

Sustainable Energy

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**Energy and Environment in the context of Sustainable
Development Goals**

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Sustainable Development Goals and Sustainable Energy

- Agreement by Member States to launch a process to develop a set of sustainable development goals (SDGs) in the United Nations Conference on Sustainable Development (UNCSD) or Rio+20.
- The United Nations Open Working Group (OWG), an intergovernmental mechanism proposed a set of 17 goals with 169 targets in July 2014.
- The proposed goals by OWG cover a broad range of sustainable development issues, including ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests.

Proposed Sustainable Development Goals by OWG: *Energy*

7.1 By 2030 ensure universal access to affordable, reliable, and modern energy services

Goal 7 Ensure access to affordable, reliable, sustainable and modern energy to all

7.2 Increase substantially the share of renewable energy in the global energy mix by 2030

7.3 Double the global rate of improvement in energy efficiency by 2030

Snapshot of the data availability at the global and national level

	Global				National			
	Indicator name	Database / Publication name	Publishing agency	Frequency of data reporting	Indicator name	Database / Publication name	Publishing agency	Frequency of data reporting
Goal 7.1: By 2030 ensure universal access to affordable, reliable, and modern energy services.	Percentage population with electricity access	World Energy Outlook	International Energy Agency	Annual	Percentage of population with electricity access	Census Dashboard	Census of India	Once in a decade
	Percentage population with clean fuel access	Global Health Observatory Data Repository	World Health Organisation	Annual	Percentage population with clean fuel access	Census Dashboard	Census of India	Once in a decade
Goal 7.2: Increase substantially the share of renewable energy in the global energy mix by 2030.	RE based electricity generation as a percentage of total electricity	International Energy Agency Statistics	International Energy Agency	Annual	RE based electricity generation as a percentage of total electricity	Annual Report MNRE	Ministry of New and Renewable Energy (MNRE)	Annual
Goal 7.3: Double the global rate of improvement in energy efficiency by 2030.	Energy intensity	International Energy Agency Statistics	International Energy Agency	Annual	Energy intensity	Coal Directory of India, Indian and Petroleum and Natural Gas Statistics and All India Electricity Statistics	Coal Controllers Organisation, Ministry of Petroleum and Natural Gas , Central Electricity Authority and Planning Commission	Annual

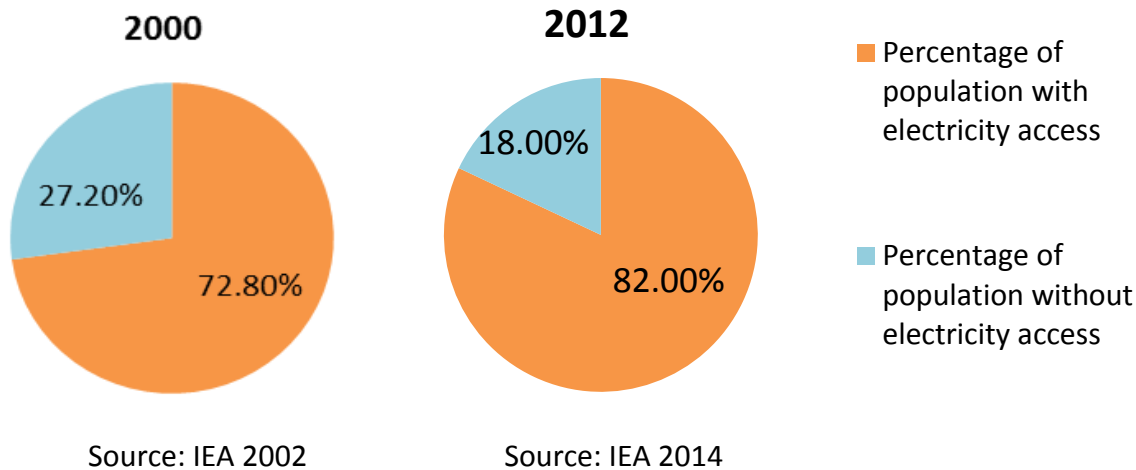
Goal 7.1:

Ensure access to affordable, reliable, sustainable and modern energy to all



Lighting:

Access to electricity at the global level



If the current trend of **0.77%** of population having electricity access per year continues, there will still be a gap of **4.2%** in 2030 in terms of population not having access to electricity

- Percentage of population with electricity access has increased from 72.8% in 2000 to 82% in 2012.
- In absolute terms, approximately 1285 million people are reported to be without electricity at the global level in 2012.

Cooking:

Population using solid fuel

Percentage of population of select countries/ country groups using solid fuel in 2012

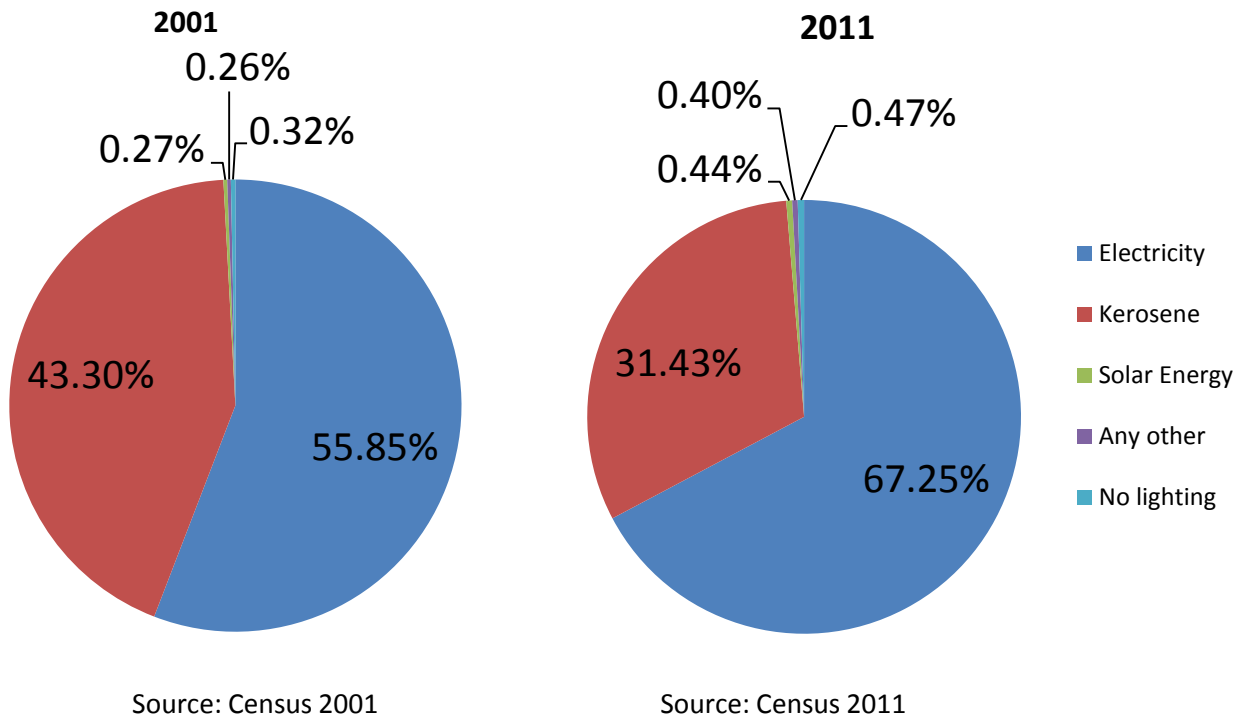
Country/country groups	Population using solid fuels (%)
India	63
China	45
EU	2
US	0
Japan	0

Source: WHO 2013

- WHO defines solid fuel use as household combustion of coal or biomass (such as cow dung, charcoal, wood, or crop residues)
- India and China have the highest percentage of population relying on solid fuel among the countries

Lighting:

Share of various sources of energy for lighting purposes in India



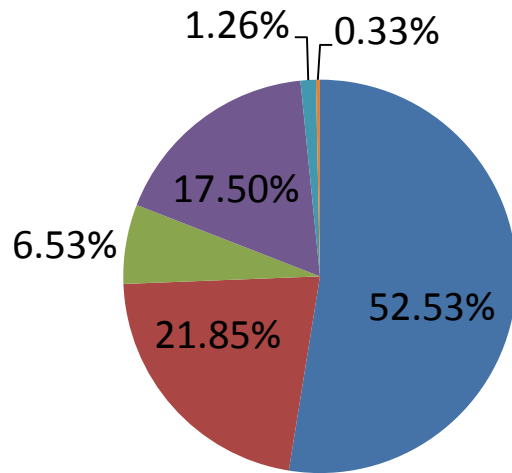
If the current trend of **1.14%** of population having electricity access per year continues, there will still be a gap of **11.09%** in 2030 in terms of population not having access to electricity

- In 2001, 55.85% of the population had access to electricity for lighting purposes which increased to 67.25% in 2011.
- Dependence on kerosene reduced to 31.43% in 2011 from 43.3 % in 2001 for lighting needs

Cooking:

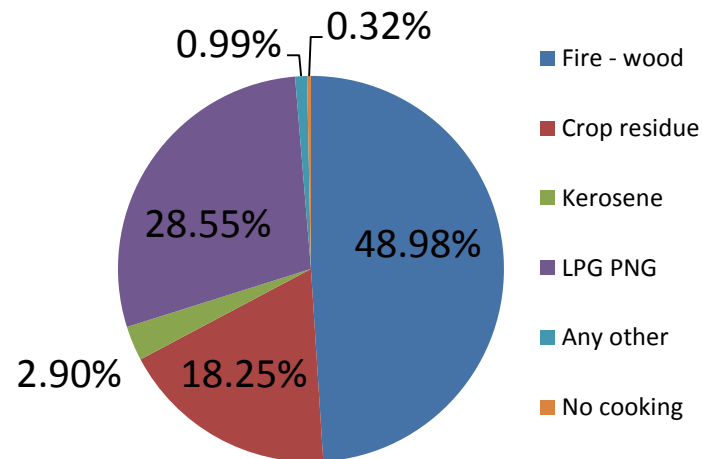
Share of various sources of energy for cooking purposes in India

2001



Source: Census 2001

2011



Source: Census 2011

If the current trend of **0.67%** of population relying on LPG per year continues, there will still be a gap of **58.72%** in 2030 in terms of population not relying on LPG fuel for cooking

- Only 28.6% of the households were dependent on LPG (clean source) for cooking purposes. State-wise analysis indicates that Punjab has the highest percentage of households (59.5%) using LPG for cooking purposes.
- Bihar has the least percentage of households with only 8.1% using LPG for cooking purposes.

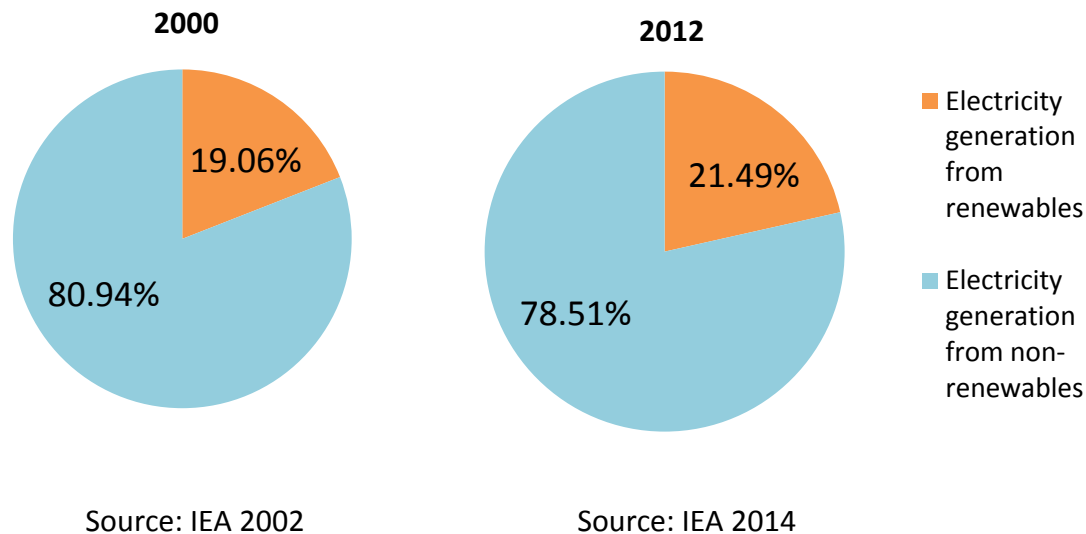
Goal 7.2:

Increase substantially the share of renewable energy in the global energy mix by 2030



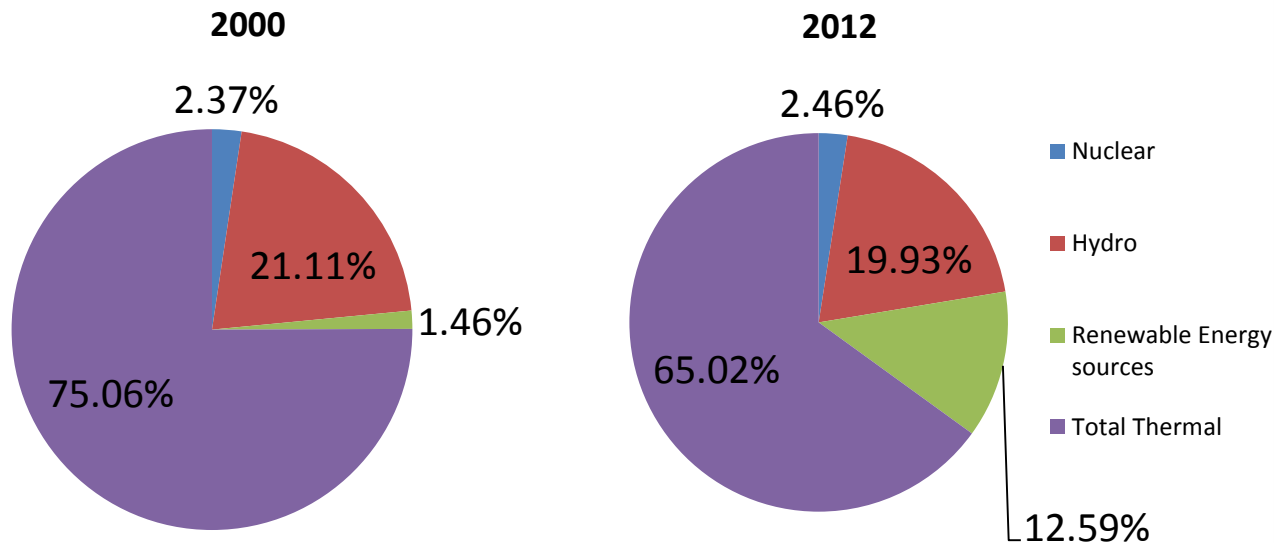
Renewable energy at the global level

- Renewable sources comprises of biofuels, waste, hydro (including production from pumped storage plants), geothermal, solar photovoltaic (PV), wind and tide. Correspondingly, the share of non-renewable sources comprising of coal, oil, gas, nuclear and other sources (including fuel cells).
- The share of renewables in the total electricity generation in the world went up from 19.06% in 2000 to 21.49% in 2012.



If the current trend of **0.20% increase** in terms of renewable energy share per year continues, the percentage of non-RE electricity will still be approximately **75%** in 2030.

Renewable energy in India



Source: CEA 2002

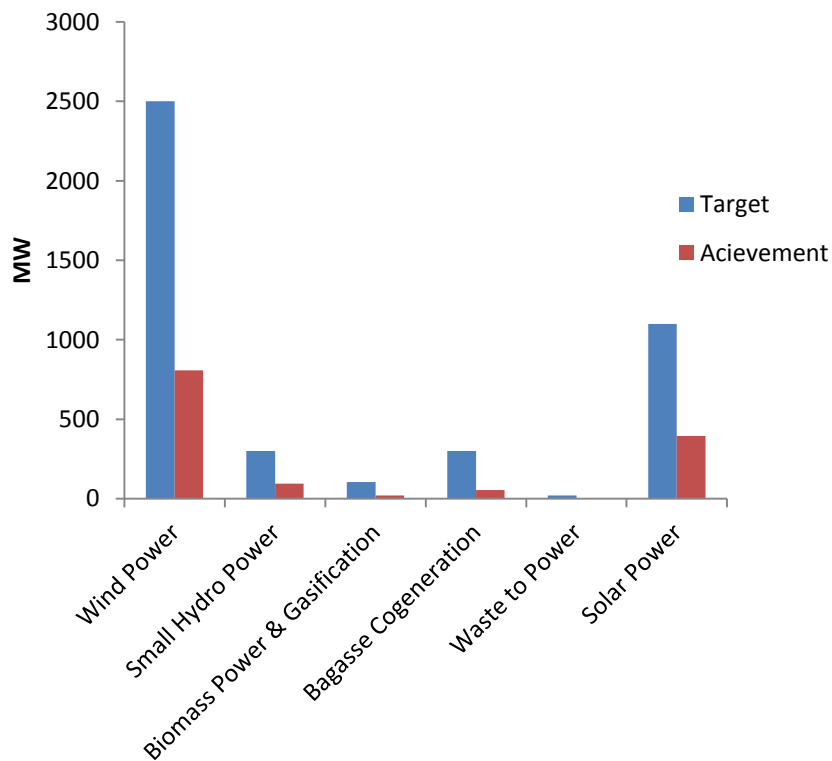
Source: CEA 2014

If the current trend of **0.93% increase** in terms of renewable energy share per year continues, the percentage of non-RE electricity will still be approximately **70%** in 2030.

- The share of renewables has increased from 1.46% in 2000 to 12.59 % in 2012. The share of thermal energy (coal, gas and diesel) has declined from 75.06 % in 2000 to 65.02% in 2012.
- Wind energy contributes 70% in the total installed capacity of grid based renewable energy and it's share is almost constant in the five year period.

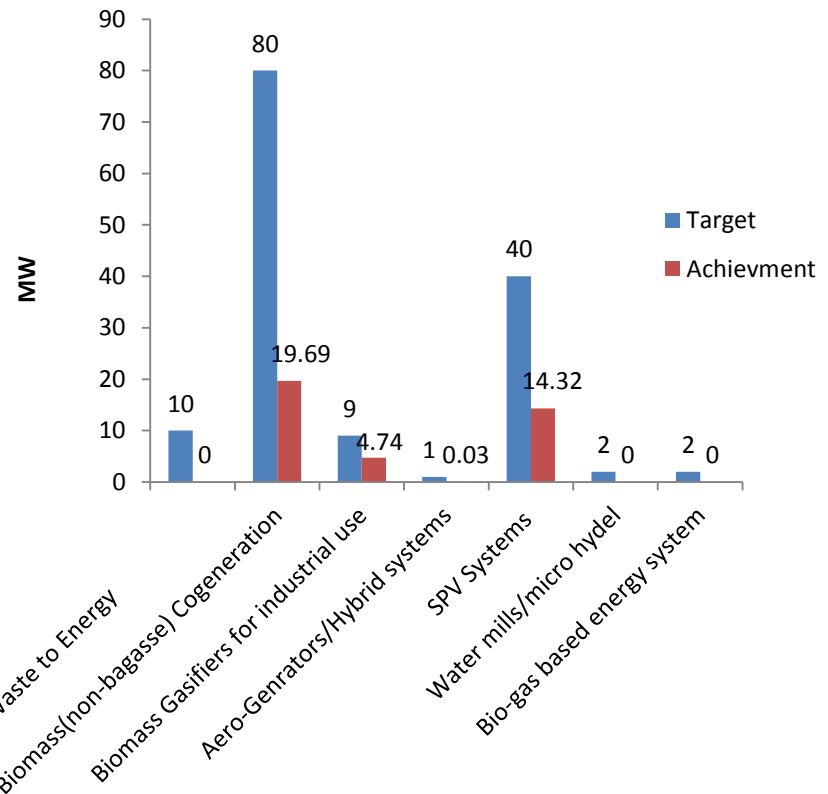
Target v/s achievement of grid and off-grid renewable energy in India in 2013-14

Target v/s achievement of grid based renewable energy in India



Source: MNRE 2014

Target v/s achievement of off-grid based renewable energy in India



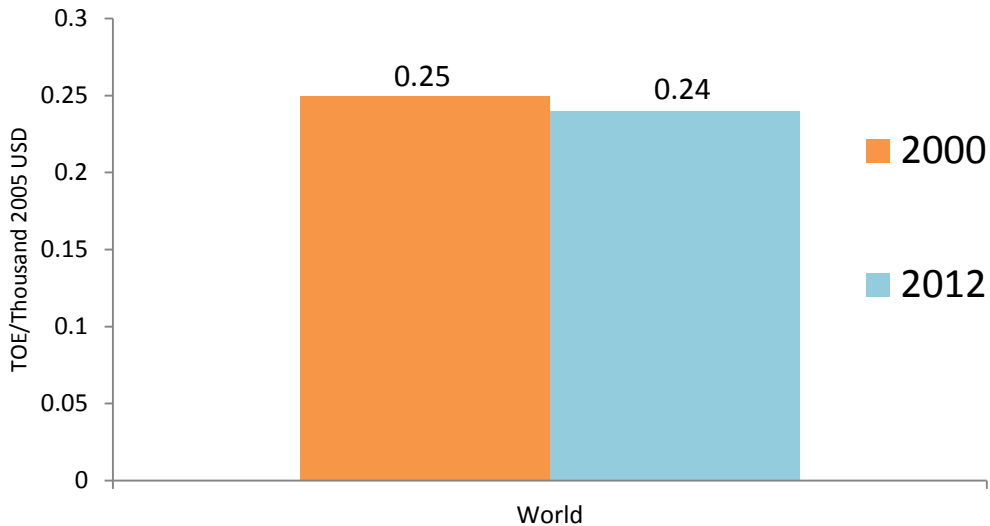
Source: MNRE 2014

Goal 7.3:

Double the global rate of improvement in energy efficiency by 2030



Energy intensity at the global level

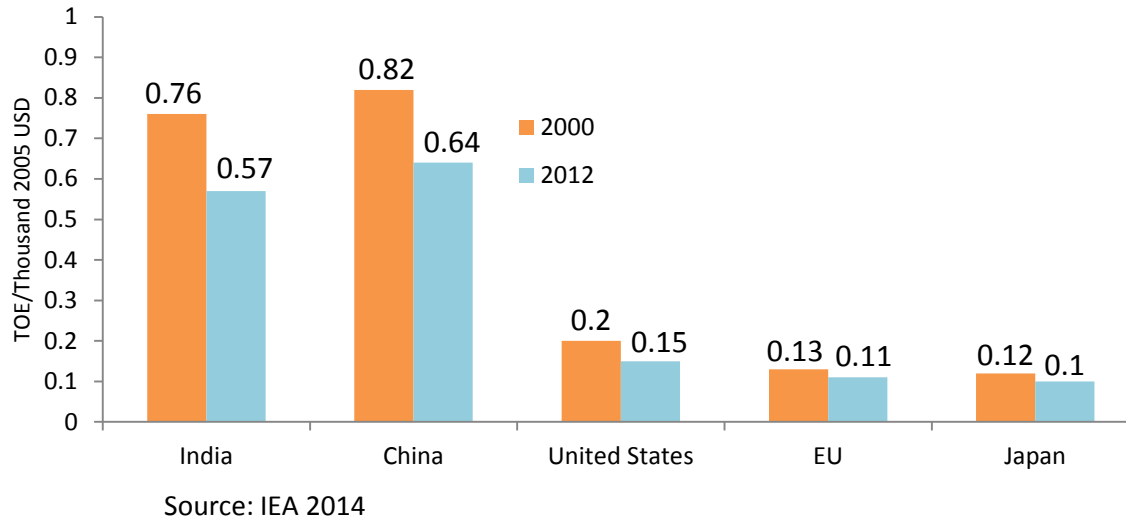


Source: IEA 2014

If the current trend of **4%** increase in 12 years (2000-2012) is doubled to **8%** the global energy intensity will be approximately **0.22** in 2030

- Energy intensity refers to the amount of energy consumed in producing a given level of output or activity.
- It is measured by the quantity of energy required to perform a particular activity divided by the total output of the activity.

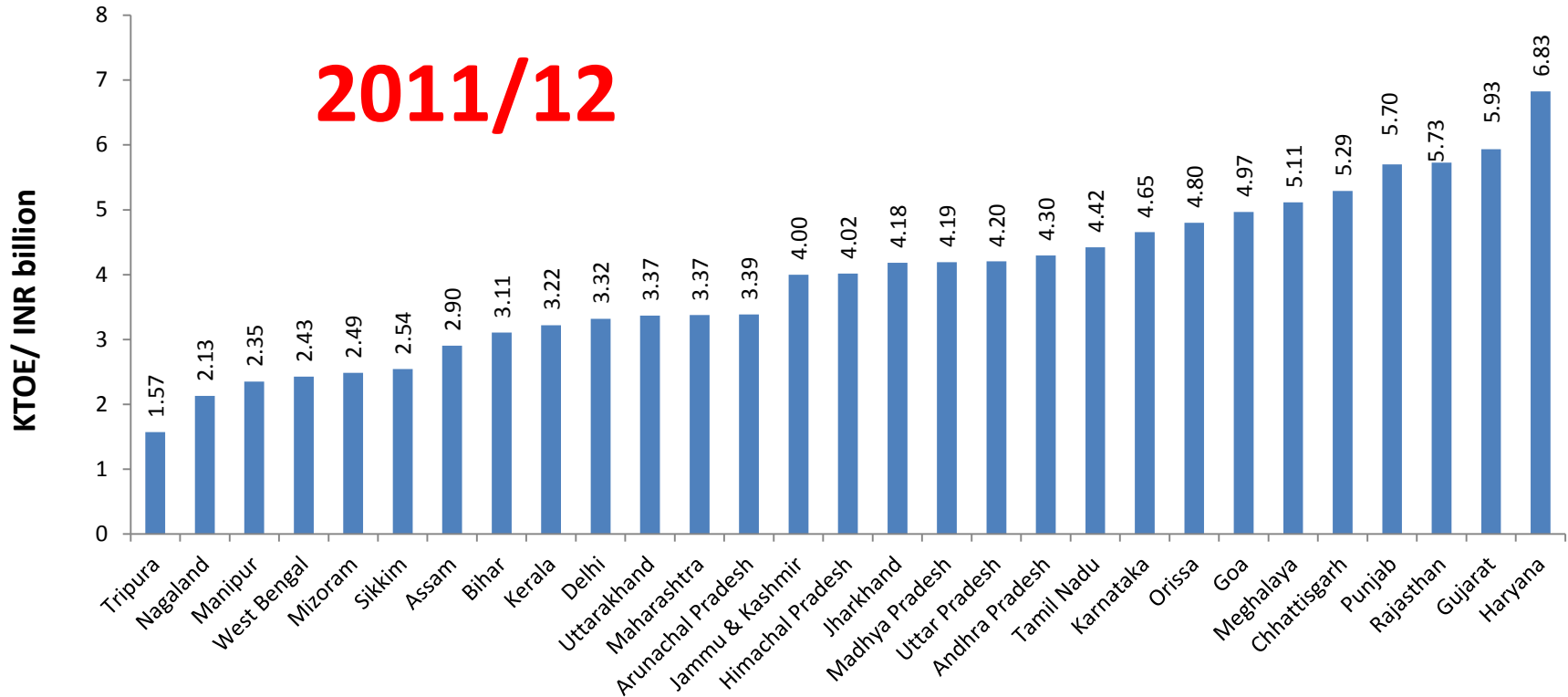
Energy intensity for key economies



If the current trend of **25%** increase in 12 years (2000-2012) continues the energy intensity for **India** will be approximately **0.285** in 2030 which is still below many advanced economies.

- Energy intensity values have greatly differed between 2000 and 2012 in emerging economies like India and China while it has not changed very drastically for the industrialized economies like United States, European Union and Japan which are already at lower energy intensity levels.
- There is a need to calculate energy efficiency sector by sector.
- Also a sectoral comparison on best available technologies (BAT) is important

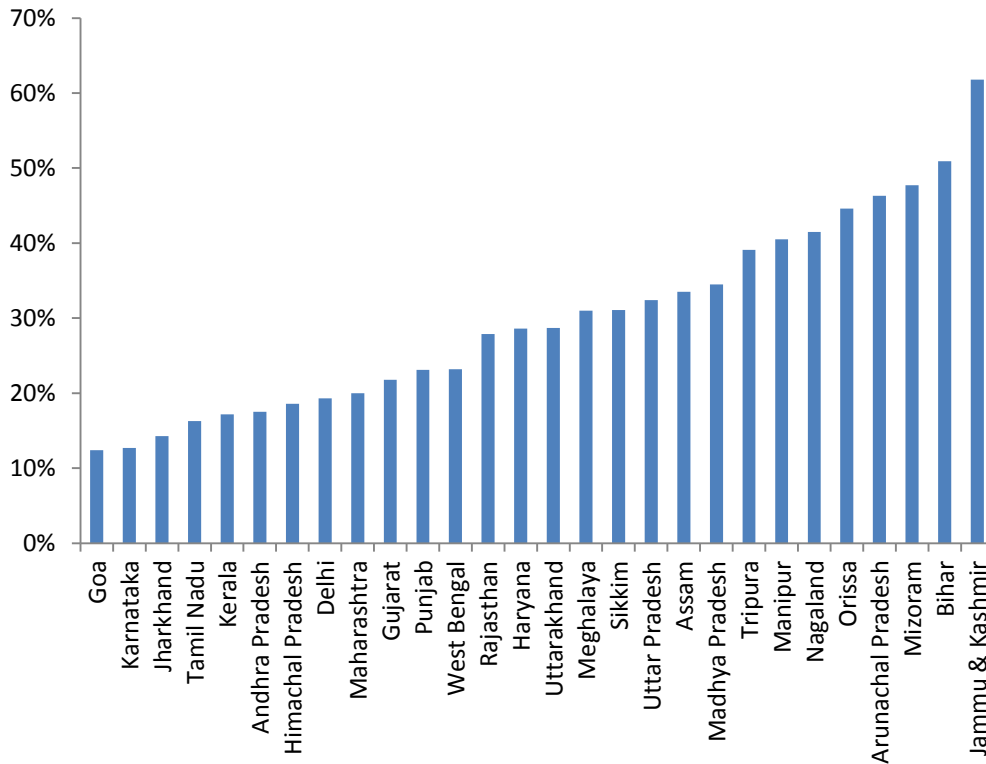
State-wise energy intensity



Source: Author's estimates

Data has been compiled from agencies such as Planning Commission, Coal Directory of India, Indian Petroleum and Natural Gas Statistics and All India Electricity Statistics.

T&D losses in 2011/12



Source: CEA 2013

- Energy losses occur in the process of supplying electricity to consumers due to transmission & distribution losses
- T&D losses include losses in transmission between sources of supply and points of distribution and in the distribution to consumers, including pilferage.
- Goa is the best performing state (with least T&D losses) and J&K is the worst performing state (with the highest T&D losses)

Looking ahead

- Significant efforts are needed to improve data collection methodologies, bridge identified data gaps and implement the statistical standards.
- Much greater investments in building national statistical capacities and strengthening standards is a necessity.
- Since SDGs are goals applicable to all countries, every country needs to design a tracking framework according to their national policies and targets to track progress on sustainable development goals.
- Implementation of SDGs will depend on a global partnership for sustainable development with the active engagement of multilaterals and bilaterals, governments, business & industry, civil society and research & academia.

Thank You