Summary of the Workshop on the Role of Utilities, Big Data and Geo-Spatial Data in Energy Transition

(14 November, 2018, Kyiv)

The workshop was organized by UNECE. It provided the insights on the case studies on the use of Big and geo-spatial data and on application of related data management and analysis methods on regional, city and building scales. The panel sessions focused on the development of legal and organizational practices in the countries of UNECE region.

Oleg Dzioubinski, Regional Adviser, UNECE opened the workshop and provided comments on the role of utilities, big data and geo-spatial data in improving energy efficiency and in energy transition. Alisa Freyre, Atlas & Energy Observatory Projects Manager, Services Industriels de Genève (SIG) chaired the workshop and **moderated Panel 1: Barriers and best practices.**

Romanas Savickas, Senior Advisor for Energy, UNEP-DTU Partnership, Copenhagen Centre on Energy Efficiency presented *Energy Mapping* concept and examples of its application at the city level (Vilnius and Panevezys (Lithuania) and Belgrade (Serbia)). Energy mapping helps to encourage households to take an active role in Energy Management through energy consumption comparison between buildings, supports city development plans and contributes to better implementation of systems engineering measures in buildings. Among the major barriers in application of these methods are lack of capacity and financial resources by municipalities, and insufficient incentives for private companies to invest in big data and GIS projects.

Matija Vajdic, Project Manager, Interreg CENTRAL EUROPE Joint Secretariat, presented how his organization tackles big and geo-spatial data challenges of Central Europe's energy transition. He presented compelling examples of GIS and big data use in projects *Managing waste heat* (project budget - 2.05 mln. EUR), *Encouraging the use of geothermal energy* (project budget - 2.89 mln. EUR), *Finding energy savings in buildings* (project budget - 2.33 mln. EUR), and *Powering public buildings more efficiently* (project budget - 2.2 mln. EUR).

Rob Geldhof, Consultant on renewable energy and data, Over Morgen, demonstrated how GIS-based solutions support energy transition in Dutch municipalities, inform and connect stakeholders, define a new role for utility companies, and contribute to citywide data-driven policymaking. As an example, The Hague is using *Geo-Data Analysis* to plan and develop a geothermal district heating for 50 thousand dwellings within twenty years. This will help the Netherlands to cut emissions by 49% by 2030, making heating and cooling completely carbon neutral by 2030, without the use of natural gas. Currently, Dutch cities and regions are planning district heating networks using geothermal energy and industrial waste heat, as well as significantly upgrading energy efficiency of buildings and introducing heat pumps.

Stephanie Favre, Founder & CEO, Geodata Concept, presented geological information system for managing Geothermal Project in Geneva. The project *GEothermie 2020* focuses on reprocessing old and collecting new data in order to increase geological knowledge on the Greater Geneva Basin for the development of geothermal energy projects. Energy demand data is also evaluated and cross-checked with geothermal resources data to ensure that available resources are in line with the energy needs and territory planning issues.

In the context of the *GEothermie 2020* project, a new legal framework and a geo-spatial information system GESDEC is currently under development. The future information system should be able to gather all information related to the subsurface resources, answer queries to produce maps and models, guide geothermal project leaders, and assist the cantonal authorities for an optimal management of the subsurface resources to guarantee a sustainable expansion of geothermal energy.

The open discussion moderated by Alisa Freyre was focused around practical issues of GIS and big data methods application, replication and implementation in terms of timelines, data collection challenges, resources, and stakeholders' engagement. Experts and participants also discussed main barriers for application of GIS and big data methods in energy transition projects (technical, communication problems with stakeholders, human and financial resources, data protection issues, etc.).

Panel 2: Institutions, utilities and legal framework was moderated by Fabian Kreuzer, Economic Affairs Officer, Energy Division, ESCAP and started with the presentation by Alisa Freyre on energy transition programme *éco21* run by Services Industriels de Genève (SIG), a publicly owned utility in the Canton of Geneva, promoting energy efficiency and renewable energy technologies through subsidies, partnership programmes, information and awareness campaigns. Multiple IT tools have been developed to support operational and strategic works. AtlasEco21 project led by *éco21*, developed by IT company idlab, developed solutions for data exchange among the stakeholders via the network of interconnected GIS-based tools. These solutions allow to ease operational work through automatization of data treatment processes and support decision-making by energy consumers, contractors, utility, and the local authorities through a more comprehensive picture of the state of the energy system and implemented and planned sustainable energy projects.

Izmail Petrov, Energy Management System Expert, National Cleaner Production Center (NCPC) of the Russian Federation, demonstrated *Energy Management Analytics (EMA)* system based on the UNIDO approach for energy consumption analysis. EMA is a web application for monitoring of energy efficiency on a day-to-day basis both for industry and cities. An example of the "Sustainable City" programme in Astrakhan was presented. The basis for this programme is organization of data collection and analysis of a large number of objects such as municipal schools, hospitals, and residential buildings. For this purpose, NCPC uses dispatching system for data collection and monitoring of technical parameters of the energy users and EMA application for energy analysis.

Stefan Doerig, Director Markets, enersis suisse ag, presented one of the decision-making tools for policy makers – *GRIDS energyCity* web-based software for territorial energy and climate planning. The 3D platform visualizes all energy-relevant information for cities, municipalities and regions in a bottom-up and user-friendly way. By modelling the real world with a "digital twin", the complex relationships and processes in a sustainable city become transparent and tangible. *GRIDS energyCity* is a modern internal and external communication platform creating transparency for all stakeholders (residents, authorities, energy suppliers, and companies) and allowing them to participate in the energy transition. The tool is being applied in several cities and municipalities in Switzerland and Germany. It was developed by two Swiss companies in close cooperation with the Energy and Municipal Research Centre (CREM) in Martigny, Switzerland.

Alexey Kalayda, Manager of Technical Department, DTEK Grids, presented the key objectives and elements of digitalization of Ukrainian utility company comprising 5 distribution system operators (DSO). GIS system was introduced in one DSO (Kyiv) so far, the implementation in two other oblasts (regions) is under way. The Kyiv Grids company customer service website has a map of the electrical networks, and this allows customers to apply online for electrical connections and receive all the technical parameters. The software for scheduling customer requests for work with metering devices and digital crew route planning has been created. Considering main challenges, e.g. fast growth of distributed generation and prosumers, changes in customers' preferences in terms of services quality, and deep penetration of digital technologies, DTEK Grids plans to further digitalize the maintenance crews management and develop remote monitoring system of the network (SCADA-NMS).

Selin Yilmaz, Postdoctoral Researcher, Energy Efficiency Group, University of Geneva, presented *ElectroWhat* platform that provides electricity demand model based on simulated load curves for Switzerland. The *ElectroWhat* platform will allow to explore the specificities of consumption of each Swiss municipality. The annual estimated consumption of each municipality split into activities and electric appliances will be made available by a web service. The GIS maps will allow to visualize total annual demand for municipalities, annual demand per capita, and decomposition of demand into main activity sectors. This knowledge can be used to design energy efficiency programmes at the municipal, cantonal and national levels.

The presentations were followed by an open discussion. As a result of the workshop, participants adopted **Outcomes of the discussion on the role of utilities, Big data and geo-spatial data in energy transition**, which outline: major barriers for application of geo-spatial data and Big data methods in energy transition projects; proposed legal and organizational practices to mitigate or remove the existing barriers; role of institutions and utilities in creation and sharing of geo-spatial and Big data; and finding a balance between open access and personal data protection policies on energy-related data. Alisa Freyre and Oleg Dzioubinski made closing remarks.