

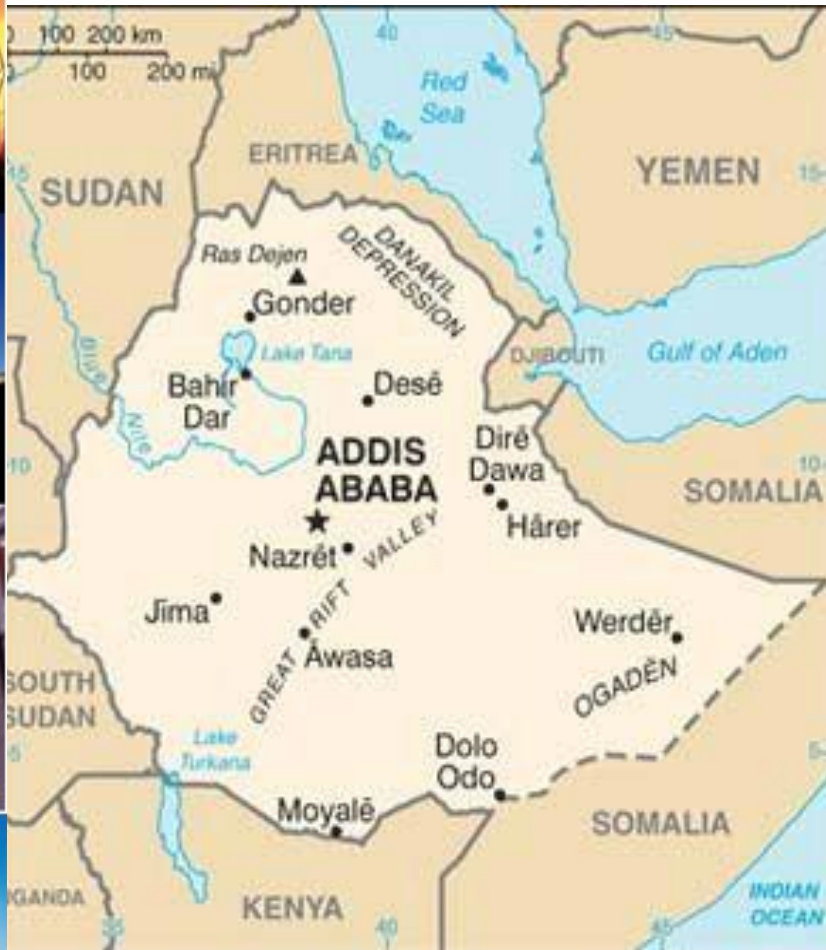
Multi-Stakeholder Workshop on Wind Energy



**Ethiopia's Experience on Renewable Energy Development
and sector Strategy
Copenhagen, Denmark, April 13-15 2012**



Some Factsheet



Area: 1.14 million km²

Population: 82 million

Rural/Urban: 83.5% / 16.5%

GDP per capita: USD 392

Inflation: 2.8%

GDP per sector:
Agriculture - 41%
Industries - 13%
Services - 46%

Installed Capacity: 2.012MW

Energy Mix:
Hydro - 94%
Fuel and other RE- 6%

Institutional Framework

- Ministry of Water and Energy: Responsible for the country's energy sector development expansion and supervision, energy policy drafting and implementing.
- Ethiopian Electricity Agency: Responsible for the regulation of the operations in the electricity supply sector including licensing, ensuring safety and quality standards.
- EEPCo: State-owned utility engaged in the generation, transmission, distribution and sales of electricity including UEAP .
- Ministry of Mines: Responsible for Geothermal resources exploration
- Environmental Protection Authority: Responsible for the regulation of the environmental aspects related to energy development.



Power Generation Resources

- Hydropower Potential > 45, 000 MW
- Wind Power > 1,035 GW
- Geothermal Potential > 5,000 MW
- Solar electric potential plenty
- Natural Gas- 4 TCF (trillion cubic feet)



1.3 Generation and Electrification Status

- The current installed generation capacity 2,012 MW
 - Hydropower 1, 839 MW (94%)
 - Wind 45 MW
 - Geothermal 8 MW } (2.6%)
 - Diesel 120 MW (3.4%) (stand by)
- No. of electric customers 2 million.
- Access to electricity is about 47%;

Phase I (30 MW) Operational Vergnet/Alstom wind turbines



15 mw operational Hydrochina (1.5 MW generating unit)



Internationally awarded HPP arch dam 2010

300 MW Tekeze
HPP



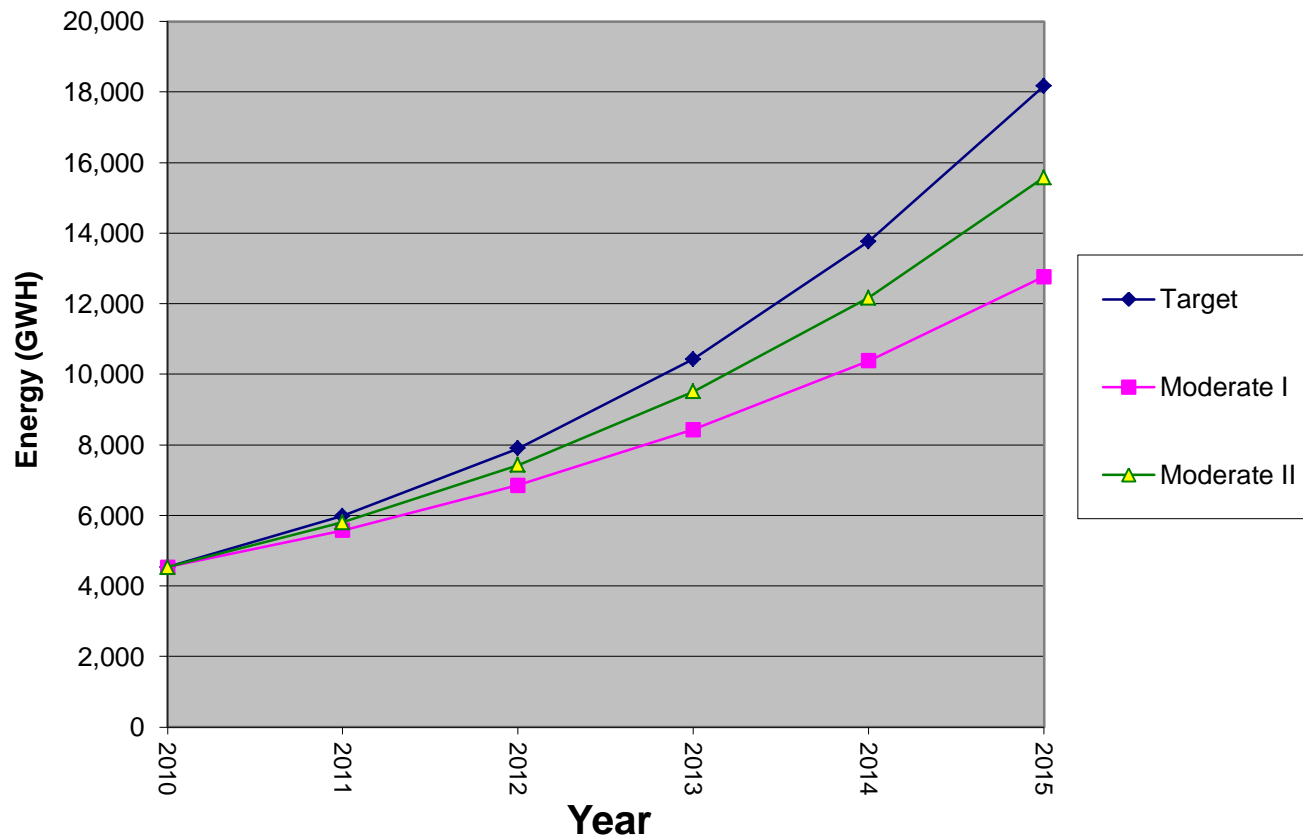
420 MW HPP 26 KM Tunnel



Power Demand Forecast

Target and Moderate forecast

Energy Demand forecast Result

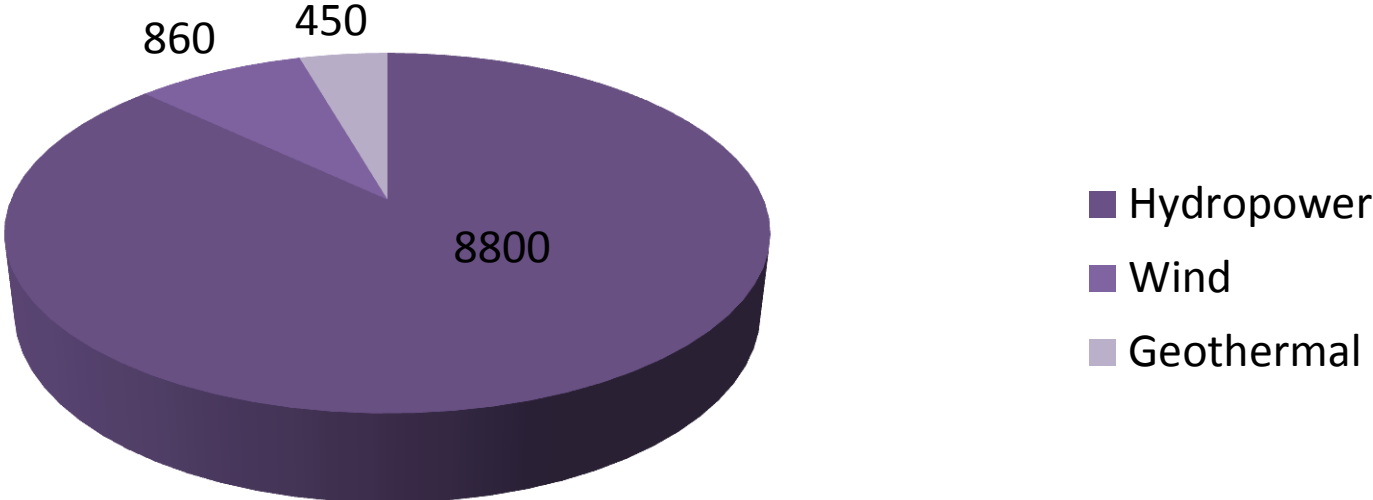


According to the Target scenario electricity demand will be expected to grow by **32%** for the period 2011-2015.

Recent Plan

- scale up and diversify the Renewable energy mix, to minimize hydro dependency

Planned Renewable energy mix (MW) in 2015



Sector Strategy and Transformation Plan

- Growth and Transformation Plan (GTP): The objectives set in the GTP include (i) increase additional installed capacity of 8.000 MW by 2015, (ii) double elec. customer base to 4 million and the general access rate (rural towns and villages coverage) from 41% to 75%. More than 1,500 towns and villages electrify/yr. more than 3 million solar lanterns and SHS 9 million efficient cook stove with the assistance of Development partners (AfDB, WB ..etc)



6,000 MW Grand Ethiopian Renaissance Dam Project under construction (The nation's project)



Sector Strategy

- Climate Resilient and Green Economy Strategy (CRGE): The objectives set in the CRGE include (i) guide the country against adverse effects of climate change, (ii) utilize the country's hydro, wind and geothermal resources, develop fuel efficient stoves (iii) totally discontinue the fuel based generation by 2015.
- Draft Electricity Feed-in-Tariff Law: Expected to be completed by 2012. It shall pave the way to the introduction of IPPs/PPPs in the RE sub-sector.
- Others: (i) Electric Power Generation Construction Program; (ii) Electric Transmission and Distribution Lines Construction Program; (iii) the Rural Electrification Fund; and (iv) the Universal Electrification Access Program.



Sector Strategy and Transformation Plan

National Energy Policy under revision:

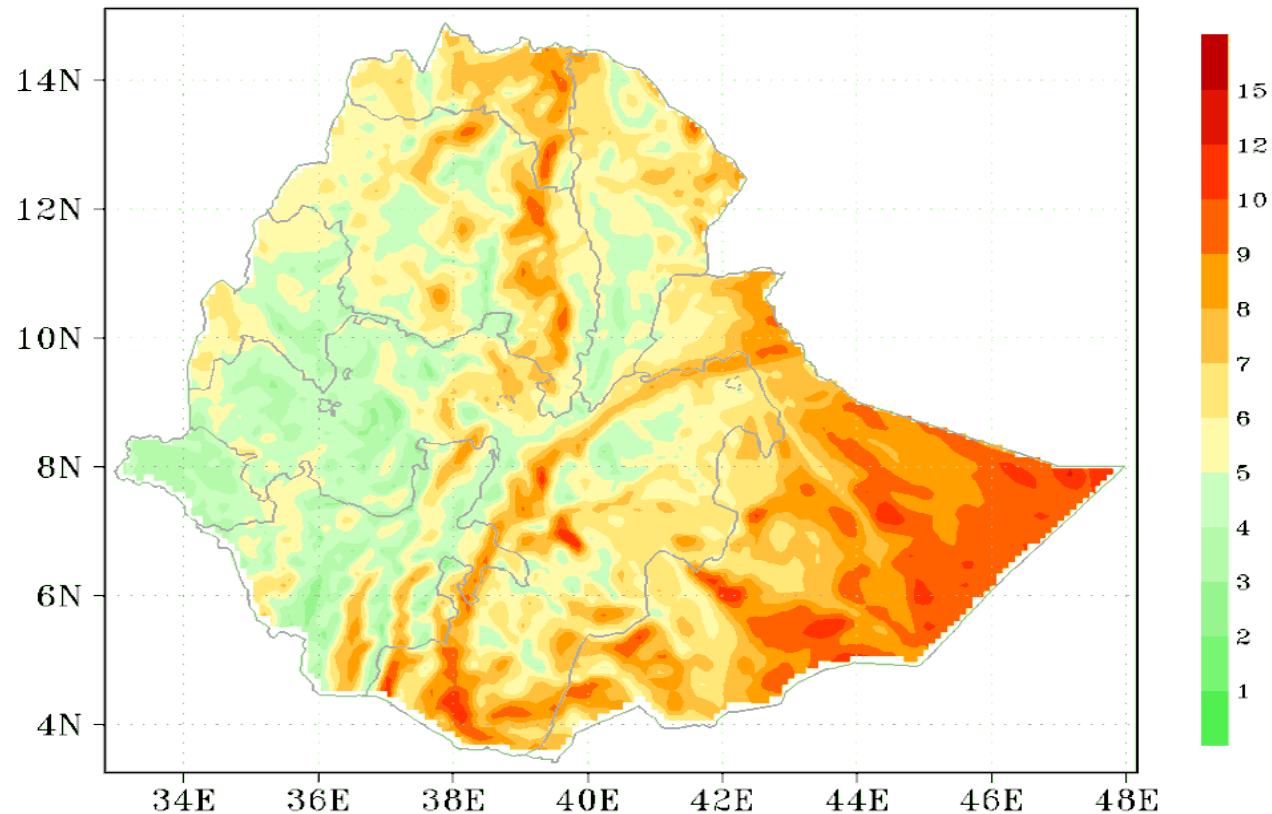
- Localization/technology transfer for RE through private sector participation
- Energy efficiency and conservation
- Special renewable energy fund
- Tax policy (incentive)
- Capacity building
- Bio-fuel Development
- Afforestation



Wind and Solar resource Assessment Master Plan

- The Master Plan recommends 51 wind projects (with total planned capacity of 6,820MW) and 5 solar PV projects (with total planned capacity of 135MW) up to the period 2030.
- Recommends the major policy options to be developed for wind and solar energy expansion.

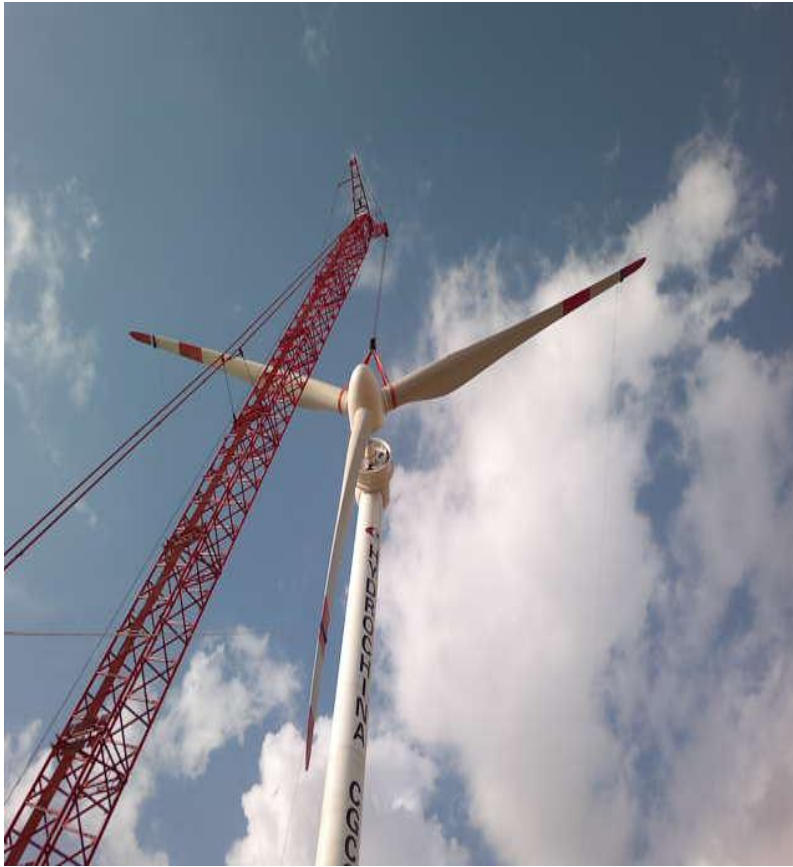
Distribution of Average Wind Speed, m/s (Height: 50m, 1980~2009) 1,035 GW potential for exploitation



126 MW Under construction will be completed
this year (1.5MW generating units)

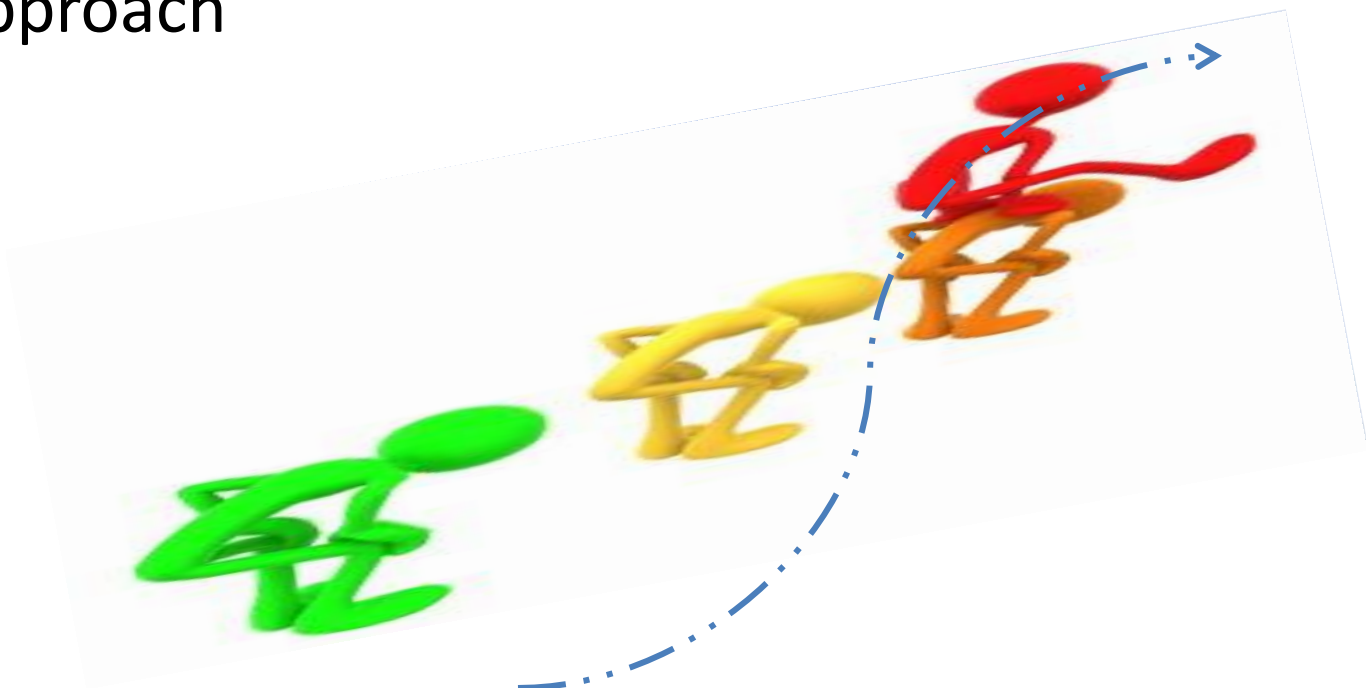


Under construction (Hydrochina and Alstom)



Rural electrification

- UEAP both on grid and off-grid
- Electrify more than 1500 towns and villages every year.
- address rural energy poverty, focusing on women and/girls through leap frog approach



Finance

- The investment Plan including large HP generation, transmission and, Universal Electricity Access Program more than 2 Billion USD/yr.



Expected Transformational Impacts

- Diversify future RE mix and Increase investment confidence as the Investment Plan target sub-sectors at early stages of development (e.g. wind and geothermal)
- Pave the way for the development of future IPPs/ppp's in the Geothermal and wind energy
- Create a solid supplier base and provide access to finance needed for SMEs on competitive terms
- Stimulate local wind technology manufacturers
- Will address rural communities energy poverty specially women and girls through dissemination of efficient stoves, on leap frog approach .



Sector Strategy ..contd

Regional interconnection

- Ethiopia-Djibouti interconnector operational since 2011. Replaced 65% of the fuel based electricity consumption with AfDB Finance.
- Ethiopia-Sudan transmission line completed. Will be operational this year. WB finance the Ethiopian Side .
- Ethiopia-Kenya transmission project PPA signed. The construction will start this year. Finance secured.



Sector Strategy ..contd

Benefits from regional interconnections include:

- Strategic partnership among the countries, which will have significant contribution for regional economic cooperation and stability;
- All interconnected cities and villages will have lower unit energy costs and renewable energy which displaces expensive and environment unfriendly thermal generation.
- Contributes for climate mitigation action and help to scale up RE development..win-win solution.



Sector Strategy ..contd

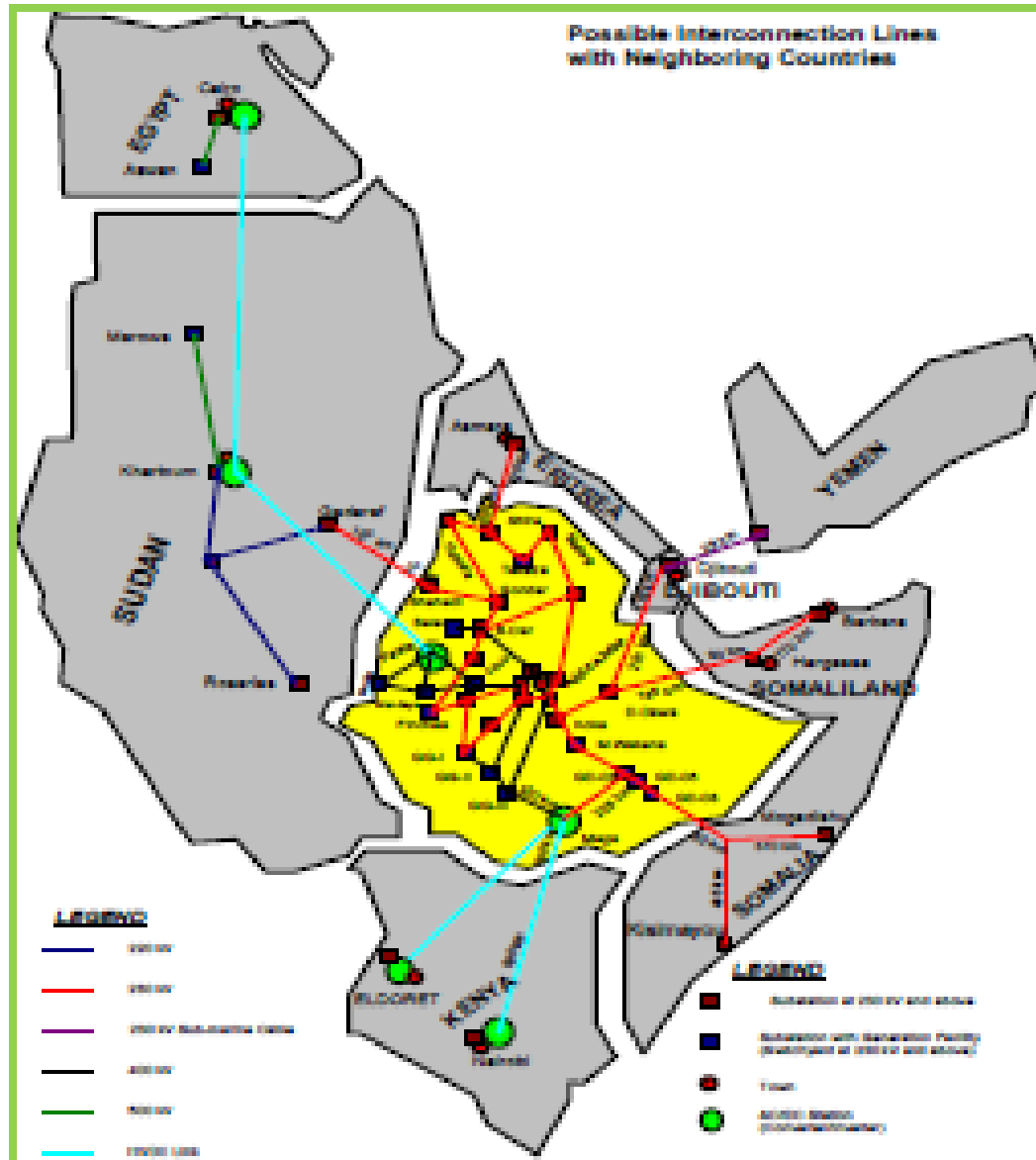


Figure 6.3-1 Schematic Diagram of Power Transmission in Ethiopia



***Ethiopia will be climate
resilient and have zero
carbon growth by 2025***

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I Thank you

