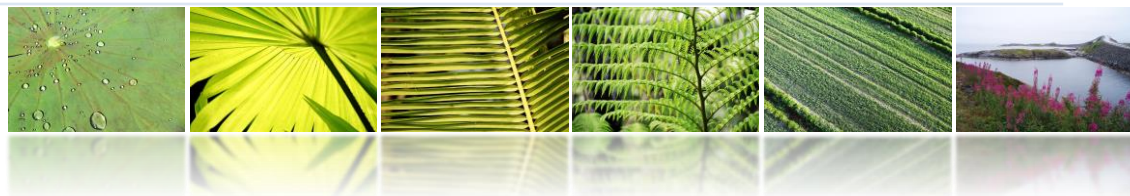




United Nations  
Statistics Division

# Energy Statistics, Balances & Accounts for Policy & SDGs



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SESRIC HQ, Ankara, Türkiye, 10 December 2024  
Workshop on Energy Statistics, Balances and Accounts for  
Informed Energy and Climate Policies

# Overview

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- Energy policies
- Information for energy policies from
  - energy statistics,
  - energy balances, and
  - energy accounts
- Conclusion





# Energy Policies

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# Statistics and Policies

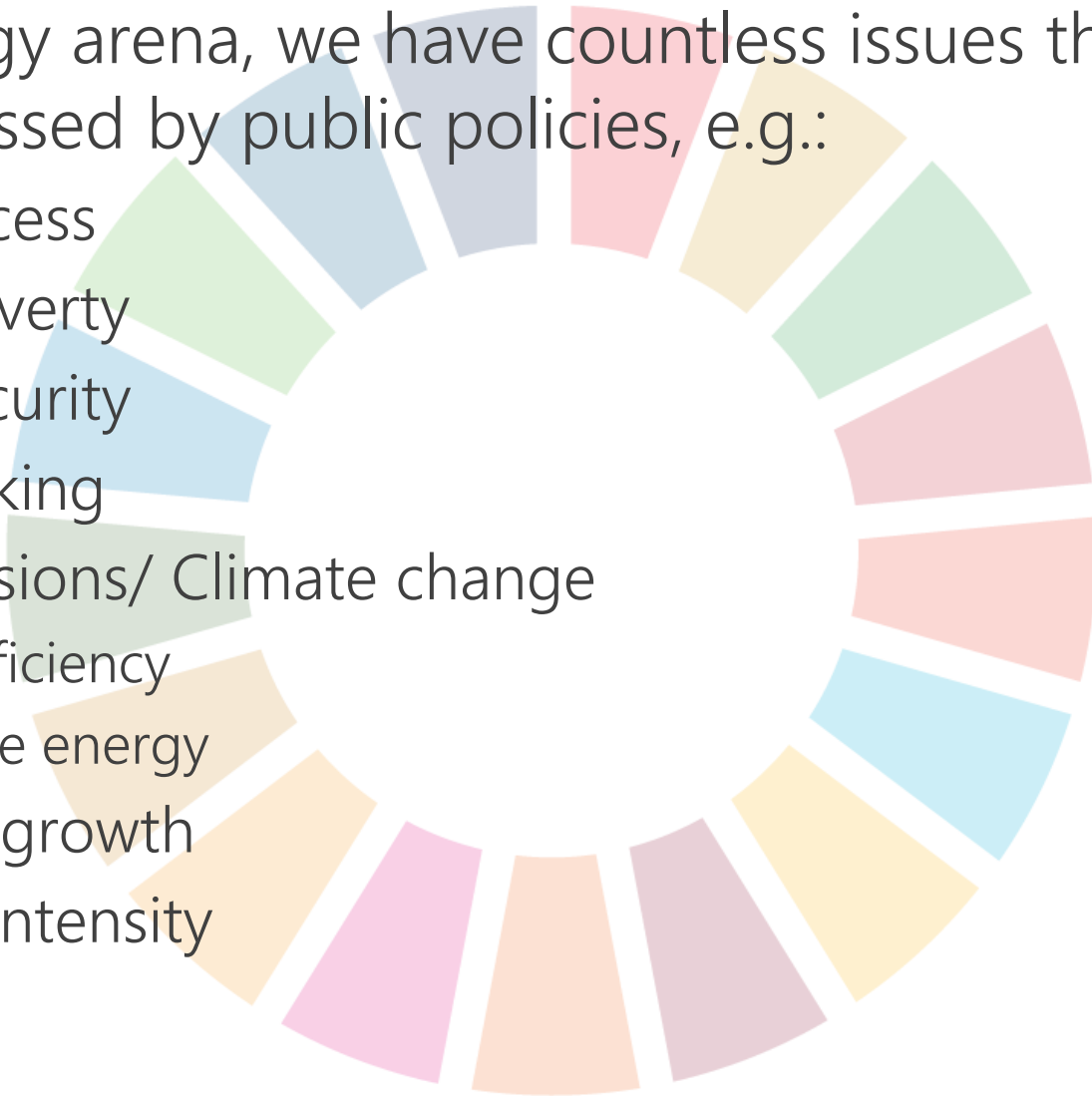
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- Why do we make policies?
- What areas/policies should we prioritize?
- How can we make informed decisions regarding policies?
  - Is it working?
  - Should we change course?
  - What problems should we prioritize/address?
- We need to measure it! STATISTICS!
- How can we ensure that what we are measuring is what we want to measure?
- How can we ensure that we can replicate good practices?

# Energy policies

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- In the energy arena, we have countless issues that we want addressed by public policies, e.g.:
  - Energy access
  - Energy poverty
  - Energy security
  - Clean cooking
  - GHG emissions/ Climate change
    - Energy efficiency
    - Renewable energy
  - Economic growth
  - Resource intensity



# Energy policy

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- Of the examples given in the previous slide, some policies can be informed by basic statistics, such as:
  - Energy access (% of population with access to electricity)
  - Energy poverty (energy expenditure as % of income)
- Some others will require more complex aggregations of basic energy statistics, where different fuels/energy need to be expressed in a common unit:
  - Energy security and fuel substitution will need a framework more like energy balances;
  - Fuel consumption by value added will require more comparability with national accounts, such as SEEA energy accounts; and
  - Others such as GHG emissions can use either balances or accounts, depending on whose responsibility it is for the emissions (economic territory vs. economic residence)

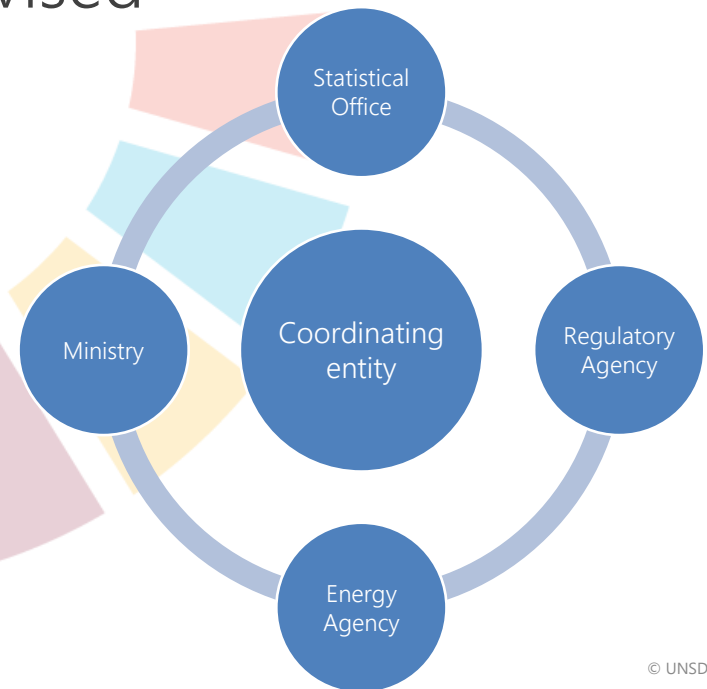
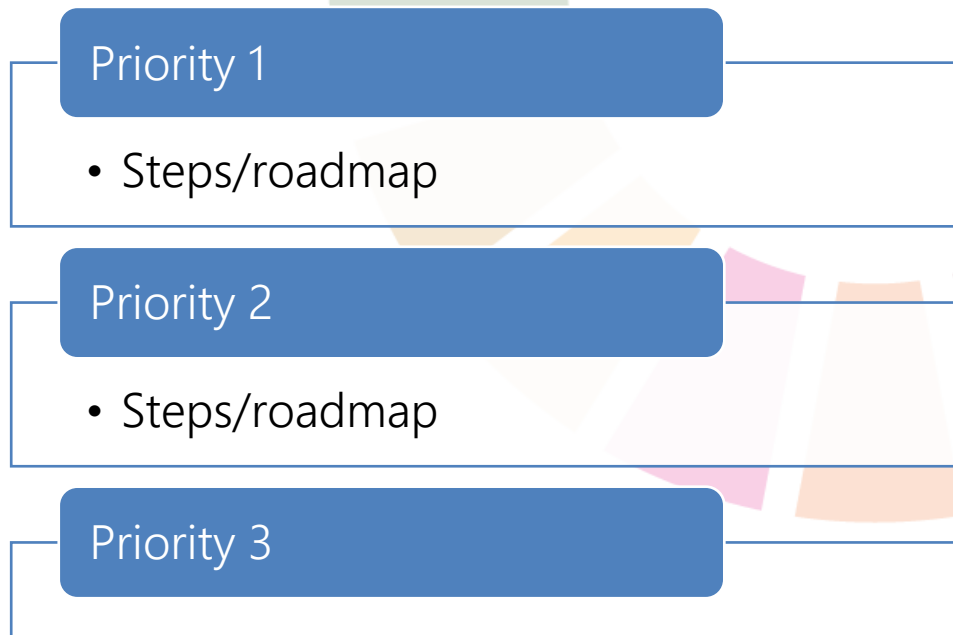


# Information for energy policies from energy statistics, energy balances and energy accounts

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# Prioritization of information

- As we will see later in this workshop, national priorities must be discussed between stakeholders through a coordination mechanism with clear definition of roles
- Users and uses must be considered, data sources must be explored, data gaps identified, and strategies for filling these information gaps must be devised





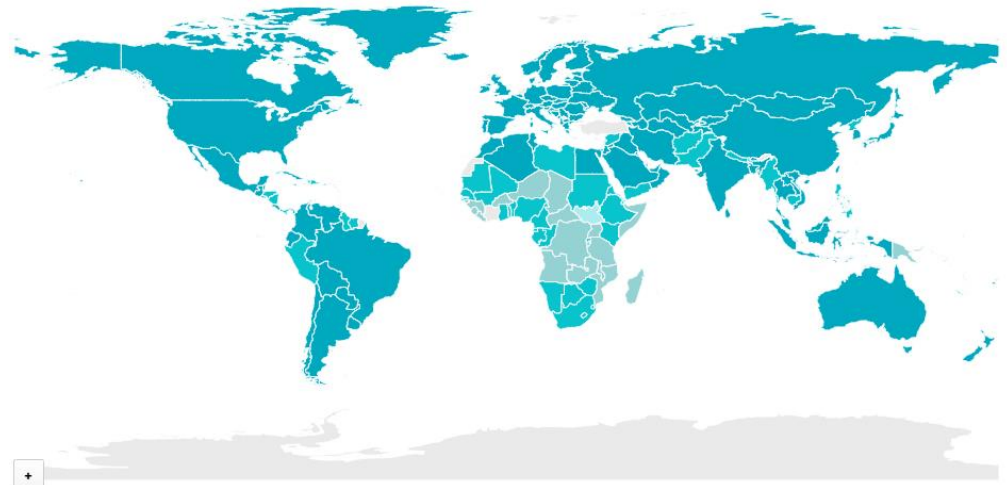
# Statistics for energy policies

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- Once the priorities are identified (which may need additional statistics/surveys), some may have its information needs satisfied with basic statistics
- For example, as part of a wider decarbonization policy, let us say that subsidies are offered for the purchase of EVs, with a target of achieving 10% of electric vehicles in five years.
- Statistics on the fleet are necessary to monitor the rate of success of the policy towards its target
- Statistics on road fuel use are needed to evaluate the policy, and maybe info on additional fuel for electricity
  - Costs vs benefits: are subsidies worth reduction in fuel use?

# Statistics for energy policies

- Another example on how simple statistics may be used to inform policy is on energy access
- If we prioritize reducing inequalities, we will want to ensure access to electricity and clean cooking, which may require regular surveys
- Surveys may collect binary data or tiered type of access



© World Bank. Population estimates based on UN population data.

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Indicator: Electricity access rate (%)

<10 10 - 49 50 - 99 100

Unit: % of population

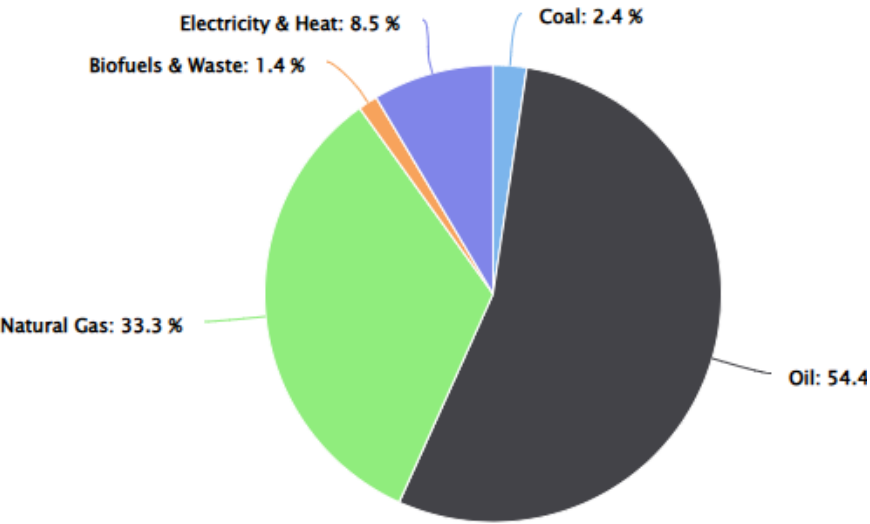
# Balances, accounts for policy

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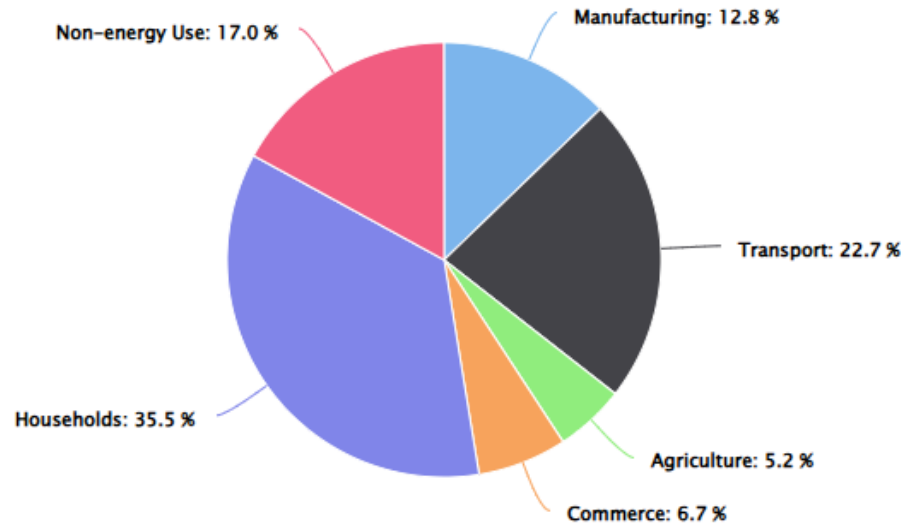
- Now, you may need information for policies covering the wider energy sector, such as energy security (with or w/o fuel substitution - projections), emissions and climate change.
- For these policies, you will need a more comprehensive framework such as energy balances and/or accounts.
- For example, for energy security, you may need projections for energy demand and availability of supply in the national territory, better informed by energy balances
- If you need to pinpoint which economic activities are consuming more fuel or emitting more GHGs to help your industrial policy, you may need SEEA energy accounts (and/or air emission accounts)

# Balances: Energy in a country in a snapshot

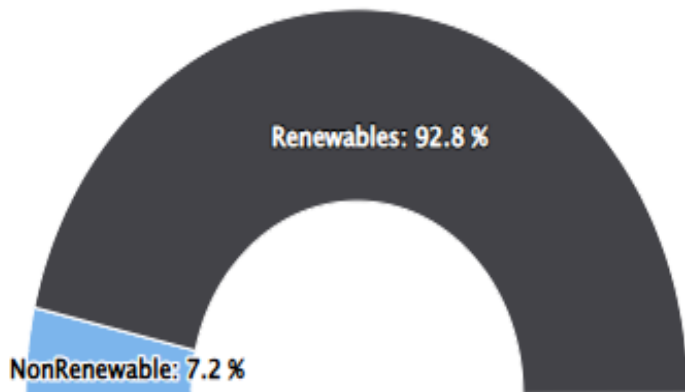
Jordan, TES 2021



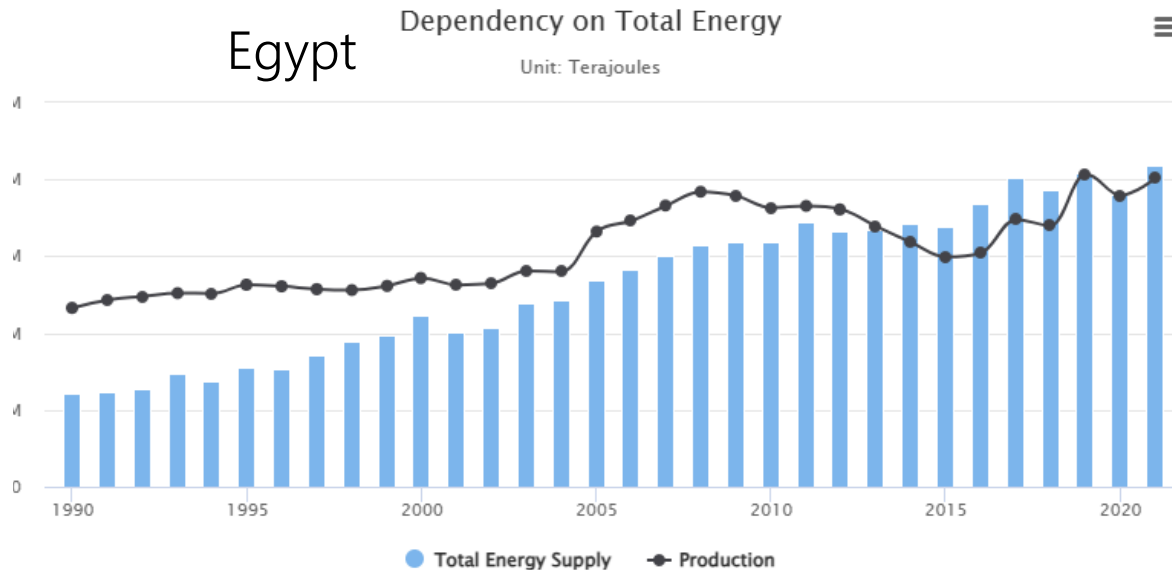
Azerbaijan, TFC 2021



Uganda, ren % in TES 2021



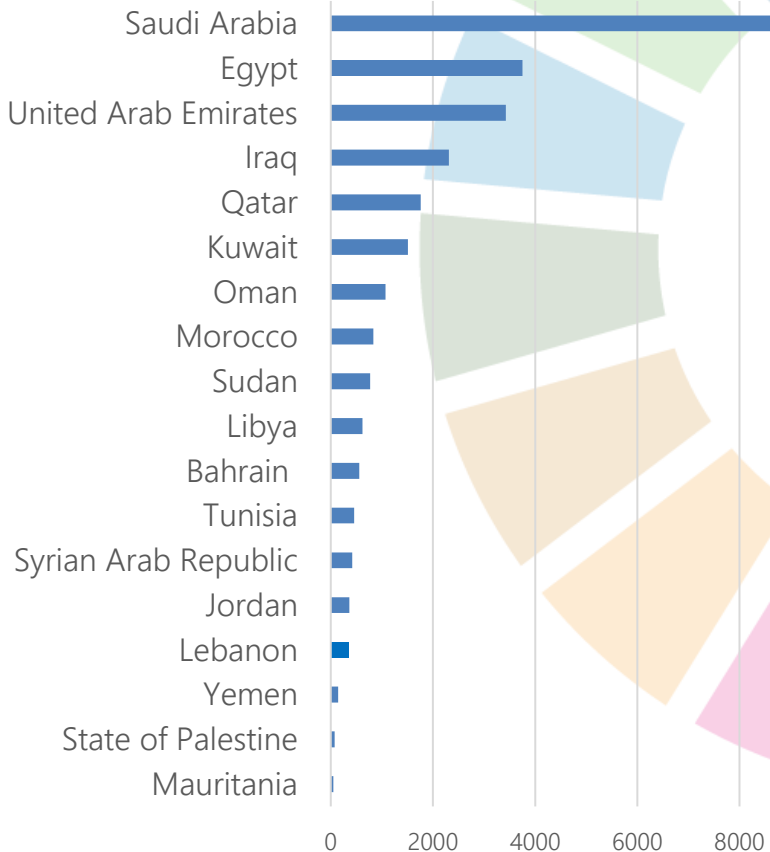
Egypt Dependency on Total Energy



# Balances: international comparison

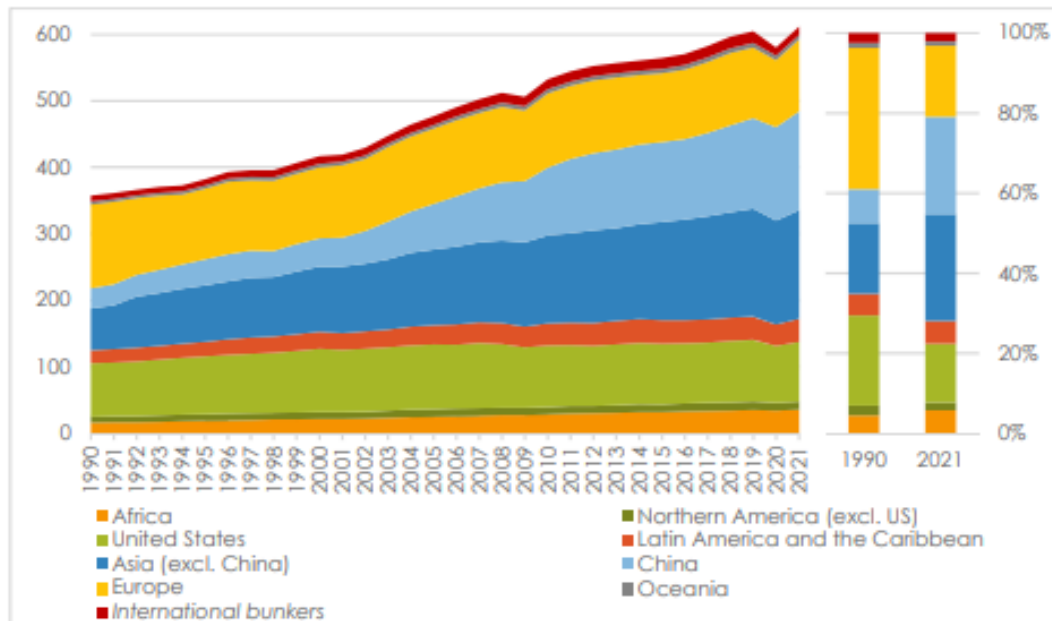
- Different countries can be compared, and world totals can be calculated

Total energy supply, PJ, 2016



6. Total energy supply by region, 1990 – 2021

Exajoules and percentage

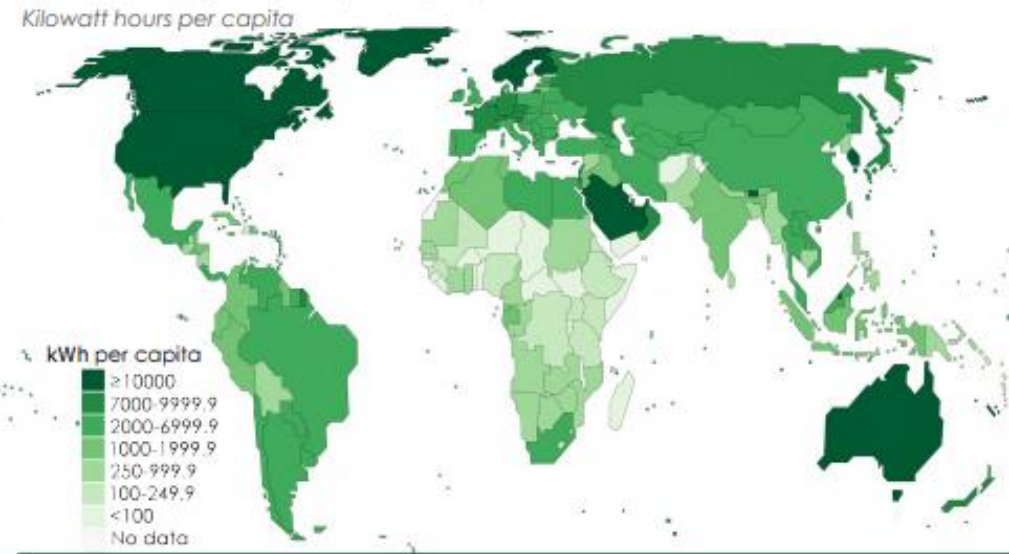


Source: *2024 Energy Statistics Pocketbook, UNSD*

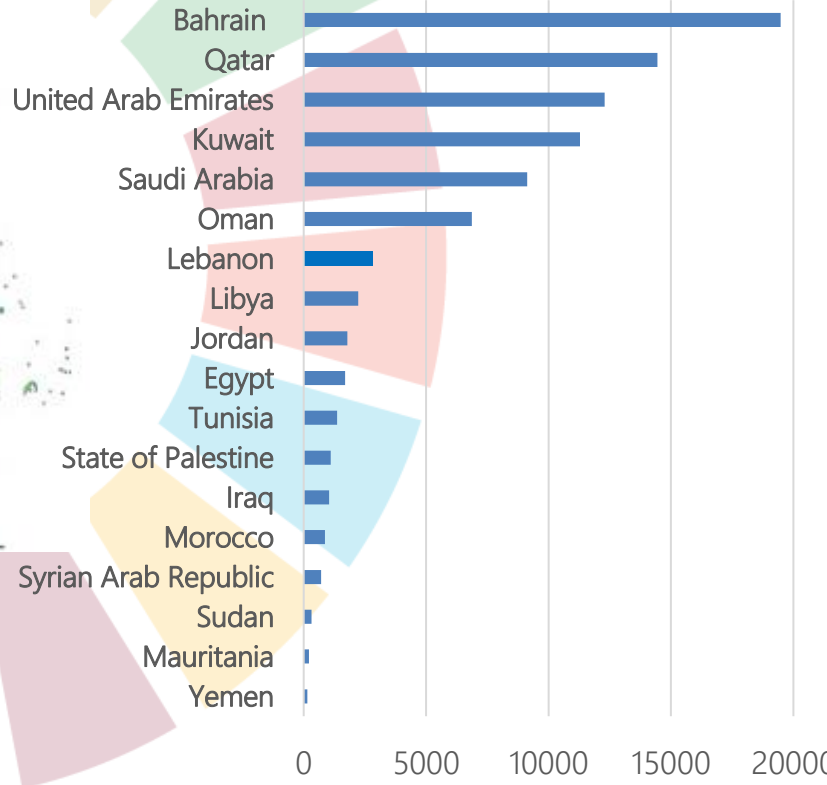
# Balances: energy indicators

- Coupling energy balances data with demographic variables

Electricity generation per capita, 2021



Electricity consumption per capita (kWh)

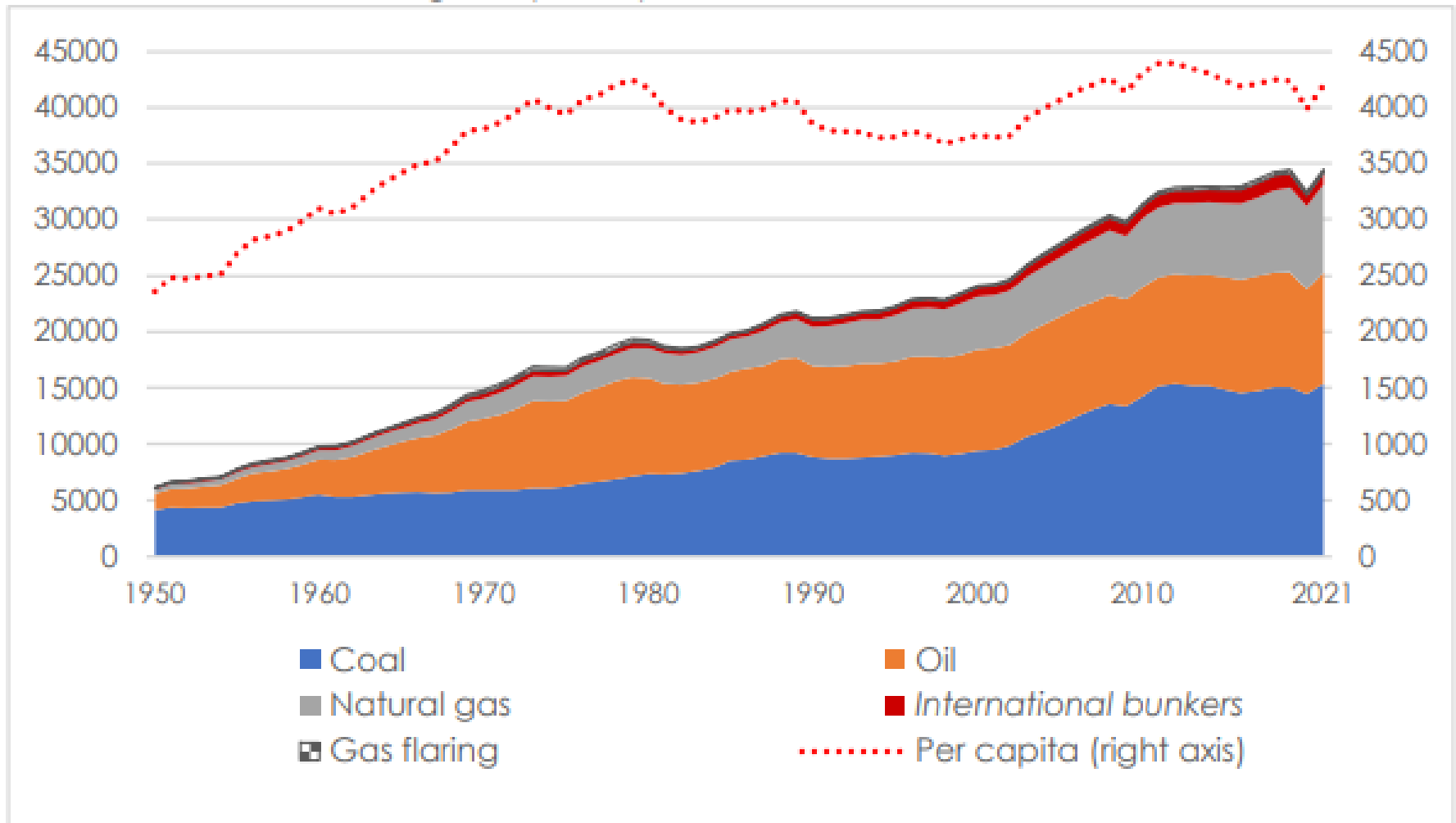


Source: [2024 Energy Statistics Pocketbook](#), UNSD

# Basis for estimating CO<sub>2</sub> emissions

## 82. CO<sub>2</sub> emissions from fossil fuel combustion, by fuel and per capita, 1950-2021

Million metric tons and kilograms per capita



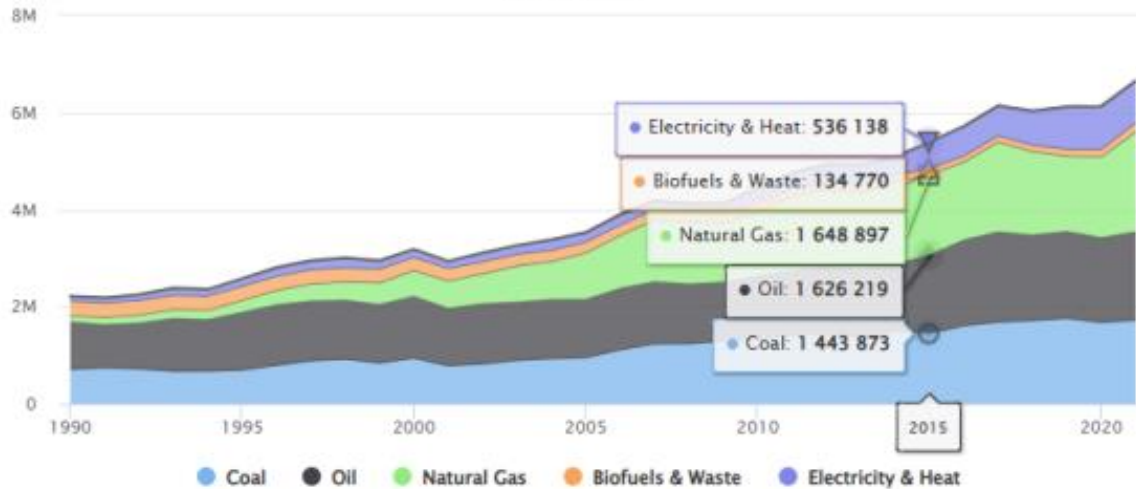
Source: [2024 Energy Statistics Pocketbook](#), UNSD

# Balances: energy modelling

Türkiye

Total Energy Supply by Fuel

Unit: Terajoules

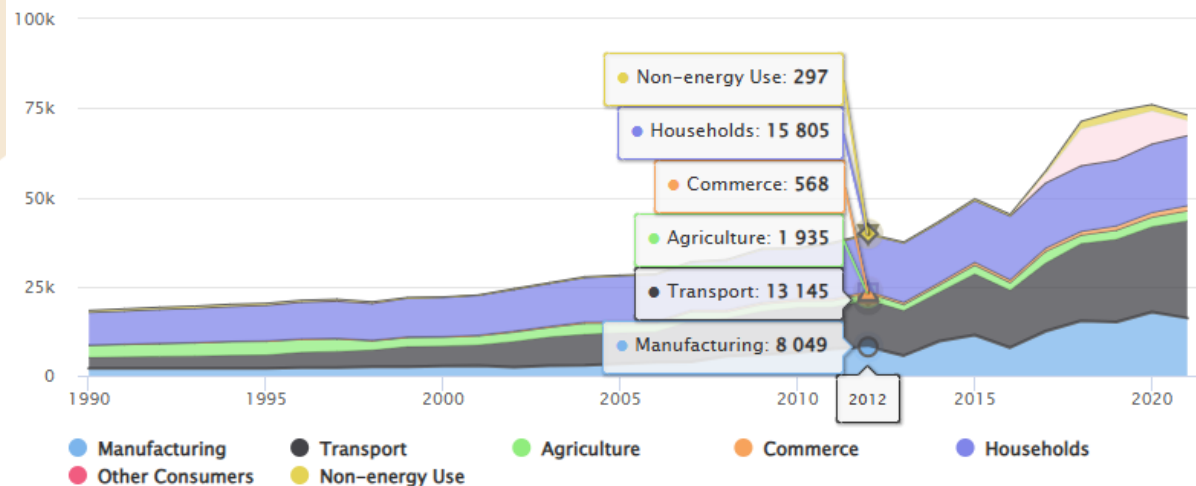


- Energy balances are a basis for projecting energy demand
- Long and consistent time series are needed

Final Consumption

Mauritania

Unit: Terajoules



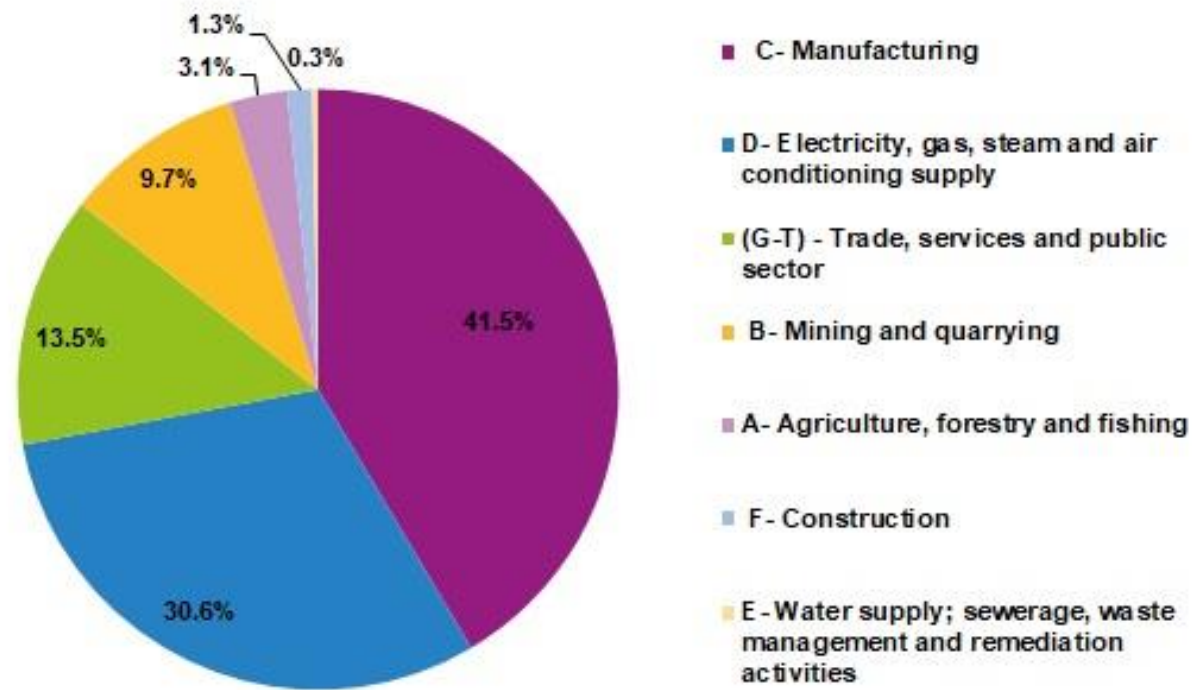
Source: [UNSD energy balance visualization portal](#)



# Energy accounts: analysis by industries

- Energy accounts are designed to be used with economic data that is compatible with the System of National Accounts, and can be used with economic variables like value added

Türkiye, distribution of energy use by economic activities, 2021



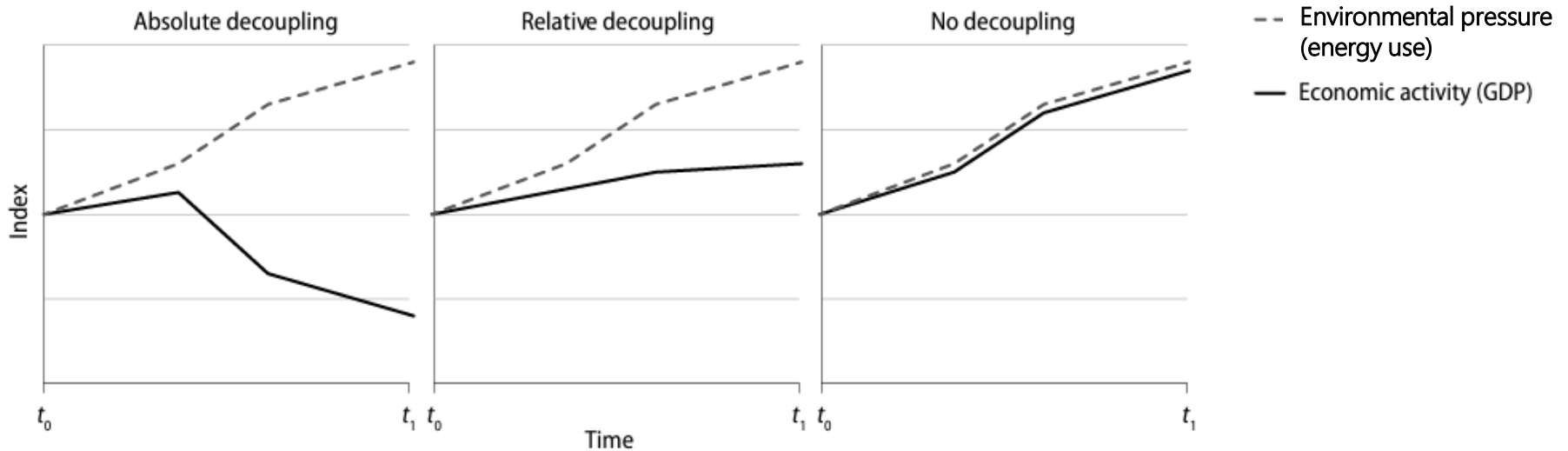
Source: [Turkstat](#)

# Energy accounts: decoupling analysis

- Energy accounts can be used to analyze if decoupling of energy from economic growth is taking place



Stylized examples of decoupling trends



Source: [Eurostat](#)

# Estimating air emissions

- Similar to balances, energy accounts can be used to estimate air emissions. Air emission accounts complement air emission inventories by providing data which is readily comparable to macroeconomic data.

Indonesia- CO2 emissions from energy use by industries and households (thousand tonnes, 2017-2021)

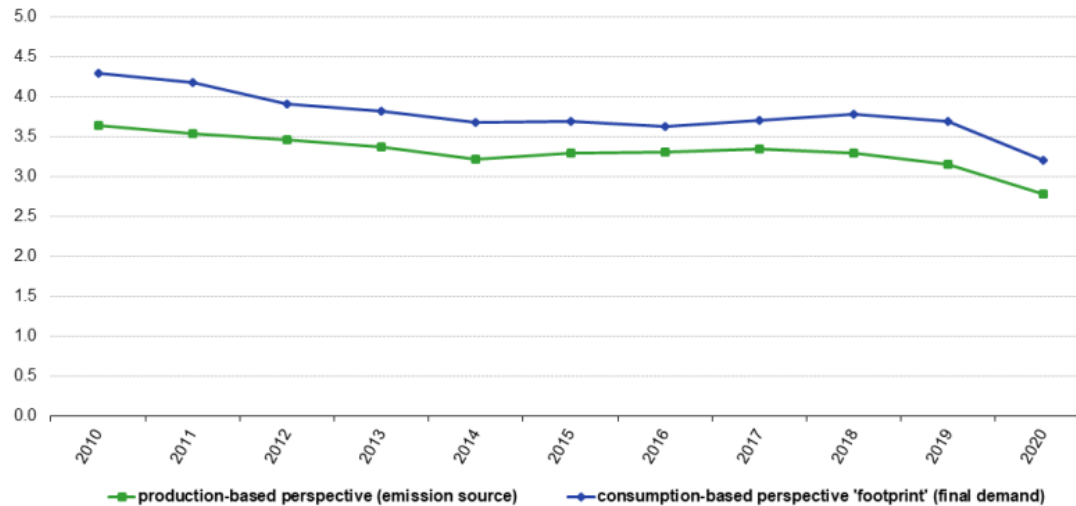
Sektor Ekonomi <i>Economic Sector</i>	2017	2018	2019	2020	2021
(1)	(2)	(3)	(4)	(5)	(6)
<b>Seluruh Lapangan Usaha</b> <b><i>All Industries</i></b>	<b>456 932</b>	<b>548 368</b>	<b>593 715</b>	<b>535 453</b>	<b>536 830</b>
- Pertanian, Kehutanan, dan Perikanan <i>- Agriculture, Forestry, and Fishing</i>	1 121	1 229	1 272	1 295	1 284
- Pertambangan dan Penggalan <i>- Mining and Quarrying</i>	4 891	7 544	11 878	6 639	9 485
- Industri Pengolahan <i>- Manufacturing</i>	70 222	121 407	152 545	139 092	110 608
- Pengadaan Listrik dan Gas <i>- Electricity and Gas Supply</i>	261 179	306 342	321 095	299 417	325 035
- Transportasi <i>- Transportation</i>	93 382	81 555	67 892	56 776	57 068
- Lapangan Usaha Lainnya <i>- Other Industries</i>	26 137	30 291	39 033	32 234	33 351
<b>Rumah Tangga</b> <b><i>Households</i></b>	<b>72 608</b>	<b>77 045</b>	<b>82 546</b>	<b>79 346</b>	<b>82 025</b>

Source: [BPS-Statistics Indonesia](#)

# Energy accounts: modelling

European Union

CO<sub>2</sub>-emissions by perspective, EU 2010-2020, billion tonnes



- Energy accounts can be a basis for compiling air emission accounts, which can be used for carbon footprints
- Carbon footprints can be looked at from the perspective of final demand (consumption) as well as economic production in the economy

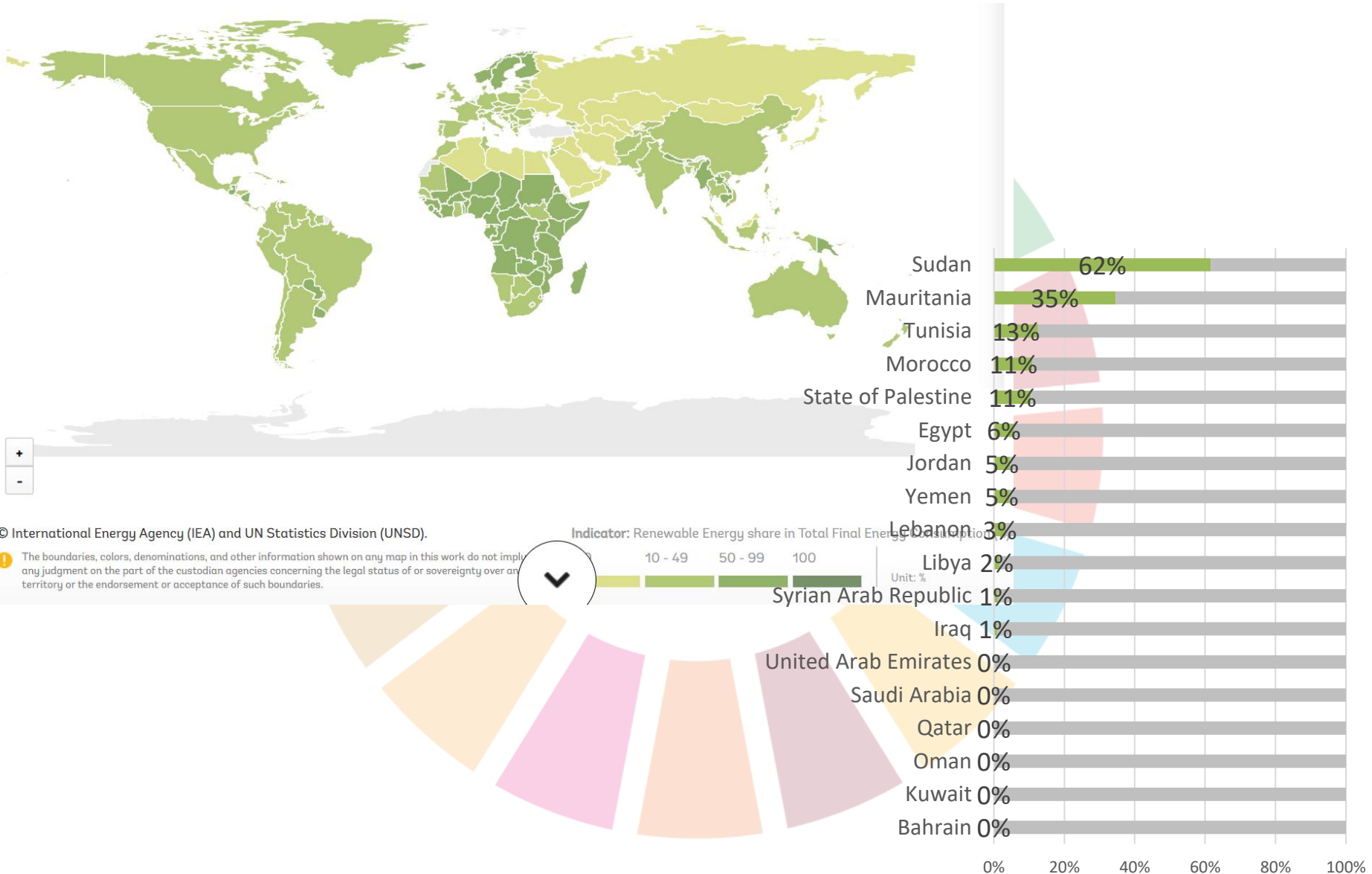
Source: [Eurostat](#)



# Energy balances for SDG7

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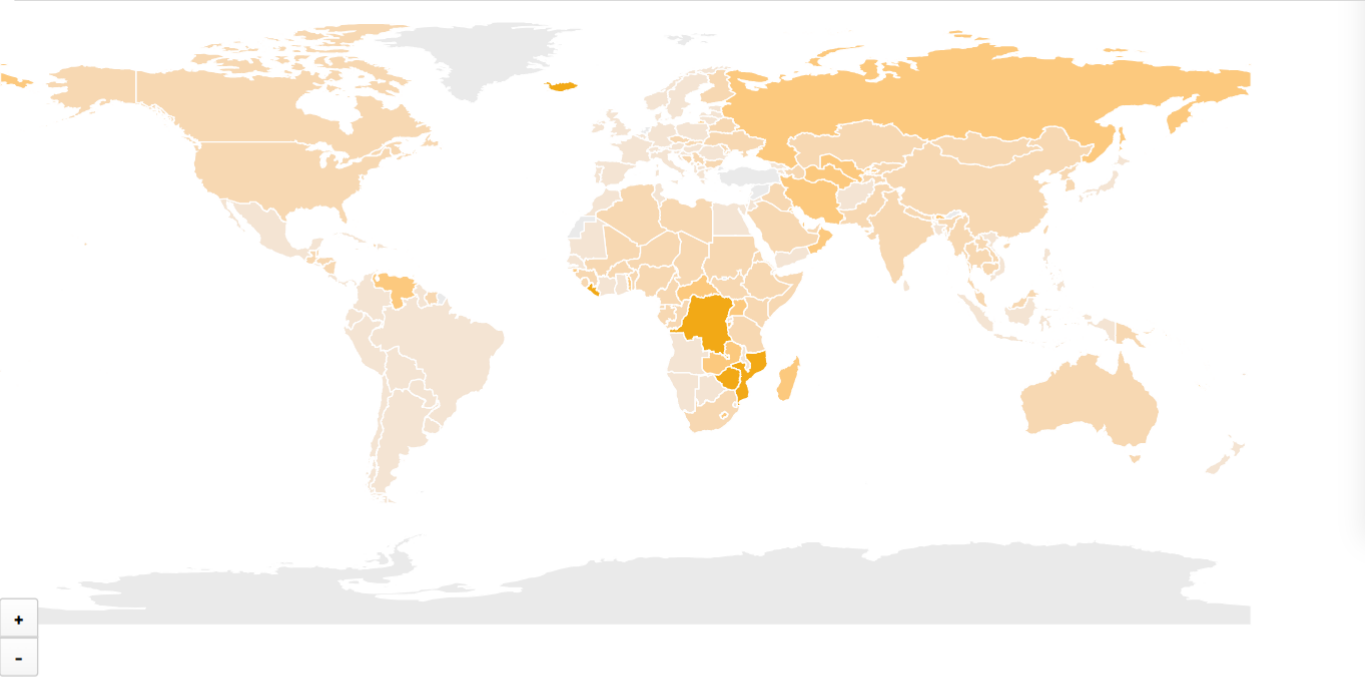
# Renewable energy share in TEC, 2021



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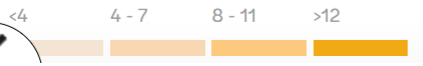
# Energy Intensity 2021 (MJ/USD PPP 2017)



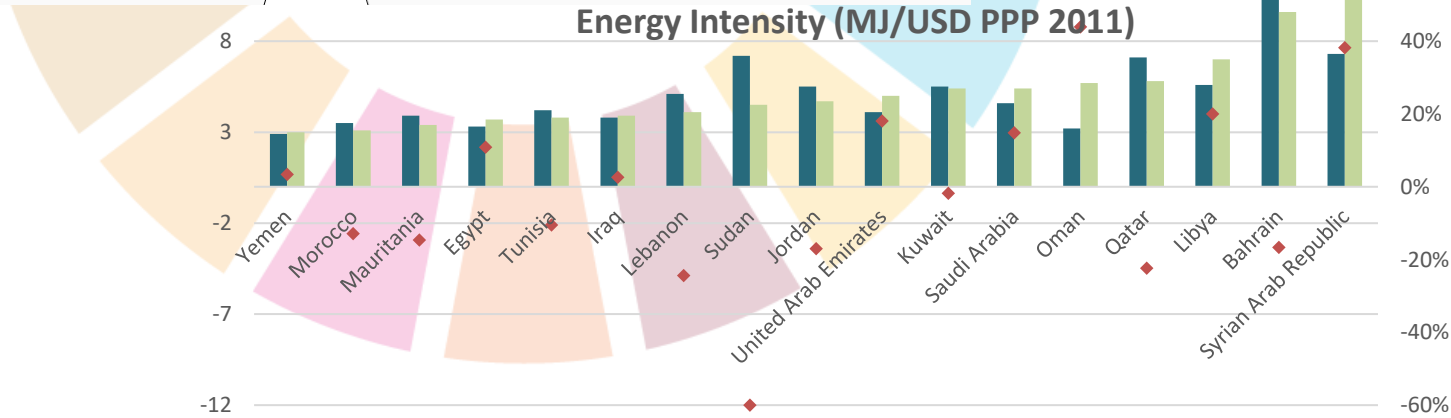
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Indicator: Primary



Unit: MJ per 2017 USD PPP



Source: 2024 SDG7 Tracking: The Energy Progress Report



# Conclusion

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# Concluding remarks

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Global/national/regional/local policies need information for monitoring and evaluation, and energy and climate change policies are no different

- Depending on what kind of information is needed, basic energy statistics may fulfil that need
- However, more complex policies may involve more than one energy product and will need a comprehensive framework for inter-product comparison
- Energy balances and energy accounts are examples of such frameworks, each with their own focus which will suit certain policies better than others



# SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

<http://un.org>

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

[energy\\_stat@un.org](mailto:energy_stat@un.org)