



Focus on sectoral energy data : Electricity and industry

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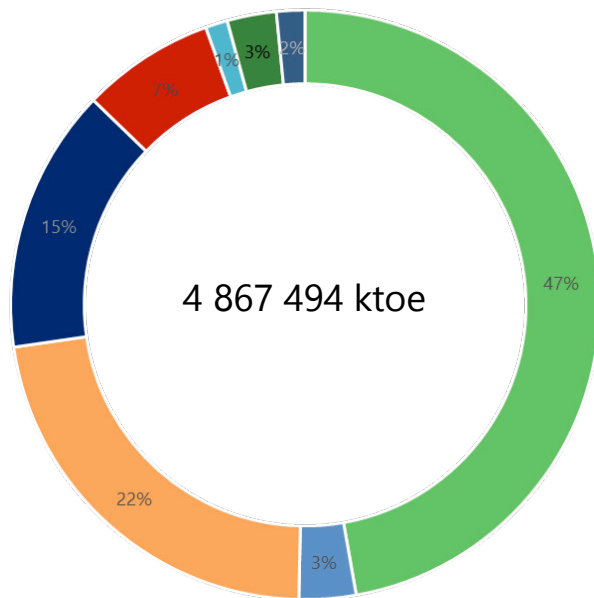
Joint IEA UNEP UNFCCC Workshop on Energy Data for Climate Policy – November 2020

The energy balance: A focus on the power sector

SUPPLY AND CONSUMPTION [unit]	Coal	Crude oil	Oil products	Natural Gas	Nuclear	Hydro	Geotherm. solar etc.	Biofuels & Waste	Electricity	Heat	Total
Production	39725	3597	-	6551	22052	1767	10974	31254	-	-	115920
Imports	39665	92632	39411	81613	-	-	-	889	2437	-	256646
Exports	-1401	-103	-22700	-19328	-	-	-	-1455	-6781	-3	-51771
Intl. marine bunkers	-	-	-2790	-	-	-	-	-	-	-	-2790
Intl. aviation bunkers	-	-	-8657	-	-	-	-	-	-	-	-8657
Stock changes	-756	773	-737	1495	-	-	-	-	-	-	775
TES	77233	96899	4527	70330	22052	1767	10974	30688	-4344	-3	310123
Transfers	-	1405	-660	-	-	-	-	-	-	-	745
Statistical differences	-1404	11	-858	3373	-	-	-	1	-	-	1123
Electricity plants	-54256	-	-783	-3111	-22052	-1767	-10184	-5699	44631	-	-53220
CHP plants	-6495	-	-436	-12100	-	-	-	-8434	10702	8127	-8635
Heat plants	-332	-	-137	-2198	-	-	-38	-1347	-	3081	-970
Blast furnaces	-5531	-	-32	-	-	-	-	-	-	-	-5564
Gas works	-	-	-	-	-	-	-	-	-	-	-
Cokepat.fuelBKB/PEplants	-581	-	-355	-	-	-	-	-	-	-	-936
Oil refineries	-	-104174	102579	-	-	-	-	-	-	-	-1595
Petrochemical plants	-	5859	-6006	-	-	-	-	-	-	-	-148
Liquefaction plants	-	-	-	-	-	-	-	-	-	-	-
Other transformation	-	-	-	-	-	-	-	-	-	-	-
Energy industry own use	-821	-	-5624	-1257	-	-	-	-535	-4288	-299	-12824
Losses	-544	-	-	-	-	-	-	-23	-2215	-1125	-3906
TFC	7268	-	92214	55039	-	-	752	14651	44486	9782	224191
INDUSTRY	6318	-	2352	19489	-	-	-	3907	19484	4273	56823
TRANSPORT	-	-	52820	446	-	-	-	2572	1009	-	56846
RESIDENTIAL	520	-	11447	22092	-	-	663	5846	11023	4420	56010
COMMERCIAL AND PUBLIC SERVICES	27	-	7009	10388	-	-	89	2327	12970	-	-

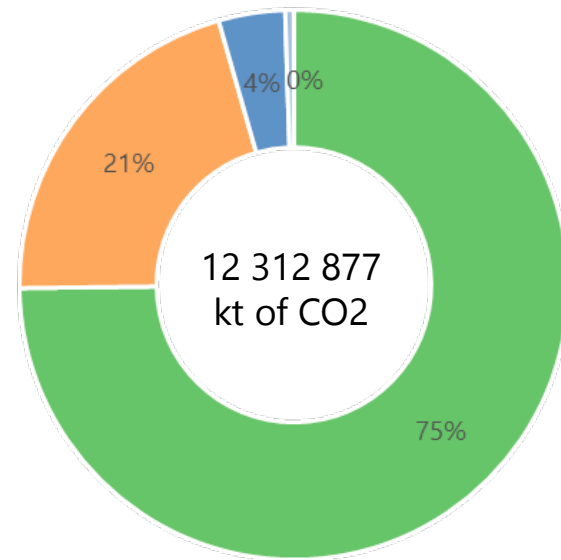
The energy balance: A focus on the power sector

Inputs to electricity and heat main activity plants by fuel,
World 2018 (ktoe)



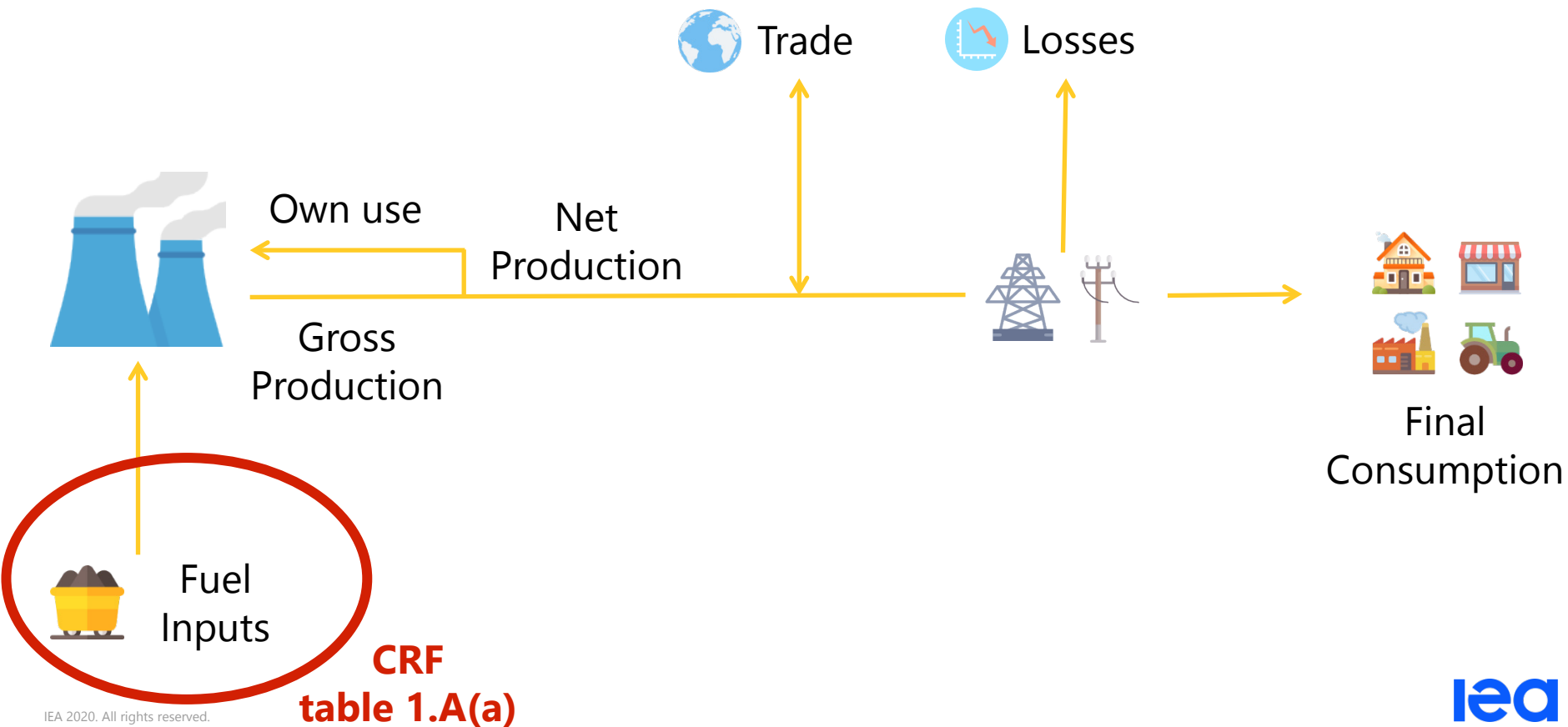
■ Coal ■ Oil ■ Natural gas ■ Nuclear ■ Hydro ■ Geothermal ■ Solar, tide, wind, etc. ■ Biofuels and waste

CO2 emissions from main activity electricity and heat
production by fuel, World 2018 (kt of CO2)



■ Coal, peat and oil shale ■ Natural gas
■ Oil ■ Municipal and industrial waste

Supply & demand chain for electricity



Electricity: Definition

- In the **International Recommendations for Energy Statistics**, statistics on electricity and heat (SIEC Section 7 - Electricity and Section 8 - Heat) are collected according to the type of producer and type of generating plant.
- Two types of producers:

**Main
Activity
Producer**

**Generate electricity / heat for third parties
as a primary activity.**



Autoproducer

**Generate electricity / heat wholly or partly
for their own use as an activity which
supports their primary activity.**



Electricity: Definition (2)

- Three types of generating plants:

**Electricity
Only**

Generate electricity only



**Heat
Only**

Generate heat only



**Combined
Heat and
Power (CHP)**

Generate both electricity and heat simultaneously



Mapping IEA and CRF definitions

IRES / IEA

Main Activity Producer



Autoproducer



CRF Table 1.A(a), sheet 1

Public electricity and heat production

IPCC 2006 Guidelines describe “main activity producers” as “formerly known as public utilities” and defined as those undertakings whose primary activity is to supply the public. They may be in public or private ownership.

Autoproducer

*Emissions from **autoproducers** should be assigned to the sector where they were generated and not under 1.A.1.a.*

The energy balance: A focus on the industry sector

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Mining and quarrying

Construction

Manufacturing

Iron and steel

Chemical and petrochemical

Non-ferrous metals

Non-metallic minerals

Transport equipment

Machinery

Food and tobacco

Paper, pulp and print

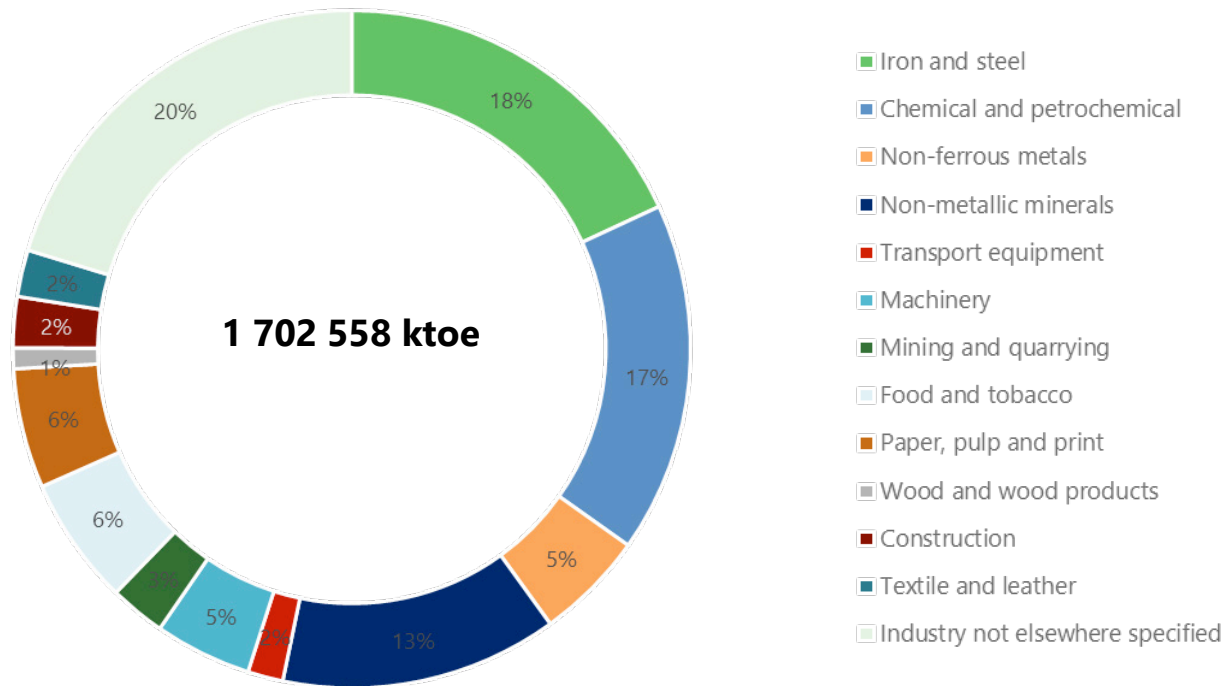
Wood and wood products

Textile and leather

Non-specified (industry)

The energy balance: A focus on the industry sector

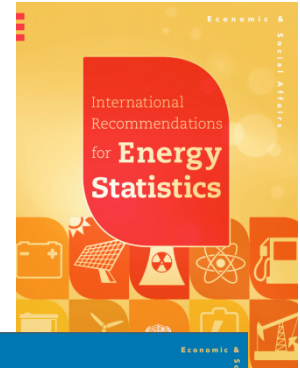
World 2018 industry energy consumption by sub-sector



20% of the world's energy industry consumption is « not specified »

Definition: Industry

- In the **International Recommendations of Energy Statistics (IRES)**: **Industry** refers to the manufacture of finished goods and products, as listed under “manufacturing industries and construction” within the UN IRES and outlined **International Standard Industrial Classification (ISIC)** codes.
 - IEA: Definition of industry sector activities follow IRES definitions, and outlined ISIC codes. Services sector separate in IRES.
 - Excludes upstream power generation, refineries, and distribution of electricity, gas and water (transformation sector).
- In terms of energy consumption, the industry sector covers all energy-using activities across industries.
 - It excludes all transport related activities.



Mapping IEA and CRF differences

IEA Industry subsector

Mining and quarrying

Construction

Manufacturing

Iron and steel

Chemical and petrochemical

Non-ferrous metals

Non-metallic minerals

Transport equipment

Machinery

Food and tobacco

Paper, pulp and print

Wood and wood products

Textile and leather

Non-specified (industry)

*While IRES refers to **ISIC Rev. 4**, UNFCCC follows the 2006 IPCC Guidelines which refer to **ISIC Rev. 3.1***

CRF Table 1.A(a) (Sheet 2)

1.A.2 g.iii. Other - Mining (excluding fuels) and quarrying

1.A.2 g.v. Other - Construction

1.A.2 a. Iron and steel

1.A.2 c. Chemicals

1.A.2 b. Non-ferrous metals

1.A.2 f. Non-metallic minerals

1.A.2 g.ii. Other - Manufacturing of transport equipment

1.A.2 g.i. Other - Manufacturing of machinery

1.A.2 e. Food processing, beverages and tobacco

1.A.2 d. Pulp, paper and print

1.A.2 g.iv. Other - Wood and wood products

1.A.2 g.vi. Other - Textile and leather

1.A.2 g.viii. Other - Other (please specify)

Note 1: Emissions arising from off-road and other mobile machinery in industry (Table 1.A(a), 2 g.vii. Off-road vehicles and other machinery) should, if possible, be broken out in the separate subcategory. In general, energy used for transport by industry should not be reported here but under Transport (Table 1.A(a), sheet 3).

Data sources – types of data collection

Surveys



For the power sector

Power producers, transmission and distribution system operators, market operators /electricity exchanges

Enterprises, Households

For the industry sector

Enterprises: power plants, iron and steel, cement manufactures...

Administrative data



Energy regulators

Customs offices

Data collected from programme/policy implementation

Ministry of Industry, Chamber of commerce, Industry associations

Reports of production, of sales (from petroleum products retailers for example)

Direct measurements



Conventional and smart meters

Smart meters

Estimation/modelling



e.g. Plant capacity information –
Solar PV capacity -> Solar PV

Electricity generation behind the meter

e.g. Steel production -> coal
consumption trends in the iron
and steel industry

