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APEC Renewable Energy Goal: Definitional Issues

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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 looking at carbon, human and environmental health, social values, etc.

The APEC goal "Sustainable Energy" could consists 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	**Municipal Solid Waste**
Municipal waste (non-renew)	other (non-renewable)	Municipal waste (non-renew)	
Wood pellets	Wood and straw pellets/briquettes	Solid biofuels excluding charcoal	**FireWood & Wood waste**
Other Fuelwood, wood residues and by-products	Fuelwood		
	Wood waste		
Other vegetal material and residues	Rice husks		**Other Biomass**
	Straw		
	Other vegetal and agricultural waste		
	Other primary solid biomass		
Black liquor	Black liquor		
Bagasse	Bagasse		**Bagasse**
Hydro electricity	Hydro	Hydro	**Hydro**
	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	○	-	-	-	○	-	-	-	-	-	-	-	-	○	-	-
Hong Kong, China	-	-	○	-	○	-	-	○	-	-	○	-	○	-	-	○
Indonesia	○	○	○	-	○	-	-	-	-	-	-	○	-	-	-	-
Malaysia	○	-	○	-	-	-	-	-	-	-	-	-	-	-	-	-
Papua New Guinea	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	○	-	○	-	-	○	-	-	○	○	○	○	-	-	-	○
Philippines	○	○	○	-	○	-	-	-	○	○	○	○	-	-	○	○
Russia	○	○	-	-	○	-	-	-	○	-	-	-	-	○	-	-
Singapore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-
Chinese Taipei	○	-	○	-	○	-	-	○	○	-	-	-	○	-	○	-
Thailand	○	○	-	-	○	○	-	-	○	○	○	○	○	-	○	○
Viet Nam	○	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-

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.**

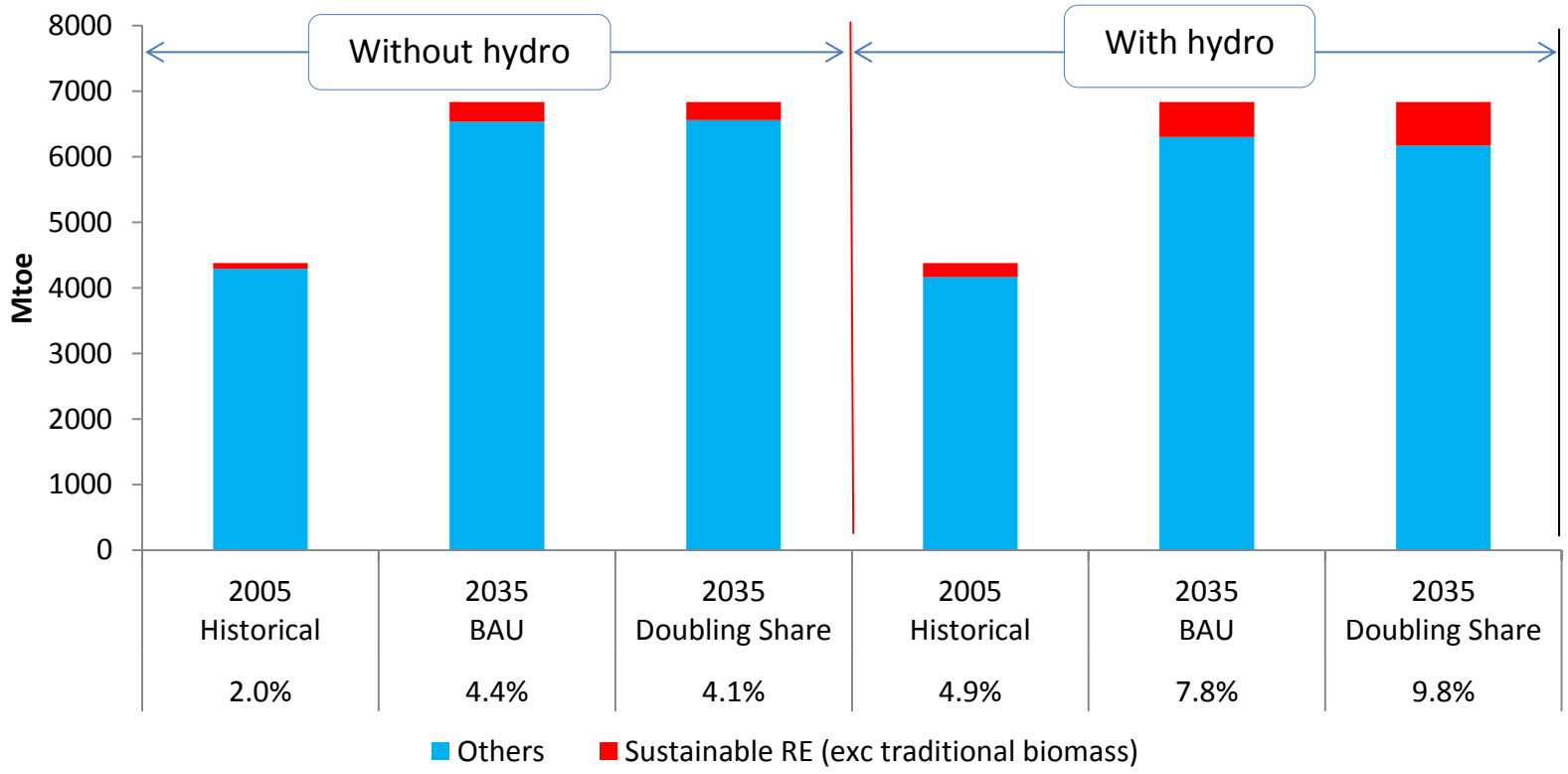
- **Due to the data constraints, the "Sustainable RE" categorization here consists of:**

1. **All RE power generation.**
2. **Direct-use of RE (but excludes RE in the residential, commercial and other sector).**

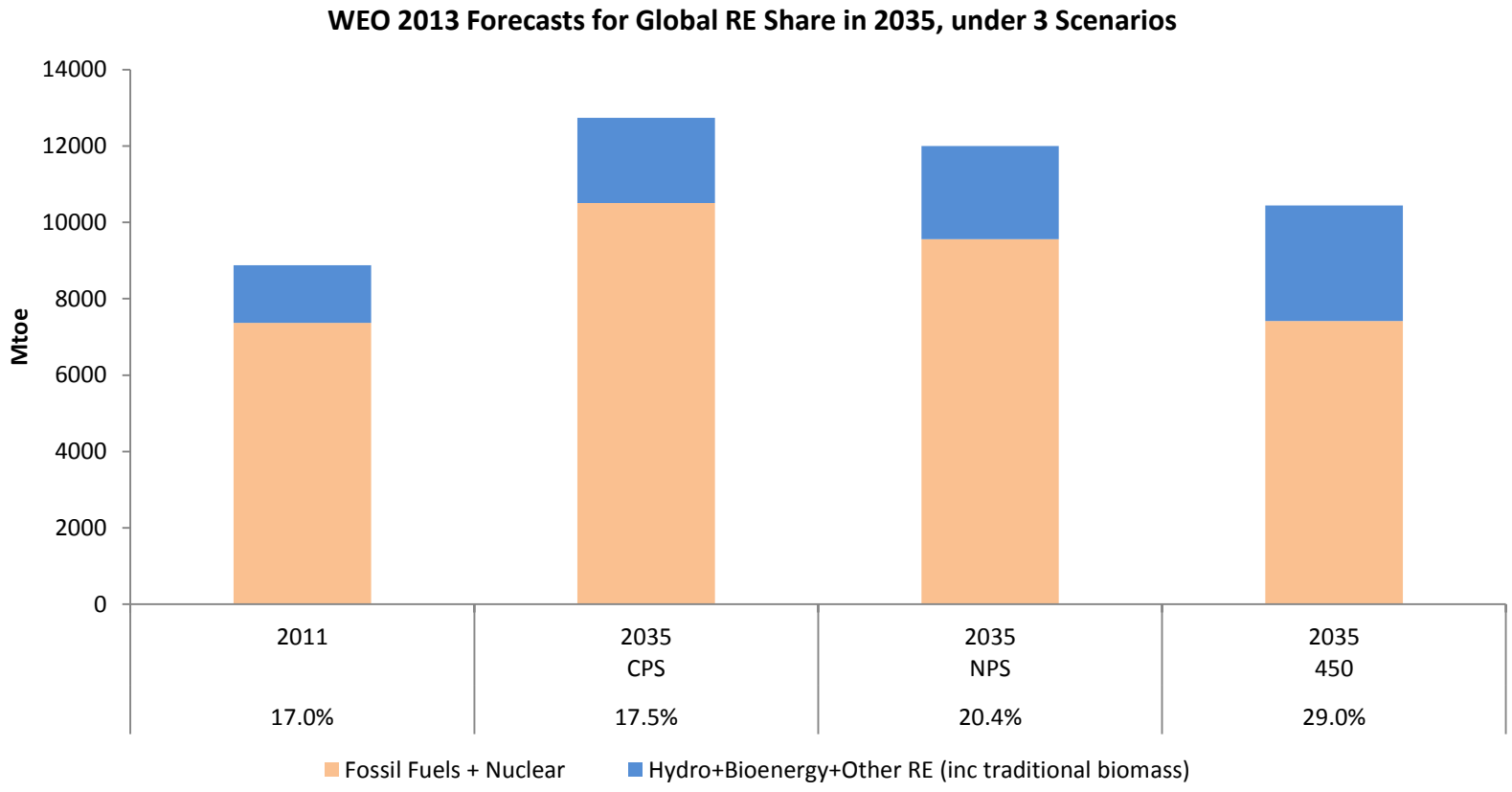
- **The denominator is the Total Final Energy Consumption (TFEC).**

Example 1

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



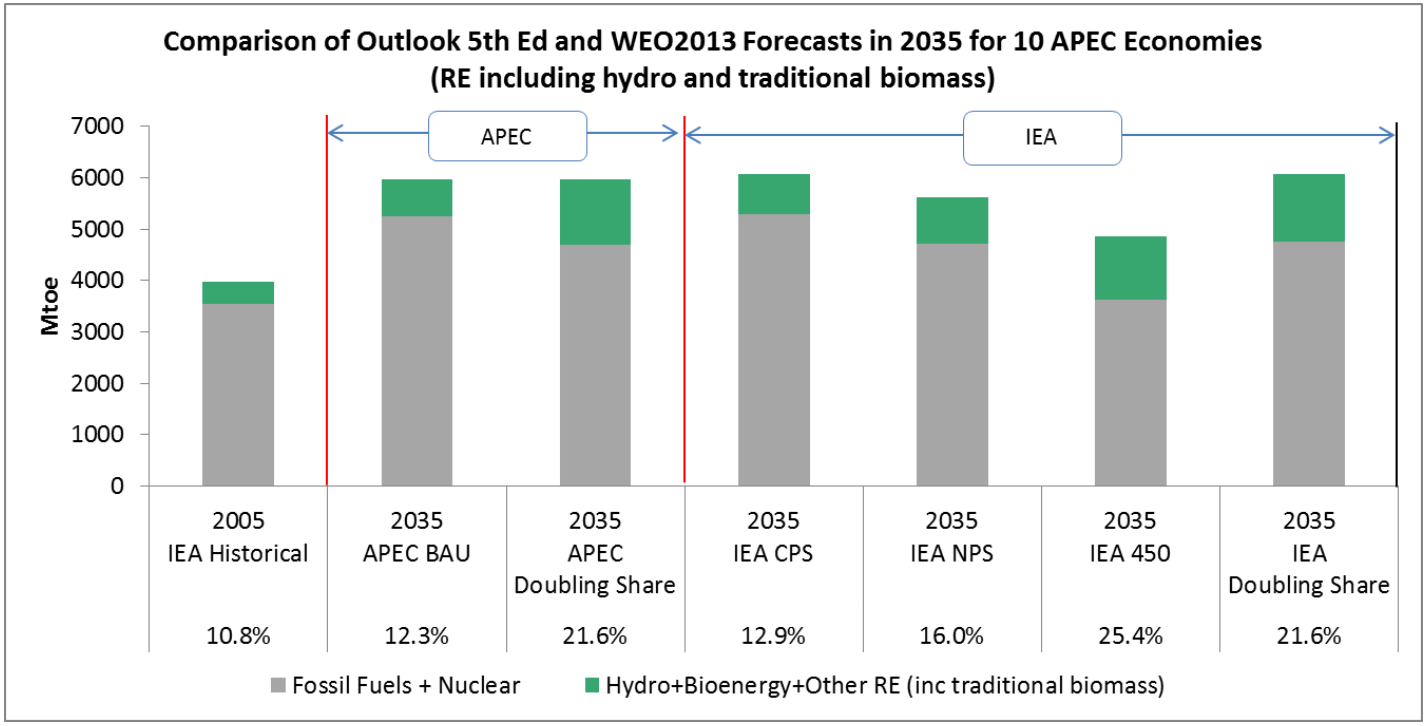
Comparing APEC and IEA Forecasts



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

Comparing APEC and IEA Forecasts

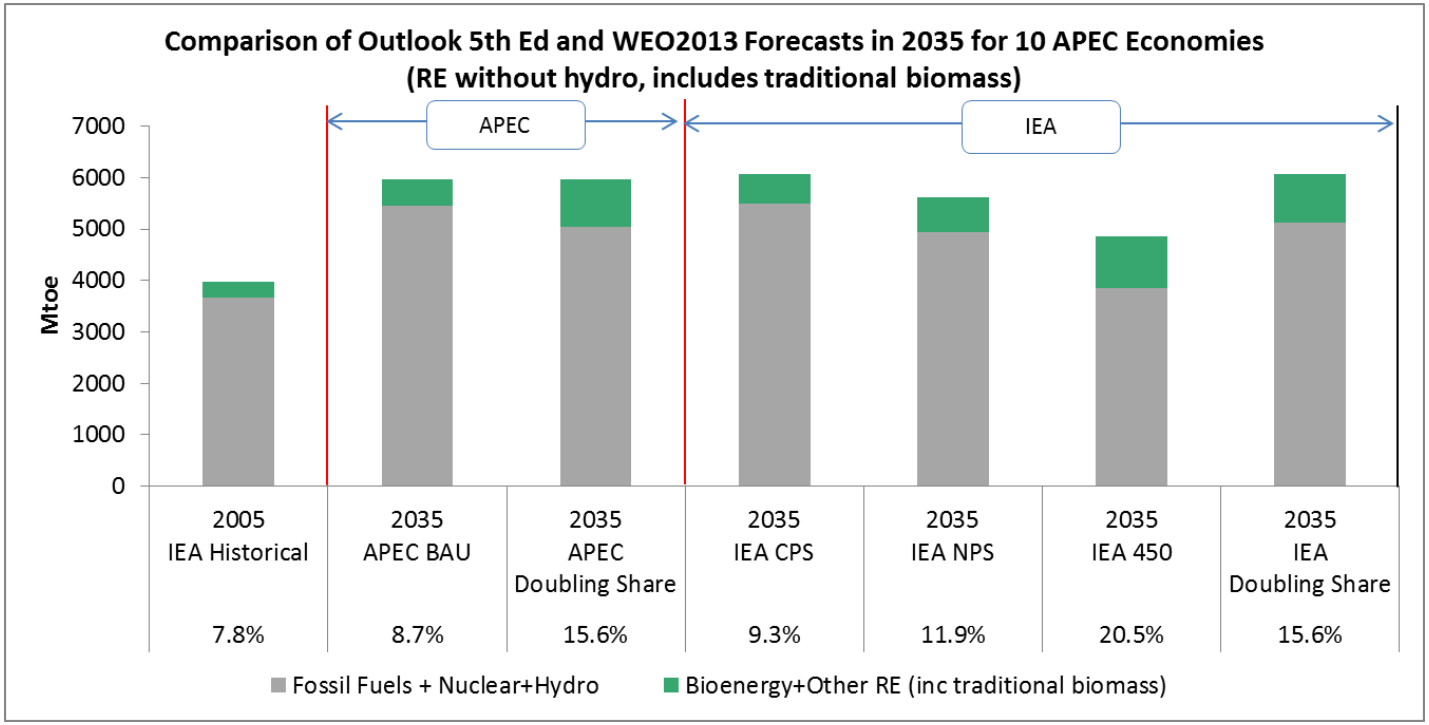
•**Based on available IEA data, comparison can be made for 10 out of 21 APEC economies (> 85% of APEC TFEC). The following table includes hydropower as RE.**



* 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.