

SOUTH ASIA SUBREGIONAL WORKSHOP

INCLUSIVE CLEAN ENERGY TRANSITIONS IN BHUTAN AND NEPAL

“Policy Innovation for Access & Affordability in Bhutan”

22-23 May 2025 • Paro, Bhutan



Outline

- Energy Resources & Energy Access
- Energy Demand Supply
- Hydropower Development
- Renewable Energy Resource Development
- Draft Energy Policy 2025
- Other Innovative Solutions

Energy Resources & Energy Access



Hydro potential
36,888 MW (154,145 GWh/a)



Solar Potential
12,018 MW (20,025 GWh/a)



114 GWh/a Solar Thermal
Potential



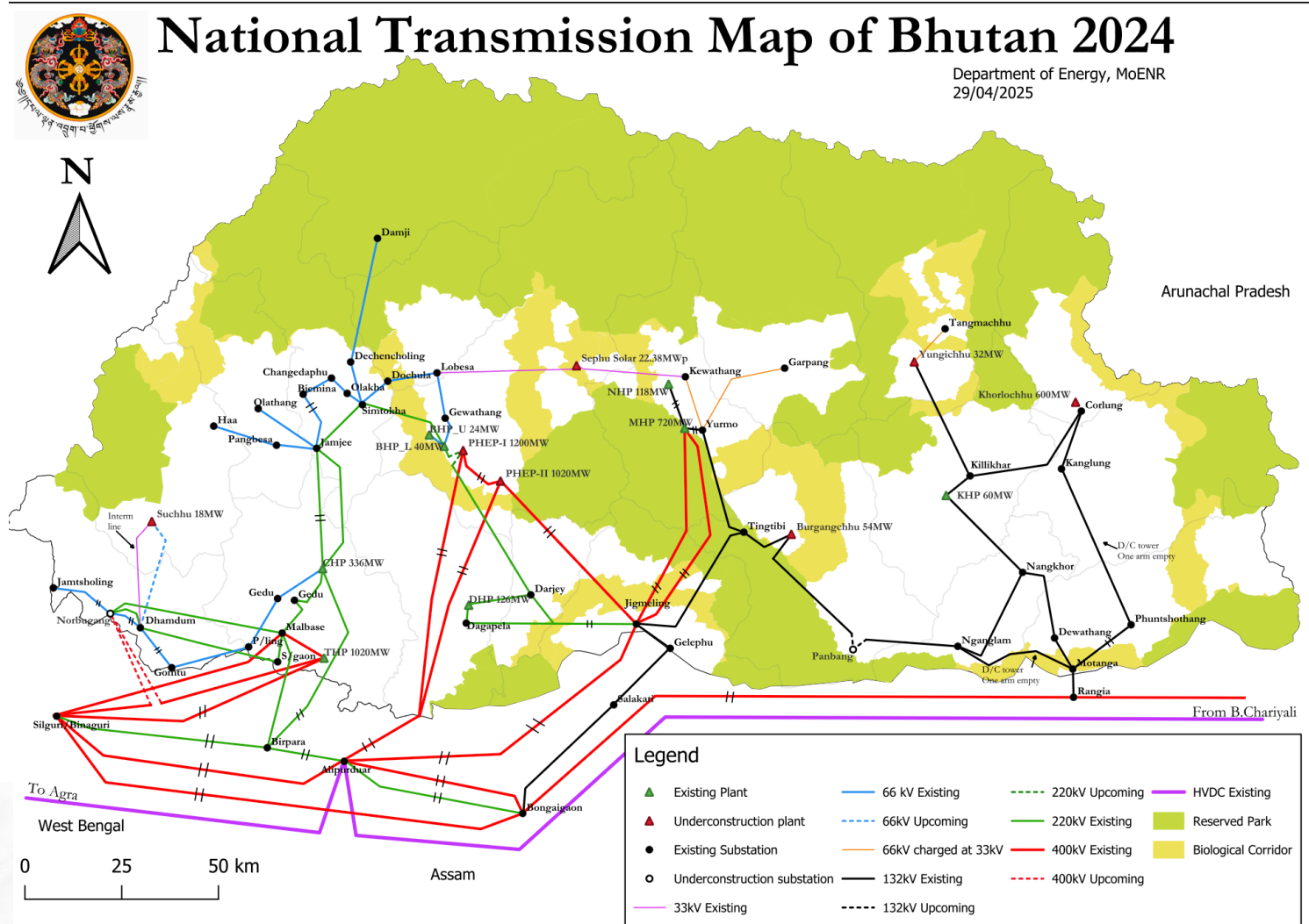
Wind Potential
761 MW (308 GWh/a)



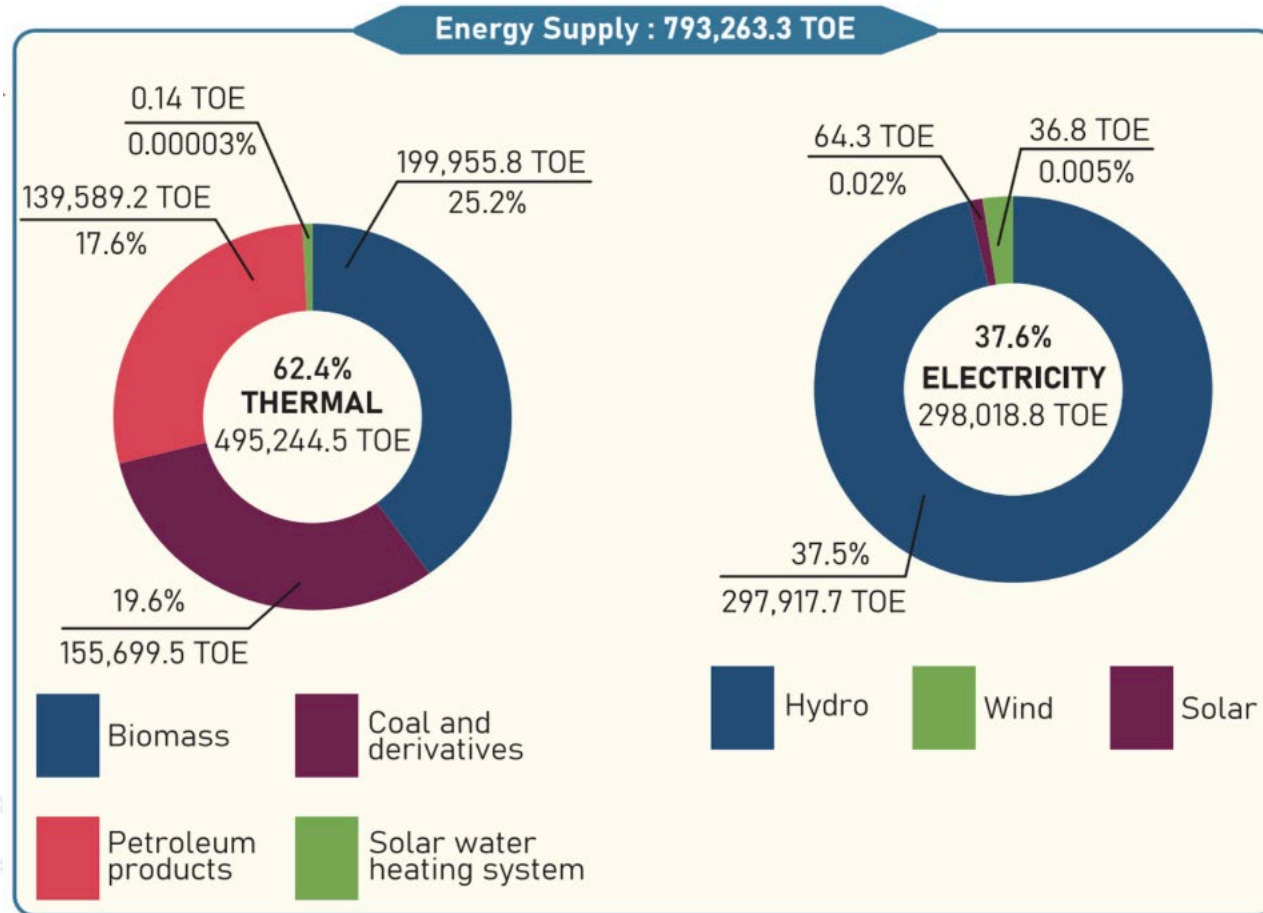
2.6 GW Biomass Potential



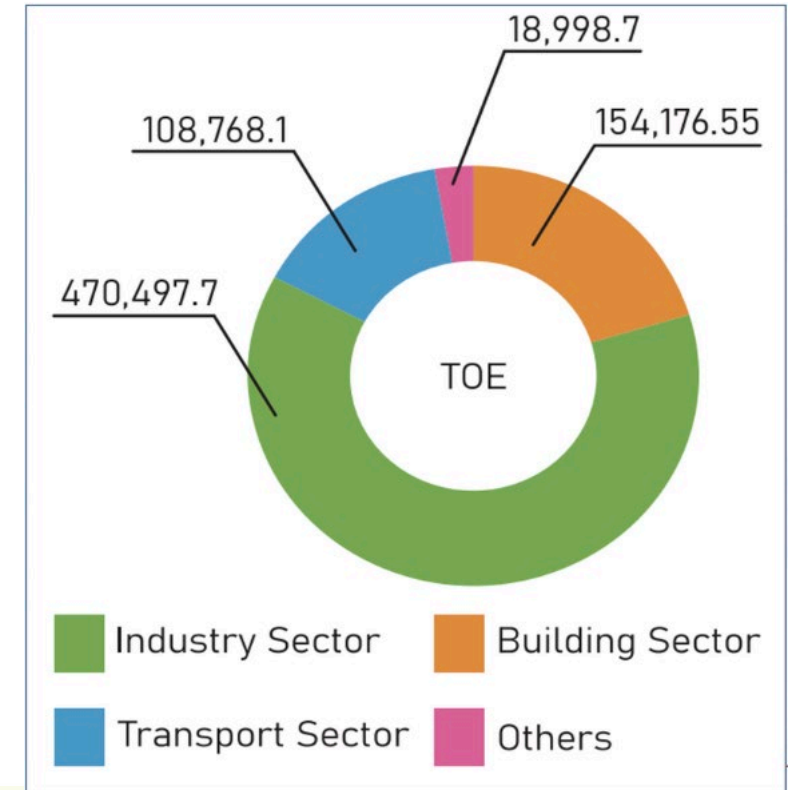
Green Hydrogen



Energy Supply & Demand



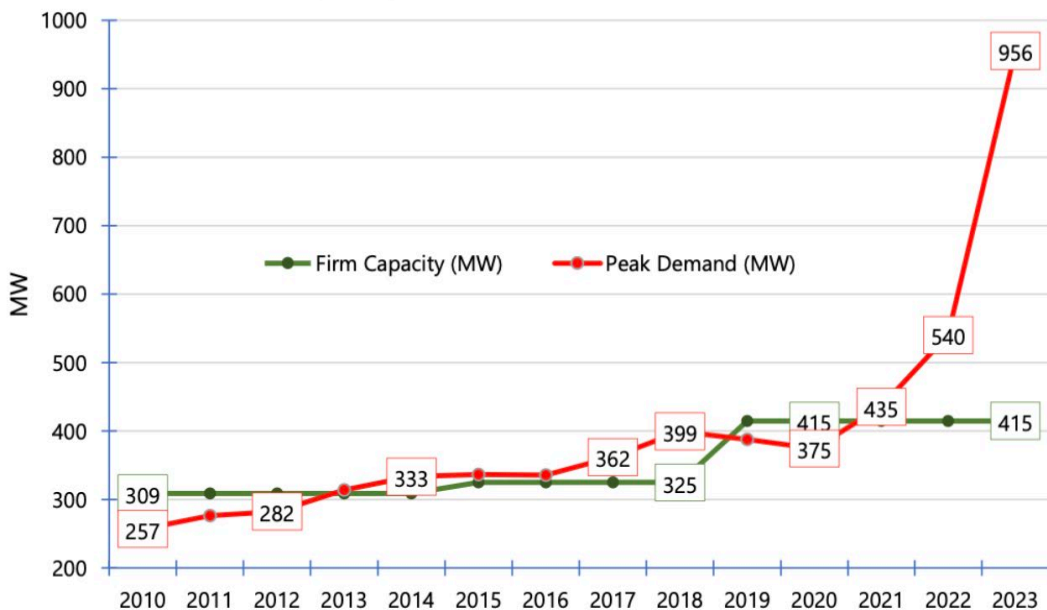
ENERGY SUPPLY & Fuel Mix in 2022



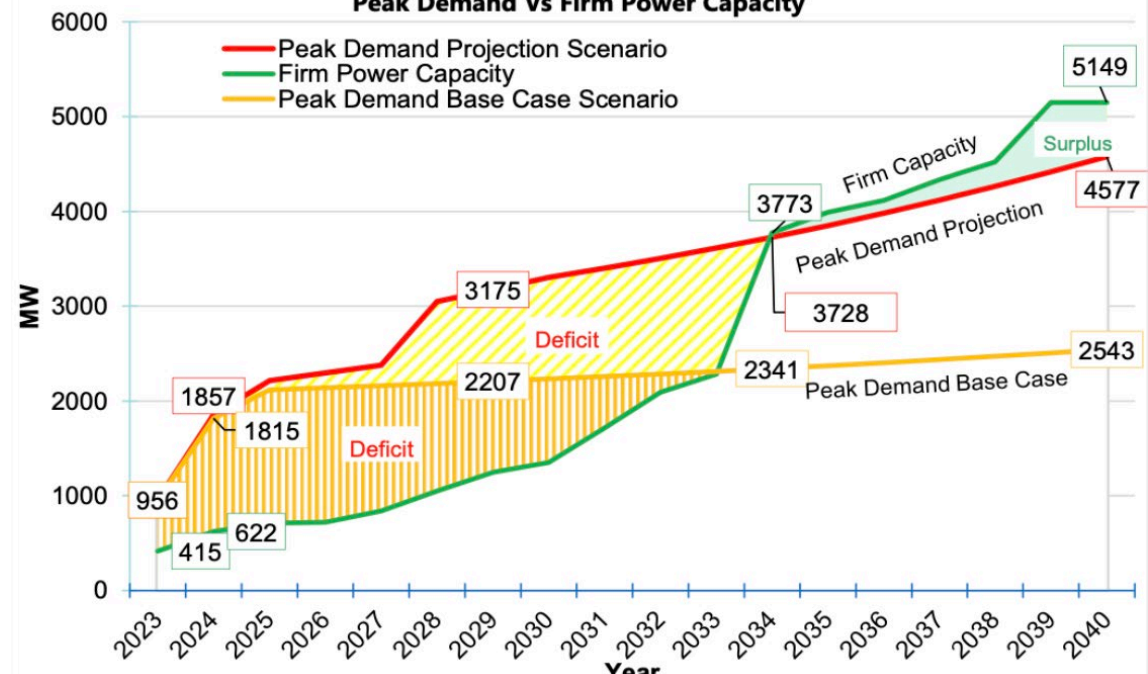
ENERGY DEMAND in 2022

Outline

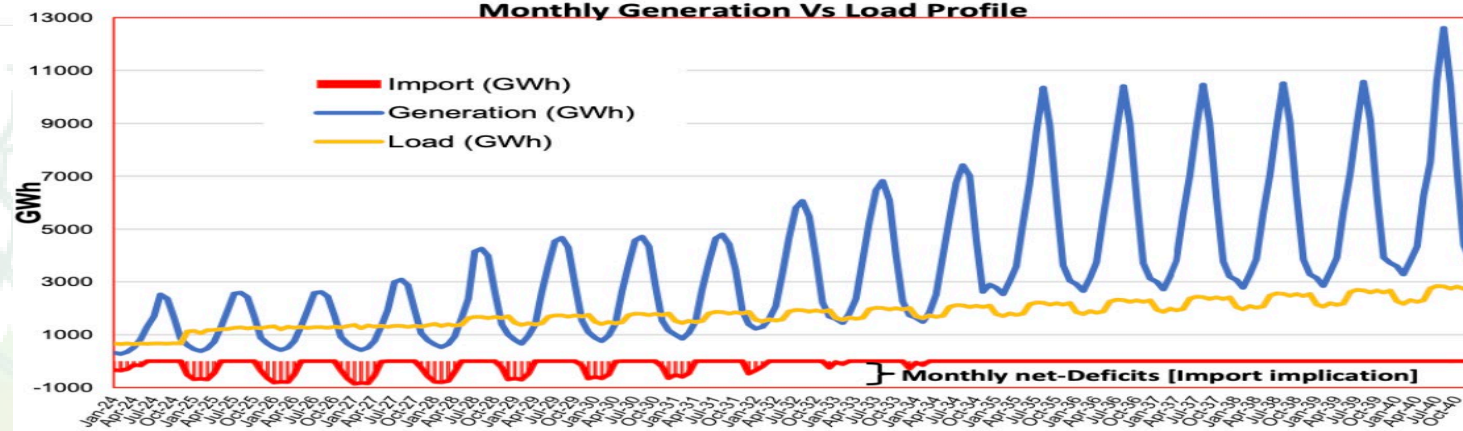
Firm Capacity Vs Peak Demand (2010 - 2023)



Peak Demand Vs Firm Power Capacity



Monthly Generation Vs Load Profile

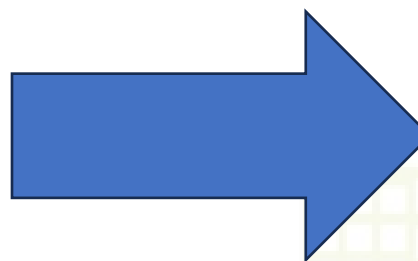


Overarching guidance and inspiration drawn from His Majesty The King's Royal address of 116th National Day (2023):

*"I want to emphasise three immediate priority areas that will support the Gelephu project: Energy, Connectivity, and Skills. First, we need to further expand our energy sector. We should tap all available sources including solar, wind, thermal and hydropower. Considering our current expertise, we need to enhance the installed capacity of hydropower by expediting the construction of projects such as Kholongchu, Chamkharchu, Dorjilung, Nyera Amari, Wangchu, Bunakha and Sunkosh, for which Detailed Project Reports are ready. Our **electricity prices should be among the most competitive in the region** so that our hydro resources are not just a source of revenue, but also an **enabler of other investments**."*

LONG-TERM PLAN

1. Renewable Energy Development Roadmap
2. Hydrogen Roadmap
3. 13th FIVE YEAR PLAN



HYDROPOWER

2029 - 3,119 MW

2034 - 11,000 MW

2040 - 15,000 MW

Existing

2,452 MW



SOLAR

2029 - 1,000 MW

2034 - 1,500 MW

2040 - 5,000 MW

Existing

~3 MW



WIND

2029 - 28 MW

Existing

0.6 MW

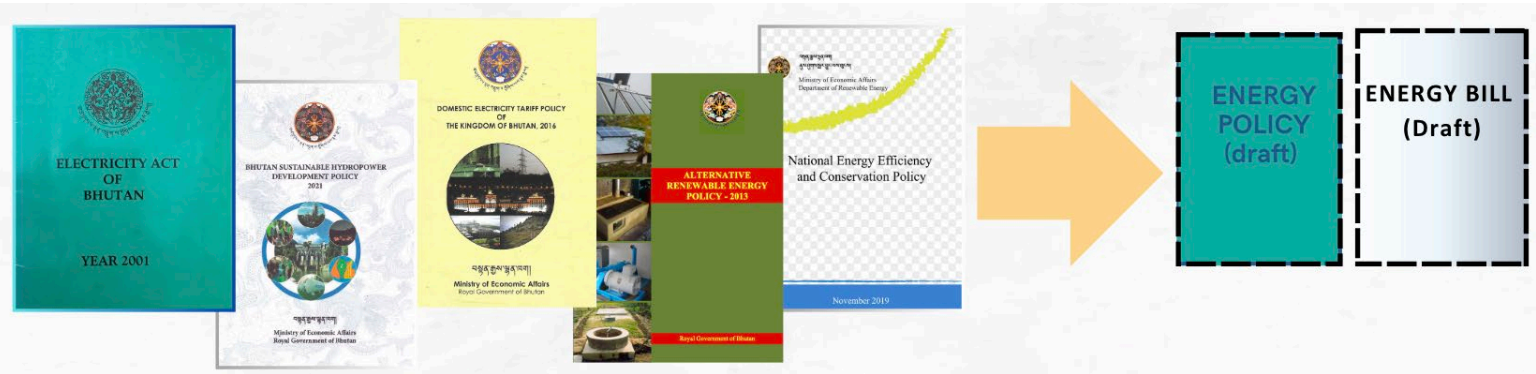


HYDROGEN

2029 - 5 MW (700 MT/yr)

2040 - 123 MW (18 KT/yr)

Policy Reform



1. Integration of existing four policies into one single National Energy Policy
2. Formulation of Energy Bill to supersede the existing Electricity Act



- 1 Ensure Energy Security
- 2 Ensure Reliable and Competitive Energy Supply
- 3 Attract Investments
- 4 Develop Energy Market and Regional Integration
- 5 Enhance Climate Change Mitigation and Resilience
- 6 Promote Energy Efficiency and Conservation
- 7 Foster Institutional Growth and Capacity Building

New Energy Policy: Strategic Recommendations

Capacity additions: 15,000MW Hydro and 5,000MW Solar by 2040

Opening up of hydro for private investments - up to 49% via strategic partnership on project-specific basis

Domestic private investments in small hydro also up to 49%

Solar development as IPP/captive power with option for PPP

Concession period for hydro extendable by a maximum of 5 years based on conditions precedent and partnership performance

Prioritize development of reservoir and pumped storage hydro including BESS

Royalty/free power quantum reduction from 15% to 13% of net generation

Establishment of domestic Power Market & integration with carbon trade MRV

Tax incentives for renewable energy projects

Key Interventions

Institutional Restructuring

Policy review and reform

Target setting and realignment of priorities

Innovating financing (PPP projects, blended financing and result based financing models)

Last mile energy access - distributed generation, solar water heating, prosumer & biogas

Exploration, innovation & research focus - green hydrogen, SAF, geothermal, pumped hydro etc