EGEDA
under EWG-APEC

APEC
Asia-Pacific
Economic Cooperation

IRENA
International Renewable Energy Agency

Session 2B - Renewable energy data collection

The 18th APEC Workshop on Energy Statistics

Joint APEC-IRENA Training Workshop on Renewable Energy Statistics

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1. What and where (from whom) to collect?
2. How to collect/estimate data?
   - Administrative data
   - Surveys
   - Use of trade data
   - Example of methodologies
3. Learn from other economies

1. What and where (from whom) to collect

Producers and users of renewable energy

FLOW	SECTOR						
	Energy	Industry	Commerce	Services	Other (AFF)	Transport	Households
Production	Primary and secondary fossil fuels and primary renewable heat	Secondary fossil fuels, primary renewable heat, biofuels and waste		Wastes, biofuels (solids, biogas)	Biofuels (solids, biogas)		Biofuels (solids, biogas) and primary renewable heat (solar water heating)
Trade, stock changes and bunkers	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels and bunkers	
Electricity and heat production	Electricity and heat from all sources	Electricity and heat from all sources	Electricity and heat from renewables (small scale devices, such as solar PV, wind)	Electricity and heat from all sources, especially waste, biogas and solar PV	Electricity and heat from all sources, especially biofuels	Electricity and heat from all sources (for rail)	Electricity from renewables (small-scale devices, such as solar PV, wind)
Other transformation	Primary to secondary fuel transformation	Primary to secondary fuel transformation					Charcoal production
Distribution losses	Electricity, heat and fuel losses	Electricity, heat and fuel losses		Electricity, heat and biogas losses	Electricity, heat and biofuel losses	Fuel losses	
Final consumption	Own use and final sales of all energy types	Own use and final sales of all energy types	Own use of all energy types and final sales of fuels	Own use of all energy types and final sales of biofuels, electricity and heat	Own use of all energy types and final sales of biofuels, electricity and heat	Own use of all energy types and final sales of secondary fuels and biofuels	Own use of all energy types and final sales of biofuels

Renewable energy products

- Electricity
  - Grid-connected – should be easy to collect
  - Off-grid – difficult and needs alternative methods
- Non-electricity
  - Traditional
  - Modern

Renewable energy producers/consumers

- Electricity
  - Electric utilities
  - Auto-producers (consuming sectors)
  - Waste management companies
  - Households (off-grid solar PV installations)
- Non-electricity
  - Manufacturing industries
  - Commercial sector
  - Households

2. How to collect/estimate?

Administrative data

- Regulators
  - Power sector (production, end-use sectors)
  - Planning authorities (capacity)
  - Tax records (sales taxes and duties)
- Incentive schemes
  - Government agencies and tax authorities
- Existing surveys
  - Business surveys (autoproduction)
  - HH surveys and census (off-grid production)

Surveys

- Sampling strategy
  - Sampling frame
  - Population
  - Stratified sampling
  - Imputation
- Survey instruments
  - Questionnaire (paper, online, telephone)
  - Annual, quarterly, monthly

Producers and users of renewable energy

FLOW	SECTOR						
	Energy	Industry	Commerce	Services	Other (AFF)	Transport	Households
Production	Primary and secondary fossil fuels and primary renewable heat	Secondary fossil fuels, primary renewable heat, biofuels and waste		Wastes, biofuels (solids, biogas)	Biofuels (solids, biogas)		Biofuels (solids, biogas) and primary renewable heat (solar water heating)
Trade, stock changes and bunkers	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels	Primary and secondary fossil fuels and biofuels and bunkers	
Electricity and heat production	Electricity and heat from all sources	Electricity and heat from all sources	Electricity and heat from renewables (small scale devices, such as solar PV, wind)	Electricity and heat from all sources, especially waste, biogas and solar PV	Electricity and heat from all sources, especially biofuels (all)	Electricity and heat from all sources (for rail)	Electricity from renewables (small-scale devices, such as solar PV, wind)
Other transformation	Primary to secondary fuel transformation	Primary to secondary fuel transformation					Charcoal production
Distribution losses	Electricity, heat and fuel losses	Electricity, heat and fuel losses		Electricity, heat and biogas losses	Electricity, heat and biofuel losses	Fuel losses	
Final consumption	Own use and final sales of all energy types	Own use and final sales of all energy types	Own use of all energy types and final sales of fuels	Own use of all energy types and final sales of biofuels, electricity and heat	Own use of all energy types and final sales of biofuels, electricity and heat	Own use of all energy types and final sales of secondary fuels and biofuels	Own use of all energy types and final sales of biofuels

BIOFUEL SURVEY

TRADE DATA

ENTERPRISE SURVEY

ENERGY COMPANY SURVEY

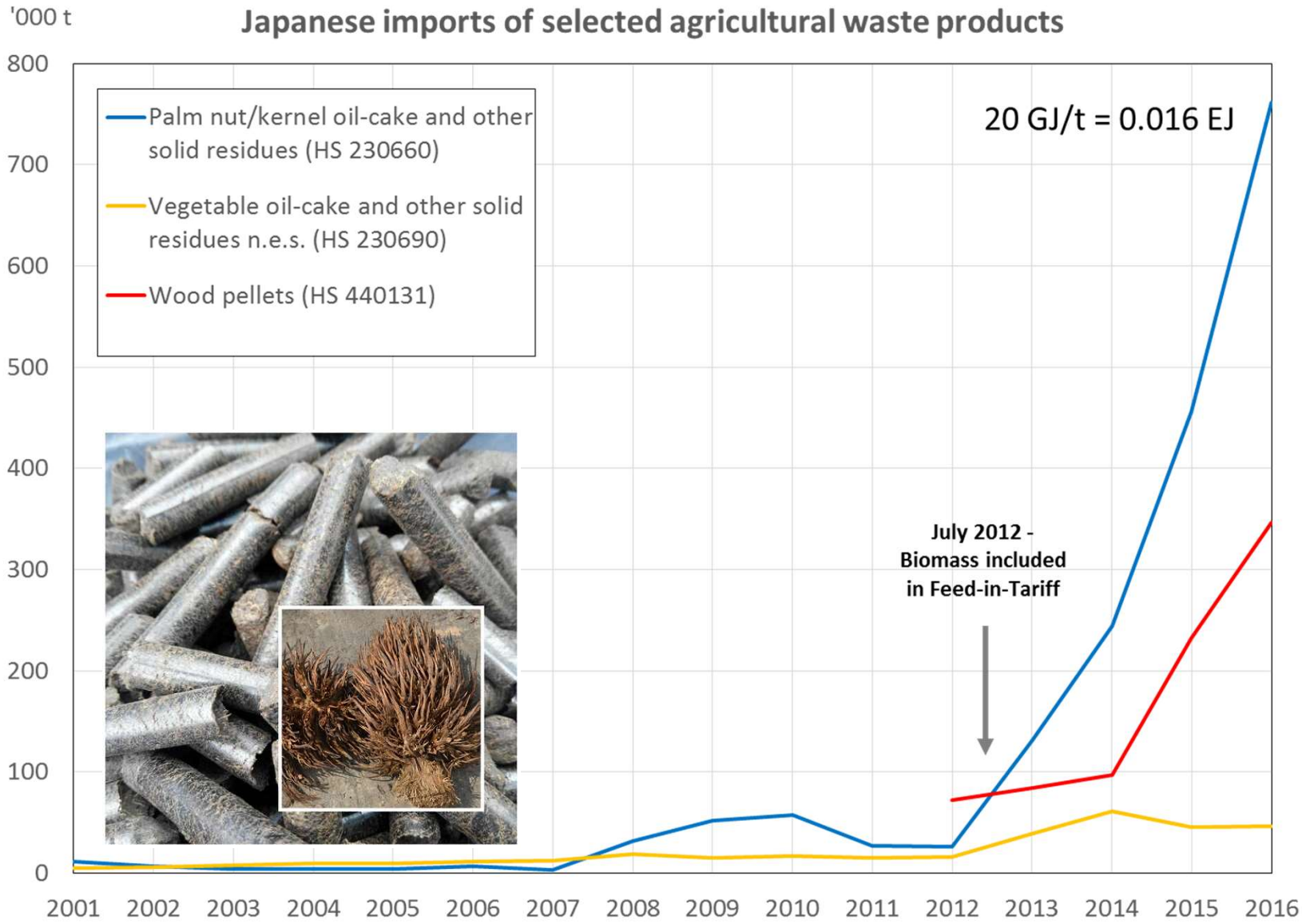
HOUSEHOLD SURVEY

Trade data (HS codes)

- Biofuels
  - Wood fuels 1401.10*, 4401.10, 4401.21/22*
  - Charcoal 4402.00
  - Wood waste 4401.21/22/39*, 4707.10-90*
  - Straw 1213.00*
  - Bagasse 2303.20*
  - Rice husks 2302.40*
  - Biomass pellets 4401.31, plus many others
  - Biogasoline 2207.20*, 2905.11/13/14*, 2905.14*, 2909.19
  - Biodiesel 2710.20*, 3826.00*

** Only part of the product category may be used for energy*

Trade in EFB Pellets



Trade data is improving - solar products

1. Harmonized System:

- 5,000 6-digit codes used for international trade
- Covers 98% of global trade
- HS 2017 just entered force; next is HS 2022
- Commodity description and coding system

2. Solar products:

- 841919 Instantaneous or storage water heaters, non-electric (excluding instantaneous gas water heaters and boilers or water heaters for central heating)
- 854140 Photosensitive semiconductor devices, incl. photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes (excluding photovoltaic generators)
    - ***Definition of solar cells:*** *silicon photovoltaic cells which convert sunlight directly into electric energy. They are usually used in groups as sources of electric power, e.g., in rockets or satellites employed in space research, for mountain rescue transmitters.*

Improving trade data- solar products

3. Solar lights and lighting kits:

- All over the place!

85 = Electrical machinery
94 = Furniture

850131:
DC generators

940540: Electric lights n.e.s.

940550: Non-electric lights

850239:
Generating sets

940510: Electric ceiling and wall lights

850440: Static converters

854370: Electrical machines n.e.s.

854140: Solar panels

851310: Electric torches

850680: Batteries

850760: Lithium-ion accumulators

Example of estimation methodologies

- Residential solar heat consumption using number of solar water heaters in the economy
- Biogas production/consumption using household biodigesters data
- Fuel wood and charcoal using FAO statistics
- Biomass and biogas consumption in industry using industrial production data
- Off-grid solar PV generation using solar panel trade data
- Bagasse consumption using FAO sugar cane production data

3. Learn from other economies

Learn from other economies

- **Australia** – biomass consumption in the industrial sector
- **Canada** – biomass consumption in pulp and paper industry
- **Indonesia** – off-grid solar PV electricity generation
- **Malaysia** – biomass and biogas for electricity generation
- **New Zealand** – direct and indirect use of geothermal energy
- **Philippines** – household energy consumption survey
- **Chinese Taipei** – industrial and municipal solid wastes for electricity generation

Thank you for your attention

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https://irena.org/