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Applying scientific thinking in the service of society

Turning science on: Improving access to energy in sub-Saharan Africa

South Africa

Mauritius

Cameroon

Mozambique

Ghana

Senegal

Kenya

Uganda

Nigeria

Zimbabwe

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Overview

- The publication presents an overview of the **current status** of access to electricity and modern fuels in sub-Saharan Africa.

- The importance of energy access to the achievement of the **Millennium Development Goals (MDGs)** is underlined and some **key interventions** that have worked in Africa are described.

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Current Status

Access to energy in sub-Saharan Africa (SSA) is the lowest in the world, even though Africa has significant energy resources in the form of oil, gas, coal, hydro and renewable energy.

Source: World Development Report (2009)

In SSA, **585 million** people or approximately **70%** of the population do not have access to electricity

In **some countries**, such as the DRC, Malawi and Uganda, over **90%** of the population has no access to electricity

The entire installed power capacity in SSA is **68 GW**, comparable to that of Spain and 10% of that of Latin America

If South Africa is excluded, installed capacity falls to only **28 GW**

Up to a quarter of this capacity is unavailable due to **poor maintenance**

Energy consumption per capita is barely **1%** of that of high-income countries

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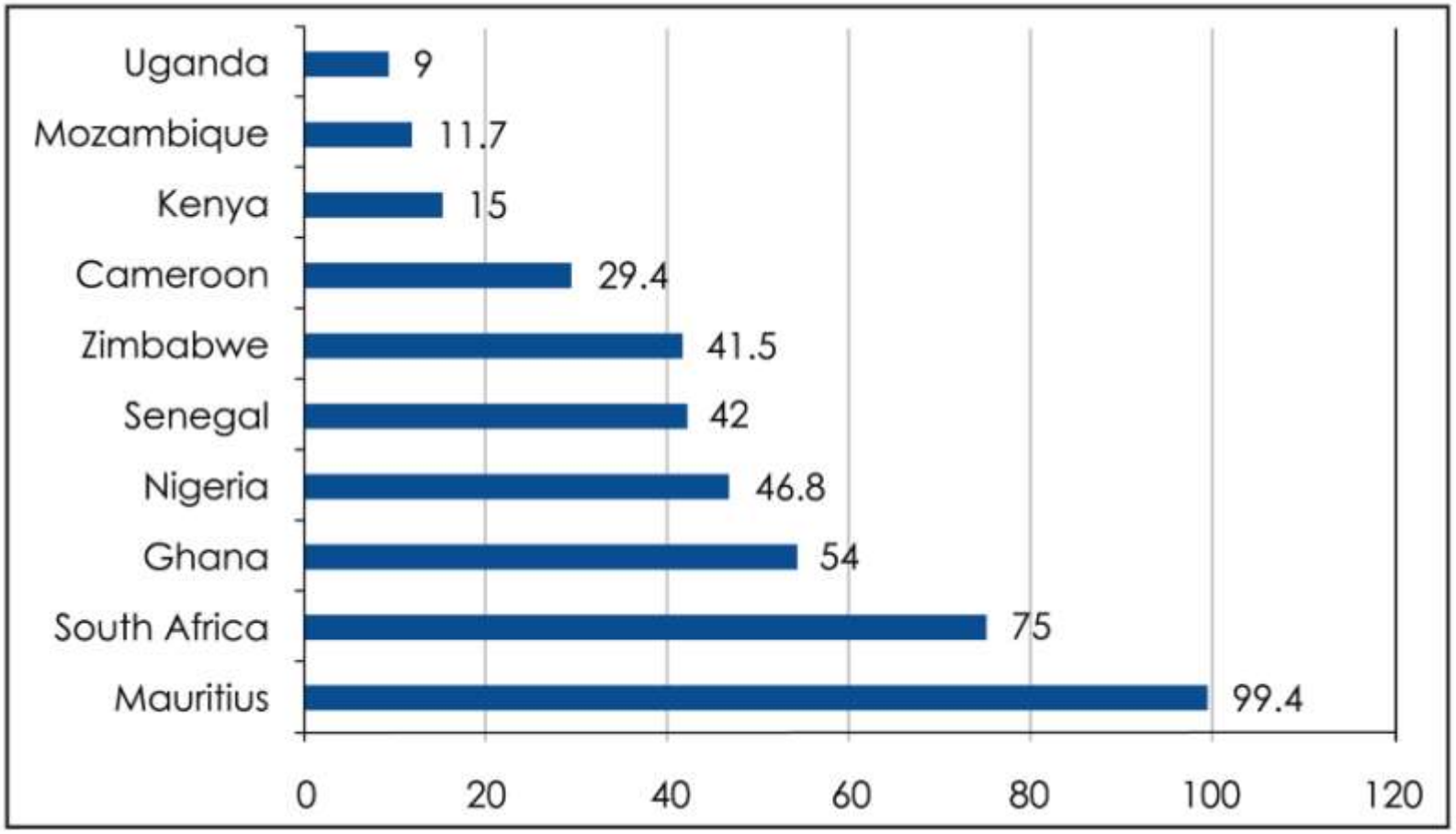
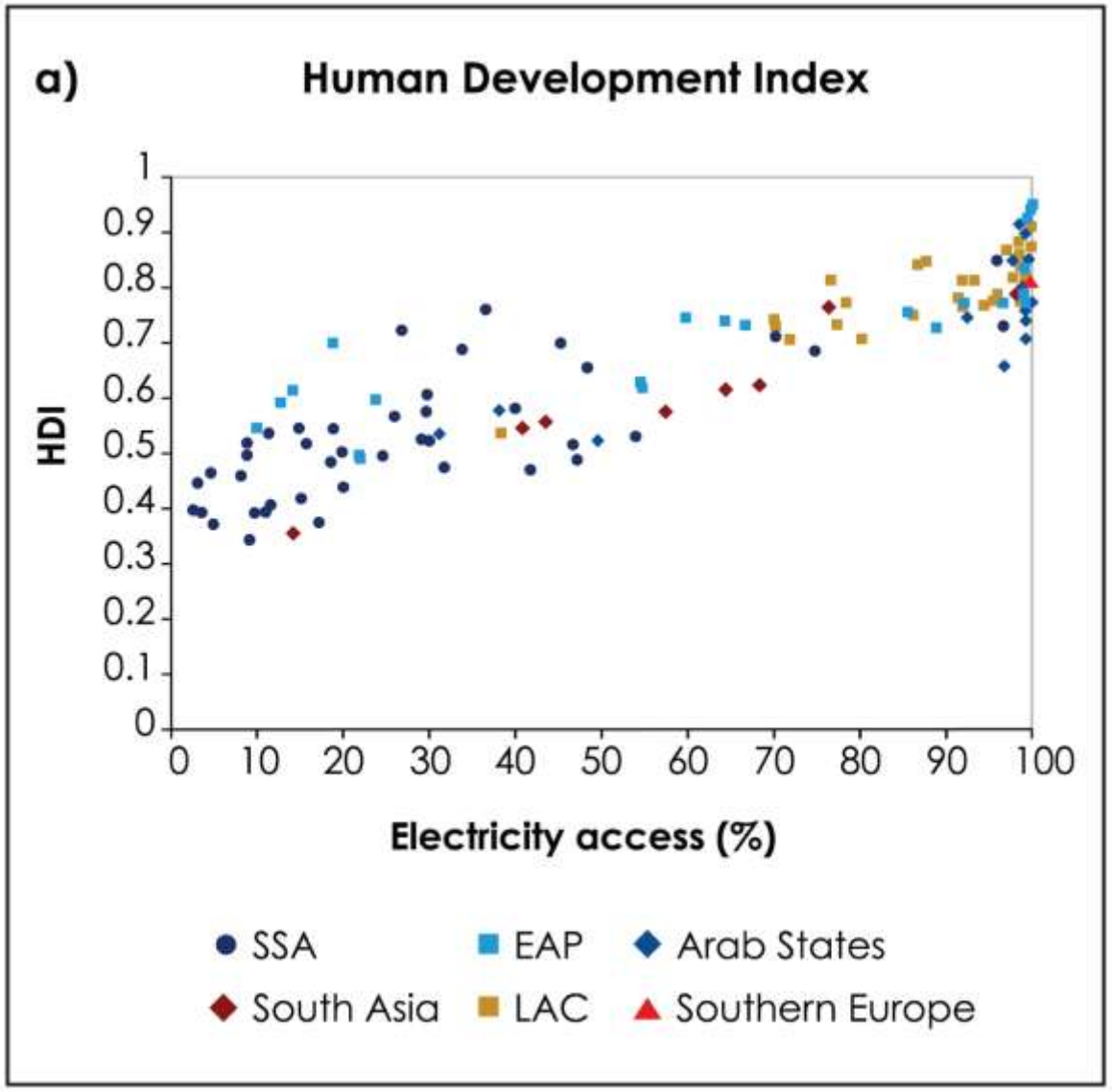
An investment of over **$340 billion** is required to provide all households with electricity

In SSA, 80% of the population or **653 million** people rely on biomass fuels for cooking

Percentage of population with access to electricity

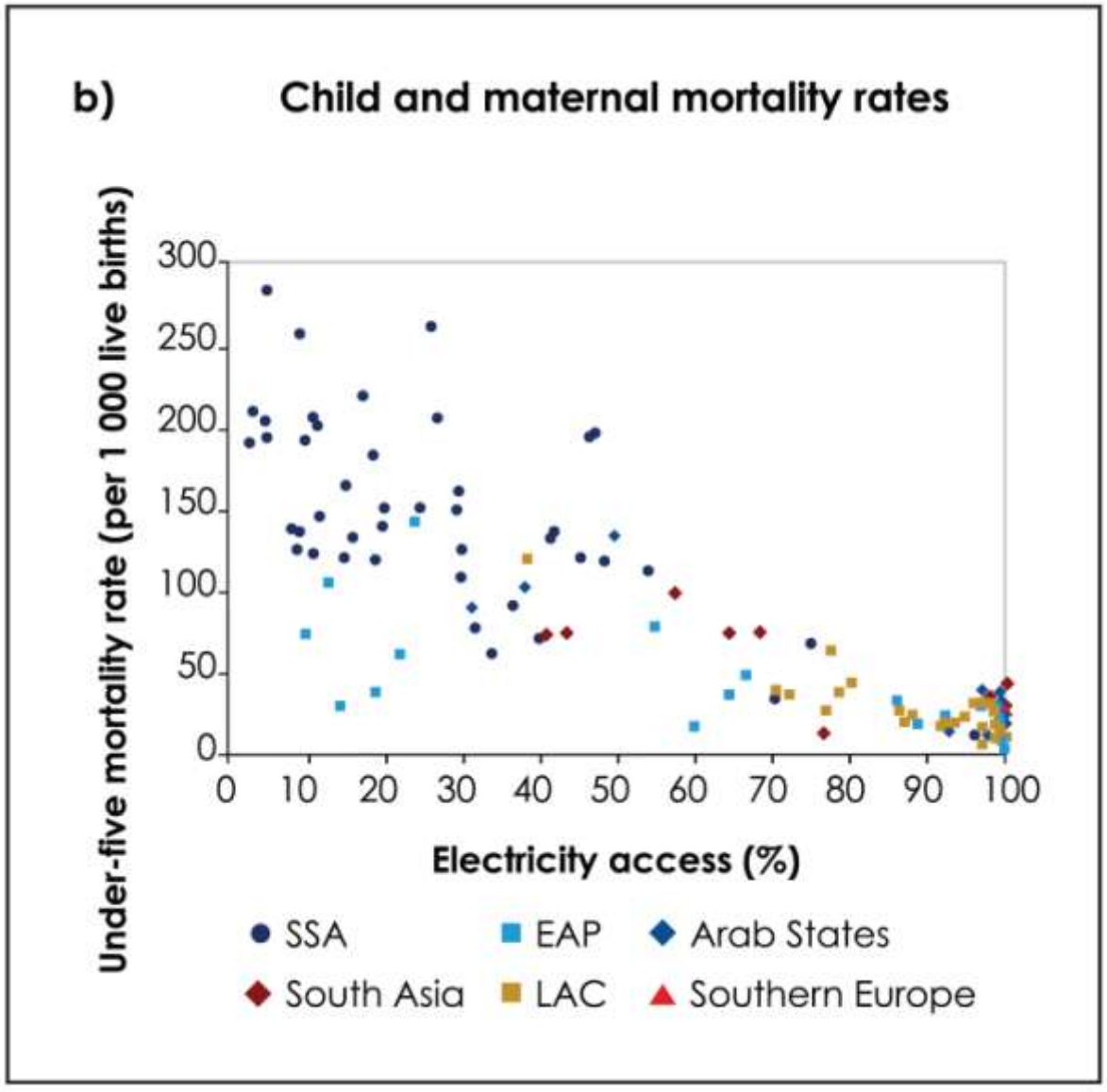


Source: UNDP and WHO (2009)



Electricity access is central to human development

Source: UNDP and WHO (2009)



There is a negative correlation between electricity access and child and maternal mortality rates

Source: UNDP and WHO (2009)

Key Messages for Policy-makers

1. Increasing access to energy is pivotal to the achievement of the **Millennium Development Goals (MDGs)**. Policy-makers must push for the inclusion of an additional goal related to energy access

Key Messages for Policy-makers

2. Private sector investment, governance reform of state-owned power utilities and the unlocking of regulatory barriers are necessary to improve energy access

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Key Messages for Policy-makers

3. Universal access to electricity can only be achieved by an **integrated approach** that relies on extensions to the national grid, as well as the installation of mini-grids and off-grid isolated systems

Key Messages for Policy-makers

4. In the short- to medium-term, whilst there is a continued reliance on traditional biomass fuels for cooking, **improved cook stoves** that minimise emissions harmful to human health must be promoted. Fuelwood continues to be a major energy source, hence its sustainable production has to be included into national development programmes

Energy interventions that have worked

1. Local financing
    - Kenya Electricity Generating Co. – raised local funds from public through attractive & affordable pricing of shares offered

Energy interventions that have worked

1. Local financing
2. Improved cookstoves
    - Use less fuelwood, reduce indoor air pollution and improve combustion efficiency

Energy interventions that have worked

1. Local financing
2. Improved cookstoves
3. Integrated energy provision
    - Kuyasa project in Cape Town – thermal insulation, solar water heaters, compact fluorescent lights – Clean Development Mechanism (CDM) Gold Standard project

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Role of science academies

1. Convene expert groups to brainstorm key scienitific & policy challenges & implementation barriers
2. Advise on role & constraints of science
3. Highlight best-practice examples & promote information exchange
4. Identify research gaps & encourage high quality research

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Role of science academies

5. Translate scientific research into policy recommnedations
6. Monitor investments by governments
7. Review state of public & private research infrastructure and advise on necessary changes

Conclusions

- Political will and enabling policies and regulations are important in implementing universal access to modern energy services. Some countries have reached high rates of access supported by enabling policies

- Scientific solutions to many of these problems already exist

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Conclusions

- Policy-makers must create an attractive business climate, support market mechanisms and facilitate access to credit so that the private sector invests in the energy sector

- Policy-makers can learn from energy success stories in Africa and in other regions to improve access to modern energy services

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