ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES

PROGRAMME FUNDED BY THE EU

ACTIVITY COMPLETION REPORT

ITS Technical Assistance to Belarus in the field of Energy Statistics in the extension period (Feb. 2015 – Jan. 2016)

(CWP.08.BY, CWP.10.BY, CWP.11.BY)

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

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List of acronyms

AM	Armenia
AZ	Azerbaijan
BY	Belarus
CCs	INOGATE Country Coordinators
CEs	INOGATE Country Experts
CNG	Compressed Natural Gas
CWP	Country Work Plan
EaP	Eastern Partnership
ECT	Energy Community Treaty
ECS	Energy Community Secretariat
EnC	Energy Community
EEIs	Energy Efficiency Indicators
ENP	European Neighbourhood Policy
ESAP	Energy Statistics Action Plan
ESN	Energy Statistics Network
EU	European Union
GE	Georgia
HPP	Hydro Power Plant
ITS	INOGATE Technical Secretariat
IEA	International Energy Agency
KZ	Kazakhstan
KY	Kyrgyzstan
M&V	Measurement and Verification
MCM	Million Cubic Meters
MD	Moldova
NGO	Non-government Organisation
NSI	National Statistical Institute
NSS	National Statistical Service
PCs	INOGATE Partner Countries
RWP	Regional Work Plan
RES	Renewable Energy Sources
TA	Technical Assistance
TJ	Tajikistan
TM	Turkmenistan
TPP	Thermal Power Plant
UA	Ukraine
UZ	Uzbekistan

1 PART 1 – EUROPEAN COMMISSION

1.1 Background

Assignment Title:	ITS Technical Assistance to Belarus in the field of Energy Statistics in the extension period (Feb. 2015 – Jan. 2016)
Country and Dates:	Overall, the TA to Belarus during the extension period was delivered as follows: - TA mission to Belstat, Minsk on 7-8 December 2015 (CWP.08.BY, CWP.10.BY, CWP.11.BY) - Regional workshop on Energy Efficiency Indicators on 22-24 September 2015 in Minsk (RWP.12) - Remote assistance as per necessary
Beneficiary Organisation:	National Statistical Committee of the Republic of Belarus (Belstat), Ministry of Energy of the Republic of Belarus, State Committee for Standardization (SCS) of the Republic of Belarus
Beneficiary Organisation - key contact persons – name and e-mail address:	See list of key persons and their contact details in Annex 2.4.1
Deliverables Produced:	• Activity Completion Report for activities CWP.08.BY, CWP.10.BY, CWP.11.BY • Final Assessment Report 2012 - 2016 Model for Monitoring and Verification of Energy Efficiency Indicators and Energy Savings in Belarus • Model for Calculating Fuel Energy Consumption by End-Uses in Households in Belarus • Recommendations for the calculation of energy consumption for hot water production from solar heaters
Expert Team Members:	• Mr Nicolas Brizard, Key Expert for Energy Statistics • Ms Alenka Kinderman Lončarević, Senior Non Key Expert for Energy Statistics • Mr Damir Pesut, Senior Non Key Expert for Energy Statistics • Mr Tomasz Trus, Junior Expert for Energy Statistics

1.2 Essence of the Activity

Belarus is one of the nine INOGATE PCs that have agreed upon an Energy Statistics Action Plan (ESAP) with ITS. Belarus beneficiaries have worked actively to implement the ESAP during 2012-2016. The overarching objective of the Technical Assistance to Belarus was to improve its energy statistics systems and to increase the capacity of Belstat to collect and compile energy statistics harmonised with EU and international standards. Another objective was to further consolidate the work on Energy Statistics carried out since 2012.

Activities CWP.08.BY, CWP.10.BY, CWP.11.BY were implemented during the TA mission to Belarus on 7-8 December 2015, during the Regional workshop (RWP.12) in which Belarus participated very actively and also, through remote assistance provided during the preparation and follow-up phases of the workshop and the TA mission to Minsk.

The main objectives of the TA mission to Belarus on 7-8 December 2015 were:

- Analysis and discussion about the preliminary results of the survey on final energy consumption in the household sector carried out by Belstat in 2015 and assistance in developing a tailor-made methodology for the calculation of final energy consumption by end-use in households (CWP.08.BY);
- Assistance in the development of a methodology for the calculation of energy efficiency indicators;
- Calculation of a first pilot for indicators for the household and industry sector (CWP.10.BY);
- Assistance in the preparation of the plan and concept for the implementation of energy surveys in other sectors, in particular in the services sector that Belstat plans to survey in 2016 (CWP.11.BY).

Energy Statistics activities proposed in the ESAP form a continuum of logical steps and complementary activities initiated in 2013. As a result, while focussing on the activities carried out during the extension period (February 2015-April 2016), this report also takes stock of all activities carried out since project inception, in particular when it comes to assessing the impact of INOGATE and making recommendations for the future.

1.3 Key Findings

Belarus is highly dependent on energy imports. Hence the development of energy efficiency and its monitoring through detailed indicators is a priority for Belstat, the Ministry of Energy and the State Committee for Standardization (SCS) of the Republic of Belarus. This was one of the main reasons why Belstat launched a survey on energy consumption in the household sector in 2015. At the time of the TA mission to Belarus in December 2015, not all results from this survey were available. The full results of the survey are expected to be available by mid-2016.

Starting from 2016, Belarus will compile and publish energy balances (2015 data) that follow international standards (IEA). In 2015, Belstat developed and agreed with all national stakeholders on a new methodology for energy balances based on international standards. In December 2015, Belstat's Council approved the new methodology. The quality of submissions of 5 joint annual energy questionnaires to the IEA has also been improved in 2015.

Cooperation with other Belarusian institutions has been enhanced since 2012 with the establishment of a functional Energy Statistics Working Group. In 2015, Belarus further reinforced the already excellent interagency cooperation between Belstat, the Ministry of Energy and the Department on Energy Efficiency of the SCS. The three organisations have worked in close collaboration to develop the household energy survey and energy efficiency indicators. The project was carried primarily by Belstat, but will be handed over to the SCS in the future.

Belstat adopted and included in its annual work programs from 2014 to 2016, ITS' recommendations for a further improvement of energy statistics, energy balances and energy efficiency indicators. Bel-

stat is in the process of implementing these recommendations. Improvements which were highlighted are the development and adoption of a climate correction methodology, which adjusts energy statistics and energy balances with a climate correction factor[1] and the public dissemination of energy statistics and balances on Belstat's website.

1.4 Challenges Faced

No major issues to report.

1.5 Ownership and Benefits of the Activity

Technical Assistance provided by ITS in 2015-2016	Actions undertaken by the NSI in 2015-2016
• **Developed and delivered two tailor-made models: Model for the calculation of disaggregated final energy consumption statistics by end-use and Model for the M&V of energy savings. The models were tested using preliminary results from a household survey conducted in 2015 and other available official macroeconomic and energy data** • **Capacity building in the use of models during the Regional workshop on EEI and TA mission to Belstat** • **Update of input data in the models according to final survey results** • **Capacity building to prepare and organise surveys in the services and transport sectors and to integrate survey results in the Models** • **Finalisation of the Models and delivery to Belstat**	• Approval and implementation of international standards (IEA) for the 2015 Energy Balance • Carried-out an energy consumption survey in the household sector in 2015 and started to develop the first related energy efficiency indicators • Reinforced interagency cooperation between Belstat, the Ministry of Energy and the Department on Energy Efficiency of the SCS • Further development of data collection in other final energy consumption sectors • Adopted a methodology for temperature (climate) correction of final energy consumption and calculation of climate corrections for energy time series since 2000 • Introduction of additional activities aimed at improving energy statistics in the Development Strategy of National Statistics of the Republic of Belarus until 2017

1.6 Recommendations

Overall assessment and status quo

In a very short period of time, Belarus managed to achieve significant progress in the field of calculation of energy efficiency indicators and energy savings. The Belarusian experience **can be used as an example of excellent practice by other countries**. The main reasons for such good progress are the following:

- Energy statistics and energy balances are compiled according to the international standards;
- Good interagency cooperation and Belstat's commitment to take responsibility for the collection and compilation of detailed energy statistics and the calculation of energy efficiency indicators;

[1] It should be noted that Energy Balances are published without climate corrections

- Belstat's ability to carry out surveys on energy consumption relying on its own resources. This is the best way to ensure the sustainability of data collection for energy efficiency indicators in the future;
- Skilled, motivated and cooperative experts in Belstat.

The development of a system for energy efficiency indicators is one of the most complex activities included in Energy Statistics Action Plans and there were lot of doubts at the beginning of the project whether to implement it or not. After the 1st ITS TA mission to Belstat in 2013, ITS experts considered available capacities in Belarus sufficient and decided to prepare specific methodologies and tools for the calculation of end-use energy consumption statistics and energy efficiency indicators for the household and services sectors. One of ITS' objectives was to later replicate this proposed approach in other National Statistical Institutes. The system of EEIs is based on the *Recommendations on Measurement and Verification methods in the framework of Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services*.

These specific tools developed for Belarus were necessary because, in practice, National Statistics Institutes in EU countries are not directly involved in the calculation of EEI. In the EU, EEIs are mostly under the responsibility of energy agencies or similar institutions which apply very complex tools and procedures for their calculation.

The case of Belarus confirmed that **it is possible for National Statistics Institutes to develop and calculate EEIs.** If similar activities are to be planned in other countries in the future, NSI's capabilities and skills should be carefully assessed beforehand and the system designed accordingly.

Beside Belarus, Azerbaijan, Moldova and Ukraine also initiated activities to calculate energy efficiency indicators. It is recommended that these countries follow and exchange experiences with Belstat **as much as it is practically possible**.

It is assumed that, **with additional TA, Belarus can complete its system of energy efficiency indicators in the next three years.** After the successful completion of EEIs for the household sector, Belstat should continue to collect additional data and calculate indicators for the services, industry and transport sectors.

Conclusions and recommendations

Energy statistics are constantly evolving due to a changing situation in energy markets, the appearance of new energy products and new technologies. Methodologies applied to energy data collection and compilation should be constantly reviewed, revised and adjusted to the new requirements from international organisations (Eurostat, IEA, UNSD).

The concept of **short-term Energy Statistics Action Plans (ESAPs) can be considered a successful mechanism for the coordinated planning of statistical activities on both regional and national levels**. The main goal of such concept is the optimal planning of energy statistics activities and the optimal use of available resources in Partner Countries in order to ensure ownership and the sustainability of proposed activities.

I**t is recommended that Belstat develop a new ESAP at national level to summarize and assess the overall progress achieved in the period 2012-2015 and to define new priority activities for the short and medium term horizon, for example 2017-2020**. Priority activities should be selected based on the previous work done in Belstat and based on the new requirements stemming from international standards and organisations.

To summarize, Belarus should consider carrying out the following energy statistics activities in the next few years:

- Preparation and organization of surveys on final energy consumption in the services and transport sectors;
- Completion of the calculation of energy efficiency indicators in the services and transport sectors using the final results from the surveys on energy consumption in these sectors;
- Implementation of international requirements for quality documentation;
- Development of a system of energy indicators to monitor the implementation of energy strategies and policies harmonised with EU standards.

1.7 Impact Matrix

1.7.1 Impact assessment by ITS experts (2012-2016)

The table below shows, for selected ESAP indicators, a summary of the progress made by Belarus since 2012 in the field of energy statistics.

Belarus: Key ESAP Indicators 2012-2016

Indicator	Sept. 2012	Feb 2016	Observations
Legal framework in place	●	●	
Available methodology for EB	◐	●	New methodology adopted and under implementation
Energy statistics plans in place at NSI	●	●	
# of Energy Statisticians (at NSI)	19	19	
# of trained gov. staff in last year	0	28	
Stakeholder meetings	○	●	Excellent interagency cooperation
Household energy survey	◐	●	Energy survey carried out in 2015
EB follow international standards	○	●	In place since 2016 (2015 data)
IEA/Eurostat/UNECE questionnaires	● (5)	● (5)	
Monthly Statistics	○	●	
Energy Price Statistics	○	○	Not in ESAP
Energy Efficiency Indicators	◔	◔	Work in progress for households and industry
Official statistics used for planning	◐	◐	Partly

Source: ITS Experts

1.7.2 Impact assessment by the main beneficiary (2012-2016)

Impact assessment of the INOGATE project according to BELSTAT

Key areas of impact	Impact level (1 to 5 scale)	Comment
Improvement of interagency cooperation	**5**	As a result of INOGATE, a working group was established. The working group consisted of representatives from Belstat, the Ministry of Energy, the Energy Efficiency Department and the Academy of Science. Working meetings enabled discussion about the changes needed in the area of Energy Statistics. INOGATE played an important role in the improvement of the coordination between different stakeholders. INOGATE is considered a "pioneer" project as far as the improvement of the institutional collaboration is concerned.
Harmonisation of the Energy Data Collection System with international standards (Eurostat, IEA, UN…)	**4**	Belstat stated that the impact of the harmonisation was positive, especially in terms of Renewable Energy Sources and the methodology for the compilation of Energy Efficiency Indicators.
Improvement of the quality of energy balances and the 5 joint questionnaires	**5**	The five IEA/Eurostat/UNECE joint questionnaires are in use since 1991. INOGATE impacted positively the quality assessment of data submitted to the IEA with respect to the compilation of the energy balance.
Development of energy efficiency indicators	**5**	Belstat stated the importance of the switch to the physical method in the household survey and the enhancement of the Energy Efficiency Indicators system for the different sectors of economy. In that respect, INOGATE had a very high impact thanks to the assistance provided to Belstat on the household survey methodology.
Improvement of public dissemination of energy statistics, energy balances, etc.	**5**	With INOGATE's assistance, the concept of "limited dissemination" was revoked and a directory for energy statistics was placed on Belstat's website. Also, work on the modelling of seasonality started. The results are to be published, starting with data from 2016.
Use of statistics in energy policy and decision-making	**4**	A representative from the Ministry of Economy stated that INOGATE had impacted favourably the process of data dissemination and access, which had resulted in the enhancement of the dialogue with the main decision-makers. Higher quality statistics brought clarity to the process underlying the development of the energy policy in Belarus.
Overall impact	**5**	Before INOGATE, international organisations were not working with Belstat's energy statistics. Also, before INOGATE, Belstat had only a theoretical knowledge of IEA publications and methodologies. INOGATE improved the practical knowledge and the awareness of Belstat's staff. It also assisted Belstat in the implementation of new methodologies, processes and techniques.

Source: ITS, Baseline Monitoring Interviews with INOGATE beneficiaries, January 2016

2 PART 2 – BENEFICIARIES

2.1 Executive Summary

Overall assessment and status quo

In the period 2015-2016, Belarus made significant progress toward the development of an official system for the calculation of energy efficiency indicators and the monitoring of energy savings in the country. The main reasons for such good progress are the following:

- Energy statistics and energy balances are compiled according to the international standards;
- Good interagency cooperation and Belstat's commitment to take responsibility for the collection and compilation of detailed energy statistics and the calculation of energy efficiency indicators;
- Belstat's ability to carry out surveys on energy consumption relying on its own resources. This is the best way to ensure the sustainability of data collection for energy efficiency indicators in the future;
- Skilled, motivated and cooperative experts in Belstat.

The development of a system for energy efficiency indicators is one of the most complex activities included in Energy Statistics Action Plans and there was lot of doubt at the beginning of the project whether to implement it or not. After the 1st ITS TA mission to Belstat in 2013, ITS experts considered available capacities in Belarus sufficient and decided to prepare specific methodologies and tools for the calculation of end-use energy consumption statistics and energy efficiency indicators for the household and services sector. One of ITS' objectives was to later replicate this proposed approach in other National Statistical Institutes. The system of EEIs is based on the *Recommendations on Measurement and Verification methods in the framework of Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services*.

These specific tools developed for Belarus were necessary because, in practice, National Statistics Institutes in EU countries are not directly involved in the calculation of EEI. In the EU, EEIs are mostly under the responsibility of energy agencies or similar institutions which apply very complex tools and procedures for their calculation.

In 2015, Belstat started to collect detailed data on energy consumption in households using the regular Household Budget Survey. It is expected that the results from this survey will be fully available in April 2016. Based on the preliminary survey results, ITS experts together with Belstat performed the calculations of energy efficiency indicators for the household sector using tailor-made models developed by ITS experts. The main achieved results are the following:

- Total final energy consumption disaggregated by end-use energy consumptions: heating, cooking, hot water production and appliances;
- Preliminary energy efficiency indicators for the household sector were calculated: energy consumption for heating per square meter (P1), energy consumption for hot water production per person (P3), energy consumption for appliances (P4) and lighting per person (P5), total electricity consumption per household (M1) and total non-electricity consumption per household (M2);
- Preliminary energy efficiency indicators for the industry sector using macroeconomic data and data from the energy balance were calculated: energy consumption of industry sub-

sectors per unit of production (P14), energy consumption of industry sub-sectors per value added (M8);

- Preliminary energy efficiency indicators for the services sector were calculated: non-electricity consumption in service sub-sectors per indicator of activity (P6), electricity consumption in service sub-sectors per indicators of activity (P7).

During 2015, in addition to the calculation of the first preliminary results for the household sector, ITS provided capacity building in the organisation and implementation of surveys in the transport and services sectors with the aim to collect data to calculate energy efficiency indicators in these areas.

The case of Belarus confirmed that it is possible for National Statistics Institutes to develop and calculate EEIs. If similar activities are to be planned in other countries in the future, NSI's capabilities and skills should be carefully assessed beforehand and the system designed accordingly.

Beside Belarus, Azerbaijan, Moldova and Ukraine also initiated activities to calculate energy efficiency indicators. It is recommended that these countries follow and exchange experiences with Belstat as much as it is practically possible.

It is assumed that, with additional TA, Belarus can complete its system of energy efficiency indicators in the next three years. After the successful completion of EEIs for the household sector, Belstat should continue to collect additional data and calculate indicators for the services, industry and transport sectors.

Conclusions and recommendations

Energy statistics are constantly evolving due to a changing situation in energy markets, the appearance of new energy products and new technologies, etc. Methodologies applied to energy data collection and compilation should be constantly reviewed, revised and adjusted to the new requirements from international organisations (Eurostat, IEA, UNSD).

The concept of **short-term Energy Statistics Action Plans (ESAPs) can be considered a successful mechanism for the coordinated planning of statistical activities on both regional and national levels**. The main goal of such concept is the optimal planning of energy statistics activities and the optimal use of available resources in Partner Countries in order to ensure ownership and the sustainability of proposed activities.

It is recommended that Belstat develop a new ESAP on national level to summarize and assess the overall progress achieved in the period 2012-2015 and to define new priority activities for the short and medium term horizon, for example 2017-2020. Priority activities should be selected based on the previous work done in Belstat and based on the new requirements stemming from international standards and organisations. To summarize, Belarus should consider carrying out the following energy statistics activities in the next few years:

- Preparation and organization of surveys on final energy consumption in the services and transport sectors;
- Completion of the calculation of energy efficiency indicators in the services and transport sectors using the final results from the surveys on energy consumption in these sectors;
- Implementation of international requirements for quality documentation;
- Development of a system of energy indicators to monitor the implementation of energy strategies and policies harmonised with EU standards.

2.2 Краткий обзор

Общая оценка и текущее положение дел

За период 2015-2016 гг. Беларусь достигла значительного прогресса в направлении развития официальной системы для расчета показателей энергоэффективности и мониторинга экономии энергии в стране. Основными причинами такого значительного прогресса являются:

- Формирование энергетической статистики и энергетических балансов согласно международным стандартам;
- Высокий уровень межведомственного сотрудничества и готовности Белстата взять на себя ответственность за сбор и формирование подробной энергетической статистики и расчета показателей энергоэффективности;
- Способность Белстата проводить обследования энергопотребления, используя собственные ресурсы. Это является наилучшим способом обеспечения постоянства сбора данных для показателей энергоэффективности в будущем;
- Квалифицированные, мотивированные и открытые для сотрудничества специалисты Белстата.

Развитие системы показателей энергоэффективности является одним из наиболее сложных видов деятельности, содержащихся в Планах действий по энергетической статистике, и на первых этапах проекта были сомнения относительно того, следует ли реализовывать эту деятельность или нет. После первой миссии технической помощи ITS в Белстат в 2013 г. эксперты ITS посчитали, что существующие возможности в Беларуси являются достаточными, и решили подготовить конкретные методики и инструменты для расчета статистики по конечному энергопотреблению и показателей энергоэффективности в секторах домашних хозяйств и услуг. Одна из целей ITS состояла в воспроизведении предложенного подхода в других национальных статистических институтах со временем. Система показателей энергоэффективности основана на *«Рекомендациях относительно методов измерения и верификации в рамках Директивы 2006/32/ЕС по энергоэффективности конечного использования энергии и энергетических услуг»*.

Эти инструменты, разработанные для Беларуси, были необходимы, так как на практике национальные статистические институты стран-членов ЕС непосредственно не участвуют в расчете показателей энергоэффективности. В Европейском Союзе за показатели энергоэффективности отвечают энергетические агентства или подобные организации, которые используют очень сложные инструменты и процедуры для их расчета.

В 2015 году Белстат начал сбор подробных данных об энергопотреблении домашних хозяйств, используя регулярные обследования бюджетов домашних хозяйств. Ожидается, что результаты таких обследований будут полностью доступны в апреле 2016 года. Основываясь на предварительных результатах обследования, эксперты ITS совместно с Белстатом выполнили расчеты показателей энергоэффективности для сектора домашних хозяйств с использованием моделей, специально разработанных экспертами ITS. Основными достигнутыми результатами являются:

- Общее конечное энергопотребление, дезагрегированные по целям конечного энергопотребления: отопление, приготовление пищи, производство горячей воды и электроприборы;
- Рассчитаны предварительные показатели энергоэффективности для сектора домашних хозяйств: энергопотребление на единицу отапливаемой площади (P1),

энергопотребление для производства горячей воды на человека (P3), энергопотребление электробытовыми приборами (P4) и на освещение в расчете на человека (P5), общее потребление электроэнергии на домашнее хозяйство (M1) и общее потребление других видов энергии (кроме электроэнергии) на домашнее хозяйство (M2);

- Рассчитаны предварительные показатели энергоэффективности для промышленного сектора с использованием макроэкономических данных и данных энергетического баланса: энергопотребление в промышленных подсекторах на единицу продукции (P14), энергопотребление в промышленных подсекторах на добавленную стоимость (M8);
- Рассчитаны предварительные показатели энергоэффективности для сектора услуг: потребление других видов энергии (кроме электроэнергии) в подсекторах услуг по показателям деятельности (P6), потребление электроэнергии в подсекторах услуг по показателям деятельности (P7).

Кроме расчета первых предварительных результатов для сектора домашних хозяйств в 2015 году эксперты ITS также провели мероприятия по повышению квалификации специалистов в области организации и проведения обследований в секторах транспорта и услуг с целью сбора данных для расчета показателей энергоэффективности в этих сферах.

Пример Беларуси подтвердил, что для национальные статистические институты могут разрабатывать и рассчитывать показатели энергоэффективности. Если подобная деятельность планируется в других странах в будущем, то необходимо заблаговременно тщательно оценить способности и навыки национальных статистических институтов и соответствующим образом спроектировать систему.

Кроме Беларуси деятельность по расчету показателей энергоэффективности также была инициирована в Азербайджане, Молдове и Украине. Этим странам рекомендуется наследовать опыт Беларуси и обмениваться опытом с Белстатом настолько, насколько это возможно.

Предполагается, что при условии предоставления дополнительной технической помощи, Беларусь сможет завершить формирование системы показателей энергоэффективности в течение следующих трех лет. После успешного завершения формирования показателей энергоэффективности для сектора домашних хозяйств Белстату слудет продолжать собирать дополнительные данные и рассчитывать показатели для секторов услуг, промышленности и транспорта.

Выводы и рекомендации

Энергетическая статистика постоянно развивается благодаря изменяющейся ситуации на энергетических рынках, появлению новых энергетических продуктов и новых технологий, и т.д. Методики, применяемые к сбору и составлению энергетических данных, должны постоянно пересматриваться и адаптироваться к новым требованиям международных организаций (ЕВРОСТАТ, МЭА, СО ООН).

Концепция **краткосрочных Планов действий по энергетической статистике (ПДЭС) может рассматриваться как успешный механизм скоординированного планирования статистической деятельности на региональном и национальном уровне**. Основной целью подобной концепции является оптимальное планирование деятельности в области энергетической статистики и оптимальное использование доступных ресурсов в Странах-

партнерах с целью обеспечения активного участия стран и долгосрочной перспективы предложенной деятельности.

Рекомендуется, чтобы Белстат разработал новый ПДЭС на национальном уровне, в которым были бы подведены итоги и оценен общий прогресс, достигнутый за период с 2012 г. по 2015 г., а также определялись бы новые приоритетные направления деятельности в краткосрочной и среднесрочной перспективе, например на 2017-2020 годы. Приоритетные мероприятия следует выбирать исходя из работы, проделанной Белстатом, и основываясь на новых требованиях, вытекающих из международных стандартов и организаций. В итоге Беларуси следует рассмотреть возможность проведения следующих мероприятий в области энергетической статистики в течение трех последующих лет:

- Подготовка и организация обследований конечного энергопотребления в секторах услуг и транспорта;
- Завершение расчёта показателей энергоэффективности в секторах услуг и транспорта, используя окончательные результаты обследований энергопотребления в этих секторах;
- Выполнение международных требований к качеству документации;

Разработка системы энергетических показателей для контроля над реализацией энергетической стратегии и политики, согласованных со стандартами ЕС.

2.3 Main Report

2.3.1 Mission report for the 3rd ITS TA mission to Belarus

This section corresponds to a mission report for the visit made by ITS expert to Belarus in December 2015.

The 3rd Technical Assistance Mission to Belarus was organised with the aim to provide capacity building in the preparation and implementation of detailed surveys on energy consumption (CWP.08.BY and CWP.11.BY) and to calculate related energy efficiency indicators (CWP.10.BY). These activities are a follow-up to the activities conducted in the first project period and are closely connected to the activities performed during the Regional workshop on Energy Efficiency Indicators that was held in Minsk in September 2015.

The 3rd ITS TA mission to Belarus took place from 7 to 8 December 2015 at Belstat's premises in Minsk, Belarus. During the mission Belstat delivered a comprehensive overview of the status of activities conducted in the frame of the INOGATE project and presented the preliminary results of the survey on energy consumption in households.

Belstat reported that assessments for calorific values for different energy products have been agreed based on the laboratory measurements and will be applied in the new energy balance. Belstat also explained that they had a problem related to the calculation of solar heat production from solar heaters and requested ITS experts to assist with the preparation of a corresponding methodology.

ITS experts gave a presentation of the *Model for calculating final end-use energy consumption in households* and discussed with Belstat the following issues:

- Final energy consumption by demand sectors in Belarus;
- Demography and household data;
- Number of households by type of heating (central and room heating), type of dwellings (family houses, apartments in multifamily buildings) and energy products used for heating, cooking and hot water production;
- Surface area by type of heating (central and room heating) and type of dwellings (family houses, apartments in multifamily buildings);
- Calorific values;
- Overview of the final survey results calculated by the Model.

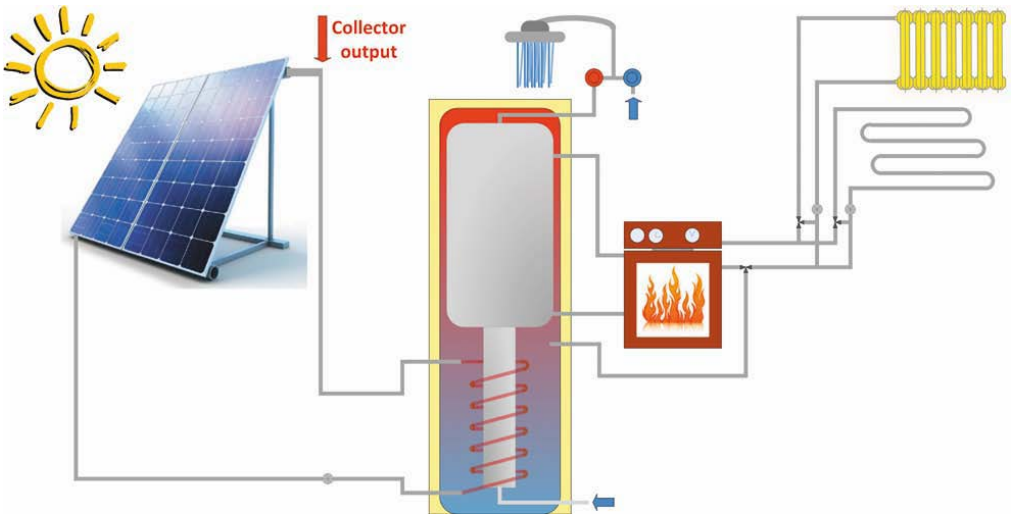
Following the analysis and verification of survey data, ITS experts explained the methodological concept for the calculation of final and useful specific energy consumptions for heating, cooking and hot water in households. It is crucially to understand these definitions because they are used for calculating and deciding about consumption equivalents for different energy products used for the same purpose (end-use). It is recommended that the final specific energy consumption values be agreed between Belstat and the main stakeholders responsible for energy efficiency of the country.

During the mission, ITS experts also presented and discussed the system for the calculation of energy efficiency indicators using the *Model for M&V of energy efficiency,* explained which data was missing and what additional data to collect in the coming years. ITS experts also explained how to calculate energy savings in the current year in comparison to the base year.

In addition ITS experts gave presentations about the collection of data in the services and transport sectors and prepared a list of recommendations on how to organise and implement comprehensive surveys in these sectors.

Finally, a methodology for the calculation of solar heat production/consumption was presented and discussed.

The following figure shows the working-principle of a solar water heating system. Such a system normally includes collector panels, a storage tank and an additional burner for times when solar radiation is not sufficient. The solar heat can be used to heat swimming pools (normally unglazed collectors), for the production of domestic hot water (DHW-Systems) or for domestic hot water production and space heating (Combi Systems) and (theoretically) for space cooling, but space cooling is not currently common in private households in Belarus.



The International Energy Agency/ESTIF developed a method for the calculation of solar heat production. It is recommended for use by member states because:

- It is very simple and needed data are available in member states;
- It takes into account all relevant systems, for the time being;
- It follows the Eurostat/IEA fuel definitions.

The only needed data is the installed surface area of collectors or the thermal capacity of a collector; the type of solar system (e.g. glazed collector types) and the average annual global radiation for the region.

The calculation of solar heat production in the cases, where installed surface area is available, is as follows:

- Un-glazed collectors: 0.29 × H0 × Aa
- Glazed collectors in DHW systems: 0.44 × H0 × Aa
- Glazed collectors in combi-systems: 0.33 × H0 × Aa

The calculation of solar heat production in the cases, when the thermal capacity of solar collector, is available is as follows:

- Un-glazed collectors: 0.42 × H0 × Pnom
- Glazed collectors in DHW systems: 0.63 × H0 × Pnom

- Glazed collectors in combi-systems: 0.47 × H0 × Pnom

Where:

- H0 is the annual global solar radiation in kWh/m²
- Aa is the collector aperture area (in m²), but used in the calculation without a unit like a constant as shown in the example below.
- Pnom is the nominal thermal power output of a collector in (kW), but used in the calculation without a unit like a constant as shown in the example below.

Example of a calculation for a typical family house in Minsk, Belarus which uses a DHW system for hot water production and which size is 5.9 m^2. The average annual solar radiation in Minsk is 950 kWh/m^2.

- Solar heat production (DHW) = 0.44 × H0 × Aa = 0.44 × 950 × 5.9 = 2466 kW

2.3.2 List of participants for the 3rd ITS TA mission to Belarus

2.3.2.1 International experts:

- Alenka Kinderman Lončarević, Senior Expert on Energy Statistics, INOGATE Technical Secretariat;
- Damir Pešut, Senior Expert on Energy Statistics, INOGATE Technical Secretariat.

2.3.2.2 National Statistical Committee of the Republic of Belarus:

- Olga Dovnar, Deputy Chairperson;
- Aleksandr Snetkov, Head of Industrial Statistics Department;
- Irina Savitskaya, Head of Energy Statistics Unit, Industrial Statistics Department;
- Vladimir Kazei, senior economist of Energy Statistics Unit, Industrial Statistics Department;
- Anna Kondratskaya, senior economist of Energy Statistics Unit, Industrial Statistics Department;
- Svetlana Khalilova, senior economist of Energy Statistics Unit, Industrial Statistics Department.

2.3.2.3 Ministry of Economy of the Republic of Belarus:

- Dmitry Skvotsov, Deputy Head of Energy Policy Division, Fuel and Energy, Chemical and Pharmaceutical Industry Department;
- Galina Malyushkova, consultant of Energy Policy Division, Fuel and Energy, Chemical and Pharmaceutical Industry Department;
- Igor Bogdan, Head of Fuel and Energy Regulation Section, Research Economy Institute;
- Anna Penyaz, junior research fellow of Fuel and Energy Regulation Section, Research Economy Institute.

2.3.2.4 Ministry of Energy of the Republic of Belarus:

- Anna Sheveleva, consultant of Production and Technology Division;
- Mikhail Malashenko, Head of Energy Efficiency Division;

- Inna Potupchik, Head of Electricity Supply Unit, State Production Association "Belenergo";

2.3.2.5 National Academy of Science of Belarus (NASB):

- Vladimir Rak, Head of Energy Economy Sector, RNPUP "NASB Energy Institute";
- Sergei Aleksandrovich, engineer of Energy Economy Sector, RNPUP "NASB Energy Institute";

2.3.2.6 Department for Energy Efficiency of the State Committee on Standards of the Republic of Belarus:

- Inna Eliseeva, Head of Information-Analytical Unit;
- Elena Ivanova, consultant of Information-Analytical Unit.

2.3.3 Specific deliverables

- Model for calculating final energy consumption by end-use in households
- Model for monitoring and verification of energy efficiency indicators and energy savings

2.4 Annexes

2.4.1 Key contact persons

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