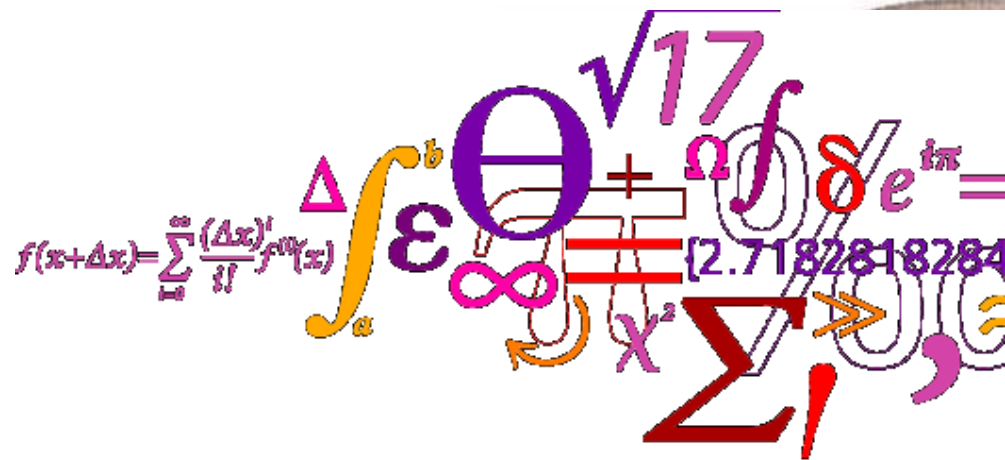


# Energy for Sustainable Development in Africa: Successes, Challenges and the way forward

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# Outline

- Background of UNEP DTU Partnership (UDP)
- Why Energy for SD?
- Africa is rich in energy resource, yet poor in energy access – 'The 66% issue'
- Investment required and # of jobs
- Country case examples (based on some success stories)
- Challenges for Energy for SD in Africa
- Suggestions on way forward (for possible consideration)



UN City, Copenhagen

## UNEP DTU Partnership (UDP)

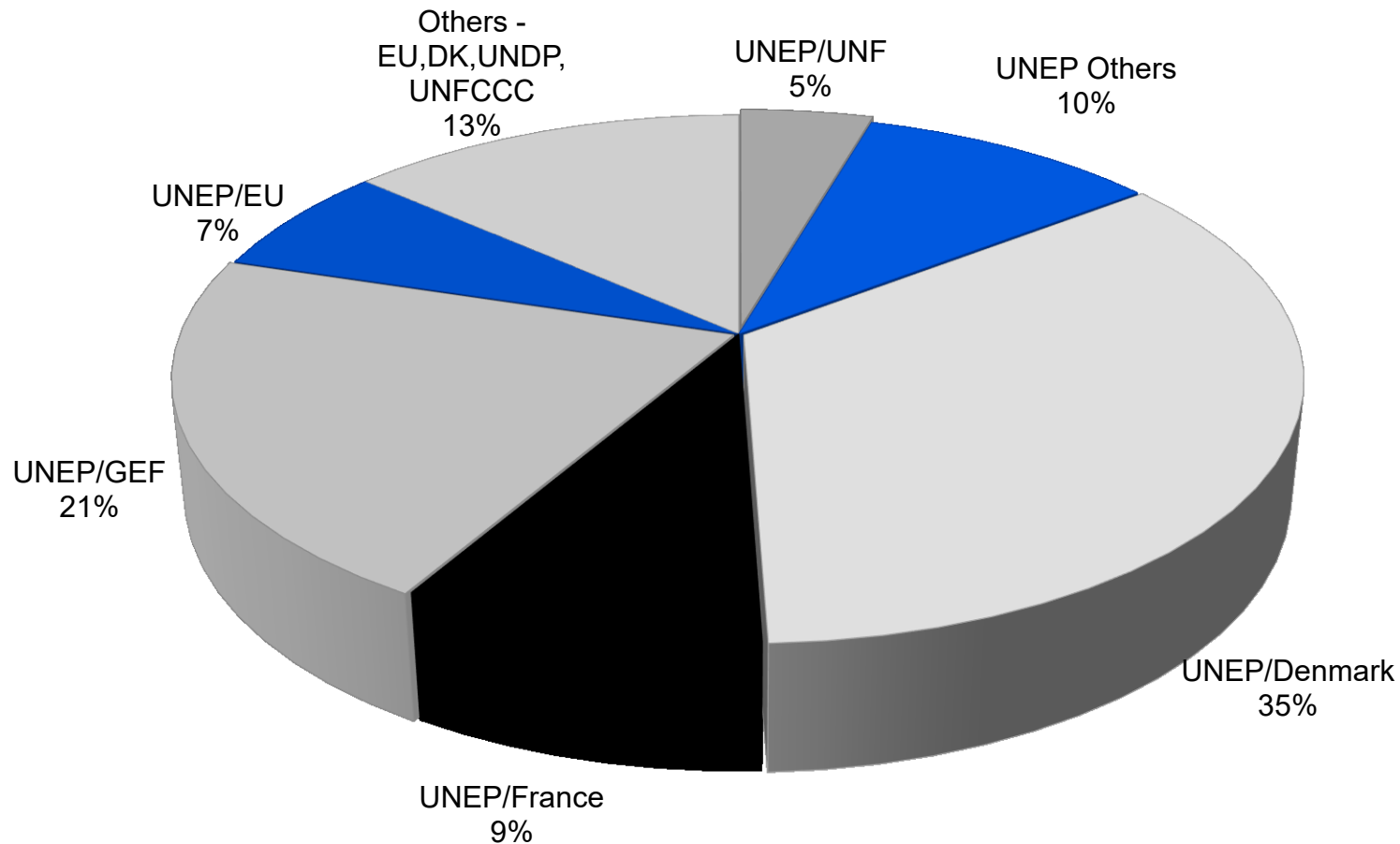


UN City/FN Byen in Nordhavn,  
Copenhagen

UDP was established in 1990 as an independent unit based on an agreement between **UNEP, DTU** and **The Danish Ministry of Foreign Affairs**

General mandate is to support and promote **UNEP activities** in the areas of **energy and climate change**, with a **special emphasis on developing countries**.

## Major donors

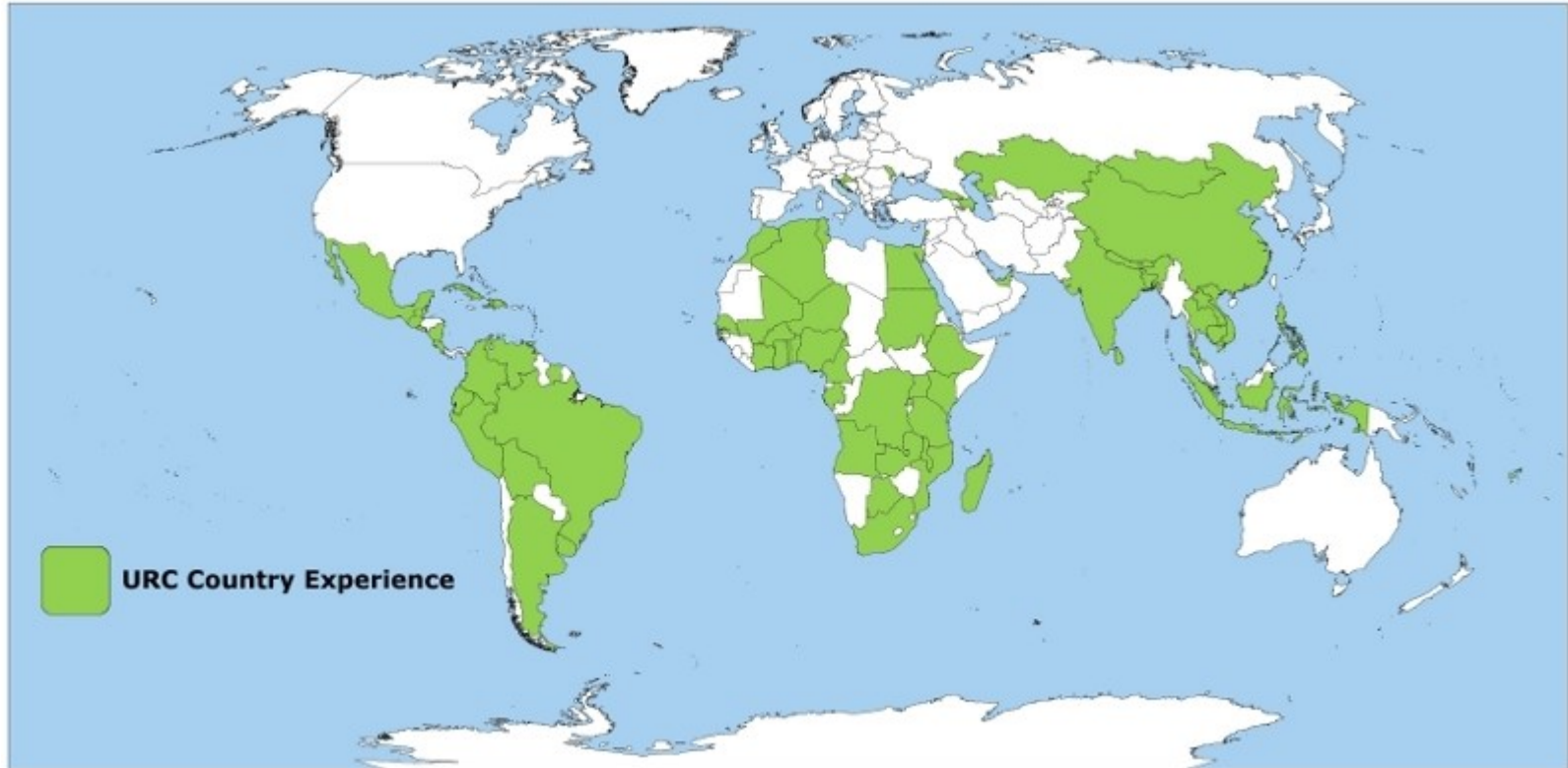


**Annual turnover (2011) = 10 million USD**

# Special setting of UNEP DTU

- Integrated part of UNEP with a core research budget
- >65 economists and scientists from >20 different nations
- Access to a broad range of energy scientists and specialists at DTU
- A wide network of collaborating institutions, NGO's and partners in more than 50 developing countries
- A non profit public institution with high demands to procedures, transparency and accounting

# UNEP DTU Partnership Country Experience



## *Which of these should have the highest priority?*

- Access to **modern energy services** i.e. lighting, cooking etc

- Food security

- Water

- Health

- Jobs

- Gender equity



Source: [www.archive-india.org](http://www.archive-india.org)

***Answer: they are all very important***

However **ENERGY** stands out as an enabler for the rest (WB, 2017)



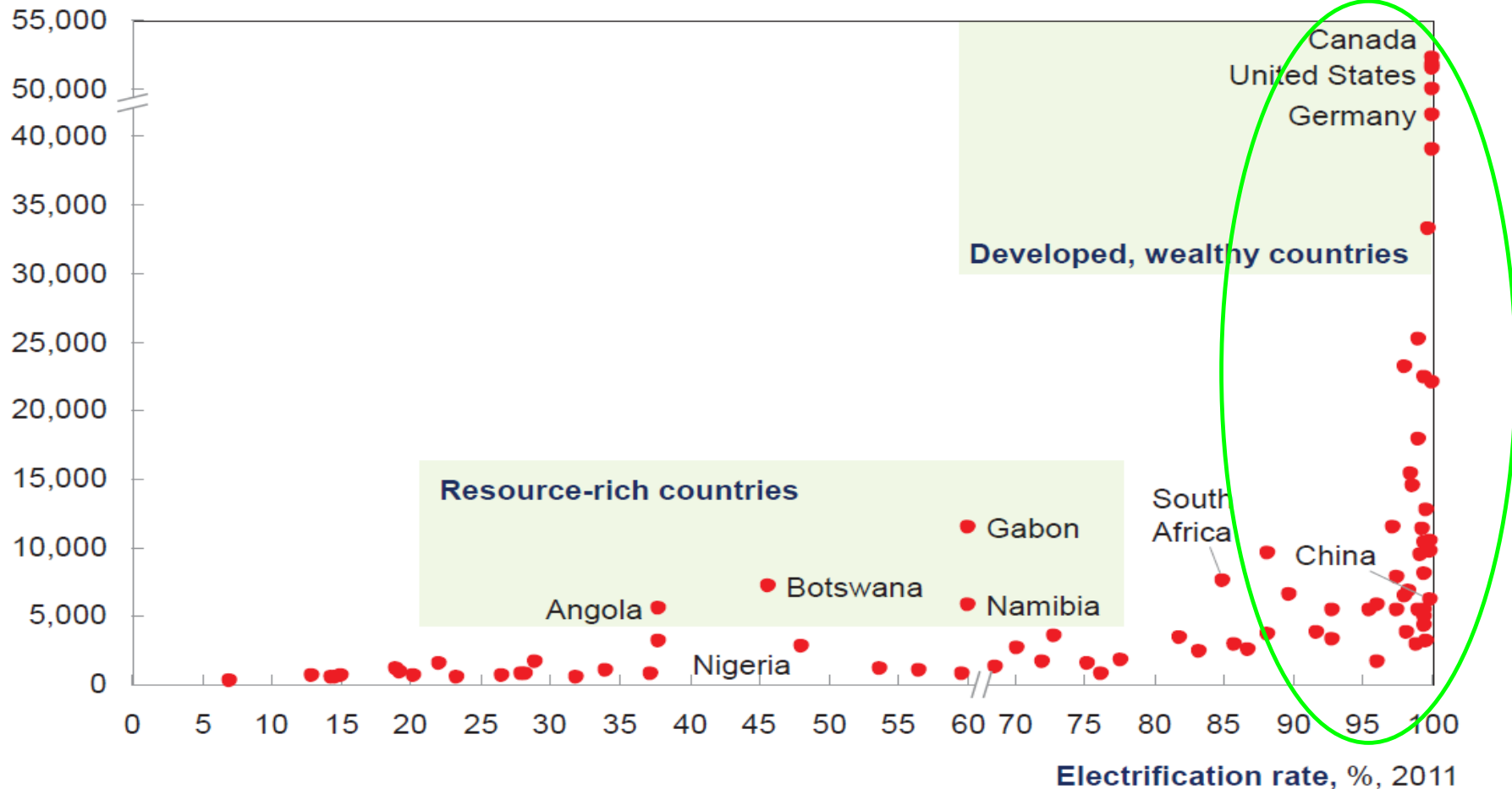
# ENERGY: SDGs Multiplier





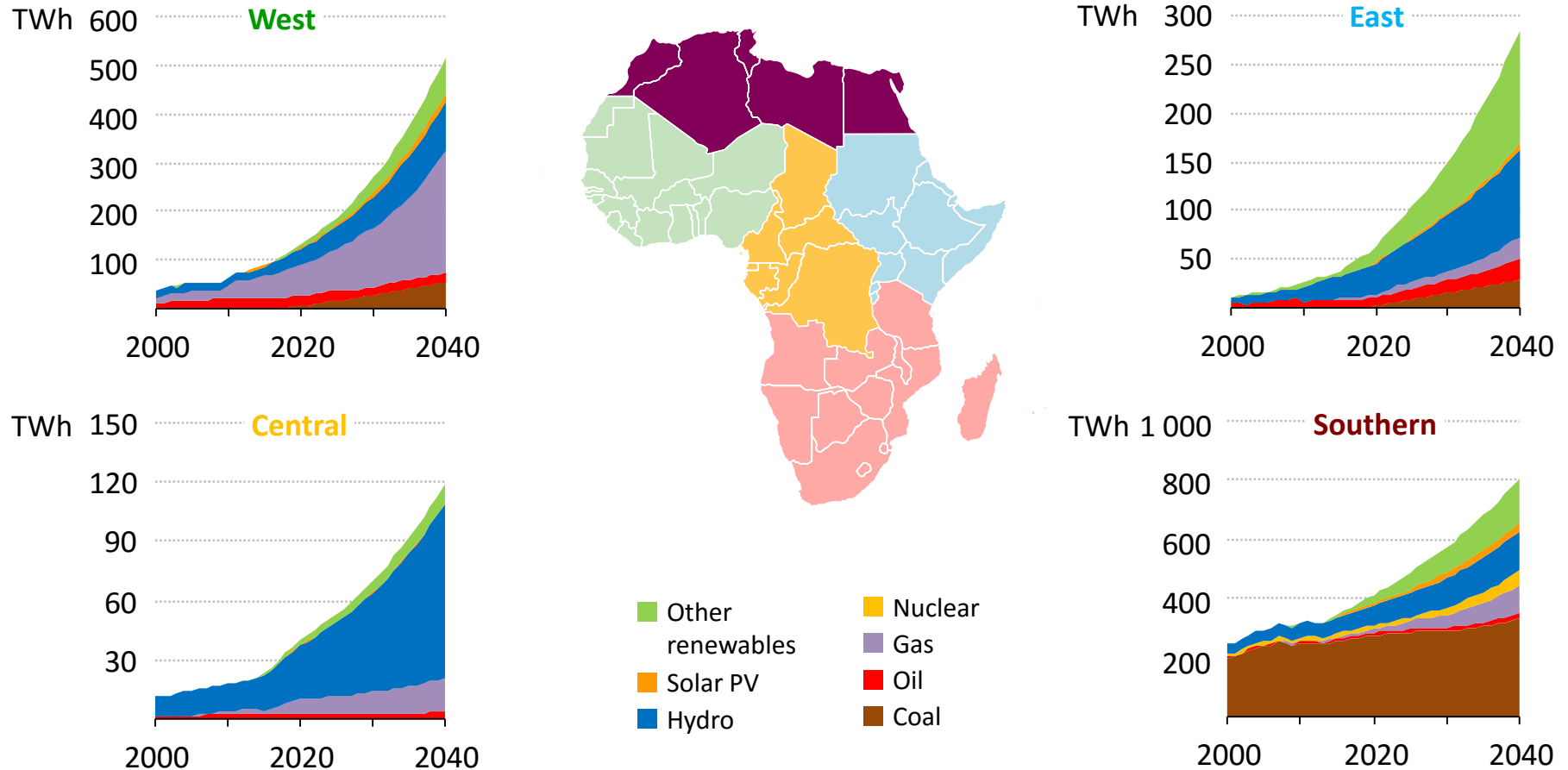
## Relationship between Energy Access & Prosperity

GDP/capita, \$ thousand, 2012



# Africa is rich in energy resource, yet poor in energy access

## Energy Resource Potential in SSA



Source: IEA WEO 2014

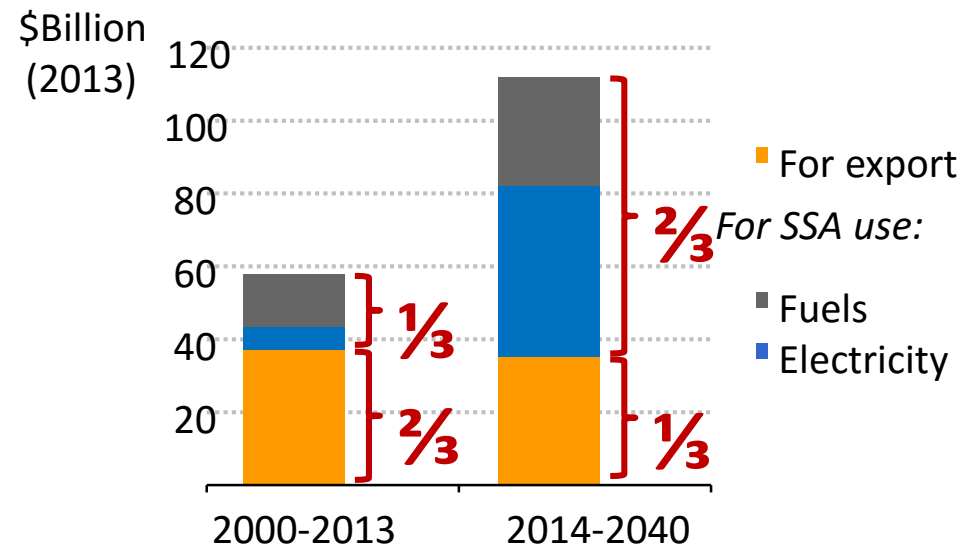
# The current '66% - lack of access, energy investment situation'

- **66%** of SSA population have no access to electricity
- **66%** of energy investments in SSA are for export rather than internal utilization



World Bank 2011

## Average annual investment in SSA energy supply



## Investment (US \$ cummulative)

	Global		SSA
	Now	Year 2040	Year 2040
Energy Supply & Access	1.6 trillion	24 trillion	835 - 958 billion  (for >70% energy access)
Energy Efficiency	130 – 310 billion	5-8 trillion	25 – 29 billion
McKinsey 2015; IEA WEO 2014; IEA Energy Efficiency Market Report 2014;			

- \$40 billion in Energy Access capital savings from regionalization & power pooling (McKinsey, 2015)

## Jobs & Economic Benefits from Energy Access – sub Saharan Africa (SSA)

- Estimated ~ **2.5 million jobs (direct)** by 2040 for achieving **70% Energy Access in SSA** (McKinsey, 2015)
  - **1.9 million jobs** construction of power plants (temporal but skills can be transferred to other construction or related industries afterwards)
  - **300,000 – 450, 0000** day-to-day operation and maintenance of the generation, transmission & distribution management
  - Increased jobs in the supply industries i.e. cement industry
- **Indirect:** value chain e.g. pipelines, rails etc)
- Additionally, **every \$1** invested in Energy Access yields **>\$15** in incremental GDP (IEA WEO, 2014)

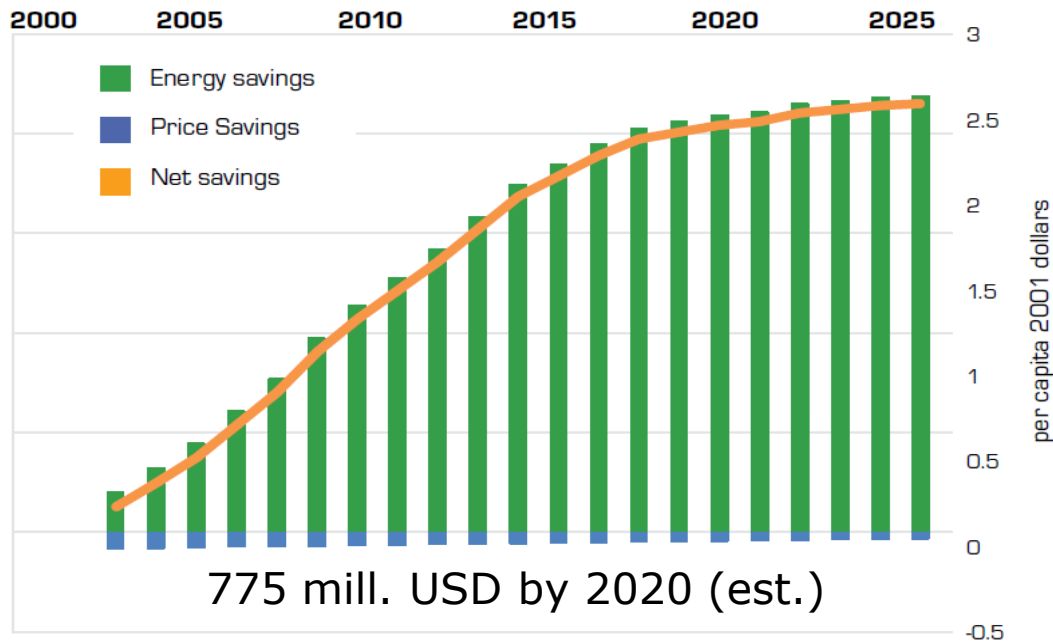


## Case example: Ghana

- Pre-1989, national electrification rate in Ghana was **15%** (rural access only 5%).
- 1989, Ghana launched the National Electrification Scheme (NES) targeted at universal access by 2020.
- The NES comprise of the:
  - District Capitals Electrification Programme (DCEP) targeted at grid extension to all District capitals
  - Self Help Electrification Programme (SHEP) to connect communities within 20km of an existing 33kV or 11kV sub-transmission line to the grid
- By 2011, Ghana recorded national electrification rate of **73%** (5-fold increase from 1989 level).
- Private sector was encouraged to support electricity generation which in 2001 led to Ghana's first IPP (Takoradi International Company, TICO) to generate 1040 GWh
- Similar experience by Egypt and Morocco. Eg. Morocco increased rural access from 18% (1995) to 96.5% by 2009 (via its PERG initiative).

## Energy Efficiency – (a 'resource' seen in Ghana to complement national energy access drive) & savings

### Ghana's room air conditioners



Source: CLASP 2015; Agyarko, 2014

### Estimated cost savings/year for Ghana

- Room air conditioners – **30 mill. USD**
- Refrigerators – **72 mill. USD**
- CFLs – **39.5 mill. USD**
- **Additionally, 100 Jobs (2 CFL factories)**

- **Strong political will & target setting was a key driver**



## Challenges for Energy for SD in Africa

A study by Brew-Hammond et al. (2014) revealed key reasons to be:

- The seemingly lack of a strong political will to bridge the rural-urban access gaps
  - however, with the SDG (7) and SEforAll, signs appear promising
- Lack of **well designed** and **implemented policies** targeted at strengthening the institutional structures to promote expanding energy access
- Lack of private sector involvement
  - Uncompetitive tariff regimes (enabling policies/framework are essential)
- Rural electrification and connecting the last mile
  - Decentralization of energy systems hold good promise
- Strengthening the existing grid
- Pioneering work by UNEP/UDP via GNESD (2014) shows that informal settlements in peri-urban communities (a considerable and ever growing population in developing countries) should also be considered

- Strong **political will** and **target setting** will drive Energy Access goals
- Reversing the 66% situation
- Strengthening the existing grid (to solve the reliability and quality issues)
- Increased regional integration and power pooling
- Decentralization of electrification schemes (especially for rural electrification and electrifying the last mile)
- Productive uses and enterprise development from energy access, to create wealth and reduce poverty
- Boosting investor confidence and access to finance (domestic, private, international)
- Energy efficiency has potential to enhance energy access (i.e. grid reliability, expansion). It should be considered as important energy RESSOURCE.
- Do not forget to electrify the informal settlements in peri-urban communities (GNESD 2014, GNESD 2008)

# Thank you

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