



United Nations Statistics Division

Sustainable Energy Statistics and IRES

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**Training of the National Officials and Experts
Responsible for Sustainable Energy Data Collection**

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Overview

- Historical context of energy statistics leading to IRES and the SDGs
- IRES and sustainable energy statistics
 - Renewables
 - Primary energy
 - Biomass
- Conclusion

Importance of energy stats

- Energy is fundamental for socio-economic development.
- Availability/access to energy is essential to poverty reduction
 - And improvements in the standards of living.
- As a result, there is a constantly increasing demand for energy
- Concerns about sustainability & reliability of current production and consumption patterns
 - And the impact of the use of fossil fuels on the environment.
- Taking into account these circumstances, quality energy statistics is of paramount importance
 - So that countries can design effective energy policies toward sustainable development.

Context

- Availability of high-quality energy statistics has always been a matter of concern for the statistical community.
- The United Nations Statistical Commission (UNSC) has discussed issues relevant to energy statistics since its inception (as part of economic statistics).
- Since the 1950's UNSD has been maintaining a database on energy statistics (data from 1950 to latest year available).
 - Accessible from the UNdata Portal (data.un.org/Explorer.aspx?d=EDATA)
- And publishing the Energy Statistics Yearbook
 - The 2014 Edition was the 58th edition
 - First Edition (1952) was called “World Energy Supplies in selected years, 1929-1950”

Statistics

Motor Gasoline Search glossaries

Source: Energy Statistics Database | [United Nations Statistics Division](#)

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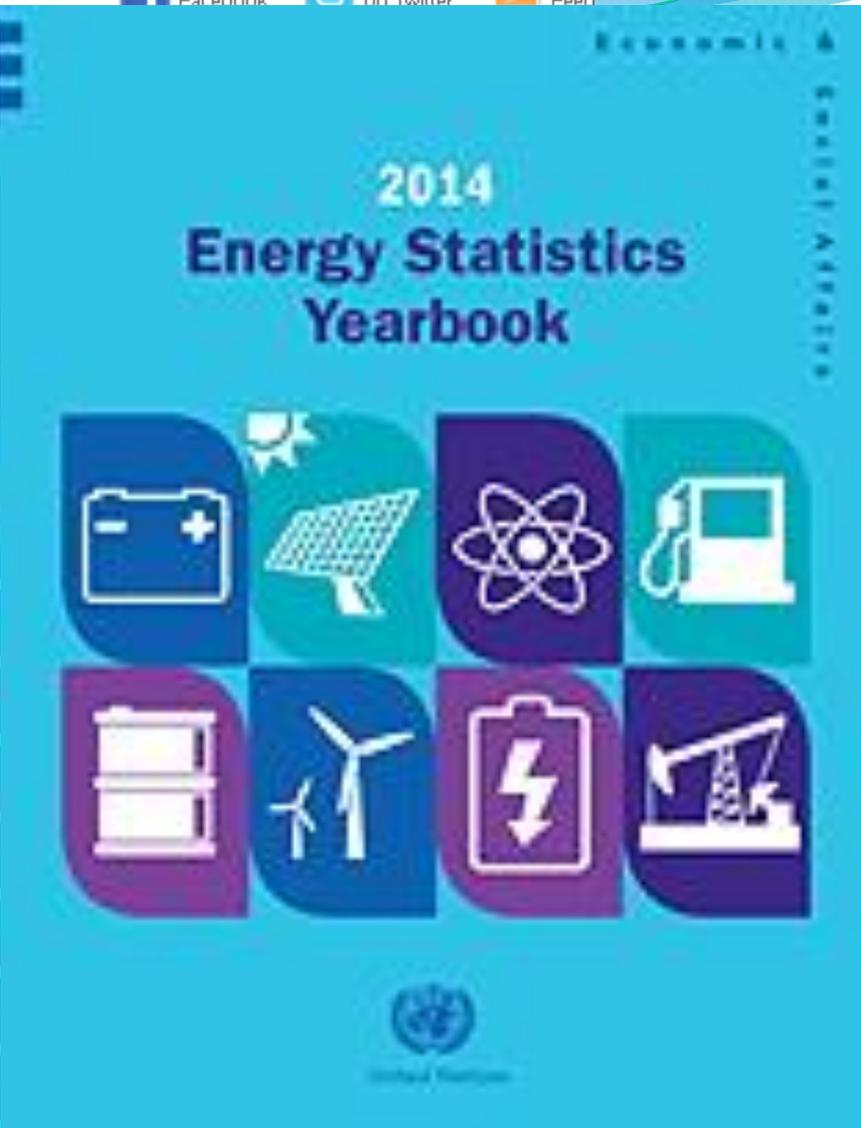
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Context (cont.)

- In the aftermath of early 1970s energy crisis, UNSC put energy statistics on its agenda as a separate item
 - and requested a special report on energy statistics to be prepared and presented to it for discussion.
- One of the outcomes was that UNSC agreed on the use of energy balances as the key instrument
 - in the coordination of work on energy statistics and
 - the provision of data in a suitable form for understanding and analysing the role of energy in the economy.
 - Since then UNSD has been publishing Energy Balances (and Electricity Profiles)

Economic &

Social Affairs

2014 Energy Balances



Economic &

Social Affairs

2014 Electricity Profiles



Context (cont.)

- The next few decades saw developments in energy statistics,
 - with the publication of guidance documents, and
 - the incorporation of novel energy products and technologies.
- Such guidance documents were rich in information and influenced country methodologies,
 - but were descriptive in nature, not focusing on harmonisation.
- These documents covered important topics but needed updates to reflect energy market developments.
- Additionally, references to other international classifications (ISIC, CPC, HS) were mostly absent.

Oslo Group & InterEnerStat

In this context, in 2005, UNSC recognised need for further development of energy statistics guidance and set up:

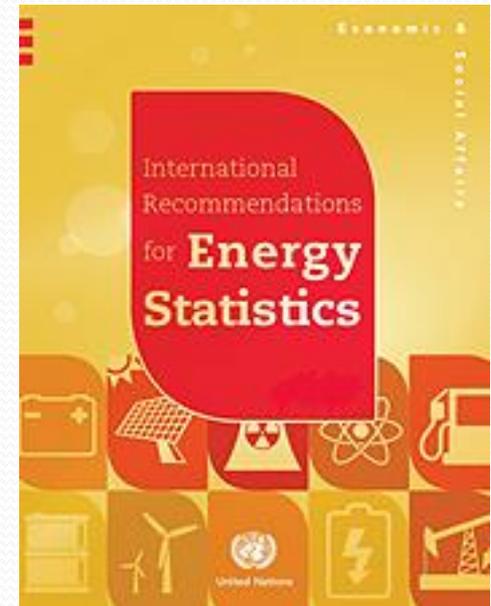
- Oslo City Group on Energy Statistics (Oslo Group)
 - to “contribute to the development of improved methods and international standards for national official energy statistics”.
- Intersecretariat Working Group on Energy Statistics (InterEnerStat).
 - to harmonise differing definitions across organisations as close as possible

Oslo Group & InterEnerStat

- In the Oslo Group the main actors are the countries, working under UNSD supervision
- InterEnerStat is a group of over 20 international organisations working in the field of energy statistics, headed by the IEA
 - It published a harmonised list of energy products and flows in 2010.

IRES

- Building on the harmonisation work achieved by InterEnerStat, the Oslo Group helped draft the *International Recommendations for Energy Statistics* (IRES)
- With the main goal of providing standards and guidance to national compilers covering:
 - relevant concepts and definitions,
 - classifications,
 - data sources,
 - data compilation methods,
 - institutional arrangements,
 - data quality assurance,
 - metadata and dissemination policies.
- IRES in its draft form was endorsed by UNSC in 2011.



IRES, SIEC and ESCM

- IRES contains the Standard International Energy product Classification (SIEC)
 - first definitive standard classification for energy products.
 - built on a set of internationally harmonised definitions of energy products
 - developed by InterEnerStat as mandated by the UNSC.
- As a practical companion to the more theoretical IRES, the *Energy Statistics Compilers Manual* (ESCM), bountiful with country examples, was drafted and is undergoing final edition and formatting.

Energy statistics and the 2030 Agenda for Sustainable Development, SDGs

- IRES's endorsement was a timely one, since one of the major outcomes from the Rio+20 Conference was the development of a set of Sustainable Development Goals (SDGs) in which SDG7 is a dedicated stand-alone SDG on energy
- SDG7 has three major targets and two additional targets representing means of implementation.
- The set of SDGs is an essential element of the 2030 Agenda for Sustainable Development to be implemented for the 2016-2030 period, including a total of 17 SDGs, 169 targets and 241 indicators.

SDG 7 - Ensure access to affordable, reliable, sustainable and modern energy for all

Target	Indicator
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Proportion of population with access to electricity
	7.1.2 Proportion of population with primary reliance on clean fuels and technology
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption
7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP
7.a By 2030, enhance international cooperation... (means of implementation)	7.a.1 Mobilized amount of US\$...
7.b By 2030, expand infrastructure and upgrade technology... (means of implementation)	7.b.1 Investments in energy efficiency ...

IRES

- *International Recommendations for Energy Statistics* improves comparability across products, flows & countries
- By defining:
 - What an energy product is;
 - Concept of production (and all other flows to be measured);
 - Scope of energy statistics.
- By providing:
 - Standard International Energy Product Classification (SIEC), with links to CPC and HS;
 - Harmonized definitions;
 - List of renewable products;
 - And much more (<https://unstats.un.org/unsd/energy/ires>)
- ESCM the accompanying compilers' manual (w/ country examples)

Renewables

- IRES offers no definition of renewable energy
 - Difficulty to come up with a technically correct definition that includes/excludes all that we want included/excluded
 - Difficulty to disentangle the concepts of renewability and sustainability
- Instead, it offers a list of renewable energy products and sources.

Primary and secondary energy

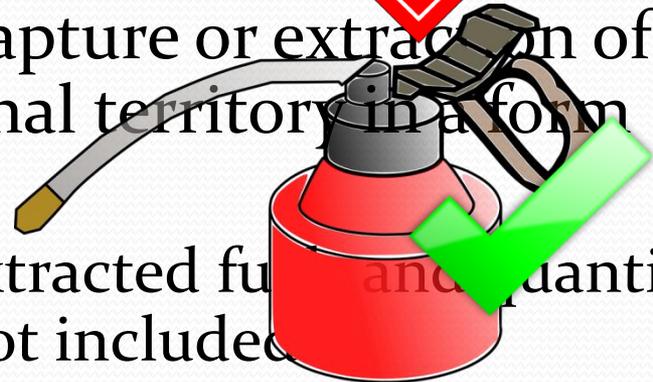
- Which energy product is primary and which is secondary is determined by the principle of multiple uses:
 - the primary energy form should be the first energy form downstream in the production process for which multiple energy uses are practical.
- For electricity and heat, the application of this principle leads to the choice of the following primary energy forms:
 - Heat for nuclear, geothermal and solar thermal;
 - Electricity for hydro, wind, tide, wave and other marine, and solar photovoltaic.
- In the absence of measurement of heat input, it is assumed efficiencies of 33.3% for nuclear and solar thermal and 10% for geothermal electricity.

	Primary products	Secondary products
Non-renewables	<ul style="list-style-type: none"> - Hard coal - Brown coal - Peat - Oil shale - Natural gas - Conventional crude oil - Natural gas liquids (NGL) - Additives and oxygenates - Industrial waste - Municipal waste (partially¹) - Nuclear Heat - Heat from chemical processes 	<ul style="list-style-type: none"> - Coal products - Peat products - Refinery feedstocks - Oil products - Electricity and heat from combusted fuels of fossil origin - Electricity derived from heat from chemical processes and nuclear heat - Any other product derived from primary/secondary non-renewable products
Renewables	<ul style="list-style-type: none"> - Biofuels (except charcoal) - Municipal waste (partially¹) - Heat from renewable sources², except from combusted biofuels - Electricity from renewable sources², except from geothermal, solar thermal or combusted biofuels 	<ul style="list-style-type: none"> - Charcoal - Electricity and heat from combusted biofuels - Electricity from geothermal and solar thermal - Any other product derived from primary/secondary renewable products

2.18: it's important that the energy output of the energy conversion process is also included in the total energy production.



Primary production is the capture or extraction of energy from the national territory in a form suitable for use in the extracted fuel and quantities collected, flared or vented are not included.



Biomass and waste according to SIEC

			Primary (P)	Renewable (R)
SIEC Headings			Secondary (S)	Non Renewable (NR)
5		Biofuels		R
51		Solid biofuels		R
511		Fuelwood, wood residues and by-products	P	R
	5111	Wood pellets	P	R
	5119	Other Fuelwood, wood residues and by-products	P	R
512	5120	Bagasse	P	R
513	5130	Animal waste	P	R
514	5140	Black liquor	P	R
515	5150	Other vegetal material and residues	P	R
516	5160	Charcoal	S	R
52		Liquid biofuels	P	R
521	5210	Biogasoline	P	R
522	5220	Biodiesels	P	R
523	5230	Bio jet kerosene	P	R
529	5290	Other liquid biofuels	P	R
53		Biogases	P	R
531		Biogases from anaerobic fermentation	P	R
532		Biogases from thermal processes	P	R
6		Waste	P	
61		Industrial waste	P	NR
62		Municipal waste	P	R/NR

- *2.11 Boundary of energy products.* The description of the boundary of the universe of energy products is not always straightforward.
- For example, *corncoobs* can be:
 - (1) combusted directly to produce heat;
 - (2) used in the production of ethanol as a biofuel,
 - (3) consumed as food, or
 - (4) thrown away as waste.
- According to the scope of SIEC, corncoobs, as such, are considered energy products for the purpose of energy statistics only in case (1) above, that is when they are combusted directly to produce heat (c.f. paragraph 3.10).
- In all other cases, they either do not fall within the boundary of energy statistics (when used as a source of food), or they enter the boundary of energy statistics as a different product (e.g. ethanol).

Final remarks

- Measuring sustainable energy should be primarily done to inform development policy
 - Thorough coverage of non-traded energy products is important to accurately assess the energy situation
- Following international recommendations/standards ensures comparability
- However, country needs may call for deviations in the way data are compiled
 - Which should be explained in the metadata



United Nations Statistics Division



Thank you.

<http://unstats.un.org/unsd/energy>