

“Renewable Energy Policy and Wind Energy Development in DPRK”

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1. Renewable energy policy

1.1 seeking the sustainable strategy

The industrialization in DPRK has started its first step in 1970s and at that time its energy sector was characterized as a heavy dependence on coal.

Since then, the country experienced to stable economic growth with expanded energy production and consumption based on its rich resource of coal.

Since mid-1990, however, the country has undergone severe economic draw backs mainly due to continuous natural disasters and other several reasons. Especially, the crises in energy sector have led to severe impediment in economic development.

Coal, which represents about 70% in primary energy mix is getting inferior in quality and the condition of coal mining is getting more unfavorable.

As the almost whole economy of the country was fueled mainly by coal, it caused chaos in the economy and laid serious hurdles in the road of the development of the country.

In addition to this DPRK has not discovered its oil yet and imports petroleum needed for the transportation energy consumption. The flotation of the world oil market made the energy stability in DPRK even more vulnerable and expensive. The lack of the fossil fuels in the country left no choice but to seek the new solution for energy. The environment concern was one of the criteria for DPRK in consideration of energy solution. As the world concern on environment has reached its peak, the world energy takes its new trend to the safe and clean energy that can prove the efficient energy making. As DPRK is surrounded by sea on 3 sides and especially, almost 80% of its territory is covered by mountains, it has good resources of the hydro-power, wind power and tidal power.

These energies are environmentally safe and at the same time can prove the sustainable utilization in future.

1.2 The Evolution of the DPRK policy on Renewable energy

The main path for the long-term energy security of the country is to realize diver-utilization of energy resource and to enhance by improving demand side management.

For this purpose, DPRK government emphasizes the oil exploration, nuclear power generation, introduction of advanced energy-efficient technology and renewable energy development. Here the renewable energy is relatively most feasible and reliable in consideration of its technology and its abundant resources.

The DPRK government always attaches great importance to the development and improvement of renewable energy for the sustainable development of national economy.

Renewable energy development has been taken as part of energy, environment and ecology construction in DPRK.

For the safe security of the development and utilization of the renewable energy, the DPRK government has taken several relevant measures. To develop the renewable energy as the

main energy sources of economy, first of all, it was necessary to establish the appropriate organization that can mobilize and concentrate all the related efforts for the renewable energy.

In 1993, the state has established the non-conventional energy development centre(NCEDC) in order to provide a unified leadership over the management and the research work in the country and contribute to the national energy production.

As the social awareness is getting raised and the scientific and the technological research has further advanced, in 1994 national Non-Standing Renewable Energy Commercial (NNREC) has been organized with the aim to ensure wider development and utilization of the renewable energy in the economy. The NNREC involves some ministers of the government, which considers the important proposals related to the renewable energy development and devise adequate measures. Establishing the relevant organizations, the government has set of forth series of policies and rules to promote the renewable energy development at the same time.

For need of the environment protection, DPRK government has adopted “The law on Environment protection” in 1986.

In 1998, DPRK government has enacted “The law on energy management” in order to make the most rational use of energy. According to this law, the state promotes the active development and the utilization of the renewable energy and its appliances in organizations, institutions and households.

In 2000, the government has notified the instructions for executing the wind turbine production for its important role in greenhouse gas mitigation and national electricity supplement.

The reduction of carbon emissions through the energy efficiency measures, improved combustion efficiencies and substitution with New and Renewable Energy play an important role in mitigation options.

In 1993, the government issued its National Action Plan which is focusing on transition to sustainable development. In this document, the development of New and Renewable Energy and in particular wind, featured as one of the three main strategies.

Wind energy development is stated priority for the DPRK, especially now that the country faces shortages of conventional fuel and electricity, hardship in the rural sector and a rising concern for pollution caused by its one indigenous source of energy, coal.

2. Current Situation of Wind Energy Development

2.1 Wind Resource

The DPRK is a land of peninsula, long stretching north-south surrounded by sea on three sides, with natural and geological conditions favorable for power resource development.

The government has organized the wind energy team in 1978.

The wind survey team has collected wind velocity data in 130 locations throughout the country for the last 20 years.

Although these data measurements are more of estimates, as they were measured using crude instruments, the initial wind survey has concluded that the east and west coasts and upland are rich in wind resource including tidal dykes of 500 km and mountain ridges of 150 km.

By these survey results, annual average wind speed is above 4.5m/s in 18% areas of the territory and it is expected to have an installed capacity of about 4 GW of wind generated electricity. Annual average wind speed was reported about 6m/s for some coastal areas and 8m/s for high mountainous areas.

Most of west seashore of the country covering several millions hectare of tidal land is suitable for installing large sized wind turbines.

The offshore wind resource is good particularly in the west sea of DPRK with wind speed 8-10 m/s from mainly southwest in summer.

2.2 Research and Development

Fundamental study on wind energy is conducted relatively in depth, but its industrialization is still premature. The national institutes directed by State policy have carried out the research on stand alone wind electric systems and wind pumps for the last 15 years.

In some institutes and universities, the wind energy research teams are organized and they are now conducting the study on wind power generation. Wind turbines ranging from 50 to 75 KW have been manufactured in the country. Total installed capacity of wind power generation throughout the country is about 3MW by the end of 2004, but small sized stand alone systems below 10 KW are most common. In addition, there are some examples of applying wind pumping systems of up to 1.5KW capacity to practice such as drinking water supply.

In the past, two wind energy projects were implemented with international assistance. The grid connection wind turbines donated from Denmark (two 90 KW Vestas wind turbines) were firstly installed in west coast in 1986. In 1998, the Nautilus Institute funded the installation of stand alone wind energy system, with a combined total capacity of 11KW, with individual capacities ranged from 500w to 4.5 KW as dedicated service to 60 households in a cooperative farm.

Through this project, the potentials and application of small wind energy systems in rural areas in DPRK will be realized in near future.

3. Wind Energy Development Strategy

3.1 Prospect of wind energy development

DPRK is now framing the new strategy of national wind energy development. According to this strategy the total installed capacity of wind turbines is prospective to reach at 500 MW by 2020.

The large sized wind turbines are designed to be installed primarily in an intensive manner in tidal land and dykes of the west coastal region. The plan for wind farm construction is set

by three stages. At the first stage in the period of 2006-2010, the DPRK is planning to construct the prototype wind farm with capacity of 10 MW, which will consist of individual wind turbines with the capacity of over 600 KW.

During this period, the DPRK will be acquired the knowledge and experiences on design, construction, operation and management of large wind farm. At the second stage for period of 2011-2015, three main wind farm projects will be implemented for the whole capacity of 100 MW.

DPRK is planning to implement those projects with the cooperation of the international organizations and other NGO groups and communities.

At the third stage for period of 2015-2020, the construction of onshore and offshore wind farms through out the country will be actively driven.

Meanwhile, manufacturing process for 5 KW small wind turbine will be arranged within a few years to supply electricity to remote villages and stand alone wind energy systems for household will be established in the isolated rural areas and islands.

The wind resource including offshore will be re-explored and the national wind atlas will be completed by the end of 2008.

3.2 Activities

Though the economy of DPRK is recovering little by little, there are some difficulties for the project.

The capacity building in wind energy sector is considered as top priority for policy makers, technicians and managers.

The capacity building will include:

- training for policy makers with focus on wind energy markets and policy design issues
- technical training for technicians with technical focus on integrated wind farm design construction, operation and management
- training for project managers and operators

In line with the capacity building, DPRK is also deeply interested in exchange of the scientific and technology information with other countries to increase the social awareness and promote the research work.

For this, the Government promotes the joint research work and joint development in the field of the renewable energy to advance its science and technology'

The main barrier in the activities of DPRK for wind energy development is the lack of funds and technologies. But these problems will be gradually solved through the correct policy of DPRK and the technical transfer and project implementation under the cooperation with the international community.

Thank you.