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International Science and Technology Cooperation Program on New and Renewable Energy

As clean and sustainable resources, new and renewable energy presents important solutions to future energy supply. The *International Science and Technology Cooperation Program on New and Renewable Energy* (hereinafter referred to as the *Program*) is introduced with an aim to:

- I advance the development and application of new and renewable energy technologies in China and around the world;
- I pool efforts to tackle global climate change, save energy resources for sustainable socio-economic development and a harmonious world;
- I and promote science and technology (S&T) cooperation between China and other countries in this regard.

In the *Program*, the term “new and renewable energy” mainly refers to solar energy, wind energy, biomass energy, geothermal energy, ocean energy, hydrogen energy, gas hydrate, and the like.

Background

I. Background

The current world is heavily dependent on fossil fuels which account for 74% of the global energy consumption in the form of coal, petroleum, natural gas, etc. Though providing momentum to social progress, such resources are on the verge of exhaustion and their excessive use has given rise to severe environmental pollution and climate change. Hence countries around the world have identified the development of new and renewable energy as an integral part of their future energy strategies. Up till now, over 30 developed countries and more than 10 developing countries have set national targets to develop renewable energy.

It is widely acknowledged that the issue of energy concerns every country and calls for joint efforts of the international community. It is our common choice to intensify international S&T cooperation and vigorously develop new and renewable energy so as to enhance energy supply, save energy and reduce consumption, safeguard energy security, cut down greenhouse gas emissions, foster the low-carbon economy, and ensure sustainable socio-economic development. The enforcement of the *Kyoto Protocol* and the Clean Development Mechanism (CDM) has substantially invigorated the international cooperation on new and renewable energy. With growing public understanding and acceptance of the *United Nations Framework Convention on Climate Change (UNFCCC)*, more and more countries and international organizations will come to support



Background

the development of new and renewable energy. The Chinese government has promulgated a series of laws and policies such as the *Law on Renewable Energy* and the *Outline of National Medium- and Long-term Science and Technology Development Plan (2006-2020)*, and formulated the *Medium- and Long-Term Renewable Energy Development Plan*. Those are efforts aimed at creating a favorable environment for tapping new energy and renewables in China and facilitating international S&T cooperation.

Purposes

II. Purposes

Through international S&T cooperation, China will demonstrate to the international community her determination to explore new and renewable energy, reduce greenhouse gas emissions, and build a resource-conserving and environment-friendly society by S&T innovation. China is also committed to joining hands with the world in facing up to the future energy challenges. China will do her best in the international efforts in developing world-class technologies for new and renewable energy, and introduce technologies that meet the urgent demand at home. The aim is to broaden channels for technology introduction and facilitate the transfer of such technologies from the developed to developing countries and among developing countries as well. A platform for international exchanges is also to be established to promote China's advanced and appropriate energy technologies to the global market, energize the overall S&T advances in new and renewable energy and help create a synergy of advanced technologies. International S&T cooperation is expected to bolster China's efforts to introduce technical professionals, upgrade the level of basic research, and resolve key S&T issues in the field of new and renewable energy. Moreover, such cooperation is to provide impetus to the new and renewable energy industry, improve energy efficiency, enhance large-scale use of new energies, and effectively bring down their costs. Meanwhile, mechanisms for dialogue, consultation and communication should be put in place to connect China with foreign authorities, enterprises and research bodies.

Principles

III. Principles

Mutually Beneficial and Win-Win Cooperation Bilateral and/or multilateral S&T cooperation will be conducted in line with international norms and by taking into account the advantages and characteristics of different countries for the purpose of a mutually beneficial and win-win scenario.

Protection of Intellectual Property Rights The international S&T cooperation in new and renewable energy should strengthen the protection of intellectual property rights (IPR) of advanced technologies that serve S&T progress and innovation, and the transformation, application and dissemination of S&T achievements.

Sharing of Advanced Technologies On the basis that each party protects its own IPR, exchanges and cooperation should be intensified in the field of new and renewable energy, including basic research, technology R&D, demonstration and application. The introduction of China's advanced technologies to the international exchange platform should be encouraged and the sharing of the state-of-the-art technologies and S&T resources should be promoted.

Integration of Strengths The "invite-in" and "go-out" endeavors, along with other new approaches to mobilizing resources, should make the best of resources at home and abroad to upgrade the technical level and innovativeness of China's renewable energy industry, and promote the application of the world's new energy technologies.

Technological Innovation International S&T cooperation is to expedite technological innovation, develop new technologies that utilize energy in an efficient and environment-friendly manner, improve the comprehensive utilization of energy, and stimulate the transformation towards new energy structures.

A teal banner at the top of the page features a faint image of several wind turbines on a hill. The word "Objectives" is written in white, sans-serif font in the lower-left corner of the banner.

Objectives

IV. Objectives

Efforts should be made to develop new patterns for international exchanges and cooperation, encourage countries to complement each other with respective technological strengths, and set up a platform for technological cooperation. When attracting the transfer of advanced foreign technologies, China should also promote her advanced technologies abroad and further the S&T ties with other developing countries. A technical guide on the international interaction of new and renewable energy will be formulated and China will take part in setting the world's technical standards. China is to do a better job in introducing, digesting, and absorbing technologies from abroad, and conducting re-innovation in new and renewable energy by teaming up with foreign counterparts and running demonstration projects. It is also important for China to identify enterprises as the major player in the fortified industry-education-academia synergy, speed up the transformation of research findings, initiate and advance a number of big demonstration projects, and foster technological innovation in new and renewable energy. In view of local conditions and diversified developments, bases for international S&T cooperation in new and renewable energy should be established to foster large-scale development. Joint training will be carried out to nurture high-caliber professionals for the R&D in the field of new and renewable energy.

Priority Areas

V. Priority Areas

Support will be provided primarily to research on basic science and applied technologies in the following fields:

1. Integration of Solar Power Generation and Solar-powered Building Structures

solar thermal/photovoltaic power generation systems, thin-film PV cells and other new types of PV cells, buildings integrated with solar energy, low-cost and low-pollution production technology of high-purity silicon materials, the industrial application of solar thermal technology and so on.

2. Biomass Fuels and Biomass Power Generation

Non-food energy crops and ethanol from cellulose materials, energy forestry, bio-diesel, biomass briquettes and biomass gasification, biogas and power generation, and so on.

3. Wind Power Generation

Wind energy resources assessment, large high efficiency wind turbines, offshore wind turbines and the building of wind farms.

4. Hydrogen Energy and Fuel Cells

Technologies for the production, storage and transportation of hydrogen, and technologies for new types of fuel cells and fuel cell automobiles.

5. Development of Gas Hydrates

Technologies for the exploration, development, storage, transportation, and utilization of gas hydrates.

Major Tasks

VI. Major Tasks

1. Basic Research

Efforts should be made to encourage and support the active participation of Chinese research institutes and universities in international joint research and exchanges concerning new and renewable energy, carry out basic theoretical studies on new technologies, substantially enhance the overall capacity in basic sciences and frontier technology studies, and accomplish a number of S&T theoretical findings that are of high global impacts.

2. Industrial Demonstration

China is to stay focused on tracking, introducing and studying advanced technologies that serve the cost-effective and large-scale development and utilization of new and renewable energy, conduct system appraisal of renewable resources endowment, and devote R&D efforts to the distributed new and renewable energy systems that provide multiple, mutually reinforcing forms of new energy. Given that new and renewable energy presents a new type of industry that is based on modern manufacturing technology, one cooperation priority is to develop technologies for the design and manufacturing of equipment, and set up international testing centers.

3. Scale Application

Play an active role in setting international and regional technical standards related to new and renewable energy, and prepare for the



Major Tasks

market entry of new products. Collaborate with foreign counterparts and draw on their managerial expertise and experience in making plans and policies for new and renewable energy, with a view to establish and improve a Chinese regulatory and management system.

4. Pursue the “Go-out” Strategy

Efforts should be made to motivate Chinese enterprises, research institutes and universities to go global and play active roles in big cooperative projects in new and renewable energy, build up joint R&D centers or bases, forge long-term cooperative partnerships with countries concerned in this field, and stimulate technology transfer from the developed to developing countries and among developing countries.

5. Promote International Exchanges and Dialogues

It is important to develop dialogue mechanisms for international S&T cooperation in new and renewable energy, in order to exchange ideas of energy development and utilization, and pool efforts to look for solutions to bottlenecks. Through various channels such as forums, seminars and policy dialogues, China will be more engaged in the dialogue, consultation and communication with foreign authorities, enterprises and research bodies.

6. Nurture High-caliber Professionals

By taking advantage of joint research projects, joint R&D centers, demonstration projects and other platforms for international S&T cooperation, China aims to team up with foreign counterparts to nurture high-caliber professionals for the R&D in the field of new and renewable energy.

Organization and Management

VII. Organization and Management

1. Setting up an Organizing Agency

The implementation of the Program will be jointly organized by the Ministry of Science and Technology (MOST) and the National Development and Reform Commission (NDRC) of China, and carried out by government agencies, international organizations and major research institutes. A Steering Committee on International S&T Cooperation will be established for the Program to initiate international endeavors. MOST and NDRC will extend worldwide invitations to high-level experts on new and renewable energy in a bid to establish an Expert Consultation Committee on International S&T Cooperation to provide the Steering Committee with suggestions on priority fields, major tasks, and cooperation patterns of the Program.

2. Special Funds

Special funds will be arranged for the launch of the Program with a view to attracting financial input from foreign governments and international organizations for the implementation of the Program. Equal attention will be given to soliciting private capital and investment from the business sector, especially the international energy giants, for the purpose of stimulating international S&T cooperation in the field of new and renewable energy.
