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可再生能源与新能源国际科技合作计划

可再生能源与新能源作为清洁、可持续利用的能源，为解决人类未来能源供应问题提供了重要的途径和手段。为提升可再生能源与新能源在中国和全球的发展和应用技术水平，共同应对全球气候变化，节约能源资源，实现经济社会可持续发展，建设和谐世界，加强中国与世界各国在可再生能源与新能源方面的国际科技合作，特制定“可再生能源与新能源国际科技合作计划”（以下简称“计划”）。本计划所称可再生能源与新能源主要包括太阳能、风能、生物质能、地热能、海洋能以及氢能、天然气水合物等。

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:

- l advance the development and application of new and renewable energy technologies in China and around the world;
- l pool efforts to tackle global climate change, save energy resources for sustainable socio-economic development and a harmonious world;
- l 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.

背景

一、背景

当今社会主要依赖于传统的化石能源，全球总能耗的74%来自煤炭、石油、天然气等矿物能源。化石能源的应用推动了社会的发展，但资源却在日益耗尽。同时化石能源的无节制使用，造成了严重的环境污染和气候变化问题。世界各国纷纷把发展可再生能源与新能源作为未来能源战略的重要组成部分，截止到目前，全球有三十多个发达国家和十几个发展中国家制定了本国的可再生能源发展目标。

各国都清楚地认识到，能源问题是一个全球性问题，需要国际社会的共同努力。加强国际科技合作，大力发展可再生能源与新能源，已经成为各国增加能源供给，促进节能降耗，保障能源安全，减少温室气体排放，发展低碳经济，实现经济与社会可持续发展的共同选择。《京都议定书》的正式生效和清洁发展机制的提出，为发展可再生能源与新能源，促进这一领域的国际

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

背景

合作提供了强大动力。随着人们对联合国《气候变化公约》的深入理解和广泛接受，发展可再生能源与新能源将会得到更多国家和国际组织的认同与支持。中国政府为促进可再生能源与新能源的发展，出台了一系列的政策与法规，公布实施了《可再生能源法》、《国家中长期科学技术发展规划纲要（2006–2020年》，编制完成了《可再生能源中长期发展规划》等，为中国发展可再生能源与新能源提供了良好的制度环境，也为国际科技合作创造了有利条件。

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.

宗旨

二、宗旨

通过国际科技合作向国际社会展示中国依靠科技创新，积极发展可再生能源与新能源、减少温室气体排放和建设资源节约型、环境友好型社会的决心，以及携手解决世界未来能源问题的努力；通过选择国际领先和国内急需的可再生能源与新能源科学技术开展国际科技合作，拓宽引进先进技术的渠道，促进发达国家先进技术向发展中国家转移以及发展中国家之间的技术转移，建立国际交流平台，支持我国先进、实用的能源技术走向国际市场，推动可再生能源与新能源科学技术的整体发展，促进各国先进技术的融合；通过国际科技交流合作，积极引进可再生能源与新能源的技术人才，提高中国可再生能源与新能源的基础研究水平，解决可再生能源与新能源发展中的关键科技问题；发展可再生能源与新能源产业，提高能源利用效率，推进规模化利用程度，有效降低可再生能源与新能源的使用成本；建立中国与世界各国政府、企业和科研机构之间的对话、协商和沟通机制。

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.

原则

三、原则

合作互利共赢。结合世界各国可再生能源与新能源的优势和特点，按照国际惯例，在科技领域广泛开展双边和多边合作，互惠互利，合作共赢。

保护知识产权。在可再生能源与新能源的国际科技合作中，要加强有利于科技进步和科技创新，有利于科技成果的转化、应用和推广的先进技术的知识产权保护。

先进技术共享。在保护各自知识产权的基础上，加强各国在可再生能源与新能源基础研究、技术研发、示范和应用方面的交流与合作，鼓励我国先进新能源技术进入国际交流平台，促进先进技术和科技资源共享。

集成优势资源。通过“引进来”、“走出去”和其他新的资源组织方式，充分利用国际、国内两种资源，提升中国可再生能源产业的技术水平和创新能力，同时为国际新能源技术推广应用做出贡献。

开展技术创新。通过国际科技合作开展技术创新，开发高效与环境友好的能源利用新技术，提高能源利用的总体水平，推动能源新结构的转型与发展。

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.

目标

四、目标

发展新的国际交流与合作模式，促进各国技术优势互补，建立技术合作平台。在吸引国外先进技术向中国转移的同时推动中国的先进技术走出去，加强与发展中国家的科技合作；制定可再生能源与新能源国际交流与合作技术指南，参与国际可再生能源与新能源技术标准规范的制定；促进可再生能源与新能源技术的引进、消化、吸收和再创新，与国外联合建立先进技术应用示范项目；以企业为主体，强化产学研合作，加快可再生能源与新能源科研成果的转化；建立与发展一批大的示范项目，促进可再生能源与新能源技术创新；因地制宜、多元化发展，建立可再生能源与新能源国际科技合作基地，推进可再生能源与新能源规模化发展；合作培养从事可再生能源与新能源研究与开发的高层次专业人才队伍。

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.

优先领域

五、优先领域

重点支持以下领域的基础科学与应用技术研究。

（1）太阳能发电与太阳能建筑一体化

太阳能光热发电和光伏发电系统，薄膜太阳能电池和其它新型太阳能电池，太阳能综合建筑，低成本、低污染太阳能高纯硅材料生产技术，太阳能热利用技术工业应用等。

（2）生物质燃料与生物质发电

非粮能源作物、纤维素原料乙醇、能源林业植物、生物柴油、生物质成型燃料、生物质气化、沼气及发电等。

（3）风力发电

风能资源评估，大型高效风电机组，海上风电机组及风电场建设等。

（4）氢能及燃料电池

制氢（太阳能、核能等）、储氢和输氢技术，新型燃料电池与燃料电池汽车技术等。

（5）天然气水合物开发

天然气水合物勘探、开发、储运、利用技术等。

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.

重点任务

六、重点任务

（1）开展基础研究

鼓励和支持中国研发机构与大学积极参与可再生能源与新能源的国际合作研究与交流，开展新技术的基础理论研究，显著增强基础科学和前沿技术研究的综合实力，取得一批在世界上具有重大影响的科技理论成果。

（2）建立产业化示范

重点跟踪、引进和研究国际适宜低成本、规模化开发利用可再生能源与新能源的先进技术，开展可再生能源资源禀赋的系统评价及分布式可再生能源与新能源多能互补系统等研发工作。可再生能源与新能源的发展是以现代制造技术为基础的新型产业，因此要重点合作开发其装备设计与制造技术，合作建立国际化的检测中心。

（3）面向规模应用

积极参与制定可再生能源与新能源的国际化和地区性技术标准与规范，为新产品进入市场提前做好准备。

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

重点任务

交流和借鉴国外发展可再生能源与新能源的规划、政策及管理经验，建立和完善中国的法规与管理制度。

（4）实施“走出去”战略

鼓励中国企业、研发机构和大学走出去，积极参与国内外大型可再生能源与新能源合作项目，并在国内外合作建立研发中心或基地，与有关国家建立可再生能源与新能源长期合作伙伴关系，同时推动发达国家向发展中国家及发展中国家之间的技术转移。

（5）促进国际交流和对话

建立与发展可再生能源与新能源国际科技合作对话机制，交流在能源开发与利用方面的观点和经验，共同探讨解决发展瓶颈的方法与策略。以论坛、研讨会、政策对话等形式加强中国与世界各国政府、企业和科研机构之间的对话、协商和沟通。

（6）培养高层次人才

利用合作研究项目、合作研究中心和示范工程等国际科技合作交流平台，共同培养从事可再生能源与新能源研发的高层次专业人才队伍。

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.

组织与管理

七、组织与管理

（1）成立计划组织机构

由国家科技部与国家发展与改革委联合协调有关政府部门、国际组织和重要科研机构，组织实施“计划”。成立“计划”国际科技合作指导委员会，启动国际合作机制。

由科技部和国家发展与改革委联合组织，在全球范围内聘请可再生能源领域的高层次专家，成立“计划”国际科技合作专家咨询委员会，对“计划”的优先领域、重点任务和合作方式提出咨询建议，供指导委员会决策。

（2）设立专项资金

将安排专项资金启动“计划”，吸引外国政府和国际组织的资金共同推动“计划”实施。同时重视吸引国际大型能源企业以及其他企业和私营资本投入可再生能源与新能源国际科技合作。

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.