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APEC
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IRENA
International Renewable Energy Agency

2.1 APEC renewable energy questionnaire

Definition of products and flows

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Outline of presentation

1. Definition of products
2. Explanation of flows

Definition of products (1)

Fuelwood and wood waste

Wood and straw pellets/ briquettes

–agglomerated from wood residues by compression with or without the addition of a small quantity of binder. ***Briquettes*** are fuel comprising of small blocks of dried, highly compressed wood made without a binding agent.

Fuelwood

—any part of a tree or trees (brushwood, pellet or chip form) that will be used as fuel for purposes such as cooking, heating or power production. Also included are wood residues used as fuel (the original composition of wood is retained). Charcoal and black liquor are excluded.

Wood Waste

—yard trash and types of waste typically generated by sawmills, plywood mills and woodyards; such as wood residue, cutoffs, wood chips, sawdust, wood shavings, bark, wood refuse, wood-fired boiler ash, and plywood or other bonded materials

Definition of products (2)

Bagasse fuel obtained from the fibre which remains after juice extraction in sugar cane processing.

Rice Husks

the outermost layer of protection encasing a rice grain. It is a yellowish color and has a convex shape. Typical dimensions are 4 to 6 mm, having a ground bulk density of 340 kg/m3 to 400 kg/m3.

Straw a single stalk or stem, especially of certain species of grain, chiefly wheat, rye, oats and barley

Charcoal

solid residue from the carbonisation of wood or other vegetal matter through slow pyrolysis.

Definition of products (3)

Other vegetal and agricultural waste

Other vegetal and agricultural waste includes all other solid plant material waste used for energy; includes a wide variety of waste from the agricultural and food processing industries

- fruit skins and peel (from fruit processing);
- nut shells;
- olive seeds;
- solid wastes from oil palm processing (palm shells and empty fruit bunches)
- waste from brewing, wine making and distilling; and
- waste plant materials produced from urban park maintenance.

Other primary solid biomass

Other primary solid biofuels (animal waste) includes all solid non-fossil materials of biological origin used for energy that are not counted elsewhere.

- animal waste (dung), although it can also include other agricultural and food processing waste derived from animals
- may also include animal waste mixed with other materials (e.g. used poultry litter, which is a mixture of waste, feathers and material used as bedding).

Definition of products (4)

Biogas

Gases arising from the anaerobic fermentation of biomass and the gasification of solid biomass (including biomass in wastes).

Landfill gas: Biogas from the anaerobic fermentation of organic matter in landfills.

Sewage sludge gas: Biogas from the anaerobic fermentation of waste matter in sewage plants.

Other biogases from anaerobic fermentation not elsewhere specified- Two of the largest sources of these biogases are the fermentation of energy crops and the fermentation of manure on farms.

Biogases from thermal processes: by gasification or pyrolysis) of biomass; mixture containing hydrogen and carbon monoxide (usually known as syngas) along with other components; may be further processed to modify their composition and can be further processed to produce substitute natural gas.

Definition of products (5)

Industrial Waste

Non-renewable waste which is combusted with heat recovery in plants other than those used for the incineration of municipal waste.

Municipal solid waste

Household waste and waste from companies and public services that resembles household waste and which is collected at installations specifically designed for the disposal of mixed wastes with recovery of combustible liquids, gases or heat.

Black Liquor

The alkaline-spent liquor obtained from the digesters during the production of sulphate or soda pulp required for paper manufacture.

The lignin contained in the liquor burns to release heat when the concentrated liquor is sprayed into a recovery furnace and heated with hot gases at 900ºC. Black liquor is used as a fuel in the pulping process.

Definition of products (6)

Liquid Biofuels

Liquids derived from biomass and used as fuels.

Biogasoline refers to liquid fuels derived from biomass and used in spark- ignition internal combustion engines; may be blended with petroleum gasoline or used directly in engines; blending may take place in refineries or at or near the point of sale.

Biodiesel refers to liquid biofuels derived from biomass and used in diesel engines. Biodiesels may be blended with petroleum diesel or used directly in diesel engines.

Bio -jet kerosene refers to liquid biofuels derived from biomass and blended with or replacing jet kerosene.

Other liquid biofuels – other liquid biofuels not classified not included in the classifications above

Definition of products (7)

Hydro -the generation of electricity from mechanical devices driven by flowing fresh water. 4 categories in the questionnaire:

- Storage, Run-of-river, Pumped-storage and Mixed

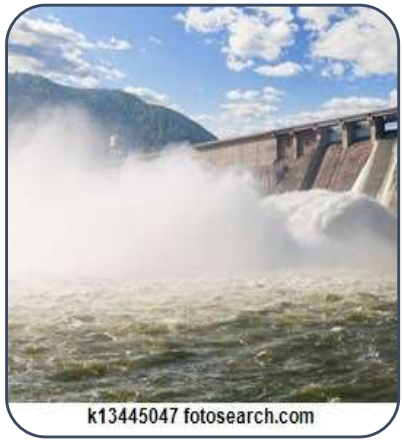
Geothermal - heat extracted from the earth, usually in the form of hot water or steam.

- Electricity and Heat

Solar - refers to the production of electricity and heat from solar radiation; 3 categories in the questionnaire:

- Photovoltaic, Thermal and Heat

Definition of products (8)



Tidal wave and Ocean

• Ocean energy refers to electricity generated from devices driven by ocean currents.

• Wave energy refers to electricity produced from devices driven by the motion of waves.

Wind- energy extracted from air flow and used to produce electricity.

- produced using a range of mechanical devices, such as: wind turbines; sails; aerofoils; kites; or similar equipment.

- 2 categories, **on-shore** (devices located on land) and **off-shore** (devices located in water)

Explanation of NRE flows (Table 1 : Supply) (1)

- **Production**
  - For combustible fuels, these are the amounts that are used for energy purposes
  - Unused amounts are not to be reported except for liquid biofuels which are to be reported as stock change
  - For electricity generated from renewables, report the gross generation
  - Production of pumped-storage hydro are not to be included in hydro generation

Explanation of NRE flows (Table 2 : Transformation) (2)

- **Autoproducer electricity and heat generation**
  - Generation from off-grid producers is requested to be reported
  - Off-grid producers are electricity producers that are not connected to the main electricity grid.
  - “District cooling plants” row was added to capture use of renewable energy in the production of chilled water

Explanation of NRE flows (Transformation) (3)

- **Biofuels processing**
  - This is where the amount of biofuels that are blended with gasoline, diesel and/or jet-kerosene are to be reported
  - The amounts that are directly consumed are to be reported in final consumption
- **Charcoal production**
  - Charcoal production is a secondary product. The primary product is the material that is used to produce charcoal. The material could be fuelwood, woodwaste, agricultural waste and other biomass material

Final consumption cells were unlocked to allow the reporting of direct consumption of liquid biofuels

Conversion factors

Table 4 : Conversion factor

The calorific values or the quantity of heat released by unit quantity of fuel, when it is burned completely with oxygen, and the products of combustion are returned to ambient temperature are reported'

Renewables have separate calorific values for production, imports and exports.

The average of the values of production, imports and exports should also be reported.

- ***Calorific values are essential to be able to produce an energy balance.***
- ***The minimum requirement is the Net Average value***

What are counted and not counted as NRE

- **Solar – only those used for electricity generation and water heating**
  - Solar heat for crop drying, clothes drying, etc. are not counted
- **Wind energy - Only the electricity output**
  - Mechanical power in water pumping are not included
  - Wind power that push sailboats are not counted
- **Biomass - Only those used for energy purposes**
  - Non-energy uses like wood used to make furniture are not included
  - Agricultural waste that are burned for disposal are also not included
- Use of **deep water source** for heating and cooling are not included
- **Animal power** like those of horses in carriages are not included

Thank you for your kind attention

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