

# Monitoring and Evaluation of the RED Programme in China, Final

Monitoring & Evaluation Completion Report

Mission 27<sup>th</sup> October. - 7<sup>th</sup> November 2014

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## List of Abbreviations and Acronyms

AC	Advisory Committee (of CNREC)
AD	Administration Department
BoD	Board of Directors
BP	Business Plan
CEPRI	China Electrical Power Research Institute
CICETE	China International Centre for Economic and Technical Exchanges, branch of MOFCOM
CIFF	Children's Investment Fund Foundation
CITCD	China International Talent Development Centre Human Resources
CNREC	China National Renewable Energy Centre
CRED	Centre for Renewable Energy Development (part of ERI)
CRESP	China Renewable Energy Scale-Up Programme
CVIG	China Variable Energy Integration Group
DAC	Development Assistance Committee
DEA	Danish Energy Agency
DKK	Danish Kroner
DSS	Decision Support Systems
EC2	Europe China Clean Energy Centre
ERI	Energy Research Institute
EUDP	Danish, Energy Technology Development and Demonstration Programme
EU	European Union
FS	Feasibility Study
GoC	Government of China
HoD	Head of Department
IA	International Adviser
IEA	International Energy Agency
LFA	Logical Framework Approach
MDGs	Millennium Development Goals
M&E	Monitoring and Evaluation
MC	The Management Committee (for CNREC)
MF	Monitoring Framework
MFA	Ministry of Foreign Affairs
MOFCOM	Ministry of Commerce,
MOP	Management, Operation Mechanism and Work Plan for CNREC 2012
MOST	Ministry of Science and Technology
MoU	Memorandum of Understanding
NDRC	National Development and Reform Commission
NEA	National Energy Administration
NEC	National Energy Commission
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Cooperation and Development
PAP	Process Action Plan
PCR	Project and Programme Support Completion Report
PD	Programme Document
PDB	Programme and Project Database
PM	Project Manager
PMO	Programme Management Office
PRSP	Poverty Reduction Strategy Paper
PSC	Programme Steering Committee
PTF	Programme Task Force
QA	Quality Assurance

RAM	Review Aide Mémoire
RDE	Royal Danish Embassy
RE	Renewable Energy
RED	Renewable Energy Programme
REIAC	Renewable Energy Information and Analysis Centre
RMB	Renminbi, Chinese currency
ROACH	Results Oriented Approach for Capacity Change
SBS	Sector Budget Support
SC	The Steering Committee
SERC	State Energy Regulatory Commission
SGERI	State Grid Energy Research Institute
TL	Team Leader of the Monitoring & Evaluation Team
TOR	Terms of Reference
WED	Wind Energy Development Programme

## 1 EXECUTIVE SUMMARY

### Impact and Outcome

The RED Programme aimed to reduce CO<sub>2</sub> emissions from China through two types of engagements:

- Component 1, Developing capacity on renewable energy policy research,
- Component 2, Supporting partnerships between Chinese and Danish enterprises and research organisations on joint renewable energy research and innovation.

The RED Programme had an impact and contributed to a more sustainable energy production and consumption and reduction of CO<sub>2</sub> emissions from China. Within the last two years, major changes in Chinese policies and practices have taken place:

- The overall share of renewables in energy production has increased substantially and exceeded the targets set by the 12<sup>th</sup> five-year plan:
- Between 2010 and 2013 the contribution of renewables to power production grew from approximately 16 to 23 % (including hydropower).
- The contribution of wind to power production doubled in the period to approximately 4.5%;
- Between 2011 and 2013 the contribution of renewable energy to electricity production grew from 16 to more than 20%<sup>1</sup>.

The key policy research conducted as a result of the RED Programme and the establishment of the China National Renewable Energy Centre (CNREC) contributed to this impact.

### Start Up and Turn Around

The RED Programme had a troubled start in 2009. This was due to differences in expectations and cooperation problems between the main parties responsible for the programme.

Three factors contributed to the turnaround of the programme: Firstly, a critical review mission in November 2010 demanded constructive and concerted action from the parties involved; this resulted in engagement of a Process Consultant, appointment of a new Chef Adviser and preparation of a feasibility study and business plan by a joint Chinese-Danish taskforce laying the documentary foundation for the creation of the China National Renewable Energy Centre (CNREC). Lastly – but perhaps most importantly - the Chinese Government through the National Energy Agency (NEA) in February 2012 endorsed the legal recognition of CNREC.

The Monitoring and Evaluation (M&E) team was engaged in late 2011 and have been following the programme from the setting up of CNREC in February 2012 to the end of 2014.

### Effectiveness & results

CNREC arose as a merger between the RED programme organisation and the Centre for Renewable Energy Development (CRED) of the highly recognised Energy Research Institute (ERI) under the influential National Development and Reform Commission (NDRC) under the Chinese State Council.

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<sup>1</sup> CNREC Activities within China National Renewable Energy Centre, March 2014, page 2, <http://www.cnrec.org.cn/english/publication/2014-03-31-414.html>

The establishment of CNREC by integrating a loose internationally-oriented programme organisation with a reputable Chinese research institute into a “Policy Think Tank” was a visionary social and organisational accomplishment, which was made possible by a dedicated and combined Chinese, Danish and international efforts.

Since its establishment, CNREC has generated a number of important results:

- Input to the 12<sup>th</sup> and 13<sup>th</sup> five-year development plan - a major policy instrument setting overall targets for renewable energy development;
- The Scenario 2050 Study setting targets and time bound benchmarks for the increase in renewable energy by 2020, 2030 and 2040 based on the CREAM model. The study takes into account: Economic growth, transport, household consumption, environmental and social factors as well as the cost of renewable energy and phasing out energy generation based on fossil sources. The study was based on Danish experience and served as a foundation for guiding other research at the CNREC;
- Elaborating strategies for a 15% fossil free energy share by 2015;
- Research addressing problems with curtailment of wind power and contributing to the reduction in curtailment from 20 % in 2012 to 11% in 2013<sup>2</sup>. Research included methods to address technical issues in relation to regulating power outputs of coal power plants as well as issues related to evacuation of wind power due to constraints in transmission capacity;
- Research on financing, pricing, regulation and economic policies for increasing the role of renewable energy in the overall energy production. E.g. the research contributed to a change of policies – setting and adjustment of feed-in tariffs for wind power. Another change in support was an increase of the surcharge to electricity consumers, which was raised from 0.8 to 1.5 RMB cents per kWh in 2013 - to support the Chinese renewable energy fund;
- Introducing renewable energy for district heating as a major area of promoting renewable energy and more effective use of energy resources generally;
- Promoting the role of China as a serious and active key player in renewable energy policies and practices internationally through active participation in IRENA, IEA, Global Green Growth Forum (3GF) and close cooperation with UN, EU, NREL from USA, GIZ from Germany and a wide range of other countries and international players in the field of energy;
- Development of the energy technology catalogue as a tool for energy planning;
- Preparation of roadmaps for solar, biomass and wind energy setting more precise targets and strategies for the increase of use of these renewable energy sources by 2015, 2020, 2030 and 2050;
- Support to planning for increased use of renewable energy covering the population of a range of provinces and governments for example, Jilin, Chengdu, Sanshui, Ningxia, Guanshu, Jianxi, Gansu, San Shui and Alxa;
- Substantial research on distributed energy to provide energy to remote and poor rural communities;
- During its existence CNREC has gradually improved the financial sustainability through widening the range of clients and funding generated. Recently CNREC was awarded a Grant from the Children’s Investment Fund Foundation (CIFF) of USD 2,5 Mio. annually over a five year period, guaranteeing the financial basis for the centre’s future development.

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<sup>2</sup> Ibid page 2

Component 2 was started late due to the initial delay of the RED Programme; however, the Danish Embassy, CNREC and the Danish Energy Agency made a substantial effort to fast-track activities during the last part of the programme. 12 projects proposed by joint ventures of business and research enterprises were selected for support covering strategic areas of all types of renewable energy and addressing pertinent technological, economic and institutional issues.

Although the projects must be regarded as highly relevant, continued cooperation of the established partnerships is unlikely without continued public funding, except for one or two of the joint ventures established.

### **Effectiveness – Processes & Causes**

The driver of the institutionalisation of CNREC as a sustainable professional organisation has been the commitment to promote renewable energy. This overarching objective guided the development of the Centre and served to motivate staff.

Another factor contributing to the success of CNREC has been the ability of the Centre to stimulate high-level political interest in the work. More than 10 visits by Ministers and high-level political decision makers took place between China and Denmark from 2012 to 2014, emphasising the commitment and political attention to renewable energy. The strong cooperation between CNREC and the Danish Energy Agency (DEA) contributed to this.

The vivid horizontal cooperation between political and government officials in China and Denmark, was linked to two factors: effective technical cooperation between CNREC, DEA, NEA and the Danish Ministry of Climate Energy and Building (MCEP) which led visionary, innovative and strategic evidence based policy research from the operational and research level, which again fed into policy development and discussions at the highest government level. In other words a dynamic relation between policy and research has been created.

A decisive factor was the Chinese energy sector leaders, who invested ample time and energy in getting the Centre up and running. At Director level, CNREC has been blessed with visionary, open and strategic leadership. Moreover at the establishment of CNREC a Chinese RED programme Director was appointed whose managerial skills and hard work was a driver facilitating the process of building CNREC. CNREC also benefitted from a boon of professional senior researchers from CRED who took up the challenge and responsibility as managers in the CNREC in parallel with their academic research careers. A group of promising young researchers and project managers has complemented the leadership of CNREC and worked to put the strategies into practice.

An important factor was the Chief Expert whose competencies in renewable energy and management in combination with strong networking skills and links to Danish institutions, has been important in developing constructive solutions to the issues pertaining to a new joint international organisation - and creating shared visions on renewable energy expansion.



The Danish Embassy has played a key role in backing the programme. By adopting a flexible approach, the Embassy has supported constructive adjustment of the programme to fit the actual needs of the cooperation partners through all phases of the programme. During the last year of the programme, it has benefitted from engagement of an Energy Adviser based at the Embassy, who was able to render relevant and timely capacity development support to the Centre and assist in facilitating political and research initiatives.

The Danish Energy Agency (DEA) served as adviser to CNREC, and DEA specialists were highly appreciated for establishing equal and accountable working relations and for knowledge sharing on new approaches, concepts and research tools. It was important that the close cooperation with DEA meant that CNREC staff obtained a first-hand introduction to policy and research working methods of a comparable influential governance agency. CNREC staff express the need for continued cooperation with DEA specialists and find that direct capacity building in Denmark has not been sufficient.

DEA and CNREC in cooperation were responsible for the strong links that were created to and between the Chinese and Danish Government institutions, NEA and NRDC in China and MCEB and several other Ministries in Denmark.

The latest and very important outcome of CNREC is its success in obtaining funding from the Children's Investment Fund Foundation (CIFF) for an additional five years of operation and thereby securing the financial sustainability of CNREC. The CIFF funding covers 50% of CRED and 80 % of RED staff salaries, as well as capacity development and communication. The funding includes funds for a continued engagement of the Chief Expert and modelling expert.

Throughout the implementation, CNREC has refined its business strategy from the original principle of a technology-driven centre to focusing more on system integration and overall policy research. In conducting research with a broader focus, CNREC combines its different competencies in technology, economics, legislative and system related measures. This change of strategy appears to be relevant and responsive to a demand from central and provincial governments, enterprises, the public and international partners - for overall systemic solutions integrating different forms and uses of renewable energy.

### **Key Recommendations**

CNREC is continuously refining its way of engaging with stakeholders. The CVIG is an example of this where interaction with stakeholders is made more interactive through workshops, networking and internet based professional exchanges. The CVIG is an important initiative to seek to involve more stakeholders in developing solutions for managing a larger share of variable renewable energy generation in its energy mix.

Internally at CNREC, however, there is room for strengthening communication and management mechanisms and human resource development. Since its start, the different employment conditions of RED and ERI staff have been a challenge. A staff survey conducted in 2014 as well as interviews reveal that staff have limited knowledge about objectives and their own role. Staff would like to better understand their role in achieving CNREC's objectives, how their performance is assessed and how this links to a clearer career perspective.

The M&E team sees a need for CNREC to make a systematic effort to strengthen management cooperation and skills. The CIFF programme comprises resources for management development and the M&E team supports this as a priority area for CNREC. This entails setting up regular meetings of directors and heads of department to address upcoming issues and share information on new initiatives, as well as intensifying management communication to staff on performance.

It is also recommended that the managerial role of directors and heads of department is reinforced. Managers and directors have a key role in securing effective engagement of staff and a rational and fair division of responsibilities and tasks. It may be beneficial for CNREC managers to have access to inspiration from management training and coaching.

The M&E team recommends that CNREC dedicate resources to complete the implementation of a performance management system for contracted staff, which is under development. The aim is to give the ambitious contracted staff a clearer understanding of the career opportunities and the requirements for promotion to more responsibility and challenging tasks. The performance system should strengthen the links between ERI and CNREC by taking elements of the ERI career system and use this in performance assessments and development of the former RED staff.

Project management should be an integral part of the career system of CNREC. The role of the project manager combines social and research competences and is essential to support the internal coherence and matrix organisation of CNREC.

The M&E team has supported the introduction of a project management system inspired by European practice, with limited success. In a longer perspective, it is recommended that CNREC introduces a system enabling greater oversight of the utilisation of resources and outputs.

Denmark has invested substantially in developing close relations to China in the energy sector at political level as well as between technical and research organisations. It is important that Danish organizations make a dedicated commitment to continue the close cooperation. This entails continued close cooperation between DEA and CNREC, moreover it is important to seek to strengthen cooperation by involving private enterprises, research and educational institutions to a larger extent. In line with the continued need for capacity development at CNREC, and also in Danish and Chinese partner organisations, it is proposed that a shared twinning or training project is launched as a continuation of the Chinese – Danish programme for promotion of renewable energy internationally.

An important outcome of the RED Programme has been the creation of the Renewable Energy Information and Analysis Centre (REIAC), which is an integral part of CNREC. REIAC has delivered important outputs from the RED Programme in the form of several international and national publications and an attractive and dynamic website. REIAC is conducting important work in terms of establishing a comprehensive database on renewable energy policies in China. REIAC also has an important role in communication and distribution of research results to stakeholders.

However, the cooperation between REIAC and the other CNREC departments is not functioning effectively. The link between research and database needs to be reinforced. The accessibility and presentation of data collected should respond to the needs of research. At the same time, it must be ensured that REIAC obtains admission to use new data developed by researchers.

The CNREC does not at present have a formal quality management system, although the Quality Assurance system of ERI has some prevalence. Never the less, deadlines are frequently short, and the lack of a formalised quality assurance system implies a risk that reports or other research documentation does not live up to the standards for quality research. As renewable energy is gradually becoming a more contested area, there is a risk that research that is not up to standard may compromise the professional reputation of CNREC. It is recommended that a simple quality management system be agreed and institutionalised. One solution may be to adopt the ERI quality assurance system; as a first step it should be obligatory that all final versions of documents - planned to be shared with external partners or clients - are subject to quality assurance reading and feedback from a senior researcher. In a longer perspective, introducing a formally recognised quality assurance system like the ERI system or an internationally recognised system is recommended.

The M&E team finds it important for CNREC to have a strong link between research and communication of CNREC's mission and results. Performance in this regard has improved substantially. The CIFF prioritises communication and comprises funding to employ five new staff of which one will be dedicated to communication. The employment of a communications specialist is important and should be utilised to strengthen strategic communication within CNREC and externally. The information management role of REIAC should form an integral part of the communications strategy.

CNREC will reemploy the contracted RED staff who are interested and capable to work for the Centre in the future. Most of the staff are expected to remain in CNREC as contracted staff. To ensure optimal performance of CNREC, it is important that the recruitment and reemployment is done professionally and systematically. The aim is to effectively match the requirements of the Centre with the expectations of staff and new applicants. CNREC requires dedicated staff with a talent for research and an understanding of political issues and mechanisms, and should be able to offer jobs that are challenging and where staff have the opportunity to develop through exposure to new innovative research and practices in China and internationally.

Due to staff turnover, CNREC will have limited capacity in human resource management. CNREC should consider upgrading staffing resources in this respect, as job satisfaction is decisive for effectiveness.

## **2 INTRODUCTION**

This report is the completion report from the monitoring and evaluation (M&E) of the Renewable Energy Development (RED) Programme. The report is partly based on the final of six M&E missions to CNREC. The Terms of Reference (ToR) for the mission is included as Annex 1.

The RED programme's objective is: *Enhanced national capacity to develop the renewable energy sector in China with the overall objective of reducing greenhouse emissions.*

The objective of the M&E is to support the strategic management of the Programme. The M&E has been carried out during a series of six missions to the Programme. In February 2012, the Programme established China National Centre for Renewable Energy (CNREC) and since then the M&E has focussed on capacity development of the CNREC.

It was decided that the completion mission would focus on analysis of the performance since the start of the RED programme with the aim of identifying best practice and lessons learned. Moreover, the mission was to document the performance of the Programme and assess progress since the previous mission in February 2014.

The monitoring follows a framework which has been developed in cooperation with CNREC's management, the framework is enclosed as Annex 1 to this report, the Monitoring Framework assessing the Departments are published in Volume II of this report.

The Report has been prepared by Mette Visti, Team Leader, and Christine Rud Wennerberg, Energy Specialist.

### **3 Method and Role of Monitoring and Evaluation**

#### **3.1 The Programme Objectives and Background**

The original goals and objectives are summarised below and illustrate that the LFA and theory of Change for Red and CNREC remains intact.

<p><b>Development Goal</b> <i>Reduced future greenhouse gas emissions through increased use of RE</i></p>
<p><b>Immediate Development Objective</b> <i>Enhanced national capacity to develop the renewable energy sector in China</i></p>
<p><b>Component 1 Immediate Objective (CNREC)</b> <i>The Government of China's capacity to manage the Chinese RE sector is enhanced</i></p>
<p><b>Component 2 Immediate Objective:</b> <i>Danish-Chinese institutional and business partnerships are in place to cooperate on further development of RE technologies in China.</i></p>

Up to 2011 the RED Programme had experienced problems. The Programme had experienced difficulties in delivering relevant results and key representatives of the programme's management complained that cooperation between the main parties involved was not optimal. The history of the RED Programme and the technical and organisations issues pertaining to the first part of the RED programme was analysed in the first M&E report on the programme<sup>3</sup>.

<sup>3</sup> Monitoring and management support to the Renewable energy Development (RED) Programme and china national renewable energy Centre (CNREC) Final December 2012 VOLUME I – III, The report was the Inception Report on M&E, which was postponed as the M&E team was working with reporting, planning and capacity development support in parallel.

The RED Programme Document from 2008 saw the reduction of climate change through the reduction of greenhouse gases as the major impact to be achieved by the Programme. Poverty reduction was seen as an indirect impact on the Programme; China is becoming a middle income country and does not fulfil the DAC criteria for a low income country. Poverty reduction would be achieved by helping poor people in China get access to energy and also by contributing to addressing the negative effects of climate change, from which poor and vulnerable people globally are suffering the worst effects<sup>4</sup>.

The Danish law on International Development Cooperation was amended in 2012, putting more emphasis on the integration of Danish development cooperation with foreign, trade, climate and security policies and seeing development cooperation as an important foreign policy instrument<sup>5</sup>. The M&E team finds that the RED Programme may be seen as more relevant and in line with the law after the conceptualisation of the RED Programme, which views climate, poverty, security and trade as integrated global problems that have to be addressed by the international community through improved global governance.

Today, MFA and Danida underline the need for programmes to be guided by country strategies that integrate the different themes of cooperation. In 2008, a specific strategy for China had not been prepared yet. Rather, the overall strategic guidance for the programme was set by Denmark's commitment to international climate policies and legislation<sup>6</sup>.

### 3.2 Integrating M&E with Capacity Development

When one of the major outcomes of the RED programme was achieved with the establishment of CNREC - in February 2012 - it was decided that the Monitoring and Evaluation (M&E) should focus on capacity development. Rather than taking a backward looking perspective, the M&E should be a "real time evaluation" where the team would provide feedback to CNREC's management during and after each mission. A total of six M&E missions were carried out, three missions in 2012 focussing on capacity development, one mission in 2013 and two missions in 2014, of which the first comprised a survey with management and staff.

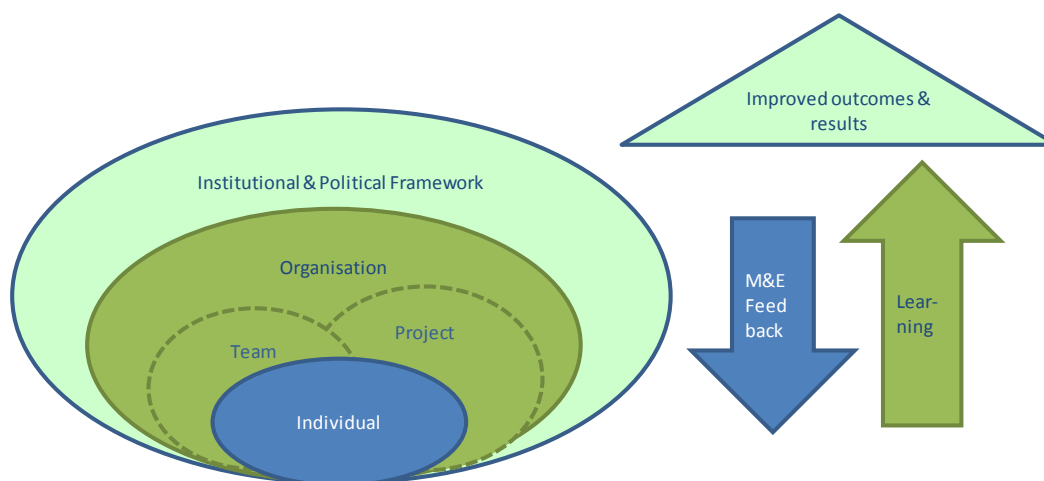
The monitoring and evaluation has been based on an analysis of the documentation – in particular progress reports. The list of documents used for the completion mission is included as Annex 2. Moreover interviews with individuals as well as focus groups interviews were conducted. The list of people consulted is included as Annex 3. During each mission, we have held a workshop with management to discuss strengths, weaknesses, opportunities and threats (SWOT). The aim has been to identify weaknesses in the organizational performance of CNREC and agree measures to address these weaknesses. The idea has been to support CNREC by working on learning and capacity development at individual, team and organization level as illustrated below.

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<sup>4</sup> Renewable Energy Development (RED) Programme, China 2009 – 2013, Final Programme Document, 22 September 2008, Page 17-26

<sup>5</sup> Lov om Internationalt Udviklingssamarbejde, Folketinget, 11. april 2012, [http://um.dk/da/~media/UM/Danish-site/Documents/Danida/Nyheder\\_Danida/2011/Lovforslag%20om%20international%20udviklingssamarbejde.ashx](http://um.dk/da/~media/UM/Danish-site/Documents/Danida/Nyheder_Danida/2011/Lovforslag%20om%20international%20udviklingssamarbejde.ashx)

<sup>6</sup> Climate Change 2007: Synthesis Report, Summary for Policy Makers, IPCC 2007, [https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf)



Source: Elaborated from Kirkpatrick, D.L., & Kirkpatrick, J.D. (2005). *Transferring Learning to Behavior*, Berrett-Koehler Publisher

To provide a tool for monitoring of progress, the M&E Team developed a Monitoring Framework together with CNREC's management. The Monitoring Framework has two parts, the overall part covers management and organisational issues and stakeholder relations, the second part is more detailed and monitors the projects and specific activities of the CNREC Departments, this part has been used in the discussions with departments on performance. The overall monitoring framework is included as Annex 4 of this report. The Monitoring Frameworks for the Departments are included as Annex 5, in Volume II a separate volume to this report. The Monitoring Framework is an elaboration of the Logical Framework (LFA) or Theory of Change, which was prepared as part of the CNREC Business Plan. The LFA had to be changed to reflect that one of the outputs – the establishment of CNREC - had been achieved. Moreover, the new Monitoring Framework sought to reformulate the qualitative objectives that were part of the aims of the old LFA for CNREC, these qualitative objectives stated that CNREC should aim to be:

- Knowledgeable
- Influential
- Innovative
- Cooperative
- Reliable

A management workshop in October 2012 sought to make these objectives more specific, as they are formulated in the overall part of the Monitoring Framework, the management workshop moreover agreed specific indicators for the following outcomes:

- **Policy research results with external stakeholders**, Government, public, industry, research institutions and international organisations, concerning increased use of RE and reduction of CO<sub>2</sub> emissions
- **Results related to Internal stakeholders** - emphasising organisational measures to strengthen CNREC, such as organisational structure, financial management systems and support from monitoring and evaluation

The Monitoring Framework moreover includes a list of the most important projects implemented by each department from the start of CNREC. CNREC is essentially a project organisation and outputs are prepared in the form of projects. Monitoring projects therefore seems to be a relevant way to provide inspiration for the dialogue regarding CNREC's performance and to assess and give feedback on performance.

The final M&E Mission was carried out in parallel with the final review of the Programme. In order to avoid overlap, it was discussed that the final review mission should focus more on CNREC's external political relations whereas the M&E mission should concentrate on CNREC's learning and technical performance. The purpose of the final M&E mission was:

*“With CNREC analysing and documenting the performance of the programme since the start of CNREC in 2012, with main focus on most recent results. Based on the analysis the mission shall identify lessons learned and best practices and discuss the strategic direction of CNREC in the future to maintain the overall objective of increased reliance on renewable energy in China - through strengthening CNREC as a financially and professionally sustainable and independent Think Tank, while maintaining close strategic cooperation with the Danish Government and public and private enterprises and research organisations in Denmark”.*

In other words, the final mission both had a perspective on results, covering both the most recent results, as well as on the longer term perspective. Finally, emphasis was on identifying best practices, constraints and lessons learned from the programme. As mentioned the ToR for the completion mission are included as Annex 1.

To serve the aim of capacity development the M&E Team have sought to use the internationally recognised vocabulary on monitoring and evaluation by using the OECD DAC Dictionary on key concepts<sup>7</sup>.

Before each mission we have moreover prepared evaluation questions to make sure to cover a broad range of issues which the M&E team have assessed to be important. To the extent possible, the questions were sent to CNREC's management before each mission.

## **4 TECHNICAL PROGRESS**

### **4.1 The Starting Point**

In order to discuss the performance with CNREC's management, and to have “base line” for the discussion, a brief overview of the achievements made when CNREC was established in February 2012 was prepared. The overview was discussed at the management workshop in November and is presented below.

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<sup>7</sup> Glossary of Key Terms in Evaluation and Results Based Management, OECD DAC revised edition 2010, 在综合评价与结果管理关键术语词汇, <http://www.oecd.org/dac/evaluation/18074294.pdf>



Results had been achieved in technical, organisational and financial terms such as the wind power road map and input to the 12<sup>th</sup> five- year plan. Nevertheless, the workshop concluded that several problems and issues were outstanding, including the consolidation of CNREC as a robust organisation and influencing energy policies developed by Government, provinces and industry.

#### 4.2 Progress October 2014

In previous reports, the monitoring and evaluation team have recommended that CNREC should have greater strategic focus. The M&E team finds that CNREC is very much a “project driven” organisation. The number of projects managed by CNREC and the number of reports completed is impressive – also by international standards.

It is the understanding of the M&E team that the projects given priority are selected by the directors and heads of departments in cooperation and based on criteria which may be summarised as follows:

- The importance of the client, with NDRC and NEA having the highest priority. Other clients that are part of the Government hierarchy are also given priority, in particular Provincial Governments;
- The size of the project in financial terms;
- The strategic importance which directors and heads of departments give to the project in view of the overall targets of reducing CO<sub>2</sub> emissions and increasing the share of renewable energy in Chinese energy supplies.

It is however the impression of the M&E team that this discussion of strategic priorities has not been very explicit. There may be several reasons for this:



- Management and staff underline that CNREC is directed by the overall policies and priorities of the Government - in particular the two main Government agencies developing Chinese policy on energy, namely NDRC and NEA, this means that CNREC to a large extent has to react to requests from these two agencies;
- The director of CNREC travels a lot and thus is frequently absent from the CNREC. Nevertheless, the director is able to communicate clearly to management about priority projects and research areas;
- The directors and heads of departments of the ERI CRED team in particular have been working together for many years. They appear to know each other's professional capacities and network of contacts very well; very little communication between the members of this team is necessary for them to understand each other's priorities.

The M&E team notes that despite the limited reporting and communication on strategic priorities, a shift has taken place. New projects and initiatives have in common that they address systemic issues related to the integration of renewable energy in fulfilment of energy demand. Moreover, the projects have more emphasis on planning and the political, institutional, financial and technical network conditions for integrating and giving renewable energy a larger share of the supply and consumption of energy in China.

One explanation appears to be that the Scenario study, which covers both the supply and demand side and takes into account all forms of renewable energy, has set an example on how research – covering the full range of issues pertaining to the promotion of renewable energy - may be a very relevant tool for evidence based policy making, by setting more specific time bound targets for the different areas of renewable energy.

At the same time the Scenario study appears to serve as an integrating factor in the work of CNREC, because projects are conceptualised more clearly with the aim of reaching the long and short term targets of increasing the share of renewable energy in the Chinese energy supply and consumption.

Another feature noted from the interviews and project descriptions is the more holistic approach to the selection of projects and design of interventions. It is notable that environmental and social concerns play a greater role in the work of CNREC. Many projects – especially those working with economic analysis of alternative energy solutions - now take into consideration the environmental and human cost of the pollution related to fossil energy.

### 4.3 New Renewable Energy Projects & Initiatives

The Consultant compared the projects listed in the Monitoring Framework with the new projects in the Progress Report and discussed important new projects with the Heads of Departments with a view to analysing the relevance of the projects in relation to the intended programme outcome of influencing Chinese energy policies to increase the share of renewable energy<sup>8</sup>. About 30 new projects have been initiated by **the Policy and Industry Department** since the Mission in March 2014<sup>9</sup>.

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<sup>8</sup> See the Monitoring Framework for the Departments in Volume 2 of this report.

<sup>9</sup> For a diagram on the organisational structure and departments, please refer to section 7 of this report.

Important new projects of a more **overarching renewable energy planning** nature include:

**13<sup>th</sup> Five Year Plan**, covering the period 2015-2020. CNREC is providing research input to the plan, which is a key policy document for the Government of China. Despite the importance of the document, the previous 12<sup>th</sup> five-year plan actually underestimated the increase in the role of renewable energy, which has reached a higher share of the country's energy production than predicted.

**15 Non Fossil Fuel Target by 2015.** This is a project feeding into the five-year plan. The NEA has requested this research on how to quickly increase the share of non-fossil fuels as part of the primary energy sources.

**The China Variable-Generation Integration Group (CVIG)** is based on experiences from a similar group (UVIG) in the USA and aims at establishing a forum for sharing, discussing and developing knowledge on renewable energy and its integration into large scale energy systems. UVIG will cover technical, engineering, institutional, financial, economic, institutional and political issues related to integrating and increasing the share of renewable energy in a large complex energy system which is also based on energy from other sources. The overall perspective of CVIG is to aim at the highest possible level of sustainability as well as economic and sustainable management and consumption of resources<sup>10</sup>.

The CVIG members are key stakeholders and decision makers in the Chinese energy sector. Members include such important stakeholders as NEA, China Electric Power Research Institute of New Energy, State Grid Energy Research Institute, China Wind Energy Association and China Electrical Power Research Institute. The M&E during the mission participated in one of the first sessions of the CVIG, which was attended by 134 representatives of important stakeholders representing government, the private and public energy sector in China and internationally.

At the session, Energinet.dk presented experience with managing the Danish and Nordic energy networks. Emphasis was on increasing the share of renewable energy and integrating variable forms of energy while at the same time enabling a 24-hour market for energy where the most economical form of electricity is always used. Energinet.dk also facilitated a discussion on how the Nordic experience may be used in China.

The participants showed great interest in the presentation and a relevant discussion took place on issues such as management of surplus power from different sources as well as the mechanisms to determine prices for electricity.

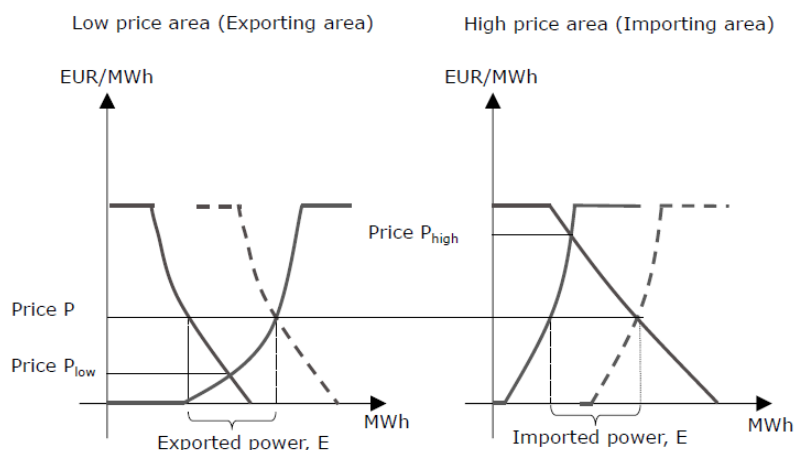
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<sup>10</sup>可再生电力并网研究协作组“章程, Terms of Reference and list of members of CVIG (Google Translation)

Figure 3 Price Calculation in the Nordic Power Market

ENERGINET/DK

**If interconnector capacity is large enough, the spot prices of each area will converge into the equal prices**



11/3/2014

Workshop with China National Renewable Energy Centre

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Source: Power Point Presentation by Martin Schröder, Energinet.dk

**Reinventing fire** – this project is funded by the US Energy Foundation together with the Rocky Mountain Institute and Lawrence Berkeley Laboratory and aims to find the most effective road map in order to increase RE in the power generation, industry, housing and transport sectors using a bottom-up approach and taking consumption as the starting point. The work is done through use of the CREAM-EDO model developed by CNREC.

The modelling tools are regarded as important by staff, because managers and staff are motivated by the ability to assess the potential impact of different changes in supply, demand and prices in a long term perspective. However, members of the PSC and management express concern that the staff capacity on energy modelling is limited in CNREC, which makes CNREC vulnerable to possible staff changes in the area.

Projects addressing **financial, pricing and economic and regulatory aspects** of a renewable energy increase include:

**Benefit Analysis of Solar and Wind Energy Grid Integration** - calculating the pricing, social and economic benefits of an optimal integration of wind and solar energy into the grid, requested for policy development and planning by NDRC. The study takes into account the environmental impact of different energy solutions.

**RE Power Integration at Reasonable Pricing** calculating the lowest possible prices of increasing the share of all forms of renewable energy, taking into account the environmental cost of fossil fuel.

**Financing Tax** to improve long term renewable energy development, analysing international and Chinese practice regarding subsidies and taxes on renewable energy to propose the most affordable and sustainable plan for pricing and subsidies.

**RE Quota Calculations** continues previous research on the Quota Measures managed by Central Government – financed by CRESP - to ensure an effective and economical inclusion of renewable energy.

**Cooperation with Provincial Governments and Cities** continue to be a major focus area of CNREC. The M&E Team discussed with CNREC's management whether a lower ratio of new projects at provincial level was a sign that CNREC was less able to engage in provincial energy planning.

However, CNREC's management underlines that the utilisation of CNREC's capacity is close to its upper limit, and additional projects would not be possible. Secondly it is emphasised that the Chinese Government is working on the preparation of a new phase of the Energy City Programme to be financed by CRESP. CNREC has been involved in research in a new energy city project funded by CRESP. When the new phase is launched an increasing number of provincial RE assignments are likely to develop and CNREC may continue to be a key player in the provincial governments' renewable energy planning. Important recent initiatives at **city and provincial level** are:

**New Energy, New Urbanization and New Life Action Plan**, requested by NEA covers research in measures to increase the share of RE through improved energy planning of urban expansion.

**Guangzhou New Energy Strategy**, assisting the Government of Guangzhou in increasing the share of biomass, solar and bio thermal energy in Guangzhou's energy consumption. This project includes an analysis of the environmental impact of different energy solutions.

A number of new projects are defined by the **type of renewable energy** selected. Several of these projects are conducted in cooperation with provincial governments and seek to apply renewable energy at a larger scale. Examples of important projects are:

**Wind Power Cost Evaluation and Subsidy Optimization Research**, analysing China's overall wind power resources, including issues regarding grid integration, subsidies and cost efficiency. The aim is to provide input to NEA's wind energy policies.

In the area of wind power a major policy change has taken place. CNREC was asked to prepare a study analysing the options for lowering wind energy feed-in tariffs. In order to be competitive, the cost of renewable energy must be closer to that of fossil energy. The CNREC study showed that it was possible to lower the feed-in tariffs for wind energy, but this was of course not very popular in the wind industry.

**Improving Dispatch of Wind Power in Baicheng, Jilin province** as a pilot contributes to the strategy for lesser dependence on coal power by increasing the flexibility of the plants to introduce greater reliance on wind power.

**Off Shore Wind Power Policy Support Research** is one of several new projects covering this area. Requested by NEA and NDRC, research is carried out on all aspects of off shore wind energy from cost related to sea conditions, connectivity and industry resource base.

Efforts to use **renewables for heating** are emphasised as a new research area, inspired by Denmark. Heating is promoted as part of the wind energy use and also as part of the biomass roadmaps:

**The Biomass Roadmap** funded by the RED Programme continues to be a key pillar in CNREC's biomass research. The project analyses the status of biomass resources and exploitation and sets scenarios for an increase of biomass utilisation for energy for 2015, 2020, 2030 and 2050. Biomass for heat supply is an important part of the roadmap.

**The Biomass Liquid Fuel Roadmap** is prepared along the same principles and similar to the biomass roadmap has to be completed in 2014.

**Solar, PV and Geothermal** remain important in the CNREC portfolio. Distributed energy to rural and remote areas that do not have access to the grid is a priority area.

**The solar energy roadmap** in line with the 2050 studies sets out two – medium and high - scenarios aiming at different speeds of increasing solar power exploitation. The solar roadmap also emphasises the use of solar energy for heating.

**Solar PV Industry of Alxa in Inner Mongolia** comprises a technical, financial and cost benefit analysis and recommendations for policy measures at provincial level.

**Monitoring, Evaluation of Off-grid PV Systems Construction and Supply in Non-Electrified Areas** carry out research on how to promote and manage reliable PV systems in areas without electricity supply from the central grid.

**Sanshui City Distributed PV Demonstration Zone** on a pilot basis explores ways to expand, own and manage PV systems for distributed energy.

**Solar PV Technology Innovation Capacity Building Research** is one of a few projects directed towards innovative technological development e.g. for components and batteries.

The drafting of a **geothermal strategy** is carried out together with Beijing Jike. The study will feed into the increased use of geothermal energy as part of the 13<sup>th</sup> five-year plan.

Only a few new projects centre on cooperation with the RE industry, however a large project was initiated with an important actor in the Chinese energy sector:

Cooperation with the **Guoneng Biomass Group** was to contribute to a more effective utilisation of biomass for energy production and consumption.

#### 4.4 International Initiatives

During the Mission in October and November, the M&E Team noted that in comparison to previous missions the international cooperation was emphasised more as a factor that can inspire and develop CNREC's research methods and approaches and contribute to the promotion of renewable energy in China.

**The International Department** continues to play an important role in establishing and maintaining international relations for CNREC and NEA.

An important activity in the Department was the support to the development of the **China Grid Programme** supported by the Children's Investment Fund Foundation. NREL, which is already a cooperation partner of CNREC, will have a key role in the programme. At the same time, the programme will enable the Danish Chief Adviser and a special Danish adviser to continue their work on energy modelling. The objective of the programme is:

*“ to build capacity and assist CNREC to articulate a low carbon strategy for the Chinese energy system with a high share of renewable energy, energy efficiency and low coal consumption”.*

The CIFF Grid Programme is of decisive importance to the future of CNREC as the project grants USD 11,788,000 as funding support to CNREC over a five-year period, starting in October 2014. A large part of the funding secures 80 % of the salaries of the staff presently funded by RED and 50% of the salaries of the ERI staff working for CNREC. In other words, the programme secures the continuation and sustainability of CNREC in a five-year perspective. The M&E team finds that obtaining this funding is a major achievement of CNREC and the International Department in particular. The CIFF Grid Programme is discussed further in Section 9.

Other important projects and activities of the International Department include:

**Chinese participation in the 3GF** in October in Copenhagen. China sent a major delegation to the conference and gave important presentations on the transformation of the energy sector which lead to important discussions on system integration issues and possible international cooperation on solutions. The Chinese delegation moreover gave an important presentation of the Chinese scenario study showing the ambitions of China and the potential increases in China's renewable energy share. The presentation were attended by many of the important international decision makers participating in the conference and demonstrated to all participants how China is becoming a main force in the efforts to promote renewable energy.

**The Chinese membership of the International Renewable Energy Agency (IRENA)** is important as China as the world's second largest economy – in GDP terms – strengthens the leverage of IRENA. The membership has become institutionalised during the past six months and CNREC is seconding one staff member to work in IRENA headquarters. The International Department serves as the Chinese secretariat to IRENA and supports the ongoing dialogue between IRENA and NEA as well as other key stakeholders in the Chinese energy sector.

**The cooperation with Germany and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)** is important to CNREC and China as Germany represents another key role model in setting ambitious targets and implementing strategies for greater dependence on renewable energy. CNREC and GI have agreed to cooperate closely on a six-month project, placing four GIZ staff in CNREC. The purpose of the cooperation is improve data collection and analysis of the energy supply situation and also analysing options and best practice for increasing the renewable energy share of China's energy supply. The research will feed into the Scenario study.

The International Department also plays a key role in facilitating a wide range of other important international cooperation initiatives, such as China's participation in the **International Energy Agency (IEA)** and cooperation with the British, Italian and Netherlands embassies to strengthen the international relations of CNREC and China in general.

In addition, the International Department continues to support the cross strait cooperation with Taiwan. Another important new project of the past six months provides support to "**New Energy Enterprises Going Out**", whereby the International Department by NEA is mandated to support Chinese renewable energy enterprises in expanding into the international market.

#### 4.5 Cooperation with DEA

The cooperation between CNREC and DEA has continued to be intense. Both parties stated that the first year of cooperation was affected by uncertainty about objectives and expectations and moreover both sides felt uncertain about the roles and responsibilities and what the other party could contribute. However, after the first year cooperation became more stable and fruitful .

The plan for 2014 laid out the main areas of cooperation and stated who would be responsible from CNREC and DEA, respectively, covering:

- **Energy, policy and system analysis**, continuing previous work on analysis of the Danish energy model and comparing this to the Chinese situation and quantifying the environmental cost of energy production feeding into the Road Map for a sustainable energy supply in China as well as the Scenario studies and energy maps;
- **Power market development** focusses on regulation, financing, pricing and incentives to create an energy market and establish grid integration in China which supports a greater role for RE – the work relates to pilot projects on power system design in Baicheng City in Jilin Province;
- **RE for heating** is an area which was not included in the original RED Programme Document, however the cooperation between DEA and CNREC illustrated the potential in terms of more effective energy utilization by expanding use of RE for heating;
- **Roadmap Review**, the roadmaps for wind, solar and bioenergy are being reviewed in order to create a stronger evidence base as well as more stringent analysis and recommendations. Moreover, DEA is cooperating with CNREC to prepare a road map for off-shore wind power which is a key priority for CNREC and China.

Management and staff give very positive feedback on their cooperation with DEA, emphasising the following strong points of the cooperation:

- DEA specialists are found to be knowledgeable in their fields of specialization and CNREC staff mention that they have gained important insight and understanding of new concepts and tools from their DEA working partners
- DEA staff react quickly and always give good feedback when you present questions or raise issues with them also by e mail;
- It is important that DEA represents an authority which is part of the Danish government system
- There is equal and “eye to eye” cooperation, which all managers and staff enjoy

Despite praising cooperation with DEA, management and staff identify areas where they see room for improvement. Many staff members underline that it has taken time to build personal relations with DEA, which they see as the basis for close cooperation; staff in CNREC would like to have DEA specialists visit China more frequently and for longer periods because this will increase the possibility of learning from DEA staff.

The M&E team has not had a formal report presenting activities and outputs for the past year, which limits the basis for assessing DEA performance. The M&E team has however received substantial information from meetings, political memos, and reports on projects which have been assessed.

A key focus area of the cooperation between CNREC, DEA and the Danish embassy has been to organise visits by high level Government officials and political decision makers from the energy sector in China and Denmark. The Chinese leaders interviewed stress that they consider Denmark a particularly useful working partner, firstly because the Danish organisations are seen as independent, but also they view Denmark – despite its small size – as a model for strategies to increase the role of renewable energy as a source for energy consumption and environmental sustainability. Managers in ERI and CNREC believe that a close relationship between Denmark and China will continue: As one leader puts it:

*“When you drink from a well, you will not forget the people who helped you to dig the well”,*

The high level political visits and exchanges have been frequent and intense during the implementation of the RED Programme. Both representatives of CNREC and Danish organisations point out that the political visits have contributed to secure management priority and focus on the programme. Technical studies have been fed into the discussions during the high level political meetings and have created dynamics between the political and operational level.

The general lesson learned is that the technical cooperation between two institutions at the same level in Government hierarchies can form a structure for very relevant knowledge sharing and cooperation. Ideas are applied in different settings leading to further innovation. Parallel horizontal political and technical cooperation appears to support a dynamical relation between evidence based policy research and policy making and practice.



Many of the issues, which have been addressed in cooperation between DEA and CNREC, are complex challenges, and developing solutions to these challenges will be a long-term process. This includes for example: Creation of a power market, solving the issue of curtailment of wind energy as well as use of renewable energy for heating. The work in these areas will continue during the new phase of support from DEA, which the Danish Government will be funding.

#### **4.6 The Role of the Danish Embassy**

The Danish Embassy has taken an active role in the implementation of the RED programme. The Embassy assisted in addressing the critical issues raised by the review mission in November 2010.

When the start-up of Component 2 was delayed the Embassy took key responsibility with CNREC and DEA in organising the proposal process and contracting the 12 project partners. Since then the Embassy has continued to have a key role in supporting, monitoring and evaluating the Component 2 projects.

The Embassy has had a key role in organising high level political visits to Denmark and visits of Ministers and high level officials from Denmark to China. The Embassy has been effective in ensuring that the objectives of CNREC and the RED programme were integrated as a key topics in the political dialogue during the high level visits. The embassy – with DEA - contributed to securing a strong political focus and public attention to renewable energy and CNREC in particular. During the last year the Embassy support to CNREC has been strengthened with an Energy Counsellor, this has improved the possibility of linking the energy technical issues with the political consultations between Denmark and China.

An important feature of the support of the Embassy to the Programme has been a flexible approach. Several times during implementation, it has been necessary to modify the theory of change or intervention framework guiding the programme. Generally the embassy has been quick and effective in supporting and authorising the changes - necessary for pursuit of the programme objectives. In this way the Danish Embassy in Beijing has contributed to the success of the programme.

Overall the implementation of the RED Programme may be seen as a good example of implementation of the Law of Development cooperation from 2012, which emphasises the need to work within the framework of a long term strategy and to integrate climate, development, trade and foreign policy. The RED programme is linked to the Danish international policies on climate and the programme applies a close connection between policy, trade and development cooperation.

#### **4.7 The RE Information and Analysis Centre (REIAC)**

The vision in the Business Plan was that the **RE Information and Analysis Centre (REIAC)** plays a key role in the development of CNREC by creating a national data base on renewable energy, which would be updated on a continuous basis and fed into the centre's research.

In the early phase, REIAC was assisted by Danish advisers in the design of the databases. According to REIAC management and staff, the assistance was very useful. The Danish adviser broke up the job into smaller tasks, which made it easier for staff to get an overview and participate in the working process.

Since the previous mission, REIAC has been working on ongoing and new projects:

The database for **CNREC's Information Platform for Renewable Energy** was initiated with support from RED, the database is still being developed, expanding the area from where information is collected and developing analytical and presentation tools. From the database monthly, quarterly and annual data on renewable energy are published to support NEA's mid-term and long-term planning. The database also covers information on energy policies from major countries worldwide.



Management Seminar in CNREC, from left Chief Expert Kaare Sandholt, Head of REIAC Liu Jiandong and Head of Policy Department Shi Jingli, discussing how to achieve an optimal balance between effectiveness, research quality and staff satisfaction.

**Wind Power Monitoring and Evaluation System** collects data on equipment, new project sites and grid connections in China and seeks similar information internationally. The information is published in monthly and annual reports and will support NEA in policy making.

**The Project database** covers data on wind, solar and biomass for new installations, power generation from 637 biomass projects, 1276 wind projects and 271 solar projects.

The work on **New Energy City Information Monitoring System** was initiated in June 2014 to monitor the performance of New Energy Cities. The work is funded with RMB 200,000 from NEA and data is supplied by the large grid companies. The aim of NEA is to achieve a better overview of the energy production and utilisation. The number of cities applying to obtain credits and support as New Energy Cities is going up; the threshold for becoming a New Energy City is 7.5% of the production developed as renewable energy.

REIAC has fruitful cooperation with the researchers working on the energy modelling and scenario studies, who use and feed data into the database. However, other researchers are less active in the use of the database. They feel that REIAC cannot provide the data they need, and at the same time they do not feel comfortable sharing data which they personally have obtained. In some cases, clients or cooperation partners provide data on the condition that it is kept confidential. Overall, the M&E Team finds that REIAC is not engaged to its full potential. There seems to be a need for dialogue between the Directors, Heads of Departments and REIAC in order to identify more clearly what the data needs of the researchers are and what the priority actions are for REIAC to fulfil those needs. Moreover, there seems to be a need for an information and data sharing policy which would support a more effective generation and analysis of data.

REIAC also works on the preparation of a number of publications presenting energy statistics:

**The CNREC Website** is a major tool for publication about the aims and challenges of increasing renewable energy in China. REIAC aims to continuously make available reports and research prepared by the centre. The number of hits on the website is monitored. It is important that NEA recognises the importance of the website and encourages CNREC to make more information and reports accessible on the website.

The internal **weekly newsletter** on ongoing activities of CNREC and cooperation partners.

The **China Renewable Energy Magazine** provides information and critical debate on issues related to the increase of renewable energy production. The magazine is distributed to a wide range of relevant industry and private sector stakeholders and the number of subscribers continues to increase.

The **Annual Data Handbook** on renewable energy, providing key data on renewable energy to stakeholders and researchers.

Revision of the **Power Generation Yearbook** on China's renewable energy together with the National Bureau of Statistics of China. REIAC provided support for the design and development of methods for data collection in order to upgrade the quality of the Yearbook.

The list of publications, web and data activities is impressive. REIAC provides solid access to information and data on renewable energy, which is of decisive importance for NEA's decision and policy making. At the same time however, REIAC's services would be more effective if clearer guidance were given to link the research profile with the database. It is also important that publication activities are linked to CNREC's communication strategy and stakeholder management.

#### 4.8 Component 2

DKK 30 million was allocated to Component 2 (C2). **The Immediate Objective** is:

*Danish-Chinese institutional and business partnerships are in place to cooperate on further development of RE technologies in China.*

CNREC has managed the C2 projects in close cooperation with the Danish Embassy and DEA. The application and selection process emphasised that projects represent:

- Key priority technical, institutional or economic areas of renewable energy development in China and internationally
- Robust and trusted partners who have a reputation for high performance and for being abreast of technologies within their field of specialization
- Research as well as implementation
- Different geographical regions and different technologies
- Propose projects with realistic plans and budgets within the designated two-year period
- Have a high probability of creating sustainable business alliances between the partners involved

40 applications for projects - which also included an element of self-financing - were received and a thorough evaluation was carried out to select the 12 most relevant and feasible projects. The projects selected are listed in the box below. CNREC appointed a team which have been monitoring the projects in cooperation with the embassy and DEA:

- **Project Management and administration:** Han Cuili and later Hang Yu;
- **Biomass:** Qin Shiping and Zhang Qingfen;
- **Wind:** Gao Hu, Zhao Yongqing;
- **Solar:** Hu Runqing; Sun Peijun;
- **RE systems:** Shi Jingli, Ren Dong Ming & Tao Ye.

The clear division of labour made it possible for CNREC to be in dialogue with, influence and learn from the projects. The projects have been under close supervision. It has been emphasised that projects need to deliver on time and to the quality defined in the contracts. As the contracting was delayed, most projects have had to be implemented in two years, which proved difficult for some projects.

Project 7, which involved construction of physical facilities, ran into problems as the construction site selected proved unsuitable; identification of a new project site turned out to be difficult and time consuming.

#### **Component 2 projects implemented.**

1. **Biogas to electricity demonstration project**, by Shandong Shifang Environmental Protection and Bo Energy Co.Ltd. China and PlanEnergi, Denmark – demonstration Project, 2.16
2. **Offshore wind resource mapping** - China Meteorological Administration (CMA) Center for Wind and Solar Energy Resources Assessment and Technical University of Denmark (DTU), Research Project, Research Project, DKK 1 million
3. **Solar heating testing platform – district heating**, China Academy of Building Research (CABR), Technical University of Denmark (DTU), Beijing Solar Energy Research Institute Group Co. Ltd (BSERI), Sunda Solar Energy Technology Co. Ltd. (Sunda), Institute of Electric Engineering, Chinese Academy of Sciences (CAS IEE), PlanEnergi, Denmark, Demonstration Project, DKK 3 million
4. **Testing System for Wind Turbines**, Institute of Electrical Engineering, Chinese Academy of Sciences and Aalborg University, Denmark, Research Project, DKK 1 million
5. **Wind Turbine Testing**, Baoding Diangu Renewable Energy Testing and

- Research Co. Ltd and DTU Wind Energy, Demonstration Project, DKK 5.8 million;
6. **Kenaf Cellulose Ethanol Production Demonstration Project** – Dahua Engineering Management Company, Denmark, Novozymes, Denmark, Shanghai Zhongwei Biochemical Co. Ltd., China Winery Co. Ltd, DKK 5 million, Demonstration Project, DKK 5 million
  7. **Demonstration Programme on efficient solar-geo-hybrid heating and cooling**, Beijing Jike Company, Esbersen Consulting Engineers, Denmark, Demonstration Project, DKK 4 million
  8. **Integration of High Penetration of RE Resources into the Industrial Power System with Micro Grid Solutions**, Hebei Construction & Investment Group CO. Ltd, Envision Energy Co. Ltd, Department of Electrical Engineering, Tsinghua University, Department of Electrical Engineering, Technical University of Denmark, Demonstration Project, DKK 2 million;
  9. **Micro Grid Technology Research Based on Wind, PV, Storage Hybrid System**, Solar Energy Science and Technology Co Ltd. and Aalborg University Denmark, Research Project, DKK 1 million
  10. **Regional Wind Heating** supply project in Shanxi Province, China Hydro Power and Water Resources Planning and Design Institute, Demonstration Project, DKK 2 million
  11. **System Integration of Wind Power by Use of DH/CHP Systems in North East China**, COWI, EA Energy, CEORI and SGERI. Research Project, DKK 1 million
  12. **Modelling and Simulation of Wind Power and VSC-HVDC and Application in Offshore Wind Power Integration**, China Electrical Power Research Institute, DTU and AAU, Denmark, Research project, DKK 1 million

The supervision has been thorough. CNREC has hired specialised consultants to read and comment on reports and deliverables of the projects. The M&E team participated in one meeting between the project implementation team, CNREC, the consultant and the embassy. The presentations appeared to be thorough and the reviews and feedback given were relevant and clear.

The M&E Team had the possibility to study two progress reports from projects 7 and 11. The report on project 11 is very detailed, relevant and problem oriented and relates specifically to the overall institutional issues addressed by the project. The report on project 7 is more general and describes activities conducted. The M&E team did not have the possibility to review the C2 projects in depth, but the process for managing and monitoring the projects is well organised and effective. In addition to CNREC, the Embassy has put in a great effort to support and enable project implementation.

The M&E Team participated in the presentation and discussion seminar organised for all the C2 projects by DEA on May 14<sup>th</sup>. The meeting gave a good overview of the projects and their performance. Most projects - with one or two exceptions - have achieved the planned results.

A couple of challenges seemed to be shared by all the projects. Almost all project groups reported that the Danish and Chinese research teams had experienced problems in cooperating across the countries. Several had chosen to work as two separate teams. The reasons given were that communication was difficult and also research methods deviated.

The M&E team asked the project teams about the sustainability of the projects and most projects indicated that cooperation on their specific project could not continue without public funding.

The M&E team finds that the project preparation should have given more attention to cooperation, methods of knowledge sharing and long-term sustainability of the projects. Institutional sustainability was one of the criteria used for approval of applications and the project implementing agencies should be held accountable in this respect. Projects should be requested to report how they intend to continue cooperation and how long-term effects of the projects may be harvested.

#### 4.9 Overall Assessment

During the workshop on 2<sup>nd</sup> November, CNREC's management discussed and agreed on most of the achievements made during the last three years. It is clear that CNREC has made substantial progress and has reached a number of impressive results.

The results realised will contribute to a change in Chinese energy policies towards a greater phasing in of renewable energy.

Policy Research	Industry	Information Management	International Cooperation	Administration
2050 Scenario Study	Technology Catalogue	RE Information Platform	IRENA membership	New Contracts
13th five year plan	Biomass Roadmap	RE Industry Yearbook	IEA Cooperation	New Performance System
15% RE by 2015	Solar Roadmap	International RE Report	High Level policy Dialogue	New Salary System
CVIG	Provincial Energy Planning	Policy Data Base	Taiwan Inland Cooperation	Recruitment
Feed In Tariffs	New Energy Cities	News Letter	NEA foreign relations	Study Tours
Addressing Curtailment	CRESP II Scale Up	RED & CNREC Web Site	GIZ – Germany Cooperation	Outplacement
Quota System	C2 Demo & Dev projects	New Energy City Monitor		Staff survey
Off Shore Wind Power	Industry monitoring	Wind Power Monitor		Capacity Development
RE Quota work	PV Innovation Research	IT systems		On-the-Job-Training
Green Tax policy	Biomass Pricing			
RE Heating Guidance				

A main change in CNREC's performance is that the organization is not technologically driven. The Programme Document put great emphasis on wind, solar and biomass energy, but the focus of CNREC has changed and the portfolio now relates more to overall system issues, combining knowledge on the various forms of renewable energy with insights into energy economics, system development and integration. In other words, the capacity of CNREC relates to overall planning and policy solutions.

## Lessons learned

Most of the Danish – Chinese cooperation has been constructive and fruitful. However, in a few areas the constraints have been notable.

Overall it is clear that the technical cooperation between peers is a strong driver for performance. Chinese and Danish specialists are very interested in learning from each other and this creates a constructive environment for professional development. The lesson learned from the cooperation between DEA and CNREC is that it is important - early in the cooperation process - to assign individual working partners who are responsible for cooperation in their area of specialisation. If at all possible advisers should be allocated for a longer time period because the development of personal relations is important for the professional dialogue and learning.

The advantage of having DEA as technical adviser to CNREC was that DEA has been able to demonstrate methods of doing policy research and influencing the political level from a Danish perspective, this has contributed to a synergy between technical research at the operational level and dialogue at the political level.

The M&E Team and the Chief Adviser underlined the importance of CNREC having a project management system. From a European perspective, it is necessary for the management of an organisation to have an overview of human, financial and technical resources. However, the efforts to introduce a project management system ran into difficulties. Chinese organisations have a different approach to resource management and agreeing on workloads. A key argument against the project management system was that it would document overtime which was effectively not paid for. It is notable that same problem pertains to the use of project management systems in Europe, but here staff in knowledge based organizations would have the bargaining power to reject such a system. In Europe, project management systems are also used as a tool for management and staff to agree on work planning and workloads in a transparent and standardised manner, which may also protect staff against too heavy workloads.

The lessons learned is that methods of organisation of work may be quite difficult to transfer and that such processes need ample time.

At the same time, the cooperation between Danish and Chinese teams shows that approaches and methods can indeed be transferred. The explanation from a Head of Department illustrates the experience gained:

*“We were working with the Danish adviser. We worked as a brainstorming session and put all the problems and issues on the table. Then we agreed what was most important, and who would do what. This would not be the Chinese way. In China the manager would have formed the overview and told everybody what to do. The advantage of the Danish approach is that everybody understands the process from the beginning”.*



A couple of staff members mentioned that working with Danish consultants had introduced new working methods. The Danish working partners had a more problem oriented approach and were more likely to take new initiatives without asking the manager. At the outset, the Danish partners viewed their terms of reference and responsibilities as broader than many of their Chinese counterparts. Staff members of CNREC also emphasised that they had learned about new methods and concepts for research and analysis.

From a Danish perspective, the patience of the Chinese counterparts is impressive. The Chinese are very persistent in their pursuit of new methods and ideas, and in finding out what may lie behind the idea and how to apply new principles in practice.

## Challenges

**Information sharing** clearly presents a challenge for CNREC. During the interviews, management and staff showed surprisingly limited knowledge about the centre's projects and activities. More open communication and knowledge sharing appears to be the obvious way to increase the comprehensive capacity of the centre.

The management workshop underlined that **quality assurance** is posing a challenge for CNREC. Management and staff are often under severe time pressure to complete assignments. Some staff have limited experience with data search and measures to ensure the validity of findings and analysis. According to the interviews, reports are sometimes sent to clients and partners without any kind of quality assurance procedure. The legitimacy of CNREC is closely linked to the ability of the centre to prepare high quality research and reports and the lack of quality assurance represents a threat to CNREC's professional reputation.

It is important that the quality assurance procedure is linked to the professional development of staff so that quality assurance can serve as a measure to motivate staff and improve learning.

## 5 STAKEHOLDERS AND INSTITUTIONAL FRAMEWORK

### 5.1 CNREC Stakeholder Relations

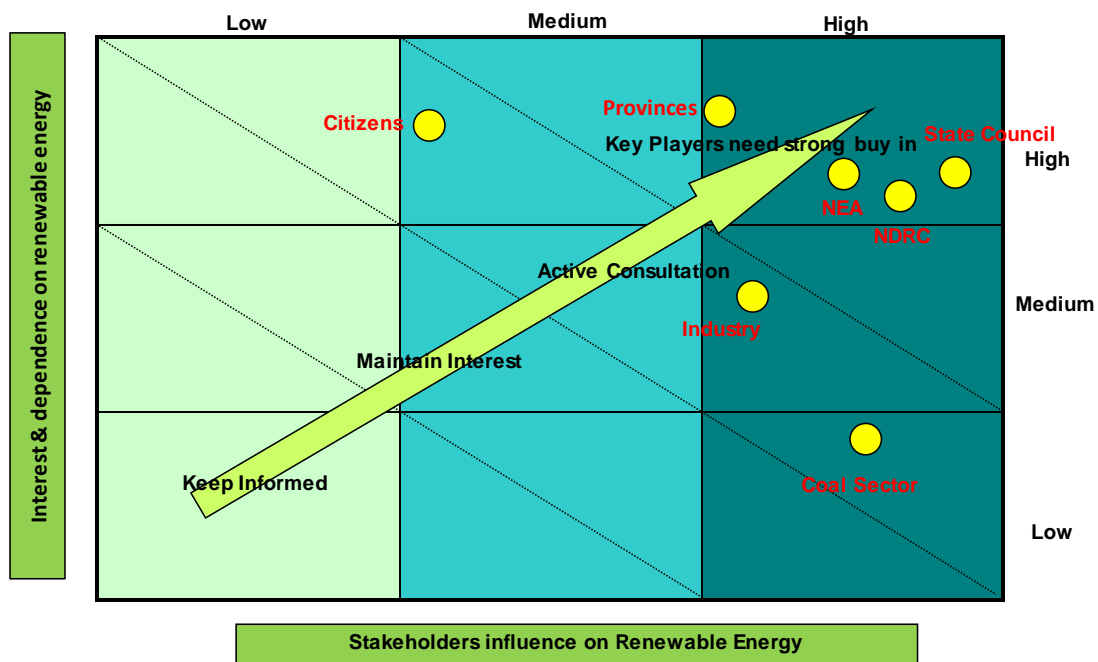
One of the key objectives of the RED Programme was to influence stakeholders to understand the opportunities and benefits offered by renewable energy. It is the aim of CNREC - as a policy research institute - to seek to influence stakeholders to use the research prepared by the centre. In the monitoring framework, the outcomes and indicators are expressed as they relate to the regulations, policies, strategies, plans and technologies influenced and elaborated by stakeholders. The importance of influencing the most influential stakeholders - NEA, NDRC and ultimately the State Council - is emphasised.



These outcomes have to a very large extent been achieved as China’s Government is increasingly adapting policies based on research from CNREC – with the 13<sup>th</sup> five-year plan and the recent change in feed-in tariffs as important examples. Several interviews point to the fact that renewable energy has now reached a level of strategic importance in the national economy. According to the annual report of CNREC for 2013 the contribution of renewables to the electricity production grew from approximately 12 to 24 % Between 2010 and 2013 (including hydropower) in the same period the contribution of wind to the electricity production doubled in the period to approximately 4.5% of the total electricity consumption<sup>11</sup>.

With a greater role for renewable energy, opponents to renewable energy and the coal lobby are strengthening their agitation against renewable energy and CNEC in particular. This underlines the need for CNREC to prepare high quality research.

The diagram below illustrates the need for taking into account stakeholder interests and influence. It is noted that with CVIG and with the working groups on central heating, CNREC is working very systematically with stakeholder management. This work will further be strengthened by the focus on communications under CIFF funding.



Source: Prince 2 Project Management Manual elaborated by the authors

<sup>11</sup> CNREC Activities within China National Renewable Energy Centre, March 2013, page 2

Interviews with leaders suggest that a power sector reform is underway, but will take five to ten years to unfold with differentiated prices for peak and off peak generation. The market reform is likely to lead to an increase in wind power installations from 30 GW to 100 GW per year. To maintain market shares, proponents of coal fired power plants are claiming that clean coal energy is an option, but although much can be done to limit the environmental damages from coal, the pollution will remain a problem. Coal pollution is increasingly becoming a publicly debated issue. It is however important to take into account that coal fired power plants and the oil and coal sector employ about 12 million people. These jobs will have to be phased out over a 30 to 40 year period. But the strength of the scenario studies and modelling is that realistic calculations can be prepared - on how this can be done.

The national recognition from NEA is important – this creates trust and respect for CNREC amongst stakeholders. Likewise, the close link to ERI is important for the professional legitimacy of CNREC. Nevertheless, interviews confirm that CNREC is gradually establishing itself as a professional organisation with substantial capacity in renewable energy research.

Demand from NEA has changed within the last six months as more responsibilities have been decentralised to the Provincial Governments. The Provincial Governments – which lead provinces that are at larger than most European countries – are decisive in implementing the strategy to increase renewable energy, because they have the executing power in practice. Concerning financial management, the authority to set heating prices is vested in the Provincial Governments, whereas the power to set the price of electricity is vested in the Central Government. The New Energy City was put on a halt while the second phase of CRES was being prepared, - and one role of New Energy Cities was to create connections between the provincial governments and CNREC – nonetheless, cooperation with provinces has continued. In the next phase of New Energy Cities, it is expected that CNREC cooperation with provinces will intensify.

Interviews underline the good cooperation with China's industry. Enterprises from the renewable energy sector contact CNREC for advice, not only on technological aspects but also on policy, planning and regulatory initiatives that influence the working conditions of industry. CVIG and initiatives to coordinate stakeholders interested in district heating are important steps to attract representatives of the industry, and such forums are used for discussion of strategic approaches. Moreover CNREC supports and participates in a number of Chinese and international initiatives on promotion on renewable energy such as for example the annual China Wind Power conference.

## **5.2 International Partnerships**

International partnerships are an integral part of the work of CNREC. During the first missions to CNREC, some staff expressed the view that approaches to renewable energy should preferably be developed within the framework of Chinese engineering sciences and tradition, and scepticism was expressed about the benefit of international cooperation. However, during recent missions management and all staff emphasised the importance of international relations as a source of relevant research methods and approaches.

It is important that CNREC's management be well aware of the importance of China as a decisive player in international energy policies and management. Middle management is more oriented towards the international scene. Also, China's membership and active participation in international partnerships such as IRENA and IEA strengthens the levying power of these organizations. An example on an important initiative to increase renewable energy is the IRENA REMAP initiative which seeks to prepare and agree realistic plans for doubling the share of renewable energy worldwide by 2030<sup>12</sup>.

Interest in cooperation between Denmark and China has changed. The interviews show that in the early phase of CNREC, stakeholders in the Chinese energy sector mainly knew Denmark for its potential in wind energy. Now the country is known for its general strategy of phasing out fossil energy and for its flexible energy system management with Sweden and Norway. Denmark is now seen as part of the European energy network. The European energy network is of great interest to CNREC and stakeholders in the Chinese energy sector in general as a part of China's international orientation. In this context, CNREC is also giving high priority to the close cooperation with GIZ and Germany, a decisive player in international energy policy and practice.

### **Lessons learned**

The approach taken by the CNREC programme from early 2012 appears to have been effective. CNREC first concentrated on internal organisation strengthening and then gradually increased its scope and contact with external stakeholders – in China and internationally.

The RED Programme has undergone a change during the implementation period. Whereas the Programme in the early phase had focus on Chinese – Danish cooperation, the centre gradually has become more oriented towards the international scene. As the capacity of CNREC has been growing, the need for international cooperation and approaches has become more pertinent. For future international cooperation programmes on renewable energy and environmental solutions, it may be a lesson learned that the need for global policies and global governance should be an integrated working area.

## **6 CNREC ORGANISATION STRUCTURE**

### **6.1 Legal Status**

The legal status has been subject to much discussion and research by the M&E team. A legal recognition of CNREC as a Government institution was perceived by the business plan as a way to ensure the sustainability of CNREC and guarantee continuous government funding.

However with the agreement on funding from the Children's Investment Fund Foundation (CIFF), these considerations have proven to be less important. With funding from CIFF CNREC will continue to employ the majority of staff from RED and the Centre has the necessary funding to continue to develop over the coming years.

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<sup>12</sup> [irena.org/remap/](http://irena.org/remap/)

In Europe, there is substantial discussion on the advantages of knowledge based or research organizations being private or publicly owned. Important Western social scientists point to competition and a degree of external control as factors which contribute to the effectiveness of research organizations or think tanks<sup>13</sup>.

Moreover, the issue of independence is much debated. On one hand, government affiliation ensures base funding, which gives researchers the time to do in depth research. On the other hand, there is concern that any dependence on funding may influence the direction of the research. Specialists agree that the major factors securing research quality and independence are the professional qualifications and integrity of the scientist, researcher or consultant<sup>14</sup>.

The M&E team finds that the following considerations may be taken into account in the considerations of the future organization of CNREC:

- The affiliation to Government gives CNREC the advantage of being able to feed into Government policies;
- A fully privatised organisation may generate more revenue to CNREC and enable CNREC to pay higher salaries. However, the sources of innovation in the form of international links and dialogue with the public sector may be lost;
- Status as a Non-Government Organisation could also mean that CNREC lose its Government connections and influence and consequently its legitimacy.

Based on these considerations, the strategy pursued by CNREC to function as a Government affiliated project organisation appears to be the right one. According to the interviews, CNREC is likely to obtain legal recognition from NDRC, but with the Government's emphasis on simplifying the public sector and reducing costs, this is likely to take at least three years. In the meantime, CNREC is fortunate to have CIFF and other sources of funding to support the development and growth of the organization.

## 6.2 Programme Management

When CNREC was established in 2012 the RED Programme organisation was merged with the CRED from ERI. ERI Directors and CRED managers took the role as Directors and senior CRED staff were requested to take the positions Heads of Departments in the CNREC. Three RED staff were appointed as Heads of the International and Administration as well as REIAC. The Programme Demonstration Department largely consisted of former CRESF staff.

In this way a few bold actions were taken to integrate the structures of the RED programme with a recognised well establish Chinese research organisation.

In March 2012, management identified a wide range of issues relating to the organisational effectiveness, this included weak institutionalisation of the role of the departments as well as the position as head of department, unclear division of roles and responsibilities as well as unclear structures of communication.

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<sup>13</sup> Max Weber, *Wirtschaft und Gesellschaft*, J.C.B Mohr, Tübingen 1980

<sup>14</sup> Ole Winckler Andersen, *Some Thoughts on Development Evaluation Processes*, IDS Bulletin 3. November 2014

In the past two years most of these issues have been addressed and CNREC is consolidated and is generally a well-functioning organisation. One explanation to this success is that ERI appointed one of its assistant Directors as RED programme director, this meant that ample and competent management resources were dedicated to manage the program on a daily basis and support the merger of the organisations. Other directors and senior staff from CRED also took up the challenge of changing from a career focussed on research to on which combines management and research. One director was given the arduous task of adapting international employment conditions to standards similar to Chinese public research institutions and much creative thinking led to gradually developing new employment systems, which will benefit CNREC in the new phase.

The basic functions of finance and administrative management of the RED programme are cumbersome and resource demanding, but the International and Administrative Departments were able to continue the performance of these functions effectively while in parallel strengthening the International profile of CNREC together with development of human resource management systems.

The flexibility and engagement of the Embassy was important to support the new organizational structures, and to accommodate the gradual change of finance management and reporting.

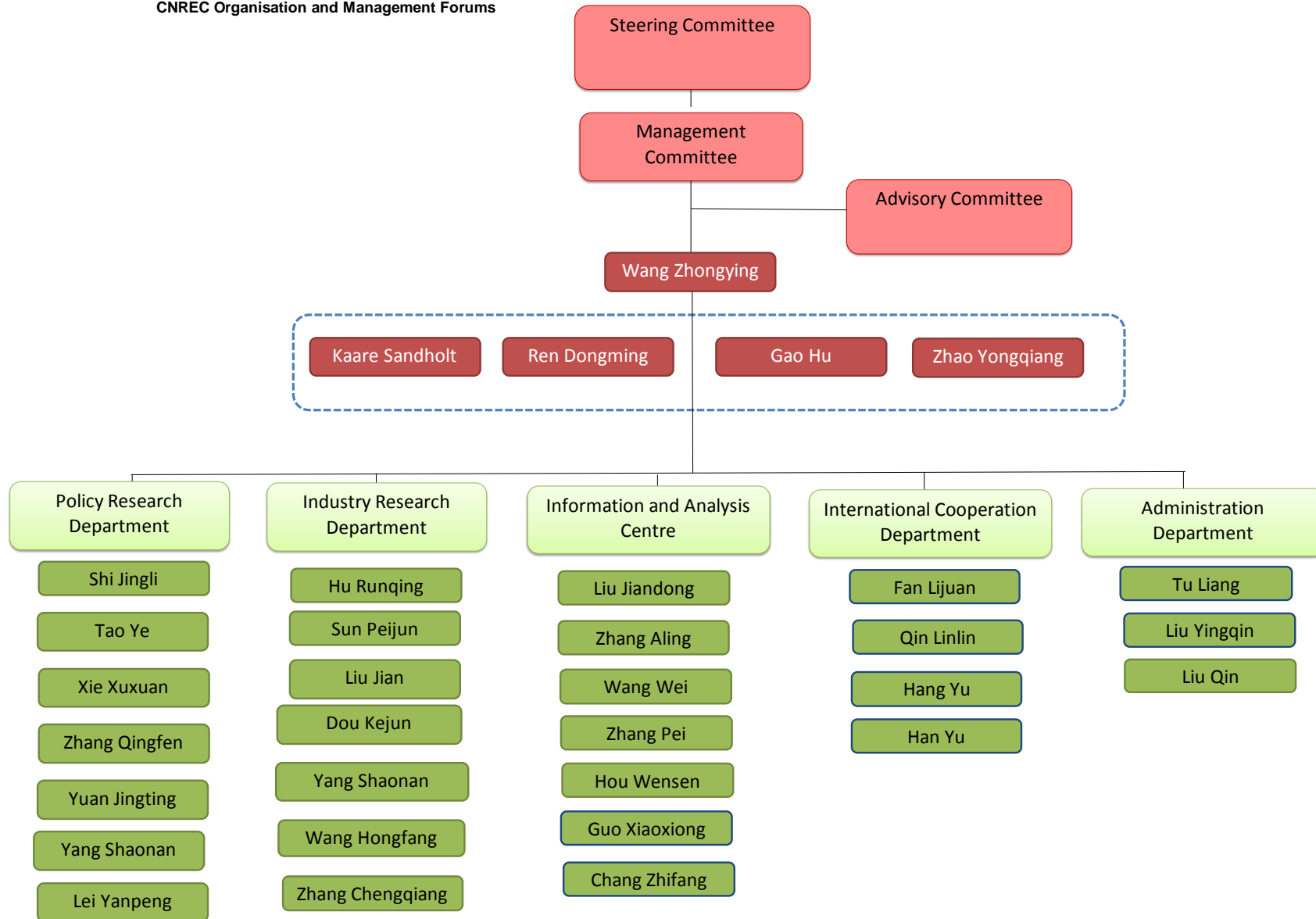
### **6.3 CNREC Organisation**

The organisation structure of CNREC as of November 2014 is illustrated overleaf. Staff in the survey express great confidence in and admiration for management. The Director is recognised for vision and the ability to set strategic direction, the Chief Adviser is appreciated for technical knowledge as well as the ability to facilitate difficult processes. The whole management team and Programme director are valued for their effective efforts to develop the organization. The department structure is functioning well in the sense that the Heads of Department feel very responsible for their teams, and the staff feel that they belong to their Departments and report to their Head of Department.

A well-functioning division of roles and responsibilities has developed between the Industry and Policy Department, with the Policy Department engaging more in overall analysis of the various forms of energy and related institutional issues. The focus of the Industry Department is on relations to the provincial governments, enterprises and industry as well as issues related to regulation and policy making at provincial level and planning for integration of renewable energy in practice.

Despite the qualities of the organisation, both management and staff express the view that the management team and the CNREC organisation as a whole could be better integrated and more effective by working closer together.

CNREC Organisation and Management Forums



The directors also have prime responsibility related to the departments. Ren Dong Ming is supervising the Policy and Administration Department, Gao Hu the Industry Department, and Zhao Yongqiang the International Department. The supervision entails that the head of department uses the director as sparring partner and staff refer to the director in the absence of the head of department.

However, it has been decided to close the Programme Demonstration Department, as the Head of Department and two staff have been recruited to work for the CRESP Programme. Most of the project portfolio has been transferred to the Industry Department. While the decision may be relevant, it is surprising that this organisational change has not been subject to much discussion between managers and staff.

One of the issues originally identified, namely the lack of recognition of the need for skills and capacity in project management appears to have been addressed. Interviews and workshops indicate that management and staff are aware of the need for knowledge, skills and competences on organisation and management of project work.

The aim of CNREC to function as a project and matrix organisation has been achieved. All staff in CNREC are involved in several projects. Directors and heads of department are responsible and take the lead in a wide range of projects, whereas most staff are engaged in three to five different projects.

One surprising finding from the mission is the relatively low level of information even among the managers. For example, some heads of department had very little knowledge of the ClIFF Programme application which is decisive for the future for CNREC. The heavy workload of CNREC also means that managers and staff have to concentrate on ongoing projects and that there is little time to discuss issues of a general nature.

The M&E Team finds it important that CNREC's management have a high level of information on professional, financial and performance related issues of the organisation. For the Director of the Centre – and the management in general – it is important to make sure that responsible leaders with overview and insight into the situation of the centre are present to manage the centre at all times. Moreover, well informed managers are the basis for sharing information with staff and in some cases for optimal stakeholder management.

It would be relevant for CNREC's directors and heads of department to hold a management meeting at least every two weeks. The agenda could include:

- New incoming projects
- Performance of the departments
- Upcoming events and travel
- Financial situation
- Human resource situation

The M&E team finds that such regular meetings would be worthwhile in terms of improving effectiveness and job satisfaction in CNREC.

## 6.4 Human Resource Development

CNREC today employs 34 staff, of whom 30 are research staff (8 senior, 12 middle and 10 junior) and 4 are project administrative staff – 1 senior and 3 junior. In comparison to March 2014, 5 staff have left CNREC to work for CRESP. One staff member has been seconded to work at IRENA's headquarters.

Interviews and workshops underline that human resource management in CNREC is still affected by staff being divided into two groups – with ERI and RED contracts, respectively. It is generally recognised that the staff recruited for ERI have an educational level and Ph.D's that give them a stronger profile for managing the research jobs in CNREC. At the same time however all managers recognise that many of the RED staff are very talented. When the most ambitious of these staff receive research training and experience, they can achieve a level of qualifications comparable to the staff recruited for ERI. However, management underlines that it must be made clear to all staff that a successful career requires hard work and commitment.

In order to assess the development in human resource management since the establishment of CNREC, the M&E Team conducted focus group interviews, analysing Strengths and Weaknesses of working in CNREC with the staff of all five departments<sup>15</sup>. The results of the discussion from one department is illustrated below. Strengths and weaknesses identified across the departments are very similar.

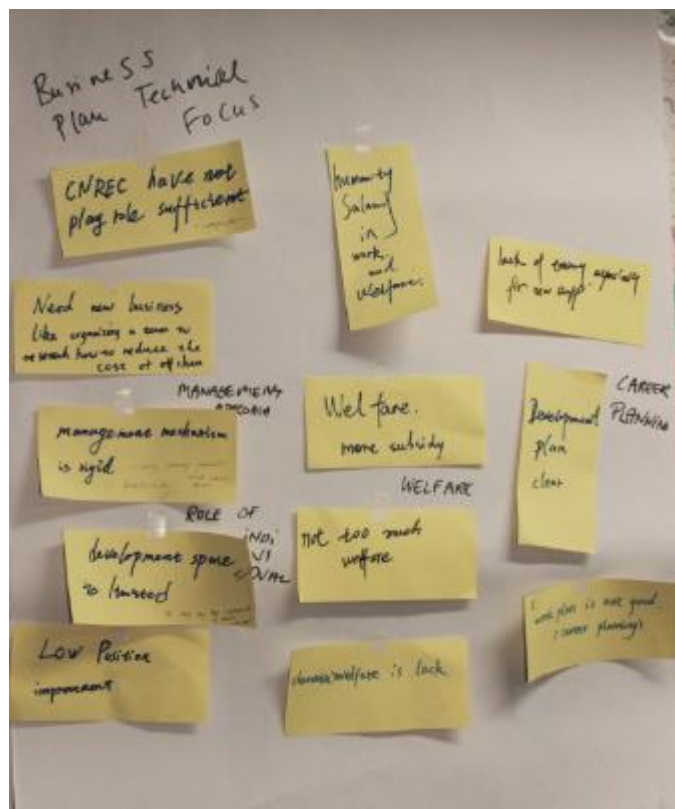
In summary weaknesses identified are:

- **The objectives are conflicting.** Several staff feel that with a heavy workload they often have to prioritize between tasks; staff do not feel they have clear guidance or objectives to guide this decision. For example, requests from different project managers or from external partners may conflict.
- **Uncertainty about the career perspectives.** This issue was brought forward by RED staff. Many feel they have now worked for the organization for several years and they do not see a career perspective. One staff member claimed, "*I feel I am not developing*", the reasoning was that the employee felt s/he was always doing the same kind of work; there was limited development and learning enabling the staff member to take on more challenging assignments. Also, a couple of staff mentioned that it was embarrassing – from a social viewpoint – that they were not promoted.
- **Lack of information sharing and insight** was mentioned by several staff. Participants mentioned that they do not know what their colleagues are doing or "*What is everybody so busy with?*". Staff complained about lack of information sharing and said they sometimes thought that CNREC had information in an area, in which they were doing research, but that either they did not know who might have the data or felt that it would be inappropriate to ask colleagues to share data.
- **Job security.** Some staff complained that they were not sure about the job situation after the completion of the RED Programme, while others had been informed about the CIFF funding and the continued job opportunities.
- **Limited influence on time management.** Several staff expressed frustration that they cannot manage their own time. They feel they are shifted between urgent tasks all the time.

<sup>15</sup> As the time was limited it was decided to focus on the factors controlled by the organisation itself whereas it was decided not to discuss opportunities, which are normally included in an analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT).



- **Little communication with the Head of Department** was a complaint raised by a couple of staff, who felt a bit isolated and demotivated, because they think their work is not appreciated.
- **Not enough welfare** was mentioned by many staff. They feel that the workplace would be much more attractive if more social events were organized. Staff have good memories from the celebration of birthdays and joint meals with international specialists visiting CNREC.



While the problems are similar to those of many other organisations; addressing the issues may greatly improve CNREC's level of satisfaction and effectiveness.

**Clarity of objectives and improved level of information** may be addressed through regular staff meetings for example once a month. It is important for staff to have a formal meeting with the highest ranking officials in their organisation at regular intervals. Such a meeting may be used to inform about the most recent successes and also of new assignments that may cause stress. For most people it is motivating to know how their work contributes to the achievement of the overall objectives of their organisation.

**Career objectives and possibilities for promotion** are important to motivate all staff in CNREC. The ERI staff are covered by a well-defined career ladder, where specialists through research projects have to demonstrate better knowledge and skills in their professional work. High performance is rewarded through more prestigious titles.

CNREC has made substantial efforts to introduce a performance management system which would motivate RED staff. The aim has been to develop a system with some similarities with the ERI system, examining general performance, progress on projects and the more social aspects such as being a good colleague. The intention was to combine this with the automatic time management system.

However, the introduction of the system has not been very successful, firstly the system is not linked to the salary, so the heads of department complain that weak or excellent performance does not have any consequences. The contracts with RED staff have been a constraining factor in setting up a shared human resource management system for CNREC, because the contracts did not make it possible to introduce performance based payment.

The heads of department also complain that there is no agreed mechanism for gathering information and assessing performance. Staff are often working on projects and the head of department does not receive information on performance from project managers outside the department. Some managers feel they cannot report on the performance of staff if the information available is incomplete, also it worries the heads of departments, that they are not sure how the information will be used.

**The Administration Department** with the dedicated director has continued to work on **the** development of job descriptions for RED staff. The plan is that the majority of the RED staff will be offered new jobs based on the CIFF funding and contracts will be agreed with China International Talent Development Centre Human Resources (CITCD).

The conditions of the new jobs will be more similar to the ERI positions. A Government reform means that the basic salary for ERI staff is only RBM 3000 per month and the same will be offered in the new contracts. In addition, the contract will include social insurance in line with Chinese legislation.

The plan is that additional salaries will depend on the performance and the level of the position - enabling staff to reach a salary level comparable to the level under the RED Programme. Managers underline that the basic salary is very low and in some cases this means that managers do not want to ask junior staff to work overtime.

Along with the new contracts, the Administration Department has been working on **job descriptions**. The job descriptions are in Chinese so the Consultant has only been able to carry out an assessment of a few selected examples. In comparison to the job descriptions prepared at the time of the establishment of the Centre, the new descriptions are substantially more precise and clear and give a good overview of the managerial and technical aspects of the job. It was discussed with CNREC management that the job descriptions to a larger extent need to reflect the expertise of CNREC in addressing complex situations, taking into account both regulatory, political, technical and economic conditions.

Concerning human resource management, the M&E team finds it worrying that the present Head of the Administration Department is planned to start to work for CRES P at the completion of the RED Programme. The experience of the RED programme shows that systematic work with human resource management and capacity development is decisive for the performance of the Centre. The other heads of departments have research and project management profiles and it is important that they can get assistance on matters relating to human resource administration. The M&E Team is aware that the Head of the Administration Department has promised to support CNREC after his engagement with CRES P, but this may lead to frustration if there are not enough resources for effective human resource management.

The issue of **Job Security** will be addressed when staff are offered employment with C IFF funding. It is however important that the reemployment process make the requirements and expectations to staff very clear as staff with the right profiles are decisive for the future of CNREC.

### **The Leadership Role of Directors and Heads of Department**

The other problems identified by staff may be addressed by emphasising the role of human resource management, to the heads of departments and supporting directors. Most of the heads and directors are educated and trained as researchers, and several expressed a wish to receive management training.

Particularly the heads of departments must enforce their role leading the work and deciding on roles and responsibilities and division of tasks. During the management workshop, the heads of departments agreed that *“balancing the workload and not overworking staff”* is a challenge in CNREC.

The staff should be aware that if issues arise on priorities on assignments, s/he should consult with the head of department. The head of department should also be aware of his/her role of ensuring that staff are well informed on relevant issues. The head of department should be responsible for ensuring a reasonable workload – in dialogue with staff.

In the introduction of the new performance management system, the head of department should be given the role as leading the work and in parallel monitoring the performance of staff, giving feedback on performance and making sure that staff learn and strengthen their performance to the benefit of the organisation. If possible - the role as leader of the department should be emphasised in the monitoring of the performance of the heads of departments and directors. The aim is to make the departments a nucleus where they feel they belong, while at the same time ensuring that staff understand how their performance contributes to the overall performance of CNREC.

The role as **project manager** will continue to be important in CNREC. A project manager has to be able to divide tasks between and supervise a research team. In Europe the ability to take on the role as project manager is frequently part of the career ladder in research or consultancy organisations. The advantage and challenge of being a project manager is that the position is not permanent. This means that the people who are leading a team one day, –may be team members for the same colleague the following day. This flexibility and change of roles is recognised to contribute to a balanced working environment with a high degree of team spirit.

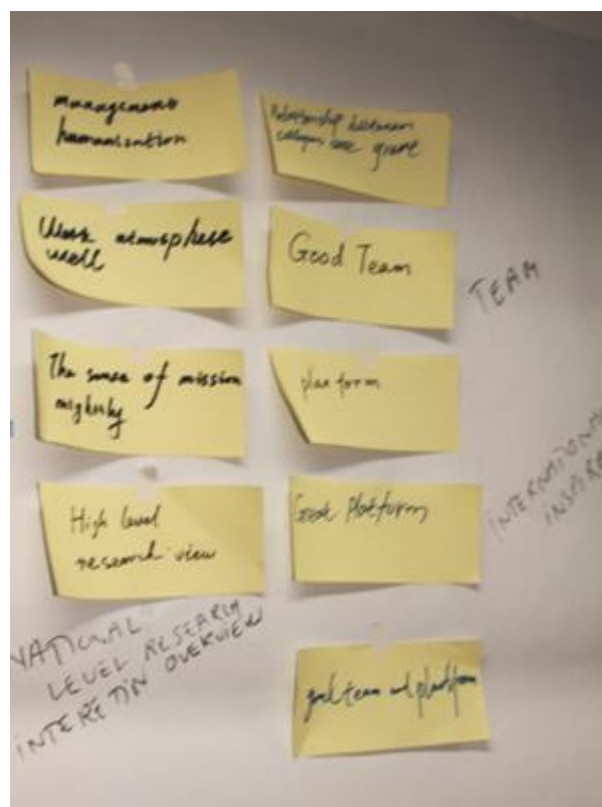
Despite well qualified staff, the interviews show that with many new projects and contacts for additional work there is still ample need for skills and capacity. Some managers emphasise a need for competence related to:

- Research methods, i.e. how to collect data, how to assess when you have sufficient data to make a judgement,
- Renewable energy and its use for district heating.

As underlined above, it is very important that the recruitment process proposed under CIFI takes into account:

- Staff have to be prepared and have the background to work in an environment where most of the colleagues are very ambitious and dedicated researchers,
- Staff must have the capacity to conduct research on their own or be able to learn this quickly,
- Staff should have the capacity to manage projects or be able to learn this quickly,
- Staff have to be interested and willing to work in a dynamic working environment with frequent changes and heavy workloads at times.

As illustrated below, staff identified a number of important strengths, which again were similar across the departments.



The Strengths of CNREC can be summarised as:

- **Meaning.** Despite the heavy workload and the fact that staff want more information on the objectives and direction of CNREC, they underline that the meaning and importance of the subject matters is a very important motivating factor for them. The discussions show that the employees are very committed to the aim of achieving environmental sustainability through greater inclusion of renewable energy. Staff find they contribute to an overall target of China of achieving more balanced environmental management.
- **Team work.** Although staff complain about the heavy workload, they also find that the work teams in the departments are very strong. They point out that senior staff are always willing to help and colleagues will also step in and support if one colleague has a particularly challenging task or tough deadline. In this way, almost all staff highlight the positive atmosphere in CNREC.
- **Professional challenges.** In the survey some staff complained that they did not feel professionally challenged. However, during the recent workshops staff stressed that there is ample space for obtaining challenging and professionally interesting assignments in CNREC. The impression is that CNREC is an organization with a relatively high delegation of responsibility. Staff who show good performance and are willing to take on new and more comprehensive tasks generally get the opportunity, although the allocation of tasks could be done more systematically and the above mentioned management meetings could contribute to this.
- **Dynamic Environment.** Several staff emphasize that they like the dynamic atmosphere of CNREC, mentioning friends who work for organizations where the workday is marked by inertia and changes are few. Staff in CNREC emphasize that the dynamic work climate leads to job satisfaction.
- **International relations.** Employees also say that they see international professional relations and cooperation as an important value added to the job. The Centre provides many opportunities to work with foreign nationals and to be exposed to new concepts and approaches. Many staff also get the opportunity to travel. Staff underline that the international profile and exposure is a strong motivating factor.



Staff from the Policy and Industry Department discuss strengths and weaknesses. Interviews and surveys underline that staff would like to understand better the strategy of CNREC and their role in achieving the objectives. Workshops in November 2014 showed that the overall importance of renewable energy is a key motivating factor. Staff from left to right are: Researcher Yuan Jingting, Researcher Yang Shaonan, Researcher Zhang Chengqiang, Researcher Wang Hongfang

Despite the challenges mentioned above, the strengths identified illustrate that CNREC has a strong basis of committed staff with a constructive attitude to their work and colleagues, an attitude which can be further developed in the coming consolidation phase of CNREC.

## 6.5 Overall Assessment and Lessons Learned

Given the focus on capacity development, it may have been effective from the start of the programme to give higher priority to systematic capacity development. This could have entailed for example designing training courses to educate CNREC staff and plans for systematic knowledge exchange between DEA and CNREC.

The approach of the RED programme has been to define outputs - in terms of renewable energy technology and policy research and subsequently cooperating and coaching to elaborate the research outputs. This has been possible partly because senior CRED staff have acted as mentors to junior staff. DEA specialist have also taken a constructive approach to capacity development.

Another important factor behind the successful capacity development is the work and role of the Chief Adviser. The Chief Adviser has taken a key role in facilitating the cooperation between DEA and CNREC – and other international organisations - representing very different working culture and approach. The Chief Adviser has been responsible for facilitating difficult processes and dialogues. Moreover the Chief Adviser in the CNREC management team has exemplified a modern management approach with a high degree of delegation and participation. The role of the Chief Adviser has been important to support the capacity development process at CNREC.

The M&E team also finds that capacity and human resource development gradually has been given more attention in CNREC and a number of important human resource issues have been addressed skilfully by the Administration Department and the director dedicated to this area. Never the less a more systematic capacity development approach from the start of the project may have led to better motivated and more effective staff.

It is important that the new initiatives taken to strengthen human resource managed are backed up and implemented with the support of directors and heads of departments in CNREC, these measures include several integral measures:

- Contracts making employment conditions clear and realistic in relation to the position;
- Clear job descriptions lined to the strategy and performance objectives;
- Performance management and appraisal system;
- Performance related salary system;
- Designated capacity development and training for example through close cooperation with senior CNREC, DEA, NREL or GIZ staff;
- Study tours as relevant.

It is important that CNREC holds sufficient managerial capacity to lead the human resource management tasks and focus in the future. With the CIFF support it will be relevant for CNREC to give more attention to capacity and human resource development.

## **7 FINANCE**

### **7.1 Financial Management of RED Programme**

Financially the RED continued to be managed as a Danida funded programme, the Administration Department of CNREC managed the budget for project activities while salaries for RED contracted staff were paid through ERI, JIKE (which is the wing of ERI dealing with consultancies and external contracts) and CITCD. The table overleaf gives an overview of disbursements made by the Danish Embassy till December 2014.

Disbursements for the RED programme by the Danish Embassy December 2014<sup>16</sup>

Description used RDE accounts system	Budget line	Original budget	Annual disbursements in DKK					Total end 2013	08-12-2014	Total as of 08/12/2014	Remaining DKK	Remaining in %
			2009	2010	2011	2012	2013					
<b>RED Component 1</b>	<b>2110606</b>	<b>44.400.000</b>	<b>5.301.570</b>	<b>1.150.000</b>	<b>9.854.591</b>	<b>6.680.960</b>	<b>11.517.340</b>	<b>34.504.461</b>	<b>9.880.485</b>	<b>44.384.946</b>	<b>15.054</b>	<b>0%</b>
Component 1	211060610		5.301.570	1.150.000	9.854.591	6.680.960	11.517.340	34.504.461	9.880.485	44.384.946		
<b>RED Programme component 2</b>	<b>2110607</b>	<b>34.900.000</b>	<b>-</b>	<b>-</b>	<b>602.000</b>	<b>1.641.595</b>	<b>8.785.660</b>	<b>11.029.255</b>	<b>5.480.581</b>	<b>16.509.836</b>	<b>18.390.164</b>	<b>53%</b>
frame budget for component 2	211060720		-		602.000	1.641.595	8.785.660	11.029.255	5.480.581	16.509.836		
<b>RED programme administrative frame</b>	<b>2110608</b>	<b>8.600.000</b>	<b>2.533.951</b>	<b>1.750.000</b>	<b>1.317.025</b>	<b>1.574.800</b>	<b>1.045.481</b>	<b>8.221.256</b>	<b>413.936</b>	<b>8.635.192</b>	<b>(35.192)</b>	<b>0%</b>
programme administrative frame	211060830		2.533.951	1.750.000	1.317.025	1.574.800	1.045.481	8.221.256	413.936	8.635.192		
<b>RED programme international advisor</b>	<b>2110609</b>	<b>5.300.000</b>	<b>494.751</b>	<b>1.058.559</b>	<b>945.631</b>	<b>956.891</b>	<b>961.691</b>	<b>4.417.524</b>	<b>888.297</b>	<b>5.305.821</b>	<b>(5.821)</b>	<b>0%</b>
House rent and salary	211060901		494.095	1.058.559	920.482	956.512	961.691	4.391.339	175.414	4.566.753		
other reimbursement	211060902		656		25.150	379		26.185		26.185		
<b>RED programme monitoring review</b>	<b>2110610</b>	<b>2.300.000</b>	<b>-</b>	<b>329.182</b>	<b>49.898</b>	<b>1.410.577</b>	<b>249.467</b>	<b>2.039.124</b>	<b>501.999</b>	<b>2.541.123</b>	<b>(241.123)</b>	<b>-10%</b>
RED programme monitoring review	211061050			329.182				329.182		329.182		
second review of RED contract1	211061051				49.898	106.924		156.822		156.822		
second review of RED contract2	211061052					231.694		231.694		231.694		
second review of RED contract3	211061053					1.071.959	249.467	1.321.426	501.999	1.823.425		
<b>RED Programme unallocated fund</b>	<b>2110611</b>	<b>3.500.000</b>	<b>75.406</b>	<b>-</b>	<b>33.768</b>	<b>-</b>	<b>-</b>	<b>109.174</b>	<b>-</b>	<b>109.174</b>	<b>3.390.826</b>	<b>97%</b>
RED Programme unallocated fund	211061140				33.768			33.768		33.768		
currency exchange	211061175		75.406					75.406		75.406		
<b>Contingencies</b>		<b>1.000.000</b>									<b>1.000.000</b>	<b>100%</b>
<b>Grand total</b>		<b>100.000.000</b>	<b>8.330.272</b>	<b>4.287.741</b>	<b>12.769.146</b>	<b>12.264.822</b>	<b>22.559.638</b>	<b>60.320.793</b>	<b>17.165.298</b>	<b>77.486.091</b>	<b>22.513.909</b>	<b>23%</b>

<sup>16</sup> Source financial overviews provided by the Danish Embassy in Beijing



During the first years of RED, the programme was underspending. The problems on cooperation meant that planned projects were not launched and the level of activities were lower than planned. It should be noted that the disbursement system only shows the expenses after a certain time. It is clear that the expense level increased after the launch of CNREC and establishment of a stronger management structure.

Financially CNREC under Component 1 was implemented ahead of time, while other initiatives were lagging behind, this led to the decision of extension of the Programme by one year. The extension meant that although Component 2 started late, most of the projects were implemented before programme completion. The funds which have not been disbursed – as of December 2014 - are mainly dedicated to the Component 2 projects which will be completed in the coming months.

In the RED programme document the budget was structured according to the programme outputs, but these became less relevant when CNREC was established and new projects such as for example the scenario study and the work on modelling was launched. The M&E team has not followed the finance management in details, but notes that systems recognised in China and internationally for financial control have been applied and adhered to. On the Chinese side Financial control has been exerted by CICETE.

It is not possible to make a detailed assessment of the cost efficiency of the RED programme. The main cost items have been salaries and consultancies. Generally relevant measures using competition have been applied to obtain consultancy services at reasonable prices. Likewise salaries have been at the levels of Chinese or international norms, and gradually CNRECs salaries and projects have changed to become funded by the Chinese Government and other clients. In comparison to the outcomes achieved the M&E Team assess the programme to be cost efficient.

## **7.2 Financial Sustainability and Revenue Generation**

The Business Plan of CNREC set the aim for CNREC to gradually become financially self-sustainable. The assessment of the financial performance of CNREC is constrained by the lack of a comprehensive financial management system. The RED programme has a separate financial management system with detailed budget and accounts – however RED funding is now integrated in the CNREC budget as one of several financing agencies. The M&E team has tried to establish an overview over incomes and expenses for CNREC.

The budget illustrated below shows expenses of CNREC, the remain at a stable level as only few staff have been recruited and the Chinese Government continues to subsidise the rent. The last item is expenses for projects such as consultants assisting with studies. This budget item may have been relatively high due to the high number of activities supported by RED. However it is expected that CNREC will continue to have a high level of project activities in the future.

The **general budget** below presents the main expenses of CNREC.

<b>CNREC-Annual accounts estimate, Mio. RMB</b>			
Expense Type	2013	2014	2015
Salaries	7,7	8,5	9,5
Operational expenses	4,5	4,5	4,5
Project Expenses (RED funded till 2014 only - estimate for 2015)	17,15	13,7	15
<b>Total</b>	<b>29,35</b>	<b>26,7</b>	<b>29</b>

Source: CNREC Administration Department.

The business plan proposed that Government support would be relatively high in the early phase and decrease to a permanent level of approximately 30% of the CNREC budget. The Government of China is currently providing core funding through payment of the salaries for ERI staff working for CNREC, moreover Government funds offices and some operational expenses. This is estimated at a value of RMB Mio. 3.5 per year. The RED Programme has been supporting CNREC with approximately 12 Mio RMB over the last three years, mainly covering salaries and expenses for projects.

Overall management emphasizes that there is plenty of demand for renewable energy research, it is also not necessary to have an acquisition strategy, because client come to CNREC and ask for assignments to be done. The difficulty – according to management - is to fulfil the demand. The tendency, which was noted in March 2014 of gradually gaining more contracts from central Government Agencies, Industry and international agencies - is continuing. The number of new financial contracts with is lower, related to a pause in CRESP new energy cities

The M&E Team has reviewed the list of projects prepared by CNREC and enclosed in the Monitoring Framework, moreover we have communicated with Heads of Departments to get information about the value of ongoing contracts in 2014 and new contracts signed for 2014. The overview of income from these projects is presented below.

<b>Client</b>	<b>RMB</b>
US Energy Foundation	5.842.500,00
NDRC	1.510.000,00
MOF	450.000,00
NEA	400.000,00
Provinces	1.560.000,00
IISD	290.000,00
Private Enterprises	2.000.000,00
ASDB	615.000,00
CRESP	1.604.350,50
EC 2	1.135.290,00
China Development Bank	451.000,00
<b>Total</b>	<b>15.858.140,50</b>

The overview has to be read with reservations, some projects have been agreed with a time horizon of several years, and the funding covering 2014 is an estimate by the M&E team. It should be noted that information on income from several projects was not available. In some cases this might be projects, requested by Government agencies, without a budget allocated, but in some cases project incomes may have been left out - as financial overview was not the prime purpose of the project list. Generally CNREC underlined that the tendency of particularly NEA to request support without funding – has decreased, because NEA has been equipped with additional staffing resources.

The important finding is that CNREC is capable of generating enough income to support its own operations and is very successful in terms of generating revenue. It should be noted that with the present system is not able to retain the funding earned, part of the funding may be retained in ERI and part has to be allocated to the Central Government.

In addition to the core funding to an approximate value of RMB 3.5 Mio of Government is funding projects through NEA, NDRC and Ministry of Finance (MoF) amounting to RMB 2,36, totalling RMB 5,86 Mio. With an expense budget around RMB 30 Mio, the Government funding level is around 20% of the budget.

CNREC has also been able to fulfil the target of the Business Plan of widening the scope of clients. The clients in 2014 comprise:

- NDRC
- NEA
- New Energy Cities Project, through CRESP
- WB through CRESP
- Provincial Governments and cities e.g. Alashan, Jiangxi, Shuanshi and Guangzhou
- Private enterprises, with for example The Three Gorges Corporation as client on a major project.

In addition to the traditional funding CIFF now makes a major contribution to the financing of CNREC, contributing to USD 2,5 Mio annually over the coming five year period. Moreover from October 2014 GIZ has initiated a project to support CNREC with four people working in CNREC and comprising funding for study tours. Overall the financial outlook for CNREC is very positive.

## **8 CNREC'S STRATEGY**

### **8.1 The Future Focus of CNREC**

CNREC's strategy was discussed at the management workshop in November. The M&E Team supports the strategic orientation proposed. It is recommended that the Centre emphasize contact with key stakeholders in the electricity sector, provinces, industry or research organizations. Focus should be on being very open to new initiatives and encompassing new developments and challenges in relation to the development of renewable energy solutions. CNREC should be able to take the lead in RE innovation, development of the electricity market mechanism, integration of renewable energy in the energy systems and modelling of the energy system. It will require close cooperation with more stakeholders and institutions.

This approach is one way to focus the work of CNREC. CNREC should proactively lead the discussions, not just collect information about what others do. The approach would require additional specialized personnel resources for CNREC

A different emphasis may be to take advantage of the ability of CNREC to present a general overview of many technologies and to combine knowledge from one area with other areas. The task of CNREC would be to create overview and put developments into a context. This is important for the overall sector overview and for policies which can create coherence in the overall renewable energy policy.

The CIFF Programme is decisive for the development and strategy of CNREC.

The objective of the CIFF Programme is:

*"to provide technical assistance to CNREC and other Chinese energy system stakeholders to enable them to articulate a transformative power sector future, with the ambition of assisting China to implement a low carbon strategy for the Chinese energy system with a high share of renewable energy, energy efficiency, and low coal consumption".*

Based on an assessment of the most urgent needs, four main thematic areas of the CIFF Programme are:

**1. Comprehensive Energy Scenarios for a Beautiful China**

Preparation of *comprehensive energy system scenarios*, documenting the technical, economic and institutional feasibility of low carbon solutions for China with a high share of RE.

**2. RE-friendly Grid Development**

Research and analysis to provide credible, objective, and technically sound *low carbon and RE-friendly grid development strategic options for China*.

**3. Power System Flexibility**

Research to advance *power system flexibility in China* as a means for successful integration of increasing amounts of renewable energy.

**4. Boosting Distributed Generation of Renewable Energies**

Documentation of policy, regulatory, and technical advancements that would enable greater development of *distributed RE generation*.

CNREC will have the main responsibility for carrying out the work. NREL will provide technical assistance to, and carry out research in support of, the four thematic areas.

The present Danish Chief adviser will continue as special adviser on the Programme and part of the CNREC management team, moreover the modelling adviser working on the RED Programme will continue as adviser to CNREC on a full-time basis.

The CIFF programme also plans to prioritise capacity development, this will be done by developing the job descriptions and requirements to more effectively reflect the overall CNREC objectives. In addition the CIFF programme plans to schedule travel and allocation of staff to projects and activities with due regard to career planning and individual competency development.

The communications element is an important part of the CIFF programme, and the aim will be integrate the role of REIAC in the communications strategy to be developed.

The M&E team finds the CIFF programme is a very rational and relevant continuation of the RED Programme. The programme represents a logical development of CNREC's focus towards the development of the electricity system and grid development to encompass renewable energy. The programme also appear to aim to address some of the institutional and political economy issues which is apparently constraining the progress of renewable energy today. CIFF appears to continue the constructive approach of the scenario study of letting the vision guide the research.



Management Strategy Seminar in CNREC. Discussing the focus of the Centre and what a broader perspective and relations to all stakeholder imply for the approach of the Centre. From left Head of Industry Department, Hu Runqing, Assistant Director Zhao Yongqiang and Counsellor at the RDE Christian van Maarschalkerweerd.

It is important that DEA and the Danish embassy continue the substantial involvement in CNREC to secure the continued close cooperation between the renewable energy organisations and enterprises in Denmark and China. The task for the new phase is to broaden the cooperation to a wider range of relevant Danish actors in the renewable energy field – including private enterprises, NGOs and research institutions.

In addition to, CNREC will continue its wide range of projects with agencies in the Government and the public and private sector in China.

The organizational set-up and planned inputs and results for the new phase appear relevant and effective in order to ensure that CNREC continues as a high performance think tank on renewable energy in China and internationally.

One concern needs to be raised. With the CIFF funding, this programme may have a dominant role in CNREC. It is important to take into account that the strengths of CNREC very much originates from constructive engagement of the former CRED managers and staff as well as staff employed by RED. It is important that the different staff groups and their strengths continue to play a key role. The optimal solutions to the challenges to renewable energy in China are most likely to be developed by integration Chinese and international knowledge and skills.

## **9 CONCLUSIONS, LESSONS LEARNED AND RECOMMENDATIONS**

### **9.1 Conclusions**

Below the M&E team summarises the conclusions from the perspective of the start of CNREC in 2012 to the nearing of completion of the RED Programme.

#### **Relevance**

The relevance of the RED Programme is high. It is clear that the Programme matched a need and a political and strategic priority in China.

The programme was able to work with partners who were open to change and willing to try to influence energy policies at the highest levels in China. Working with ERI, CNREC found a partner who engaged professionals with the professional capacity and spirit of innovation that was necessary to make a substantial impact on China's energy policies.

The Programme was blessed with the willingness of both China and Denmark to invest political time and attention in the Programme. The Programme has been involved in more than ten high level political visits by ministers to China and Denmark. This combination of political interaction with cooperation on policy research meant that a dynamic programme evolved, which in many respects performed beyond expectations.

The cooperation between DEA and CNREC was relevant because it supported the important link between the political and operational level. A combination of political and technical cooperation has proven relevant and effective.

#### **Effectiveness**

The RED Programme had difficulties in the early phase due to unclear expectations and communications and in this phase the project was not effective.

The RED Programme had a troubled start in 2009. This was due to differences in expectations and cooperation problems between the main parties responsible for the programme.

Three factors contributed to the turnaround of the programme. Firstly, a critical review mission in November 2010 gave very critical feedback on the programme performance and demanded constructive and concerted action from the parties involved. As a result of this a joint Chinese-Danish taskforce was appointed to develop a feasibility and business plan in close cooperation with CNREC management and stakeholders. The feasibility study and the business plan constituted a documentary foundation and guidance for the creation of the China National Renewable Energy Centre (CNREC).

Lastly – but perhaps most importantly - the Chinese Government through the National Energy Agency (NEA) in February 2012 endorsed the legal recognition of CNREC and approving the mandate and organizational set up proposed in the business plan.

When the programme had regained momentum, results were achieved. The main outcome is the establishment of CNREC, which is a major contribution to capacity development within renewable energy policy research in China. The Centre has gained a role and reputation as a being dynamic, professional, respected and nationally and internationally recognised think tank in the field of renewable energy.

Major outputs that led to outcomes and impacts include:

- The scenario study contributing to creating a vision and setting milestones and benchmarks for a future Chinese economy based on renewable energy;
- The Roadmaps on wind, solar and biomass setting targets for the specific renewable energy types;
- Emphasis on renewable energy for district heating bringing a new energy and effective use;
- Addressing the issue of curtailment of wind energy;
- Strong support to increase of the share of renewable energy production at the provincial level;
- Getting political attention to the need for an energy market, and integrated grid and a more flexible energy and electricity system – as well as creating political understanding of measures to address this need.

Due to the delay, Component 2 had to be implemented in a short time frame. The projects represent important technological advances in fields of strategic and technical importance, but it is disappointing that only few of the business partnerships will survive.

### **Impact and Outcomes**

Through the Scenario Study and the modelling tools, the RED Programme contributed to changing Chinese energy policies towards increasing the share of renewable energy, which again will lead to substantial CO<sub>2</sub> reductions.

The programme contributed to giving China a stronger role as a promoter and practitioner within renewable energy, which will strengthen the role of renewable energy internationally.

The CNREC itself represents a major force in the Chinese energy sector which will continue to influence Chinese energy policies towards increased application of renewable energy.

### **Cost efficiency**

The cost efficiency has been good, but the slow start-up phase meant in the early phase - resources were not utilised to their full potential

The involvement of DEA may have been relatively costly, because it took time for CNREC to get ready to absorb such a massive support.

The Component 2 seems relatively costly in view of the apparently limited number of viable business partnerships created. However a wide range of innovative business associations have been created. In some of these associations and enterprises continue in a longer term perspective, the investment may prove to have been cost efficient.

## Sustainability

The agreement with CIFF to fund a five-year extension of the RED Programme is a major achievement which will secure the sustainability of CNREC.

In parallel, the sustainability of CNREC is supported by funding from Government and a wide range of other sources, indicating that a viable professional organisation has been created.

In itself the programme has contributed to environmental sustainability internationally by contributing to cutting CO2 emissions from China.

If Component 2 enterprises across China and Denmark would be able to continue and grow this would strengthen sustainability.

### 9.2 Lessons Learned

The M&E team proposes that the following lessons may be learned from the RED Programme:

- When the programme experience problems in the early phase it was important that they were clearly identified, and addressed quickly;
- The long term commitment from Denmark was essential – starting already a decade ago with the Wind Energy Development Programme. This has given the time to develop feasible strategies and build relations between people and organisations;
- The shared commitment to RE and climate of the political and research environment in China and Denmark has been a strong driver for change; peer cooperation has shown to be a forceful engine for development of research results;
- A visionary strategic focus on more specific time bound targets for increase of renewable energy in combination with an broad energy market focus served as an important strategic development of the RED programme and CNREC;
- A dynamic combination of policy relations and technical cooperation has been a strong catalyst for the programme to achieve its outcome; researchers have been motivated by political leaders and vice versa;
- The commitment of the Chinese Government to the RED programme and CNREC has been decisive for its success. The Chinese Government contributed through pertinent support from major actors in Chinese energy policies in particular ERI, NEA and NDRC; moreover the Chinese Government through the support to the Programme demonstrated staunch support to the international cooperation on renewable energy;
- The success of CNREC was also achieved through a strong and visionary leadership of CNREC as well as dedicated and capable programme management. The commitment and dedication of a range of senior managers and researchers was also decisive for the positive outcomes of CNREC.



- A chief adviser with a strong professional background in renewable energy as well as ample experience with modern management has been important. It was also important that the chief adviser held a network of contacts in Denmark enabling facilitations of contacts to the renewable energy;
- The flexibility and involvement of the Embassy and energy expertise at the Embassy has been important; on many occasions there has been a need to modify approaches and the Embassy has been effective in supporting necessary changes, the appointment of a specialised energy adviser was important for the process of the RED programme performance towards the objectives;
- The use of the M&E team to focus on internal organizational processes and capacity development in a real time evaluation approach was relevant. Initially CNREC management felt that the M&E process required quite substantial use of management and staffing resources. However management claim that they find the M&E Process useful, because an independent team was able to assist in raising important issues and make sure they are addressed up front. The long term engagement of the M&E has been useful because it has enabled the team to get to know the programme and the people involved and thus engage in a more confident discussion on performance.
- Capacity development does not appear to have been handled in an entirely systematic manner, for example it took some time before working partners were selected to work with DEA specialist, and the staff survey did not reflect a systematic approach to engaging staff in international activities.
- Development of business enterprises across China and Denmark is likely to require more than a two year time frame.

### 9.3 Recommendations

1. Revise the Business Plan & Strategy to establish consensus on the way forward otherwise there is a risk that with continuous “project mushrooming”, CNREC cannot continue to be effective. It is recommended that the strategy be made public as an important advocacy tool for CNREC and renewable energy in a broader sense,
2. The CVIG and groups on renewable energy and district heating are important initiatives. In line with this, networking & stakeholder management are key priority for CNREC. Stakeholder management and external communication should be guided by the strategic planning of CNREC.
3. The CNREC should make more effective use of REIAC as a source for modelling and research data, and researchers should be obliged to feed data into the shared database. This should be combined with installation of a robust “intranet” enabling staff at CNREC to have shared access to data on ongoing projects managed by CNREC and also to share information on professional and social activities in the centre.

4. Quality Assurance should be strengthened to ensure that CNREC maintains a high quality and professional standard. It is proposed that CNREC may use the ERI quality assurance system, or alternatively introduces a simple system by which all official documents to external clients and partners are checked by a senior staff member before they are submitted. In a longer term perspective it is recommended that CNREC considers introducing a quality assurance system which is recognised in China and internationally.
5. The overall management structure of CNREC should be strengthened, this may be done by conduct of regular management meetings for example every two weeks where management has the opportunity to discuss challenges and important new projects. The CIFF programme is already proposing additional focus on leadership and this is highly recommended. It is important to the motivation of staff that the relevant outcomes of management meetings are communicated – so that staff aware of upcoming demanding events for the Centre – and their role in such events.
6. Project management and departmental leadership roles should be strengthened – competences in communication, management of work processes, delegation and motivation should be strengthened. It is positive that CIFF proposes to allocate resources to serve this purpose. Leadership and project management skills may be developed through attendance to management training in China and abroad, but also through on ongoing discussions between management colleagues on human resource issues and how to tackle them.
7. CNREC may consider – again – introducing a project management system inspired by Western models. The advantage is that overview is created on ongoing work, resources allocated and outputs produced. It may be considered to examine whether the ERI project management system may be applied more broadly and combined with an electronic data base on ongoing projects. Project management systems from other comparable organisations could also be examined to see if they can effectively be applied in CNREC
8. CIFF proposes to work with systematic capacity development and recruitment in order to keep CNREC at the forefront of RE policy research, and this is highly recommended. It is proposed that the strategy of CNREC is used as a framework to set objectives for staff performance. Job descriptions – like wise – should reflect the strategic objectives and be used to direct training and capacity development activities for staff.
9. Career planning for staff should be done systematically to use resources effectively and motivate staff. It is proposed that the career system is inspired by the ERI to secure coherence in the performance management between the ERI and contract staff at CNREC. The career system at CNREC may also be inspired by European systems, which typically reflect technical and managerial capacities, with the ability to perform as project manager as a recognised step forward in the career. Career planning may include allocating staff to training or study tours according to their path of career and area of specialisation.

10. It is proposed to develop a twinning and training partnership between Denmark and China, the purpose would be to continue and further expand the strong relationship and strengthen joint efforts on promotion of renewable energy internationally. The purpose would also be to strengthen the capacities and competences of Chinese and Danish specialists. The capacity development would take partly through on-the-job training in major organisations in the renewable energy sector, this could be for example State Grid or the Wind Energy Association in China, in Denmark organisation participating may include Energinet.dk, Vestas or Dong Energy. The idea would be to continue the joint learning and innovation initiated in CNREC.
11. To render the investments in the Component 2 Projects more valuable, DEA and CNREC may consider . CNREC, DEA and the RDE may consider supporting strategic projects in applying for funding for continued research and cooperation.
12. The recruitment of new staff to CNREC should be handled systematically with due regard to the performance objectives set by the CIFF programme and CNREC more generally. It is important that communications on the new jobs try to attract senior as well as junior professionals. It is moreover important that job descriptions and performance requirements have been considered in some detail to make sure that recruited staff are able to handle research and work in a demanding and dynamic environment.
13. In the new phase, where CIFF will have a dominant role it is important to continue to pay attention to the skills and capacities that have produced the results that CNREC has achieved. It is important that modern and innovative approaches to promote are developed through interaction of Chinese and international knowledge, skills and ideas.

## 10 ANNEX 1, TERMS OF REFERENCE FOR FINAL M&E MISISON

### Terms of Reference (ToR)

#### **Monitoring and Evaluation (M&E) and Capacity Development Mission to China National Centre for New and Renewable Energy (CNREC) 27<sup>th</sup> October to 5<sup>th</sup> November 2014**

#### **Overall Objective of M&E and Capacity Development.**

According to Programme ToR: "The programme management incl. the Programme Steering Committee (PSC), the Embassy of Denmark and the management of CNREC assisted in monitoring of the Renewable Energy Development (RED) programme and organisational strengthening of CNREC - addressing management approaches, institutional strengthening, capacity building and human resource development well as strategic aspects enabling the PSC, CNREC and programme management to learn from the experiences of the programme and establish CNREC effectively in accordance with the programme implementation strategy".

#### **Background:**

The M&E work has sought to combine monitoring, evaluation and capacity development using a real time evaluation and capacity development approach, learning and adjusting performance based on joint monitoring. With CNREC management a monitoring and intervention framework has been developed with reference to the change theory and intervention framework for the RED Programme, adapter for the Business Plan for CNREC. Based on discussions and feedback on performance during five missions to CNREC, the team has made recommendations and supported implementation of measures to strengthen capacity, improve performance, stakeholder relations and financial management.

These ToR cover the final mission before completion of the RED Programme.

#### **Purpose of the Mission:**

The overall purpose of the mission is:

With CNREC analysing and documenting the performance of the programme since the start of CNREC in 2012, with main focus on most recent results. Based on the analysis the mission shall identify lessons learned and best practices and discuss the strategic direction of CNREC in the future to maintain the overall objective of increased reliance on renewable energy in China - through strengthening CNREC as a financially and professionally sustainable and independent Think Tank, while maintaining close strategic cooperation with the Danish Government and public and private enterprises and research organisations in Denmark.

#### **Focus:**

The M&E Team will cooperate closely with the evaluation mission analysing CNREC performance in relation to external stakeholders and power sector reform in China and giving recommendations on the way forward for CNREC. The M&E team will focus on aspects relating to the organisation and capacity of CNREC whereas the evaluation mission will focus on the role of CNREC in relation to external stakeholders and power sector reform.

The two missions will prepare reports which complement each other.

**Tasks:**

Based on the intervention and monitoring framework agreed with CNREC, previous reports and the cooperation process the M&E team will cooperate with CNREC on:

- Analysing the performance of CNREC since the start of the programme, with main emphasis on performance since the last mission, covering:
  - Organisational structure,
  - Capacity development,
  - Human resource management,
  - Technical and professional performance,
  - The Chinese and international project portfolio,
  - Financial Management,
  - Stakeholder relations and communications;
- Assessing the cooperation with the Danish Energy Agency (DEA) and the Danish Ministry for Climate, Energy and Building (MCEB) and its contribution to the achievement of the programme objectives;
- Assessing the performance of Component II and its contribution to the achievement of the programme objectives;
- Based on the analysis and assessment discuss and identify with CNREC management and staff, - lessons learned, best practices and challenges to optimal performance;
- Based on the analysis discuss the strategic priorities of CNREC to continue the strengthening of the organization towards greater impact on energy policy in China and internationally in parallel with proactive professional development and job satisfaction;
- Make recommendations to support the strengthening of CNREC in the future terms of:
  - Organisational structure,
  - Capacity development,
  - Human resource management,
  - Technical and professional performance,
  - The Chinese and international project portfolio,
  - Financial Management,
  - Stakeholder relations and communications,
  - Cooperation with DEA, MCEB and relevant public and private sector energy organizations to maintain the cooperation between Denmark and China to promote renewable energy internationally.

**Method of work:**

The M&E Team will carry out the following tasks:

- Interviews and meetings with all Heads of Departments to discuss progress and plans, this will include follow up on indicators and new initiatives related to the performance monitoring framework and theory of change for the programme;
- Management workshop with Directors and Heads of Departments to discuss performance and the way forward;
- Interviews with Members of the PSC to discuss CNREC performance and how the Chinese-Danish Cooperation may continue;
- Discussion with the Head of the Administration Department and the Assistant Director on Administration - to assess the human resource management system implemented in CNREC as well as the budget and financial management system and resources of CNREC;
- Discussions with the Danish Embassy on programme performance and continued cooperation with CNREC and the renewable energy sector more broadly;
- Discussions with the Danish Energy Agency on continued cooperation;
- As possible and relevant - meeting with one or two external stakeholders in Beijing to discuss performance and continued cooperation;
- As possible and relevant - meeting with one or two Danish partners involved in Component II of the programme to assess the performance and discuss continued cooperation with the Chinese partner.

**Outcomes:**

A final Monitoring and Evaluation Report presenting the findings, analysis, discussion and recommendations on strategic direction – covering the tasks listed above.

The report will be completed in close cooperation with the evaluation expert on external stakeholders and power sector reform to make sure that the research and reporting from the two missions complement each other.

**Reporting:**

The M&E team reports to Counsellor Christian van Maarschalkerweerd, at the Royal Danish Embassy to China.

At CNREC the Consultant will report to Director of the Administration Department Mr. Tu Liang and as Necessary to Deputy Director General Ren Dong Ming and Deputy Director – Manager of the RED Programme, Mr. Gao Hu.

Mette Visti & Christine Ruud Wennerberg, 8. October 2014

## 11 ANNEX 2, LIST OF DOCUMENTS CONSULTED

Boosting Renewable Energy, Power Point Presentation on the five year project, CNREC, NREL & DEA Sponsored by Children's Investment Fund Foundation, (CIFF), Power Point Presentation November 2011

Final Programme Document - Renewable Energy Development (RED) Programme, China (2009 – 2013), 22 September 2008

RED Programme Progress Report for the Period from June 2013 to January 2014

1<sup>st</sup> Programme Review Danish-Chinese Renewable Energy Development (RED) Programme 2009 – 2013 - Review Aide Memoire (RAM); 5 November 2010.

2<sup>nd</sup> Programme Review Danish-Chinese Renewable Energy Development (RED) Programme 2009 – 2013 - Review Aide Memoire (RAM); 14 November 2011.

C2 Mid Term Project Report, Demonstration Program on Efficient Solar-Geo Hybrid Heating and Cooling, February 2013 – October 2014, Beijing Kike New Energy Technology Development Company, Danish Management Group A7S, Shandong Auhua New Energy Co. Lit. & Shanghai Jiaotong University.

Children's Investment Fund Foundation, Programme for Cooperation with CNREC, October 2014

China National Renewable Energy Centre (CNREC), Business Plan for Approval, 17-08-2011

China National Renewable Energy Centre (CNREC), Feasibility Study, 15-08-2011

Climate Change 2007: Synthesis Report, Summary for Policy Makers, IPPC 2007, [https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf)

CNREC List of Ongoing Projects, prepared by CNREC for NEA March 2014

CNREC 2013, Activities with China National Renewable Energy Centre, March 2014

CNREC 2015-2019 Outlook, CNREC March 2014

CNREC & DEA, Work Report 2013, February 2013

DEA, Opgørelse af effekter ad LCTU og Kina arbejdet, Juni 2013 (*Considerations of the Effect of the work of the LCTU and in China*)

DEA Work Plan 2014, 19.02.2014

Development of Transmission Grid from a European And Danish Perspective, November 2014, by Morten Pindstrup, Energinet.dk

Electricity Market Development, The current set up and future challenges of the Danish electricity market, Workshop presentation by Martin Schrøder, Energinet.DK

GIZ, Financing Agreement between GIZ and Energy Research Institute (ERI) and NDRC on Project on Renewable Energies, September 2014

License for the Approval of the National Renewable Energy Centre supported by the Energy Research Institute and the National Development and Reform Commission, issued by the National Energy Agency. 15 November 2011

Lov om Internationalt Udviklings samarbejde, Folketinget, 11. april 2012, ( Law on Danish Development Cooperation, June 2012) [http://um.dk/da/~media/UM/Danish-site/Documents/Danida/Nyheder\\_Danida/2011/Lovforslag%20om%20internationalt%20udviklingssamarbejde.ashx](http://um.dk/da/~media/UM/Danish-site/Documents/Danida/Nyheder_Danida/2011/Lovforslag%20om%20internationalt%20udviklingssamarbejde.ashx)

Max Weber, Wirtschaft und Gesellschaft, J.C.B Mohr, Tübingen 1980  
Ole Winckler Andersen, Some Thoughts on Development Evaluation Processes, IDS Bulletin 3. November 2014

Monitoring and management support to the Renewable energy Development (RED) Programme and china national renewable energy Centre (CNREC) Final December 2012 VOLUME I – III, The report was the Inception Report on M&E, which was postponed as the M&E team was working with reporting, planning and capacity development support in parallel.

OECD DAC: Glossary of Key Terms in Evaluation and Results Based Management, 基于在评价关键术语和结果术语管理, <http://www.oecd.org/development/peer-reviews/18074294.pdf>

Progress Report for the Period from February 2014 to September 2014, CNREC, October 2014

Progress Report on C2 Project, Regional Renewable Energy Hating Supply Project, 2013.11 to 2014.4, China Renewable Engineering Institute, Energinet.dk, Datang Shanxi Renewable Power Co., Ltd.

Renewable Energy Development (RED) Programme, China 2009 – 2013, Final Programme Document, 22 September 2008, Page 17-26

Terms of Reference for China Variable Energy Integration Group, 2014



## 12 ANNEX 3, LIST OF PEOPLE CONSULTED

Deputy Director General, **Shi Lishan**, Department for New and Renewable Energy, NEA

Director General, **Han Wenke**, ERI

Director General, **Wang Zhongying**, CNREC

Counsellor, **Christian van Maarschalkerweerd**, Royal Danish Embassy, Beijing

Programme Officer, **Bei Chen**, Royal Danish Embassy, Beijing

Director, **Ren Dongming**, CNREC

Deputy Director, **Gao Hu**, CNREC

Chief Expert, **Kaare Sandholt**, CNREC

Assistant Director, **Zhao Yongqiang**, CNREC

Head of Department, **Shi Jingli**, CNREC

Head of Department, **Hu Runqing**, CNREC

Head of Department, **Fan Lijuan**, CNREC,

Head of Department, **Liu Jiandong**, CNREC

Head of Department, **Tu Liang**, CNREC

Executive Director, **Luo Zhihong**, CRESA, WB & GEF

Senior Consultant, **Yin Jingjing**, CNREC

Researcher, **Dou Kejun**, CNREC

Researcher, **Yuan Jingting**, CNREC

Researcher, **Wang Hongfang**, CNREC

Researcher, **Zhang Chengqiang**, CNREC

Researcher, **Yang Shaonan**, CNREC

Project Manager, **Hang Yu**, CNREC

Researcher, **Qin Linlin**, CNREC

Project Assistant, **Liu Quin**, CNREC

Research Associate, **Wang Wei**, CNREC

Researcher, **Chang Zhifang**, CNREC

Researcher, **Zhang Pei**, CNREC

IT Manager, **Hou Wensen**, CNREC

## 13 ANNEX 4, OVERALL MONITORING FRAMEWORK

## CNREC OVERALL OUTCOMES AND PERFORMANCE INDICATORS

Outcome	Outcome in Relation to External Stakeholders	Indicators	How to verify	Quantitative Specification	Status May 2013	Status October 2014
<b>Deliver significant policy results to the key external stakeholders</b>	<b>The Government</b>	<ol style="list-style-type: none"> <li>1. Planning, policy and strategy development support to national government</li> <li>2. Assistance with local governments for RE planning development</li> <li>3. Management and coordination support to national government regarding demonstration programs, international and regional cooperation</li> <li>4. RE Data provider to the National Bureau of Statistics</li> </ol>	<ol style="list-style-type: none"> <li>1. Support to draft the planning, policy and strategy by working together with NEA, NDRC, seminar, workshop, etc.,</li> <li>2. Suggestion of research reports and surveys, adopted</li> <li>3. Demonstration project evaluated and approved</li> <li>4. Number of high level visits organized, relevant participation, feed back on events, contacts and initiatives prepared</li> <li>5. Support to document draft and review for international affairs.</li> <li>6. Verified evidence based data available on website and in statistical yearbook</li> </ol>	<ol style="list-style-type: none"> <li>1. 3 events on RE with NEA, NDRC or similar organizations annually</li> <li>2. 3 major RE policy proposals adopted annually by GoC</li> <li>3. 2 major regional RE projects approved annually</li> <li>4. Four high level visits between China and internationally organized with good attendance &amp; positive feed back</li> <li>5. CNREC supporting establishment of international relations on RE for five key players</li> <li>6. 3 key stakeholders (RE producers, electricity producers or provincial organizations) adding RE data annually</li> </ol>	Several relevant events, examples are: <ul style="list-style-type: none"> <li>• 2050 RE Scenario Study</li> <li>• Ninxja province demonstration of RE</li> <li>• Guangzhou New Energy Planning</li> <li>• New Phase of New Energy cities planned</li> <li>• Jiangxi province RE planning</li> <li>• Global RE outlook for 2020, 30 and 50 for NDRC</li> <li>• Policy decision Support System to be developed for web site – data missing</li> <li>• Micro grid demonstration project with EF</li> </ul>	<ul style="list-style-type: none"> <li>• Several relevant events, examples are:</li> <li>• Input to 13th five year plan</li> <li>• 15% energy non fossil primary energy sources by 2015</li> <li>• CVIG stakeholder management group engaging key stakeholders in discussion of grid expansion and energy integration mechanisms</li> <li>• The “reinventing fire initiative” setting new international agendas for renewable energy</li> <li>• Studies for economic policies and initiatives to integrate renewable energy</li> <li>• New Provincial engagements with Alashan; Guangzhou, Sanshui and Jiangxi City and Provincial</li> </ul>

Outcome	Outcome in Relation to External Stakeholders	Indicators	How to verify	Quantitative Specification	Status May 2013	Status October 2014
					<ul style="list-style-type: none"> <li>• &amp; MoF New Comprehensive Energy Demonstration with several provincial governments</li> </ul>	<p>Governments</p> <ul style="list-style-type: none"> <li>• Proposal for policies on new energy tax system in support of integration of renewable energy</li> <li>• Several studies to increase Off Shore wind power expansion</li> <li>• Solar and Biomass road Maps completed</li> <li>• Research on Off grid PV systems</li> </ul>
	<b>On the public</b>	<ol style="list-style-type: none"> <li>1. Awareness and interests on RE</li> <li>2. Request to use green energy sources</li> </ol>	<ol style="list-style-type: none"> <li>1. Brochures/research reports/public incl. four annual RE Magazines and monthly newsletter</li> <li>2. Portal visit hits/ranking of the portal/CNREC web in the search tools</li> <li>3. Blogs visit hits</li> <li>4. High participation and interest in RE events where CNREC is co-organizer</li> <li>5. Media coverage of RE issues</li> </ol>	<ol style="list-style-type: none"> <li>1. Distribution of magazines and newsletter increasing by 10 % annually</li> <li>2. Dialogue initiated based on publications or newsletter</li> <li>3. Frequency and professional RE contents</li> <li>4. Participation and feed back on CNREC events</li> <li>5. 3 RE news stories covered in national media</li> </ol>	<p>Several examples including:</p> <ul style="list-style-type: none"> <li>• Cooperation with China RE society on application of solar thermal RE</li> <li>• Weekly Newsletter to be placed on the Web Site and be accessible to the public;</li> <li>• 120 people participating in Green Energy County Training</li> </ul>	<ul style="list-style-type: none"> <li>• Public events engaging large groups of citizens</li> <li>• Increasing number of hits on websites</li> <li>• Increasing Number of Subscribers to RE magazines and publication</li> </ul>
	<b>On industry</b>	<ol style="list-style-type: none"> <li>1. Wind power/biomass/solar roadmaps</li> <li>2. RE Industry</li> </ol>	<ol style="list-style-type: none"> <li>1. Requests for assistance by industry</li> <li>2. Support to companies to develop their RE</li> </ol>	<ol style="list-style-type: none"> <li>1. 5 requests for major players in RE industry annually</li> <li>2. 3 Company strategies</li> </ol>	<p>Several events examples are:</p> <ul style="list-style-type: none"> <li>• Solar Thermal industry meeting</li> </ul>	<p>Several events examples are:</p> <ul style="list-style-type: none"> <li>• Major industry</li> </ul>

Outcome	Outcome in Relation to External Stakeholders	Indicators	How to verify	Quantitative Specification	Status May 2013	Status October 2014
		expansion 3. Technological development in RE Industry	strategies 3. Successful RE projects implemented with industry 4. Support to technological development in RE 5. Support to international contacts and projects for RE industry	leading to sustainable RE use 3. Sector targets for RE use for selected industries 4. 2 technical RE innovations applied annually 5. 2 international industry projects initiated annually leading to increase in RE use	<ul style="list-style-type: none"> <li>• Evaluation of utilisation of Solar energy</li> <li>• Roadmap on biomass non liquid fuel</li> <li>• China RE technology catalogue</li> <li>• RE industry report is done by all departments</li> <li>• China Renewable Energy Magazine being upgraded and delivered to a wide range of industrial stakeholders</li> <li>• Component 2 contracts awarded and work starting</li> </ul>	project with Three Gorges Group <ul style="list-style-type: none"> <li>• New Initiative with Guoneng Biomass Group</li> <li>• Technology catalogue updated to support industry cooperation on renewable energy</li> <li>• New “Chinese Energy Enterprises going out with NEA”</li> </ul>
	<b>On the research institutions, university, etc.</b>	1. CNREC provide verified data on the RE situation in China 2. High quality recognized RE research 3. CNREC acting as	1. Publishing of annual statistical yearbook 2. RE Data bank developed and used by research institutions and experts 3. Five articles published in international research magazines	1. Volume of Distribution and references made to the yearbook 2. Hits and requirements made to the data bank 3. – 4. Eight presentations annually by CNREC	Several examples including: <ul style="list-style-type: none"> <li>• Roadmap on biomass liquid fuel with Tsinghua University</li> <li>• Contract with Guanjo Research</li> </ul>	Several examples including: <ul style="list-style-type: none"> <li>• Continued cooperation with Tsinghua University on biomass</li> <li>• Cooperation on Gird research Issues with</li> </ul>

Outcome	Outcome in Relation to External Stakeholders	Indicators	How to verify	Quantitative Specification	Status May 2013	Status October 2014
		coordinator of Chinese contributions to IEA, IRENA etc.	4. Presentations in international conferences 5. CNREC participation in large research projects incl. international projects 6. International and national scholars, interns, working at CNREC 7. Papers published after visits to CNREC 8. Feed back on CNREC research work	staff 5. 3 large scale international projects initiated annually 6. 3 international scholars working and CNREC annually 7. 3 international papers published based on research by international scholars in cooperation with CNREC 8. 3 positive appraisals by international RE experts on CNREC projects or research	Institute on solar thermal <ul style="list-style-type: none"> <li>• Component 2 started involving many research organizations</li> <li>• Off shore wind power policy research</li> <li>• RE data manual to be available to research institutions</li> </ul>	State Grid Research Institute <ul style="list-style-type: none"> <li>• Wind Power Map review with Wind Energy Research Institute</li> <li>• Component 2 projects supporting cooperation with Chinese Academy of Sciences, State Grid Research Institute and China Electrical Power Institute</li> </ul>
	<b>On the international stakeholders</b>	1. Strong cooperation between Government of China and Denmark 2. CNREC official partner to international RE stakeholders	1. Strong project teams cooperating on joint DEA – CNREC projects 2. Successful international visits promoting RE in China and Denmark 3. RE R&D projects prepared in cooperation with Danish institutions 4. Close cooperation between CNREC and DEA experts to ensure mutual learning 5. Projects and cooperation between CNREC and international agencies such as IEA and IRENA	1. Successful completion of joint CNREC – DEA Projects: a. Phase 1 of 2050 RE study completed July 2013 and used by GoC b. Funding for Phase 2 of 2050 study secured c. RE Technology catalogue to be completed December 2012 d. Bio fuel Road Map completed for March 2014 e. Solar Road Map	Several events have been organised and implemented. Examples are: <ul style="list-style-type: none"> <li>• The visit of the Danish Minister of Finance to China in June 2013.</li> <li>• The Wind Energy Forum in Beijing</li> <li>• The Chinese presentations at the Global Renewable</li> </ul>	Several events have been organised in the last six months Examples are: <ul style="list-style-type: none"> <li>• Membership and active involvement of China in IRENA,</li> <li>• Close cooperation with IEA,</li> <li>• Active Chinese participation in 3GF</li> <li>• CIFF adding substantial international funding and strengthening</li> </ul>

Outcome	Outcome in Relation to External Stakeholders	Indicators	How to verify	Quantitative Specification	Status May 2013	Status October 2014
			6. Projects and Cooperation between CNREC and national RE agencies such as NREL of US and CENER of Spain	<p>completed June 2014, incl. semi annual Exco meetings incl. IEA-SHC &amp; IEA-PVPS</p> <p>2. Two high level visits of political or civil leaders between China and Denmark annually and visits followed up by RE ideas, concepts or projects for Danish-Chinese cooperation</p> <p>3. Contracts signed for Component 2 R&amp;D projects spring 2013; monitoring framework agreed during 2013 and projects developing sustainable RE technologies and mechanisms</p> <p>4. Number and profile of people involved in Project Teams, Tasks sheets and reporting from DEA CNREC cooperation – incl. visits from CNREC to DEA</p> <p>5. Two international projects or events organized with IEA or IRENA annually</p> <p>6. Two international projects or events</p>	<p>Energy Forum</p> <ul style="list-style-type: none"> <li>• RE seminar with GIZChina</li> <li>• RE data to be accessible on the web site, but some data still missing.</li> <li>• Europa China Clean Energy Centre, for cooperation on RE with Euro 1 Mio. funding</li> <li>• Sino-German Wind Seminar</li> </ul>	<p>cooperation with NREL</p> <ul style="list-style-type: none"> <li>• Close cooperation with DEA; NREL, EU, GEF, GIZ and a wide range of renewable research and development institutions internationally</li> </ul>

Outcome	Outcome in Relation to External Stakeholders	Indicators	How to verify	Quantitative Specification	Status May 2013	Status October 2014
				organized with national RE agencies such as NREL of US and CENER of Spain IEA or IRENA annually		
	<b>Stakeholders in general</b>	1. Stakeholders trusting CNREC analysis and	1. Effective Steering Committee, Management Committee, Programme Steering Committee and Advisory committee supporting CNREC 2. Stakeholder map prepared to guide contact with stakeholders 3. Plan for strategic external communications prepared	1. Minutes of Meetings 2. Stakeholder mapping report completed May 2014 & stakeholder management workshop May 2014 3. Effective communications plan prepared June 2014	<ul style="list-style-type: none"> <li>• Energy Foundation Solar PV roadmap</li> <li>• Brief version of RE news to be accessible on the web site.</li> </ul>	<ul style="list-style-type: none"> <li>• Surcharge on electricity to support energy development fund</li> <li>• Increasing concern on environmental issues</li> <li>• Increased demand for CNREC publications giving information on Renewable energy</li> </ul>



Outcome	Outcome in Relation to Internal CNREC	Indicators	How to verify	Quantitative Specification	Status May 2014	Status October 2014
<p><b>CNREC has the technical, financial and human capacity to survive and grow for centuries</b></p>	<p><b>Organization</b></p>	<ol style="list-style-type: none"> <li>1. Clear organization structure</li> <li>2. Clear definition roles and responsibilities</li> <li>3. Effective project management in use</li> <li>4. High competence of all managers and staff in CNREC</li> </ol>	<ol style="list-style-type: none"> <li>1. Organization manual defining roles and responsibilities of Departments, manages and staff</li> <li>2. Contracts and job descriptions in place</li> <li>3. Capacity development plan</li> <li>4. Training and coaching of CNREC staff incl. participation in international training and internship</li> <li>5. Recruitment of strong staff for CNREC</li> <li>6. Job satisfaction survey</li> <li>7. Career of managers and staff in CNREC</li> <li>8. Former staff of CNREC acting as ambassadors for CNREC</li> </ol>	<ol style="list-style-type: none"> <li>1. To ready June 2013</li> <li>2. To be ready June 2013</li> <li>3. To be ready June 2013</li> <li>4. Specific training plan to be prepared for May 2013 and capacity development events to take place over remaining RED programme period</li> <li>5. Profiles of CNREC staff recruited 2013 and 2014</li> <li>6. Surveys in May 2013 and 2014 showing strong job satisfaction</li> <li>7. Records of former and present employees</li> <li>8. Questionnaire to staff leaving CNREC</li> </ol>	<ul style="list-style-type: none"> <li>• New Staff recruited</li> <li>• Good cooperation on projects and in departments</li> <li>• Challenge that some staff resources are not well utilised</li> </ul>	<ul style="list-style-type: none"> <li>• New contracts prepared for continuation of majority of RED staff under CIFF funding</li> <li>• New Performance Management system</li> <li>• New Job Descriptions based on CNREC performance objectives</li> <li>• Support for capacity development international and local training initiatives under CIFF</li> <li>• Strengthening of leadership underlined in planning for CIFF</li> </ul>

Outcome	Outcome in Relation to Internal CNREC	Indicators	How to verify	Quantitative Specification	Status May 2014	Status October 2014
	<b>Finance</b>	1. Financing in place for CNREC	<ol style="list-style-type: none"> <li>1. Feasible Business Plan updated annually</li> <li>2. Clear and transparent finance management system</li> <li>3. Financing plan for CNREC in place balancing income and expenses</li> <li>4. Government contributing a share of CNREC cost</li> <li>5. CNREC able to acquire new financed projects for private and public enterprises</li> <li>6. CNREC able to acquire international financing for RE projects</li> </ol>	<ol style="list-style-type: none"> <li>1. Gradual improvement of CNREC self financing and increasing share of revenue generating projects</li> <li>2. Description of finance system to be ready may 2013</li> <li>3. To be ready May 2013</li> <li>4. Clear plan and policy for Government financing agreed with Government spring 2013</li> <li>5. Acquisition strategy, financial and technical proposals prepared, two projects for private and public enterprises acquired annually</li> <li>6. Acquisition strategy, financial and technical proposals prepared, two internationally funded projects acquired annually</li> </ol>	<ul style="list-style-type: none"> <li>• Dependence on RE is less</li> <li>• Large portfolio of incoming projects</li> </ul>	<ul style="list-style-type: none"> <li>• 2,5 Mio. USD granted by CIFF for a period of five years</li> <li>• Approximately 3,5 Mio RMB in Government core funding</li> <li>• 15,8 Mio RMB in incoming project funding</li> </ul>

Outcome	Outcome in Relation to Internal CNREC	Indicators	How to verify	Quantitative Specification	Status May 2014	Status October 2014
	<b>Monitoring</b>	1. Performance and reporting system developed for CNREC	<ol style="list-style-type: none"> <li>1. Monitoring and reporting system providing oversight of progress, results &amp; issues</li> <li>2. Regular review of performance in relation to monitoring framework</li> <li>3. Regular revision of monitoring framework to reflect new developments</li> </ol>	<ol style="list-style-type: none"> <li>1. Key performance indicators and list of projects reviewed during each mission of the M&amp;E Team</li> <li>2. Report from each M&amp;E visit</li> <li>3. Regularly reviewed and revised list of projects and</li> </ol>	<ul style="list-style-type: none"> <li>• Monitoring visit completed in May</li> <li>• M&amp;E framework being updated</li> </ul>	<ul style="list-style-type: none"> <li>• Visit to CNREC 27<sup>th</sup> October to 8<sup>th</sup> November</li> <li>• Management workshop 2<sup>nd</sup> November</li> <li>• Completion report December 2014</li> </ul>

