NATIONAL ENERGY POLICY 2025

Empowering Energy Security & Sustainable Growth

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Ministry of Energy & Natural Resources

Royal Government of Bhutan

June 2025

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Ministry of Energy & Natural Resources

Royal Government of Bhutan

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Excerpt from 106th National Day Address 2013

"Hydropower is considered our nation's most precious resource that belongs to all the people of Bhutan."

Druk Gyalpo, His Majesty Jigme Khesar Namgyel Wangchuck

Excerpt from 116th National Day Address 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 Khorlochu, 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."

Druk Gyalpo, His Majesty Jigme Khesar Namgyel Wangchuck

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FOREWORD

For decades, the roaring and cascading waters of our majestic rivers have been the life-blood of our nation, not just sustaining fresh eco-systems and communities, but generating clean energy and powering our socio-economic progress as envisioned by the successive benevolent Monarchs. Hydropower is more than an energy source: it is a cornerstone of our energy independence & national progress, a testament to our resourcefulness, and the bedrock upon which our economic foundation & its future anchors. It has illuminated our homes & towns, powered our industries, brought in revenues and fueled our economic journey. We owe much to this renewable legacy and remain steadfast in our commitment to responsibly develop our remaining hydropower potential, recognizing its irreplaceable role in our clean energy future besides other renewable energy sources.

However, as we stand on the cusp of an ambitious future alongside the aspirations of a modern and developed economy coupled with pathbreaking Gelephu Mindfulness City (GMC), reliance on a single source of energy, however abundant, is no longer sufficient for our long-term energy security, resilience and sustainable growth. Our burgeoning towns, expanding industries, digitalizing society, and our continued commitment to improving the lives of every citizen demand more resilient and reliable energy than ever before. Climate change impacts are undeniable, taking toll on our weather and altering hydrological patterns which reminds us of the vulnerability inherent in such mono-resource dependence. Our vision for 2034 – a thriving, resilient, and globally competitive Bhutan – requires an energy system capable of meeting

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unprecedented demand, withstanding evolving challenges, and providing unwavering reliability and security of supply round-the-clock and for all times.

With growing demand, where the peak power demand has outpaced firm power supply by 125% in 2024 which is expected to increase further, securing the country's long-term energy security has become ever more a priority. For Bhutan, long-term energy security means meeting winter demands when our hydropower generation ebbs to the lowest. In addition, the urgency to ramp up the efforts to add generation capacities, through portfolio diversifications, has been accentuated and inspired by the Royal Address of 116th National Day in 2023 as part of supporting GMC through three priority areas of Energy, Connectivity and Skills and where, projects must ensure competitiveness of tariffs so that our hydro resource becomes not just a source of revenue but the enabler of other investments. Hence, to secure our future prosperity, we must continuously evolve and innovate to achieve 10x capacity addition by 2040 so that energy remains a key enabler.

This National Energy Policy represents a decisive, unified, and ambitious blueprint for that endeavor. It integrates the earlier policies of Sustainable Hydropower Development Policy-2021, Energy Efficiency & Conservation Policy-2019, Domestic Electricity Tariff Policy-2016 and Alternative Renewable Energy Policy-2013 into one cohesive framework. Our goal is unequivocal: to achieve a total installed capacity of 25,000 MW by 2040 to support the national agenda of "High-income GNH Economy by 2034" and power long-term energy security. This includes harnessing 15,000 MW from our vital hydropower resources while simultaneously making a transformative

leap by adding 5,000 MW from solar energy, alongside tangible contributions from wind, geothermal, biomass, and other complementary renewables. This diversification is not an option; it is an imperative for security, sustainability, and growth.

Achieving this scale of development demands a paradigm shift in our approach. Therefore, this Policy marks a historic turning point or in fact a watershed moment: the bold and decisive opening of our generation sector to strategic private investments including from the domestic. Recognizing the scale of capital, innovation, and efficiency required, we are creating a transparent, stable, and attractive environment for reliable domestic and international private partners, financiers, and developers. We will actively leverage partnerships with bilateral, reliable Private Sector agencies, Multilateral Development Banks, Financial Institutions, and Sovereign Wealth Funds, among others, combining their resources, expertise, support to energy transitions to accelerate green energy deployment. This collaborative model is fundamental to reaching our 2034-40 targets drawn in keeping with the Renewable Energy Development Roadmap-2024.

This Policy is built upon five interconnected pillars:

(i) Strategic & sustainable hydropower development;
(ii) Accelerated renewable energy diversification;
(iii) Enabling modern infrastructure & technology;
(iv) Robust market framework & private engagement; and,
(v) Enhancing energy efficiency & conservation.

The objectives driving this integrated strategy are clear: Guarantee long-term energy security; fuel sustainable socio-economic growth; enhance resilience against climate change; ensure continued access to reliable and competitive energy; and position Bhutan in the forefront of clean energy development.

Achieving this vision demands a whole-of-nation effort. This journey requires the collective commitment of our entire nation – the government, the private sector, communities, civil society, citizens, banks and especially that of the utilities like Druk Green Power Corporation and Bhutan Power Corporation together with associated agencies. We call upon the ingenuity and investment from the domestic, development partners (bilateral & regional) and global energy community to partner with RGoB. This Policy provides the framework, the strategic direction, key initiatives and its success depends on our shared resolve, collaboration, and sustained action.

This supportive and forward-looking Policy, approved by RGoB on 5th June 2025, addresses the full spectrum of energy issues by incorporating principles including access to energy, diversification of renewable energy (RE), attracting financing & investments to accelerate resource development, institutional reforms, dynamic tariff setting, scaling up energy efficiency & demand side management, setting up power trade & market development, research & capacity building, climate change & adaptation, local engagement, energy value chain development and much more. Any impacts of accelerated RE investments and the construction activities on the larger national economy shall be analyzed continuously with MoF and timely measures put in place for minimizing any predicted adverse impacts. This Policy document was prepared

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with wide ranging consultations, inputs and support from the energy sector and government agencies, the UNDP as well as the private sector.

By embracing this bold diversification strategy and unlocking the power of private partnership, we are not just building power plants; we are forging the secure, sustainable, and prosperous future Bhutan deserves where green energy will remain a catalyst for green growth. Let us unite to harness our energy resources and reliably power our common destiny of “High-income GNH Economy” besides contributing to the regional green energy landscape.

TASHI DELEK!

23/6/2025

(Gem Tshering)

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Acronyms

ATS	Associated Transmission System
ARE	Alternative Renewable Energy
BESS	Battery Energy Storage System
BPC	Bhutan Power Corporation Ltd.
CA	Concession Agreement
COD	Commercial Operation Date
DoE	Department of Energy, MoENR
DGPC	Druk Green Power Corporation Ltd.
ESIA	Environmental and Social Impact Assessment
ERA	Electricity Regulatory Authority
FDI	Foreign Direct Investment
GW	Gigawatt
GWh	Gigawatt hour
MW	Megawatt
NTGMP	National Transmission Grid Master Plan
O&M	Operation and Maintenance
PoE	Panel of Experts
PPA	Power Purchase Agreement
PPP	Public-Public/Private Partnership
PSA	Power Sales Agreement
PSMP	Power System Master Plan
PV	Photovoltaics
RE	Renewable Energy
REDR	Renewable Energy Development Roadmap
RGoB	Royal Government of Bhutan
SOP	Standard Operating Procedures
kTOE	Kilo Tonnes of Oil Equivalent

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1 Introduction

1.1 Bhutan's sustainable socio-economic development will continue to be largely driven by access to adequate, affordable and reliable energy. Hydropower development has played a pivotal role in the country's socio-economic growth by spurring industrial growth, bringing in revenue through export of surplus electricity, and, improvement in living standards of the people through nationwide grid electrification. Ensuring continued energy supply in cost effective and reliable manner is essential to sustaining the socio-economic progress and to maintain carbon neutral status.

1.2 As the domestic energy demand continues to grow, ensuring long-term energy security is a national priority. Therefore, it is crucial to not only continue development of hydropower including reservoir/pumped storage integrated with solar energy, but diversify the energy basket by harnessing solar, wind, biomass and geothermal resources. Further, it is also important to adopt emerging technologies such as green hydrogen, Battery Energy Storage System (BESS) and modular reactors, amongst others.

1.3 Bhutan is endowed with huge hydropower potential together with solar, wind and biomass resources. The techno-economically viable hydropower potential is 33,000 MW from 90 sites as per the Power System Master Plan 2040 (PSMP), where these sites are mostly located outside of the ecological parks and the biological corridors. Solar and wind potentials are also estimated at around 12,000 MW and 800 MW respectively. The estimated usable biomass energy potential is about 2,700 GWh per annum and the

coal resource is estimated to be 1.15 million tonnes as of 2020. In addition, the Hydrogen Roadmap envisages production of 70,000 tons of green hydrogen by 2040-50 for use mainly in transport and industry sectors.

1.4 Of the total national energy supply of 793 kTOE or 9,200 GWh in 2022, thermal energy sources, which include coal and its derivatives, biomass, and petroleum products, constituted 62% of the total energy supply while balance 38% was attributed to electricity. In terms of the energy mix, electricity constituted the largest portion of the total TOE, followed closely by biomass at 25%, coal and its derivatives at 20%, and petroleum products at 17%. The industry sector is the largest consumer of energy at 63%, while the building and transport sectors consume 21% and 15% respectively of the total energy consumption of 752 kTOE or 8,700 GWh.

1.5 Bhutan's electricity is 100% green and renewable, primarily generated from hydropower with an installed capacity of 3,490 MW as of June 2025, representing 11% of country's techno-economic potential. The production from solar and wind sources is about 6 MW.

1.6 Bhutan is carbon negative and has committed to remain carbon neutral. Harnessing of sustainable hydropower including reservoir and pumped storage along with other renewable energy sources is key to ensuring long-term national energy security, resilience and climate change adaptation and mitigation.

1.7 Despite efforts to augment domestic energy generation capacity, no significant capacity addition could be achieved in the last two decades to keep up with the rising internal load demand. As a result, the supply-demand gap has widened in recent years, with peak load exceeding firm power capacity by more than 125% in 2024. This is further accentuated due to the Himalayan hydrological run-offs being highly vulnerable to the adverse impacts of global warming and climate change, leading to erratic weather patterns and unpredictable inflows, which impact hydropower generation. To meet the energy supply deficits, particularly during the dry winter season, Bhutan has resorted to power imports from the year 2022, and this is expected to continue until adequate additional firm capacity is developed.

1.8 The energy sector was governed by several policies, such as the Bhutan Sustainable Hydropower Development Policy-2021, Alternative Renewable Energy Policy-2013, Domestic Electricity Tariff Policy-2016 and National Energy Efficiency & Conservation Policy-2019. With implementation of institutional reforms and restructuring in pursuant to the enactment of Civil Service Reform Act 2022, these policies were reviewed and consolidated to ensure a holistic and comprehensive development framework for energy supply and efficient usage across the value chain in keeping with the national development vision.

1.9 Presently, the installed capacity of hydropower projects under construction is 2,081 MW. In addition, 23 MW of utility solar is under construction. The RGoB has further set a target to add 15,000 MW of hydropower and 5,000 MW of solar capacities

by 2040 amongst others upon adoption of Renewable Energy Development Roadmap-2024 (REDR-2024) to support the national development goal of "***High-Income GNH Economy by 2034***" and achieve long-term energy security.

2 Title, Commencement and Extent

2.1 This policy shall be called the "National Energy Policy - 2025" and come into effect from 10th day of June, 2025 and remain in force until superseded by another policy.

2.2 This policy extends to the whole of the Kingdom of Bhutan.

3 Supersession

3.1 This policy shall supersede the following policies and all other contradictory policy provisions of the RGoB:

- Alternative Renewable Energy Policy 2013
- Domestic Electricity Tariff Policy 2016
- National Energy Efficiency and Conservation Policy 2019
- Bhutan Sustainable Hydropower Development Policy 2021

3.2 Projects that are already implemented and/or being implemented at the time of adoption of this policy shall continue to be governed by the provisions of the arrangements/development modes/ frameworks under which the plants/projects were allocated till the expiry of the tenures of those arrangements.

4 Objectives

The objectives of this policy are:

4.1 **Ensure Energy Security:** Provide an enabling framework to achieve generation capacity of 25,000 MW by 2040 through development of hydropower, solar and other renewable energy resources for optimal complementary benefits and diversified energy mix, and expansion of transmission systems for domestic supply and cross-border electricity trade.

4.2 **Ensure Reliable and Competitive Energy Supply:** Ensure reliable energy supply through enhanced generation including distributed energy generation systems, grid automation, promotion of ancillary services, modernization, and adoption of innovative technologies. Further, ensure reliable energy supply at competitive prices to enable other investments and drive economic growth.

4.3 **Attract Investments:** Attract competitive and innovative financing, including private sector investments & participation, carbon & climate finance for renewable energy infrastructure development and leverage on green electricity as a competitive advantage in production of goods and services.

4.4 **Develop Energy Market and Regional Integration:** Establish domestic energy market trading platform and promote regional energy market integration for enhanced cross-border energy trade through market mechanisms for export/import including swapping/banking arrangements.

4.5 **Enhance Climate Change Mitigation and Resilience:** Ensure that energy infrastructure is resilient to climate change impacts and natural hazards by implementing robust mitigation and adaptation measures to secure the long-term reliability and sustainability of energy supply & use, supported through Nationally Determined Contributions (NDCs) activities that also includes strategies to reduce reliance on fossil fuels through increased adoption of electric and fuel cell vehicles.

4.6 **Promote Energy Efficiency and Conservation:** Implement energy efficiency initiatives and advanced technologies to support long-term energy security and reduce green-house gas emissions.

4.7 **Foster Institutional Growth and Capacity Building:** Strengthen institutions and enhance national capacities including the private sector through governance reforms, innovation, research and development along the entire "energy value chain".

5 Institutional Arrangement

Ministry Energy and Natural Resources

5.1 The Ministry of Energy and Natural Resources (MoENR) shall be responsible for formulating and guiding policy within the energy sector.

5.2 The MoENR shall facilitate issuance of clearances concerning environment, forest, water, land, cultural and other approvals for development of renewable energy projects.

Department of Energy, MoENR

5.3 The Department of Energy (DoE) shall be responsible for policy, planning, approval, allocation and concession for development of renewable energy including monitoring and evaluation.

5.4 The DoE shall be responsible for implementation of pilot or demonstration projects to accelerate the uptake of new energy technologies, systems and innovation.

5.5 The DoE shall be responsible for policy and technical oversight of power systems and energy markets including cross-border trade of electricity.

5.6 The DoE shall be responsible for formulation of, amongst others, tariff setting and power allocation guidelines for the supply of power to the domestic market other than for captive power plants.

Electricity Regulatory Authority

5.7 The Electricity Regulatory Authority (ERA) shall be responsible for licensing and domestic tariff setting, including tariffs for generation not covered by Power Purchase Agreements (PPAs), transmission, distribution and retail sale of electricity.

5.8 ERA shall issue regulations and technical standards for generation, transmission, system operation, distribution, and retail sale of electricity besides ensuring efficient, safe and secure operation of the sector in delivering quality services.

System Operator

5.9 The Bhutan Power System Operator (BPSO) shall be responsible for the efficient coordination and management of power system operations, for both domestic and cross-border electricity transactions.

National Centre for Hydrology and Meteorology

5.10 National Centre for Hydrology and Meteorology (NCHM) shall be responsible for providing scientific and technical data on hydrology, meteorology, climatology, cryosphere and GLOF, supporting the energy sector with essential planning information.

Generation Utility

5.11 The Druk Green Power Corporation Ltd. (DGPC) and its subsidiaries, as licensed entities, shall carry out feasibility studies, construction, operation and maintenance of renewable energy projects and the bulk trade of power, and shall provide ancillary support services.

5.12 Special Purpose Vehicles (SPVs), Independent Power Producers (IPPs) and other Project Developers shall also develop and operate the renewable energy projects, as per the law and regulations.

Transmission and Distribution Utility

5.13 The Bhutan Power Corporation Ltd. (BPC), as licensed entity,

shall be responsible for development, operation and maintenance of the transmission & distribution networks, wheeling and supply of electricity to the consumers and for exports.

Power Trader

5.14 The DoE shall designate power trader for cross-border electricity trade.

5.15 The Power Trader shall enter into PPA, Power Sales Agreement (PSA) and other related contracts to facilitate the sale of electricity domestically and across the border. All cross-border PPAs/PSAs shall be approved by the DoE.

Institutional Reforms

5.16 To promote efficiency and competition, the RGoB may undertake required institutional reforms including restructuring of the power sector or its utilities.

6 Energy Resources Development

6.1 The DoE or the authorized agency shall conduct comprehensive site assessments including field investigations and investment studies for the proposed energy projects comprising of hydropower, solar and other renewable energy resources. These studies shall strictly adhere to both national and international standards and adopt best practices for sustainability and resilience.

6.2 This policy shall guide DoE and ERA on formulation of technical guidelines, instruments, regulations, standards and codes to ensure the efficient use and development of the energy resources.

Hydropower

6.3 The hydropower projects shall be categorized by the installed capacity as follows:

a. Mega projects – more than 1,000 MW
b. Large projects – more than 500 MW and up to 1,000 MW
c. Medium projects – more than 100 MW and up to 500 MW
d. Small projects – all capacities up to 100 MW

6.4 Hydropower development will be prioritized by RGoB through its authorized agency on project-specific, bilateral, and regional collaborations. As a strategic resource belonging to the people and therefore to ensure that the benefits primarily accrue to its people, the RGoB shall retain majority ownership.

6.5 Foreign and domestic investors/entities may participate in medium, large and mega hydropower projects through public-public or public private partnerships (PPP), with ownership capped at 49%. The RGoB authorized agency shall hold at least 51% ownership in any such PPP. The RGoB will select strategic partners based on factors such as access to financing, power off-take arrangements, and technology and other value chain advantages. In partnerships where domestic investors are also participating, the combined ownership of foreign and/or domestic investors shall not exceed 49%.

6.6 For small hydropower projects, only domestic investors shall be allowed for partnership with the RGoB authorized agency. The ownership of the domestic investors shall however not exceed 49% of the equity component.

6.7 In case of domestic investors under Clauses 6.5 and 6.6, the shareholding by the domestic investors shall be based on visibility and transparency of funding source with no divestments to the foreign partners.

6.8 Identification and selection of hydropower projects for development shall be based on the PSMP, which shall be periodically updated by the DoE in keeping with the REDR-2024 and in conformity with extant Guidelines for Development of Hydropower Projects.

6.9 The medium, large and mega hydropower projects shall provide thirteen percent (13%) of net electricity generated as Free Power and at no cost to the RGoB or equivalent cash payments at 13% of the electricity revenue. For projects below 100 MW, the quantum of Free Power shall be determined at the time of project commissioning based on financial viability of each individual project.

6.10 Development of multi-purpose, reservoir and pumped storage projects including solar hybrids shall be prioritized to ensure maximization of firm power availability and value from energy so as to derive complementary benefits through balancing of intermittent generation sources and enhance climate resilience.

6.11 Hydropower assets shall be developed, operated and maintained with the highest standards of quality, efficiency and sustainability through deployment of state-of-art technologies.

6.12 Hydropower resource shall not be allowed to be developed as a Captive power plant.

Solar and Other Renewable Energy

6.13 The DoE shall promote development of solar and other renewable energy resources such as wind, geothermal, biomass, hydrogen and emerging technologies to expand and diversify the energy supply sources including energy needs for heating and cooling.

6.14 The identification of solar and other renewable energy sources shall be as per the Renewable Energy Master Plan (REMP) 2017 which shall be updated periodically in keeping with REDR.

6.15 Solar and other renewable energy will be promoted through both public and private investments including Foreign Direct Investment (FDI) in the form of Public-Private Partnership (PPP), Independent Power Producer (IPP) & Captive arrangements. This will be facilitated through appropriate routes along with PPA and/ or Transmission Access Agreement (TAA) with transmission and distribution utilities.

6.16 The DoE shall prepare inventory of solar sites with minimum details which shall be made available for investments through appropriate mechanisms.

6.17 Any interested project developer shall submit solar proposals, which are not in the solar inventory list to the DoE for approval. The DoE shall issue an SOP for allocation of solar and other renewable energy resources.

6.18 The DoE shall promote Renewable Energy Service Providers (RESP) to scale up energy supplies to the consumers from solar and other renewable energy sources along with Prosumers to harness solar and other renewable energy, reduce the national electricity supply deficit and enhance energy independence for which connectivity and tariff guidelines shall be issued.

6.19 The DoE shall promote Distributed Energy Resource Systems (DERS) to provide energy solutions for those areas where grid connectivity is not viable.

6.20 The DoE shall promote productive end-use of renewable energy solutions to empower communities, enhance livelihoods and sustainable socio-economic development through cross-sectoral applications such as water pumping, EV charging stations, and community-driven small enterprises.

6.21 Project Developer may set up solar and other renewable energy projects on their own land or on leased State/private land.

Concession Agreement (CA)

6.22 Any Project Developer intending to set up Renewable Energy projects shall enter into a Concession Agreement (CA) with

the DoE. This agreement shall outline the rights, obligations and detailed terms & conditions governing the construction, commissioning, operation & maintenance of the project and reversion of the project to the RGoB, as relevant, after the expiry of concession.

6.23 The DoE shall develop a comprehensive framework for the CA for signing with the Project Developer(s).

6.24 The CA for the development of hydropower projects shall be valid for a period of 30 years from the Commercial Operation Date (COD).

6.25 The CA for the development of solar projects shall be valid for a period of 25 years from the COD.

6.26 The period of CA for other renewable energy projects shall be as notified by DoE.

6.27 The validity of CA under Clauses 6.24 and 6.25 may be extended by a maximum of five (5) years, subject to predefined conditions as may be prescribed in the CA.

6.28 Project Developer(s) of solar rooftop projects or the RESP shall enter into lease agreement with the property owner, granting rights to use the property for solar installation and operation for which DoE will issue the lease arrangement guidelines.

Hydrogen and Derivatives

6.29 The DoE shall encourage the development and integration of hydropower value chain by adopting emerging renewable energy technologies and innovations including green hydrogen and its derivatives such as hydrogen fuel, green ammonia and other energy storage systems.

6.30 The DoE shall facilitate the creation of an enabling ecosystems to support innovations, investment and the development of the hydrogen economy and its value chain for both domestic and foreign markets.

6.31 The DoE shall promote and advance use of green hydrogen as an alternative fuel for the transport sector and related industries, along with green ammonia and other derivatives, in line with the Hydrogen Roadmap 2024 and future amendments, supported by regulatory frameworks.

6.32 The DoE shall add hydropower generation capacity as needed to support production of hydrogen and other energy storage products.

Other Energy Initiatives

6.33 The DoE shall explore the substitution of fossil fuels in various sectors with green electricity, green hydrogen, e-mobility and bioenergy to reduce greenhouse gas (GHG) emissions.

6.34 The DoE shall promote the use of other energy generation

sources like small modular reactors (SMR) and other innovative technologies to support long-term energy security.

6.35 The DoE shall promote waste-to-energy technologies for energy recovery and reduce GHG emissions.

6.36 In cases of critical energy security concerns, the DoE, with prior approval of the RGoB, shall permit captive power generation using non-hydro resource or any other alternative fuels.

6.37 The DoE shall explore energy swapping/banking and other suitable mechanisms to ensure a stable domestic energy supply.

Institutional and Human Resource Capacity Building

6.38 The RGoB shall strengthen the public & private energy institutions by implementing targeted reforms, review energy related educational curriculum and course modules in technical institutes, and investing in capacity building initiatives to ensure sustainable growth of the sector.

6.39 The DoE shall facilitate growth of RESP to drive the expansion and management of solar and other renewable energy resources.

6.40 The DoE shall provide necessary support to facilitate formation of Project Management Consultants (PMCs) and Panels of Experts (PoE) to provide specialized management, technical and professional services for the development and sustenance of the renewable energy ecosystem.

6.41 The DoE, in collaboration with all energy-related entities and educational institutes, shall conduct Research, Development and Demonstration (RD&D) on emerging and innovative energy technologies to meet future energy needs.

6.42 The DoE may establish a National Green Energy Panel consisting of relevant experts in the field. The Panel will provide technical and advisory support to promote the development of renewable energy and other emerging technologies.

7 Transmission, Load Dispatch & Distribution

7.1 The Associated Transmission Systems (ATS) for the renewable energy projects including system strengthening shall be developed in conformity with the NTGMP, REDR and other priority plans as directed by the RGoB.

7.2 The Transmission and Distribution (T&D) utility shall build, own and operate the transmission and/or distribution lines to connect the renewable energy projects with the nearest grid and make access possible to the developers.

7.3 The utility shall provide open access to the grid and ensure adequate grid capacity to allow seamless power evacuation and transmission for both domestic consumption and cross-border export/import, while ensuring transmission grid resilience.

7.4 A Project Developer must secure a Power Evacuation Agreement with the transmission and distribution utility at the time of CA

signing. This agreement will ensure that transmission and distribution facilities are available for wheeling the electricity within Bhutan and for export, till the delivery point at the international border or other agreed-upon delivery points for cross-border transactions.

7.5 A Project Developer shall pay the required wheeling and/or network charges as determined by the Regulator.

7.6 The DoE shall provide necessary support to facilitate the transmission of power in coordination with transmission entities of the neighbouring or exporting/importing countries.

7.7 The utility shall deploy advanced technologies, including artificial intelligence (AI), smart meters, Internet of things (IoT), digital twin, and other innovations to enhance grid security, reliability, resilience, and improved service delivery as well as ensure protection against cyber threats through real time monitoring.

7.8 All power projects shall adhere to scheduling and dispatch requirements as per the Grid Discipline Mechanism (GDM) Regulations.

7.9 Solar and wind projects shall be granted priority dispatch, subject to grid reliability, safety, and capacity constraints, as determined by the System Operator.

7.10 The use of ancillary services shall be promoted to efficiently manage the national and interconnected grid with appropriate

regulations implemented to support such initiative.

8 Land Acquisition

8.1 The DoE shall facilitate the allocation of State Reserve Forest (SRF) land and acquisition of private land for the Renewable Energy projects including for the transmission and distribution infrastructure. The land acquisition and leasing shall be carried out in accordance with the Land Act of Bhutan 2007 and its regulations and guidelines, as may be amended from time to time.

8.2 In case of the private land required for Renewable Energy project, the DoE will facilitate its acquisition and conversion to SRF. The costs/compensation shall be as per the extant Land Act and rules and regulations. If private land has been acquired by way of providing a SRF as substitute land to the landowner, the land shall be leased to the Project on payment of annual lease rents.

8.3 The DoE shall lead in framing Guidelines and Rules for obtaining Right of Way (RoW) for transmission and distribution lines.

8.4 For the purpose of raising finance for the hydropower, solar and other renewable energy projects, the Rights-to-Use of land allotted under the Land Lease of National Land Commission may be Mortgaged for the period of concession.

9 Power Allocation and Supply

9.1 The DoE shall regularly undertake supply-demand projections

and energy security analysis for planning generation, transmission and distribution network expansions and upgradations to meet domestic energy needs.

9.2 The DoE shall assess and allocate power supply to industries in consultation with the relevant RGoB agencies.

9.3 The order of merit for supply of electricity from the national grid shall be as below ((i) being the highest priority):

i. Essential public institutions and services
ii. Individual households
iii. General commercial establishments
iv. Industries including construction power

In the event of a power deficit scenario, requiring load shedding, the order of load shedding shall be in reverse order to the above order of merit. The DoE shall issue guidelines to execute this provision during exigent circumstances.

10 Financing and Investments

10.1 The RGoB shall allocate sufficient resources to support development of renewable energy projects. This includes activities like project profile preparation, site investigations, environmental studies, securing clearances, capacity building, and promotion of projects.

10.2 The DoE, in collaboration with relevant agencies, shall explore and facilitate diverse, competitive and innovative capital financing

models for implementation of projects. These shall include a mix of financing sources from Multilateral Development Banks, FDI, carbon & climate financing, international & regional investments, EXIM banks, IPOs/FPOs, Green Bonds, private sector investments and other appropriate financing options for renewable energy projects and associated transmission and distribution systems.

10.3 The DoE shall promote blended financing for solar, other renewable energy and Energy Efficiency projects, by mandating a certain portion of the Commercial Bank's annual loan portfolios for these projects as prescribed by the Royal Monetary Authority.

10.4 Adequate government funding shall be allocated through the budgetary system to promote research, development, innovation and demonstration activities, particularly those related to energy value chain initiatives and energy storage/carrier solutions.

10.5 The MoF, MoENR and DHI shall facilitate reinvestments from the hydropower earnings through an appropriate Dividend Policy to finance the development of renewable energy projects.

10.6 The fiscal incentives for Renewable Energy and Energy Efficiency projects shall follow the provisions of the extant Fiscal Incentives Act and its Rules. In addition, the DoE may propose appropriate incentives for the investments in renewable energy projects to remain competitive in the market.

10.7 Repatriation of capital and remittance of dividends for the foreign investors shall be in the currency of the investment in keeping

with the prevailing FDI rules and regulations.

11 Environment and Social Considerations

11.1 All renewable energy projects including generation, transmission and distribution shall comply with the national environmental laws and adhere to international best practices.

11.2 A Project Developer shall conduct comprehensive Environmental and Social Impact Assessments (ESIA) as per the environmental laws and regulations of the country and the relevant RGoB guidelines.

11.3 The MoENR and the Project Developer shall determine the minimum quantity of water to be released at all times from the hydropower projects in keeping with the water regulation.

11.4 A Project Developer shall be responsible for mitigating adverse environmental impacts, as outlined in the approved ESIA Report. The Project Developer shall also implement the Environment Management Plan (EMP) throughout the project's lifecycle.

11.5 The DoE shall collaborate with relevant agencies for the issuance of forestry and environmental clearances for the renewable energy projects.

11.6 A Project Developer shall avoid installation of project components within human settlements and private land. In events where installation within such premises becomes unavoidable, a Project

Developer shall bear the costs of acquisition, resettlement and rehabilitation as per relevant laws, rules and regulations.

11.7 A Project Developer shall ensure integration with the local area development for meeting the housing needs and sourcing of local products as may be prescribed in the CA.

11.8 For hydropower projects, the DoE or any authorized agency shall undertake an integrated geohazard assessment to evaluate the potential environmental and multi-hazard risks, including those posed by climate change. This approach will enable design of more resilient and adaptive infrastructure to withstand or adapt against multi-hazard cascading events, particularly where projects have to be located in vulnerable catchment areas.

12 Local Engagement

12.1 The construction of renewable energy projects shall prioritize active engagement of local contractors, workforce, and employees for fostering national capacity building and innovation, with a focus on inclusive approach for sustainable development.

12.2 Whenever expatriates of specialized skills are employed during the construction, a Project Developer shall mandatorily ensure structured knowledge transfer and capacity building programs for the local counterparts, to enable Bhutanese professionals to lead in future projects.

12.3 During the operation and maintenance phase, all employee

positions shall be filled by Bhutanese nationals, except for roles requiring highly specialized skills. Efforts shall be made to develop and transfer these skills to local professionals to minimize reliance on external expertise.

13 Power Market and Green Energy Trade

13.1 The DoE shall establish a dynamic domestic power market platform for aggregating power supply and demand, facilitating fair supply and trade based on a transparent market-driven pricing mechanism.

13.2 The RGoB shall promote industries that utilize green electricity for production, aiming to enhance green value-added exports while reducing the carbon footprint and contributing to sustainable economic growth.

13.3 The RGoB shall strengthen regional grid interconnections and pursue market integration for green energy trade through bilateral, regional and multilateral frameworks, contributing to regional clean energy transition and collaboration.

13.4 The DoE shall leverage the power market platform to digitally account and monitor the carbon offset benefits from renewable energy projects for trading in carbon markets and other cooperative mechanisms.

13.5 The DoE shall facilitate Project Developer(s) in accessing the international carbon market and other mechanisms to support the

development of renewable energy projects.

13.6 Benefits arising from the sale of carbon credits shall accrue to the Project Developer. Carbon credit verification, registration, sale and transaction at the national or international level shall be the Project Developer's responsibility. The RGoB shall levy tax and fees on the transaction of such credits as per the Bhutan Carbon Market Rules and Framework.

13.7 Cross-border trade of clean electricity shall be expanded by engaging with evolving regional power markets, leveraging innovative mechanisms such as Renewable Purchase Obligations (RPOs), Renewable Energy Certificates (RECs), and other tools to contribute to regional GHG emission reductions.

14 Tariffs

14.1 The tariff for generation, transmission, distribution and retail services shall be based on fair and competitive cost of supply.

14.2 The tariff shall reflect the following:

a) The value of equity at the time of commissioning of the renewable energy project shall be maintained throughout the project concession period for determination of Return on Equity (RoE).

b) The allowance for RoE should be comparable to that of regional power market and industrial benchmark to attract and sustain investments.

c) The assets of the hydropower plants after their Economic

Life shall be revalued based on replacement cost basis and the debt equity mix of 70:30 shall be considered and equity thus derived will be used for determination of RoE.

d) The benchmark tariff shall be the realizable tariff from other opportunities such as export, import, PPAs with end consumers, and internal and external energy markets.

e) To ensure predictability and reliability, projects shall determine generation tariff through long-term PPAs by securing off-taker for domestic sale which shall be endorsed by the ERA.

14.3 The retail tariff shall be structured to ensure competitiveness, efficient usage, and reasonable return to the utilities. The RGoB may address affordability of the targeted consumers by providing an appropriate subsidy.

14.4 To balance supply-demand incongruities while optimizing grid efficiency, the tariff regulations will incorporate dynamic pricing mechanisms. This mechanism may include Time-of-Use (ToU) or differential tariffs to address seasonal supply/demand variance, incentivize efficient use and conservation of electricity and other demand side behaviours.

14.5 Truing-up of costs during the period of tariff cycle for adjustment of differences shall be allowed for which the DoE shall issue the necessary guidelines.

14.6 The DoE shall make necessary arrangements to meet the domestic electricity demand, including electricity imports from energy

markets, energy banking or through PPAs with external parties.-

14.7 Import of power shall only be undertaken as a measure of last resort, after all available domestic generation capacities have been utilized to meet demand. In events where electricity imports are required to meet the domestic shortfalls, the cost of these imports including associated charges shall be allocated in the order below:

i. Industries including construction power
ii. General commercial establishments
iii. Individual households
iv. Essential public institutions and services

14.8 All generation plants shall be mandated to prioritize domestic supply. The obligation for the domestic supply amongst the operational hydropower plants shall be proportionate to the generation capacity of each power plants. A Project Developer and distribution utility/end users shall enter into PPAs or PSAs defining timelines, quantum of the energy and tariffs.

14.9 The Regulator shall determine the appropriate network or wheeling charges applicable to both domestic and cross-border electricity trade including any trading margins.

14.10 The DoE shall oversee the cross-border electricity trade, determining export and import arrangements through appropriate mechanisms.

15 Energy Efficiency and Conservation

15.1 Demand Side Management (DSM) shall be a key component in reducing energy demand, enhancing efficiency in energy use, and increasing energy savings across all sectors.

15.2 The DoE shall promote energy efficiency and conservation by enforcing Energy Auditing & Certification programs for Energy Intensive Consumer (EIC) in line with the national Energy Efficiency Roadmap.

15.3 The DoE shall develop and implement standards and labelling programs to encourage the adoption of energy efficient technologies and appliances across industries and households.

15.4 The DoE shall facilitate the development of Building Energy-Efficiency Codes to improve energy conservation in the building and residential sectors ensuring a sustainable living environment.

15.5 The RGoB shall continue to support and promote sustainable transportation systems including e-mobility, hydrogen fuel cell electric vehicle (FCEV), hybrids, biofuels as well as other emerging technologies.

15.6 The DoE shall support the institutionalization of Energy Efficiency practices and provide capacity building programs for EIC, ensuring widespread adoption and implementation of energy saving measures.

16 Policy Implementation

16.1 The DoE shall develop necessary frameworks, instruments, guidelines and strategies to implement the policy and achieve its objectives.

17 Policy Review, Amendment and Interpretation

17.1 This Policy shall be reviewed and amended as and when required by the RGoB to make it responsive to sectoral developments and national priorities.

17.2 The MoENR shall serve as the authority for interpreting this policy, with its interpretations to be final and binding.

18 Definitions

Captive Power Generation	Shall mean a power plant set up by any person or an entity to generate electricity for own use.
Commercial Operation Date (COD)	Shall mean the date of commencement of commercial operation of generating unit or station, as declared by the BPSO.
Concession Agreement	Shall mean a legal instrument through which the RGoB grants concession rights and obligations to the Project Developer for the construction and operation of the project.
Construction Power	Shall mean the power used for construction of hydropower project and other infrastructure.
Distribution	Shall mean the conveyance of electricity at voltages below 66 kilovolts or as is deemed by the ERA to be a part of the distribution network.
Domestic Investor	Shall mean a person who is a citizen of Bhutan or an entity which is incorporated or registered within Bhutan with 100% ownership by the Bhutanese.
Economic Life	Shall mean thirty (30) years from the COD of a hydropower project and 25 years for a solar project or as notified by the Regulator.

Energy conservation	Shall mean reducing energy consumption by using less energy.
Energy efficiency	Shall mean a way of managing and restraining the energy consumption such that less energy is used to provide the same service or output using advanced process, technology or equipment.
Energy Intensive Consumers	Shall mean those consumers (HV and MV industries) with contract demand of more than or equal to 2 MW.
Essential Public Institutions	Shall mean institutions such as Hospitals, Military establishments, Communication establishment and services, Dzongs, Schools, Religious institutions and Government offices.
Firm Power	Shall mean the minimum guaranteed amount of electricity generation throughout the year.
Free power	Shall mean the electricity that would be made available to the RGoB for free of charge during the concession period starting from the COD of the project.
General Commercial Establishments	Shall mean the commercial establishments such as hotels, shopping malls, supermarkets, business complexes, etc.
Industries	Shall mean all industrial establishment consisting of cottage & small, medium and large (EIC) industries.

Lenders	Shall mean the lenders or other providers of debt (including multilateral or bilateral credit agencies).
Mortgage	Shall mean exercising by the Lender on the Rights-to-Use of the leased land for continuation of project activity without taking ownership in case of default by the hydropower, solar and other renewable energy project developer.
Power Purchase Agreement	Shall mean an agreement or contract between a buyer and producer to purchase electricity for a set price and period of time.
Project Developer	Shall mean a person or body of persons, company, firm and such other private or government undertaking, who finances, designs, processes, constructs, commissions, operates and maintains the project facilities and, at the end of the concession term, transfers them to the RGoB where applicable.
Prosumer	Shall mean an electricity consumer that produces part of electricity needs from solar and other renewable energy systems installed in its premises and uses the distribution network to inject excess production for sale and to withdraw electricity when self-production is not sufficient to meet own needs from the same distribution network.

Regulator	Shall mean the Electricity Regulatory Authority or its successor as per the Electricity Act of Bhutan 2001 or its amendment.
Renewable Energy (RE)	Shall mean energy derived from hydropower, solar, wind, biomass, geothermal resources, biofuels, and green hydrogen.
Rights-to-Use	Shall mean the grant of use of the leased land including defined subterranean space for continuation of the project activity till the concession period.
Royal Government of Bhutan (RGoB)	Shall mean the government and the ministries, departments, agencies, and entities working for the RGoB.
Special Purpose Vehicle (SPV)	Shall mean a body corporate created to fulfil narrow, specific or temporary objectives, primarily to isolate financial risk.
Transmission	Shall mean an activity of a transmission system including the conveyance of electricity at voltages of 66 kilovolts and above or as is deemed by the ERA to be a part of the transmission network.

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