At the 25th Meeting of the Energy Charter Conference (ECC) held in Astana, the head of JSC “Samruk-Energy” Almassadam Satkaliyev proposed a number of initiatives to determine promising areas of cooperation in the energy sector and improve global energy security.

**Creating a Global Smart Grid -
New Opportunities for Steady Growth**

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Further development of the global energy is a multi-sided process. This is due to the features that define the energy policies of individual countries. They are combined by universal factors, including the following old fundamental issues:

* limited amount of fossil resources;
* environmental issues.

As for stable energy supply and transit in the new world architecture, it is necessary to take into consideration new challenges that have both technological and social aspects:

* increasing demand for electricity, global computerization and electrification of transportation and other technological processes;
* the necessity for the global community to solve the problem of energy poverty (more than 2 billion people around the world do not have access to electricity);
* unequal distribution varying by region and access to mineral resources and renewable sources depending on natural features, to new technologies and financial resources depending on historical and geopolitical factors.

Leveling of these issues can be achieved through a synergy of different fuels and renewable energy sources. In the long term, there is a fusion – the most common energy producing natural process, or a closed nuclear decay cycle that uses the energy we have obtained from supernova explosions. Anyway, these types of energy sources must be developed to solve the energy problem once and for all.

With the experience gained, the transition to low-carbon energy is a process subject to the laws of economy. The acceleration of transition will lead to unjustified expenses, while the wait-and-see policy can also lead to negative consequences. We have a wider time horizon to rely on the most promising direction. We should make full use of our energy advantages to achieve the most optimal way of development.

Kazakhstan has a unique opportunity to become a major player in the region in terms of electricity supply. For example, in 2013, LLP “Ekibastuz GRES-1” exported about 2.45 billion kW/h of electricity to Russia. In this case, the unused potential amounted to 4.6 billion kW/h. This is the amount that was not in demand in the local market. At the same time, a large-scale work is being done on the modernization of existing energy capacities and construction of new ones. Power units with a capacity of 500 MW at Ekibastuz GRES-1 are being restored, Ekibastuz GRES-2 is being expanded by a power unit with a capacity of 636 MW, and Balkhash TPP with a capacity of 1,320 MW is being constructed. According to the estimated balance of electric capacity of Kazakhstan’s UES for the period up to 2030, the excess capacity in Kazakhstan’s UES will amount to 1,500 MW in 2016, and 1,800 MW in 2020.

According to the UNDP assessment, the uniqueness of certain regions of Kazakhstan provides the economic potential for the production of 1 trillion kW/h per year, with the consumption level at only 90 billion kW/h per year. This potential of clean energy should be utilized in the medium term. EXPO-2017 that will be held in Astana under the slogan “Energy of the Future” will be one of the incentives for the development of renewable energy. In 2015, “Samruk-Energy”, together with EBRD and CTD (Clean Technology Fund) will begin to expand the Yereymentau Wind Farm, which will increase its capacity from 45 to 95 MW.

The main task to be solved by the expert and scientific community, is to find a mechanism for combining various regional competitive advantages. If parties agree, an effective solution may include the creation of a Global Smart Grid, the members of which would get new opportunities that ensure the sustainable growth, including environmental risk management (as well as the carbon emissions regulation).

The Global Smart Grid can become a more environmentally friendly alternative to pipelines. It should be mentioned that we do not pretend to change the paradigm of energy transit.

Moreover, regional opportunities can be used in the long term. For example, the future revolutionary energy solutions (Fusion, pure coal, renewable energy) could be organically connected to the Global Grid, which would benefit a wider range of regions.

An example of similar trends may be the CASA-1000 project for the construction of a new system of high-voltage power lines, which would improve access to electricity for Afghanistan and Pakistan, integration and expansion of markets by making the best use of resources in Central Asia. In addition, this project will contribute to developing sustainable solutions in the field of water resources management in this region.

As a first step, from Kazakhstan’s perspective, may be construction of new lines and cables, as well as synchronizing Power Grids with China, Europe and Central Asian countries, with which they are not yet synchronized. Looking back, Kazakhstan’s power system was formed as an important part of the UES of the former Soviet Union. The combined power systems located in different time zones helped control electricity generation, level the peak loads of the USSR energy system, ensure stable power supply even in the event of failure of individual power plants. Therefore, despite the collapse of the USSR, the Kazakhstan’s power system still works in parallel regime with the UES of Russia and CES of Central Asia.

Today, Kazakhstan’s UES includes a unique power line of 1,150 kV, which currently operates at a voltage of 500 kV. Powerful electric connections of 500 kV ensure the transit of Russian electricity via Kazakhstan along the route Siberia (Russian Federation) – Kazakhstan – Ural (Russian Federation) (transit in 2013 – 5.1 billion kW/h).

In addition, the Republic of Kazakhstan has the technical opportunity for electricity transit from the Central Asian CES to the Russian UES. The construction of 500 kV overhead lines along the route “North-East-South” will increase the capacity of transit lines between the northern and southern parts of Kazakhstan from 1,350 MW to 2,100 MW, which will optimize operating modes, increase the efficiency of the power system and improve the transit potential.

With the signing of the Treaty on the Establishment of the Eurasian Energy Union, cooperation in the energy industry of Kazakhstan, Russia and Belarus is moving to a new level. Despite different models and approaches, the EAEC members have a practical interest in the formation of a common energy market. Among them is the complementarity of generation types during peak hours and the possibility to export and/or import electricity. Today, Kazakhstan is considering the possibility to supply electricity to the Republic of Belarus through the Russian power grids. Should these supplies be successful, one should expect the possibility to supply electricity to the EU. In addition, Kazakhstan is considering electricity supplies to China, Afghanistan and Pakistan.

It should be mentioned that electricity transit is exposed to a variety of risks, including political risks. The international agreement and the possibility of using the ways and means of solving disputes and contradictions regarding the transit, can influence the reduction of the impact of political and other risks in this area.

The creation of the Global Grid will allow solving the problems that are “bottlenecks” for many countries, become a catalyst for the necessary intergovernmental processes. At the same time, an effective intergovernmental dialogue in this area is also provided by the G-Global platform and EXPO-2017.

We believe that this innovative approach fits the ideology and modern trends of the world energy development, and it has the potential for a more detailed study in the near future.