Speech of Satkaliyev A.M. at the session

”Financing Resilience: De-risking energy infrastructure development”

World energy leaders’ summit

*(May 22, 2014)*

Nowadays, access to various energy sources practically became one of the human rights. Among existing methods of energy delivery, the feature of the electric power is that for the end consumer actual use is detached from means of electricity production. For last 20-30 years, types of electricity production were complemented with solutions related to renewable and other alternative energy sources, combined with improvements of traditional types of generation.

Due to low environmental impact of recently-developed generation technologies, close integration at a consumption spot of the electricity production has become possible. This creates a system of autonomous microgrids that will increase reliability of the energy infrastructure as a whole. Additionally, energy storage systems help to eliminate a problem of uneven generation of renewables, and also would become an important anchoring component of microgrids.

Existing energy system of Kazakhstan provides several categories of reliability of energy supply; objects where interruption of energy supply poses threat to human life, state security, unique equipment are supplied per special and first categories. The second category is supplied according to standards eliminating threat to normal activity of the society. The third category includes all other consumers.

Microgrids with energy storage make possible uninterrupted electricity supply: today only objects of special category have such reliability. The “smart grid” technologies will play the key role.

How can we reduce our dependence on traditional energy sources like oil and gas? There is one answer that is being actively pursued: it is the maximum possible electrification of modern technologies, leading to reduced dependence on fuel infrastructure; this particularly relates to transportation. My recent visit to Tesla Motors once again confirmed existing interconnectedness between electric transportation and microgrids: such program is being actively pursued by the company management.

In remote regions, the localized generation will bring access to all latest technologies in a development scenario with expanded electrification; it goes beyond simply reliability of energy infrastructure.

Technologies of electricity to gas (or any other energy carriers), discussed at this forum, also act as a stabilizing factor of energy infrastructure and can lead to effective hybrid solutions increasing energy supply reliability.

The traditional energy infrastructure in the future has to support energy supply of the heavy industry and integration of global network of microgrids. Meeting the increasing energy demand of the society only at the expense of renewables presents a limiting scenario. In this regard, work on carbon capture and storage for traditional energy generation, ongoing research on new types of nuclear generation (fission or fusion), work on options of energy conversion with small requirements for water supply are being conducted all around the globe.

The main burden on the choice of sustainable, strategically reliable ways of development of energy production of high density lays on traditional utilities.

The reality is that the choice of a type of production and delivery generally depends on a LCOE, and is not directly related to its sustainability from the development perspective.

The long-term program of energy infrastructure development needs not only a correct choice of a sustainable path, but also the guiding investment mechanism. The Finance for Resilience organization (FiRe), which also includes WEC, set the task of working on such methods as the main recommendation on transition to a new energy infrastructure.

Due to the extended coverage of consequences of CO2 emission, a development of “social cost of carbon” can be such an example, calculation of which takes into account economic consequences of global warming and related destabilizing processes, which are contrary to sustainable development. Ideally, the tax based on these calculations is reinvested in support and development of new types of energy production with low carbon intensity. Thus there is the mechanism, balancing increase in capital investments for solutions like carbon capture and storage, with considerable decrease in operating expenses on tax payment. The risk associated with CO2 is studied enough and generally understood, which makes possible its management.

Taking into account few accidents with devastating consequences, decrease of nuclear generation in Europe clearly has political character, but a financial component exists. Is it even possible to simply average the economic damage caused by accidents in Chernobyl and Fukushima for development of “social cost of uranium”, quote-unquote?

And how do we even begin to estimate potential danger of rapid increase in production of plutonium in types of nuclear generation with the closed cycle? This risk probably will also be difficult to assess through “social cost of plutonium”, quote-unquote. Recent technology reducing probability of a nuclear proliferation, give reason for some optimism, especially in a thorium perspective, but can the threat be completely eliminated? Which of the evils is less, or simply more familiar?

Also there is no developed economic approach to assessment of consequences of traditional hydro power, besides development prospects are limited in many cases. The potential of small hydro is attractive and is included in the program of sustainable development of our society as one of the types of renewables with small impact to the environment.

Speaking on the long-term perspective, fusion nowadays seems as the solution of the future, but to be realistic, this type of generation possibly won't find widespread introduction even within the 21st century. Transition strategy, effective within our century, is thus necessary.

In summary, there appears to be no one standard solution for the problem of resilience of energy infrastructure. The multi-faceted approach depending on both needs of the consumer and type of generation is required. Electrification of transport and possibly all energy-consuming technologies along with continuing developments in the field of energy efficiency, will improve reliability of energy infrastructure. Financial methods aimed at the development of sustainable and strategically reliable types of energy also need to be fully aligned, taking into account pros and cons of all types of energy production.