

AFRICA'S DEVELOPMENTAL ASPIRATIONS, the ENERGY CHALLENGE and MAXIMISING OPPORTUNITIES

*(CONCENTRATING ON THE ELECTRICITY
INDUSTRY)*

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SUSTAINABLE DEVELOPMENT IN AFRICA

In practical terms, the primary objectives of sustainable development in Africa remain:

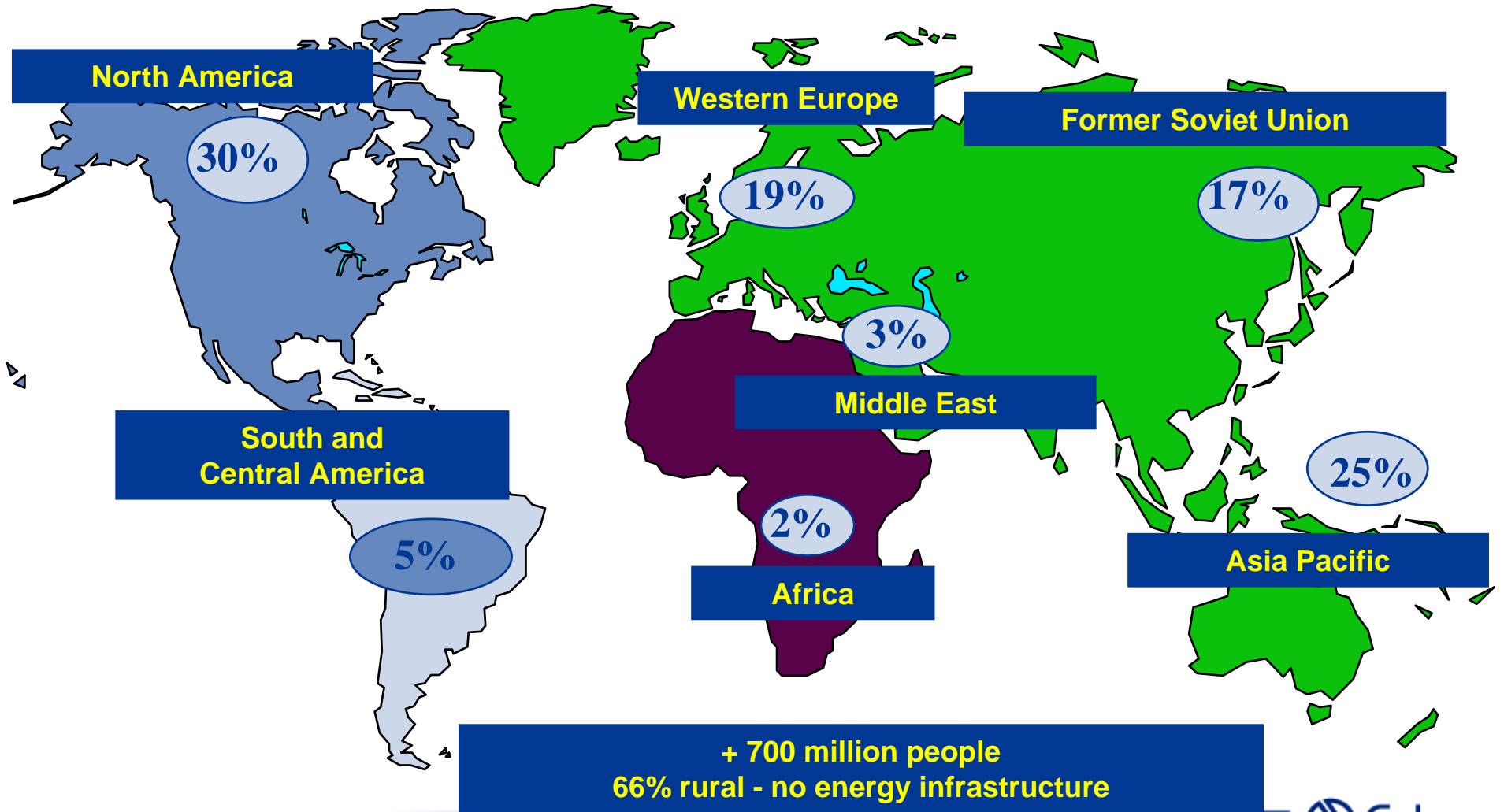
- **DEVELOPMENT!**
 - Eradication of poverty;
 - Fulfilment of basic human needs;
 - Sustained economic development



SUSTAINABLE DEVELOPMENT IN AFRICA

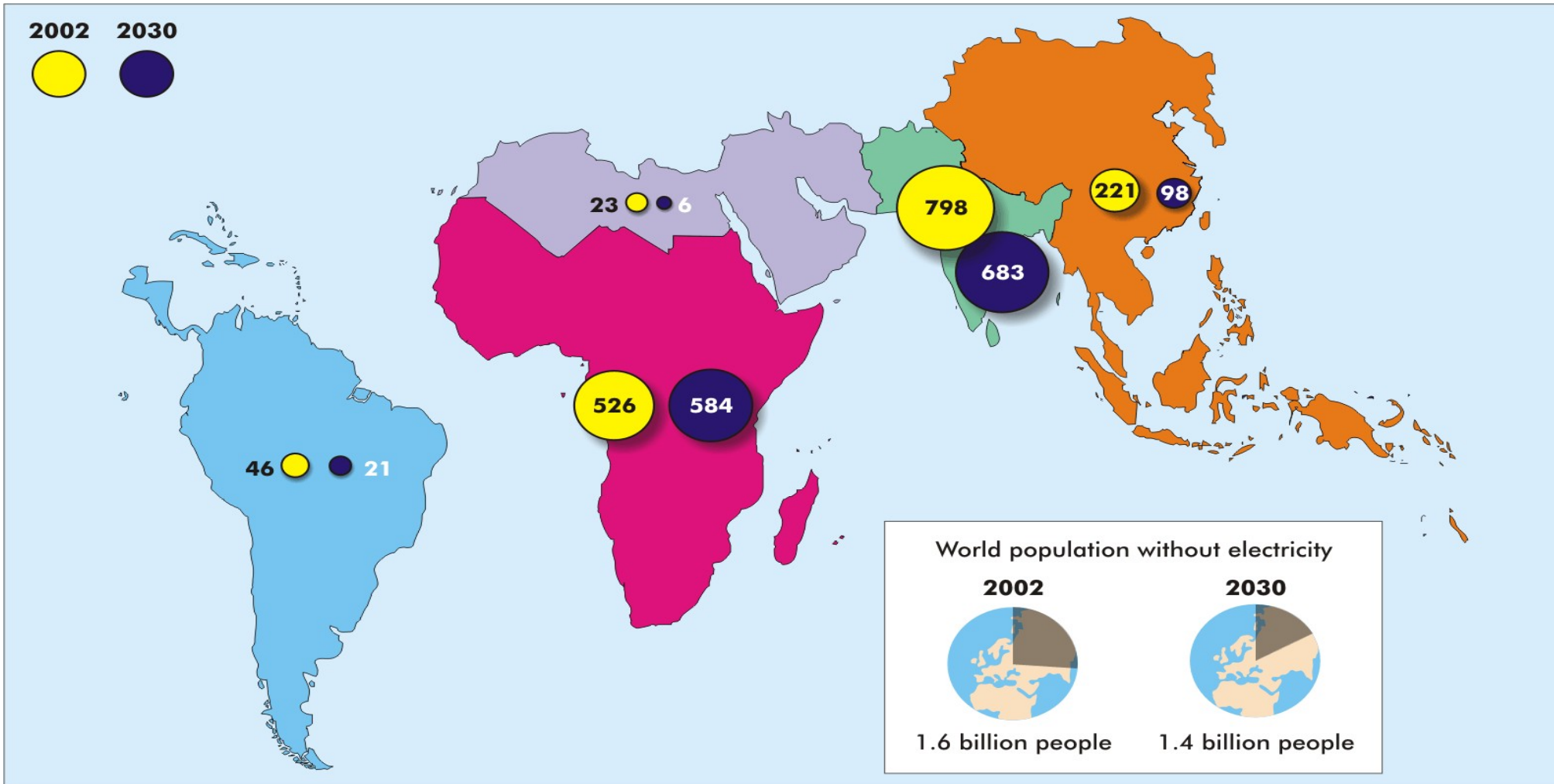
- Delhi Ministerial Declaration
- ...Decision 1/CP.8 outlined the importance of linking climate change and sustainable development in both directions: mitigation measures should be “integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change...”
- Innovative thinking around development.
 - **Meeting need for increased access to basic needs**
 - **Meeting aspirations for development beyond a mud hut with a solar panel**
 - **Meeting these practically, pragmatically and in a manner that has the co benefit of lowered emissions.**
- Energy Access plays a key role

Share of Global Energy Consumption



Electricity Deprivation

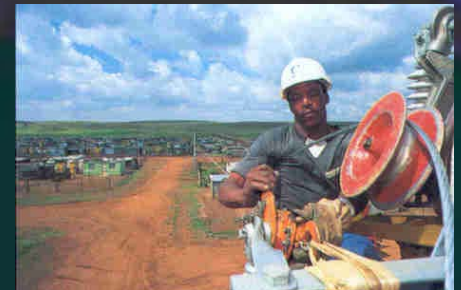
In 2030 there could still be 1.4 billion people without electricity



Africa Challenge: Access to Affordable Energy Services

12% of the global population

but consumes only 2% of all electricity produced

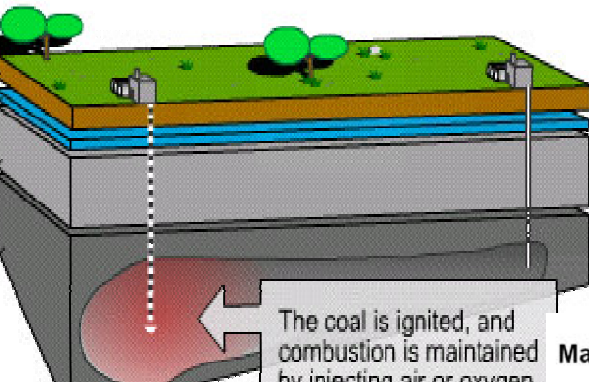


DEVELOPMENTAL CHALLENGES - Adaptation & Mitigation

- **Africa's challenge is one of development.**
- **Using Africa's abundant energy to develop Africa as opposed to exporting the continent's wealth.**
- **Develop infrastructure in a robust manner whilst embedding the elements of sustainable development.**

- **Generation** - Vulnerability of hydro and coal infrastructure, Droughts, floods, silting
- **Transmission** – Vulnerability of lines and substations – floods, wind, snow and ice
- **Distribution and end use** – droughts, floods, land use change

Technological Options



Coal

The coal is ignited, and combustion is maintained by injecting air or oxygen and/or steam through one of the boreholes



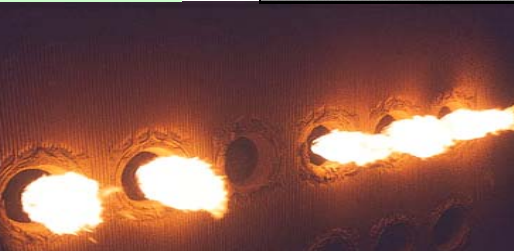
Gas



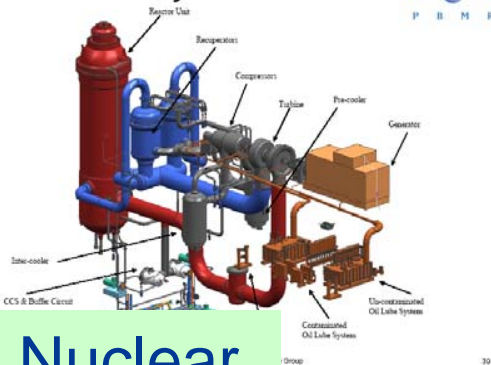
Efficiency



Renewables



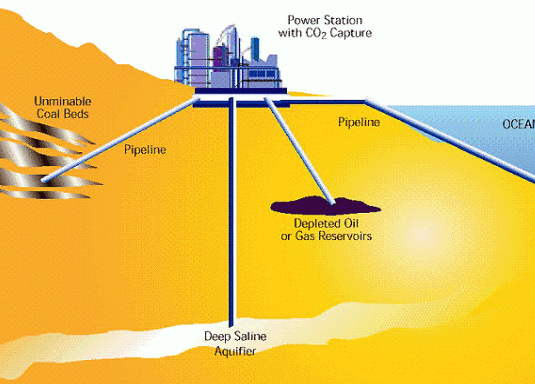
Main Power System



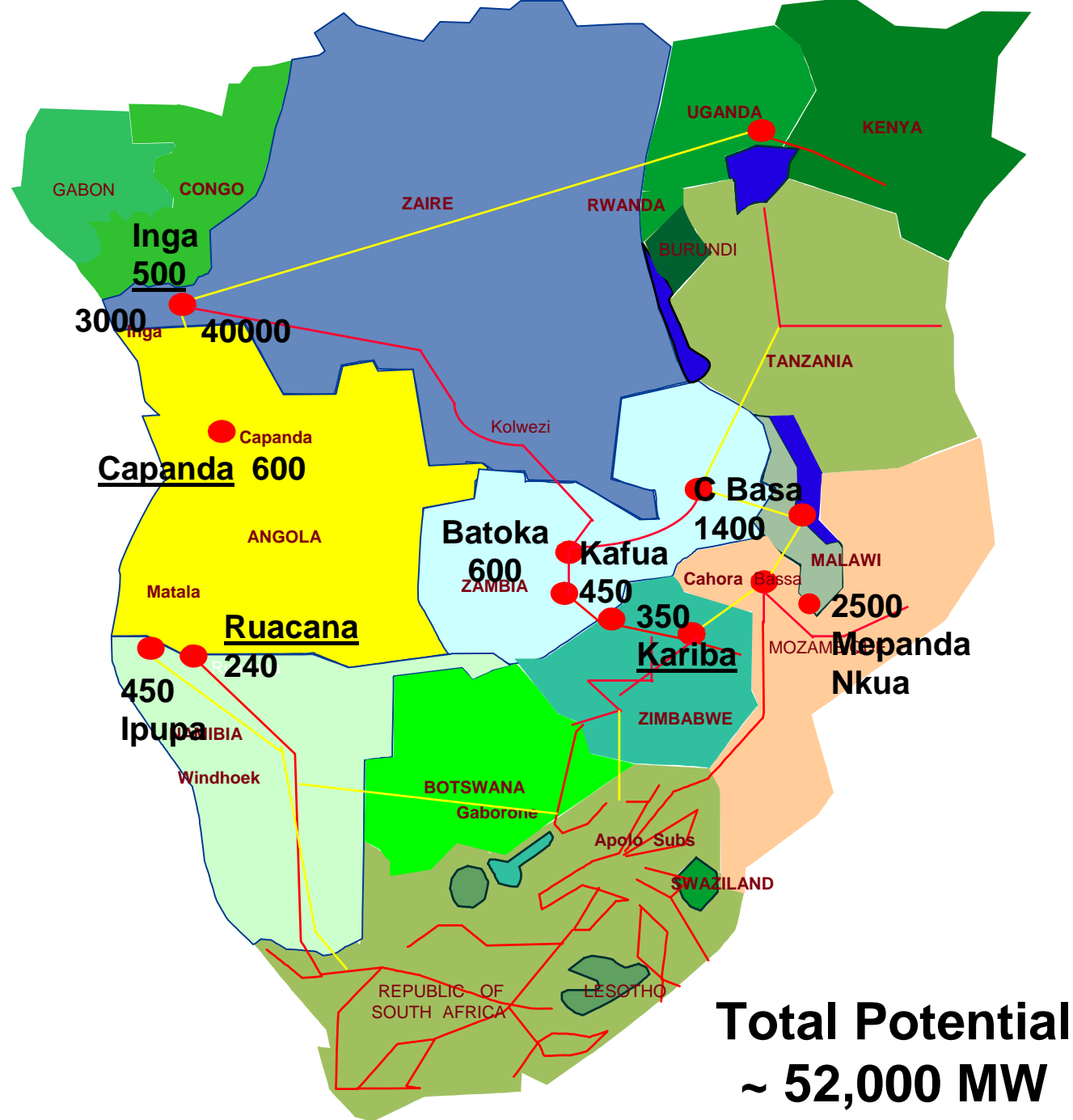
Nuclear



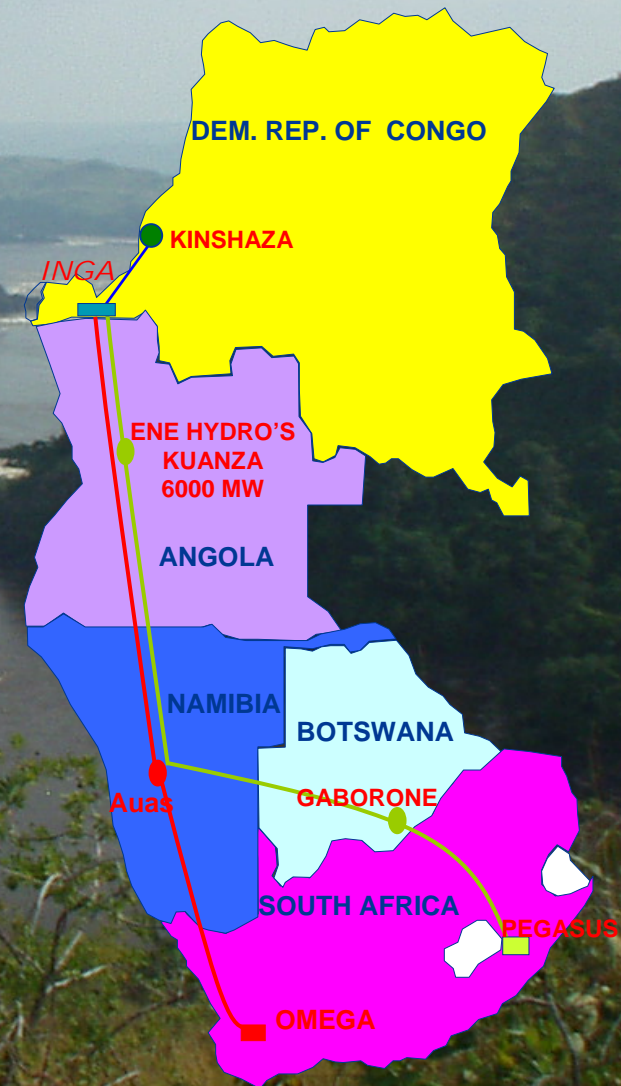
Transmission

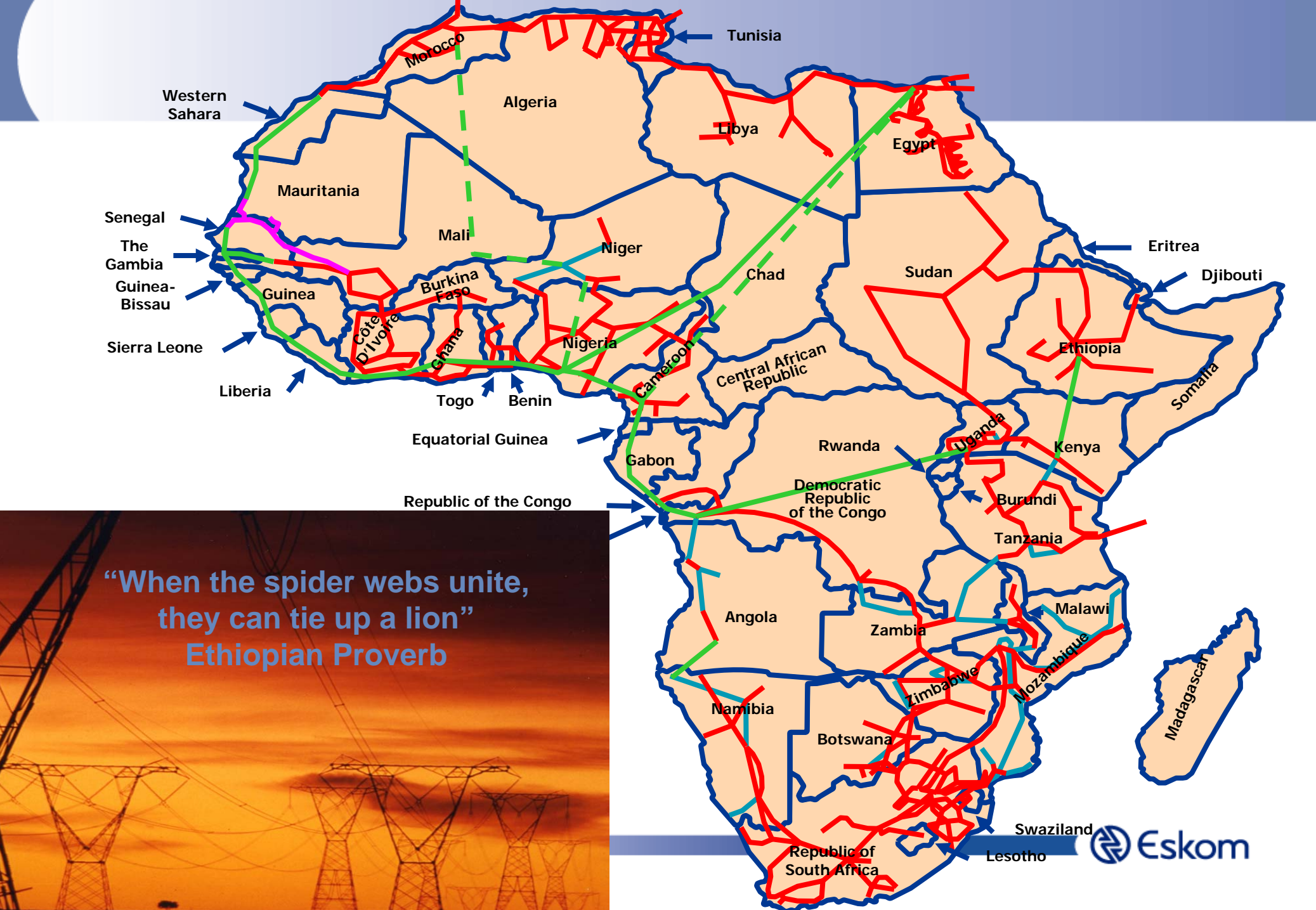


**Renewable
hydro
resources in
Southern
Africa -
potential to
energise the
continent**



The Hydro Option – 50 000MW to energise Africa??





“When the spider webs unite,
they can tie up a lion”
Ethiopian Proverb



Technological Gaps

- **Advanced clean coal technology**
 - Supercritical and ultrasupercritical – with gas cleaning and dry cooling
 - Carbon Capture and Storage
 - Gasification
- **Nuclear**
 - Technology base
 - Licensing
 - Regulatory environment
 - Proliferation
- **Hydro**
 - Large scale run of river systems

Technological Gaps Cont..

- **Renewables**
 - Cost
 - Resource modeling and assessment
 - Distributed systems
- **High Voltage DC infrastructure**
- **Power system dynamics and management**
- **Energy efficient end use technologies**
- **Monitoring and observation systems**
 - The physical environment including weather and climate
 - Resources
 - Demographics
 - Land use
 - Infrastructure integrity
 - Condition monitoring
- **Modeling of impacts and analysis of trends**

- **SO.... TELL ME AGAIN THAT**

- *THERE ARE LIMITED OPPORTUNITIES IN AFRICA?*
- *THERE IS LIMITED SCOPE FOR MARKET MECHANISMS?*
- *THERE IS LIMITED DEMAND FOR ENERGY?*
- *ETC?*
- *ETC?*

MARKET OPPORTUNITIES

- Market opportunities - motivation is to increase capital and technology flows into sectors that enhance developmental priorities.
- Enablers –investment incentives and/or guidelines to direct financial flows to projects that align with national sustainable development priorities and by inference towards CDM, and such markets
- Solutions
 - Public sector finance to catalyse projects, particularly for those countries with poor institutional capacity or high risk ratings.
 - Combination of capacity building and mechanisms for supporting CDM project funding on a basis other than private capital market financing, including sources such as multilateral financing, soft financing
 - Such financing however must address the question of ODA

• Solutions

- Engagement between Governments and Business to find ways to promote enabling frameworks, cooperation and create opportunities for investments nationally and through bilateral / multilateral frameworks.
- Innovation in thinking - long term strategy and vision:
 - Avoid upfront exclusions of technologies – i.e. assess potential of all technologies without exclusions before doing the research.
 - Avoid mistrusting efforts to promote market mechanisms before doing the research.
 - Listen

Conclusion

- **Although posing many challenges - technological, social and economic - there is theoretically nothing that cannot be achieved through using Africa's energy for Africa's development.**
- **Key to this is the development of African power grids as this will promote many benefits in the long term and will allow collaborating nations to share in the benefits of energy diversification and access.**
- **To successfully achieve such goals, the gaps need to be identified and quantified so that they can be systematically tackled on a prioritised basis.**
- **This will need firm long term commitment and collaboration among African nations and from financial institutions and development agencies alike.**
- **Innovation around market mechanisms**
 - Strengthening current mechanisms for now and for the future
 - Thinking long term investment in energy for sustainable development
 - Increase capital and technology flows into sectors that enhance developmental priorities