

Benefitting from Global and Regional Energy initiatives

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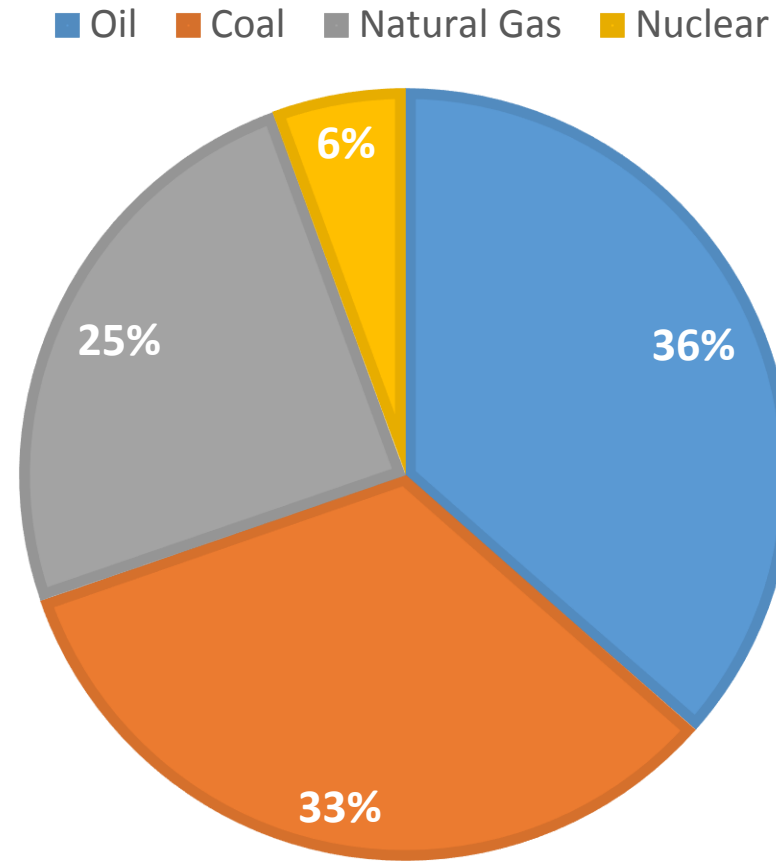
The energy context in Africa

- Over 645 million Africans have no access to electricity.
- Power consumption per capita in Sub-Saharan Africa is the lowest of all continents, currently estimated at 181 kWh per annum, compared to 6,500 kWh in Europe and 13,000 kWh in the United States (World Energy Outlook 2015).
- Unreliable access to energy costs the continent 2% of GDP
- **Health implications:** An estimated 600,000 Africans (mostly women and children) die annually due to indoor air pollution associated with the use of fuel wood for cooking.
- 30 percent of health centers operate without electricity (AfDB 2014)
- Lives are at risk in African hospitals, as life-saving equipment and services lie unused because of lack of electricity

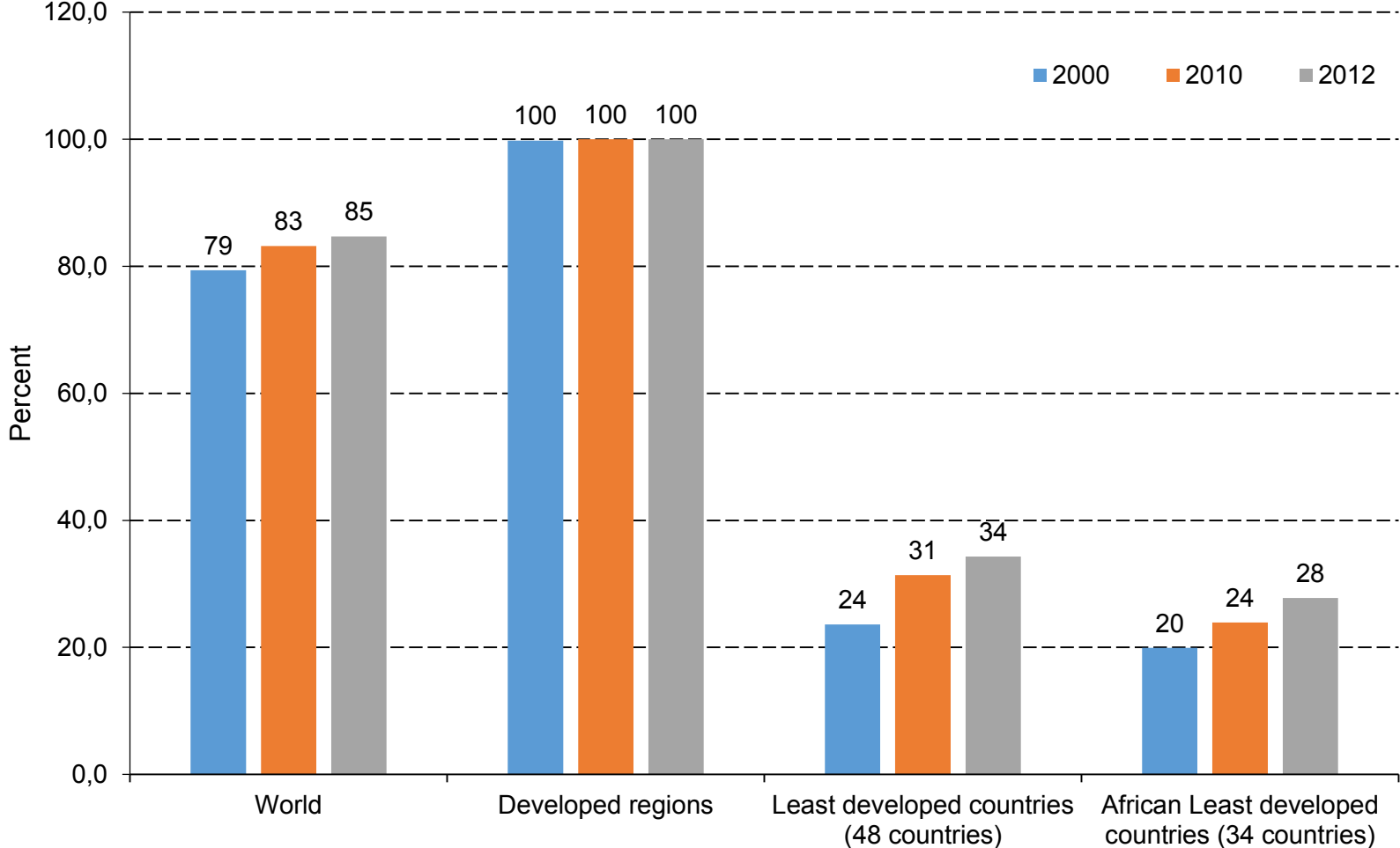
The energy context in Africa

- **Education implications:** Children under-perform for lack of electricity, since over 90% of Africa's primary schools lack electricity.

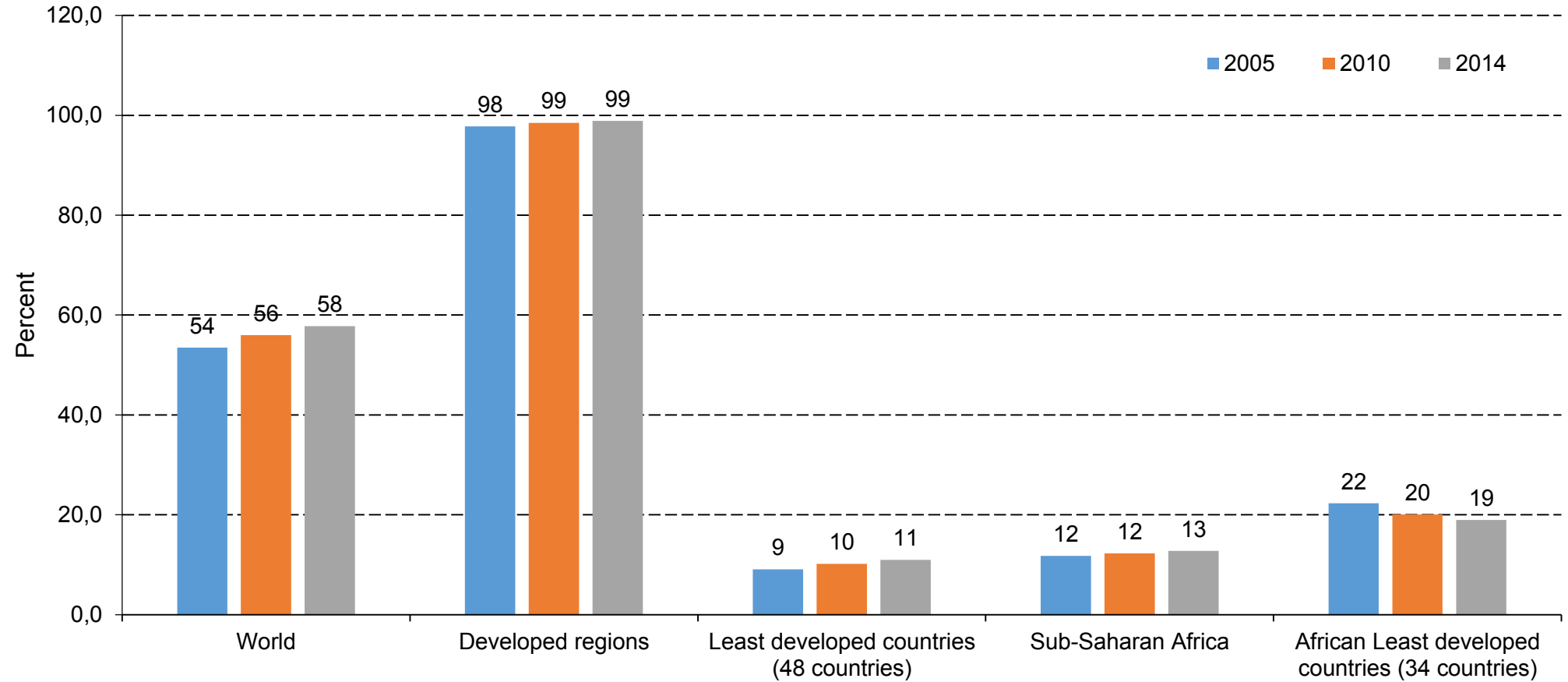
Composition of Total Primary Energy Supply



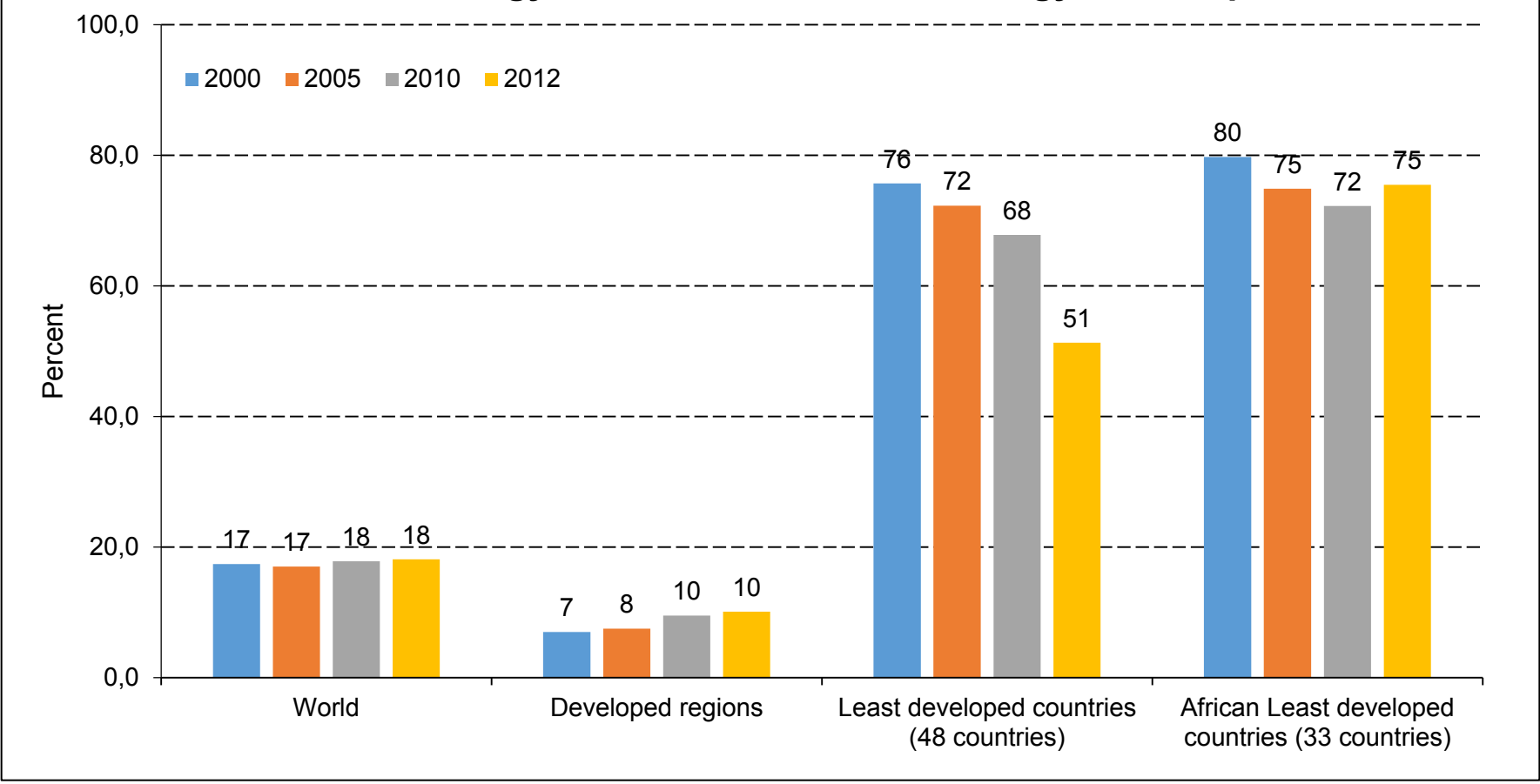
SDG 7.1.1 Proportion of population with access to electricity



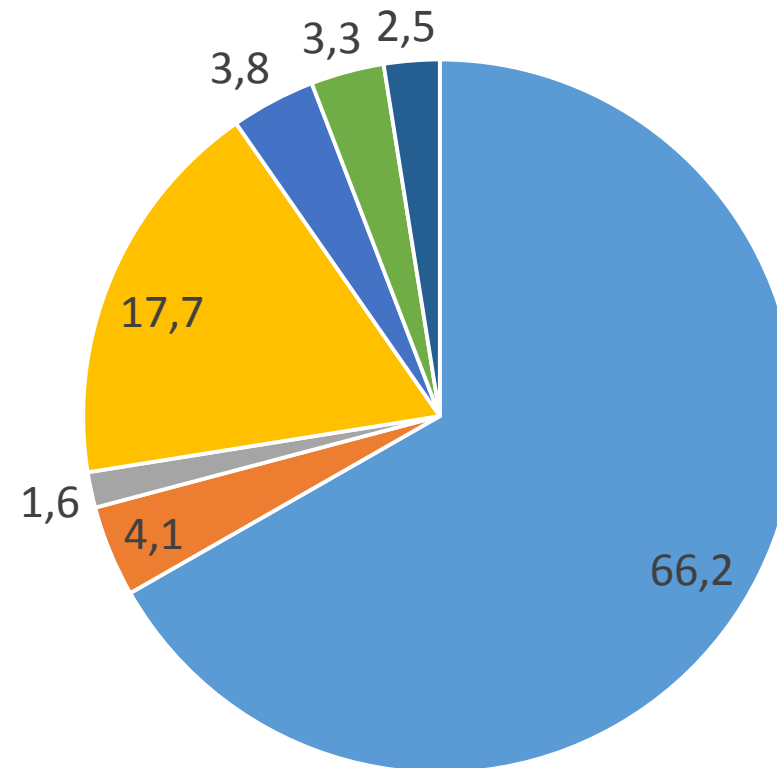
SDG 7.1.2 Proportion of population with primary reliance on clean fuels and technology



SDG 7.2.1 Renewable energy share in the total final energy consumption



Global composition of renewables (%)



■ Solid Biofuels ■ Liquid Biofuels ■ Biogases ■ Hydro ■ Geothermal ■ Wind ■ Solar, Tide

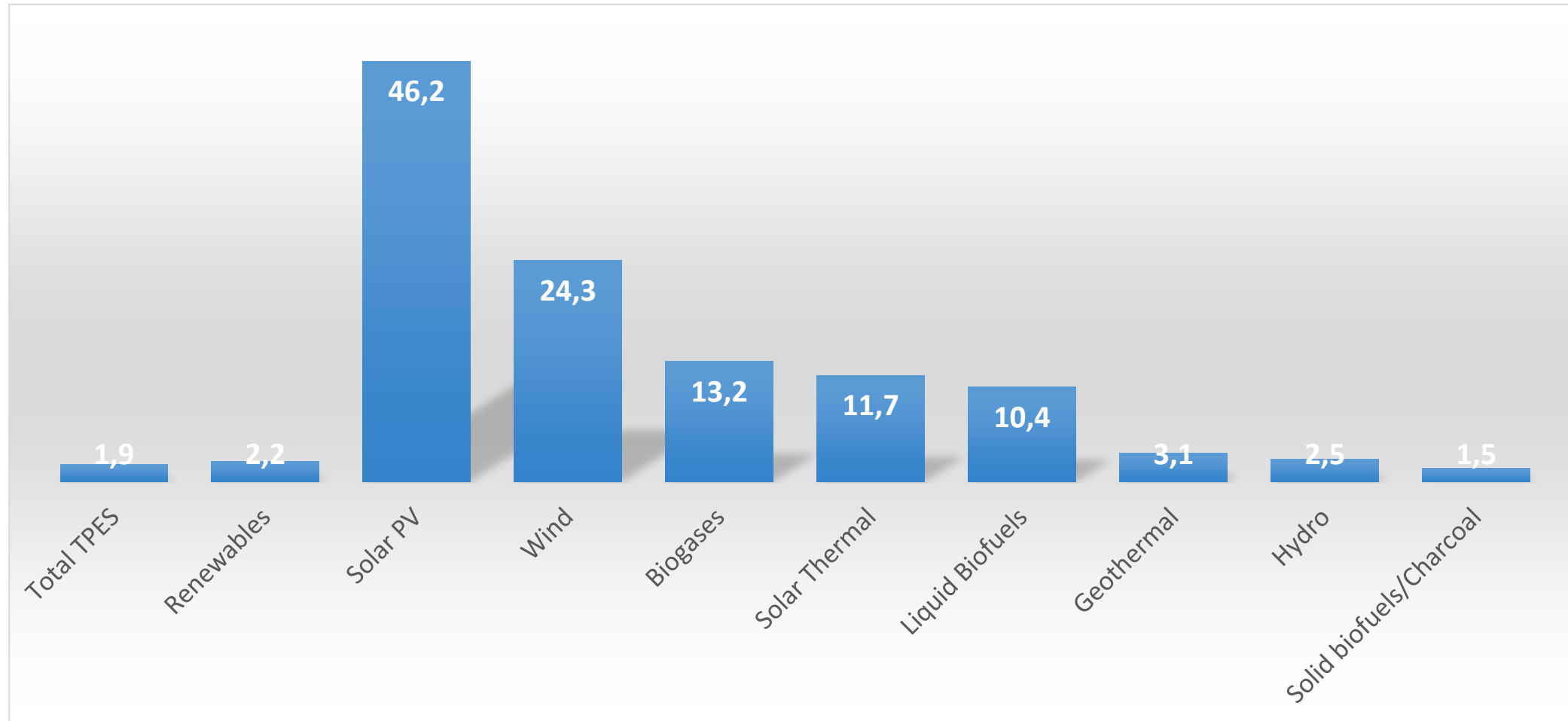
Trends in renewable energy

- Africa as a region accounts for the largest share (49.6%) of renewables globally due to abundant use of solid biofuels/charcoal
- **Solid biofuels/charcoal** is by far the largest renewable energy source, representing **66.2%** of global renewables supply.
- Africa, which accounted for only 5.6% of the world's total Total Primary Energy Supply in 2014, accounted for **29.3% of the world's solid biofuels** supply second only to China (29.9 per cent in 2014).
- OECD countries account for the largest share of “new” renewables, supplying 65.7% of world energy from solar, wind, tide, renewable municipal waste, biogases and liquid biofuels in 2014

Trends in renewable energy

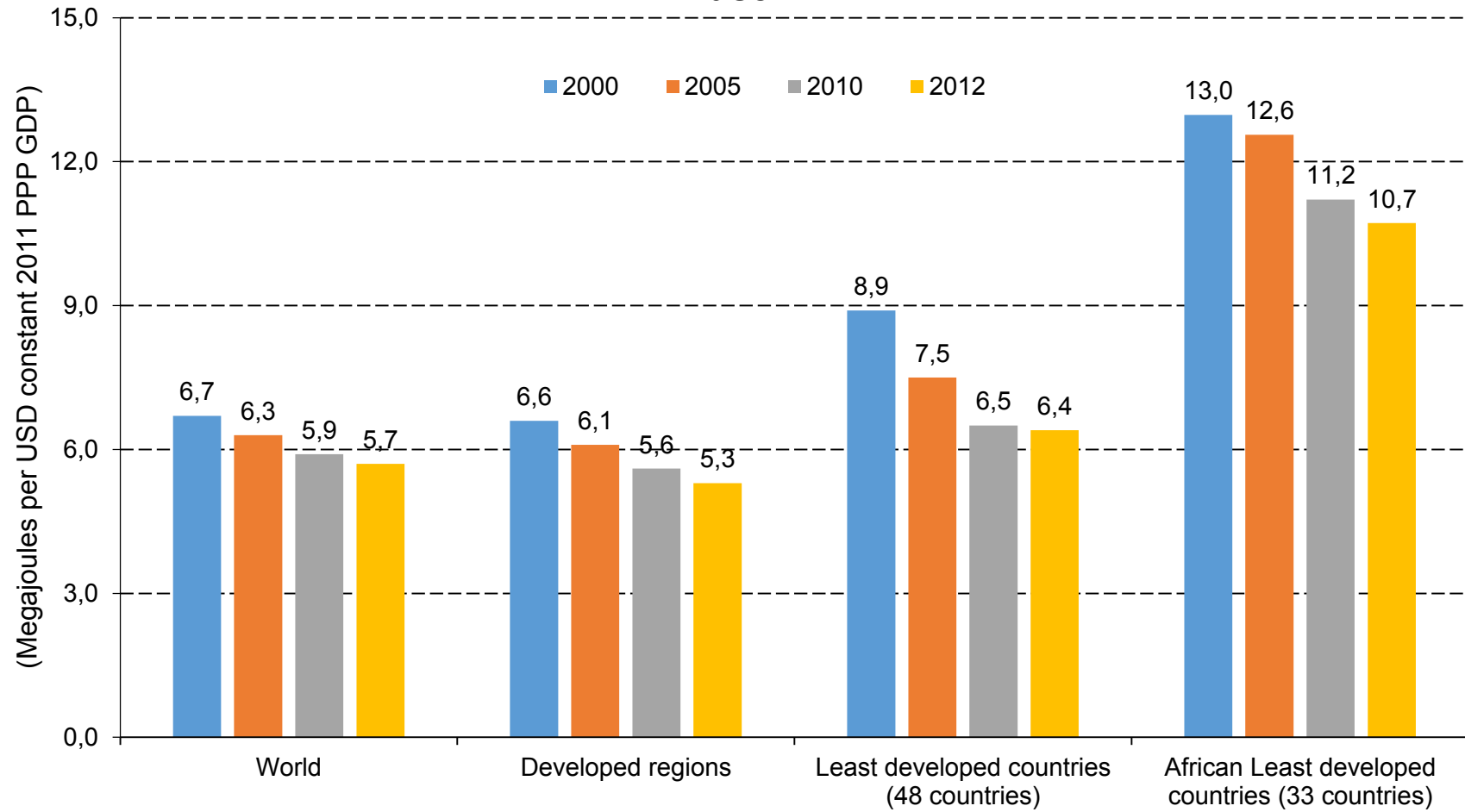
- Renewables grew faster than TPES globally, led by solar PVs
- Globally only 32.5% of renewables are used for electricity production and heat production; 48.5% are used in the residential, commercial and public sectors
- Hydroelectricity supplies the vast majority of renewable electricity, generating 16.4% of world electricity, and 73.2% of total renewable electricity,
- biofuels and waste, including solid biofuels, play a minor role in electricity generation, supplying 1.8% of world electricity.
- Hydro growth was particularly strong in Mozambique, showing growth rate of 18.3%, followed by Viet Nam (10.5%).

Global growth in renewables 1990-2014 (%)



SDG 7.3.1

Energy intensity: African LDCs are relatively less efficient in energy use



Reducing energy intensity

- In Africa energy intensity is high in part because as much as 40% of power generated is lost in transmission and distribution (**supply-side**)
- The decline in energy intensity in **developed** countries has been driven largely by improved energy efficiency in key end-uses such as vehicles, appliances, space heating and industrial processes.
- In addition, governments have implemented a wide range of policies and programmes such as funding research and development (R&D), energy efficiency standards, educational efforts, obligations on market actors and financial incentives to accelerate the development and adoption of energy efficiency measures
- Energy efficiency can provide social benefits such as **increased productivity and employment**, reductions in the high energy cost burden faced by low income households, improved comfort and public health, enhanced national security, and **conservation of finite resources** such as oil and natural gas

Energy opportunities in Africa

- The Grand Inga on the Congo river can generate 300TWh (Terawatt hours) of hydro-electricity per year enough to supply 60 percent of the continent's energy needs
- The continent has a significant share of the world's renewable energy potential: hydropower, bio-energy, geothermal, solar and wind power.
- Only 5% of Africa's vast hydropower resources are currently being tapped
- The Democratic Republic of the Congo and Ethiopia alone—with their dense river networks—would have the capacity to supply most of Africa's energy needs, if **regional interconnection energy networks** were fully leveraged to enable the trading of electricity.

Responding to the Energy deficit: A-2063

Long term objectives

- By 2063, **climate resilient low carbon production systems** would be in place, thus significantly minimizing vulnerability to climate risk and related natural disasters.
- All agricultural and industrial activities would be climate smart and sustainability certified.
- An **African climate fund (ACF)** established to address the continent's climate adaptation and mitigation concerns, including technology development and regional/continental sustainability certification schemes established.

Responding to the Energy deficit: A-2063

Long term vision

- Renewable energy (wind, solar, bio, hydro, ocean tidal waves, geothermal and other renewables) **will claim more than half of the energy consumption** for households, businesses and organizations.
- All urban buildings will be certified as energy smart and all urban mass transport will operate on renewable and low to zero emissions fuels.
- The share of renewable energy to total energy production would have **exceeded the 50% threshold**.
- **Regional power pools** would have been in place, while continental power pools (e.g. Inga Dam) would be fully functional before 2063 thus making the continent well lit and fully powered.

Responding to the Energy deficit: A-2063

Flagship Energy Project – Grand Inga Dam

- Implementation of Grand Inga Dam is one of the 10 flagship programmes of the 10 year Implementation plan of Agenda 2063.
- The optimal development of the Inga Dam will generate 43,200 MW of power to support current regional power pools and their combined service to transform Africa from traditional to modern sources of energy and ensure access of all Africans to clean and affordable electricity

Energy synergies between SDGs and A-2063

SDG Energy Goal	SDG Energy Target	Agenda 2063 Target
Ensure access to affordable, reliable, sustainable and modern energy for all	By 2030, ensure universal access to affordable, reliable and modern energy services	Access and use of electricity and internet is increased by at least 50% of 2013 levels by 2023 .
		Reduce proportion of fossil fuel in total energy production by at least 20% by 2023
		Increase electricity generation and distribution by at least 50% by 2020

Energy synergies between SDGs and A-2063

SDG Energy Goal	SDG Energy Target	Agenda 2063 Target
<p>Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<p>7.2. By 2030, increase substantially the share of renewable energy in the global energy mix</p>	<p>Increase the efficiency in energy usage by households by at least 30%</p>
		<p>At least 10% of renewable energy sources is from wave energy.</p>
		<p>Reduce proportion of fossil fuel in total energy production by at least 20%</p>
	<p>7.3. By 2030, double the global rate of improvement in energy efficiency</p>	<p>Increase the efficiency in energy usage by households by at least 30%</p>

Energy synergies between SDGs and A-2063

SDG Energy Goal	SDG Energy Target	Agenda 2063 Target
Ensure access to affordable, reliable, sustainable and modern energy for all	7.a. By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	n/a
	7.b. By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	n/a

Closing the energy deficit

- The International Energy Agency estimates that Africa needs investments of more than \$60 billion each year to achieve universal access to electricity by 2040.
- The Agency has identified 12 African countries as needing major investment in their energy sectors—among them Africa's two most populous countries: Nigeria, where 82 million people lack access to electricity (47% of population), and Ethiopia, where 64 million lack access (68% of population)

Key Energy Initiatives

Initiative	\$ Commitment	Target	Remark
New Deal – AfDB’s Light up and Power Africa Initiative	Invest \$12bn and leverage \$50bn in public/private funding (2016-2020; triple climate finance to \$5bn/yr and leverage \$20bn in climate investments by 2020	universal access to energy in Africa by 2025	Coordinates existing initiatives. Energy resource neutral.
Power Africa – Barack Obama 2013	\$60m new electricity connections	30 GW of new capacity by 2030	Partnership model that brings private sector actors
Sustainable Energy for All – Ban Ki Moon 2011		Universal access to modern energy services; double energy efficiency; double share of renewable energy in energy mix by 2030	

Key Energy Initiatives

Initiative	Commitment	Target	Remark
Africa Renewable Energy initiative – CP21 2015	At least \$10bn for renewable energy investments in Africa by G7 countries between 2015 and 2020	10 GW additional renewable energy by 2020	Focus on renewable energy
Electricity Financing Initiative (ElectriFI) – CP21	Support electrification investments leading to new and improved connections		
African Energy Leader's Group (AELG)	Brings political and economic leaders at highest level to drive reforms and investments to end energy poverty		

Key Energy Initiatives

Initiative	Commitments	Target	Remark
Sustainable Energy Fund for Africa (SEFA) is a multi-donor trust fund administered by the African Development Bank – launched in 2012	a US \$95-million multi-donor facility funded by the governments of Denmark, the United Kingdom, the United States and Italy.		Supports small- and medium-scale Renewable Energy (RE) and Energy Efficiency (EE) projects in Africa
	In 2013, USAID committed to providing US \$20 million to support SEFA		Financing windows: project preparation; equity investments; and enabling environment support

Key Energy Initiatives

Initiative	Commitment	Challenges
Global Environment Facility (GEF) established in 1991	Its mandate is to provide new and additional grants and concessional funding to cover the "incremental" or "additional" costs associated with achieving global environmental benefits.	<ul style="list-style-type: none">• Insufficient funds.• Long project cycle as long as 60 months• Countries face challenges in complying with environmental standards
	i) funds reporting commitments under the conventions, such as the climate change national communications ii) funding pilots of emerging technologies and applications, e.g. energy efficiency and renewable energy; and iii) funding the technical assistance and capacity building underpinning these activities.	

Other funding sources

- the more than \$1 trillion in African pension funds,
- ending fuel subsidies
- Crackdown on illicit finance flows estimated at \$50bn/yr

Lessons in Implementing Energy initiatives

- Decentralized renewable approaches tend to be more cost-effective: a decentralized renewable approach would cost as little as [\\$70 billion in total](#).
- Innovative, small-scale and off-grid clean energy technologies will play a key role in bringing power to remote areas
- In areas where household density is low (<50 cap/km²), any investment in larger grid infrastructure would not be cost competitive
- Hence the 37% off-grid, 63% on-grid target in the New Deal does not represent either the fastest or least-cost option to achieve universal energy access.
- The IEA projects that >64% of rural electrification would be delivered by off-grid solutions.

Lessons in Implementing Energy initiatives

- Clean energy solutions involve high initial capital costs, but are cost-effective over the longer term.
- the economic costs of renewables, particularly wind, biogas and hydro, are now falling within the range of costs for non-renewable alternatives.
- Slow pace of financial support to energy projects, service companies and consumers despite large financing commitments
- Many off-grid enterprises are ready to deliver energy access in Rwanda, including from the Green Climate Fund and the Scaling Up Renewable Energy Program, but there are insufficient funds in the market for them to access.

Lessons in Implementing Energy initiatives

- Countries such as Algeria, Morocco and Tunisia have made good progress on energy efficiency through improvements in planning, network upgrading, maintenance and investments in modern technology.
- Major cost savings can also be made at the consumer end, often through such simple measures as using low-energy light bulbs.
- Africa urgently needs to attract private investment into the energy sector to meet the energy deficit. So far, progress in this area has been slow

Lessons in Implementing Energy initiatives

- Strategies for expanding access to energy must be fully integrated with development plans.
- A satisfactory legal and regulatory framework, a robust financial sector and stronger institutional capacity in the sector will all help to attract the necessary private investment
- Regional power pools enable energy-rich countries to export to other countries.

Thank you

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Key Energy Initiatives

- Energy Africa campaign (DFID),
- Power Africa (Obama presidency),
- Sustainable Energy Fund for Africa (AfDB),
- the Dakar Agenda for Action (DAA)

Glossary of Terms

- **Biogases**

Biogases are gases arising from the anaerobic fermentation of biomass and the gasification of solid biomass (including biomass in wastes). The biogases from anaerobic fermentation are composed principally of methane and carbon dioxide and comprise landfill gas, sewage sludge gas and other biogases from anaerobic fermentation.

- **Liquid biofuels**

Liquid biofuels includes biogasoline, biodiesel and other liquid biofuels. It does not include the total volume of gasoline or diesel into which the biofuels are blended.

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Glossary of Terms

- **Primary solid biofuels and charcoal**

Primary solid biofuels and charcoal are defined as any plant matter used directly as fuel or converted into other forms before combustion. This covers a multitude of woody materials generated by industrial process or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, sulphite lyes also known as black liquor, animal materials/wastes and other solid biomass).

- Charcoal produced from solid biomass is also included here. Since charcoal is a secondary product, its treatment is slightly different than that of the other primary solid biofuels. Production of charcoal (an output in the transformation process) is offset by the inputs of primary solid biofuels into the charcoal production process. The losses from this process are included in the row other transformation. Other supply (e.g. trade and stock changes) as well as consumption are aggregated directly with the primary solid biofuels. In most countries, only the primary solid biofuels are reported.