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Energy Resource Mix in Ethiopia:
Current Status and Future Direction

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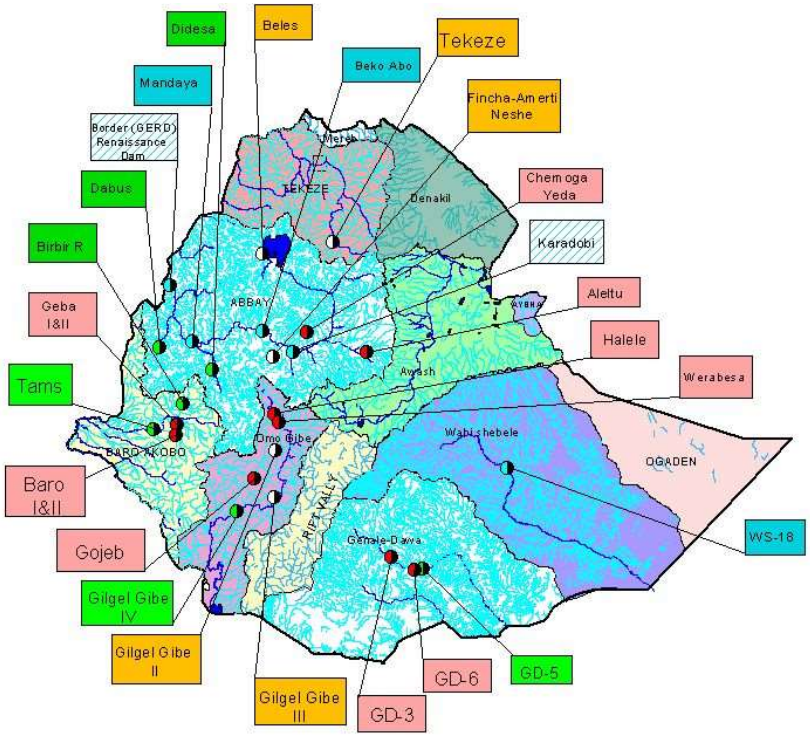
Energy Resources

Hydropower	~ 45,000 MW
Geothermal	~ 10,000 MW
Solar	Average daily irradiation of ~ 5.75 kWh /sq.m. day
Wind	> speed of 7 meter/second and greater at 50 m AGL
Wood	~ 1,120 million tones (annually sustainably exploitable)
Agricultural waste	~ 15 to 20 million tones
Natural gas (proven reserve)	8 TCF (226 billion m^3)
Coal (proven reserve)	> 300 million tones
Oil shale (proven reserve)	253 million tones

Hydropower Resource Map



- 8 wet river basins, 45,000 MW of hydropower potential

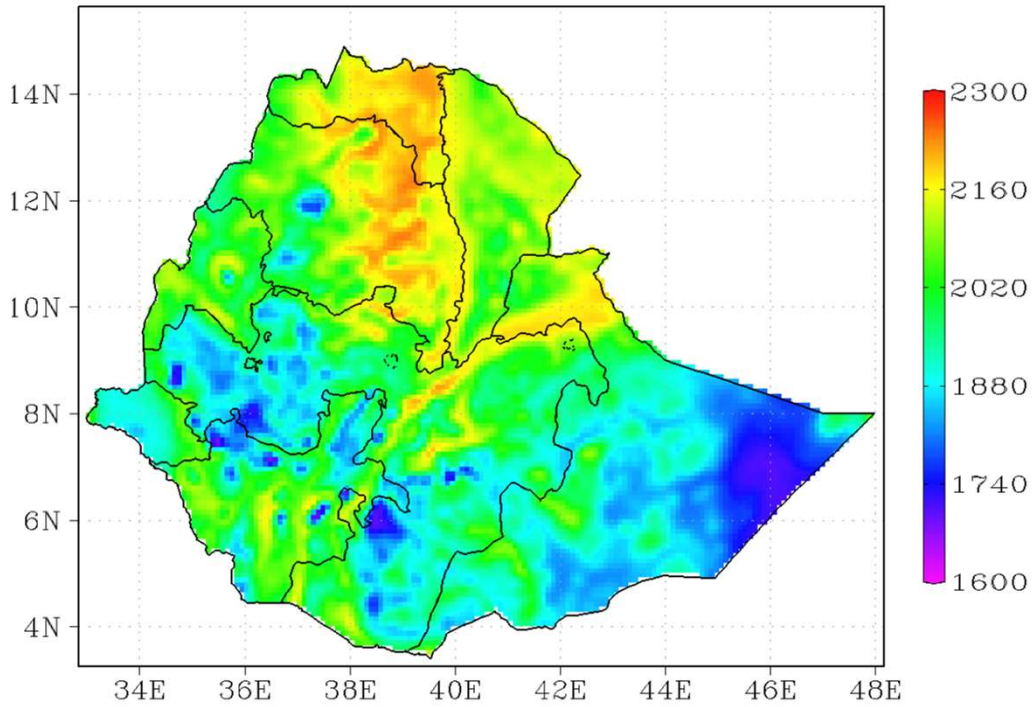
Source: MoWIE

Geothermal Energy Resource Map

- 24 prospect sites identified with total potential of over 10,000 MW

Source: GSE

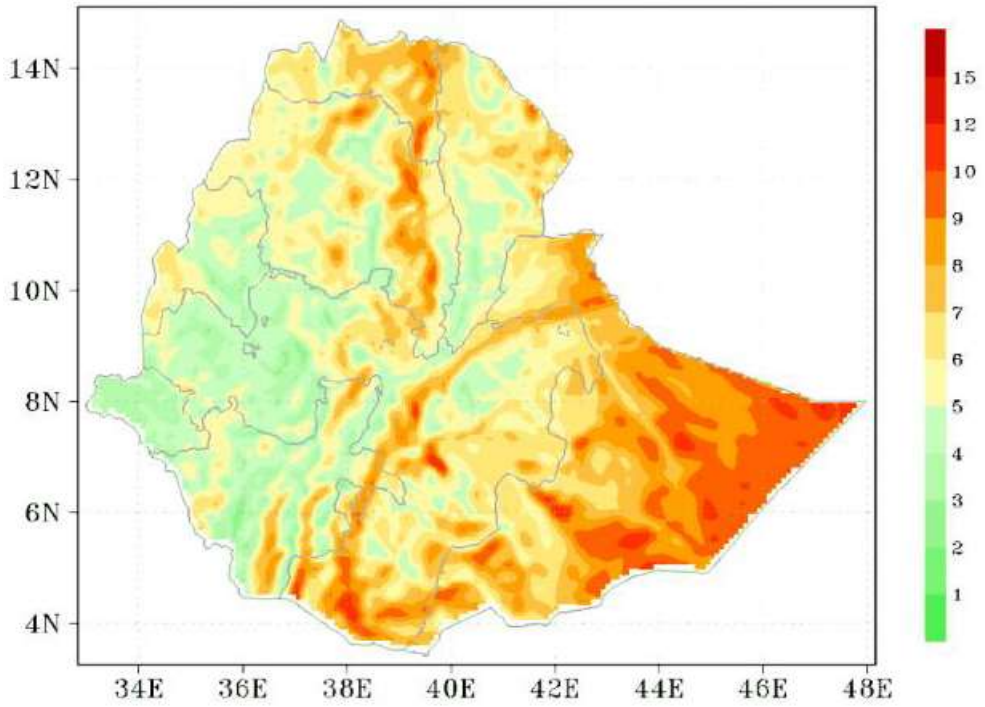
Solar Energy Resource Map



- Distribution of Average Annual Total Solar Radiation, kW·h/(m2·a) (1980~2009)

Source: Master Plan Report of Wind and Solar Energy in the Federal Democratic Republic of Ethiopia , 2012

Wind Energy Resource Map



- Distribution of average wind speeds (m/s) in Ethiopia (1980-2009) – 50m height

Source: Master Plan Report of Wind and Solar Energy in the Federal Democratic Republic of Ethiopia , 2012

Electricity

- Generation capacity in the grid – 4,284 MW
  - Hydro – 3,810 MW
  - Wind – 324 MW
  - Solid Waste – 25 MW
- Geographic access to electricity grid ~ 60%
  - Household connectivity > 44%
  - Per capita electricity consumption ~ 100 kWh/a

Electricity

- Average annual electricity demand growth rate > 20%
- Some factors for high demand growth,
  - GDP growth of ~10%
  - New demand from industry and services
  - expansion of the grid to rural towns and villages raising geographic coverage from 15% to almost 60% in 12 years (2005 – 2017)
- All current electricity production in the grid is from renewable sources (hydro, wind)

Existing Power Plants Installed Capacity (MW) to the National Grid

No	Power Plant	Hydro	Geothermal	Wind	W2E	Total	In-service date
1	Koka	43.2				43.2	1960
2	Awash II	32.0				32.0	1966
3	Awash III	32.0				32.0	1971
4	Finchaa	134.0				134.0	1973
5	Meleka Wakena	153.0				153.0	1988
6	Tis Aby I	11.4				11.4	1964
7	Tis Abay II	73.0				73.0	2001
8	Gilgel Gibe	184.0				184.0	2004
9	Aluttu Langano		7.3			7.3	1999
10	Tekeze	300.0				300.0	2009
11	Gilgel gibe II	420.0				420.0	2010
12	Beles	460.0				460.0	2010
13	Fincha Amerti Neshi	97.0				97.0	2011
14	Ashegoda			120.0		120.0	2012
15	Adama I			51.0		51.0	2010
16	Adama II			153.0		153.0	2015
17	Gibe III	1870.0				1870.0	2015
18	Reppi Waste to Energy				25.0	25.0	2019
	Total	**3809.6**	**7.3**	**324.0**		**4165.9**	

Future Direction for Energy Mix

Resource Type	@2018	(%)	@ 2030	(%)
Hydropower	3,810	91.5	20,200	62.2
Geothermal	7	0.1	3,500	10.8
Solar	0	0	3,000	9.2
Wind	324	7.8	2,500	7.7
Nuclear	0	0	2,000	6.1
Natural Gas	0	0	1,000	3.1
Waste to Energy	25	0.6	300	0.9
Total:	4,166		32,500	

Thank You