

# Global Energy Transformation

## Efficiency and Decarbonization

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# Towards a Sustainable Future

- Initiated in 2006 and involves >300 CLAs, LAs and ERs and >200 Anonymous Reviewers
- Final report (Cambridge Univ. Press) to be launched at Rio+20
- First globally comprehensive assessment of major challenges and how to address them
- Explores regional developments consistent with global change
  - Understand drivers of regional change
  - Interactions between regions



2012 INTERNATIONAL YEAR OF  
SUSTAINABLE ENERGY  
FOR ALL

## **2030 Energy Goals**

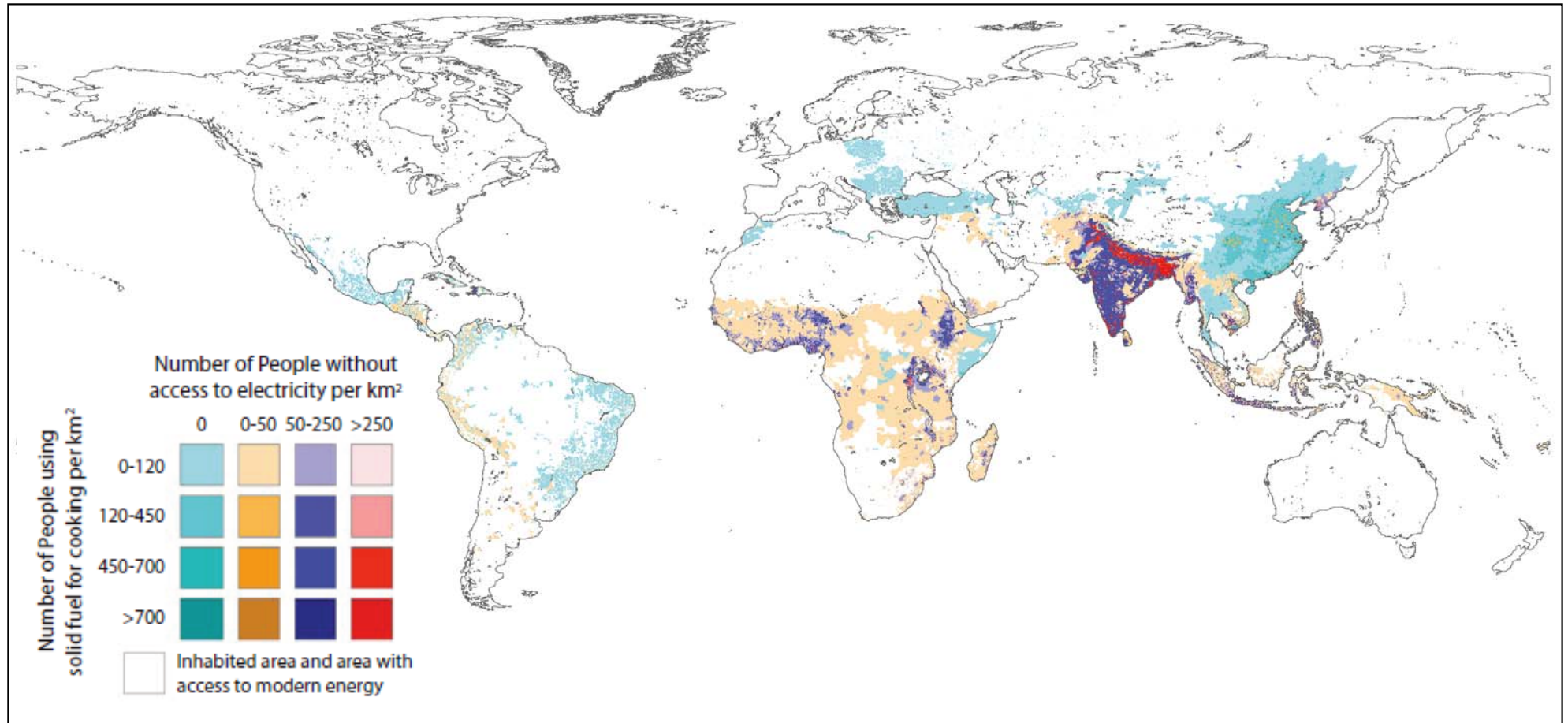
- Universal Access to Modern Energy
- Double Energy Efficiency Improvement
- Double Renewable Share in Final Energy

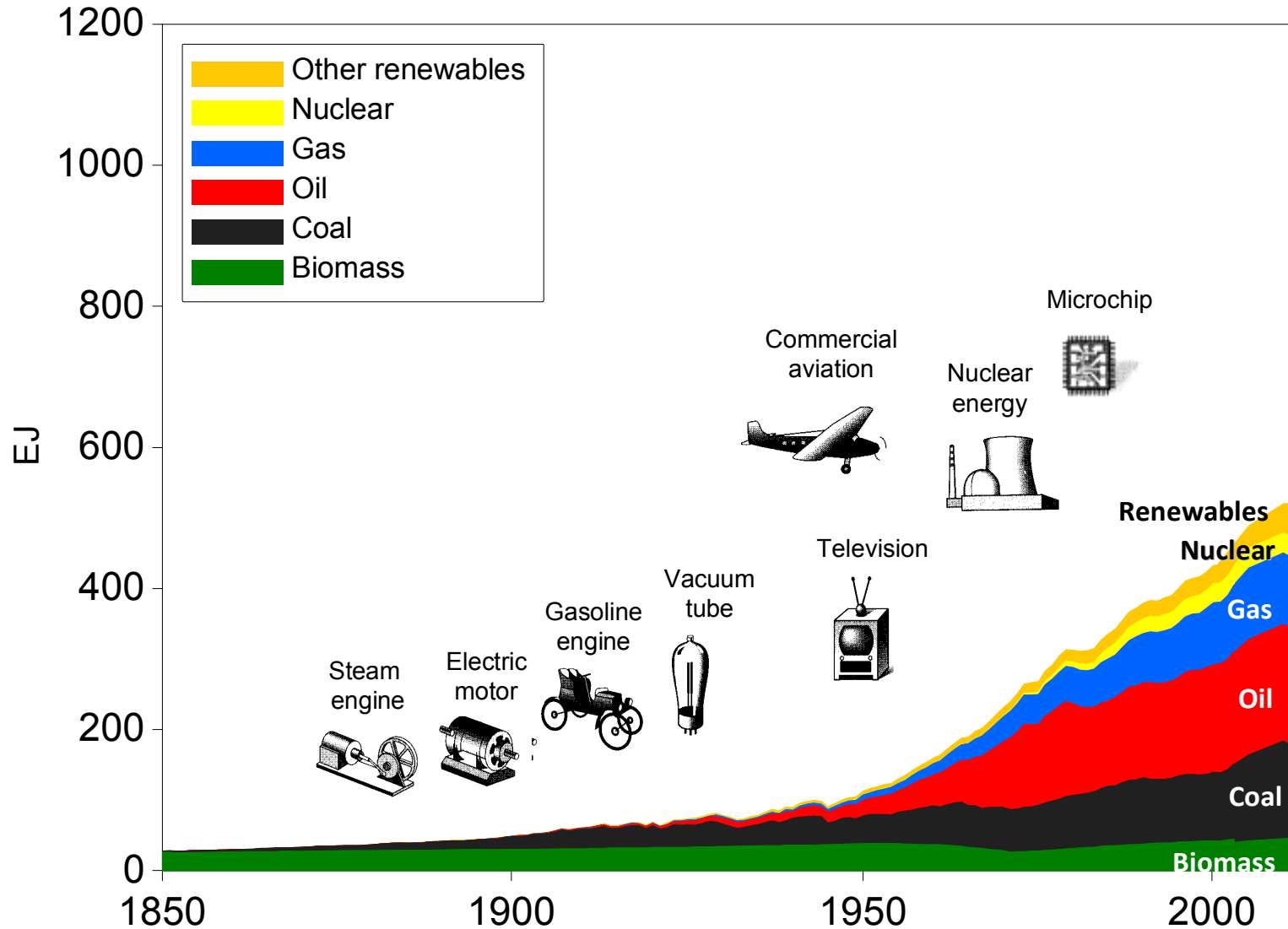
**Aspirational & Ambitious but Achievable**



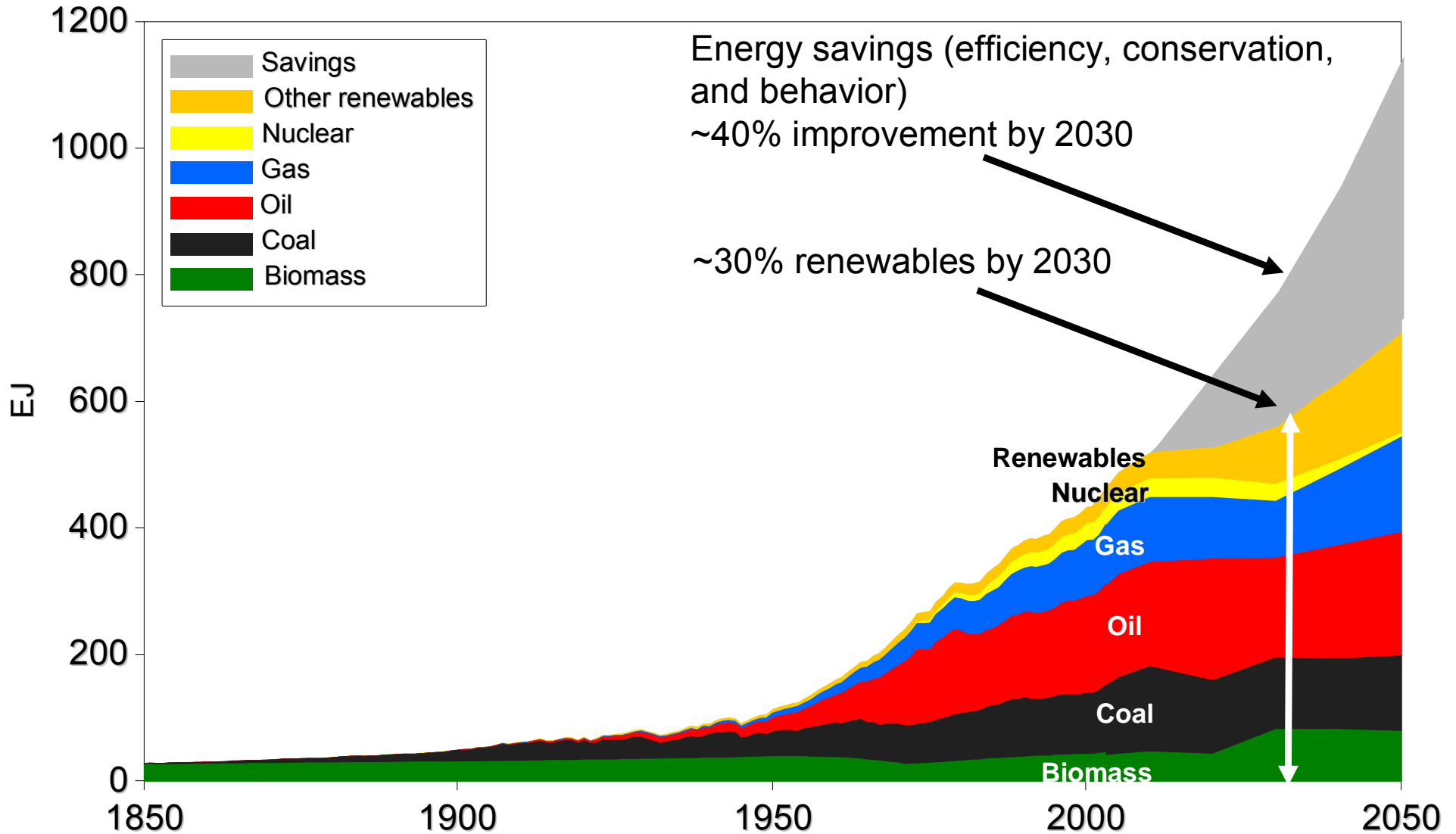
Source: Modi, 2011

## Final energy access (non-commercial share) in relation to population density





## All 3 SE4All Objectives



Energy savings (efficiency, conservation, and behavior)

~40% improvement by 2030

~30% renewables by 2030

Renewables

Nuclear

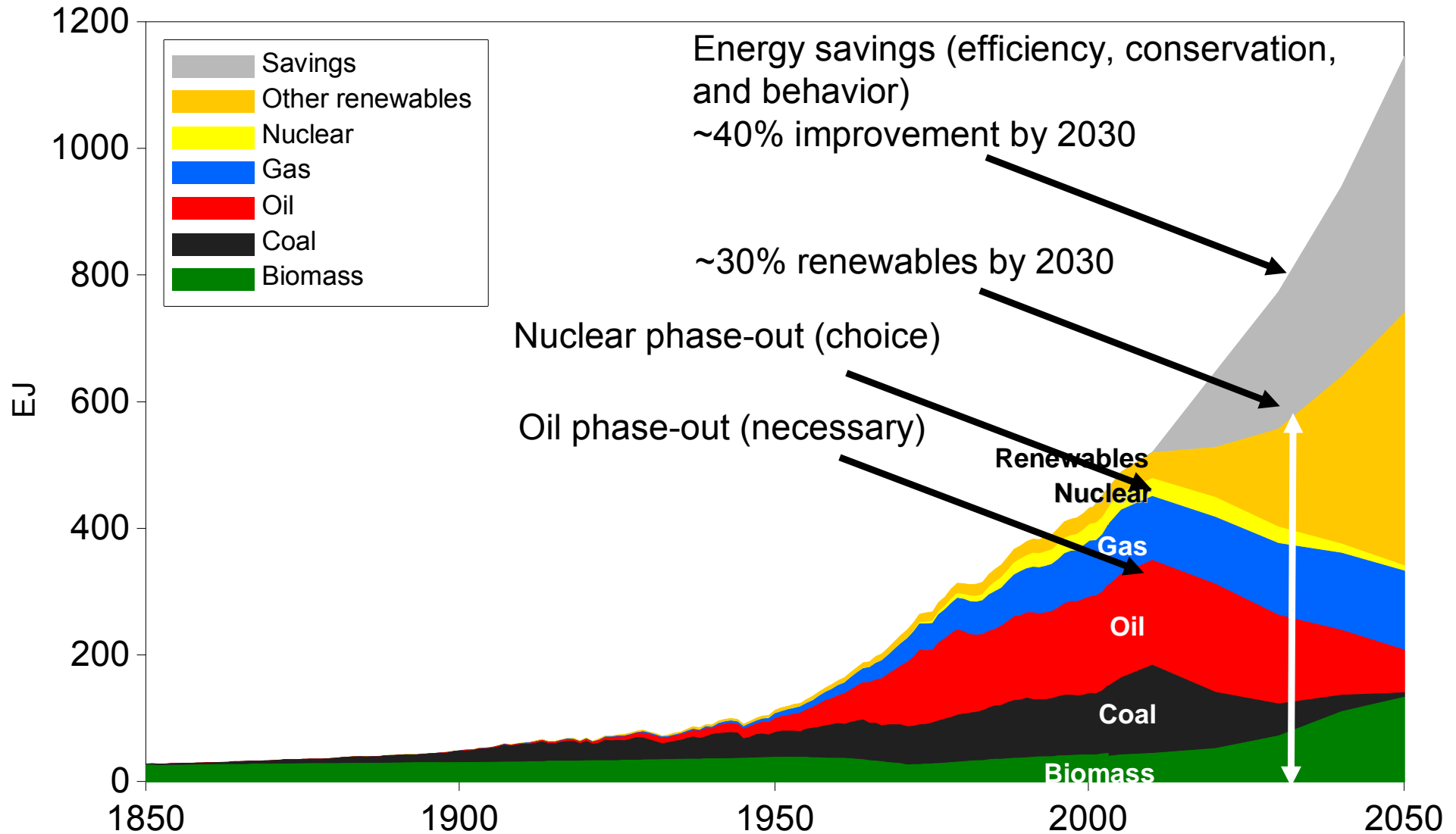
Gas

Oil

Coal

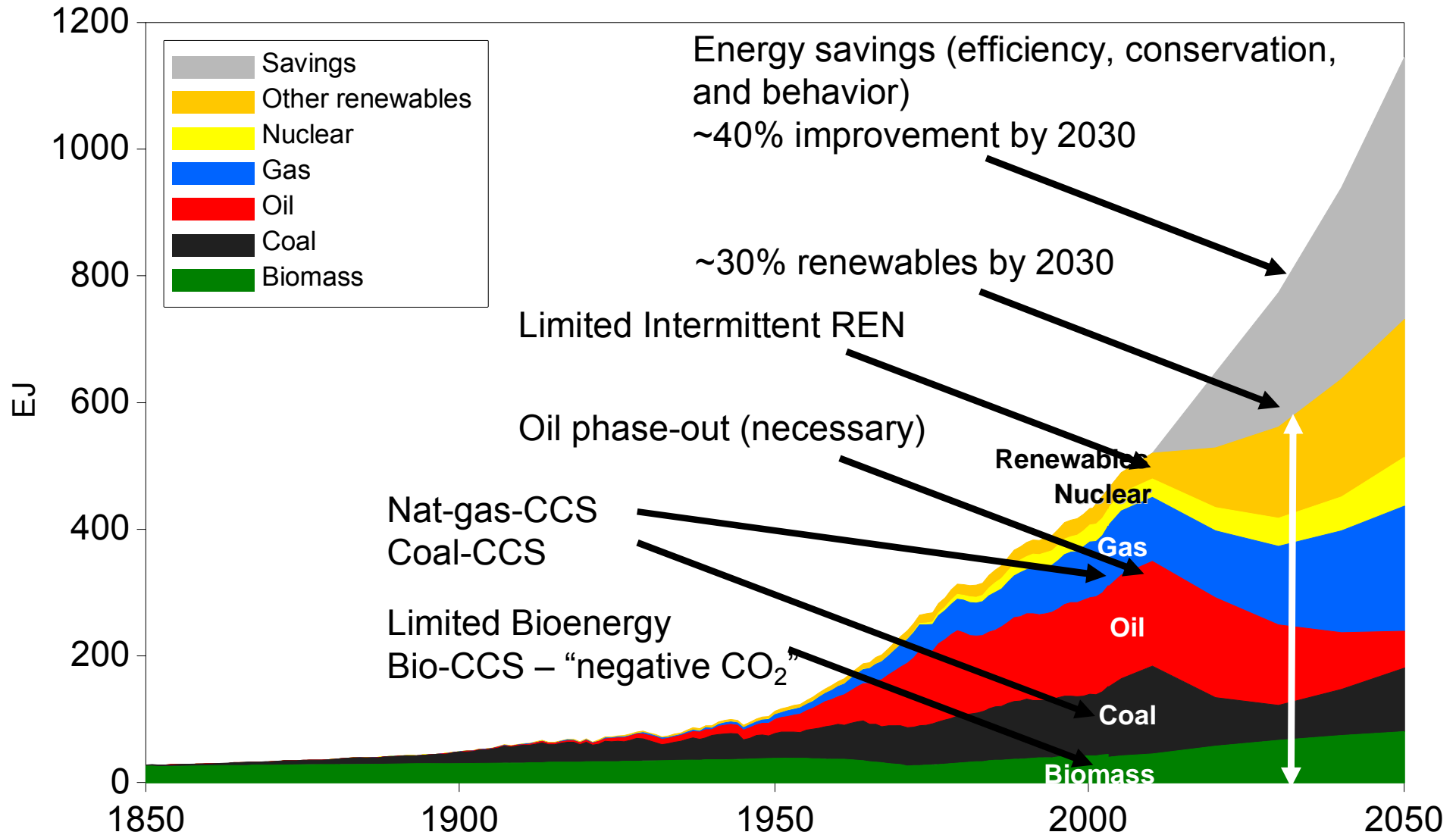
Biomass

## no CCS, no Nuclear

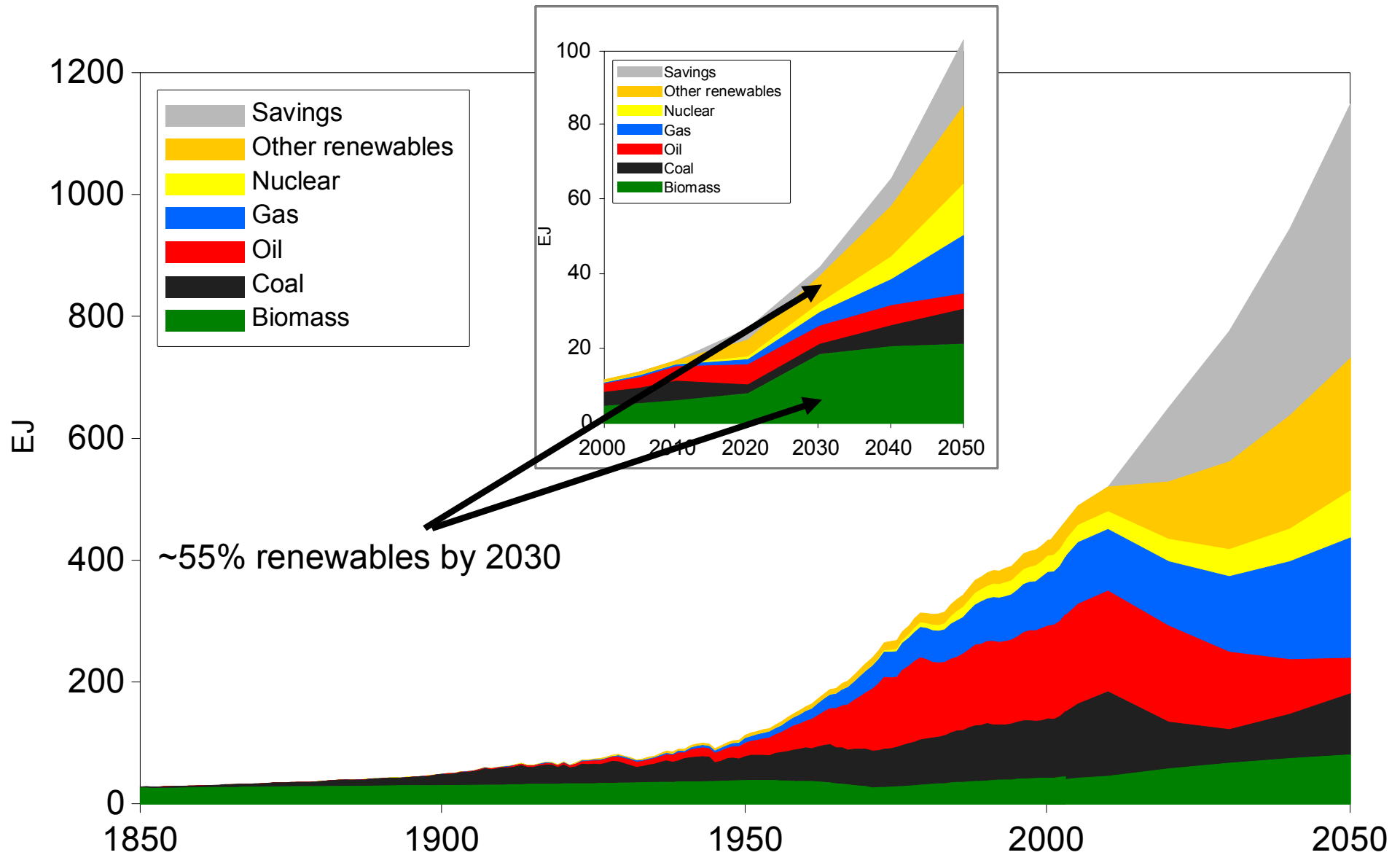




## lim. Bioenergy, lim. Intermittent REN



## Sub-Saharan Africa



~55% renewables by 2030

## for SE4All by 2030 ~ 24 Bill. US\$/yr

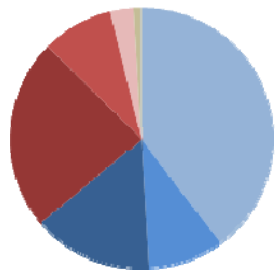
Rural Electrification		Bill. US\$/yr
	Grid investment	14.5
	Power system O&M	0.2
	Power system investment	0.3
Modern Cooking		
	Fuel price support	8.38
	Improved Biomass Stoves	0.71
	New LPG stoves	0.18

## Sub-Saharan Africa

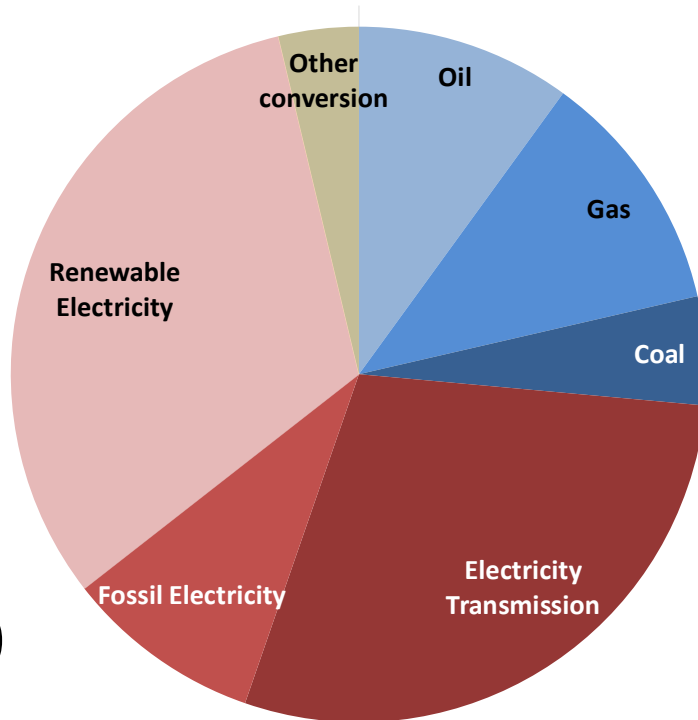
### No Sustainability Policies

(226 bill.)

**Today**  
(30 bill.)



**2005-2010**



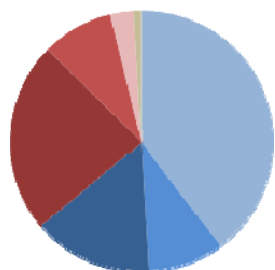
**2050**

## Sub-Saharan Africa

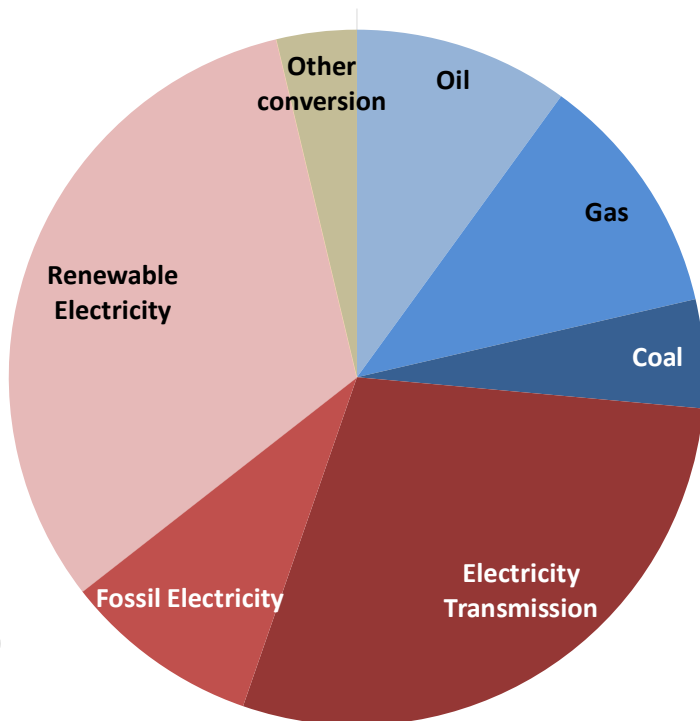
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(30 bill.)

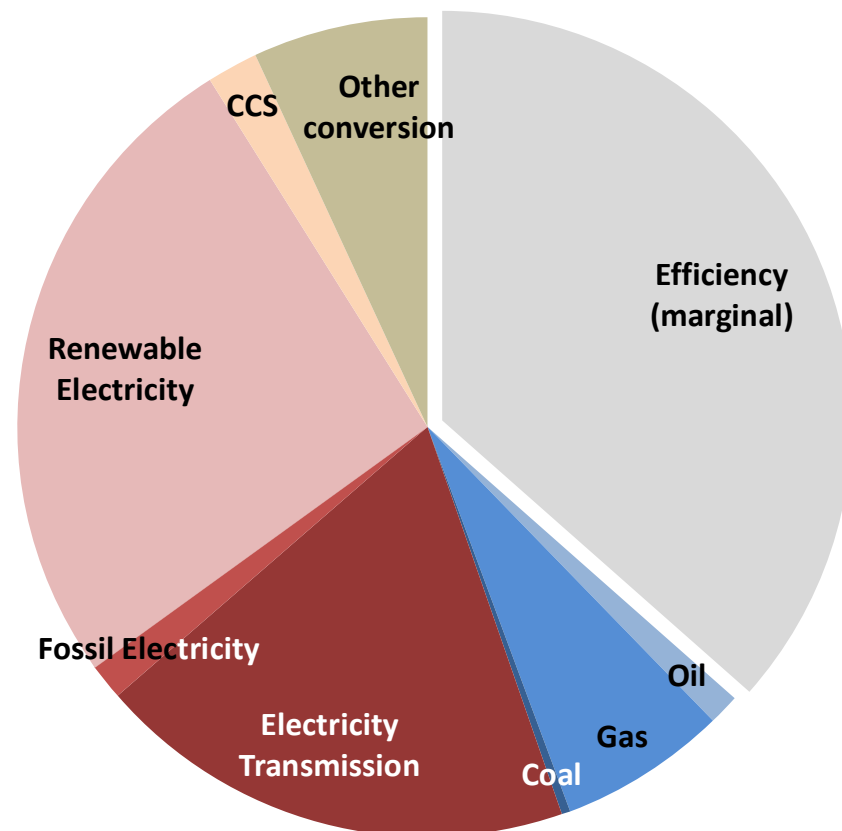


**2005-2010**



### GEA-Efficiency

(309 bill.)



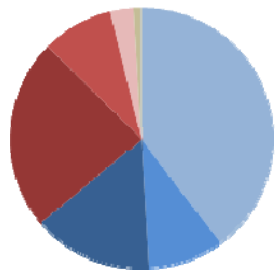
**2050**

## Sub-Saharan Africa

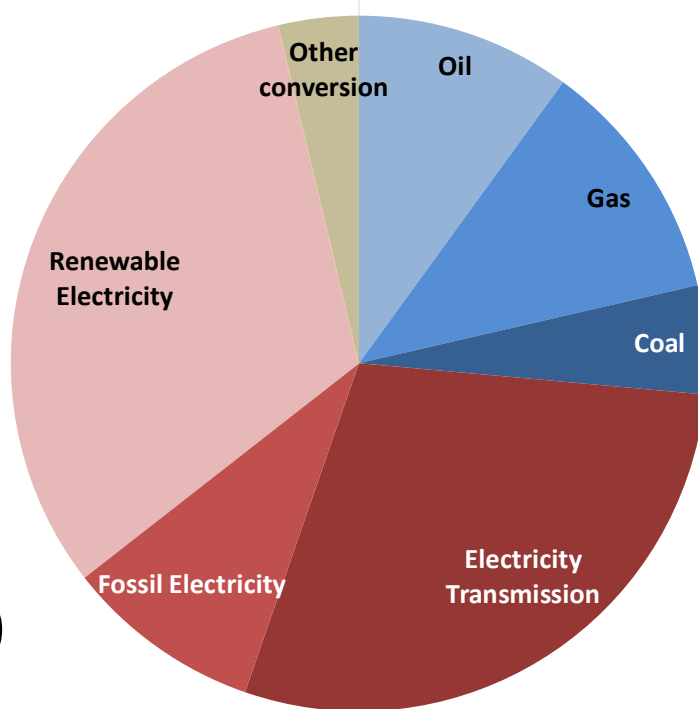
### No Sustainability Policies

(226 bill.)

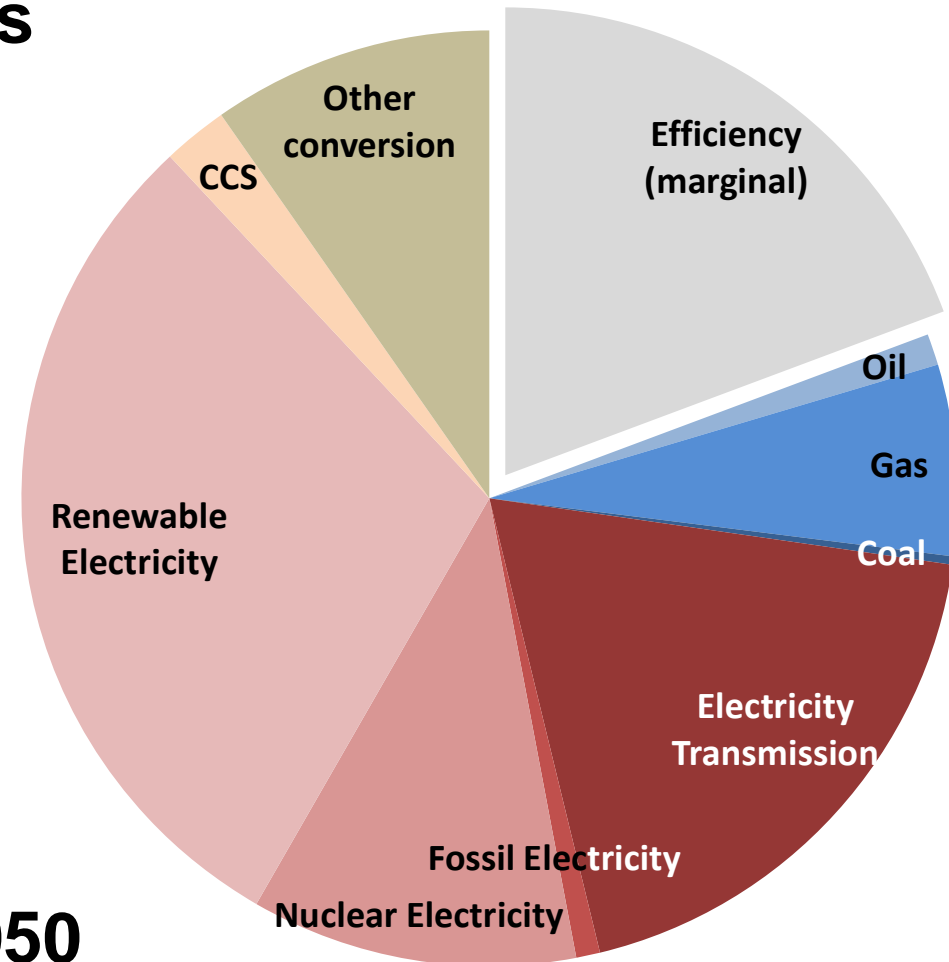
**Today**  
(30 bill.)



**2005-2010**



**GEA-Supply**  
(403 bill.)



**2050**



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# Investments

<b>Annual Energy Investments</b>	<b>Innovation RD&amp;D</b> [billion US\$2005]	<b>Markets Formation</b> [billion US\$2005]	<b>Present Investments</b> [billion US\$2005]	<b>Investment for SE4All</b> [billion US\$2005]
	<b>2010</b>	<b>2010</b>	<b>2010</b>	<b>2010 - 2030</b>
<b>Efficiency</b>	<b>&gt;&gt; 8</b>	<b>~ 5</b>	<b>300</b>	<b>260-370</b>
<b>Renewables</b>	<b>&gt; 12</b>	<b>~ 20</b>	<b>200</b>	<b>260-410</b>
<b>Access</b>	<b>&lt; 1</b>	<b>&lt; 1</b>	<b>~ 9</b>	<b>30-40</b>
<b>Total</b>	<b>&gt; 50</b>	<b>&lt; 150</b>	<b>1250</b>	<b>1770 - 2420</b>

# Action Areas Suggested by SE4All

## Sectoral Action Areas

- A** Modern cooking appliances and fuels
- B** Distributed electricity solutions
- C** Grid infrastructure and supply efficiency
- D** Large scale renewable power
- E** Industrial and agricultural processes
- F** Transportation
- G** Buildings and appliances

## Enabling Action Areas

- W** Energy planning and policies
- X** Business model and technology innovation
- Y** Finance and risk management
- Z** Capacity building and knowledge sharing

