

ACTIVITY COMPLETION REPORT

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

(CWP.10.AM)

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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
DSO	Distribution System Operator
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
MCM	Million Cubic Meters
MD	Moldova
MENR	Ministry of Energy and Natural Resources
NGO	Non-government Organisation
NPP	Nuclear Power Plant
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
TSO	Transport System Operator
UA	Ukraine
UZ	Uzbekistan

1 PART 1 – EUROPEAN COMMISSION

1.1 Background

Assignment Title:	ITS Technical Assistance to Armenia in the field of Energy Statistics in the extension period (Feb. 2015 – Jan. 2016)
Country and Dates:	TA delivered remotely and during a workshop on Energy Balance Compilation held in Zagreb on 2-4 November (RWP.13)
Beneficiary Organisation:	National Statistical Service (NSS), Armenian Institute of Energy and the Ministry of Energy and Natural Resources (MENR)
Beneficiary Organisation - key contact persons – name and e-mail address:	See list of key persons and their contact details in Annex 2.6.1
Deliverables Produced:	<ul style="list-style-type: none"> • Pilot Energy Balance For Armenia (2014 data) • Five Joint Questionnaires IEA/Eurostat/UNECE filled-in: Coal, Oil, Natural Gas, Electricity and Heat, Renewables • Update of the methodology for data collection from natural gas sector • Update of the methodology for data collection from households • Activity Completion Report for activity CWP.10.AM • Final Assessment Report
Expert Team Members:	<ul style="list-style-type: none"> • Mr Nicolas Brizard, Key Expert for Energy Statistics • Ms Alenka Kinderman Lončarević, Senior Non Key Expert for Energy Statistics • Mr Branko Vuk, Senior Non Key Expert for Energy Statistics • Mr Tomasz Trus, Junior Expert for Energy Statistics

1.2 Essence of the Activity

Armenia is one of the nine INOGATE PCs that have agreed upon an Energy Statistics Action Plan (ESAP) with ITS. Armenian beneficiaries have worked actively to implement the ESAP during 2012-2016. The overarching objective of the Technical Assistance to Armenia started in 2012 was to improve its energy statistics systems and to increase the capacity of the National Statistical Service to collect and compile energy statistics harmonised with EU and international standards.

The main objective of activity CWP.10.AM carried out during the extension period (February 2015-February 2016) was to assist the beneficiary organisations to produce the first national Energy Balance of Armenia and strengthen their ability to fill-in the five joint IEA/Eurostat/UNECE energy questionnaires.

Activity CWP.10.AM was implemented partly during the regional workshop (RWP.13) to which Armenia was invited and partly through remote assistance provided during the preparation and follow-up phases of the workshop.

1.3 Key Findings

Some good progress was made towards the improvement of the completeness of energy data and statistics in Armenia in 2015 and early 2016. This enabled the NSS to improve and submit to the IEA five questionnaires instead of four for the 2014 cycle. The reception of the five questionnaires was confirmed by the IEA. A preliminary or pilot energy balance has also been compiled with ITS' assistance during the workshop in Zagreb in November 2015.

However, the quality of the questionnaires and energy balance still has to be improved due to insufficient detailed or good quality data on energy consumption in the services and agricultural sectors. Surveys providing coverage of the household, industry and transport sectors have been implemented, but due to lack of financial and human resources, the planned surveys for services and other sectors (e.g. agriculture) had to be postponed to 2016. As a result, work on data collection had to be distributed across several NSS departments. Also, the questionnaires used for industry, transport and construction are new both for the NSS and the respondents, which implies a steep learning curve.

In the case of agriculture, there is no direct data on the use of energy in this sector. The NSS has to resort to making estimates using indirect data (e.g. fleet and unit consumption data) collected from other NSS departments, which implies a good coordination among them, but also the provision of sectoral expertise to the NSS (since NSS staff are not energy experts). Unfortunately, this expertise available at the Ministry of energy proved difficult to mobilise, which made the compilation of the energy balance a difficult exercise for the NSS.

Another problem is the consumption of natural gas in Armenia as data are not shared by Gazprom. Negotiations to obtain data have started with Gazprom but still have to produce results.

Despite those difficulties, the NSS has reached a higher level of self-sufficiency and should, starting in 2016, be able to collect the necessary data with the aim to compile an official energy balance (2015 data) according to international standards. There was no obligation to prepare a 2014 energy balance. In that respect, the 2014 pilot energy balance that was prepared in Zagreb in November 2014 is considered as a trial version, which will provide a good base for the 2015 energy balance (availability of control data) and a way to gather experience and identify the data gaps.

It should be noted that according to the Law on Energy Savings and Renewable Energy, the NSS has to publish in 2016 and for the first time since 1996, an official energy balance for Armenia (2015 data).

1.4 Ownership and Benefits of the Activity

Technical Assistance provided by ITS	Actions undertaken by the NSI
<ul style="list-style-type: none"> • Remote technical assistance on the preparation and compilation of data for energy balances and the five IEA/Eurostat/UNECE joint questionnaires • Capacity building to compile energy balance using the ITS tailor-made model and the five joint IEA/Eurostat/UNECE questionnaires using real data collected in 2015 during the Zagreb workshop (RWP.13) in November 2015 • Update of the methodologies used for the collection of data on the natural gas sector and households • Prepared a list of recommendations for priority follow-up activities for the short-term and the medium-term • Armenian representatives from the NSI and the Ministry of Energy also participated in complementary activities: the Seminar on the use of energy statistics in energy planning (June 2015, Chisinau, Moldova) and the ESN meeting (in November 2015, Tbilisi, Georgia) 	<ul style="list-style-type: none"> • Improved system of codes for energy products • Data collection system improved: <ul style="list-style-type: none"> ○ Conducted a pilot survey in 2014 and a full survey of industry, construction and agriculture sectors in 2015 ○ The existing data collection system for the transport sector and households was improved and now includes questions related to energy consumption • Pilot energy balance for 2014 compiled • Five IEA/Eurostat/UNECE questionnaires for 2014 filled in and submitted to the IEA

1.5 Challenges Faced

In 2014, Armenia adopted the Law on Energy Savings and Renewable Energy, which defines among other things the division of labour between the NSS and Ministry of Energy with respect to the compilation and dissemination of energy balance. The NSS is responsible for the collection and production of energy statistics and the dissemination (publication) of the official energy balance. The Ministry of Energy is responsible for the compilation of the official energy balance.

However, in practice, the division of work established by Law does not function well. By December 2015, the Ministry of Energy still had not appointed the person(s) responsible for the compilation of energy balances. As a result, the NSS took the initiative to compile the energy balance for Armenia until the issue is resolved at the Ministry of Energy.

1.6 Recommendations

In the short term, ITS experts make the following recommendations to Armenia with the aim to improve the quality of the official energy balance and the five IEA/Eurostat/UNECE joint questionnaires:

- A transparent and more practical institutional setup is needed in order to improve the collaboration between the Ministry of Energy and the NSS;
- The Ministry of Energy should appoint expert staff responsible for the compilation of the

energy balances based on data provided by the NSS;

- Detailed statistics on natural gas are necessary for the improvement of the energy balance and the five IEA/Eurostat/UNECE joint questionnaires. Questionnaires have been designed and are already available. The NSS should submit them to GazpromArmenia which is both the TSO and the DSO of the Armenian natural gas system;
- The NSS should improve its surveys on energy consumption in households and other sectors by adding additional questions to the questionnaire;
- The NSS should improve statistics on production and consumption of renewables and in particular fuel wood and other types of biomass in all sectors.

In the medium term, Armenia should consider implementing the following actions:




















- The NSS should start the development of quality documentation for energy statistics;
- The NSS should start the preparation of a comprehensive survey of final energy consumption in key sectors of the economy (households, industry, services, agriculture, transport) in order to collect disaggregated consumption data by end-use or sub-sectors;
- Using disaggregated consumption data collected through surveys, Armenia should start the modelling and calculation of Energy Efficiency Indicators;
- The NSS should start the development of monthly energy statistics;
- The NSS should start with the development of statistics on the RES share (renewable energy) and CO₂ emissions.

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 Armenia since 2012 in the field of energy statistics.

Armenia: Key ESAP Indicators 2012-2016

Indicator	Sept. 2012	Feb. 2016	Observations
Legal framework in place			Division of work between NSS and MoE still needs clarification
Available methodology for EB			Under implementation
Energy statistics plans in place at NSI			3-year program for Energy Statistics adopted in 2013
# of Energy Statisticians (at NSI)	2	2	
# of trained gov. staff in last year	2	8	Chisinau, Zagreb and Tbilisi workshops in 2015
Stakeholder meetings	 (0)	 (4)	Inter-agency cooperation needs further improvement
Household energy survey			Data collected through Household Living Conditions survey
EB follow international standards			Pilot energy balance for 2014 compiled
IEA/Eurostat/UNECE questionnaires	 (0)	 (5)	
Monthly Statistics			Not in ESAP
Energy Price Statistics			Not in ESAP
Energy Efficiency Indicators			Not in ESAP
Official statistics used for planning			Needs improvement

Source: ITS Experts

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

Impact assessment of the INOGATE project according to the NSS and the MENR

Key areas of impact	Impact level (1 to 5 scale)	Comment
Improvement of interagency cooperation	4 / 5	<p>Prior to INOGATE, there was no cooperation between the MENR and the NSS. INOGATE resulted in a much-improved cooperation including exchange of information and opinions on energy data.</p> <p>As a result of INOGATE, legal documents were implemented which defined clearly each stakeholder's roles in the process of production of Energy Statistics. This also improved the quality of statistical data.</p>
Harmonisation of the Energy Data Collection System with international standards (Eurostat, IEA, UN...)	4	The main goal of the NSS's work during this project was the harmonisation of its statistics with EU standards. As a result, a new data collection system was created but there is still room for improvement.
Improvement of the quality of energy balances and the 5 joint questionnaires	4	INOGATE impacted very positively on the improvement of the questionnaires used by the NSS and generated a lot of useful knowledge on the compilation and reporting processes.
Development of energy efficiency indicators	3	Energy Efficiency was not a priority topic for Armenia during the extension period, hence the limited impact at this stage.
Improvement of public dissemination of energy statistics, energy balances, etc.	N/A	The dissemination issues were not a priority topic but would be an important subject for future cooperation with the EC. The Energy Balance is a specific statistical product, which needs special attention from the dissemination point of view.
Use of statistics in energy policy and decision-making	N/A	Without figures and data there is no information to refer to while designing energy policy. Figures should lead decisions in terms of energy strategy and planning processes. Since official data are not available yet, a full assessment of INOGATE's impact is not possible. So far the impact is moderate.
Overall impact	5	<p>Without INOGATE the cooperation between the MENR and the NSS on Energy Statistics would have been delayed. The impact of INOGATE is considered very high, because it has increased significantly the professional knowledge of the staff and made it possible to use this knowledge in a very practical way.</p> <p>All activities led to results for the NSS. INOGATE impacted positively the process of questionnaire preparation, data collection and compilation. Activities were well planned and delivered.</p>

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

2 PART 2 – BENEFICIARIES

2.1 Executive Summary (English)

The main objective of activity CWP.10.AM was to perform an analysis of the quality and accuracy of energy data prior to the compilation of the annual energy balance for 2014 for Armenia. Based on data received from the NSS, ITS experts developed a tailor-made tool for the compilation of the energy balance. The tool was presented and structured so as to highlight Armenia's energy sector specificities and to facilitate the capacity building of NSS' and MENR's staff.

This activity was a continuation of the work done in 2012-2014 during which specialists from NSS and ITS experts worked intensively on the preparation of the methodologies used for the collection of data which are necessary to compile energy balances.

Three weeks before the Regional Workshop on energy balance compilation (RWP.13), the NSS sent a data set which included detailed data on electricity production and own consumption in NPP, TPPs and HPPs, import and exports of all energy products and detailed survey results: energy balances of individual industrial enterprises which belong to the NACE sections B, C, D, E, F and G; and results for energy consumption in households in 2014.

The first survey on energy consumption in industry, agriculture and construction conducted in 2015 was a very important step towards the development of energy balance. The survey covered about 1,230 industrial enterprises, 700 construction enterprises and about 500 enterprises from the transport sector. The questionnaire included questions about the purchase, production, stock changes, sale and consumption of energy by consumption categories: for heat and electricity production, other use, transport and not thermal consumption.

Although some problems appeared during the interview and data compilation phases of the survey due to the fact it was carried out for the first time, the final results can be considered satisfactory. It is worth mentioning that the NSS conducted the survey in the industry sector without any additional financial and human resources. The Industry Statistics Division of the NSS only had available for its regular activities planned for 2015 but nevertheless decided to conduct this pilot.

Besides the survey on energy consumption in industry, the NSS collected data on energy consumption in households using a simple method based on existing regular households surveys which questionnaires were amended to accommodate questions on quantities of energy consumed. The results were not satisfactory and the NSS will need to improve the questions in the coming years. In particular, questions on the use of renewable energy such as fuel wood, wood residues and other types of biomass should be asked.

Examining data received from the NSS, ITS experts identified that important data on natural gas supply and consumption were still missing. During the Regional workshop in Zagreb, missing data were estimated based on expert knowledge. However, in the future, natural gas data should be officially reported by GazpromArmenia. Also, estimates were used when filling in the five joint IEA/Eurostat/UNECE energy questionnaires. The missing data on natural gas are the biggest gap in current Armenian energy statistics. The main reason for gaps in natural gas data are the absence of cooperation between GazpromArmenia and the NSS and the reluctance of GazpromArmenia to report natural gas data.

In January 2016, after the joint questionnaires had been sent to IEA, ITS experts performed additional research on data published by GazpromArmenia on its web site and discovered that GazpromArmenia publishes basic statistics on natural gas supply to energy sector and final users every year. Natural gas consumption in Armenia in 2013 and 2014 were reported as follows:

- 2014: 1,720 mcm (TPPs: 328 mcm, industry: 196 mcm, households: 527 mcm, CNG stations: 485 mcm, other users: 185 mcm);
- 2013: 1,945 mcm (TPPs: 511 mcm, industry: 268 mcm, households: 539 mcm, CNG stations: 455 mcm, other users: 172 mcm);

The main issue in statistics is natural gas used in TPPs. In 2014, TPPs reported that 799 mcm of natural gas had been used for electricity generation which is significantly different from the amount reported by GazpromArmenia.

ITS experts also studied exports of natural gas from Iran to Armenia, as there is a specific agreement between the two countries. An official publication reported that natural gas imports from Iran amounted to 389 mcm in 2014. According to the agreement, Armenia has to export electricity back to Iran in the same amount: for each cubic meter of imported natural gas from Iran, Armenia has to export 2 kWh of electricity to Iran. The joint IEA/Eurostat/UNECE questionnaires for Gas and Electricity for 2014 were revised accordingly.

Conclusions and recommendations for the NSS and the MENR:

- Armenia's energy system being not too complex, the NSS can improve significantly its energy balance if it succeeds to collect data on natural gas supply and improve the questionnaire for households. These achievements will enable the NSS to compile energy balances in full compliance with international standards. ITS experts estimate that these improvements can be achieved within one calendar year.
- When collecting data on natural gas supply and consumption, the NSS should take into account imports from both Iran and Russia and account for corresponding flows in an appropriate way. ITS experts prepared improved versions of the questionnaires for the natural gas sector and delivered them to the NSS.
- The NSS should improve the questionnaire use to collect data on households by introducing more detailed questions about quantities of energy consumed and introducing additional questions for quality control. ITS experts prepared an improved version of the questionnaire for the household sector that was delivered to NSS. It is also important to identify more precisely the use of renewables by households.
- The NSS should repeat the energy survey in industry every year because it is not possible to estimate energy consumption in this sector.
- The NSS is now fully capable of collecting energy data and compiling energy balances. If the MENR does not appoint specialists to compile energy balance as agreed initially, the NSS should be given the role to compile and publish energy balances – of course with the needed resources to do so. It is recommended that the NSS starts developing a concept for the publication of official annual energy balances which should be disseminated through the NSS' official website and sent directly to key stakeholders.
- The NSS should also consider the calculation and publication of key energy development indicators.

- Provided adequate and additional financial and human resources are secured, the NSS should consider expanding its energy statistics activities and initiate the compilation of monthly statistics and the preparation/submission of monthly IEA questionnaires. Monthly statistics can contribute greatly to the improvement of the accuracy and quality of annual statistics.
- In later stage, the NSS should consider the collection of data needed for the calculation of energy efficiency indicators. It should also consider calculating the RES shares for Armenia as well as CO² emissions. For these new activities, the NSS can draw on the experience of Belarus, Moldova, Azerbaijan and Georgia.
- Quality Documentation should be developed.

2.2 Краткий обзор (на русском языке)

Основная цель деятельности CWP.10.AM заключалась в проведении анализа качества и точности энергетических данных до формирования годового энергетического баланса Армении за 2014 год. На основании данных, полученных от НСС, эксперты ITS разработали специальный инструмент для формирования энергетического баланса. Инструмент был представлен и структурирован таким образом, чтобы подчеркнуть особенности энергетического сектора Армении и содействовать повышению профессиональных навыков сотрудников НСС и МЭПР.

Эта деятельность стала продолжением работы, проделанной в 2012-2014 годах, во время которой специалисты из НСС и эксперты ITS интенсивно работали над разработкой методик, используемых для сбора данных, необходимых для составления энергетических балансов.

За три недели до начала регионального семинара по вопросам формирования энергетического баланса (RWP.13), НСС направила набор данных, который включал подробные данные о производстве электроэнергии и собственном потреблении на АЭС, ТЭС и ГЭС, об импорте и экспорте всех энергетических продуктов, а также подробные результаты обследования: энергетические балансы отдельных промышленных предприятий, которые относятся к разделам В, С, D, E, F и G классификатора NACE, а также результаты обследования энергопотребления в секторе домохозяйствах в 2014 году.

Первое обследование энергопотребления в промышленности, сельском хозяйстве и строительстве, проведенное в 2015 году, было очень важным шагом для формирования энергетического баланса. В обследовании приняли участие около 1230 промышленных предприятий, 700 строительных предприятий и около 500 предприятий транспортного сектора. В анкету были включены вопросы о покупке, производстве, изменении запасов, продаже и потреблении энергии по категориям потребления: для производства тепла и электроэнергии, другого использования, для транспорта и не теплового использования.

Хотя во время интервью и на стадии формирования данных возникали некоторые проблемы, связанные с тем, что обследование проводилось впервые, окончательные результаты можно считать удовлетворительными. Следует отметить, что НСС провела обследование в промышленном секторе без каких-либо дополнительных финансовых и людских ресурсов. Отдел статистики промышленности НСС располагал только ресурсами для своих регулярных мероприятий, запланированных на 2015 год, но все-таки решил провести это экспериментальное обследование.

Кроме обследования энергопотребления в промышленности, НСС собрала данные об энергопотреблении домохозяйствах, используя простой метод, основанный на существующих регулярных обследованиях домашних хозяйств, в вопросники для которых были внесены вопросы о количестве потребляемой энергии. Результаты оказались неудовлетворительными, поэтому в ближайшие годы НСС необходимо будет улучшить вопросы. В частности, необходимо включить вопросы об использовании возобновляемых источников энергии, таких как топливная древесина, древесные отходы и другие виды биомассы.

Анализируя данные, полученные от НСС, эксперты ITS определили, что по-прежнему отсутствуют важные данные о поставках и потреблении природного газа. В ходе регионального семинара в Загребе, для недостающих данных применялись оценочные значения, основанные на экспертных знаниях. Тем не менее, в будущем данные о природном газе должны будут официально предоставляться компанией «Газпром Армения». Кроме того, оценочные значения были использованы при заполнении пяти совместных энергетических вопросников МЭА / Евростата / ЕЭК ООН. Недостающие данные о природном газе являются самым большим пробелом в энергетической статистике Армении на сегодняшний день. Основной причиной

пробелов в данных о природном газе является отсутствие сотрудничества между «Газпром Армения» и НСС, и нежелание со стороны «Газпром Армения» предоставлять данные о природном газе.

В январе 2016 года, после направления совместных вопросников в МЭА эксперты ITS провели дополнительные исследования данных, опубликованных компанией «Газпром Армения» на её веб-сайте, и обнаружили, что «Газпром Армения» ежегодно публикует основные статистические данные о поставках природного газа в энергетический сектор и конечным потребителям. Отчетность о потреблении природного газа в Армении в 2013 и 2014 годах выглядела следующим образом:

- 2014 год: 1720 млн. куб. м (ТЭС: 328 млн. куб. м, промышленность: 196 млн. куб. м, домохозяйства: 527 млн. куб. м, АГНКС: 485 млн. куб. м, другие пользователи: 185 млн. куб. м);
- 2013 год: 1 945 млн. куб. м (ТЭС: 511 млн. куб. м, промышленность: 268 млн. куб. м, домохозяйства: 539 млн. куб. м, АГНКС: 455 млн. куб. м, другие пользователи: 172 млн. куб. м).

Основной проблемой для статистики является природный газ, используемый на тепловых электростанциях. В 2014 году ТЭС сообщили, что для выработки электроэнергии было использовано 799 млн. куб. м природного газа, что существенно отличается от количества, о котором сообщает «Газпром Армения».

Эксперты ITS также изучили экспорт природного газа из Ирана в Армению, поскольку между этими двумя странами существует особое соглашение. В официальном издании сообщалось, что в 2014 г. импорт природного газа из Ирана составил 389 млн. куб. м. В соответствии с соглашением, Армения должна экспортировать электроэнергию обратно в Иран в том же объеме: за каждый кубометр импортного природного газа из Ирана Армения должна поставить Ирану 2 кВтч электроэнергии. Совместные опросники МЭА/ Евростата/ ЕЭК ООН по газу и электроэнергии за 2014 год были пересмотрены соответствующим образом.

Выводы и рекомендации для НСС и МЭПР:

- Поскольку энергетическая система Армении не слишком сложна, Национальная статистическая служба Армении может значительно улучшить энергетический баланс, если ей удастся собрать данные о поставках природного газа и улучшить вопросник для домохозяйств. Эти достижения позволят НСС формировать энергетические балансы в полном соответствии с международными стандартами. По оценкам экспертов ITS, эти улучшения могут быть достигнуты в течение одного календарного года.
- При сборе данных о поставках и потреблении природного газа НСС необходимо учитывать импорт, как из Ирана, так и из России и отчитываться за соответствующие потоки надлежащим образом. Эксперты ITS подготовили улучшенные версии опросников для сектора природного газа и передали их НСС.
- НСС следует улучшить использование вопросников для сбора данных о домашних хозяйствах путем введения более подробных вопросов о количестве потребляемой энергии и дополнительных вопросов для контроля качества. Эксперты ITS подготовили улучшенный вариант вопросника для сектора домохозяйств, который был передан НСС.

Также важно более точно определить использование возобновляемых источников энергии домашними хозяйствами.

- НСС следует проводить энергетическое обследование в секторе промышленности каждый год, потому что это оценить энергопотребление в этом секторе невозможно.
- НСС теперь вполне способна собирать энергетические данные и формировать энергетические балансы. Если МЭПР не назначит специалистов для составления энергетического баланса, как это было согласовано на начальном этапе, функция формирования и публикации энергетических балансов должна быть предоставлена НСС, естественно, вместе с необходимыми для этого ресурсами. Рекомендуется, чтобы НСС начала разрабатывать концепцию для публикации официальных годовых энергетических балансов, которые должны распространяться через официальный сайт НСС и направляться непосредственно ключевым заинтересованным сторонам.
- НСС следует также рассмотреть возможность расчета и публикации ключевых показателей развития энергетики.
- При условии обеспечения соответствующими и дополнительными финансовыми и людскими ресурсами НСС следует рассмотреть вопрос о расширении своей деятельности в области энергетической статистики и инициировать формирование ежемесячных статистических данных и подготовки / подачи ежемесячных вопросников в МЭА. Ежемесячные статистические данные могут внести значительный вклад в улучшение точности и качества ежегодной статистики.
- На более позднем этапе НСС следует рассмотреть вопрос о сборе данных, необходимых для расчета показателей энергоэффективности. Следует также рассмотреть вопрос о расчете долей ВИЭ для Армении, а также выбросов CO₂. В этих новых видах деятельности НСС может опираться на опыт Беларуси, Молдовы, Азербайджана и Грузии.
- Необходимо разработать документацию о качестве.

2.3 Main Report

In this section, we describe in more detail the methodology and approach used by ITS Experts to compile the pilot energy balance of Armenia for 2014.

After receiving energy data from NSS, the ITS experts observed that the following energy forms are produced and used in Armenia:

- Other bituminous coal, Fuel wood, Charcoal, Other vegetal materials and residuals (animal dung), Natural gas, Nuclear energy, Liquefied petroleum gas, Motor gasoline, Kerosene type jet fuel, Kerosene, Road diesel, Fuel oil – high sulphur, Lubricants, Bitumen, Hydro energy, Wind energy, Electricity and Heat.

During the Regional workshop in Zagreb (RWP.13), ITS experts and NSS representatives discussed the fact that the NSS recognises only one kind of Fuel oil and does not recognise the following product classification: (i) Fuel oil – low sulphur content (<1%) and (ii) Fuel oil – high sulphur content (>1%).

It is recommended that these two energy products be introduced in official reporting and in the compilation of the energy balance. The NSS explained that Armenia became a member of the Eurasian Customs Union and will very soon harmonize its codes with international standards.

After analysing data on energy products, ITS experts reviewed energy flows in the country:

- Primary energy production
- Transformations in Power/CHP plants
- Final energy consumption.

The main conclusions listed below were reached and later confirmed during the Regional workshop in Zagreb:

- There are no reliable energy data on natural gas supply and consumption and no data on the calorific value of the imported natural gas;
- The Yerevan TPP (Combined Cycle) is not a CHP power plant. It does not produce heat and should therefore be considered treated as a TPP which significantly simplifies the compilation of the energy balance;
- There are no “autoproducers” of energy amongst enterprises in Armenia;
- The consumption of all transport fuels that were allocated to the industry sector should be accounted to the transport sector;
- Because of the lack of data on energy consumption in the services sector, all statistical differences will be allocated to the services sector;
- Data on the consumption of fuel wood and wood products should be improved.

After analysing the structure of Armenia’s energy system, ITS experts identified the following relevant energy flows for Armenia’s energy balance, which was then structured around these flows:

1. Domestic supply
 - Production
 - Imports
 - Exports
 - Stock changes
2. Transformations
 - MA Thermal Power Plants (TPPs)
- Nuclear Power Plant (NPP)
 - Wind Power Plant (WPP)
 - MA Hydro Power Plants (HPPs)
3. Energy sector own use
 - MA Thermal Power Plants (TPPs)
 - Nuclear Power Plant (NPP)
 - Wind Power Plant (WPP)
 - MA Hydro Power Plants (HPPs)
4. Distribution Losses
5. Final Consumption
6. Industry Sector
 - Iron and steel
 - Chemical (including petrochemical)
 - Non-ferrous metals
 - Non-metallic minerals
 - Transport equipment
 - Machinery
 - Mining and quarrying
 - Food, beverages and tobacco
 - Paper, pulp and printing
 - Wood and wood products
 - Construction
 - Textiles and leather
 - Not elsewhere specified (Industry)
7. Transport Sector
 - International aviation
 - Domestic aviation
 - Road
 - Rail
 - Domestic navigation
 - Pipeline transport
 - Not elsewhere specified (Transport)
8. Other Sectors
 - Commercial and public services
 - Residential
 - Agriculture/forestry
 - Fishing
 - Not elsewhere specified (Other)
9. Non-Energy Use
 - Transformation sector
 - Energy sector
 - Transport sector
 - International aviation
 - Domestic aviation
 - Road
 - Rail
 - Domestic navigation
 - Pipeline transport
 - Not elsewhere specified (Transport)
 - Industry sector
 - Iron and steel
 - Chemical (including petrochemical)
 - Non-ferrous metals
 - Non-metallic minerals
 - Transport equipment
 - Machinery
 - Mining and quarrying
 - Food, beverages and tobacco
 - Paper, pulp and printing
 - Wood and wood products
 - Construction
 - Textiles and leather
 - Not elsewhere specified (Industry)
 - Other sectors
 - Commercial and public services
 - Residential
 - Agriculture/forestry
 - Fishing
 - Not elsewhere specified (Other)

2.4 Ad hoc methodological tools developed for Armenia

In order to help Armenia improve its energy statistics and energy balance, ITS recommended to collect missing data in the natural gas and residential sectors. This section shows the various questionnaires (or additional questions) proposed by ITS experts to improve the data collection in these two areas

2.4.1 Questionnaires for the natural gas sector

2.4.1.1 Questionnaires for the Transmission System Operator and the Underground Storage Operator (GazpromArmenia)

Table 1. Natural gas balance for the transmission system

		-in 000 m ³ -	-in TJ (GCV)-	-in TJ (NCV)-	
5	Imports (by countries of import):	0,00	0,00	0,00	(5)=(6)+...+(11)
6	- Russia				
7	-				
8	-				
9	-				
10	-				
11					
12	Exports (by countries of export):	0,00	0,00	0,00	(12)=(13)+...+(20)
13	-				
14	-				
15	-				
16	-				
17	-				
21	Stock changes in Underground Gas Storage (UGS):	0,00	0,00	0,00	(21)=(23)-(22)
22	- opening stock level at 1st January				
23	- closing stock level at 31st December				
24					
25	Losses in transmission system:				* քրժն. 0,5 %
26	Own-use consumption in transmission system:				
27					
28	Total natural gas supply in the country:	0,00	0,00	0,00	(28)=(1)+(5)+(12)+(21)-(25)-(26)
29					
30	Specification of supply:				
31	- Delivery to distribution companies				
32	- Delivery directly to large customers				
33	- Delivery to TPP (electricity plants)				
34	- Other not specified				
37	Total delivery (supply):	0,00	0,00	0,00	(37)= (31)+...+(34)

Table 2. Specification of supply – distribution companies

	Delivery to distribution companies	-in 000 m ³ -	-in TJ (GCV)-
1	- name (for each distribution company)		
2			
3			
4			
5			
6			
7			
8	Total	0,00	0,00

(8)=(1)+...+(7)

Table 3. Specification of supply – large customers

	Delivery to large customers*	-in 000 m3-	-in TJ (GCV)-
1	- name (for each distribution company)		
2			
3			
4			
5			
6			
7			
8	Total	0,00	0,00 (8)=(1)+...+(7)

Table 4. Specification of supply – TPPs

	Delivery to TPPs	-in 000 m3-	-in TJ (GCV)-
1	- name (for each TPP)		
2			
3			
4			
5			
6			
7			
8	Total	0,00	0,00 (8)=(1)+...+(7)

2.3.1.1 Questionnaire for the Distribution System Operator (GazpromArmenia)

Table 5. Natural gas balance for the distribution system

	The name of the distribution company	Natural gas distribution		Natural gas price, including VAT *	
		1000 m3	TJ (GCV)	1.srp	31.pro
	1	2	3	4	5
1	Natural gas entry in the distribution system/network (Natural gas at delivery point):				
2					
3	Natural gas supply by supplier companies:	0	0		
4	- for each natural gas supplier/trader				
5					
6					
7					
8	Total natural gas distribution:	0	0		
9	- households				
10	- manufacturing sector				
11	- service sector				
12	- agriculture				
13	- TPPs				
14					
15					
16	- other consumers				
17					
18					
19	Losses in distribution system:	0	0		

* Prices in energy unit (GCV)/monetary unit

2.5 Questionnaire for the household sector

Table 6. Annual energy consumption in households

	Energy forms	Do you use following energies for housing purposes ? (yes/no)	What are total quantities of energy product used during last 12 months?	Units	Did you have any costs for the energy consumed? (yes/no)	If yes, can you please specify how much was the costs, (monetary units)?
	1	3	4	2	4	5
1	Electricity			kWh		
2	Liquid petroleum gas			kg		
3	Gas/diesel oil			lit		
4	Fuel oil			kg		
5	Coal			kg		
6	Charcoal			kg		
7	Fuel wood			(m3)		
8	Wood waste and wood chips			(m3)		
9	Wood pellets, brickets, others			(kg)		
11	Kerosene			lit		
12	Animal waste/dung			kg		
13	Biomass			kg		
14	- specify others					
15	Biogas					
16	-----specify all other in use					
13	Solar energy					
14	Wind energy					

If your household have solar PVr:			
9	what is capacity of the solar PV?	(MW)	
11	what is annual electricity generation of solar PV?7	kWh	
12			

If your household have solar panel			
9	what is capacity of the solar panel?	(MW)	
11	what is total surface of solar panel?	m2	
12			

2.6 Annexes

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