EU SE4All Technical Assistance Facility (TAF) Eastern and Southern Africa

Introduction on Energy Efficiency Issues of Relevance in Sub-Saharan African Cities

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Energy Efficiency in African Cities
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Plan Design Enable

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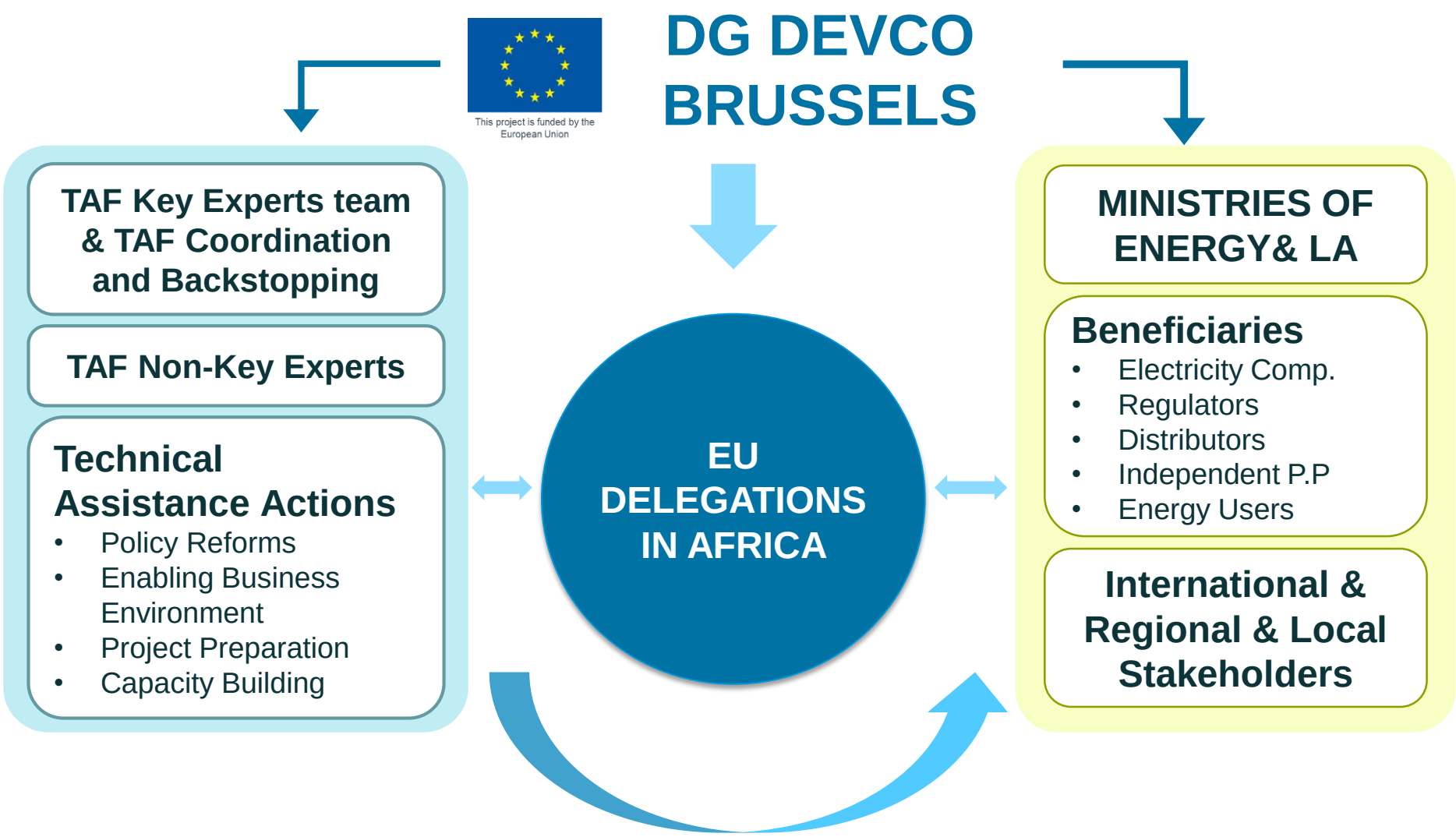
TAF Implementation Structure & **Results**



Qualitative and quantitative TAF's results: Upgraded Technical content, Continuity, Synergies, Fast Experts' Mobilization, Results multiplication, Perspectives, reinforcement of Cooperation, creation of EU vision and strategies at National and regional level.

European Covenant of Mayors > **Experience**

- EU initiative launched in 2008 by the Commission – DG ENERGY to endorse and **support local and regional authorities in the fight against climate change**

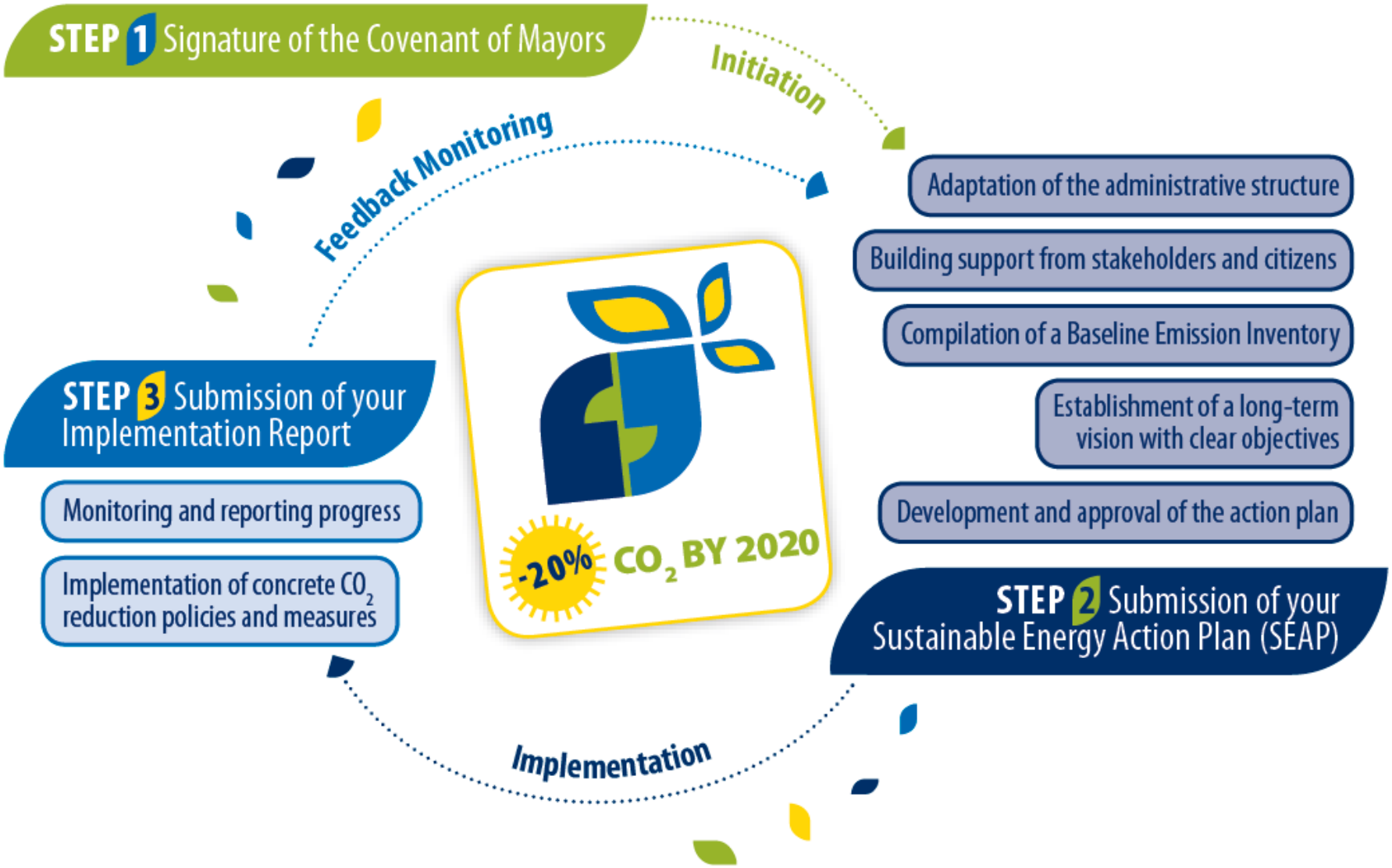
- **Voluntary commitment** of signatories to meet and exceed the EU **20% CO_2 reduction** target through the implementation of a **Sustainable Energy Action Plan**

- The Covenant of Mayors can be used as a tool for planning and implementing changes at city level towards sustainable development

Covenant of Mayors
Committed to local sustainable energy

Source: Covenant of Mayors

Covenant of Mayors EU Approach



Source: Covenant of Mayors

Integrated Model For EU Cities > **Development**

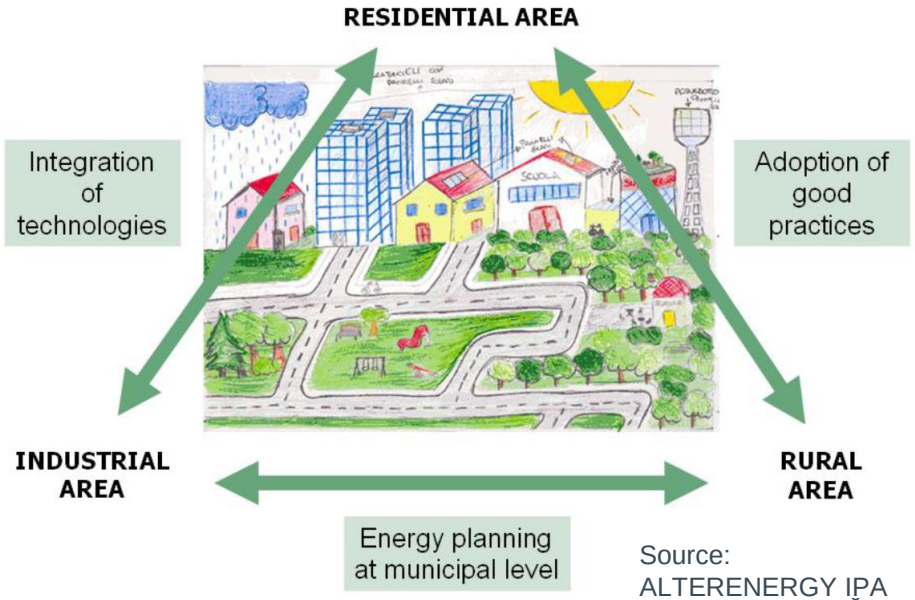
Current Situation

Reduced Energy Consumption

Increased Renewable Energy Production

Zero energy consumption

Zero CO_2 emissions

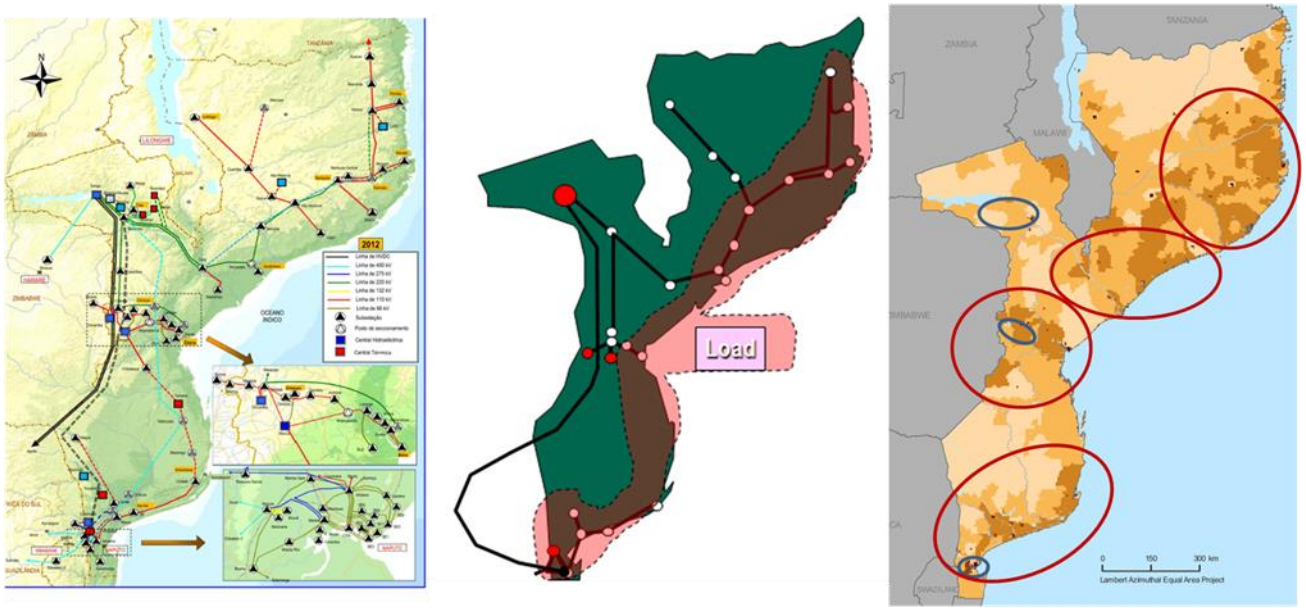


Source:
ALTERENERGY IPA Adriatic Project

Urban vs Rural : **Sub-Saharan Africa**

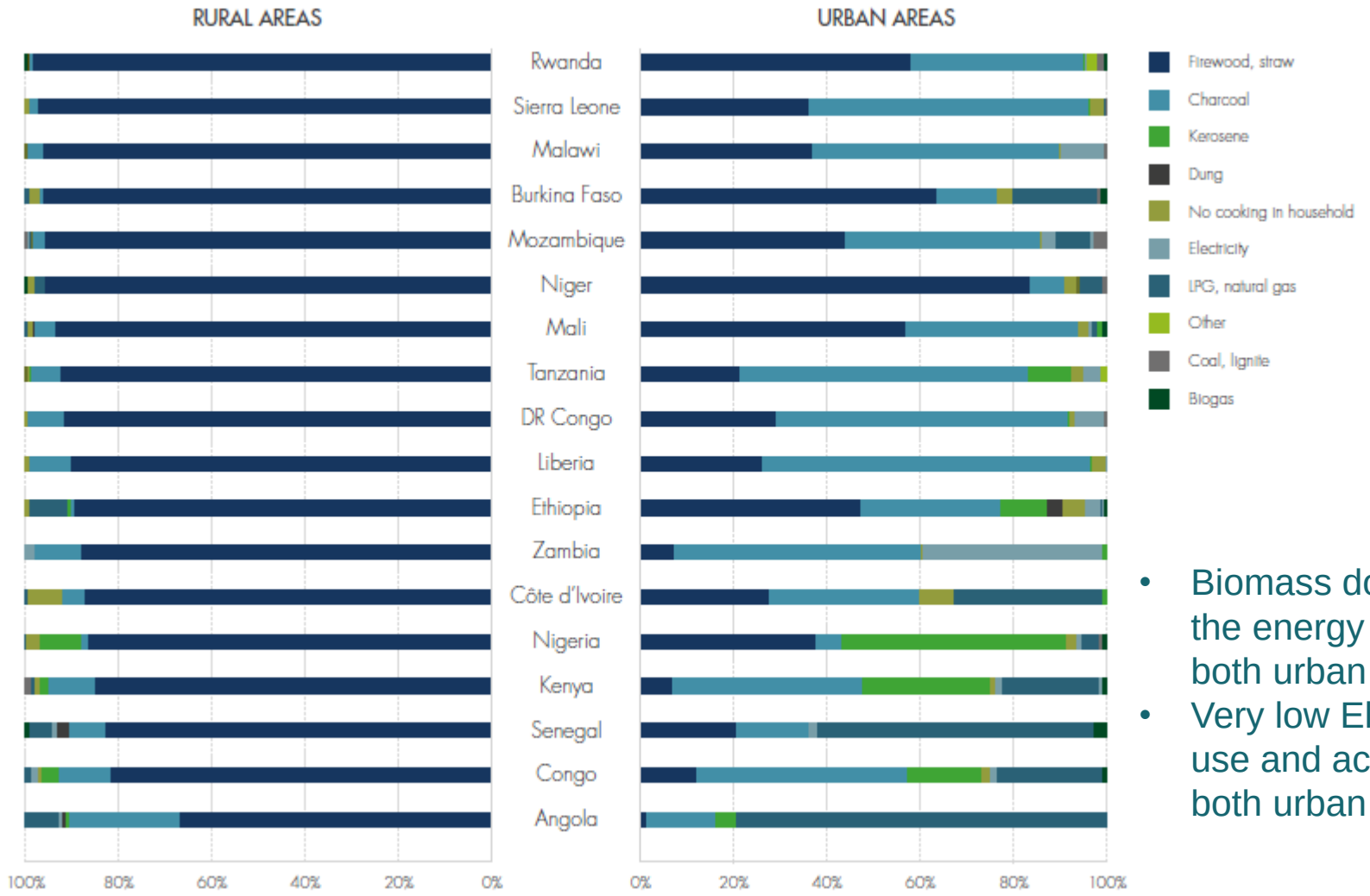
According to the IEA Energy Outlook 2010 in Sub-Saharan Africa 585 million people did not have access to electricity.

The Urban Electrification access is approximately 60% whereas the Rural Electrification access was a only 14 %



Electrical Grids / Load are present mostly in the urban areas: Mozambique case

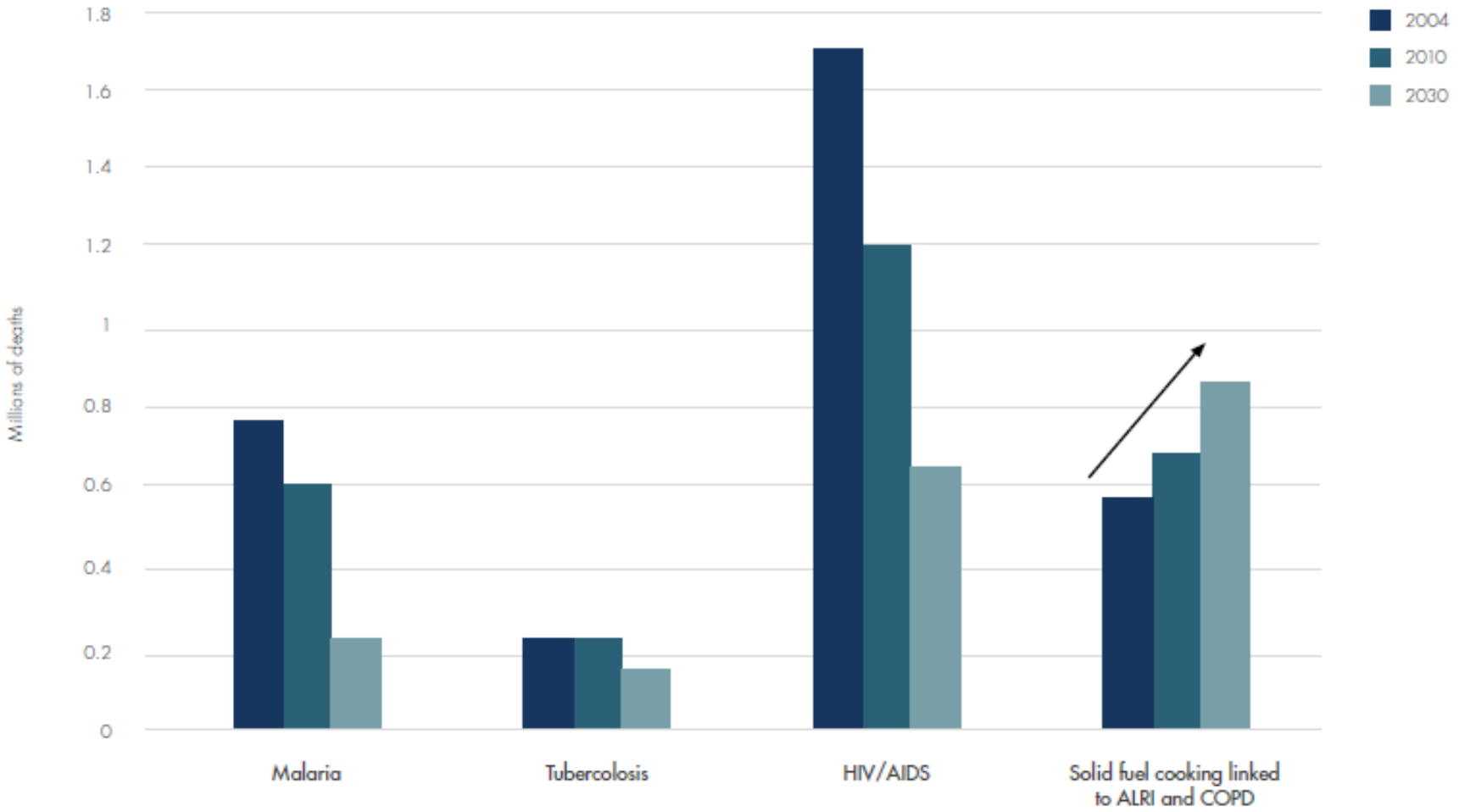
Household Fuel Consumption



- Biomass dominates the energy supply in both urban and rural
- Very low Electricity use and access in both urban and rural

Source: Power People Planet – Seizing Africa's Energy and Climate Opportunities – Africa Progress Report 2015

Energy & Health Links with Solid Fuel Cooking



Source: Power People Planet – Seizing Africa's Energy and Climate Opportunities – Africa Progress Report 2015

Towards Modern Cooking Fuels

In Sub-Saharan Africa the use of biomass (firewood and charcoal) is greater than all other forms of energy combined.

More than 650 million people is estimated to continue to cook using biomass inefficiently and dangerously in 2040.

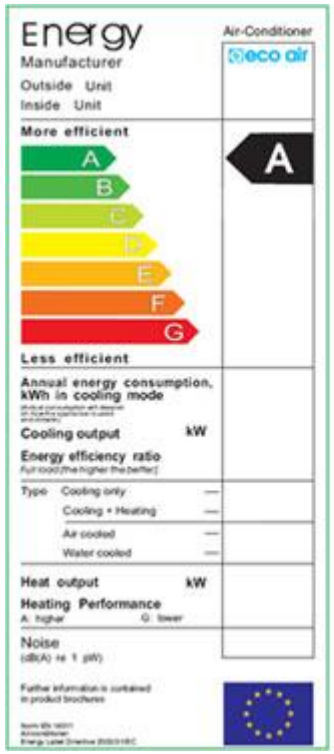
The promotion, at least in cities, of the substitution of biomass with cleaner forms of energy.

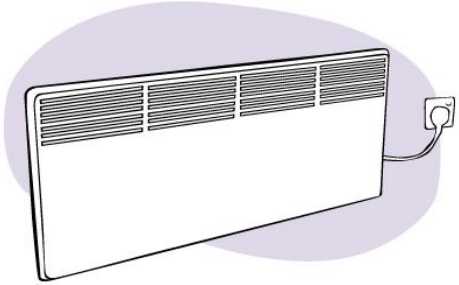
Actions Fostering Sustainability In SSA Cities (I)

Adoption of standards and labels

- Lighting
- Biomass cookers
- Solar Water Heaters
- Heating / Cooling
- Electric Motors
- White Appliances
- Waste to energy

Zero Investment Cost – only harmonization of legislation





Actions Fostering Sustainability In SSA Cities (II)

Public Buildings Sector

- ✓ Adopt minimum performance in buildings
- ✓ Adoption of standards and energy audits
- ✓ Green Public Buildings → Demonstrators of Sustainability
- ✓ RES integration to building envelop (PV, Natural Ventilation, Solar Thermal, Geothermal Low Enthalpy Heat Pumps, etc.)
- ✓ Implement financial, tax incentives and loans
- ✓ Raise the awareness of relevant stakeholders (architects, building developers, construction companies, citizens…)
- ✓ Implement targeted information and training actions

Note: The above measures should be adapted to local / National African climatic conditions and economic environment

Actions Fostering Sustainability In SSA Cities (III)

Transport Sector

- ✓ Organize better public transportation
- ✓ Reduce the need for private car transport
- ✓ Improve walking and cycling infrastructure
- ✓ Promotion of low carbon emissions vehicles
- ✓ Fuels quality control
- ✓ Fuel subsidies
- ✓ Vehicle technical control

Actions Fostering Sustainability In SSA Cities (IV)

Public Lighting

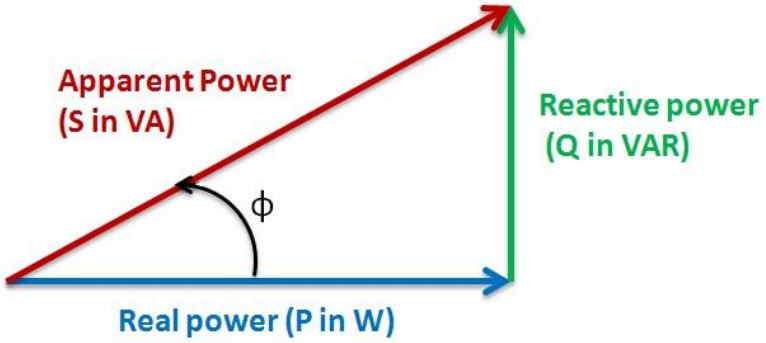
- Promote the use of LED and Compact Fluorescent Lamps (CFL)
- Use management systems for activation / deactivation and dimming
- Promote PV lighting

Actions Fostering Sustainability In SSA Cities (V)

Power Factor Correction and Demand side management

The Power Factor Correction is a measure of how efficiently the load current is being converted into useful work output

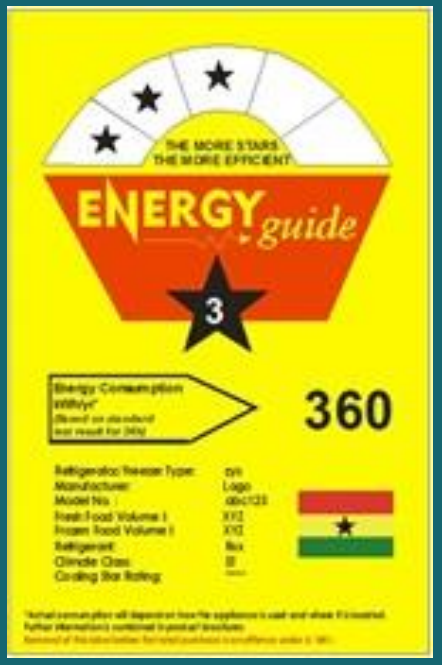
- By installing suitably sized switched capacitors into the power distribution circuit, the Power Factor is improved and the value becomes nearer to 1
- Payback period is about 1 year
- Increase the Energy Control Management Applications



Success Story 1: Ghana

Standards and labelling program

- ✓ Air Conditioners: estimated savings of at least **7 mil €**, reduced emissions of **132,000 tons of CO2** and power generation capacity savings of approximately **29 MW** by 2010
- ✓ Refrigerators: **save 63 mil € per year**
- ✓ Lighting: Compact Fluorescent Lamps (CFL) result to **household income savings of 2.5%** for Ghanaians in larger cities



Sources:
http://www.un.org/esa/sustdev/publications/energy_casestudies/section3.pdf
http://clasp.ngo/en/OurPrograms/SuccessStories/Ghana
http://clasp.ngo/~/media/Files/SLDocuments/1993-2005/2002_CLASP_GhanaSL.ashx

Success Story 2: South Africa
Solar Water Heaters Project

UNDP/GEF Solar Water Heaters project

- ✓ Set up a measuring and testing lab
- ✓ Financed the installation of 500 systems
- ✓ Subsidies per system:
  - ❑ 200 systems – at 330 €,
  - ❑ 200 systems – at 265 €
  - ❑ 100 systems – at 200 €

Ongoing subsidy programme in South Africa

Sources:
https://www.climate-eval.org/sites/default/files/evaluations/514 Solar Water Heaters %28SWHs%29 for Urban Housing.pdf
http://www.eskom.co.za/AboutElectricity/FactsFigures/Documents/The_Solar_Water_Heating_SWH_Programme.pdf

Success Story 3: Kenya
Efficient Lighting Project

In 2010 Kenya Power was financed by the Government of Kenya for the exchange of ~1.500.000 Incandescent Lamps (IL) with Compact Fluorescent Lamps

The CFL program consisted of:

- CFL Procurement
- Project Management and Logistics
- Implementation – retrofit by Kenya Power staff
- Project monitoring
- Disposal of incandescent lamps
- Communication – Awareness campaigns

Sources:
http://www.usea.org/sites/default/files/event-presentations/WangombeIhuthiaPPT.pdf

Success Story 4:
Mediterranean Partner Countries
Energy Efficiency in the Construction Sector

Objective of the MED-ENEC project “To develop the markets for EE and RE in the Building sector and related industrial and services activities within the Mediterranean Partner Countries”

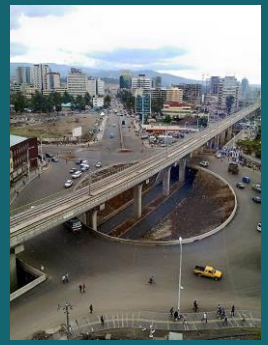
- Improve framework conditions
- Develop business and technology cooperation
- Build institutional capacities and offer Technical training
- Support awareness campaigns
- Initiate and promote success stories through pilot projects
- Intensify networking among actors

Source: http://www.med-enec.com

Success Story 5: Ethiopia

Addis Ababa Light Rail

- 17km line running from the city centre to industrial areas since Sep 2015
- Planned total length: 31 km
- Transportation service to 15,000 people per hour in one direction and 60,000 in all four directions.
- Final cost US$475m



Source: http://www.med-enec.com

Success Story 6: Tanzania

Power factor correction

- The head office of Tanzania Posts Corporation experienced substantial monthly bills
- the power factor averaged **0.75** (active power was 225 kW & Reactive power 198 kVAr for a power demand of 300 kVA) the power factor was corrected to **0.98**
- An investment to capacitors was made that cost **4000 €**
- **annual savings of ~2625 €.**
- the **payback period** of this investment was **just over 18 months**.

Sources:
www.unido.org/fileadmin/import/83268_Module15.pdf

Initiatives for Energy Efficiency in Africa (1)

Initiative	Achievements	Barriers	Countries
National EE Strategy	countries surveyed have a **published strategy**.	A **lack of regular review and updating** of the strategy when in place.	Botswana, Cameroon, Chad, Ethiopia, Lesotho, Malawi, Mauritius, Morocco, Sierra Leone, South Africa, Sudan, Zambia.
Standards and Labelling	**Low implementation rate** for countries but **success** achieved **for cooking stoves in Malawi**.	**Lack of cooperation** of stakeholders and **lack of regulations** enforcing compliance.	Egypt, Ghana, Malawi, Mauritius, South Africa.
Mass Rollouts of Technology	Have achieved **success in most countries**. Particularly **CFLs** and **solar water heaters** in South Africa.	**Quality control** on technologies (labelling) and **monitoring** (M&V). Sustainability of use is also questionable once rollout is complete.	Ghana, Mauritius, Morocco, Nigeria, Rwanda, South Africa, Tunisia, Zambia, Zimbabwe.

Source: *Accelerating Energy Efficiency Initiatives and Opportunities – Africa* Copenhagen Centre on Energy Efficiency, 2015

Initiatives for Energy Efficiency in Africa (2)

Initiative	Achievements	Barriers	Countries
Subsidized Energy Audits	Schemes in operation in five countries. Mostly funded by **external funding organisations**.	**The conversion of identified opportunities into actual savings is not known.**	Algeria, South Africa, Kenya, Tunisia, Zambia.
Financing and Soft Loan schemes	Implemented in a number of countries using either **donor funding or public (government) funding**.	**Lack of regulatory framework. Continuity of funding.**	Botswana, Kenya, South Africa.
Awareness and Promotion	Countries have implemented **awareness schemes** to educate end users into making efficient choices.	**Energy prices too low** to provide incentive. **Lack of institutional capacity**. **Monitoring** of results.	Egypt, Ghana, Kenya, Tunisia, Mauritius, Zambia.

Source: *Accelerating Energy Efficiency Initiatives and Opportunities – Africa* Copenhagen Centre on Energy Efficiency, 2015

Recommendations : Urban Energy Saving in SSA

- ✓ **Development of urban sustainable energy action plan**
- ✓ **Municipal energy managers**
- ✓ **Indicative specific urgent actions**
  - Promotion of new efficient cooking
  - Lighting (exchange of light bulbs)
  - Low cost investment with high potential for energy saving in electricity sector (short term measures → more than 20 % reduction in energy consumption) e.g lighting, heating /cooling, solar water heating
  - Improvement of energy efficiency in Buildings
  - Promotion of efficient urban transport
  - Increase the application of Demand Side Management
- ✓ **Introduction of energy efficiency criteria in public procurement**
- ✓ **Improving of institutional framework, urban energy and environment policies, capacity building of public servants**
- ✓ **Mobilize citizens and implement awareness campaigns**
- ✓ **Promotion of specific financial mechanisms**

Greening African Cities is FEASIBLE!

Thank you for your Attention!

EU SE4All Technical Assistance Facility Eastern and Southern Africa

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Energy efficiency TAF Key Expert

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