Universal access to affordable, reliable and modern energy services

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World Bank Energy and Extractives

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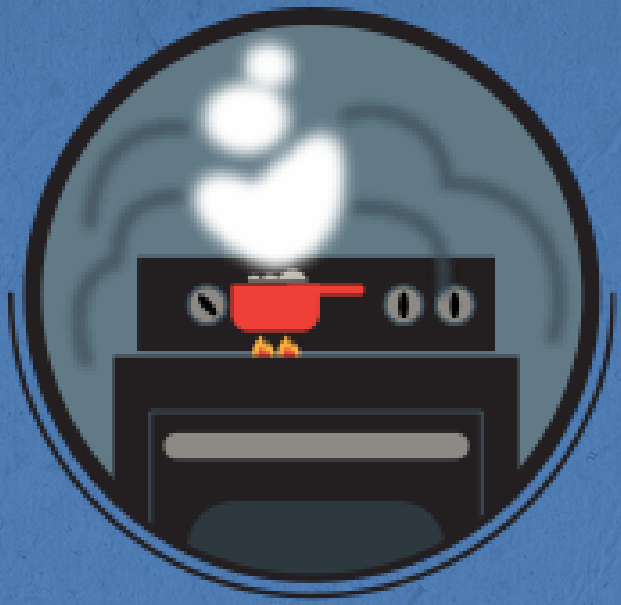
What does the energy access challenge involve?



Energy Access Redefined: adequate quantity, available when needed, good quality, reliable, convenient, affordable, legal, healthy and safe

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Why do we care about energy access?

Access is a means to many ends

Access to energy is crucial for socio-economic development.

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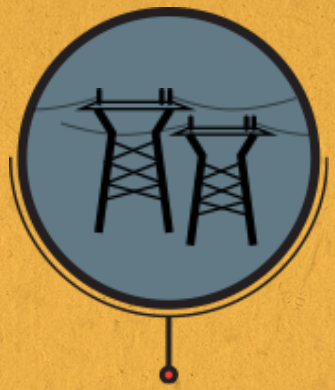
Why think beyond connections?

BEYOND CONNECTIONS MEANS:

Off-grid solutions



Quality and quantity of grid electricity

Upstream electricity projects

Clean cooking solutions

Energy for community facilities and productive engagements

Energy access can no longer be understood
in terms of number of grid electricity connections.

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Measuring energy access: the multi-tiers

TIER 0	TIER 1	TIER 2	TIER 3	TIER 4	TIER 5
	4HR	4HR	8HR	16HR	23HR

Improving attributes of energy supply leads to higher tiers of access.

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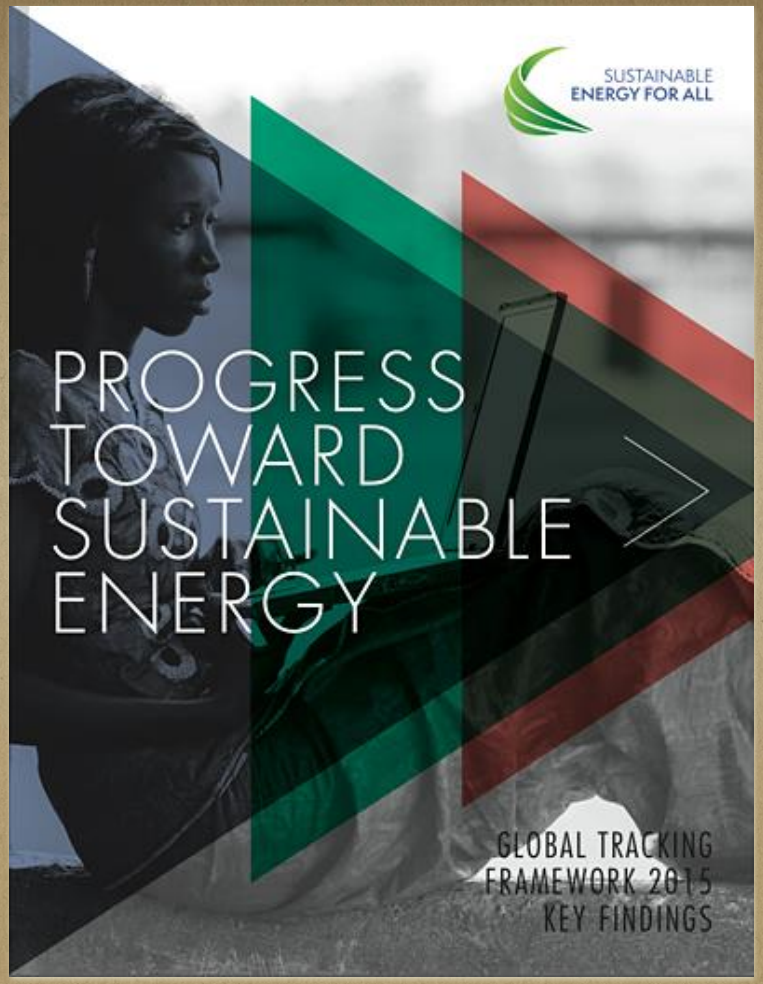

PROGRESS TOWARD SUSTAINABLE ENERGY: GLOBAL TRACKING FRAMEWORK 2015

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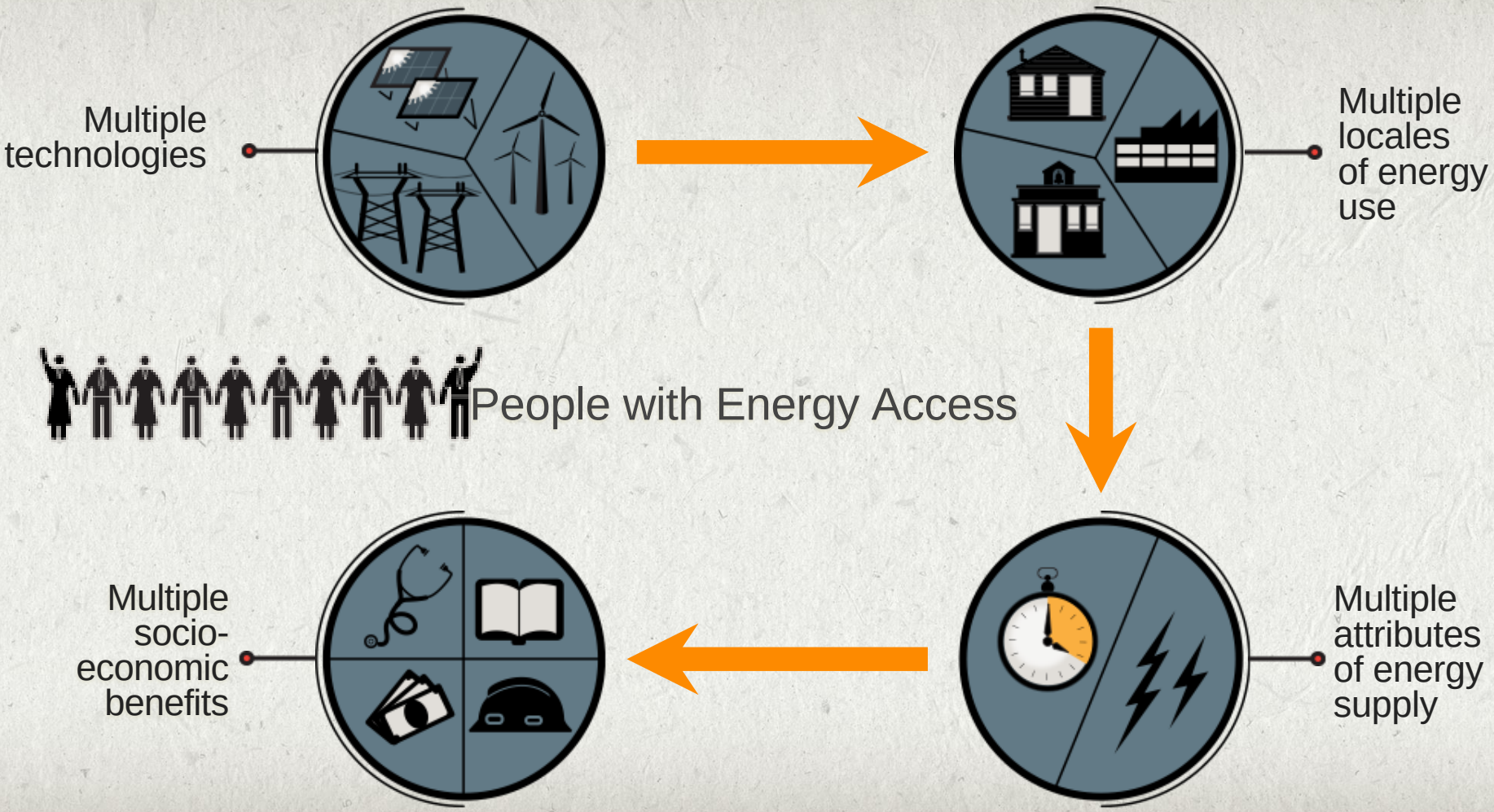
Shifting the energy access paradigm



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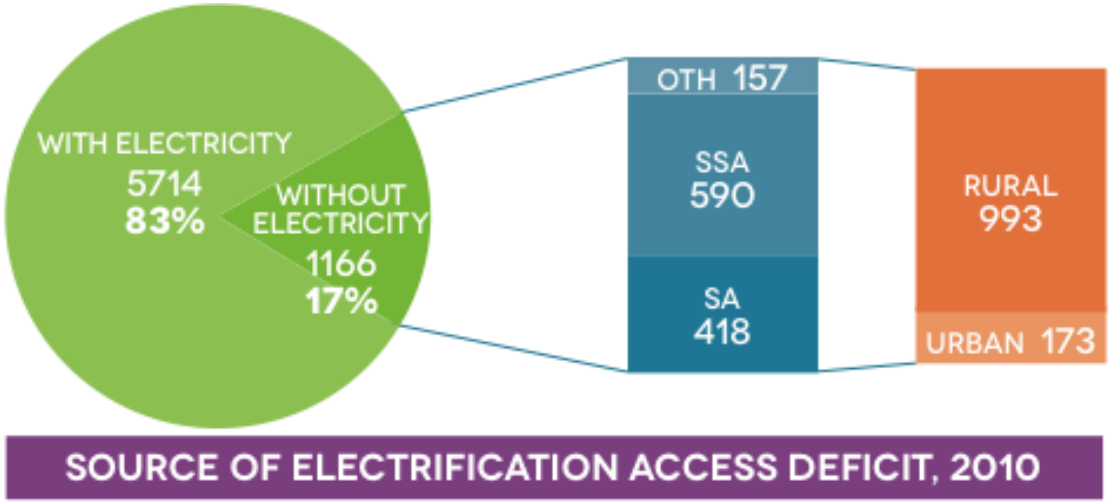
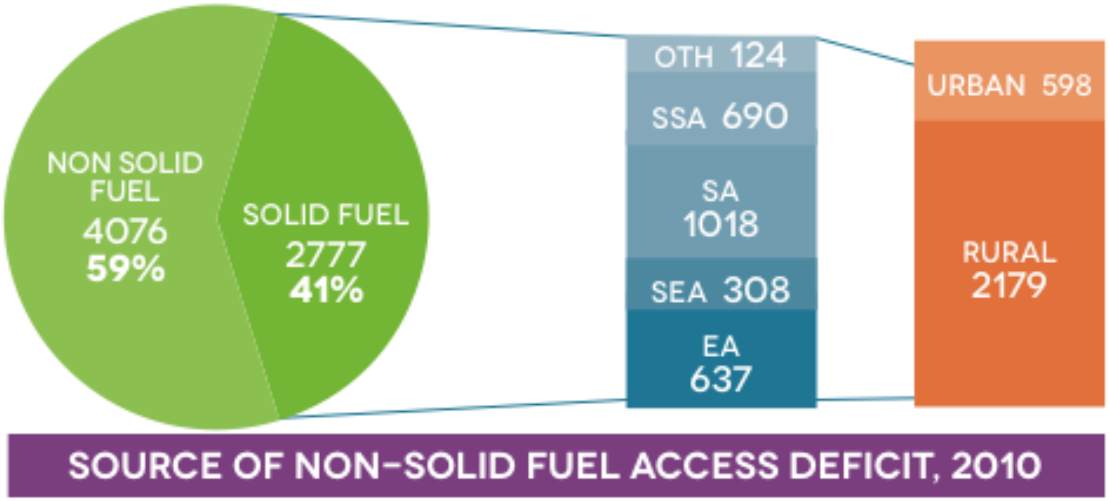
ENERGY CHALLENGE – ENERGY DEFICIT

1.1 billion people live without any electricity

2.9 billion cook with health-damaging solid fuels

Another 1 billion are connected to the grid but have only intermittent service





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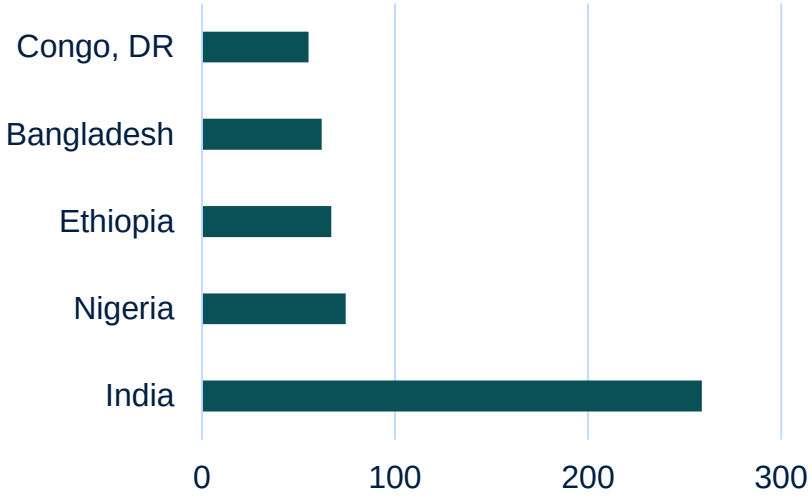
SOURCE: WB, WHO
NOTE: ACCESS NUMBERS IN MILLIONS OF PEOPLE. EA = EASTERN ASIA; SEA = SOUTH-EASTERN ASIA; SA = SOUTHERN ASIA; SSA = SUB-SAHARAN AFRICA; OTH = OTHERS.

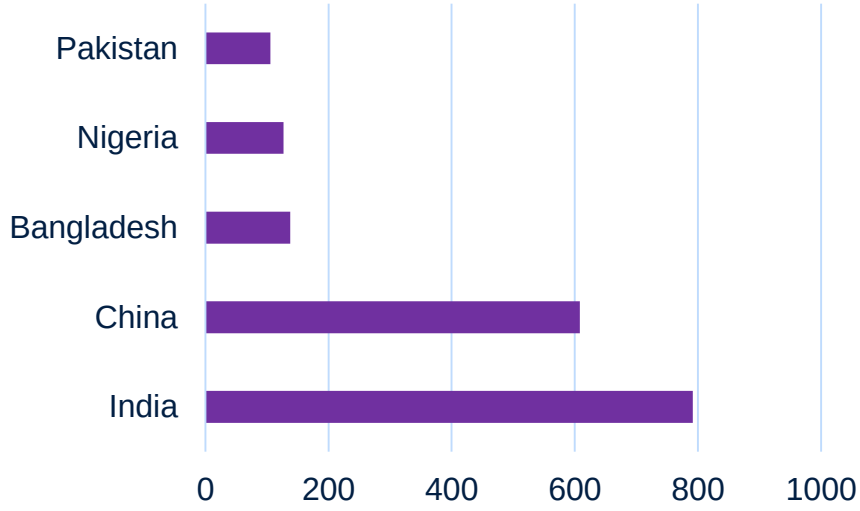
SPATIAL DISTRIBUTION (TOP 5 COUNTRIES)

Top 5 countries with largest population without electricity access, millions of people, 2012



Source: World Bank, Global Tracking Framework, 2015 (data from 2012).

Top 5 countries with largest population without access to non-solid fuels, millions of people, 2012



Source: World Bank, Global Tracking Framework, 2015 (data from 2012).

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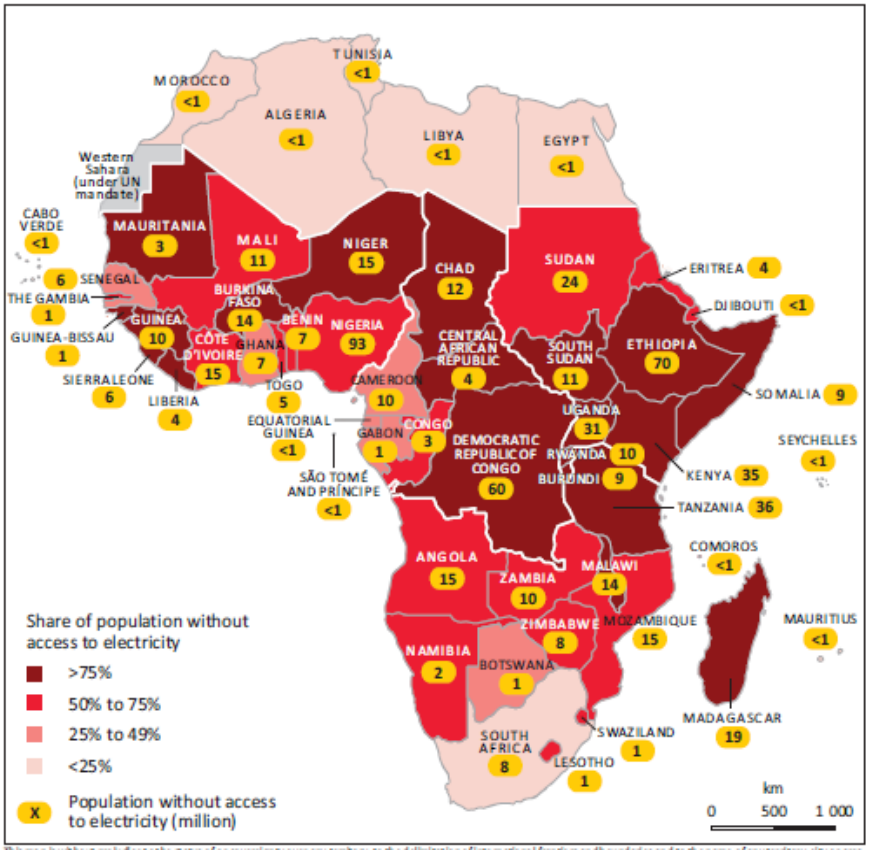
EXAMPLE: AFRICA'S ENERGY DEVELOPMENT CHALLENGE

*Increased energy access leads to **economic growth**, **poverty reduction**, and **shared prosperity***

- 600 million people and 10 million SMEs have no access in Africa
- Energy growth is not keeping pace with GDP growth



Source: EU and World Bank Estimates

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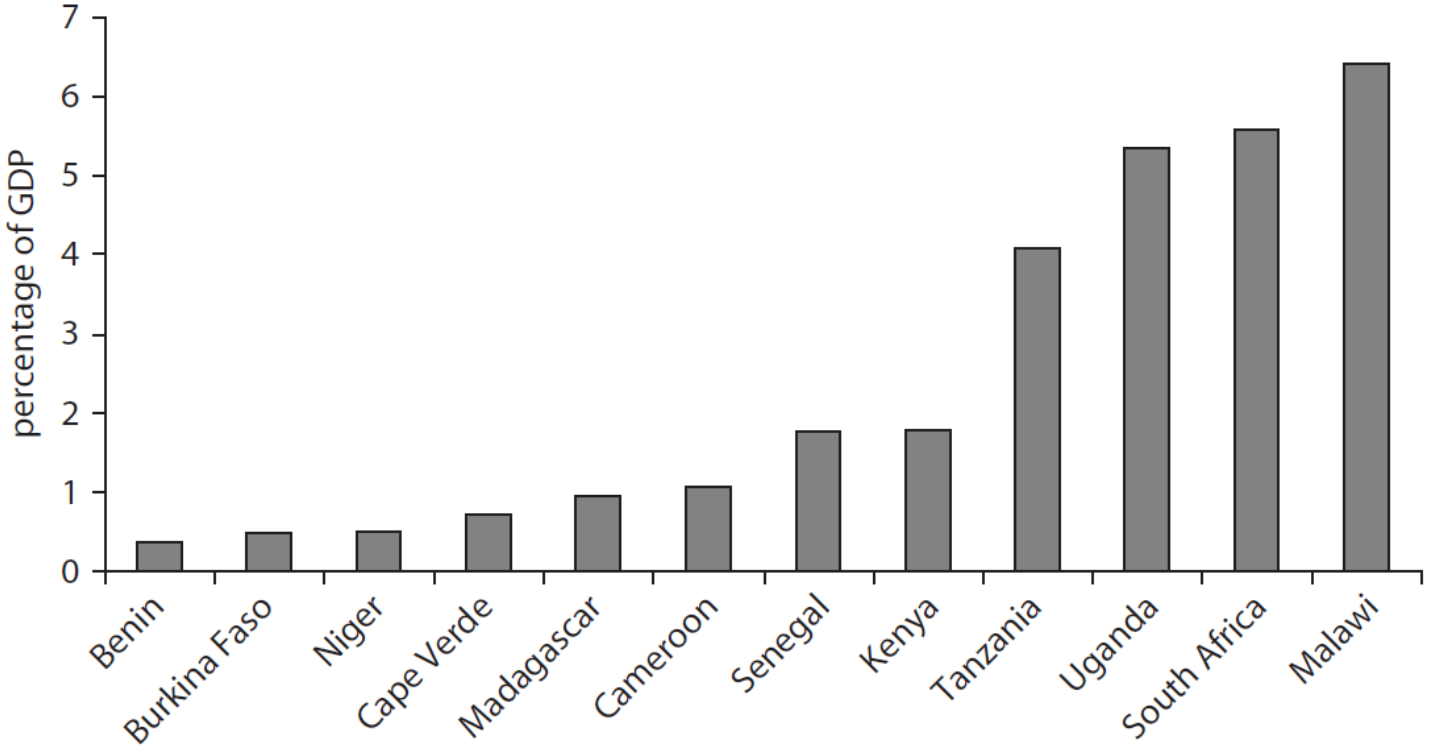
ECONOMIC IMPACT OF SHORTFALL

Economic Cost of Power Outages as Share of GDP, 2005



Source: Briceño-Garmendia 2008 and authors' calculations of own-generation costs based on Foster and Steinbuks 2008.

Note: GDP = gross domestic product.

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2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030.

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

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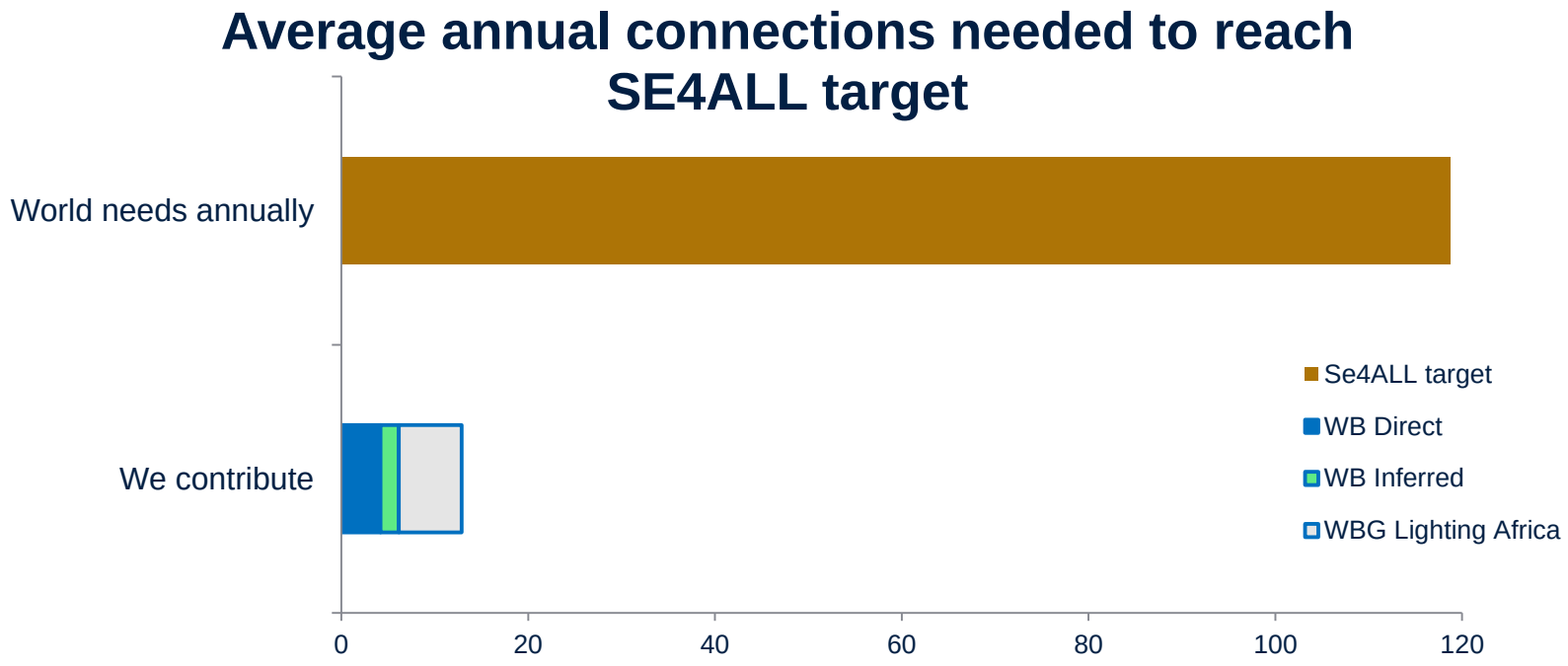
THE UNIVERSAL ACCESS CHALLENGE IS ENORMOUS



- Only 14 years left to reach the universal access target
- 1.1 billion need electricity today = 1.9 billion by 2030 (= average 120 million annually)

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HOW CAN WE SCALE UP?

A. Provide more resources

- Increase access lending as a share of energy lending (currently 5%)
- Integrate with non-access projects (e.g. more explicit links with G+T+D investments)
- Integrate with non-energy projects (e.g. urban/rural; agriculture)

B. Improve cost-effectiveness

- Scope to scale up lower-cost connections through densification and off-grid solutions
- Scope to reduce costs of grid extension through more appropriate designs
- Scope to be more active in slum electrification (high density+ poverty = high impact)
- Make access an integral part of sector reform / sector dialogue
- Improve planning and implementation – e.g. support programmatic involvement

C. Leverage innovation

- Off-grid electrification – tremendous innovation in technology, markets, business models
- Possible to leverage impacts undreamed of 5 years ago
- Distributed generation – potential to combine grid-connected and off-grid renewable energy market
- Energy efficiency – can help drive access agenda
- Support productive uses/gender to increase impact

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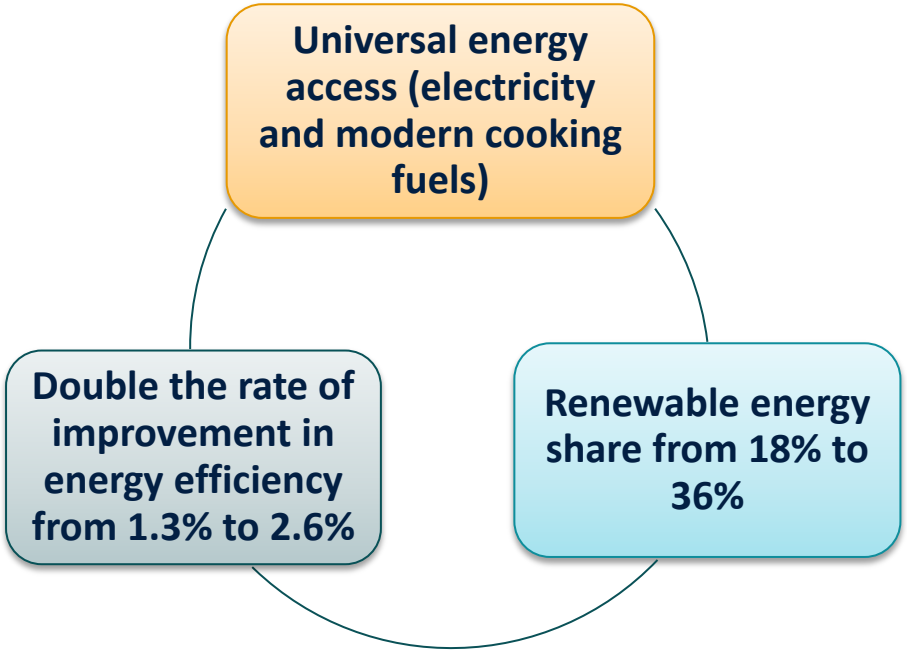
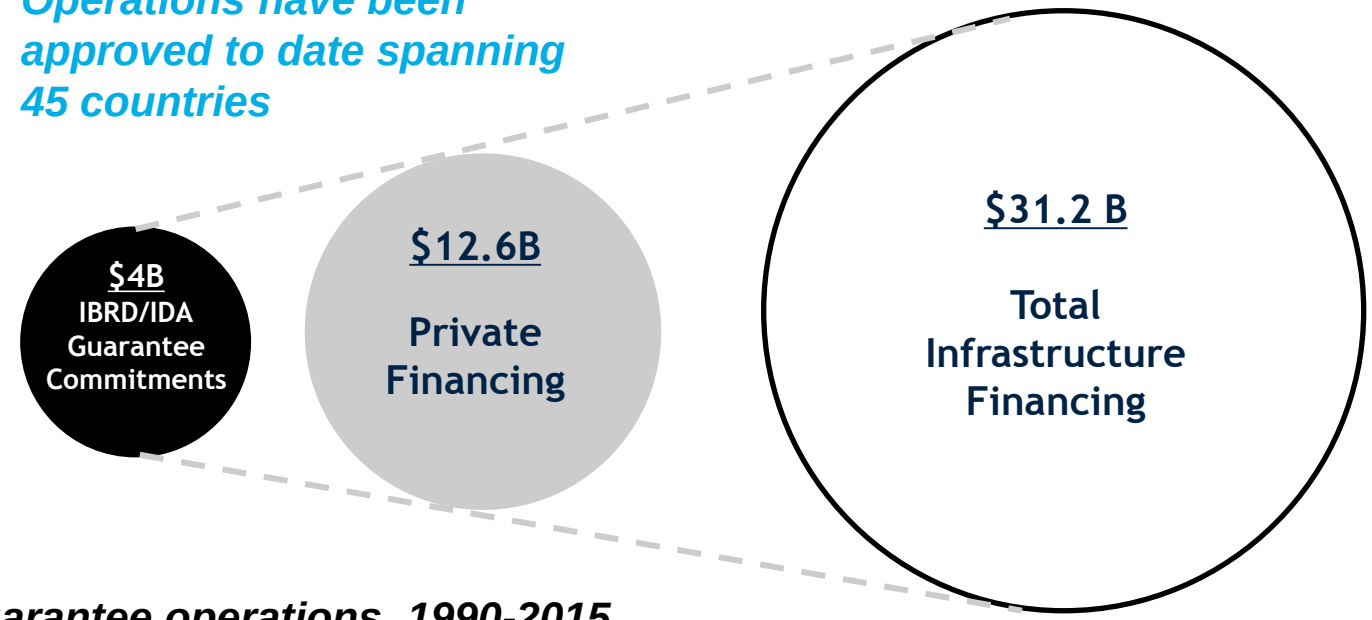
ENERGY EQUITY: INVESTMENT REQUIREMENTS



	Current Annual $US bn	Required Annual $US bn	Scale-Up Gap
Energy Access	9	45	500%
Energy Efficiency	225	393 (615 WEO-450)	175%
Renewable Energy	244	320 (442 WEO-450)	131%
SE4All Total	478	758 – 1,102	158%

MOBILIZING PRIVATE CAPITAL TO ADDRESS CHALLENGE

56 World Bank Guarantee Operations have been approved to date spanning 45 countries



***All guarantee operations, 1990-2015**

✓ **Optimizing the Use of the Bank's "AAA" Balance Sheet to Leverage Private Capital**

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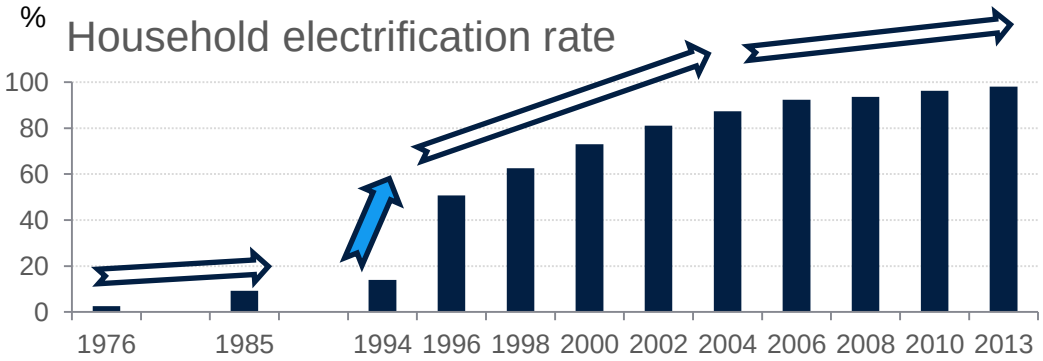
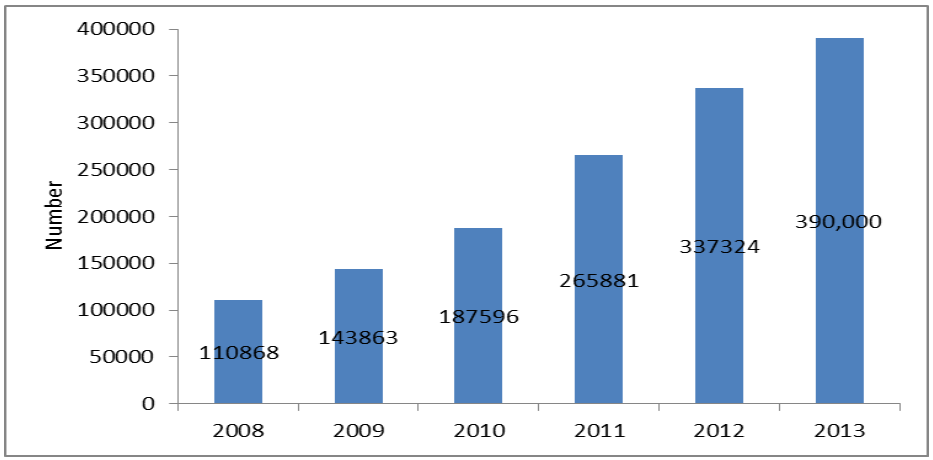
ENERGY EQUITY: SCALING UP GRID EXPANSION

Many countries have a population density that supports successful grid upgrade

Vietnam- last mile grid electrification





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ENERGY EQUITY: GRID EXTENSION FOR THE POOREST

Slum populations

- Nearly one billion people live in slums; UN Habitat forecasts 1.5 billion by 2020 and 2 billion by 2030
- Slum dwellers often show as electrified in household surveys, but many connections are illegal and unsafe
- Current potential: 300-500 million households.

Unelectrified in electrified areas

- Over half of the unelectrified in South Asia and about a third in SSA live in electrified areas. These are an "easy" target for densification

Reduce grid extension costs

- US distribution networks built at fraction of costs of African grids (NRECA)
- Better planning, appropriate technical standards and procurement processes can cut the costs by at least half

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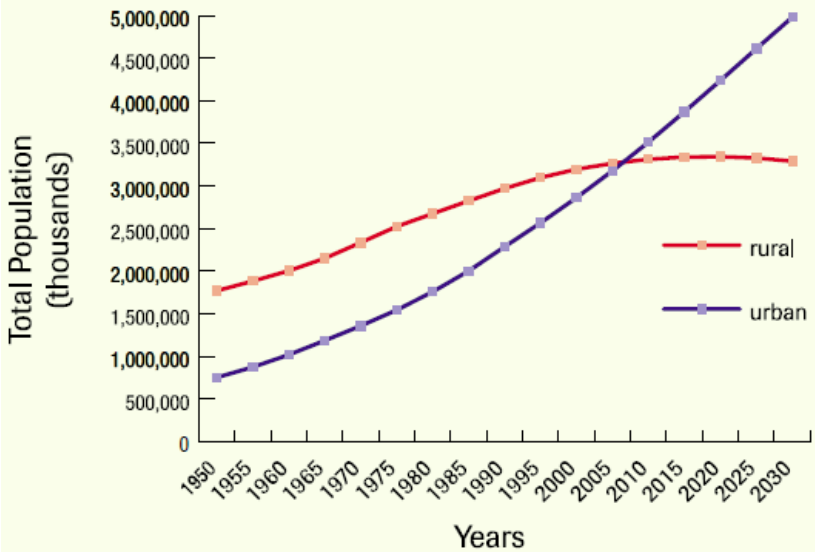
World Population Growth



Country	Densification potential (mn)	% of unelectrified
India	214.2	68%
Tanzania	7.9	22%
Ghana	5.4	54%
Kenya	20.9	61%
Nigeria	62.5	82%

WB estimates based on available data

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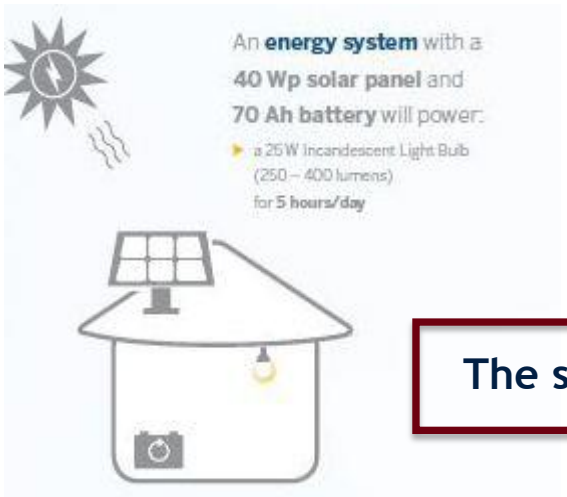
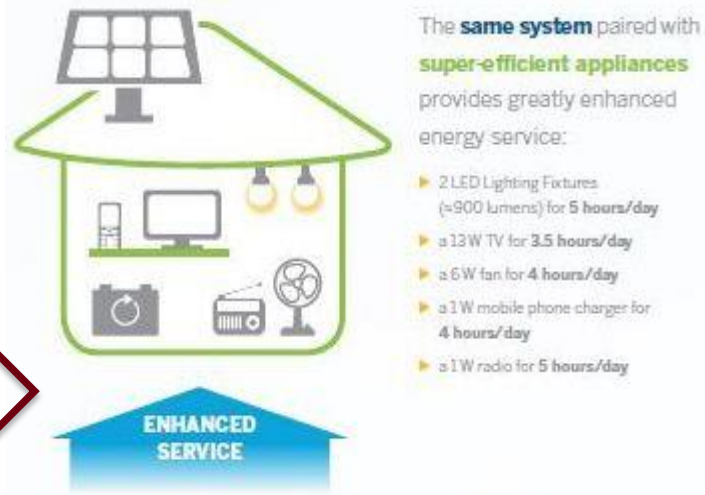
TECHNOLOGY ADVANCES ARE HELPING ACCELERATE ACCESS

System sizes	Able to power	Price
Currently available		
30 Wp	2 LED lights + a 14” flat-screen color TV	Under US$ 200
50 Wp	4 LED lights + a 14” flat-screen color TV + a fan	Under US$ 400
Soon to be available (with the state of the art energy efficient appliances)		
40 Wp	2 LED lights + a 21” flat-screen TV + a fan + a mobile phone charger + a radio	Under US$ 250



10 years ago = one light

The same 40 Wp system



Today = two lights, TV, radio fan, cell phone charging

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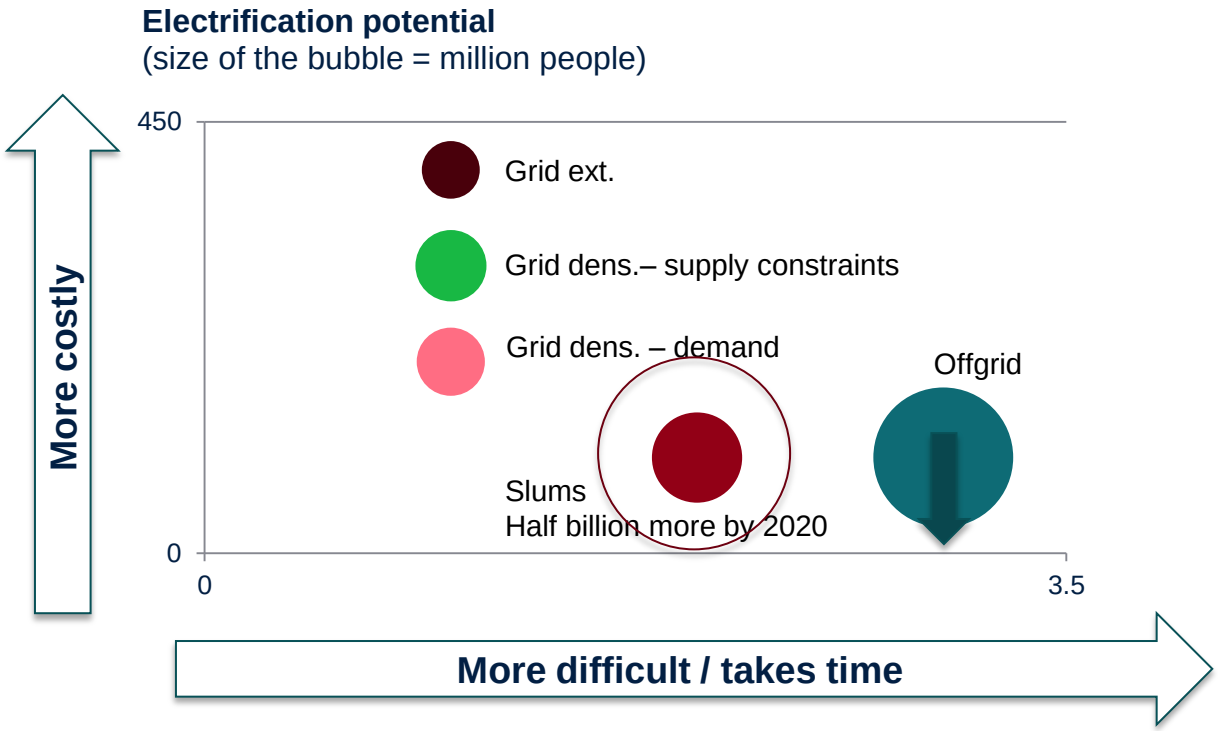
CHANGE INTERVENTION MIX: BALANCE QUICK WINS WITH HIGH IMPACT



- Potential to increase impact and lower costs
  - Increase support to grid densification and slum electrification
  - Reduce costs of grid extension through appropriate designs
  - Leverage cost reductions and innovations in the off-grid space

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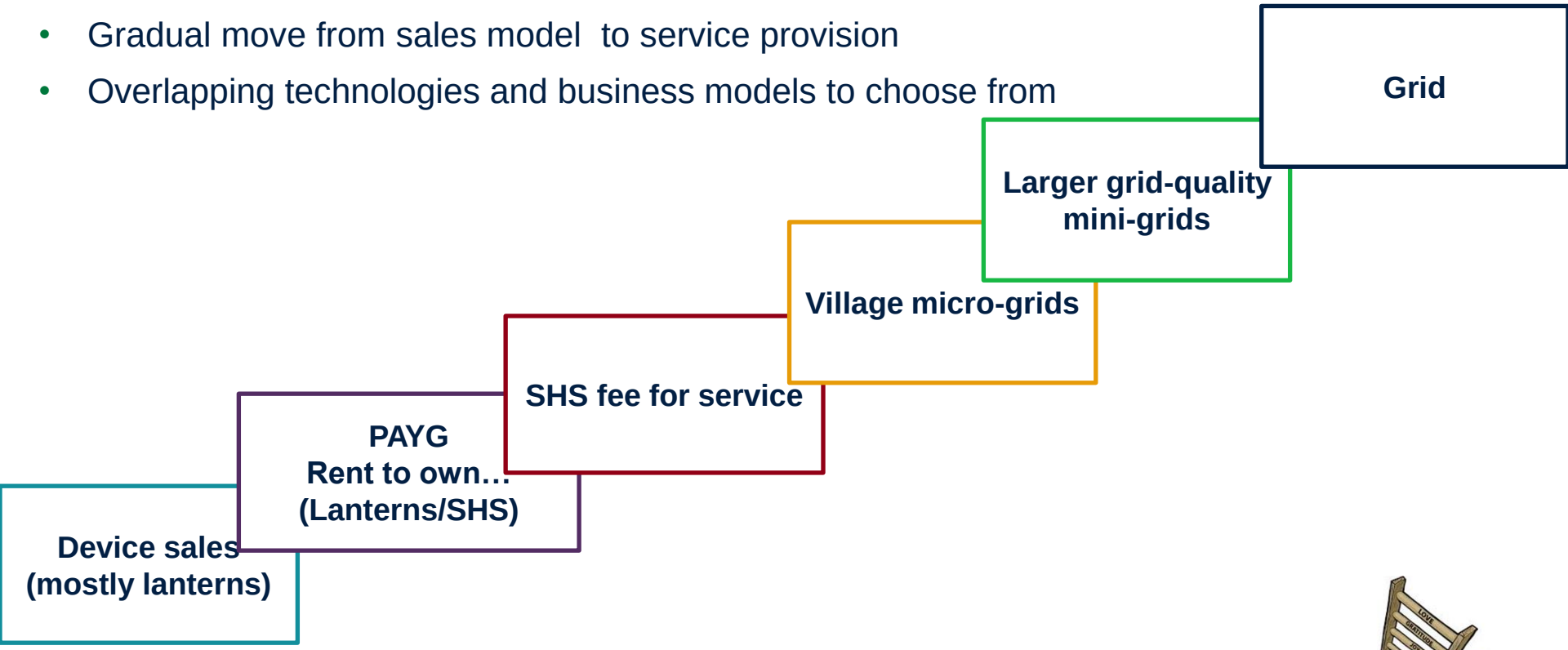
CLIMBING THE ENERGY LADDER

- Not only falling costs and efficiency improvements:
- Pay as you go, mobile payments, smart micro-grids are transforming business models
- Gradual move from sales model to service provision
- Overlapping technologies and business models to choose from



- Lanterns often the first step in energy service chain
- Higher tiers limited by affordability
- Service approach improves affordability (no high upfront payment) and helps people to reach higher tiers

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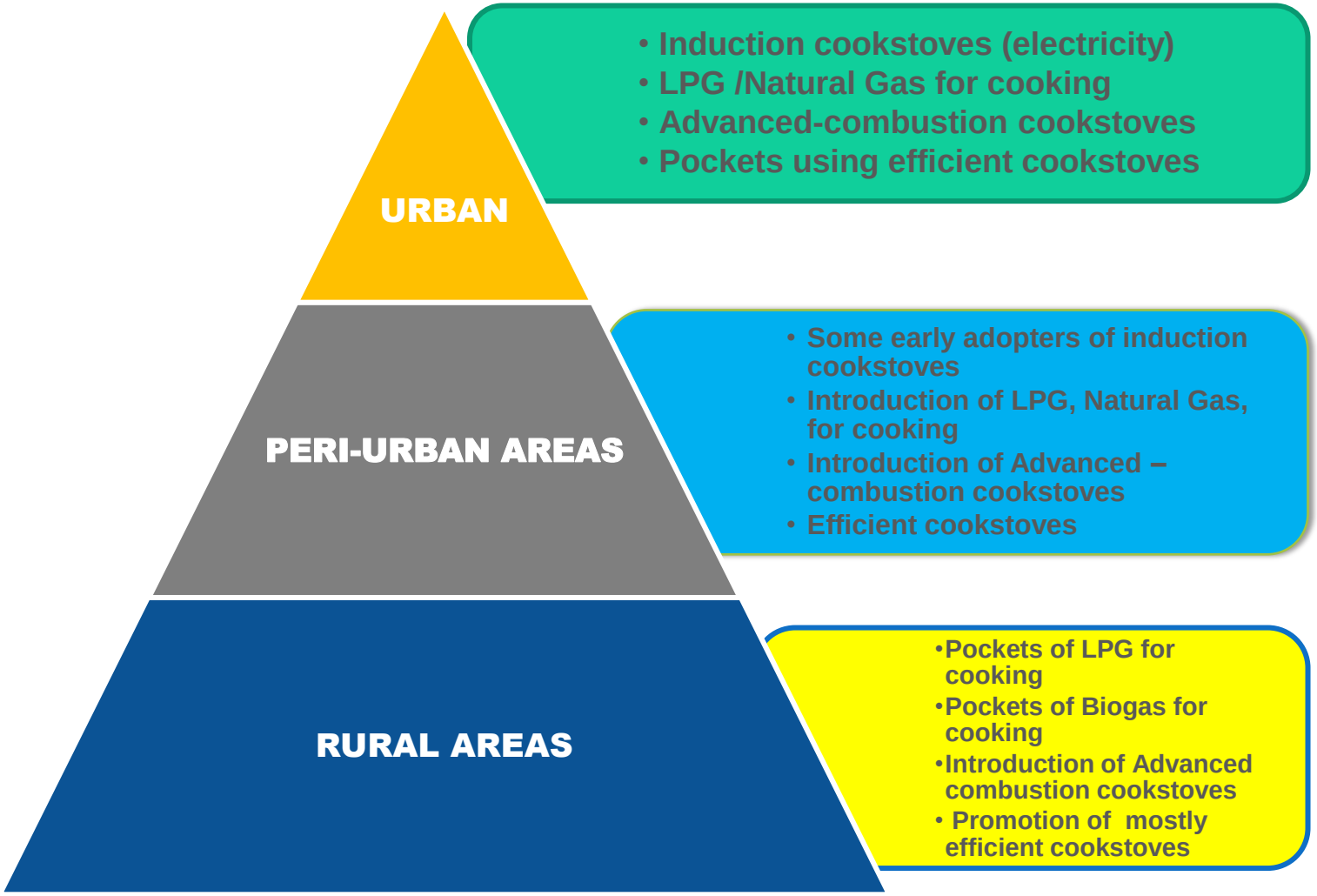
THE CLEAN COOKING SOLUTIONS PYRAMID



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Thank you