

# **Accelerate Global Energy Interconnection for the World's Sustainable Development**

Keynote Speech at the UN High-level Luncheon  
(November 1, 2017)  
Liu Zhenya, Chairman of GEIDCO

Your Excellency Under-Secretary-General Liu Zhenmin  
Distinguished leaders, honored guests, ladies and gentlemen,  
Good afternoon.

This morning, GEIDCO (Global Energy Interconnection Development and Cooperation Organization) and UN DESA (United Nations Department of Economic and Social Affairs) co-hosted a high-level symposium. Many leaders and guests attended the event and shared with us their visions and insights. This symposium is significant as a milestone for pooling together global wisdom and efforts, searching for more common ground on GEI (Global Energy Interconnection), speeding up its construction and facilitating the implementation of the *2030 Agenda for Sustainable Development* (hereafter referred to as “*2030 Agenda*”). I would like to take this opportunity to extend my warm welcome to all leaders and guests present at the Luncheon on behalf of GEIDCO.

Dear speakers, your enlightening speeches at this morning's symposium were very perceptive and inspirational. Now I would like to take this opportunity to share with you some thoughts on three aspects of GEI development.

## **1. Building GEI Is a Major Strategic Move That Matters to the Future and Destiny of Mankind**

Since the Industrial Revolution, fossil fuels have been excessively developed and unduly used for socio-economic development, which has led to severe challenges including resource constraints, environmental pollution and climate change, all of which are threats to human existence and development. The global proven reserves of natural gas and coal will be exhausted in 50 years and 100 years, respectively. Ecological deterioration has become a severe problem, with the surface temperature of the Earth having risen more than 1°C compared to pre-industrial revolution levels. If no action is taken, by the end of this century, the global temperature rise will exceed 4°C, with dire consequences such as melting glaciers, rising sea levels and reduced grain production.

The root cause of these challenges is reliance on carbon-based energy, also known as fossil fuel dependence. To effectively address these challenges, we must develop low-carbon and zero-carbon clean energy. The world is bestowed with abundant clean energy. By merely exploiting 0.05% of such energy, we could meet total global energy demand. However, energy resources are not evenly distributed, with resource-rich areas usually being far away from load centers. Therefore, it is necessary to promote optimal allocation of energy resources by converting them into electricity locally and transmitting them over long distances and on a wider scope. Meanwhile, wind and PV power generations are intermittent and volatile. Only after being integrated into a bulk power grid can they enjoy smoother and better development. This means that building GEI with UHV power grids as the backbone is the only effective way to realize the efficient development, allocation and use of clean energy.

To solve the bottlenecks of energy development and promote the transition to a clean and low-carbon model, China has made extensive efforts in the research, application and innovation of UHV grid technologies. The UHV power grids are comprised of 1000kV AC (and above) and  $\pm 800$ kV DC (and above) systems, with prominent advantages like longer transmission distance, larger capacity, higher efficiency, less line loss, less land occupation and improved safety. Since 2004, China has begun efforts to innovate in and apply engineering of UHV technology. As of now, China has completed eight AC and 10 DC UHV power transmission projects. Another two AC and four DC UHV projects are under construction. These projects constitute an energy highway transmitting electric power from the West to the East and from the North to the South, boosting clean development and ensuring China's energy supply. Aided by UHV power grids, China has increased its installed capacity of hydro, wind and solar power to 340GW, 160GW and 110GW, respectively, more than that of any other country in the world.

Based on China's success in UHV technology and inspiration from the global internet, we came up with the initiative of Global Energy Interconnection, or **GEI, which is a clean energy-dominant, electricity-centered, extensively interconnected, co-constructed and sharing modern energy system. This important platform promotes energy transition, representing the future of global energy development.** In essence, GEI is “**Smart Grid + UHV Grid + Clean Energy**”. Smart grid is the foundation, UHV grid is the key, and clean energy is the priority. The fundamental solution to over-reliance on fossil fuels and the problem of carbon emission is to develop GEI, realize “**Two Replacements, One Increase and One Restore**”, that is, to replace

fossil energy with clean alternatives in energy production; replace coal, gas and oil with electricity in energy consumption; increase electrification and restore fossil fuels to their basic attribute as an industrial raw material for sustainable development worldwide.

Energy is the premise of the socio-economic development and sustainable energy supply is the underlying guarantee of human sustainability. Building GEI for the transition to green and low-carbon development can give an all-around and crucial boost to the sustainable development of the global economy, society and environment.

**First, it helps to implement the goals of the 2030 Agenda.** The *UN 2030 Agenda* presents 17 sustainable development goals (SDGs), covering energy, the economy, society, the environment and other aspects. The development of GEI will accelerate the energy transition, protect the ecosystems of the planet, and keep the world on a sustainable and resilient path. It will help provide sustainable energy for all, alleviate poverty and hunger, bridge regional gaps and realize coordinated regional economic development. It will promote global connectivity, help build a community of shared interests, destiny and responsibility featuring mutual political trust, economic integration and cultural inclusiveness, and contribute to a coordinated development relationship among people, between human beings and nature and between man and society. In this way, the SDGs (sustainable development goals) put forth in the *2030 Agenda* will be achieved.

**Second, GEI facilitates the implementation of the Paris Agreement.** The *Paris Agreement* clarified the target of controlling the rise in global temperatures to within 2°C by the end of this century in an effort to address climate change. The aspirational goal is to limit the temperature rise to within 1.5°C. Building GEI will help control energy-related CO<sub>2</sub> emissions at 11.5 billion tons, so as to fulfill the pledges of the *Paris Agreement*, by constructing a green and low-carbon modern energy system for the massive development and use of clean energy and for the transition from fossil fuels to clean energy.

**Third, GEI promotes a community of shared destiny.** Building a community of shared destiny committed to fostering an open, inclusive, clean and beautiful world with lasting peace, universal security and common prosperity. This is the great vision of people for peace, development, cooperation and win-win growth. Building GEI will promote the transition of human society from competition for fossil fuels, to sharing and cooperation

in clean energy, thus ushering in a new era of peace and harmony. It will promote the development and use of clean energy, mitigate regional conflicts and construct a new landscape of global security and development. It will enhance global energy and power infrastructure connectivity and promote the establishment of a new global economic system of prosperity and development. It will enable millions of households to enjoy the benefits of modern civilization, promote cooperation among countries and nations and open up a new chapter in the development of human civilization. Besides, GEI will also help eliminate environmental pollution at its root, promote the coexistence and harmony of humanity and nature and build a green and beautiful planet for all.

## **2. Promote the Implementation of the 2030 Agenda with Ten Actions of Global Energy Interconnection**

The *2030 Agenda* is a far-reaching historic decision, which charts the course for sustainable development of all countries. The GEIDCO formulated *Global Energy Interconnection Action Plan to Promote the 2030 Agenda for Sustainable Development* (hereinafter *GEI Action Plan*) based on thorough analysis and studies on the goals and tasks of the *2030 Agenda*, the status quo and prospects of economic, social, energy and power development across different continents. The Ten Actions include concept promotion, clean development, universal power access, power grid interconnection, electricity replacement, smart grids, energy efficiency enhancement, technology innovation, capacity building and policy support. Their implementation is of great significance to building GEI and realizing the *2030 Agenda*. In a nutshell, the Ten Actions could be summarized as “One Concept, Two Constructions, Three Supports and Four Enhancements”.

**First, we should cement “One Concept”.** Efforts should be made to spread the concept with all-dimensional multi-layered publicity for its wide acknowledgement and in-depth perception around the world. GEI is a concept advocating green and low-carbon development, interconnection, co-constriction and sharing. Once this concept is well adopted by people, all countries and societies will be able to better understand, support and participate in the development of GEI, which will have positive implications for the implementation of the *2030 Agenda* and the *Paris Agreement*. We also need to follow the laws of energy development to shift from the conventional concept of energy security based on fossil fuels featuring resource acquisition and energy independence to a new concept of security based on clean energy featuring resource sharing and energy interconnection. That way, we can

promote the massive development and application of clean energy, foster a global energy community and build a community of shared destiny.

**Second, we need to speed up “Two Constructions” and accelerate grid interconnection.** The priority is to apply UHV and other advanced transmission technologies to build backbone power grid within each country, and propel transnational and intercontinental interconnection projects for domestic, intra-continental and intercontinental interconnection for optimal resource allocation on a larger scale. We should **speed up smart grids.** Emphasis should be given to smart control, big data, cloud computing, mobile connectivity and other advanced technologies and equipment to improve the intelligence of the power system. That way, we will enable the flexible integration of centralized and distributed clean energy of all kinds into the grid and realize the coordinated optimization, complementary benefits and efficient use of power sources, power grids, power loads and power storage for diversified customer needs.

**Third, we need to consolidate “Three Supports.”** **First, we must consolidate innovation support.** Research and development should be strengthened in the fields of energy conversion, allocation and consumption, with the focus on key technologies such as clean energy, UHV and smart grids to make these new technologies more economical, reliable and environmentally-friendly. **Second, we must consolidate capability support.** The priority should be strengthening talent development and team building, promoting international exchange on technology and personnel training among developed and developing countries, and improving the planning, research, construction and management of GEI. **Third, we must consolidate policy support.** Preference should be given to the formulation of policies, laws and regulations and standards on promoting clean development, grid interconnection and efficiency improvement to guide and promote the building of GEI.

**Fourth, we need to realize the “Four enhancements.”** **1) we must enhance clean development.** Clean replacement in energy development should be emphasized to accelerate the development of large energy bases located near the Arctic and the Equator with supplementary support of centralized and distributed clean generation in all countries, as well as increasing the share of clean energy in the total energy mix (the share of clean energy in the total energy mix was 18.5% globally and 24% in Europe in 2015). **2) We must enhance electrification.** The focus is to implement electricity replacement in the fields of industry, transportation, construction and residential use and

adopt new technologies and equipment such as electric boilers, electric heating, electric cookers and electric vehicles to increase the ratio of electricity in global final energy consumption (the ratio of electricity in global final energy consumption stood at 18.5% globally, 33% on average in Sweden, Finland and Denmark and 46% in Norway in 2015). **3) We must enhance universal power access.** The key is to take active, multiple and precise measures to solve this problem, such as via governmental subsidies, commercial development, financial assistance and technological innovation (in 2014, the global electricity access rate was 85.3%, with around 1.06 billion people in the world living without access to electricity). **4) We must enhance energy efficiency.** The key is to use policies, standards and technologies to improve the management of energy production, allocation and consumption and promote energy conservation and efficiency to control energy consumption on the basis of meeting energy demands (in 2015, global average energy consumption per \$1,000 of GDP was about 0.26 tons of standard coal. If this can be reduced to the OECD average of 0.16 tons of standard coal, nearly 8 billion tons of standard coal or 40% of total global energy consumption in 2015 could be saved).

The Ten Actions of GEI facilitate coordinated and sustainable global energy, economic, social and environmental development. According to initial estimates, by 2030, the share of clean energy in global primary energy consumption will increase to 35%, 16 percentage points higher than that of 2015; the share of electricity in terminal energy consumption will increase from 18.5% in 2015 to more than 30%; clean energy will be able to replace fossil fuels equivalent to 8 billion tons of standard coal. This will lead to limiting greenhouse gas emissions to around 40 billion tons, effectively addressing climate change. Additionally, the global electricity access rate will be increased to 94% and the population living without access to electricity will be reduced to less than 500 million, down by more than half from 2014 levels; the global electric power industry will witness an aggregated investment of more than \$20 trillion between 2015 and 2030, with 50 million jobs being created in the process, greatly promoting the realization of the *2030 Agenda*.

### **3. Push for an Innovation-Driven GEI with Concerted Efforts**

Building GEI will bring fundamental changes to productivity and production relations in the energy sector, which is faced with the historical opportunity of achieving the accelerated development of clean energy and the huge challenges of concept development, technological improvements and project implementation. Since the concept of climate change came into being in the

late 19th century, people have worked for more than 120 years to seal the *Paris Agreement*. Having gone through denial and suspicion, in addition to difficult and drawn-out negotiations, the *Paris Agreement* finally became a widely recognized joint action plan against climate change with solid theoretical and practical support from countries all over the world. By the same token, as a major initiative concerning the sustainable development of mankind, GEI will also go through the process of developing consensus, forming synergy and motivating joint action.

Currently, the conditions for building GEI are suitable. **First, it is technically feasible.** UHV power transmission technology is advanced and mature, with constant progress being achieved in clean energy and wide application of smart grid technologies. **Second, it is economically competitive.** The costs of wind and PV power generation worldwide have declined by 30% and 75%, respectively, in the past 5 years. It is estimated that new energy will be more cost-effective than fossil fuels by 2025. **Third, it is an issue of global consensus.** Over 140 countries have introduced incentive policies for clean energy development with related goals having already been set. The United Nations, related governments, organizations, businesses and institutions all over the world support the development of GEI.

In summary, GEI is technically feasible, economically competitive and politically favorable. Besides, we have no other choice when it comes to combating climate change. I'm confident that with concerted efforts, we can make the best of GEI. Finally, I would like to make four proposals.

**(1) Set up institutions to effectively promote GEI.** We hope the United Nations can establish a special GEI secretariat/office to strengthen leadership and coordination in related issues and incorporate GEI into the energy development strategies of all countries as an important effort to implement the *2030 Agenda* and the *Paris Agreement*. The secretariat will encourage governments to strengthen policy support and take concrete actions for the innovative development of GEI.

**(2) Formulate international conventions and rules.** International organizations should take the lead to formulate international conventions and rules on the development of GEI, with wide support from various countries, to guide clean energy development, transnational grid interconnection projects, global power trade and grid coordination and operation for the rapid and sound development of GEI.

**(3) Promote global power grid interconnection.** Adopt the combined approaches of both top-level global design and independent national-level planning for the overall consideration of global energy resources and needs, and formulate collaborative plans on global, regional and national power grids. This can help realize coordination and connection of planning at different levels for better project implementation.

**(4) Reinforce technical and capital support.** Organizations, businesses, universities and investment and financing institutions shall pool resources and capital from all over the world to promote innovation in GEI technology, equipment and standards, as well as initiate special funds to support GEI.

Ladies and gentlemen, dear friends,

GEIDCO is committed to building a platform of joint discussion, co-construction, mutual sharing and win-win cooperation. We are fully willing to cooperate with all sides to jointly promote GEI. Let's make concerted efforts and take concrete action to help realize the goals of the *2030 Agenda* and create a bright future for mankind.

(End)