

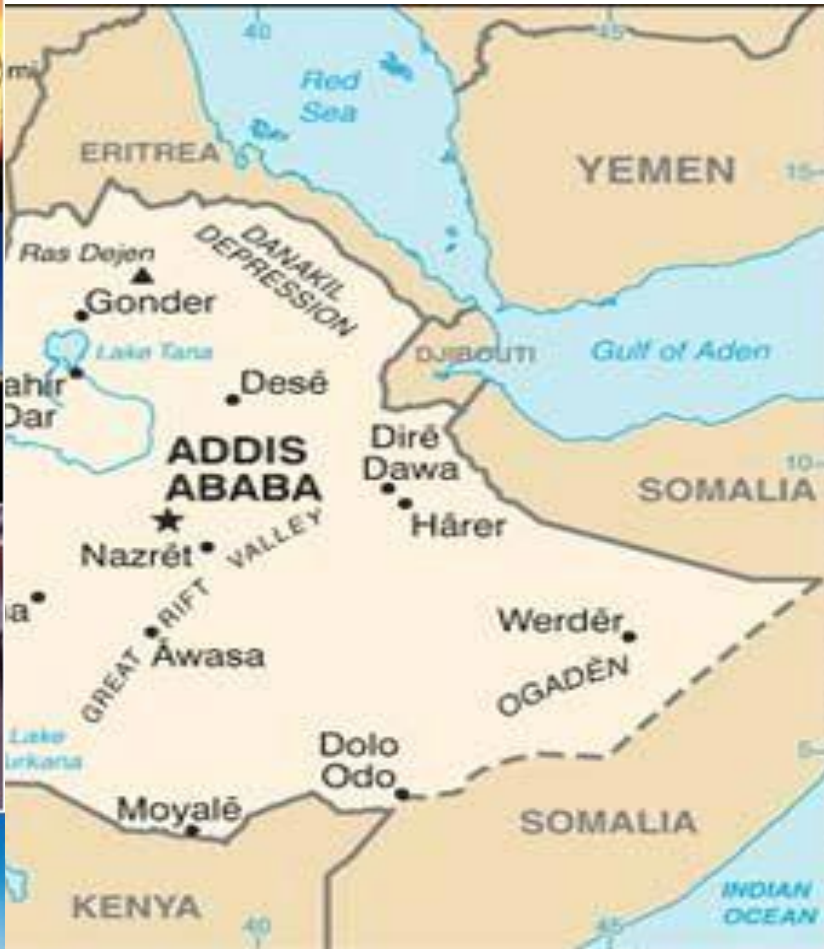


# Conservation of Migratory Birds in Wind Power Projects

The case of Ethiopia

May 4, 2012 IFC, Washington DC

# Some Factsheet



**Area:** 1.14 million km<sup>2</sup>

**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%

# Power Generation Resources

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- 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)
- Access to electricity is about 47%; (towns and village coverage)

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



90 MW under construction (Phase II)



# 15 mw operational Hydrochina (1.5 MW generating unit (Gold wind )



# 36 MW will be operational operational

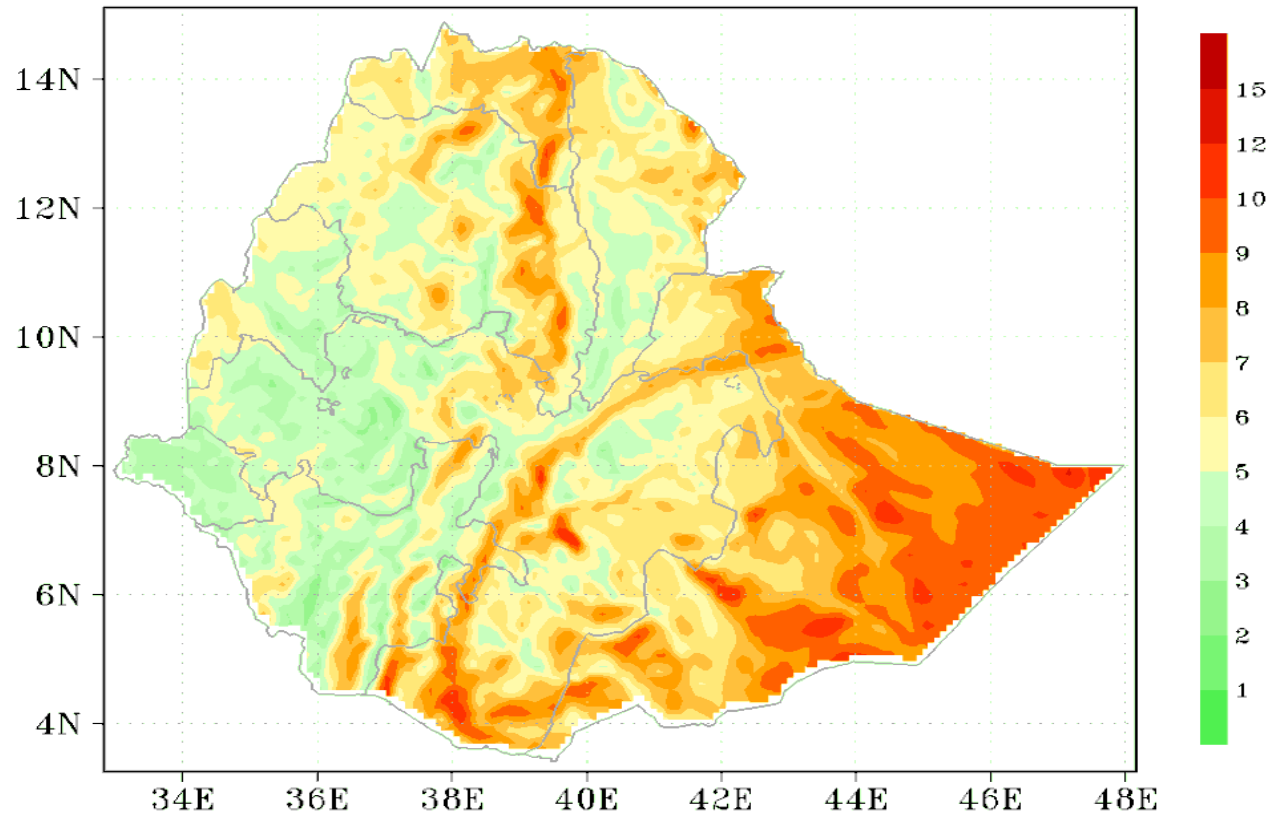


# Wind resources Assessment Master Plan

- Completed the draft wind resources Assessment Master Plan Study for the country.
- The Master Plan recommends 51 wind projects including Assela wind farm project (with total planned capacity of 6,820MW) up to the period 2030.
- Recommends the major policy options to be developed for wind energy expansion including the environment impacts on birds and wild animals.



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



# Transmission line construction

- constructed 10,812.02 km transmission lines and 138,838 km distribution lines until to-date.
- All these transmission /distribution lines are overhead structures constructed to span or cross wetlands, streams, rivers, near-shore areas of lakes, etc. The transmission lines principal structures include the line itself, conductors, towers and supports.
- The tower structure will vary directly with the required voltage and capacity of the intended power transmission lines.

# Bird population and migratory birds

- There are about 862 birds, of which 16 are endemic to Ethiopia.
- besides the indigenous bird population in the country, the Great Ethiopian Rift Valley is visited by migratory birds every year

- There are two known major bird migratory routes; the first route is to migrate to Africa through Egypt and flow down to many African Countries and the second route follows Eastern Mediterranean-Babel Mendeb-Djibouti-Ethiopia and to the East African countries (Kenya, Uganda and Tanzania).

# I. Migratory bird route through North Africa







# International treaty on migratory birds and wild animals

- Ethiopia has ratified the international treaty on migratory birds, the “Agreement on the Conservation of African-Eurasian Migratory Water birds” (AEWA),
- issued a Proclamation No. 635/2009, entitled “A Proclamation to Ratify the Agreement for Conservation of African Eurasian Migratory Water Birds” in June 30, 2009.
- Issued a Proclamation No. 634/2009 to Ratify the convention on Migratory Species of Wild Animals.
- These treaties are found to have paramount importance in conserving the migratory water bird and wild animal species through the cooperation of member states.

# Transmission Lines Vs Bird Population

- Birds usually are thought to select their breeding habitats on the basis of vegetation coverage. After the construction of the transmission /distribution line the vegetation clearing activity in the ROW will affect birds in many ways.
- Bird collision nowadays is also becoming a significant issue not only from environmental point of view, but also from economical and technical view points.

- There is a threat to those birds with relatively large body size, fast flight, flocking behavior, long appendages relative to body size, poorly developed fovea and spending relatively high proportion of time in the air.
- Some of the conductors are thinner and are more difficult to be seen hence, causes bird collision.
- Birds at most risks are due to their relatively wide wingspans and tendency to use poles as nesting platforms.

- bird collisions with the transmission line occur especially to those night active once.
- Electrocution and death of birds occur when bird's body bridges the gap between two energized components of conductors.
- Moreover, other birds also are more often killed through direct flying into wires at high speed.

# Mitigation Measures

- Careful pre-construction siting should avoid transecting wetlands or separating known roosting and foraging habitats. The line should also be parallel to prevailing winds condition, and on prominent landscape features such as cliffs it should utilize existing transmission line corridors.
- Power lines should be modified and re-designed to make sure that wires are more visible to avifauna to protect them from power line collisions.
- Remove all static leftover lines from poles.

# Mitigation measures

- Use wire markers on static lines to make it more visible.
- Minimize opportunities for birds to come in contact with wires by placing perches above wires.
- Ensure that wires are spaced to accommodate the wingspan of the largest birds and provide nesting platforms in areas where raptors are likely to nest on poles.
- Install deflectors /flapper devices or balloons in sensitive areas with potential for bird collision, which will be fixed on shield wires to make it more visible and reduce or minimize collision of birds significantly.



# CONCLUSION

- Every project activity should strictly adhere and abide to the Ethiopian government's Proclamation No. 635/2009 of June 2009. Also as a signatory body of the "Agreement on the conservation of African-Eurasian Migratory Water birds" Ethiopia has a vested interest and legally binding law to conservation of Migratory Birds and wild animals.

- EEP Co as a proponent for the construction of transmission /distribution lines throughout the country used to take this issue seriously and tried to minimize the impact of transmission lines by electrocution and collision of bird population during the feasibility, ESIA study and design stages of projects.
- Besides birds being killed by collision, in most cases it also results in power outages and hence needs to be thoroughly studied and serious action be taken starting from early stages.

- According to the Master Plan Study the birds' distribution are located around Hula plant area, Harar west plant area, Mek'ele north plant area, Debre Birhan plant area and Bahir Dar plant area. Therefore, the wind turbine arrangement of these plant areas shall pay attention to the impact of wind turbine location and operation on the activities of birds.

# I Thank you

