Energy Sector in Bhutan

Department of Energy
Ministry of Energy & Natural Resources

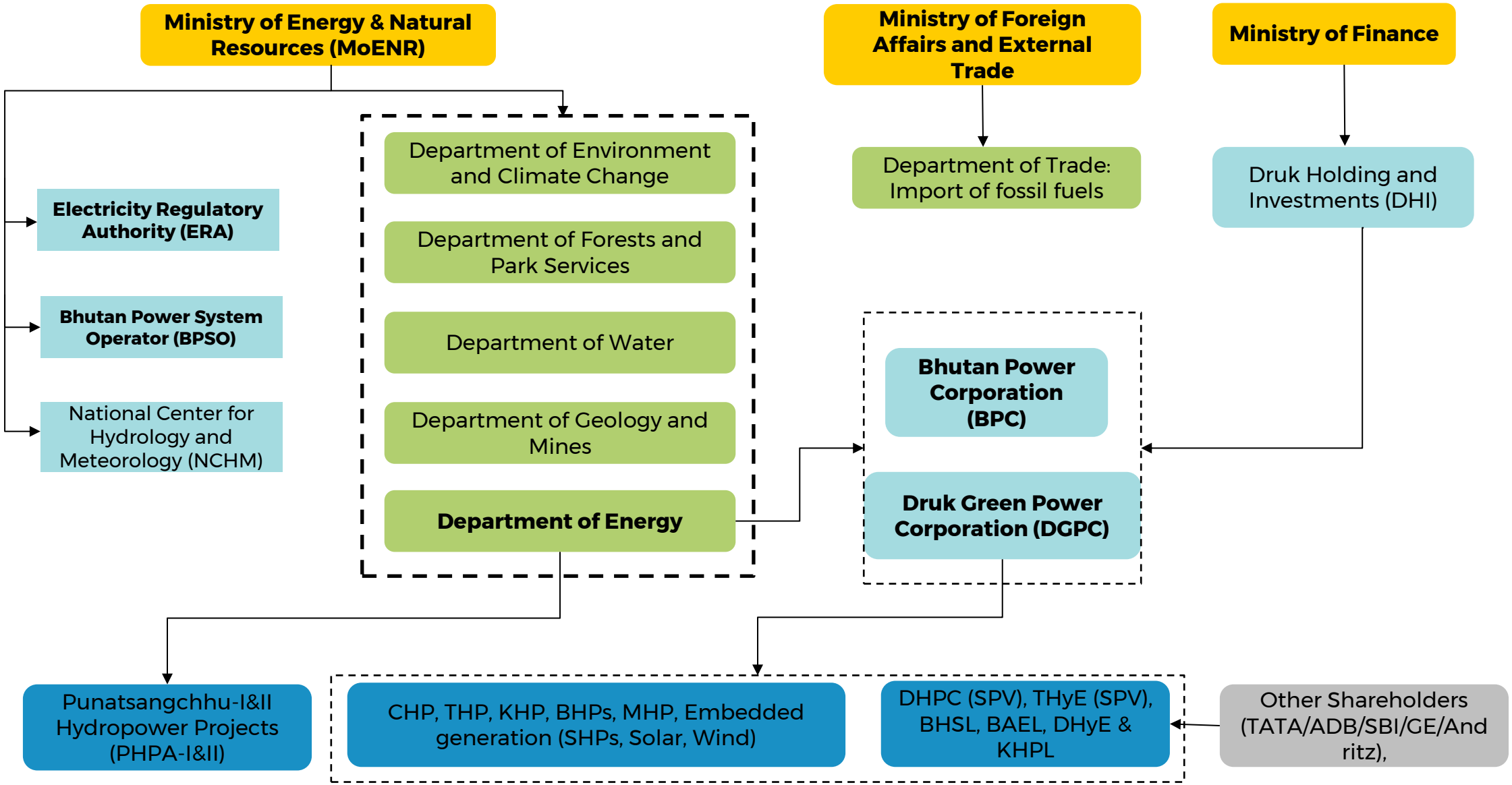
June 4, 2025

BHUTAN
Believe

Outline

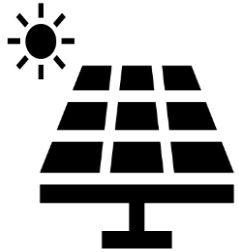
1. Institutional Set-up
2. Energy Resource Potential
3. Current Sector Scenario
4. Electricity Demand – Supply Trend
5. Situational Analyses
6. Generation Capacity additions
7. Financing & Implementation modalities

Institutional set-up



Energy Resource Potential

Hydropower potential
36,888 MW (154,145 GWh/a)
Techno-Economic – **33,000 MW**
Excludes PSP potential



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

114 GWh/a Solar Thermal Potential

Wind Energy Potential
761 MW (308 GWh/a)

Green Hydrogen

Existing Hydropower projects

Kurichhu HPP (2001)

60 MW

Basochhu-I&II HPPs (2001/04)

64 MW

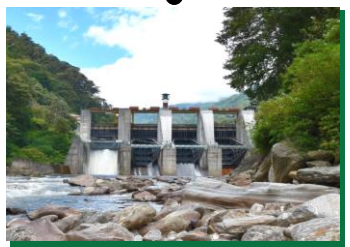
Mangdechhu HPP (2019)

720 MW

IC - 2,452 MW including SHPs

2024 Generation – 11,195 MU

Firm Power – 455 MW (~19%)



Chukha HPP (1986-88)

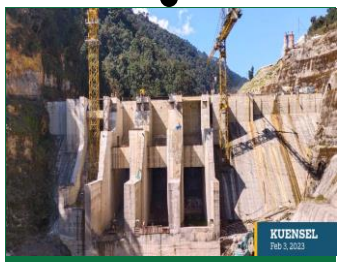
336 MW

Tala HPP (2006-07)

1020 MW

Dagachhu HPP (2015)

126 MW



Nikachhu HPP (2024)

118 MW

Under Commissioning/Construction

Punatsangchhu-II

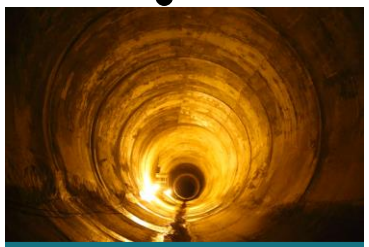
1,020 MW

Burgangchhu SHP

54 MW

Suchhu SHP

18 MW



Phunatsangchhu-I

1,200 MW

Khorlochhu

600 MW

Yungichhu SHP

32 MW

2,924 MW

(Including SHPs-I)

Solar Plants - 5.6 MW

2.60 MW at Dechencholing, Thimphu (2023-24)

251 kW at CFM Rooftop, Thimphu (2023-24)

1.60 MW Rooftop, Royal Academy, Pangbisa, Paro ('24)

Solar Plant under Construction

17.38 MW
Installed Capacity

+ 5MW

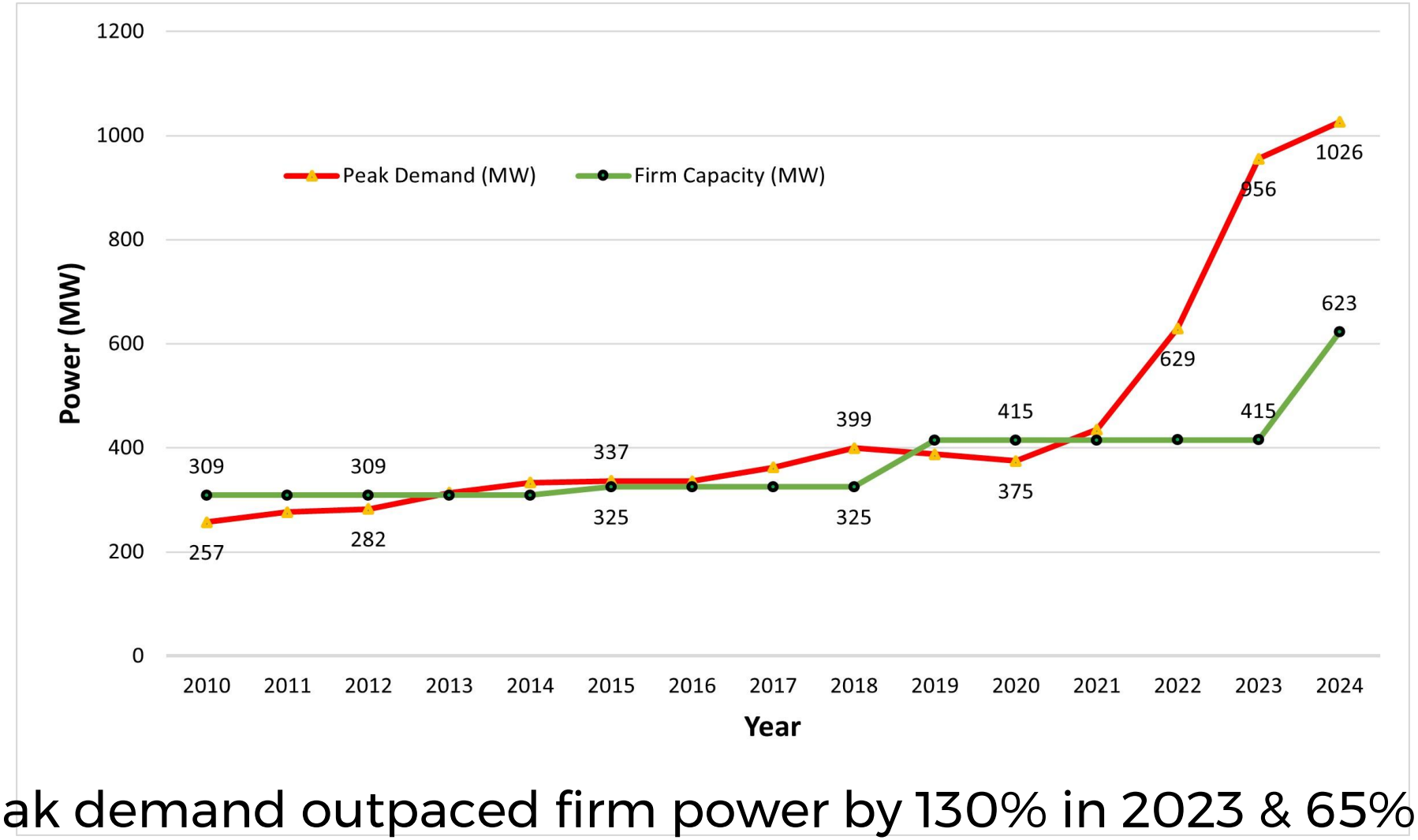
65.49 Acres
Project Area

25 GWh
Design Annual Energy

USD 10,972,430.27
Contract Amount

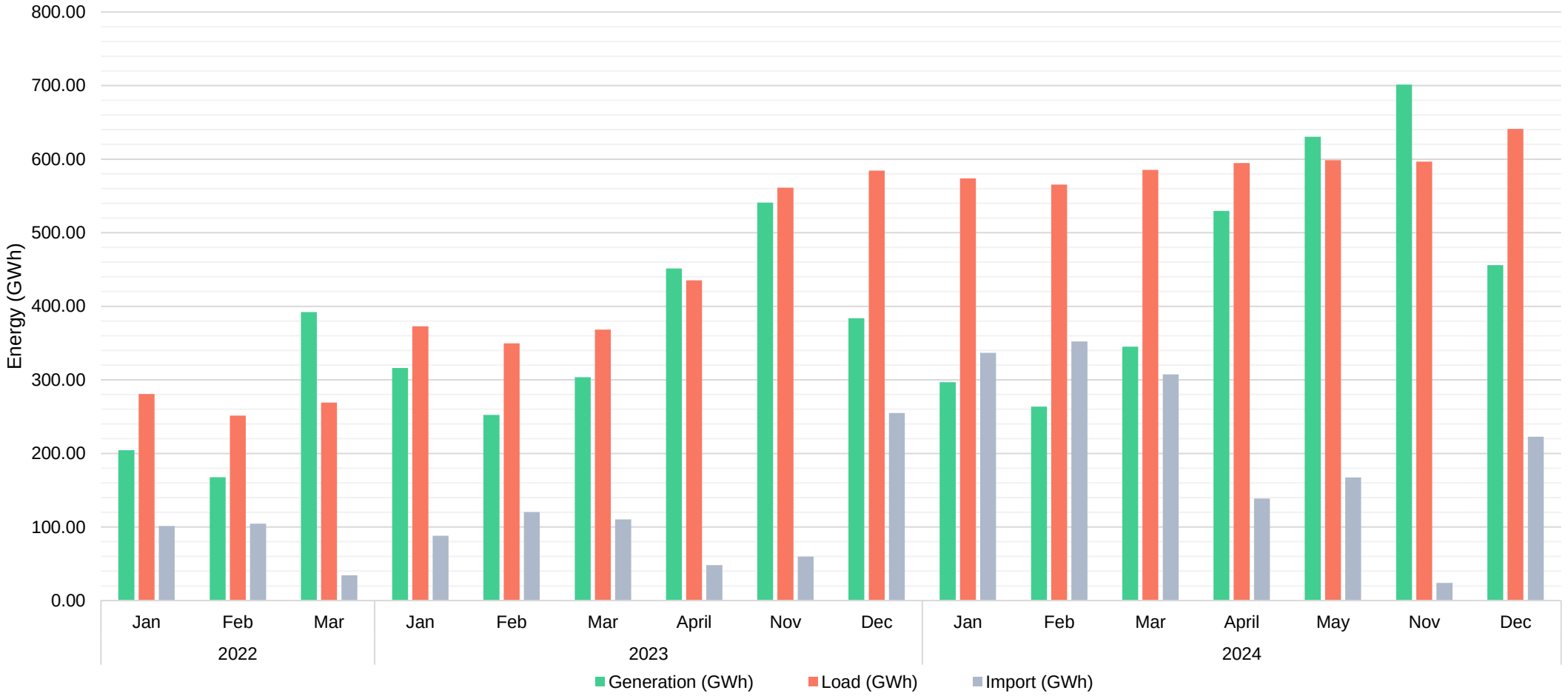
Yongtru, Sephu
Project Location

Electricity Demand-Supply Trend



- Peak demand outpaced firm power by 130% in 2023 & 65% in 2024
- Widening demand-supply gap

Imports Trends



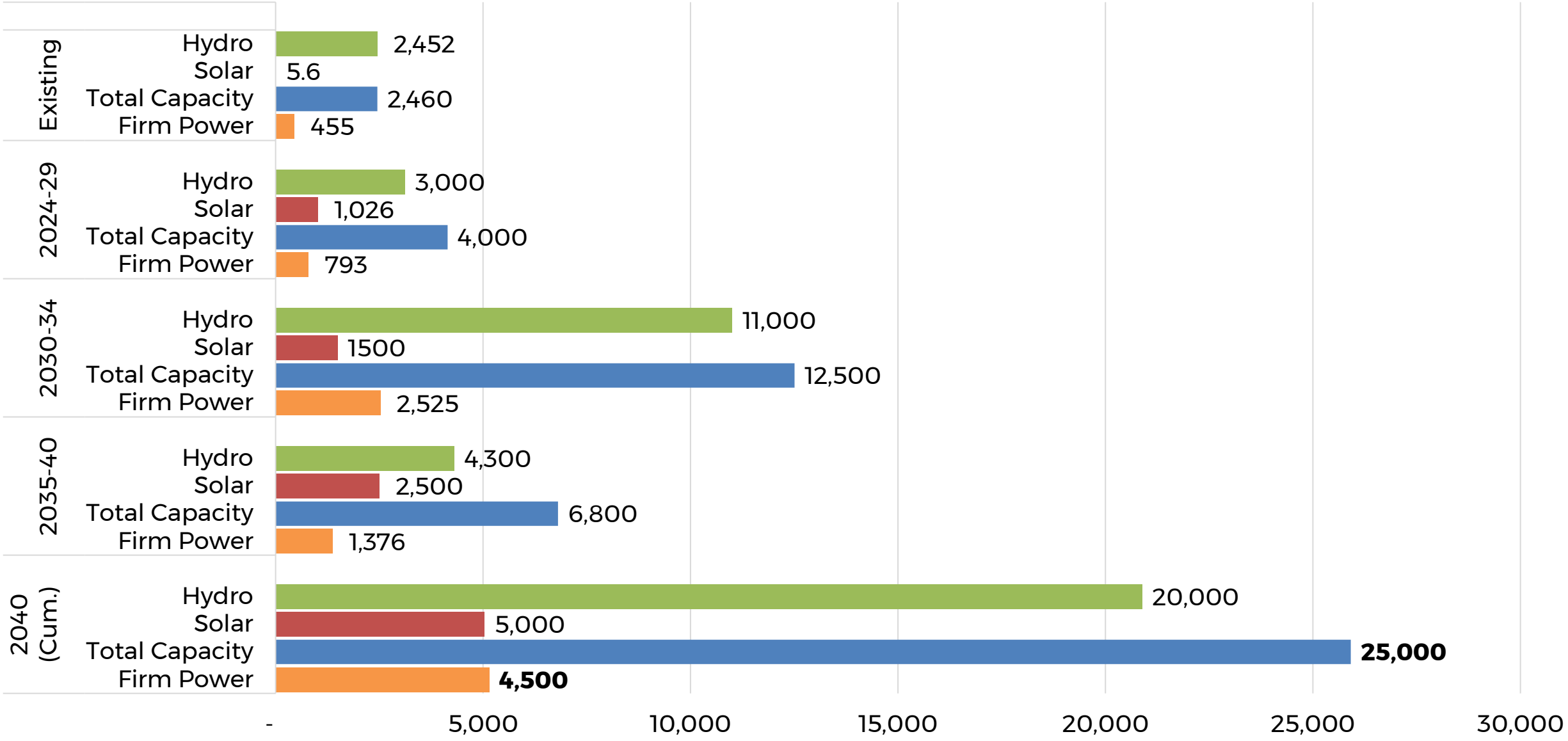
- Winter season imports made in 2022 (240 MU), 2023 (680 MU) & 2024 (1,500 MU)

Situational Analysis

- Rising Demand-Supply gap & Imports (Winters)
- High Income GNH Economy by 2034

- Quadrupling of the Installed Capacity by 2034/40:
  - 16 GW Hydro and 2.50 GW Solar by 2034
  - 20 GW Hydro and 5 GW Solar by 2040)
- Achieve national energy security by 2034 & maintain adequate generation capacity thereafter to drive economic growth

Capacity Additions (MW): 2024-40



Financing Needs

- **Total financing needs:**

  US$ 26 billion till 2040 for Hydro & Solar

- **Annual Financing requirements:**

  US $ 1.70 billion

- **ATS Financing :** US$ 723 million

Implementation Modalities

a) Hydropower Projects (>100MW)

1. RGoB financing
2. Inter-Governmental (IG)
3. Public-Public/Private Partnership (PPP): PPP between Bhutanese Public Sector and Foreign Public/Private Sector.

Contd....

b) Solar Projects

1. RGoB Financing
2. Public-Private Partnership (PPP): PPP with Domestic/Foreign Private Investors and RGoB Public entity
3. Independent Power Producers (IPP) - Domestic

Thank You

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