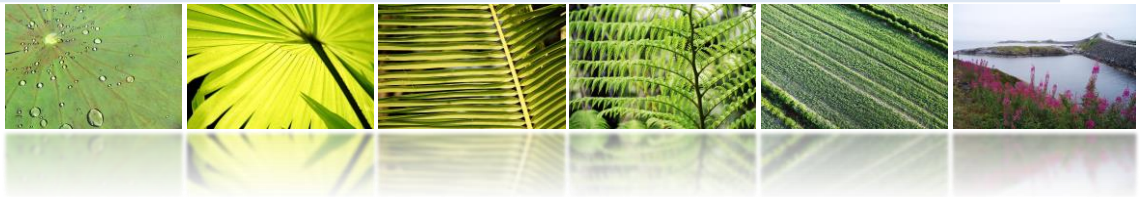
United Nations
Statistics Division

Electricity



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UNSD/ESCWA Technical Assistance to Lebanon

Electricity info for an energy balance

- Electricity delivered through a grid (like in the case of EDL) is generally easier to measure
  - Because the companies involved in production, transmission & distribution (or the system operator) keep track of most measurements, including for billing
- What might not be available is the exact type of each consumer, but it should not be too difficult to link consumers to a business register, if one exists

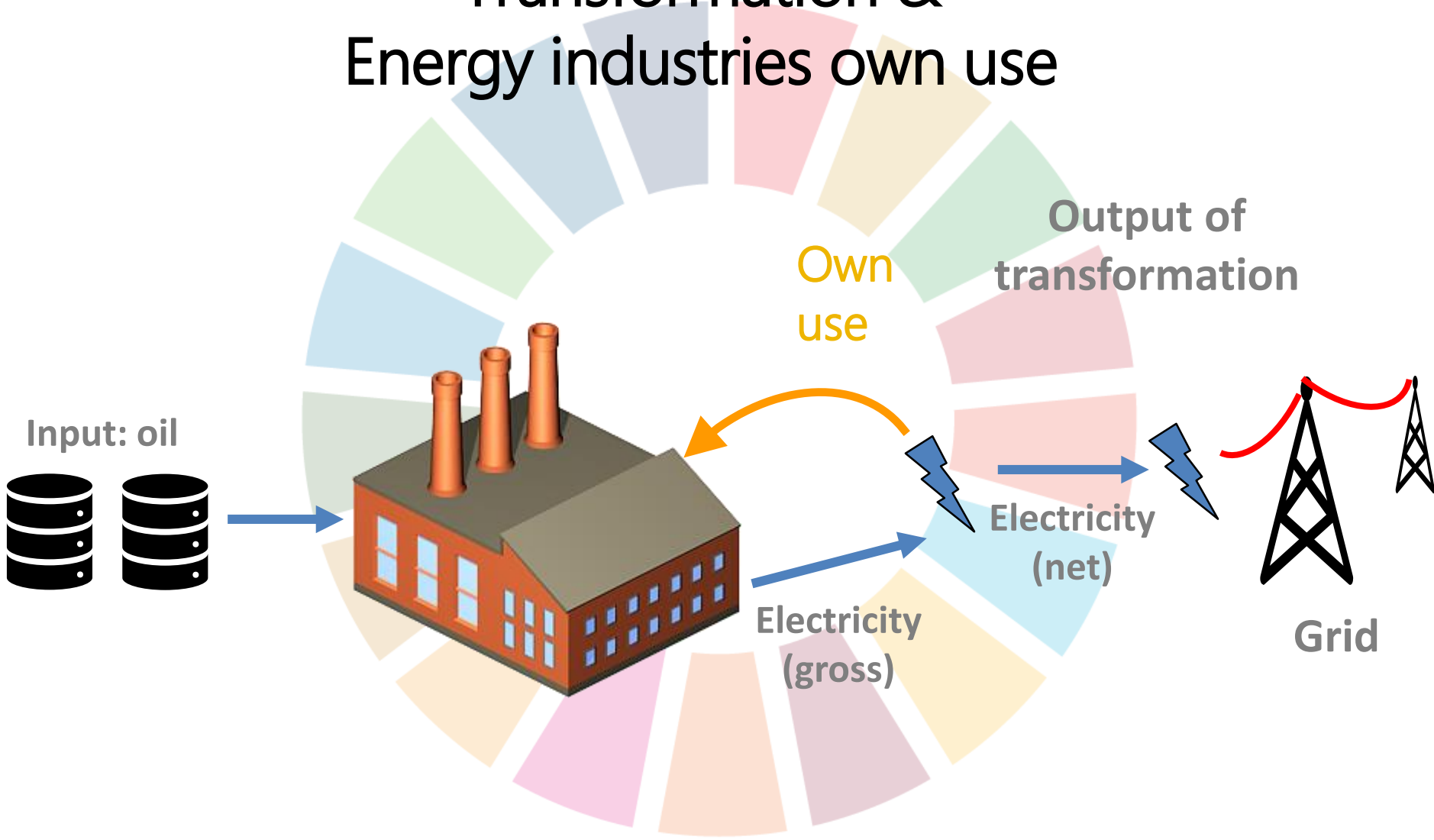
Electricity info for an energy balance

- Typically, the following information is needed:
  - Gross production (by type, source)
    - That includes all production by all sources
  - Fuel inputs to production
  - Own use by power plants
  - Net production (Gross production MINUS own use)
  - Imports and exports
  - Transmission and distribution losses
    - If possible, a distinction should be made between technical and non-technical losses
  - Consumption by category

Details of electricity info

- Fuel inputs to production:
  - fuel delivered does not necessarily equal fuel used. If different, it is good to have an idea of stock (inventory) changes.
- Production (by type, source)
  - Source: fossil fuel, biofuel, solar, wind, hydro, etc
  - Type: main activity, autoproducer
- Consumption by category:
  - Other energy industry (own use)
  - Manufacturing, construction, mining (non-energy), by ISIC activity
  - Commerce and public services
  - Households
  - Transport

Transformation & Energy industries own use



Exercise: electricity production from diesel

- Diesel used for electricity:
  - The 1300 kt of diesel used by the main electricity company generated 5200 GWh, but only 5000 GWh sent to grid
  - The 1000 kt of diesel used by IPPs generated 3500 GWh, where 3400 GWh sent to grid
  - The 300 kt of diesel used by other companies produced 900 GWh, where 800 GWh used by them (400 GWh commercial and 400 GWh industrial) & 100 GWh sent to grid
  - The 100 kt of diesel used by households produced 250 GWh, which were consumed by households.

	Gross prod.	Net prod.	Own use
Main elec. Co.	5200	5000	200
IPPs	3500	3400	100
Other Cos.	900	900*	0*
Households	250	250*	0*

Exercise: other electricity production

- The main electricity company also generated 600 GWh from hydro, 30 GWh from wind and 12 GWh from solar PV, all of which being fed to the grid (negligible own use).
- Households generated 2 GWh from solar PV, 1 GWh of which being fed to the grid.
- Other commercial companies generated 5 GWh from solar PV, all of which used by them.

With the info above, fill out the table in GWh

		Gross production	Own use	Net production
Thermal (diesel)	Main activity			
	Autoproducer			
Hydro	Main activity			
	Autoproducer			
Solar	Main activity			
	Autoproducer			
Wind	Main activity			
	Autoproducer			
Total				

Solution: electricity production in Gwh

- Electricity production in Gwh

		Gross production	Own use	Net production
Thermal (diesel)	Main activity	8700	300	8400
	Autoproducer	1150	-	1150
Hydro	Main activity	600	-	600
	Autoproducer	0	-	0
Solar	Main activity	12	-	12
	Autoproducer	7	-	7
Wind	Main activity	30	-	30
	Autoproducer	0	-	0
Total		10499	300	10199

Exercise (cont.)

- Knowing that:
  - An additional 45 GWh of electricity were imported and 22 GWh were exported; and
  - Electricity were delivered through the grid as follows:
    - 1900 GWh to commercial establishments;
    - 2000 GWh to households;
    - 4000 GWh to industrial establishments
    - 100 GWh to agriculture
    - 10 GWh to trains

- Fill the following table:

Final consumption (GWh)

- Fill the yellow cells.
- Does supply match final consumption?

Net production			
Imports			
Exports			
Supply			
		Through grid	At production site
Final Consumption			
Industrial			
Transport			
Commercial			
Agriculture			
Households			

Answers

- Does supply match the final consumption? If not, what can be the causes?

Net production	10199		
Imports	45		
Exports	22		
Supply	10222		
		Through grid	At production site
Final Consumption	9066	8010	1056
Industrial	4400	4000	400
Transport	10	10	0
Commercial	2305	1900	405
Agriculture	100	100	0
Households	2251	2000	251