FINAL TERM EVALUATION

Kazakhstan – Wind Power Market Development Initiative

Government of Kazakhstan
United Nations Development Programme
Global Environment Facility

FINAL VERSION

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Jan van den Akker	Natalya Druz
International consultant	National consultant

LIST OF ABBREVIATIONS

APR-PIRs	annual project implementation reviews
CO_2	carbon dioxide
EBRD	European Bank for Reconstruction and Development
GEF	Global Environmental Facility
GW	gigawatt (1,000,000,000 Watt)
KEA	Kazakhstan Electricity Association
KEGOC	Kazakhstan Energy Grid Operation Company
KOREM	Kazakhstan Market Operator of Power and Capacity
KW	kilowatt (1,000 Watt)
Law on RES	Law about support of usage of renewable energy sources
MEMR	Ministry of Energy and Mineral Resources
MINT	Ministry of Industry and New Technologies
MEP	Ministry of Environmental Protection
MTE	mid-term evaluation
MW	megawatt (1,000,000 Watt)
PDF	Project Development Facility
PIU	Project Implementation Unit
PPA	power purchase agreement
PSC	Project Steering Committee
REC	renewable energy certificate
REC system	system of renewable energy certificates and quota obligations
RE	renewable energy
RES	renewable energy source
RET	renewable energy technology
REEEP	Renewable Energy and Energy Efficiency Partnership
t	tonne
TATEK	Taldy-Korgan Region Electricity Distribution Company
TOE	tonne of oil equivalent
UNDP	United Nations Development Programme
USD	US dollar
Wh	watt-hour


KAZAKHSTAN
National capital
Oblast capital
Town, village
Airport
International boundary
Oblast boundary
Main road
Secondary road
Railroad
RUSSIAN FEDERATION
URAL MOUNTAINS
Chelyabinsk
Kurgan
Petropavl
Omsk
Kamsuk
NORTH KAZAKHSTAN
Kostanay
Rudnyy
Kokshetau
Kazlu
Kachiry
Pavlodar
PAVLODAR
Lebyazhiye
Kurchatov
Semey
Oskemen
QOSTANAY
Zhalina
Astana
AQMOLA
KAZAKH UPLANDS
Arqalyk
Qarqaraly
Georgiyevka
Beskamek
EAST KAZAKHSTAN
Ayaguz
Zaysan
Urdzhar
Oral
Dzhambeyty
Furmanovo
WEST KAZAKHSTAN
Kalmykovo
Aqtobe
Khromtau
Qarabutaq
Torghay
Oyyl
Emba
ATYRAU
Atyrau
AQTÖBE
Yrghyz
Shalqar
Ganyushkino
Aktumsyk
Zhezqazghan
QARAGHANDY
Dzhambul
Balqash
Batkol
Sayshagan
Beyneu
Fort Shevchenko
MANGHYSTAU
Aqtau
Zhetybay
Ustyurt Plateau
ARAL SEA
Qyzylorda
QYZYLORDA
BETPAQ DALA
Akbakay
Taldyqorghan
ALMATY
Akshiy
Furmanovka
ZHAMBYL
Zhanatas
Zhambyl
Shu
Almaty
Aksu
SOUTH KAZAKHSTAN
Shymkent
Bishkek
KYRGYZSTAN
CHINA
Baku
CASPIAN SEA
TURKMENISTAN
UZBEKISTAN
Tashkent
Samarqand
TAJIKISTAN
KAZAKHSTAN

EXECUTIVE SUMMARY

The *Kazakhstan – Wind Power Market Development Initiative* project began in December 2004 and is expected to conclude in June 2011. It has been financed by the Global Environment Facility (GEF) with a contribution of USD 2.55 million and implemented by the United Nations Development Programme (UNDP) and the Government of Kazakhstan.

The **goals** of the projects have been "to reduce Kazakhstan's greenhouse gas emissions by facilitating the sustainable development of the wind energy market in Kazakhstan" and "to remove the existing barriers to the grid-connected wind energy production in Kazakhstan". These barriers identified fell into three broad categories:

- Awareness, information and capacity barriers
- Financial barriers and low electricity prices
- Policy and institutional barriers

In accordance with regulations of UNDP and GEF, a Final Evaluation has to be carried out. A mission team was fielded to Kazakhstan in 10-19 May 2011. During the mission, extensive discussions were held with representatives from UNDP Kazakhstan, the Project Implementation Unit, the Ministry of Industry and New Technologies (MINT) and other government bodies, electricity companies, project developers and other stakeholders. Relevant project documents were analysed.

The main **conclusion** is that the project has achieved substantial progress on realising its objective to reduce Kazakhstan's greenhouse gas emissions by facilitating the sustainable development of the wind energy market in the country.

The main **outcomes** of the project are summarised below:

1. Foundation of an efficient regulatory framework for the development of the wind energy sector and relevant institutional capacity for efficient local implementation
   - A legal-regulatory framework for the development of the wind energy sector has been put in place in the form of the Law on Renewable Energy Sources (RES) and linked Regulations;
   - Relevant institutional capacity for efficient implementation has been strengthened
   - A National Wind Energy Development Programme has been developed, but approval has been pending. This, together with lack of appropriate feed-in tariff setting remains a barrier to full market-based development of grid-connected wind energy;
2. Expanded access to information on regulatory framework and other conditions in Kazakhstan for development of commercially feasible investment projects and their funding structure
   - Local capacity in developing and implementing wind energy projects has been strengthened;
   - Wind potential at 15 wind farm sites was monitored; Kazakhstan's first wind atlas was elaborated;
   - Pre-investment wind farm studies were performed at 10 sites;
3. Financial decisions and commencement of construction of the first large-scale wind farms in Kazakhstan
   - Technical support has been provided to several interested developers and investors to develop up to 7 wind farms; a number of these are continuing, but have not resulted in power purchase agreements yet;
4. Events in the project framework for promotion wind energy market in Kazakhstan.

- Project experience and outcomes were summarized for subsequent development of the wind energy sector in Kazakhstan; an exit strategy was designed (and signed in February 2011) in which the Kazakhstan Energy Association (KEA) will continue the project's promotional activities and support the web site of the Project with all of the Project's materials and data Measurement equipment (wind masts) has been transferred to relevant Kazakh organizations, such as universities (Nazarbayev University, Almaty University of Power Engineering) and MINT.

The project has achieved its outcomes except the one on the construction of a 5 MW pilot wind farm, (as originally envisaged in the Project Document). Due to difficulties in negotiating an adequate purchase power agreement for with the Government the pilot project and the prevailing legislation at the time (lack of appropriate feed-in tariffs), private sector involvement was not enough to bring a pilot project to fruition.

The project had to adjust its **implementation** approach to these changing circumstances. The Project funds destined for supporting the development of the pilot project have, in part, been redirected to good effect to support more fundamental work with potentially greater impact on market development, e.g. development of legislation, and supporting a number of feasibility studies at selected sites. The focus on policy-regulatory barriers has resulted in support to drafting the Law on Renewable Energy Sources (RES), its Regulations as well as the formulation of the National Wind Energy Programme (still in draft). Together with the resource assessment and capacity building activities and bringing together a critical mass of representatives in government and business community interested in renewable energy, the project has laid the groundwork for future commercial renewable energy development in Kazakhstan.

The Evaluation Team judges the project has performed quite **satisfactorily.** The Project has been a success in that it has made the prospect of a successfully functioning wind energy development sector in Kazakhstan a real and immediate one. Prior to the Project, this looked unlikely, today it is a question of when, not if, the first wind farms will be developed in Kazakhstan. The Project has tackled barriers that are present in many other transition economies and is therefore a very important source of knowledge and experience for tackling these issues elsewhere.

Regarding **sustainability**, the Project outcomes have been handed over to the Kazakhstan Electricity Association to ensure that the wind energy market continues to develop and mature. While acknowledging that the Project has effectively removed or mitigated a significant number of barriers to the development of a wind energy industry in Kazakhstan, some barriers do remain to developing commercially viable wind farms. With respect to these, major **recommendations** include:

- That there be a stronger commitment by Government to promote wind energy by means of officially approved targets, by approving the draft Wind Energy Programme;
- That Government deliver on plans to level the playing field by encouraging true economic costing of electricity that reflects the need for future power expansion;
- Amendment to the the Law on RES to include a fixed feed-in-tariff (available to wind farm developers for a defined period of time) will be carried out (as planned by the end of 2011. This is supported and will be promoted further by EBRD).

For future activities, UNDP could consider to continue supporting mainstreaming sustainable energy in the overall Government's policy e.g. by defining energy prices that reflect long-term marginal costs and by helping formulate long-term renewable energy and energy efficiency targets, also in relation with the long-term greenhouse emission reduction targets. This will help making both renewable energy technologies more competitive and energy

efficiency measures more cost-effective. Another area to look into is small-scale renewable energy application in remote areas, such as wind-powered water pumping, and in general promoting energy efficiency in residential and commercial sectors.

One **lesson learnt** is that the construction of wind parks takes a long time, especially when project having to go through a long process of tariff negotiation, obtaining permits and processes for selection of equipment and service suppliers. One should be careful therefore in linking a capacity building programme's indicator of success too much with the realization of one particular pilot project, which may be too ambitious a goal. Similarly, political decision-making is a long process. A project period of 3-5 years may simply not be enough time to cover the cycle of raising awareness, policy formulation, enacting laws and defining regulations. In the case of the Kazakhstan wind project this has become clear. To really have a policy formulation impact, a series of smaller interventions over a longer period of time in a more programmatic approach might be considered in future UNDP/GEF projects.

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1. INTRODUCTION

1.1 Background

Energy sector is one of the most developed economic sectors in Kazakhstan. Kazakhstan is rich in fossil fuel resources, which are sufficient to meet the domestic needs as well as for exporting to other countries. In 2007, the domestic consumption of primary energy resources constituted 2.3 quadrillion BTUs, of which 57% was covered by coal,19% by oil, 20% by natural gas and 3% hydroelectricity. Kazakhstan has very large coal, oil, gas and uranium resources that are all being actively exploited. Reserves are circa 40 billion barrels of oil with production at around 1.5 million barrels per day, most of which is exported by pipeline to neighbouring countries. Coal resources in Kazakhstan are in the region of 40 billion tonnes. The country produces some 90 million tonnes per annum. Approximately 35% of this is exported to markets such as Russia and Ukraine while much of the remainder is used to feed the country's coal burning electricity generation plants.

In 1990, the total power production in Kazakhstan was 87 billion kWh and the power consumption 105 billion kWh. As a result of the economic crisis in the 1990s, the power consumption has decreased significantly from the 1990 level to 48 billion kWh in 2001. The last decade saw, however, a tendency for increased power consumption, due to the economic improvement. Power production was at 68 billion kWh in 2005 and 75 billion kWh in 2008. To meet the rising demand would require the construction of new power generation capacity as many existing plants are out-dated and worn-out and in need of renewal. Of the 19,000 MW of installed generation capacity only 12,000 MW is available. It will be necessary to replace 3,265 MW of ageing capacity and introduce 2,230-2,550 MW of new capacity. However, the tariff structure currently does not reflect the marginal cost of production.

Other issues regarding power supply are:

- The power supply differs between regions. In the Northern region, where the main generation capacity is located, electric energy is abundant and even exported to Russia. The Western and Southern zones are characterized by a power supply deficit. In order to meet the southern deficit a second 500 kW North-South transmission and new hydropower stations (300 MW) are planned, but this will not be enough to cover demand in the longer run;
- The large size of the Kazakhstan area and low population density implies that significant transmission lines are needed in the rural areas which are costly to extend and to maintain;
- Eighty-seven (87) per cent of the power generation capacity of Kazakhstan consists of coal-fired power plants. Most of them are located near to large industrial cities. Without sufficient flue gas treatment, the plants are causing major pollution in the surrounding cities and areas;
- One result of the abundance of energy resources has been the lack of a driver, in developing wind energy on the basis of a scarcity of indigenous energy resources

Kazakhstan possesses significant renewable energy resources, such as hydro, solar and wind energy. Hydro potential is estimated as 27 billion kWh per year and the wind potential as 920 billion kWh per year with 350 GW capacity (PB Power, 2009; Lettice, 2010) However, apart from a small amount of hydropower, these resources have not really been utilized until now. The availability of cheap coal, the tradition of centralized, fossil fuel based power generation

and the current low tariff levels have so far, however, prevented the utilisation of the available wind resources.

In 1999, the Government of Kazakhstan developed the Energy Sector Development Program until 2030. The main goal is to achieve power independence of Kazakhstan based on the use of the existing energy resources, by reconstructing and modernizing existing plants and by constructing and commissioning new power plants serving exclusively to replace import. In that context, the plan is also to increasingly introduce renewable energy resources into the country's energy balance.

The key strategic directions of the Programme are listed below:

- Establishing a common energy system of Kazakhstan;
- Restoring the parallel operation with the common energy system of Russia and those of the other Central Asian Republics;
- Developing an open, competitive power market;
- Maximizing the employment of existing energy resources, their reconstruction and modernization;
- Commissioning new capacities, serving exclusively to replace import;
- Improving the structure of power production by means of non-traditional (renewable) energy resources;
- Rehabilitating and modernizing the existing systems with combined generation of heat and power.

The Power Industry Law of 2004 introduced deregulation and privatisation in the power sector. The power sector now consists of energy production (of which about 30% state-owned), energy transmission companies and regional network companies and regulated by the grid operator KEGOC and the market operator KOGEM. There are 21 regional energy companies (RECs) that distribute electricity . Large generating plants and the REC's trade in an unregulated wholesale market and consumers fall into two categories i.e. large industrial customers (> 0.75 MW) and the remaining customers.

Liberalization of the power sector has resulted in hard competition on power market. Combined with the possibility of using cheap domestic coal with no major environmental investment requirements for fuel gas cleaning and the fact that most currently operating power plants have been inherited from Soviet times, for which no capital costs or future rehabilitation costs are currently accounted, the tariffs have remained low. Currently, the tariffs are based on a production cost of USD 0.015-0.025/kWh and whole prices are around 0.021-0.036 per kWh. These prices are set at below cost recovery rates. The electricity price does not reflect long-term costs for replacing of generation nor does it reflect the (external) costs associated with the negative environmental costs of the coal industry. It simply, uses a "cost plus" mechanism to cover operating costs and a profit margin. Generating plants built under the former Soviet regime are considered "paid for" however the result of this is to give an artificially low electricity price which lacks the necessary incentive to encourage new, independent generating plants including wind farms. The reasons for this under-pricing may be laudable (ensuring the affordability of electricity for individual consumers, helping industry and tackling energy poverty) at first sight. However, in the long-run they are uneconomic and distort the electricity industry preventing new entrants and especially preventing new technologies such as wind energy.

A Government Decree (No. 392) in March of 2009 concerning power tariff levels envisages a wholesale rate of between USD 0.031/kWh and USD 0.064/kWh in 2015 (up to 10.2 c/kWh

for final end-users) in order to help stimulate investment in new generation capacity. (Source: Lettice, 2011)

Kazakhstan is rich in wind energy resources. Wind energy resource assessments show that windy sites (with wind speeds over 6 metres per second, m/s) available in the North of Kazakhstan near the Caspian sea, around Astana-Karaganda and some areas in the South. However, at the current low power production tariffs, it is difficult to justify investments in wind power (or any new power source, such as gas), even in a promising site as Djungar Gate. The average generation costs for wind power would be at least USD 0.10 per kWh depending on the location (wind speed) and on the turnkey investment costs of the wind farm.

There is potential for cost reduction of wind turbines in Kazakhstan by involving local manufacturing and assembling. Kazakhstan has well developed machinery building industry, used to the large extent in the Former Soviet Union for military purposes. The Government of Kazakhstan tries to convert this industry to civil goods production. It has been estimated that in co-operation with western producers at least some of the former machinery plants could be converted to produce some components of wind turbines.

Apart from the barrier of relatively low electricity tariffs, the following barriers were identified during the preparatory (PDF B) phase of the project as main obstacles to the development of the wind energy sector in Kazakhstan:

The barriers identified fell into three broad categories:

- Awareness, information and capacity barriers
- Financial barriers and low electricity prices
- Institutional barriers

The first category included barriers that are typical of any new market being developed. It included a general lack of awareness of the opportunities associated with wind energy, a lack of technical experience in aspects of the development, construction and operation of wind farms as well as the absence of any wind farms in the country and few examples in the region.

The financial barriers, including the low price of electricity in the country, centred on the lack of an existing support scheme or clear facility for power sales, difficulties in attracting foreign investment and the, at that time insurmountable, commercial risks faced by indigenous companies wishing to participate in the wind energy market.

Finally, the institutional barriers related to the absence of a clear national policy for wind energy development, a lack of specific legislation and regulation relating to the wind energy market along with the absence of a central office or department to foster the development of wind energy.

1.2 Project objectives and strategy

As will be discussed in paragraph 2.1.4, it is expected that the power tariffs in Kazakhstan will continue to increase to reflect the full cost of power production and transportation, including the expenses for rehabilitation and construction of new power generation capacities and electricity grid. This will provide a sounder basis also for the development of country's abundant renewable energy resources, including wind.

To address the other barriers, the United Nations Development Programme (UNDP) and the Ministry of Energy and Mineral Resources decided to implement a wind power development programme. Funds were applied for to the Global Environment Facility (GEF). A project preparatory phase "Removing Barriers to Wind Power Production in Kazakhstan" (with GEF funding from its PDF B window)" was started in 1997 and completed in 1999. As a part of the PDF B phase of the project, a detailed wind resource assessment was made for two specific sites in the south-eastern part of the country, namely Djungar Gate and Chilik Corridor . The Project was also informed by a 1997-98 project funded by the Government of the Netherlands, Wind Energy in Kazakhstan which determined that Kazakhstan was "one of the most appropriate countries in the world to develop wind energy" from a wind resource point of view (ECN, 1999). The results indicate that wind power generation, especially for remote places with the wind conditions similar to the Djungar gate, could be a cost-effective source of electricity, with small "incremental" costs[1].

The PDF B phase resulted in the formulation of a full-size project, called "Kazakhstan - Wind Market Development Initiative". The UNDP-GEF Project Document mentions as its project **goal** (environmental objective) is "to reduce Kazakhstan's greenhouse gas emissions by facilitating the sustainable development of the wind energy market in Kazakhstan. The project's (development) **objective** is "to remove the existing barriers to the grid-connected wind energy production in Kazakhstan".

The document of the full-size project was formally signed in July 2004 with a total budget of US$ 7.274 million with GEF financing of US$ 2.55 million, government co-financing of US$ 164,000 and leveraged private sector investment of US$ 4.56 million. Implementation of the project started in December 2004, was scheduled to end in 2009, but has been extended and now scheduled to end by June 2011[2].

1.3 Evaluation methodology and structure of the report

In accordance with regulations of the UN Development Programme (UNDP) and the Global Environment Facility (GEF), evaluations need to be carried out under the responsibility of the GEF-implementing agency (i.e. UNDP). A **mid-term evaluation** was carried in September 2007 by two independent evaluators, Mr Jan van den Akker (Netherlands) and Mr Vadim Nee (Kazakhstan). The main findings are summarised in Annex A as part of the Terms of Reference (ToR) of this report.

As the project will be closed by 30 June 2011, a final evaluation mission was fielded to Kazakhstan in May 2011. The team consisted, again, of Mr. Van den Akker and national consultant, Ms Natalya Druz and their findings are presented in this report. The evaluators also participated in the 2-day 'Regional Conference on Renewable Energy Development in Central Asia and CIS', during which the experience of Kazakhstan and other Central Asian nations in development of the wind power market was discussed (12-13 May 2011, Astana).

[1] On the basis of the measured wind regime, the average generation costs for wind power were estimated at 3.5 cents per kWh in Djungar Gate (with 8% discount rate and "turnkey" investment costs of US$ 1100/kW) and at around 5 cents per kWh in the Chilik corridor. The Djungar Gate figure was too low for realistic bids to be submitted and contributed to difficulties with the PPA. The process was assessed in 1999, while the tender was carried out in 2005. In the meantime, prices had changed.

[2] The project document was signed on July 2004. The PSC was established on 2 November 2004 and first met in December 2004 when the project was officially launched. Thereafter, the PSC has met on a regular basis (about twice a year) over the period 2004-2010. The Project Implementation Unit (PIU) was set up at the office of KEGOC (the nation al grid operator) in Almaty in the beginning of 2005 and moved to the new capital, Astana, in 2010.

The **purpose of the final evaluation** is to measure the effectiveness and efficiency of project activities in relation to the stated objective so far, and to produce possible recommendations on:

- The key elements of success of the project and further steps to be taken to secure successful development of the wind power market initiative in Kazakhstan;
- Any gaps remaining after the project implementation to be addressed in further initiatives by the Government;
- Identifying risks to the sustainability of the project initiatives to be considering by the Government in future development of the wind power in Kazakhstan.

During the mission, the external evaluation mission drew up a table of contents that covers the issues to be addressed as mentioned in its Terms of Reference (see Annex A) and follows the structure of this report:

- Introduction (project description and evaluation method)
- Findings on project progress
  - Project's performance in terms of results (achieving objectives and outputs by means of realised activities and inputs used) and impacts, quantitatively and qualitatively measured by indicators (as set in the project document and the annual project review documents)
  - Description of project impacts
  - Evaluation Team's assessment of the project design and execution
- Conclusions and recommendations
  - Conclusions taken into account sustainability and replicability issues
  - Lessons learned and recommendations

The report is divided into three sections. This first section provides general background of the project, purpose of evaluation, project implementation setup, partners/stakeholders and evaluation methodology. The next section dwells on findings from the reports and from interactions with stakeholders. These findings are described within the logical framework design of the project, as given in the Project Document. In the third section, conclusions from the observations and findings are discussed in the context of project objectives. These also pertain to sustainability and replicability of project. The section ends with recommendations for the further direction of the Project and some lessons learnt.

1.4 Project set-up and stakeholders

The project is executed by the Ministry of Industry and New Technologies (MINT), on behalf of the Government of the Republic of Kazakhstan which replaced the Ministry of Energy and Mineral Resources (MEMR) in 2009 in this role.

For general coordination, monitoring and strategy support for the project implementation, a Project Steering Committee (PSC) was established. Over the duration of the project (2004-its membership has changed somewhat, reflecting changes in government and in project approach, but has during 2010-2011 consisted of representatives from:

- Ministry of Industry and New Technologies (MINT),
- Ministry of Environment Protection (MEP); the focal point of GEF
- KEGOC,
- Almaty University of Power Engineering and Telecommunications
- National Welfare Fund Samruk Kazyna
- KazSelenergoproject Institute

- JSC Samruk Energy
- JSC Energiya Institute
- Kazakhstan Foreign Investors' Council Association
- UNDP

A Project Implementation Unit (PIU) was set up, led by a full time Project Manager (PM)[3] who is supported by an International Technical Adviser (un til 2008)[4], a Technical Specialist[5] and a Project Assistant[6]. The PM is responsible for the day-to-day management of the project. He ensures[7] that the expected outputs are completed on time and that they comply with the specific UNDP/GEF criteria and requirements. The project manager will also regularly report on the progress of the project to the executing agency and UNDP.

The Vice Minister of Industry and New Technologies (MINT) has been the National Director[8], chairing the PSC as the person responsible for the project from the Government side.

[3] Mr. Gennady Doroshin, succeeded in 2009 by Ms Sospanova, while Mr Doroshin remained project advisor
[4] Mr. Peter Dickson
[5] Mr. Mikhail Rakov
[6] Currently, Ms. Mugulshin Tutkoshova
[7] Mr. Gennady Doroshin
[8] Mr. Duisenbay Turganov (since 2010)

2. FINDINGS

2.1 Implementation: assessment of achievement of outcomes and outputs

This section assesses the progress in the implementation of the project's outcomes and outputs, following the format as given in the latest progress reports (APRs; annual progress reports). The wording has changed in comparison with the 'strategic results framework' of the UNDP Project Document to reflect changes that occurred during project implementation and after the mid-term evaluation (carried out in November 2007).

2.1.1 Outcome 1 Foundation of an efficient regulatory framework for the development of the wind energy sector and relevant institutional capacity for efficient local implementation

Original project document (2003/4):

- *Outcome 2* Adoption of a cross-sectoral national wind energy programme to achieve the goals set forward in the Energy Sector Development Programme
- *Indicator:* National wind energy programme is adopted

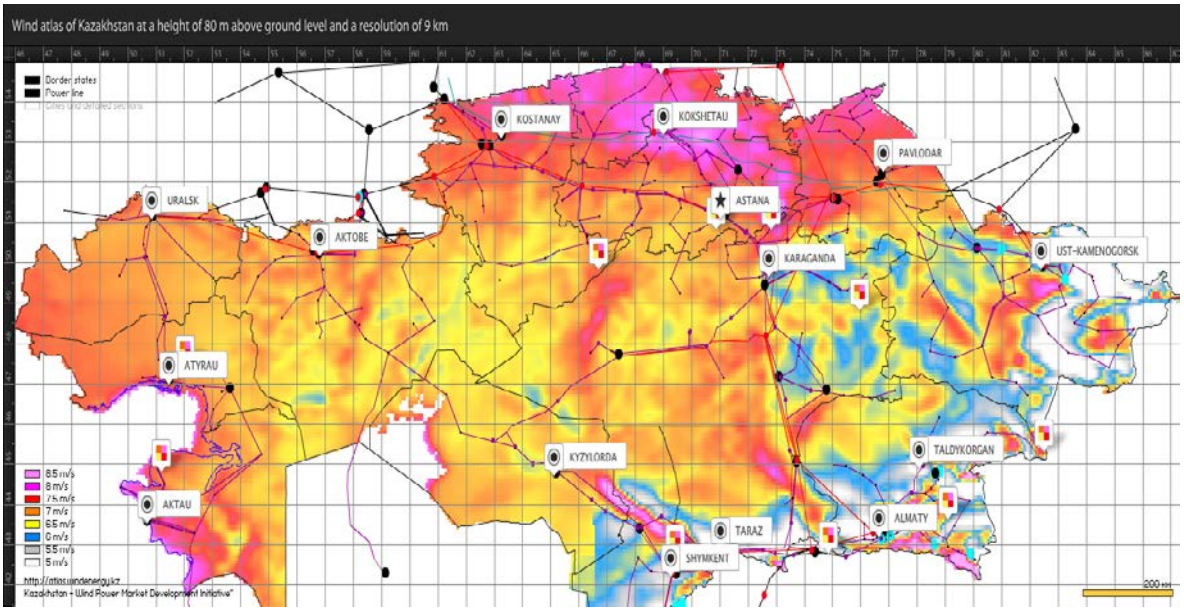
Table 1 Outputs, indicators and budget of outcome 1

Outputs (as in latest APRs)	Original project document outputs and indicators
1.1 Expanded assessment of technical and economic potential of wind energy development in Kazakhstan: 1.2 Informal forum of investors and other stakeholders of wind energy development in Kazakhstan 1.3 Analysis and recommendations on improving regulations and standards for effective development of wind energy sector in Kazakhstan 1.4 Trainings and other events on opening opportunities of the state entities.	2.1 Site mapping and evaluation of economically feasible potential for wind energy development • Wind map and report describing the economically feasible sites 2.2 Recommendations for the legal and regulatory framework to support investments in wind energy • Report analysing the existing legal and regulatory framework and making recommendations for the changes needed to support investments 2.3 Proposal for the introduction of financing mechanisms • Report analysing and describing possible new and innovative financing mechanisms 2.4 Adoption of the 'national wind energy programme' • National Wind Energy Programme adopted by the Government

Output 1.1

The Finnish company VTT jointly with the Kazakh company KazNIPITES «Energia» carried out the works on Integrated analysis of the existing generation, transmission and distribution systems and its further development needs for wind power promotion in commercial scale in the chosen regions. The final report is provided at the project´s website (VTT, 2011). A study on the macroeconomics of wind development in Kazakhstan is under preparation.

Figure 1 Wind map, Kazakhstan



Source: http://atlas.windenergy.kz

Output 1.2

A series of workshops and seminars were held, such as:

- Perspectives of projects development in wind energy considering the experience of Ukraine" with representatives of Ukrainian wind energy association and Supreme Rada of Ukraine;
- Two seminars were organized in Astana and Almaty with representatives of Danish company Vestas;
- Legislative, scientific and economic aspects of Renewable Energy Sources use in Kazakhstan, in which representatives of state bodies, akimats[9], universities and business entities were invited.

Output 1.3

At the time of the mid-term evaluation, a draft version of the 'Law about Support of Usage of Renewable Energy Sources' had been prepared, hereafter referred to as the Law on Renewable Energy Resources (RES Law). To promote RES regulation in Kazakhstan, additional funds from the Renewable Energy and Energy Efficiency Partnership (REEEP) and the Global Opportunities Fund (UK) were attracted (USD 60,000 and USD 180,000 respectively. The project team has assisted the process of formulation of the RES Law by raising awareness amongst governmental and parliamentary representatives (both in the Senate and the Majilis) as well as business community through a series of meetings and

[9] Kazakkstan is administratively divided in 14 provinces (oblasts), which are further divided in districts. Each province is headed by an *Akim* (provincial governor) appointed by the Presiden

Box 1 Law on Renewable Energy Resources

The RES Law sets out the purpose, scope and main directions of state regulation of renewable energy development. It also sets out the responsibilities of the Authorised Body for Renewable Energy as well as the responsibilities of local executive bodies.

The support for renewable energy projects in selling electricity (and/or heat) is addressed in Article 9 of the RES Law. The Law establishes a novel form of feed-in-tariff, although without a guaranteed price as commonly used with such schemes elsewhere, with the following characteristics pertinent to wind energy:

- Regional electricity distribution companies must purchase the full volume of renewable electricity produced by qualified generators to cover up to 50% of the electricity loss in the respective distribution network.
- If the renewable electricity exceeds the volume of 50% of losses in the distribution company, then the remainder will be purchased by the system operator (KEGOC) to cover losses in the national electricity network.
- Power Purchase Agreements (PPAs) are made at prices "no less than the renewable energy unit's construction cost recovery terms appointed in the feasibility study of the renewable unit construction project"
- Article 9.5 states that the price of power is to be established by the generator (the "qualified energy production organisation") independently but not more than the level stated in the feasibility study of the project of renewable energy unit construction.
- Generators have the right to enter into direct agreements with consumers.

In addition to the RES Law, the Government, with the support of the Project has developed and adopted the following Rules in support of renewable energy:

- Rules of purchase of electricity from qualified power generating organisations
- Rules of definition of the nearest point of connection to the grid or thermal networks for renewable energy
- Rules for monitoring of the use of renewable energy
- Rules for feasibility study assessment and approval

The Rules are important as they provide detail not covered explicitly in the RES Law concerning wind energy development. The official text (in Russian) as well the unofficial translation of the Law and its Regulations are available at www.windenergy.kz

roundtables. For example, four high-level seminars were organised and a group of Kazakhstan officials visited UK in 2007.

A Roundtable discussion with various stakeholders was organised in Parliament in March 2007 to discuss the RE legislation with assistance from MEMR. Recommendations were prepared on regulatory framework in RES. The reports are translated into Russian and placed on the project web site as well as disseminated to state bodies[10].

The Law on the Support of Usage of Renewable Energy Sources (The RES Law) was adopted in 2009. Its creation is significant achievement as it provides a legal foundation for developers to base commercial decisions and it further enhances the reputation of Kazakhstan as a country intent on welcoming wind energy and other renewable energy developments

[10] Such as the reports on legislation issues (Shalabayeva/UNDP, 2005; Dickson/UNDP, 2006). With REEEP funds, two reports have been prepared, one on the commercial potential for the development of RE in Kazakhstan (Cherednichenko, 2007) and another on how the proposed mechanisms for legislation may be affected by the Kyoto Protocol should this be ratified by Kazakhstan in the near future (Inyutina, 2007).

The idea that was floated in the early discussion on the Law was the introduction of annual quota obligations (renewable energy certificate system) to energy producers to have renewable energy produced (proportional with the yearly produced volume of power). But this was rejected by MEMR and not included[11]. The issue of how to meet renewable energy targets in future, appropriate tariff setting are described in the report Effective legal and regulatory framework for the support of wind energy in Kazakhstan (Lettice/UNDP, 2010). The results of the work were presented at the meeting of the Working group on RE under MINT, in in which the project has been participating.

In 2007, various consultations were held with stakeholders, including government partners, industry and academia, to discuss the draft 'National Wind Energy Programme', building on the outputs 1.1-1.3. The text has been finalised and submitted to the Government (MEMR) for approval (2008), but has met substantial delays in getting approval.

Output 1.4

A study tour was organized in Germany for 3 specialists of MINT aiming at learning the experience of Germany and EU on RES development, especially, legislative regulation, financing and implementation of RES projects, technical issues of RES.

2.1.2 Outcome 2 Expanded access to information on regulatory framework and other conditions in Kazakhstan for development of commercially feasible investment projects and their funding structure.

Project document:
Outcome 2 Adoption of a cross-sectoral national wind energy programme to achieve the goals set forward in the Energy Sector Development Programme
Indicator: Financing decisions are concluded for at least 2 wind energy projects

Table 2 Outputs, indicators and budget of outcome 2

Outputs (APR)	Project document outputs and indicators
2.1 Wind Atlas for the whole country and detail maps of wind potential for the chosen sites 2.2 Development of schemes for financing and co-financing for investment support into wind power market, including mechanisms of Kyoto Protocol 2.3 A practical guide/handbook for local and foreign investors which is intended to introduce with regulatory framework and	3.1 Detailed wind resource assessment for selected sites • Detailed wind resource assessment finalised for 6 sites 3.2 Enhanced capacity of local stakeholders to prepare feasibility studies, business plans and investment proposals • Feasibility studies and investment proposals prepared for at least 4 projects; financing under negotiation 3.3 Improved contracts between local wind power developers and potential investors

[11] In such a system, power producers have to meet their renewable energy (RE) obligation (set by an RE Authorised Body). This obligation can be met to generate RE obligations themselves, by Renewable Energy Certificates (RECs) from RE Production Organizations (that are registered with the Body) or directly from the Body itself. Each REC will be based on measurements of units of renewable energy being produced and transmitted to the grid and will have a registration number. The idea behind the REC system is that the additional cost of developing renewable energy in an equitable away across the entire power sector. The cost will not be carried by the Government, but will be passed on to the consumer.

existing mechanisms of support as well as procedures and requirements during development and construction of wind farms and connecting those to the grid of Kazakhstan	• Meetings held bringing together investors and developers

Output 2.1

A report describing perspective wind sites in Kazakhstan was prepared (EnergieTeam/, 2006). Out of 33 inspected sites, 8 were selected. The assemblage of 8 meteo masts (provided by RISOE and Wilmers Ltd.) in Zhambil, Karaganda, Akmola, Kostanai, Atyrau, Fort Shevchenko and South Kazakhstan regions and measurements took place in 2006-2007 after which they were dismantled in 2008 and moved to other 5 sites in 2009 for further measurements (Aralsk, Kuryk, Badamsha, Borovskoe, Agadyr). The last sites wind monitoring programme was cnmpleted in 2010.. Thereafter, measurement data were compiled and analysed. Commercial wind farms will normally require on site data monitoring and robust wind resource assessment (using long term data and statistical techniques) for development. So, this work has been completed for a good number of prospective wind farm sites in Kazakhstan. Data are available on the project website www.windenergy.kz. In the process, trainings on issues of wind monitoring and assessment programme, the usage of the WindPro and MapInfo software, project financing and business plan preparation were conducted.

In 2010 the equipment was dismantled and transferred to various institutions (four to MINT and the others to four universities[12]). The measurements have provided the data necessary for the preparation of the Wind Atlas of Kazakhstan (see Figure 1), which is available from the project's website.

Output 2.2

Three reports on innovative financing for RE projects in Kazakhstan have been prepared (Dickson/UNDP, 2006 and Vovk, 2010) and one on carbon financing in Kazakhstan. These reports provide information on support mechanisms employed elsewhere, including investment subsidies/capital grants, fiscal measures, feed-in tariffs, quota obligations/tradable certificates, bidding systems, carbon markets, project and equity financing. These have served as input into the formulation of the financial mechanism of the draft 'Law on RES'.

Ten pre-feasibility studies have been prepared, based on the site measurements, mentioned in Output 2.1, among others Astana Wind Farm; Arkalyk Wind Farm; Ermentau Wind Farm; Fort Shevchenko Wind Farm; Karabatan Wind Farm; Karkaralinsk Wind Farm; Kordai Wind Farm and Zhuzumdyk Wind Farm (see Table 3).

A draft model feasibility study was prepared for a 50 MW windfarm at Chilik Corridor and the 5 MW wind farm at Djungar Gate. The progress regarding investment in the pilot wind farm at Djungar Gate will be discussed under output 4.1. Memorandums of Understanding were signed with Samruk-energo and Karaganda Oblast Akimat on the development of the wind energy sector and elaboration of wind farm projects in Kazakhstan. A pre-investment study for 300MW Shelek wind farm was performed for Samruk-energo

[12] Almaty Energy and Communication University; Kazakhstan-German University; South Kazakhstan University; New Astana-Nazarbaev University

Table 3 Wind monitoring sites

Wind potential measurement site	Average wind speed (in M/s at 50 m height)	Wind farm capacity (in MW)	Power generation (MWh/yr)
Astana city (Akmola Oblast)	6.48	20-50	2,800
Arkalik city (Kostanai Oblast)	6.93	20-50	2,800
Djungar Gate (Almaty Oblast)	9.7	50	3,800
Ft. Shevchenko (Mangystau Oblast)	7.83	20-50	3,635
Ereymentau city (Akmola Oblast)	7.79	50	3,610
Karakalinks city (Karaganda Oblast)	6.29	50	1,790
Zhuzhymdik village (S. Kazakhstan Oblast)	7.06	50	3,070
Korday village (Zhambyi)	5.72	20	2.040
Karabatan village (Atyarau Oblast)	7.15	50	3,480
Shekik Corridor (Almaty Oblast)	7.8	300	

See: www.windenergy.kz

The project organised seminars, roundtables and meetings have been carried out that created links and contacts between national and international investors and local developer, including training in attracting carbon funding for RES projects. The project has supplied consultative support to investors and developers on the development of the wind energy sector in Kazakhstan.

Output 2.3

The development of the guidebook was completed and is available at www.windenergy.kz.

2.1.3 Outcome 3 Financial decisions and commencement of construction of the first large-scale wind farms in Kazakhstan

Project document:
Outcome 2 Facilitating the construction of the first pilot projects
Indicator: First pilot project successfully in operation

Table 4 Outputs, indicators and budget of outcome 3

Outputs (APR)	Project document outputs and indicators
3.1 Open access to information and other target technical assistance for making financial decisions and commencement of construction of the first projects in Kazakhstan	4.1 Successfully launched public call for tender for the construction of the first project • Contract with the selected investor signed 4.2 Enhanced capacity of local stakeholders to install, operate and maintain the wind turbines • Wind turbines installed and in operation

Output 3.1

Originally a 5 MW pilot wind farm (with wind turbines provided by Mitsubishi) was envisaged to be established at the Djungar Gate near the Chinese border (see the reports WindSolutions, 2005 and Johannes 2005 as well as the available tender information). A detailed investment proposal for 5MW was also compiled, in accordance with the original

project objectives. The project has provided assistance to MEMR in negotiations between the project developer and MEMR. Earlier ALD Consulting (Kazakhstan) was selected after a tendering process in 2005 to develop the project (5 MW), with KazSelEnergo Institute providing technical assistance in the design of the wind farm. In addition, UNDP planned to support the Djungar pilot wind farm with a US$ 1 million contribution.

Originally it was envisaged that the power distribution company TATEK would purchase the power generated, but TATEK was privatised and then split up. After the restructuring of the power sector, the electricity supply organisations have to work with a profit objective[13].

To achieve better economics of scale, it was suggested by ALD in 2007 to expand to 50 MW (with the equipment provider to be decided). By mid-2007, a complete investment proposal was compiled for the pilot project including equity from National Innovation Fund and ALD Consulting, debt from EBRD and Japanese export credit[14]..In the end the project was not supported by MEMR and no Power Purchase agreement (PPA) was agreed upon.

There is still no operational wind farm in Kazakhstan. However, rather than focussing on one pilot project, the project has provided explanatory work and consulting support in project development with prospective investors (Samruk-Energo, Green Energy, SPK Zhetysu, SPK Caspiy, Spain Consulting, Samruk-Energy JSC and other stakeholders the Kazakhstan). A series of meetings and negotiations were held with akimats of Akmola, Karagandy, Aktobe and Almaty regions aiming at determining the status of the land plots on the sites monitored.

2.1.4 Outcome 5 Events in the project framework for promotion wind energy market in Kazakhstan.

Project document:

Outcome 5 Using the results and lessons learnt for further development of the wind energy market in Kazakhstan

Indicator: Project results and lessons learnt incorporated into the strategies to develop the wind market in Kazakhstan

Outcome 1 Finalising the organizational structure and other necessary arrangements for project implementation

Indicator: Project is effectively under implementation

Table 5 Outputs, indicators and budget of outcome 5

Outputs	Indicators
4.1 Association on renewable energies intended for satisfying informational needs and support the development of renewable energy market in Kazakhstan as a whole 4.2 Disseminating the project outcomes and regularly updated web site of the project	1.1 PSC and PIU established, work plan prepared as well as ToRs for consultants and subcontracts • PIU and PSC established; Work plan adopted; Consultants and other experts recruited 5.1 Project monitoring and evaluation reports • Finalised monitoring and evaluation reports 5.2 Dissemination of results and lessons learnt • Results disseminated through seminars, publications and other outreach activities

[13] The tariff needed to make the 50 MW Djungar wind scheme profitable would be around US$ 0.07/kWh, while the end-user tariff based on coal-based generation currently is around US$ 0.055/kWh.

[14] € 35 million, Bank for Development of Kazakhstan; € 17 million, EBRD; € 1 million, ALD; € 4 million, National Innovation Fund

Output 4.1

In the result of several meetings with potential stakeholders as stable entities the project appointed Kazakhstan Energy Association (KEA)[15] as a partner of the project exit and will responsible for some of the project's activities, such as continuation of the project's website, advice to and networking with potential (foreign) investors, lobbying with Kazakh authorities, etc. The project reached the agreement with the Kazakhstan Energy Association about founding the Committee on RES under this association. The regulation aspects on the Committee as well as staffing chart were developed. The protocol of the Board of Directors of KEA approved the documents on the Committee.

The idea of establishing a Wind Energy Association of Kazakhstan has been mooted. Next step would be to arrange for a forum of potential investors and key market players to discuss opportunities for such an association in place, to consolidate info and developed required procedures, an organizational structure and sustainable funding sources for the association.

Output 4.2

The project status was revised; documents for continuing the project in 2009-2010 (rationale, project logframe, work plan and budget) were prepared and approved. Project outcomes were presented at a number of domestic and international workshops and conferences; project information is updated on www.windenergy.kz. A film about development of wind energy in Kazakhstan was updated.

2.2 Implementation: assessment of the project's benefits and impacts

The fundamental consideration of rational investors when assessing an opportunity is the nature of the risk-return balance. Crucial to controlling commercial risk is a stable, transparent and enforced policy, legal and regulatory framework which outlines the rights and responsibilities of actors, defines Government support and describes enforcement measures and penalties for non-compliance. Investors must be confident that laws and regulations upon which they base their decisions will be enforced this means that, to inspire investor confidence, the legal and regulatory framework must be attractive and the country must nurture a reputation of stability and legal enforcement.

Significant progress has been achieved over the lifetime of the Project in developing a legal and regulatory framework that can foster wind energy development, as described in Box 1. Apart from the Law on RES and the related Regulations, another fundamental document is the *National Wind Power Development Program* for Kazakhstan, which is in draft form however. The objective of the Program is to achieve a target of 750 million kWh of electricity generation from wind energy in Kazakhstan by 2015 and 5 billion kWh by 2030. This production figure equates to approximately 250 MW and 2000 MW respectively. Note that the peak load in the electrical system of Kazakhstan is expected to double from current levels (about 15,000 MW) in 2030. The Program aims to achieve these targets by fulfilling the following goals:

[15] The Kazakhstan Electricity Association (KEA) is a non-governmental, non-profit organization, officially registered in January 1999. The Association includes thirty three (33) corporate members, representing power generating and electric networks companies, large industrial customers, branch research and designing institutes, energy equipment manufacturers and other companies.

- Development and implementation of legal and technical documentation for wind power sector development
- Designing and implementation of activities to install wind power capacities by 2015 with perspective until 2030
- Support of small scale wind power generation
- Development of scientific, technical and industrial base of wind power sector
- International cooperation under Program of wind power development

The UNDP/GEF project 'Kazakhstan Wind Power Market Development Initiative' has been about removing, or mitigating the effects of barriers to the development of a properly functioning wind energy market in Kazakhstan. When the Project began in 2004 a range of existing barriers were identified to be addressed. They are each listed and extensively examined in the excellent report Lettice (2011), which presents a final analysis of the project's impacts, remaining issues, lessons learned and recommendations. Based on the Lettice report, Table 6 presents an overview of the achievements of the project in mitigating barriers. It should be noted that the Evaluation Team has re-organised them differently than in the Lettice report and has blended in some of its own observations.

Table 6 Achievements of the project in removing or mitigating the effect of barriers

Type of barrier	Before the project	After
Power sector capacity and awareness	Due to the lack of information and direct experience of accommodating wind power on the system, utilities and the grid operator KEGOC were cautious on impact of wind. The limited choice available for power purchase agreements and grid connections presented a lack of options for developers and meant there was little incentive for distribution companies to assist developers	The VTT study (VTT, 2011) found that meeting the target of 2000 MW would not require any special measures. However, these organizations often take a conservative approach and the issue may come up again as indeed wind farms start getting connected. There has been significant liberalisation of the electricity market in Kazakhstan and the RES Law, in theory, provides a clear avenue for the sale of power. In practice, as will be discussed further, the level and nature of PPAs is an issue that needs to be addressed further.
Information	A lack of information (no hard data, no good quality financial model) and experience to determine accurately the specific construction and operational costs of wind power generation in Kazakhstan makes the risk to investors prohibitive. With no experience of wind farm development in Kazakhstan at the beginning of the Project, there were no "success stories", case studies, best practice guides or exemplar projects to imitate. Some preliminary work was done to identify the wind resource potential, but not in the level of detail required by developers to	An online Kazakhstan Wind Atlas has been prepared by Parsons Brinckerhoff and is available to investors. It gives long-term average wind speeds at 80 metres above ground level for the entire country. Furthermore, meteorological monitoring has taken place at a total of 15 sites across the country and pre-feasibility studies carried out for 10 sites. A practical guide for investors on the required steps, procedures, technical and legal requirements for developing wind farms in Kazakhstan has been prepared. All this provides a good basis for wind development. Of course, the feasibility analyses and measured data will need to undergo a reality check once the first wind farm is constructed and actually functioning.

	"screen" multiple potential wind farm locations	
Local capacity to develop, install and maintain	Kazakhstan possesses a well-educated workforce and there was (and is) no shortage of proficient engineers experienced. However, without experience of working specifically with wind turbines (other than possibly in other countries), Kazakh professionals lacked the technology specific skills and confidence for the installation, operation and maintenance of wind turbines. In advance of the Project there was little experience in Kazakhstan of the procurement processes, technical specifications and necessary balance of plant required for wind turbines. There were no recognised standards for turbines; this meant that there was no guidance for developers regarding what could be connected to the grid. This was an additional source of uncertainty.	The capacity certainly exists now within Kazakhstan to prepare feasibility studies, with the assistance of international experts where appropriate (for instance, in the case of wind resource assessment). Academic institutions have been engaged. Government and civil society have been active participants. A variety of training events were held for Kazakh professionals in the areas of wind turbine technology, wind potential assessment, energy yield assessment, usage of the simulation programme Wind Pro and in the preparation of bankable proposals. Nonetheless, *no* pilot project has not been completed and constructed within the timeframe of the Project. So, there has been no opportunity for Kazakh professionals to experience a wind farm being installed, commissioned, grid-connected, operated and subsequently maintained. A new question that has come up is where turbines will be sourced from (Europe, India or China), whether to buy new turbines or cheaper 'second-hand' turbines and how they will be transported and delivered to sites in Kazakhstan. This remains to be resolved.
Electricity pricing and power purchase agreements (PPA)	Low prices of USD 0.023-0.04/kWh were (and are) due to an abundance of inexpensive domestic coal and the continued operation of older, Soviet-era, power plants for which no capital cost or future replacement costs had been accounted for. The low electricity prices were identified as a major barrier to wind energy development and remain a cause for concern as the artificially low prices make wind energy projects appear wholly uneconomic by comparison, depress any likely PPA prices and discourage investors and developers who require a sufficiently high, long-term and stable price signal in order to make their commercial decisions.	The RES Law and the Rules for the Purchase of Electricity, developed with the assistance of the Project, are fundamental building blocks which can be built upon. Unfortunately, the initial form of the feed-in-tariff mechanism is being regarded as not giving the right signals, because the price is not fixed but has to be determined following a lengthy and costly feasibility study carried out by the aspiring developer. A fixed feed-in-tariff for wind farm operators (defined for a fixed period) is a common method of market support used successfully in other countries. Currently, amendments to the Law, including fixed tariff setting are under discussion and would be put to parliament. A Government Decree (No. 392; 2009) envisages a wholesale rate of up to USD 0.105/kWh for final end-users in 2015 (between USD 0.031/kWh and USD 0.061/kWh for generators) in order to help stimulate investment in new generation capacity

Attracting foreign investors	Credible international partners are an important element wind energy development market. They often bring experience gained in other (sometimes similar) jurisdictions and markets. At the beginning of the project there was little contact with potential international partners or the finance sources they could potentially unlock. Prior to this Project there was significant uncertainty over the nature, level, stability and "bankability" of any PPA to attract such foreign investors. Despite tremendous progress since independence, there is no doubt that Kazakhstan was, at the beginning of this project (and beyond), regarded as a relatively high risk economy in which to invest. For higher-risk developments with an importance for the public-good, it is not uncommon for Governments or state agencies to provide guarantees to local creditors in order to ensure "soft loans" i.e. credit at a price below the prevailing market rate.	The Project has succeeded in engaging the attention of a number of international developers, some of whom are currently actively engaged in feasibility and development work. Also, Kazakh developers are now aware of the important skills, experience and finance that international developers can bring to projects. The Project has made great strides in developing policy, legislation and capacity supportive of a successful wind energy industry. This will reduce risk for investors and improve credit terms. However, a clearly price signal is needed before investors will be confident of committing scarce development funds to wind farm projects in Kazakhstan. Also, soft loans or some other form of exceptional Government support would still be helpful in supporting the first pilot wind farm projects. The wind energy industry is not an isolated part of the economy. Therefore, the problem of formal and in-formal barriers to trade affecting the wider economy also affects the wind sector. All necessary steps must be taken to ensure a continued improvement of the ease of doing business in Kazakhstan.
Policy and regulatory framework	Prior to the Project, there was, effectively, no coordinated strategy or policy framework for the development of wind energy. No specific policy documents, laws or rules were in existence to promote and govern the industry.	Significant progress has been made in removing this particular barrier. In particular the RES Law and the Rules for the Purchase of Electricity. This provides a good basis, although certain issues need to be resolved, as mentioned earlier. A National Wind Energy Program for Kazakhstan was prepared by MENR and the projects which sets targets for wind energy generation for up to the year 2030. The Program is, however, still in draft form. Together with the amended RES Law (fixed feed-in tariffs), this would give a clear signal of the Government's commitment to Kazakh and foreign wind developers and investors.

Wind energy is well-recognised internationally as having real and substantial benefits to local, regional and national economies as well as to the global environment. Some benefits and impacts may be location specific or more generally associated with the technology or commercial activities. Defining the potential benefits of wind energy to Kazakhstan is

important for the on-going promotion of the industry amongst stakeholders. Table 7 provides an overview of the envisaged or potential impacts of the project.

Table 7 Summary of indicators of the project's benefits and impacts

Impact of the Project	**Indicators** (based on the APRs, the Evaluation Team's observations and Lettice, 2009)
1. Installed RE capacity, annual energy production and potential economic benefits	• Assuming the target of 2,000 MW of wind power installed in 2030 would be met (as set in the draft National Wind Energy Programme), this would produce about 4.2 billion kWh in 2030 • Reaching the 2030 target would benefit the economy of Kazakhstan by up to USD 10 million[16];
2. Annual and cumulative CO_2 reduction	• *Direct*: With no wind farm operating yet, there is no direct emission reduction. The combined wind farm capacity at the sites of the 10 pre-feasibility studies (see Table 3) would amount to 500 MW, resulting in generation of 1,500 million kWh annually • *Indirect*: Assuming the same target of 2,000 MW of wind power installed in 2030, and corresponding CO_2 reduction of 84 million tonnes of CO_2. This would have the same emissions reduction impact as removing over 600,000 cars from Kazakhstan's roads. (Lettice, 2011; Cherednichenko, 2007) • Kazakhstan (finally) ratified the Kyoto Protocol in 2009. Wind energy could make a contribution to meeting its emission reduction targets of about USD 80 million in 2030 (assuming a carbon price of USD 20/tCO_2) or USD 1.5 billion over the lifetime of the wind farms (based on Lettice, 2011)
3. Development of sectoral policies, laws and regulations	• Law on Renewable Energy Sources (Law on RES) approved by Government with Regulations for specific topics; a National Wind Energy Programme has been drafted, but is still under discussion;
4. Improvement of awareness and understanding of technologies among producers and users	• Site mapping and wind measurements at more than 15 sites, resulting in good site-specific data am the first wind atlas of Kazakhstan and pre-feasibility analysis for 10 sites • Technical and financial-economic capacity strengthened of government officials and business community; (Informal) networks of people in Government entities, private sector and academia established
5. Expansion of business and supporting services for renewable energy	• There is still no operating wind farm. A PPA for the first pilot wind farms still needs to be arranged with developers, financial closure reached. • The manufacture, installation and O&M of wind farms in the world has generated employment of about 1.33 per MW installed (Lettice, 2011). Assuming that by 2020 Kazakhstan would source wind turbines from within its borders, this would imply that 1500 people could be employed. • With a growing wind energy experience, Kazakhstan could export assessment, design, logistics and O&M experience to neighbouring and other countries in the region • A growing local wind energy capacity, would also have beneficial spin-off in the capacity development and supporting service delivery capacity for smaller rural applications of wind energy, thus spurring rural development

[16] Source: Lettice (2011). Assuming that cost of developing 1 MW of wind energy is about USD 1.5-2.5 and would generate of up to USD 2.9 million over its 20-year lifespan at a PPA of USD 0.06 per kWh and production of 50 GWh per 1 MW of capacity.

6. Increase of financing availability and financing mechanisms	• Several project developers and investors have plans for commercially viable investments in wind parks • Appropriate financing mechanisms (feed-in tariff and other financial/investment issues) still need to be clarified for investors to take final investment decisions.

2.3 Project relevance, design and stakeholder involvement

2.3.1 Project conceptualisation

The objectives and expected outcomes and outputs are indicated in the logical framework laid down in Annex III of the UNDP Project Document with success indicators and risk assumptions, based on the analysis of barriers, given in the same document. The Tables 1-2 and 4-6 in Section 2.1 of this evaluation report provide a summary of outputs and indicators.

The Project Document describes the informational, financial and institutional barriers that hinder wind energy development in Kazakhstan (see Section 1.1 and Table 6 of this evaluation report). The project is centred on the establishment of wind demonstration plant in Djungar Gate, the first such large a wind farm in Kazakhstan, but up to now has not been realised. The project design correctly recognises that at the outset it was not sufficient to implement just a technical solution (the Djungar pilot), but also to look at 'soft' options, like capacity building, national RE strategy formulation, institutional strengthening and financial options, to ensure long-term sustainability.

The Mid-Term evaluation concludes that *the problems and barriers that the project addresses were all identified, except for the barrier posed by the rapidly changing institutional setup of the power sector and the barrier of higher cost per unit of energy produced of wind power*. Long-term policy and legal certainty is essential to attract wind energy developers and investors. The discussion on privatisation and deregulation of the power sector (implemented in 2004, the same year as the Project Document was signed) must have come up before during the project design stage. The unsure status in the power sector framework should at least been identified as a major risk factor in the Project Document. In a competitive market, why would a privatised energy supply company purchase more expensive wind power? In fact, the project document dodges the question of who will pay in the end for the additional of wind power in comparison with fossil-fuel fired plants (subsidy, higher tariffs, etc.) and how a wind energy market could be really commercially developed.

The first pilot wind farm project(s) in Kazakhstan was originally expected to be a circa 5 MW wind farm in the Djungar Gate region. It was later suggested to make the potential project more economically attractive by increasing its capacity to 50 MW development. This suggests that the size of demo or pilot project activities should be more critically looked at in project design.

However, the Evaluators notice that many GEF project proposals from the late nineties or early noughts, such as Kazakhstan Wind, have a similar set-up, stressing the *demonstration* aspect; all have a demonstration component, a technical capacity building component and less focus on policy-regulatory issues. Later GEF projects (from the GEF-3 and GEF-4 budget cycles) have a bigger focus on *market development*, although still retaining a demonstration component as part of the project. Influencing policy-regulatory barriers has given a higher priority, is at least, the practical experience of one of the Evaluators.

2.3.2 Relevance and country drivenness

Some 75-80% of fuel used in power stations comes from old coal-fired plants. New capacity will be needed to meet the rapidly rising demand and new tariffs proposed will reflect this marginal cost of production. Another issue is the supply of power in a country with a vast surface area and low population density and transmission losses can be up to 15-25%. An alternative for power supply is generation aimed at local demand, thus avoiding the large transmission losses. The aging power generation infrastructure in Kazakhstan and the immediate need to replace this in order to maintain acceptable levels of power quality and reliability presents an opportunity for wind energy. This increased efficiency in the delivery of power to end users will have cost and environmental benefits for consumers and society.

Another concern is environmental pollution. The concentration of harmful substances in smoke gases from the coal-fired power stations exceeds international standards by several times. Thermal power stations are one of the primary sources of greenhouse gas emissions. Kazakhstan participates in the UNFCCC and ratified the Kyoto Protocol in June 2009. The first commitment phase of the Kyoto Protocol will end in 2012. While a post-2012 international framework still needs to be negotiated, Kazakhstan's ratification is likely to imply the necessity to reduce greenhouse gas emissions in the power sector in the longer run, which can be achieved by increasing energy efficiency and expand the utilization of renewable energy. Kazakhstan currently has one of the highest, per capita, carbon footprints in the world. In 2007, the International Energy Agency ranked Kazakhstan 16th in per capita carbon dioxide emissions. The very low (near zero) carbon intensity of wind farms presents an attractive opportunity for Government and investors as developing climate change financing mechanisms help to make such projects commercially feasible.

The Action Plan of the Conception on Sustainable Development until 2024 approved by the Government on 14 February 2007 requires the Ministry of Environment Protection (MEP) to initiate in 2007 the process of development of legislative framework for sustainable development, including the issues of usage of renewable and alternative sources of energy. In conclusion, in the recent years, political support has emerged for the implementation of a more environmentally sustainable pathway for the development of the energy sector. The Law on Renewable Energy Sources (RES Law) was passed in 2009 and forms an example of legislation aimed at sustainable development.

2.3.3 Stakeholder involvement in design and implementation

The following main players had been involved in the project design:

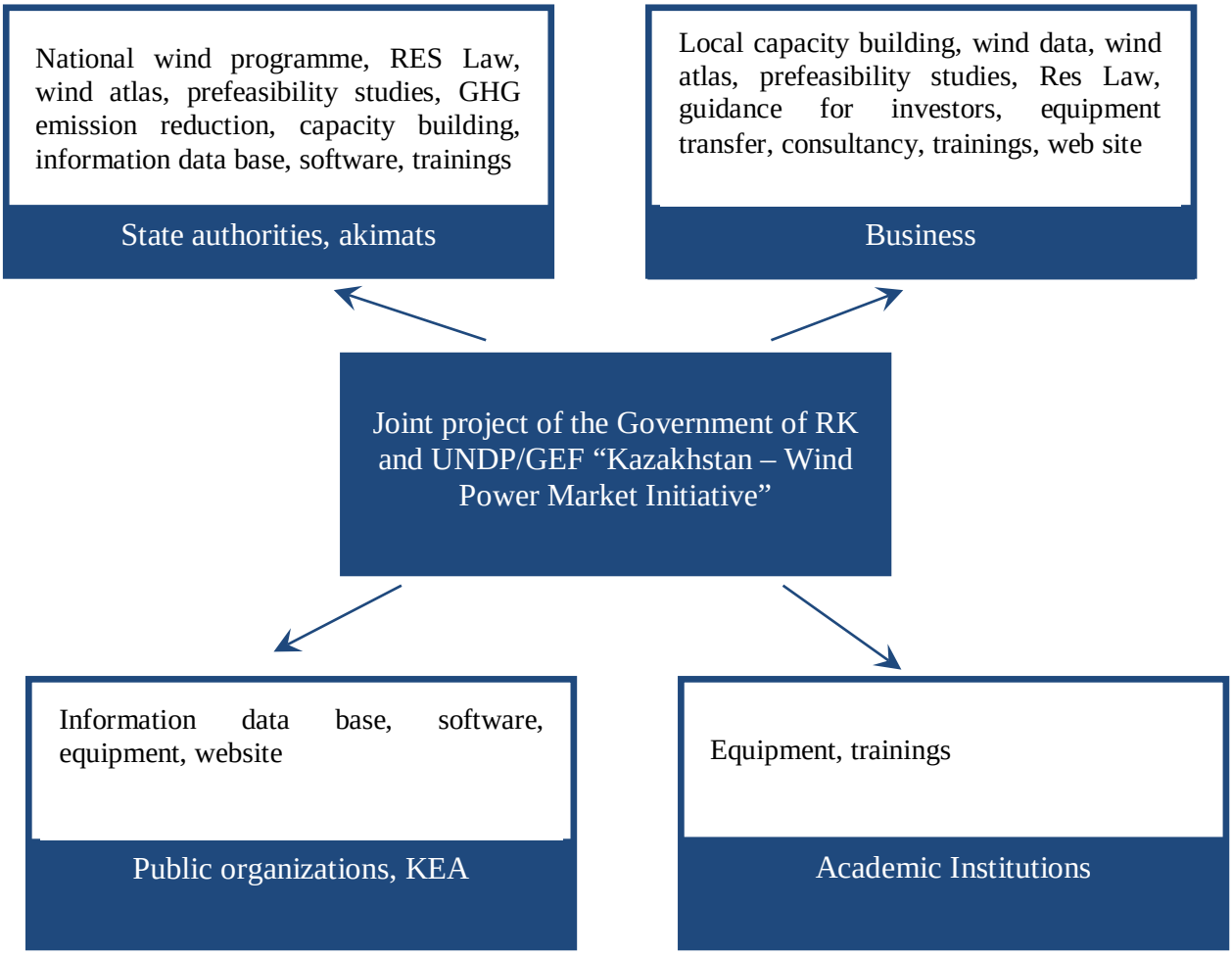
- KEGOC - National Electricity Grid Operator
- Ministry of Energy and Mineral Resources (MEMR)
- Ministry of Environment Protection (MEP)
- Kazselenergo Project Institute – a research institute
- Almaty Institute of Power Engineering and Telecommunications
- Alamaty Oblast Akimat
- UNDP
- TATEK

The envisaged buyer of the power generated by the Djungar Gate wind farm, TATEK, was privatised and split up in production and distribution companies (regional energy companies,

RECs). In this new semi-commercial set-up of the power sector, the project has established good contacts with energy producers, regional energy companies as well as foreign and local investors and prospective developers.

On the Government level, the PIU has relations with representatives from both government ministry entities, MEP and MEMR (the latter replaced by MINT in 2009, as responsible for energy policy) and with both Chambers of Parliament; all of which has helped substantially to formulate the RES Law in a way politically acceptable to all government parties involved. Last, but not least, should be mentioned the project has provided assistance and information to project developers in realising the feasibility studies and has facilitated networking between these developers, utilities and local executive bodies.

Figure 1 The project and its partners



2.4 Assessment of the implementation approach

2.4.1 Financial planning and delivery of counterpart inputs

Table 8 provides an overview of the original budget and actual annual expenditures up to the end of December 2010. It was noted during the Mid-Term Evaluation (MTE) in 2007 that

after 2.5 years (60%) of project implementation only 39% of the budget resources had been spent. This reflects the fact that large part of the budget had been allocated to supporting the Djungar wind farm (US$ 1 million). However, if subtracting this amount from the total GEF budget of US$ 2.55 million, budget spending had been more or less in line with the implementation rate of project activities, namely two-thirds. It was recommended in the MTE that the Djungar Gate budget should be spent on other activities, including supporting support feasibility studies on wind power farms in other areas of the country and further support for developing the policy-regulatory framework. Various pre-feasility studies have indeed been supported, as mentioned in Section 2.1. By the end of 2010, about 92% of the GEF budget was spent. More details on project budget and co-financing (proposed and actual figures) are also presented in Annex C.

Table 8 Planned project budget and actual expenditures

Budget as in Project Document	Total (US$)	2004	2005	2006	2007	2008	2009	2010
UNDP/GEF	2,550,000	529,000	443,000	1,410,000	168,000			
MEMR	160,000							
Investor	4,560,000							
Government in-kind								
Actual expenditures (up to Dec. 2010)	**Total**	**2004**	**2005**	**2006**	**2007**	**2008**	**2,009**	**2010**
UNDP/GEF	2,363,466	25,999	228,657	556,169	167,000	462,175	401,200	522,266
MEMR/MINT/MEP	192,500					160,000	5,000	27,500
Investors (in-kind)	1,770,000						300,000	1,470,000
REEEP	59,250			6,130	53,120			
GOF	96,371				96,371			
KEGOC (in-kind)	76,000	4000	12000	12000	12000	12000	12000	12000
UNESCO(in-kind)	10,000							10000
KEA (in-kind)	41,000							41,000

GEF makes the availability of co-financing an important condition for accepting projects. From the GEF viewpoint, the fact that with the delay in the Djungar Gate wind farm most of the co-financing has not materialised yet, has led that co-financing has not been forthcoming and, related, MEMR funds have never been allocated.

On the positive side, the project has attracted additional funding from REEEP (US$ 72,915) to assess the commercial potential of RES in Kazakhstan and support legislation (Law on RES). Also, the original project design does not include in-kind co-financing and in the latest progress reports (PIRs) only a small in-kind contribution by KEGOC has been allocated (reflecting, e.g., that KEGOC has made office space available to the project team). In reality, the Evaluation Team believes that the 'real' in-kind contribution by Kazakh project partners and stakeholders has actually been much higher than reported, e.g., in terms of staff time directly and indirectly involved and travel cost made available for staff to be able participate in the project's activities (conference participation, workshops). Also, the various investors have spent time and money in developing the wind assessment and feasibility analysis. We have tried to quantify these contributions and an estimate of realized co-financing is given in Table 9 below.

Table 9 Overview of realized co-financing

Co-financing in USD	Components 1	2	3	4	PM	TOT
Government						
- MEMR/MINT/MEP	176,800				18,000	194,800
- KEGOC	20,000				80,000	100,000
Donors						
- REEEP & GOF	60,000	90,000				150,000
Private & NGO:						
- In-kind			100,000	100,000		200,000
- ALD (5 MW)			620,000			620,000
- Green Energy 51 MW)			200,000			200,000
- New Smart Energy (41 MW)			250,000			250,000
- Samruk-Energy (33 MW)			100,000			100,000
- Spain Consulting (24 MW)			100,000			100,000
- HAP (210 MW)			250,000			250,000
- DMK (21 MW)			150,000			150,000
- KEA				65,000		65,000
Total	**256,800**	**90,000**	**1,770,000**	**165,000**	**98,000**	**2,379,800**

Notes:

- KEGOC: USD 20,000 for policy-related training and USD 80,000 for make available office space (2005-2011)
- Investors have contributed USD 1,670,000 in assessment of wind energy potential and feasibility analysis and USD 100,000 estimated travel expenses for participation in workshops and conferences
- MEMR/MINT: USD 164,000 for development of wind energy national programme; Contribution of MEP of USD 18,000 for project office

2.4.2 Risks, adaptive management, monitoring and partnership strategy

Risks

One intended outcome of the Project was to facilitate the construction of the first pilot wind farm project(s) in Kazakhstan. The unbundling and semi-privatisation of the electricity sector in 2004, implied that (now having a profit maximisation objective) all independent (and renewable energy) power generation appearing as wholly uncompetitive in comparison with the (artificially) low wholesale electricity prices. This has created big difficulties in negotiating an adequate PPA for the output of the first pilot project, the Djungar Gate wind farm, Given the prevailing legislation (lack of a support scheme) at the time, private sector involvement was not enough to bring a pilot project to fruition and there is still no operational wind farm in Kazakhstan. Following the recommendations of the Mid-Term Evaluation, the Project funds destined for supporting the development of the pilot project have been, rightly so, redirected to support more work on fundamental aspects of policy, legislation and capacity building.

Logical framework and monitoring

Progress reports are drafted on an annual basis with annual work plans (with budget), one made at the end of the year, called Annual Progress Report (APR) and one halfway the year for reporting purposes to the GEF, called Project Implementation Review (PIR). The progress described in the first APR-PIRs follows the original logical framework as formulated in the 'project planning matrix' of the Project Document.

A Mid-Term Evaluation (MTE) of the Project was carried out in November 2007 according to UNDP and GEF regulations. Conclusions and recommendations arising from the MTE for the on-going direction of the Project were responded to by the management team of the Project. This included changes to the Logical Framework description of the outcomes and outputs of the Project. These changes are summarised in Section 2.1.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

The following summarises the findings of the evaluation. Each of the points discussed below has been dealt with in more detail in the previous Chapter 2.

3.1.1 Attainment of project objective and outcomes

The goal of the project is to promote the development of the wind energy market in Kazakhstan in order to reduce greenhouse gas emissions generated by the energy sector. The way in which the project has achieved its objective against the indicators differs per outcome.

1. Foundation of an efficient regulatory framework for the development of the wind energy sector and relevant institutional capacity for efficient local implementation
   - A legal-regulatory framework for the development of the wind energy sector has been put in place in the form of the Law on Renewable Energy Sources (RES) and linked Regulations;
   - Relevant institutional capacity for efficient implementation has been strengthened
   - A National Wind Energy Development Programme has been developed, but approval has been pending. This, together with lack of appropriate feed-in tariff setting remains a barrier to full market-based development of grid-connected wind energy;
2. Expanded access to information on regulatory framework and other conditions in Kazakhstan for development of commercially feasible investment projects and their funding structure
   - Local capacity in developing and implementing wind energy projects has been enhanced;
   - Wind potential at 15 wind farm sites was monitored; a wind database has been set up for 15 sites; Kazakhstan's first wind atlas was elaborated;
   - Pre-investment wind farm studies were performed at 10 sites;
3. Financial decisions and commencement of construction of the first large-scale wind farms in Kazakhstan
   - Technical support has been provided to several interested developers and investors to develop up to 7 wind farms; a number of these are continuing, but have not resulted in power purchase agreements yet;
4. Events in the project framework for promotion wind energy market in Kazakhstan.
   - Project experience and outcomes were summarized for subsequent development of the wind energy sector in Kazakhstan; an exit strategy was designed (and signed in February 2011) in which the Kazakhstan Energy Association (KEA) will continue the project's promotional activities and the documentation of all project outcomes will be transferred to KEA. Measurement equipment (wind masts) has been transferred to relevant Kazakh (research) institutes.

The project has achieved its outcomes except the one on the construction of pilot wind farm. After 2007, the project's outcomes were revised and re-formulated into the above-mentioned four new outcomes due to lack of progress in the pilot Djungar Gate wind farm changes in policy priorities and need for further assistance to the Government on legislative work and

involvement of investors. The revised project strategy was in place in April 2009 and under implementation currently. *The project is rated as "satisfactory" in terms of the achieving results.*

The Project has been a success in that it has made the prospect of a successfully functioning wind energy development sector in Kazakhstan a real one. Prior to the Project, this looked unlikely, today it is a question of when, not if, the first wind farms will be developed in Kazakhstan.

3.1.2 Sustainability and replicability

The activities of the project were focused on regulatory framework enhancement, capacity building of Kazakhstan specialists and technical support during elaboration of wind farm projects in Kazakhstan, including wind measuring and Wind Atlas, as well as on building and sustainable development of the wind energy market in Kazakhstan. The project rendered considerable assistance to state bodies during elaboration of regulatory framework to support RES and capacity building of state officials. The RES Committee has been established by KEA under agreement with the UNDP-GEF project.

The results of the project provide good support for potential investors and companies developing Wind Energy in Kazakhstan as those allow making decisions based on wind measuring data and pre-investment researches made. The project has strong ties with foreign investors, including international companies, such as Vestas and Samsung, which are interested to develop wind energy in Kazakhstan. Samsung has ambitious plans on construction of wind parks in Kazakhstan and recently signed Memorandum with the Ministry of Industry New & Technologies (MINT). In short, a number of wind energy initiatives have been undertaken and are in various stages of development and in some cases agreement on PPA has been reached. This is an important building block of sustainability.

Currently MINT is planning to continue the wind monitoring program which was started by the project. Many of the barriers to wind energy have been addressed, a number do remain however:

- A certain and sufficient level of financial support (ideally by means of a fixed feed-in-tariff) is essential to make projects commercially viable and capable of attracting support from investors. Currently, amendments to the RES Law are under discussion to define a fixed feed-in tariffs regime;
- Government is a prime mover in the development of the market; it should give clear signals to prospective developers and financiers on its commitment by establishing wind energy programme with realistic targets. It is important therefore that the National Wind Energy Programme will be approved, which defines such targets.

3.1.3 Project design and project implementation

The project “Kazakhstan - Wind Market Development Initiative” started in 2004 aiming at removing existing barriers to the grid-connected wind energy production in Kazakhstan. The project seeks to achieve this by means of wind energy resource assessment, local capacity building, and formulation of a national wind programme and, last but not least, by supporting the construction and showcasing of a 5 MW pilot wind farm at Djungar Gate, near the Chinese border. To set up the wind farm a project developer-cum-investor would be selected by a tender procedure and reach a PPA with the Government . In the same year, 2004, the Power Industry Law of 2004 introduced deregulation and privatisation in the power sector of

Kazakhstan. This liberalization of the power sector has offered both challenges and opportunities to the UNDP/GEF project.

With the privatization all energy companies have a profit objective and are not so interested in buying more expensive wind power, which cannot compete against the low tariffs based on the coal-based generation capacity. Due to difficulties in negotiating an adequate PPA for the output of this pilot project and the prevailing legislation (lack of appropriate feed-in tariffs) at the time, a PPA could not be reached at that time, as has been explained earlier in the text.

This has posed problems for project management in terms of budget and co-financing:

- In the original project budget, 40% was destined for support to the Djungar wind farm, because, which would now be unspent;
- Investment in the wind farm would be the bulk of co-financing; without it the co-financing of the project would not have been realised, while GEF is quite adamant on realising co-financing.

To the credit to the project team, it has seized opportunities:

- By focussing on the policy-regulatory barriers, by assisting in drafting a Law on the promotion of Renewable Energy Sources (RES) and Regulations as well as supporting the formulation of the National Wind Energy Programme (still in draft)
- The Project funds destined for supporting the development of the pilot project have, in part, been redirected to good effect to support more fundamental work with potentially greater impact on market development, e.g. development of legislation.

By drafting this draft Law on RES and together with the resource assessment and capacity building activities and bringing together a critical mass of representatives in government and business community interested in renewable energy, the project has laid the groundwork for future commercial renewable energy development in Kazakhstan. *In this sense, the Evaluation Team concludes that the PIU has been performing satisfactorily, by adequately reacting to the changing circumstances and environment.*

3.2 Lessons learnt

3.2.1 Wind power development

Kazakhstan is fortunate to have a very good wind resource, a cohort of technically proficient professionals and experience of large infrastructure projects. However, without an appropriate legal and regulatory regime that provides commercial certainty, the wind sector will falter. Wind energy has a higher cost in per unit of energy than fossil fuel technologies. This implies that a financial support scheme must be devised to 'level the playing field' and pay for the incremental cost difference, which is accepted by the state bodies and electricity companies involved and trusted by investors and developers.

The project team rightly identified lack of policy, legislation and regulation as one of the main barriers. Rather than focussing on showcasing one pilot wind farm, the Project has focussed more on laying the conditions for market development by getting local developers and foreign investors interested in establishing wind farms at various sites in Kazakhstan.

The barriers identified at the outset of the Project were, in general, those that did, in fact, require addressing. However, a number of barriers proved to be more complex and intractable than anticipated, some barriers are more important than others and not all barriers can be

addressed within the same timeframe. The logistics surrounding the delivery of turbines to sites in Kazakhstan has been identified as an unexpected barrier. International turbine suppliers should be consulted with in an effort to determine possible shipping, road and rail options. As discussed above, the policy-regulatory barrier is crucial and without a power purchase support scheme, market-based wind power development will not take off. A holistic approach to removing barriers is required, with one goal i.e. the reduction of commercial risk to a level that stimulates investment in the market, by having a stable and adequate legislation, properly implemented and enforced. Wind farms will be developed in Kazakhstan as soon as a risk-reward balance acceptable to a credible investor/developer has been arrived at. At all times, the need for investors to justify their decisions by means of a commercial model must be borne in mind. Anything that prevents a commercial basis for projects is a barrier that needs to be tackled.

3.2.2 Project design

Lessons learnt regarding the design of UNDP/GEF renewable energy projects are:

- The timeframe to develop an adequate policy-regulatory framework can be long, in any case longer than the 4-5 year duration of a typical GEF project. In the case of Kazakhstan, support for renewable energy at government body was lukewarm a decade ago, and it takes a time to convince policy-makers on the merits of green energy and even more time to translate this support in a workable policy, laws and regulations;

- Similarly, the timeframe to develop a wind farm from beginning (site identification) to financial closure (when construction takes many years), including 1-2 years of wind measurements (if such data are not available) to have a bankable proposal, as well as construction time. Also, it has turned out that a 5 MW wind farm is too small to arouse interest of commercial developers. It looks that 5 MW has been chosen to satisfy the GEF funds: co-financing ratio of 1:3 or 4 (GEF USD 2.55 million; investment: USD 4.56 million), rather than with a cost-benefit objective in mind of the wind farm investments involved. Having said this, a significant amount of commercial interest and project know-how has been developed as a result of the work undertaken to establish a pilot project. This has not been lost despite the wind farm not being completed and the work undertaken on the pilot has helped focussing on the very barriers and roadblocks that needed to be removed, but it does raise questions about the role and proper design of ‘demonstration’ projects.

3.3 Recommendations

Wind energy development in Kazakhstan

The Government is a prime mover in the development of the market; it should continue to actively support the development of the market by means of establishing appropriate targets, supporting legislation.

Regarding recommendations, the question can be asked – what is missing that would help unlock the potential of the sector and remove the remaining barriers faced by commercial developers? As a result of the work undertaken during the course of the Project and considering the current status of the wind energy industry in Kazakhstan and elsewhere, the following recommendations are made to be able to attract investors

- Setting long-term targets for wind energy will give a good indication that the Government has serious plans in developing wind energy as well as other renewable sources of energy
- A fixed feed-in-tariff for a fixed period of time should be available to wind farm developers rather than continuing the status-quo of negotiating a feed-in-tariff following a feasibility study as per the RES Law

Questions have been raised if the power system in Kazakhstan could integrate multiple wind farms in a smooth way. The wind power scenario of the draft National Wind Energy Programme foresees about 700 GWh per year production in 2015 (with 250 MW of wind power capacity) and about 6,00- GWh per year of production in 2030 (2000 MW). The current gross demand in Kazakhstan is less than 100,000 GWh per year and it is foreseen to grow to 105,000 GWh per year in 2015 and 155,000 GWh in 2030. The wind power penetration level, from energy, would thus be less than 1 % in 2015 and about 4 % in 2030. This is still quite moderate wind power penetration level, which means that no large impacts can be seen in the system[17]. However, it is good to prepare for further increase in wind power. The adoption of wind turbine Grid Codes similar to those used in many Western countries would ease the integration of larger amounts of wind at a later stage. Wind generation forecasts will be crucial in the day-ahead scheduling process to ensure that during windy periods all wind power production will be taken into account in day-ahead planning thus reducing other production and also low wind periods will be taken into account in scheduling more conventional power production on-line.

Future UNDP activities

For future activities, UNDP could consider to continue supporting mainstreaming sustainable energy in the overall Government's energy policy, e.g. by defining energy prices that reflect long-term marginal costs. This will help making both renewable energy technologies more competitive and energy efficiency measures[18] more cost-effective. Support in formulating long-term renewable energy and energy efficiency target will help in achieving greenhouse emission reduction targets. Another area to look into is small-scale renewable energy application in remote areas, such as wind-powered water pumping.

Design of GEF projects

The GEF project format can be quite a straightjacket for project designers. The Kazakhstan project is an example that not always projects fit into this straightjacket. In this case, some barriers (policy-regulatory) were more important than others and could not be fully addressed in the timeframe of 4 to 5 years of a typical GEF climate change project. However, addressing these barriers turned out to be a condition for any wind farm to be developed commercially.

All projects seem to have a similar format, with a policy-institutional component, awareness raising and capacity building and demonstration component. Also, budgets and co-financing are relatively 'fixed' with always a couple of USD million as GEF contribution, which needs to be matched by co-financing with a ratio 1:3 or 4 or higher, irrespective of the size of a country, type and importance of barriers to be removed and of technology involved. It also assumes that all barriers can be addressed simultaneously and within the same timeframe.

[17] Only the large Shelek wind farm (with 300 MW capacity in 2030) may have some local limitations for wind power connection.

[18] For example, UNDP is supporting the project "Energy-Efficient Design and Construction of Energy-Efficient Buildings" (2010-2015). The project could be supplemented with raising general awareness on efficiency use in the residential sector by promoting energy efficiency in domestic appliances.

Rather than focussing on one-time 3 to 5 years interventions, one option for GEF is allow a more long-term programmatic approach which would consists of several modules (smaller projects) that address specific issues and barriers, of which some would be in parallel others in a consecutive order . This would allow for flexibility in defining outputs and activities and fine-tune to the specific charactersitics of the technology or intervention and the country's changing needs over time. Rather than defining a package of activities worth several millions of dollars from the onset, this would also allow for more accurate, bottom-up, based budgeting per module. Acknowledging that the overall budget commitment for a longer-term programme could be risky, breakpoints could be inserted in the programme at some stage allowing for modules to start, depending on progress in other projects and depending on the context as the situation is evolving. In this concept, the current practice of co-financing in a 1:3 or 1:4 ratio only should be critically looked at and more flexibility built in. In some modules, e.g. technical training and capacity building, co-fin would be small or in-kind only, while in others, e.g. technical and advisory support to investors, co-fin could be much higher.

From the viewpoint of market development, the concept of 'demonstrating' or 'showcasing' a number of technology projects has become less relevant. The technologies GEF typically focuses on, near-commercial one, have been technically demonstrated elsewhere. Rather than focussing on one or more demos, from a sustainability point of view it is more interesting to have a portfolio of investment projects, of which some may indeed have reached construction and operation by the project's end, others will have reached financial closure, and more would still be in the feasibility or pre-feasibility stage or in the process of identification.

ANNEX A. TERMS OF REFERENCE OF THE EVALUATION

Final Evaluation of the UNDP/GEF Project

"Kazakhstan- Wind Power Market Development Initiative"

Background:

Standard UNDP/GEF Monitoring and Evaluation requirements

The Monitoring and Evaluation (M&E) policy at the project level in UNDP/GEF has four objectives: i) to monitor and evaluate results and impacts; ii) to provide a basis for decision making on necessary amendments and improvements; iii) to promote accountability for resource use; and iv) to document, provide feedback on, and disseminate lessons learned.

A mix of tools is used to ensure effective project M&E. These might be applied continuously throughout the lifetime of the project e.g. periodic monitoring of indicators, PIRs – or as specific time-bound exercise such as mid-term reviews, audit reports and final evaluations.

The evaluation is to be undertaken in accordance with the "GEF Monitoring and Evaluation Policy" (see http://thegef.org/MonitoringandEvaluation/MEPoliciesProcedures/mepoliciesprocedures.html) .

Evaluations in the GEF explore five major criteria:

(i) Relevance – the extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time.
(ii) Effectiveness – the extent to which an objective has been achieved or how likely it is to be achieved.
(iii) Efficiency – the extent to which results have been delivered with the least costly resources possible.
(iv) Results – the positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention. In GEF terms, results include direct project outputs, short-to medium term outcomes, and longer-term impact including global environmental benefits, replication effects and other, local effects.
(v) Sustainability – the likely ability of an intervention to continue to deliver benefits for an extended period of time after completion. Projects need to be environmentally as well as financially and socially sustainable.

The mid-term evaluation for the project was conducted in September 2007. The mid-term evaluation made the following rating and conclusions in its report:

The **achievements** of the project to the date of the mid-term evaluation were summarized as follows:

- Outcome 1. The project management structure was established by the end of 2004, beginning of 2005 with the Project Implementation Unit (PIU) and Project Steering Committee (Outcome 1)
- Outcome 2 (National Wind Energy Programme) has more-or-less been achieved according to schedule and much work has been done on preparation of the wind atlas. Additional funding from REEEP was mobilised resulting in reports on financing and regulatory mechanisms and the addition to the project of the production of draft legislation and presentation to the Ministry of Energy and Mineral Resources (with the REC system as the financial mechanism to equitably share the cost of wind energy in the

power sector as a whole). Also, the draft National Wind Energy Programme is under discussion.

- Outcome 3 has met delay in the wind monitoring programme, because the component only started by September 2006 instead of 2005. Measurements are being undertaken at 8 sites and, after the 1-year measurement period, masts will be shifted to other sites.
- Outcome 4 is delivered partially due to the delay in signing contracts and power purchase agreements with the investors. The main reason for the delay in the planned Djungar Gate wind farm pilot project is simply that the Government has not been able to deliver the promised purchase power agreement (PPA).

One **external factor** has greatly influenced project implementation. In the same year the project document was signed, in 2004, the Power Industry Law of 2004 introduced deregulation and privatisation in the power sector of Kazakhstan. The challenge for the project has been finding a buyer for the wind-generated power at Djungar Gate, after TATEK dropped out due to this restructuring of the power sector. In Kazakhstan, wind power cannot compete against the low tariffs based on the coal-based generation capacity. With the privatization all wind energy companies have a profit objective and are not interested in buying more expensive wind power. A group of investors in the Djungar Gate farm has been identified to develop the Djungar gate, but no Purchase Power Agreement (PPA) has been concluded because the cost per unit of energy produced would be higher than any prospective power buyer would be willing to pay for.

The opportunity for the project was to propose a regulatory mechanism to overcome this cost barrier to wind development in the framework of the restructuring power sector. The project team has successfully seized this opportunity by adding the task of drafting a Law on the promotion of renewable energy sources (RES), which will propose measures. In discussion with government representatives various measures were considered, such as feed-in tariffs, a quota system, a bidding mechanism, fiscal measures or capital subsidy. Eventually the quota system was opted for. The basic idea was to introduce annual quota obligations to energy producers to have renewable energy produced proportional with the yearly produced volume of power.

Major **conclusions** coming out the mid-term evaluation analysis were as follows:

- By drafting this draft Law on RES and together with the resource assessment and capacity building activities and bringing together a critical mass of representatives in government and business community interested in renewable energy, the project is laying the groundwork for future commercial renewable energy development in Kazakhstan. In this sense*, the* Evaluation Team concludes that the Project Implementation Unit has been performing quite satisfactorily*.*
- However, the project's sustainability and replicability will critically depend on the Government and Parliament accepting the Law on RES and, based on the Law, to have adequate regulations to make renewable energy investments commercially attractive for project developers.

The Evaluation Team has the following recommendations:

- Law for RES*.* The most important outcome of the project may be the successful adoption of such a Law. The project should put all possible resources into ensuring that the Law is passed with no significant changes from the draft, including organizing political coordination between governmental entities as well as diplomatic missions to ensure political pressure in favour of RES at the highest level.
- *Djungar Gate pilot wind farm.* The consortium of investors proposes to have the Djungar project is planned to be up-scaled from 5 MW to 50 MW to make the project more economically attractive, although the Government (MEMR) has not officially adopted this proposal. Even if the (RES) would be passed in 2008, it would still take some time to have the proper regulations on the renewable energy certificates (REC) in place. Only an

operating REC will provide the additional revenue stream to make investments in projects, such as Djungar Gate, viable. An interim support option for Djungar Gate (to cover the period up to when RECs can support its commercial performance) should be negotiated urgently:

- Implementation of the Djungar Gate project could be advanced if somehow the Government (MEMR) would provide some additional financial support, for example, in the investment itself or in guaranteeing a certain level of wind power sales at a tariff that would make Djungar Gate financially feasible; The case could be made, since showing results is important by having the first demonstration of a wind farm in Kazakhstan.
- Even if agreement would be reached on the Djungar pilot, it will take some years or so anyway to get the project started after PPA conclusion, including the time needed to get financial closure, technical design and specifications. So, one option is to delay the expenditure of the US $1 million (destined in the project budget as support for Djungar Gate) until after the end of the project's operations (end of 2008) until the moment that the pilot will be commissioned.

- *Budget and prioritization of activities.* If the above-mentioned interim support options for Djungar Gate (to cover the period up to when certificates can support its commercial performance) cannot be negotiated, the question becomes urgent what to do with the US$ 1 million originally destined in the UNDP/GEF budget for supporting the Djungar Gate pilot1. An alternative option for the money could be to support feasibility studies on wind power farms in other areas of the country, so these can be presented to project developers and investors (once a functioning REC system is in place). Also, if the Law on RES would approved soon, some funds could be spent on defining the regulations for the certificate system and to elaborate generic PPAs.

- The *Project Steering Committee* (and especially MEP and MEMR) should play a stronger role in providing political support (e.g., an urgent agreement of the additional GOF funding for support of the legislation is needed) as well as providing stronger guidance to the PIU on the Djungar Gate project. An urgent Project Steering Committee (PSC) meeting will have to be called for to agree on what to do in the remaining period of 2007-2008, based on the above-mentioned options. Maybe higher level staff of the Ministries should participate in the PSC to enable such important decisions on budget and priorities.

- Based on the PSC's decision regarding budget and activity priorities, the PIU needs to draft a sound work plan for the remaining period of 2007-2008. The should include a good *exit strategy is defined regarding the transfer and dissemination of the project information*, wind data and reports and the ownership of the wind measuring equipment. Some projects funds should be dedicated top set up a good website at an existing institute in Kazakhstan were the project information can be downloaded.

4. According to the Recommendations, the Project Management Responses and decisions of the PSC the Project Logframe was revised with the followings outcomes: 1) An enabling legal and regulatory framework for wind energy development and adequate institutional capacity to effectively implement that in place, 2) Improved access to information on the specific framework conditions in Kazakhstan to develop commercially feasible investment projects and to structure financing for them. 3) Financial closure and start-up of the construction of the first, larger scale wind energy plants in Kazakhstan. 4) The results and services provided by the project sustained to foster further development of the wind energy market in Kazakhstan.

5. Expected main results :

1) The National Wind Energy Development Program, the new Renewable Energy Law and the associated, wind energy related by-laws adopted with concrete incentives and other provisions promoting investments in wind energy. Strengthened capacity of the the key public authorities to effectively implement the adopted legal and regulatory framework

2) Completed wind atlas of Kazakhstan with more detailed wind resources assessments for over 10 sites publicly available.

   Readily available information on the applicable legal and regulatory framework, tariff policy, available financing options, possible partners and typical steps required for the development of wind energy projects in Kazakhstan made available in an organized and easily accessible form to the potential local and foreign investors.
3) Financing decisions concluded for at least 2 new wind energy projects by the end of the project.
4) Self-sustaining arrangements in place by the end of the project to continue the information and wind energy project facilitation services.

The revised Project Logframe and Annual Works Plans for 2009-2010 were prepared and adopted by the SC in 2009. This UNDP/GEF wind project is scheduled to close in June 2011. Thus the final evaluation's focus should be a lessons-learned section for wide distribution to other countries planning similar activities in area of renewable energy and climate change mitigations.

The Final Evaluation of the UNDP/GEF Project "Kazakhstan- Wind Power Market Development Initiative" is initiated by UNDP as the GEF Implementing Agency. It aims to provide stakeholders (Ministry of Industry and Innovative Technology PK, PIU, UNDP-Kazakhstan Project Office and UNDP-GEF levels) with strategy and policy options for more effective and efficiently manner to support the wind energy development in Kazakhstan and for replicating the results. It also provides the basis for learning and accountability for managers and stakeholders.

Objective:

The overall purpose of the evaluation is to measure the effectiveness and efficiency of project activities in relation to the stated objective so far, and to produce possible recommendations on:

- The key elements of success of the project and further steps to be taken to secure successful
  development of the wind power market initiative in Kazakhstan ;
- Any gaps remaining after the project implementation to be addressed in further initiatives by
  the Government;
- Identifying risks to the sustainability of the project initiatives to be considering by the Government in future development of the wind power in Kazakhstan.

The Final Evaluation is to consider the currently evolving policy and economic climate in consideration of the risks and the further development of the initiatives as the external pressures
on results and executing agency have changed during the last year of the project.

Project performance will be measured based on the indicators of the project's logical framework. Many of these indicators relate to the elimination of the key barriers to wind energy development in Kazakhstan.

The Final Evaluation serves as an agent of change and plays a critical role in supporting accountability. The emphasis of the evaluation should be the following:

Project indicators

The evaluators will assess the achievement of indicators of the project's logical framework and review the work plans, planned duration and budget of the project.

Implementation

The evaluation will assess the implementation of the project in terms of quality and timeliness of inputs and efficiency and effectiveness of activities carried out. Also, the effectiveness of management as well as the quality and timeliness of monitoring and backstopping by all parties to the project should be evaluated. In particular the evaluation is to assess the Project team's use of adaptive management in project implementation and the Project team's fulfillment of management responses to evaluation recommendations made during the mid-term evaluation in September 2007.

Project outputs, outcomes and impact

The evaluation will assess the outputs, outcomes and impact achieved by the project. This should encompass an assessment of the achievement of the immediate objectives and the contribution to attaining the overall objective of the project. The evaluation should also assess the extent to which the implementation of the project has been inclusive of relevant stakeholders and to which it has been able to create collaboration between different partners. The evaluation will also examine if the project has had significant unexpected effects, whether of beneficial or detrimental character.

The Final Evaluation will also cover the following aspects:

1. *Progress Towards Results*
   (a) Changes in development conditions: Address the following questions with a focus on the perception of change among stakeholders:
      - Has the National Wind Energy Development Program and the new Renewable Energy Law and by-laws been adopted with concrete incentives for wind energy investments?
      - Has the capacity of the public authorities to implement the legal and regulatory provisions been strengthened?
      - Has access to information required by investors for their initial financing decisions with further feasibility studies been enhanced?
      - Has the financing decisions been concluded for at least 2 new wind energy projects by the end of the project?
      - Has self-sustaining arrangements been in a place by the end of the project to continue the information and wind energy project facilitation services?.

   (b) Measurement of change: Progress towards results should be based on a comparison of indicators before and after (so far) the project intervention. Progress can also be assessed by comparing conditions in the project site to conditions in similar unmanaged sites;

   (c) Project strategy: how and why outcomes (listed as outputs in the project document) and strategies contribute to the achievement of the expected results:
   - Examine their relevance and whether they provide the most effective route towards results.

   (d) Sustainability: Extent to which the benefits of the project will continue after it has come to an end. Relevant factors include for example: development of a sustainability strategy, establishment of financial and economic instruments and mechanisms for mainstreaming wind projects into energy market, etc;

   (e) Gender perspective: Extent to which the project accounts for gender differences when developing and applying project interventions. How are gender considerations mainstreamed into project interventions? Suggest measures to strengthen the project's gender approach.

2. *Project's Adaptive Management Framework*
   (a) Monitoring Systems:
   - Assess the monitoring tools currently being used:
      a. Do they provide the necessary information?
      b. Do they involve key partners?

c. Are they efficient?

- Ensure the monitoring system, including performance indicators, at least meets GEF minimum requirements [19]. Apply SMART indicators as necessary.
- Apply the GEF Tracking Tool and provide a description of comparison with initial application of the tool.

(b) Risk Management:

- Validate whether the risks identified in the project document and PIRs are the most important and whether the risk ratings applied are appropriate. If not, explain why. Describe any additional risks identified and suggest risk ratings and possible risk management strategies to be adopted.
- Assess the project's risk identification and management systems:
  - Is the UNDP-GEF Risk Management System [2] appropriately applied (with particular emphasis on the pilot wind farm arrangement risks related to signing appropriate power purchase agreement between the wind farm and Government)?
  - How can the UNDP-GEF Risk Management System be used to strengthen project management?

(c) Risk Management:

- Validate whether the risks identified in the project document and PIRs are the most important and whether the risk ratings applied are appropriate. If not, explain why. Describe any additional risks identified and suggest risk ratings and possible risk management strategies to be adopted.

1 _____

- Assess the project's risk identification and management systems:
  - Is the UNDP-GEF Risk Management System [2] appropriately applied (with particular emphasis on the pilot wind farm arrangement risks related to signing appropriate power purchase agreement between the wind farm and Government)?
  - How can the UNDP-GEF Risk Management System be used to strengthen project management?

(d) Work Planning:

- Assess the use of the logical framework as a management tool during implementation and any changes made to it.
  - Ensure the logical framework meets UNDP-GEF requirements in terms of format and content.
  - What impact did the retro-fitting of impact indicators have on project management?
- Assess the use of routinely updated workplans.
- Assess the use of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
- Are work planning processes result-based[20]?

[19] See section 3.2 of the GEF's "Monitoring and Evaluation Policies and Procedures", available at http://www.undp.org/gef/05/monitoring/policies.html

[2] UNDP-GEF's system is based on the Atlas Risk Module. See the UNDP-GEF Risk Management Strategy resource kit, available as Annex XI at http://www.undp.org/gef/05/monitoring/policies.html

[3] RBM Support documents are available at http://www.undp.org/eo/methodologies.htm

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions. Any irregularities must be noted.

(e) Reporting:
- Assess how adaptive management changes have been reported by the project management.
- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

3. Underlying Factors

- Assess the underlying factors beyond the project's immediate control that influence outcomes and results. Consider the appropriateness and effectiveness of the project's management strategies for these factors.
- Re-test the assumptions made by the project management and identify new assumptions that should be made.
- Assess the effect of any incorrect assumptions made by the project

4. UNDP Contribution

- Assess the role of UNDP against the requirements set out in the UNDP Handbook on Monitoring and Evaluating for Results. Please consider
  - field visits;
  - Steering Committee meetings/TOR follow-up and analysis ;
  - PIR preparation and follow-up;
  - GEF guidance.
- Consider the new UNDP requirements outlined in the UNDP User Guide [4], especially the Project Assurance role, and ensure they are incorporated into the project's adaptive management framework.
- Assess the contribution to the project from UNDP "soft" assistance (i.e. policy advice & dialogue, advocacy, and coordination).

5. Partnership Strategy

- Assess how partners are involved in the project's adaptive management framework:
  - Involving partners and stakeholders in the selection of indicators and other measures of performance
  - Using already existing data and statistics
  - Analysing progress towards results and determining project strategies.

- Identify opportunities for stronger substantive partnerships.
- Assess how local stakeholders participate in project management and decision-making. Include an analysis of the strengths and weaknesses of the approach adopted by the project and suggestions for improvement if necessary.

Consider the dissemination of project information to partners and stakeholders and if necessary suggest more appropriate mechanisms.

[4] The UNDP User Guide is currently only available on UNDP's intranet. However UNDP can provide the necessary sections from content.undp.org/go/userguide/results/rmoverview/progprojorg/?src=print

Scope of work:

- The Final evaluation is to consider that a mid-term evaluation has been completed and that the management of the project has prepared management response to this evaluation and to a certain degree, tailored further activities in the project taking into consideration the recommendations from the mid-term evaluation.

It is in the interests of the Project team and UNDP Kazakhstan that the evaluators dedicate more effort to evaluate progress in the areas which have been launched, or which have achieved significant progress or which have been identified by the Project team or UNDP Kazakhstan as problematic.
In this regard, the project evaluators are asked to pay particular attention to:

- An enabling legal and regulatory framework for wind energy development and adequate institutional capacity to effectively implement that in place.
- Improved access to information on the specific framework conditions in Kazakhstan to develop commercially feasible investment projects and to structure financing for them.
- Financial decisions and start-up of the construction of the first, larger scale wind energy plants in Kazakhstan.
- The results and services provided by the project sustained to foster further development of the wind energy market in Kazakhstan

Ownership of the project by the Ministry of Industry and New Technology (MINT) is one of the key factors in the project's success to achieve success in the project implementation and thus, the evaluators are asked to make an objective assessment of the ownership of the project outcomes/results by the MINT.

• Expected results and payments:

The key product expected from the final evaluation is a comprehensive analytical report in English and Russian that should, at least, include the following contents:
Please note that some of the categories in the findings and conclusions need to be rated in conformity with the GEF guidelines for final evaluations.

1. Executive summary

- Brief description of the project
- Context and purpose of the evaluation

Main conclusions, recommendations and lessons learned

2. Introduction

- Project background
- Purpose of the evaluation
- Key issues addressed
- The outputs of the evaluation and how they will be used
- Methodology of the evaluation
- Structure of the evaluation

3. The Project and its development context

- Project start and its duration
- Implementation status
- Problems that the project seeks to address
- Immediate and development objectives of the project
- Main stakeholders
- Results expected

4. Findings and Conclusions

In addition to a descriptive assessment, all **criteria marked with (R) should be rated** using the following divisions: Highly Satisfactory, Satisfactory, Marginally Satisfactory, Unsatisfactory

4.1. Project Formulation

Conceptualization/Design (R). This should assess the approach used in design and an appreciation of the appropriateness of problem conceptualization and whether the selected intervention strategy addressed the root causes and principal threats in the project area. It should also include an assessment of the logical framework and whether the different project components and activities proposed to achieve the objective were appropriate, viable and responded to contextual institutional, legal and regulatory settings of the project. It should also assess the indicators defined for guiding implementation and measurement of achievement and whether lessons from other relevant projects (e.g., same focal area) were incorporated into project design.

Country-ownership/Driveness. Assess the extent to which the project idea/conceptualization had its origin within national, sectoral and development plans and focuses on national environment and development interests.

Stakeholder participation (R) Assess information dissemination, consultation, and "stakeholder" participation in design stages.

Replication approach. Determine the ways in which lessons and experiences coming out of the project were/are to be replicated or scaled up in the design and implementation of other projects (this also related to actual practices undertaken during implementation).

Other aspects to assess in the review of Project formulation approaches would be UNDP comparative advantage as IA for this project; the consideration of linkages between projects and other interventions within the sector and the definition of clear and appropriate management arrangements at the design stage.

4.2. Project Implementation

Implementation Approach (R). This should include assessments of the following aspects:

(i) The use of the logical framework as a management tool during implementation and any changes made to this as a response to changing conditions and/or feedback from M and E activities if required.

(ii) Other elements that indicate adaptive management such as comprehensive and realistic work plans routinely developed that reflect adaptive management and/or; changes in management arrangements to enhance implementation.

(iii) The project's use/establishment of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.

(iv) The general operational relationships between the institutions involved and others and how these relationships have contributed to effective implementation and achievement of project objectives.

(v) Technical capacities associated with the project and their role in project development, management and achievements.

Monitoring and evaluation (R). Including an assessment as to whether there has been adequate periodic oversight of activities during implementation to establish the extent to which inputs, work schedules, other required actions and outputs are proceeding

according to plan; whether formal evaluations have been held and whether action has been taken on the results of this monitoring oversight and evaluation reports.

Stakeholder participation (R). This should include assessments of the mechanisms for information dissemination in project implementation and the extent of stakeholder participation in management, emphasizing the following:

(i) The production and dissemination of information generated by the project.

(ii) Local resource users and NGOs participation in project implementation and decision making and an analysis of the strengths and weaknesses of the approach adopted by the project in this arena.
(iii) The establishment of partnerships and collaborative relationships developed by the project with local, national and international entities and the effects they have had on project implementation.

(iv) Involvement of governmental institutions in project implementation, the extent of governmental support of the project.

Financial Planning: Including an assessment of:

(i) The actual project cost by objectives, outputs, activities
(ii) The cost-effectiveness of achievements
(iii) Financial management (including disbursement issues)
(iv) Co-financing[21]

- Sustainability. Extent to which the benefits of the project will continue, within or outside the project domain, after it has come to an end. Relevant factors include for example: development of a sustainability strategy, establishment of financial and economic instruments and mechanisms, mainstreaming project objectives into the economy or community production activities.
- Execution and implementation modalities. This should consider the effectiveness of the UNDP counterpart and Project Co-ordination Unit participation in selection, recruitment, assignment of experts, consultants and national counterpart staff members and in the definition of tasks and responsibilities; quantity, quality and timeliness of inputs for the project with respect to execution responsibilities, enactment of necessary legislation and budgetary provisions and extent to which these may have affected implementation and sustainability of the Project; quality and timeliness of inputs by UNDP and GoC and other parties responsible for providing inputs to the project, and the extent to which this may have affected the smooth implementation of the project.

4.2. Results

Attainment of Outcomes/ Achievement of objectives (R)*:* Including a description *and rating* of the extent to which the project's objectives (environmental and developmental) were achieved using Highly Satisfactory, Satisfactory, Marginally Satisfactory, and Unsatisfactory ratings. If the project did not establish a baseline (initial conditions), the evaluators should seek to determine it through the use of special methodologies so that achievements, results and impacts can be properly established.

This section should also include reviews of the following:

[21] Please see guidelines at the end of Annex of these TORs for reporting of co-financing

- Sustainability*:* Including an appreciation of the extent to which benefits continue, within or outside the project domain after GEF assistance/external assistance in this phase has come to an end.
- Contribution to upgrading skills of the national staff

5. Recommendations

- Corrective actions for the design, implementation, monitoring and evaluation of the project
- Actions to follow up or reinforce initial benefits from the project
- Proposals for future directions underlining main objectives

6. Lessons learnt

This should highlight the best and worst practices in addressing issues relating to relevance, performance and success.

7. Evaluation report Annexes

- Evaluation TORs
- Itinerary
- List of persons interviewed
- Summary of field visits
- List of documents reviewed
- Questionnaire used and summary of results
- Comments by stakeholders (only in case of discrepancies with evaluation findings and conclusions)

8, Evaluation approach

An outline of an evaluation approach is provided below, however it should be made clear that the evaluation team is responsible for revising the approach as necessary. Any changes should be in-line with international criteria and professional norms and standards (as adopted by the UN Evaluation Group; http://www.uneval.org/). They must be also cleared by UNDP before being applied by the evaluation team.

The evaluation must provide evidence-based information that is credible, reliable and useful. It must be easily understood by project partners and applicable to the remaining period of project duration.

The evaluation should provide as much gender disaggregated data as possible.

The Final Evaluation will be done through a combination of processes including a desk study, site visits (Astana, Almaty) and interviews with all stakeholders. The methodology to be used by the evaluation team should be presented in the report in detail. It shall include information on:

- Documentation review (desk study) - the list of documentation to be reviewed is included in the Annex 1 to the Terms of Reference;
- Interviews will be held with the following organizations and individuals at minimum: UNDP Kazakhstan, UNDP/GEF RTA, MEMR, Steering Committee, project team, municipalities project developers and interesting organizations and NGOs;
- Field visits;
- Questionnaires;
- Participatory techniques and other approaches for the gathering and analysis of data.

5. Evaluation team

The Final Evaluation will be carried out by team of two external consultants:

- International consultant - expert on areas of international projects' monitoring and evaluation with the focus on climate change, sustainable development, energy sector, particularly on wind energy, and
- National consultant – expert on areas of environmental management, climate change, energy and renewable energy.

The evaluation team is responsible for the successful completion of the evaluation and finalizing the Final Evaluation report.

Team Qualities:

- Recent experience with result-based management evaluation methodologies;
- Experience applying participatory monitoring approaches;
- Experience applying SMART indicators and reconstructing or validating baseline scenarios;
- Recent knowledge of the GEF Monitoring and Evaluation Policy;
- Recent knowledge of UNDP's results-based evaluation policies and procedures
- Competence in Adaptive Management, as applied to climate change and energy resource management projects;
- Recognized expertise in the management of energy for sustainable use;
- Familiarity with energy sector and renewable energy policies and regulation in Kazakhstan;
- Demonstrable analytical skills;
- Work experience in relevant areas for at least 10 years;
- Project evaluation experiences within United Nations system will be considered an asset;
- Excellent English/Russian communication skills.

Specifically, the *international expert (team leader*) will perform the following tasks:

- Lead and manage the evaluation mission;
- Design the detailed evaluation scope and methodology (including the methods for data collection and analysis);
- Assist in drafting terms of reference of the national consultant(s)
- Decide the division of labor within the evaluation team;
- Conduct an analysis of the outcome, outputs and partnership strategy (as per the scope of the evaluation described above);
- Draft related parts of the evaluation report; and
- Finalize the whole evaluation report.

The *National Consultant* will provide input in reviewing all project documentation and will provide the International Consultant with requested information during the evaluation mission. Specifically, the national expert will perform tasks with a focus on:

- Collect necessary information regarding energy sector, renewable energy in Kazakhstan
- Review documents and materials available in Russian only;
- Participate and provide support (including translation/interpretation when necessary) during mission
- Conduct an analysis of the outcome, outputs and partnership strategy (as per the scope of the evaluation described above);

- Draft related parts of the evaluation report;
- Assist Team leader in finalizing document through incorporating suggestions received on draft related to his/her assigned sections;
- Proof reading of the Russian version.

The evaluation will be undertaken in-line with GEF principles[22]:

- Independence
- Impartiality
- Transparency
- Disclosure
- Ethical
- Partnership
- Competencies and Capacities
- Credibility
- Utility

The evaluators must be independent from both the policy-making process and the delivery and management of assistance. Therefore applications will not be considered from evaluators who have had any direct involvement with the design or implementation of the project. This may apply equally to evaluators who are associated with organizations, universities or entities that are or have been, involved in the delivery of the project.

Any previous association with the project, executing agency, the Ministry of Environment, or other partners/stakeholders must be disclosed in the application. This applies equally to firms submitting proposals as it does to individual evaluators.

If selected, failure to make the above disclosures will be considered just grounds for immediate contract termination, without recompense. In such circumstances, all notes, reports and other documentation produced by the evaluator will be retained by UNDP.

The Team Leader will have overall responsibility for the delivery and quality of the evaluation products. Team roles and responsibilities will be reflected in the individual contracts. If a proposal is accepted from a consulting firm, the firm will be held responsible for the delivery and quality of the evaluation products and therefore has responsibility for team management arrangements.

6. Implementation Arrangements

The principal responsibility for managing this evaluation lies with UNDP Kazakhstan. It is the main operational point for the evaluation responsible for liaising with the project team to set up the stakeholder interviews, to arrange field visits and co-ordinate with the Executing Agency and other counterparts. UNDP Kazakhstan will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team.

The timeframe for submission of the first draft of the report: 3 weeks upon a date of arrival to Kazakhstan with mission. The report will be submitted both electronically and in printed version, in Russian and English.

The report should be submitted to UNDP Country Office in Kazakhstan (to the attention of Mr. Stanislav Kim, e-mail address: stanislav.kim@undp.org mailing address: 26, Bukey Khan Str., 010000, Astana Kazakhstan, tel. (+7-7172) 592550

Prior to approval of the final report, a draft version shall be circulated for comments to government counterparts, project management, UNDP CO and UNDP/GEF Regional Technical Advisor for Climate Change for Europe and CIS): The Project Director and members of the project steering group members representing the following institutions:

- Ministry of Industy and Innovation Technology PK

[22] See p.16 of the GEF's Monitoring and Evaluation Policy

- Ministry of Environmental Protection
- Akimats
- Samruk-kazyna
- Samruk- energo
- Kegoc
- Relevant institutes
- The United Nations Development Programme

If any discrepancies have emerged between impressions and findings of the evaluation team and the aforementioned parties, these should be explained in an annex attached to the final report.

ANNEX B. ITINERARY OF THE EVALUATION TEAM AND LIST OF DOCUMENTS

B.1 Mission schedule and list of people met

#	Participants	Date	Place
1	Project team: Ms Ainur Sospanova – project manager Mr Gennady Doroshin – project adviser	10 May	Project office
2	Mr Stanislav Kim United Nations Development Programme Head of Environment and Energy Department Ms Irina Gorunova United Nations Development Programme Programme Analyst/ Portfolio Manager	11 May	UNDP office
3	Mr Stephen Tull UN Resident Coordinator UNDP Resident Representative	11 May	UNDP office
4	Mr Oleg Dalabayev Chief Engineer of LLP Institute "Kazselenergoproject', SC Member	12 May	Regional Conference on renewable Energy Development in Central Asia and CIS
5	Mr Shaimerden Urazalinov the Head of Kazakhstan electricity association (KEA) Ms Gulbanu Pazylhair the Vice Head of Kazakhstan electricity association (KEA)	12 May	Regional Conference on renewable Energy Development in Central Asia and CIS
6	Ms Marina Olshanskaya UNDP-GEF Regional Technical Advisor, Climate Change Mitigation, Europe and CIS	12 May	Regional Conference on renewable Energy Development in Central Asia and CIS
7	Mr Dairbekov Erlan LLP «Green Energy Almaty»	12 May	Regional Conference on renewable Energy Development in Central Asia and CIS
8	Mr Sovet Ebolsiev Spain Consulting	13 May	Regional Conference on renewable Energy Development in Central Asia and CIS
9	Prof. Bolotov A.V. Almaty University of Power Engineering &Telecommunications , Director of LLP "Ecoenergomash"	13 May	Regional Conference on renewable Energy Development in Central Asia and CIS
10	Ms Raissa Ligai JSC «Energy»- Director of Department, SC Member Mr Valery Tugai JSC «Energy»- Head of Sector	13 May	Regional Conference on renewable Energy Development in Central Asia and CIS
11	Mr Catullus Helmer Advisor to the Prime Minister of the Republic of Kazakhstan	13 May	Regional Conference on renewable Energy Development in Central Asia and CIS
12	Mr Tolebay Adilov The Head of Kyoto Protocol Department	13 May	Regional Conference on renewable Energy Development in Central Asia

	Ministry of Environmental Protection		and CIS
13	Mr Vladimir Kliakin Deputy director of Electric-power and Coal Industry Ministry of Industry and New Technologies	16 May	Ministry of Industry and New Technologies office
14	Mr Dusenbay Turganov Vice Minister of Industry and New Technologies National Director of the Project	16 May	Ministry of Industry and New Technologies office
15	Ms Ekaterina Paniklova Deputy Resident Representative	17 May	UNDP office De-briefing meeting at UNDP
16	Mr Esbergen Abitaev First Deputy Chairman of the Board JSC «Samruk-Energy»	17 May	JSC «Samruk-Energy» office
17	Mr Askarbek Kyanyshbaev Managing Director on National Grid Development of KEGOC Mr Kyanysh Moldabayev The Head of National Grid Development Department of KEGOC Mr Baglan Esenov Deputy Chief Dispatcher of KEGOC Ms Farida Zharmagambetova The Deputy Head of National Grid Development Department of KEGOC Ms Kamilia Shunusova Specialist of National Grid Development Department of KEGOC	18 May	KEGOC office

Note:
Due to structural changes in the Government of the Republic of Kazakhstan that affect the Ministry of Environmental Protection in the beginning of 2011, there was no official Operational Focal Point at the time of the evaluation mission. The UNDP Country Office will therefore meet with the Operational Focal Point to discuss the evaluation report results once officially appointed

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Power System Assessment for Wind Energy Development in Kazakhstan. Final report. VTT (Finland)

Project and other documentation

Law about Support of Usage of Renewable Energy Sources

Project Document

Project Inception Report

Annual Progress Reports (APRs)

Project Implementation Reviews (PIRs)

ANNEX C. PROJECT IDENTIFICATION AND FINANCIAL DATA

Required Project Identification and Financial Data

The terminal evaluation report should provide information on project identification, time frame, actual expenditures, and co-financing in the following format, which is modeled after the project identification form (PIF).

I. Project Identification

GEF Project ID: [Assigned by the GEF Secretariat at pipeline entry.]
GEF Agency Project ID:0125**; ATLAS: Award:** 37327 **Project ID:** 40847
Countries: Kazakhstan
Project Title: Wind Power Market Development Initiative
GEF Agency (or Agencies): UNDP

II. Dates

Milestone	Expected date	Actual date
CEO endorsement/approval		27/04/2004
Agency approval date		27/07/2004
Implementation start		01/11/2004
Midterm evaluation		November 2007
Project completion	30/06/2007	30/06/2011
Terminal evaluation completion		June 2011
Project closing		30/06/2011

III. Project Framework

Project component	Activity type	GEF financing (in $)		Cofinancing (in $)	
		Approved	Actual	Promised	Actual
1. An enabling legal and regulatory framework for wind energy development and adequate institutional capacity to effectively implement that in place.	TA	90,000	614,965	160,000	256,800
2. Improved access to information on the specific framework conditions in Kazakhstan to develop commercially feasible investment projects and to	TA	960,000	744,857		90,000

structure financing for them.					
3. Financial closure and start-up of the construction of the first, larger scale wind energy plants in Kazakhstan .	TA	1,370,000	818,762	4,560,000	1,770,000
4.The results and services provided by the project sustained to foster further development of the wind energy market in Kazakhstan	TA	130,000	188,234		165,000
5.Project management		Part of 1-4.	183,071	2336690	98,000
Total		2,550,000	2,549,889	4,720,000	2,379,800

Activity types are investment, technical assistance, or scientific and technical analysis.
Promised co financing refers to the amount indicated at the point of CEO endorsement/approval.

IV. Co financing

Sources of Cofinancing	**Type**	**Project preparation**		**Project implementation**		**Total**	
		Expected	**Actual**	**Expected**	**Actual**	**Expected**	**Actual**
Host gov't contribution (MEMR/MINT/MEP)		131,380	131,380	164,000	194,800	295,380	326,180
KEGOC					100,000		100,000
GEF Agency (ies)		350,000	376,000			350,000	376,000
Private sector:				4,560,000*	1,870, 000	4,560,000	1,870,000
NGO KEA 65,000					65,000	0	65,000
Other: GOF-90000 REEP-60000					150,000	0	150,000
Total Cofinancing		481,380	507,380	4,724,000	2,379,800	5,205,380	2,887,180

Expected amounts are those submitted by the GEF Agencies in the original project appraisal document. Co-financing types are grant, soft loan, hard loan, guarantee, in kind, or cash.

ANNEX D. DRAFT LAW ON RENEWABLE ENERGY SOURCES

Unofficial translation

Law of the Republic of Kazakhstan

«ABOUT SUPPORT OF USE OF RENEWABLE SOURCES OF ENERGY»

The present Law determinates purposes, forms and directions of Renewable Energy Sources use support.

Chapter 1. General Provisions

Article 1. Basic definitions of the present Law

The present Law uses the following basic definitions:

1) Renewable Energy Sources – energy resources that are replaced rapidly by natural processes: energy of sunlight, wind energy, hydrodynamic water energy used for thirty five MW derivation units working without modification of hydro-geological regime of rivers**,** geothermal energy: ground heat, heat of underground waters, rivers, water basins, and antropogenic resources of primary energy sources: biomass, bio-gas and other organic waste used for electricity and (or) heat generation;

2) Renewable Energy Unit is the independent facility with infrastructure components needed for production of electricity and (or) heat by usage of renewable energy sources.

3) Authorized Body is the authorized governmental body that is in charge in the area of support of the usage of Renewable Energy Sources;

4) Standard Electricity Losses are the technological losses of electricity occur during transportation and distribution of electricity through electricity grid;

5) Qualified Energy Production Organization is the legal organization that generates electricity and (or) heat by using of Renewable Energy Sources.

Article 2. Legislation of the Republic of Kazakhstan in the area of support of renewable energy sources utilization

1. Legislation of the Republic of Kazakhstan in the area of renewable energy sources utilization support is based on the Constitution of the Republic of Kazakhstan and consists of the present Law and other normative legal acts of the Republic of Kazakhstan.

2. Public relations in the area of bio-fuel production and trade shall be regulated by the legislation of the Republic of Kazakhstan about the state regulation of production and trade of bio-fuel.
3. Public relations in the area of electrical and (or) heat energy generation, transmission, and consumption, which are not regulated by this Law, shall be regulated by the Republic of Kazakhstan legislation about electrical energy.
4. If an international treaty ratified by the Republic of Kazakhstan establishes other rules than the present Law, then the rules of the international treaty shall apply.

Chapter 2. State regulation in the area of support of renewable energy sources utilization

Article 3. Purposes and methods of the state regulation in the area of support of renewable energy sources utilization

1. State regulation in the area of support of renewable energy sources utilization is performed with a purpose of creation of favorable conditions for electrical and (or) heat power generation with utilization of renewable sources of energy in order to reduce energy intensity of economic sector, to decrease environmental impact of power industry, and to increase the share renewable energy sources for electrical and (or) heat power generation.

2. State regulation in the area of support of renewable energy sources utilization for electrical and (or) heat power generation includes:

   1) approval and realization of renewable energy units location plan (program);

   2) licensing;

   3) establishing of indicative goals and amount of renewable energy sources in the total volume of electrical power generation in electrical power development programs;

   4) creation of conditions for training of Kazakhstani specialists and conducting of scientific research in the area of renewable energy sources;

   5) technical regulation;

   6) acceptance of normative legal acts in the area of development of renewable energy sources utilization.

Article 4. Main directions of the state regulation in the area of support of renewable energy sources utilization

State regulation in the area of support of renewable energy sources utilization is performed in the following main directions:

1) establishing of favorable conditions for construction and operation of renewable energy units;

2) stimulation of electrical and (or) heat power generation using renewable energy sources;

3) provision to individuals and legal status persons realizing planning, construction and exploitation of renewable energy units, investment preferences according to the Republic of Kazakhstan legislation About Investments;

4) establishment of favorable conditions for efficient integration of renewable energy units into the unified electricity and heat power system and electricity and heat power market;

5) contribution to fulfillment of the international obligations of the Republic of Kazakhstan in reduction of green-house gases emissions.

Article 5. Authority of the Government of the Republic of Kazakhstan in the area of support of renewable energy sources utilization

The Government of the Republic of Kazakhstan:

1) develops main directions of the state policy in the area of renewable energy sources utilization;

2) approves industrial (sectorial) programs for renewable energy sources development and utilization;

3) approves the renewable energy sources utilization monitoring procedures order;

4) approves technical regulations in the area of renewable energy sources utilization;

5) approves the order and terms of renewable energy sources utilization units feasibility study harmonization and affirmation.

Article 6. Authority of the

Authorized Body The Authorized Body:

1) realize State policy in the area of renewable energy sources use;

2) develops industrial (sectorial) programs for renewable energy sources development and utilization;

3) develops technical regulations in sphere of renewable energy sources use and offers amendments for improvement of the state standards in the area of

designing, construction, operation and safety of renewable energy units for electricity and (or) heat power generation;

4) develops and approves normative legal acts in the area of renewable energy sources utilization;

5) approves renewable energy units location plan (program);

6) endorses projects of construction of renewable energy units with a capacity of twenty-five megawatts and higher;

7) carries out renewable energy sources usage monitoring;

8) determinates the order and terms of the nearest connection of renewable energy units point to electrical and (or) heat power grid;

9) controls renewable energy units connection to electrical and (or) heat power grid of energy transmission organizations, in accordance with legislation of the Republic of Kazakhstan in the areas of electrical energy;

10) determinates the order of electrical power purchase in qualified energy transmission organizations;

11) coordinates the interaction of state bodies, enterprises and research and development institutions in the field of development and usage support of renewable energy sources;

12) provides international cooperation in the field of usage of renewable energy sources.

Article 7. Authorities of local executive bodies in regions, cities under republic jurisdiction and capital

Local executive bodies of the regions, cities under republic jurisdiction and capital:

1) participate in implementation of industrial (sectorial) programs for renewable energy sources development and utilization;

2) develop and realize regional Renewable Energy Sources development program with consideration of Renewable Energy Sources units' location at remote non-electrified sites, where the centralized power supply is inexpedient;

3) endorse projects for construction of Renewable Energy Sources units of up to 25MW and projects for construction of Renewable Energy Sources units for general heating supply system.

Chapter 3. Support of usage of Renewable Energy Sources

Article 8. Support in designing and construction of units of

Renewable Energy Sources

Local executive bodies of the regions, city under republic jurisdiction, capital:

1. shall consider industrial (sectorial) programs of renewable energy sources implementation and utilization during development of plans, economic and social programs of the region, city under republic jurisdiction, capital improvement.

2. shall reserve and provide land for construction of renewable energy sources units according to the legislation of the Republic of Kazakhstan and the plan (program) of the renewable energy units location.

Article 9. Support in selling of electricity and (or) heat power generated with renewable energy sources

1. Regional electricity distribution companies, which have directly connected Renewable Energy Sources units into the network, shall purchase the full volume of the renewable electricity generated by respective qualified energy production organizations to cover up to fifty percent of the electricity loss in the respective distribution network.

   If the renewable electricity generated by the qualified energy production organization exceeds the volume of 50 percent of electricity loss of corresponding regional distribution company, then the rest of such renewable electricity volume shall be purchased by the system operator to cover the electricity loss of the national electricity network.

2. Produced by the qualified energy production organization electrical and (or) heat power Purchase contracts are made no less than renewable energy units construction cost recovery terms appointed in the feasibility study of the renewable unit construction project.

3. The system operator to which electricity power grid the renewable energy source connected, according to the Republic of Kazakhstan legislation shall purchase the whole volume of electrical power produced by the qualified energy production organization for his networks electricity loss compensation.

4. Heat power generated by the qualified energy production organizations and supplied into general network of heat supply of the town or of the settlement, with the corresponding parameters of a heat-carrier in general heat power supply system, shall be purchased by the power supply organization.

   The cost of heat power generated by qualified energy production organization shall be included into the tariff of the power supply organization, according to the legislation of the Republic of Kazakhstan about natural monopolies and markets regulation.

The qualified energy production organization shall adjust with the energy supply organization the time-period of heat power supply into the general network of heat power supply depending on the season heat power supply conditions.

5. The price of the renewable power is established by the qualified energy production organization independently but not more that a level stated in the feasibility study of the project of renewable energy unit construction.

6. The qualified energy production organization in terms of electrical and (or) heat power supply are free of electrical and (or) heat power transmission organization services payment.

7. Expenses for transmission of electricity produced by the qualified energy production organizations shall be included into the tariff for power transmission services of the regional electrical grid companies and system operator, according to the legislation of the Republic of Kazakhstan about natural monopolies and markets regulation.

8. The qualified energy production organizations shall have the right to enter direct agreements for electricity and (or) heat power supply with the consumers.

Power transmission organizations shall provide free access tp qualified energy production organizations' electricity production market according to the Republic of Kazakhstan legislation.

9. The qualified energy production organizations can purchase electrical power from another electrical power producing company for reservation to realize its' obligations on consumers contracts only in the case of emergency power losses and (or) temporary power decrease depending on the natural conditions. Reserved power is realized by the reserving electricity producing companies tariffs, considering the electricity transmission organizations electricity transmission tariffs.

Article 10. Support of Renewable Energy Sources units for electricity and (or) heat power grid connection and transmission

1. New Renewable Energy Sources units and reconstructed units regardless of start-up date shall be connected to the nearest point of electricity and (or) heat power network of the power transmission company in accordance with the class of generator voltage or heat-carrier parameters in the general network of heat supply.

2. Energy transmitting organization shall provide with unimpeded and nondiscriminatory identification of the nearest point of electricity and (or) heat power network in accordance with generator voltage of heat-carrier parameters in the general network of heat supply, and provide with connection of the renewable energy sources units.

3. The electricity generated by the qualified organization shall get priorities for transmission in case of limited section of current electricity network.

4. Renewable electricity units shall get priorities in dispatching of the electricity capacity.

5. Extension and reconstruction of the present electricity and heat network facilities of energy transmitting organizations in order to connect renewable energy sources units shall be carried out by the owner of the electricity and heat power networks. The cost for such extension and reconstruction shall be included into the tariff of the energy transmitting organization – the owner of the network, in accordance with the legislation of the Republic of Kazakhstan about natural monopolies and markets regulation.

6. Construction of renewable energy units network facilities to the point of grid connection shall be provided by the owner of such renewable energy unit, and the cost shall be included into the project cost.

Chapter 4. Final Provisions

Article 11. The responsibility for the Republic of Kazakhstan the Renewable Energy Sources Support Law violation.

The violation of the Republic of Kazakhstan Law in area of Renewable Energy Use, support, leads to the responsibility, in accordance with the legislation of the Republic of Kazakhstan.

Article 12. Entry into force

The present Law shall become effective in ten calendar days after the day of its first official publication.

President

Of the Republic of Kazakhstan

N. Nazarbayev