United Nations | Statistics Division

Session 1: Biofuels/bioenergy/biomass energy according to IRES

Workshop on the Strategic Framework for the African Bioenergy Data Management

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Lomé, Togo

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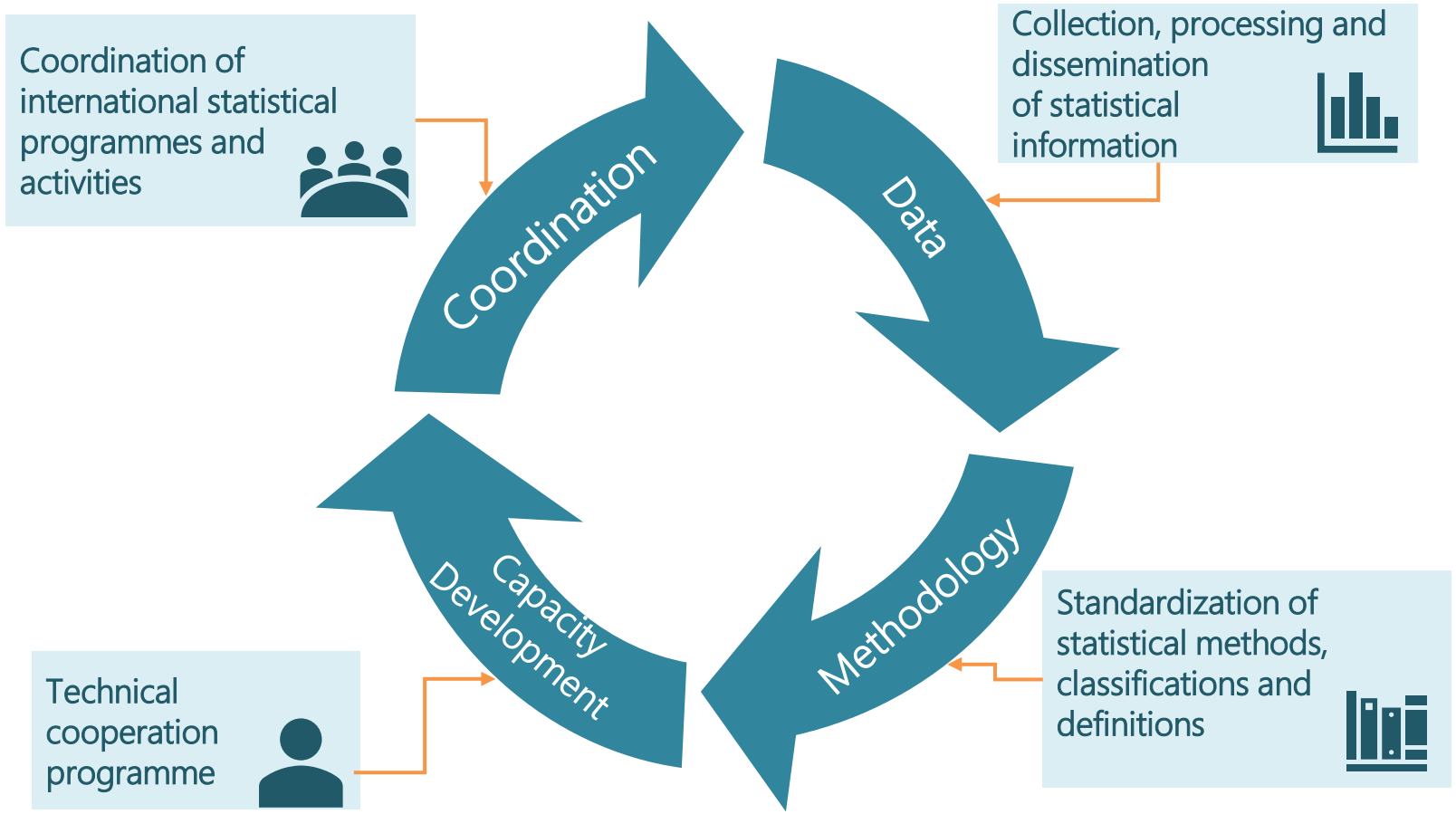
Outline

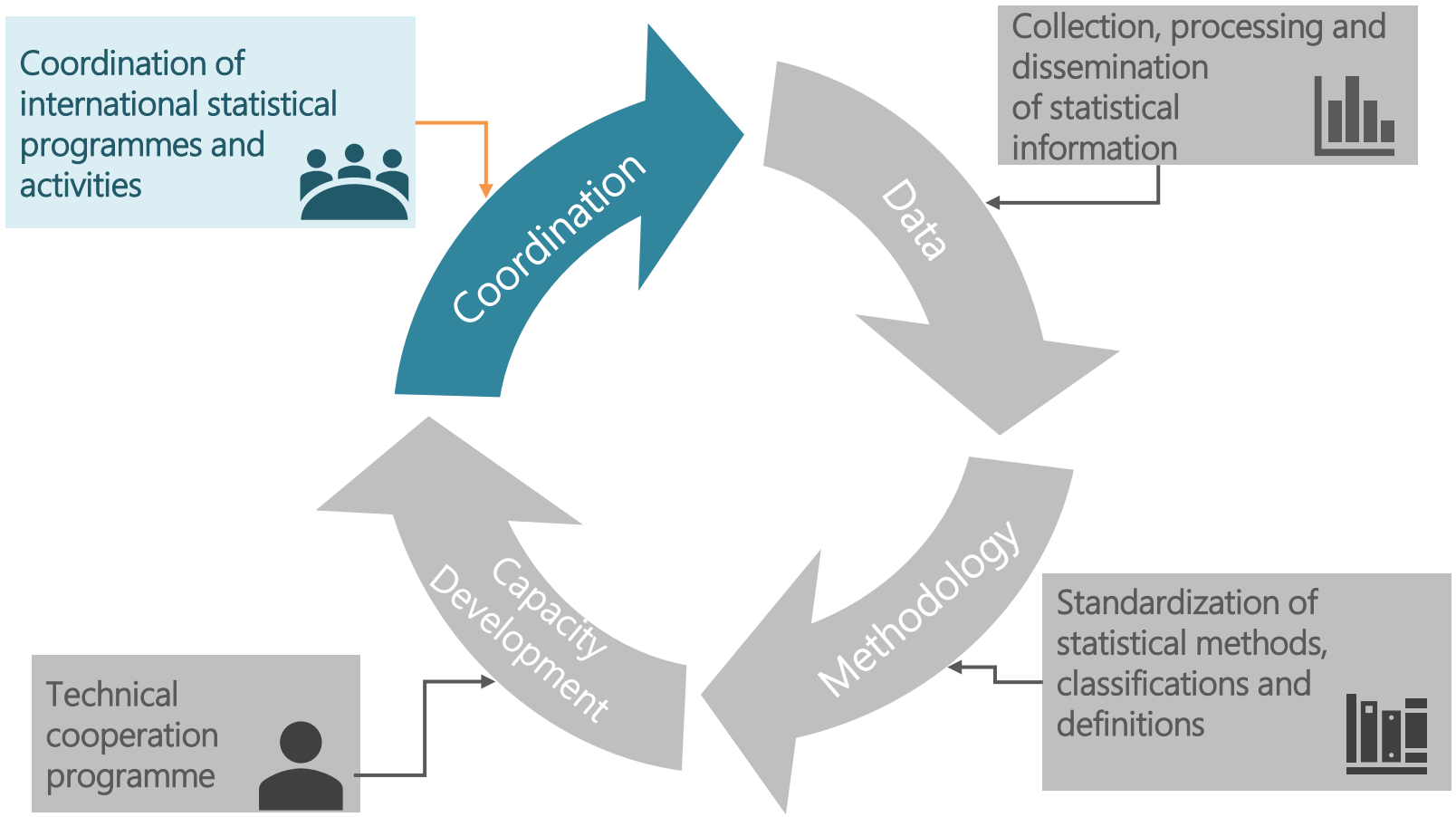
- UNSD
- International Recommendations for Energy Statistics
- Standard International Energy Product Classification
- Biomass, biofuels and bioenergy
- Solid biofuels, liquid biofuels and biogases
- Conclusion

UNSD – Mission and Functions

Mission: to advance the global statistical system



Energy Statistics – Cooperation/Coordination



Coordination

- Oslo Group on Energy Statistics
  - UNSD acts as the secretariat of the Oslo Group on Energy Statistics,
  - To ensure a fair and inclusive process to develop methodology, discuss relevant issues in the field of energy statistics, among other things.

- Intersecretariat Working Group on Energy Statistics (InterEnerStat)
  - UNSD is a key player of InterEnerStat
  - Again ensuring that all voices are heard and that the process is fair

Coordination

THE UN REGIONAL COMMISSIONS


ECA


ECLAC


ESCAP


ESCWA


UNECE

- UNSD coordinates with the Regional Commissions to avoid duplication of work and to ensure a concerted effort is made to support harmonization of concepts/methods and ultimately sustainable development

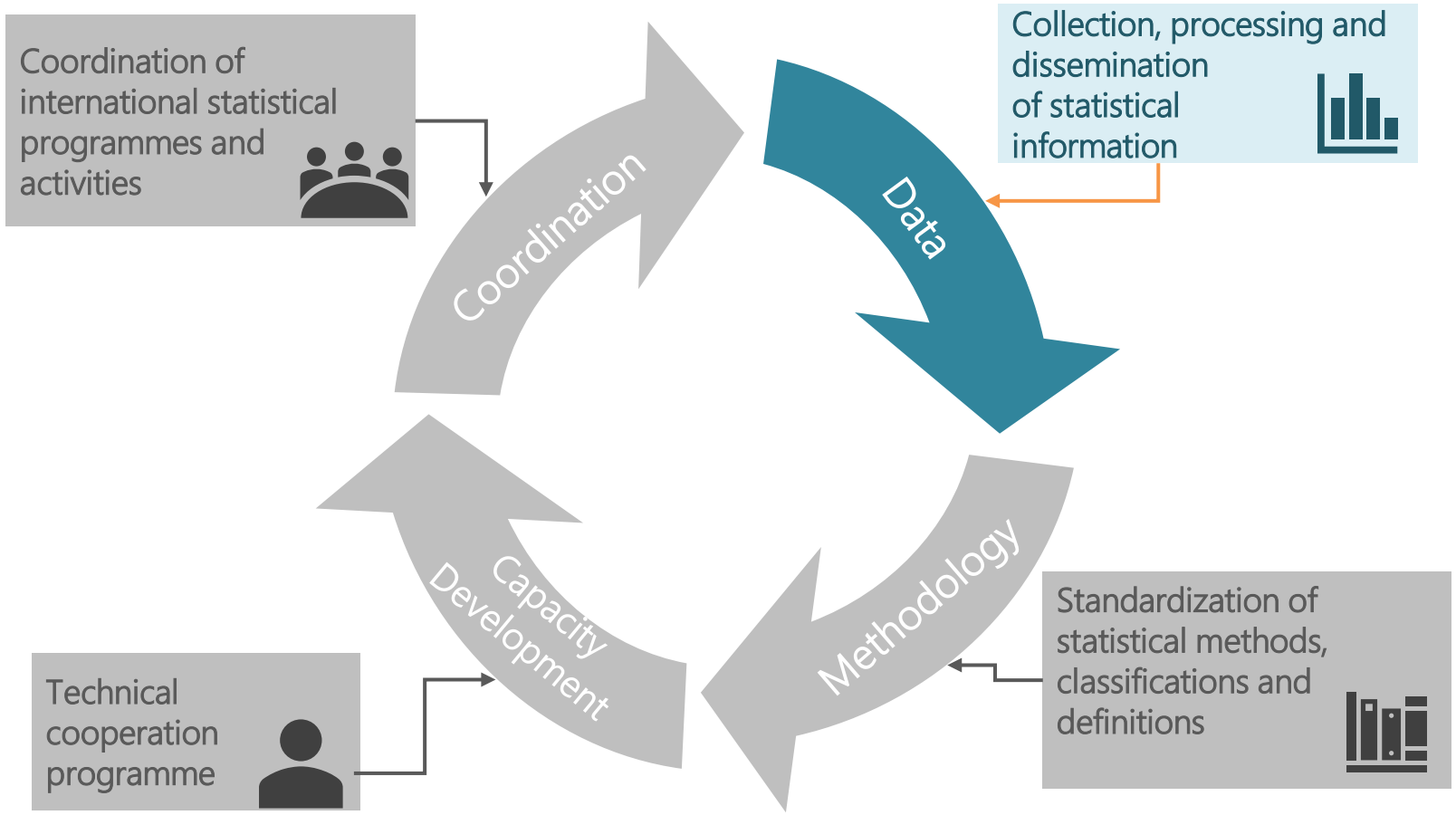
International cooperation: SDG7

Co-author of SDG7 Tracking Report

Custodian of SDG indicators

- 7.2.1 (renewable energy, with IEA and IRENA), and
- 7.3.1 (energy efficiency, with IEA)

Energy Statistics - Data



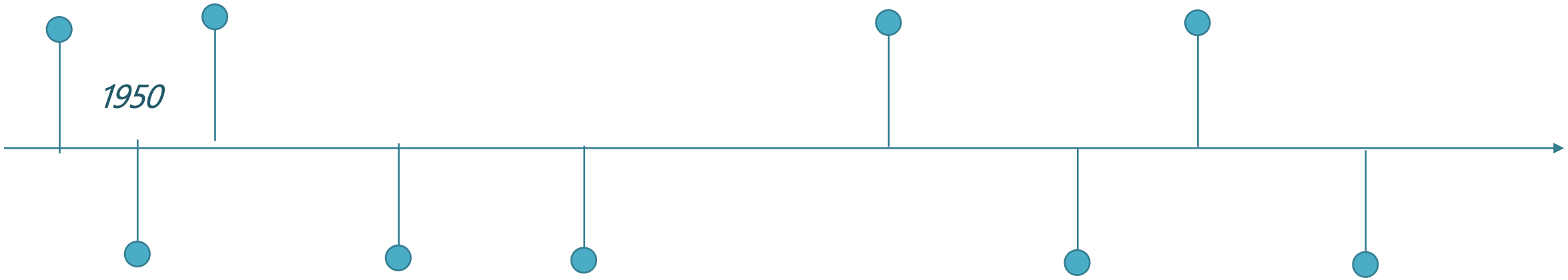
Energy Statistics - short history

1946: UN Statistical Commission established (UNSC)

1950s: Fundamental work: among others: International Trade, National Accounts, Industrial Statistics, Migration Statistics,
1952: World Energy Supplies in Selected Years, 1929-1950 published

2005 UNSC: need for developing energy statistics as part of official statistics
2006: Oslo Group established
2006: Intersecretariat Working Group on Energy Statistics convened

2018: "Energy Statistics Compilers' Manual" (ESCM)
2018: Energy Statistics Pocketbook
2019: Energy balances visualization portal



1950: UN Statistical Office (UNSO, now UNSD) instituted as the central statistical unit within the UN Secretariat

1970s: Energy statistics separated from Economic statistics

1976: UNSC agreed on the use of energy balances as the key instrument of energy statistics. UNSC recommended preparation of SIEC (!).

2011: "International Recommendations for Energy Statistics" (IRES), including SIEC, the Standard International Energy Product Classification.

2023: SIEC revision

Energy Statistics Database

Annual energy data collected from 225 countries and areas:

- 267 countries/areas if historical data are included
- Available since 1950

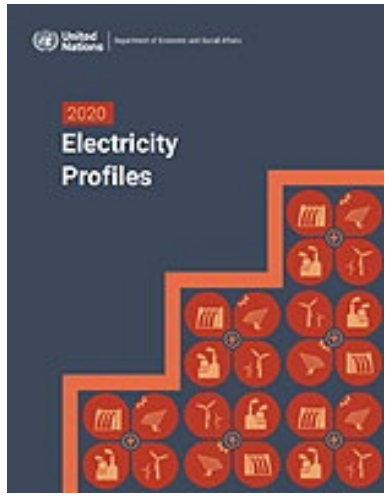
Coverage:

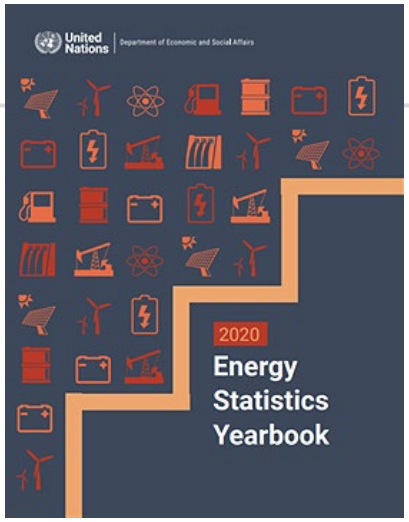
- 72 energy products
- 197 flows

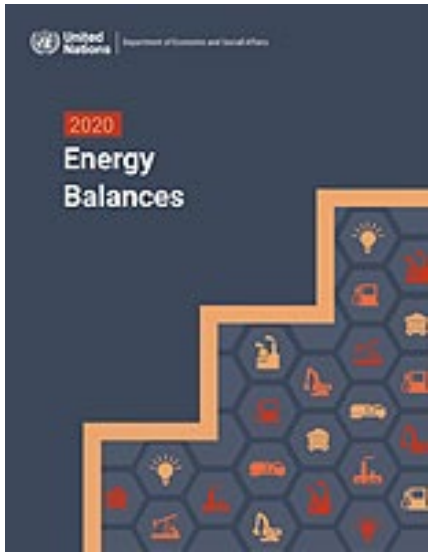
Energy Statistics - publications and data

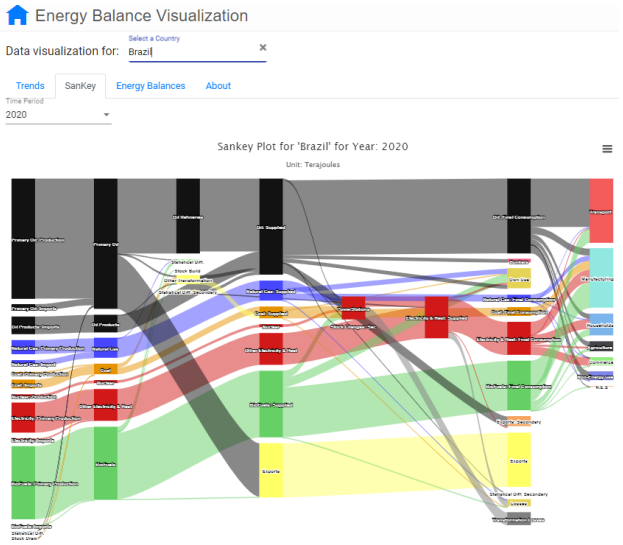
Main publications:

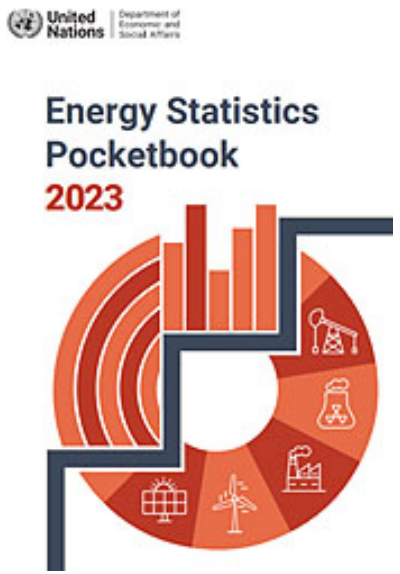
- Energy Statistics Pocketbook
- Energy Statistics Yearbook
- Energy Balances
- Electricity Profiles







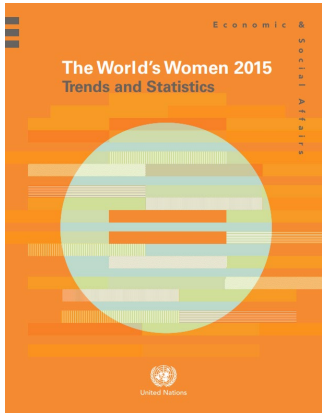


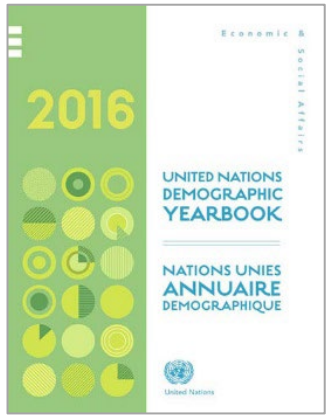


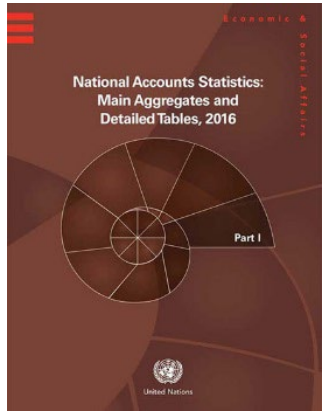
UNSD other key publications and database

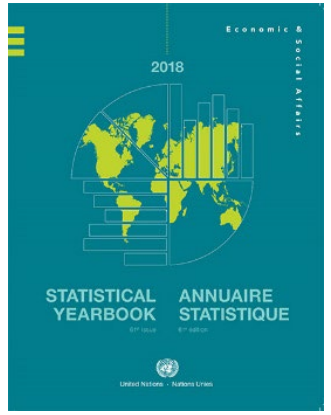
Main topics:

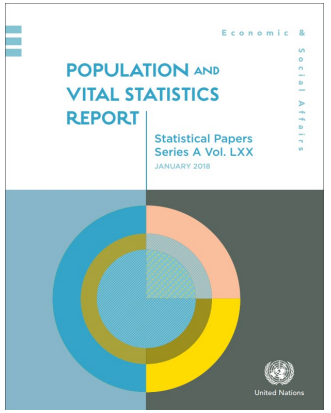
- Economic Statistics
- Demographic and Social Statistics
- Environmental Statistics
- Geospatial Information



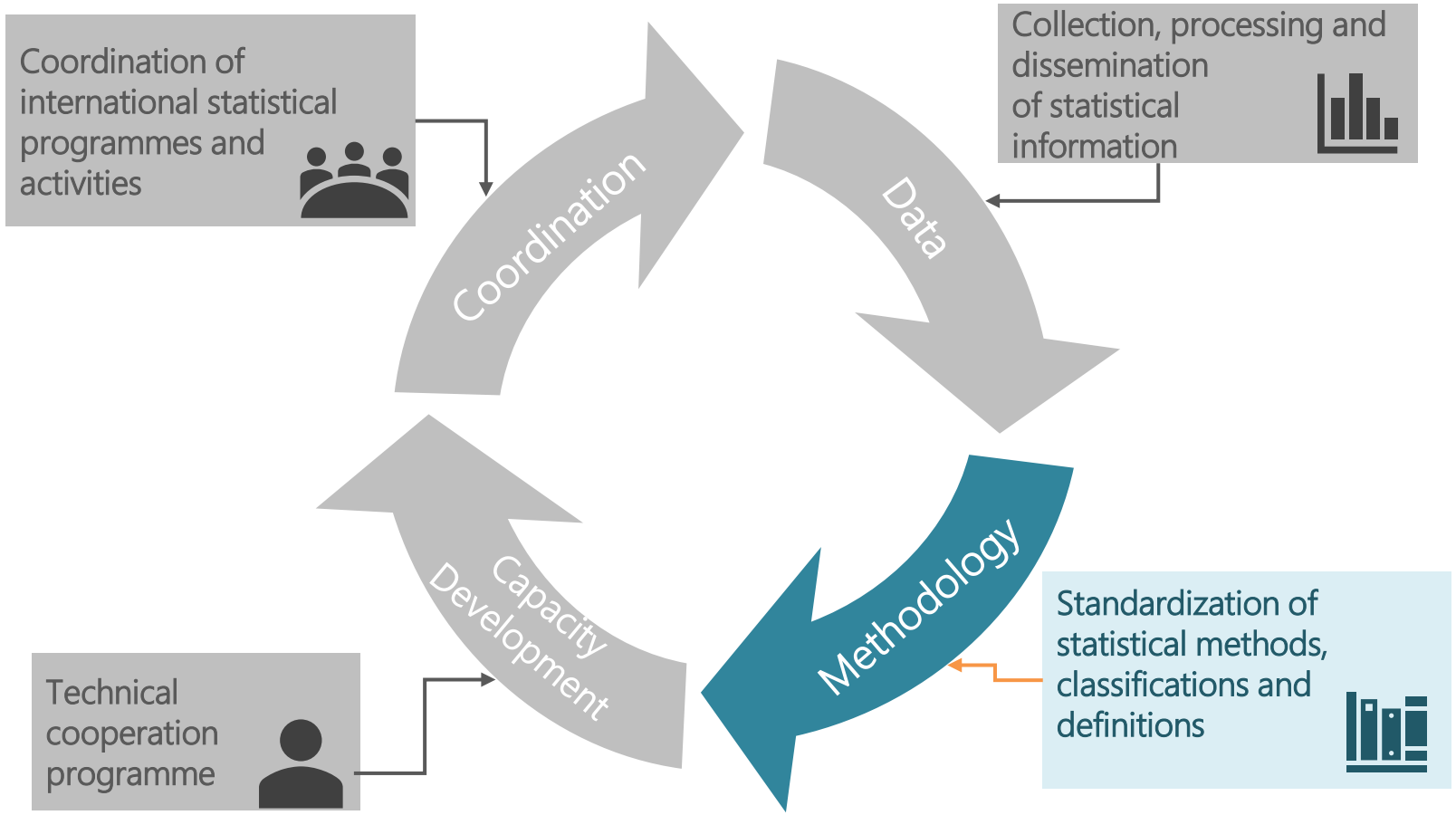




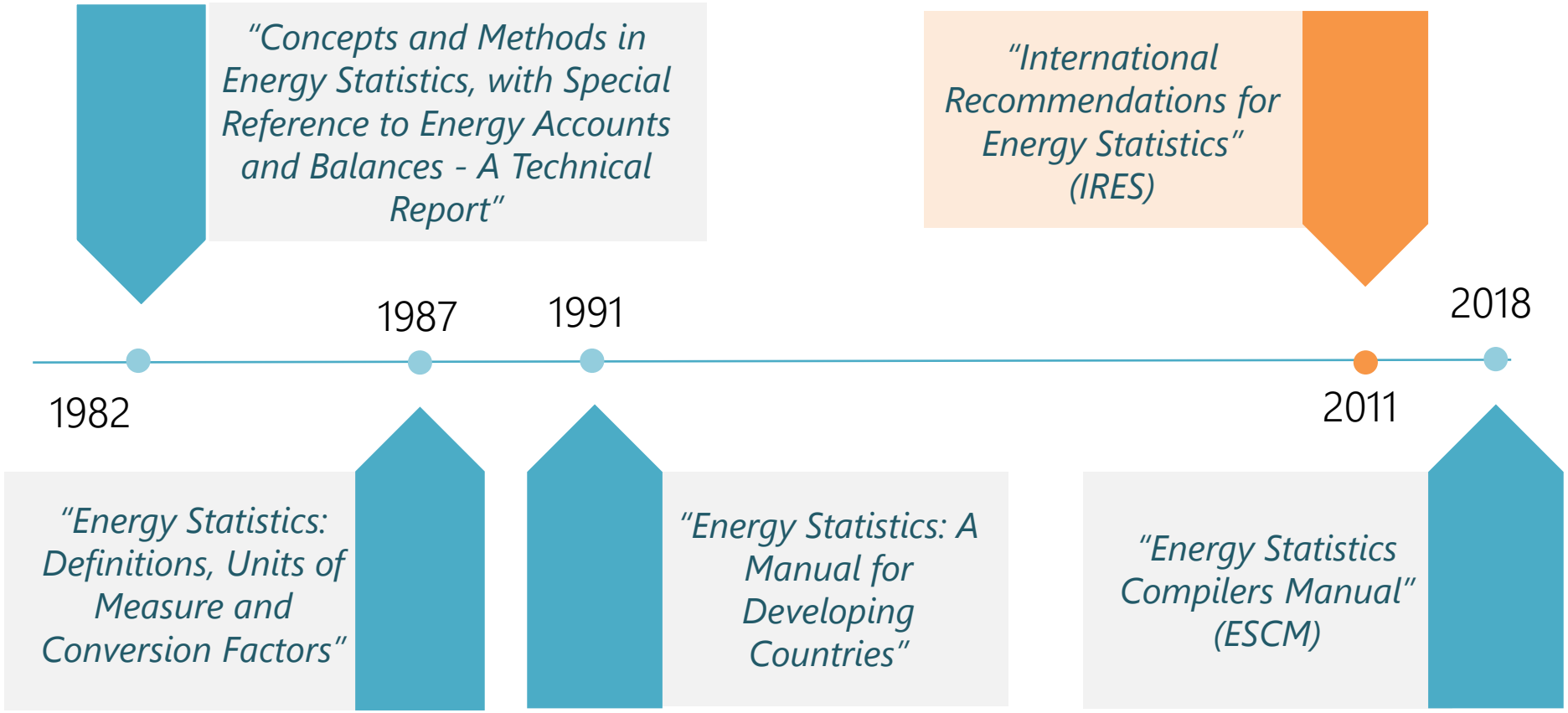




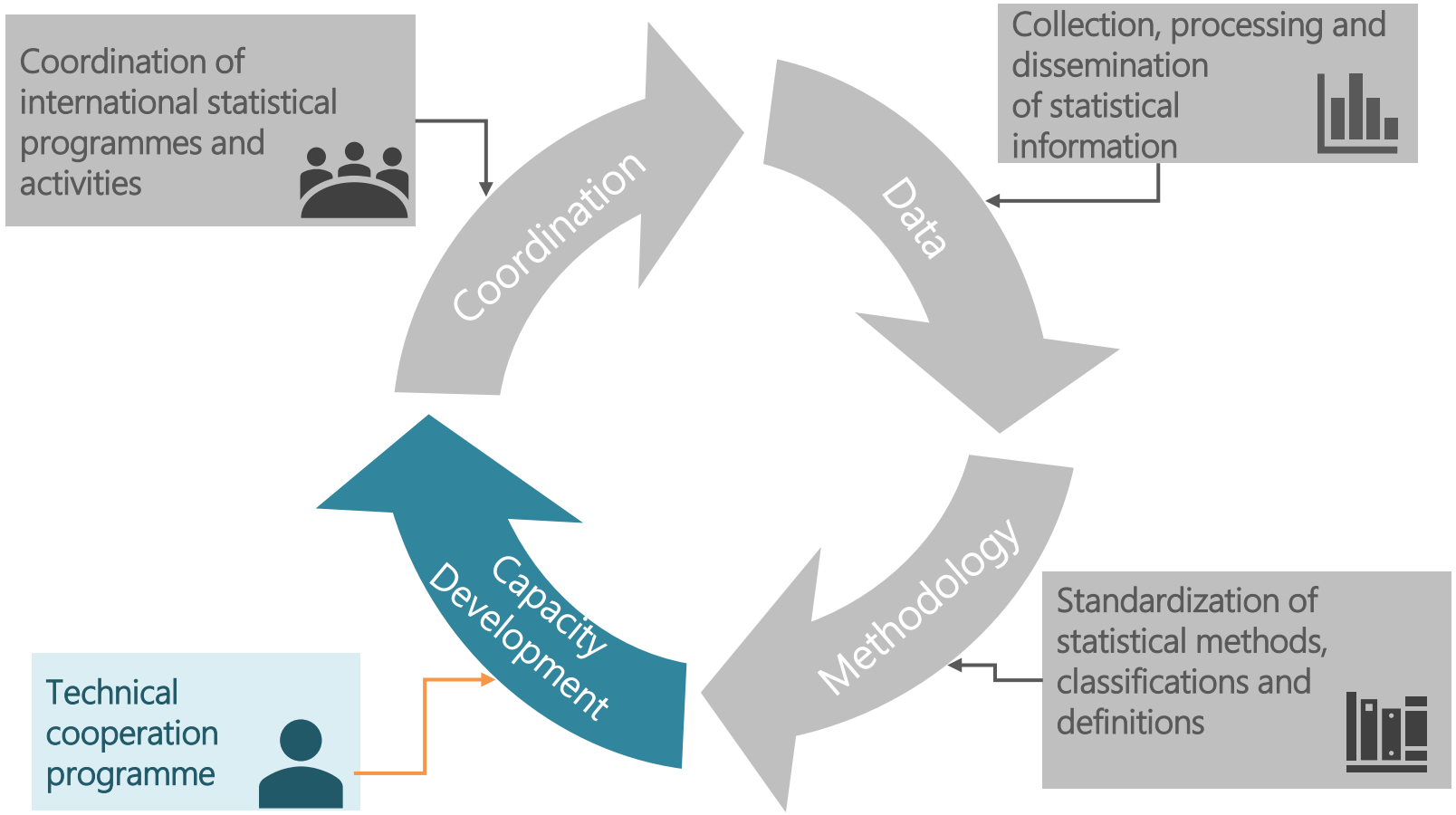
Energy Statistics methodological work



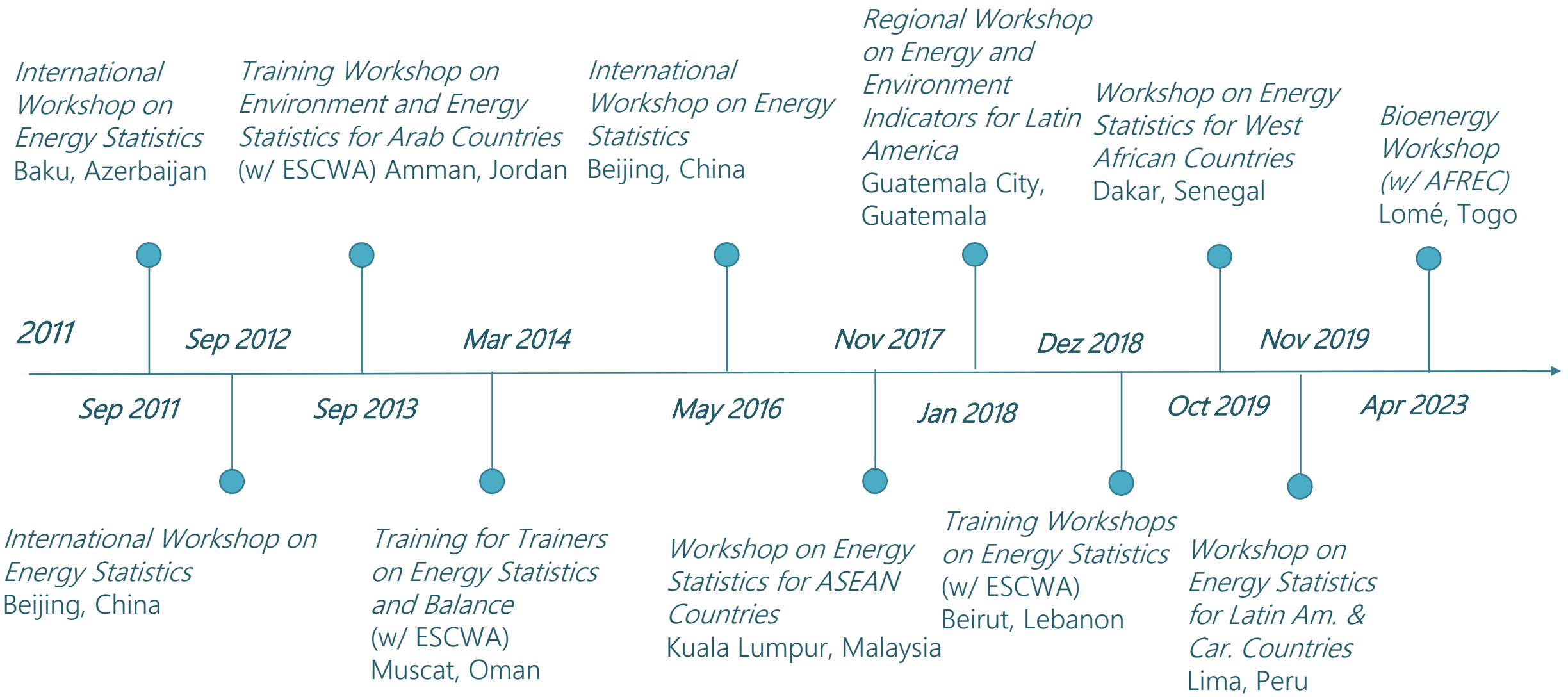
Energy Statistics methodological work



Energy Statistics – Capacity Development

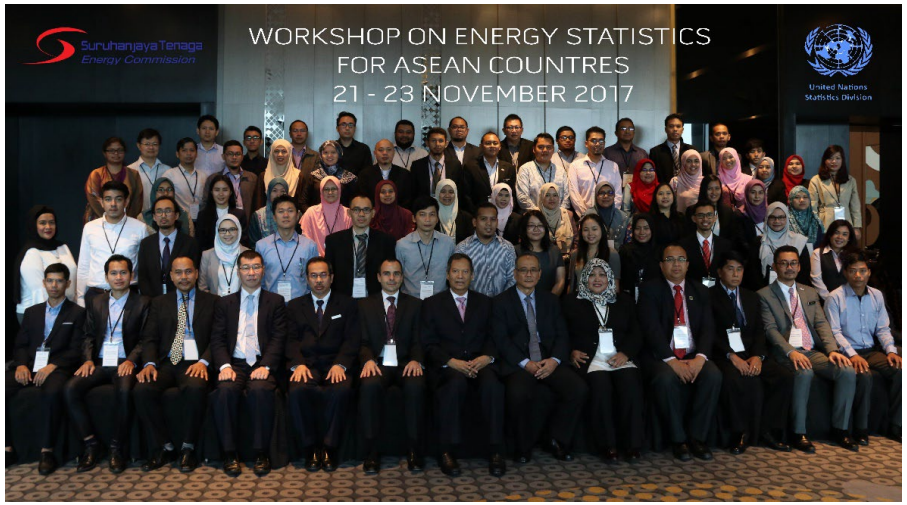


(In-person) Energy Statistics workshops



Energy Statistics Workshops

Workshop on Environment and Energy Statistics - September 2013 Amman, Jordan



Workshop on Energy Statistics
Latin Am. & Car. Countries – Peru 2019

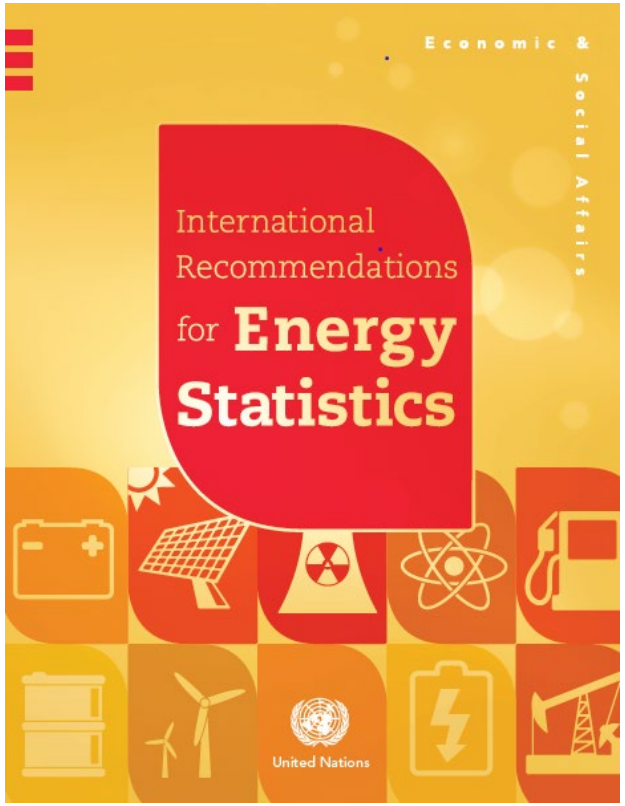
Training Workshops on Energy Statistics
11-12 December 2018
Beirut, Lebanon

Capacity Development: Beijing 2016

Workshop on Energy Statistics
Western African Countries – Senegal 2019

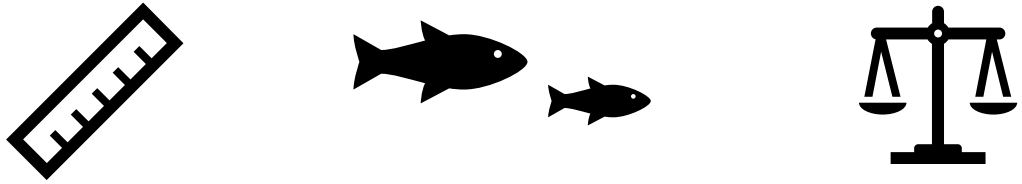
International Recommendations for Energy Statistics (IRES)

- Internationally agreed and adopted by the UN Statistical Commission (2011) – implementation encouraged in all countries
- Comprehensive framework on: scope of energy statistics, **classifications**, units, methods; data collection, institutional arrangements, quality assurance, dissemination
- Importance of developing energy statistics as official statistics (UN Fundamental principles)

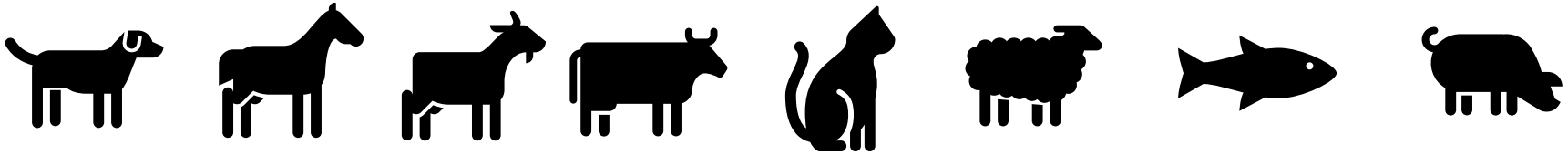


Classifications

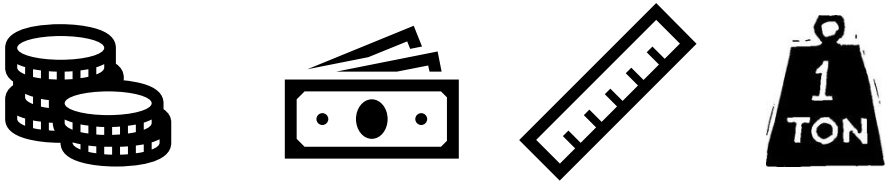
- Provide clear definitions of objects to be measured



- Provide a structure to place measured objects in context



- Allow compiled statistics to be comparable across programs
  - Help identify related concepts and objects
  - Help defining relationships



SIEC - Energy Product Classification

- IRES contains the Standard International Energy Product Classification (SIEC), first definitive standard classification for energy products.

Table 3.1

Standard International Energy Product Classification (*SIEC*)

SIEC Headings			Correspondences	
Section/ Division/ Group	Class	Title	CPC Ver.2	HS 2007
0		Coal		
01		Hard coal		
011	0110	Anthracite	11010*	2701.11
012		Bituminous coal		
	0121	Coking coal	11010*	2701.19
	0129	Other bituminous coal	11010*	2701.12
02		Brown coal		
021	0210	Sub-bituminous coal	11030*	2702.10*
022	0220	Lignite	11030*	2702.10*
03		Coal products		
031		Coal coke		
	0311	Coke oven coke	33100*	2704*

SIEC – relations with other systems

- HS 2710.12: “Light oils and preparations ”
- CPC 33311, 33312 and 33320: “Aviation gasoline”; “Motor gasoline” ; “Gasoline-type jet fuel”
- SIEC 465: “Gasolines”
- JODI: “Motor and aviation gasoline”

HS	2710.12*		
CPC	33312	33311	33320
SIEC	4651	4652	4653
JODI	Motor and aviation gasoline		

Biofuels definition – IRES

- Biofuels - fuels derived directly or indirectly from biomass.
- Remark: Fuels produced from animal fats, by-products and residues obtain their calorific value indirectly from the plants eaten by the animals.

Unified Bioenergy Terminology

IRES does not provide a definition of bioenergy and biomass, but bases the reasoning on the FAO publication "UBET: Unified Bioenergy Terminology". UBET defies:

- **Biomass -** material of biological origin excluding material embedded in geological formations and transformed to fossil;
- **Biofuel -** fuel produced directly or indirectly from biomass;
- **Bioenergy -** energy from biofuels.

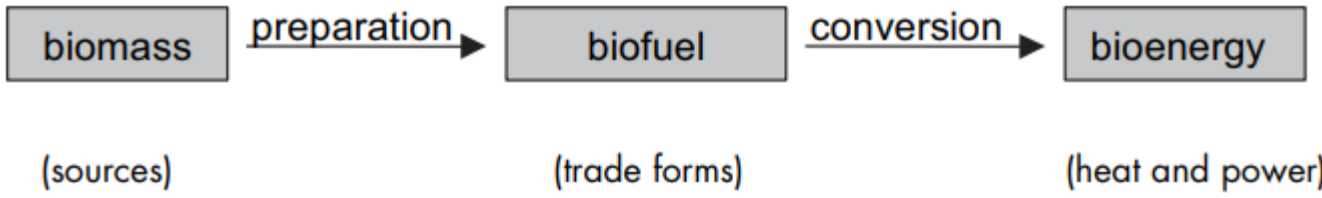
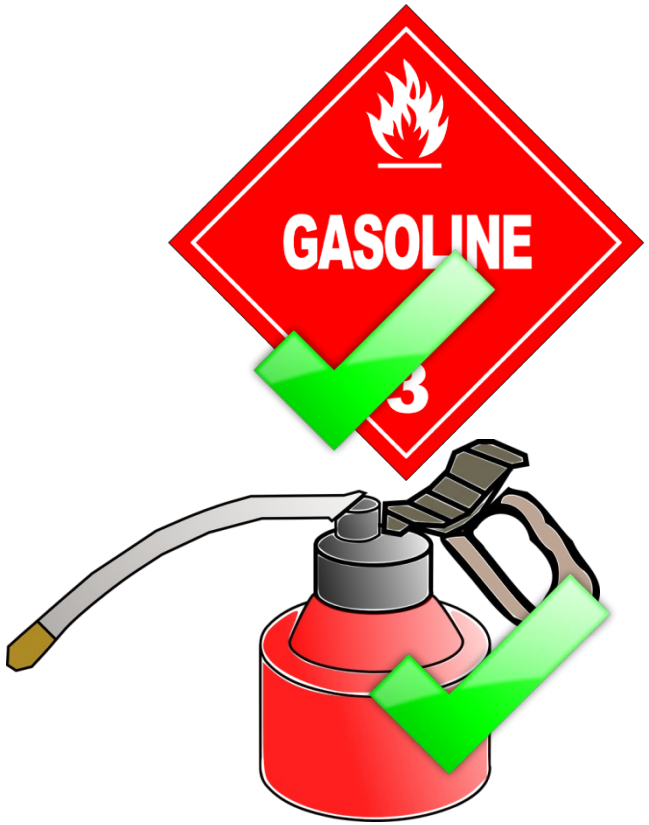


Figure 2: Production chain of bioenergy

Source: Food and Agriculture Organization of the United Nations (2004). *UBET: Unified Bioenergy Terminology*

“Energy products” refers to products exclusively or mainly used as a source of energy. Biomass and waste included only when used for energy purposes

- Wood, ethanol excluded when not used as an energy product.
- Fossil fuels always included by definition, even when used for non-energy purposes (e.g. lubricants).

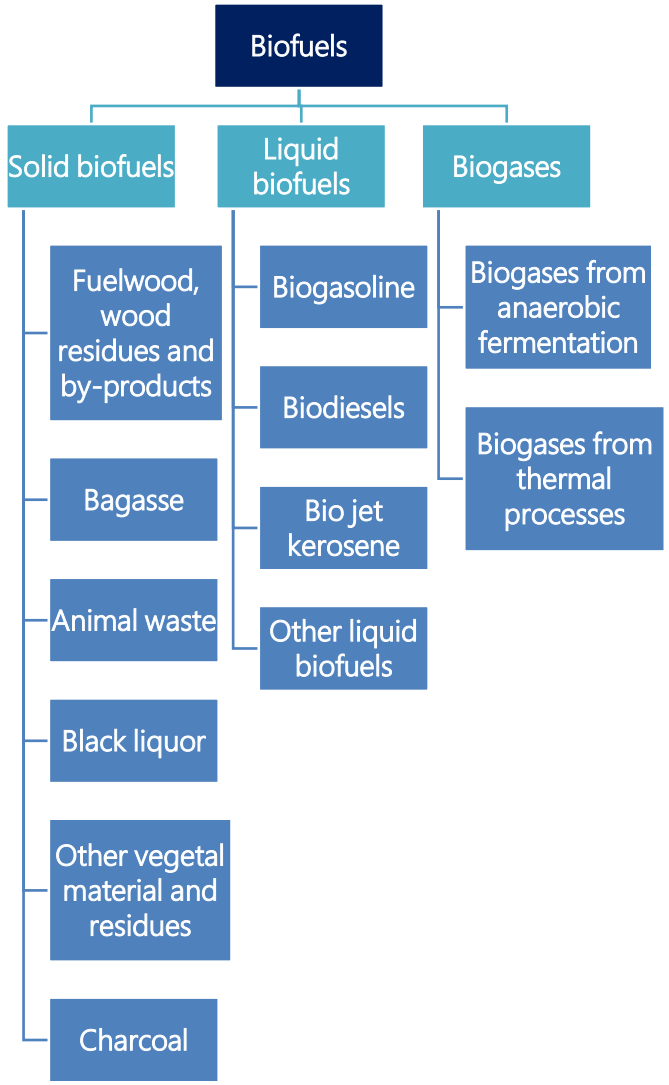


- *Boundary of energy products*. The description of the boundary of the universe of energy products is not always straightforward.
- For example, *corncobs* can be:
  - (1) combusted directly to produce heat;
  - (2) used in the production of ethanol as a biofuel,
  - (3) consumed as food, or
  - (4) thrown away as waste.
- According to the scope of SIEC, corncobs, 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).

IRES: Scope of Energy Statistics

- It’s important that data on the production of energy outside energy industries is also collected and included in total energy production.
  - Results: fuelwood collected and used non-commercially needs to be properly accounted for;
  - By-products used by industries for energy (e.g., bagasse, black liquor) too;

Bioenergy - classification



SIEC Headings			Correspondences	
Section/ Division/ Group	Class	Title	CPC Ver.2	HS 2007
5		Biofuels		
51		Solid biofuels		
511		Fuelwood, wood residues and by-products		
	5111	Wood pellets	39280*	4401.30*
	5119	Other fuelwood, wood residues and by-products	03130, 31230, 39280*	4401.10, 4401.21, 4401.22, 4401.30*
512	5120	Bagasse	39140*	2303.20*
513	5130	Animal waste	34654*	3101*
514	5140	Black liquor	39230*	3804.00*
515	5150	Other vegetal material and residues	01913, 21710, 34654*, 39120*, 39150*	0901.90*, 1213, 1802*, 2302*, 2304, 2305, 2306, 3101
516	5160	Charcoal	34510	4402
52		Liquid biofuels		
521	5210	Biogasoline	34131*, 34139*, 34170*	2207.20*, 2905.11*, 2905.13*, 2905.14*, 2909.19*
522	5220	Biodiesels	35490*	3824.90*
523	5230	Bio jet kerosene		
529	5290	Other liquid biofuels		
53		Biogases		
531		Biogases from anaerobic fermentation		
	5311	Landfill gas	33420*	2711.29*
	5312	Sewage sludge gas	33420*	2711.29*
	5319	Other biogases from anaerobic fermentation	33420*	2711.29*
532	5320	Biogases from thermal processes		

Solid biofuels: definition and sources

Solid biofuels - definition

- Solid fuels derived from biomass.

Solid biofuels - sources

- Produced professionally (commercial fuelwood)
- Recycled commercially (post-consumer wood)
- Industrial by-products and used on-site (bagasse, black liquor, vegetal waste)
- Produced in the informal/grey sector (charcoal producers)
- Completely non-commercially (households collecting their own firewood)

Definitions – solid biofuels

Fuelwood, wood residues and by-products CUBIC METERS

- Fuelwood or firewood (in log, brushwood, pellet or chip form) obtained from natural or managed forests or isolated trees. Also included are wood residues used as fuel and in which the original composition of wood is retained.

Charcoal METRIC TONS

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

Bagasse METRIC TONS

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

Definitions – solid biofuels

Animal waste TERAJOULES

Excreta of animals, meat and fish residues which, when dry, are used directly as a fuel.

Black liquor TERAJOULES

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

Other vegetal material and residues TERAJOULES

- Solid primary biofuels not specified elsewhere, including straw, vegetable husks, ground nut shells, pruning brushwood, olive pomace and other wastes arising from the maintenance, cropping and processing of plants.

Liquid biofuels – definition and classification

Liquid biofuels - definition

- Liquids derived from biomass and used as fuels.

Liquid biofuels - classification

SIEC classification is made by **use** rather than chemistry.

What fuel is it being blended with? What engine is it used in?

- **Biogasoline** (includes bioethanol, biomethanol)
  - Used pure or blended in gasoline engines
- **Biodiesels** (methyl-esters, Fischer Tropsch oil)
  - Used pure or blended in diesel engines
- **Bio jet kerosene**
  - Liquid biofuels derived from biomass and blended with or replacing jet kerosene.
- **Other liquid biofuels**
  - This group includes liquid biofuels not elsewhere specified.

Biogases

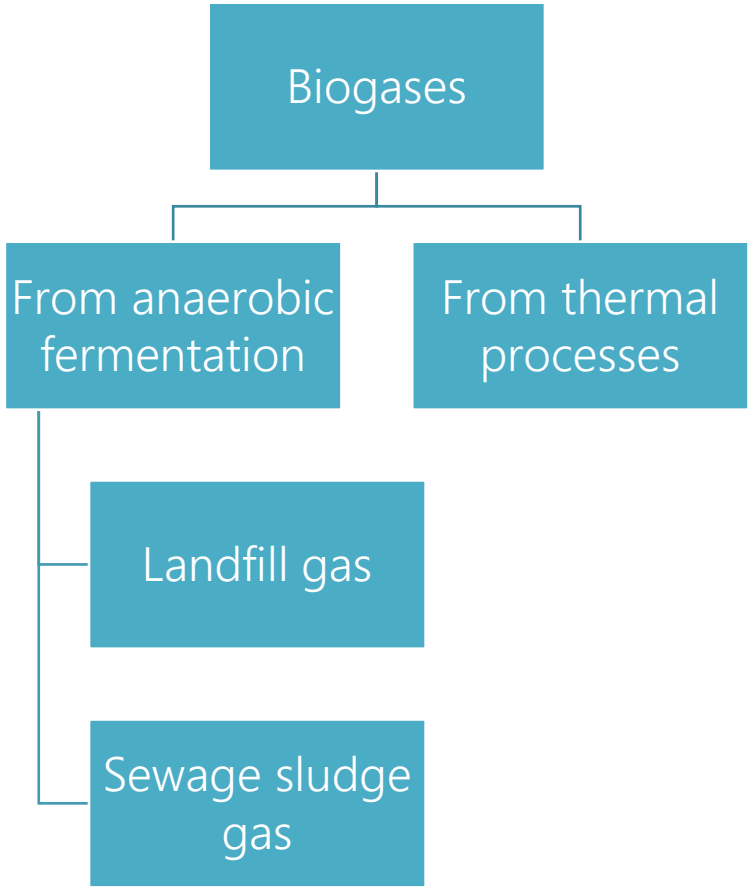
Gaseous biofuels - definition

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

Gaseous biofuels – remarks

Biogases often used on site, but can be blended into the natural gas distribution network too.

All data on the total quantity of biogases produced should be collected, regardless of their production process.



Conclusion

- IRES provides methodology to compile energy statistics that are comparable across products and countries, and consistent with other areas of statistics
- Following international recommendations/standards ensures comparability, particularly for data submitted to international organizations (AFREC, IEA, UNSD)
- On the other hand, measuring energy should be primarily done to inform development policy
- Deviations from international norms/formats that are relevant for national policies should be signaled in the metadata, and ideally adjusted for international reporting
- Thorough coverage of non-traded energy products is important to accurately assess the energy situation

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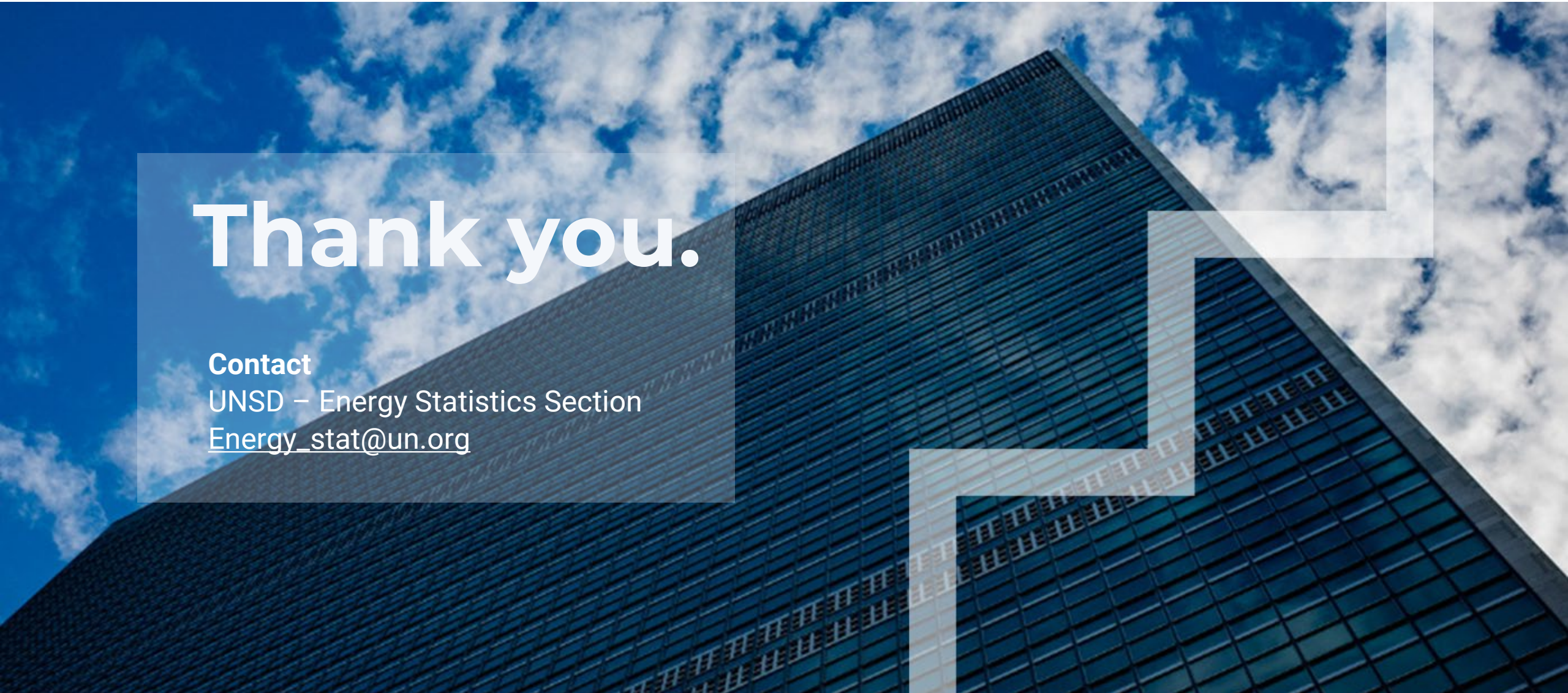

Thank you.

Contact
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