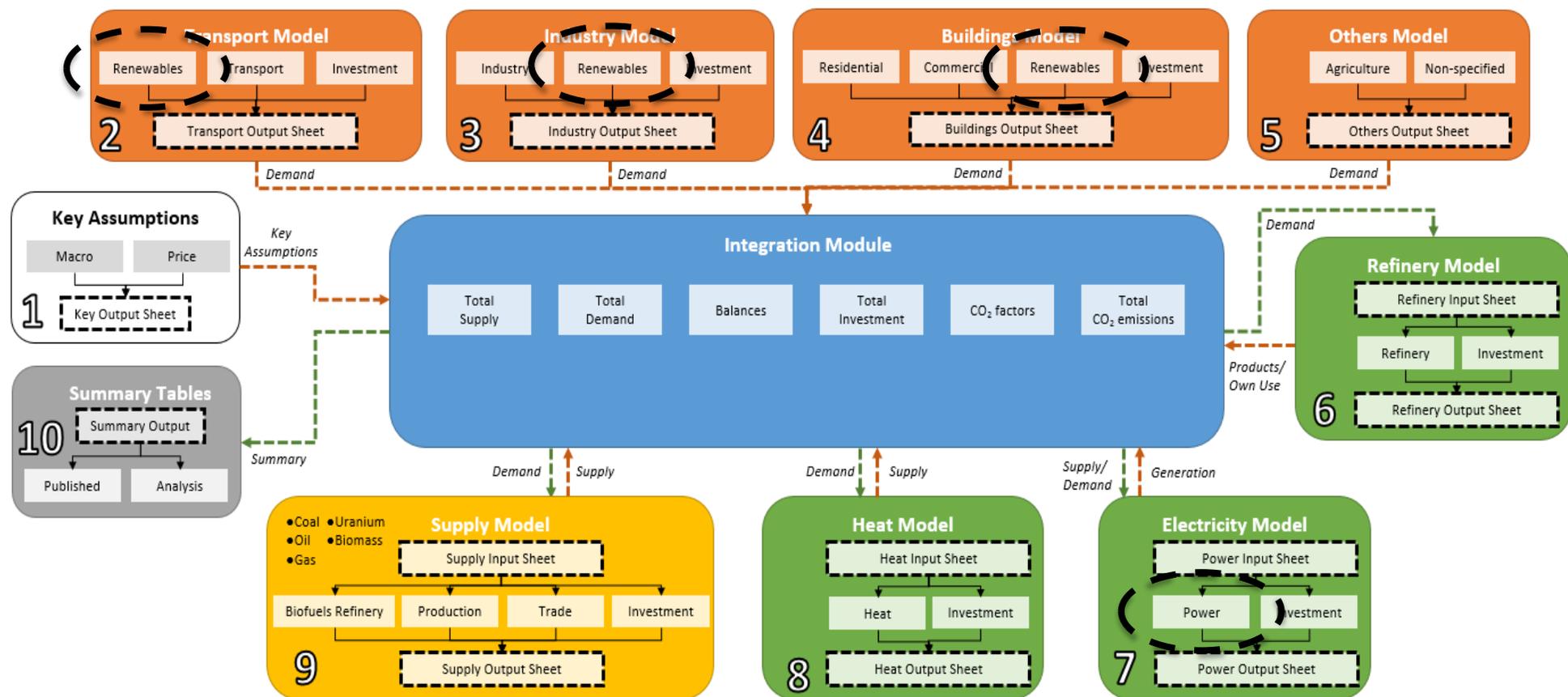


***IEA ETP sees a declining share of APEC budget within global emissions***

# Past: 6<sup>th</sup> Edition - Outlook model structure



# Present: 7<sup>th</sup> Edition – Outlook model structure, including integration module to aggregate data



# Renewables modelling updates for 7<sup>th</sup> Edition

Integrate renewable energy analysis into Demand (Buildings, Industry, and Transport) and Power models

- Consider policy mandates, technical limits...

Incorporate renewable capacity stock modelling

- Look at currently available waste/residue

Assess direct renewable use (for heating and cooling applications)

Estimate detailed renewable potential by economy and by sector

Improve daily load curves analysis to quantify impacts of variable renewables in power

Expand list of renewable technologies in Demand and Power models

## **Part 1 – APEC demand and supply under business as usual**

- Introduction
- Outlook for energy demand
- Outlook for energy supply
- Outlook for the power sector

## **Part 2 – APEC demand and supply under alternative scenarios**

- APEC energy goals scenario (combined intensity + doubling renewables share)
- 2-degree scenario (low carbon transition/advanced technologies)
- Energy investment
- Energy security
- Raising APEC climate ambitions (focus on implementation)

# Models are being run & results will be reviewed this autumn

	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	2019
Economy review of assumptions	✓								
Model development	✓	✓	✓						
Demand model runs			✓						
Power & supply model runs				✓					
Economy reviews of model results				✓					
Model reruns to respond to comments					✓				
Outlines, drafting of chapters					✓	✓			
Editing, printing							✓	✓	
Publication									April



# APEC Overview

# Background

proposed by Australia during the EGEDA meeting held in Japan last March 2000 and approved at the EWG 19 meeting in April 2000;

APERC has been responsible for;

- coordinating and information gathering from member economies, and
- preparing yearly reports/updates (Overview) for EGEDA members' review;

Since 2000, 16 editions;

In 2015, coordinating agency for EGEDA and data collection were lodged in APERC, which is now called ESTO

## **APEC Energy Overview serves as a good avenue for**

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Sharing the latest information on energy-related government policies of member economies;

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providing useful (latest) information and insights to policy makers and researchers in the region; and

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promoting the use of EGEDA data

***APEC Overview*** uses data provided by ESTO

## Social and Economic Indicators (WB)

- Population
- GDP (PPP) and GDP/capita

## Energy data (submission from members)

- TPES (production and net imports, by fuel)
- TFC (consumption by fuel and by sector)
- Power Generation (by fuel)

# Key Parts

Introduction

Energy Supply & Demand

- Primary Energy Supply, Final Energy Consumption

Energy Intensity Analysis

Policy Overview:

- Energy Policy Framework, Market Policy, Energy Security, Upstream Energy Development, Energy Markets Development (Petroleum, Natural Gas, Coal, Nuclear,) Energy Efficiency, Renewable Energy, and Climate Change, etc.

Notable Energy Developments

Useful Links

**❖ Tracking of RE doubling goal as agreed upon by EGNRET Secretariat and APERC during its meeting**

# Indicative Timelines

<b>Data preparation (ESTO)</b>	<b>September–November 2017</b>
Final data	10 Nov 2017
Drafting of chapters	1 December 2017–16 February 2018
Send 1 <sup>st</sup> Round Draft to Outsourced Editor	Last week of February 2018
Received 1 <sup>st</sup> draft	15 March 2018
Send to EGEDA members for comments	23 March 2018 (1 month)
Send back to Researchers to incorporate EGEDA comments	23-27 April 2018
2 <sup>nd</sup> Round of Edits (Outsourced if needed)	30 April – 11 May 2018
Finalization	14-31 May 2018
For publication	end of May or 1 <sup>st</sup> week June 2018



# Discussion on RE doubling goal part in the Overview



**Thank you for your kind attention**

<http://www.egeda.ewg.apec.org>