



Global Energy Interconnection Action Plan to Promote 2030 Agenda for Sustainable Development

**Global Energy Interconnection
Development and Cooperation Organization
November 1, 2017
New York, the United Nations**



I. GEI is the Key to Sustainable Development

II. GEI Advances All 17 SDGs of 2030 Agenda

III. GEI Ten Actions to Promote 2030 Agenda Fulfillment

IV. Promote GEI with Five Mechanisms

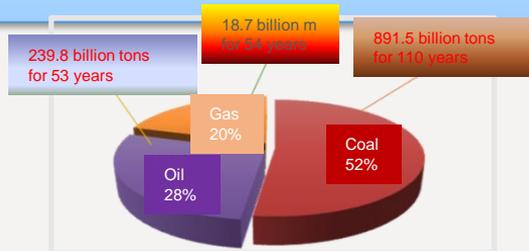
i. Energy's Overarching Role in Sustainable Development



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- Sustainable development is the theme of the contemporary world, and the fundamental requirement of development and progress for the human civilization.
- Energy is the material basis of modern society. Energy Sustainability is a priority for the sustainable development of mankind, and is a key task of the 2030 Agenda.
- The abusive use of fossil energy is the root cause for many acute threats such as resource constraints, environmental pollution, climate change and large number of populations without access to electricity. It is a serious problem affecting the realization of SDGs of 2030 Agenda, and this needs to be solved as soon as possible.

Resource constraints



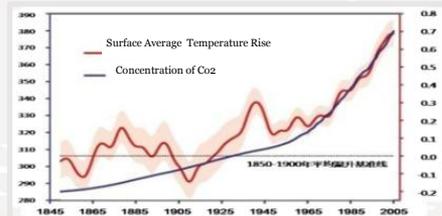
remaining global proven reserves of fossil energy

Environmental pollution



The burning of fossil energy causes serious pollutions

Climate change



CO2 concentration in the atmosphere and temperature rise

Population without electricity access



Global population without access to electricity hits 1.06 billion

ii. GEI's Connotation and Significance



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- GEI is an important platform for the large scale development, transmission and utilization of clean energy resources. GEI is essentially "Smart Grid+UHV +Clean Energy".
- Smart grid is the foundation, UHV grid is the key, and clean energy is the priority.

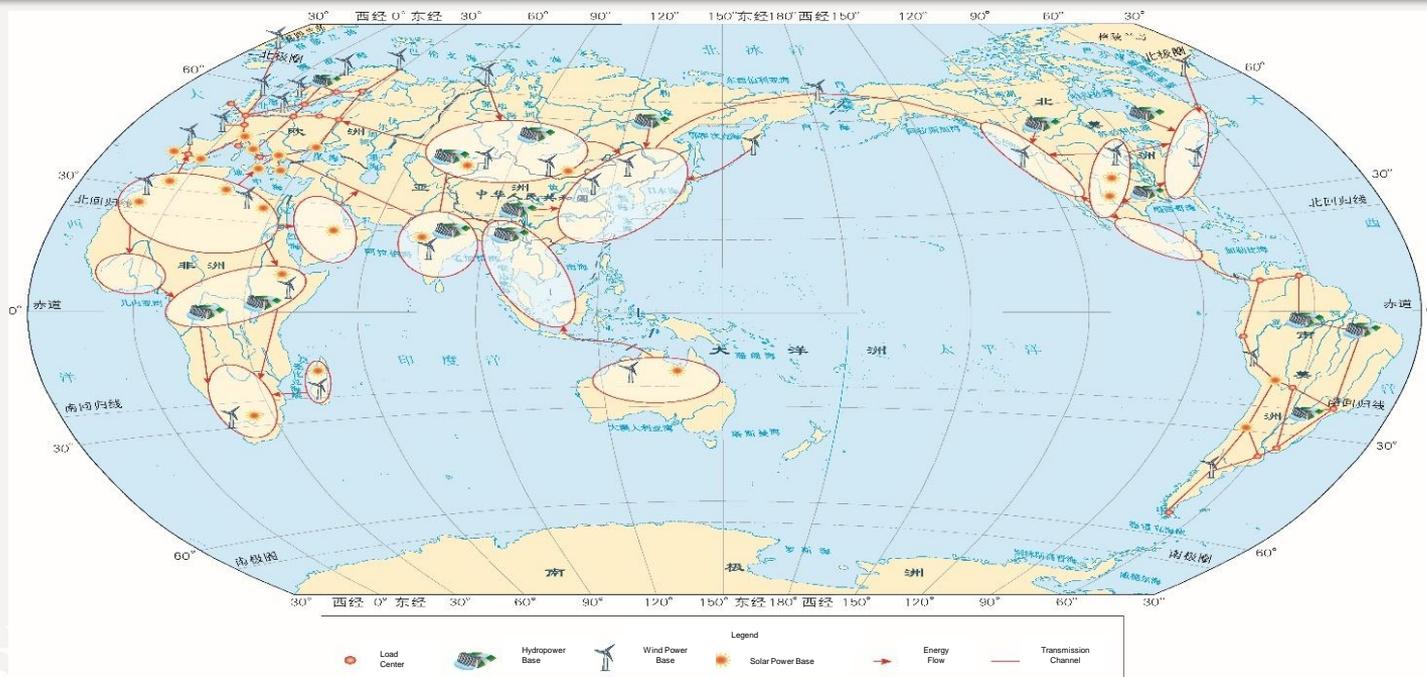


ii. GEI's Connotation and Significance



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- To meet the world energy challenges and promote the sustainable development of mankind, it is necessary to **speed up the development of GEI**, promote world energy revolution and transition, and establish a modern energy system centered on clean energy and electricity, on the basis of mutual consultation, co-development, sharing and win-win cooperation.



Blueprint of GEI

ii. GEI's Connotation and Significance



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- **GEI will facilitate the transition of primary energy resources from high carbon to low carbon, the transition of energy consumption from fossil fuel dominated to electricity centered, and the transition of energy allocation from local balance to global allocation, and effectively upgrade the world energy system.**

1

• It can accelerate energy transition, heal and protect the earth, and provide a sustainable and resilient development path for the world community.

2

• It can mitigate poverty and hunger, improve inequality within and between nations, establish a peaceful, just and inclusive society, permanently protect the earth and its natural resources and achieve sustainable, inclusive and sustained economic growth.

3

• It can create a world of safe, energetic and sustainable environment for mankind and a world in which everyone can obtain affordable, reliable and sustainable energy, and establish a relationship of harmonious development among people, between man and the nature, and between man and the society.

4

• It can create a new pattern of world development characterized by political mutual trust, economic integration, cultural inclusion and beautiful environment, and achieve SDGs for humans, the earth, prosperity, peace and other respects set forth in the 2030 Agenda.



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IV. Promote GEI with Five Mechanisms



- The earth and its ecosystem constitute our common homeland. The United Nations 2030 Agenda for Sustainable Development sets forth 17 sustainable development goals (SDGs) in economy, society and environment.
- Through in-depth analysis of the relationship between GEI and sustainable development, building GEI will advance the implementation of all 17 SDGs of 2030 Agenda:

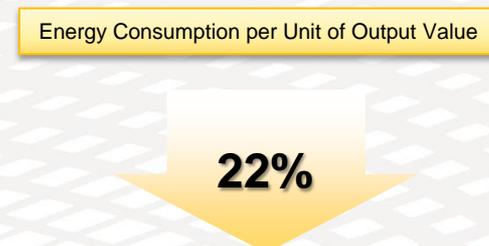
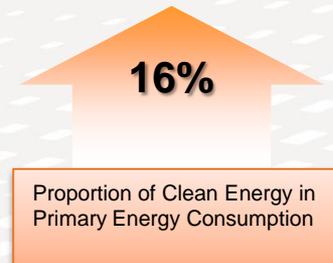
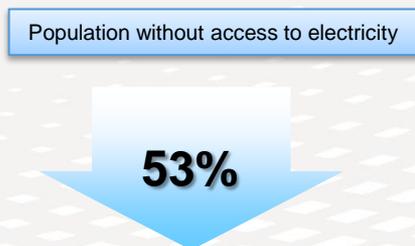




1. GEI will ensure sustainable energy for all



- By 2030, global power installed capacity will be around 5.3 TW;
- Population without access to electricity will be reduced to below 500 million from 1.06 billion at present;
- Clean energy's share in primary energy consumption will increase to 35% from 18.5% at present;
- Construct and upgrade domestic, transnational and intercontinental power grid infrastructures.





2. GEI will effectively reduce greenhouse gas emission



- By 2030, global carbon dioxide resulted from energy consumption will be around 26.7 billion tons;
- Total greenhouse gas emission will be reduced to 40 billion tons, achieving the emission reduction target in Paris Agreement.

3. GEI will lead to sustainable production and consumption



- By 2030, 5.6 billion tons of oil equivalent of fossil energy will be replaced by clean energy each year;
- The proportion of electricity in final energy consumption will increase to 33%;
- Coordinated development of economy and environment. Human being will live in harmony with the Nature.



4. GEI will establish clean, low-carbon and smart cities



- Replace local fossil fuel power generation with clean power energy from afar, and promote distributed power generation development;
- Accelerate urban smart grid development with different energy resources complementing one another.

5. GEI will facilitate infrastructure construction, industrialization and technological innovation



- Build globally interconnected modern power grids, and upgrade power infrastructures;
- Develop energy related industries and advance technological progress in energy, information and other sectors.



6. GEI will stimulate economic growth



- 2015-2030, the total investment in the power sector will amount to more than 20 trillion USD, contributing to 0.1-0.2% of annual GDP growth;
- Foster strategic emerging industries, reduce energy supply costs, and serve as new engine for world economic recovery.

7. GEI will alleviate global poverty



- Reduce population without access to electricity; ensure opportunities of the underprivileged to learning, work and business;
- Turn resource advantages into economic strengths to boost underdeveloped countries' economic growth.



8. GEI will relieve developmental imbalance among countries and regions



- Make full use of underdeveloped countries' resource strengths to participate into global energy governance fairly and effectively.
- Alleviate energy poverty by diversifying income sources of the most underprivileged in remote areas in order to narrow the wealth gap.

9. GEI will facilitate world peace and harmony



- Facilitate the transition from competition over fossil energy to sharing and cooperation for clean energy;
- The focus of energy security will shift from individual security to collective security;
- The world will become more peaceful, safe, open and inclusive.



10. GEI will consolidate global partnerships



- Promote effective coordination and alignment of policies, strategies and plans of different countries, for win-win cooperation and common development;
- Promote stakeholders to cooperate in energy technology, construction, operation, trade ,financing and investment.

11. GEI will promote agricultural development and food security



- Provide adequate and reliable energy supply for agricultural development and food security;
- Tackle global climate change to lessen atrocious weather's impact on agricultural industry.



12. GEI will facilitate medial care, and reduce diseases and deaths



- Drastically reduce fossil energy pollution and its impact on human health;
- Ensure clean air, water and food, favorable living conditions and beautiful natural environment.

13. GEI will promote fair and inclusive quality education



- Benefit all the people with modern electricity civilization so they can have better education and living conditions;
- Promote sustainable development concept so that more people can grasp relevant knowledge and skills.



14. GEI will promote gender equality



- Drive innovative development in knowledge-intensive and technology-intensive industries so that women will enjoy equal employment opportunities and career development;
- Increase economic income through employment to empower women in family and society.

15. GEI will ensure clean drinking water and environmental sanitation



- Adequate and affordable electricity will provide strong support for seawater desalination and sewage treatment, and solve the problem of water shortages;
- Reducing water pollution caused by fossil fuel consumption so as to protect and restore ecosystems.



16. GEI will protect and promote sustainable use of the ocean and marine resources;



- Gradually shut down thermal power and nuclear power plants near sea coasts to reduce energy industry's pollution on the ocean;
- Reducing carbon dioxide emission into the ocean to fundamentally solve ocean acidification problem .

17. GEI will protect the terrestrial ecosystem and prevent land degradation



- Reduce fossil energy exploitation to prevent land degradation and water pollution.
- Rationally develop energy resources in deserts and gobi areas to promote vegetation restoration.

- In short, GEI will profoundly change the global energy, economic, political, social, and environmental landscape. People will enjoy more sufficient energy, more comfortable lives, more habitable environment, and more harmonious society. It will bring a bright future of sustainable development to the world.



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IV. Promote GEI with Five Mechanisms



Based on the goals set forth in the 2030 Agenda and the development status of countries around the world, the GEI Action Plan proposes **Ten Actions to implement the 2030 Agenda**.

Concept Promotion

Clean Development

Universal Access
to Electricity

Power Grid
Interconnection

Electricity
Replacement

Smart Grid

Energy Efficiency
Enhancement

Innovation Driven

Capacity Building

Policy Support

i. Concept Promotion



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- Based on GEI's important roles in facilitating the green and low-carbon transition of energy and achieving the UN 2030 Agenda goals, we need to spread the idea of GEI through all-dimensional multi-layered publicity to gain worldwide recognition.

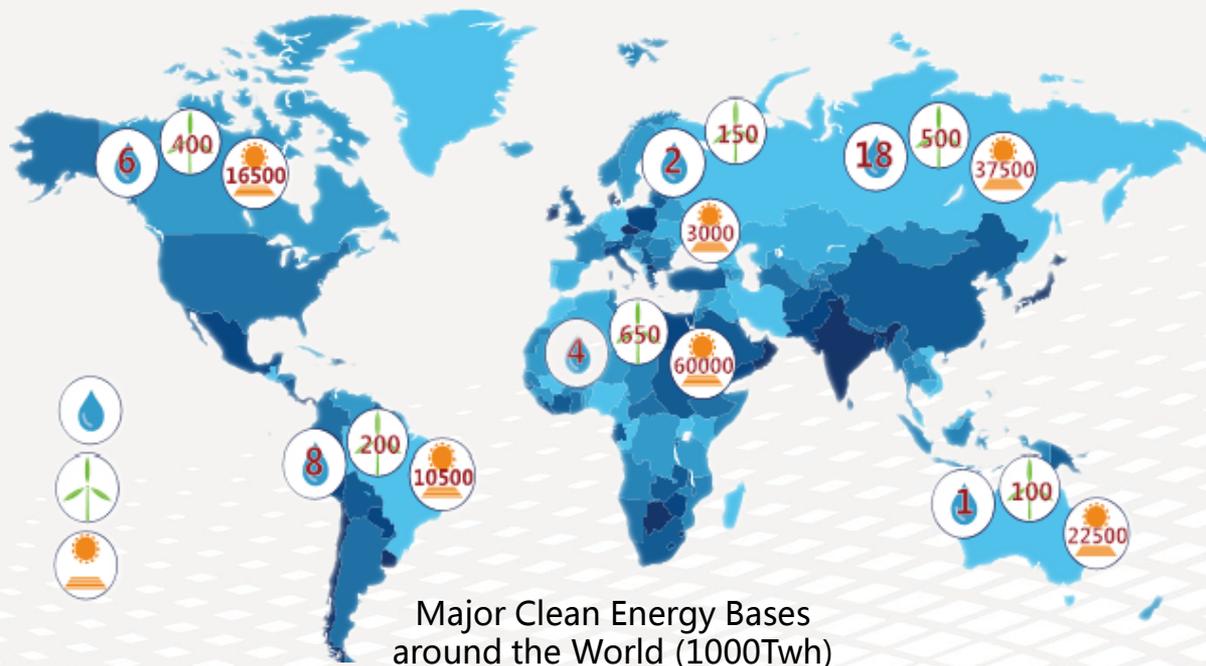


Members of GEIDCO

ii. Clean Development



- Develop both centralized and distributed energies. Make well-coordinated plan for global clean energy development and optimal allocation. Enhance the proportion of clean energy in energy structure.

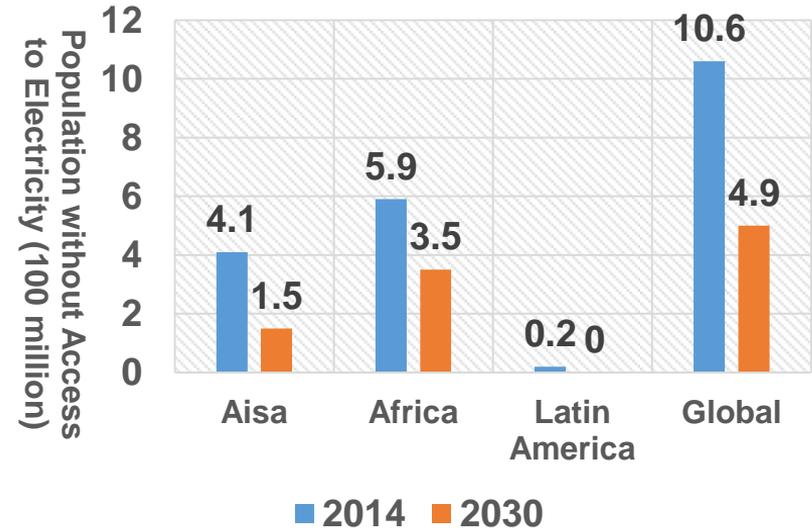
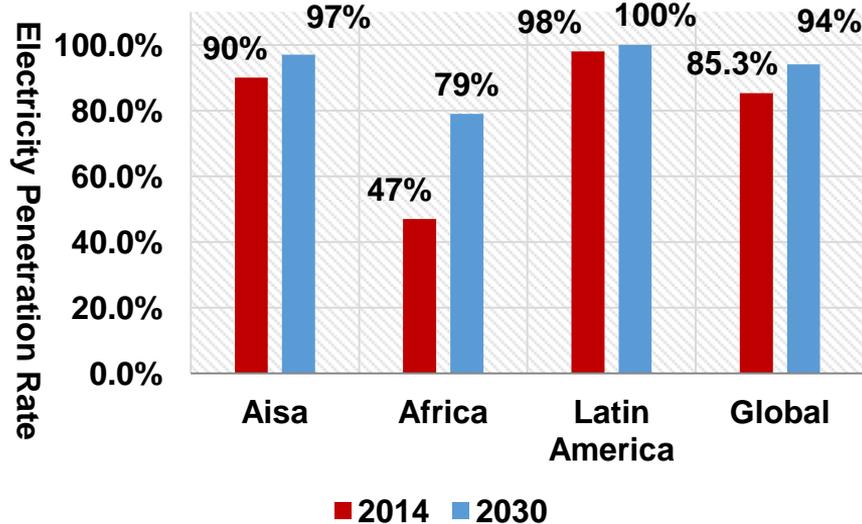


iii. Universal Access to Electricity



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- Reduce population without access to electricity in Asia, Africa and Latin America through governmental subsidies, commercial development, financial assistance and technological R&D by taking advantage of GEIDCO and its international offices' role as a global platform.



Goals of Universal Access to Electricity in Various Continents

iv. Power Grid Interconnection

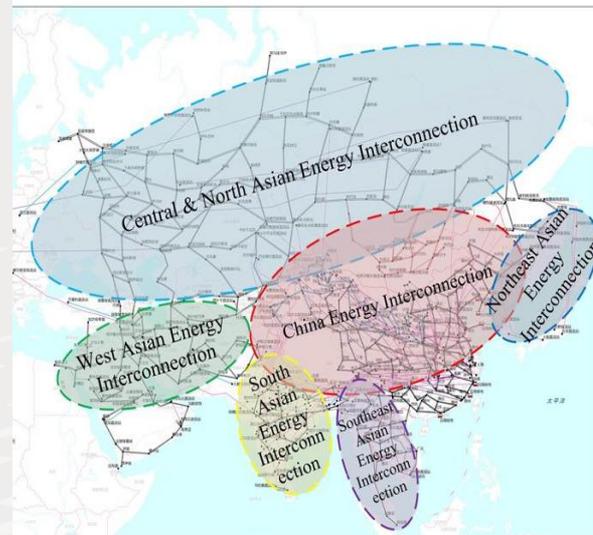


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- Speed up domestic and transnational power grid interconnectivity to achieve domestic, intracontinental and intercontinental interconnection for optimal allocation of energy resources in a wide range. Below are future roadmaps of grid interconnection .

Asia

- Speed up the development of clean energy in West Asia, Central Asia, western and northern China, Mongolia, Russia, Indo-China Peninsula and other regions, transmit the electricity to Northeast Asia, Southeast Asia and South Asia, and form Asia's energy interconnection pattern of "west to east and north to south electricity transmission" .





Europe

- Strengthen the construction of backbone power grid networks for large-scale development and utilization of clean energy within the continent.
- Expand clean energy import from Africa, Asia and the Arctic.



Europe Energy Interconnection



Africa

- Speed up the construction of interconnected power grids in northern, western, central, southern and eastern regions and transmission channels among large energy bases.
- Fulfill hydropower's role as the “regulator”, to complement wind power and solar power in southern and northern regions for stable power supply.
- Transmit electricity to Europe.



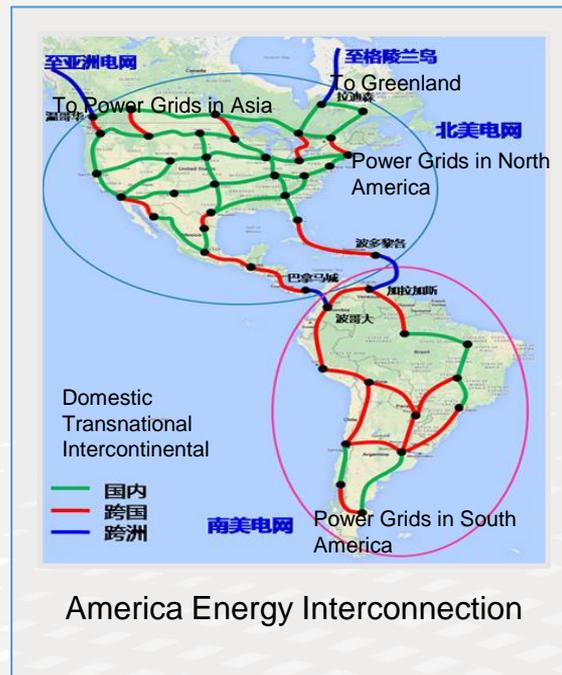
iv. Power Grid Interconnection



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America

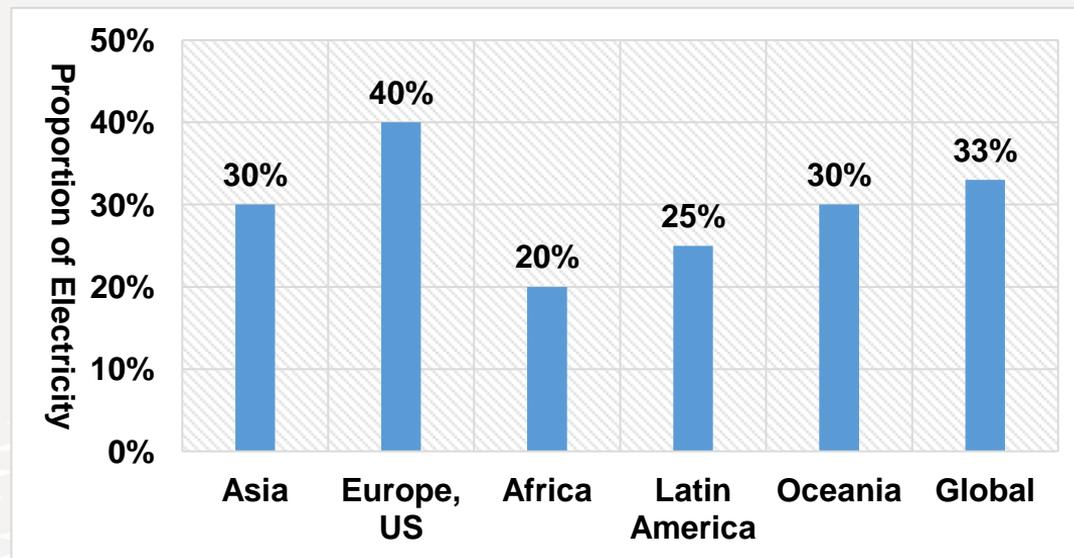
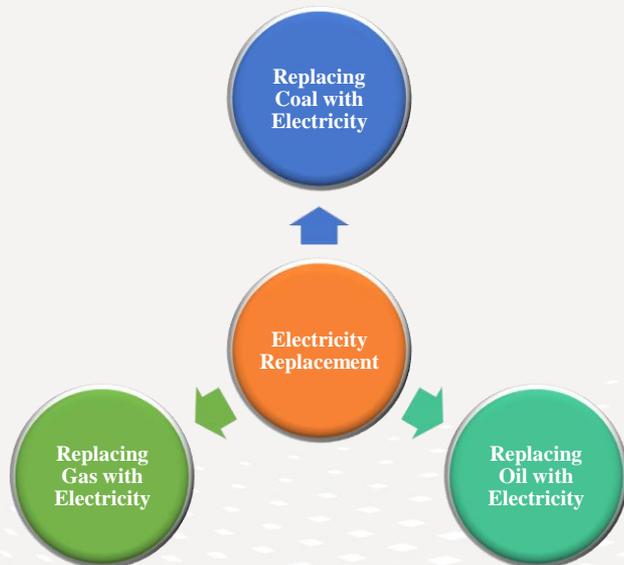
- Speed up clean energy development in Canada, the United States and Mexico, and transmit electricity to the eastern and western coastal regions of the United States.
- Accelerate the development of hydropower resources of Amazon and clean energy in Chile and Peru. Transport the electricity to the southeastern part of South America;
- Achieve North America-South America power grid interconnection via Central America.



v. Electricity Replacement



- The focus is to use new technologies and new equipment to replace coal, oil and gas with electricity in industry, transportation, residential uses and other areas. Thus, replace fossil fuels with electricity in final energy consumption.





- Apply cloud computing, big data, Internet of things, mobile Internet and other advanced technologies and equipment to enable higher intelligence of power systems, flexible integration of clean energy, optimization of power resources, transmission, load and storage, to meet users' diverse demands.

Smart Generation

- Establish global solar and wind power prediction systems.
- Promote Virtual synchronous machine and other technologies that enhance the flexibility and stability of new energies

- Adopt highly accurate power simulation and other systems to better analyze big power grid' s operational status.
- Upgrade power grid dispatching automation systems to enhance online monitoring and intelligent control.

Smart transmission

Smart Distribution

- Build Active Distribution Network (ADNs) with adaptive and self-healing capabilities
- Speed up the development of distributed clean energy generation and microgrids

- Widely install smart meters
- Speed up the construction of charging piles for electric vehicles
- Establish new business models to involve users in grid operation adjustment.

Smart Utilization

vii. Energy Efficiency Enhancement



- The focus is to adopt administrative and market means to formulate strict policies and technical standards on energy production, distribution and consumption. Develop and use energy-saving technologies.

Energy Production

- Improve wind, solar and other renewable power generation efficiency.
- Replace low-parameter generating units with high-parameter units to improve coal's utilization efficiency.
- Build more biomass energy and waste-to-energy power plants.
- Develop energy-saving technologies with combined heat and power generation and centralized heating at the core

Energy Distribution

- Roll out UHV and other advanced power transmission technologies to reduce line loss.
- Optimize distribution network structures and operation modes to reduce line loss
- By 2030 the total length of AC/DC UHV transmission lines is aimed to exceed 100,000 kilometers with less than 6% line loss on average around the globe.

Energy Utilization

- Roll out highly efficient and energy-saving terminals in industry
- Develop green public transport
- Phase out high-energy consuming equipment in construction sector
- Realize the integrated and complementary utilization of cooling, heating and electricity energies

viii. Innovation Driven



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- **Technological innovation:** Focus on innovative research and development of key technologies on smart grids, UHV, clean energy, and power grid operation and control.
- **Financial innovation:** Focus on innovative development of business models, and investment & financing patterns to fund GEI projects.

Smart Grid Technologies

- Make breakthroughs for smart technologies on power generation, transmission, distribution, consumption, and dispatching

UHV Technologies

- Make breakthroughs for technologies and/or equipment of UHV AC/DC power transmission, submarine cables, and their application under extremely cold, heat or high-altitude environments.

Clean Energy Technologies

- Develop ultra-large highly cold-resistant wind generation units for better generating efficiency.
- Develop hydro-wind-photovoltaic combined, complementary and optimized operation systems.

Power Grid Operation and Control Technologies

- Make breakthroughs for safe and stable operation mechanism and characteristics analysis technologies for ultra-large AC/DC hybrid grids, and improve overall defense capacity of big grids.

Establish Mutual Beneficial Business Models

- Governments, energy enterprises, investment and financing agencies and other stakeholders participate in different forms to share benefits and risks.

Establish Multi-layered Investment and Financing Systems

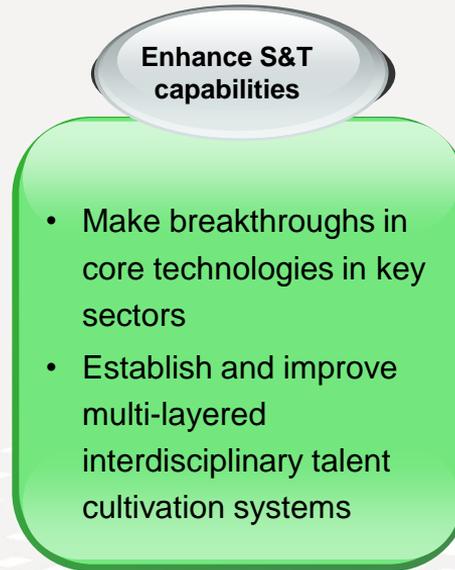
- Support project participants fund projects with different financing or investing methods. Gain policy banks' support. Obtain government's favorable financial and taxation policy support.

Establish Highly Efficient Investment and Financing Guarantee Mechanisms

- Reasonably allocate stakeholders' benefits. Strengthen favorable national investment and financing policies. Strengthen investors' guarantee mechanism.



- Based on funds, technology, education and think tanks, enhance national development, S&T and R&D capabilities for GEI implementation.





- Governments should formulate policies and measures for clean development, grid interconnection, universal access to electricity and energy efficiency enhancement. Intergovernmental organizations should play a guiding and coordinating role to render different nations' policies compatible.

Clean Development Policy

- Set development routes, detailed objectives and specific measures.
- Gradually remove inefficient fossil energy development subsidies.
- Establish special funds for electrification and energy efficiency

Power Grid Interconnection Policy

- Formulate policies and regulations to promote transnational projects
- Strengthen the coordination and integration among different countries on policies concerning cross-border power transmission tariffs and trade.

Universal Power Access Policy

- Develop detailed objectives and roadmap to enhance electricity penetration rate
- Establish relevant subsidy mechanisms and public investment systems
- Formulate incentive policies to attract diversified investments



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In order to build GEI, governments, enterprises, social stakeholders need to establish a strong cooperation mechanism to communicate and take concerted actions for planning, construction, trade and technical standards.

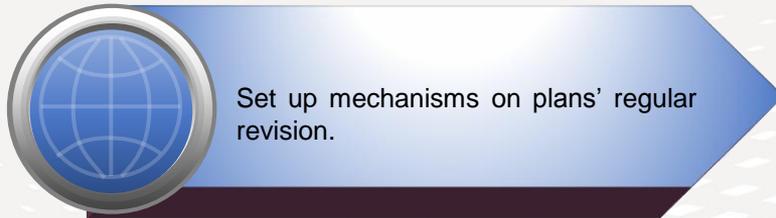
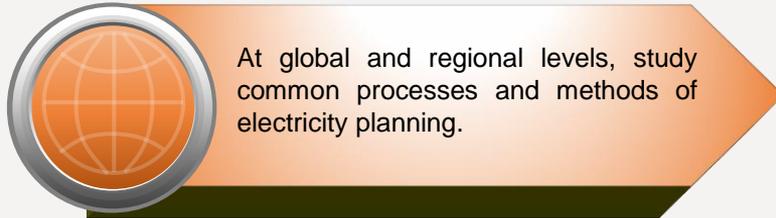


i. Global Power Grid Planning Mechanism



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- The focus is to make global, regional and national power grid development plans based on overall consideration of world's resource allocation and demand, combining global plan with the individual plans of each country.



ii. Transnational Project Construction Mechanism



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- The focus is to innovate business model, attract global investors to participate in the global clean energy development, transnational grid interconnection and project implementation.



Establish a global project research and engineering platform to carry out preliminary work together.



Establish good business models to attract global investors.



Strengthen the cooperation among financial institutions, NGOs and grid companies for project funding and construction.

iii. Global Electricity Trade Mechanism



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- The focus is to coordinate the mechanism and market formation of different countries, establish open, fair and orderly power markets at different levels to achieve highly coordinated global electricity trading and optimal resource allocation.



Coordinate different countries' policies on taxation and other aspects.



Promote bilateral and multilateral mid/long-term and spot trading to form regional electricity markets.



Establish power transmission service fee mechanism for transnational transmission lines, and enable involving parties to reasonably share service fees and channel capacities.



Establish electricity trade mediation mechanisms.

iv. Interconnected Power Grid Coordination Mechanism



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- The focus is to formulate the convention and protocol for global power grid operation, establish multi-level, multi-area, well coordinated and integrated power grid systems to ensure the security, economic and operation efficiency of bulk power grid system with high clean energy integration.



Develop interconnected power grids' operating mechanisms to coordinate transnational and regional power grid operation.



Formulate transnational and intercontinental power grid operation agreements to optimize electricity transmission.



Establish global power grid information and alarming systems, and strengthen collaboration for the safe operation among power grids.

v. Collaboration in Technical Standards Mechanism



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- The focus is to formulate technical standards and specifications on equipment manufacturing, market transactions, operation and maintenance, promoting the smooth R&D, engineering practice and operation of GEI.



Compile relevant technical standards on the construction and equipment of transnational power grid interconnection projects.



Study and develop the models and algorithms for transnational power trade.



Improve different national standards and specifications' compatibility on global power grid operations.



Establish international standard joint research platforms, and organize various parties to formulate standards together.



The development of GEI is closely related to the sustainable development of mankind. Implementing the 2030 Agenda is a common task for all countries in the world. GEIDCO is willing to deepen pragmatic cooperation with all sides on the principle of joint consultation, development, sharing and win-win cooperation, to jointly promote GEI's innovative development, achieve the goals set forth in the UN 2030 Agenda for Sustainable Development at an earlier date, and make contribution to the sustainable development of all mankind!



Thank you!

