FINAL REPORT

“IMPROVEMENT OF THE CURRENT LEGISLATION AIMED AT RES PROMOTION IN HEAT AND ELECTRICITY GENERATION” (AHEF.26.BY)

“INOGATE Technical Secretariat & Integrated Programme in support of the Baku Initiative and the Eastern Partnership energy objectives”

Disclaimer: The content of this report is the sole responsibility of the contractor and can in no way be taken as reflecting the views of the European Union

Contract No 2011/278827

A project within the INOGATE Programme

Implemented by:
Ramboll Denmark A/S (lead partner)
EIR Development Partners Ltd.
The British Standards Institution
LDK Consultants S.A.
MVV decon GmbH
ICF International
Statistics Denmark
Energy Institute HrvojePožar

<table>
<thead>
<tr>
<th>Prepared by</th>
<th>Reviewed by</th>
<th>Approved by</th>
</tr>
</thead>
</table>
| Ainars Mengelsons
Vidmantas Jankauskas
Alexander Antonenko | Larry Good
Mark Allington       | Bo Klinke     |

Tbilisi, Georgia
November 2013
**Abbreviations**

The following abbreviations will be used throughout this document:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHEF</td>
<td>Ad Hoc Expert Facility</td>
</tr>
<tr>
<td>AIB</td>
<td>Association of Issuing Bodies</td>
</tr>
<tr>
<td>DSO</td>
<td>distribution system operator</td>
</tr>
<tr>
<td>EE</td>
<td>energy efficiency</td>
</tr>
<tr>
<td>EECS</td>
<td>European Energy Certification System</td>
</tr>
<tr>
<td>FIT</td>
<td>feed-in tariff</td>
</tr>
<tr>
<td>GO</td>
<td>guarantees of origin</td>
</tr>
<tr>
<td>IEA</td>
<td>International Energy Agency</td>
</tr>
<tr>
<td>ITS</td>
<td>INOGATE Technical Secretariat</td>
</tr>
<tr>
<td>kVA</td>
<td>kilovolt amperes</td>
</tr>
<tr>
<td>kW</td>
<td>kilowatt</td>
</tr>
<tr>
<td>kWh</td>
<td>kilowatt hours</td>
</tr>
<tr>
<td>MoE</td>
<td>Ministry of Energy</td>
</tr>
<tr>
<td>MoEC</td>
<td>Ministry of Economy</td>
</tr>
<tr>
<td>MNREP</td>
<td>Ministry of Natural Resources and Environmental Protection</td>
</tr>
<tr>
<td>MS</td>
<td>Member States</td>
</tr>
<tr>
<td>MW</td>
<td>Megawatt</td>
</tr>
<tr>
<td>MWh</td>
<td>Megawatt hours</td>
</tr>
<tr>
<td>NREAP</td>
<td>national renewable energy action plan</td>
</tr>
<tr>
<td>PPP</td>
<td>public and private partnership</td>
</tr>
<tr>
<td>RB</td>
<td>The Republic of Belarus</td>
</tr>
<tr>
<td>RE</td>
<td>renewable energy</td>
</tr>
<tr>
<td>RECS</td>
<td>Renewable Energy Certificate System</td>
</tr>
<tr>
<td>REHA</td>
<td>Renewable Energy Heat Act</td>
</tr>
<tr>
<td>RES</td>
<td>renewable energy sources</td>
</tr>
<tr>
<td>RESC</td>
<td>Renewable Energy Support Component</td>
</tr>
<tr>
<td>RES-E</td>
<td>renewable energy sources electricity</td>
</tr>
<tr>
<td>RET</td>
<td>renewable energy technology</td>
</tr>
<tr>
<td>SME</td>
<td>small and medium enterprises</td>
</tr>
<tr>
<td>SPA</td>
<td>State Production Association</td>
</tr>
<tr>
<td>TA</td>
<td>technical assistance</td>
</tr>
<tr>
<td>TGCs</td>
<td>tradable green certificates</td>
</tr>
<tr>
<td>ToR</td>
<td>terms of reference</td>
</tr>
<tr>
<td>TPA</td>
<td>third party access</td>
</tr>
<tr>
<td>TSO</td>
<td>transmission system operator</td>
</tr>
<tr>
<td>USD</td>
<td>United States dollar</td>
</tr>
</tbody>
</table>
## Table of contents

Executive summary ................................................................................................. 2

1. Introduction ........................................................................................................ 3

2. Current achievements in energy efficiency and renewable energy .................. 4

2. Analysis of current legislation framework on RES ........................................... 6
   2.1. RES policy planning, institutional set up and monitoring ......................... 7
   2.2. Electricity and heat tariffs, cost unbundling and transparency .................. 9
   2.3. Investment stability – feed-in tariff calculation ........................................ 11
   2.4. Third party access (TPA) to the power grid ........................................... 12
   2.5. Guarantees of origin ................................................................................. 13
   2.6. Summary of analysis .................................................................................. 14

3. Core principles of EU legal framework applied in promoting development of renewable energy .............................................................................................................. 17
   3.1. Power production authorisation and licensing ......................................... 17
   3.2. Support schemes, FIT and green certificates (tradable green certificates) and heat production promotion from renewable sources ..................................... 18
   3.3. EU legal framework on guarantees of origin and trade with third countries ...................................................................................................................... 20
       3.3.1. Guarantees of origin ....................................................................... 20
       3.3.2. Trade with third countries .............................................................. 21

4. Examples of possible institutional arrangements to promote RES in EU countries ......................................................................................................................... 23

5. Proposals to improve the current legislation aimed at the RES promotion and introduction of incentive mechanisms ........................................................................... 24
   5.1. Recommendation to improve the clarity of structure of the energy sector relating to RES development ................................................................................. 24
   5.2. Recommendations for improvement of legislation based on the analysis of the best experience of EU member countries ................................................. 25
       5.2.1. Policy planning and monitoring ......................................................... 26
       5.2.2. Generation authorisation/licensing .................................................. 26
       5.2.3. Cost unbundling and transparency .................................................. 26
       5.2.4. Clarification of investment provisions ............................................. 27
       5.2.5. “One stop shop” for processing of RES applications and providing technical assistance to the applicants ......................................................... 27
       5.2.6. Heating sector .................................................................................. 28

Annex 1. List of normative documents promoting RES development in the Republic of Belarus ........................................................................................................... 30
Annex 2. The main RES support schemes ............................................................... 31
Annex 3. Designated competent bodies issuing GO and European Energy Certification System ........................................................................................................ 33
Annex 4. Examples of institutional schemes ............................................................ 35
       A4.1. Green certificates in Poland ................................................................. 35
       A4.2. Support of RES in heat production in Germany ..................................... 37
       A4.3. Support schemes for development of renewable energy sources in Lithuania ....... 39
Executive summary

This assignment is to help facilitate the deployment of renewable heat and electricity in the Republic of Belarus. To this end it is helpful to identify the main barriers in the current legislation and develop recommendations on overcoming these barriers, making use of the significant experience of the EU countries in this subject area.

According to the strategy of energy potential development in Belarus, approved in 2010, the share of domestic energy resources (including renewable) in the boiler and furnace fuels should be at the level 32-34% by 2020. The country increased this share from 17% in 2005 to 20.7% in 2010, but the current rate of progress indicates that the targets cannot be achieved using the existing mechanisms supporting RES development. Therefore this INOGATE intervention was well-timed and should help the Belarus achieve the approved targets by 2020.

The report has four chapters and annexes.

Chapter 1 provides background information on the development of renewable energy and energy efficiency in the country and highlights the importance of actions needed to achieve the established RES targets.

Chapter 2 presents analysis of the current energy policy, key legislation acts and the energy market structure. This chapter presents the main findings of the ITS experts and reveals the main obstacles to renewable heat and electricity development in the country.

Chapter 3 outlines core principles of the legal framework applied in promoting development of renewable energy in the EU. It comprises analysis of RES licensing, comparison of support schemes: feed-in tariffs (FIT) and green certificates as well as guarantees of origin and mechanisms for collaboration between the EU and third countries regarding the trading of electricity produced from RES.

Chapter 4 concisely shows examples of institutional arrangements to promote RES in Poland, Germany and Lithuania.

Chapter 5 proposes changes needed to improve the current legislation on RES in Belarus. The ITS recommendations consist of: a set of measures aimed at developing more comprehensive RES data collection and monitoring; transformation of licensing practice regarding guarantees of origin to RES equipment; adjustment of the methodology for FIT calculation; and improvement of the investment climate.
1. Introduction

This report is the final deliverable of a task carried out under the Ad-Hoc Expert Facility of the INOGATE Technical Secretariat (ITS) project funded by EC/Europeaid. ITS implemented the task in response to an application entitled “Improvement of the current legislation aimed at RES promotion in heat and electricity generation” that the Ministry of Natural Resources and Environmental Protection (MNREP) of the Republic of Belarus submitted. The ITS Sustainable Energy component implemented the task over the period of July - November 2013.

ITS first developed terms of reference (ToR) in response to the application. The scope of work for this assignment, according to the ToR, included the following activities:

- To analyse the current legislative framework (primary and secondary legislation) on promotion of the development of renewable energy sector Belarus; to identify barriers to the development of renewable energy sources (RES) in Belarus covering financial, institutional and investment issues.

- To familiarise the beneficiary with the core principles of the EU legal framework applied in promoting development of RES, covering the following specific aspects: power production authorisation; guarantees of origin; green certificates (tradable green certificates); and heat production promotion from renewable sources.

- To explain the legal framework and existing practices related to the cross border trade of guarantees of origin (GO) in the countries of the EU.

- To select and present 2-3 examples of possible institutional arrangements to promote RES in heat and electricity production applied in the countries of EU.

- To develop proposals to improve current legislation aimed at RES promotion (electricity and heat) in line with EU principles and to indicate necessary steps for Belarus to sell electricity generated from RES domestically and export it to the EU Member States.

- To develop proposals to improve current legislation aimed at introduction of incentive mechanisms and commitments to increase the share of renewables in total energy consumption, using green certificates or other support mechanisms for RES.

Work began with a fact finding mission in July, 2013. It gave the INOGATE experts an opportunity to get acquainted with the local situation; understand the principal legal acts; present an overview of the EU RES support mechanisms; and acquire a detailed understanding of the beneficiary’s expectations. Work finished with a discussion of specific legal, financial and institutional aspects, presentation of preliminary findings and discussion of possible solutions and ITS recommendations with key stakeholders in Minsk during a second visit in October, 2013.
This report has been organised to present to the beneficiary a) concise and clear evaluation of the national legislation and existing barriers to RES development, b) an overview of EU practice, and c) proposals to develop and improve primary and secondary legislative acts considering EU practice.

2. Current achievements in energy efficiency and renewable energy

Between 1996 and 2008, Belarus reduced its ‘energy intensity’ (energy consumption per unit GDP produced) steeply to a level below that of Ukraine and Russia, but still significantly higher than Poland and the Baltic States\(^1\). This was the result of the government’s comprehensive energy efficiency policy. The measures included, among others, establishment of a Committee for Energy Efficiency in 1993, which evolved into the Energy Efficiency Department of the Committee for Standardization with a mandate to develop and implement the energy efficiency improvement strategy. Two National Energy Savings Programmes, approved in 1996 and 2011 respectively, and the Law on Energy Savings in 1998 established political commitments on energy efficiency. The policy on promoting EE in the country was supported with substantial financing, amounting to USD 4.2 billion in 1996-2008 and USD 1.2 billion in 2008 alone.

Additionally, the Republic of Belarus is implementing several other programs\(^2\):

- Programme on Energy Efficiency and Renewable Energy
- State Programme for Construction of Hydropower Plants in 2011–2015
- State Programme for Development of Dwelling and Utility Services Sector \(^3\) 2013-2015

Only state enterprises and institutions are eligible for participation in state programs. During visits the ITS team learned that due to budget constraints parts of the investment programs have not been fulfilled.

As previously stated, Belarus’ energy intensity in 2010 was lower than that of its southern and eastern neighbours. In 2010 Belarus used 0.64\(^4\) tons of oil equivalent (toe) to produce USD


\(^2\) [http://www.iea.org/policiesandmeasures/renewableenergy/?country=Belarus](http://www.iea.org/policiesandmeasures/renewableenergy/?country=Belarus)


1,000 of its GDP, demonstrating a better performance compared to Ukraine’s 1.46\(^5\), Russia’s 0.77 and Moldova’s 0.98 toe/USD 1,000. However, despite substantial recent progress and good standing in its regional sub-group, Belarus is still far from its energy efficiency potential in comparison with the closest western neighbours. Poland and Lithuania\(^6\) use 0.25 and 0.26 toe/USD 1000 respectively (IEA 2010/2011).

Belarus has set national EE targets to reduce energy intensity as compared to the 2005 level:
- at least by 50% in 2015
- at least by 60% in 2020

According to the strategy of energy potential development in the Republic of Belarus, approved in 2010, the share of domestic energy resources in the boiler and furnace fuels (including renewable)\(^7\) should be at the level of 32-34% by 2020.\(^8\)

The country increased this share from 17% in 2005 to 20.7% in 2010, but the current rate of progress (Fig 1.1) implies that the targets cannot be achieved using the existing mechanisms supporting RES development.

![Figure 1.1. The share of domestic energy resources (including RES) in the energy balance for the production of heat and electricity in 2005-2020, %](image)

According to the National Development Programme for Local and Renewable Energy Sources Development in 2011-2015, the Republic of Belarus has an immense economically feasible


RES potential (in wind, small hydro, biomass and solar technologies), which can be developed through the improvement of the legislation framework and the establishment of EU best practise support schemes for RES.

2. Analysis of current legislation framework on RES

There are several legal acts which form the legislative background for development of RES in Belarus. One of the key documents is an acting Directive\(^9\) of the President No. 3 “Economy and saving are the main factors for economic security of the country” (the Directive). The Directive includes separate components of the energy strategy and ensures not less than 25% of production of electricity and heat in 2012 by using local fuel types\(^10\), secondary energy resources\(^11\) and alternative energy sources. With that, this Directive does not separately address the development perspectives and specific share of RES within the energy balance.

Another document, the Strategy of the development of power potential (the Strategy), was approved by the Council of Ministers of the Republic of Belarus, Regulation № 1180 starting on August 09, 2010. The Strategy\(^12\) for the period 2011–2015 and until 2020 specifies the parameters and mechanisms of medium-term development of the Belarus power sector under new economic conditions, while keeping the long-term guidelines of the energy policy established in the Concept on National Security\(^13\) and Directive No. 3 unchanged.

The Strategy determines investment priorities and the need to develop and adopt a number of laws, including a new Law on Energy Saving, the Law on Electricity, the Law on State Regulation of Tariffs for Electricity and Heat; and the Law on Heat Supply. In accordance with the Strategy, the key instrument of energy saving policy implementation is the development and fulfilment of the state targeted programs.

According to publicly available information there are several activities taking place in Belarus aimed at drafting the new legislation envisaged by the Strategy\(^14\). Of particular importance for RES development is the draft Law on Electricity, the draft Law on State Regulation of Tariffs for Electricity and Heat and the draft Law on Heat Supply. These legal acts will determine the future

---

10 Covers: oil and associated gas, bituminous shales, brown coal, peat, wood and others.  
11 Present definition - “Secondary energy should be used to designate all sources of energy that results from transformation of primary sources” UN, Concepts and Methods in Energy Statistics, New York, 1982.  
structure of the power sector, along with the legal environment for involvement of RES energy generation facilities within the power system. The information available concerning the intention to restructure the power sector indicates that the changes foreseen are intended to harmonise with EU practice in the organisation of the energy sector.

Another important legislative act is the recently adopted Law of the Republic of Belarus on Renewable Energy Sources (Law on RES). This law sets general principles, assigns responsibilities among different parties and authorises institutions to issue secondary legislative acts handling different aspects of RES development in the country.

The sub-sections below provide analysis of the main provisions of the Law on RES and their interrelation with the practices applicable in Belarus concerning: RES policy planning; institutional set up; transparency; clarity; and stability of provisions determining the investment climate, i.e., the feed-in tariff, and third party access to the grid. There also appears a review of secondary legislative acts related to the issuing of certificates of origin and comments on established monitoring practices used to assess efficiency of development of RES.

2.1. RES policy planning, institutional set up and monitoring

The Law on RES assigns responsibilities to different state authorities. The main actors in this field are the ministries responsible for economics, energy and environment and the Department of Energy Efficiency of the State Committee for Standardization of the Republic of Belarus (the EE Department).

The institutional framework for the implementation of RES programs in Belarus is organised through centralised planning. State regulation of RES activities is ensured by decrees and directives of the President of Belarus and by resolutions of the government and the Ministry of Economics, with legislative support from National Assembly of Belarus.

The main institution that develops and implements the state policy on energy efficiency and renewable energy is the EE Department. It also monitors policy implementation and provides for state control of the rational use of fuel, electricity and heat.

The EE Department prepares special assignments (programs, target indicators and projects) under the national energy efficiency and RES programs and submits them for approval to the

15 http://energobelarus.by/news/Belarus/sovershenstvovanie_sistemy_upravleniya_energeticheskoy_otraslyu_belarusi_budet_prokhodit_v_tri_etapa/

16 Calculation of target indicators determine instruction of department , it is available at web page of department - http://www.belarus.by/en/government/government
Council of Ministers. The Council of Ministers, in turn, assigns the target indicators and obligations to all ministries and departments (state level) and to all regional executive committees and the Minsk Executive Committee (municipality level) in accordance with the structure of state and municipalities in Belarus\(^\text{17}\). The Council of Ministers (by authorisation of article 9 of the Law on RES) issues regulations that determine the issuance of guarantees of origin of electricity generated by RES facilities.

There are departments and committees responsible for the implementation of energy saving programs in each line ministry and regional governmental authority. The business plans of individual state enterprises must include objectives for energy efficiency and these should ensure the fulfilment of their specific tasks. The EE Department\(^\text{18}\) monitors assignments and target indicators; checks performance indicators\(^\text{19}\) reported by responsible subdivisions and units in ministries, departments, executive committees; and further reports the results to the Council of Ministers. The monitoring of implementation of energy efficiency programs is undertaken by the regional affiliates of the EE Department.

Another institution which has been involved in the monitoring of RES performance after the adoption of the Law on RES is the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus. The MNREP, authorised by article 12 of the Law on RES, has responsibility to issue the certificate of origin and to establish the state cadastre (register) of RES. The cadastre contains information about RES facilities commissioned after adoption of Law on RES. It is important to monitor RES development because, it allows assessment of the efficiency of the selected strategies and instruments as well as helping the control of process.

**Findings on RES policy planning and monitoring**

There are several institutions involved in planning and implementation of RES development programs and monitoring of RES development performance. The present monitoring system organised at state level by the EE Department gives the broad statistical picture about the status of RES development at national level, regional level and in different sectors of industry, but it provides rather limited information about the status of utilisation of different type of RES


\(^{18}\) The EE Department has cetral structure and it’s regional affiliates, [http://energoeffekt.gov.by/about/structure.html](http://energoeffekt.gov.by/about/structure.html)

\(^{19}\) Performance indictors shows achievements and department hold periodically collected information, here is a link to target monitoring results disclosing share of local resources [http://energoeffekt.gov.by/statistics/indicators/1460------2013-.html](http://energoeffekt.gov.by/statistics/indicators/1460------2013-.html)
and their performance efficiency. Figure 2.1 below illustrates the publicly available information on the achievement of EE RES targets, available at the EE Department’s web-portal.

![Figure 2.1. Example of monitoring fulfilment of RES/EE targets at http://energoeffekt.gov.by](http://energoeffekt.gov.by)

From the broad spectrum of statistical data collected by the EE Department, it is difficult to evaluate the real efficiency of individual RES types used for heat or power plant.

The web-page of the MNREP provides the register of issued guarantees of origin (GO). The register includes the following information:

- Certificate number;
- RES technology used;
- Date of commissioning, name and location of the facility;
- Information about the owner of the installation (name and coordinates of the enterprise);
- Name and date of the decision to issue a certificate;
- Capacity of the plant (MW) and the maximum possible amount of energy to be produced (MWh).

As of 1 July 2013, the register includes information on about 52 issued certificates. However, the register contains information about installed capacities and planned energy production only, not actual energy production statistics. This makes the data useless for analysis.

### 2.2. Electricity and heat tariffs, cost unbundling and transparency

The power sector in Belarus is organised on a single supplier basis, with the functions of generation, transmission and distribution carried out by the association of electricity producers Belenergo SPA.
The Law on Pricing from 10 May 1999 determines the framework on pricing of electricity, heating and gas in Republic of Belarus. The Ministry of Economy (MoEC) regulates and approves tariffs for final commercial and industrial consumers, but the Council of Ministers approves the electricity and heat tariffs for residential consumers. Regional executive committees and the Minsk Executive Committee approve heat tariffs for legal entities within the system of the Ministry of Housing and Utilities.

State utilities which provide public services (electricity, gas, hot water, district heating) submit the calculated tariff of their services to the MoEC according to a recommended methodology. On 1 February 2013, Belarus introduced more widely differentiated end user tariffs for electricity. The most recent modification of tariff has been in force since 1 November 2013. The decision was laid down in Resolution No.941 of the Council of Ministers, dated 30 October 2013, which increased the tariff of household customers by 6% starting 1 November 2013.20

Taking into account that the electricity tariff for industrial customers (with installed capacity up to 750 kVA) is used as the reference value for setting FIT, cost unbundling and transparency of end-user electricity tariffs becomes very important. From another point of view, the electricity tariffs for household and state institutions are heavily subsidised21 and therefore the elimination of subsidies, which is planned in the Strategy, will influence the reduction of the electricity tariff for industrial customers that consequently will lead to the decrease of FIT. According to EU practice, the FIT should be disconnected from the end-user tariffs and approved by a separate document in order to provide correct signals to investors in the long term. However, if the approval of separate FIT tariffs is not currently acceptable in Belarus, all efforts should be devoted to the cost unbundling and transparency of end user electricity tariffs.

The legislation presently in force in Belarus does not clearly describe the procedure through which the costs of RES development are allocated to the end user. Article 20 of Law on RES has a general clause stating that costs incurred by purchase of electricity from RES that are eligible for feed-in tariffs (FIT) under the Law, should be included in the power production costs of state energy supply entities in a legislative order. However, there is no publicly available document which describes this procedure for cost allocation. The implication is that Belenergo SPA has a process for balancing costs of different power production methods, both RES and fossil fuel based.

20 http://www.government.by/upload/docs/file38ca8ed4d54063fa.PDF
21 http://www.energo.by/sbyt/p81.htm
At the time of this writing, the purchase costs of electricity produced by RES form an insignificant part of the end user electricity tariff (because the relative proportion of RES electricity is very low). However in the future the tariff structure should clearly reflect the costs related to development and support of RES, if other financial funds are not provided, e.g., some form of cross-subsidy from general taxation. Cost control of RES development using the FIT system is important due to its impact on electricity bills. For example, the German renewable energy levy (EEG), which is paid by private customers today, is 5.277 eurocents/kWh, and starting in 2014 it will be 6.240 eurocents/kWh.  

*Findings*

Transparency is important to facilitate the efficient development of RES. Data about production costs of conventional energy generation or import in Belarus are not available due to bundled electricity tariffs. Lack of such information makes it difficult to compare generation costs using conventional and renewable sources. Thus, it leads to inability to assign the required level of RES support in the country.

The alternative to power generated by RES is a mix of imported electricity and fossil fuel based electricity generated within the system of Belenergo SPA. The present tariff system does not allow determination of the cost of the present FIT system for RES in comparison with the mix of conventional generation and import. The cost control of RES development using the FIT system is important due to its future impact on electricity bills.

The heat tariff calculation methodology is not publicly available. The Ministry of Housing and Utility by decree of the Minister from 29.11.2010 Nr. 175 has approved a complex two step data collection system – with a lot of different data forms with no description of how the collected data are used for setting heat tariffs.

**2.3. Investment stability – feed-in tariff calculation**

In accordance with Article 13 of Law of the Republic of Belarus on Renewable Energy Sources (Law on RES) of 27 December 2010 (No 204-W), the Ministry of Economy is authorised to set the tariff to support energy produced using RES. Article 20 of the Law on RES determines the main principles to be applied in setting up the purchase tariff (feed-in tariff) on electricity generated from RES in Belarus.

---

The Law states that the basic feed-in tariff (FIT) applicable for purchase of electricity generated using RES is to be set at the level of the end users' tariff approved for industrial or equivalent consumers connected to the low voltage grid with capacity up to 750 kVA. This basic tariff is multiplied by coefficients depending on the generation facility, which are differentiated depending on the RES type used. The Resolution of the Ministry of Economy No. 100 of 30 June 2011, “On tariffs on electricity produced from renewable energy sources,” sets the following multipliers for determining the FIT:

- For electricity generated from biogas, wood, hydro, wind and geothermal:
  - 1.3 for the first 10 years from the date of putting the plant into operation
  - 0.85 for operation beyond 10 years for the next 10 years
- For electricity generated from solar:
  - 3 for the first 10 years from the date of putting the plant into operation
  - 0.85 for operation beyond 10 years for the next 10 years

The FIT is indexed to the exchange rate of USD/ BYR.

**Findings**

The present FIT support does not provide complete clarity about the application of FIT for each commissioned power plant within the period defined in Law of RES. Also, there is discrimination in the application of the FIT – Belenergo SPA plants are not eligible to receive the FIT support.

After 20 years of operations the purchase price of energy produced by RES is not defined.

Some of the existing power plants within the Belenergo SPA system are at the end of their design lifetimes, yet it would be feasible to refurbish them23.

### 2.4. Third party access (TPA) to the power grid

At the time of this writing, there is no legal act in place in the Republic of Belarus that determines third party access to the power grid. However, as a first step towards TPA, there is a resolution of the Ministry of Economics of the Republic of Belarus Nr. 23 from March 29, 2012 “On distribution and transmission tariff.” The resolution states that a tariff of 354 BYR per kWh is to be applied to transmission and distribution of energy produced by legal entities (later in the text – ‘producers’) which are not within a Belenergo SPA and which supply legal persons, individual entrepreneurs and private persons within the region of Minsk, being situated in the

---

23 Information base on Belenergo SPA data, provided by local expert during site visit.
same region as the producer. The determination of the principle of TPA in legislative acts is one of the prerequisites for sustainable development of the power sector.

2.5. Guarantees of origin

According to the Law on RES, the Ministry of Environment and Natural Resources is responsible for issuing guarantees of origin (GO). The GO certificate is a prerequisite for allowing RES facilities to be connected to the grid of Belenergo SPA.

The document called Certificate of Guarantee of Origin has a different meaning to that understood within the EU RES directive, i.e., it does not reflect a quantitative measure – 1 GO for one 1 MWh of electricity produced (see 3.3.1). The application of GO requires a functioning market mechanism in the power sector through which the GO could be traded as a separate product alongside the energy produced. Section 3 provides the EU legislation framework describing GO.

At present it is easier to think of the Belarus GO as an RES generation permit. The Ministry of Natural Resources has developed a register and, since 2011, has been collecting data on RES producers qualified to receive FIT. The list of companies entered into this register is available on the web page of the Ministry (http://www.minpriroda.gov.by). The register contains information about the facility owner, address and location, planned maximum amount of electricity production, installed capacity and commissioning date. The actual electricity produced from RES is not reflected in the register. Assessment of these data shows that, at the time of this writing:

- 19 power plants have been built using state support programs;
- 17 power plants have been commissioned before 2010;
- 9 power plants built within the period of 2010-2013 are outside the state support program (mostly built by private entrepreneurs).

The RES plants which were built with the assistance of state programs are not on the register because they are owned by the Ministry of Energy, which by the Law of RES is not financed via FIT. Also, RES plants producing heat are not included on the register.
### 2.6. Summary of analysis

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect (findings)</th>
<th>Implications/proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core documents</strong></td>
<td>The Strategy determines investment priorities and the need to develop and adopt a number of laws, including: a new Law on Energy Saving; the Law on Electricity; the Law on State Regulation of Tariffs for Electricity and Heat; and the Law on Heat Supply.</td>
<td>These envisaged legal acts will determine the future structure of the power and heat sector, along with the legal environment for involvement of RES energy generation facilities. The information available concerning the intention to restructure the power sector indicates that the changes foreseen are intended to harmonise with EU practice in the organisation of the energy sector.</td>
</tr>
<tr>
<td>Adopted Directive and Strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RES policy planning, institutional set up and monitoring</strong></td>
<td>The present monitoring system gives the broad statistical picture about the status of RES development at national level, regional level, and in different sectors of industry, but it provides rather limited information about the status of utilisation of different type of RES and their performance efficiency.</td>
<td>Organise the broader RES data collection and monitoring in future by using the format applied by Eurostat and consider introduction of the format of National Renewable Energy Action Plans (NREAP).</td>
</tr>
<tr>
<td>The EE Department runs state efficiency programs and monitors results.</td>
<td>The register contains information about installed capacities and planned energy production only, but not actual energy production statistics. This makes the data useless for analysis.</td>
<td>Carry out training on performance of efficiency audits to audit industry and utility sectors, set efficiency standards and based on the audits adjust the plans on implementation of RES policies and programs. Adjust data requirements to be submitted in register.</td>
</tr>
<tr>
<td>New 400 MW of heat production capacities using RES has been developed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>within last 3 years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The web-page of the MNREP provides the register of issued guarantees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of origin (GO).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Some of the existing power plants within Belenergo SPA system are</strong></td>
<td>Discrimination exists in the application of the FIT – Belenergo SPA plants are not eligible to receive FIT support.</td>
<td>Provide FIT support for Belenergo SPA plants. This creates additional incentives for Belenergo SPA to develop RES in the country. Introduce such incentive in the RES Law with the condition that refurbished plant efficiency will be at least 10% higher than before.</td>
</tr>
<tr>
<td>at the end of their design lifetimes, yet it would be feasible to refurbish them.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effect (findings)</th>
<th>Implications/proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment stability</strong>&lt;br&gt; The value of FIT defined by the RES Law seems reasonable, but investors are not active.&lt;br&gt;The present FIT support does not provide complete clarity towards the application of FIT for each commissioned power plant.</td>
<td>The electricity tariff for industrial customers is used as the reference value to set the FIT value. End users (household and state institutions) are heavily subsidised&lt;br&gt;FIT is not stable assuming that with the elimination of the subsidies (gradually planned by Strategy) the electricity tariff of industrial customers will decrease and hence so will the FIT if it remains linked to the industrial tariff.&lt;br&gt;After 20 years of operations the purchase price of energy produced by RES remains not defined.</td>
<td>Fix the FIT on certain period (10+10 years) and align it with the issuing of licence/permission for power generation using RES thus providing investment stability and guaranteed access to market.&lt;br&gt;Another proposal for a longer perspective is to consider unlinking the FIT from the end user tariff and transferring the FIT system to the feed-in premium system.&lt;br&gt;The proposal is to make the purchase price after the 20th year reasonably below an average mix of an import price and generation price of the main power producer, to keep the motivation of Belenergo SPA to purchase excess electricity or sell it at market price.</td>
</tr>
<tr>
<td><strong>Transparency and cost unbundling</strong>&lt;br&gt;The vertically integrated company Belenergo SPA dominates power production.&lt;br&gt;A small number of independent producers are present in power sector.&lt;br&gt;There no cost control mechanism in place related to the development of RES.</td>
<td>Data about production costs of conventional generation/import is not available due to bundled electricity tariff.&lt;br&gt;Lack of such information makes it difficult to compare generation costs using conventional and renewable sources. Thus, it leads to inability to assign the required level of RES support in the country.&lt;br&gt;There is no mechanism which allocates RES costs in tariff&lt;br&gt;The cost control of RES development using FIT system is important due to its impact on electricity bills.</td>
<td>Planned restructuring of the power sector will provide costs unbundling with further reflection in tariffs and will ensure third party access to the grid thus providing opportunity for new producers entering market&lt;br&gt;Introduce concept of renewable energy support component (RESC) to allow control of impact of RES development costs in power production (see 5.2.3).</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td><strong>Effect (findings)</strong></td>
<td><strong>Implications/proposals</strong></td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Heat sector</td>
<td>The country is lacking a transparent data platform to be used for the assessment of efficiency of the utilised measures.</td>
<td>Further RES development requires proper monitoring and it is important to count installed heat capacities and monitor the real amounts of produced and consumed heat by different types of the RES facilities. The format applied by the Eurostat can be used to organise the broader heat data collection and monitoring in future. The proposal is to organise training on the execution of efficiency audits, audit the industry and utility sectors, set the efficiency standards and based on the repeated audits, and adjust the plans on implementation of RES policies and programs in the heating sector. The registry held by the Ministry of Natural Resources could serve also as this platform, providing an efficient registration and monitoring of heat generation facilities using RES.</td>
</tr>
<tr>
<td>Belarus has good achievements in switching from conventional fuels to RES in heat production.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Core principles of EU legal framework applied in promoting development of renewable energy

3.1. Power production authorisation and licensing

Licensing is a universal tool that can be used to achieve a number of important energy policies and goals. Governments typically implement licensing instruments as a means of keeping some level of control over entities operating in strategic industries. In the electricity sector, licensing is used as a method of overseeing the activities of companies engaged in the electricity business and of enforcing compliance with energy, environmental and other laws or regulations.

One of the most common purposes of licensing is to create a procedural mechanism that government can use to exercise some degree of control over the construction of new power plants. The government may simply review new generating projects as they are proposed for operation in market conditions (an 'authorisation procedure'), or the government may take a more active role in determining capacity needs and organising calls for proposals for new projects and choosing the winner (a ‘tendering procedure’).

In both cases, the government may consider the economics, fuel source, and environmental impact of the plant, as well as other issues, before granting a construction / operation license.

Licensing in the power sector may also serve other purposes, including the following:

- The initial licensing process may be used to ensure that business enterprises participating in the power sector have adopted the appropriate corporate form and have demonstrated adequate financial resources and technical ability to carry out the licensed activity.
- Licence conditions may impose requirements regarding accounting practices and the right of the government to review and audit a company’s books and records. These conditions may assist regulators when reviewing a company’s tariffs and may help protect investors and consumers from improper business practices.
- Licence conditions may assign some rights to the licensee, for instance the feed-in tariff and related terms and conditions.
- As a condition of licensing, sector participants may be required to compile and make available information on their operations that will assist the government in developing long-term national energy policy.

The legal framework where this process is described began in 1996, when the European Union passed an Electricity Directive (96/92/EC). Later, in 2003, this was replaced by a new Directive (2003/54/EC), which reinforced requirements on Member States to unbundle their electricity
industries and introduce competition in generation and retail supply. The most recent revision was the adoption of 2009/72/EC, which is currently being implemented.

More specifically the authorisation procedure for new generation capacity (as opposed to the tendering procedure) provides for the spontaneous development of new generation plants based on an informed investment decision (project feasibility) and appropriate due diligence checks on issues such as environmental impact and land use, which are typically done at the local level. This implies no central planning and allows investors to compete for the “best” investment with only an obligation imposed by the state that needs to be satisfied, which is in turn provided for by a set of predefined criteria in the energy law.

### 3.2. Support schemes, FIT and green certificates (tradable green certificates) and heat production promotion from renewable sources

A successful policy support frame for RES should remove regulatory barriers and provide suitable and long-term investment conditions to attract potential RES developers. In general, the policy framework for supporting RES followed by most EU countries, entailed an integrated approach including setting targets, revision of the legislation and administrative framework and a package of support instruments.

Concerning the support mechanisms, there are a number of options that have been used to promote renewable energy with the following variations:

- Obligatory or voluntary
- Applied to various target groups ranging from investors, households, industry etc.
- Involving variable level of support according to installed capacity or produced energy (Rewarding actual energy production through a preferential tariff is the most common.)
- Entailing direct support schemes
- Including guaranteed access to markets

Generally, a mix of instruments is applied.

A classification of internationally applied instruments, covering all the currently applied strategies referring to the promotion of RES-E deployment, appears in Table 3.1.
Table 3.1. Classification of RES support strategies

<table>
<thead>
<tr>
<th>Regulatory</th>
<th>Direct Price-driven</th>
<th>Direct Quantity-driven</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Investment incentives</td>
<td>Tendering system</td>
<td>Environmental taxes</td>
</tr>
<tr>
<td></td>
<td>Tax Incentive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feed-in tariffs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate-based incentives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generation based</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voluntary</td>
<td>Investment focused Shareholder programs</td>
<td></td>
<td>Voluntary agreements</td>
</tr>
<tr>
<td></td>
<td>Contribution programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green tariffs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With regards to the EU the following conclusions can be drawn, on the basis of a multi-year experience and monitoring of support schemes:

- The effectiveness and efficiency of support schemes differ widely across the EU Member States.

- Different support schemes are characterised by different levels of maturity. In some countries, policies, in particular quota obligation systems, are fairly new, for example the Romania RECS system obtained legal certainty in October 2011 after receiving state aid permission from the European Commission and implemented additional amendments in 2013.

- There is scope for greater cooperation between Member States and optimisation of individual support schemes.

- Whilst harmonisation of support schemes was considered a long term objective, market barriers for the increase of RES-E and the low level of competition in the electricity market rendered this harmonisation quite premature.

Member States are continuously fine-tuning existing policy measures aiming to improve the performance of these measures. In fact, since 2005, more than a dozen countries have adapted their support schemes in pursuit of adopting best practice or otherwise optimizing system efficiency.

In 2012 the European Commission issued a communication stating that principles for support schemes need to be established that minimize market distortions, avoid over compensation and


ensure consistency across Member States. These will address transparency, predictability and the need to stimulate innovation.

In most cases, a single support instrument is not effective for parallel development of various types of available RES due to regional variations in resource potentials and differences in renewable technology costs. Hence, very often a combination of support schemes is needed to facilitate investments in a customized approach. A common practice has been to apply investment subsidies or soft loans in addition to the main support scheme, which may be either feed-in tariffs or quota obligations.

Figure 3.1 provides a schematic of the main support systems used in the EU-27 countries in 2008.

A broader description of support schemes appears in Annex 3

3.3. EU legal framework on guarantees of origin and trade with third countries

3.3.1. Guarantees of origin

EU has adopted several directives to implement its renewable energy policy. The requirements for guarantees of origin to be accurate, reliable and fraud-resistant are set out in the directives for the promotion of the use of energy from renewable sources\(^\text{29}\) and the promotion of cogeneration\(^\text{30}\). Each Member State (MS) of the EU shall ensure that reporting the origin of electricity produced from RES shall be objective, transparent and non-discriminatory. A

---


\(^{30}\) EU Directive 2004/8/EC
guarantee of origin is issued upon request from a producer of electricity from RES. In addition Member States may arrange that guarantees of origin are issued upon a request from producers of heating and cooling using RES. A guarantee of origin shall be of the standard size issuing, just 1 Guarantee of origin (GO) for 1 MWh of produced energy. MS shall ensure that the same unit of energy produced from renewable sources is taken into account only once.

A guarantee of origin can be transferred, independently of the energy to which it relates, from one holder to another. However any use of a guarantee of origin shall take place within 12 months of its production.

A guarantee of origin should be cancelled once it has been used\(^{31}\). Energy from renewable sources in relation to which the guarantee of origin has been issued and sold separately should not be disclosed or sold to the final customer as energy from renewable sources.

MS or designated competent bodies shall supervise the issuance, transfer and cancellation of guarantees of origin. The details about tasks of designated competent bodies, content of guarantee of origin and description of the European Energy Certification System are provided in Annex 3.

### 3.3.2. Trade with third countries

The Directive 2009/28/EC sets binding national RES targets. Some MS would have difficulties to meet their mandatory target due to scarce domestic RES potential or high costs that render projects not economically viable. In order to meet the MS target on production of electricity from renewable energy sources, one or more Member States may cooperate with one or more third countries\(^{32}\). According to the forecasts of the MS that were submitted to the European Commission in December 2009, only a comparatively small quantity of energy is expected to be subject to the cooperation mechanisms. Only five Member States each expect to have a total deficit of 2 Mtoe in 2020, less than 1% of the total renewable energy needed in 2020. Ten member states expect to have a surplus of in total 5.5 Mtoe in 2020, around 2% of the total renewable energy needed in 2020.

The National Renewable Energy Action Plans (NREAPs)\(^{33}\) submitted by the MS to the European Commission by 30 June 2010 specify how each MS expects to reach its legally binding 2020 target for the share of renewable energy in their final energy consumption.

---

31 The amount of energy from renewable sources corresponding to guarantees of origin transferred by an electricity supplier to a third party shall be deducted from the share of energy from renewable sources in its energy mix.

32 A ‘third country’ is a country outside the European Union

33 http://ec.europa.eu/energy/renewables/action_plan_en.htm
Article 9 of the RES Directive puts forward certain technical requirements to the MS and third country hosting a joint project. For the purposes of compliance with the requirements of the directive on national overall targets, the amount of electricity produced from RES in the third country should be consumed in the EU. The following requirements should also be met:

- An equivalent amount of electricity to the electricity accounted for has been firmly nominated to the allocated interconnection capacity by all responsible transmission system operators in the country of origin, the country of destination and, if relevant, each third country of transit;
- An amount of electricity equivalent to the electricity accounted for has been firmly registered in the schedule of balance by the responsible transmission system operator on the community side of an interconnector; and the nominated capacity and production of electricity from RES by the installation refer to the same period of time;
- The electricity is produced by a newly constructed installation that became operational after 25 June 2009 or by the increased capacity of an installation that was refurbished after that date, under a joint project; and the amount of electricity produced and exported has not received support from a support scheme of a third country other than investment aid granted for installation.

Therefore, the physical transfer of electricity produced from renewables in a third country should take place as presented in Figure 3.2 below.

![Figure 3.2 RES transfer from a third country to the EU Member States](image)

In the occasion there is no link between a third country and the EU, there is still a possibility to realize a joint project in the context of the construction of an interconnector with a very long lead-time between a Member State and a third country assuming the following conditions are met:

- Construction of the interconnector is started by 31 December 2016;
- It is not possible for the interconnector to become operational by 31 December 2020;
- It is possible for the interconnector to become operational by 31 December 2022;
- After it becomes operational, the interconnector will be used to export to the community of electricity generated from renewable energy sources;
- The application relates to a joint project that fulfils the criteria described above and that will use the interconnector after it becomes operational, and to a quantity of electricity that is no greater than the quantity that will be exported to the community after the interconnector becomes operational.

4. Examples of possible institutional arrangements to promote RES in EU countries

EU Member States have chosen their own way to promote RES. This chapter indicates three possible ways to organise support for RES development. The first is in Poland, the second is German's support to RES in heat sector, and the third is the application of FIT in Lithuania.

Contrary to the majority of the European countries that foster renewable energy markets with feed-in tariff schemes, Poland promotes renewable energy generation providing investors with the Renewable Energy Certificates (REC’s) system\textsuperscript{34}. According to the Polish REC system, power generation companies must deliver to consumers a certain volume of green energy or buy a certain REC volume. Each investor who wants to obtain green certificates must submit an application to the Energy Regulatory Office. The certificates are tradable and may be sold on the Polish Power Exchange.

REC\textsubscript{s}, a.k.a. green energy certificates, were introduced in Poland in 2005. Since then the Polish REC system is considered to be one of the most generous and attractive to foreign investors. For instance, wind development started in the country in 2002 when the first wind turbine was installed. RECs attracted new investments, attaining a capacity of over 91 MW in 2010.\textsuperscript{35}

Another possible way to organise support is Germany’s experience in promotion of RES in the heat sector. The support program in Germany is realised by the Federal Office of Economics and Export Control (BAFA). BAFA is a federal authority subordinated to the Federal Ministry of Economics and Technology. Investment support by BAFA\textsuperscript{36} is given for heat produced in existing buildings. Installations in new buildings are only eligible if process heat is used. The investment support is divided into basic support, bonus support and innovation support. Installations must be erected in Germany and must operate for at least 7 years. A combination

\textsuperscript{34} http://www.res-legal.eu/search-by-country/poland/single/s/res-e/t/promotion/aid/quota-system-2/fastp/175/


\textsuperscript{36} http://www.res-legal.eu/search-by-country/germany/single/s/res-hc/t/promotion/aid/subsidy-investment-support/fastp/135/
with other support schemes is possible if not otherwise stated. The amount of heat generated by facilities using RES increased more than two times in Germany from 2003 to 2010.37

Lithuania supports development of RES to increase its energy independence by reducing the need for imports of expensive fossil fuels. Effective use of RES allows the country to increase reliable energy supplies and comply with the environmental requirements of the EU. Support of electricity production using RES is assured by setting a feed-in tariff (different for each RES, technology and plant capacity). The tariff is set for a 12 year period by the national energy regulator – National Control Commission for Energy and Prices (NCC). The Law envisaged two ways of tariff setting: 1) For all facilities with capacity less than 30 kW, NCC was to fix the tariff. 2) For larger facilities, an auction system defines the tariff, and NCC would only set the cap of the tariff. NCC arranges an auction for a certain capacity (a range of capacities is given) of power plants using a certain type of RES38. Use of RES in generation of electricity increased more than two times in Lithuania from 2005 to 2013.39

A more detailed description about each of the cases is provided in Annex 4.

5. Proposals to improve the current legislation aimed at the RES promotion and introduction of incentive mechanisms

This section presents recommendations focusing on practical steps to be taken to improve the legislative framework, whilst also indicating the required energy sector restructuring changes. The recommendations are based on analysis of the legislative framework, practices applied in promotion of RES in Belarus and review of the experience of the EU member countries.

5.1. Recommendation to improve the clarity of structure of the energy sector relating to RES development

Even though the Law on Renewable Energy Sources provides the main principles of RES promotion, the Republic of Belarus has not yet passed sector-specific regulations in the electricity and heat sectors. At the time of this writing (November 2013), several activities were taking place to tackle this issue; however they require inter-ministerial coordination, which can take significant time. The development of RES is, to a large extent, determined by the choice of structures of the power and heat sectors.

Some of the core principles to be resolved in the energy sector are listed below:

- Selection of the management model of the heat and power sectors, including definition of responsibilities;
- Generation authorisation requirements;
- Unbundling and cost transparency (tariffs);
- Introduction of third party access to the grid;
- Supervision of the sector including definition of reporting requirements and monitoring (on fulfilment of licensing conditions).

### 5.2. Recommendations for improvement of legislation based on the analysis of the best experience of EU member countries

The price of electricity in market conditions fluctuates with the balance between demand and supply. Today Belarus applies the single supplier model with limited opportunities for third parties to participate in supply of energy to customers. Application of green certificates to support development of RES requires market conditions through which energy supply and distribution companies have an opportunity to select a least cost approach in fulfilling their obligations and RES developers have an incentive to generate power. The demand market in this case is organised through binding obligations, but at the same time provides the customer and supplier with the opportunity to choose either to buy RES from the market or to produce it on site (for example the use of biomass combined heat and power plant on industrial sites).

It is not considered useful to oblige industrial enterprises to achieve binding RES targets in the production or consumption of electricity without also giving them the opportunity to generate and sell the excess of their own generated electricity. If this opportunity is not provided, such an obligation would increase production costs of the core businesses of industry (especially energy-intensive industries, such as steel production) and will make them less competitive.

As long as Belarus has not introduced market relations in the power production sector, ITS does not recommend a shift towards the green certification system by replacing the present feed-in tariff support system of RES. The absence of a power market and the inability to guarantee a sufficient income stream to cover investments are the reasons. This section presents some possible solutions related to transparency, the investment climate, grid access and monitoring, which will facilitate development of RES in the energy sector.

During their second visit in October, 2013, the ITS experts presented the following recommendations on the improvement of the legislative framework. The recommendations are based on detailed analysis and review of the experience of EU member countries and also take into account the merits and drawbacks of the 2011 Law of Renewable Energy Sources.
5.2.1. Policy planning and monitoring
The register of issued guarantees of origin contains information about the installed capacities and the planned production amounts, but not about the actual energy production amount making it impossible to use production data for analyses. Improvement should be introduced by indicating separately installed heat and power capacities, at least, and adding columns with actual heat and power production amounts. A possible way to organise the broader RES data collection and monitoring in the future is to use the format applied by Eurostat.40

An additional proposal in this respect would be to carry out training on performance of efficiency audits, to audit industry and utility sectors, to set efficiency standards and make adjustments based on the audits the plans on implementation of RES policies and programs.

The other important aspect is the availability of an extended data exchange platform and with common access for other institutions. The cadastre (register) held by the Ministry of Natural Resources could (after improvement) serve as such a platform, providing efficient RES facility registration and generation monitoring.

5.2.2. Generation authorisation/licensing
It is recommended that the present practice of issuing of guarantees of origin of RES should be transformed through the introduction of licensing or authorisation of electricity production using RES. The Ministry of Natural Resources could carry out this task. A licence would be issued prior to making investments in the sector and would contain an obligation on the investor to build and operate a plant in exchange for a feed-in tariff for the energy production within a certain time scale. Other requirements, such as reporting and decommissioning could be added. With the further utilisation of RES in the country it may become necessary to introduce quotas for different types of RES. In this case the licensing or authorisation system would be a suitable mechanism.

5.2.3. Cost unbundling and transparency
In addition to the need for cost unbundling and transparency in the energy sector described in Section 2.2, another possible solution is to introduce a renewable energy support component (RESC). The RESC will impose a difference between the cost of energy generated by facilities of RES and the cost of conventional generation/import mix (market price) of electricity. For tariff collection purposes, the RESC costs divided by energy consumed will be expressed in BYR/kWh. Such an approach in a transparent way will allow monitoring an impact of RES development costs in power production. Furthermore, to have a safeguard against severe

Collection of renewable data is provided using in TABLE1. GROSS ELECTRICITY AND HEAT PRODUCTION.
increase of the end user tariff, the Ministry of Economics could set a limit, for example not to exceed 2-3% of conventional production costs. Every year or half year, a single supplier would calculate the costs of energy received from RES using FIT. The real support cost will represent margin above the conventional generation / import mix, which will be included in tariff calculation.

5.2.4. Clarification of investment provisions

In order to reduce the investment risk and provide more clarity with the application of certain values of FIT, ITS recommends fixing the value of the applied FIT at the date of commissioning of the power plant, in a document issued by the Ministry of Natural Resources, rather than with certificates of origin. Discrimination should also be eliminated in the application of FIT. The FIT should not be subject to change for a period of 20 years: An increasing coefficient should apply in the first 10 years, and the next 10 years accordingly an incentivised coefficient. Another proposal for a longer perspective is to consider unlinking the FIT from the end user tariff and transfer the FIT system to a feed-in premium system.

After 20 years of operations the purchase price of energy produced by RES is not defined. The proposal is to make it a reasonable amount below an average mix of an import price and generation price of the main power producer in order to keep Belenergo SPA motivated to purchase produced electricity or to sell it at a market price.

Some of the existing power plants within Belenergo SPA system are at the end of their design lives, yet it would be feasible to refurbish them. In order to provide a refurbishment incentive, an FIT could also be applied for these plants, with condition that the refurbished plant efficiency will be at least 10% higher than before. The attraction of private capital to refurbish power plants within the system of state company Belenergo SPA could be pursued using the principle of public-private partnership (PPP). Refurbishing aged production assets should use concession agreements with a condition to pass the asset to state ownership after the concession period, provided the plants meets efficiency requirements. A delegated competent authority must control compliance with efficiency criteria.

5.2.5. “One stop shop” for processing of RES applications and providing technical assistance to the applicants

In accordance with the Law of RES, the RES planning, development and monitoring are performed by a number of national authorities:

- Council of Ministers
- State Committee for Standardization
- Ministry of Energy
- Ministry of Natural Resources and Environmental Protection
It would also be expedient to establish an agency, or “one stop shop,” at the Ministry of Natural Resources with the following mandate:

- Provide information about possible sites to develop RES;
- Review applications for RES development;
- Licence power and heat production activities planning to use RES;
- Supervise licensed RES companies;
- Set reporting requirements and monitor them

Development and preparation of RES projects requires clear guiding principles. They should be developed in parallel with the basic regulatory framework. In fact, development of this document is the implementation of one of the national policy principles in the area of RES usage in the Republic of Belarus, namely: “availability of information in the area of RES usage,” which is indicated in Article 4 of the Law of RES.

The guiding principles would provide information for potential investors or RES producers and would include the following information:

- Project agreement phases;
- List of regulatory documents that regulate RES usage;
- Authority of the national bodies;
- Information on national policy and guarantees of the Republic of Belarus with respect to RES;
- Information on available capacities in the Republic of Belarus and connection procedure;
- Prices, coefficients and RES electricity purchase conditions;
- Fiscal stimulation and exemption from custom duties;
- Rights and obligations of the RES electricity producers.

5.2.6. Heating sector

Taking into account the strategic documents41 of the Republic of Belarus, the following important questions regarding structural improvement of the heating sector need answers:

• Who will carry out authorisations of heat generation capacities, and who has the initiative for the development of heat production capacities and networks?

• How will be the integrated state unitary heat utilities interact with self-producers of heat?

• How will unbundling and cost transparency be organised?

• Who will carry out supervision and reporting, and who will set monitoring requirements?

Belarus has good achievements in switching from conventional fuels to RES in heat production, however the country is lacking a transparent data platform to be used for the assessment of efficiency of the utilised measures. Further RES development requires proper monitoring, and it is important to count installed heat capacities and monitor the actual amounts of produced and consumed from various types of the RES facilities.

The format applied by the Eurostat can be used to organise the broader heat data collection and monitoring in future.42

Current assets in the heating sector are presumably owned by the state, and financial arrangements for reconstruction depend on the availability of funds in the state budget or in the budgets of unitary state utilities. The criteria defined by Department of Energy Efficiency of the State Committee for Standardization to select the investment projects as eligible for financing seem reasonable. However, it would be worth obtaining feedback about the efficiency of implemented projects. ITS’ proposal for the heating sector is

a) to organise training on the execution of efficiency audits;

b) to audit the industry and utility sectors;

c) to set efficiency standards;

d) based on repeated audits, to adjust plans to implement RES policies and programs.

The other important aspect is the availability of an extended data exchange platform and the ability for its common utilisation by other institutions. The registry held by the Ministry of Natural Resources could also serve as this platform, providing efficient registration and monitoring of heat generation facilities using RES.

Collection of renewable data is provided using in TABLE1. GROSS ELECTRICITY AND HEAT PRODUCTION.
Annex 1. List of normative documents promoting RES development in the Republic of Belarus

1. Law of the Republic of Belarus on Renewable Energy Sources of 27 December 2010 (No 204-W)

2. Investment codex of the Republic of Belarus No.37-3 of June 22, 2011

3. Decree of the President of the Republic of Belarus No. 6 of May 7, 2012 “On Stimulation of Business Activity in the Territory of Medium and Small towns, and Rural Areas”

4. Decree of the President of the Republic of Belarus No.10 of August 6, 2009 “On Creation of Additional Conditions for Investment Activities in the Republic of Belarus”

5. Resolution of the Council of Ministers No.1058 of August 6, 2011 “On Measures to implement the Decree of the President of the Republic of Belarus No. 4 of June 6, 2011”


7. Resolution of the Ministry of Economy No. 100 of June 30, 2011 “On tariffs on electricity produced from renewable energy sources”

8. Resolution of the State Committee for Standardization of the Republic of Belarus No. 10 of February 27, 2009 “On Approval of Instruction on the procedure for issuance of conclusions about the attribution of imported goods to the equipment used in the production or reception (reception), transformation, accumulation and (or) transfer of power produced from unconventional and renewable sources of energy”
Annex 2. The main RES support schemes

Two support schemes are primarily used in almost all EU countries and have been associated with the increase of RES deployment in recent years: Feed-in Tariffs and Quota based systems.

**Feed-in tariff (FIT)** is generation-based price-driven incentive.

Under this scheme, there is a legal obligation to the utility company or system operator to purchase electricity from the renewable energy producer at a premium rate, usually over a guaranteed period. The extra cost is shared among all energy users, thus being reduced to minimum possible levels. The tariff rates are set by the government and are scientifically determined for each technology to ensure the profitable operation of the facilities. Unlike traditional subsidies, FITs are not funded by the government budget, but through an additional component to the electricity price. FITs usually take the form of either a total price for RES-E production, or an additional premium on top of the electricity market price paid to RES-E producers. FITs allow technology specific and band specific promotion as well as an acknowledgement of future cost reductions by introducing decreasing tariffs.

**Quota obligations based on Tradable Green Certificates (TGCs)** are a generation-based quantity-driven instrument.

The government defines targets for RES-E utilization and obliges any party of the electricity supply-chain, e.g., generator, wholesaler or consumer, to meet them. Typically, governments mandate a minimum share of capacity or generation of electricity (generally grid-connected only), or a share of fuel, to come from RES. The share required often increases gradually over time, with a specific final target and end-date. Once defined, a parallel market for RE certificates is established and their price is set according to demand and supply conditions (forced by the obligation). Hence, financial support for RES generators may arise from selling certificates in addition to the income from selling electricity on the power market. Certificates can be obtained through a) a supplier owning generation plants, b) from other generation plants, or c) from a broker acting as an intermediary.

Other mechanisms for RES support are briefly presented below.

- **Tendering systems** are quantity-driven mechanisms. The financial support can either be investment focused or generation based. In the first case, a fixed amount of capacity to be installed is announced and contracts are given following a predefined bidding process, which offers winners a set of favorable investment conditions, including investment subsidies per installed kW. The generation based tendering systems work in a similar way. However, instead of providing up-front support, they offer support in the size of the ‘bid price’ per kWh for a guaranteed duration. Tenders are being used in
Denmark (off shore wind), France (wind, biomass, biogas), Latvia (over 0.25 MW) and Portugal (wind, biomass).

- **Net metering** is a variation on feed-in tariffs that allows a two-way flow of electricity between the electricity distribution grid and customers with their own generation. Depending on the system, the producers pay only for the net electricity used, or producers are paid for every kWh they feed into the grid. Mandated targets or quotas can be used simultaneously with net metering. In Europe, Belgium, the Czech Republic, Denmark and Italy introduced net metering as an additional support instrument. Net metering without other financial incentives is not enough to advance RES market penetration but might have a greater impact if private generators could have time-of-use rates for electricity they put into the grid. This applies to photovoltaic (PV) installations.

- **Financial and fiscal incentives** aim to render RES technology less expensive and encourage the respective industry, leading to cost reductions. Fiscal incentives usually work via the tax system and include exemptions from rebates on taxes, tax refunds, lower VAT rates on equipment or favorable depreciation schemes. In addition, financial incentives are usually provided in the form of subsidies for stimulating new technologies and demonstration projects. A following chapter analyzes these further.

In addition to the regulatory instruments described above, more and more voluntary approaches have appeared with on-going market liberalisation. They include environmental taxes and other voluntary schemes, mainly based on the willingness of consumers to pay premium rates for RE. However, in terms of effectiveness so far, i.e., actual installations resulting from the schemes implementation, their impact on total RES-E deployment is negligible.
Annex 3. Designated competent bodies issuing GO and European Energy Certification System

The designated competent bodies issuing GO should be independent of production, trade and supply activities. The responsible parties shall implement appropriate schemes to ensure that guarantees of origin are issued, transferred and cancelled electronically, and are accurate, reliable and fraud resistant. The issuing body is always responsible for the guarantee of origin registry, but does not necessarily need to operate it itself. A guarantee of origin shall specify at least:

a) the energy source from which the energy was produced and the start and end dates of production;
b) whether it relates to electricity, heating or cooling;
c) the identity, location, type and capacity of the installation where the energy was produced;
d) whether and to what extent the installation has benefited from any kind of subsidy or support scheme, whether and to what extent the unit of energy has benefited in any other way from a national support scheme, and the type of support scheme;
e) the date on which the installation became operational;
f) the date and country of issue and a unique identification number.

MS shall recognize guarantees of origin issued by other MS. A Member State may refuse to recognize a guarantee of origin only when it has well founded doubts about its accuracy, reliability or veracity.

Where energy suppliers market energy from renewable sources to consumers with a reference to environmental or other benefits of energy from renewable sources, Member States may require those energy suppliers to make available, in summary form, information on the amount or share of energy from renewable sources that comes from installations or increased capacity that became operational after 25 June 2009.

The European Energy Certification System (EECS) is a harmonized system for trading energy certificates, which provides standards for the operation of public and commercial certificate systems. The EECS has been developed by the Association of Issuing Bodies (AIB), which is an association registered under Belgian law. The certificate issuing activities of members of the

www.aib.net.org
AIB are regulated by means of the Principles and Rules of Operation of the EECS at an international level.

An overview of the institutional set up system is disclosed in Figure A3.1 below.

![Institutional scheme of guaranties of origin](image)

**Figure A3.1. Institutional scheme of guaranties of origin**

EECS is based on harmonized structures and procedures, including a standard format for the interface between national registries, facilitating international trade in standardized guarantees of origin without the danger of double accounting and double selling.

The AIB monitors the volumes of certificates issued and cancelled within EECS, as well as the certificates exported and imported within the system. Within EECS both guarantees of origin (‘EECS GO’) and RECS (‘EECS RECS’) certificates exist. Within the statistics of AIB / RECS International no exact distinction can be made between EECS guarantees of origin and EECS RECS certificates.

Most of the guarantees of origin registries are originally based on the RECS system as the RECS system predate the guarantee of origin system. In most cases the registries are combined and also serve the guarantees of origin system. Within the regulations of the AIB the guarantee of origin system and the RECS system exclude each other, so it is impossible for members of the AIB to issue double certificates. If the guarantee of origin is also eligible for the RECS system the guarantee of origin is ‘flagged.’ This opens the possibility to transfer a guarantee of origin to a RECS system. Most registries publish statistics: total volumes of issued, transferred and cancelled certificates. The published statistics do not make individual trades visible for reasons of privacy of the market players.
Annex 4. Examples of institutional schemes

A4.1. Green certificates in Poland

Contrary to the majority of the European countries that foster renewable energy markets with feed-in tariff schemes, Poland promotes renewable energy generation providing investors with the Renewable Energy Certificates (REC’s) system. The REC’s (also known as green energy certificates) were introduced in Poland in 2005. Since then the Polish REC’s system is considered to be one of the most generous and attractive to numerous foreign investors.

Green energy producers obtain the REC’s on top of regular payments for the energy produced. The Polish Energy Regulatory Office (ERO) manages the REC system. Apart from providing investors with necessary power generation and grid connection licenses, the institution decides also on REC prices and is responsible for awarding investors with particular certificates. Every investor who wants to obtain green certificates must submit an application to the Energy Regulatory Office. The certificates are tradable and may be sold on the Polish Power Exchange. According to the Polish REC system, power generation companies must deliver to consumers a certain volume of green energy or buy a certain REC volume. Figure A4.1 shows required quotas.

The mechanism gives a stable perspective for green energy producers. The REC prices are not set in the long run and the Energy Regulatory Office decides upon them every year. However, the Polish energy law establishes the minimum and maximum price range of the particular types of certificates, which correspond to the average price of the electricity in Poland.
Green certificates are granted to investors producing electricity from renewable energy regardless of the generation technology. Thus, the green certificates may be granted to wind energy, hydro, photovoltaic or biogas producers. The Polish law regulates the minimum price of the certificates by setting a value of special fee which may be paid by power grid companies instead of buying green certificates. The fee’s value is adjusted every year given the Polish inflation index. In 2012 the green certificate price was approximately 74 EUR/MWh.

![Diagram of green certificate scheme]

The Polish Power Exchange is involved in registration and trading certificates. It also conducts the market of property rights, where are bought and sold property rights to the certificates of origin for electricity produced from renewable sources or cogeneration. Only stock exchange members, who are allowed to operate in the market of property rights, and who are also members of register of certificates of origin, are eligible to buy or to sell. Eligible parties include energy producers, energy companies and trading companies. Property rights are traded in the single price system and the continuous trading system. In the market of property rights, limits of price variation do not apply. The stock exchange is also involved in recording out-session transactions, or transactions carried out by the buyers and sellers without participation of the stock exchange. National Depository for Securities JSC is involved in financial settlement of transactions concluded on the green certificates.

However, in contrast to feed-in tariffs, the Polish REC scheme promotes only large scale energy generation, and along with difficulties with the grid connection procedure rules out the markets individual green energy producers. Therefore, some experts urge implementation of feed-in tariffs in Poland. The introduction of feed-in tariffs would certainly contribute to the development of small scale renewables like residential PV systems or small wind turbines.
The Ministry of Economy has prepared a change in the support system for “green energy.” Certificate system will remain, but correction coefficients will be introduced depending, among others, on the viability of the technology. The new rules are to adjust the amount of support to the profitability of different kinds of sources. The new system will strongly support cost-effectiveness of some technologies, such as photovoltaic, while the power producers will receive less support in the technologies already being used on a large scale. Certificates of origin will not be granted for life at the same rate. Their value will decrease during the life of an installation. Renewable sources, however, will receive certain percentages of the certificates of origin for the whole lifetime because it enables recording of “green energy.” A system will also be implemented to distinguish whether the systems already operated are used or new ones. However, owners of existing plants cannot count on keeping the current system. The amount of awarded certificates of origin will also decrease.

**A4.2. Support of RES in heat production in Germany**

Germany is a leading European country in the penetration of RES. In 2012 the total installed wind energy capacity in Germany was about 30 GW, Solar photovoltaic power capacity almost reached the same point. Germany plans to increase the share of RES in final energy consumption to 18% by 2020 and to 60% by 2050.

The Renewable Energy Directive (2009) gives to the member states certain targets for RES development expressed as a share of final energy consumption. Therefore, member states are supporting not only electricity production using RES, but also the use of various RES technologies in heat production and the transport sector.

In Germany as of 1 January 2009 the Renewable Energy Heat Act (REHA) came into force, confirming the 14% target of heat coming from RES by 2020. The objective of the REHA is to increase the share of RE technology in the heating sector in new buildings and in existing public buildings by using solar, geothermal energy and biomass (liquid, solid and gaseous). The Law imposes an obligation to use RES in new and public buildings. Financial support is envisaged from the Market Incentive Programme (financed from the state budget and the emission trading system), the total budget for 2011 was 350 million EUR.

The obligation to use RES depends on the source and technology. The requirements are to use 15% solar thermal energy, or 30% biogas, or 50% biomass or geothermal. Equipment has to meet specific technological requirements in order to be accepted under the Law. If RES cannot be applied, an investor can substitute for it with other measures, e.g., insulation 15% better than required under the Energy Saving Ordinance, or 50% from combined heat and
power. Combinations of various technologies are also possible. Support is for individual and most cost effective solutions.

The program is carried out by the Federal Office of Economics and Export Control (BAFA). BAFA is a ranking federal authority under the Federal Ministry of Economics and Technology. BAFA gives investment support for heat produced in existing buildings. Installations in new buildings are only eligible if they use process. The investment support is divided into basic support, bonus support and innovation support. Installations must be erected in Germany and must be operating for at least 7 years. A combination with other support schemes is possible if not otherwise stated.

Support depends on type of technology, size of facility and fuel used. The table below shows examples of investment support provided in Germany.

Table A4.1. Investment support provided in Germany for facilities in heat production using RES.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Eligible facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td>Plants with automatic feed of solid biomass for heating purposes, ≤ 100 kW nominal heat output; low emission logwood boilers ≤ 100 kW nominal heat output Secondary measures for emission reduction and efficiency increase of plants ≤ 100 kW nominal heat output</td>
</tr>
<tr>
<td>Geothermal energy</td>
<td>Efficient heat pumps ≤ 100 kW nominal heat output</td>
</tr>
<tr>
<td>Solar thermal energy</td>
<td>Solar collectors with gross collector area ≤ 40 m² except for installations providing only hot water Solar collectors with gross collector area &gt; 40 m² on single or two family houses with high storage capacity Solar collectors with a gross collector area from 20 m² to 100 m²</td>
</tr>
</tbody>
</table>

The investment program provides support to different type of applicants: private persons, freelancer, small and medium size companies (SME), municipalities or local authorities, non-profit organisations, companies in which the public authority has a share of > 25 % with a turnover less than the SME threshold. The application procedure is simple and differs slightly depending on the type of support: basic and bonus or innovating support.

Main aspects of the basic and bonus support procedures:

- Applications shall be sent no later than 6 months after a plant started operating (the date of receipt at BAFA matters).
- Applications shall include proof of operation of the installation or plant (day/month/year), detailed and complete invoices, proof of installed collector area or installed rated thermal input, and other specific proofs depending on the technology (specified in the guidelines cf. Section on supported technologies).
Application forms can be obtained from BAFA and need to be signed.

The support is paid after examination of the documents and can be postponed to the next budgetary year.

Requirement of the innovation support procedure:

Applications need to be filed before starting the project.

The start of the project is defined as the signing of a contract on the delivery of the plant or measure (as a proof of operation, documents required for basic support need to be sent to BAFA at the latest before the expiration of official note of approval).

More details about differentiation of investment support and about procedure and eligibility for support are available at web sites of EU RES legislation portal44.

A4.3. Support schemes for development of renewable energy sources in Lithuania

Lithuania supports development of renewable energy sources (RES) as this increases its energy independence, reduces the need for imports of expensive fossil fuels. Effective use of RES allows the country to increase reliable energy supplies and comply with the environmental requirements of the EU.

The Law on Energy from Renewable Resources was adopted by the Lithuanian Parliament in 2011. It defined the roles and functions of the government, of various ministries and other governmental institutions. The main objective of the Law is to guarantee rational use of RES utilising the economically justified potential of the resources within the country. The first important goal defined by the Law is to reach a 23% share of RES in the final energy consumption by the year 2020. This share could be reached by utilising RES in electricity generation, heat production and transport. Respective shares of RES should be 20% in electricity use, 60% of heat use and 10% of transportation fuels.

The Law defined a system of possible RES support schemes:

- feed-in tariff for electricity produced using RES;
- obligatory purchase by the system operator of all electricity produced using RES;
- partial compensation of expenses for connection to the network;
- free system services;
- support for production of raw material for biofuels (support of agricultural production);

support for investments.

Support to electricity production using RES is assured by setting a feed-in tariff (different for various forms of RES, technologies and plant capacities). The tariff is set for a 12 year period by the national energy regulator – the National Control Commission for Energy and Prices (NCC). The Law envisaged two ways of tariff setting: 1) For all facilities with capacity less than 30 kW, the tariff was to be fixed by the NCC. 2) For larger facilities, a system of auctions defines the tariff, and only the cap of the tariff is to be set by the NCC. NCC arranges an auction for a certain capacity (a range of capacities is given) power plants using a certain type of RES. Several investors compete to get a permit to build such power plants, and the permit is given to one which proposes the lowest tariff, this tariff is granted to the winner for the 12 year period. This approach was expected to guarantee the lowest price to the consumers. Additionally, for the guaranteed tariff and guaranteed purchase of all electricity produced using RES, discounts for the connection to the network are granted to the winner of an auction. These producers are exempt from paying electricity system charges (balancing and reserve).

The Law defined the feed-in tariff calculation principle. It guaranteed a fair return for investors. The tariffs were to be calculated once a year and to be valid for 12 years. Based on those principles, the NCC calculated price caps and concrete tariffs for different technologies. Table 4.2 shows tariffs and tariff caps, approved by the NCC for 2012, for capacities exceeding 30 kW.
Table A4.2. FIT approved by the NCC for 2012

<table>
<thead>
<tr>
<th>Capacity, kW</th>
<th>RES type</th>
<th>Feed-in tariff, LTct/kWh, (1 € = 3.4528 LTL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 30</td>
<td>Wind</td>
<td>37</td>
</tr>
<tr>
<td>31-350</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>More than 350</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>Less than 30</td>
<td>Biomass</td>
<td>50</td>
</tr>
<tr>
<td>31-350</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>351-5000</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>More than 5000</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Less than 30</td>
<td>Hydro</td>
<td>28</td>
</tr>
<tr>
<td>31-350</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>351-1000</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>More than 1000</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Less than 30</td>
<td>Biogas</td>
<td>64</td>
</tr>
<tr>
<td>31-1000</td>
<td></td>
<td>58</td>
</tr>
<tr>
<td>More than 1000</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Less than 30</td>
<td>Solar PV</td>
<td>144</td>
</tr>
<tr>
<td>31-1000</td>
<td></td>
<td>133</td>
</tr>
<tr>
<td>More than 1000</td>
<td></td>
<td>104</td>
</tr>
<tr>
<td>Less than 30</td>
<td>Solar PV integrated into buildings</td>
<td>180</td>
</tr>
<tr>
<td>31-350</td>
<td></td>
<td>166</td>
</tr>
<tr>
<td>More than 1000</td>
<td></td>
<td>128</td>
</tr>
</tbody>
</table>

The Law put additional safeguards to avoid the uncontrolled growth of the RES share in the national energy balance. The Law defined targets to be reached by 2020 for various technologies in the electricity sector: 500 MW for wind energy, 355 MW for biomass and biogas, 144 MW for hydro and 10 MW for Solar PV. When these targets are reached (before 2020) the Government may decide about future support. These quotas were calculated based on the capacity of the electricity network (the possibility to connect all new generation units using RES to the grid without significant investment in the network) and on the availability of the resources.

The support scheme worked well, and in a short time all wind energy quotas were exhausted as investors applied for all possible capacities, competing fiercely in the auctions arranged by the
NCC. The competition reduced the feed-in tariffs for wind energy from almost 9 €ct/kWh to 7 €ct/kWh. There was also competition among developers of biomass and biogas power plants.

RES penetration in the district heating sector was even faster as wood fuel became 2-3 times less expensive than imported natural gas. Therefore, all district heating companies were eager to switch to biomass use in their boilers. Some support from the EU hastened the process. In 2012 almost 30% of the fuel in the district heating sector was biomass, showing an impressive growth from a couple of per cent in 2000.

The support scheme for electricity production using RES was rather generous, but it had several safeguards mentioned above. Nevertheless, some gap in the system was left. Small scale generators (≤ 30 kW) using RES were exempt from the quotas. They did not require licenses (only very simple permits issued by the Ministry of Energy). They were heavily subsidised for connection to the network. In 2012 Solar panel prices dropped by 50% in a short time, and as NCC had set a feed-in tariff in 2011 for all of 2012, not expecting such a drop, investments in solar power plants became very attractive. By the end of the year the Ministry of Energy received more than 20 000 applications for construction of solar PV power plants. The Ministry issued about 15 000 construction permits and the electricity distribution company granted more than 8 000 permits for connection to the network. Consequently, at the end of the year there was about 70 installed MW of solar PV, 7 times more than was planned according to the Law.

Further uncontrolled growth of the solar energy share was threatening to boost electricity prices to consumers, so the government made fast and decisive steps to reverse this trend. The Law on Energy from Renewable Resources was amended and the further growth of the solar PV share was restricted. NCC was granted a right to change the feed-in tariffs quarterly instead of annually, the capacity of non-regulated installations was reduced to 10 kW, and so on.

The main conclusion of this lesson is that support to the development of RES should be sufficient to attract investments, but also flexible, allowing reaction to changes in international and national markets.