



Министерство экономики Республики Беларусь  
 Отдел международной технической помощи  
 Главного управления внешнеэкономической политики  
**ЗАРЕГИСТРИРОВАНО**  
 в базе данных программ и проектов  
 международной технической помощи  
 от 24 декабря 2014 г.  
 Регистрационный номер 21 14 1000734

United Nations Development Programme  
 Country: Belarus  
**PROJECT DOCUMENT**

Срок реализации  
 01.01.2015 - 31.12.2015

**Project Title:** Removing Barriers to Wind Power Development in Belarus

**UNDAF Outcome(s):** 3.1. National capacity to mitigate and adapt to climate change enhanced

**UNDP Strategic Plan:** Area of Work 1: Sustainable development pathways. b. Sustainable access to energy and improved energy efficiency.

**Expected CP Outcome(s):** 3.1 Country's capacity to mitigate and adapt to the climate change strengthened

**Expected Output(s):** 1. Renewable energy policy and regulation in place 2. Renewable energy capacity installed 3. Electricity produced from renewable sources

**Executing Entity:** Ministry of Natural Resources and Environmental Protection of Belarus

**Implementing Entity:** UNDP

**Brief Description**

The project supports removal of barriers to the adoption of wind energy in Belarus pragmatically. Currently there are several ministries responsible for various aspects of renewable energy, but there is no single entity to take ownership of this effort. This project proposes to establish a financially viable Private company funded by an investment grant to facilitate investment into wind energy in Belarus by providing first loss capital and establishing market based empirical precedents. By the end of the project it is expected that the project will enable the development of sound Feed-in-Tariff and procedures to directly foster >25 MW of installed wind capacity during the 5-year program and the generation of over 1 million MWh of renewable energy over the project.

<b>Programme Period:</b>	2011-2015	<b>Total resources required</b>	US\$ 43,945,000
<b>Atlas Award ID:</b>	00075891	<b>Total allocated resources:</b>	US\$ 43,945,000
<b>Project ID:</b>	00087557	<b>Project budget:</b>	US\$ 3,345,000
<b>PIMS #</b>	4462	<b>GEF</b>	US\$ 3,045,000
<b>Start date:</b>	July 2014	<b>UNDP (cash)</b>	US\$ 300,000
<b>End Date</b>	January 2019	<b>Parallel co-financing:</b>	
<b>Management Arrangements</b>	NIM	<b>UNDP</b>	US\$ 300,000
<b>PAC Meeting Date</b>	16 April 2014	<b>DEE</b>	US\$ 70,000
		<b>M of Education</b>	US\$ 20,000
		<b>M of Energy</b>	US\$ 3,100,000
		<b>M of Environment</b>	US\$ 110,000
		<b>TDF-Ecotech</b>	US\$ 20,000,000
		<b>Triple LLC</b>	US\$ 17,000,000

**Ministry of Natural Resources and Environmental Protection of the Republic of Belarus:**

Mr. Vladimir G. Tsalko

Minister

Date/Month/Year 9.27.14

**UNDP:**

Mr. Sanaka Samarasinha

Resident-Representative

Date/Month/Year 02/02/2014

МИНИСТЕРСТВО ЭКОНОМИКИ  
Республики Беларусь  
ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
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Страна: Республика Беларусь

Название проекта: Устранение барьеров для развития ветроэнергетики в Республике Беларусь

Результат(ы) Рамочной программы ООН по оказанию помощи Республике Беларусь: 3.1. Укрепление национального потенциала в области смягчения последствий и адаптации к изменению климата

Ожидаемый результат Страновой Программы: 3.1.2. Созданы национальные правовые и институциональные рамки для использования возобновляемых источников энергии, в том числе энергии ветра.

Исполняющая организация: Министерство природных ресурсов и охраны окружающей среды Республики Беларусь

Реализующее агентство: ПРООН

Период страновой программы:	2011-2015 гг.	Объем требуемого финансирования:	US\$ 43 945 000
Номер гранта в системе Atlas:	00061612	Объем выделенного финансирования:	US\$ 43 945 000
Идентификационный номер проекта:	00078116	<b>Бюджет проекта:</b>	<b>US\$ 3 345 000</b>
Номер проекта в системе PIMS:	4462	ГЭФ	US\$ 3 045 000
Начало реализации:	июль 2014 г.	ПРООН	US\$ 300 000
Завершение реализации:	январь 2019 г.	<u>Параллельное финансирование:</u>	
Схема управления: национальное исполнение		ПРООН	US\$ 300 000
Дата заседания КОП: 16 апреля 2014		Департамент по энергоэффективности	US \$70 000
		Министерство образования	US\$ 20 000
		Министерство энергетики	US\$ 3 100 000
		Минприроды	US\$ 110 000
		«ТДФ Экотех»	US\$ 20 000 000
		ООО «Трайпл»	US\$ 17 000 000

Министерство природных ресурсов и охраны окружающей среды Республики Беларусь:

Владимир Г. Цалко,  
Министр

9.07.2014

ИМЯ

ПОДПИСЬ

Число/Месяц/Год

**ПРООН:**

Санакса Самарасинха,  
Представитель ПРООН

02/07/2014

ИМЯ

ПОДПИСЬ

Число/Месяц/Год

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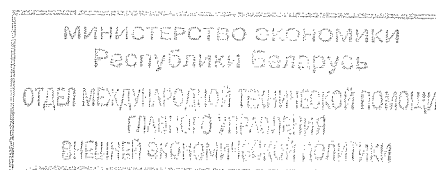
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## List of Acronyms

Agency	National Agency for Investment and Privatization
APR	Annual Project Review
PMU	Project Management Unit
BAU	Business As Usual case without GEF involvement
CO	UNDP Country Office
CO2	Carbon dioxide
ECA	Export Credit Agency
EE	Energy Efficiency
EED	Energy Efficiency Department of State Standardization Committee of the Republic of Belarus
EFR	Energy and Fuel Resources
EKF	Danish Export Credit Fund
EU	European Union
EBRD	European Bank for Reconstruction and Development
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
MIGA	Multilateral Investment Guarantee Agency
M&E	Monitoring and Evaluation
MNRE	Ministry of Natural Resources and Environmental Protection of the Republic of Belarus
MoE	Ministry of Economy of Belarus
NGO	Non-Governmental Organization
QPR	Quarterly Progress Report
PIR	Project Implementation Review
PMU	Project Management Unit
PPG	Project Preparation Grant
PRI	Political Risk Insurance
RCU	UNDP Regional Coordination Unit
RTA	UNDP Regional Technical Adviser
SEAP	Sustainable Energy Action Plan
toe	ton of oil equivalent
TPR	Tripartite Review
TTR	Terminal Tripartite Review
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	Office of United Nations High Commissioner for Refugees
UNCITRAL	United Nations Commission on International Trade Law
WESU	Wind Energy Support Unit
WPMI	Wind Private Finance Initiative



## 1. SITUATION ANALYSIS

### 1.1. Context and global significance

Belarus is an upper-middle income country with a gross national income per capita of US\$6,030<sup>1</sup> and a population of 9.5 million people with approximately 20% of the population living in the capital, Minsk City<sup>2</sup>. Belarus is a landlocked country in Central Europe encompassing a geographic area of 207,595 km. Belarus borders on Russia to the east, Poland to the west, Latvia and Lithuania to the north, and Ukraine to the south.

The country gained its independence from the USSR when the Commonwealth of Independent States was formed. Minsk was designated as the administrative center for the CIS. In 1994, Belarus adopted a constitution that formed a Presidential Republic. Belarus is a country in transition from a highly centralized planned economy to a more market based economy. The credit rating for the sovereign credit from Standard and Poor's is currently a B-. This is a non-investment grade rating, and it reflects the need for foreign and domestic investors to earn a risk premium for investments in Belarus. Many of these risks can be addressed for investments in renewable energy through renewable energy specific regulations as discussed herein.

Belarus was one of the former Soviet Union's major industrial republics, specialised in the production of machinery and equipment and, although industry has declined significantly since independence from the USSR in 1991, heavy industry and manufacturing continue to make an important contribution to the economy. Belarus has retained close political and economic ties with Russia, and has signed a treaty on a two-state union that envisions greater political and economic integration.

The economy has been closely correlated with the economy in Russia. In the aftermath of the Russian Debt Crisis in 1998, when the Russian government devalued the rouble and defaulted on its debt, the economy in Belarus slowed down substantially. The economy did not enter a recession, but it did see growth decrease from about 8.4% in 1998 to 3.4% in 1999. The industrial sector remained vibrant in 1999 with a growth rate of 10.3%.<sup>3</sup>

The world financial crisis of 2009 was a serious test of sustainability for the Belarusian economic system. The GDP growth rate dropped down to 0.2 percent, but the country evaded recession. In 2011, the economy in Belarus faced another crisis after the National Bank lost 20% of its foreign currency reserves after a sharp rise in the price of oil imports from Russia. The crisis was a cause for alarm in Minsk and forced the government to devalue the Belarusian Rouble by 50%.

The economic theory of purchasing power parity would predict that the prices for products in Belarus would increase in price. The prices would increase until the price in Belarusian Roubles equals the price of the same goods in foreign countries in hard currency. This concept is based on market forces which do not yet exist in Belarus. But the government planners have been able to approximate these changes through planning. One example of this which is central to our project is for the price of natural gas.

Belarus does not have its own significant energy and fuel resources (EFR). Belarus is currently only able to fulfil 15% to 17% of its fuel needs with its own EFR<sup>4</sup>. The majority of this local fuel is wood and wood waste. They currently generate 90% of their electricity using natural gas which is imported from Russia. The gross fuel consumption share by fuel types is shown below:

Figure 1.1: Gross Fuel Consumption by Fuel Type

<sup>1</sup> World Development Indicators database, World Bank, Updated July 1, 2011. <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf>

<sup>2</sup> National Statistical Committee of the Republic of Belarus Updated December 1, 2012. <http://belstat.gov.by/homep/en/indicators/press/demographics.php>

<sup>3</sup> Ibid

<sup>4</sup> Heinrich Boll Stiftung, Belarus – Russia: Dependency or Addiction“ [www.pl.boell.org/downloads/Belarus\\_Russia\\_energy.pdf](http://www.pl.boell.org/downloads/Belarus_Russia_energy.pdf)

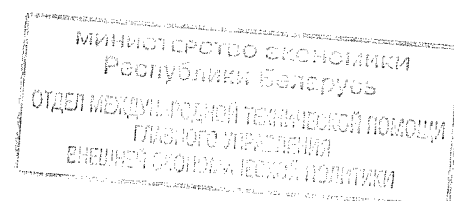
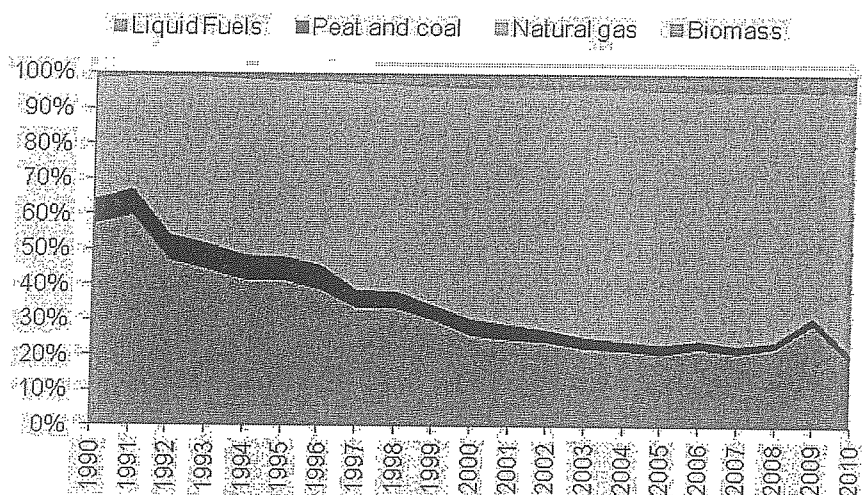




Figure 1: The gross fuel consumption share by fuel types



Source: IEA World Energy Statistics

Until 2006, Gazprom supplied natural gas to Belarus at below market prices. These low rates were the result of the close integration between the two countries. In December 2006, Gazprom and Belarus signed an agreement that increased the price of natural gas from US\$47/thousand cubic meters (TCM) to US\$100/TCM in 2007 with additional incremental increases until the price reached global market prices in 2011. The price reached US\$170/TCM in 2010 and US\$223/TCM in 2011 and by the end of 2011 reached US\$276/TCM.<sup>5</sup> Gazprom already owned 50% of the Belarusian pipeline company, Beltransgaz. In 2011, they negotiated the acquisition of the remaining 50% of the pipeline concern for US\$2.5 billion. This deal was linked to Gazprom's reducing the price for natural gas starting in 2012 to US\$164/TCM which was once again below market rates.

Energy security is a major concern for Belarus. Most of the power supply is from natural gas fired generation, and the natural gas is almost entirely supplied by Russia. Belarus will benefit greatly from the diversification that a robust renewable energy initiative can provide. This diversification is a priority of the government:

**Directive No 3 of June 14, 2007**

“Economy and thrift are the main factors of the economic security of the state”:

..., the fact that the country lacks an integrated system of material resource savings lowers the competitiveness of economy, the effectiveness of the use of all kinds of fuel, raw products, materials and equipment...

Belarus does not adequately take advantage of renewable sources of energy such as biomass, hydro, wind, geothermal, solar energy and others.<sup>6</sup>

The industrial sector is the largest user of electricity at 45% as compared to 24% for the industrial sector in the EU. The second highest sector is residential which is essentially tied with Public Services. The picture is very different for consumption of heat with residential utilizing 42% of the heat produced. As noted above, the energy production profile is skewed towards natural gas fired generation. The trend has remained constant over the past three years based on IEA statistics from 2009.<sup>7</sup>

<sup>5</sup> Data from the UNDP Belarus office

<sup>6</sup> <http://president.gov.by/en/press38819.html>

<sup>7</sup> International Energy Agency (IEA) Statistics Division. 2009. Electricity/Heat in Belarus in 2009 (2009 edition) IEA. [http://www.iea.org/stats/electricitydata.asp?COUNTRY\\_CODE=BY](http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=BY)

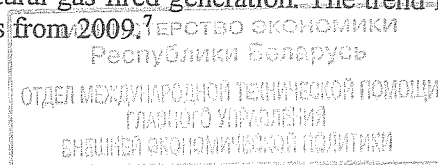
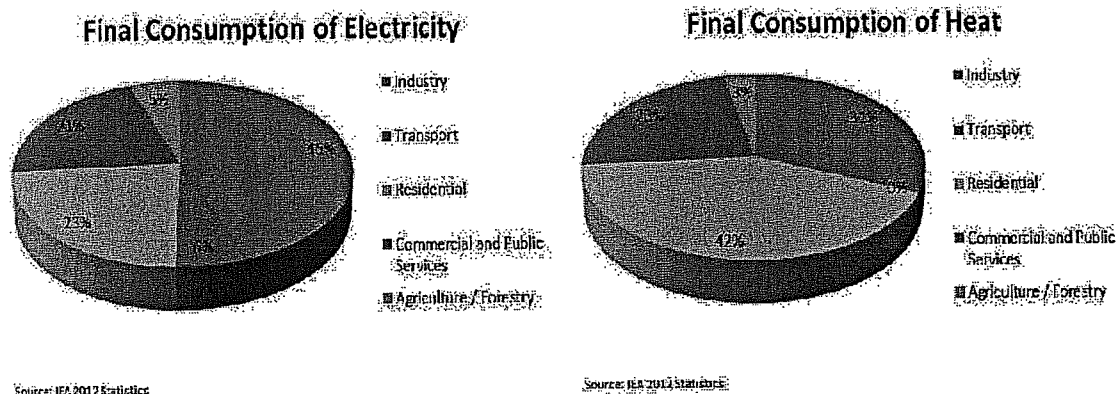


Figure 2: Final electricity and heat consumption in Belarus, 2009

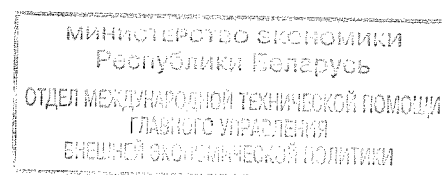


Belarus inherited from the Soviet era a large but inefficient power industry with very high specific fuel consumption per unit of energy produced (ca 0.245 t.o.e./MWh). Belenergo, the state electric concern, has made many efforts to retrofit the existing plants. Losses in the energy mix including auxiliaries are almost twice as much as in the EU. While the heat supply system consumes 70% of the gross energy consumption, the heat supply pipelines are unavailable due to maintenance and repairs over 50% of the time. This low availability is an order of magnitude higher than in the availability rates in the EU.

In view of the above national circumstances, the Government plans and implements actions that are to incentivize introduction of the policy leading to extensive use of RES and energy efficiency improvement both in energy supply and demand sides. The current picture, as of January 2012, of the situation in the national power industry can be briefly summarized as follows:

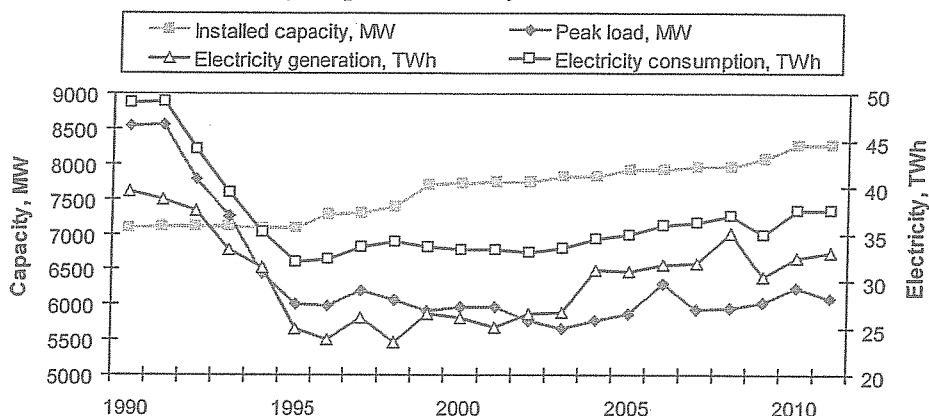
- annual gross consumption of primary energy resources is 27.3 Mt.o.e. (317.5 thousand GWh);
- total installed capacity is 8,445.4 MW, including
  - two condensing turbine power plants of 3,417.6 MW total,
  - 34 combined heat-and-power plants of 4,519.1 MW total,
  - 22 hydro power plants of 9.4 MW total,
  - a wind power unit of 1.5 MW, and
  - 119 mini-CHPs of 497.8 MW total;
- annual power output: 29.66 thousand GWh;
- annual heat output: 40.30 thousand GWh;
- spread of power supply network: 35,760 km; length of heat supply pipeline: 5,900 km;
- annual investments (2011) are about \$767 million USD directed mostly to modernization of existing assets.

The chart below demonstrates the trend for the main indices of the power industry during the period from 1990 till 2011. This chart illustrates that since 1993 electricity consumption has declined, and currently it's enough of the own generating capacity to meet peak demand. Nevertheless during maintenance periods, Belarus imports necessary power to make up the shortage of power supply.<sup>8</sup>



<sup>8</sup> Based on information from meetings with Belenergo in July 2012

Figure 3: Main indices of the power industry in Belarus, 1990-2011



## 1.2. Current energy sector policy

### 1.2.1. Climate change policy context

Since 9 August 2000, the Republic of Belarus is an Annex I Party to the United Nations Framework Convention on Climate Change (UNFCCC) and is a Party to the Kyoto Protocol as of 24 November 2005. By the Belarusian Government, the Ministry of Environment was assigned as an organization responsible for implementation of the climate related policy of Belarus. According to the amendment to Annex B to the Kyoto Protocol adopted in 2006 by decision 10/CMP.2 in Nairobi, Kenya, Belarus assumed its target of the first commitment period (2008-2012) as 92% of its base year (1990) emission level. To date, this amendment has not entered into force, and this not only leaves the country outside the Kyoto Protocol compliance and accounting systems, but also prevents it from having the ability to trade carbon credits and use such additional financial resource in its climate change mitigation policy.

Belarus agreed to the Copenhagen Accord on December 18, 2009. Belarus indicated that its quantified economy-wide emission reduction target would be up to 10% reduction of GHG emissions in 2020 as compared to 1990. The major driving force for strengthening the climate change mitigation policy is an acute lack of domestic fossil fuel resources (only ca. 5% of demand) and dependency on only one fuel supplier (85% of gross energy consumption originates from Russia). Another reason is that a significant share (approx. 65%) of export products in total GDP does not have a comparative advantage in international trade. In order to be more competitive, Belarus needs to use effective low carbon technologies.

In addition to this, we need to keep in mind that Belarus' personal fossil energy consumption is currently about 2.6 t.o.e. per capita. This is almost half of the level of the OECD Member Countries with similar climate conditions, who have more than 5.0 t.o.e. per capita. The current level in Belarus reflects the current lower living standard. As this standard increases, this will require further expansion of power generation. This possible expansion of personal fossil energy use would affect the energy intensity of the national economy.

The energy conservation policy and measures for the energy sector on the energy supply side are mainly focused on incentivizing six major directions: (i) reduction of fuel specific consumption per unit energy produced through retrofitting old inefficient power generation facilities; (ii) introduction of cogeneration schemes and combined cycles; (iii) renovation of power transmission systems; (iv) replacement of old inefficient boilers with CHPs; (v) renovation of heat supply pipelines; and (vi) introduction of renewable energy sources.

Since 2005, due to its targeted energy conservation policy, Belarus can demonstrate the highest energy intensity reduction rate in the world when compared to the business-as-usual development scenario, as energy intensity has decreased by 50.4% over the past decade. This significant decrease in carbon intensity is partially attributable to doubling the use of renewable energy sources. Even so, Belarus is

unable to demonstrate a durable decoupling of economic growth and emission trends. The current trend of GHG emissions is approx. 1-2% increase per year, pollutants emission increases approx. 0.3% per year. The GHG and pollutants emission prognosis proves that emissions will be increasing at least until 2020 with the current governmental policy with respect to renewable energy sources development.

Figure 4: Trends of major indices as compared with 1997

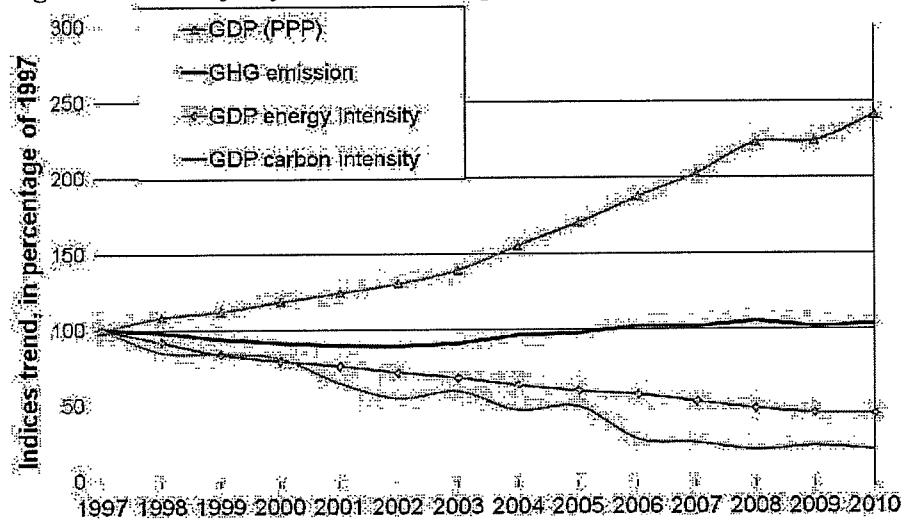
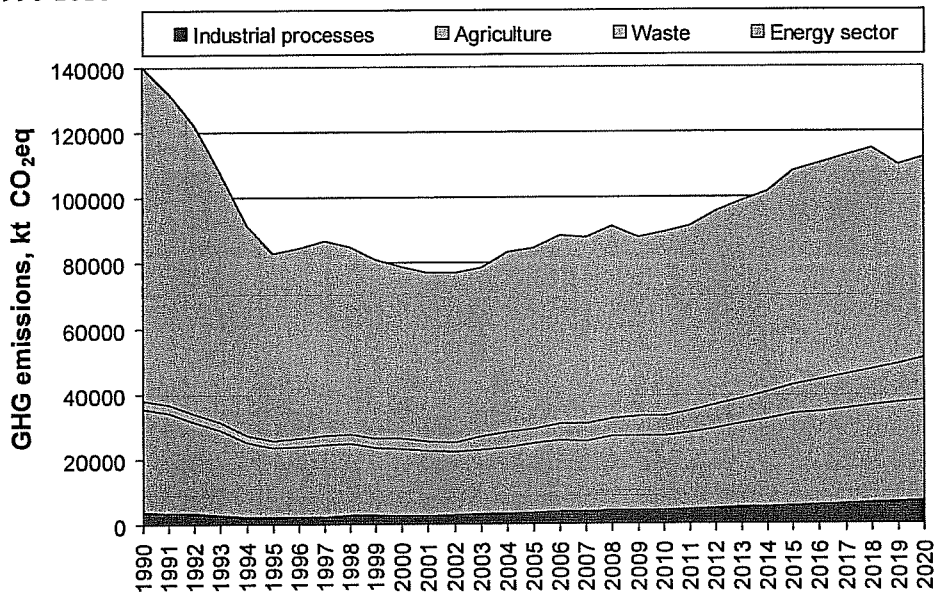


Figure 5: Trends (1990-2010) and projections (2011-2020) of GHG emissions per sectors in Belarus, 1990-2010



One of the potential options in GHG and pollutants emission reduction is to raise the share of energy produced by renewables to as much as 25% of total energy produced. In Belarus today, the net contribution of renewable energy (except for secondary energy sources) into boiler-furnace fuel consumption is about 7.3%<sup>9</sup>. The existing renewable energy installations are capable to produce annually about 505,110 MWh of electricity (of which only 1.8% is generated by wind converters) and 893,295

<sup>9</sup> Data from the EED in its publication "Increase of Energy Efficiency and Use of Renewable Energy Sources in Belarus", Minsk, 2011

Gcal of heat<sup>10</sup>. The existing renewable energy sites are presented in the State Renewable Energy Cadastre launched by the Ministry of Environment in August 2012<sup>11</sup>. The major share of this value constitutes wood fuel (about 95%). With the proper incentivization the long-term potential for other renewables in Belarus, including wind, may also be strong enough. Our assessment<sup>12</sup> shows that the renewable energy potential presented below could provide more than 10 Mt CO<sub>2</sub>-eq of cumulative GHG emission reductions by 2015.

*Table1: Renewable Energy Potential*

Renewable energy source	Actual level in 2011 <sup>13</sup> , in MW of installed capacity	Potential <sup>14</sup> , in thousand t.c.e.	Economically justified <sup>15</sup> , in thousand t.c.e. by 2015
Wood fuel and phytomass waste	>600	5080	2919.5
Wind power	3,47	975	193.0
Biofuel	57.1 (thousand t.c.e.)	500	not specified
Biogas	12.9	350	124.5 (in 2015)
Hydro power	16.1	280	140.0

According to these estimations, biomass energy has the second highest potential after biomass in Belarus. Yet, while significant efforts have been made to explore the biomass potential in Belarus, very little activity has taken place to promote wind power development because of a number of regulatory, institutional, financial and awareness barriers discussed hereby in following paragraphs. The Belarusian Government sees the development of wind energy as a priority for renewable energy development in the country, and this GEF project is to help the country to address these barriers.

The future of power industry development was stipulated in a number of recently prepared documents<sup>16</sup>.

*Table 2: Major indices for future power industry development*

Years 2011-2015:	
Investments in modernization and expansion, billion USD	8.5-9.0
New efficient capacities to deploy, MW	3150
Phase out old capacities, MW	2336
Accumulated depreciation to reach, %	43
Fuel saved as a result of modernization, thousand t.o.e.	885.5
Hydropower plants, MW	208
Wind farms, MW	150-280
Years 2016-2020:	
NPP Unit No.1, MW	1170

<sup>10</sup> State Renewable Energy Cadastre (<http://93.84.112.219:8080/apex/f?p=105:2:4237751375681938:::..&tz=3:00>)

<sup>11</sup> State Renewable Energy Cadastre (<http://93.84.112.219:8080/apex/f?p=105:1:4237751375681938:::NO>)

<sup>12</sup> Due to the dominant share of natural gas in energy mix we used CO<sub>2</sub> emission factor for natural gas (1,636 tCO<sub>2</sub>-eq per 1 t.c.e.).

<sup>13</sup> Data from the EED in its publication "Increase of Energy Efficiency and Use of Renewable Energy Sources in Belarus", Minsk, 2012

<sup>14</sup> National Report on Renewable Energy Development in Belarus, by the Department for Energy Efficiency of the Standardization Committee of the Republic of Belarus under the UNECE Project "Development of Renewable Energy in the Russian Federation and CIS Countries" (May, 2009)

<sup>15</sup> Appendix 1 to the National Program of Local and Renewable Energy Sources Development for years 2011-2015, adopted 10.05.2011

<sup>16</sup> Energy Potential Development Strategy of the Republic of Belarus (Aug-9, 2010); State Energy Sector Development Programme until 2016 (adopted by decision of the Council of Ministries of Belarus No 194 in February 29, 2012).

NPP Unit No.2, MW	1170
Renovation of existing CHPs, MW	290
Share of local energy resources by 2020, %	32
Hydropower plants, MW	100
Wind farms, MW	200

### 1.3. Current Regulatory Environment

#### 1.3.1. Renewable Energy Law

The Law “On renewable energy sources” of the Republic of Belarus was signed by the President on 27.12.2010. The law became effective on 05.07.2011. Nevertheless, further enabling legislation that provides for the practical application of the law is still required. For example, the law describes a right to receive a “certification of origin” that is required in order to receive the renewable energy premium. The law does not provide the necessary details to implement this certificate of origin.

The feed-in premium model established by this law attempts to reflect similar system practiced in many EU countries, e.g., in Germany but does not mitigate currency risk or commodity price risk like the European tariffs do. In Europe the tariffs are set in Euros and are set at a specific tariff level as opposed to a floating premium level in Belarusian Rubles as this law prescribes. The premium tariff in this law is not easily financeable. The main features of the law include:

Table 3:

Renewable Energy Law	
<b>Scope</b>	Law applies to all energy produced from renewable sources.
<b>General Principles</b>	The law outlines the goal of sustainable and efficient development of renewable energy with state support including financial incentives.
<b>Grid Connection</b>	Guaranteed grid connection at the nearest possible point. SPA Belenergo must provide this connection without regard to the cost of the connection. SPA Belenergo, will pay for all of the costs to upgrade the transmission system to enable connection.
<b>Receipt of a Certificate of Origination</b>	The Ministry of Natural Resources and Natural Protection of the Republic of Belarus will provide renewable energy projects with a Certificate of Origination confirming that the energy is renewable. The Ministry of Natural Resources and Environmental Protection is currently finalizing the details of how this process will work in co-ordination with the Council of Ministers.
<b>Guaranteed off-take</b>	Guaranteed off-take for 20-years from SPA Belenergo for RES projects that produce a Certificate of Origination.
<b>Payment for electricity based on Support Premium levels</b>	The Law on RES guarantees that that the State Production Association Belenergo must purchase the renewable energy. The rates, in Belarusian Roubles, for the first ten years will be set using the energy premium at the time multiplied by a multiplying factor of 1.3 times. After ten years the rate will be set using a stimulating ratio of 0.85 times the energy tariff at the time. This is designed as a floating rate. (See Annex 0 for more details)
<b>Competition</b>	RES producers are protected from unfair competition from state owned or major electricity producers
<b>Cadastre</b>	Mechanism for Ministry of Natural Resources and Environmental Protection to register potential renewable energy sites
<b>Land Tax</b>	Land tax exemption is guaranteed for the land occupied by RES installations and facilities, as well as for the land occupied during their construction.

Value Added Tax	The VAT for importable goods is exempted for equipment and spare parts acquired/purchased for RES installations and facilities. For RES the reduced environmental tax rate is applied (from 20% to 50% of the established base rate).
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### 1.3.1.1. *Concept of Energy Security*

The Concept of Energy Security of the Republic of Belarus is approved by the Edict of the President of the Republic of Belarus dated 17.09.2007 No. 433. This Concept directly states that increasing non-traditional renewable sources of energy is a key strategic goal for Belarus and seeks to achieve a 25% share of gross energy consumption by 2020. In line with this Concept, the Energy Potential Development Strategy of Belarus for Years 2011-2015, and extending for a period up to 2020, was developed (approved by the Council of Ministers of Belarus in August 9, 2010, No. 1180). The Strategy envisages, *inter alia*, introduction of wind power capacity up to 300 MW in 2011-2015.

### 1.3.1.2. *National Renewable Energy Program*

The five-year National Program of Local and Renewable Energy Sources Development, which were approved by the Council of Ministers of the Republic of Belarus, dated 10.05.2011 No. 586.<sup>17</sup> The resolution supports a number of measures directed to effective use of local fuel resources, including wood fuel, secondary thermal energy resources and other renewable energy options. It is envisaged that as a result of implementation of these measures the country will utilize 2,767,013 t.c.e. of local energy sources in 2011-2015, of which 193,200 t.c.e. will be the wind energy.

Because Belarus has not yet enacted legislation to fully enable the law on RES, renewable energy projects have entered into ad hoc Investment Agreements outlining the key points that are outlined in the Law on RES. These agreements can provide an investor with a more tailored approach until there is further enabling legislation. The current Law on RES also allows for the continued use of Investment Agreements.

### 1.3.1.3. *Investment Code of the Republic of Belarus*

In 2001 the government of Belarus enacted the Investment Code of the Republic of Belarus. This legislation replaced all previous legislation with respect to foreign investment in Belarus. The Code provides foreign investors with state guarantees for the following rights: property rights, the right to remit profits abroad, complete and timely compensation in the event of a nationalization including LIBOR based interest payments. The Investment Code introduces the concept of concessions which can be used to privatize the parts of the economy that are controlled by the state.

Under the Investment Code of the Republic of Belarus, an investment is any property, including monetary resources, securities, equipment and intellectual property that belongs to the investor, and property rights, allocated for investment operations in order to gain profits and/or attain some other specific result.<sup>18</sup>

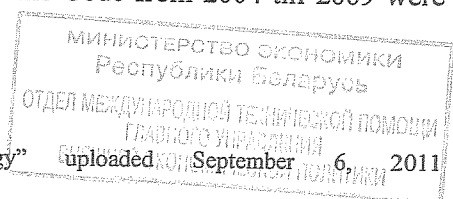
In spite of the very attractive statements in the Code, soon after its enactment, the State introduced a concept that gave the state under the right to exercise a majority vote in any company by introducing a preferential share. This preferential share is referred to as the Golden Share and gave the government the majority management vote in companies where the share was introduced. Beginning in 1997 and ending in 2008, the Government had Golden Shares in 38 companies (37 public and one private)<sup>19</sup>. The Golden Share rule was reversed in 2008. Subsequent amendments made to the Code from 2004 till 2009 were aimed to further improve the investment climate in the country.

<sup>17</sup> Vlasova, Mikhel& Partners. "Review on Renewable Energy" [http://en.vmp.by/publications/review\\_on\\_renewable\\_energy\\_in\\_belarus\\_2011/](http://en.vmp.by/publications/review_on_renewable_energy_in_belarus_2011/)

<sup>18</sup> Revera Consulting Group, "Doing Business in Belarus"

2011. [http://taglaw.com/files/Doing%20Business%20Guides/Doing%20Business%20in%20Belarus\\_en.pdf](http://taglaw.com/files/Doing%20Business%20Guides/Doing%20Business%20in%20Belarus_en.pdf)

<sup>19</sup> Edict of the President 591 of November 14 1997, Source: <http://www.iflr1000.com/pdfs/Directories/13/Belarus.pdf>



#### 1.4. Stakeholder Analysis

During the fact finding mission in Minsk from June 26, 2012 – June 29, 2012 and a Workshop for the Stakeholders convened on October 9, 2012, a number of meetings with the key stakeholders were held. Key groups of stakeholders identified and during project preparation include:

##### Government stakeholders:

The following governmental stakeholders are involved in decision-making related to wind energy:

Table 4: Governmental stakeholders

Ministry of Natural Resources and Environmental Protection (MNRE)	Responsible for current and future climate change entire policy framework, some elements of the RES development policy and its implementation. In particular, the Ministry organize and coordinate the operation of the national environmental monitoring system, including monitoring of winds, identify and record spots for possible placement of wind energy installations, inform local authorities about these spots.
Department for Hydrometeorology	The Department for Hydrometeorology was reorganized into the Division of Hydrometeorological Activity under the <b>Ministry of Natural Resources and Environmental Protection</b> . The Division is in charge of the issues of climate change monitoring and reporting, mitigation and adaptation strategies, flexible project-based GHG abatement mechanisms, administering the RES Cadastre. The MNRE will stand behind all of this division's obligations to the Project.
Ministry of Economy	Responsible for state policy in the field of fuel/energy, investments, tariff policy, etc. and issues in coordination of cooperation with international organizations and donors of technical assistance projects.
National Agency on Investment and Privatisation	A division of the <b>Ministry of Economy</b> which is authorized to represent interests of the Republic of Belarus on the issues of attracting investment to the country and acts as a "one-stop shop" for a foreign investor. Renewable energy is one of the priority areas for the Agency.
Department for Energy Efficiency	A division of the State Standardization Committee develops national concepts and plans for energy efficiency and renewable energy and monitors its implementation.
Ministry of Energy	Responsible for current and future national policy in the power industry sector and its implementation: viewpoints, perspectives, insights, information, data, capacity building needs assessment, expert networking.
State Electricity Production Association ("Belenergo")	Belenergo is the "State Electricity Production Association". They manage an installed capacity of 8470MW. It is subordinated to the Ministry of Energy. In the near term, Belenergo may be re-organized into a separate transmission concern and a separate generation concern. As part of the RES Law, Belenergo is to: <ul style="list-style-type: none"> <li>• provide wind farms with access to its electric transmission system and that, as the law is currently written, Belenergo will pay for all necessary</li> </ul>



	<p>transmission upgrades. The wind farm is responsible for the cost of delivering the electricity to the nearest Belenergo grid access point</p> <ul style="list-style-type: none"> <li>• pay appropriately documented wind farms the feed-in-premium rate .</li> </ul> <p>More importantly, Belenergo, through the Ministry of Energy, is providing \$3.1million of co-financing that is earmarked for investments in wind farm installations.</p>
National Statistical Committee	Responsible for national policy in the field of statistics and its implementation, and issues of improvement of GHG inventory system.
Ministry of Foreign Affairs	Humanitarian Cooperation and Human Rights Administration Division of the Ministry of Foreign Affairs presents country's position for post-2012 negotiations under UNFCCC, Rio process and other multilateral and bilateral arrangements relevant to sustainable energy in line with international agreements and overall national internal and external policy.

Table 5: Private sector

Enertrag	Enertrag is a German developer who has been attempting to build a 160 MW wind farm in Belarus. They have recently suspended their development activity in Belarus.
Triple	Triple is a Belarusian conglomerate with wide experience in commerce in Belarus. They are planning to develop wind farms in Belarus. Their first attempt is a 20 MW wind farm.
ENECA	ENECA is an engineering firm in Minsk. They have worked on several of the existing turbine installations including the 1.5 MW turbine from Grodnoenergo.

Table 6: NGOs

“Green Network” Civil Association	Raising awareness amongst NGOs, local authorities and representatives of local communities about climate change issues, EE and RES, and sustainable development, as well as NGO-Government partnership experience: viewpoints, perspectives, insights, information, data, capacity building needs assessment, expert networking.
“Ecoproject Partnership”	International Civil Organization – Multi-stakeholder cooperation in the areas of water, waste, EE and RES: viewpoints, perspectives, insights, information, data, capacity building needs assessment, expert networking.
Renewable Energy Association	An independent think-tank, which acts as a mediator between the government and business sector for facilitation of renewable energy development in Belarus.

Table 7: R&D

Belarusian Research Centre	GHG inventories, preparation of GHG Cadastre Reports and
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“Ecology”	National Communications and operation of the National ET Registry, assistance in administering the RES Cadastre.
Institute of Power Engineering National Academy of Sciences of Belarus	Division of the Belarus National Academy of Sciences studies in the fields of power engineering, sustainable power industry development and energy security: viewpoints, perspectives, insights, information, data, capacity building needs assessment, expert networking.
A.V. Luikov Heat and Mass Transfer Institute of the National Academy of Sciences of Belarus	Heat and Mass Transfer Institute of NAS of Belarus is the largest academic institution in Belarus, which is engaged both in solving fundamental and applied problems of heat/mass transfer, fluid dynamics, power engineering, thermal engineering, etc. and in developing energy-efficient and environmentally friendly technologies and equipment, facilities for power engineering and engineering, agro-industrial complex and construction industry, medicine and other industries. The institute also works on development of sustainable energy effective scenarios, managing the key indicators of energy efficiency of Belarus economy, the identification of scientific-based energy efficiency potential of Belarus economy in comparison with best world practice.
Institute for Nature Management National Academy of Sciences of Belarus	Division of the Belarus National Academy of Sciences studies in the fields of nature management, ecology, climatology, geophysics, biogeochemistry, sustainable development and environmental security, climate change impacts, vulnerability and optimal countermeasures, climate change monitoring and prognoses, peat extraction and utilization: viewpoints, perspectives, insights, information, data, capacity building needs assessment, expert networking.
International State Sakharov Environmental University	International State Environmental University studies and high education in the fields of environmental protection, sustainable development and environmental security, climate change and RES: viewpoints, perspectives, insights, information, data, capacity building needs assessment, expert networking.

Table 8: International financial institutions

European Bank for Reconstruction and Development (EBRD),	As part of its current country strategy is launching a framework operation of US\$ 50 million to foster sustainable energy investments in energy intensive Belarus. The framework will comprise credit lines to local banks for on-lending to industrial companies and small and medium-sized enterprises (SMEs) undertaking energy efficiency and renewable energy projects.
Nordic Environment Finance Corporation (NEFCO)	An international finance institution established in 1990 by the five Nordic countries: Denmark, Finland, Iceland, Norway and Sweden. NEFCO provides loans and makes capital investments in order to generate positive environmental effects of interest to the Nordic region. To date, NEFCO has financed a wide range of environmental projects in Central and Eastern European countries, including Russia, Belarus and Ukraine. NEFCO invests 1,65 million Euros in renewable energy in Belarus. The planned project will be implemented by the Swedish energy

	company RindiEnergi AB and their Belarusian partner Grodno State Production Forestry Association.
KfW	Germany's leading development bank. It has a possibility to support renewable energy projects in Belarus via European Fund for Southeast Europe. Three-fourths of loan commitments are made to micro, small and medium-sized enterprises (SMEs). The EFSE offers the following financial products: medium- to long-term loans, subordinated loans, equity participations, savings deposits, bonds and guarantees. Some 760 million Euros has been made available through the EFSE since its launch, around 15 per cent of that total from private investors.

Table 9: National financial institutions

BPS-Sberbank	The bank provides funding via Eurasian Development Bank's program, which aims to support innovational technologies. The minimum amount for a loan is 100,000 USD, the maximum is 10,000,000 USD. Additionally, there is a possibility to apply for a loan via program for support of SME, which is supported by EBRD.
Belvnesheconombank	A partner of the International Energy Centre (ESCO), established within the GEF project dedicated to improving energy efficiency in the state sector in Belarus. The Bank provides financial assistance to energy efficiency projects including <i>inter alia</i> renewable energy. The amount of available financing for this type of projects is around 120 mln USD.
MTB Bank	Is a partnering bank of IFC and the EBRD BelSeffprogram. The Bank provides loans to SME in the fields affiliated with implementation of energy efficient technologies and renewable energy.
Belinvestbank	Supports energy efficient and renewable energy projects via established ESCO (Belinvestesco). The capacity of credit line is equivalent of 20 mln USD. Financial support can be also provided via leasing.
Priorbank	A partner of the World Bank program on social retrofitting in Belarus and EBRD's partner within the program on support of SME. The Bank can provide up to 12 mln USD for support of various projects aimed at improving social infrastructure including energy sector.

Table 10: International/bilateral agencies

EU Delegation	The Delegation has the status of a diplomatic mission and officially represents the European Union in Belarus. Support the preparation and implementation of the technical assistance programs financed by the EU such as the EU Project: Support to the Implementation of a Comprehensive Energy Policy for the Republic of Belarus described in Section 1.8 below.
World Bank programme ESMAP-	This KEMA World Bank funded study includes the following

REMTI “Belarus: Renewable Energy Legislation Harmonization with the E.U.”	main tasks: (i) Detailed analysis of the existing RE legal and regulatory framework, as well as technical standards and requirements related to RE of Belarus (ii) Detailed analysis of the differences between the Belarus and EU RE legal and regulatory frameworks, as well as technical standards and requirements related to RE; (iii) Recommendations concerning the harmonization of the Belarus and EU RE legal and regulatory framework, as well as technical standards and requirements related to RE; (iv) Recommendations concerning the main content of RE legal and regulatory acts, as well as technical standards and requirements related to RE which are currently non-existent in Belarus based on the experience of the EU; (v) An assessment of policy, institutional and other barriers to scaling-up RE in Belarus; (vi) Recommendations addressing barriers to scaling-up RE in Belarus.
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### 1.5. Barrier analysis

The main problem that the project seeks to address is that wind energy in Belarus is not commercially attractive to private developers of wind farms due to a number of barriers. Each project component in the table below addresses specific barriers.<sup>20</sup> Currently, there are a number of barriers that hinder the development which were outlined in the original Project Identification Form dated 9/13/2010. They are as follows:

Table 11: Barrier analysis

Project Component	Type	Project response
Secondary Legislation in place to support wind energy with the support of the project.	Institutional	<p>1.1. Assistanse in development and adoption of provisions for institutional infrastructure based on the best European practice and policies, in particular for the State RES Cadaster, RES inventory and validation systems, green power record keeping and certification systems, etc., as per the RE Law.</p> <p>1.2. Assistance in formulation and enforcement of secondary legislation relevant to renewable energy developed to operationalize the Renewable Energy Law (RE Law) based on the best European practice and policies with favorable conditions to wind energy</p> <p>1.3. New/improved technical norms and standards including those related to windfarm positioning and windfarm-to-grid connection that are harmonized with relevant European regulations. These provisions include, inter alia, provisions to establish the fixed lower limit for the one-part tariff which is a baseline for the established feed-in tariff, or another viable alternative, and a methodology for its determination, provisions to establish fair and square transmission tariffs, provisions for infrastructure charges, provisions for loss compensation costs and many</p>

<sup>20</sup> The information on this table is copied from the PIF Table I. B. with yellow highlights for the areas that have changed from the PIF. These changes are addressed in Section 2 below.

		<p>other cost components, which provide viability for wind farm projects.</p> <p>1.4. Establishment of a Wind Private Finance Group in Belarus along with formulation of recommendations concerning the enhancement of the investment climate, focusing on the conditions for investment by local and foreign investors in energy sector, and on the development of a commercially viable wind energy industry in Belarus.</p>
<ol style="list-style-type: none"> <li>1. Increased confidence in the profitability of wind power projects</li> <li>2. Clear perception of the benefits of wind energy and other RE for power generation by stakeholders and general public.</li> </ol>	<p>Information and perception</p>	<ol style="list-style-type: none"> <li>2.1. Completed awareness raising program for decision-makers (in government agencies and local authorities, public institutions, companies, financial sector) for increasing understanding and appreciation of wind power.</li> <li>2.2. Specialized local engineering and consulting companies with enhanced technical capacity to site, design, install, operate and maintain wind turbines at the selected project site.</li> <li>2.3. Introduced wind power topics for an additional subject in RE related curricula of specialized universities and technical institutes.</li> <li>2.4. Completed support for ancillary costs related to the development of a successful windfarm including site visits, permits, approvals, and necessary consents.</li> <li>2.5. Developed and published manuals, brochures promoting wind power as one of RE sources with social, environmental and economic benefits, including a 'Guidebook on Wind Energy' for investors and developers, on wind project development, site evaluation, licensing, construction and operation.</li> </ol>
<ol style="list-style-type: none"> <li>1. An Investment Grant(s) is made by the GEF project which helps to ensure the successful construction and operation of a pilot wind farm in Belarus</li> <li>2. Further Investment Grants are made by the WPMI in case of availability of co-financing from the Government / investors</li> </ol>	<p>Financial</p>	<ol style="list-style-type: none"> <li>3.1. Completed support provided for potential sites identification, environmental assessments, pre-feasibility and feasibility studies, and business planning that meet requirements of potential foreign investors and developers, including support for detailed wind measurements in the best selected site.</li> <li>3.2. Identified and evaluated available public, private and carbon financing, local and foreign investors, banking proposal preparation and negotiation with potential investors and stakeholders for predevelopment of at least 5 wind farm sites and the permitting, financing, and construction of wind farms with total capacity of &gt;25 MW and generation of &gt; 1 million MWh of renewable energy over 20 years.<sup>21</sup></li> </ol>

<sup>21</sup> The 25MW of installed capacity could come from 5 wind farms of 5 MW but it could also be from one site of 10 MW and 15 MW. The exact configuration is yet to be determined because private sector partners are conducting pre-feasibility work.

		3.3. Completed support for the preparation of designing work on targeted sites to reduce risk to the successful operation of larger wind farms of at least 5 MW (target size is 10 MW).
<p>1. At least three (3) successful wind farm projects are successfully financed, constructed, and operated in Belarus with assistance from the WPMI.</p> <p>2. WPMI continues to operate and provide assistance to wind energy projects in Belarus beyond the lifetime of the project.</p>	Strategic	<p>4.1. Assistance in updating of the Atlas of Wind Potential in the Republic of Belarus that helps identify most appropriate regions for wind farms in the country.</p> <p>4.2. Completed web portal for the project.</p> <p>4.3. Completed site study visits during development of the pilot wind farm by local experts and entrepreneurs.</p> <p>4.4. Developed, reviewed, revised, finalized and published Lessons Learned study on the pilot wind projects is completed and published.</p>

\* Yellow highlights denote changes from the original PIF.

#### 1.6. Project baseline

The project baseline includes many existing conditions which at face value should provide incentives to catalyze the development of a wind energy industry in Belarus.

1. Feed-in-Premium
2. Guaranteed wind farms grid interconnection
3. Government consensus on desire for wind energy
4. Plan for installation of 350 – 480 MW of wind power by 2020 (see Table 12: below)

However, in the absence of the GEF project it is highly unlikely that there would be any large scale private commercial investment in windfarms in Belarus over the next 5 years. The reason for this is the existence of a large number of barriers that this project will seek to help to reduce.

Each one of the above items is flawed. For example, because there is an existing RE Law which calls for a Feed-in-Premium linked with the existing tariff for electricity (as discussed in section 1.6.1 below and in Annex), it is difficult for the Government to pursue a revised RE Law with a viable Feed-in-Tariff. They are working with consultants who have proposed Feed-in-Tariff rates that, in our opinion, are not high enough to incentivize investment. It is for this reason that the Government has reverted to negotiating each wind farm on a one-off basis.

Belenergo, the state energy concern, has plans, included in the baseline case, to install 6 MW during the timeframe of the project. This number is smaller than one would expect due to Belenergo's capital constraints. It is also noteworthy that Belenergo, as a public concern, will not receive the feed-in-premium. They will receive a premium equal to 85% of the market rate for the first ten years and 70% for the second ten years.

The most telling evidence of that more needs to be done is the fact that the German developer, Enertrag, decided in April 2011 to suspend its development activities in Belarus after their recent experience in attempting to develop a proposed €300-million 160 MW commercial wind farm after spending €300,000 on developing the project.

Investors require certainty of price, certainty of regulation, and certainty of access to viable debt. All three of these items pose impediments to the development of a wind energy industry in Belarus. All three of these items are intertwined and need to be addressed.

The Government's own prescriptions call for the installation of as many as 460 MW during the project period:

Table 12:

Programme title	Installed capacity of wind farms prescribed
Action Plan for Implementation of the Directive No.3 dated June 14, 2007 of the President of the Republic of Belarus (enacted Aug 31, 2007)	at least 150 MW annually from 2010 onward
State Comprehensive Program of Modernization of Basic Production Assets of the Belarusian Energy System, Energy Saving and Raising the Proportion in Using Local Fuel-Energy Resources in the Republic for the Period until 2011 (Nov 15, 2007)	the SPA Belenergo's plans: 1.25 MW until 2008 4.1 MW until 2010 5.2 MW until 2012.
Energy Potential Development Strategy of the Republic of Belarus (enacted Aug 9, 2010)	up to 300 MW in 2011–2015 (assuming theoretically practicable potential: >1 600 MW)
National Programme of Energy Conservation for 2011–2015 (enacted Dec 24, 2010)	8 wind farms with up to 420 MW until 2015
National Programme for Development of Local and Renewable Energy Sources in 2011–2015 (enacted May 10, 2011)	224 wind turbines of 440–460 MW total until 2015 (assuming economically feasible potential: 600–700 MW)
State Power Industry Development Programme up to 2016 (enacted Feb 29, 2012)	150–280 MW in 2012–2015

This joint UNDP GEF project, as described in this project document, will focus on addressing the barriers detailed above using transparent, arms-length, and replicable mechanisms.

#### 1.6.1. BAU Feed-in-Premium

The current status of the renewable energy premium scheme is that it is not appropriate and commercially attractive. The consensus is that the current Feed-in-Premium is faulty. The current Feed-in-Premium is not viable because it exposes projects to both commodity price risk and currency risk. (See Annex O for details.)

#### 1.6.2. Grid Connection

Thus far, in relation to wind projects, the only examples we have of Grid Connection come from the Enertrag project. Enertrag had grid connection issues with the second proposed project. That site had impractical very high connection costs on the project side and on Belenergo's side. Based on the Project Document team's interview with the company, this cost appeared to be €24 million for Enertrag in order to build transmission lines from the wind farm to the nearest grid connection point indicated by Belenergo, and €10 million for Belenergo in order to upgrade/adjust its facility (e.g., build a substation, including terminals, busbars, transformers, etc) to accommodate wind farm capacity. As it is stipulated by the RES Law, Belenergo is responsible only for upgrading/adjusting its own facilities and transmission line at the closest grid access point, and the investor is responsible for all costs of transmission from its wind farm site to the grid access point. This additional cost for transmission, in Enertrag's opinion, made this other site not feasible.

Other examples may be revealed from smaller biogas plants currently under operation, which do not have problems with grid connection, and Belenergo assumed all cost of all necessary upgrade of their grid and nearest grid connection point to transport renewable energy from these plants.

Республики Беларусь  
ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
ГЛАВНОГО УПРАВЛЕНИЯ  
ВНЕШНЕЙ ЭКОНОМИЧЕСКОЙ ПОЛИТИКИ

### 1.6.3. BAU Government Consensus

Based on the fact-finding mission of the UNDP/GEF ProDoc Drafting Team from June 25<sup>th</sup> to June 29<sup>th</sup> 2012 and the Project Workshop on October 9<sup>th</sup> 2012, it is clear that there is broad support for renewable energy within Belarus. On the surface, the current RE Law provides a market based Feed-in-Premium. Equally important, the RE Law guarantees wind farms grid interconnection at the nearest possible point without discrimination based on the fact that the resource is intermittent. However, the premium is flawed as it introduces commodity price risk and exchange rate risk making it difficult to raise financing or equity. The regulatory framework is weak because there is no template for permitting and constructing a wind farm – just an iterative process. And lastly, country risk remains as a real barrier to wind farm development.

In fact, the Project found support in each and every Ministry that the Project met with. In each case the Project asked the relevant Ministry: what if anything was missing in order to spur investment in wind energy in Belarus? The response from all but one of the stakeholders was that nothing is missing. This statement is true for the desire to develop wind, but not for the implementation.

The most telling evidence of this is the fact that the German developer, Enertrag, has decided to suspend its development activities in Belarus after their recent experience. The developer Triple is tentatively moving forward with their plans for three 20 MW wind farms, but they do not have confidence in the tariff rate that they will receive for their renewable energy.<sup>22</sup> This rate may decrease in value if the cross-subsidies are eliminated. They may also change if the Government chooses to implement the rates advocated by the EU sponsored study by DNV Kema outlined in Annex 0 below. Triple is also not clear that they will have access to debt financing on viable terms. The current domestic lending rate is 30% which is not viable.

In both of these cases, uncertain incentives, a weak regulatory framework, and a country risk premium have combined to stifle investment. It is for this reason that public sector companies like Grodnoenergo have been the ones to install wind turbines. These installations tend to be for a single turbine.

### 1.6.4. BAU Cost Effectiveness As Compared to Alternative Approaches

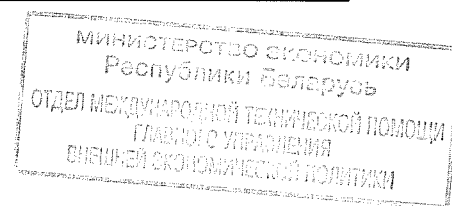
Medium to large wind farms like the ones that this project is proposing to develop are currently theoretically the most cost effective method of producing renewable energy and reducing green house gases in Belarus. The following table represents the suggested levelized costs for Belarus for 4 different technologies and shows that wind is the lowest cost.

The levelized costs assume a 7.5% - 10% return on equity and the wind and solar calculations assume a credit rate of 15%.

Table 13:

		Wind*	Solar	Biomass	Biomass	Biogas	Biogas
Installed MW	KW	25,000	1,000	2,000	20,000	50	1,000
Levelized Cost	€/kWh	9.37	16.74	14.50	10.00	16.00	8.00

\*medium size medium price; no Climate Control<sup>23</sup>



<sup>22</sup> In Triple's case, they cited the cross-subsidization rules as one key uncertainty.

<sup>23</sup> Support to the Implementation of a Comprehensive Energy Policy for the Republic of Belarus Final Task Report C 1.4: "Development (calculation) of Feed-in-tariffs for RES", Kema, Sofreco November 2012



It should be noted that one of the main goals of this project is to confirm with empirical methodology what the above levelized rates need to be based on projects with actual i) wind data, ii) turbine pricing ii) credit rates, and iii) equity rates.

#### 1.6.5. Business-as-Usual Case and PIF

This is the current status quo in Belarus and represents the project baseline, or the business-as-usual case (BAU). It would take many years, if ever, for a wind farm industry to develop under these circumstances and there will be a continued lack of investment in Belarus. There are already three demonstration projects in the country utilizing single megawatt scale turbines. It is also clear that if the Project used the GEF funds to promote a wind farm of 5–10 MW this would not promote a market based wind farm industry. The reason for this is that the GEF funds or grants would distort the economics for the 5–10 MW project such that it would not provide a pricing mechanism for other projects to enter the market.

This is a classic chicken and the egg scenario where many developers do not want to invest money, even the 50,000 Euros to 100,000 Euros required for wind measurement, and proceed with projects until they know that incentives will be certain (the current premium is not as it has exchange rate and commodity price risk), there is at least a roadmap leading towards a regulatory framework, and developers have access to viable debt.

Without GEF's involvement it is clear that the Government would not make the necessary changes to the Feed-in-Premium. They would instead continue to negotiate one-off Investment Agreements with projects like Enertrag's and Triple's. If this is the case, without GEF's involvement, there may be up to 20 MW of installed private capacity if Triple is able to achieve their required returns. But they would receive a preferential bilateral investment agreement, based on their strong ties to Government, which does not open the door for other developers to follow. And, the lack of regulatory framework leads to investment agreements that are not transparent and may not create a level playing field for all developers.

In the Project Document team's opinion, Enertrag is suspending development and Triple is moving forward tentatively because of regulatory uncertainty and a lack of confidence in the market.

The best case without GEF's involvement is that the Government implements the policy prescriptions of the EU study. These prescriptions may foster the installation of additional single turbine investments, but would not foster any larger installations of wind farms, neither these would provide sustainable development of wind energy sector.

### 1.7. Incremental Changes with GEF Involvement

#### 1.7.1. Wind Private Finance Initiative

For any project to succeed, the developer needs a regulatory roadmap. The current stakeholders believe that they are providing enough guidance. The GEF project will augment this and provide developers with a "one-stop-shop" for regulatory matters. They will accomplish this by providing developers either with guidance, or with turn-key investment opportunities where the regulatory risk has already been mitigated.

This conclusion is based on the following information that the Project Document team collected:

- The Ministry of Natural Resources and Environmental Protection thought that they were doing all that they needed to encourage wind farm development. They outlined the permitting procedures and the process for the Cadastre. They also pointed to the feed-in premium in the Law on RES as a reason for success. They believe that they provided the Enertrag's Dzerzhynsk wind project with everything needed to succeed.
- The Department of Energy Efficiency thought that they had many viable investors for renewable energy in Belarus, yet they had not seen significant foreign direct investment.
- Belenergo thought that they have done everything necessary to promote renewable energy. But the second site proposed to Enertrag was not viable due to the high cost for upgrading the

Belenergo facilities, and because the wind farm's economics could not support a vast amount for connection of their potential wind farm to the grid under the conditions of the Investment Agreement adopted by parties and Minsk Oblast Executive Committee. It is not clear whether there were additional efforts beyond offering this second site.

- The MNPE installs tall met towers to measure wind velocity in areas where the military allow wind farm development.
- The Ministry of Economy thought that they had provided Enertrag with everything necessary for their success. This includes the tariff scheme that Enertrag requested in their Investment Agreement. Firms like Triple, a large Belarusian conglomerate who is considering participating in the co-financing of the Project, are sitting on the sidelines as they wait for a revision of the current energy tariff scheme for renewables. The Ministry of Economy is prepared to listen to any tariff scheme proposed to them for actual wind farm development, but they are not prepared to suggest a tariff scheme on their own. The tariff scheme that is currently being suggested by the EU commission may not be feasible for utility scale wind farms in Belarus. The tariff rate suggested by the European Commission report does not appear to include risk premiums for country risk. The tariff rates that they suggest for large-scale wind may be too low to incentivize the development of wind farms in Belarus.
- The National Agency for Investment and Privatization believed it was doing enough by reaching out to potential investors.

The project baseline includes many existing conditions which at face value should provide incentives to catalyze the development of a wind energy industry in Belarus.

Under the business-as-usual (BAU) scenario with no GEF involvement, it is clear that the government of Belarus is not on a clear path towards creating a viable wind energy industry despite the above existing conditions. The current best case scenario is that several medium sized projects sponsored by developers with opaque one-off agreements would be built.

In the case of Belarus, the institutional structure and responsibilities for wind energy are divided across a few ministries, whose activities vary from policy development and capacity building, to provision of technical support and issuing clearance for potential wind sites. The following governmental stakeholders are involved in decision-making related to wind energy:

- 1) Ministry of Natural Resources and Environmental Protection is responsible for developing and updating Wind Energy Cadaster. Additionally, the Ministry aims to: i) elaborate and pursue a common public policy in environmental control and rational utilization of natural resources; ii) exercise integrated environmental control in the country, coordinate activities of other republican bodies of state administration and corporate bodies along these lines; iii) exercise state control over environmental protection and nature management; iv) make public aware of the environmental conditions and actions taken for environmental recovery, v) establish a system of environmental education and training, and vi) interact with public environmental associations to maintain international ties within its competence. Department of Hydrometeorology sits under the Ministry of Natural Resources and assist with development Wind Atlas, populating and replenishing the RES Cadastre, and defining potential sites.
- 2) Department of Department for Energy Efficiency of the State Committee for Standardization of the Republic of Belarus is formally the key institution responsible for development, implementation and monitoring of the government policy in the field of energy efficiency and RES. The regional branches of the Department are instrumental for impmenetation and monitoring of RES programs and projects developed by the Department.
- 3) The President of the Republic of Belarus defines the state policy with respect to the renewable energy use. In accordance with the Decree # 667, the President also makes decisions on the use of agricultural lands and assigning these ladns for other use (transferring to other categories).

- 4) Ministry of Economy is responsible for setting the FiT rate and is one of the key signatories to any Investment Agreement. The FiT for Belarus for wind energy projects currently stands to EUR 0.14 per 1 kWh (for the first 10 years from the date of commissioning) and EUR 0.09 per 1 kWh (for the second 10 years of commissioning). Additionally, there is a possibility to negotiate and set the tariff for each wind energy project for the whole period of investment agreement. The Ministry is also in charge of general investment policy, including inter alia for wind energy projects, and coordinating regional development.
- 5) The Ministry of Energy is responsible for the entire energy mix in Belarus and performs as a principal governmental agency in implementation of the state energy programs. The Ministry of Energy determines energy policy at the governmental level. Entities of the Ministry of Energy of the Republic of Belarus work in the certain areas as: Gas, electric and thermal energy supply to consumers at the national level; Transit of gas from Russian Federation; Electric energy export and import; Fuel and fertile soils production from peat for domestic and export needs; Design, construction, mounting and adjusting of energy facilities.
- 6) Belenergo is subordinated to the Ministry of Energy of Belarus and manages all state owned entities operating in the electricity sector. Belenergo manages the energy system and the power engineering companies of the Republic of Belarus. Belenergo incorporates six regional energy supplying companies (Unitary Enterprise (UE) Oblenergo), design, construction and other companies. The regional energy supplying companies act as initiators of investment projects in the field of power engineering. Belenergo is in charge of development of energy system, including financing of projects for upgrading of the old and construction of new facilities. Consequently, it is responsible for issuing technical specification, connection to the grid, grid upgrades. including upgrades of connection points or busbars, in order to adjust grid voltage and wind farm capacity. Belenergo monitors medium and long term supply and demand balance, and submits fuel and electricity forecasts to the Ministry of Energy. Belenergo prepares plans for the development of generating facilities and networks and supervises the execution of those plans. Maintenance and monitoring of the networks is performed by the regional electricity grid companies, all subsidiaries of Belenergo, which also are responsible for the quality of service.
- 7) Regional Government (Oblispolkoms) is in charge of issuing the land and planning permissions based on the assessments conducted by the Regional Evaluation Committees. The Regional Government takes part in the development of state programmes and undertakes the development, approval and implementation of regional programmes. They decide on the entry of certain sites, proposed by the Ministry of environment, into the registry of potential RES sites and about the designation of land plots for RES facilities and inform the Ministry of environment about all decisions on registry and designation. Oblispolkoms are also in charge of issuing the permissions for land use.
- 8) Ministry of Defence of the Republic of Belarus is responsible for issuing the clearance from the perspective of potential impact of wind farm on performance of the air defense radar facilities.
- 9) Ministry of Communication and Informatisation of Belarus is responsible for clearing the wind project from the perspective of interference with civilian radio communications and TV broadcasters.

Development of a new wind farm involves application to multiple agencies working on parallel paths, which results in considerable permitting and clearance challenges for project developers. The following diagram indicates the governmental agencies involved in issuing permits and clearances for wind energy projects:

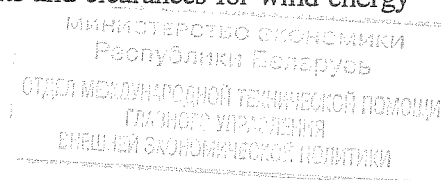
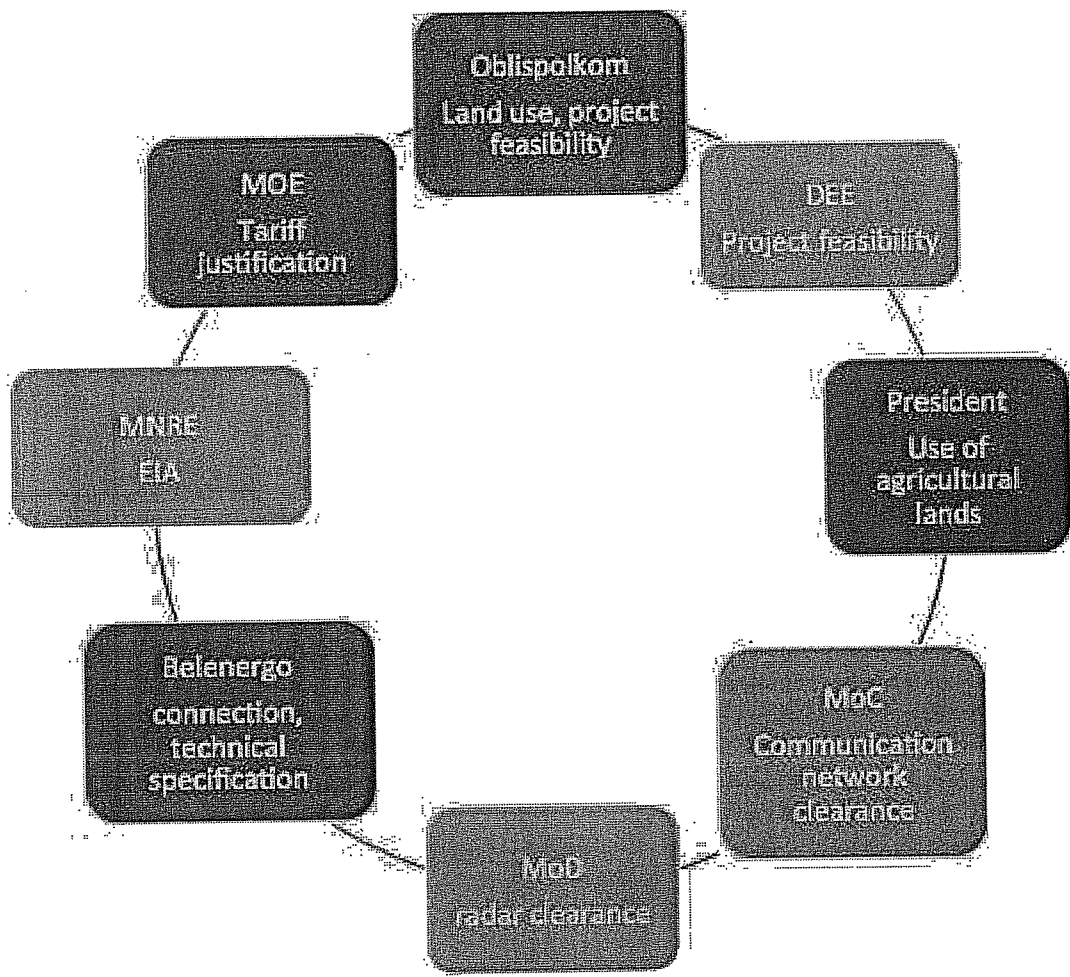


Figure 6: Responsible state agencies and Iterative Application Process



The above table illustrates the lack of a clear regulatory framework as there is no clear permitting process. Rather, the process is iterative as a developer needs to go back and forth between the agencies.

In the absence of the Project, under BAU, Belarus would continue with the above cited building of 1–2 turbine pilot projects. These projects, many of which are supported by grants, do not provide the necessary precedent for building larger scale market driven wind farms.

With the GEF support and ensuing replications and spillover effects, the following impacts are expected:

- Enactment of comprehensive Secondary Legislation including a viable Feed-in-Tariff based on European best practices and set high enough to incentivize the creation of a sustainable wind energy industry in Belarus (by 2015).
- The establishment of a Wind Private Finance Initiative that will support development of at least 5 project sites with the goal of permitting, financing and constructing >25 MW of wind farms generating > 1 million MWh of renewable energy over their 20-year lifespan. This fund will be self-sustaining in the short to medium term as it uses the premiums that it collects to fund its ongoing operations. Its goal is to set realistic tariff rates that will generate a premium for sale of the better projects. If the WPMI is doing its job correctly, this premium will go away in the medium term.
- The WPMI will be formed as a private-state partnership between relevant state agency (e.g. MNRE) and an engineering firm chosen through a tender process.

- Private investment into the wind energy sector in Belarus on a scale of €62.5 million directly from project outcomes replication efforts with a total of over \$1 billion by 2025.
- As a result of the project, approximately 5% of the nameplate generation capacity in Belarus will be generated by wind in 2025.
- The establishment of Procedural Guidelines and a Handbook for developing wind energy projects in Belarus.
- The WPFI will leverage GEF's funding. Each \$1 of GEF funding can lead to over \$20 of private investment.
- The combined impacts of the project-supported interventions and ensuing replications within 10 years of the GEF project influence period are estimated to enable cumulative build-out of approximately 400 MW of nameplate capacity for wind farms in Belarus.

### 1.7.2. Current status of wind power development in Belarus

In 1998, the Belenergosetproekt Institute carried out its study of wind power potential for all regions in Belarus. According to this study, there are natural uplands with background wind speed of 5.9-6.2 mps at the height of 10 m that corresponds to wind speed of 7.5–8.5 mps respectively at the height of wind turbine hubs. These values were confirmed during monitoring of several prospective sites by Belarusian specialists in 2006-2009. In 2010, the Ministry of Natural Resources and Environmental Protection under the State Programme of Scientific Researches "Energy security and reliability of energy supply"<sup>24</sup> prepared a lay-out of a wind atlas for Belarus, and perspective sites for installing wind parks have been preliminary identified (1840 potential locations) where mean annual wind speeds at 10-m height exceed 5 m/s<sup>25</sup>. The Ministry of Natural Resources and Environmental Protection of the Republic of Belarus estimates that these sites can support 1,600 MW of generation<sup>26</sup> or approximately 4,600 MW of installed nameplate capacity.<sup>27</sup> Among the principal factors affecting the decision-making on deploying a wind park is specific energy production per MW installed that is determined mainly by the wind speed. Over the past decade, there have been advances in wind turbine technology for low-wind speed sites. It is now economical to build wind parks at locations with wind speeds as low as 6-7 m/s at heights of 90–120 m. This is a good sign for Belarus as there are many locations that now have adequate wind resources.

The institutional structure related to wind energy in Belarus is currently as follows:

- The President of Belarus determines the state policy for the use of RES and some other matters, as specified in the Law;
- The Council of Ministers ensures the implementation of the state policy on RES, determines the regulation for the certification of energy produced from RES, determines the rules for the state registry of RES, coordinates the work of the state bodies in the area of RES, approves State Programmes of development;
- The Ministry of Natural Resources and Environmental Protection is responsible for determining a list of sites to be used for the construction of RES generation facilities and communication of the possible RES sites to local authorities, determining rules for wind measurement and for the use of meteorological data for wind estimation. It takes part in the development of state programmers and to some extent sector and regional programmers;
- The State Committee for Standardisation through its Energy Efficiency Department implements the state policy for RES, undertakes active measures and coordination of work for its

<sup>24</sup> Approved by Resolution of the Council of Ministers No.1339 of 28.11.2005

<sup>25</sup> The best sites in Belarus for wind power installations are the elevated relief of the north and north-west of Belarus, Vitebsk upland, the central zone of the Minsk upland and some adjacent regions to the west, e.g., Novogrudok upland.

<sup>26</sup> The Republic of Belarus' National Report on Demonstrable Progress in the Implementation of the Kyoto Protocol ("Kyoto Progress")

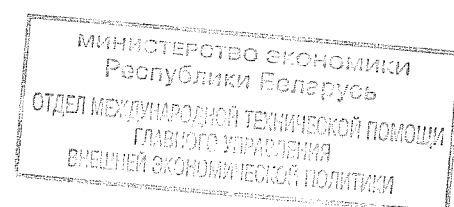
<sup>27</sup> Assuming each location supports one 2.5 MW wind turbine.

realization, develops the state programmers and takes part in the development of the regional and sector programmers as well as in their approval process, monitors and checks the fulfillment of the state programmers, organizes the work required for the development of RES<sup>28</sup>;

- The Ministry of Energy is responsible for implementing measures ensuring guaranteed network connection and off-take of all energy produced from renewable sources, as well as payment for energy from RES at tariffs in accordance with the Law, takes part in developing the state programmers and develops and approves sector programmers;
- The Ministry of Economy is responsible for setting the tariffs for energy produced from renewable sources and for defending the RES producers against;
- The State Committee for Science and Technology organizes the implementation and financing of scientific research in the area of RES, organizes the development, consultation and approval of the state and to a certain extent sector research and development programmers, co-ordinates innovation and plans the preparation of science and development personnel;
- Local authorities take part in the development of state programmers and undertake the development, approval and implementation of regional programmers. They decide on the entry of certain sites, proposed by the Ministry of environment, into the registry of potential RES sites and about the designation of land plots for RES facilities and inform the Ministry of environment about all decisions on registry and designation. They also take into account the information from the state registry of RES in their spatial planning.<sup>29</sup>

In May 2011, twenty locations were selected by Belarusian specialists in the National Programme of Local and Renewable Energy Sources Development for 2011-2015 for the first stage development of large-scale wind farm installations. At least nine of these sites have average background wind velocity of around 8 m/s at 10 m height. These sites are now listed in the Cadastre, the state registry of renewable energy resources.

The following chart provides more information about wind potential at a hub height of 100 m.



<sup>28</sup> The wording of the respective paragraph (10) was revised substantially from the draft law to the finally approved state. Competences related to the State Programmes were added. Something not reflected in the Law, but under discussion, is a change of status and subordination of the Department of Energy Efficiency, with options ranging from it becoming part of the Ministry of Energy to becoming a separate governmental body of ministry level.

<sup>29</sup> ESMAP Study on Belarus: Renewable Energy Legal and Regulatory Framework Harmonization with the EU

Figure 7: Wind potential at a hub height of 100 m

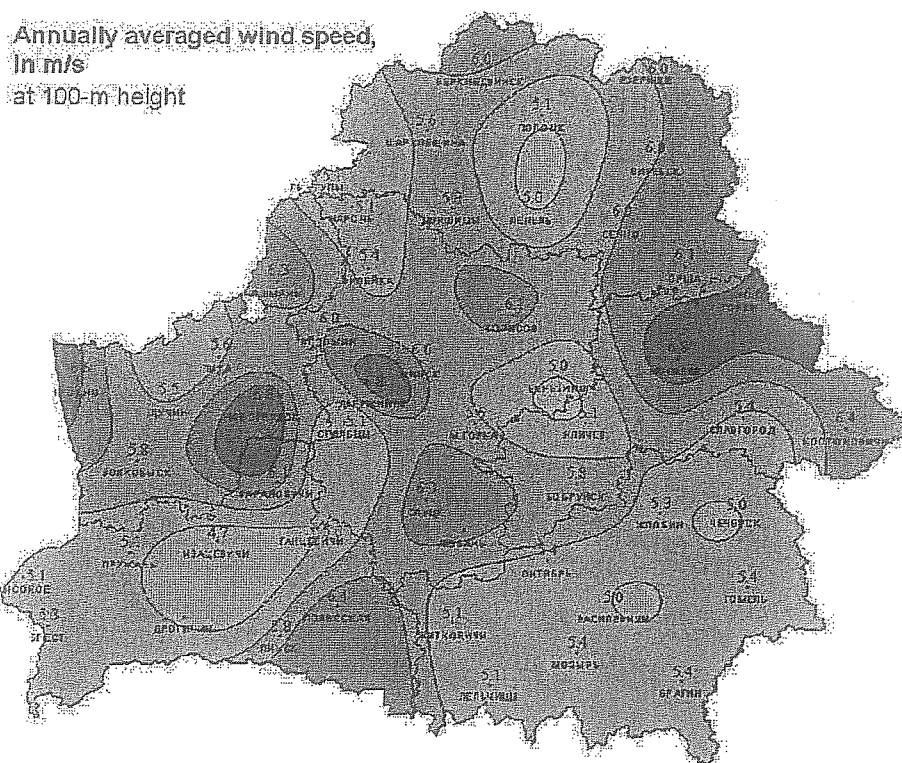


Table 14: Potential Wind Park Locations and Projected Capacities in the Republic of Belarus

Name of the location	Oblast	Capacity, MW	Developer	Status
Liozno / Gorodok Regions	Vitebsk	50-60	VitebskEnergо	call for BOT
Dzerzhynsk Region	Minsk	80 (1st stage); 80 (2nd stage)	Enertrag AC	investment agreement signed; > 1 yr onsite measurements; proposed alternative sites; project suspended
Logoysk Region	Minsk	50	TDF Ecotech	protocol of intent
Volozhyn Region	Minsk	60	Corvusolar (Turkey)	protocol of intent; proposed alternative sites
Oshmiany Region	Grodno	20-30	TBD	
Novogrudok Region	Grodno	25	GrodnoEnergо	1.5 MW installed
Smorgon Region	Grodno	15	GrodnoEnergо	call for BOT
Goretsky / Mstislavsky Region	Mogilev	50	Triple; TDF Ecotech	wind measurements ongoing; protocol of intent
Shklovsky Region	Mogilev	7.5	TBD	

The “State Integrated Programme for Modernization of Belarusian Energy System Basic Production Assets, Energy Saving and Increase of Domestic Fuel-Energy Resources Share in the Period until 2011” (approved by the Decree of the President of the Republic of Belarus, No 575 of 15.11.2007) envisages increase in electricity production by wind parks to 7.3 million kWh (corresponding to 4-1 MW installed)



in 2010 and to 9.3 million kWh (corresponding to 5.2 MW installed) in 2012. The current GEF program seeks to increase this estimate more than 20 MW. Entrepreneurs are also encouraged to develop projects outside of the national programs. For example, the energy production company “Grodnoenergo” in April 2011 has installed a 1.5 MW Hewind turbine (HW82/1500) in Novogrudok Region of Grodno Oblast in Grabniki village. The manufacturer, Huawei Electric Apparatus Group of China organized an 85% loan for the project.

The “BelNeftchem” Concern has plans to develop a wind power farm of 4.5-6.0 MW in Grodno Oblast, still under discussion with Siemens.<sup>30</sup> At least ten companies (listed in Appendix 7.2 below) have approached Belarusian authorities and utilities with proposals to invest in wind power development in the locations cited in the table above.

One of these potential investors, the Triple LLC is developing three wind farms of 20 MW each using 2.5 MW wind turbines, in Mogilev Oblast. They are certain that their sites are in compliance with military radar regulation, and fit existing infrastructure. The company has already obtained permission to install met towers and contracted a specialized European company. The measurements began since mid-August, and they will conduct a one-year cycle of data collection. Another company, the Turkish Global Wind Corvusolar in 2011 negotiated to build a wind farm with a total investment of €200 million in Volozhyn Region of Minsk Oblast. In contrast to the case of Triple, the site was not approved by the Ministry of Defence.

Based on the limited number of installations, local experience in wind turbine operation and maintenance has been limited. The table below illustrates the installations in Belarus to date. The total is just over 5 MW.

Table 15: Wind installations in Belarus

Wind Farm Location	Owner	Operation Date	Turbine	MW	Comment
Grabniki (Grodno Oblast)	Grodno-energo	April 2011	Hewind 82/1500	1.5	Publicly owned. Financed with 85% Chinese debt at 3%
Dzerzhynsk Region of Minsk Oblast	Aerola Ltd	2000	Magnus	0.250	Currently not operational due to design defects and is used for educational purposes by the Sakharov International State Environmental University
Svitiazianka Korelichy Region of Grodno Oblast	Aerola Ltd	2008	77 kW turbines	0.231	
Myadel Region of Minsk Oblast	Eco- House NGO	2002	Nordex 29/250 and Jacobs 48/600	0.25 0.6	The best load factor achieved by the 600 kW Jacobs turbine was 20.1% with average annual factor of 18.3%. Financed using grant support
Braslav Region of Vitebsk Oblast	Individual entrepreneur Tereshchenko	2010	Seewind	0.132	

<sup>30</sup> Wind Farm of 4.5-6.0 MW Capacity.



Zhukovo Mogilev district of Mogilev Oblast	Tycoon LLC	May 2011	Lagerwey 80 kW	0.08	Tycoon plans to complete a 3-turbine wind farm (Micon M750 turbines of 400 kW each) to be located next to Mogilev's belt-road.
Polykhovichi Mogilev district of Mogilev Oblast	Tycoon LLC	March 2012	Micon M 750 2 x 400 kW	0.8	
Polykhovichi, Kupely Mogilev district of Mogilev Oblast	Tycoon LLC	April 2013	Nordex 29/250	0.25	
		April 2013	TACKE TW-600	0.6	
		April 2013	TACKE TW-600	0.6	
		September 2013	TACKE TW-600	0.6	

#### Enertrag Case Study

- Enertrag AG of Germany has proposed a €300mm 160 MW project in the Dzerzhynsk region until 2015.
- The company reached advanced stages of development on the project including onsite data collection from 100m meteorological towers for over one year. Enertrag has spent over €300,000 on the project development.
- The project negotiated an Investment Contract with the government, outside of the proposed feed-in-tariff. This agreement was signed on July 1, 2010.<sup>31</sup> This agreement set a tariff of 11.3 Euros (equivalent) per MWh of wind energy for 20 years.
- The project could not obtain consent from the Ministry of Defence due to issues with proximity to military radar installations. This project was subsequently abandoned since April 2011.
- In July 2011, the developer was offered a separate 160 MW project which also had fatal flaws. The alternative project internal transmission cost was over €10 million and the grid connection cost was over €24 million. However, in interviews with Belenergo, we learned that the Minsk Oblast and Belenergo planned to compensate or pay Enertrag for any economic shortfall between the original site and the new site.<sup>32</sup>
- Despite the above offered assistance, Enertrag which expended considerable effort and resources already is currently no longer seeking to invest in wind energy in Belarus.
- The only conclusion supported by the facts is that Enertrag decided that the opportunity cost, the cost of their time and resources to develop the new project site, combined with continued uncertainty was too high for them to continue development in Belarus.

The GEF Project will investigate the possibility of co-operating with the Ministry of Defence on co-ordinating policy for siting wind farms in the vicinity of military or civilian radar installations. There is precedent in the United States for large developments to work together with the air force in order to arrive at suitable solutions to mitigate the effects of wind farms on military radar. The precedent was set for a series of wind farms in California that have been constructed as close as 4.5 nautical miles from military

<sup>31</sup> Enertrag website viewed 1/1/2013. <https://www.enertrag.com/en/project-development/international-projects.html>

<sup>32</sup> Based on conversations with Belenergo

radar. The mitigation that was employed was based on a combination of software and manual changes to the operation of the radar.<sup>33</sup> Other potential mitigations included the installation of additional radar receptors combined with software to mitigate the effects of the turbine blades on the radar. The cost to install a completely new radar facility is estimated at between \$3 million and \$8 million. It may be within the scope of a larger project to pay for the new installation which would benefit the project and the Ministry of Defence.<sup>34</sup> Importantly, this precedent was based on the potential large scale deployment of wind turbines. The scale of the projects made the cost of the mitigation possible as compared to smaller European projects. The Enertrag proposed project has the appropriate scale.

Another form of mitigation would be to investigate sitting fewer turbines and decreasing the size of the project.

### 1.7.3. Summary

The history of wind energy development thus far has revolved around building single turbine demonstration projects. These projects have not provided the economic precedent to give developers the confidence to undertake larger projects.

In two instances, Enertrag and Corvusolar, developers have attempted large scale projects only to find their efforts stifled by a combination of: i) Ministry of Defence opposition, ii) grid connection issues, and iii) a lack of a concrete and transparent regulatory regime. The developer with the most promise and highest probability of success appears to be Triple LLC. They have three 20 MW projects which they have sited away from military installations. They have chosen 20 MW as a suitable amount based on the ease of interconnecting this amount to the grid. Triple also has a strong local presence which will be needed as they may need to negotiate an Investment Agreement including a bespoke tariff rate, which is approved by the President.

### 1.7.4. Pro-forma Economics

Current wind projects in Belarus may be compared to the hypothetical<sup>35</sup> pro-forma economics of the aforementioned project implemented by the energy production company "Grodnoenergo" in Grabniki village, Novogrudok Region of Grodno Oblast. The project is a 1.5 MW Hewind turbine (HW82/1500) with a rotor diameter of 82 meters and a hub height of 81 meters installed at an elevation of about 320 meters. This turbine was placed in operation in April, 2011 by the Huayi Electric Apparatus Group, of China. The average wind speed at the hub height at this location is 6.8 m/s.

The project was financed by a Chinese soft loan (commodity credit under 3% annual interest rate) covering 85% of the investment cost plus 15% equity from Grodnoenergo. Grodnoenergo owns and operates this wind turbine. The cost of construction is given in Annex I to this document, and its breakdown was provided by the "ENECA" Co LTD., a local project developer. The turn-key cost to construct this project was \$3.8 million USD. This is a single turbine and may not include typical expenses for (i) internal collection systems, (ii) transmission to substation, and (iii) substation expenses such as transformers.

Based on the 31% achieved net capacity factor, the annual energy production may achieve 4,073.4 MWh; this assumes that the annual capacity factor is equal to the long term average. If we were to apply the RES feed-in premium (currently around \$18 US cent per kWh), the annual gross revenue could be estimated as \$562.13 thousand USD, the annual operational expenses being \$95.66 thousand USD according to records available from Grodnoenergo. The annualized cost of energy production would be \$13.3 US cent per kWh.

<sup>33</sup> United States Transportation Command Cooperative Research And Development Agreement "Assessment Of Wind Farm Construction On Radar Performance" Operations

<sup>34</sup> Michael Brenner "Wind Farms and Radar" a paper prepared for the US Department of Homeland Security <http://www.fas.org/irp/agency/dod/jason/wind.pdf>

<sup>35</sup> These figures are hypothetical because Grodnoenergo is not eligible to receive the premium energy rates under the RE Law because it is a public company.

Using a discount rate of 10%, the NPV of this project would be \$981 thousand USD with IRR of 14.1% (a US Project with this amount of debt would require a >20% return) and pay-back period of 6 years. It is worth noting that the subsidy associated with the feed-in premium in this case constitutes \$843.19 thousand USD, i.e. about 22% of the investment cost.

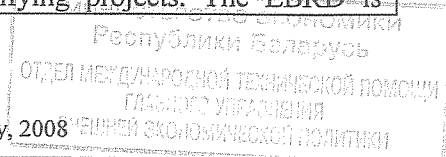
1.8. *Other related past and ongoing activities*<sup>36</sup>

Table 16:

Name of Project and Donor	Start Date – Finish Date	Comments
World Bank programme ESMAP-REMTI “Belarus: Renewable Energy Legislation Harmonization with the E.U.”	June 2010 to March 2011	Project analyzed the current framework for RE and made recommendations on harmonizing the framework with the EU.
EU Project: Support to the Implementation of a Comprehensive Energy Policy for the Republic of Belarus	August 2008 to Dec 2012	Component One: Legal and procedural convergence, and capacity building for Implementation Gradual convergence, where appropriate, of environmental legislation, development of secondary legislation and alignment of institutional structures towards the EU environment policy and body of environmental law and best practices, with particular focus on integrated water resource management, integrated permitting Component Two: Building 4 Biogas Pilot Projects
UNDP-GEF project: Biomass Energy for Heating and Hot Water Supply in Belarus	2003 – 2008	This project shared many of the same development activities as envisioned by this Project. <ul style="list-style-type: none"> <li>• Substantial progress towards elimination of barriers to widespread use of wood waste for fuel in Belarus;</li> <li>• Six investment projects (5 demand side and one supply side) being implemented;</li> <li>• Replication mechanisms in place through awareness-raising activities, investment-friendly policies and the availability of decision making tools and finances through a revolving fund;</li> <li>• Close working relationship with an institute as an exit strategy after the completion of the project;<sup>37</sup></li> </ul>
Belarus Sustainable Energy Finance Facility (“BelSEFF”)	ongoing	This is a facility/program that is sponsored by the EBRD. The two main goals of BelSEFF are: Implementation of a \$30 million fund that will indirectly support RE and EE projects by providing funding to local banking institutions. These banking institutions will then onlend these funds to the qualifying projects. The EBRD is

<sup>36</sup> Additional information on related and past programs can be found in the Annex.

<sup>37</sup> UNDP Project Document: Final Evaluation of Biomass for Heating and Hot Water Supply, 2008



		providing liquidity and low cost funds so that the local banking institutions can provide more loans and at lower interest rates. Loans will have a maximum value of \$5 million.
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МИНИСТЕРСТВО ЭКОНОМИКИ  
Республики Беларусь  
ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
ГЛАВНОГО УПРАВЛЕНИЯ  
ВНЕШНЕЙ ЭКОНОМИЧЕСКОЙ ПОЛИТИКИ

## 2. STRATEGY

### 2.1. *Project Objective, Outcomes, Outputs and Activities*

The project objective is assistance in the reduction of barriers to the widespread implementation of wind energy projects in Belarus. The project's contribution to this objective will be measured by the extent to which the Project succeeds in developing at least 5 projects that directly or indirectly leads to the permitting, financing, constructing of as many as 25 MW of wind farms in Belarus which are commissioned during the five year project period. The Project's goal is to develop these wind farms in a way that provides a template and opens the door for future development of wind farms by private developers.

The expected outcomes of the project are that by the end of the project

- full secondary legislation is in place with the support of the project which will greatly facilitate investment in wind energy,
- we create an enabling environment which leads to increased confidence in the attractiveness of wind energy in Belarus.

The MNRE with informational and limited financial support will create a Wind Energy Support Unit ("WESU").

The Project will also create and directly finance special company (Co Ltd, LLC Company) which will be formed by consulting or engineering firm (as a separate company or a branch of an engineering company), selected by the Project based on the results of the tender. The working name of the company is the Wind Private Finance Initiative ("WPFIF").

The WESU will be responsible for providing information support to WPFIF and for coordinating the interaction of the latter with the government. Staffing structure of the WESU is presented in the TOR.

The project's objective is to create a pool of projects combining the 5 WPFIF developed projects with at least 3 Private Sector projects. The Project will then have negotiating power as it will be working on behalf of a large concentration of projects. With this pool, the WPFIF specialized consultant, working together with the WESU, will negotiate a financeable tariff with the Ministry of the Economy and other concerned agencies for the implementation of a target number of MW at a single fixed tariff rate for all of the projects. In other words, the Ministry of Economy in cooperation with other concerned agencies will decide wind installations to be built. In essence, the Ministry of Economy would be setting a *de facto* feed-in-tariff based on the number of MW the Ministry of Economy and other concerned agencies would like to see installed. This is the project's main objective. This tariff scheme will be presented to the government as part of a comprehensive feed-in-tariff that can be used by all future projects.

Funding of a Pilot project or projects with a grant mechanism, as envisioned in the PIF, may not lead to additional self-sustainable development. The reason for this is that the grant mechanism does not allow market forces to develop, and it does not create a market precedent to spur additional development. This approach has already been tried in Belarus and has been demonstrated not to work and not to facilitate additional commercial investment.

In addition, this concept addresses one of the main drawbacks of many FiT's from the perception of the Belarusians': Developer Surplus. In the usual FiT, the Regulator decides on how much RE construction is optimal over a certain period. The FiT is then set at a "clearing level" in order to incentivize the new construction. This level will create a "surplus" profit for many developers.

The goal of WPFIF is to empirically demonstrate what the "clearing" tariff needs to be to attract not single but massive investments into wind energy. WPFIF will also discuss with the authorities issuing permits for wind installations construction (Ministry of Defense, Ministry of Communication and Informatisation, etc.) to identify "limiting" factors for wind installations construction, with Belenergo – on access to the grid and other expenses. WPFIF will conduct measurements and analyze the results in accordance with international methodologies, prepare feasibility studies with financial calculations, conduct market

research to identify the most suitable types of turbines, prepare business plans *etc.* After completion of all this work, WPMI will have a document package for each of the 5 identified locations for further wind installations designing and construction. These document packages will be open to tender to potential investors. A company offered the highest price would get the package. WPMI will then capture any developer surplus, which WPMI will use to finance further development activity. This solution is intuitive in Belarus as the ProDoc Team saw during the fact finding mission.

WPMI<sup>38</sup> must avoid setting tariff rates for individual projects as this would be counter-productive. This does not mean that the tariffs cannot be differentiated based on the size of the proposed wind farms. The WPMI is self-sustaining because it generates premiums through tenders which it can use to fund its operations. The goal is to see those premiums decrease over time. This decrease in premium is an indicator of success for the Project. This decrease will also lead to the obsolescence of the WPMI.

In addition, the financial sustainability of WPMI (that it continues to operate and is financially sustainable beyond the lifetime of this project) from providing the above mentioned services will be a key measure of the success of this project.

In addition to the above, the project will create a wind energy capacity building team that together with the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus and the Project Management Unit will implement capacity-building activities, including the dissemination of best practices for Belarus obtained in the framework of ongoing activities of WPMI.

### **Outcome 1: Secondary Legislation is in place to support wind energy with the support of the project**

**Output 1.1:** *Develop and agree provisions for institutional infrastructure based on the best European practice and policies, in particular for the State RES Cadastre, RES Inventory, and validation systems.*

*Activity 1.1.1:* Cadastre publication including all of the data that is required.

*Activity 1.1.2:* Provide Ministry of Natural Resources and Natural Protection of the Republic of Belarus with manuals from other best practices markets for the implementation of a system to track renewable energy attributes specifically for wind farms.

The system must assign each electron that has been certified as renewable with a unique tracking number. The purpose of this is to ensure that renewable electrons are not double-counted when they are traded. This is a pre-requisite for the international trading of renewable energy attributes.

*Activity 1.1.3:* Provide a timeline for the future implementation of the certification system.

The certification system will not be incorporated during the first stages of renewable energy development in Belarus. This activity is scheduled for year 4 of the project.

*Activity 1.1.4:* Provide training for the WESU on maintaining this system

*Activity 1.1.5:* Provide educational materials to market participants explaining the value of having such a system in place

**Output 1.2:** *Formulated and enforced Secondary Legislation*

*Activity 1.2.1:* Conduct conjointly with Wind Energy Support Unit Pro-forma\* economic calculations for WPMI's projects supporting proposals for tariff schemes.

- These will be detailed project specific financeable pro-formas as opposed to ones created using benchmarks
- Include country risk through debt premium and equity premium

<sup>38</sup> For a full description of WPMI see the annexes.

- Include country specific civil construction costs and delivered equipment costs

*Activity 1.2.2:* The Project conjointly with WESU will demonstrate that the suggested tariff levels are required and sufficient to incentivize the desired level of construction by benchmarking the economic calculations to European benchmarks (with the addition of appropriate premiums for country risk)

*Activity 1.2.3:* The Project conjointly with WESU will develop and present projects from WPMI to the Ministry of Economy with suggested tariff schemes.

- Discuss appropriate size for build-out over 5-year term
- Present a portfolio of projects with a single clearing tariff scheme

*Activity 1.2.4:* The Project conjointly with WESU will negotiate with private developers, including women, for the inclusion of private projects into the WPMI Project Pool.

*Activity 1.2.5:* Negotiate Investment Agreements for Project Pool with a single tariff rate for the entire Project Pool.

*Activity 1.2.6:* Cooperate with the European Union project and any other relevant projects, including representatives on Steering Committee in establishing the proposed tariff scheme.

*Activity 1.2.7:* Prepare a report for the Ministry of Economy to suggest adapting the above tariff scheme in Secondary Legislation implementing Law on RES

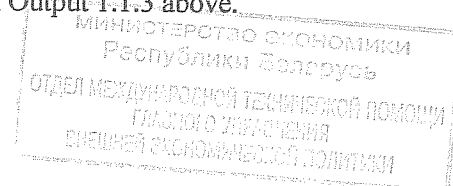
GEF support is required to provide the Ministry of the Economy with concrete projects with which to prove out the economic viability of tariffs schemes. WPMI will develop these projects. (See Output 3, below for specifics on WPMI.) The Ministry of the Economy welcomes this input as they are currently receiving input from the EU Project that may not support the viability of larger scale (>5 MW) wind energy projects. The project will present projects with various economically viable tariff schemes in the context of real wind energy projects.

*Activity 1.2.8:* The project will analyze and prepare reports on two concepts for the tariff scheme<sup>39</sup> demonstrating that the tariffs are harmonized with the best European practice.

Key Indicator for Outcome 1: Increased foreign and domestic developer activity in Belarus. Availability of market priced debt and equity for wind energy projects in Belarus.

The above methodology is consistent with the concepts that the EU Project is using. As per the fact finding mission meeting with a representative from the EU Project, “We are practicing the traditional approach of using the actual cost of implementation of renewable energy in euro cents per kilowatt hour and not tied to the cost of electricity in Belarus”. This is consistent with Output 1.1.3 above.

### ***Output 1.3: New/Improved Technical Norms and Standards***



<sup>39</sup> The tariff schemes will be based on, inter alia, the following concepts:

- 1) The current FiT scheme with the addition of a minimum tariff level set in hard currency (the original PIF scheme).
- 2) Fixed Schedule without Exchange Rate Risk
  - a) Calculating a schedule for expected energy rates in Belarus over the 20-year tariff period.
  - b) Multiplying this fixed schedule by the existing 1.3 multiplier for the first ten years and the 0.85 multiplier for years 10-20.
    - i) If the above calculations are in Euros, this would be the calculation for the tariff.
    - ii) If the above calculation is in Belarusian Roubles, the energy rate would be equal to the product of the above rate times the current Belarusian Euro exchange rate.
- 3) If the final energy rate in 2 above is not economically viable, the Project will suggest higher multipliers. In other words, the multipliers will be based on the actual cost of implementation for a wind farm in Belarus. (This is consistent with the ESMAP recommendation.)
- 4) This methodology incorporates the current Ministry of the Economy concept while eliminating commodity price risk and exchange rate risk. It is also aligned with the European Union concept of setting tariffs at levels that are sufficient to stimulate construction.

*Activity 1.3.1:* WPFI together with the project, through the activity listed below, will support the introduction of new and improved technical norms by providing the most up to date techniques for wind turbine positioning, wind farm to grid connection *inter alia*.

***Output 1.4: Creation of WPFI***

*Activity 1.4.1:* Finalizing Terms of Reference for WPFI

*Activity 1.4.2:* Finalizing Terms of Reference for staff and hiring WPFI Staff

**Outcome 2: Reduce regulatory risks for investments in wind power in Belarus to the point that at least 5 wind farms are developed, financed, and eventually constructed.**

***Output 2.1: Awareness raising program for decision makers***

*Activity 2.1.1:* The Project Steering Committee meetings will include key decision makers and will emphasize that wind energy can be viable in Belarus.

*Activity 2.1.2:* Through the activities outlined in Outcome 3, WPFI will increase investment activity from both local and foreign developers and investors which will heighten awareness amongst key decision makers.

*Activity 2.1.3:* Preparation and dissemination of promotional materials on wind energy. This will also include informational materials on possible environmental and social adverse impact.

***Output 2.2: Specialized local engineering***

*Activity 2.2.1:* The project tenders in Output 3.1 will stipulate that whenever possible, local contractors, subcontractors, and engineers must be used. However, there will be criteria stipulating a certain level of experience. This may mean that a local contractor is a sub-contractor on the first project and then becomes the general contractor after gaining the requisite experience.

For developer's, who do not have prior specialized engineering experience, this may mean that they are partnering with turbine vendor's to jointly bid on projects.

The local firm then partners or is a subcontractor on the first project(s) and when they meet the criteria for experience, they can lead projects. This is how the industry has developed in other Eastern countries like Poland where there are now local general contractors and developers.

***Output 2.3: Introduce RE related curricula at Universities***

*Activity 2.3.1:* The project tenders, wherever possible, will contain provisions for continued local support of the projects from local technical universities such as the International State Sakharov Environmental University.

***Output 2.4: Completed support for ancillary services***

***Output 2.5: Developed and published manuals***

*Activity 2.5.1:* Produce guidebook containing template guidelines for future wind energy development

*Activity 2.5.2:* The Project Management Unit will create Procedural Guidelines based on Activity 3.2 that will provide future developer's with a template. This activity will also provide future Regulator's with guidelines for empirically setting FiT levels.

*Activity 2.5.3:* Guidelines on EIA of wind power development projects will be developed. Belarusian specialists will be trained on how to conduct EIA of wind power projects.



**Outcome 3: Wind Energy Project Technical Assistance Facility is established to support the WPMI investment in and the development of documentation for at least 25 MW of wind power**

*Output 3.1: Completed support provided for potential site developments*

*Activity 3.1.1:* The PMU supports the Ministry of Natural Resources and Environmental Protection to establish WESU.

*Activity 3.1.2:* Finalize the legal form and administrative criteria of the WPMI.

*Activity 3.1.3:* Finalize the agreement between the WESU and the WPMI in the manner most conducive to operation in current conditions in Belarus. The project will engage a domestic attorney for this purpose. (see short TOR below).

*Activity 3.1.4:* Conduct a tender to select an engineering firm to form the WPMI using generally accepted international standards for such tenders. The tender will use the criteria established in the TOR in the annexes below (see also Activity 1.4.1). The selected engineering firm will be the core of the development activity.

*Activity 3.1.5:* Seek additional contributors to the funding of the WPMI in order to extend the range of WPMI capabilities.

*Activity 3.1.6:* WPMI screens all of the Cadastre sites and selects 5 target sites based on the sites that can achieve the lowest possible energy rates. The only exception to this rule is that the Wind Energy Support Unit may add a selection that has specific strategic importance for the overall success of the GEF UNDP project. This discretion rests with the project steering committee alone. For example, Belenergo may desire a project to be built contiguous to a Belenergo project.

The first part of this activity is a pre-feasibility screening of the sites/areas provided by the Cadastre. This screening would provide preliminary independent verification of the Belarus Wind Atlas that investors will need in order to proceed. This screening will screen out many of the Cadastre sites. Ideally, we will tender for one engineering firm to provide an overall support contract for all of the other activities.

*Activity 3.1.7:* As part of the pre-feasibility screening, WPMI will gain preliminary clearance from the Ministry of Defence, Ministry of Communication and Informatization and other relevant agencies for siting.

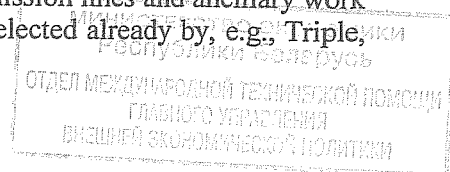
This screening is critical at this stage so that the Project does not mismanage its funding by pursuing projects with fatal flaws.<sup>40</sup> This screening criteria will also screen out several sites. Final clearance can only be obtained after WPMI has the site layout and turbine selections.

*Activity 3.1.8:* WPMI together with WESU will also seek to work through the established procedures with the Ministry of Defense to seek appropriate mitigation for the risks related to obtaining clearance from the Ministry of Defense (e.g. the Dzerzhynsk site linked with the past Enertrag activities). This may include using WPMI to pay for experienced consultants in this field. The activity will also include formulation of guidelines for the specific project as well as guidelines for future applications.

*Activity 3.1.9:* Final selection of 5 sites for development and collection of onsite wind data.

Obtain relevant clearances and permits at the municipal and/or national level for the construction. WPMI would choose between two and six sites to begin the collection of wind data. At this stage, WPMI would also screen the projects, on a preliminary basis, for the cost to build transmission lines and ancillary work to connect to the Belenergo grid. WPMI would also re-examine the sites selected already by, e.g., Triple, Enertrag and others.

*Activity 3.1.10:* Transmission review of selected sites.



<sup>40</sup> There are two examples of firms who did not take this additional step (Enertrag and Corvusolar) only to find that the sites they had selected were not viable for wind installation location due to issues with military and civilian radar.

Providing independent verification of the Belenergo work and possibly assisting in cases where it is necessary to negotiate with Belenergo. This work will include review of the engineering for the project's internal transmission line and ancillary services

*Activity 3.1.11:* Securing permission for up to 5 sites of 1 ha and erect meteorological towers of 98 m in height.

*Activity 3.1.12:* WPMI would begin the permitting, Power Purchase Agreement, and grid connection processes with the relevant agencies.

WPMI would seek to finalize the costs for any transmission upgrades in order to establish that there will not be any punitive charges. WPMI will screen out projects that have punitive charges that undermine the economics of the project to the point where the project is not profitable.

*Activity 3.1.13:* Working with WPMI on a preliminary site layout that includes flexibility on turbine choice.

The preliminary site layout can be obtained after collecting 3 to 6 months of data. Once WPMI has a preliminary plan it can approach the local authorities with regards to securing rights to the land.

*Activity 3.1.14:* Environmental report for Investors.

Investors, IFI's and NGO participants will require an independent verification of the environmental impact assessment for the site.

*Activity 3.1.15:* The Project conjointly with Wind Energy Support Unit performs Pro Forma analysis on the selected projects and calculates the minimum tariff required to support the financing and construction of all of the selected projects including those from private developers.

*Activity 3.1.16:* The Project conjointly with Wind Energy Support Unit negotiates draft Investment Agreement with the Ministry of Economy using the tariff calculated in 3.1.15 above and co-ordinates with other relevant ministries.

The suggested tariff for the Investment Agreement should reflect energy rates that can sustain a project in the absence of concessionary finance including grants. In other words, the energy tariff should be one that reflects a market mechanism rather than a subsidized project which can survive with a lower energy tariff. The tariff needs to be negotiated in close partnership with the engineering firms.

*Activity 3.1.17:* After collecting one year of wind data, WPMI will provide a financeable report that combines the on-site data with the existing long-term data (suitable for bank debt financing).

This will provide a meaningful long-term view of the wind resource. The engineer will be able to adjust the on-site data upwards or downwards based on whether or not the year of on-site data is representative of long-term wind speeds. This report will be included in the tender documents (This report released only with a non-disclosure agreement).

*Activity 3.1.18:* Preparation of Information Memorandum

The Project, Wind Energy Support Unit and the WPMI prepare the memorandum including all pertinent information for potential developers/investors. The pro-formas will be based on market information. This information will include current market pricing for turbines and for the civil construction of the projects with the assistance of WPMI.

*Activity 3.1.19:* Consultant for tender of "Construction Ready" projects

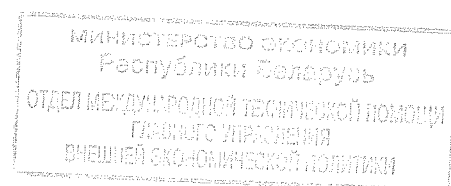
WPMI's TOR will include criteria for a consultant specializing in the tender of wind farm assets to tender the Pre-Investment Assets. The tenders will be established in order to promote local participation whenever possible.

*Activity 3.1.20:* The Project, WPMI and the Wind Energy Support Unit will tender the Pre-Investment Assets to investors.

If the assets are structured properly there will be a payment of an upfront premium from the investor to the fund for the acquisition of the assets rights. In this way, the fund will be self-sustaining in the near to medium term. In a very concrete way, the upfront fees from the investors, if any, allow the government of Belarus to maintain a level playing field between renewable energy projects

WPMI will include the capability to provide the following services for the above development: i) independent engineer for wind verification; ii) Environmental work including radar clearance from appropriate ministries (Ministry of Defense and the Ministry of Communications) and local permitting; iii) Transmission; iv) Independent Engineer for Financeable<sup>41</sup> wind forecast; v) Legal for negotiations on the Investment Agreements. WPMI will either pursue a single tender for all services (except legal) or separate each out individually. There are pros and cons to each approach. A single tender would push firms to cooperate to form teams as few firms offer all of the services. The bidding firm would then be more aligned with the projects. The negative is that the winning bid may not have the best or least expensive in each category.

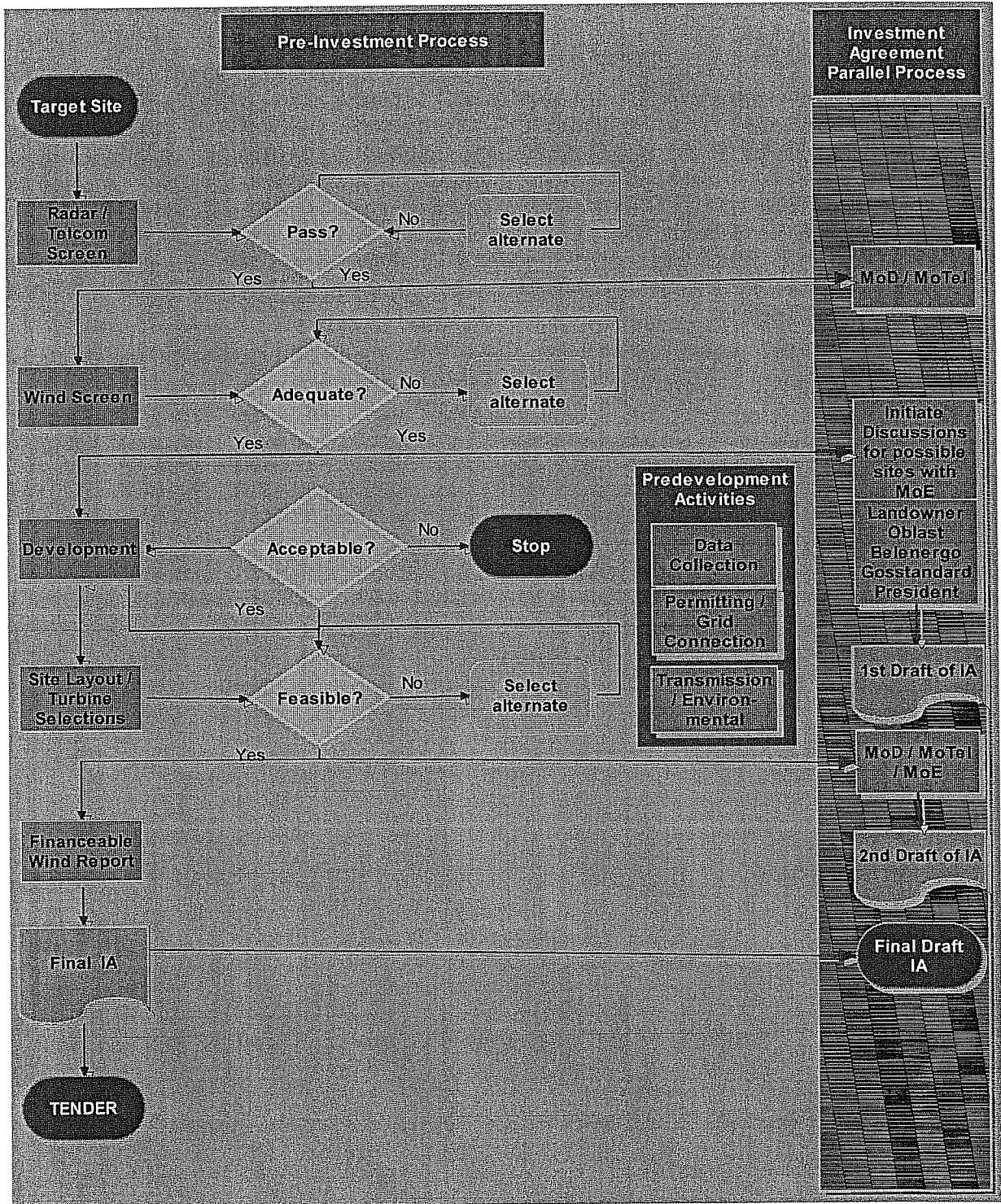
The following page provides a preliminary flow chart for the Pre-Investment and the Investment Agreement processes. The first steps show that this is an iterative process.



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<sup>41</sup> The definition of Financeable Wind Report is proven experience, within the past 3-years, that a major first tier bank has relied solely upon the wind report to base their credit decisions for the provision of debt to a wind farm. First tier is intended to exclude banks in struggling countries like Spain, Portugal, Greece, and other under-performing banks.

Figure 8:



**Output 3.2:** Identify and evaluate available public and private debt and equity financing for above site developments

**Activity 3.2.1:** Regular discussions and outreach with potential foreign and domestic developers and investors.

WPMI will not work in a vacuum. This will help WPMI to focus the above work in 3.1 in order to better satisfy the needs of equity capital. WPMI activity in Output 3.1 is designed to reduce project, country, and regulatory risk for the projects thus making investing in Belarus wind energy more attractive on a risk adjusted basis.

*Activity 3.2.2:* The Project together with WPMI and WESU will work with International Financial Institutions to identify and evaluate debt solutions.

*Activity 3.2.3:* The Project together with WPMI and WESU will provide term sheets for debt, as part of the Tenders, for the above projects based on international market terms and conditions.

*Activity 3.2.4:* The Project together with WPMI and WESU will prepare term sheets for debt for projects that are currently being developed by developers such as Triple and Ecotech based on international market terms and conditions.

*Output 3.3: Completed support for the preparation of development work on the targeted sites*

*Activity 3.3.1:* Completing the investment justification stage and preparation of pre-feasibility studies for construction and commissioning of wind energy plants in excess of 25 MW

**Outcome 4: At least 5 wind farm projects are successfully developed and the Wind Energy Support Unit continues to operate past the lifetime of the project**

*Output 4.1: Validation of data in existing Wind Atlas of Belarus*

*Activity 4.1.1:* Site specific wind studies for at least (5) project sites will be used to validate the existing Wind Atlas of Belarus. The Project Management Unit will use the onsite wind data from projects supported by WPMI to provide validation of the Wind Atlas in a manner that will preserve the confidentiality of the actual onsite wind data. This validation will not be complete, but will rather be dictated by the location and quality of the wind data collected. For example, data from one site may be used to validate a region within 25 – 50 km diameter from the onsite meteorological tower locations.

*Outcome 4.2: Completed Web portal for the project*

*Activity 4.2.1:* Develop a project site/portal.

*Activity 4.2.2:* The Project will support the MNRE in validation and actualization of the Wind Atlas of Belarus and will place the validated version on the Project's web portal.

*Activity 4.2.3:* Publish all relevant documentation on the web portal including project tender documents and information memorandums.

*Activity 4.2.4:* Development of the brochures explaining the value proposition of wind energy. These brochures will also be available on the web portal.

*Outcome 4.3: Completed site study visits as part of project due diligence process.*

*Outcome 4.4: Developed, reviewed, revised, finalized and published Lessons Learned study*

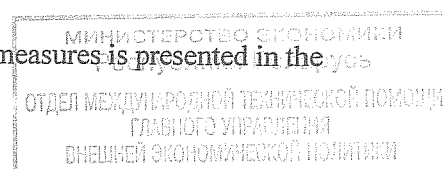
*Activity 4.4.1:* After 24-months, the Project will hire an international consultant to perform an intermediate review.

## **2.2. Project Risks**

A summary of the main risks identified, along with the proposed mitigation measures is presented in the risk log below in section 7.11.

## **2.3. Expected Global and National Benefits**

On a global level, the project will lead to a direct reduction of GHG from the projects commissioned as a result of the project. The project will directly save 1,515 ktCO<sub>2</sub>-eq



And indirectly save 19,395 ktCO<sub>2</sub>-eq (See Annex 7.6 below).

The direct GHG reduction benefits of the Project have been estimated at 9,697 ktCO<sub>2</sub>-eq over the 25 year lifespan of the 25 MW of commissioned projects.

The main national and local benefits are expected to be:

- Creation of a sustainable wind energy industry
- Provision of energy that is independent of imports providing diversification
- General socio-economic benefits in the rural communities where the wind farms are sited through employment opportunities and property taxes.

#### **2.4. Project Rationale and GEF policy conformity**

Within the GEF focal area of climate change (CC), the project supports the objectives of Strategic Priority #3 on “Promote investment in renewable energy technologies”. The project aims to support removal of barriers to the adoption of wind energy in Belarus. The project stresses the importance of developing sound policies and regulatory frameworks and creating market mechanisms that support to investments in grid-connected wind energy. The project aims to create conditions for long-term and sustainable wind power development that is an environmental priority and to enable the development of a commercially viable wind energy industry in the Republic of Belarus.

The project is also consistent with the GEF gender policy which specifies that gender equality and equity are important factors taken into consideration during funding of projects on global environmental issues as soon as relationships, roles and responsibilities of men and women have a significant impact on the extent of their access to and control over natural resources, goods and services provided by projects<sup>42</sup>. The GEF gender policy defines the minimum requirements for organizations responsible for the implementation of its projects, at the same time stating that the possibilities for promoting the rights and opportunities for men and women in GEF projects may vary depending on thematic areas of projects.

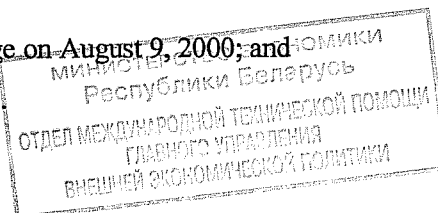
Implementation of this project is in accord with the UNDP Gender Equality Strategy 2014-2017, which in particular reads: ‘UNDP will support governments to ensure that women can access affordable, clean energy and will support capacity building of women to participate in the development of policy and institutional frameworks. This will include supporting training and the establishment of incentive mechanisms to enable women to become energy entrepreneurs and to participate in public-private partnerships’.<sup>43</sup>

#### **2.5. Country Ownership, country eligibility and country drivenness**

As Belarus is highly dependent on imports of Russian natural gas for over 80% of its energy needs, renewable energy provides them with an important diversification. For this reason, there is a presidential edict titled: The Concept of Energy Security of the Republic of Belarus which was signed in September of 2007. This Concept directly states that increasing non-traditional renewable sources of energy is a key strategic goal for Belarus

According to the Instrument for the Establishment of the Restructured Global Environment Facility, Belarus qualifies for GEF financing on the following grounds:

- It has ratified the UN Framework Convention on Climate Change on August 9, 2000; and
- It receives development assistance from UNDP’s core resources.



<sup>42</sup> GEF Gender Policy, p.1

[http://www.thegef.org/gef/sites/thegef.org/files/documents/document/PL.SD\\_02.Policy\\_on\\_Gender\\_Mainstreaming.05012012.Final\\_.pdf](http://www.thegef.org/gef/sites/thegef.org/files/documents/document/PL.SD_02.Policy_on_Gender_Mainstreaming.05012012.Final_.pdf)

<sup>43</sup> UNDP Gender Equality Strategy (2014-2017), p.14

Belarus enacted its Law on RES in December 2012. Environmental protection aspects of activities in the field of renewable energy are controlled by the Ministry of Natural Resources and Environmental Protection of Belarus, which is also responsible for the potential sites determination package and for conducting of a registry of such sites. MNRE defines the procedure for winds monitoring and linkage of meteorological stations data with the selected sites for wind installations location; informs the local authorities about identified sites for potential renewable energy installations locations; issues conformation certificates for energy source; takes part in the development of state programmes and, within the ministry's competences, agrees line and regional programmes. Ministries and agencies are actively working with developers to assist in the construction of wind energy plants.

Responsible for current and future climate change entire policy framework, some elements of the RES development policy and its implementation. In particular, the Ministry organize and coordinate the operation of the national environmental monitoring system, including monitoring of winds, identify and record spots for possible placement of wind energy installations, inform local authorities about these spots.

## *2.6. Financial Modality and cost effectiveness*

The GEF support will primarily consist of grants that will be distributed by the WPMI to finance development services. The GEF funding of \$3.045 million will be complemented by the direct co-financing of \$40.9 million. In addition to the Co-Financing, the WPMI will leverage GEF's funding. Each \$1 of GEF funding can lead to over \$20 of private investment after the sale of the development assets and their subsequent construction and commissioning.

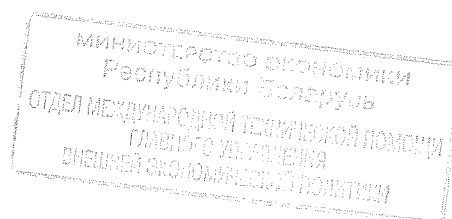
## *2.7. Sustainability*

The Project is self-sustainable over the medium term if the FiT is set at a level that is sufficient to incentivize the desired construction, the early projects that are developed by the WPMI will be sold at a premium. These premiums will then be used to develop additional projects. At a certain point, the newer projects, on the less desirable sites, will not generate premiums in the medium to long term. At this point, the Project will have achieved its objective since the wind energy industry in Belarus will be self-sustainable at that point in time.

The sustainability of the WPMI is secured over the medium term by the above premiums. The wind energy industry will be sustainable, based on the efforts and progress of the WESU, over the long term as wind energy will become a viable industry. Moreover the Government has stated that they would support WESU if there were enough projects being developed. The base case for this GEF program is that we will create an adequate pipeline of projects to support such an effort.

## *2.8. Replicability*

Replication potential is substantial as this methodology can be used in any country where there is not yet a financeable Feed-in-Tariff. The goal of the project is to reduce the barriers to wind power development. The project is achieving this goal by creating a template for attracting investment capital to Belarus for the construction of wind energy plants. After the project is finalized, this template will be firmly in place. WPMI will no longer be needed, and the Capacity Building Group should have the requisite number of ongoing projects to merit an ongoing initiative on behalf of the Ministry of the Environment.



### 3. PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: 3.1: Country's capacity to mitigate and adapt to the climate change strengthened

Country Programme Outcome Indicators: Enabling environment and status of implementation of national and international environmental commitments

Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 1. Mainstreaming environment and energy OR

2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.

Applicable GEF Strategic Objective and Program: GEF Strategic Objective 4: Increased production of renewable energy in electricity grids

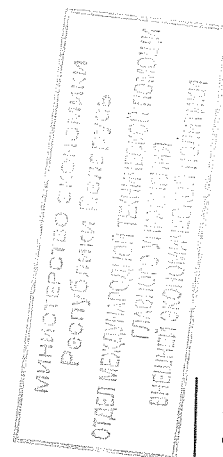
Applicable GEF Expected Outcomes:

Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
<p><b>Project Objective</b> Removing Barriers to Wind Power Development in Belarus and the installation of over 25 MW of nameplate generating capacity with a minimum of 5 MW per project and the generation of &gt;1 million MWh of renewable energy and achieving direct greenhouse gas emission reductions totaling &gt;500,000 tonnes of CO<sub>2</sub> equivalent</p>	<p>Zero; &lt;5 MW</p>	<p>10 active debt and equity investors; 25 MW with a minimum of 5 MW per project</p>	<p>Project monitoring system</p>	<p>– Feasibility studies prove cost-effectiveness of wind energy technologies in Belarus context – Required investments are forthcoming</p>
<p><b>Outcome 1:</b> Secondary Legislation is in place to support wind energy with the support of the project</p>	<p>RE Law</p>	<p>Enabling legislation in place with the assistance of GEF project.</p>	<p>Rules and Edicts of Government of Belarus</p>	<p>One key assumption is that the government desires a viable FIT. Government may continue its two pronged approach. On the one hand there is an unfinanceable FIT, on the other there are one-off agreements with developers.</p>

Республика Беларусь  
ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
НАШОУ-УПРАВЕЛЕННЯ  
РАДУМНЫ АЭКОНАМІЧЭСКАЙ ПОЛІТЫКІ



Rules and procedures for grid connection.	RE Law	Secondary legislation and regulations and procedures for grid connection and financing grid connection with the assistance of the GEF project. <sup>44</sup>	Central Energy Agency (currently Belenergo but will include a Transmission entity)	Rules for grid connection may contain indirect barriers for wind energy development if they are not crafted properly.
<b>Outcome 2:</b> Increased confidence in the profitability of wind power projects in Belarus	Zero	Completion of 5 wind farms providing a clear FIT, guidelines and confidence for future development. Comprehensive manual	Project monitoring system Project web portal	There is a risk that the government does not provide the projects with a financeable FIT. There is the risk that the projects run into other unknown risks
<b>Outcome 3:</b> An Investment Grant is made by the GEF project which funds the WPFI	Zero	Adequacy of funding for the WPFI and the PMU	Project web portal	GEF funding is not available for an adequate amount or period of time (i.e. until after the first tender and sale)
Selection of an outside consultant capable of performing the development work	Zero	At least 1	Project web portal	The project is looking for firms capable of performing multi-functional work and may not find a single suitable consultant.
Installation of at least five meteorological towers are installed and data is collected for at least one year.	1	6	Hydrometeorology group reports	The project must obtain the rights to install the meteorological towers on the desired locations.
The WPFI, a private entity, obtains permits and Investment Agreements for at least 5 projects	0	5 or >	Ministry of Natural Resources and Environmental Protection	The project may fail to acquire permits or to negotiate Investment Agreements that are acceptable to developers and or investors.
The WPFI, a private entity, successfully tenders at least 5 projects and finds acceptable level of investor interest	0	5 or >	Project monitoring system	The project's consultants will negotiate tariffs that are in line with the assumption of the required investor returns. The tariff rates negotiated in the Investment Agreements may be too low to attract investor interest.



<sup>44</sup> It is clear that it is not tenable for Belenergo to pay for the grid connection out of Belenergo's finances. Belarus needs a mechanism for financing these expenses.

<p><b>Outcome 4:</b> At least (5) wind farm projects are successfully developed and the WPF1 continues to operate past the lifetime of the project</p>	<p>WPF1, a private entity, develops 5 wind farms which developers purchase and proceed to construction.</p>	<p>&lt;5 MW</p>	<p>25 MW with a minimum of 5 MW per project</p>	<p>Project web portal</p> <p>See the above risks.</p>
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TABLE 17: TOTAL BUDGET AND WORKPLAN

<b>Award ID:</b>	00061612	Project ID(s):	00078116
<b>Award Title:</b>	Belarus PIMS 4462 Removing Barriers to Wind Power Development in Belarus		
<b>Business Unit:</b>	BLR10		
<b>Project Title:</b>	Belarus PIMS 4462 Removing Barriers to Wind Power Development in Belarus		
<b>PIMS no.</b>	4462		
<b>Implementing Partner (Executing Entity)</b>	Ministry of Natural Resources and Environmental Protection		

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc. as per CO price list)	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
Outcome 1.1	UNDP	62000	GEF										
				71200	International Consultants	consultant	20 000	0	0	0	0	20 000	1
				71300	Local Consultants	consultant	16 800	0	0	0	0	16 800	2
				71600	Travel local	travel	5 600	5 600	5 600	2 250	2 250	21 300	3
				71600	Travel international	travel	13 000	6 500	6 500	6 500	6 500	39 000	4
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	12 000	12 000	6 000	6 000	6 000	42 000	5

МИНИСТЕРСТВО ПРИРОДНЫХ РЕСУРСОВ И ЭКОЛОГИИ  
 РЕСПУБЛИКИ БЕЛАРУСЬ  
 ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
 ПЛАНОВОГО УПРАВЛЕНИЯ  
 ВНЕШНЕЙ ЭКОНОМИЧЕСКОЙ ПОЛИТИКИ

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc., as per CO price list))	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
Outcome 1.2	UNDP	4000	UNDP		Subtotal Outcome 1.1 GEF		67 400	24 100	18 100	14 750	14 750	139 100	
				71200	International Consultants	consultant	10 000	10 000	0	0	0	20 000	6
				71300	Local Consultants	consultant	6 000	3 600	0	0	0	9 600	7
				71600	Travel local	travel	960	2 600	2 600	2 600	2 600	11 360	8
Outcome 1.3	UNDP	62000	GEF		Subtotal Outcome 1.2 UNDP		16 960	16 200	2 600	2 600	2 600	40 960	
				71200	International Consultants	consultant	10 000	0	0	0	0	10 000	9
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	0	10 000	10 000	10 000	10 000	40 000	10
				74200	Audio Visual & Print Prod Costs	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	192	192	192	192	192	960	11
				71300	Local Consultants	consultant	4 800	0	0	0	0	4 800	12
		4000	UNDP		Subtotal Outcome 1.3 GEF		14992	10192	10192	10192	10192	55 760	
	МИНИСТЕРСТВО ЭКОНОМИКИ Республики Беларусь СЛУЖБА МЕХАНИЗМОВ ТЕХНИЧЕСКОЙ ПОМОЩИ ГЛАВНОМУ УПРАВЛЕНИЮ ВНЕШНЕЭКОНОМИЧЕСКОЙ ПОЛИТИКИ			74200	Audio Visual & Print Prod Costs	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	608	608	608	608	608	3040	13

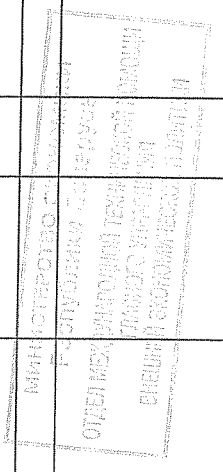
GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc., as per CO price list)	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
					Subtotal Outcome 1.3 UNDP		608	608	608	608	608	3040	
					Total Outcome 1.3 (GEF&UNDP)		15600	10800	10800	10800	10800	58800	
Outcome 1.4	UNDP	62000	GEF										
				71300	Local Consultants	consultant	7200	0	0	0	0	7200	14
					Subtotal Outcome 1.4 GEF		7200	0	0	0	0	7200	
Total Outcome 1 GEF							89592	34292	28292	24942	24942	202060	
Total Outcome 1 UNDP							17568	16808	3208	3208	3208	44000	
Total Outcome 1							107160	51100	31500	28150	28150	246060	
Outcome 2.1	UNDP	62000	GEF										
				71200	International Consultants	consultant	0	20000	0	0	0	20000	15
				71300	Local Consultants	consultant	6000	6000	0	0	0	12000	16
				71600	Travel local	travel	2600	2600	2600	2600	1800	12200	17
				71600	Travel international	travel	18000	18000	0	0	0	36000	18
					Subtotal Outcome 2.1 GEF		26600	46600	2600	2600	1800	80200	
Outcome 2.2	UNDP	62000	GEF										
				71300	Local Consultants	consultant	4800	0	0	0	0	4800	19
				71600	Travel local	travel	2600	0	0	0	0	2600	20
					Subtotal Outcome 2.2 GEF		7400	0	0	0	0	7400	
Outcome 2.3	UNDP	62000	GEF										
				71200	International Consultants	consultant	0	20000	0	0	0	20000	21
				71300	Local Consultants	consultant	7200	7200	0	0	0	14400	22
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150000)	6000	6000	0	0	0	12000	23

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name)	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Years (USD)	Total (USD)	Budget notes (see below)
Outcome 2.4	UNDP	62000	GEF		Subtotal Outcome 2.3 GEF		13 200	33 200	0	0	0	46 400	
				71500	Local Consultants	consultant	0	7 200	0	0	0	7 200	24
				71600	Travel Local	travel	0	1 600	0	0	0	1 600	25
				72100	Contractual Services - Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	6 000	6 000	0	0	0	12 000	26
Outcome 2.5	UNDP	62000	GEF		Subtotal Outcome 2.4 GEF		6 000	14 800	0	0	0	20 800	
				71200	International Consultants	consultant	0	20 000	0	0	0	20 000	27
				71300	Local Consultants	consultant	7 200	9 600	0	0	0	16 800	28
				71600	Travel Local	travel	1 300	1 300	0	0	0	2 600	29
				71600	Travel International	travel	18 000	18 000	0	0	0	36 000	30
				72100	Contractual Services - Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	6 000	12 000	0	0	0	18 000	31
Total Outcome 2 GEF					Subtotal Outcome 2.5 GEF		32 500	60 900	0	0	0	93 400	
Total Outcome 2/UNDP							85 700	155 500	2 600	2 600	1 800	248 200	
Total Outcome 2							0	0	0	0	0	0	
Outcome 3.1	UNDP	62000	GEF				85 700	155 500	2 600	2 600	1 800	248 200	
				71200	International Consultants	consultant	0	90 000	70 000	0	0	160 000	32
				71300	Local Consultants	consultant	0	20 400	27 600	12 000	0	60 000	33

МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА  
РЕСПУБЛИКИ БЕЛАРУШЬ  
ОТДЕЛ МЕДИЦИНСКОГО ОБСЛУЖИВАНИЯ  
И ПИТАНИЯ  
УПРАВЛЕНИЕ  
БЕЛОРУССКО-КАНАДСКОЕ ПАРТНЕРСТВО

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate Unit name (travel, tender, consultant, etc. \$ per CO price tag))	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Years (USD)	Total (USD)	Budget notes (see below)
				71400	Contractual Services - Indiv	quantity of personnel and duration of contract	11 000	18 700	18 700	18 700	18 700	85 800	34
				71600	Travel local	travel	2 600	5 200	5 200	5 200	5 200	23 400	35
				71600	Travel international	travel	9 000	9 000	9 000	9 000	9 000	45 000	36
				72200	Equipment and Furniture	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	250 000	0	0	0	0	250 000	37
				72300	IT Equipment		4 000	0	0	0	0	4 000	38
				72400	Communication & Audio Visual Equip		1 200	0	0	0	0	1 200	39
				76400	Equipment Services		500	500	500	500	500	2 500	40
				72500	Supplies		350	350	350	350	350	1 750	41
				76100	Contractual Services - Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	60 000	340 000	340 000	85 000	170 000	995 000	42
МИНИСТЕРСТВО ЭКОНОМИКИ Республики Беларусь ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ ГЛАВНОГО УПРАВЛЕНИЯ ВНЕШНЕЙ ЭКОНОМИЧЕСКИХ ПОЛИТИКИ					Subtotal Outcome 31 GEF		338 650	484 150	471 350	180 750	203 750	1 628 650	
Outcome 3.2	UNDP	62000	GEF										
				71200	International Consultants	consultant	0	0	50 000	40 000	0	90 000	43
				71400	Local Consultants	consultant	0	0	20 400	14 350	0	34 750	44
				71400	Contractual Services - Indiv	quantity of personnel and duration of contract	12 100	18 700	18 700	18 700	18 700	86 900	45
				71600	Travel local	travel	1 300	1 300	1 300	1 300	1 300	6 500	46
				71600	Travel international	travel	9 000	9 000	9 000	9 000	9 000	45 000	47

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc., as per CO price list))	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
		4000	UNDP		Subtotal Outcome 3.2 GEF		22 400	29 000	99 400	83 350	29 000	263 150	
				74200	Audio Visual & Print Prod Costs	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	800	800	800	800	800	4 000	48
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	12 000	12 000	12 000	10 850	0	46 850	49
					Subtotal Outcome 3.2 UNDP		12 800	12 800	12 800	11 650	800	50 850	
					Total Outcome 3.2 (GEF&UNDP)		35 200	41 800	112 200	95 000	29 800	314 000	
Outcome 3.3	UNDP	62000	GEF										
				71300	Local Consultants	consultant	0	0	10 800	10 800	0	21 600	50
				71400	Contractual Services - individual	quantity of personnel and duration of contract	12 100	19 800	19 800	19 800	19 800	91 300	51
				71600	Travel local	travel	2 600	5 200	5 200	5 200	5 200	23 400	52
				71600	Travel international	travel	9 000	9 000	9 000	9 000	9 000	45 000	53
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	0	0	10 000	10 000	10 000	30 000	54
					Subtotal Outcome 3.3 GEF		23 700	34 000	54 800	54 800	44 000	217 300	
Total Outcome 3 GEF							384 750	547 150	625 550	268 900	276 750	2 703 700	



GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc., as per CO price list))	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
Total Outcome 3 UNDP							12 800	12 800	12 800	11 650	800	50 850	
Total Outcome 3							397 550	559 950	638 350	280 550	277 550	2 153 950	
Outcome 4.1	UNDP	62000	GEF										
				71200	International Consultants	consultant	0	20 000	0	0	0	20 000	55
				71300	Local Consultants	consultant	6 000	10 800	7 200	6 000	6 000	36 000	56
				71600	Travel local	travel	2 600	5 200	5 200	5 200	5 200	23 400	57
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	0	0	15 000	15 000	15 000	45 000	58
					Subtotal Outcome 4.1 GEF		8 600	36 000	27 400	26 200	26 200	124 400	
Outcome 4.2	UNDP	62000	GEF										
				71300	Local Consultants	consultant	3 600	10 800	10 800	7 200	3 600	36 000	59
				72100	Contractual Services-Companies	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	15 000	10 000	0	0	0	25 000	60
					Subtotal Outcome 4.2 GEF		18 600	20 800	10 800	7 200	3 600	61 000	
Outcome 4.3	UNDP	62000	GEF										
				71300	Local Consultants	consultant	0	0	0	4 800	4 800	9 600	61
				71600	Travel local	travel	2 600	5 200	5 200	5 200	5 200	23 400	62
				71600	Travel international	travel						0	63
					Subtotal Outcome 4.3 GEF		2 600	5 200	5 200	10 000	10 000	33 000	
Outcome 4.4	UNDP	62000	GEF										
				71200	International Consultants	consultant	0	0	30 000	0	60 000	90 000	64
				71300	Local Consultants	consultant	0	0	7 200	6 000	22 800	36 000	65



GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc., as per CO price list))	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
				71600	Travel/Local	travel	0	0	1 300	0	940	2 240	66
		4000	UNDP		Subtotal Outcome 4.4 GEF		0	0	38 500	6 000	83 740	128 240	
				74200	Audio Visual & Print Prod Costs	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)			800	0	800	1 600	67
				75700	Training, Workshops and Confer	training	0	0	6 000	0	6 000	12 000	68
					Subtotal Outcome 4.4 UNDP		0	0	6 800	0	6 800	13 600	
					Total Outcome 4.4 (GEF&UNDP)		0	0	45 300	6 000	90 540	141 840	
Total Outcome 4 GEF							29 800	62 000	81 900	49 400	123 540	346 640	
Total Outcome 4 UNDP							0	0	6 800	0	6 800	13 600	
Total Outcome 4							29 800	62 000	88 700	49 400	130 340	360 240	
Project Mngmt.	UNDP	62000	GEF				18 734	17 871	18 003	20 039	19 903	94 550	69
				71400	Contractual Services - Individ	quantity of personnel and duration of contract							
				72200	Equipment and Furniture	Micro-purchasing, tenders, CAPs (over USD 50000), ACPs (over USD 150 000)	2 500	0	0	0	0	2 500	70
				72800	IT Equipment		4 000	0	0	0	0	4 000	71

МИНИСТЕРСТВО ЭКОНОМИКИ  
 РЕСПУБЛИКИ БЕЛАРУСЬ  
 ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ СОПРОВОЖДАЮЩЕЙ  
 ПРОГРАММЫ  
 ВНЕШНЕЙ ЭКОНОМИЧЕСКОЙ СОТРУДНИЧЕСТВА

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budget Account Code	Atlas Budget Description	Unit Of Measure (please indicate unit name (travel, tender, consultant, etc., as per CO price list))	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget notes (see below)
				72400	Communic&Audio Visual Equip		1 200	0	0	0	0	1 200	72
				73400	Equipment services		250	250	250	250	250	1 250	73
				72500	Supplies		200	200	200	200	200	1 000	74
				73100	Utilities		1 500	1 500	1 500	1 500	1 500	7 500	75
				74599	UNDP Cost Recovery Charges-Bills		7 006	7 869	7 737	4 561	5 827	33 000	76
					<b>Subtotal Proj. Mgmt. GEF</b>		<b>35 390</b>	<b>27 690</b>	<b>27 690</b>	<b>26 550</b>	<b>27 680</b>	<b>145 000</b>	
		4000	UNDP										
				70400	Contractual Services - Individ	quantity of personnel and duration of contract	38 566	39 329	39 197	37 171	37 287	191 550	77
					<b>Subtotal Proj. Mgmt. UNDP</b>		<b>38 566</b>	<b>39 329</b>	<b>39 197</b>	<b>37 171</b>	<b>37 287</b>	<b>191 550</b>	
					<b>Total Project management (GEF&amp;UNDP)</b>		<b>73 956</b>	<b>67 019</b>	<b>66 887</b>	<b>63 721</b>	<b>64 967</b>	<b>336 550</b>	
							<b>625 232</b>	<b>826 632</b>	<b>766 032</b>	<b>372 392</b>	<b>454 712</b>	<b>3 045 000</b>	
							<b>68 934</b>	<b>68 937</b>	<b>62 005</b>	<b>52 029</b>	<b>48 095</b>	<b>300 000</b>	
							<b>692 166</b>	<b>895 569</b>	<b>828 037</b>	<b>424 421</b>	<b>502 807</b>	<b>6 345 000</b>	
<b>TOTAL GEF</b>													
<b>TOTAL UNDP</b>													
<b>GRAND TOTAL</b>													

МИНИСТЕРСТВО ЭКОНОМИКИ  
Республики Беларусь  
ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
ГЛАВНОГО УПРАВЛЕНИЯ  
ПО ВОПРОСАМ ПОЛИТИКИ

**Budget Notes:**

- 1 International consultant: RES Policy Specialist – 6 weeks @ 5000 USD/week
- 2 Local consultants: (i) Legal Specialist – 8 weeks @ 600 USD/week; (ii) Database Expert (RES Cadastre and Inventory System) – 20 weeks @ 600 USD/week
- 3 19 local trips: 228 person-days (inception stage study, visits of RES Cadastre data acquisition/processing sites)
- 4 6 international trips: 36 person-days (study visits by WESU staff members)
- 5 Project Inception Workshop and 6 seminars on RES tracking policy and instruments, legal provisions for RES Cadastre and presentation/discussion of education issues: venue room/hall rent, equipment rent, catering and other meeting costs
- 6 International consultant: Economy and Tariff Policy Specialist – 4 weeks @ 5000 USD/week
- 7 2 Local consultants: (i) Legal Specialist – 4 weeks @ 600 USD/week; (ii) Economy and Tariff Policy Specialist – 12 weeks @ 600 USD/week
- 8 9 local trips: 78 person-days (meetings with developers and negotiations of investment agreements)

9	International consultant: Specialist on RES Standards and Technical Norms – 2 weeks @ 5000 USD/week
10	4 Annual International Conference on RES technical norms and standards, wind farm positioning, best development practices, etc.: venue room/hall rent, equipment rent, catering and other meeting costs covered by GEF
11	Contribution to design and printing of information materials for stakeholders and general public: DVDs, printed reports, and other awareness raising materials
12	Local consultant: Specialist on RES Standards and Technical Norms – 8 weeks @ 600 USD/week
13	Contribution to design and printing of information materials for stakeholders and general public: DVDs, printed reports, and other awareness raising materials covered by UNDP
14	Local consultant: Legal Specialist – 12 weeks @ 600 USD/week
15	International consultant: Wind Farm Engineering Specialist – 4 weeks @ 5000 USD/week
16	2 Local consultants: (i) Wind Farm Engineering Specialist – 12 weeks @ 600/week; (ii) PR Specialist – 8 weeks @ 600 USD/week
17	Local travelling expenses for implementation of the outcome 2.1
18	International travelling for implementation of the outcome 2.1
19	Local consultant: Procurement Specialist – 8 weeks @ 600 USD/week
20	Local travelling expenses for implementation of the outcome 2.2
21	International consultant: Wind Farm Engineering Specialist – 4 weeks @ 5000 USD/week
22	2 Local consultants: (i) Wind Farm Engineering Specialist – 16 weeks @ 600/week; (ii) PR Specialist – 8 weeks @ 600 USD/week
23	Contractual services for organizing of 2 workshops on introduction RE related curricula at the universities of Belarus
24	2 Local consultants: (i) Wind Farm Engineering Specialist – 8 weeks @ 600/week; (ii) PR Specialist – 4 weeks @ 600 USD/week
25	Travel expenses for the local consultant for implementation of the Outcome 2.4
26	Organizing of two workshops on provision of ancillary services
27	International consultant: Wind Farm Engineering Specialist – 4 weeks @ 5000 USD/week
28	2 Local consultants: (i) Wind Farm Engineering Specialist – 20 weeks @ 600/week; (ii) PR Specialist – 8 weeks @ 600 USD/week
29	Local travelling expenses for implementation of the outcome 2.5
30	International travelling for implementation of the outcome 2.5
31	Contractual services for organizing of two workshops and international conference addressing specific approaches to development of wind energy projects
32	2 International consultants: (i) Wind Farm Engineering Specialist – 18 weeks @ 5000 USD/week; (ii) RES Policy Specialist – 14 weeks @ 5000 USD/week
33	5 Local consultants: (i) Wind Farm Engineering Specialist – 28 weeks @ 600 USD/week; (ii) Tender Logistics Specialist – 12 week @ 600 USD/week; (iii) Economy and Tariff Policy Specialist – 20 weeks @ 600 USD/week; (iv) Legal Adviser – 20 weeks @ 600 USD/week; (v) Environmental Impact Assessment Specialist – 20 weeks @ 600 USD/week
34	2 Local Consultants under Service Contract: (i) WPMI Director – 78 weeks @ 600 USD/week; (ii) WPMI Senior Specialist – 78 weeks @ 500 USD/week
35	Local travelling expenses for implementation of the outcome 3.1
36	International travelling for implementation of the outcome 3.1
37	Equipment for development of site screening for future wind-farms, including inter alia wind gauges and masts
38	IT Equipment for WPMI office
39	Design and printing of information materials for stakeholders and general public: DVDs, printed reports, and other awareness raising materials
40	Technical services and maintenance of equipment for development of site screening for future wind-farms, including inter alia wind gauges and masts
41	Office supplies for WPMI Office
42	Contract services for implementation of WPMI ToR, including inter alia installation of MetTowers USD 85,000 per site*5, collection wind data USD 12,000 per site*5, Preparation of financeable wind report with turbine options and sitting USD 50,000 per site*5, Radar review 10,000 per site*5, Environmental Impact Assessment including soil review 10,000 per site*5, Transmission review including assessment of optimal grid connection point 15,000 per site*5,
43	International consultant: Specialist on Finance and Investments – 18 weeks @ 5000 USD/week
44	4 Local consultants: (i) Wind Farm Engineering Specialist – 12 weeks @ 5000 USD/week; (ii) Tender Logistics Specialist – 12 weeks @ 5000 USD/week; (iii) Specialist on Finance and Investments – 20 weeks @ 5000 USD/week; (iv) Legal Adviser – 12 weeks @ 600 USD/week
45	2 Local Consultants under Service Contract: (i) WPMI Director – 79 weeks @ 600 USD/week; (ii) WPMI Senior Specialist – 79 weeks @ 500 USD/week

46	Local travelling for implementation of the outcome 3.2
47	International travelling for implementation of the outcome 3.2
48	Design and printing of information materials for stakeholders and general public: DVDs, printed reports, and other awareness raising materials
49	Contractual services for designing and implementing for training on implementation of various stages of development work for the wind farm
50	2 Local consultants: (i) Wind Farm Engineering Specialist – 20 weeks @ 600 USD/week; (ii) Legal Adviser – 16 weeks @ 600 USD/week
51	2 Local Consultants under Service Contract: (i) WPFI Director – 83 weeks @ 600 USD/week; (ii) WPFI Senior Specialist – 83 weeks @ 500 USD/week
52	Local travelling for implementation of the outcome 3.3
53	International travelling for implementation of the outcome 3.3
54	Contractual services for tender for pre-development assets
55	International consultant: Wind Potential Measurement / Monitoring Specialist – 4 weeks @ 5000 USD/week
56	Local travelling for implementation of the outcome 4.1
57	International travelling for implementation of the outcome 4.1
58	Contractual services for processing received wind data
59	3 Local consultants: (i) Web Design Specialist – 24 weeks @ 600 USD/week; (ii) Database Expert (RES Cadastre and Inventory System) – 12 weeks @ 600 USD/week; (iii) PR Specialist – 24 weeks @ 600 USD/week
60	Contractual services for technical work for development of the project web-site
61	2 Local consultants: (i) Wind Farm Engineering Specialist – 8 weeks @ 600 USD/week; (ii) PR Specialist – 8 weeks @ 600 USD/week
62	Local travelling for the site-visits
63	International travelling for implementation of the outcome 4.3
64	3 International consultant: (i) Project Performance Mid-term Evaluation Specialist – 6 weeks @ 5000 USD/week; (ii) Project Performance Terminal Evaluation Specialist – 6 weeks @ 5000 USD/week; (iii) Lessons Learnt Study Specialist – weeks @ 5000 USD/week
65	6 Local consultants: (i) Wind Farm Engineering Specialist – 8 weeks @ 600 USD/week; (ii) GHG Emission Evaluation Specialist – 20 weeks @ 600 USD/week; (iii) PR Specialist – 8 weeks @ 600 USD/week; (iv) Project Performance Mid-term Evaluation Specialist – 8 weeks @ 600 USD/week; (v) Project Performance Terminal Evaluation Specialist – 8 weeks @ 600 USD/week; (vi) Lessons Learnt Study Specialist – 8 weeks @ 600 USD/week
66	Local travelling expenses for implementation of the outcome 4.4
67	Design and printing of information materials for stakeholders and general public: DVDs, printed reports, and other awareness raising materials
68	Organizing of workshop for presenting learned lessons on development of wind farms in Belarus
69	2 Local PIU members under service contract: (i) National Project Manager (this cost will be shared between GEF and UNDP) – 45% of 250 weeks @ 600 USD/week; Administrative and Financial Assistant (this cost will be shared between GEF and UNDP) – 45% of 250 weeks @ 500 USD/week
70	Equipment for PMU office
71	IT Equipment for PIU office
72	Design and printing of information materials for stakeholders and general public: DVDs, printed reports, and other awareness raising materials
73	Technical services and maintenance of equipment for PIU office
74	Supplies for PIU office
75	Communal utility service expenses for running PIU office
76	Direct Project Costs
77	2 Local PIU members under service contract: (i) National Project Manager (this cost will be shared between GEF and UNDP) – 55% of 250 weeks @ 600 USD/week; Administrative and Financial Assistant (this cost will be shared between GEF and UNDP) – 55% of 250 weeks @ 500 USD/week

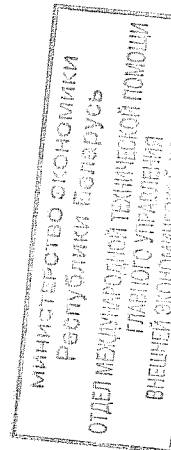


Table 18: Total Co-financing

Name of co-financier	In-kind, thousand USD	Cash, thousand USD
Department for Energy Efficiency of the State Standardization Committee	70	
Ministry of Education (Sakharov International State Environmental University)	20	
Ministry of Energy	100	3,000
Ministry of Natural Resources and Environmental Protection (original obligations of Department for Hydrometeorology)	30	80
TDF-Ecotech		20,000.00
Triple LLC		17,000.00
UNDP (in-kind/cash)	300	300
<b>Total Co-financing</b>	<b>520</b>	<b>40,380</b>

**Summary of Funds:**

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
GEF	625,232	826,632	766,032	372,392	454,712	3,045,000
UNDP	68,934	68,937	62,005	52,029	48,095	300,000
UNDP (in-kind)	60,000	60,000	60,000	60,000	60,000	300,000
Department for Energy Efficiency of the State Standardization Committee(in-kind)	20,000	20,000	10,000	10,000	10,000	70,000
Ministry of Education (Sakharov International State Environmental University)(in kind)	4,000	4,000	4,000	4,000	4,000	20,000
Ministry of Energy (in-kind)	20,000	20,000	20,000	20,000	20,000	100,000
Ministry of Energy (cash)		1,500,000	1,500,000			3,000,000
Ministry of Natural Resources and Environmental Protection (original obligations of Department for Hydrometeorology) (in-kind)	10,000	5,000	5,000	5,000	5,000	30,000
Ministry of Natural Resources and Environmental Protection (original obligations of Department for Hydrometeorology) (cash)	20,000	20,000	20,000	10,000	10,000	80,000
TDF-Ecotech (cash)		5,000,000	5,000,000	5,000,000	5,000,000	20,000,000
Triple LLC (cash)	5,000,000	4,000,000	4,000,000	4,000,000		17,000,000
<b>TOTAL</b>	<b>5,828,066</b>	<b>11,524,569</b>	<b>11,447,037</b>	<b>9,533,421</b>	<b>5,611,807</b>	<b>43,944,900</b>

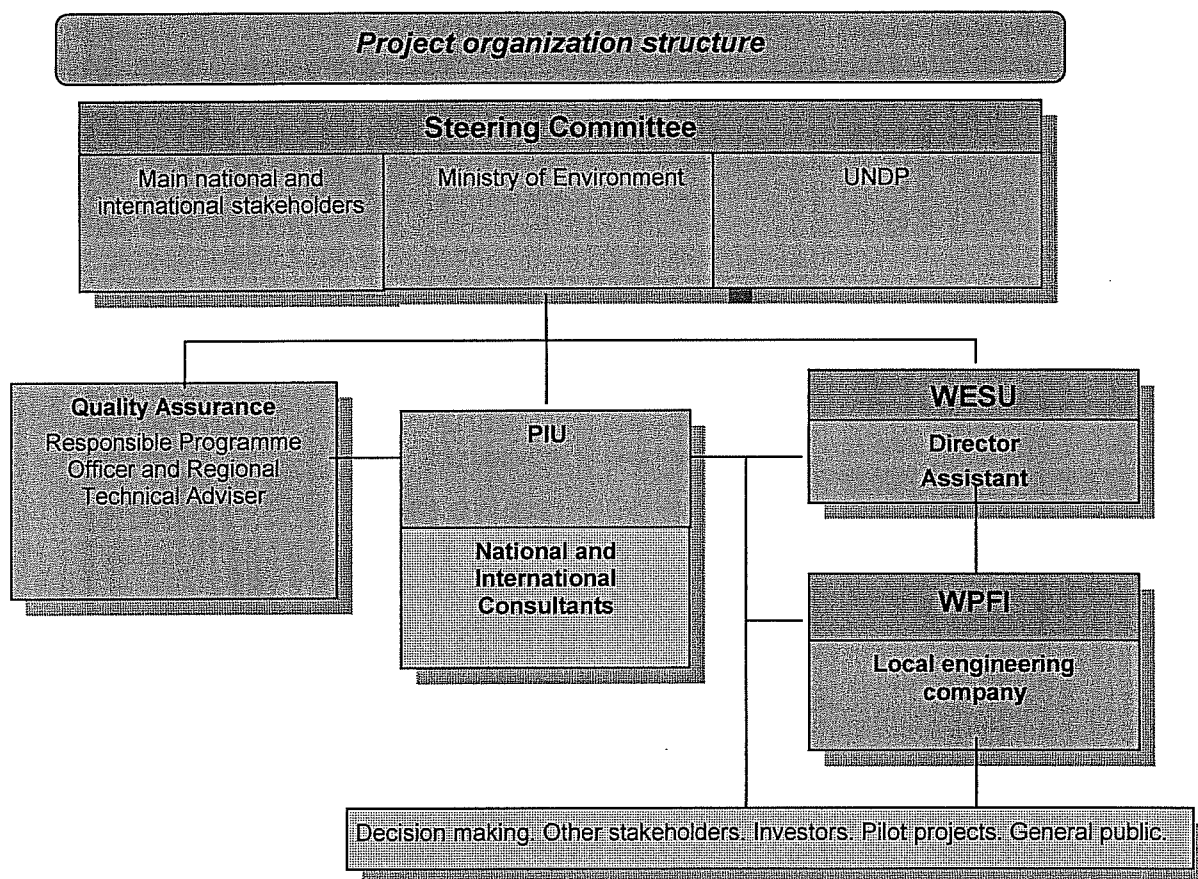
МИНИСТЕРСТВО ЭКОЛОГИИ  
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 ВНЕШНЕЭКОНОМИЧЕСКИХ СВЯЗЕЙ

#### 4. MANAGEMENT ARRANGEMENTS

The Ministry of Natural Resources and Environmental Protection of Belarus (Ministry of Environment) acting as an executing agency for this project will take responsibility for overall coordination of project implementation, efficient use of project resources and achievement all the planned project results. The executing agency closely cooperates with UNDP to ensure successful implementation of all the projects activities and achievement of all the objectives and tasks. The executing agency (Ministry of Environment) will assign a senior official as the Project Director who will provide general coordination and support to the project on behalf of the Ministry of Environment.

The project organization structure is summarized in the figure below will consist of a Project Board, Project Assurance, and a Project Implementation Unit (PIU) and also include the WESU and the WPFI.

Figure 9: Project organization structure



A Project Board (PB) will be established at the inception phase of the project to monitor the project progress, to guide its implementation and to support the project in achieving its listed outputs and outcomes. It will be chaired by the Project Director and include representatives from the main stakeholders, including the Ministry of Environment, the Ministry of economy, the Energy Efficiency Department under the State committee on Standardization, UNDP and other organisations. Other

members can be invited at the decision of the PB on an as-needed basis, but taking due regard that the PB remains sufficiently lean to be operationally effective. The project manager will participate as a non-voting member in the PSC meetings and will also be responsible for compiling a summary report of the discussions and conclusions of each meeting. The final list of the PB members will be completed at the outset of project operations and will be approved by UNDP and the Ministry of Environment. The first PSC meeting will take place within 6 months from the project start date. The PB will meet at least twice a year to discuss the issues related to project implementation. The PB could meet more often if it will be deemed necessary.

The day-to-day management of the project will be carried out by a Project Implementation Unit under the overall guidance of the Project Board. The PIU will include Project Manager (PM), Expert on Wind Energy, and Administrative and Financial Assistant (AFA). The PIU staff will be selected through an open competitive process by the Ministry of Environment taking into account consultations with UNDP. Effectiveness of the PIU staff work will be evaluated annually by the UNDP Belarus. Based on the evaluation results and consultations with the Project Director, a decision will be made on renewal/non-renewal of the PM contract. Tentative ToR for the PM and AFA are presented Annex 7.7.

The Project will be supported by short-term international and national experts taking the lead in the implementation of the specific technical assistance components of the project. This assistance will be classified as first loss equity capital investment. Contacts with experts and institutions in other countries that have already gained more experience in implementing building energy efficiency programs, related policies and financial support measures are also to be established.

A work plan for the first year of project implementation will be developed and approved by the Ministry of Environment and UNDP during the project inception stage. Work plans for the second and subsequent project implementation years will be prepared during the last month of an on-going year.

The Ministry of Environment will host the Wind Energy Support Unit (WESU). Project and the Ministry of Environment select the WESU Director and Assistant. The WESU will cooperate with the PIU as described in the activity box in 4b. The Ministry of Environment will provide office space and personnel for the WESU as required as part of their co-financing.

The activities of the WESU will be ongoing from the onset of the Project. These activities will intensify after the “pre-investment” work begins to show results. The PIU activities will, among other things, include:

- i) They will also co-ordinate the development work of the WPFi with the various ministries and agencies. A good example of this is the permitting work that requires the involvement of several ministries and agencies.
- ii) They will also co-ordinate with other private developers who will be working with the WESU with regards to establishing a feed-in-tariff or framework tariff for the WPFi projects and the participating private projects. These will include Triple and TDF Ecotech among others.
- iii) They will also be responsible for managing the consultants for the negotiation of the feed-in-tariff or framework tariff.

The WPFi will be based in Minsk and will report to the Ministry of Environment, WESU, UNDP and the Project Board. The WPFi will be composed of a full-time Team Leader, and a full-time Assistant. The Team Leader will be responsible for managing and expediting the development activities of the WPFi. Particular attention will be required for development activities that require cross-ministerial involvement and on strategic issues such as the ultimate siting of wind farm projects. The staff will be required for a total period of 60 person-months. However, contracts will initially be for a period of 12 person-months renewable subject to satisfactory performance. Additionally, external experts (e.g. legal, financial and

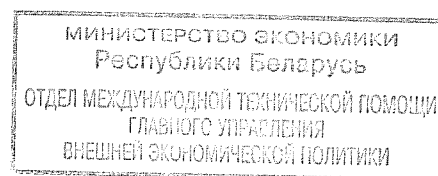
tendering advisors) can be engaged on short-term basis for assistance with preparation of tendering documents and investment agreements for the project developers.

The UNDP Belarus will maintain the project oversight and monitoring of project expenditures. It will be responsible for monitoring project implementation, timely reporting of the progress to the UNDP Regional Co-ordination Unit and GEF as well as organizing mandatory and possible complementary reviews and evaluations on an as-needed basis. It will also support the implementing agency in the procurement of the required expert services and other project inputs and administer the required contracts. Furthermore, it will support the co-ordination and networking with other related initiatives and institutions in the country. The description of UNDP Country Office support services is provided in Annex 7.1.

For successfully reaching the objective and outcomes of the project, it is essential that the progress of different project components will be closely monitored both by the key local and international stakeholders and, starting with the finalization of the detailed, component-specific work plans and implementation arrangements and continuing through the project's implementation phase. The purpose of this is to facilitate early identification of possible risks to successful completion of the project together with adaptive management and early corrective action, when needed. During the implementation, proper care will be taken to have adequate communication and co-ordination mechanisms in place to ensure that areas of common interest can be addressed in a cost-efficient way.

In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including any hardware purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgement to GEF.

During the implementation, proper care will be taken to have adequate communication and co-ordination mechanisms in place to ensure that areas of common interest can be addressed in a cost-efficient way.





## 5. MONITORING AND EVALUATION

The project will be monitored through the following M&E activities. The M&E budget is provided in the table below.

### Project start:

A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-a-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- b) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

### Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

### Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements. This will include requirements for collection and presenting data disaggregated by gender.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes –each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

#### **Periodic Monitoring through site visits:**

UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

#### **Mid-term of project cycle:**

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

#### **End of Project:**

An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out

recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

**Learning and knowledge sharing:**

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

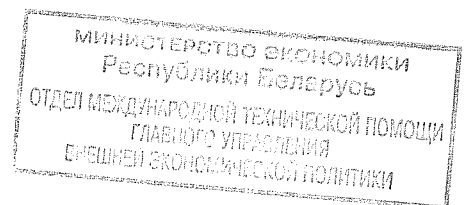
Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

**M&E workplan and budget**

Type of M&E activity	Responsible Parties	Budget US\$ Excluding project team staff time	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> <li>▪ Project Manager</li> <li>▪ UNDP CO, UNDP/GEF</li> </ul>	\$4,000	Within first two months of project start up
Measurement of Means of Verification of project results	<ul style="list-style-type: none"> <li>▪ UNDP/GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members</li> <li>▪ Monitoring and Reporting consultant</li> </ul>	To be finalized in Inception Phase and Workshop	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> <li>▪ Oversight by Project Manager</li> <li>▪ Project team</li> </ul>	To be determined as part of the Annual Work Plan's preparation	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ UNDP RTA</li> <li>▪ UNDP EEG</li> </ul>	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> </ul>	None	To be determined by Project team and UNDP CO
Mid-term Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	\$20,000	At the mid-point of project implementation.

Final Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team,</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	\$20,000	At least three months before the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ local consultant</li> </ul>	0	At least three months before the end of the project
Audit	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ Project manager and team</li> </ul>	\$4,000	Annually
Visits to field sites	<ul style="list-style-type: none"> <li>▪ Government representatives</li> </ul>	\$4,000	As needed
<b>TOTAL indicative COST</b>		<b>US\$ 52,000</b>	
Excluding project team staff time and UNDP staff and travel expenses			

The Ministry of Environment together with PIU, WESU, WPMI prepares and submit to UNDP other reports upon agreement between UNDP and Ministry of Environment.



## 6. LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

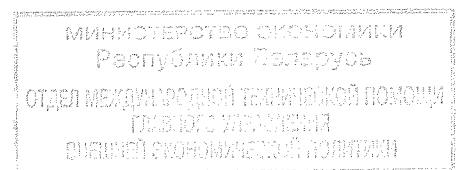
The implementing partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

Audit Clause: The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects.



## 7. ANNEXES

### 7.1. Provision of UNDP country office support services in implementation of the Project “Removing Barriers to Wind Power Development in Belarus”

The UNDP country office may provide at the request of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (Ministry of Environment) the following support services for the implementation of activities of the project “Removing Barriers to Wind Power Development in Belarus”.

- Payments, disbursements and other financial transactions
- Recruitment of project personnel and consultants
- Procurement of goods and services
- Organization of training activities, conferences and workshops

The support services provided by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Direct project costs incurred with regards to UNDP support services are to be recovered to UNDP.

Pursuant to the relevant provisions of the Standard Basic Assistance Agreement (SBAA) between the Government of Belarus and UNDP, signed on 24 September 1992, and provisions of the project document, the provisions on liability and privileges and immunities shall apply. The Government shall retain overall responsibility for the nationally managed project through its Ministry of Environment. The responsibility of the UNDP country office for the provision of the support to the Ministry of Environment shall be limited to the services detailed in the table below.

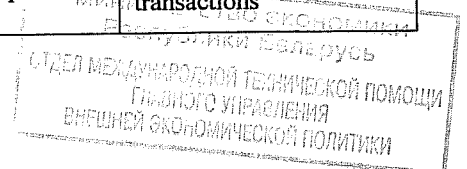
Any claim or dispute arising under or in connection with the provision of support by the UNDP country office shall be handled pursuant to the relevant provisions of the SBAA.

In accordance with the provisions of the project document “Removing Barriers to Wind Power Development in Belarus”, the UNDP country office shall provide support at the request of the Ministry of Environment as described in the table below. Cost-recovery by UNDP country office for direct project costs shall be funded from the project budget using method specified below:

Fee based method, when UNDP Country Office charges the project for provided services based on number of transactions and transaction fee in accordance with the country office pricelist.

Schedule for the provision of ISS, cost and method are described in the table below.

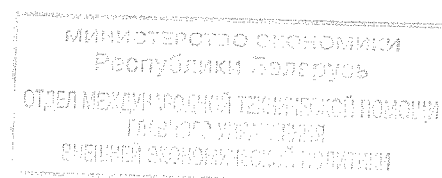
Support Services	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
Processing of payments disbursements and other financial transactions	Based on request for payment	transaction fee in accordance with the country office pricelist	periodic billing based on actual number of transactions
Procurement of goods and services	Based on request and project annual work plan	transaction fee in accordance with the country office pricelist	periodic billing based on actual number of transactions
Project personnel and consultants selection and recruitment process	Based on request and project annual work plan	transaction fee in accordance with the country office pricelist	periodic billing based on actual number of transactions



Travel arrangements	Based on request and project annual work plan	transaction fee in accordance with the country office pricelist	periodic billing based on actual number of transactions
General administration (pouch service, visa support, customs clearance, etc)	Based on request and project annual work plan	transaction fee in accordance with the country office pricelist	periodic billing based on actual number of transactions
IT services	Based on request and project annual work plan	transaction fee in accordance with the country office pricelist	periodic billing based on actual number of transactions
Communications service	Based on UNDP country office communication plan	1% of the UNDP resources contributed to a project	Billing once a year

If the requirements for support services by the country office change during the life of a project, the annex may be revised with the mutual agreement of the UNDP Resident Representative and the Ministry of Environment.

**International Public Sector Accounting Standards** are financial reporting standards used in UNDP.



## 7.2. *List of Potential Developers*

(as of June 2012)

### **ENERTRAG**

ENERTRAG Aktiengesellschaft  
D – 17291 Dauerthal  
Tel.: + 49 (0) 3 98 54 64 59 119;  
Fax: + 49 (0) 3 98 54 64 59 419;  
E-mail: [enertrag@enertrag.com](mailto:enertrag@enertrag.com)

### **Electrawinds**

John Cordierlaan 9, B-8400 Oostende  
Tel. +32(0)59 569 700  
Fax. +32(0)59 569 701  
[www.electrawinds.de](http://www.electrawinds.de)

### **Greta Energy Inc.**

(Canadian HQ)

5140 Yonge Street, Suite 2250  
Toronto, Ontario, Canada M2N 6L7  
Tel: +1 (416) 590.0197  
Fax: +1 (416) 590.1701  
E-mail: [info@gretaenergy.com](mailto:info@gretaenergy.com)

(RussianBrach)

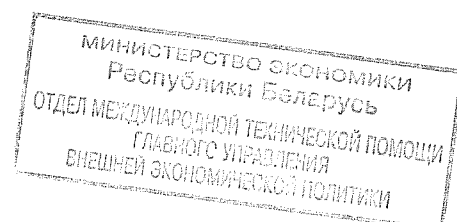
Tel. +7 (495) 727-39-20 ext. 243  
Fax. +7 (495) 727-39-21  
cell +7-906-718-52-97  
E-mail: [kdunaev@gretaenergy.com](mailto:kdunaev@gretaenergy.com)

### **SUNOFFER**

Avda./San Luis 27  
28033 Madrid  
Tel./Fax +34 911 889 541  
Tel.: (+34) 917592737  
Fax: 917592737  
E-mail: [ak@sunoffer.es](mailto:ak@sunoffer.es)

### **Global Wind Power**

BaodatCaddiesi No: 183/6  
34730 Ciftehavuzlar – Istanbul





Tel. + 90 216 385 3106  
Fax. + 90 216 467 8990

**Corvusolar**

AysecavusCaddesi No: 17/7  
Suadiye – Kadikoy – Istanbul  
Tel. 0 216 373 17 17  
E-mail: [kaan.esin@corvusolar.com](mailto:kaan.esin@corvusolar.com)

**Spacio 2009 Ltd**

(Italy, Belarusianbranch)

58 Nezavisimosti Ave., office 425  
220005 Minsk  
Tel./Fax.+ 375 17 331 62 34

**Wikow Industry**

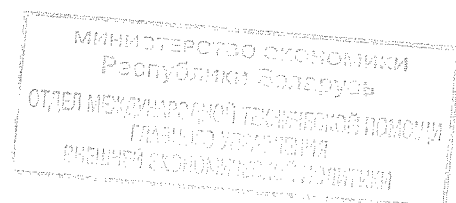
City Tower, Hvezdova 1716/2b  
CZ-140 78 Praha 4  
Tel. + 420 222 753 124  
Fax. + 420 602 347 712  
[www.wikov.com](http://www.wikov.com)

**TelDaFax**

M?hlenstr. 3  
D – 318112 Bad Pyrmont  
Deutschland  
Tel. + 49 52 81 1 84 48  
+ 49 52 81 165 59 67  
Fax. + 49 52 81 60 62 59  
E-mail: [twb@contep.de](mailto:twb@contep.de)  
[www.teldafax.de](http://www.teldafax.de)

**Triple LLC**

51 Pobediteley Ave., building #2  
220035 Minsk, Belarus  
Tel.: +375 17 309-21-03  
Fax: +375 17 309-20-25  
[info@triple.by](mailto:info@triple.by)



### 7.3. List of legal acts dealing with the EE and RES fields

#### EE on energy supply side

Policy document (effective date)	Measure
The Republic of Belarus' National Security Concept (Sep 17, 2007, add. Nov 9, 2010)	The Concept covers many spheres, which determines national security, including energy security. It emphasizes the importance of EE policy to secure the sustainable development of the country.
Energy Potential Development Strategy of the Republic of Belarus (Aug 9, 2010)	<p>The document sets up the main goals of fuel-energy complex development. It is planned to build:</p> <ul style="list-style-type: none"> <li>• combined cycle gas turbine unit with installed capacity 400 MW on Lukoml Power Plant;</li> <li>• combined cycle gas turbine unit with installed capacity 400 MW on Beresa Power Plant;</li> <li>• coal power plant with installed capacity up to 920 MW in 2015;</li> <li>• nuclear power plant with installed capacity up to 2340 MW by 2020;</li> <li>• hydro power plants with total installed capacity not less than 120 MW by 2015.</li> </ul> <p>This is one of the core documents that provide legal framework and technical standards for a low-carbon energy development roadmap.</p>
Measures to Increase the Efficiency of Using Fuel and Energy Resources for the Period Until 2012 (#248, Feb 22, 2010)	<p>The annex of the document consists of a number of concrete measures and projects including</p> <p>(i) introduction of mini-CHPs;</p> <p>(ii) reconstruction of heat network with re-isolated pipes, renovation of heat supply systems as a whole and modernization of local heat points, phasing out with further excluding from operation the boiler equipment with specific fuel consumption exceeding 160 kg of coal equivalent per 1 Gcal, etc.;</p> <p>(iii) reduction of electricity losses in the country power grid;</p> <p>(iv) decentralization of selected heat supply systems in small cities and region administrative centers.</p>
State Comprehensive Program of Modernization of Basic Production Capacities of The Belarusian Energy System, Energy Saving and Raising the Proportion in Using Local Fuel-Energy Resources in the Republic for the Period until 2011 (Nov 15, 2007)	The Program consists of a number of measures in about 55 energy installations to retrofit old inefficient power generation capacities and reduce accumulated depreciation of main assets. Realization of these measures led to 1 575 million t.c.e. of energy saving during the 2006-2010 (the fact). It is expected that by the end of this program the total effect will exceed 1 850 million t.c.e.

Policy document (effective date)	Measure
Republic's Programme on Transforming Boiler Houses into Mini CHP for the Period 2007-2010 (Sep 28, 2007)	The program supports a number of measures in 62 former boiler houses to convert them into mini-CHPs with total capacity of 132 MW and efficiency of not more than 160 t.c.e. per 1 GWh.
State Energy Sector Development Programme until 2016 (Feb 29, 2012)	The program suggests continuing modernization of the power generation, transmission and distribution installations, in particular construction and operation wind farms of 162 MW by 2016 and another 200 MW by 2020.

## RES

Policy document (effective date)	Measure
Law of the Republic of Belarus "On Renewable Energy Sources" (Dec 27, 2010)	This law is one of the recent milestones of the country's power industry development policy. The Law establishes some important instruments, which raise incentives for RES investors and producers through introduction of feed-in tariffs, green certificates, the RES Cadastre and other arrangements. It is further suggested to extend some of provisions of the Law to some other energy efficiency improvement options such as mini-CHP, ORC-technology, heat pumps, etc., what would make these projects viable and commercially attractive.
National Programme of Developing Local and Renewable Energy Sources in 2011-2015 (May 10, 2011)	The resolution supports a number of measures directed to effective use of local fuel resources, including wood fuel, secondary thermal energy resources and other renewable energy options.
State Programme of Building Energy Sources Powered by Local Fuels in 2010 – 2015 (July 19, 2010)	The resolution supports about 161 measures directed to effective use of local fuel resources, including wood fuel, secondary thermal energy resources and other renewable energy options.
State Programme of Building Hydroelectric Power Stations in the Republic of Belarus in 2011-2015 (Dec 18, 2010)	This document supports rehabilitation of existing small hydropower plants all over the country and building a number of new cascade hydropower installations.
State Programme of Building Energy Sources Powered by Biogas in 2010 – 2012 (June 9, 2010)	<p>This document is very much consistent with the Law on RES and enables the most attractive provisions of the said law through its application to utilization of biogas from agricultural waste, communal sewage, landfill, and livestock waste.</p> <p>(i) It is envisaged that the energy sources powered by biogas will be installed in a number of livestock and poultry farms with total capacity of 19.8 MW.</p> <p>(ii) It is envisaged to introduce a new technology of wastewater treatment based on the anaerobic decomposition and digestion in some wastewater treatment facilities with resulting biogas combustion in CHP installations. The plan for 2012-2013 is to retrofit nine wastewater treatment plants with installation of mini-CHPs of 13.6 MW total.</p>

Policy document (effective date)	Measure
Strategy on the development of energy potential of Belarus 2011-2015 (approved August 9, 2010)	In Dzerzhinsk region Minsk oblast in 2011–2014 it's planned to build the wind park of total capacity 160 MW. In general the total constructed wind power capacity in 2011-2015 could be up to 300 MW.

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Республики Беларусь  
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ГЛАВНОГО УПРАВЛЕНИЯ  
ВНЕШНЕЙ ЭКОНОМИЧЕСКОЙ ПОЛИТИКИ

#### 7.4. *Feed-in-Premium Explained and Analyzed*

The feed-in premium model established by this law attempts to reflect similar system practiced in many EU countries, e.g., in Germany. However, it is not a feed-in tariff. Rather, it is a feed-in premium. There is a 1.3 times multiplier linked to the energy tariff for the first ten years and a 0.85 multiplier for years onward. The Ministry of Economy chose these multipliers based on their interpretation of the best practice that they saw in the West (mostly Germany and Austria). However, these countries has set **Feed-in-Tariff's** that set the energy rate for each project in Euros and the Belarusian premium is structured as a floating price in Belarusian Roubles. They understand that it is not a perfect scheme since no wind farm has been developed. Nevertheless, "some feed-in tariff is better than none". The Ministry of Economy wanted to impress upon us that there is an ability to change the structure of the renewable energy incentive pricing. They are open to change. They are in a position to implement a new system. They are working with the European Commission Sustainable Energy Policy project to create a new scheme. So investors should not be too worried about the existing system.

The current green premium using the multiplier would be €14 cents for the first year but is variable thereafter. In addition to the premium, investors need to look at overall policy which includes other preferences, like subsidies, custom duty exemption, soft loan availability, and preferential conditions for investment in projects in small cities.

The feed-in premium is strictly pinned to the industrial one-part tariff that in turn is coupled to imported fuel prices. This directly exposes projects to the commodity price if the prices go down. There is also the risk that the feed-in premium may decrease in the course of the elimination of current cross-subsidization arrangements. The Government is planning to eliminate these rates in the near future. According to our estimation, if the cross-subsidy is eliminated, the feed-in premium will lose up to 12% of its value.

In addition, the existing premium rate does not appear to include risk premiums for country risk.

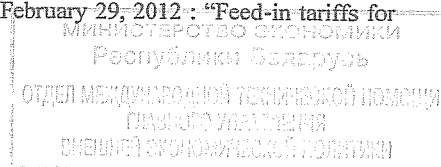
The government has relied on studies from a European Union funded project to amend this premium for Belarus. However, these studies advocate the creation of a FiT scheme in Belarus that seems to promote the development of small size projects (i.e. single turbine projects) over large size projects. The tariff scheme proposes tariffs for Belarus that are at a bare minimum sufficient for a small project. The suggested tariff for the large scale project, between 4.82 €/kWh to 5.99 €/kWh<sup>45</sup> is not structured to attract investors to build large wind farms in Belarus. The Ministry of the Economy stated that they are open to negotiating a new tariff scheme, but it has to be in the context of the development of an actual wind farm. These ad hoc tariffs may lead to the development of a wind farm that is sponsored by a strong local company, like Triple LLC. But it will not lead to the implementation of a broader FiT that is viable.

The current status is that the government does not want to propose a new renewable energy incentive pricing scheme until they have projects come forward asking for specific tariff schemes. It is the Project's opinion that the European Union's proposed tariff scheme is too low to incentivize utility scale wind farms (at least 10 MW in size). This scheme may incentivize the implementation of additional single turbine sites as the pricing scheme is geared towards these smaller projects (see Annex IV).

The current premium scheme does not take into account the floating-rate for the premium for energy over a 20 year period. In the case of Belarus the cost of electricity is highly correlated to the price of natural gas since over 90% of their energy is derived from the burning of natural gas. The cost of natural gas is very volatile. In the case of Belarus, they are currently receiving their natural gas from Russia's Gazprom at the cost of production plus pipeline transportation. In general it is very difficult to finance a project where the energy rate is volatile. In addition, the tariff scheme needs to take into account the volatility of

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<sup>45</sup>Holger Ziegler, KEMA/SOFRECO presentation to Work Group Session in Minsk On February 29, 2012 : "Feed-in tariffs for Renewable Sources - Solar PV and Wind Power"



the foreign exchange rate of the Belarusian Rubles. Often when you take account of one of these risks you can exacerbate the other risk. This seems to have been the case with Enertrag.

Table 19:

		Small size				Medium size			Large size		
		expensiv e	medium price	medium price, no CC	medium price, no CC, best sites	no CC	no CC, best sites	no CC	no CC, best sites	no CC	no CC, best sites
Initial upfront investment costs (without CC)	€/kW	1500	1250	1250	1250	1250	1250	1250	1000	1000	1000
Cold climate capability	%	5%	5%	0%	0%	5%	0%	0%	5%	0%	0%
O&M costs (portion of upfront investment) - nominal terms	€/kWh	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,015	0,015	0,015
Additional cold climate triggered O&M cost	%	5,0%	5,0%	0,0%	0,0%	5,0%	0,0%	0,0%	5,0%	0,0%	0,0%
Credit rate	%/a	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Electric generation capacity	MW	10	10	10	10	25	25	25	50	50	50
Average daily wind speed (10m height)	m/s	4,00	4,00	4,00	4,50	4,50	4,50	5,00	4,50	4,50	5,00
Annual power production (gross)	MWh	18559	18559	18559	23704	59261	59261	72195	118521	118521	144390
Full load working hours electricity per year	h/a	1856	1856	1856	2370	2370	2370	2888	2370	2370	2888
Efficiency losses from cold climate conditions (share in annual production)	%	5%	5%	0%	0%	5%	0%	0%	5%	0%	0%
Power losses due to grid losses, self consumption, turbulances, limited technical availability	%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Annual power production (net)	MWh	15868	15868	16703	21334	50668	53335	64975	101336	106669	129951
Yield after tax	%	7,50%	7,50%	7,50%	7,50%	7,50%	7,50%	7,50%	7,50%	7,50%	7,50%
FiT required (nominal terms)	€/kWh	10,56	9,15	8,46	7,06	7,62	7,06	6,15	5,99	5,55	4,82

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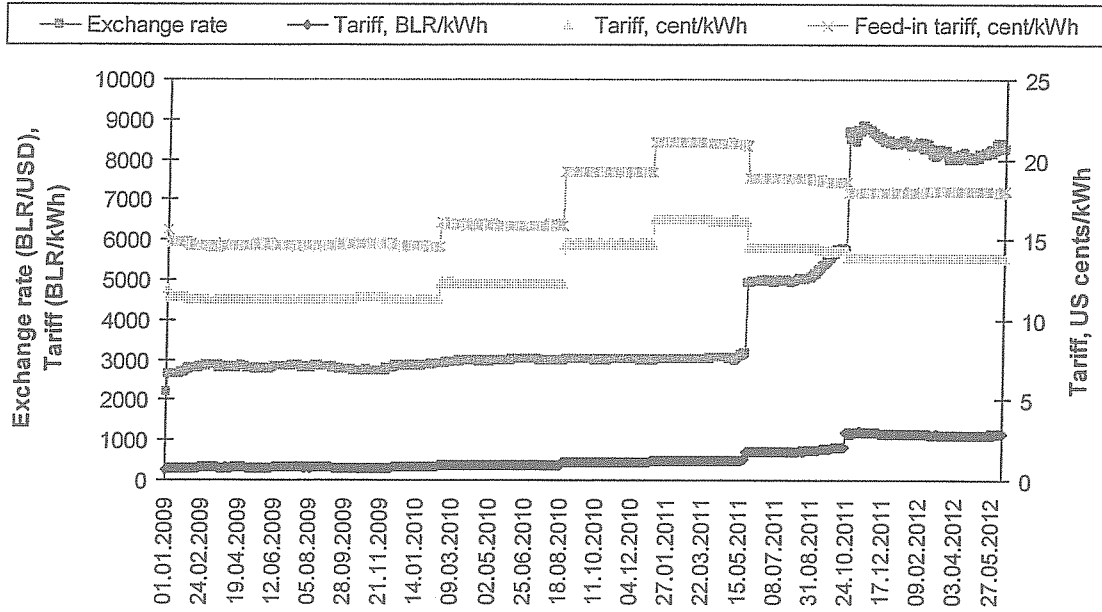


This project is funded by the European Union



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Figure 10: Dynamic of currency exchange rate and energy premiums:



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ГЛАВК С УЗБЕКИСТАНА  
СЕРВІС СУВЕРЕНІТЕТУ КОРАБІВ

## 7.5. Financial Institution Analysis

### EBRD

The WPFI will examine the possibility of funding the project with debt from the EBRD using its A/B loan structure. The EBRD remains the lender of record for the entire loan and sells participations to commercial banks. The commercial banks benefit from the EBRD's preferred creditor status. They can also benefit from guarantees from the EBRD. These guarantees are only provided if the credit risk is acceptable. Under this structure, the maximum amount of leverage tends to be 70%. Half of this amount, 35% can be directly from the EBRD in the form of debt or equity while the remainder can be from participating banks. This is lower than the leverage found in EU projects which can be as high as 80% to 85%. The WPFI needs to take these terms and the potential pricing implications of the debt into account.

*Stand-alone Political Risk Insurance.* A key component of the debt can also include pre-negotiated terms for political risk insurance ("PRI"). The PRI can cover the following risks:

- Currency Inconvertibility and Non-Transfer Risk
- Confiscation, Expropriation, Nationalization and Deprivation
- Breach of contract
- Non-honouring of sovereign financial obligations

The above coverage can be sourced from a range of providers including the World Bank's Multilateral Investment Guarantee Agency ("MIGA"), various export credit agencies, and private insurance providers. The Project will only be able to obtain true indications once one of the above projects has reached a more mature stage.

The PRI will be combined with a debt facility. This facility, if it meets the relevant criteria<sup>46</sup>, can also be executed within the framework of the EBRD's direct loan function.

### Export Credit Agencies

Export Credit Agencies ("ECA") can also provide credit facilities for projects in Belarus. These facilities are subject to meeting the credit risk criteria of each agency. So for example, EKF, based on the current facts and circumstances, can provide loans with tenors of between 2 – 5 years to support Danish equipment sales to Belarus. EKF can normally extend loans with tenors up to 18-years. The project will examine which ECA's, based on the results of the WPFI's activities, can provide these longer tenors for Belarus.

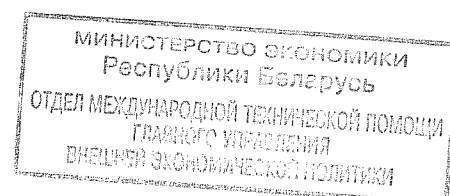
Table 20: List of Export Credit Agencies

Denmark	Export Kredit Fund
Germany	Hermes
United States	US Exim
China	Export Import Bank of China

### BPS-Sberbank

Sberbank is one of the largest Russian banks. Sberbank has a joint venture with a domestic bank in Belarus, BPS (formerly - BelPromStroyBank). Sberbank has been an active lender to the government and to the national potash company Belaruskali. Sberbank lent to this entity over €1 billion based on their

<sup>46</sup><http://www.ebrd.com/pages/workingwithus/loans.shtml>





hard currency export contracts. Sberbank has also been an active lender to Belenergo, specifically to Belenergo's regional energy enterprises. They can easily work with municipalities as well. They have financed co-generation at a regional level. In particular they have financed peak load plants. They view working with Belenergo as a low risk. They have not looked at renewable energy projects yet.

Their facilities with the Belenergo entities are all based in Belarus Roubles. Since the devaluation in 2011, they have introduced a stress test methodology in order to size the amount of their debt facilities. Specifically, Sberbank analyzed whether or not the borrower would have the ability to make its principal and interest payments (possibly only interest payments) in a stress scenario where there is a 40% devaluation which lasts one full capital cycle (conservative approach). Sberbank views the fluctuation of the energy rate as being part of the fluctuation of the currency. Therefore they do not run a separate stress test on the energy rate.

Sberbank would be interested to look at providing 100% of the required debt in Belarus Roubles for renewable energy projects. They do not need to syndicate the risk. They can be the sole lender. Sberbank would be happy to provide us with the terms and conditions for a renewable energy loan including price and the tenor of the loan when we have a concrete project to discuss.

They can also provide funding in a form of financial leasing for project development costs in conjunction with their activities on support of SME under the auspices of the respective EBRD SME Support Programme.

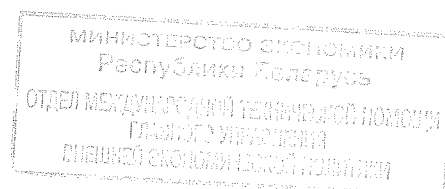
Sberbank can also provide loans together with the Eurasian Development Bank.

Before 2011 all of Sberbank's major loans went through the government and the banks. The National Bank reserve is, in Sberbank's opinion, adequate. The National Bank reserves are approximately 18 months.

### Chinese Lenders

There are several examples in Belarus today of Chinese lender's providing debt to infrastructure projects in Belarus using Chinese equipment. The Chinese soft loan (commodity credit under 3% annual interest rate) can cover 85% of the investment cost.

For example, the China Development Bank is lending \$189-million to finance the construction of the Vitebsk hydropower plant on the Western Dvina River. This is a project with Turkish equity investors and will utilize turn-key engineering, procurement and construction services from China National Electric Engineering Company (CNEEC).



## 7.6. Calculation of Greenhouse Gas benefits

Table 21: Direct and indirect GHG emission

<b>Direct Emissions Reduction</b>	0.643860 Mt CO <sub>2</sub> -eq
<b>Indirect Emissions Reduction (top down)</b>	1,931 Mt CO <sub>2</sub> -eq
<b>Indirect Emission Reductions (bottom-up)</b>	41,207 Mt CO <sub>2</sub> -eq

## 7.7. Annex Greenhouse gas emission reduction analysis

This Annex calculates the CO<sub>2</sub> emission reductions associated with the implementation of the present project based on the “GEF Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects”.

### A. Direct Emission Reductions

The main aim of this project is to remove the barriers for wind development projects in Belarus by developing up to five wind projects and by supporting the government in the implementation of renewable energy regulations. As part of this, project targets the development and tendering of 5 wind farm projects over 5 years.

As a result of these activities during the project implementation period of 5 years, direct greenhouse gas emission reductions totaling 1,894,525 tonnes of CO<sub>2</sub> equivalent will be achieved over the lifetime of the investments of 20 years. In the non-GEF case, these energy needs would be satisfied by similar generators currently providing grid electricity, with an emission factor of 0.49 tCO<sub>2</sub>-eq/MWh based on the predominance of gas fired generation for power supply.

The estimate is calculated based on the following formula and assumptions:

$CO_{2direct} = E * L * C$ ; where

- C – CO<sub>2</sub> emission factor, i.e. 0.49 tCO<sub>2</sub>-eq/MWh for grid electricity
- L – average useful lifetime of investments, i.e. 20 years; and
- E – annual energy production equal to the product of 20 years, 25 MW, 30% net capacity factor and 8760 hours equal to 1,314,000 MWh

This leads to emissions reductions compared to the baseline electricity production of 643,860 tCO<sub>2</sub>-eq

### B. Direct Post-project Emission Reductions

The project does not include activities that would result in direct post-project greenhouse gas emission reductions.

### C. Indirect Emission Reductions (bottom-up)

Using the GEF bottom-up methodology, indirect emission reductions attributable to the project are 5,683,575 MtCO<sub>2</sub>-eq calculated over the 20 years of useful lifetime of the investments. The GEF methodology specifies the following formula for this calculation:

$CO_{2indirect BU} = CO_{2direct} * RF$ , where

- CO<sub>2direct</sub> = estimate for total direct emission reductions
- RF = replication factor

The direct CO<sub>2</sub> emission reductions were estimated in step A at 1,894,525 tCO<sub>2</sub>-eq. Using a *default replication factor of 3* for a demonstration project with capacity building, suggested in the GEF GHG calculation manual, bottom-up indirect emission reductions were calculated as follows:

643,860 tCO<sub>2</sub>-eq \* 3 = 1,931 MtCO<sub>2</sub>-eq

### D. Indirect Emission Reductions (top-down)

Using the GEF top-down methodology, indirect emission reductions attributable to the project are equivalent to the 1,600 MW market potential. This is 64X the size of the project development and would

equal 41,207 MtCO<sub>2</sub>-eq. This number is not discounted since the GEF causality factor for a wind project of this type is 100%.

МИНИСТЕРСТВО ЭКОНОМИКИ  
Республики Беларусь  
ОТДЕЛ МЕЖДУНАРОДНОЙ ТЕХНИЧЕСКОЙ ПОМОЩИ  
ГЛАВНОГО УПРАВЛЕНИЯ  
ВНЕШНЕЙ ЭКОНОМИЧЕСКОЙ ПОЛИТИКИ

### 7.8. Assumptions for calculations of CO<sub>2</sub> emission factor

The used “Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas” AM0029 recommends that the following scenarios should be used as the basic ones:

1. The project activity not implemented as a CDM project;
2. Power generation using natural gas, but technologies other than the project activity;
3. Power generation technologies using energy sources other than natural gas;
4. Import of electricity from connected grids, including the possibility of new interconnections.

The high capital costs and a long payback period exceeding 12 years hinders the implementation of the project activities without receiving revenues from selling the ERUs (scenario 1).

The scenario 2 envisages an increase in energy generation at the Bereza State district power plant, Minsk CHP-5 or at the Lukoml State district power plant. The main equipment at the Bereza State district power plant was partially modernized (units #3 and #4). However, the fuel rate for electricity supply at this power plant are basically quite high and amount to 340 g. of coal equivalent/kWh, and the plant capacity factor does not exceed 0.5. However, the increased electricity production at the Bereza State District Power Plant with the high fuel rate for electricity production will result in excessive fuel consumption. The Minsk CHP-5 is operated in a condensing mode with fuel rate for electricity production equal to about 310 g. of coal equivalent/kWh.

The power plant capacity factor at the Minsk CHP-5 equals to about 0.7 (for example, in 2006 the power plant capacity factor was equal to 0.729). Hence, increase in production of electricity at the Minsk CHP-5 may amount to no more than 200 million kWh. The remaining portion of electricity will be generated at the Lukoml State district power plant which is used for regulation of peak loads in the Belarus power system. The fuel rates for electricity production at the Lukoml State district power plant equals to 316-317 g. of coal equivalent/kWh.

At the present time, the Ministry of Energy of the Republic Belarus is considering construction of coal fired power plants with a total capacity of 800 MW (scenario 3). In case the financial costs for the scenarios 1 and 3 will be comparable, the preference will be given to the latter scenario due to a continuous growth of prices for natural gas.

At the present time, imports of electric energy from the neighboring countries (Russia and Ukraine) equals to 5-6 billion kWh. There is however a stable trend towards increasing of the prices for the imported electric energy due to higher prices for fuel. Besides, it is difficult to increase the imports due to the lack of power transmission lines. Therefore, the scenario 4 is unlikely.

Thus, as the Baseline scenario, it is assumed that an increase in electricity production will be achieved at the Lukoml and Bereza State district power plant, as well as at the Minsk CHP-5 (scenario 2).

The emissions in the Baseline scenario were calculated by the formula:

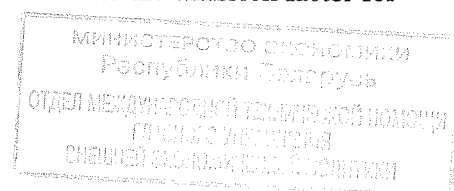
$$BE_y = EG_{PJ,y} \cdot EF_{BL,CO_2,y}$$

Where  $EG_{PJ,y}$  is the amount of electricity produced at the power plant where the project is implemented (i.e. at the Minsk CHP-5);

$EF_{BL,CO_2,y}$  is the CO<sub>2</sub> emission factor for the Baseline scenario.

As for calculation of the CO<sub>2</sub> emissions factor, the methodology AM0029 recommends, but does not obliges, to use the least value from three options:

- 1) the build margin emissions factor, calculated according to the “Tool to calculate the emission factor for an electricity system”;



2) the combined margin emissions factor, calculated according to the “Tool to calculate the emission factor for an electricity system” using 50/50 OM/BM weight;

3) the emissions factors of the technology (and fuel) identified as most likely baseline scenario.

As the Republic of Belarus does not have the emissions factor calculated in compliance with the “Tool to calculate the emission factor for an electricity system” and approved by the accredited independent entity, the emissions factor for electric energy supplied to the grid was estimated independently.

According to the procedure of calculations described in the “Tool to calculate the emission factor for an electricity system”, a simple method was selected for calculation of the operating margin emission factor. This method is used in case when electricity generation at low-cost/must-run electric power plants does not exceed 50 per cent of the total amount of energy produced by the energy system. According to the “Tool to calculate the emission factor for an electricity system”, the low-cost/must-run power plants are the plants, the loading of which is done irrespective of the day-time and seasonal fluctuations of the load within the network. The thermal power plants within the SPA “Belenergo” may be viewed as the low-cost/must-run ones for the Belarus energy system. Firstly, the cost of generated energy at combined heat and power plants is lower than at the condensing plants. Secondly, all the CHPs are operated basically according to a thermal schedule of load, and alteration of CHP load is subject to, mainly, changing of the thermal load.

Selection of the simple method is based on the fact that production of energy at the combined heat and power plants of the SPA “Belenergo”, according to the data for the period 2004-2006 makes up less than 50 per cent of the total electricity production by all the plants belonging to the SPA “Belenergo”, i.e. in 2004 – 43.7 per cent, in 2005 – 41.0 per cent, in 2006 – 40.4 per cent. Calculation of the operating margin emission factor according to the simple method was based on the data related to consumption of fuel and to supply of electricity to the grid for all the plants that are not related to the low-cost/must-run ones.

In our case to these plants belong such plants as the Lukoml State district power plant, Bereza State district power plant, and Minsk CHP-5. The operating margin emission factor was calculated by the following formula:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO_2,i,y}}{\sum_m EG_{m,y}}$$

where  $EF_{grid,OMsimple,y}$  is a simple operating margin CO<sub>2</sub> emission factor in the year  $y$  (t of CO<sub>2</sub>/MWh);

$FC_{i,m,y}$  is the amount of fossil fuel type  $i$  consumed by the plant  $m$  in the year  $y$  (mass and volume units);

$NCV_{i,y}$  is the net calorific value (energy content) of fossil fuel type  $i$  in the year  $y$  (GJ/per mass and volume unit);

$EF_{CO_2,i,y}$  is the CO<sub>2</sub> emission factor of fossil fuel type  $i$  (t of CO<sub>2</sub>/GJ);

$EG_{m,y}$  is net electricity generated and delivered to the grid by power plant  $r$ /unit  $m$  in the year  $y$  (MWh);

$m$  stands for all power plants (units) serving the grid in the year  $y$  except low-cost/must-run power plants/units;

$i$  are all fossil fuels types combusted in power plant/unit  $m$  in the year  $y$ ;

$y$  stands for the three most recent years before the year of submitting the document, for which the data are available.

The operating margin emission factor calculated by the above way was equal to 0.533 t of CO<sub>2</sub>/MWh.

As for calculation of the emissions resulting from the electric power plants introduced into the system, the “Tool to calculate the emission factor for an electricity system” recommends that the following plants be considered:

- a) the set of five power units that have been built most recently; or
- b) the set of power capacity additions in the electricity system that comprise 20 per cent of the system generation (in MWh) and that have been built recently.

According to the above recommendations for calculation of the emission factor from the power capacity additions we should take into consideration the following energy units:

- two 25 MW gas turbine units at the Bereza State district power plant, that have been installed as topping plants for the units #3 and #4 and were commissioned in 2003;
- 330 MW energy unit at the Minsk CHP-5 commissioned in 1999;
- 67 MW Combined-cycle power plant (ИПГУ-67) at the Orsha CHP commissioned in 1998;
- 180 MW cogeneration unit at the Gomel CHP-2 commissioned in 1995;
- 250 MW cogeneration unit at the Minsk CHP-4 commissioned in 1992.

When this proposal on joint implementation project was under preparation, the data on consumption of the fuel and on the supply of electricity for each of the above mentioned units were not available, and so there was no possibility of calculating the emission factor for the power plants introduced into the system for this option.

According to the tentative assessment, the emissions factor resulting from the power plants introduced into the system for this group of energy units may vary within 0.4-0.5 t of CO<sub>2</sub>/MWh. Without introducing a significant error at this stage, this factor may be assumed to be 0.45 t of CO<sub>2</sub>/MWh.

According to the procedure of calculation described in the “Tool to calculate the emission factor for an electricity system”, a combined emission factor is calculated by the following formula:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot w_{OM} + EF_{grid,BM,y} \cdot w_{BM}$$

where  $EF_{grid,OM,y}$  is the operating margin CO<sub>2</sub> emission factor in the year  $y$  (t of CO<sub>2</sub>/MWh);

$EF_{grid,BM,y}$  is the build margin CO<sub>2</sub> emission factor in the year  $y$  (t of CO<sub>2</sub>/MWh);

$w_{OM}$  is a weighting of operating margin CO<sub>2</sub> emission factor (%);

$w_{BM}$  is a weighting of build margin CO<sub>2</sub> emission factor (%).

The following default values are used for the weight factors:

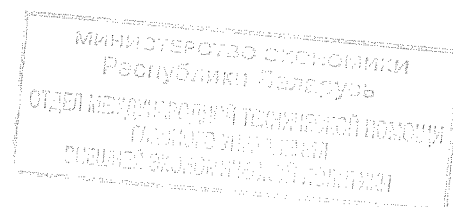
for the projects with solar electric energy plants and wind energy plants  $w_{OM} = 0,75$  and  $w_{BM} = 0,25$ ;

for all the other projects  $w_{OM} = 0,5$  and  $w_{BM} = 0,5$ .

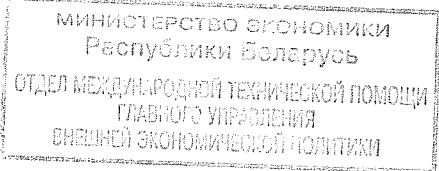
In this case, we use the weight factors specified for the second option.

The combined emission factor for electricity supplied to the grid was equal to 0.492 t of CO<sub>2</sub>/MWh.

The Lukoml State district power plant was considered as the most likely one where the electricity will be generated in case without project. The estimated emission factor at the Lukoml State district power plant was equal to 0.51 t of CO<sub>2</sub>/MWh.



The least value for the calculated factors is the value for the combined emission factor for electricity supplied to the grid, which makes up 0.492 t of CO<sub>2</sub>/MWh.





### 7.9. *Wind Private Finance Initiative Description and Differences with the PIF*

The Wind Private Finance Initiative (“WPF”) is an essential element of the project and will directly facilitate development of a significant number of wind farms in Belarus, provide a learning experience which can deliver model projects, improve confidence and help reduce future costs for project developers.

ИЗАО will be cooperating with Wind Energy Support Unit created by the Ministry of environment. ИЗАО and partly WESU will be funded via the UNDP/GEF Project. Ministry of Environment, as a WESU host, will then enter into a Cooperation Agreement with the winner of the tender for engineering services. This will either be one firm or a consortium of firms. One of the scoring criteria for the tender will be that the organization-winner maintains an office in Belarus. The full criteria for selection are detailed in the terms of reference in the annex to this document. The organization-winner will then receive funding from the Project. The WPF will manage the development of 5 or more projects. All premiums generated from the sale of wind farms at tender will be used to finance the development of additional wind farms.

The WPF will work with experienced project developers only. This means that as a minimum requirement that project developer must have a previous successful track record of having implemented a renewable energy project and must have operating revenues for the past three years. The WPF will not work with companies which are not properly capitalized and do not have an operating track record.

#### **Differences with the PIF**

- The project PIF identified the need for creating an environment for a sustainable wind energy industry in Belarus. The PIF identified the goals of helping to create a “Wind Energy Support Unit”
- creating a Pilot wind farm project of between 1 MW – 5 MW, and
- working with the government on the policy goal of drafting Secondary Legislation to implement the Law on RES,

The Expert Team held a fact finding mission in Minsk from June 26, 2012 – June 29, 2012 and a Project Workshop on October 9<sup>th</sup> 2012 to collect information supporting the best way to create this enabling environment.

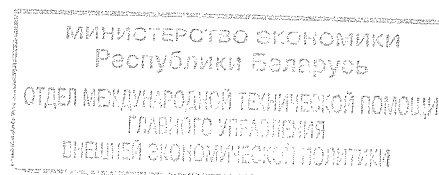
Based on the facts on the ground, the Expert Team’s conclusion is that the best way to achieve the above goals is to modify the method for achieving the goals in the following manner so that the Project can complement the work that the government and other NGO’s are conducting.

In addition to creating a Wind Energy Support Unit, the Project will create a market driven organization (legal entity) that will use investment grant funding for pre-investment development services.

A Project Implementation Unit will be created in accordance with the respective UNDP and Ministry of Environment rules and procedures. The government does not currently have the political will for a cross-ministerial group. However, they have stated that if there is a large volume of wind farm applications, they may see the need. It is expected that WPF activity will help to create the required large volume of applications.

Note well that the Management Arrangements of the Project are in line with the broad outline in the PIF.

WPF will be able to significantly leverage GEF funds by directing them to the most risky part of a wind farm investment – early to mid-stage development activities. The Project will build on the success of the above cited other UNDP/GEF projects.



Due to the different scale of investment in Biomass and wind, it is not feasible for the fund to finance 100% of a project. Even a 5 MW project capitalization, as envisaged by the PIF, is outside the scope of the Project's funding as it would be roughly \$8mln. Rather, the group will perfect development assets bringing them to the "pre-investment" phase. That is to say that the projects are at the point where they will require significant capital expenditure such as paying for deposits on turbines. These Pre-Investment Assets will then be tendered to private developers and investors. The main criteria for respondents to the tender will be their ability to construct the projects. Respondents who meet these criteria will likely also meet the standards of other International Financial Institutions such as the EBRD who are potential partners for this project. In this way, the GEF funding can directly support >25 MW of wind farm nameplate capacity development during the initial Project period.

The tendered assets will have many of similar features as a concession as the WPMI will be entrusting private developers and investors with the implementation and long term operation of the Pre-investment Assets. The WESU, which will be a joint operation between the GEF and the Belarus government, will participate in the risk sharing through its taking and removing development risks via the Cooperation Agreement with the WPMI. The tender process will seek to abide by the criteria established by the EBRD and the United Nations Commission on International Trade Law ("UNCITRAL") among others. The WPMI will utilize a formal competitive tendering procedure for the award. The awards will be negotiated on an arm's length basis and will be in line with market prices.<sup>47</sup>

***The WPMI will prepare and run economic models for the desired level of construction ensuring that the tariff is sufficient to stimulate the desired level of construction.***

The Project will negotiate tariffs with the Ministry of Finance, Belenergo, the state electric utility, and other government stakeholders. The tariffs must be sufficient, based on current financing capacity, turbine pricing, and turbine technology, to incentivize the building of a minimum of 25 MW of wind farms over the next 5 years. The question of how this will be financed is a question of political will. We will present them with projects with a clearing price for 25 MW. If the government cannot or will not subsidize this cost, then we will show them a clearing price for 20 MW and so on.

This figure is certainly higher than the 4.82 – 5.99 Euros per MWh for large projects suggested by the KEMA report.<sup>48</sup> The benchmark set by the Grabniki project, a 1.5 MW Hewind turbine in Grabniki village was 13.59 Euros per MWh. For our analysis we are assuming it was a private project, however, even at this tariff rate, this project would not have met the financial thresholds of the private market. This project received 85% leverage from Chinese debt that. If it were a private project, Grabniki would earn a 14% levered return. This is well below the greater than 20% levered returns that investors will require in Belarus.<sup>49</sup>

The conclusion is that the tariff rates need to be higher. The goal of the project is to establish what the tariff rate needs to be in order to clear the private market.

As stated above, the tenders may generate additional funding. The reason for this is that if the clearing tariff is set at a level that is high enough to finance all of the projects, the better projects will have a structural premium tariff rate. This assumes that some projects may have better economics than others. This is in miniature what happens when a country sets a Feed-in-Tariff rate. The better projects have better economics than other projects even with the same tariff level.

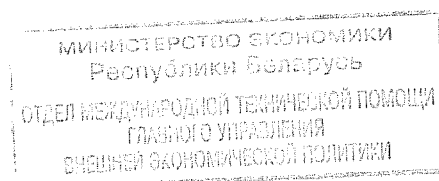
Our proposal is that in Belarus, if there is a premium, the WPMI will capture this premium through the tender process and recirculate this premium through the WPMI. Normally this premium is the developers profit for taking development risk. However in this situation the WPMI will be taking the development

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<sup>47</sup><http://www.ebrd.com/downloads/procurement/concess.pdf>

<sup>48</sup> Table 18 in the Project Document.

<sup>49</sup> See section 1.7.4 in the Project Document



risk and will be charging an appropriate fee. This WPMI structure may be self-sustaining only in the short to medium term. In the long term it is designed to eventually eliminate the need for the WPMI.

The WPMI is not lending money. Rather, it is performing development activities that give the WPMI a principal position in the development assets and selling this interest to developers and investors. At a certain point the premium amount from the tenders will decrease other things being equal.

## TERMS OF REFERENCE

### Wind Energy Support Unit

#### Introduction

During the last decade Belarus has been making efforts supporting development of renewable energy sources and increasing the share of local resources in country energy mix. The Government of Belarus adopted a number of policies aimed at diversification of energy portfolio in the country and improving energy security including inter alia via support of wind energy.

Despite governmental efforts and adoption of a number of policy measures, development of a market place for wind energy has been hampered due to a number of barriers including:

- Inefficient feed-in-premiums,
- Absence of clear guidelines for potential investors, iterative approval procedures, which involves obtaining clearance from the few ministers via uncoordinated process,
- Limited investment capacity and insufficient availability of public funds for financing of initiatives and programmes.

Establishment of a mechanism for mitigating or removing these risks is essential for catalysing development of real projects on the ground via lowering investment risks and streamlining and facilitating project application procedures, harmonise cross-ministerial coordination, provide guidelines related to administrative procedures and present a single point of contact for all inquiries in the field of wind energy.

#### Background

The institutional structure and responsibilities for wind energy are divided across a few ministries, whose activities vary from policy development and capacity building, to provision of technical support and issuing clearance for potential wind sites.

From the project developers' perspective, implementation of wind energy project in Belarus involves application to multiple agencies working on parallel paths, which results in considerable permitting and clearance challenges for project developers. The following diagram indicates the governmental agencies involved in issuing permits and clearances for wind energy projects:

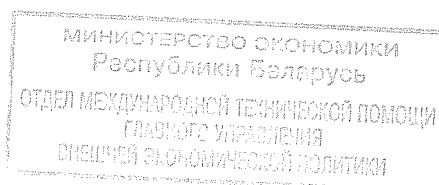
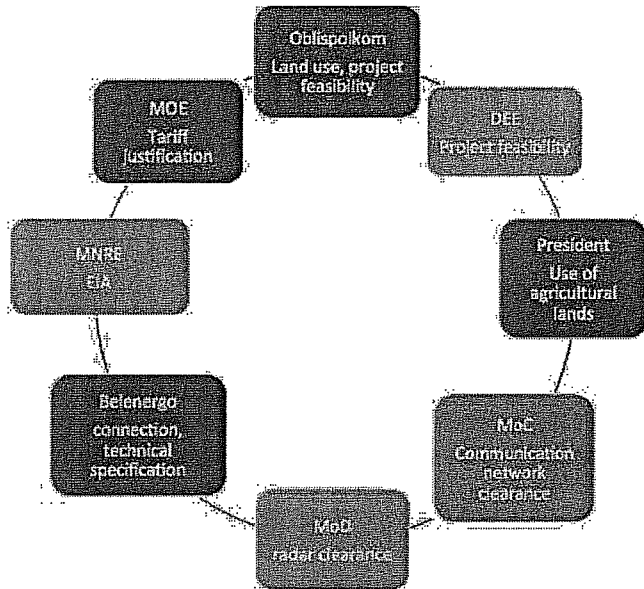


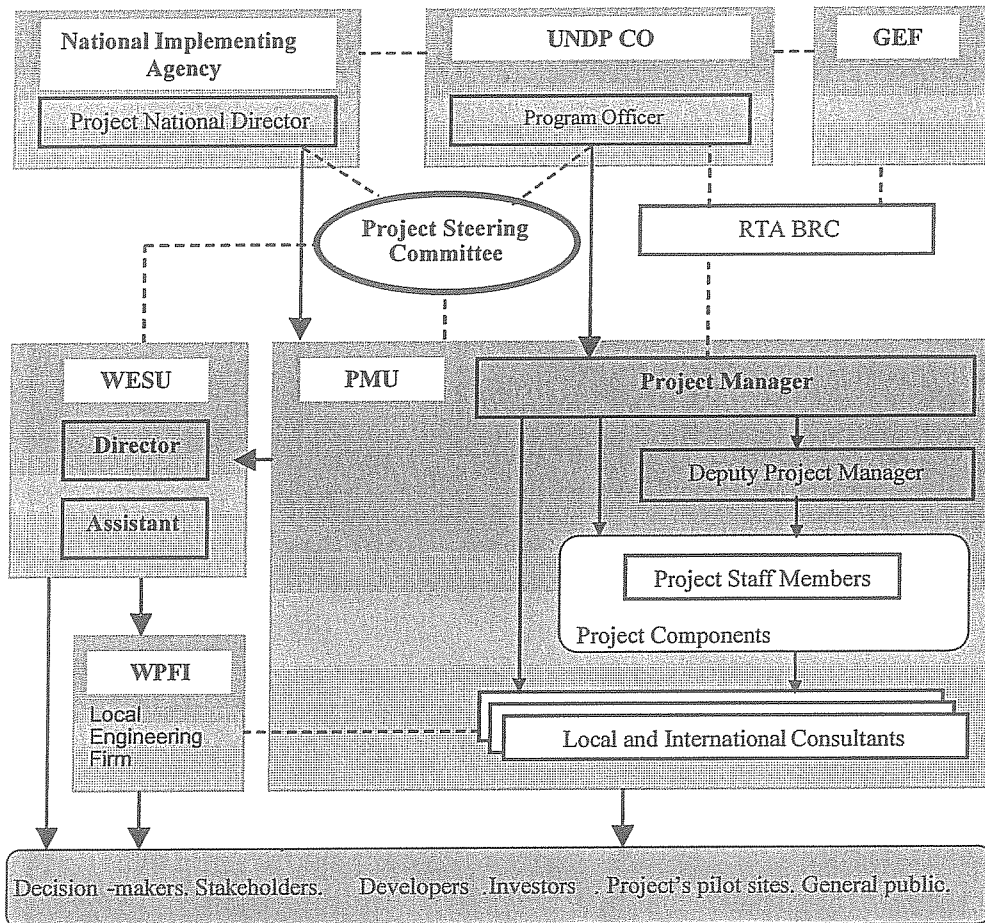
Figure 11: Responsible Ministries and Application



Process

WESU will be established of under the Ministry of Environment to promote the implementation of the UNDP/GEF Project and the subsequent dissemination of its results in the Republic of Belarus. The organizational structure of the interaction WESU with Project Bodies is presented in Figure 12.

Figure 12: Organizational structure



## Objectives

The Wind Energy Support Unit (WESU) will aim at lowering the major technical, administrative, financial and procedural barriers confronted by project-developers and facilitate creation of market-place for wind energy in Belarus by:

- acting as a catalyst and facilitating creation development of wind energy projects including inter alia via information support and coordination with Wind Private Finance Initiative whose functions will include the development of the “pre-investment” assets;
- acting as a one-stop-shop for the wind energy project developers and providing guidance, advice and assistance with regard to application of various standards and administrative governmental procedural and approval requirements related to development of wind energy projects;
- contributing to wind energy policy developments through analysis and systematization of the current wind energy practices, including policy incentives, investment mechanisms, available technologies, integrated systems and equipment and success-failure factors;
- participating in international conference and for a related to wind energy with the goal of attracting additional investment into wind energy in Belarus

### Scope of WESU Work

**Task 1.** With assistance of the UNDP/GEF experts provide coordination for a common approach to support projects in the field of wind energy development in Belarus.

Outcomes:

- Increased awareness of the key policy makers of the key administrative barriers and improved capacity to develop appropriate and effective policy solutions.
- Improved procedures and timing for approval of wind energy projects.
- Developed a typical scheme for wind energy projects applications with a single set of documentation for wind energy projects, including preparation some of investment agreements inter alia.

Outputs:

- Developed application templates and uniform project application documentation including several execution ready Investment Agreements.

Activities:

- Develop and provide clear and consistent instructions related to administrative and permitting procedures in consultation with the key Ministries and in line with the best international practices;
- Support decision making of the key Ministries, especially with respect to establishing a financeable feed-in-tariff, and provide inputs to policy updates based on the lessons learned from implementation of the wind projects;
- Improve the effectiveness of coordination the Ministries, regional and local agencies, private and non-profit organizations, and financial institutions working in the field of wind energy via information exchange;
- Facilitate permitting procedures and financial closure of projects via liaison with the key governmental agencies and financial institutions;
- Collect the best practices and lessons and systematize the knowledge on development of wind energy in Belarus and provide this information to PMU for broad dissemination;
- Provide inputs to development of the cross-ministerial strategy in conjunction with retrieved lessons and information;
- Collect the actual positive results off the WPMI development work and provide these results to the PMU to formulate general guidelines on development of wind energy projects.

**Task 2.** With assistance of the UNDP/GEF experts provide analytical information and suggestions on the development of FiT

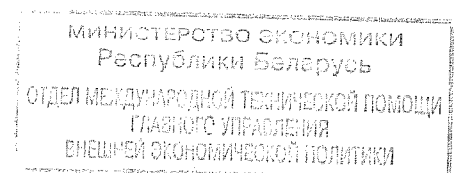
Outcomes:

- Improved effectiveness of investment in wind energy sector

Outputs:

- An ad hoc tariff scheme is developed for adoption by the government as a country wide Feed-in-Tariff.

Activities:



- Prepare analysis on economically viable tariff schemes designed to wind farms based on analysis of the pipeline of screened projects.
- Liaising and exchanging information with WPFI on the best economic approaches for development of wind energy project in Belarus
- Assist PMU with selecting and coordinating outside consultants for implementation of technical assignments on economics of the wind energy projects
- Present and negotiate the FiT to the Ministry of the Economy in the context of the projects initiated by WPFI

### Task 3. Management of Wind Private Finance Initiative (WPFI)

#### Outcome:

- At least 3 to 5 investment agreements signed for commissioning of wind energy projects

#### Output:

- Pre-investment assets are developed by WPFI and tendered for 3 to 5 locations for wind power installations construction

#### Activities:

- Assist PMU with preparation and execution of the tender for selection of the management company for WPFI.
- Monitor and supervise the activities of WPFI to ensure quality control, accountability and compliance with the national standards and regulation.
- Assist PMU with negotiate the draft investment agreements with the relevant ministries regarding the development assets developed by WPFI for further commissioning of wind energy projects

### WESU Staffing

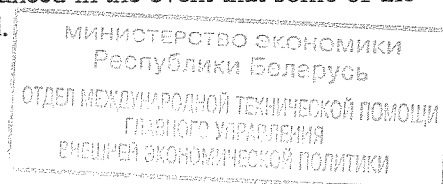
A full-time Director and a full-time Project Assistant will be selected and appointed among the permanent members of the Ministry of Environment for a total period of 60 person-months. However, contracts will initially be for a period of 12 person-months renewable subject to satisfactory performance.

#### *WESU Director*

The Director will have overall responsibility for (i) managing the WESU over the five-year project implementation period, (ii) coordination of WPFI activities, (iii) facilitating the development and financial closure of 3 to 5 wind energy projects.

#### The Director will:

- Manage the WESU activities related to reporting, coordination and liaison with Project Management Unit, including inter alia contribution to selection and hire of external consultants., information exchange and advising
- Coordinate activity with WPFI, monitor the activities of WPFI including inter alia via regular reporting, information exchange and consulting.
- Establish and maintain good contacts with relevant governmental stakeholders, developers and financial institutions to facilitate development and financial closure of wind energy projects.
- Assist with identification of alternative wind projects to be financed in the event that some of the projects identified in the pipeline by WPFI fail to be developed.



Qualifications: The Director will be a senior business development professional who meets the following requirements:

- University graduate with post graduate or professional qualification in business management environmental sciences and/or engineering. MBA would be desirable but it not required
- Working knowledge of business practices, policy and regulation in the field of renewable energy in Republic of Belarus.

Skills:

- Good leadership and team building skills
- Proactive verbal and written communicator skills, including good, active listening skills
- Economic, financial and investment analyses of power projects
- Fluency in both English and Russian

#### *Project Assistant*

Under the guidance and direct supervision of the Director, the Project Assistant provides support to the effective and efficient management of the WESU activities through contributing to the planning, management and monitoring of the WESU tasks. More specifically, the Project Assistant will perform the following duties:

- Make pertinent logistical arrangements for the prompt and effective implementation of the WESU activities;
- Assume overall responsibility for administrative matters of a more general nature, such as registry and maintenance of project files and records;
- Respond to queries from the Ministry of Natural Resources and Environmental Protection and other Governmental Bodies, Project Management Unit and UNDP with respect to WESU activities wherever required;
- Assist in the implementation of informational support of WPMU;
- Undertake other assignments that the WESU Director may deem necessary.

Qualification/requirements

- University degree in economics, finance, accounting, law, public administration
- Minimum of 3 years work experience in project support management and/or public administration in either government or international organizations preferably in the field of renewable energy
- Fluency in both oral and written English and Russian
- Some knowledge of renewable/wind energy is desirable

#### **Budget**

The budget of WESU is presented at **Table 22**. It is assumed that personnel costs will be covered as co-financing by the Ministry of Natural Resources and Environmental Protection. Other costs, including the purchase of office equipment, information, support and capacity building, will be covered by the Project.

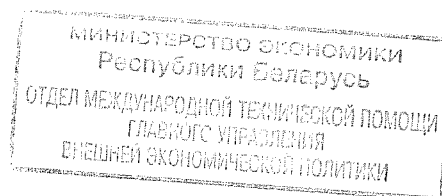




Table 22:

Item	1000 USD
Personnel	81
Director	45
Project Assistant	36
Office support	6
Travel	10
Reporting and publishing	3
<b>TOTAL</b>	<b>100</b>

## TERMS OF REFERENCE

### Wind Private Finance Initiative (WPFi)

#### Objective:

The WPFi Initiative will directly facilitate development of a significant number of wind farms in Belarus, provide a learning experience which can deliver model projects, improve confidence and help reduce future costs for project developers.

The WPFi objective is to prepare pre-feasibility studies, feasibility studies, business plans, and other pre-investment works related to technical design for potential new wind power assets meeting the standards of the international financing institutions for further tendering of at least 5 wind farms with overall capacity of at least 125 MW by private and/or public investors with the goal of commissioning 25 MW during the timeframe of the project. By supporting pre-development activities, the WPFi will decrease investment and institutional risks and earn the right to receive the premiums from the investors acquiring pre-development assets.

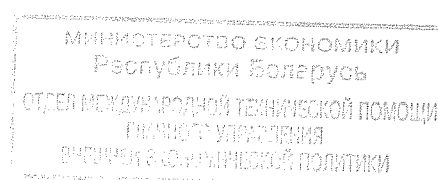
Creation of WPFi will allow developing a standardized project pipeline, accumulating sufficient knowledge on success and failure factors and establish track record for wind energy investments, which will enable future projects to proceed without the need for grant support.

#### Requirements

The tender for managing WPFi scheme will be open to experienced organizations with an operating history of at least 5 years, annual turnover of at least \$1,000,000<sup>50</sup>, and prior successful experience with energy projects and capacity to track record providing services in the following areas:

- Implementation of screening (based on 20 sites identified in Cadastre) and provision of independent verification of the Belarus Wind Atlas in relation to the actual meteorological towers installed by the Project.
- Compilation of feasibility studies for the most favourable sites (3 to 5 locations).
- Independent transmission study confirming that the grid connection point is the closest point to the project site, and that the project's internal transmission requirement does not render the project uneconomical.
- Implementation of engineering works related to erection of meteorological tower on selected sites and collection of meteorological data.
- Environmental impact assessment for selected sites.

<sup>50</sup> If the bidder is a consortium, then the annual turnover criteria shall be for the consortia member performing 50% or more of the work.



A company or a consortia should have a previous track record providing financeable wind reports that have been exclusively relied upon for the provision of project level debt to wind farms by first tier commercial banks with ratings from Standard and Poors of at least “A” and ratings from Moodys Investor Services of at least “Aa2”.

The individual company or a leader of consortium (responsible for over 50% of the work) should be required to have a turnover of at least \$750 000.

### Scope of work

Detailed description of WPMI scope of work is presented in the table below.

Table 23: description of WPMI scope of work

Name of task	Description
Implementation of screening (based on 20 sites identified in Cadastre) and provision of independent verification of the Belarus Wind Atlas	<p>Independent verification of Wind Atlas of Belarus and screening of the sites provided by Wind Cadastre from the perspective of their suitability for development of wind energy projects.</p> <p>Verification and update of baseline information necessary for developing the wind projects on the sites identified by the Cadastre. The information may include the following: Wind resource data; Grid capability and capacity to support wind power development and environmental information to ensure that there are no obvious problems with a site prior to considering it seriously, no conflicting issues with existing military and communication infrastructure.</p> <p>Selection of 3 to 5 sites with the best suitability for conduction of feasibility studies.</p>
Identification of the most attractive sites and compilation of pre-feasibility and feasibility studies	<p>Compilation of economic and financial evaluation of selected sites and the sample wind power projects. These can be either shorter pre-feasibility studies for less advanced projects or more detailed full feasibility studies (including business plan) for more advanced projects. The analyses shall include estimates, of: (i) Economic and financial internal rates of return (EIRR and FIRR), and net present value of the projects; (ii) average incremental economic and financial cost of electricity generated; and (iii) assessment of the financial risks of the project. Cost assumptions with regard to turbines and associated equipment, engineering and administration, installation and interconnection, operation and maintenance, cost of alternative energy displaced, foreign exchange and interest rates, and other financial and economic assumptions.</p> <p>Sensitivity analysis must be completed to identify and quantify changes in financial and technical parameters necessary to ensure project viability. Recommendation of fiscal and other incentives and strategies necessary to enhance the financial and economic attractiveness of the projects should be developed as well.</p>
Engineering works related to erection of meteorological tower on selected sites and collection of data	<p>Development of technical specifications for procuring wind monitoring equipment based upon the number of sites selected for analysis, as well as the total land area and terrain characteristics of each site.</p> <p>Installing the wind monitoring equipment at the selected sites in the selected regions and executing detailed wind resource assessments and analysis for each site. The assessment work will follow international standards for 10-minute data recovery, error checking and data replacement, investigating causes of erroneous data (including weather related reasons), data analysis,</p>

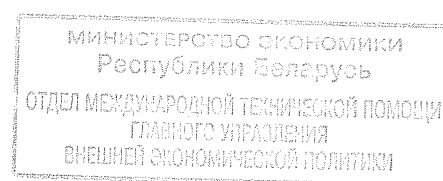
	<p>correlation with neighbouring wind monitoring stations and long-term wind speed data, and reporting.</p> <p>Submission of monthly wind resource analysis reports on each of the monitored sites to the Wind Energy Unit for their review and feedback.</p> <p>After 12 full months of data collection at each site, the consultant will submit an annual report summarizing the wind resources at each site.</p> <p>Preparation of a financeable wind report, using standards that are acceptable to banks and IFI's, for the site including up to 5 options for the turbine selection. [This can cost up to \$50k per report]</p>
Environmental impact assessment for selected sites	<p>Conduction of an environmental and social screening of selected site in line with the international standards approved by the World Bank and IFIs.</p> <p>The Environmental Impact Assessment will include but not necessarily be limited to:</p> <ul style="list-style-type: none"> <li>– Likely impacts of the development, including potential liabilities for the Developer/Investors on the described environment, including direct, indirect and cumulative impacts, and their relative importance to the design of the development's facilities.</li> <li>– Mitigation action to be taken to minimize predicted adverse impacts if necessary and quantify associated costs.</li> <li>– Monitoring Plan that should ensure that the mitigation plan is adhered to.</li> <li>– Alternatives to the project that could be considered at that site or at any other location including no action alternative.</li> <li>– A preliminary phase of this report will include a review of potential radar and aviation issues including potential mitigations.</li> </ul> <p>Conduction of public presentation(s) on the findings of the EIA to inform, solicit and discuss comments from the public on the proposed development.</p>
Tendering	<p>Designing tendering procedures in accordance with the requirements of the IFIs and in consultation with WESU.</p> <p>Developing tender dossier including: general conditions, currency of the tender, technical specification and time for performance, guarantees forms from the banks or similar institution.</p> <p>Implementing tendering process and selecting the winning bids in conjunction with developed evaluation criteria.</p>

### WPFI Staffing

In addition to the engineering firm selected by tender, the WPFI will be staffed by two development professionals. The skill set of these professionals will be business oriented and will be complementary to the mainly technical skills of the engineering firm.<sup>51</sup>

A full-time Director of Development and a full-time Project Assistant will be required for a total period of 60 person-months. However, contracts will initially be for a period of 12 person-months renewable subject to satisfactory performance.

<sup>51</sup> The engineering firm that is selected will have the option to have these two professionals as employees or as contracted consultants. In either case, their salaries are to be paid by the Project.



### *Director of Development*

The Director will have overall responsibility for (i) managing the development activities of the WPMI over the five-year project implementation period, (ii) facilitating the development and financial closure of 3 to 5 wind energy projects.

The Director will:

- Manage the WPMI activities related to reporting, coordination and liaison with Project Implementation Unit, including inter alia contribution to selection and hire of external consultants, information exchange and advising;
- Manage the contract with WPMI, monitor and supervise the activities of WPMI including inter alia via regular reporting, information exchange and consulting;
- Establish and maintain good contacts with relevant governmental stakeholders, developers and financial institutions to facilitate development and financial closure of wind energy projects;
- Assist with identification of alternative wind projects to be financed in the event that some of the projects identified in the pipeline by WPMI fail to be developed.

Qualifications: The Director will be a senior business development professional who meets the following requirements:

- University graduate with post graduate or professional qualification in business management environmental sciences and/or engineering. MBA would be desirable but it not required;
- Working knowledge of business practices, policy and regulation in the field of renewable energy in Republic of Belarus;
- We are currently budgeting \$120,000 over 60 months for the Director. However, the position may require a higher salary in order to attract personnel with adequate background and experience.

Skills:

- Good leadership and team building skills;
- Proactive verbal and written communicator skills, including good, active listening skills;
- Economic, financial and investment analyses of power projects;
- Fluency in both English and Russian.

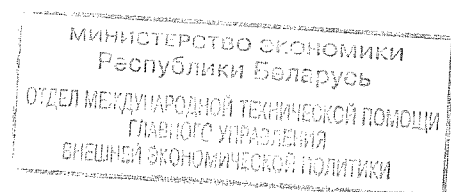
Qualifications:

- University graduate with post graduate or professional qualification in science, environmental studies or engineering;
- Minimum of five years of international experience with proven expertise in wind power project development;
- Working knowledge of business practices, policy and regulation in the field of renewable energy in Republic of Belarus.

### *Project Assistant*

Under the guidance and direct supervision of the Director of Development, the Project Assistant provides support to the effective and efficient management of the WPMI activities through contributing to the planning, management and monitoring of the WESU tasks. More specifically, the Project Assistant will perform the following duties:

- Make pertinent logistical arrangements for the prompt and effective implementation of the WESU



activities;

- Assume overall responsibility for administrative matters of a more general nature, such as registry and maintenance of project files and records;
- Assist with financial management: prepare requests for advance of funds and/or direct payments; Monitor budget expenditures and maintain a proper record of approved project budgets and their revisions; Prepare and submit expenditure and programme budget status reports;
- Respond to queries from the Government, Project Management Unit and UNDP with respect to financial aspects of the programme, liaise with appointed and external auditors wherever required;
- Assist with oversight of WPFII activities;
- Arrange for procurement of equipment, supplies and services;
- Undertake other assignments that the Director of Development may deem necessary.

#### Qualification/requirements

- University degree in economics, finance, accounting, law, public administration;
- Minimum of 3 years work experience in project support management and/or public administration in either government or international organizations preferably in the field of renewable energy;
- Fluency in both oral and written English and Russian;
- Some knowledge of renewable/wind energy is desirable.

#### Budget

The budget is based on the assumption that at least 5 investment agreements for commissioning of the wind energy projects will be prepared with support of the WPFII. WPFII will be fully financed by the grant from GEF. The WPFII budget will pay for the following services:

Site ranking and selection

Procurement and installation of met towers

Collection of and monitoring of wind data

Financeable wind report/confirmation of wind atlas

Radar clearance review (establish that the wind farm does not interfere with civilian or military radar and systems)

EIA

Transmission review/optimal grid connection point

Financial analysis, business plan, feasibility study

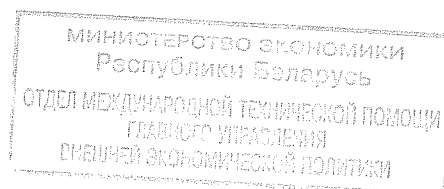
Tendering

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Director of Development

Assistant Director of Development

#### Terms of Reference



**Project Manager (PM):**

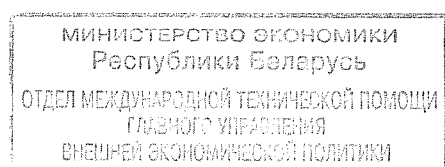
**Duties and Responsibilities:** The PM will be responsible for implementation of the project, including mobilization of all project inputs, supervision of project staff, tendering for consultants and oversight of sub-contractors. In order to ensure the independent work of the WPFI, the PM's role with regards to the WPFI will be limited to (A) overseeing the tender and consultant selection process (B) receiving reporting from the WPFI. The PM will be the leader of the Project Implementation Team and shall liaise with the Ministry of Environment, UNDP, CIU managers, and all stakeholders involved in the project. S/he will be specifically responsible for (a) overall supervision of the project; (b) work closely with project stakeholders and ensure the project deliveries as per project document and work plan; (c) ensure technical coordination of the project and the work related to legal and institutional aspects; (d) mobilize all project inputs in accordance with UNDP procedures and GEF principles; (e) finalize the ToR for the consultants and subcontractors; (f) supervise and coordinate the work of all project staff, consultants and sub-contractors; (g) ensure proper management of funds consistent with UNDP requirements, and budget planning and control; (h) prepare and ensure timely submission of monthly reports, quarterly consolidated financial reports, quarterly consolidated progress reports, annual, mid-term and terminal reports, and other reports as may be required by UNDP; (i) submit the progress reports and key issue report to the National Steering Committee; (j) prepare quarterly and annual work plan; (k) provide regular input to UNDP corporate system ATLAS for financial and programme management on project progress, financial status and various logs; (l) arrange for audit of all project accounts for each fiscal year; (m) undertake field visit to ensure quality of work; and (n) undertake any activities that may be assigned by UNDP and National Steering Committee

**Qualifications and Experience:** The incumbent should have a minimum Bachelor degree in energy/environment or other relevant academic discipline and profession qualifications with at least five (5) years professional experience at senior level. S/he should have extensive experience and technical ability to manage a large project and a good technical knowledge in the fields related to private sector development, wind power, and institutional development and/or regulatory aspects. S/he must have effective interpersonal and negotiation skills proven through successful interactions with all levels of project stakeholder groups, including senior government officials, financial sectors, private entrepreneurs, technical groups and communities. S/he should have ability to effectively coordinate a complex, multi-stakeholder project and to lead, manage and motivate teams of international and local consultants to achieve results. Good capacities for strategic thinking, planning and management and excellent communication skills both in English and Russian are essential. Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring will be an added advantage.

**Terms of Reference****Administrative and Financial Assistant to PM (1 position):**

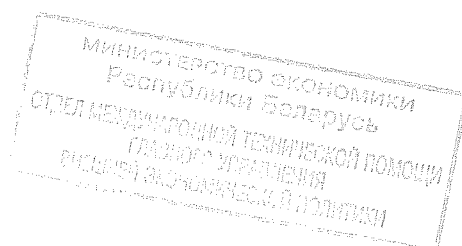
**Duties and Responsibilities:** The incumbent will be responsible to provide overall administration and financial services of the project such as processing payments, raising requisition, purchase order, projects logs etc. using UNDP corporate software ATLAS. S/he will be responsible to provide information to UNDP Project web, RRMC reporting and administrative trouble shooting. S/he will also perform (a) word processing, drafting routine letters/messages/reports, mailing (b) arrange travel, itinerary preparation for project related travels, (c) assist to arrange workshops/seminar/training programmes and mailing, (d) work at reception desk and make appointments and schedule meeting, (e) assist in work-plan and budgeting, (f) photocopying, binding and filing, (g) maintenance of all office equipment and keeping inventory/records of supplies and their usage and any other duties assigned by Project Manager or concerned officials.

**Qualifications and Experience:** The incumbent should have at least a Bachelor degree in any discipline from a recognized university. S/he should have at least 3 years relevant working experience with foreign aided projects or international development or organizations. Computer proficiency in MS Office (Word,



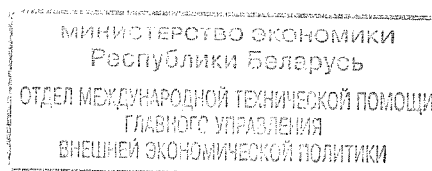
Excel and PowerPoint) and other common software is a prerequisite. Diploma in computer/secretarial science is desirable but not essential. Basic knowledge in procurement, petty cash handling, logistics supports, and filing systems is a basic requirement. Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring is preferable. Fluent both in written and spoken English and Russian is required.

**Narrative to budget line items:**



### 7.10. Capital Cost for the Grabniki Wind Project

Activity and budget items	Cost, in USD
<b>Site preparation,</b> out of which:	<b>7,306.69</b>
Land plot allotment for wind turbine installation (1.3 ha)	624.54
Fertile layer removing	1,918.68
Land plot allotment for power transmission line (203 m)	505.11
Recovery of losses in agriculture and reimbursement of lasting damages	3,759.29
Land planning	499.07
<b>Main construction objects,</b> out of which:	<b>3,491,130.08</b>
Wind converter (ex warehouse delivery)	3,041,800.00
Automatic system for commercial accounting of power consumption	5,236.99
Foundation	67,198.88
Flashlight for air transport alarm	466.54
Main pillar crane rent (Liebherr LTM 1500-8.1)	140,884.29
Transportation of the main crane	194,425.00
Auxiliary crane rent (CMK-5220)	5,911.27
Transportation of the auxiliary crane	16,228.12
Auxiliary crane rent (CMK-5220)	4,896.87
Transportation of the auxiliary crane	4,774.54
Assembling wind tower and converter	9,307.57
<b>Power supply equipment objects,</b> out of which:	<b>41,447.96</b>
Overhead transmission line	10,697.03
Transformer substation and switch-yard	6,577.14
Relay protection	24,173.79
<b>Communication and transportation management objects,</b> out of which:	<b>45,421.47</b>
Spur-track (400 m)	44,993.96
Communication system	427.51
<b>Land recovery</b>	<b>12,584.11</b>
Land improvement and rehabilitation	12,584.11
<b>Sub-total</b>	<b>3,597,890.30</b>
<b>Temporal structure</b>	<b>43,333.00</b>
<b>Other work and outlay</b>	<b>107,382.90</b>
<b>Design work and survey work</b>	<b>74,735.85</b>
<b>Reserve for unforeseen work and expenses</b>	<b>3,369.41</b>
<b>Grand Total</b>	<b>3,826,711.46</b>

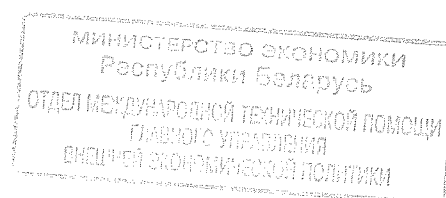




### 7.11. Risk log template

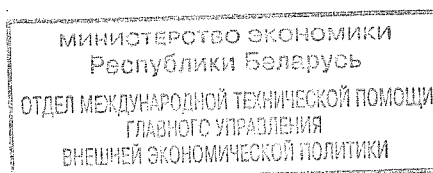
Risk	Rating	Mitigation
Institutional Risks	Medium	Wind energy is not currently a competitive form of energy in Belarus and requires political will to supply adequate subsidies for the tariff rate for wind power – mitigation through the implementation of viable premium tariffs and the Ministry of Economy’s stated goal of providing stimulating tariffs.
Lack of adequate wind resource in Belarus	Low	<p>The wind resource in Belarus, roughly 6.5 meters per second at 100 meters for suitable sites<sup>52</sup>, is not as strong as the wind resource in other countries with a strong wind energy industry – mitigation for this comes in the form of technological innovations and advances in wind turbine technology.</p> <p>Wind turbine technology has improved dramatically since the original PIF. Currently Nordex of Germany, among others, offers a turbine with a 117 meter blade. The power generated by a turbine rises exponentially as the turbine blade increases in length. Consequently, the load factor for turbines with 54 meter blades is more than doubled by the current Nordex-117. In addition to the blades, current turbines can use higher hub heights – increasing from the 70 – 80 meter level to the 90 – 140 meter level today. Wind speed increases at these higher heights.</p>
Private investors do not find wind investments sufficiently attractive	Medium	<p>The project will be working on 5 development projects. One of the key criteria for the development is that the required tariff is sufficient to attract Private Investors.</p> <p>The lack of attractively priced bank debt for projects in Belarus – this risk can be mitigated by working together with potential partners like the EBRD, who in turn will rely on a sound feed-in-tariff and solid development work from the WPFIL.</p>
Government finds is hard to commit to commercially attractive feed-in tariffs and/or other incentives	Medium	Bring in international experience (from other European countries) to advise the Government on setting an appropriate legal and regulatory framework for wind development.
Commodity and Currency exchange rate risk	Medium	Commodity and Currency exchange rate risks can be mitigated through implementation of a best practices feed-in-tariff scheme.
Climate Change Risks	Low	The risks that the impacts from climate change will make it less likely for wind projects to be implemented is low due to the fact that changes in temperature or weather patterns does not affect the commercial viability of wind turbines.

<sup>52</sup> Based on the Wind Atlas as prepared by the MNRE.



## 7.12. *Environmental and Social screening*

*[Refer to separate file for ESSP]*

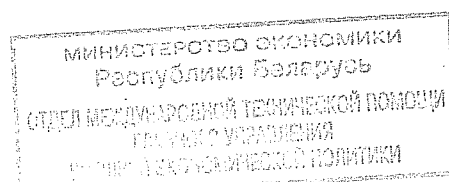


### 7.13. Co-financing letters

Table below is a summary of the co-financing commitments pursuant to the Co-financing Letters communicated by relevant governmental agencies, UNDP and private companies.

[Refer to separate file for co-financing letters]

<i>Table 24: Summary of Co-financing Letters</i> Name of co-financier	In-kind, thousand USD	Cash, thousand USD
Department for Energy Efficiency of the State Standardization Committee	70	
Ministry of Education (Sakharov International State Environmental University)	20	
Ministry of Energy	100	3,000
Ministry of Natural Resources and Environmental Protection (original obligations of Department for Hydrometeorology)	30	80
TDF-Ecotech		20,000.00
Triple LLC		17,000.00
UNDP (in-kind/cash)	300	300
<b>Total Co-financing</b>	<b>520</b>	<b>40,380</b>





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TDF-Ecotech		20,000.00
Triple LLC		17,000.00
UNDP (in-kind/cash)	300	300
<b>Total Co-financing</b>	<b>520</b>	<b>40,380</b>

