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# Energy Indicators

**Presentation to the Oslo Group  
Abu Dhabi, UAE  
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# Introduction

- “Energy Indicators” – the original Chapter 7 in the ESCM
- Developed by Martin Howley (chapter coordinator) and various contributors
- But this chapter stood out – unique
- Indicators are worth a manual of their own!



# What are Energy Indicators?

- Not just energy “data” – indicators go beyond basic statistics
  - Indicators provide value-added
  - Indicators turn energy data into “information”
- IRES summarized **what** should be collected
- ESCM describes **how** data should be collected
- An indicator manual would show how these data can be applied



# What are indicators used for?

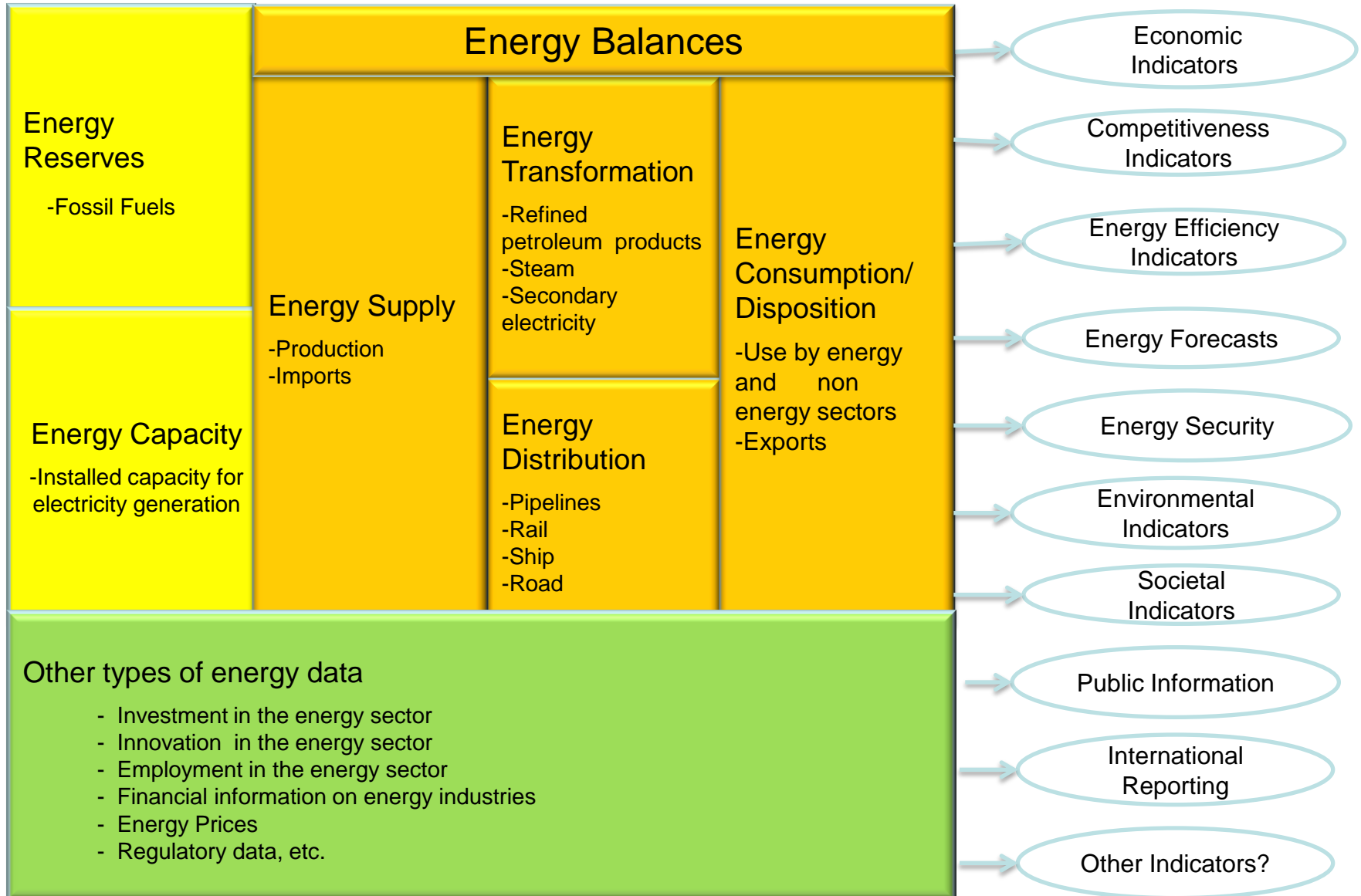
- Indicators have a variety of applications:
  - To support research, planning and decision-making
  - To monitor and evaluate programs
  - For comparisons between countries, across sectors, over time



# What makes a good indicator?

- Good quality energy data as inputs
- Clear objectives
- Tailored to the needs of users
- User-friendly; easy-to-use and understand
- Comparable – across countries, over time

# Energy data feed indicators



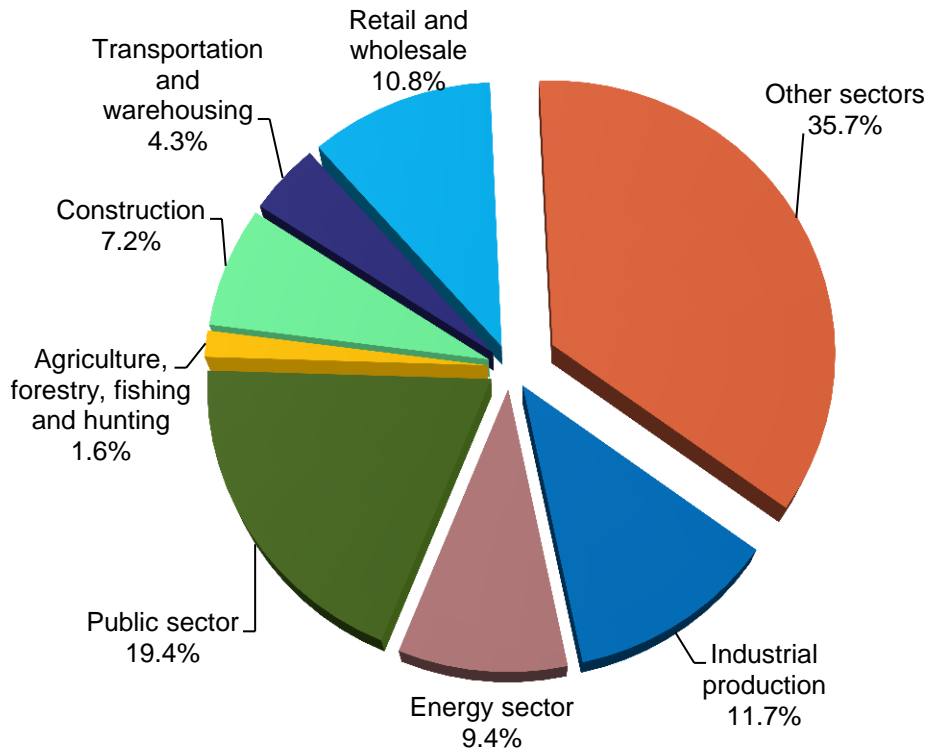


## Economic indicators

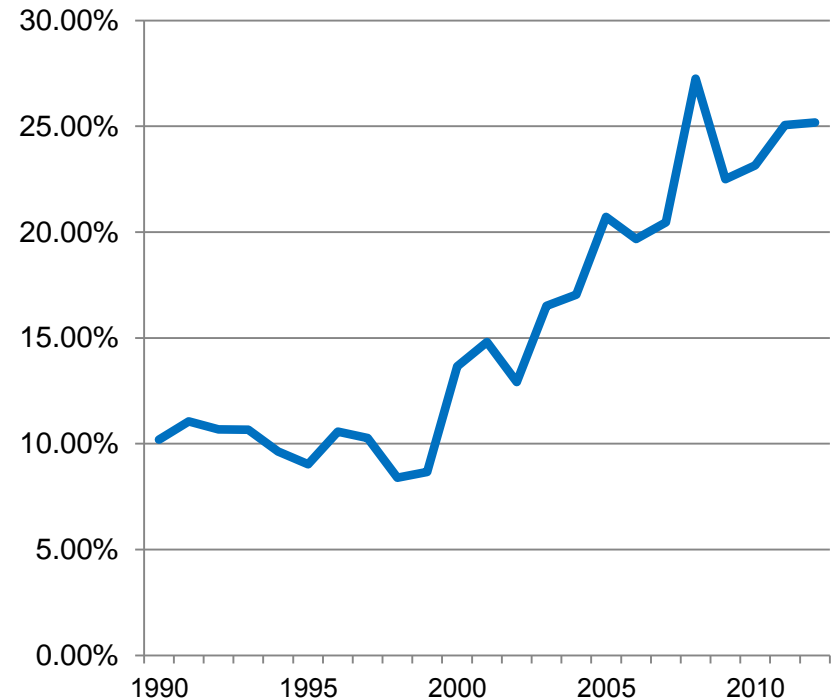
- These are important measures of economic activity for countries
- Energy data serve as key inputs
- For the System of National Accounts – in the calculation of GDP, input/output tables, trade balances, equalization payments, price index
- Energy Accounts (SEEA-Energy)

# Energy input into economic indicators

## GDP by Sector 2012



## Energy Share of Exports



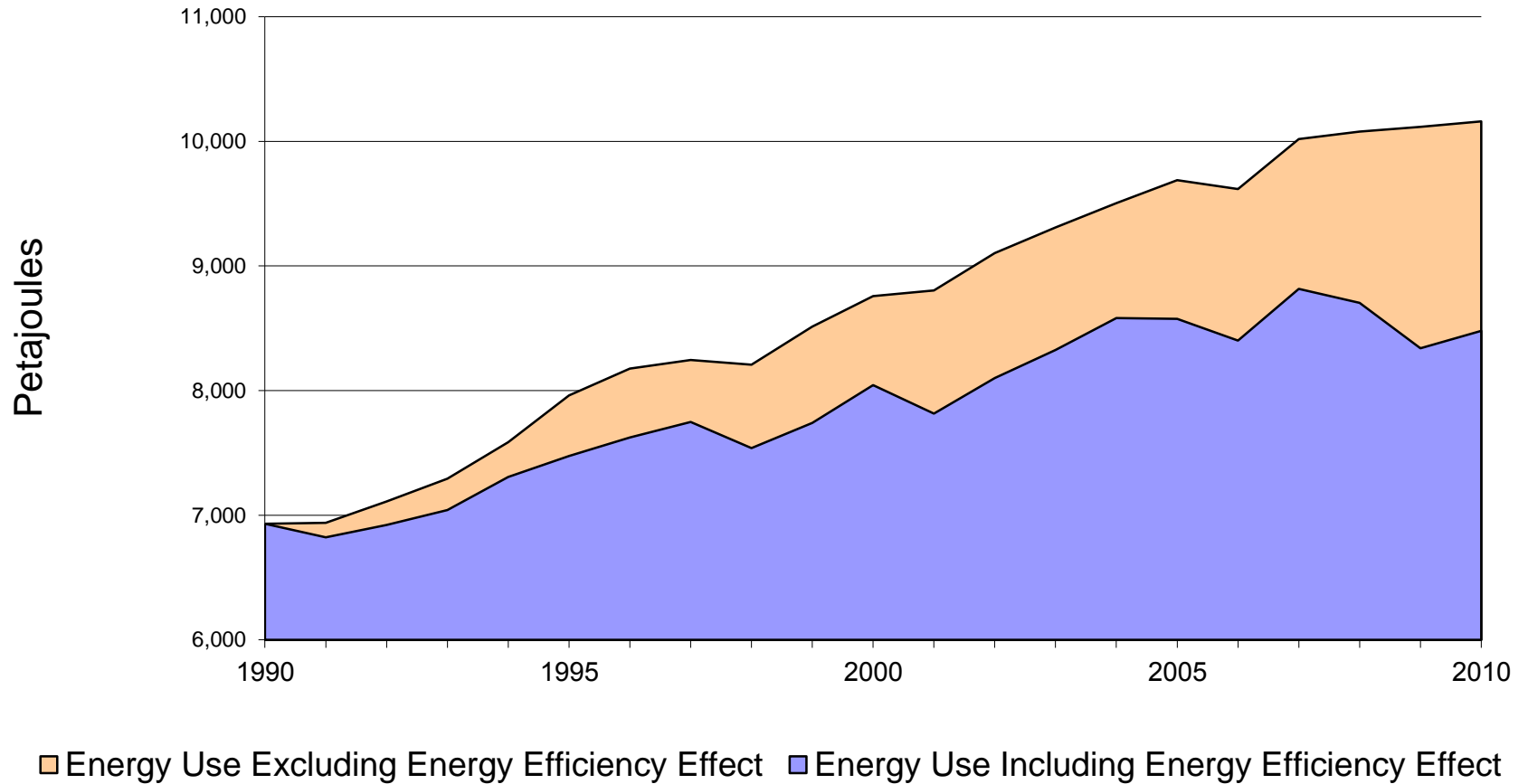




# Competitiveness indicators

- These are measures of the efficiency of the economy over time
  - Energy intensity: ratio of energy use per unit of activity
  - Monitoring energy use per economic output
  - Evaluating other contributing factors affecting energy use: sectoral structure, weather, level of activities, service level
  - Capacity utilization rate: the proportion of the installed production capacity that is in use

# Secondary energy use with & without energy efficiency improvements





# Energy efficiency indicators

- These are measures of how effectively energy is being used for a given purpose
  - Providing a similar (or better) level of service with less energy consumption on a per-unit basis is considered an improvement in energy efficiency
  - Tracking efficiency improvements and the growth in energy consumption
  - Monitoring energy use per activity

# Trends in energy use and intensity

Sector	Energy Use	Energy Intensity
Residential	+ 6%	- 29%
Commercial	+ 22%	- 13%
Transportation (passenger)	+ 18%	- 19%
Freight	+ 70%	+ 11%
Industrial	+ 19%	- 10%
Industry (w/o upstream mining)	- 6%	- 27%



# Energy forecasts

- These are measures that support the planning for a secure and sustainable energy future
  - Estimating known and economically viable energy reserves – a country's supply for the future
  - Projecting changes to supply and consumption patterns in the future
  - Modelling the impact of technology, innovation, energy efficiency, conservation, prices, etc. on energy supply and demand



# Emergency Preparedness

- These are measures to support contingency planning and emergency response in the event of supply disruptions
  - Installed capacity for electricity generation
  - Energy stores and supplies
  - Energy demand by type, location

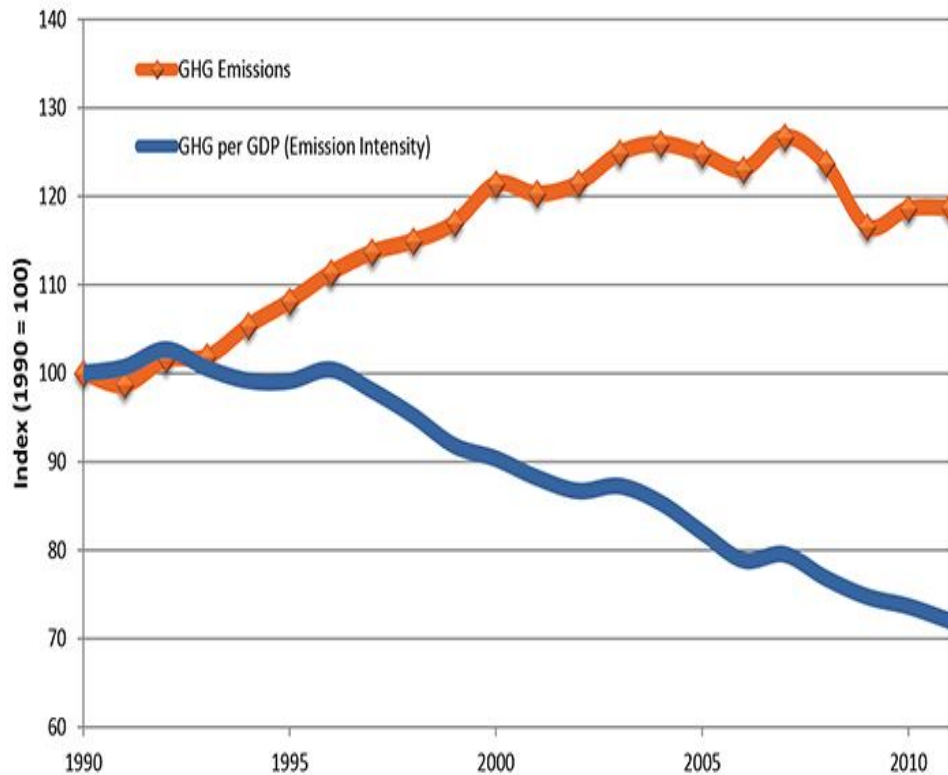


# Environmental indicators

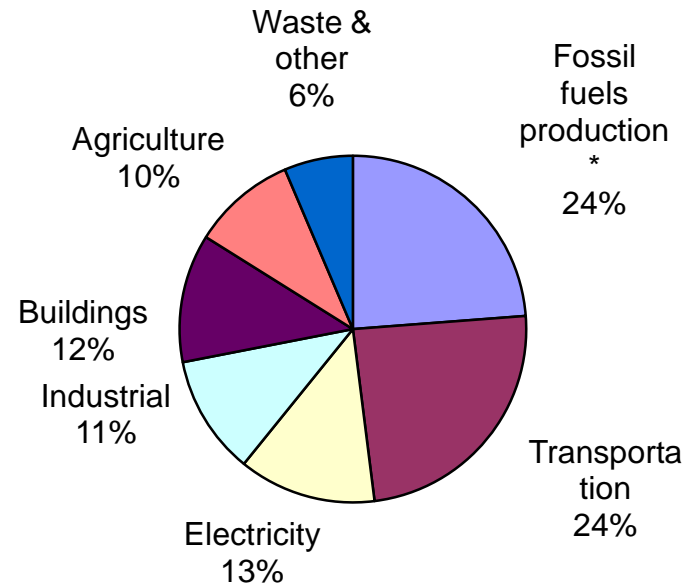
- These are measures of the impact of energy production, distribution and consumption on the environment
  - CO2 emissions per unit of primary energy
  - CO2 emissions intensity per capita
  - CO2 intensity of electricity production
  - Rate of water use

# Environmental Indicators

## GHG emissions and intensity 1990-2011



## 2011 Emissions by sector







## Societal indicators

- These are measures of the impact of energy on society
  - Energy use per capita
  - Energy use per household
  - Energy use per income
  - Share of households with access to electricity
  - Share of household income spent on electricity
  - Employment/income in the energy sector
  - Population migration to energy jobs



## Public information

- These are measures of public understanding of energy, and of the efforts to inform the public
  - Indicators of energy literacy
  - Indicators to inform, educate public about energy issues and choices – e.g. relating to trade-offs concerning the environment, transport, ownership, prices, conservation, energy prices and costs, employment in the energy sector



# International reporting

- These are measures to meet the needs for timely, comparable, complete energy data at the international level
  - For market transparency
  - For emergency preparedness and response
  - For monitoring flows and stores



# Summary

- Many indicators are possible, to support users in many domains
  - Are there other types of indicators that should be included?
- Need quality energy data as inputs, as well as data from other sources
- Need coherent indicators to enable comparison



## Questions for Discussion

- Should we focus on the preparation of a manual to support the development of standard, comparable indicators?
  - To raise awareness?
  - To share ideas, practices, methods?
  - To promote common approaches?
- Should we suggest the key indicators that countries should address first?
  - Which are the most important? Where should we start?