

Compiling Energy Statistics: Theory from IRES and Guidance from the Compilers Manual

Alex Blackburn

Statistician, UNSD

Overview

- Key IRES concepts
- IRES methodology for oil and gas
- ESCM: why, what and how
- Chapters of manual and examples

IRES: a very brief history

- UN Statistical Commission decision, 2005
- Work of Oslo City Group and InterEnerStat
- IRES (draft) endorsed by the UN in 2011
- Clear reference to other international classifications such as ISIC, CPC, HS etc.

<http://unstats.un.org/UNSD/energy/ires/default.htm>

Key IRES points

- IRES improves comparability across products, flows and countries:
 - Countries measure the same thing, reducing systematic errors
 - Countries publish data in similar formats, increasing transparency
 - Data for different products are compiled the same way, meaning product comparisons/balances are possible
 - Data users understand what the statistics should represent
- Now, some specific examples

Definition of energy product

- *IRES 2.9: “Energy products” refers to products exclusively or mainly used as a source of energy. Biomass, waste etc. included only when used for energy purposes*
- Result: energy statistics exclude non-fuel wood, or ethanol when not used as an energy product. Non-energy products from a fossil origin (lubricants) are always included by definition, allowing refinery input/output checks



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 included



IRES Applications for Oil and Gas

- Units for Dissemination: mass (kt) for oil, Terajoules (GCV) for natural gas (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.

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



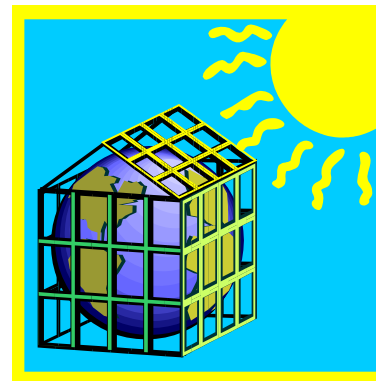
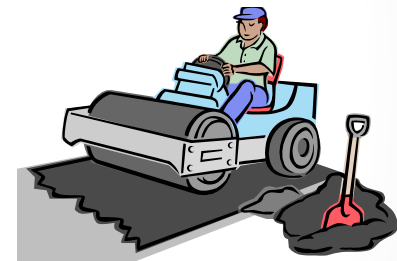
Bunkers and Non-Energy Use

IRES 5.14/5: For the purposes of energy statistics, exclude International Marine /Aviation Bunkers from exports and supply



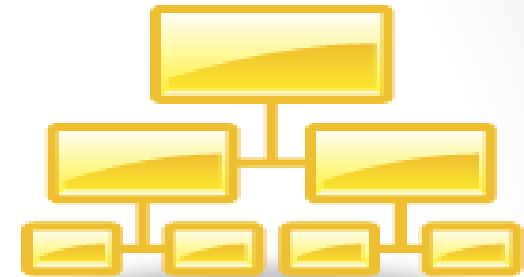
IRES 5.5: It's important to separately identify the non-energy part of final consumption.

Both important principles for accurate GHG emission inventories (but not necessarily on a monthly basis)



SIEC

- IRES 3.1: creates the Standard International Energy product Classification (SIEC)
- Provides a tree-structured framework for all energy products; different levels of detail possible depending on the country's need
- A standard to be used across countries; further breakdown possible if desired (coconut oil, olive cake, shale gas, offshore vs onshore)

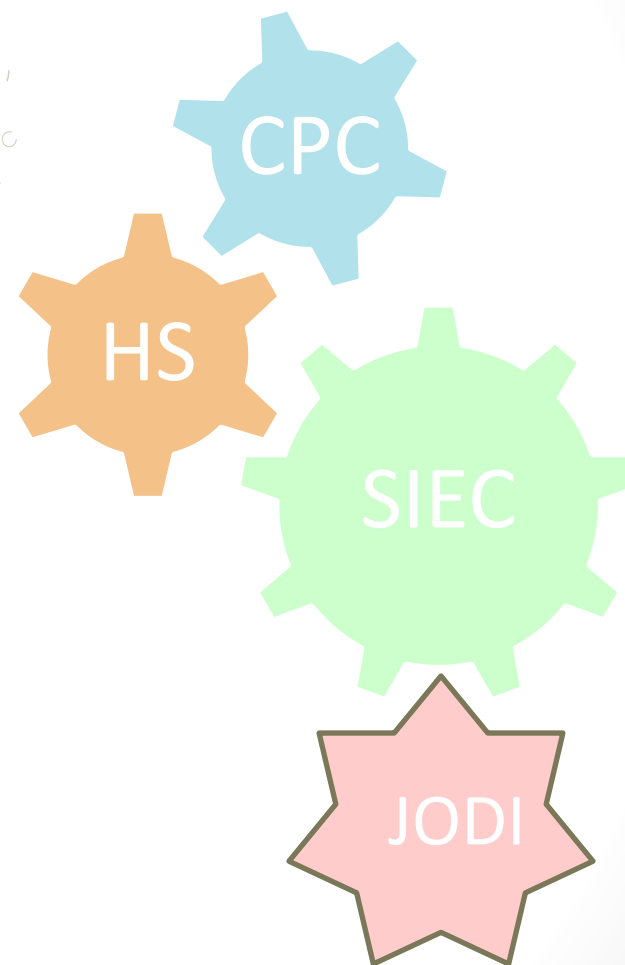


5 Biofuels
53 Biogases
531 Biogases from anaerobic fermentation
5312 Sewage sludge gas

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”*
- JODI: *“motor and aviation gasoline”*



HS	2710.11*		
CPC	33310	33320	
SIEC	4651	4652	4653
JODI	Motor and aviation gasoline		

SIEC Agrees with JODI!

JODI products are a subset of SIEC products (so no mapping problems)

SIEC Products

Refinery gas	4610
Ethane	4620
Petroleum coke	4694
Lubricants	4692
White spirit	4691
Bitumen	4695
Paraffin waxes	4693
Other oil products	4699

Motor gasoline	4652
Aviation gasoline	4651

JODI Products

Other oil products

Motor & aviation
gasoline

Definitions agree, but SIEC more detailed

JODI (short) definition:

*“LPG comprises
Propane and Butane”*

Simple and clear; ideal for a monthly data collection

SIEC definition:

“LPG refers to liquefied propane (C_3H_8) and butane (C_4H_{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.”


More exhaustive, relevant for more accurate annual data, or when deriving energy data from CPC or HS data

Definitions agree, but SIEC more detailed

JODI Term

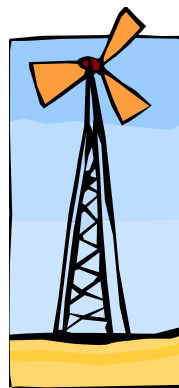
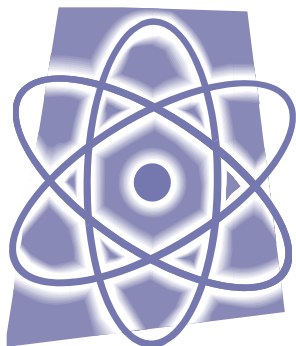
“Demand”

SIEC scope

- 
- Final consumption
 - Energy industries own use
 - International bunkers
 - Transformation

This difference reflects both the oil-specific nature of JODI, and that some data (bunkers, own use) are difficult to obtain or are less relevant monthly

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



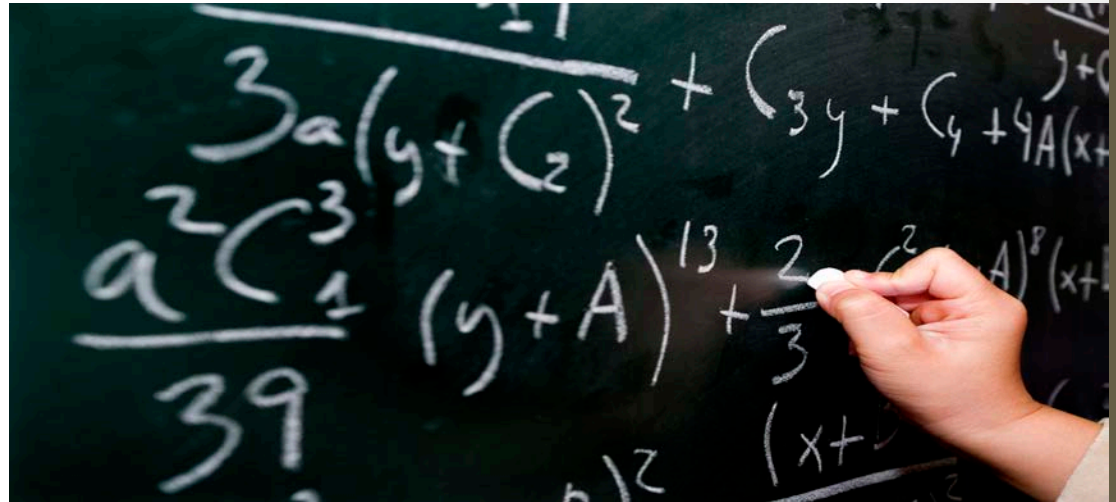
- Can I see some examples of other countries' practices?
- How should I compile metadata, or handle confidentiality?
- How do these recommendations relate to MY country?



The need for a Compilers Manual

- 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**
- Still being finalised

IRES is about
definitions of
flows/products:
THEORETICAL



ESCM is about
practical
guidance and
country
examples:
PRACTICAL

Some country practices already published (but 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

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

[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

Highlights

Presentation of primary and secondary oil products in energy statistics versus energy balances

Secondary production=0

Commodity Balance		
	Crude oil (kt)	Motor Gasoline (kt)
Production	100	30
Import		
Export	10	24
Supply	90	6
Oil Refineries	88	
Final Consumption	2	6

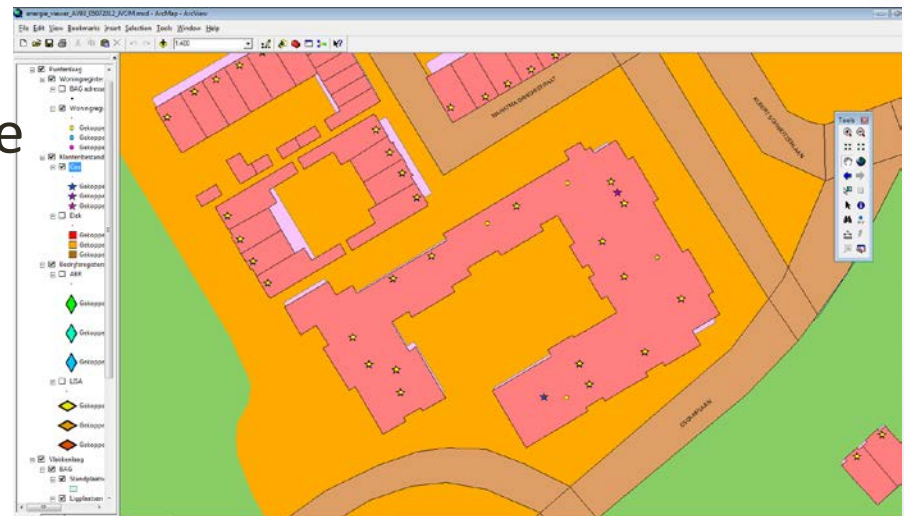
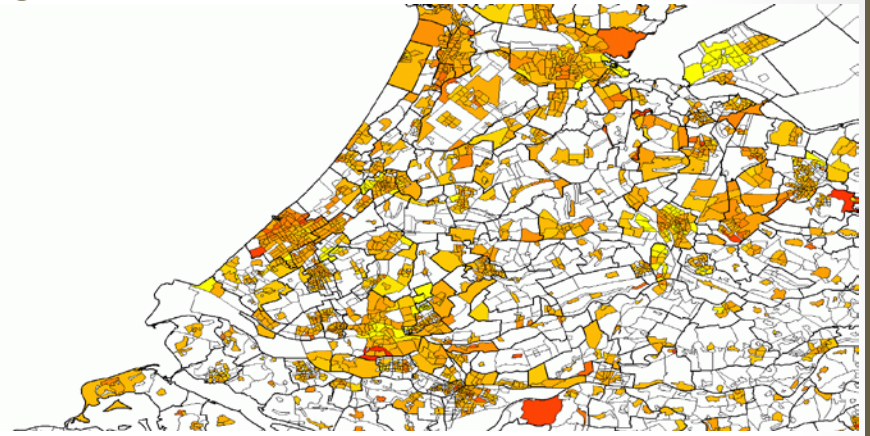
Energy Balance		
	Crude oil (TJ)	Motor Gasoline (TJ)
Production	4230	
Import		
Export	423	1063
Supply	3807	-1063
Oil Refineries	-3722	1329
Final Consumption	85	266

Motor gasoline in kt x 44.3 TJ/kt = Motor gasoline in TJ

Crude oil in kt x 42.3 TJ/kt = Crude oil in TJ

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



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 statistics
- ESCM will provide guidance on HOW, with real examples
- This applies to JODI! JODI data agree with IRES definitions and concepts, and can be used to compile annual data for international organisations (UNSD, IEA, Afrec...)
- ESCM will contain guidance and examples that will be relevant for JODI

Thanks!

BlackburnA@un.org

[Energy Stat@un.org](mailto:Energy_Stat@un.org)

Annex: GSBPM

Quality Management / Metadata Management							
Specify Needs	Design	Build	Collect	Process	Analyse	Disseminate	Evaluate
1.1 Identify needs	2.1 Design outputs	3.1 Build collection instrument	4.1 Create frame & select sample	5.1 Integrate data	6.1 Prepare draft outputs	7.1 Update output systems	8.1 Gather evaluation inputs
1.2 Consult & confirm needs	2.2 Design variable descriptions	3.2 Build or enhance process components	4.2 Set up collection	5.2 Classify & code	6.2 Validate outputs	7.2 Produce dissemination products	8.2 Conduct evaluation
1.3 Establish output objectives	2.3 Design collection	3.3 Build or enhance dissemination components	4.3 Run collection	5.3 Review & validate	6.3 Interpret & explain outputs	7.3 Manage release of dissemination products	8.3 Agree an action plan
1.4 Identify concepts	2.4 Design frame & sample	3.4 Configure workflows	4.4 Finalise collection	5.4 Edit & impute	6.4 Apply disclosure control	7.4 Promote dissemination products	
1.5 Check data availability	2.5 Design processing & analysis	3.5 Test production system		5.5 Derive new variables & units	6.5 Finalise outputs	7.5 Manage user support	
1.6 Prepare business case	2.6 Design production systems & workflow	3.6 Test statistical business process		5.6 Calculate weights			
		3.7 Finalise production system		5.7 Calculate aggregates			
				5.8 Finalise data files			