



United Nations Statistics Division

Compiling Energy Statistics Based on IRES

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SEMINAR ON

**Mainstreaming Energy Sustainable Development
Goals (SDGs), Targets and Indicators into Statistical
Programmes in Select African Countries**

27-29 June 2016

Addis Ababa, Ethiopia



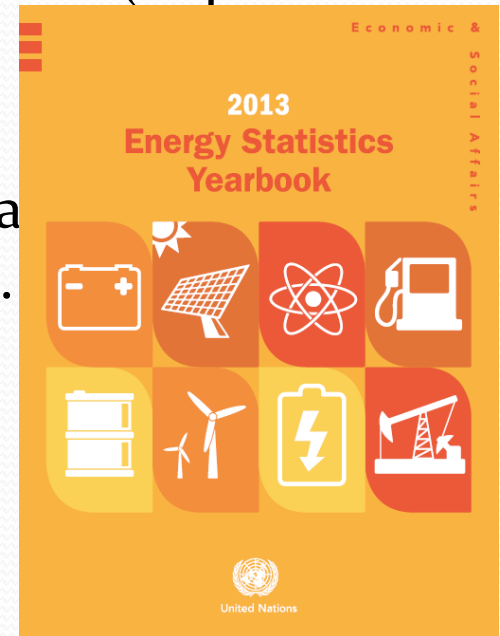
<http://unstats.un.org/unsd/energy>

Overview

- Historical background
- The need for IRES
- Key IRES concepts
- IRES practical applications for collecting energy statistics
- ESCM: why, what and how
- Chapters of compilers' manual and examples

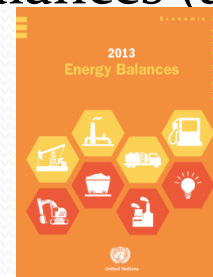
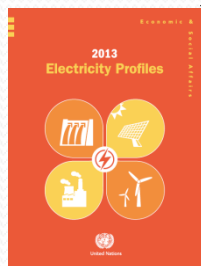
Historical background

- 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 of energy statistics (data from 1950 to latest year available).
 - Accessible from the UNdata Portal
 - <http://data.un.org/Explorer.aspx?d=EDATA>
- And publishing the Energy Statistics Yearbook
 - The 2013 Edition was the 57th edition
 - First Edition (1952) was called “World Energy Supplies in selected years, 1929-1950”



Historical background (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)



Historical background (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.
- International guidance documents on energy statistics :
 - *UN Concepts and Methods in Energy Statistics* (1982) [Focused on Energy Accounts and Balances]
 - *UN Energy Statistics: Definitions, Units of Measure and Conversion Factors* (1987)
 - *UN Energy Statistics: A Manual for Developing Countries* (1991)
 - *IEA/EUROSTAT Energy Statistics Manual* (2005)

The Need for IRES

- 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.
- Guidance on energy balance compilation, classification of energy industries, treatment of newer biofuels was necessary.

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”.
 - Main actors are the countries, working under UNSD supervision
 - Helped draft IRES
- Intersecretariat Working Group on Energy Statistics (InterEnerStat).
 - To harmonise differing definitions across organisations as close as possible
 - 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 that fed into IRES.

Principles of IRES

- Do data meet the needs of policy makers, producers and users of energy, the general public?
- Are energy statistics comparable with other statistics?
- Recommendations had to consider:
 - The availability of data sources
 - The reporting burden
 - Can **most** countries implement them?

IRES

- Important milestone for energy statistics as they provide:
 - Standard International Energy product Classification (SIEC)
 - Internationally-agreed definitions
 - Clear reference to other international classifications
 - Reference list of energy-specific data items for collection
 - Recommendations for data collection and dissemination
- The goal: to improve comparability across countries
<http://unstats.un.org/UNSD/energy/ires/default.htm>
- Draft version published in 2011; white cover version released in January 2016. Translation to other UN languages now pending

Key IRES points

- IRES improves comparability across products, flows and countries, so that:
 - Countries will measure the same thing
 - Countries will publish data in similar formats
 - Data for different products will be comparable
 - Users will understand what the statistics represent

Comparability & Transparency

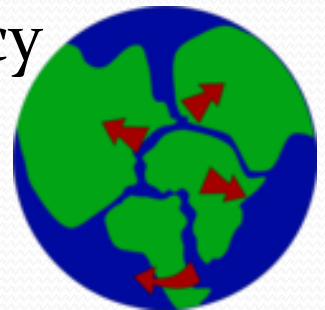


*“But my country
is different!”*

Every statistician, in all domains, worldwide

Geographical Scope of Energy Statistics under IRES

- The **territory principle** (rather than residency principle) used
- More relevant for energy policy decisions about supply, consumption and pollution in a given country
- Easier to collate
- Care is needed when combining with other statistics (e.g. national accounts compiled on the residency principle), but often a negligible difference



Definition of energy product

- IRES 2.9: “Energy products” refers to products exclusively or mainly used as a source of energy. Biomass and waste included only when used for energy purposes
- Result: energy statistics exclude wood or ethanol when not used as an energy product. Fossil fuels used for non-energy purposes (e.g. lubricants) are always included by definition, allowing efficiency checks



IRES: Scope of Energy Statistics

- IRES 2.18: it's important that data on the production of energy outside energy industries is also collected and included in total energy production.
- Result: fuelwood collected and used non-commercially needs to be properly accounted for; small “teapot” refineries should have their output measured and be included under transformation



The Concept of Production

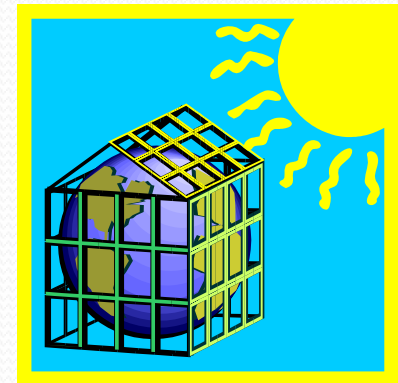
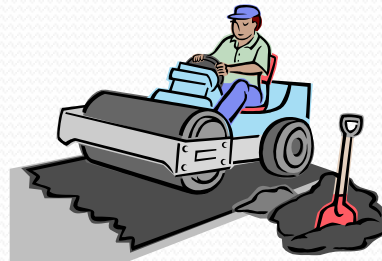
- 5.10: Primary production is the capture or extraction of fuels or energy... within the national territory in a form suitable for use. Inert matter removed from the extracted fuels and quantities reinjected, flared or vented are not included.

Data for oil and gas production should be NET of reinjected, flared and vented quantities (and water, sand etc.)



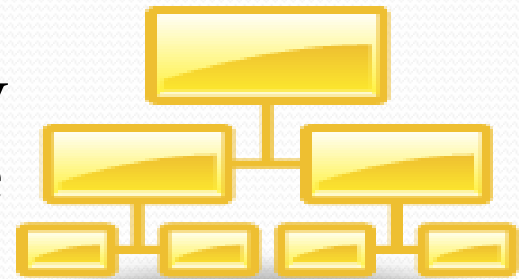
Bunkers and Non-Energy Use

- IRES 5.14/5: For the purposes of energy statistics, exclude International Marine and Aviation Bunkers from exports and supply
- IRES 5.5: It's important to separately identify the non-energy part of final consumption.
- Why? Both important principles for accurate GHG emission inventories



SIEC

- IRES 3.1: creates the Standard International Energy product Classification (SIEC)
- A tree-structured framework for all energy products; different levels of detail possible depending on the country's situation
- A standard to be used across countries; further breakdown possible if desired
 - (coconut oil, olive cake, shale gas, offshore vs onshore, high-sulphur vs low-sulphur, hardwood vs soft wood, leaded vs unleaded gasoline ...)



5 Biofuels

53 Biogases

531 Biogases from anaerobic fermentation

5312 Sewage sludge gas

4 Oil

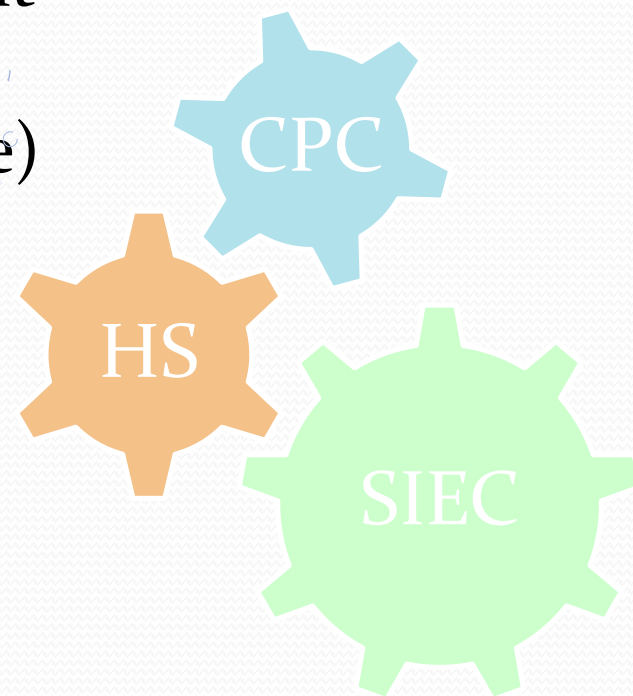
46 Oil products

465 Gasolines

4652 Motor gasoline

Relations with other systems...

- HS 2710.11: “Light oils and preparations”
- CPC 33310 and 33320: “Motor spirit (gasolene), including aviation spirit” ; “spirit type (gasolene type) jet fuel”
- SIEC 465: “gasolines”



HS	2710.11*		
CPC	33310	33320	
SIEC	4651	4652	4653

...But Relations Aren't Perfect

- Under the SIEC definition, any wood product burnt for energy should be included under fuelwood
- It's not feasible (or helpful!) to list every HS/CPC code for wood products (furniture, office supplies, books, pre-fabricated log cabins, Trojan horses etc.) as the vast majority will not be used for energy purposes

HS*	4401.3	4401.1	4401.21	4401.22
CPC*	39280	31330	31230	39280
SIEC	511			

Using HS/CPC Data (if we have to...)

- If energy stats are based on HS or CPC data, be careful not to double count quantities over multiple products (many prods share the same HS code, eg naphtha, gasoline, feedstocks)
- Try to use administrative data. Examples:
 - If “light oils and preparations” are being purchased by a transport equipment manufacturer, perhaps they’re lubricants?
 - If coal is used by a power plant, assume it’s other bituminous (steam) coal?
 - If biomass is imported into different ports, assume that only quantities imported to the port closest to the biofuel plant are used for energy?

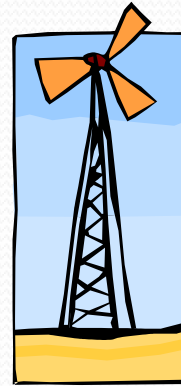
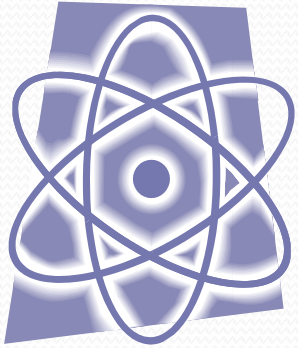
SIEC compatibility

JODI (short) definition:	SIEC definition:
“LPG comprises Propane and Butane”	“LPG refers to liquefied propane (C ₃ H ₈) and butane (C ₄ H ₁₀) or mixtures of both. Commercial grades are usually mixtures of the gases with small amounts of propylene, butylene, isobutene and isobutylene stored under pressure in containers.”
Simple and clear; ideal for a monthly data collection	More exhaustive, relevant for more accurate annual data, or when deriving energy data from CPC or HS data
Compatible	

IRES Calorific Values

- Units for Dissemination: mass (kt) for coal and oil, Terajoules (GCV) for natural gas, TJ (NCV) for solid biofuels and wastes (IRES 4.29).
- Net calorific values (aka lower heating values) should be used to compile balances in TJ (IRES 4.36), as interest lies in *useful* energy output and TJ is a SI unit.
- Country-specific calorific values should be collected. Default values should only be used as a last resort

IRES provides useful definitions of flows/products. But...



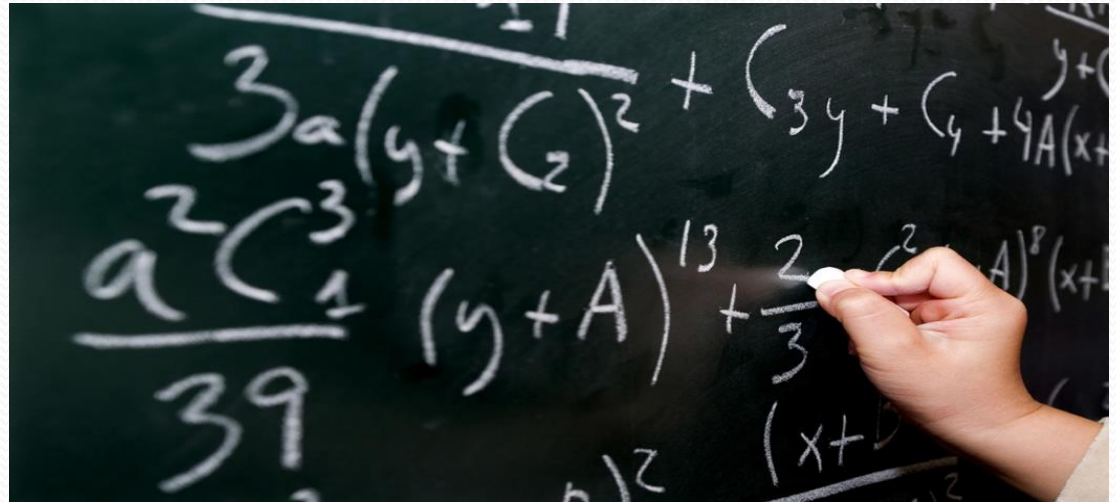
- How do these recommendations relate to MY country?
- How should I compile metadata, or handle confidentiality?
- Can I see some examples of other countries' practices?



The need for a Compilers Manual

- During the preparation of IRES, the need for more explanation was recognised
- A Compilers Manual should be a more hands-on, example-heavy document, to complement IRES.
- It is NOT a set of recommendations or “best” practices, but a set of voluntary guidance and examples for countries to use if they want to
- Almost finalised – still gathering country examples

IRES is about
definitions of
flows/products:
THEORETICAL



ESCM is about
practical
guidance and
country
examples:
PRACTICAL

Some country practices already published (ESCM will have many more)

United Nations Statistics Division - Energy Statistics - Windows Internet Explorer

http://unstats.un.org/unsd/energy/template/responses_c.htm

File Edit View Favorites Tools Help

United Nations Statistics Division - Energy Statistics

Home Statistical Databases Publications Methods & Classifications Meetings & Events Technical Newsletters [Site search] Go

Energy Statistics August 2012

Description of Activities
International Recommendations for Energy Statistics (IRES)
Energy Statistics Compilers Manual (ESCM)
Country Practice Template
Energy Yearbook
Energy Balances and Electricity Profiles
Energy Statistics Database
UNSD Annual Energy Questionnaire
Global Assessment on Energy Statistics and Energy Balances
Joint Oil Data Initiative (JODI)
Oslo Group
Intersecretariat Working Group on

Country Practice Template Responses by Country

[see responses by topic](#)

Country	Topic
Argentina	Annual energy statistics
Australia	Energy consumption
Austria	Electricity and natural gas consumption Energy analysis in industry Energy Balance Energy consumption of households Energy consumption in industry Energy consumption in the service sector

Done Internet 115%

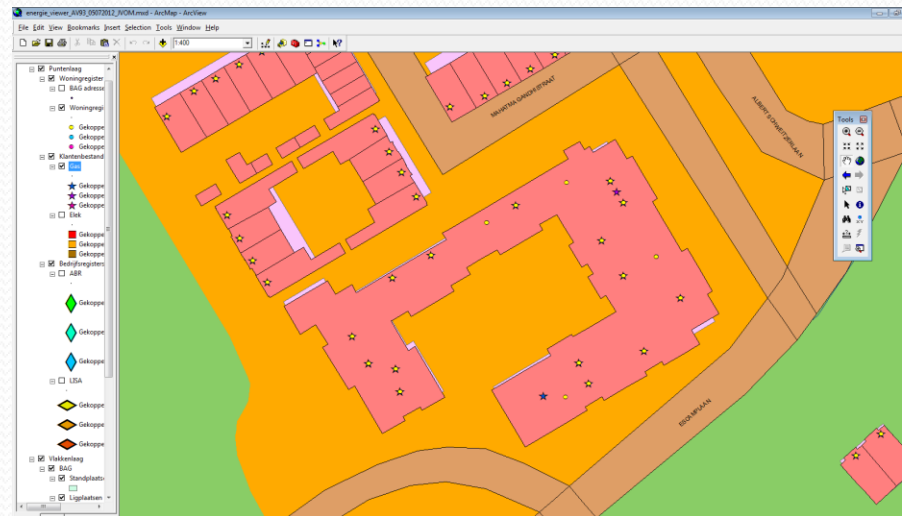
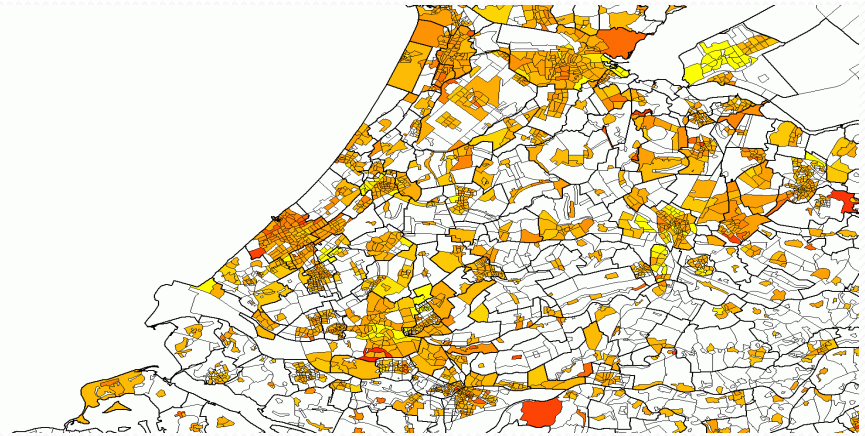
<http://unstats.un.org/unsd/energy/template.htm>

ESCM Chapters

- Introduction
- Legal Framework
- Classifications and linking with other international standards (HS, CPC, ISIC)
- Generic Statistical Business Process Model
- Data sources (surveys and administrative data sources, estimation, modelling)
- How to compile energy balances
- Data quality
- Data dissemination

Country Example: Netherlands' Use of Administrative Data

- Successfully matched >96% of electricity and gas consumers with an address taken from the business or client register
- Allowed government to target efficiency or education campaigns on the worst areas, or even specific buildings



Renewables Survey: Brazil Example

- Biggest hole in the national balance is consumption (and autoproduction); data are collected through both regular surveys and irregular ones indicating rough energy use.
- Annual Survey has 100% coverage on: steel, pulp and paper, non-ferrous metals (big sectors); 30% coverage of sugar/ethanol.

Doesn't cover minor sectors

- Supplementary data are therefore used:
 - Household surveys cover cooking fuels and type of elec appliances (5 years)
 - National fuelwood survey covered rural areas only, validates energy balance data
- Supplementary data provide benchmarks for their base years and then these figures are interpolated. Additional estimation techniques include correlations with other energy products
- One survey suggested fuelwood consumption in food industry is 30% undervalued. Highlights where to devote future resources

Other Examples

Austria: Adding an energy module to Labor Force Survey increased the response rate and reduced costs

Bulgaria: NSO's metadata policy

Norway: lessons from publishing preliminary monthly statistics and balances

UK: Energy Efficiency Data framework measures the result of energy efficiency policies

South Africa: experience with social media and dissemination in a developing country

FAO guidance on fuelwood surveys

Confidentiality practices for many countries

Azerbaijan: producing full commodity balances for all products

Legal frameworks for many countries

And many more!

Conclusion

- IRES provides methodology to compile energy statistics that are comparable across products and countries, and consistent with other areas of statistics
- This applies to everyone! IRES-compliant data can be used to compile annual data for international organisations (UNSD, IEA, APEC...)
- ESCM will provide guidance on HOW, with real examples relevant for all countries



United Nations Statistics Division



Thank you.

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