



BHUTAN

South Asia Clean Energy Forum 2024

Rooftop Solar Deployment: Challenges and Potential Solutions for South Asian Countries

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Energy Supply



Hydropower

33,000 MW tech-eco. potential
~ 2,450 MW installed capacity
~ 2,324 MW under const.



Wind Power

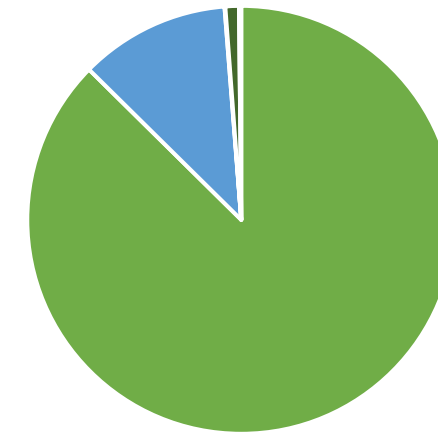
761 MW potential
0.6 MW installed
23 MW under study

Solar PV

12,000 MW potential
~ 5 MW installed capacity
23 MW under const



RE Resources Potential



■ Hydropower ■ Solar PV ■ Solar Thermal
■ Biomass ■ Wind



Energy Demand

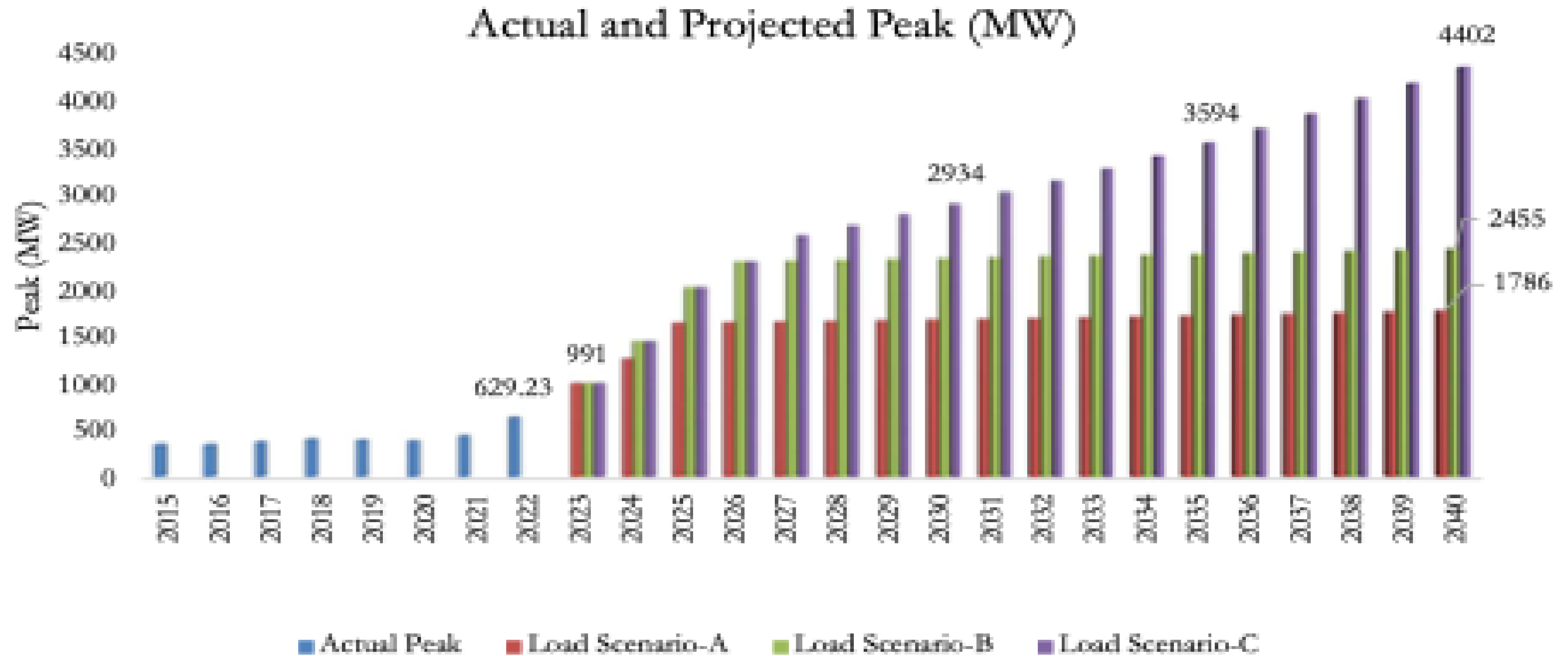


Figure 6 Year-wise Peak Demand (MW)

Energy Transition



- Carbon negative and has committed to carbon neutrality.
- Hydropower export to India and offset emissions
- Peak demand of 955 MW in December 2023 compared to 450 MW firm power
- Forecasted Peak demand 1100 MW in 2025 and 4000 MW in 2040
- Increasing dependence on import of electricity and fossil fuel for transport and industries



Renewable Energy Targets

- 20 GW Hydropower Capacity addition by 2040
- 5 GW Solar PV by 2040
- Other Renewable Energy
 - Wind, Geothermal, Solar thermal, Biogas, Waste-to-energy
 - 2.5% of the total energy supply by 2034
- Energy Storage Systems
 - Reservoir Schemes, Pumped Storage Hydropower plants, Hydrogen and Battery



Roof Top Solar Projects

- 13th FYP target of 50 MW installation
- ~ 5 MW roof top solar systems installed
- 35MW solar rooftop systems planned with ADB
 - 7.8 MW solar roof top systems under implementation
 - government offices, hospitals, schools, markets, and parking structures
- 3kW Solar PV Prosumers for 500 rural households under implementation



Challenges

- Financing
 - Capital Cost
 - Access to Finance
- Technology and Skills constraints
 - Reliance on import
 - Limited Capacity
- Grid Integration
 - Infrastructure upgradation and investments
- Electricity Pricing
 - Low consumer tariffs



Opportunities

- **International and Regional Financing**
 - Loans & Grants from Multilateral/Regional Banks
 - Support to Local Financial Institutions
- **Private Sector Participation**
- **Regional Cooperation for achieving regional climate goals through market mechanisms**
- **Capacity Building**
 - ISA support for development of policy and regulatory ecosystem
 - Solar Technology Application Resource Centre – improved quality and certification framework



Policy and Regulatory initiatives

- Alternative Renewable Energy Policy 2013
- Renewable Energy Master Plan 2017-2032
- Licensing Regulations for Solar Power Development
- Technical and Safety Standards of equipment
- Inspection and certification of DER systems for compliance with safety and prescribed standards
- Grid Integration Regulation
- Metering Systems and Business Models
- Review of Tariff Determination Regulation
- Pilot projects and regulatory sandbox