



**PROJECT IDENTIFICATION FORM (PIF)<sup>1</sup>**

**PROJECT TYPE: Full-sized Project**

**TYPE OF TRUST FUND: GEF Trust Fund**

**PART I: PROJECT IDENTIFICATION**

<b>Project Title:</b>	Removing Barriers to Wind Power Development in Belarus		
<b>Country(ies):</b>	Belarus	<b>GEF Project ID:<sup>2</sup></b>	4374
<b>GEF Agency(ies):</b>	UNDP	<b>GEF Agency Project ID:</b>	4462
<b>Other Executing Partner(s):</b>	Ministry of Natural Resources and Environmental Protection of the Republic of Belarus / Energy Efficiency Department of State Standardization Committee of the Republic of Belarus / Ministry of Energy / Ministry of Economy/ Ministry of Finance	<b>Submission Date:</b>	13 <sup>th</sup> September 2010
		<b>Resubmission Date:</b>	12 September 2011 30 <sup>th</sup> November 2011
<b>GEF Focal Area (s):</b>	Climate Change	<b>Project Duration:</b>	5 years
<b>Name of parent program: For SFM/REDD+ <input checked="" type="checkbox"/></b>		<b>Agency Fee:</b>	\$304,500

**A. FOCAL AREA STRATEGY FRAMEWORK<sup>3</sup>:**

<b>Focal Area Objectives</b>	<b>FA Outcomes</b>	<b>FA Outputs</b>	<b>Indicative financing from relevant TF, (\$)</b>	<b>Indicative co-financing, (\$)</b>
CCM-3	Favorable policy and regulatory environment created for renewable energy investments	Renewable energy policy and regulation in place	\$450,000	\$1,800,000
CCM-3	Investment in renewable energy technologies increased	Renewable energy capacity installed	\$2,100,000	\$14,000,000 <sup>4</sup>
CCM-3	GHG emissions avoided	Electricity produced from renewable sources	\$350,000	\$800,000
Project management cost <sup>5</sup>			\$145,000	\$500,000
<b>Total project costs</b>			<b>\$3,045,000</b>	<b>\$17,100,000</b>

**B. PROJECT FRAMEWORK**

**Project Objective:** Reduction of barriers to the widespread implementation of wind energy projects in Belarus

<b>Project Component</b>	<b>Grant type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Financing from relevant TF, (\$)</b>	<b>Indicative co-financing, (\$)</b>
1. Regulatory and Legislative Framework	TA	Secondary Legislation in place to support wind energy with the support of the project.	1.1 Developed and adopted 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. 1.2. Formulated and enforced Secondary legislation relevant to renewable energy	\$200,000	\$800,000

<sup>1</sup> It is very important to consult the PIF preparation guidelines when completing this template.

<sup>2</sup> Project ID number will be assigned by GEFSEC.

<sup>3</sup> Refer to the reference attached on the Focal Area Results Framework when filling up the table in item A.

<sup>4</sup> Assumes 10 MW windfarm built in two phases of 5 MW + 5 MW

<sup>5</sup> GEF will finance management cost that is solely linked to GEF financing of the project.

Project Component	Grant type	Expected Outcomes	Expected Outputs	Financing from relevant TF, (\$)	Indicative co-financing, (\$)
			<p>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 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 other cost components, which provide viability for wind farm projects.</p> <p>1.4. A cross-ministerial “Wind Energy Strategy and Development Programme in Belarus” formulated with 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>		
2. Building Capacity and Local Awareness	TA	<p>Increased confidence in the profitability of wind power projects</p> <p>Clear perception of the benefits of wind energy and other RE for power generation by stakeholders and general public.</p>	<p>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</p> <p>2.2. Completed detailed pre-feasibility study and business plan for the selected windfarm whereby the capacity of local investors and developers to prepare feasibility studies, business plans and investment proposals enhanced.</p> <p>2.3. Specialized local engineering and consulting companies with enhanced technical capacity to site, design, install, operate and maintain wind turbines at the selected project site</p> <p>2.4. Introduced wind power topics for an additional subject in RE related curricula of specialized universities and technical institutes.</p> <p>2.6. Completed support for ancillary costs related to the development of a successful windfarm including site visits, permits, approvals, and necessary consents.</p> <p>2.7. 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.</p>	\$250,000	\$1,000,000

Project Component	Grant type	Expected Outcomes	Expected Outputs	Financing from relevant TF, (\$)	Indicative co-financing, (\$)
3. Investment Grant Component – Wind Power Expansion in Selected Areas	Inv	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  Further Investment Grants are made by the Wind Energy Support Unit with Government / Co-Financing Support	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. 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 construction of a pilot wind farm with approx. size of at least 5 MW 3.3. Completed support provided through the investment grant provided for installation and operation of a wind turbine of at least 1MW capacity (investment) to reduce risk to the successful operation of a larger wind farm of at least 5MW (target size is 10MW)	\$2,100,000	\$14,000,000
4. Replication and Sustainability	TA	At least three (3) successful wind farm projects are successfully financed, constructed, and operated in Belarus with assistance from the Wind Energy Support Unit.  Wind Energy Support Unit continues to operate and provide assistance to wind energy projects in Belarus beyond the lifetime of the project.	4.1. Developed and approved Atlas of Wind Potential in the Republic of Belarus that helps identify most appropriate regions for wind farms in the country. 4.2. Completed Initial Pre-feasibility studies, including support for detailed wind measurements, carried out for at least two other potential wind farms with the view of leveraging additional co-financing and development of replication strategy for further investment in wind energy in Belarus 4.3. Completed site study visits during construction and operation of the pilot wind farm by local experts and entrepreneurs. 4.4 Developed, reviewed, revised, finalized and published Lessons Learned study on the pilot wind project is completed and published	\$350,000	\$800,000
Project Management Cost <sup>6</sup>				\$145,000	\$500,000
<b>Total Project Costs</b>				<b>\$3,045,000</b>	<b>\$17,100,000</b>

### C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
National Government	Ministry of Natural Resources and Environment Protection	In-Kind	\$250,000
National Government	Energy-Efficiency Department (EED)	In-Kind	\$1,000,000
National Government	Energy-Efficiency Department (EED)	Cash	\$1,000,000
National Government	Ministry of Energy (MoE)	In-Kind	\$100,000
National Government	Ministry of Energy (MoE)	Cash	\$50,000
National Government	Ministry of Education	In-Kind	\$100,000
Multi-lateral Agency	UNDP	In-Kind	\$300,000
Multi-lateral Agency	UNDP	Cash	\$300,000

<sup>6</sup> Same as footnote #3.

Private Sector	Enertrag AG, TDF Ecotech, Triple LLC, other possible companies to be identified during PPG stage this also includes BelSEFF (to be worked out during PPG phase after project selection)	Cash	\$14,000,000
<b>Total Co-financing</b>			<b>\$17,100,000</b>

**D. GEF RESOURCES REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY(IES): N.A.**

**PART II: PROJECT JUSTIFICATION**

**A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:**

**A.1.1 THE GEF FOCAL AREA STRATEGIES:**

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.

**A.2. NATIONAL STRATEGIES AND PLANS OR REPORTS AND ASSESSMENTS UNDER RELEVANT CONVENTIONS:**

The institutional structure for the implementation of renewable energy and energy efficiency (RE/EE) programmes reflects the concept of centrally planned policies. The state regulations concerning all activities in the field of RE/EE enter into effect through Decrees and Directives of the President of the Republic of Belarus, as well as the country’s Government’s Resolutions. From these documents one can conclude that adoption of renewable energy sources is a topical issue for the Republic of Belarus. The main institution responsible for monitoring and implementation of the government policy in the EE/RES is the Department for Energy Efficiency of the State Committee for Standardization of the Republic of Belarus and at the moment there is no unit within the EED dedicated specifically towards supporting Wind Energy and no Government Programme of Support. Environmental protection aspects of activities in the field of renewable energy are controlled by the Ministry of Natural Resources and Environmental Protection, which will be also responsible, according to the adopted RE Law, for the potential sites determination package and for conducting of a registry of such sites.

Other Ministries involved are Ministry of Economy and Ministry of Energy. A number of policy documents define the country’s energy strategy and goals up to 2020. Key issues in these are the improvement of conditions to ensure security of energy supply and reduction of dependency on energy imports (especially from Russia). It is also mentioned, among others, ‘maximal use of domestic and renewable sources of energy’. The adoption of a “Law on Electric Energy” and a “Law on Renewable Energy Sources” is a requirement of the Energy Safety Concept of the Republic of Belarus and is expected to contain legal basis of state policy in the energy sector and conditions for legal reform in the power sector. The project also supports the draft National Wind Power Development Program for 2009-2015 and further elaboration of how this project will support this program will be elaborated during the PPG stage. The program suggests an action plan for construction of wind power installations of total capacity from 95 MW up to 175 MW and envisages co-investment from public funds in the amount of up to 25% of total investments.

**B. PROJECT OVERVIEW**

**B.1. DESCRIBE THE BASELINE PROJECT AND THE PROBLEM THAT IT SEEKS TO ADDRESS:**

The project seeks to address the problem that despite the fact that there is considerable potential for developing wind energy in the Republic of Belarus, very little serious activity has been undertaken to promote the development of a wind energy industry. Potential investors in wind energy in Belarus would benefit greatly from a GEF project which is able to partne with them for up to 20% of the total investment cost of a selected demonstration wind farm of 5MW or more

(target size is 10MW in two phases of 5 MW + 5 MW to be further elaborated during project preparation). In the baseline project, the renewable energy legislation is in place in Belarus but there is no secondary legislation developed to support issues such as grid access and specific feed-in-tariffs and there is no detailed wind atlas. In addition, there is importantly no institutional support within the government for wind energy in particular. Baseline project activities include limited awareness raising activities, and some study tours and participation in seminars and conferences related to renewable energy of Belarusian experts but still no real investment. 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 24 November 2005. At the Conference of Parties in Nairobi in December 2006 the Republic of Belarus committed itself to limiting the emissions of greenhouse gases (GHG) to 92% of the base year (1990). One of the major driving factors is incentives to be provided for Belarusian industry through the RE Law recently entered in force. It is foreseen that owing to these incentives the share of renewable energy might increase up to 25 per cent. In Belarus today, the net contribution of renewable energy (except for secondary energy sources) into boiler-furnace fuel consumption is about 9.3%. The major share of this value constitutes wood fuel (about 95%). According to some assessments, there is a big potential of different renewable energy sources.

**Table 1-1: Renewable Energy Potential (in thousands of tons of coal equivalent)**

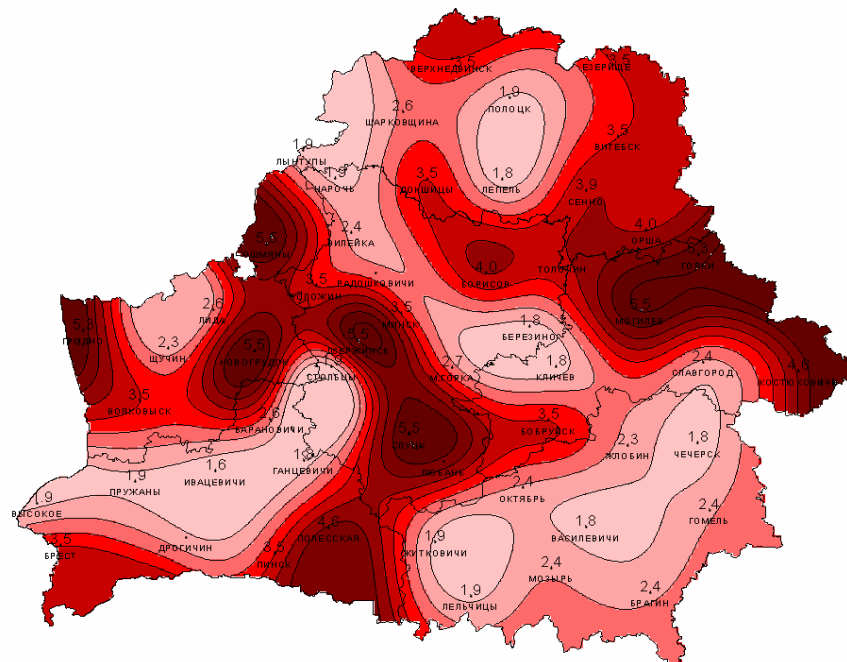
<b>Renewable energy source</b>	<b>Year 2008</b>	<b>Potential</b>
Wood fuel and phytomass waste	1810,0	5080
Wind power	0,4	975
Biofuel	5,1	500
Biogas	3,5	350
Hydro power	10,12	280

According to estimations, wind energy has second biggest 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. The Belarusian Government sees the development of wind energy as a priority for renewable energy development in the country.

### **Status of wind power development in Belarus**

Table 1-1 demonstrates that wind power potential occupies the second position in this assessment after biomass fuel in the Republic of Belarus. Investigations for the development of a wind power atlas of Belarus were conducted in 19980-1990, and perspective sites for installing wind parks have been preliminary identified (1840 potential locations). 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. The wind data show that average annual wind speed at 10-m height in most parts of the country is in the order on 4-5 m/s, but is higher at certain sites (about 8 m/s and more), which are listed in Table 1-2.

Belarusian experts have identified various sites suitable for wind parks in the Republic's territory with a theoretical wind power potential estimated at about 1,600 MW of installed capacity with annual potential for electricity production of more than 3 billion kWh. Several locations have been recently selected for the first stage development of large-scale wind farm installations where the average background wind velocity at 10 m height is around 8 m/s. Such areas are generally thought to be suitable for the construction of large scale windfarms. The following chart provides more information about wind potential annual load (given for a 2.5 MW wind converter at the height of 100 m, in thousand MW-h).



**Table 1-2: Potential Wind Park Locations in the Republic of Belarus**

Name of the location	Oblast	Projected capacity, MW
Liozno Region	Vitebsk	60
Dzerzhynsk Region	Minsk	60
Logoisk Region	Minsk	35
Novogrudok Region	Grodno	17.5
Oshmiany Region	Grodno	25
Smorgon Region	Grodno	15

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, No575 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. Some national programs foresee even more ambitious long-term wind power development. Although specific proposals for investment may come from enterprises and local organizations. For example, the energy production company “Grodnoenergo” has plans for installation of about 1.5 MW in Novogrudok Region of Grodno Oblast . The “BelNeftchem” Concern has plans to develop a wind power farm of 4.5-6.0 MW in Grodno Oblast, now under discussion with Siemens. At least four companies have been approached Belarusian authorities and utilities with proposals to invest in wind power development in the locations mentioned in the table above. Despite this lofty goal, local experience in wind turbine operation and maintenance has been quite limited, local manufacturing of commercial wind turbines is not available and investment proposal (such as the ones mentioned above) usually do not result in the industrial scale wind farm development, due to barriers mentioned below.

In 2000, one 250 kW wind turbine was installed in Dzerzhinsk Region of Minsk Oblast by Aerola Ltd., a local company, but this windfarm is currently not operational due to design defects and is to be upgraded in 2010. Three wind turbines each of 77 kW by the same producer are operated in Korelichy Region of Grodno Oblast since 2008. In 2000-2002, the first industrial scale wind farm was built in Myadel Region of Minsk Oblast with the German charitable grants. The farm has been operational since 2002 and consists of two small wind turbines of capacity of 250 kW (Nordex 29/250) and 600

kW (Jacobs 48/600), supplied from Germany and built by Nordex AG and REpower Systems AG respectively. It should be noted that today it is not possible to determine the precise values of investment and O&M cost in the examples considered due to the fact that these wind turbines were financed with grant support. Nonetheless, from the performance evaluation of these examples it can be revealed that in Belarus, regardless of quite modest experience, wind power development is feasible and in future even prove to be commercially viable if the right incentives are in place.

### **Barriers and Proposed Measures**

Ultimately, the economically justified potential of wind energy in Belarus depends on the economic attractiveness of investments, the wind turbine market opportunities and transfer rate of the technology in the country, the latter being a function of the level of technical competence of society and maturity of relevant legal and institutional infrastructure as well as the level of assurances that can be provided to banks and to providers of capital that wind energy offers an attractive return on investment at an acceptable level of risk. The results of the fact-finding mission organized by the UNDP Country Office (CO) first in November 2009 then August 2010 and finally further analysis in June and July 2011 and subsequent analysis revealed a number of barriers to wind power development in Belarus. Clearly, the barriers remain as the first commercial wind farm is still not built in Belarus. These barriers are listed in Table 1-3 below. Removing these barriers would help the effective implementation of wind energy plans in Belarus.

Therefore, the Government of Belarus approached UNDP Country Office to request assistance on the development of a wind energy project that would help country's capacity building and address removal of the regulatory, institutional, technical, knowledge and awareness-related barriers, as indicated in the table below. Most of these barriers will be addressed by the proposed GEF project with strong collaboration with the Government and other interested investors.

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## Economics of Windfarms in Belarus

### Box 1-1 Wind farm Economics in Belarus

A wind converter of 1 MW (e.g., Nordex or Vestas type) under the conditions below would yield about 1.6 million kWh per year (load factor is 18%). Assuming that a total investment cost of € 6.75 million for five wind converters (for conservative assessment the converter price plus other relevant investment costs is 30% higher than average cost in the European market) and with 20-year lifetime, annual O&M cost of 2.5% of the capital cost and at 11% discount rate, the wind farm performance analysis gives the following theoretical figures:

wind energy converter:	Nordex N-54/1000 kW	mean wind speed at 40 m height:	5.875 m/s
nominal converter power:	1000 kW	mean wind power:	227.1 W/m <sup>2</sup>
rotor diameter:	54 m	annual wind park output:	7884 MWh/a
rotor area:	2290 m <sup>2</sup>	load factor:	18%
maximum power coefficient:	0.431	investment costs:	6.75 million €
number of converters:	5	O&M costs:	168,750 €/a
total wind park power:	5 MW	levelized electricity costs:	0.129 €/kWh

Without feed-in tariffs, the IRR comes to 11.2% based on existing electricity tariffs (€ 0.13/kWh) with a NPV of around 0. If the current feed-in tariff is applied (one-part tariff multiplied by 1.3 during the first 10 years of operation; multiplied by 0.85 thereafter) the IRR would be 14.9% with a NPV of € 1560 thousand. If carbon credits are involved<sup>7</sup> for co-financing and assumption is made that the price would be 5 Euro per 1 tCO<sub>2</sub>eq, the IRR would slightly increase to 15.2% with NPV of € 1706 thousand and payback period of 5.5 years. The financial indicators above may still not be attractive for investment. This suggests various measures for improvement, i.e., increase of load factor by means of proper location, cutting down the capital cost (investment support, use of local constructors and operators, lower turbine price), soft loans (discount rate should be lower than 11% currently established), and appropriate feed-in tariffs (as it should be elaborated in by-laws under the RE Law). Please note that the capacity of the farm for this proposed project is at least 5MW and that many wind farms are constructed in Phases so for example Phase I is 5MW and then phase 2 is 5MW so total capacity is 10MW. This project envisages the establishment of 10MW windfarm ; but it is important to note that it is only during PPG phase that decisions about capacity of the project will be undertaken.

<sup>7</sup> Currently the grid emission factor is 0.466 tCO<sub>2</sub>eq per 1 MWh (Technical Code of Established Practice: Environmental protection and nature use. Climate emissions and absorptions of greenhouse gases Rules to estimate emissions after implementation of energy efficiency measures, use of alternative and renewable energy sources Part 1 - Implementation of energy efficiency measures, hydroelectric, wind-driven, heliion and photoelectric installations. (Draft) Minsk, 2010)



**Table 1-3: Barriers to the Development of Wind Energy in Republic of Belarus**

Barriers	Options
	Current situation
	<i>Proposed project-supported activities</i> (the output numbers correspond with Table A)
<b>Legal and regulatory barriers.</b>	
In the absence of secondary legislation to RE Law there is no integrated, publicly announced and uniformly applicable system in place, defining the conditions and terms for project development, licensing, operations and incentives for each category of renewable energy (RE). This creates lack of trust of RE investors with regard to long-term agreements on energy purchase and tariffs.	<p>The <i>Law of the Republic of Belarus “On renewable energy sources”</i> (hereafter referred to as <i>RE Law</i>) has been adopted in Dec 2010 and enacted in June 2011. Recently adopted Resolution of the Ministry of Economy (No.99, 10.06.2010) allows for feed-in tariffs for power produced from RE sources<sup>8</sup>, while other mechanisms such as state grants on investments and additional incentives (tax incentives, soft loans) might be applicable. These issues are expected to be defined in more detail and in a more coherent way in the by-laws to the RE Law. The RE Law suggests extended length of guarantee for power purchase by the grid and differential rates for RE energy compared to Ministry of Economy’s resolution No.99.</p>
	<p><i>Output 1.3</i></p> <ul style="list-style-type: none"> <li>• The project will support secondary legislation related to RE in Belarus including operationalization of the law, technical norms and standards, in order to facilitate conditions needed for investment in wind energy. Concerning the feed-in tariff, 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 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 other cost components, which provide viability for wind farm projects.</li> <li>• The project will develop recommendations on how to enhance the investment climate in Belarus, focusing on the conditions for investment by local and foreign investors in energy sector.</li> </ul>
Lack of relevant technical standards does not allow ensuring quality control of wind turbines to be installed.	<p>Some pieces and bits of regulation can be found in policy documents and norms regarding electricity generation and relevant technical norms and standards have been developed even in the absence of the fully operational RE Law. As an example, the Ministry of Environment has introduced a technical code of established practice “Guidance for stationing and designing a wind power installation”, TKII 17.02-03-2009. The Guidance takes into account EU standard TK 88 IEC and establishes environmental protection norms and requirements for wind power installation.</p>
	<p><i>Output 1.3</i></p> <ul style="list-style-type: none"> <li>• The project will support the development of technical norms and standards related to wind power application including, e.g., design and construction guidelines and norms, grid connection conditions, site selection requirements (land tenure, exposure, interference area with other facilities, e.g., radars), environmental impact assessment, GHG emission reduction evaluation methods, etc. and harmonization with European norms and standards with utilization of international consulting services</li> <li>• The project will develop standard financial evaluation methods applicable to Belarusian conditions to determine tariffs for wind-based electricity and an appropriate tariff level that would serve as a benchmark for wind power pricing.</li> </ul>
<b>Institutional barriers.</b>	
Lack of an integrated and uniformly applicable decision-making framework does not allow creating the conditions for wind power development.	<p>Development of RE in Belarus remains subject to central planning. However, decision-making is scattered over a number of governmental ministries and entities. Main institutions responsible for monitoring and implementation of the government policy in the EE/RES are the Department for Energy Efficiency of the State Committee for Standardization, Ministry of Natural Resources and Environmental Protection as well as the Ministry of Economy and Ministry of Energy of the Republic of Belarus.</p>
	<p><i>Output 1.1 and 1.4</i></p> <ul style="list-style-type: none"> <li>• The project will provide strengthening of Belarusian institutional capacity to carry out planning, designing and consulting on wind power application (project development, investment appraisals and searching, site evaluation, licensing, negotiating, tendering, construction and operation) by means of the formulation of a cross-ministerial “Wind Energy Development Action Plan in Belarus”.</li> <li>• The project will assist in elaboration and adoption of several necessary legal provisions for institutional arrangements stipulated by the December 2010 RE Law, e.g., RE acquisition by a power</li> </ul>

<sup>8</sup> The feed-in tariff pursuant to Resolution of the Ministry of Economy of Belarus No.99 is not attractive enough, as it stipulates 30% increase of established regular tariff only for the first 10 years of operation. After ten years of operation the wind farm can sell electricity only at 0.85 of the regular tariff. For the wind energy to compete it is important to have higher tariffs and long term guaranteed power purchase agreements.

<b>Information/Awareness and Perception Barriers</b>	
Lack of knowledge and negative perception of wind power still exist among decision-makers, banking sector, energy sector community and general public.	In general, the absence of real “success stories” of wind power in Belarus makes all stakeholders and investors indecisive about viability of this renewable energy option in the country. Local experience in wind turbine operation and maintenance is limited to a few small wind farms (see the main text)
	<p><i>Outputs 2.1, 2.6, 3.1 and 4.1-4.3:</i></p> <ul style="list-style-type: none"> <li>• Awareness raising of decision makers from institutions and investing organizations will be provided to increase understanding and appreciation of wind power investments.</li> <li>• The project will prepare all necessary data ware and provide information services for all stakeholders during the development, construction and operation of a pilot wind farm in a selected site (about a pilot wind farm see below under financial and implementation barriers).</li> <li>• The project will support installation of one demonstration wind turbine (at least 1MW) within a pilot wind farm composition as a means to reduce investment risks</li> <li>• The project will prepare and disseminate reports and other documents on lessons learned and successful application of wind energy in the European Union and other countries.</li> </ul>
<b>Capacity barriers</b>	
Need in trained professionals in relevant fields to ensure proper installation and reliable operation of the wind turbines. Relatively high project preparation cost. There is a lack of local capacity to prepare “bankable” feasibility studies and business plans, and to finalize all the other documentation needed to present projects for financing	There is almost no experience and technical education in the field of wind energy that results in lack of trained professionals in operation and maintenance of wind turbines. Another technical problem is the need in updated wind maps. Existing maps give only an idea of wind energy potential (see the figure in the main text), but not all possible areas have been adequately covered. Recently the Ministry of Environment initiated a study concerning specification of the existing wind map with improved methodological approach and new validated software tools to produce a digital GIS database of wind velocity at different height and with due account of relief specificity.
	<p><i>Outputs 2.2, 2.3, 2.4 and 2.5</i></p> <ul style="list-style-type: none"> <li>• Training for local specialists will be provided to enhance technical capacity to design installations, operate and maintain wind turbines.</li> <li>• The project will provide necessary methodological support for local specialists to meet the measurement standards in the chosen sites as required for bankable proposals (including detailed wind speed measurements).</li> <li>• The project will provide training, know-how transfer and awareness-raising for specialists from engineering and consulting firms to assist in investment justification stage, financing scheme appraisals as well as in other logistical issues where expertise in the country is limited.</li> <li>• A course on wind power engineering will be prepared as a special part in RE related university courses and introduced into curricula and pedagogical practices of high education.</li> <li>• Development and publication of manuals, hand books and brochures promoting wind power as one of RE sources with social, environmental and economic benefits.</li> </ul>
<b>Financial and project implementation barriers</b>	
There are also some strong financial barriers related to lack of reliable info on wind power potential and investment resources, risky investment climate and relatively high loan interest rate practicing by local banks. No carbon financing is foreseen in current financial schemes for wind energy	There is already a set of proposals by Belarusian industries and companies for building wind farm installations as well as there are some programs related to wind energy development including measures on construction of concrete installations and co-financing through public funds (see the main text). The project will examine different means whereby project developers can gain access to finance on preferable terms for wind farm projects and support for business.
	<p><i>Outputs 3.1, 3.2 and 4.1</i></p> <ul style="list-style-type: none"> <li>• Local sources of public and private financing will be identified and assured.</li> <li>• The project will develop all necessary documents (PIN and PDD) to enable carbon financing the wind energy projects through Kyoto compliance and voluntary GHG emission reduction markets</li> <li>• The project will help with feasibility study, wind assessment, business planning, banking proposal preparation, negotiation with potential investors, etc. to enable demonstration (construction and operation) of a pilot wind farm at the best selected sites.</li> </ul>

The most effective means of overcoming these barriers will be further explored as part of the PPG activities.

## **B.2. INCREMENTAL COST REASONING AND THE ASSOCIATED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED BY THE PROJECT:**

Under the business as usual scenario, it is expected that the approved RE Law enacted in December 2010 will provide a more sound basis for the commercial development of renewable energy sources in Belarus but it is not expected that any large windfarms will be built in the next few years. This will no doubt favor those renewable energy sources for heat and power generation, of which there is considerable experience in Belarus, such as wood and wood waste or small hydropower. However, it is much less certain that wind power development will be favored either in the new law or in the

secondary regulations which will accompany it. In Belarus, there is much less know-how and hands-on experience in wind power development and without proper regulatory basis, institutional strengthening and capacity building activities for relevant companies, wind power will take off with great difficulty, despite the nascent interest from some local companies. Therefore a do-nothing scenario with regard to wind power development is a likely alternative option in the field of RES in Belarus. The GEF funds will only be used to support activities which would not take place under a business-as-usual scenario and in particular the investment support of up to 20% of the investment cost of at least one pilot wind farm of at least 5MW (target size is 10MW with co-financing of at least USD 14 million). The project will support the process of developing windpower in Belarus by overcoming other key barriers listed before in Table 1-3. By the end of the project, it is expected that:

- The Government will follow up the RE Law of December 2010 by developing and adopting a legal and regulatory framework including new secondary legislation and regulations that will be conducive for grid-connected wind power development, including appropriate feed-in tariffs as well as other financial incentives and mechanisms to leverage financing for investment;
- A Wind Energy Support Unit will be established and operational within the Energy-Efficiency Department providing comprehensive support to all potential developers of wind energy projects in Belarus. Operational Costs of the Unit will be covered by the co-financing contribution of the Energy-Efficiency Department (EED). The Wind Energy Support Unit will develop a Wind Energy Strategy and Action plan for the development of Wind Energy in Belarus. With the assistance of the Wind Energy Support Unit and the project, local institutions, project developers and investors will have enhanced capacity to identify, develop and implement commercially feasible wind energy investment projects;
- Under the conditions created by the given project and with support from a GEF investment grant for one turbine of 1MW for up to 20% of the total investment costs a pilot wind farm of around 5 MW will be successfully commissioned and people will be trained to ensure reliable operation and regular maintenance of this and future wind farms - further investment grants (as required) will be funded by the Government of Belarus to avoid the GEF investment grant being a one off;
- Additional local and international financial resources will be identified to facilitate the implementation of future investment projects.

While the CO<sub>2</sub> emission reduction, associated with the pilot wind farm will be relatively small, the global environment benefits are expected to be much greater because longer term institutional support and capacity will have been provided to wind energy. The project will have paved the way for future, commercially viable, wind power projects resulting in less dependence on fossil fuel imports, reduction in carbon emissions and associated environmental, social and economic benefits in the long-term. A Wind Energy Support unit within the EED will have been established to give long-term support to developers of wind power projects in Belarus. If a one tenth of wind power generation potential is realized in Belarus, i.e., if about 300 million kWh per year is produced, the associated GHG emission mitigation value would be about 140 thousand tCO<sub>2</sub>eq per year, or up to 10% of the country's annual emission reduction projections. The global environment benefits of this project will be further estimated and refined as part of the PPG activities.

**B.3. DESCRIBE THE SOCIOECONOMIC BENEFITS TO BE DELIVERED BY THE PROJECT AT THE NATIONAL AND LOCAL LEVELS, INCLUDING CONSIDERATION OF GENDER DIMENSIONS, AND HOW THESE WILL SUPPORT THE ACHIEVEMENT OF GLOBAL ENVIRONMENT BENEFITS. AS BACKGROUND INFORMATION, READ [MAINSTREAMING GENDER AT THE GEF.](#):**

The project will aim to achieve the following socio-economic benefits as follows:

- (1) Creating new "green" jobs. The project will promote wide development of the wind energy sector in the country which will lead to creating of new jobs for wind turbine operation and maintenance, and, in the future, for manufacturing of equipment for wind energy in Belarus, including gender balance into the 'green jobs'
- (2) Improving country's energy security. With respect to energy used by the country, Belarus currently is dependent heavily on fossil fuels and energy exported from Russia. Promoting the wide use of local renewable energy sources, the project contributes to improvement of the security of energy supply to the Belarusian population. With prices of Russian gas and oil likely to increase further, energy generated from renewable sources may appear cheaper in the future for the population than energy generated from the conventional fossil fuels.
- (3) Catalysing public-private partnerships and social and environmental responsibility of businesses: the project will increase awareness among private companies operating in the country of the importance of tackling climate change and propose / pilot public-private partnership in the most important energy sector.

- (4) The proposed GEF project will help in the development of a 5 MW pilot wind farm to be installed most likely in Grodno Oblast in a location where an average wind speed on the wind turbine hub height exceeds 5 m/s. In this case, we link the direct emission reduction to the pilot wind farm development associated with the project. Assuming a 5 MW wind farm, annual emission reduction would be 3,674 tCO<sub>2</sub>eq per year. Given the expected lifetime of a wind turbine of 20 years, cumulative emission reduction would be 73,479 tCO<sub>2</sub>eq.
- (5) Being a capacity building project, the largest impact typically lies in long-term outcomes of the barrier removal activities achieved after the GEF project's completion. GEF's Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects (GEF/C.33/Inf.18) suggests a default replication factor of "three" for demonstration projects with capacity building (bottom-up approach). Thus, indirect emission reductions are 220 kilotonnes of tCO<sub>2</sub>eq, which corresponds to about € 2 million.
- (6) The RE Law will help raising wind power market incentives in Belarus. Today, the electricity one-part tariff for industries is 13 Eurocents per kWh. Under existing loan interest rate (11%) this can provide more or less attractive revenue and acceptable IRR only for a wind farm with total investment cost lower than 1100 Euro per kW of installed capacity. The feed-in tariff can help raising commercial attractiveness of investments in wind power in Belarus up to the extent of 1400 Euro per kW of total investment cost. Therefore, it is important that the GEF Project addresses establishing a feed-in tariff for electricity produced by a wind farm.
- (7) It should be noted that existing level of communities' involvement in decision-making with regard to RES is relatively low in Belarus. The GEF Project will facilitate the dialog between specialists, decision-makers and general public through educational process and information intervention. The effected communities and NGOs will be involved in a decision-making process regarding pilot wind farm site specification. They will also be involved in providing input to the secondary legislation and technical standards, the wind energy strategy and development programme and the wind energy atlas with requests for comments and feedback. The project will organize and hold round-tables where local communities, and NGOs will be also invited in discussions on RE-related issues.

**B.4. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS THAT MIGHT PREVENT THE PROJECT OBJECTIVES FROM BEING ACHIEVED AND IF POSSIBLE, PROPOSE MEASURES THAT ADDRESS THESE RISKS TO BE FURTHER ADDRESSED DURING THE PROJECT DESIGN**

<b>Risk</b>	<b>Rating</b>	<b>Mitigation</b>
Political Risks	Medium	Private sector investors under conditions of control by their Belarusian partners, which almost all are State-owned, are yet reluctant in investing into RE. Provisions for a less controlled environment were recently adopted in President's Directive No.4 and Decree No.72, which provide a serious incentive for private sector investors to invest. Another critical issue is a securing on grid access guaranties within the law that also was recently addressed in the RE Law level, although a whole set of respective technical norms and standards for wind parks have not been developed yet and will be addressed in the given GEF project. Adoption of appropriate by-laws in support of the RE Law will be assured through involvement of stakeholders concerned at all preparatory stages and through intensive involvement of project experts in conciliation processes.
Private investors do not find wind investments sufficiently attractive	Medium	Bring in development and private banks to have an appropriate financing mix, while the Government provides the basic regulatory framework regarding feed-in tariffs, incentives and concession/licensing terms and conditions. The project will help prepare high quality feasibility study, investment appraisal, business plans, bankable proposals that helps decision-making by financial institutions. The project will assist site selection for the first pilot wind farm with one of the best wind potential resources. The recent launching of EBRD's BelSEFF should help to make projects more attractive as project developers should have access to credit at lower interest rates.
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.
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.
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**B.5. IDENTIFY KEY STAKEHOLDERS INVOLVED IN THE PROJECT INCLUDING THE PRIVATE SECTOR, CIVIL SOCIETY ORGANIZATIONS, LOCAL AND INDIGENOUS COMMUNITIES, AND THEIR RESPECTIVE ROLES, AS APPLICABLE:**

The following key stakeholders will be involved in the project

<b>Key Stakeholder</b>	<b>Proposed Role in Project</b>
Ministry of Natural Resources and Environmental Protection of the Republic of Belarus	The Ministry is the main Governmental agency in charge of environmental control and nature protection in Belarus. The key responsibilities include: (i) to elaborate and pursue a common public policy in environmental control and rational utilization of natural resources; (ii) to exercise integrated environmental control in the country, coordinate activities of other republican bodies of state administration and corporate bodies along these lines; (iii) to exercise state control over environmental protection and nature management; (iv) to make public aware of the environmental conditions and actions taken for environmental recovery, (v) to establish a system of environmental education and training, and (vi) to interact with public environmental associations to maintain international ties within its competence. The Ministry of Natural Resources and Environmental Protection of the Republic of Belarus will act as a national executing agency for this project (subject to be further confirmed at PPG stage).
The State Committee on Standardization of Belarus and its Department on Energy Efficiency	The State Committee on Standardization of Belarus and its Department on Energy-Efficiency is the main Governmental body in charge of policy coordination in the sphere of energy efficiency, renewable energy, development and enforcement of technical norms and standards, and metrology. The Committee performs evaluation of conformance and oversight of construction, exercises control for compliance of projects and budgets with established norms and standards, and checks rational usage of fuel, power and heat energy. The Department on Energy Efficiency under the State Committee of Standardization of Belarus will be a key partner in the implementation of this project, in particular through the establishment and funding of a Wind Energy Support Unit located within the EED and funded by the EED which will play a lead role in supporting the development of wind energy in Belarus including executing the investment grant component of the project
Ministry of Energy	The Ministry of Energy and its BelEnergо Concern play significant role as major power generation and distribution agencies. The Ministry is responsible for the entire energy mix in Belarus and performs as a principal governmental agency in implementation of 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, No575 of 15.11.2007). The BelEnergо Concern will be a key negotiator for a pilot wind farm installation and grid connection.
Ministry of Economy	The Ministry of Economy will be an important counterpart of the GEF Project in discussing and establishing best environment for wind power market incentives including relevant by-laws, which drafts are to be elaborated under the GEF Project.
EBRD	The EBRD manages the BelSEFF (Belarussian Sustainable Energy Financing Facility) which makes loan to public and private sector borrowers investing in renewable energy and energy-efficiency projects in Belarus. The project will seek to cooperate closely with BelSEFF.
Private Sector	Private companies, national and international, interested in developing wind energy in Belarus will provide co-financing of the project pilot activities and will be operating the pilot wind turbines. The companies will be identified at the stage of full- fledged project formulation.
National Environmental NGOs	Belarusian environmental NGOs will be involved in project activities related to raising population awareness and in public events dedicated to promotion of the project objectives and successful results.

Other key stakeholders for this project will be identified as part of the PPG activities.

## **B.6. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:**

Currently, there are no concrete plans to invest in wind farms in Belarus from multilateral and international financial sources (only pre-liminary interest) and with the exception of the EBRD BelSEFF (Belarussian Sustainable Energy Financing Facility) which started in early 2011, there are no other donor funded initiatives currently ongoing in Belarus to promote wind energy with the World Bank renewable energy legislation harmonization project finished in late 2010. There is no single government agency with a mandate to specifically promote and support wind energy such as for example the Wind Energy Support Unit of the EED, to be created under this project and funded by the EED. Several private sector companies are involved in preliminary activities but there is no concrete large scale investment committed, to date, a situation which is exacerbated by the current financial situation of the Belarusian economy. European financing institutions, such as the European Investment Bank (EIB) are not active on wind power in Belarus. However, the EBRD has a new initiative called the BelSEFF (Belarussian Sustainable Energy Financing Facility) and it is envisaged that the project will explore ways in which to cooperate with this Facility, in particular through linking the work of the Wind Energy Support Unit to the loans made by BelSEFF. The World Bank has several ongoing activities in its agenda in order to support different initiatives and invest in renewable energy and energy efficiency. One of the relevant initiatives recently accomplished by the World Bank is the project “Belarus: Renewable Energy Legislation Harmonization with the E.U.” that was completed in late 2010. The objective of this project was to advise the Government of Belarus on the harmonization of the legal and regulatory frameworks, as well as technical standards and requirements related to renewable energy (primarily biomass, wind, and hydro) of Belarus and that of the European Union. The outcome of the World Bank’s project is a report that has revealed major gaps between the existing renewable energy legal provisions in Belarus and the European Union. The proposed GEF project will follow up this World Bank’s initiative in order to build upon the recently enacted renewable energy legislation focusing on the secondary legislation. The GEF Project will utilize recommendations from the WB advisory services with regard to the harmonization of the RE legal and regulatory framework, as well as technical standards and requirements of Belarus with that of the European Union, and will prepare, on the basis of RE Law, the drafts of by-laws and regulations to be adopted and applied specifically to wind power development. There may be other potential project partners capable to contribute in the wind energy development in Belarus, e.g. UNECE’s Sustainable Energy Division, and such agencies like NEFCO and DENA interested in energy sector in Belarus. These potential partners and opportunities for collaboration will be further explored during the PPG phase.

## **C. DESCRIBE THE GEF AGENCY’S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:**

The project is a climate change capacity building / technical assistance intervention on renewable energy that falls under UNDP’s comparative advantages as presented in Annex L of the document GEF/C.31/5 rev.1. The project does not deal with large scale investment but rather technical assistance activities aimed at promoting investment in wind energy in Belarus.

### **C.1. INDICATE THE CO-FINANCING AMOUNT THE GEF AGENCY IS BRINGING TO THE PROJECT:**

The UNDP Belarus Country Office has preliminarily committed US\$ 600,00 from its core resources as co-financing of the project which is a significant increase of \$500,000 over previous submission of this PIF. This shows the strong commitment of UNDP to this project. This funding will cover awareness raising activities related to the benefits of renewable energy, and support for training and study tours which are not provided for in the GEF financing. This is subject for further consideration as part of the PPG activities. Additionally, UNDP will help to facilitate the private sector investment in the pilot 5MW+ windfarm (target size is 10MW).

**C.2. HOW DOES THE PROJECT FIT INTO THE GEF AGENCY’S PROGRAM (REFLECTED IN DOCUMENTS SUCH AS UNDAF, CAS, ETC.) AND STAFF CAPACITY IN THE COUNTRY TO FOLLOW UP PROJECT IMPLEMENTATION:**

The final draft UNDAF for Belarus (which has been agreed with the Government and is currently under approval by the Council of Ministers of Belarus) includes Agency outcome 3.1. National capacity to mitigate and adapt to climate change enhanced. Under this Outcome, it is expected to increase national capacity and improve investment climate for wide use of renewable energy sources in Belarus. The proposed project is fully in line with the UNDP Country Programme Document (CPD) for Belarus for 2011-2016 which states that "UNDP will assist Belarus with further developing the country’s capacity to mitigate and adapt to climate change. UNDP will provide the Government with capacity building support to help meet the country’s obligations under the environmental conventions ratified by Belarus." The CPD 2011-2016 among its outputs includes Output 3.1.2. "National legal and institutional frameworks for the use of renewable energy sources, particularly wind energy, strengthened." Outcome 3 of the CPD is for enhancing environmental sustainability and has a budget of us\$3.5 million. Of this us\$3.5 million approximately us\$1 million is targeted at measures to improve renewable energy and energy-efficiency of which us\$600,000 is committed as co-financing to this project.

The UNDP Belarus Country Office’s structure includes a Programme Unit (9 people), Programme Support Unit (3 people), Finance Unit (3 people), Procurement Unit (3 people), HR Unit (2 people), and Logistics Unit. In the Programme Unit, two officers have experience in running GEF projects (and are currently supervising GEF financed projects). One of them has an MSc degree in Environmental Sciences and Policy from the Central European University, and the other one has a Master in Public Administration degree from the Harvard University. Specialists from the Finance and Programme Support have intensive experience in processing payments under GEF project, including budgeting and financial monitoring of GEF projects expenditures. The Procurement Unit has been procuring goods and services within GEF projects for more than 5 years; and the HR specialists have been recruiting and administering national and international experts for GEF projects for several years.


**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):**

<b>NAME</b>	<b>POSITION</b>	<b>MINISTRY</b>	<b>DATE (MM/DD/YYYY)</b>
Mr. Vladimir Tsalko	Minister of Natural Resources and Environmental Protection of Republic of Belarus	Ministry of Natural Resources and Environmental Protection of Republic of Belarus	August 2010
Mr. Vitali Kulik	First Deputy Minister, GEF Operational Focal Point in Belarus	Ministry of Natural Resources and Environmental Protection of Republic of Belarus	October, 2010
Mr. Vitali Kulik	First Deputy Minister, GEF Operational Focal Point in Belarus	Ministry of Natural Resources and Environmental Protection of Republic of Belarus	31 August, 2011

## GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.

Agency Coordinator, name	Signature	Date	Project Contact Person	Telephone	Email Address
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