



**43rd Meeting**

**Expert Group on New and Renewable Energy Technologies (EWG)**

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***APEC Renewable Energy Goal:  
Definitional Issues***

**Martin Brown-Santirso (APEREC)**



Asia-Pacific  
Economic Cooperation



## *Background Renewable Energy Goal*

September  
2011:

- Under the Sustainable Energy for All (SE4All) Initiative, the UN has set a goal of doubling the share of renewable energy in the global energy mix by 2030.

February  
2014:

- At the First Senior Officials Meeting (SOM1) in China, members discussed the possibility of committing to a regional energy goal that is in line with the SE4ALL initiative.

April 2014:

- At the Joint EGNRET and EGEDA Meeting in Hawaii, EGNRET members discussed the technical aspects of RE goal as well as technology cost goals.
- EGEDA and APERC were tasked to prepare a memorandum to facilitate the discussions on APEC Renewable Energy Share Doubling Goal at the APEC EWG 47 Meeting in Kunming, China.



## *Issues that arise*

- Objective of the target
  - Security, carbon, sustainability
- Definition
  - Traditional biomass, large hydro
- Data
  - Statistics availability



# Alternative Definitions

## 3-1. Purpose of the Doubling Goal

•What is the purpose of RE share doubling goal?

Priority	Geothermal	Solar	Wind	Tidal/Wave	Large Hydro	Small Hydro	Modern Bioenergy	Traditional Biomass	Waste	Imported RE
Energy Security	✓	✓	✓	✓	✓	✓	✓	X	✓	X
Emissions Reduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sustainable Development	✓	✓	✓	✓	X	✓	✓	X	✓	✓



## *Alternative Definitions*

### An Example of a Definition

- From sustainable development perspective the definition would look at carbon, human and environmental health, social values, etc.

The APEC goal “**Sustainable Energy**” could consist of:

- a) **Small-scale hydro**;
- b) Wind;
- c) Solar (photovoltaic and solar heat);
- d) Geothermal;
- e) **Bioenergy *excluding* traditional firewood and charcoal for households**;
- f) Upcoming Alternative energies that meet the sustainable criteria.



## *Survey of Definitions of Renewable Energy (RE)*

- Definitions of hydro power should be harmonized to IEA and IRENA.
- Standard methodology for renewable energy survey is recommended.

**Table: Comparison of definition of RE (excerpt)**

IRES	IRENA	IEA	APEC
Municipal waste (renewable)	Renewable Municipal Waste	Municipal Waste - Renewable	<b>Municipal Solid Waste</b>
Municipal waste (non-renewable)	other (non-renewable)	Municipal waste (non-renewable)	
Wood pellets	Wood and straw pellets/briquettes	Solid biofuels excluding charcoal	<b>FireWood &amp; Wood waste</b>
Other Fuelwood, wood residues and by-products	Fuelwood Wood waste		
Other vegetal material and residues	Rice husks		<b>Other Biomass</b>
	Straw		
	Other vegetal and agricultural waste Other primary solid biomass		
Black liquor	Black liquor	<b>Bagasse</b>	
Bagasse	Bagasse		
Hydro electricity	Hydro	Hydro	<b>Hydro</b>
	Hydro-1 MW	Hydro-1 MW	
	Hydro 1-10 MW	Hydro 1-10 MW	
	Hydro 10+ MW	Hydro 10+ MW	
	Pumped Hydro	Pumped hydro	



## Data Submission in APEC Data Collection

- Data for certain types of data is not

Table: Data Submission of RE from APEC non-OECD economies (2010)

	Hydro	Geothermal Power	Photovoltaic	Tide,Wave, Ocean	Wind	Solar thermal	Geothermal Heat	Solar Heat	FuelWood & Woodwaste	Bagasse	Charcoal	Other Biomass	Biogas	Industrial Waste	Municipal Solid Waste	Liquid Biofuels
Brunei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
China	o	-	-	-	o	-	-	-	-	-	-	-	-	o	-	-
Hong Kong, China	-	-	o	-	o	-	-	o	-	-	o	-	o	-	-	o
Indonesia	o	o	o	-	o	-	-	-	-	-	-	o	-	-	-	-
Malaysia	o	-	o	-	-	-	-	-	-	-	-	-	-	-	-	-
Papua New Guinea	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	o	-	o	-	-	o	-	-	o	o	o	o	-	-	-	o
Philippines	o	o	o	-	o	-	-	-	o	o	o	o	-	-	o	o
Russia	o	o	-	-	o	-	-	-	o	-	-	-	-	o	-	-
Singapore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	o	-
Chinese Taipei	o	-	o	-	o	-	-	o	o	-	-	-	o	-	o	-
Thailand	o	o	-	-	o	o	-	-	o	o	o	o	o	-	o	o
Viet Nam	o	-	-	-	-	-	-	-	o	-	-	-	-	-	-	-



## *Other Issues*

### Denominator in Share Calculation

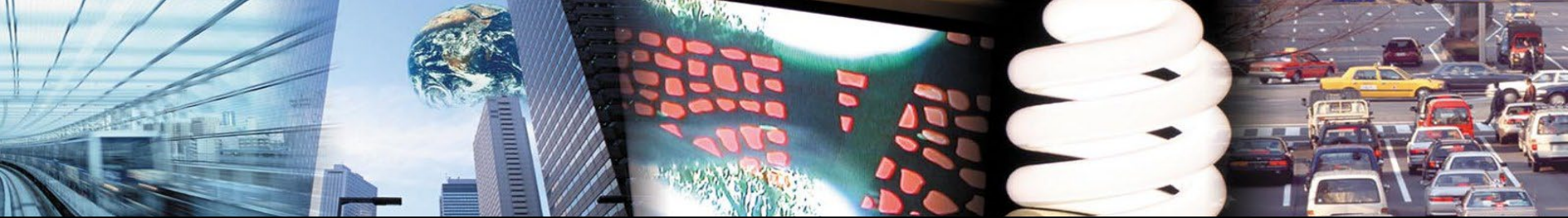
- Both **Total Primary Energy Supply (TPES)** and **Total Final Energy Consumption (TFEC)** are possible.
- In order to avoid overestimating the role of RE when low efficiency accounting method is assumed (or conversely), it is proposed that APEC uses TFEC as a denominator in RE share calculation.





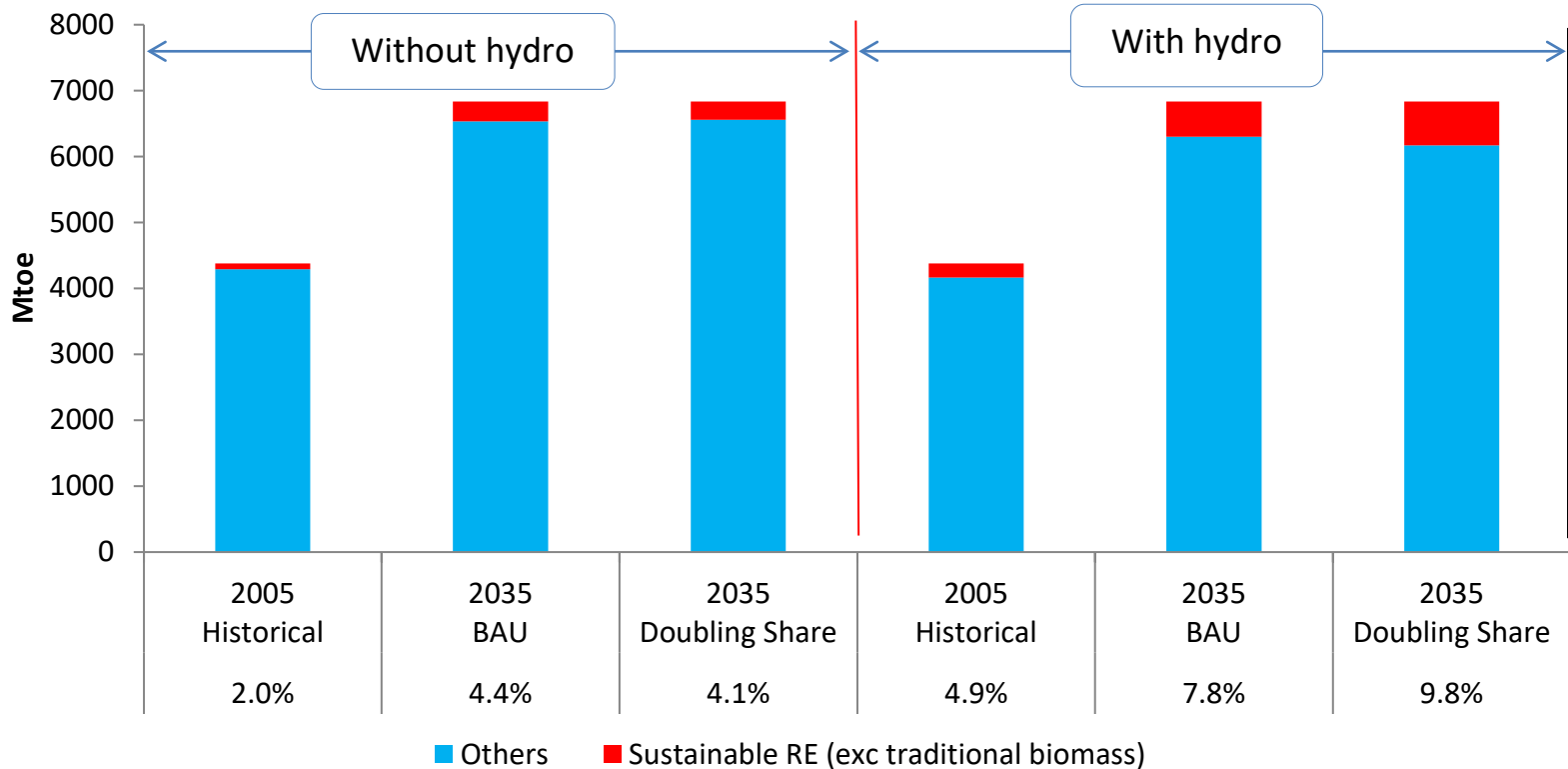
## *Example Projection*

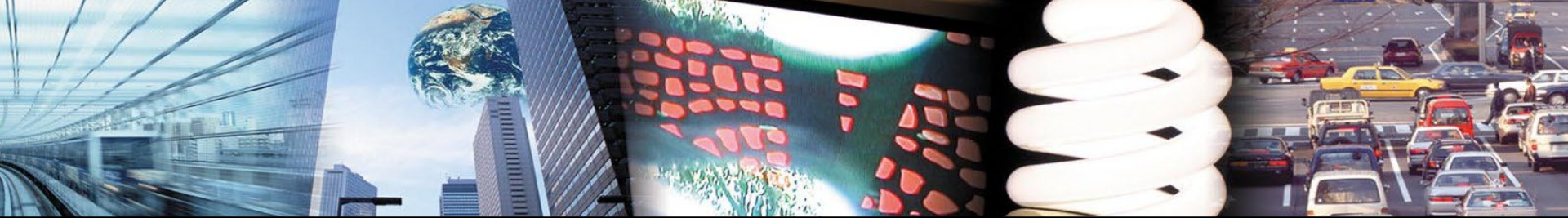
- This trial calculation makes use of
  1. The IEA Energy Balance Database for 2005 data.
  2. The APEC Energy Demand and Supply Outlook 5th Edition for the forecasted data.
- Due to the data constraints, the “Sustainable RE” categorization here consists of:
  1. All RE power generation.
  2. Direct-use of RE (but excludes RE in the residential, commercial and other sector).
- The denominator is the Total Final Energy Consumption (TFEC).



# Example 1

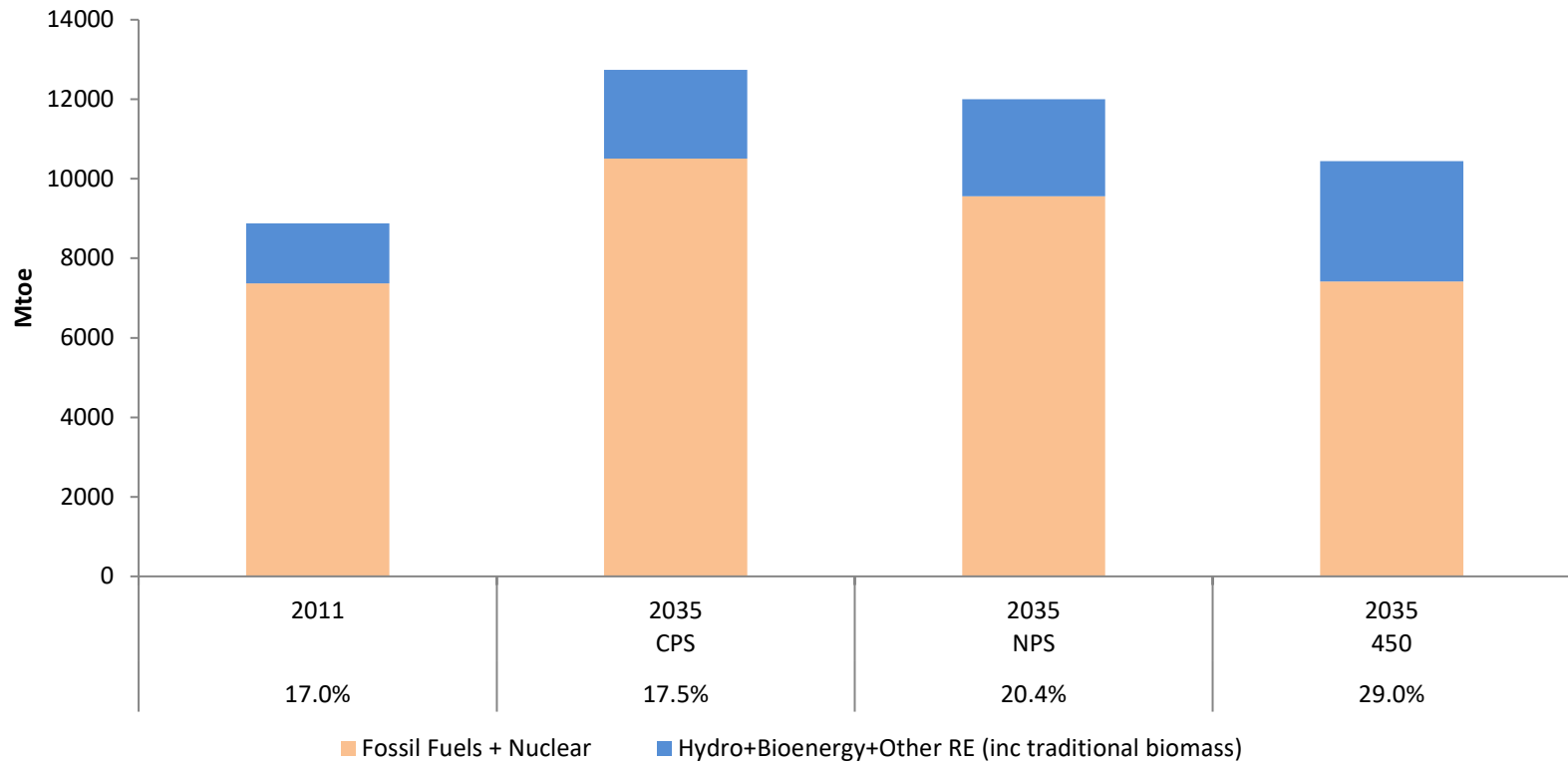
**APEC Outlook Forecasts for Share of RE in APEC TFEC, in 2035:  
Examining impact of including hydro in RE Share**





# Comparing APEC and IEA Forecasts

WEO 2013 Forecasts for Global RE Share in 2035, under 3 Scenarios

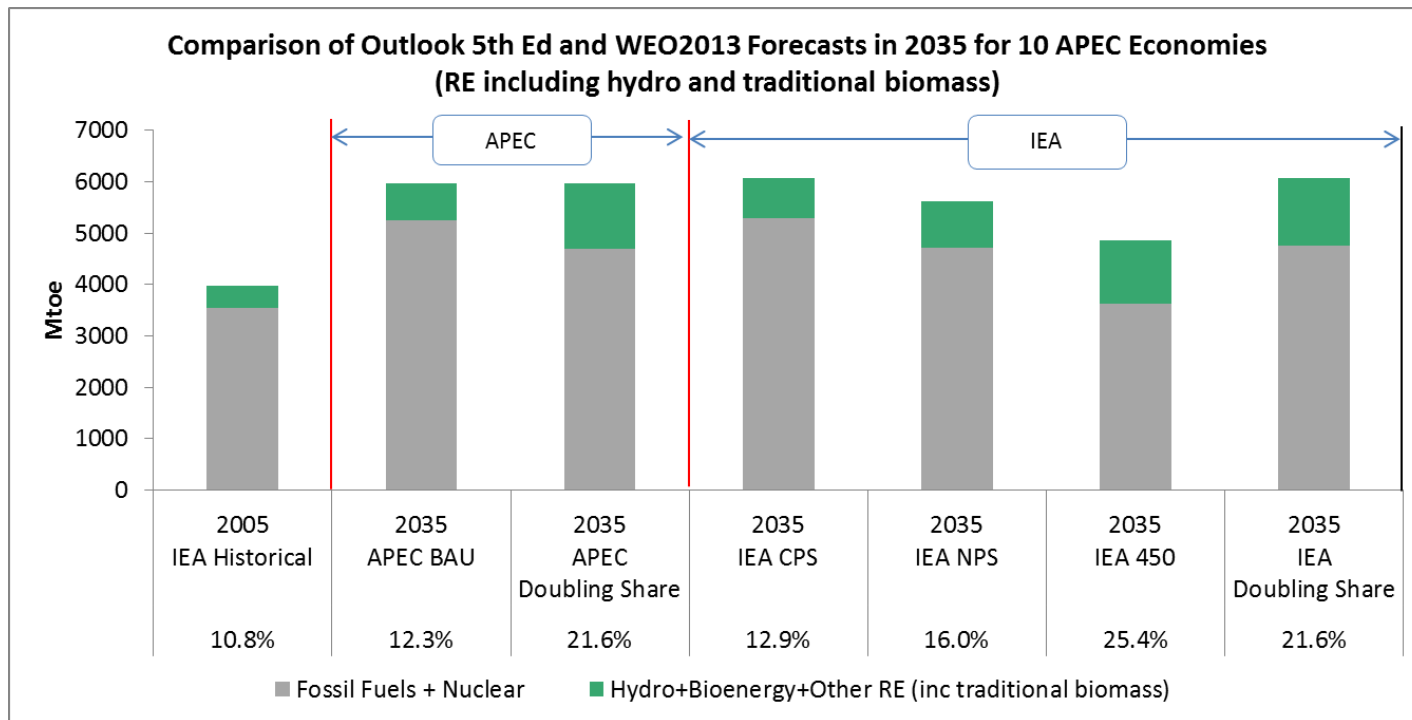


\* Disaggregated data by economy not available  
 \* Data for traditional biomass not available



# Comparing APEC and IEA Forecasts

•Based on available IEA data, comparison can be made for **10 out of 21 APEC economies** (> 85% of APEC TFEC). The following table includes hydropower as RE.

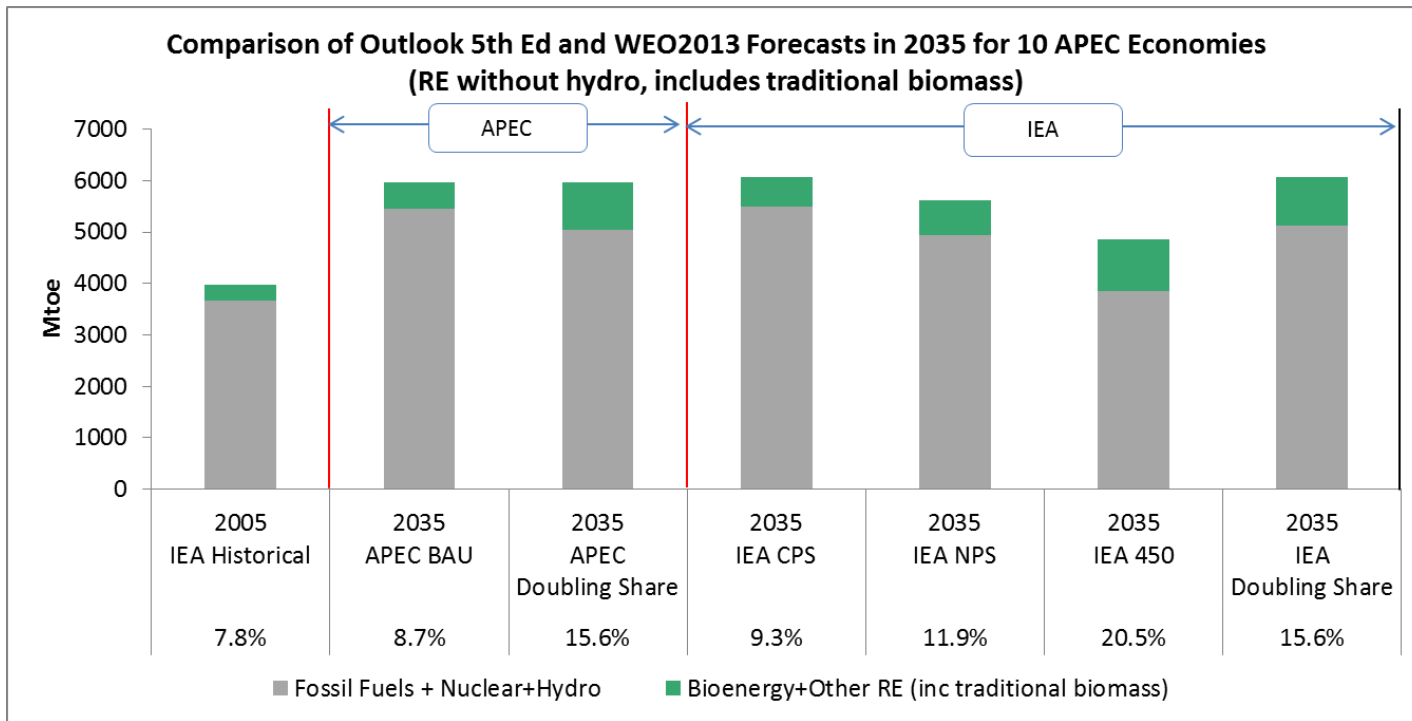


\* The ten economies are Canada, Chile, Mexico, USA, Australia, Japan, Korea, New Zealand, Russia and China.



# Comparing APEC and IEA Forecasts

- The following table does not include hydropower as RE.



\* The ten economies are Canada, Chile, Mexico, USA, Australia, Japan, Korea, New Zealand, Russia and China.



## *Conclusions*

- EWG and EGNRET need to define the parameters of the RE target
- Issues need to be settled to enable measurement.