Indicators and policy frameworks dealing with climate change: a quick IEA perspective

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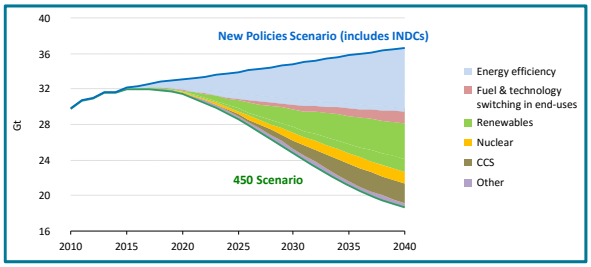
UNECE Expert Forum on Climate Change Statistics
5-7 October 2016

Energy transformation - key to climate goals: therefore needs appropriate tracking



Source: IEA WEO Special Report on Energy and Climate Change, 2015

- Energy *targets* in over 30 NDCs (renewable/efficiency/clean energy), and intentions to implement energy *actions* in over 140 NDCs
- Strengthened approaches to metrics/data would help countries understand whether actions are consistent with short/long-term goals

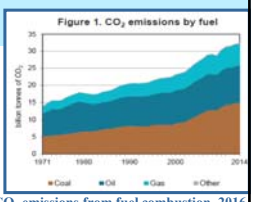
How to track the energy transition? An example set of high-level metrics

Aggregate energy sector	Carbon intensity of primary energy supply	tCO_2/toe
	Energy intensity of GDP	toe/USD
	New investment in low- and high-carbon energy supply and energy efficiency	USD
	Share of renewables in final energy demand	%
	Population and share of population without access to electricity and/or reliance on traditional biomass for cooking	million, %
	Fossil fuel subsidies	USD, % of GDP
	Percentage of energy sector emissions covered by carbon pricing	%
	Public and private investment in low-carbon energy RDD&D	USD, % of GDP
	Percentage of total RDD&D investment in low-carbon energy	%
	Energy demand per economic sector	TWh, %
Power	CO_2 emissions per unit of electricity	gCO_2/kWh
	Average efficiency of all fossil-fuel plants	%
	Share of low-carbon generation in new additions*	%
Transport	New passenger cars: CO_2 emissions per vehicle-kilometre	gCO_2/vkm
	Road freight vehicles: CO_2 emissions per tonne-kilometre	gCO_2/tkm
	Carbon intensity of total transport fuel demand	tCO_2/toe
	Aviation emissions	gCO_2/pkm
	Shipping emissions	gCO_2/tkm
Buildings	Residential: energy demand per dwelling	kWh/dwelling
	Services: energy demand per square metre of floor space	kWh/m^2
	Retrofit rate for existing buildings	%/year
Industry	CO_2 emissions per unit of value added	tCO_2/USD
	CO_2 emissions intensity of energy-intensive production	tCO_2/tonne
Fossil-fuel systems	Share of natural gas vented or lost out of total gas production	%
	GHG emissions from fugitive emissions per unit of energy extracted	tCO_2-eq/toe

Adapted from IEA, Energy, Climate Change and Environment, 2016

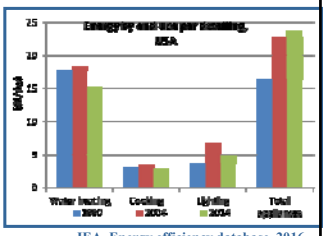
What data for a broader set of metrics? the IEA perspective

1. **Energy/emissions physical indicators**
   (emissions; intensities; shares sources, …)
   National energy statistics/balances: still essential and need strengthening at global level



IEA, CO_2 emissions from fuel combustion, 2016

2. **Energy efficiency indicators**
   (household energy/m^2 or /dw; freight energy/tkm…)
   - Strengthening demand-side detail/quality
   - Matching *energy* with *activity* data from other sectors (# dwellings, floor area, VA, …)



IEA, Energy efficiency database, 2016

3. **Beyond basic energy statistics**
   (low-carbon energy RD&D, energy efficiency investment, subsidies, …
   Better data needed on energy RD&D and energy investment by technology, … globally

IEA, World energy investment, 2016

The UNECE climate change indicators and the IEA approaches

- Some convergence on proposed metrics in areas of
  - ✓ Drivers (e.g. % fossil, carbon intensity of economy, energy/capita, …)
  - ✓ Emissions (e.g. CO_2 emission from fuel combustion, …)
  - ✓ Mitigation (e.g. % renewables in energy, …)
- Key role for NSOs to provide set of coherent data across sectors
- Essential: understanding each other's work and possible synergies

Strong metrics are built on strong data:
data cooperation will enhance energy/climate tracking, globally