Renewable Energy in Bhutan- Its Policy Perspectives

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Bhutan

Brief Overview (Bhutan 2014-2015):

Area - 38,394 sq.km
Population (est. 2015) – 757,042
GDP ~ USD 2 billion
Per capita GDP – USD 2,611.74
Forest coverage – 70.5 %

Per capita electricity consumption ~ 2,600 kWh

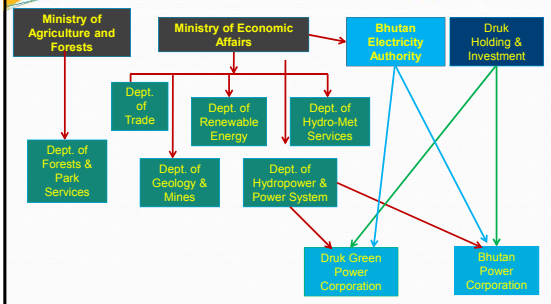
Per capita fuelwood consumption (excluding timber) ~ 0.86 tons

Primary source of Energy:
Biomass (36%),
Electricity (28%),
Diesel (16%) and
Coal (15%)

Hydropower Potential - 23,769 MW
Hydropower - 1,606 MW (3,658 MW under development)

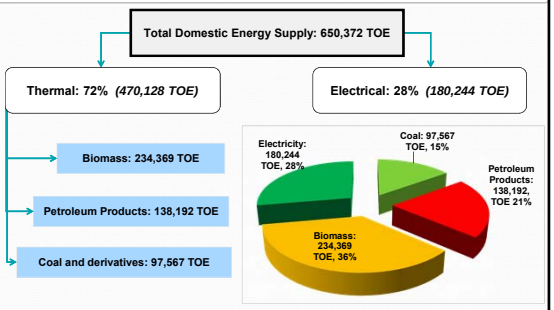
Annual electricity generation ~ 7,005.2 GWh
Electricity export - 5,175.6 GWh

Overview of Energy Sector in Bhutan



Colour Legend: Policy directives, Investment Directives, Regulatory Directives

Energy Mix Chart of Bhutan (2015)



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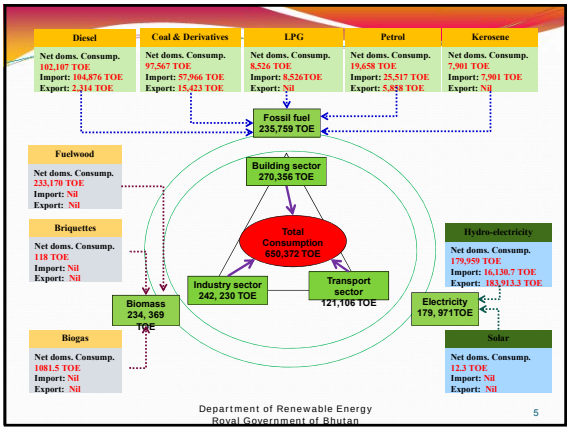

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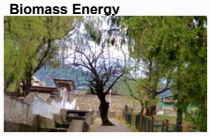
Renewable Energy Resources

Wind Energy

Hydropower (<25 MW)

Biomass Energy



Solar PV & Thermal

Achievement

- ✓ Around 99% Rural Electrification achieved through grid connection
- ✓ Off-grid Rural Electrification – 2392 sets of Solar PV Home lighting System distributed for free to rural households
- ✓ 2,849 domestic biogas plants installed through subsidy program. Cold climate biogas plants being tested/ piloted. 2 Medium scale (75 cu.m) biogas plants constructed.
- ✓ 11,561 Improved Cook Stoves rolled out through subsidy program. Impact Assessment being carried out. Further improved on the design (Bhutan EcoStove) and ongoing - roll out of 1000 stoves
- ✓ 1,610 Improved Heating stoves rolled out through subsidy. Impact assessment being carried out.
- ✓ Others:
  - ✓ Solar Water Heating Systems – 8 Nos. piloted

Energy Efficiency Improvement

Energy Efficiency & Conservation Policy- Under formulation

•40 Industries
•Building Sectors
•Transport Sector
•Appliances & Equipment Survey

•Energy Audit Outcome: *Significant Energy Saving Potential !*

•S&L Program
•DSM through efficient lighting systems (LED lights dissemination programs)

Continuous awareness program on EE conducted

Building

Industries

Transport

Appliances

Existing Policies

- Electricity Act of Bhutan, 2001
- Economic Development Policy of the Kingdom of Bhutan, 2010
- Sustainable Hydropower Development Policy 2008
- **Alternative Renewable Energy Policy 2013**
- Foreign Direct Investment Policy, 2010
- Domestic Feed in Tariff Policy (Draft)

AREP 2013 (Alternative Renewable Energy Policy)

"Promote clean renewable energy technologies in Bhutan including solar, wind, bio-mass, geo – thermal, pico/micro/mini/small hydropower plants upto 25 MW in size and waste-to-energy technologies"

AREP stipulates the introduction of a Feed-In-Tariff (FIT) as a support mechanism for renewable energy technologies.

Feed-in-Tariff Policy (Draft)

- Draft Feed-in-Tariff Framework is being developed by DRE
- Guiding principles for FIT framework are:

a. Effectiveness in meeting the objectives of a Feed-in-tariff scheme;
b. Compatibility with the tariff principles

FIT Funding- ONLY through REDF

Financial Resource Management for RE

- Budgetary Support from Royal Government of Bhutan
- Renewable Energy Development Fund

"To provide financial assistance for creating a favorable investment climate for RE in the country"

Project Related RE's: Taxes are exempted for equipment's; Subsidies on cost sharing

Challenges

- Lack of funds for operationalizing of REDF
- Lack of Public-Private partnerships
- No funds for Implementing Solar Power Plant (30MW)

THANK YOU!!!

For further information, please visit www.moea.gov.bt