



# ALTERNATIVE RENEWABLE ENERGY POLICY 2013

Royal Government of Bhutan

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ROYAL GOVERNMENT OF BHUTAN



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MINISTRY OF ECONOMIC AFFAIRS

ROYAL GOVERNMENT OF BHUTAN

Tashichho Dzong

THIMPHU



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MINISTER

8<sup>th</sup> April, 2013

## FOREWORD

Bhutan is endowed with significant natural energy resources, including hydropower, solar, wind, vast forest cover, and mineral resources. However, most of the electricity requirements in the country are being met dominantly from hydropower resources, whose generation potential could be highly impaired in the event there is adverse change in hydrological regime fueled by impending impacts of climate change. Energy today has become the most favorable element in the nation's economic growth and hydropower in particular contributes about 45% of the national revenue and constitutes about 19% of the country's GDP.

While hydropower development is seen as the key to economic growth and sustainability, development of other resources, particularly to meet primary energy requirements are required to be pursued adequately to address the energy security concerns. Further, as the country does not have fossil fuel reserves, all the petroleum products are being imported, and price of such imported fuels have remained highly volatile hurting the least developed and importing countries the hardest, impeding their economic growth. With the increase of economic activities in the country, the import levels of petroleum products have increased by multiple folds in the recent times off-setting the benefits of revenue generation from electricity exports. Therefore, growing imports of fossil fuels, the risk of reliance on a single electricity source, and the threats of climate change provide reason to consider the advantages of a more diversified and independent energy system through development of various alternative Renewable Energy Technologies (RETs) that meets national energy needs while balancing energy security, environmental preservation, and economic development potential.

This Alternative Renewable Energy Policy aims to provide the necessary direction for the promotion and development of Renewable Energy (RE) that not only contribute in meeting the current requirements but also shape future energy security options for the nation. The Bhutan Sustainable Hydropower Development Policy 2008 and the Economic Development Policy (EDP) 2010 recognize the need for an Alternative Renewable Energy Policy for promotion of RE resources in order to ensure national energy security. The Policy shall strive to ensure adequate provision and extensive use of modern energy services in rural areas, which have been largely dependent on firewood and kerosene for cooking, heating and lighting. In the urban areas, the Policy shall strive



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**MINISTER**

to optimise and conserve the usage of grid-based power through promotion of dispersed energy generation options such as solar heaters, solar rooftop and other stand-alone systems. Renewable Energy Technology in this Policy shall cover solar (both Photo Voltaic and thermal), wind, bio-energy, geo-thermal, pico/micro/mini/small hydro up to 25 MW and waste to energy (WTE). While large hydropower (above 25 MW) is considered a renewable energy, it is not under the scope of this Policy.

The Royal Government acknowledges with deep appreciation the support provided by the Asian Development Bank (ADB) for the initial drafting of this Policy. We would also like to thank all the stakeholders for their invaluable support extended during the formulation of this Policy.

This Policy was approved in the 152<sup>nd</sup> meeting of the Lhengye Zhungtshog held on 5<sup>th</sup> February 2013. This Policy will come into immediate effect.

Tashi Delek.

**(Khandu Wangchuk)**  
**Minister**

## ABBREVIATIONS

AD	Accelerated Depreciation
BEA	Bhutan Electricity Authority
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
BPC	Bhutan Power Corporation
CA	Concession Agreement
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
COD	Commercial Operation Date
CSI	Cottage and Small Industries
DDG	Decentralised Distributed Generation
DGPC	Druk Green Power Corporation
DRE	Department of Renewable Energy
DPP	Detailed Project Proposal
DPR	Detailed Project Report
EDP	Economic Development Policy
EIA	Environmental Impact Assessment
EMP	Environment Management Plan
EoI	Expression of Interest
FDI	Foreign Direct Investment
GBI	Generation Based Incentive
GHG	Green House Gas

GHG	Green House Gas
GNHC	Gross National Happiness Commission
ICS	Improved Cook Stoves
kW	Kilo Watt
LoI	Letter of Intent
MoAF	Ministry of Agriculture & Forest
MoEA	Ministry of Economic Affairs
MoF	Ministry of Finance
MoIC	Ministry of Information and Communication
MoU	Memorandum of Understanding
MW	Mega Watt
NEC	National Environment Commission
PDA	Project Development Agreement
PPA	Power Purchase Agreement
RE	Renewable Energy
REDF	Renewable Energy Development Fund
REO	Renewable Energy Obligation
RfP	Request for Proposal
RGoB	Royal Government of Bhutan
RoC	Registrar of Companies
RPO	Renewable Purchase Obligation
SHP	Small Hydropower Projects
SPV	Special Purpose Vehicle
WTE	Waste to Energy

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# 1. INTRODUCTION

- 1.1** The unique concept of Gross National Happiness (GNH) is being pursued by the Royal Government of Bhutan as its development philosophy, reflecting its sensitivity towards preservation of its rich cultural heritage and pristine environment while ensuring economic growth and overall well-being of its people. GNH is conceptually based on promotion of sustainable development, preservation of cultural values, conservation of the natural environment, and establishment of good governance as its main pillars.
- 1.2** Article 5 of the Constitution entrusts every Bhutanese as a trustee of the Kingdom's natural resources and environment for the benefit of the present and future generations. It is the fundamental duty of every citizen to contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation.
- 1.3** The Royal Government of Bhutan has committed to keep absorbing more carbon than it emits - and to maintain its status as a net sink for Green House Gases (GHG) through the Declaration of the Kingdom of Bhutan dated 11 December 2009.
- 1.4** Bhutan is endowed with significant natural resources, including hydropower, solar, and wind potential, vast forest cover, and mineral resources. These resources are not only part of Bhutan's rich ecology, but a balanced approach between conservation and sustainable resource development has helped contribute to the country's progress. In 2011, hydropower sales accounted for the largest share of GDP, and met almost all of the country's electricity needs.

- 1.5** The development of untapped hydropower potential is an integral part of Bhutan's strategy as outlined in the 10th Five Year Plan. Hydropower provides the country with a strong advantage, including economic benefits through export revenues, environmental benefits given the clean nature of electricity production, and an electricity security advantage given important domestic resource availability.
- 1.6** At the same time, when considering Bhutan's energy system as a whole, rising energy demand in the transport and industry sectors, rapidly growing imports of fossil fuels, the risk of reliance on a single electricity source, and the threats of climate change give cause to consider the advantages of a more diversified and independent energy system that meets national energy needs while balancing energy security, environmental preservation, and economic development potential.
- 1.7** In particular, the Bhutan Transport Vision 2040 projects a drop in rural population from 400,000 today to 250,000 by 2040 as individuals migrate from rural to urban centres in pursuit of better livelihoods. The redistribution of the population is expected to increase travel demands within and between urban areas, resulting in enhanced congestion and environmental degradation. The adoption of green transport technology solutions can help minimize carbon emissions and growing fuel consumption.
- 1.8** The Country has also witnessed a significant increase in vehicular traffic due to economic development. Consequently, imports of petroleum products have also increased from Nu 1.6 billion in 2004 to Nu 5.5 billion in 2011 and are projected to rise further. This has diverted Government resources from pursuing developmental programmes, and enhances vulnerability to rising fuels costs, and availability of supply.

**1.9** With some of these trends and challenges in mind, the Bhutan Sustainable Hydropower Development Policy 2008 and the Economic Development Policy (EDP) 2010 recognise the need for a Renewable Energy (RE) Policy to promote the use of available RE sources to strengthen national energy security. Promotion of RE in the country presents a unique challenge as Bhutan enjoys availability of adequate low-cost hydropower that is green and clean. The cost of RE generation is not competitive with hydropower generation if only cost of generation is considered. However, if the benefits of a more diversified energy system are considered, the rationale for supporting RE generation is clear. To realise diversified RE potential, it is however necessary to develop targeted policies, supported by shifting existing subsidies away from other sources of energy such as fossil fuels and current grid electricity, toward other RE technologies.

**1.10** In pursuit of this objective, this Alternative Renewable Energy Policy, built by taking cues from the Integrated Energy Management Master Plan 2010 and efforts of the Rural Electrification Master Plan 2005, intends to provide the necessary direction for the promotion and development of RE that not only contribute to meeting the current energy requirements but also shaping future energy options for the Country. This Alternative RE Policy aims to contribute to sustainable development, climate change mitigation, energy and economic security, and conservation of environment in the Kingdom. Management of energy demand shall be addressed in the Energy Efficiency Policy to be developed separately.

- 1.11** This Alternative Renewable Energy Policy aims to promote the following clean RE technologies: solar (both PV and thermal), wind, bio-energy, geo-thermal, pico/micro/mini/small hydro and waste to energy (WTE). This Policy shall cover, inter alia, the following areas of RE interventions:
- a) Stand-alone systems,
  - b) Decentralized Distributed Generation (DDG) systems,
  - c) Grid-connected RE systems,
  - d) Fossil fuel substitution through green energy sources like bio-fuels, electric and hybrid vehicles.
- 1.12** Renewable Energy Technology in this Policy shall cover solar (both PV and thermal), wind, bio-energy, geo-thermal, pico/micro/mini/small hydro up to 25 MW and waste to energy (WTE). While large hydropower (above 25 MW) is considered as renewable energy, it is not under the scope of this Policy.
- 1.13** The Alternative Renewable Energy Policy strives to ensure adequate provision and extensive use of modern energy services in rural areas, which have been largely dependent on firewood and kerosene for cooking, heating and lighting purposes.
- 1.14** The Alternative Renewable Energy Policy also strives to optimise and conserve the usage of grid-based power through promotion of dispersed energy generation options such as solar thermal, solar photovoltaic and other stand-alone systems. In remote locations/rural areas, community-based initiatives in the form of Decentralised Distributed Generation (DDG) or any other initiatives leading to promotion of RE sources shall be dealt on a priority basis. RE applications such as solar photovoltaic and thermal application in government buildings, institutions, hotels, and the residential sector shall also be promoted under this Policy.

## 2. OBJECTIVE OF THE POLICY

**2.1** In view of rising energy demand, the reliance on a single electricity source, increasing fossil fuel imports, and low hydropower production in winter months, it is critical to diversify the energy mix by harnessing other domestic sources of clean renewable energy to ensure energy security, economic development, and protection of the environment.

**2.2** Recognizing the above premise, the long-term and short-term objectives of the RE Policy have been stipulated as follows:

A) Long-term objectives:

- a) Contribute to energy security and broaden the energy portfolio through utilization of available renewable energy potential;
- b) Reduce GHG emissions and contribute to climate change mitigation;
- c) Promote green growth and enhance sustainable socio-economic development;
- d) Develop productive manufacturing capacity in the RE Sector; and
- e) Develop a framework for Carbon Trading Mechanisms.

B) Short-term objectives:

- a) Harness the potential of RE resources and adoption of RE technologies in the Country;
- b) Develop RE Master Plan for each of the RE technologies by mapping capacity, generation potential and cost of generation by location across the Kingdom;
- c) Design appropriate tariffs for various RE technologies to offer secure and stable market to investors and project developers with transparent, guaranteed and time-bound incentives provided by the Government;

- d) Enable, encourage and facilitate both public and private sector participation in the development of RE;
- e) Set realistic target for RE in the energy-mix;
- f) Support and promote Research & Development in RE technologies with long term potentials as viable energy resources;
- g) Institutionalize the development of national and local capacities and capabilities for enhanced and optimum utilization of RE systems;
- h) Establish the necessary administrative processes, basic physical infrastructure and institutional mechanisms to implement the provisions of this Policy; and
- i) Strengthen regulatory functions in the RE sector.

### **3. TARGET**

This Policy sets out a preliminary minimum target of 20 MW by 2025 through mix of renewable energy technologies. This minimum target may be increased following more detailed evaluations of resource potentials. Specific targets include:

#### **3.1 Electricity Generation**

- a) Solar – 5 MW
- b) Wind – 5 MW
- c) Biomass – 5 MW

#### **3.2 Energy Generation**

- a) Biomass Energy System - 3 MW equivalent
- b) Solar Thermal System - 3 MW equivalent

- 3.3** Fossil Fuel Energy substitution in Transport Sector
- a) 1000 kilolitres of oil equivalent  $\cong$  111,000MWh
  - b) 20% of the state owned and 10% of the private vehicle fleet shall be encouraged to run on clean and green fuels by 2025

The above target does not include micro/mini/small hydro, which shall be developed separately on need basis.

## **4. TITLE, OPERATIVE PERIOD AND ENFORCEMENT**

- 4.1** This Policy shall be known as "Alternative Renewable Energy Policy 2013".
- 4.2** This Policy shall come into effect from 8th April 2013 and will remain in force until superseded or modified by another Policy.
- 4.3** All RE projects shall be governed by this Policy.

## **5. INSTITUTIONAL ARRANGEMENT**

- 5.1** The institutional arrangement outlines the roles and responsibilities of relevant organizations in the promotion of RE.

### **Department of Renewable Energy (DRE)**

- 5.2** The Department of Renewable Energy (DRE) under the Ministry of Economic Affairs (MoEA) shall be the "Nodal Agency" or "NA" for implementation of the RE Policy. The NA shall be the focal point for sustainable energy development and promotion of RE sources.

### 5.3 The NA shall undertake the following functions:

- (i) Promote a 'Centre of Excellence' at the Royal University of Bhutan and in association with the prominent institutions of the Kingdom. This Centre would carry out advanced courses, applied R&D, work on different renewable energy technologies (RETs) and provide training to the manpower employed in the RE sector;
- (ii) Administer and manage the newly created Renewable Energy Development Fund;
- (iii) Serve as the central coordination and implementation body for the development of a RE Master Plan by mapping resource potential and cost of generation for different RE technologies, and, locations across the Kingdom in collaboration with relevant agencies and the private sector;
- (iv) Coordinate action plans and link together the activities of different agencies or organizations, to ensure sustainable energy planning;
- (v) Facilitate project developers in securing required clearances from various government agencies;
- (vi) Facilitate PPA with the concerned distribution utilities including appointment of trader(s) as consolidator for purchases and sales of RE generation, subject to fulfillment of Licensing requirement under the Electricity Act;
- (vii) Issue policy directives for adoption of Renewable Energy Obligations or other policy measures as deemed appropriate;

- (viii) Promote awareness of RE and other clean and green energy technologies, and integrate their development within overall national energy policy and development;
- (ix) Create market opportunities and appropriate start-up business models like energy services providers/companies to provide renewable energy services in a sustainable manner through process innovations;
- (x) Facilitate allotment of land, access to water and approval of power evacuation plan;
- (xi) Assist in obtaining various clearances related to energy plantation for use as supplementary fuel in case of biomass power plant and Waste-to-Energy Schemes;
- (xii) Develop appropriate subsidy and support mechanisms to make RE a viable energy source, including the introduction of Renewable Purchase Obligations, amongst other policy tools; and
- (xiii) Carry out inventory of renewable energy technologies on an annual basis.

## **Bhutan Electricity Authority (BEA)**

**5.4** BEA shall create a regulatory framework for the RE Sector as per the provisions of the Electricity Act to encourage electricity generation from RE sources.

**5.5** Besides these functions, the BEA shall design and develop the following:

- (i) Feed-in-tariff as per the principles contained in this Policy; and

- (ii) Norms related to grid connectivity/interfacing and load dispatch, etc.

### **Ministry of Agriculture & Forests (MoAF)**

- 5.6** MoAF shall collaborate with DRE to generate energy from the pico and micro hydropower/biomass/bio-fuels/biogas resources in the country.
- 5.7** MoAF shall collaborate with DRE in R&D for development of sustainable bio-energy technologies.
- 5.8** MoAF shall be responsible for providing sustainable source of biomass as a source of renewable energy fuel.

### **National Environment Commission (NEC)**

- 5.9** NEC shall provide support for the promotion and development of renewable energy projects.
- 5.10** NEC shall have the overall coordination responsibility with regard to water issues in its capacity as the custodian of Water Act.
- 5.11** NEC shall ensure expedient, efficient, and priority processing and issuance of clearances/permits to help promote the development of renewable energy projects.

### **Ministry of Information and Communication (MoIC)**

- 5.12** MoIC shall collaborate with NA/MoEA and provide policy and other support towards substitution of fossil fuel by green energy sources in the transport sector.

## **Thromdes**

- 5.13** Thromdes shall collaborate with NA/MoEA and provide policy and other support towards substitution of fossil fuel by green energy sources in urban transport, street lighting and district heating systems.
- 5.14** Thromdes shall provide policy and other support towards conversion of waste to energy and for promotion of green buildings.

## **6. IMPLEMENTATION MECHANISM**

- 6.1** The implementation mechanism will include the mapping of RE resources, identification of potential project sites, preparation of techno-economic feasibility studies, allocation and development of RE projects.
  - a) Government Identified RE Projects**
- 6.2** The NA will develop the RE Master Plan within three years after the adoption of the Policy.
- 6.3** The RE Master Plan will include resource analysis, potential project sites, and estimated project scale for different Renewable Energy Technologies (RETs).
- 6.4** The NA shall then undertake preparatory studies for identified projects up to at least the pre-feasibility stage to ascertain their viability. These studies shall cover the technical, financial, economic and environmental aspects of RE projects.

**6.5** The NA shall make Pre-feasibility Reports available to the general public through the website of the NA. Interested parties may be permitted to bid for these projects as per guidelines issued by the NA. The prospective developer will have the right, at his own cost, to examine, evaluate and to carry out additional studies to make his own assessment about viability of the project, as part of his due diligence process.

## **b) Allotment process for Projects Identified by NA**

### **Grid-Connected Small Hydropower Projects**

**6.6** The small hydropower projects under the RE Master Plan shall be allocated on the basis of open competitive bidding to the project developer following the bidding guidelines, rules and regulations prescribed by the NA.

**6.7** For domestic off-take projects, the bidding shall be based on lowest tariff offered by the bidder while for export oriented projects, the bidding shall be based on the highest royalty energy being offered, provided the winning bidder possess the required technical capacity to develop and maintain the project.

**6.8** If the allocation of the project is not achieved through the bidding process, the Government may direct the State-owned agencies for development.

**6.9** The Government may also direct the State-owned utilities/agencies for development of Small Hydropower Projects for strategic reasons.

**6.10** Physical construction of small hydropower projects shall prioritize the employment of national labour. However, if necessary, technical support may be outsourced to foreign nationals or firms.

## **Grid-connected Other RE Projects**

- 6.11** The NA shall release a public Request for Proposal (RfP) inviting prospective developers to submit project proposals. These documents shall comprise the requisite details about the proposed project to facilitate proposal development by project developers.
- 6.12** The RfP will have pre-qualification criteria to evaluate the technical and financial capacities of the prospective developers in line with the requirements of the project. Weightage and scores of technical and financial criteria shall be specified in the RfP. The NA shall establish minimum qualifying score for developers at the pre-qualification stage. The applicants shall be short-listed based on the evaluation, subject to scoring the minimum qualifying marks at the pre-qualification stage. Only short-listed applicants shall be invited to participate in the price bidding process.
- 6.13** The price bid will contain the offered price of electricity to the grid. The developer with least cost bid within the range acceptable to the NA defined in the bidding document will be invited to negotiate for the allocation of the project.
- 6.14** If there are two or more identical bids with same scores at this stage, allotment shall be based on the higher score obtained during the pre-qualification stage. If the scores are same even at this stage, the two bidders shall be requested to bid again based on additional criteria as specified by the NA, till one emerges as the winning bidder.
- 6.15** In the case of Biomass Power and Waste to Energy, the NA shall determine the maximum use of fossil fuel for biomass power plants during the lean period in a year and shall facilitate the process of clearance for procurement of such fuels on a priority basis for the Biomass Power Producers.

- 6.16** If specified in the RfP, the selected developer shall reimburse the expenditure incurred, if any by the Government, for infrastructure work of the project at the time of signing the Project Development Agreement (PDA).
- 6.17** The selected developer shall sign a PDA with the NA. The PDA shall outline the commitments and obligations of the parties and will provide a timeline for the selected Developer to prepare a Detail Project Report/Detail Project Proposal (DPR/DPP).
- 6.18** The quality of DPR/DPP, Construction, and Operation & Maintenance practices shall conform to International Standards and Specifications, and BEA norms and shall be enforced by the Government.
- 6.19** After the DPR/DPP is approved by the NA, the selected developer shall be awarded the Project through an Allocation Agreement (AA) with the NA. This AA shall be the key legal instrument, specifying the rights and obligations of the parties. This AA shall also include time schedules for obtaining necessary legal/administrative/technical approvals, financial closure, construction, commissioning, operation and maintenance of the project.

**c) Self-identified RE Projects**

- 6.20** Private agencies or individual shall be allowed and encouraged to identify and prepare studies up to DPR for Micro, Mini and Small hydropower projects to a maximum of 5 MW and DPP for other RE projects, following the guidelines prescribed by the NA.
- 6.21** The project developer undertaking pre-feasibility study/DPR/DPP and survey activities shall obtain the permit as per the provisions of Electricity Act.

**6.22** All costs related to self identification of projects shall be the liability of the developer and the Government shall not be responsible for this.

**6.23** The Guideline for the preparation of DPRs/DPPs shall specify detailed element(s) to be studied and/or considered, processing fees, conditions of acceptance of DPRs/DPPs for review, criteria for examination and allocation.

**d) Broad guidelines for Preparation of DPR/DPP under self-identified RE Projects**

**6.24** The detailed guidelines for the Preparation of DPR/DPP will be issued by the NA which shall, among others, include an overview of the project, justification of the project from an energy supply side, basin development plan, survey and investigation of hydrology and reservoirs in the case of hydropower projects, inter-district and international aspects, power potential and planned capacity, design of civil, electrical and mechanical structures, transmission of power and communication facilities, construction programme and planning, project organization, infrastructure facilities, environmental and ecological aspects, cost estimates, allocation of costs, economic evaluation, future utilization of buildings, and other benefits and clearances/inputs from relevant agencies as prescribed by the NA.

**e) Submission of DPRs/DPPs under self-identified RE Projects**

**6.25** The Developer intending to set up a renewable energy project shall submit the DPR/DPP to the NA for its concurrence.

**f) Allocation process for self-identified RE projects**

**6.26** After the DPRs/DPPs have been endorsed by the NA, the developer may submit the endorsed DPRs/DPPs to the NA for allocation of the project.

- 6.27** The Pico Hydropower Project(s) and Micro Hydropower Project(s) shall be allocated for the individual consumption or use by the communities/firms provided it meets the allocation criteria prescribed by the NA. Any surplus energy shall be allowed to sell to third parties.
- 6.28** For all Hydropower Projects, the developer will be required to pay the Application Processing fee and Security Deposit as specified by the NA.
- 6.29** Evaluation criteria for identification and approval of suitable and competent project developer(s) shall be specified by the NA, both for the self-identified hydropower and other RE projects.
- 6.30** If allocation of project is done for domestic supply, the purchase of energy generated from such RE Projects, except hydropower projects, shall be guaranteed by the Government under Renewable Purchase Obligation and at the tariff approved by BEA.
- 6.31** If the allocation of projects is done for export purpose, such RE projects shall require keeping provisions for domestic supply up to 20% of the production if required by the Government at the price determined by BEA for the purpose of enhancing domestic energy supply security.

## **7 DECENTRALIZED DISTRIBUTED GENERATION (DDG) PROJECTS**

- 7.1** DDG RE projects shall be developed for provision of energy-based services to remote and dispersed villages, which are not electrified or not connected to the grid. The allocation of such projects shall be based on guidelines, rules and regulations prescribed by the NA.

- 7.2** All RE projects constructed under the Government funding as distributed power generation source shall remain as the property of the Government and management of the plant shall be transferred to communities, wherever feasible.
- 7.3** For the RE projects which are constructed under Government funding and managed by the community, the tariff shall be set to meet the operation and maintenance costs only.
- 7.4** The Government shall provide back up support for RE projects developed under Government funding if there is a major breakdown and requires substantial funds for restoring the plant.

## **8 STAND-ALONE RE PROJECTS**

- 8.1** Standalone RE systems/scheme/programme based on RE technologies (solar PV, solar thermal, pico hydro, micro hydro, wind, solar home lighting system, solar lanterns, biogas plants, passive cooling systems, biomass, cook-stoves etc. for processing appliances) or a hybrid of RE technologies for the provision of decentralized energy for households/communities shall be undertaken and/or supported by the NA.
- 8.2** Civil Societies, NGOs, Communities, Companies and Individuals based in Bhutan may initiate and undertake the stand-alone projects based on the renewable energy technologies or combination of such technologies depending upon the available resources and demand of the particular location following the Guidelines prescribed by the NA.
- 8.3** For the accelerated deployment of solar thermal system in order to diversify the energy sources and to reduce the consumption of conventional energy, other policy support mechanisms, including financial support, capacity building and promotional incentives will be developed.

- 8.4** The NA shall explore innovative processes and technologies to make the stand-alone RET and its related services accessible.
- 8.5** Process of allotment shall follow the guidelines, rules and regulations prescribed by the NA.
- 8.6** The minimum capacity of RET shall be prescribed by the NA for which no specific clearances shall be required from the Government.

## **9 FOSSIL FUEL SUBSTITUTION BY GREEN ENERGY SOURCES**

- 9.1** Research and development activities shall be undertaken to explore substitution of fossil fuels by green energy transport fuel sources such as electricity and bio-fuels, and technologies such as electric, hybrid electric vehicles, and other emerging technologies.
- 9.2** In coordination with relevant Ministries and Departments, necessary infrastructure to support the use of electricity as a source of fuel supply in the transport sector will be examined. This will aim to promote the use of electric and hybrid electric vehicles to meet public sector, commercial and private sector, and individual transport needs.
- 9.3** Policies that promote the purchase and use of electric and hybrid electric vehicles will be explored, including but not limited to vehicle purchase incentives, dedicated priority parking, and other priority access policies.
- 9.4** Research and Development shall be carried out to introduce a more comprehensive and reliable mass transport system, where feasible, including electric tram networks, electric and hybrid electric buses and other clean mass transport options.

- 9.5 Bike-lanes shall be introduced in cities and towns, where feasible, to encourage biking/cycling and walking.
- 9.6 Research and Development Activities to explore the potential for domestic production and use of bio-fuels (e.g. bio-ethanol and bio-diesel) using organic matter will be undertaken, ensuring that such actions do not affect the food security of the Country.
- 9.7 The use of waste as energy source for other processes and conversion of waste to energy will be evaluated.
- 9.8 The Government shall gradually phase out subsidy on fossil fuels to encourage conservation and switch to alternative fuel sources.

## **10 PROJECT CLEARANCE**

- 10.1 NA shall facilitate necessary clearances for RE projects.

## **11 INVESTMENT MODEL**

### **Life of the Project**

#### **All RE projects except micro/mini/small hydro**

- 11.1 All RE projects for electricity generation (except for mini, micro and small hydro) shall be developed under BOO (Build, Own, Operate) model. The projects shall be allocated for the following period for the purpose of determining the economic life: wind - 20 years, biomass - 20 years and solar power project (PV and thermal) -25 years, excluding the construction period.

- 11.2** The NA shall recommend for renewal of license for operation of the plant beyond the economic life of the project on the request of project developer, based on such terms and conditions as determined by the NA.

### **Micro/Mini/Small Hydro Projects**

- 11.3** The micro, mini and small hydro projects shall be developed under Build-Own-Operate-Transfer (BOOT) model. The project shall be allotted to a developer for a concession period up to 30 years, excluding the construction period.
- 11.4** Based on the performance of the incumbent operator and the terms and conditions to be agreed upon, the concession period can be extended for a maximum of 15 years. At the end of the concession period, the ownership of the project including all existing installations, property and rights needed for power generation in working conditions shall be transferred to the Government without any compensation to the developer.
- 11.5** Other than export oriented small hydropower projects, the developers of RE Projects shall not be required to provide royalty energy.

## **12 PROJECT OWNERSHIP**

### **Grid connected, DDG and Stand-alone RE projects**

- 12.1** Investments in RE projects are open for investments from the private sector including FDI.
- 12.2** FDI shall be allowed only as minority shareholding for development of small hydropower projects.
- 12.3** FDI shall not be permitted in micro and mini hydropower projects.

## **13 LOCK-IN-PERIOD**

- 13.1** The developer developing the project shall provide information on the promoters and their shareholding in the company to the NA indicating the controlling shareholding before signing of the PDA with the NA.
- 13.2** The “Developer” identified as the “Principal Developer” in the application for allotment of RE projects, having a lead role and possessing sufficient financial strength, is required to hold the controlling shareholding in the Special Purpose Vehicle (SPV) developing the project.
- 13.3** The “lock-in-period” shall be applicable for the first “Three Years” of the project life from the Commercial Operation Date (COD). No change in the shareholding in the SPV Company developing the project shall be permitted from the date of signing the PDA till the end of the third year from the date of commissioning of commercial operation.
- 13.4** After successful completion of three years of plant operation, the project developer may divest the equity share.

## **14 WATER USE CHARGES**

- 14.1** There shall be no water user charges other than the Royalty energy.

## **15 RECYCLING AND MANAGEMENT OF WASTE**

- 15.1** All the waste generated from the promotion of RE shall be managed under the provision of the prevailing Waste Management Acts, Policies and Regulations in the Kingdom.

## **16 FOREIGN DIRECT INVESTMENT (FDI)**

- 16.1** RE Projects eligible for FDI shall be dealt as per the prevailing FDI Policy, rules and regulations of the country and provisions of this Policy.

## **17 LAND ACQUISITION AND COMPENSATION**

- 17.1** For all RE Projects, land acquisition and compensation shall be as per the Land Act.
- 17.2** For projects that are to be transferred to Government after the concession period, all land required for the project shall be facilitated by the NA and the cost will be charged to the project through an annual lease rent during the concession period.
- 17.3** For all other projects, the NA shall facilitate the project developer in acquiring the identified government land. For private land, the project developers will deal directly with the private land-owners with necessary support from NA.

## **18 FINANCIAL RESOURCE MANAGEMENT**

- 18.1** To render the services required to promote the RE sector, the NA shall utilize funds from two sources – budgetary support from the Government and the Renewable Energy Development Fund (REDF), stipulated under the Bhutan Sustainable Hydropower Development Policy and established under this Policy.
- 18.2** For the activities mandated by the Government as per Five Year Plans, the NA shall utilize the budgetary support from the Government.

## **19 RENEWABLE ENERGY DEVELOPMENT FUND (REDF)**

- 19.1** The Renewable Energy Development Fund (REDF) is hereby established.
- 19.2** The primary objective of the REDF shall be to provide financial assistance for creating a favorable investment climate for RE in the Country.
- 19.3** Funds for REDF shall come from the following sources:
- a) A part of up-front premiums received from the large hydro project developers;
  - b) A part of the revenue earned from sale of royalty energy from the generating companies and RE Projects as per the provisions of the Economic Development Policy and RE Policy as may be applicable;
  - c) Grants from International Development Agencies and other donors;
  - d) Electricity and CDM revenue earned from RE projects developed by the NA;
  - e) Any voluntary contribution from individuals or corporate agencies;
  - f) Any cess on import of fossil fuel;
  - g) Application processing fees collected under self-identified RE Projects under this Policy;
  - h) Other sources of fund that the Government may propose through additional mechanism/arrangement as deemed appropriate.

## **20 UTILIZATION OF REDF**

- 20.1** The REDF shall support all activities which are considered appropriate by the NA for the development of the RE sector and creation of a facilitating investment climate.

- 20.2** The REDF shall provide support to sustain RE programmes and projects where deemed necessary.
- 20.3** REDF shall provide support to carry out Research and Development activities to promote Renewable Energy and Energy Efficiency.
- 20.4** The NA shall administer and manage the funds in the REDF.
- 20.5** The donations made to REDF and income earned from investment of REDF shall be exempted from taxes.
- 20.6** The NA shall prepare REDF management guidelines, rules and regulations within one year from the issuance of the RE Policy in consultation with identified financial institutions.

## **21 PROMOTIONAL MEASURES**

### **General**

- 21.1** The Government shall provide technical and budgetary supports to organize publicity and awareness campaigns, seminars, workshops, symposia, business meetings, training programmes, studies, survey, etc. as deem appropriate by the NA.
- 21.2** The NA shall provide capital subsidy and/or grants to finance small scale individual and community investments in RE Projects as deemed necessary and appropriate by the NA that contribute to the following objectives:
- a) Renders RET and RET services accessible and affordable to the rural poor and marginalized sections of the society.
  - b) Accelerate up-take and adoption of RE technologies through reduction of up-front investment cost or shift capital expenditure costs from the end-users.

- c) Benefits exceed the cost of support.
- d) Promotes sustainability of the RE Projects and societal benefits.

**21.3** Any RET systems promoted under this Policy shall not be allowed to be re-sold or transferred by the beneficiaries unless approved by the NA.

### **For Project Developers, Manufacturers and System Integrators**

**21.4** The project developers, manufacturers and systems integrators of RE Projects, except small hydropower projects, shall be exempt from payment of corporate or business income tax for a period of ten years from the date of commercial operation of the RE project.

**21.5** An additional five years income tax holiday shall be given to Project developers, manufactures and system integrators of RE projects established in the remote areas of the Kingdom as notified by the NA based on poverty levels and other strategic reasons.

**21.6** The NA shall, wherever required and feasible, facilitate allocation of space required for manufacturing or fabricating solar water heating systems, accessories for biogas plants, improved cook stoves, and other RE technologies approved and/or supported by the NA.

### **Fiscal Incentives for RE Projects**

**21.7** The Project Developer, manufacturers and system integrators of RE shall be exempt from payment of all import duties and Bhutan sales tax on import of plants and equipment as direct inputs to the project during the construction period, applicable till such time as determined by the Government.

- 21.8** Sales tax and customs duty exemption shall be granted for purchase of spare parts for RE projects promoted under 7.2 and 21.2 and recommended by the NA.
- 21.9** Reinvestment by companies shall be allowed as tax deductible expenses up to a maximum of 25% of the total reinvestment. Reinvestment allowance shall be given only once for every new investment is undertaken.
- 21.10** Expenditure incurred in RE-based R&D including those by patrons shall be allowed as tax-deductible expenditure in whole.
- 21.11** RE projects/schemes/investment provided with incentive or other forms of benefits as per this Policy shall not be eligible for additional incentives under the Cottage and Small Industries (CSI).

## **22 CARBON MARKET MECHANISM**

- 22.1** All RE projects shall be encouraged to avail benefits from Clean Development Mechanism or any future international carbon market mechanisms to reduce GHG emissions. The NA shall facilitate requisite approvals from various Government agencies to enable the developers to register the projects under such mechanisms.
- 22.2** The NA shall facilitate bundling of smaller RE projects to avail benefits from such mechanisms.
- 22.3** All benefits from such mechanisms shall be accrued to the project developers.

## **23 DELIVERY MECHANISM**

### **DDG projects**

#### **Tariff determination**

- 23.1** BEA shall determine the tariff for various RE technologies.
- 23.2** The existing DDG projects, owned by the NA (including ones that are handed over to community for O&M) or community or private developers shall have the option to sell electricity to the distribution utility once the national grid reaches the area. The distribution utility shall be obligated to purchase power from such plants as may be directed by the Government.
- 23.3** Once the national grid reaches to the area, for the project developed by the NA, BPC may be directed to takeover such projects for O&M against a fee to be paid by the NA.
- 23.4** The subsidy shall be determined for such projects taking into consideration the project cost at the beginning of the project, subsidy availed by the projects, returns accrued by the project so far, remaining life term of the project, and a normative return as per the tariff determination guidelines, rules and regulations.
- 23.5** Payments against the sale of electricity from the projects owned by NA shall be deposited into the REDF.

#### **Licensing requirement**

- 23.6** The RE project developers shall apply for license as per the provision under the Electricity Act.
- 23.7** The Government may facilitate provision of Composite License (electricity, water, trade, bulk supply etc.)

## **Grid-connected RE projects**

### **Off-take of electricity**

- 23.8** The Project Developer may contract the electricity generated after complying with licensing regulations, fulfillment of technical and safety parameters in accordance with the existing grid code and applicable regulations as amended from time to time.
- 23.9** In the case of an Independent Power Producer (IPP), the entire power may be sold to any consumer or willing distribution company. Subject to approval of the Government, the power may also be exported through designated agencies or as per directives of the Government. However, the distribution utility, in whose jurisdiction the domestic off-take power plant is located, shall have the first right to purchase of power.
- 23.10** If feasible, the sale of energy to a third party or switching from one third party consumer to other third party consumer shall also be permitted by the NA, subject to approval of BEA.

### **Tariff determination**

- 23.11** BEA shall determine tariffs for grid-connected projects as per the provision of the Electricity Act.
- 23.12** For tariff determination purposes, any capital subsidy and subsidy on tariff provided to RE projects shall be factored.
- 23.13** Other forms of electricity purchase from RE projects such as export of power or third party sale shall be based on mutually agreed rates between the buyer and the seller through a Power Purchase Agreement.
- 23.14** The NA may consider the appointment of a consolidated off-taker(s) for export or domestic purposes.

## **Power Purchase Agreement (PPA)**

**23.15** The NA shall develop model PPAs for different RE technologies to facilitate signing PPAs at lower transaction cost.

## **Load dispatch**

**23.16** All RE projects approved by the NA in the Country shall be considered as “must dispatch” power projects and shall enjoy the benefit of priority dispatch. The priority dispatch status of the RE projects shall be subject to system reliability, safety and grid capacity.

**23.17** RE projects shall not be subject to scheduling and dispatch except for 10 MW and above biomass and RE-based cogeneration projects.

## **Transmission**

**23.18** The transmission utility shall provide transmission access to the Project Developer.

**23.19** The developer shall be responsible for laying transmission lines and connect to the nearest grid sub-station of the utility beyond which the utility company will provide the transmission facilities for wheeling the electricity within the Country.

**23.20** The developer shall enter into an agreement with the utility company for the transmission service and shall not be required to pay transmission and wheeling charges except for export oriented projects where such charges as determined by the BEA from time to time for usage of the utility’s transmission system shall apply.

**23.21** The Developer shall be liable for penalty, if they do not utilize the allocated transmission network capacity as prescribed by the regulation in force.

## **Other Regulatory Provisions**

- 23.22** The RE projects shall be required to comply with all regulations, codes, and standards pertaining to construction, operation and maintenance of the plant as per the applicable laws.
- 23.23** The NA shall determine the Renewable Energy Obligation (REO) for the obligated agencies in order to ascertain a long-term and real market for grid-interactive RE projects.

## **24 MONITORING AND EVALUATION**

- 24.1** The NA shall devise a comprehensive monitoring & evaluation framework for RE programmes. It shall also undertake impact studies at regular intervals and make arrangement to monitor and evaluate the RE programmes.

## **25 AMENDMENTS**

- 25.1** The Government may amend this Policy as and when required. However, the terms and conditions of agreements, which are in effect for the existing projects, shall not be subjected to these amendments.

## **26 DEVIATION FROM THE POLICY PROVISIONS**

- 26.1** Deviation from the policy guidelines shall be treated as default and in such cases, the projects shall be taken over by the Government following appropriate legal procedures applicable in the Country.

## 27 INTERPRETATION OF THE POLICY

**27.1** In the event of conflict of interpretation, the Ministry of Economic Affairs shall on behalf of the Government, be the authority to interpret various provisions of this Policy, which shall be final and binding.

## 28 DEFINITION

1. "Agreement" outlines the implementation agreement signed between the Royal Government of Bhutan and the Developer and broadly consists of the following:
  - Project Commissioning Schedule and Construction Period Requirements from the parties as per the approved DPR and/or relevant document; and
  - Terms and Conditions for the project during the operation period, i.e. from the Commercial Operation Date of the Project.
2. "Bhutan Electricity Authority (BEA)" or "Authority" means the authority of that name established pursuant to Part 2 of the Electricity Act of Bhutan, 2001.
3. "Bid" means an offer to participate in the project, made in accordance with the terms and conditions set out in a document inviting such offers.
4. "Bid Security" means the deposit of an unconditional bank guarantee; or an irrevocable letter of credit; or a cashier's or certified check, submitted with a bid and serving as guarantee to the Government that the bidder, if awarded the project, will execute the project in accordance with the bidding requirements and the contract documents.

5. "Bike-lane" is a general term denoting any trail, path, part of a highway, surfaced or smooth shoulder or any other travel way specifically signed, marked, or otherwise designated for bicycle travel.
6. "Bio-fuel transesterification" means the process used to convert extracted oil to bio diesel.
7. "Clean Development Mechanism (CDM)" is an arrangement under the Kyoto Protocol allowing industrialised countries (called Annex 1 countries) with a greenhouse gas reduction commitment to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries.
8. "Command Area" shall mean the area allocated to a biomass project developer for procurement of biomass. The Nodal Agency shall allow only one biomass project developer to set up project in the assigned command area to avoid fuel risks. The size of the command area shall depend on the size of the biomass plant.
9. "Commercial Operation Date (COD)" means the commercial operation date reckoned as the date on which each unit of the generating plant and equipment is jointly declared as commissioned by the Government and the Project Developer.
10. "Decentralised Distributed Generation (DDG)" means generation of electricity from various RE energy sources for local consumption, largely used for meeting electricity requirement in remote areas using its own dedicated distribution system.
11. "Distribution" means the conveyance of electricity through a distribution network system at voltages below 66 kilovolt or as is deemed by the Authority to be a part of the distribution network.

- 12.** "Distribution system" means a network, together with the connection assets associated with the network, which is connected to another transmission or distribution system.
- 13.** "Domestic off-take projects" means the projects wherein the power generated is consumed within the Country.
- 14.** "Detailed Project Report (DPR)" is further step in firming up a developer's bid for the techno-economic costs as well as the various other project facilities. The DPR shall include, inter alia, details of location, site description, plant design/layout, integration with grid (for grid-interactive plant), local distribution network layout (for DDG), annual output of the plant/scheme, estimates of cost, phasing of expenditure, cost of generation and tariff (for grid-interactive and DDG plants), implementation of work, bill of material, construction schedule etc.
- 15.** "Detailed Project Proposal (DPP)" shall be applicable to stand-alone projects under this Policy. The DPP shall include, inter alia, the following: site description, annual output of the project, estimates of cost, phasing of expenditure, cost of implementation of the project, implementation of work, bill of material, installation schedule, arrangement for after-sales services, availability of spare parts etc.
- 16.** "Developer" means a person or body of persons, company, firm and such other private or government undertaking, who/that finances, designs, processes, constructs, commissions, operates and maintains the project facilities and, at the end of the concession term, transfers them to the Government where applicable.
- 17.** "Feed-in-tariff" means a minimum guaranteed price per unit of electricity paid to the generator.
- 18.** "Government" means the Royal Government of Bhutan.

19. "Green Energy based technology substitution" refers to the greener technologies that replace the existing polluting technologies or sources of energy and includes bio fuel, electric/hybrid vehicles, and future substitution technologies as recognized or approved by the Nodal Agency.
20. "Grid-Connected RE projects" means the projects connected to 11 kV and above grid network of the utilities to sell electricity to the grid.
21. "Hybrid system" refers to the solution of combining two or more RE technologies with the aim to decrease the intermittent nature of generation of such technologies.
22. "Local" means a person who is a citizen of Bhutan or an entity, which is incorporated/registered within Bhutan.
23. "Nodal Agency" means the agency responsible for promotion and development of renewable energy in the Country.
24. "Pre-Feasibility Report (PFR)" is the report that delineates the project location specifics, generation potential, access and power evacuation arrangement (in case of grid-interactive plants), and details of site investigation programmes.
25. "Principal Developer" is the "Developer" identified as the "Principal Developer" in the application for pre-qualification and holding at least fifty one percent (51%) of the Developer's share of the equity in the investment.
26. "Project Development Agreement (PDA)" means a legal document expressing a convergence of will between the parties, outlining the terms and details of the agreement between the Government and the Project Company till signing of the Concession Agreement/Allocation Agreement, including each party's requirements and responsibilities.

The PDA serves as a basis for a future formal contract in the form of the Concession Agreement (CA)/Allocation Agreement (AA), and lays out the time periods in which crucial milestones must be reached prior to further progression with the deal.

- 27.** “Promoter” means the person who undertakes stand-alone RE projects.
- 28.** “Private participant” means any person from the private sector in energy business either for bulk supply or retail sale under certain conditions.
- 29.** “Renewable Energy Technologies (RETs)” means different renewable energy technologies like solar, wind, biomass, small hydro etc.
- 30.** “Renewable Energy Development Fund (REDF)” means a Fund proposed under the Bhutan Sustainable Hydropower Development Policy, 2008 and established under this Policy. The Fund will be created allocating a part of the up-front premium received from larger hydro developers and other sources prescribed under this Policy.
- 31.** “Renewable Energy Obligation (REO)” is an obligation on licensed suppliers to supply a specified proportion of their electricity supplies to their customers from renewable sources of energy.
- 32.** “Renewable Purchase Obligation (RPO)” is the minimum amount of energy required to be purchased by the obligated entities (companies) in order to meet their mandatory requirement.
- 33.** “Renewable energy sources” means renewable sources such as small hydro, wind, solar including its integration with combined cycle, biomass, bio-fuel cogeneration, urban or municipal waste and such other sources as recognized or approved by the Nodal Agency.

- 34.** “Request for Proposal (RfP)” means the document an organisation posts to elicit proposals from potential developers of a project. Ideally, RfPs stipulate the requesting organization’s requirements and delineates the deliverables associated with the project and establishes a framework for project execution so as to minimize the possibility of misunderstandings and errors.
- 35.** “Royalty Energy” means the free Energy that would be made available to the Government under a project during the concession period i.e. the period starting from the commercial operation date of the project.
- 36.** “Sale” means the sale of electricity to a customer or for resale to third parties.
- 37.** “Special Purpose Vehicle (SPV)” means a body corporate created to fulfil narrow, specific or temporary objectives, primarily to isolate financial risk.
- 38.** “Stand-alone renewable energy systems” means the systems installed at an individual’s household, community, institutions, and commercial entities for self-consumption. These systems do not have their dedicated distribution network unlike DDG, nor are they connected to grid, except for rooftop-based Solar PV systems or other technologies developed under net-metering arrangement.
- 39.** “Transmission” means an activity pertaining to a transmission system including the conveyance of electricity at voltages of 66 kilovolt and above or as is deemed by the Authority to be a part of the transmission network.

40. "Waste to Energy (WTE)" means energy generated out of waste that includes municipal solid waste or any other form of organic or inorganic wastes.
41. Hydropower projects under this Policy are classified as follows:

<b>Category</b>	<b>Capacity (kW)</b>
Pico	1 to 10
Micro	Above 10 to 100
Mini	Above 100 to 1000
Small	Above 1000 to 25000





**ALTERNATIVE  
RENEWABLE ENERGY POLICY  
2013**