MEMORANDUM OF UNDERSTANDING
between
National Energy Administration, the People's Republic of China and Ministry of Climate, Energy and Building, the Kingdom of Denmark establishing a
CHINA -DENMARK RENEWABLE ENERGY PARTNERSHIP

National Energy Administration, the People's Republic of China, and, Ministry of Climate, Energy and Building, the Kingdom of Denmark (hereinafter referred to as the "Parties");

RECOGNIZING the common interests shared by the Parties toward the development of affordable, clean, and sustainable energy sources and transition to low carbon economies;

CONSIDERING the strategic role of renewable energy, in addressing current global challenges and development needs;

WISHING to promote mutually beneficial cooperation in the field of production and use of renewable energy;

RECOGNIZING the importance of promoting renewable energy solutions and the urgency of finding cost effective and lasting solutions to energy issues that are compatible with the need for economic growth and the fight against poverty;

CONSIDERING the Joint Statement on the Establishment of a Comprehensive Strategic Partnership between the Government of the People's Republic of China and the Government of the Kingdom of Denmark (Renewable Energy Development Programme), signed on 25 October 2008;

BEARING in mind that this Memorandum of Understanding is intended to provide a general framework for cooperation and to express the cooperative intent of the Parties.

Have reached the following understandings:

I. PURPOSE

The objective of this Memorandum of Understanding is to promote a mutually beneficial partnership between the Parties in the field of renewable energy to promote the transition to low carbon economies.

II. AREAS OF COOPERATION

The following topics have been identified as high priority areas for cooperation between the Parties under the framework of this Memorandum of Understanding:

A. Capacity building and mutual knowledge sharing regarding development of renewable energy and long term low carbon transition of energy systems

B. Development of tools and methodologies for strategic policy research regarding renewable energy to promote renewable energy application in scale

C. Development of sustainable energy system roadmap and the variable renewable energy technology roadmaps

D. Strategic development of demonstration projects for promotion of wide renewable technology deployment in cities and towns, within power and heating, and distributed and scattered deployment, as well as promotion of offshore wind power cooperation and intelligent use of biomass for energy purposes.

E. Integration of high penetration of renewable energy into the electricity system and power system stability, as well as system and mechanism innovation by power sector structuring, improvement of incentive mechanisms and development of smart grid

F. Strengthening the cooperation between Danish and Chinese companies, institutions and universities regarding development of renewable energy

The specific activities within the different areas will be detailed through annual work plans. The work plan in the near term is attached as annex to this Memorandum of Understanding (MOU).

III. IMPLEMENTATION

A. Steering and Coordination group

The Parties have decided to establish a steering and coordination group. The Parties agree that the steering and coordination group should act as the coordinating body for this Memorandum of Understanding, with representatives from the Parties, to meet at least once every year to assess the progress and the cooperation activities mentioned in Article II, and to develop additional programs and projects to implement the goals of the MOU.

B. Renewable Energy Task Force

The Parties have decided to establish a Joint Renewable Energy Working Group. The Parties agree that the working group should act as the implementing body for this Memorandum of Understanding and as a forum for promoting cooperation and exchange of views on areas of interest within low carbon transition and renewable energy promotion.

The Joint Working Group should especially leverage the existing cooperation between China National Renewable Energy Center (CNREC) and Danish Energy Agency (DEA), and enhance integration of policy formulation and analytical results from the CNREC-DEA activities, based on the existing Cooperation Agreement between the CNREC and the DEA signed on 23 February 2012, as well as future extensions of this agreement. Further, the Working Group should enhance cooperation between Danish and Chinese companies, institutions and universities regarding renewable energy.

The program of activities for the Working Group is specified in the attached 2014 Work Plan. The Work Plan should be decided upon in writing between the Parties and updated regularly.

C. Encouragement of other cooperation activities

Both Parties shall encourage organizations, private companies, government institutions at all levels and research institutions on both sides to establish cooperation activities aimed at fulfilling the objectives of this Memorandum of Understanding.

D. Funding and Staffing

Costs related to the activities under this Memorandum of Understanding are subject to the availability of appropriate funds, in conformity with budgetary provisions and the relevant laws of each Party.

The implementation of each particular activity under this Memorandum of Understanding will require that the Parties put into writing the terms and conditions for the necessary funding, in accordance with each Party's relevant national legislation.

All costs resulting from cooperation under this Memorandum of Understanding are to be borne by the Party that incurs them, unless otherwise mutually agreed.

IV. GENERAL PROVISIONS

A. This Memorandum of Understanding may be amended at any time by the mutual written consent of the Parties.

B. Any dispute about the interpretation or implementation of this Memorandum of Understanding will be resolved through consultations between the Parties.

C. According to national legislation and international agreements in force in both countries, the Parties shall adopt the appropriate measures to protect the intellectual property rights arising under the implementation of this Memorandum of Understanding.

D. The conditions for the acquisition, maintenance and commercial exploitation of intellectual property rights over possible products and/or processes that might be obtained under this Memorandum of Understanding will be defined in the specific programs, contracts or working plans, which shall also set out the conditions regarding the confidentiality of information whose publication and/or disclosure

might jeopardize the acquisition, maintenance and commercial exploitation of intellectual property rights obtained under this Memorandum of Understanding.

E. This Memorandum of Understanding shall enter into force upon the signature of the Parties. This Memorandum of Understanding shall be valid for two (2) years, automatically renewed for a further period of two (2) years. Either Party may terminate this Memorandum of Understanding by means of a written notice to the other Party. Termination will take effect three months following the date of notification and will not affect activities already under implementation.

This Memorandum of Understanding replaces the previous Memorandum of Understanding signed by the parties on June 16th 2012.

Signed in Beijing, in duplicate, on April 24th 2014, in the Chinese and English languages, both texts being equally authentic.

FOR THE NATIONAL ENERGY ADMINISTRATION
OF THE PEOPLE'S REPUBLIC OF CHINA

吴新雄

FOR THE MINISTRY OF CLIMATE, ENERGY AND BUILDING
OF THE KINGDOM OF DENMARK

Frits Andersen

ANNEX: CNREC-DEA Work plan 2014

ANNEX: WORK PLAN FOR 2014

This work plan is annex to the "MEMORANDUM OF UNDERSTANDING on cooperation in the field of renewable energies between Ministry of Climate, Energy and Building, the Kingdom of Denmark and National Energy Administration, the People's Republic of China". The work plan specifies the activities within the MOU for the year 2014. By the end of 2014, the work plan will be evaluated by the Parties and a new work plan will be discussed and agreed upon, based on the experience from the first period.

Task 1: Energy policy and system analyses

Task 1.1 Energy policy and strategy in Denmark

This activity will result in a report about Danish energy policy from 1980ties until today looking at challenges, policy strategy formulation and practical implementation of efficient policy measures. Focus will be on strategies and measures for deployment of renewable energy in the power and heating sector. The report will be in three parts: 1) Challenges and solution for the Danish (and European) energy sector, 2) Thematic description on topical issues in Denmark with specific relevance for China, and 3) Possible application of Danish and European experiences in China.

Task 1.2 Roadmaps towards a sustainable Chinese energy system

Based on the developed CREAM model tools and methodology, the cooperation on 2050 renewable energy strategy will be further advanced in 2014, focusing on the more near-term future, 2020 and 2030. The analysis will be conducted regarding the different pathways to reach targets for 2020 and 2030 with different policy measures as drivers in order to examine in impact of different policy strategies and policy measures on the possible development of renewable energy. Also, together with IRENA, the comparision with IRENA's REmap study with CNRECs own 2050 scenario analyses will be made.

Task 1.3 Quantifying environmental costs from energy production

This research will use mature methodologies from Europe, meteorological modelling for China and empiric data from China to integrate environmental cost in CREAM, which serve for the 2050 scenario study. Focus will be on health effect on human health from emission of SO2, NOx, and CO2, which will be quantified including the overall energy production system.

Task 2: Power system development

Task 2.1 Flexibility in the Chinese power system, including the Baicheng project

Based on the research result from the Baicheng project conducted in 2013, the experiences by Danish power system, esp. the flexibility of CHP will be learned. With support by the experts from DEA, Energinet.dk, power plants, etc., the means and tools to obtain flexibility in the Chinese energy system shall be developed, providing

support to the Chinese stakeholders - grid companies, power companies and power system regulators.

Task 2.2 Grid planning for RE integration

This research aims to give the Chinese stakeholders a clear understanding of the European planning process and to inspire for a similar Chinese grid planning. Besides DEA also Energinet.dk will be involved. Focus will be on methodology, on relationship between central and local planning and distribution grids for RE integration.

Task 2.3 Power market development

Europe and US are making the long-term transformation of the power system into a low-carbon system with a high share of renewable energy. The current discussion regarding the future power market in Europe (and the US) is also essential for China in order to avoid a "copy-paste" of the old market system, but rather taking the next step towards a market system suitable for a large share of renewable energy This research aims to give a clear picture of the challenges for the current market set-up in Europe and analyse the different ways to an improved market set-up. Experts from DEA and Energinet.dk will contribute to this activity.

Task 3: RE for heating

Task 3.1 Guidelines for heat planning in counties and small cities

Based on both Danish experiences, including planning experience and practice experience on renewable energy district heating, as well as the research results by Yilan project, this activity will support NEA to develop Chinese Guideline for heating planning in counties and small cities, and providing suggestion on policy adjustment and implementing regulations.

The detail information guidelines for heating planning and alternative technology selection comprise:

- Analytic approach to determine the future heat energy demand that factors in both more efficient distribution network and consumer side EE measures.
- Methodology approach on how to classify and compare alternatives by using the matching parameters to evaluate and identify the best alternative.
- Introduce the general information of basic software tools in Denmark, which support and streamline both technical and economic analyses.
- Guiding principles on how to prepare accurate and high quality project proposals for MDBs in order to obtain favourable loans for investments in RE heating.
- Training tailored to heating plants and local government sectors
- Other issues to be addressed.

Task 3.2: Establishment of a RE heating platform

Learning the experiences by European RE heating and cooling platform (RHC) and

also in the IEA RE Solar Heating and Cooling group in terms of their organisation, topic areas, funding etc., DEA will facilitate contact to these groups and organize collection of best-practice experiences to be used for establishment of the Chinese RE heating platform. DEA experts will submit a report on EU RHC experience.

Task 4: Roadmap review

Task 4.1 Solar roadmap

The roadmap will be finalized in 2014, including solar PV and CSP. Danish experts will participate in the dissemination of the roadmap results. DEA will also provide insight into the Danish experiences regarding large-scale solar thermal plant as part of the district heating system.

Task 4.2 Bioenergy roadmap

The bioenergy roadmap consists of three parts: 1) biofuel roadmap, 2) biomass for combustion, and 3) a summary bioenergy roadmap. The DEA experts will assist in finalizing the summary report and provide a peer-review on the draft for the other reports.

Task 4.3 Off-shore wind power and wind energy roadmap review

DEA will assist by providing experiences from Denmark regarding experience from the implementation of off-shore wind farms, including the regulatory framework, planning for off-shore wind farms and policy measures to promote off-shore wind. Danish developers will to the extent possible be involved in this transfer of knowledge. Furthermore DEA and CNREC experts will conduct a brief review of the 2011 Wind Energy Roadmap, based on the most recent international experiences, e.g. IEA wind energy technology initiatives.

Task 5: RED C2 projects

Task 5.1 C2 evaluation and dissemination

Before the end of 2014 the C2 will conclude, and the dissemination and evaluation of the project would include CNREC, the Danish Embassy and DEA in order to ensure the necessary anchoring in both China and Denmark.

中国国家能源局与丹麦气候能源和建筑部

关于建立中丹可再生能源伙伴关系的谅解备忘录

中国国家能源局与丹麦王国丹麦气候能源和建筑部(以下简称为“双方”)；

认识到双方发展经济、清洁、可持续的能源和向低碳经济转型的共同利益；

考虑到可再生能源在应对当前全球性挑战，满足发展需求的战略作用；

希望共同推进可再生能源开发和利用方面的互利合作；

认识到促进可再生能源解决方案的重要性，以及为应对能源问题亟需发现低成本、可持续解决方案的紧迫性，这与推动经济增长和消除贫困的需求是一致的；

考虑到2008年10月25日中华人民共和国政府与丹麦王国政府签署的建立全面战略伙伴关系的联合声明（中国—丹麦可再生能源发展项目）；

双方认可谅解备忘录旨在提供一个合作框架，并表达双方的合作意向。

双方达成以下谅解：

一、 目标

该备忘录的目标是提升双方在可再生能源领域互利合作的伙伴关系，促进两国向低碳经济转型。

二、合作领域

在该备忘录框架下，合作的重点领域包括：

（一）在可再生能源开发利用和长期的能源体系低碳转型方面开展能力建设和知识共享；

（二）开发可再生能源战略政策研究工具和方法，推进可再生能源技术规模化应用；

（三）制定可持续能源体系路线图和各类可再生能源技术路线图，；

（四）推进示范项目的战略性开发，推进各种可再生能源技术在城镇的广泛应用，包括发电和供热，分布式和分散式，推进海上风电合作及生物质能智能利用等；

（五）通过电力系统结构调整、完善激励机制和发展智能电网等方式，实现可再生能源并网和电力系统稳定性和高比例接入，推动体制机制创新；

（六）加强中国和丹麦可再生能源企业、机构和大学间发展可再生能源的合作。

上述不同领域的活动将在年度工作计划中详细说明，2014 年工作计划参见此备忘录附件。

三、实施

（一）指导协调小组

双方决定各派代表组建指导协调小组，双方同意此工作组作为备忘录的协调主体，每年至少召开一次工作会议，

评估前述第二条提及的合作活动和进展情况，并设计新项目，以便实现备忘录设定的目标。

（二）可再生能源联合工作组

双方决定建立一个可再生能源联合工作组。双方同意此工作组作为备忘录的执行主体，并作为促进合作和在低碳转型和促进可再生能源领域相互交流的平台。

该工作组将基于双方已有的合作，即在 2012 年 2 月 23 日国家可再生能源中心与丹麦能源署签署的合作协议以及之后签署的能力建设协议及协议延期基础上，加强和促进双方在政策规划和活动成果方面的合作。

该工作组将致力于推动中国和丹麦的企业、机构和大学开展可再生能源领域的合作。

该工作组的活动由该备忘录的附件（2014 年工作计划）详细说明。工作计划应得到双方书面认可，并定期更新。

（三）鼓励其他合作活动

双方应鼓励机构、私营企业、各级政府部门和研究机构建立合作，推动实现谅解备忘录的目标。

（四）资金和人员安排

该谅解备忘录下相关活动的费用应符合双方预算和相关法律规定。

该谅解备忘录下每一项活动的实施都需要双方按照各自国家有关法律规定，以书面条款规定资金的具体使用。

除非双方同意，否则在该谅解备忘录下产生的一切费用都由发起的一方承担。

四、其他事项

（一）双方书面同意的情况下，该谅解备忘录可以在任何时候进行修改。

（二）任何关于该谅解备忘录的解释或实施的争议，都将通过双方协商解决。

（三）根据两国法律以及对两国均有效的国际协议，在该谅解备忘录框架下，双方应采取适当的措施保护有关知识产权。

（四）该谅解备忘录下合作产生的最终产品和（或）过程产品的知识产权，其获取、维护和商业开发条件将在具体项目、合同或工作计划中予以明确，同时还应制定保密条款，对于危害知识产权获取、维护和商业利用的信息发布和（或）披露应予以规定。

（五）本谅解备忘录自签字之日起生效。该谅解备忘录有效期两(2)年，自动延期两(2)年。任何一方都可以书面通知另一方终止该谅解备忘录。书面通知三个月后终止，但不影响已执行活动。

本备忘录将替代双方于二〇一二年六月十六日签署的备忘录。

本谅解备忘录于二〇一四年四月二十四日在北京签订，一式两份，每份均用中文和英文书就，两种文本同等作准。

中国	丹麦王国
国家能源局代表	气候能源和建筑部代表

附件：丹麦能源署与中国国家可再生能源中心合作计划

附件：2014 年工作计划

该工作计划是“中国国家能源局与丹麦气候能源和建筑部关于建立可再生能源伙伴关系的谅解备忘录”的附件。该工作计划规定了 2014 年备忘录框架下应实施的活动。到 2014 年底，双方应评估这些活动的实施情况和效果，基于评估结果准备下一年工作计划。

任务一：能源政策及情景分析

子任务 1：丹麦能源政策介绍

主要分析丹麦自 1980 年以来能源体系发展面临的挑战，能源战略形成的背景和主要考虑因素，以及实施的相关政策框架。报告将重点关注可再生能源在电力及供热领域的发展战略，分三部分阐述：1）丹麦（及欧洲）能源领域面临的挑战及解决方法，为解决这些挑战，丹麦制定能源战略时的主要考虑要点及相关政策设计；2）重点介绍与中国有密切联系的问题，及 3）丹麦与欧洲经验如何在中国应用。

子任务 2：2050 中国可持续能源体系发展路线图

基于已开发完成的可再生能源开发利用模型工具和分析方法，2014 年继续开展 2050 能源发展战略的研究合作，重点放在近中期路线图制定上，即 2020 年及 2030 年路线图。分析完成 2020 及 2030 各项目标实现的不同方式、不同政策手段对可再生能源发展可能的影响等。同时，与 IRENA 一起对比 IRENA 的 2030 可再生能源路线图研究及中丹联合开

展的2050可再生能源高比例情景分析。

子任务3：能源生产体系的环境成本量化分析研究

该研究将借鉴欧洲成熟的分析方法，结合中国的经验数据，把环境成本纳入到2050可再生能源高比例情景研究的分析中，将二氧化磷、氮氧化物、臭氧及二氧化碳等有害物质排放对人体健康影响的指标予以量化纳入可再生能源开发利用模型，对整体能源生产体系的环境成本予以量化。

任务二：电力系统的发展

子任务1：中国电力系统灵活性研究（包含白城项目）

基于2013年开展的白城示范项目研究成果，进一步借鉴丹麦电力系统特别是有关热电厂灵活性的经验，在DEA、丹麦电厂及丹麦国家电网公司（Energinet.dk）专家的协助下，总结出推动中国能源体系增加灵活性的工具和方法，为中国有关企业和机构，包括电网、电力企业及电力系统监管部门提供丹麦的经验。

子任务2：可再生能源并网规划

该研究旨在向中国各相关方提供一个清晰的欧洲电网规划制定流程，希望对中国电网规划提供启示。丹麦能源署和丹麦国家电网公司（Energinet.dk）也将提供技术支持，重点提供有关研究方法、中央及地方规划的关系和分布式可再生能源并网等经验。

子任务3：欧洲电力市场发展的新趋势

现阶段欧美也在向低碳、高比例可再生能源的电力体系开展长期转型。关于未来电力市场走向的讨论对中国电力市场转型应有重要启发，防止中国重蹈欧美老路，而采取进一步措施创建适合中国情况、可容纳高比例可再生能源的市场机制。该研究将介绍欧洲现有电力市场机制所面临的挑战，并分析不同的应对选择。丹麦能源署和丹麦国家电网公司（Energinet.dk）的专家将提供支持。

任务三：可再生能源供热

子任务 1：县级及城镇可再生能源供热规划指南

基于丹麦的经验及 2013 年开展的依兰项目成果的基础上，按照国家能源局要求，支持起草适合全国的可再生能源供热规划指导意见，提供政策调整及实施细则的建议。

指导意见包含但不限于以下领域：1、从供热端和用热端两方面提高效率，分析决定未来供热能源需求的因素；2、明确利用匹配参数比较、评估并确定最优方案的方法工具；3、包含基础软件工具支持并简化技术经济性分析；4、制定精确优质的项目方案书，从而为可再生能源供热融资。5、对供热企业和地方政府必要的配套应用培训。6、其他高效利用可再生能源供热的关键问题等。

子任务 2：可再生能源供热平台

根据国家能源局要求，筹建可再生能源供热平台，在机构建设、工作内容、筹资措施等方面借鉴欧洲可再生能源供

热和制冷平台以及国际能源署太阳能供热和制冷工作组的经验，丹麦能源署专家将提供与这些机构的沟通，并总结有关的经验报告。

任务四：中丹项目成果同业评审——路线图

子任务 1：太阳能路线图

该路线图由两个部分组成：太阳能光伏路线图及太阳能热发电路线图，丹麦能源署专家将提供有关丹麦区域供热经验，补充中国大型太阳能光热电厂方面的经验，并参与路线图成果的宣传工作。

子任务 2：生物质能路线图

该路线图由三个部分组成：生物质沼气路线图，生物燃料路线图和生物质成型燃料路线图，丹麦能源署专家将协助汇总生物质能总体路线图，支持完成最终的总结报告并提供改进意见、建议。

子任务 3：海上风电及风能路线图回顾

丹麦能源署将协助提供丹麦海上风电厂的实际经验，包括制定政策管理和监管框架，海上风电厂规划及推动海上风电发展的政策手段。丹麦海上风电项目的开发商将有可能参与经验交流活动。此外，在最新的国际经验，例如 IEA 风能技术方案的基础上，还将更新 2011 年制定的中国风能路线图。

任务五：中丹技术创新合作项目

子任务 1：项目评估及宣传

2014 年底项目结束，项目的宣传及评估、验收工作将由中心、丹麦使馆及丹麦能源署共同完成，从而确保中丹双方的利益。