Nexus Energy - Water - Food Security
EDF11 programmes

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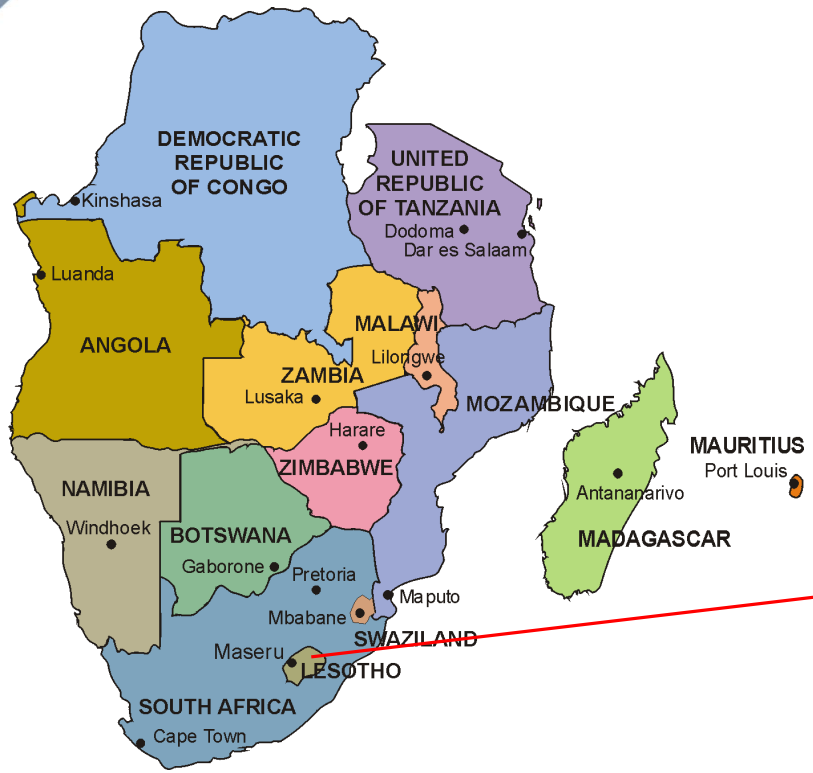
MAP of SADC, with SA & LESOTHO



European Development Fund 11 (2014 – 2020)

- **NIP 11th EDF focus on water, energy and governance**
- **Water and energy play critical role in economic development and in raising living standards in Lesotho**
- **Climate change, water resources and energy impact on agriculture, biodiversity, wetlands and erosion**
- **Governance is important, e.g. sector data generation for monitoring and results-based budgeting & management**
- **Linkages between water, energy and food security: integrated approach EU Co-operation with Government**

Energy in Lesotho

- **Lesotho: considerable energy deficit, electricity accounts only for +/- 5% in energy mix**
- **Country generates 72 MW from hydropower (Muela) and requires 150 MW in peak periods**
- **Lesotho imports > 70 MW, mainly Mozambique (29% of peak demand) and SA (20%)**
- **2016 Census: 36% h.h. = grid connected (67% in urban; 12% in peri-urban - 21% rural areas - 2% SHS)**
- **Industry biggest electricity consumer (39%) followed by domestic sector (34%)**
- **Huge potential for generation Renewable Energy**

Erosion in Lesotho

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Erosion is a natural phenomenon; however disproportional erosion is not!

Main Sources of erosion:

- **Unsustainable agricultural production methods**
- **Overgrazing: too much livestock and also inappropriate grazing patterns?**
- **Mining of woody biomass from erosion-prone hills**

All threatening energy – water – food security nexus

Mining of Woody bio-mass

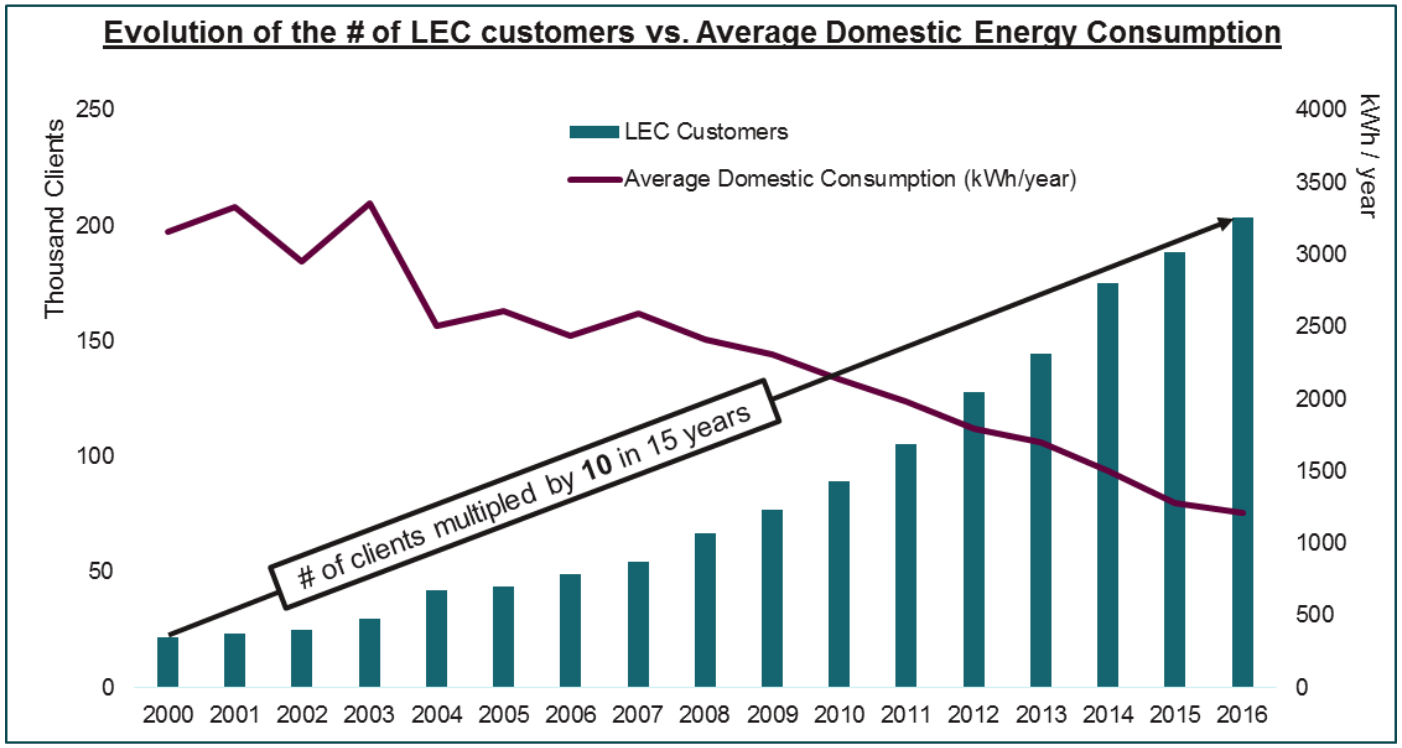
Erosion is threatening Lesotho's 'Water Tower'

Countrywide Integrated Catchment Management / Sustainable Land Management approach is the answer:

- **Improved agricultural production - adding value**
- **Safeguarding Water Tower - maintaining retention capacity of e.g. wetlands (and water quality!)**
- **Securing water needs of LS, SA, NAM and BW**
- **Maintaining potential for hydro power - mitigating GHG emissions in region**
- **Contributing to energy – water – food security nexus**

ICM programme - EDF 11 under preparation

Future in Lesotho will be Off-Grid Electrification as return on investment of grid connections is getting lower every year:



Future in Lesotho will be Off-Grid Electrification:

Energy access based on off-grid solutions presents several advantages:

- Off-grid solutions request smaller investment: with less money reaching more;
- More donor interest and Foreign Direct Investment (FDI) to develop country's economy;
- Reducing new Grid Extensions has positive impact on sustainability of whole energy sector.

Lesotho:

- Huge potential for off-grid energy solutions in Lesotho;
- By 2030 market size for off-grid will be around 1,65 M people (or 70% of population);
- Topography of country and scattered population result in need to adopt different technologies for different areas of country.

EDF 11 Call for Proposals Energy

Energy efficient household devices, distribution, after-sales structures and Mini-grids for exploring economic growth potential in rural areas

- **Global objective of call for proposals is enabling conditions for full scale access in rural areas to basic energy options**
- **Enabling conditions for such access in rural areas are reflected in the specific objectives**
- **The specific objectives of this call for proposals are:**

1. Commercialise access to improved energy household devices in pilot areas as improved cooking stoves, Solar Home Systems and other innovative technologies, including ***after-sale structures*** for such devices;
2. Show that ***mini-grid projects*** in rural areas are possible in areas with economic growth potential through e.g. emerging small rural enterprises;
3. Address ***logistical challenges*** in developing sustainable energy products and service businesses (delivery models – financing).

Target groups – Final Beneficiaries and Conditions

Target groups / final beneficiaries under this call are:

- Rural households and rural small enterprises in need of access to energy, through e.g. mini-grids and a range of renewable energy and energy efficient household appliances

Solutions offered should be:

- *Where relevant*: be combating erosion and be in support of food security, emphasising response to climate change (energy efficiency, clean energy etc.) and nexus energy-water-food security in Lesotho

No Market Distortion through Pilot Projects:

- Call is not a subsidy on energy solution / product on offer
- Focus is on 'service' support, investment in infrastructure in its broadest sense; after-sales structures – services centres – credit schemes;
- Create enabling environment for large up-scaling in future – sustainability key

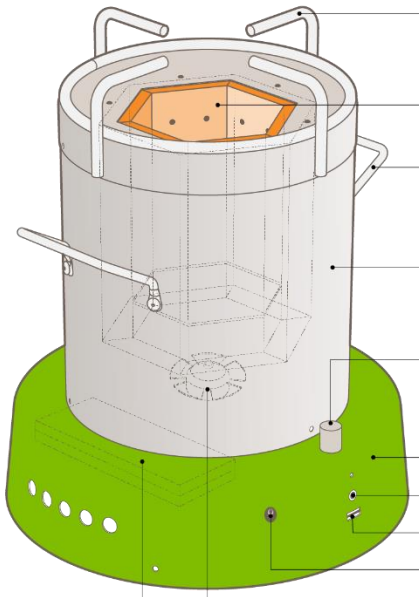
- **Expected Results can be, but not limited to:**

  - Increased access to modern energy services in Lesotho;
  - Reduction in use of biomass in households;
  - More conducive environment for private sector in off-grid energy sector;
  - Increased access to innovative financial mechanisms for Renewable Energy;
  - Greater awareness and knowledge of RE products and services;
  - Improved after-sales service options;
  - Sustainable commercial market for RE;
  - Reduced household energy costs;
  - Improved access to education, health services;
  - etc.

Improved Woodstoves – Solar Lights Lesotho

Efficient Fuel Wood Stoves

Improved Woodstoves – ACE Lesotho



Removable **steel stove top**

Burning chamber
20mm refractory ceramic tiles

Handles for portability

Stainless steel body

Control knob
output heat max. 4-5 kW, min. 2-3 kW

Powder coated **steel base**.
Available in a variety of colours.

Charging port

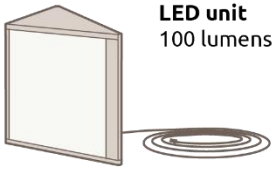
USB port

DC port for LED light

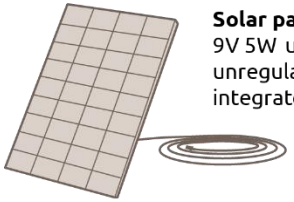
Fan

Battery LiFePO4 6.4 V / 5 Ah

OPTIONAL



LED unit
100 lumens



Solar panel
9V 5W unit
unregulated (regulator integrated into the stove)

Solar Home Systems – MOSCET Lesotho

3kW Hybrid Solar Power System at Education Resource Centre

Energy Hubs – Solar Turtle

Ultra secure solar kiosk for community electrification with special focus on schools – community centres

Energy Hubs – Solar Kiosk

SOLARKIOSK E-HUBB:

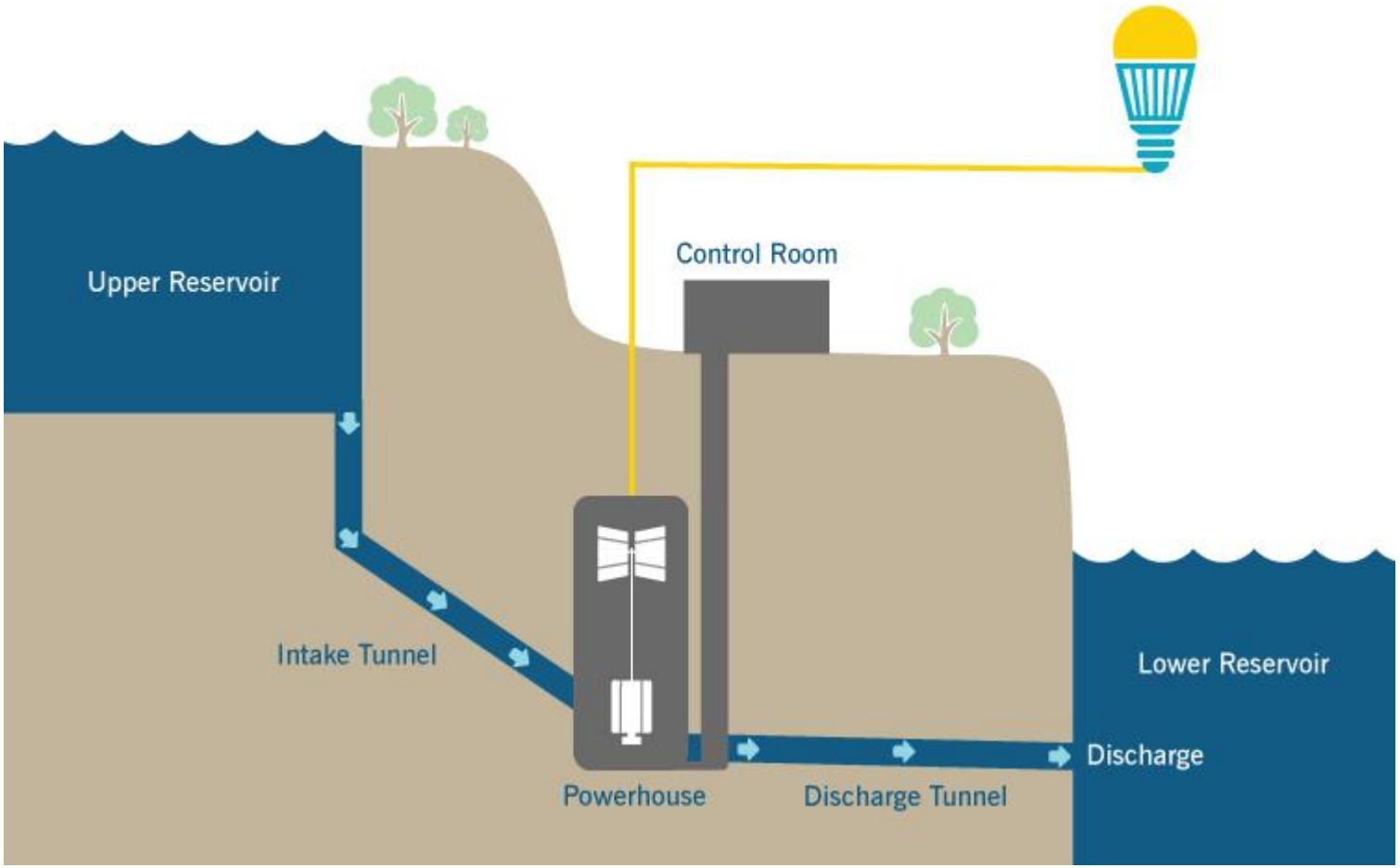
- Designed to adapt to energy demands of community;
- At night, E-HUBB is powered by energy stored in its battery pack, ensuring continuous operation;
- E-HUBB unit becomes social and economic centre of community.

Kobong Pumped Storage - Electricity

- Lesotho has huge potential wind, hydro, solar energy
- On hydro: study for 1,000 MW of climate neutral energy to cover for peak demands in region
- Lesotho demand is only 150 MW (of which half imported), demand by 2030 will be 300 MW
- Energy for input from e.g. nearby windfarm?
- So far South Africa has shown little interest……
- Unless SA buys power project will not be feasible (awaiting future price increases on carbon emission?)

Should South Africa / region be more receptive to possibilities of clean Energy from Lesotho?

How Do Pumped-Storage Hydro Plants Work?



Thank you for your Attention!

Kea Leboha!