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STATISTICS DIVISION

International Workshop on Energy Statistics
Beijing, 23-25 May 2016

Final report

1. An International Workshop on Energy Statistics was organized by the United Nations Statistics Division (UNSD) and the National Bureau of China (NBS) in Beijing, China, on 23-25 May 2016, with collaboration from the International Energy Agency (IEA).

2. This workshop was the 27th in a series of events organized under the project on strengthening statistical capacity development in China and other developing countries in Asia funded by the Chinese Government. It aimed to enhance the capacity of National Statistical Offices and line Ministries of Asian countries in the area of energy statistics. The workshop addressed specific issues in energy statistics, focusing on the recent international methodology developments, such as the publication of the International Recommendations for Energy Statistics (IRES), the Standard International Energy Product Classification (SIEC) and the development of the Energy Statistics Compilers Manual (ESCM). It also covered basic statistics, linking data items to the actual processes related to the five main types of fuels and energy. Cross-cutting issues such as energy balances, energy indicators (particularly indicators of the Sustainable Development Goal 7 – SDG 7) and energy efficiency were also covered.

3. The Workshop was attended by 21 international participants from 13 countries and 87 national participants from the host country.

4. The agenda, the list of participants and the workshop presentations are available online at: http://unstats.un.org/unsd/energy/meetings/China2016.htm

Main discussions and conclusions

Opening ceremony

5. The Workshop was opened by Mr. Xu Xianchun, Deputy Commissioner of NBS, who gave an introductory speech.

6. In addition to Mr. Xu, Mr. Leonardo Souza, Statistician with the Industrial and Energy Statistics Section of UNSD, and Ms. Wang Xiaohui, Deputy Director General of Department of Energy Statistics of NBS, made statements during the opening session.

Introduction to energy statistics

7. This session discussed the role and importance of energy statistics and reviewed recent developments to improve harmonization and usefulness of energy statistics, including the work of the Intersecretariat Working Group on Energy Statistics (InterEnerStat), the International Recommendations for Energy Statistics (IRES) and the Energy Statistics Compilers Manual (ESCM). It started with a presentation from Mr. Leonardo Souza from UNSD on why the topic of energy statistics is important historically and in the context of the 2030 Development Agenda. The

presentation related decisions made by the United Nations Statistical Commission (UNSC) on energy statistics with the then current world situation, and touched on the energy statistics publications that ensued from those decisions. It covered the main historical decisions related to energy statistics since the UNSC's inception until the recent establishment of the Oslo City Group on Energy Statistics (Oslo Group) and InterEnerStat in 2005, and the UNSC recognition of their outcomes (IRES and SIEC) as international standards in the area in 2011. Lastly, the ESCM was presented as a practical manual that will provide country examples.

8. Mr. Duncan Millard from IEA followed with IEA's view on the role and importance of energy statistics, including its many uses, such as energy policy, carbon dioxide emission calculation and to support energy efficiency initiatives. As the leading agency in InterEnerStat, IEA stressed its role in the harmonization of energy product and flow definitions that fed into IRES and SIEC. The presentation related energy policies with current challenges that are the cause or a consequence of those policies. For instance, improving energy efficiency (and therefore decreasing resource use) and the need for clean fuels, so as to reduce environmental harm from energy activities and use. It also mentioned current issues with the measurement of energy statistics, setting the tone for the sessions that followed.

9. The session also included more detailed country presentations from China, given by Ms. Wang Xiaohui, and from the US, given by Ms Ayaka Jones from the US Department of Energy/Energy Information Administration (DOE/EIA). Each presentation gave a bird's eye view of the respective national energy statistics system, including legal framework, institutions involved in data collection, coordinating body, data sources, types and frequency of surveys, processing and dissemination. Examples of survey questionnaires were displayed by Ms. Wang, while alternative data sources such as rail freight data for weekly coal production (since most coal is transported by trains) was showcased by Ms. Jones. The US presentation also included the adaptation of the Generic Statistics Business Process Model (GSBPM) that is used by the DOE/EIA in the production of energy statistics. This GSBPM adaptation is intended to be incorporated as a country practice in the respective chapter of the ESCM. The importance of such presentations on more advanced energy statistics systems lies in the fact that they provide good illustrations to international participants of what can be attained in such a system. This includes not only what can be achieved when more resources are available, but also how the available resources can be used to a maximum extent in order to provide more accurate and more frequent energy data.

International Recommendations for Energy Statistics (IRES), including international classifications used in energy statistics

10. Mr. Alexander Blackburn, Statistician with UNSD, provided an introduction to the International Recommendations for Energy Statistics (IRES), which was adopted in draft form by the United Nations Statistical Commission in 2011 and which was made available as a white cover version of the final document in the beginning of 2016. IRES provides reference guidance for the collection and compilation of energy statistics. In the presentation, UNSD described how IRES came to be an important milestone for energy statistics, providing: The Standard International Energy product Classification (SIEC); internationally-agreed definitions of products and flows; clear reference to other

international classifications; a reference list of energy-specific data items for collection; and recommendations for data collection and dissemination.

11. In contrast, previous manuals, even if very informative, did not focus on harmonization. This can be exemplified in the conventions on treatment achieved by IRES for energy statistics, such as: the concept and scope of production; the use of the territorial principle; treatment of international bunkers; concepts of Supply, Transformation, own use and final consumption; the non-energy use of energy products; and exceptions in the case of biofuels used as energy products.

12. For all these reasons, the importance of following IRES concepts and definitions was stressed not only in this session, but also in the following ones throughout the workshop. For example, China representatives displayed interest in knowing better the difference between transformation inputs and energy industries own use. While a complete descriptive answer that included several examples was provided immediately, more specific graphical examples were shown later on during the sessions focused on fuel groups.

13. Mr. Leonardo Souza followed up with a presentation describing the international classifications used in energy statistics and their links to international classifications used in other areas of statistics. It started with a description of what statistical classifications are and what their purpose is. Then it addressed the International Standard Industrial Classification of all Economic Activities, Revision 4 (ISIC Rev.4) and its relation to concepts and data items recommended in IRES, such as the definition and classification of energy industries, as well as the classification of energy consumers. Exceptions as to the use of ISIC in energy statistics were explained together with the reasons for the existence of such exceptions.

14. After ISIC Rev.4, the presentation gave an overview of SIEC, including: scope; detail, such as its coding system and definitions of the energy products contained therein; links to other classifications, such as the Central Product Classification, Version 2.1 (CPC Ver. 2.1) and the Harmonized Commodity Description and Coding System (HS), and shortcomings of such links; and issues for future work

15. The exposition on international classifications used in energy statistics was followed by a country practice presented by Ms Dulce Regala from the Philippines Statistics Authority (PSA). It started with the legal framework that recently (2013) created PSA and then detailed the main data sources for energy statistics in the Philippines, such as the main household and business surveys, and also customs data, which uses the 2004 Philippine Standard Commodity Classification (PSCC). Detailing of energy products in PSCC, which is aligned with HS, the ASEAN Harmonized Tariff Nomenclature (AHTN) and the Standard International Trade Classification (SITC), may be of interest to other countries and as such may warrant inclusion in the ESCM as a country practice.

Sessions on groups of energy products: coal, oil, natural gas, electricity and heat, and renewables

16. The first of the five sessions that focused on the main groups of energy products dealt with coal, peat and derived fuels. Mr. Emmanouil Christinakis from the IEA highlighted the role of coal, still strong today, being responsible for almost 30% of the world's total energy supply. He talked about coal

classification and the different uses for the different types of coal, explained in detail the main transformation processes and their efficiencies, stressed the importance of accurate conversion factors for the computation of indicators, and compared SIEC classes with other classifications used by specific industries. He also gave specific examples of what happens in certain processes, such as within a blast furnace, detailing what energy flows should be measured and what treatment they should receive: transformation inputs, outputs or own use.

17. UNSD raised the issue of the non-standard way China employs to account for coal washing in the energy balances. While the international practice, consolidated by IRES, excludes from the measure of production all amounts removed and/or separated before the marketable product is achieved, China in its balance accounts the activity of coal washing as a transformation one. By doing so, quantities that are not supposed to be accounted as production are added to the production figures, and the cleaning activity is displayed as a transformation from unwashed to washed coal with its implied efficiency. China clarified that Chinese coal is usually washed at independent coal washing establishments, as opposed to the common practice in the rest of the world of washing the coal at the mining site. This Chinese practice entails a difficulty of measuring coal production according to the international methodology, since the coal that leaves the mining sites is in general not yet in a marketable form. To make matters even more complex, some unwashed coal is used directly. The NBS, IEA and UNSD agreed to follow up on the topic so that the national energy balance of China can better align to the international recommendations in this respect.

18. Chinese delegates also displayed interest in learning and sharing more about metallurgical use of coal, coal-to-liquid plants and blast furnace outputs. On the issue of coal-to-liquid plants, they explained that in China a great but unknown percentage of the liquid output consists of chemicals destined for non-energy uses, which renders more difficult the scope of outputs to be measured in energy statistics, as well as the finality of the input, whether for transformation or for non-energy use. As for the blast furnace outputs, Mr. Christinakis detailed the types and typical yields, to then explain what each energy output[1] is usually employed for.

19. The session on coal and derived fuels continued with a country practice from Mongolia. Ms. Ariunaa Khurelbaatar from the National Statistical Office of Mongolia provided an overview of the coal statistics production process in Mongolia, from methodologies and classifications employed; to data sources, showing types and frequencies of surveys; to the steps in the production process, including validation procedures and dissemination.

20. The second of the five sessions on fuel groups, already in the second day of the workshop, concentrated on crude oil and oil products. Ms. Céline Rouquette, Head of the non-Member Countries Section of the IEA, offered an analysis of the oil situation in the world, still important as we head to a more sustainable world because few alternatives have become viable for supplying energy for transportation purposes. On the other hand, oil has become less important in terms of share of total energy supply, with its share having decreased by a third in 40 years, to 31% in 2013. This outlook was

[1] The main output of a blast furnace is pig iron, not an energy product.

intertwined with a view on the importance of sound energy statistics, and was followed by what detailed statistics are recommended to be collected internationally, with correspondence to the physical processes being measured. Typical efficiencies, potential data sources, the issue of energy versus non-energy use, and useful data checks were also explored.

21. NBS participants wanted to know more about refinery feedstocks and their difference in treatment compared to similar products classified differently. UNSD clarified that SIEC, unlike other product classifications, at times uses as a classification criterion either the product source or destination. In the case of feedstocks, it consists of semi-refined or returned oils destined to be used as a refinery input. They also asked about unconventional oils such as shale oil and the products from coal liquefaction. IEA and UNSD provided clarification on the treatment of such products.

22. The session benefitted from two presentations on the energy statistics production process in Malaysia, with a main focus on oil statistics. Mr. Zaharin Zulfikli from the Energy Commission of Malaysia and Ms. Salmiah Ponggot from the Department of Statistics Malaysia offered complementary views on the energy statistics system of their country. It covered legal and institutional arrangements, including links to national policies in different areas; classifications in use; data sources and data collection (including online data collection systems); compilation and processing; dissemination; and the way forward, including plans for the compilation of SEEA Physical Supply and Use Tables for Energy in the coming years.

23. The third of the five sessions on fuel groups followed, with UNSD's Mr. Souza presenting on natural gas. It started with a historical overview that began with its first recorded use for energy purposes in history circa 500 B.C., which happened to be in the host country China; until the present day, including the evolution in regional shares in the last quarter century. The SIEC definition and the main places where natural gas can be found and exploited were touched upon for the sake of context. Then the scope of production according to IRES was stressed in a number of different ways, with text, diagrams and examples. This point was emphasized because so many quantities need to be excluded, such as flaring, venting and removal of impurities; and so many "hidden" quantities need to be included or properly accounted for, such as own use by oil and gas extraction and own use in the liquefaction and regasification of natural gas. Main flows that are less problematic to measure and properly account for were listed and explained. Finally, reporting and measurement issues, including conversion factors, rounded up the presentation, along with suggested solutions for such issues.

24. There was some interest displayed by Chinese delegates in respect to gas-to-liquid (GTL) technologies, although such processes are not deemed economic in China's current energy situation. Through a GTL process, natural gas undergoes some transformations to make oil products. The middle steps depend on the technology employed, and may involve the production of methanol as an intermediary product. To enrich the discussion, Mr. Zaharin from Malaysia shared some information about the Malaysian experience with such technologies.

25. UNSD's presentation was followed by Mr. Chandrajit Chatterjee from the Central Statistics Office of India. He provided the Indian perspective as regards oil and natural gas data collection,

starting with an overview of the Indian statistical system and oil and gas sector. The presentation included the government agencies involved in the energy statistics production process, the legal framework and the institutional arrangements between them. Also shown was a list of the 22 oil refineries in the country, as well as respective locations and capacities. A summary of data sources, modes of collection (and its evolution over time) and dissemination methods concluded the talk.

26. Still in the session on natural gas, Mr. Mahinda Dhanushka Sunil Senanayake from the Department of Census and Statistics of Sri Lanka talked about energy and energy statistics in his country. His presentation covered data collection methods employed, institutional framework, the energy situation and its impact in the Sri Lankan economy. A map of renewable energy resources was displayed, as well as the evolution of some energy indicators over time. A table provided details of Greenhouse Gas (GHG) emission estimates by source.

27. The fourth of the five sessions dedicated to each main group of energy products was dedicated to electricity and heat. Mr. Loïc Coënt from the IEA talked about annual electricity and heat statistics. To give a historical perspective, he started by describing global trends on the production (by source) and consumption (by sector) over the last four decades. Then he followed with the structure of electricity and heat statistics and how they correspond with the physical processes they try to measure. That included the difference between gross and net production, own use, treatments to account for production of primary energy for the different sources of electricity and heat, types of producer (main activity or autoproducer), types of plant (electricity plant, heat plant and combined heat and power – CHP – plant), imports and exports, and combustible fuels transformed into heat and electricity (where information on the inputs and outputs of transformation are used to assess the efficiencies of the processes). Data dissemination, uses and indicators concluded the presentation.

28. In the discussion that ensued, CHP was the focus, as China employs a unique method to allocate CHP inputs and outputs to electricity-only and heat-only plants in its energy balances, rather than actually having a line to summarize CHP plants. The situation in China is somewhat unique as CHP plants generate heat in the north six months of the year and four months of the year in the south, and this pattern is directly related to the weather pattern. In a sense it is reasonable to split the electricity and heat as China does, so that CHP efficiencies do not vary too much from month to month or quarter to quarter, and year-on-year due to weather.

29. A country practice followed, where Ms. Wangmo from the Department of Hydropower & Power Systems, Ministry of Economic Affairs, Bhutan, discussed the national energy status. The energy sector is highly dominated by hydropower, which is still being developed and has a huge undeveloped potential. Institutional arrangements, data sources and challenges were summarized.After Bhutan's presentation, where rural electrification rates were displayed, a topic was raised that many small countries (e.g., Bhutan, Nepal, Sri Lanka) showed high electrification rates in short periods of time. This makes getting accurate household energy consumption data a challenge, given that surveys are often carried out only every five years, which is particularly challenging for estimating household biomass consumption.

30. The last of the five sessions on different groups of energy products or sources of energy dealt with renewable sources of energy, a topic which can overlap a bit with electricity and heat all the while keeping a different perspective. Mr. Blackburn from UNSD started by giving an overview of renewable sources of energy, highlighting their importance in the sustainable development context and detailing the related international statistical methodology. A scope of production that excludes production of biofuels for non-energy purposes was stressed, followed by the relevant product classification and structure given by SIEC. Then definitions, measurement and treatment were discussed for each group of renewables and waste, such as renewable sources of electricity and heat, different types of waste used for energy purposes, and combustible biofuels (in solid, liquid or gaseous form). Challenges were presented along with ways to address them, touching on topics such as conversion factors, estimation techniques based on default or typical relationships/efficiencies, and data collection/estimation for renewables that are not linked to a financial transaction (such as the use of black liquor in the pulp and paper industry, bagasse in sugar and alcohol manufacture, and fuelwood collected by households for their own cooking purposes). A couple of examples extracted from ESCM were shown on how specific countries address those challenges. The solutions involve direct measurement and special surveys, and were used to illustrate how the issues in hand can be tackled without necessarily endorsing such solutions.

31. International participants displayed great interest in learning how other countries conduct household surveys, particularly in the case of biomass. Measuring fuelwood consumption, and that of biomass for energy purposes in general, was acknowledged as a great challenge that can impair proper informing of national policies. Such policies can arise, for example, in the context of energy or environmental planning, particularly when electrification or fuel substitution vis-à-vis deforestation is being analysed.

32. The session continued with two country practices, the first of which was presented by Ms. Lilibeth Morales from the Philippine Department of Energy (DOE). She started with the legal basis and the DOE organizational structure, linking them to the policy motivation and energy programmes in the Philippines. An overview of energy shares by fuel/source was provided before she talked about data collection (including data sources), processing and dissemination. The national energy balance was shown, as well as results from the Household Energy Consumption Survey (HECS). Particular attention was given to the Department of Energy's work on biomass collection.

33. The second country practice was by Mr. Jay Kumar Sharma from the Central Bureau of Statistics of Nepal. Starting with the Nepali statistical system as a whole and its challenges, including a legal basis needing an update, it followed with the steps already taken to address those challenges. Then the incipient energy statistics in Nepal were briefly described, followed by the energy status in the country. As much as is the case in its almost-neighbour Bhutan, hydropower has huge untapped potential and can become a major source of energy/revenue. Unlike its neighbour, though, Nepal's energy needs still rely to a great extent on traditional biomass. In the conclusions, it was mentioned that only recently Nepal realized the importance of energy statistics, and many measures have to be taken to develop this area in the country. UNSD's capacity building activities were acknowledged, and the country was keen for more such assistance.

Commodity and energy balances

34. The last day of the event started with a session on commodity and energy balances. UNSD's Mr. Blackburn gave an introduction to commodity balances, the detailing of energy flows product by product in their original units, which can be viewed as an important step to produce energy balances. Links to key concepts in the energy industry were explained, with examples and interpretation. The flows that comprise the energy supply, transformation and own use, and final consumption were detailed, with the balance between them being displayed in the row "statistical difference". This renders the statistical difference an indicator of consistency between supply and demand data, and the point was made that while this should be small, having the statistical difference equalling zero is almost always suspicious. Some uses for commodity balances were explored, such as for analysing a refinery balance and checking for data completeness. Some limitations of commodity balances that are addressed by energy balances were discussed so as to make the link to the next main presentation.

35. Mr. Norbu Ugyen, from the National Statistics Bureau of Bhutan, talked about energy statistics and the ongoing process of building the national energy balance of Bhutan, starting with the national organization setup and following with sources and supply of energy (highly dominated by hydropower as seen in Ms. Wangmo's presentation the day before). After that, he presented oil and coal trade figures, the fuel mix and demand by sector. He concluded by discussing initiatives and challenges, such as lack of qualified manpower and the need for a systematic data collection mechanism.

36. One interesting anecdote from Mr. Ugyen's presentation that may deserve further consideration is the story of vehicles from India that come to Bhutan for refuelling because of the cheaper prices. It is accounted for by Bhutan as exports as it clearly should from a national accounts perspective based on the residence principle (Mr. Ugyen comes from a national accounts background). Energy statistics on the other hand uses the territory principle, and that is where the issue becomes interesting. If cars from India were on vacation in Bhutan, the territory principle would determine that refuelling in Bhutan is domestic consumption (and would not constitute exports). However, they cross back the border with most fuel. IRES defines exports as "all fuel and other energy products leaving the national territory" and final energy consumption as "all fuel and energy that are delivered to users for their energy use (…)." Technically the example fits both definitions and this may be further discussed in InterEnerStat or Oslo Group meetings.

37. Mr. Souza from UNSD then began his talk about energy balances, emphasizing that they are a summary of all flows of energy products in an area and a period of time. Advantages of using an energy balance, particularly as compared with using commodity balances alone, were explained. Among them, the display of figures in a common (energy) unit and rearrangements in display so that products can be compared and interrelationships between them become more apparent. Many indicators of interest can be drawn from an energy balance and this was illustrated through examples. To conclude, the importance of accurate net calorific values (NCVs) to convert figures in natural units into ones in energy units was stressed, including through numerical examples that showed how different indicators may be affected if a default NCV is used instead of a country-specific one.

38. The session ended with a country practice from Ms. Fathmath Fizna Yoosuf from the Maldives Energy Authority, who talked about the national energy balance, starting with highlights from the energy sector and following with the peculiar structure of the electricity sector in this country composed of more than 1,000 small islands, almost 200 of which are inhabited, with independent grids and no interconnection. More than 100 tourist resorts act as autoproducers. Then the three main blocks of the energy balance, namely, supply, transformation, and consumption, were analysed separately before indicators (such as GHG emissions) were presented. Recommendations for better data collection in the Maldives concluded her presentation.

Energy indicators, greenhouse gas emissions and other topics

39. This session covered some cross-cutting topics in energy statistics, such as greenhouse gas (GHG) emissions, SEEA-Energy and energy indicators, including indicators in the contexts of SDG 7 and the Green Economy Indicators (GEI) framework. Ms. Rouquette from the IEA gave a presentation on energy indicators and GHG emissions, which began with a descriptive definition of a statistical indicator and followed with types of indicators more common in energy statistics, such as those related to energy security, energy efficiency and different types of shares. The part on GHG emissions covered the recent history since the Intergovernmental Panel on Climate Change (IPCC) was established in 1988, sources of emissions and trends, IPCC methodology, and CO_2 emission indicators (per capita, GDP, total energy supply, kWh). A great part of her presentation was dedicated to energy efficiency and related indicators, covering the total economy and specific sectors, and linking the topic with policy and emissions. Particular attention was paid to the relationship between energy balances and energy efficiency indicators, as the latter can be derived from the former, but can also act as a quality check. Different types of data collection were mentioned as a way to complement available information in order to have the necessary data for the indicators.

40. Mr. Souza from UNSD followed with two short presentations, the first covering energy in the context of sustainable development as an enabler agent that has to strike a balance in order to eradicate poverty while keeping production and consumption patterns sustainable in the long run. It summarized the recent developments in the 2030 Agenda and concluded with SDG 7, its goals and related indicators. The second one summarized the SEEA-Energy framework, explaining the key similarities and differences between energy accounts and energy balances. It also covered the Green Economy Project and its indicators related to energy.

41. Discussions that ensued were aimed at differences between energy accounts and energy balances, particularly the ones entailed by the respective uses of the residency and the territory principles, but also rearrangements related to the strict use of ISIC in the accounts. Many illustrative examples were provided by UNSD to clarify these key conceptual differences.

Dissemination, use, analysis and quality issues

42. The final session covered general topics in statistics applied to the field of energy statistics. It started with a presentation on dissemination by Mr. Millard from IEA, which explained why dissemination is important, giving examples of drivers that motivate good dissemination. Selected

recommendations from IRES were offered, and then examples of charts were displayed, with strengths and weaknesses of each type being highlighted. The relationship between energy statistics (and their dissemination) and different policies and analyses was discussed, where each type of analysis or policy generates a need for specific measures (statistics) and these statistics serve studies and help monitoring policy results and evaluating their efficacy. Initiatives at the IEA to improve dissemination were showcased and some considerations were offered on the topic.

43. Mr. Blackburn from UNSD presented on the issues of data quality and dissemination, describing how UNSD has addressed them in the ESCM by means of providing numerous country examples and links to different international data quality frameworks. Examples of the latter include UNSD's National Quality Assurance Framework (NQAF) and the Generic Statistical Business Process Model (GSBPM). Metadata was used as an example that relates to both data quality and dissemination. To conclude, data quality checks in energy statistics were reviewed, with emphasis to those that can be performed with the energy balance.

44. The discussions that ensued had countries eager to share their experience with data dissemination and to learn from others. While many countries have produced complete national energy balances for a number of years, some others still struggle to produce their first ones (e.g., Bangladesh, Bhutan, Nepal). They repeatedly stressed the importance of participating in the workshop and voiced the need for other staff from their countries to attend the same kind of events so as to increase their countries' capacities in the area of energy statistics.

45. During discussions on data quality, it was stressed that having a national energy balance is a very robust data quality check, as it allows data gaps to be identified and resources devoted to fill these gaps, taking into account priorities and the most significant figures.

46. IEA gave examples of surveys and estimation techniques used in specific OECD countries. It was highlighted that, when a rough estimation technique is employed, it is good practice to keep using it in the following years until new information is available, so as to maintain consistency of the figures.

47. Afterwards, Mr. Takuya Miyagawa, from the Asia Pacific Energy Research Centre (APERC) talked about the Asia-Pacific Economic Cooperation (APEC) Energy Database. The APEC Expert Group on Energy Data and Analysis (EGEDA) was introduced as the link between APEC and APERC, through which data collection from APEC members feed the APEC Energy Database maintained by APERC. The topic of dissemination was covered, with highlights on monthly, quarterly and annual data available on the Internet and the main printed publications derived from the database. An overview on data processing, quality checks using time series and energy balances, and indicators derived from the balances concluded the talk.

48. The last presentation was given by Dr. Md. Rafiqul Islam, representing the Ministry of Power, Energy and Mineral Resources of Bangladesh. It discussed the recent radical changes in the Bangladesh energy sector and started with an overview of the national statistical system, the economy, achievements in the context of sustainable development and the current energy situation in the country. Some trends, available sources and scenarios were presented as a way to introduce national plans and

strategies for the development of energy resources and increasing energy supply. In this context, details of the country's rapidly changing energy situation were laid out, with more reliance on regional power and natural gas trade; the increased production/use of domestic coal, natural gas and solar PV; a rapid improvement in electrification; and the commissioning of wind turbines and nuclear power plants.

Conclusion

49. A roundtable discussion was held where representatives talked about the way forward in relation to energy statistics in their countries/institutions and voiced their opinions on what type of assistance should be provided by international organizations. All participating countries expressed the notion that the workshop was useful and that they had learned a lot from it. The need for continued participation of staff from their countries in capacity building workshops and other international activities was also expressed by the participants. Such participation would increase the expertise pool in their institutes and in other government agencies involved in the area of energy statistics, and as a result facilitate the improvement of the respective national energy statistics systems. As countries are at different stages of energy statistics development, their needs and priorities are distinct. For instance:

a. China and Malaysia, which have a reasonably well developed energy statistics system, expressed interest in better aligning their statistics with the international recommendations;

b. Bangladesh, Bhutan, Cambodia, Mongolia and Nepal need technical assistance in order to produce their first energy balance and thereafter being able to produce energy balances regularly;

c. Maldives, the Philippines and Sri Lanka need capacity building to improve their energy statistics and energy balances.

d. India requested assistance to improve the coordination of their data collection systems and the quality of energy data in general.

50. The final touch of the workshop was the projection of the 6-minute official workshop video made by NBS of China.

Follow-up

51. The international organizations (UNSD and IEA) will follow up with participating countries on the issues raised during the meeting. Future assistance (e.g. in workshops and other capacity building events on energy statistics) will also address these issues and monitor progress within the countries. Options for direct country assistance may be explored. The main issues are highlighted below:

52. Bhutan, Cambodia and Nepal participants expressed the need for developing the incipient energy statistics in their countries, which do not have a dedicated energy section or department in their NSOs, nor are coordinated by another government body. Nepal explicitly mentioned the need for creating an Energy Statistics Section in CBS Nepal.

53. In addition to these three countries, Cambodia and Mongolia also do not have an overall energy balance[2]. Representatives from these five countries requested continuous technical assistance in order to construct the first national energy balance and to be able to publish annual updates afterwards.

54. Maldives, the Philippines and Sri Lanka do produce energy balances, but their representatives requested involvement in technical cooperation and capacity building events to improve the underlying energy statistics and to align the methodology with international guidelines.

55. India has well-established (and complex) data collection processes, in addition to producing energy balances on an experimental basis. Nevertheless this process involves many government agencies and is difficult to coordinate. For this reason, the representative from India requested assistance to improve the coordination of their data collection systems and consequently the quality of energy data in general. This would allow the publication of energy balances in a more definitive basis.

56. China and Malaysia have a reasonably well developed energy statistics system, including detailed energy balances, and their representatives expressed interest in better aligning their statistics with the international recommendations. For these purpose they asked to be involved in similar future events.

57. The representative from Malaysia asked a question as to whether UNSD would participate if they organized a similar event in Malaysia, to which he obtained a tentative positive answer. Malaysia can be consulted if they can act as hosts in similar future events.

58. The NBS of China expressed interest in translating IRES into Chinese for their own internal use. UNSD raised the possibility of having the NBS-translated version as the official UN Chinese translation of IRES, as has been the case with other statistical publications such as the System of National Accounts 2008. The benefits would be twofold: UN staff resources would be saved in a time of budget cutting and the official translation would be done by specialists in energy statistics.

59. Other issues that arose pertain to interesting examples and practices that may be incorporated in the ESCM or further discussed to clarify their treatment within international methodology. They are described below.

60. One area where the international recommendations are lacking is the use of customs data in energy statistics, because the current international trade classifications are not detailed enough for the purpose of identifying energy products according to SIEC. Examples of how India and the Philippines use customs data for compiling international trade in energy products, and link their more detailed national classifications to international ones (HS, SITC), may be studied and possibly incorporated in the ESCM.

61. Institutional arrangements of participating countries presented at the workshop may be used as examples in the ESCM.

[2] Although partial balances may be available, e.g. thermal and electrical balance in Mongolia.

62. The example from China on coal washing happening at independent coal washing establishments outside the mining site, with some unwashed coal being used directly, warrants some considerations on the international treatment of related coal production data and the possibility of exceptions being documented in country metadata.

63. Two country practices provided by the United States could be included in the ESCM: the GSBPM adaptation to energy statistics; and the use of freight data from the Association of Railways to estimate weekly coal production.

64. Finally, the example from Bhutan on Indian vehicles refuelling in Bhutan and going straight back to India described in paragraph 36 deserves further consideration on whether data collection methods need refinement.