

Shanghai's Path to Renewable Energy Sources

Shanghai Forum 2013

1. Problems and Challenges

Shanghai is confronted with a series of challenges and problems during the development of renewable energy resources while it has achieved a plurality of FIRSTs.

- 1) **Resource scarcity; a relatively large gap exists between Shanghai and other major provinces in terms of resources.** Shanghai is endowed with fairly ordinary new energy resources. The land and environment are constraining factors. Compared to total energy consumption, available resources are highly limited. This gap is especially prominent between Shanghai and major provinces rich in wind power and photovoltaic energy.
- 2) **High cost of development, influenced by factors such as application conditions, infrastructure, and component prices.** The cost of new energy development and utilization is high; meanwhile, due to unapparent scale economies effect, Shanghai clear stands at a disadvantage with respect to those provinces holding energy superiority. Under circumstances of inefficiently combing electricity price, the low competitiveness of Shanghai's new energy industry is one of the main factors impeding its development.
- 3) **Shanghai lacks core technology. The predicament of maintaining technology but lacking property rights and application is especially salient.** Although Shanghai possesses certain capabilities of new energy technology research & development and equipment manufacturing, core technology for design, processing, materials and system integration is still lacking, The capability for independent innovation awaits further enhancement.
- 4) **The institutional dilemma must be resolved. Further development of new energy is constrained by the current system and mechanisms. The pertinence, continuity, flexibility and cooperativeness of policy support needs to be strengthened. This is necessary when propelling the industrialization and marketization of new energy development at crucial stages of development.** In general, a large amount of guiding input by central government has not yet motivated the new energy industry to step completely across the “Death Valley” that spans from technology research & development to industrial application. All kinds of demonstrative projects still fail to build up their own competitive advantages in their process of truly marketing. The optimization of future supporting mechanisms, and “targeted assistance” mechanisms on policy supports will have a direct bearing on realizing a substantial leap in renewable energy source development.

2. Necessities

The world's leading resource and economic powers are spurred by the deepening evolution of the financial crisis to seek re-industrialization. Taking new energy

industry as the strategic direction of economic resurgence, revitalization and revolution of the industry must take place. In the key phase of driving innovation and transformation development, Shanghai should take advantage of technological high ground of new energy sources and establish industrial strength of new energy production as soon as possible in order to avoid a situation in which a new round of industrial transformation becomes a missed opportunity.

- 1) The convergence of new energy and information technology must become the predominant direction of industrial transformation.** Recently, there have been many signs that the information industry has tremendous growth potential and the new energy industry is increasingly mature. This will likely ignite a third industrial revolution through all-around convergence of these two factors. The technological paradigm on which new energy industry relies is mainly characterized by distributed and intermittent energy use. Economically, this technological revolution has actually overturned the natural and reasonable monopoly basis of the traditional electric power sector; meanwhile, in terms of manufacturing costs, economies of scale along with the escalation of applications in the input factor market have brought about a significant drop in cost. The economic efficiency of distributed energy resources is much more salient.
- 2) New types of traditional energy technology applications and the sudden rise of unconventional energy have increased the uncertainty of renewable energy source development prospects. If we do not enter a new stage of industrial development as soon as possible, heavy capital input invested in the early developmental stage may fall silent.** Most new energy technology is not yet fully mature, the cost of which remains higher than fossil fuel; the traditional fossil fuel sector is actively exploring technologies of cleaning and efficient use: technologies such as CCT and IGCC are all competitors for renewable energy. On the other hand, rapid expansion of unconventional gas – shale gas – in US has imposed a serious impact on the technical route of global low-carbon transformation as well. Various countries are studying the effects of this phenomenon.
- 3) Both denuclearization process in Japan and Germany and the prudence of other European countries towards nuclear power have far reaching effects on the path of depuration and low-carbonization of global system of energy supply and demand.** Generally speaking, the fact that a cautious attitude towards nuclear power held by every country all over the world slows down the development of this energy is indisputable, which offers great opportunities to accelerate the development of other new energies such as wind power, solar energy and geothermal energy.
- 4) Industrial transformation in Shanghai should comply with international trends as well as play to its own strengths.** Shanghai has carried out technical demonstration and primary exploration to early-stage industrialization of wind power equipment manufacturing, photovoltaic system integration, smart power

grids and energy storage batteries. In the future, Shanghai should not only enlarge the scale of new energy usage on its own terms, but also strive to develop relevant industries such as equipment manufacture, key technology integration and exploiting extended service patterns.

3. Policy Suggestions

- 1) Ensure that renewable energy power generation is consumed efficiently by means of strict coercive on-grid institutions.
- 2) Make sure that investment in renewable energy sources could yield stable and sound profits according to the institution of flexible classified electricity price, fostering its stronger market competitiveness than that of conventional thermal power step by step.
- 3) Make government, enterprises and end-users jointly share the profits and risks of renewable energy development through expense allocation institution. Suggest the state to speed up the legal system construction of renewable energy development, guaranteeing the normalization of compulsory institution.
- 4) Deepen market-oriented reforms in the energy sector; build up a green electricity market as quickly as possible and lead a rational allocation of renewable energy sources.
- 5) Eliminate unnecessary trade barriers and improve the convenience of international trade in renewable energy equipment.

Global climate change negotiations and domestic jobs in energy conservation and emissions reduction have proposed higher requirements for rapid progress of renewable energy in Shanghai. As a leader of the “opening and reform” era, Shanghai should be the first to explore and establish a more efficient policy system to promote renewable energy development, providing referential experience for national strategic decisionmaking. The present Shanghai Model is also typical for its feature of governmental guidance and group operation. The experience and setbacks of Shanghai, on the one hand, provide China—and Asia—with an example of renewable energy applications in coastal megacities, and on the other hand serve as an example of problem-solving for low demand of renewable energy sources as a result of system design and market creation channels. Shanghai must focus on strengthening its first-trial advantage in offshore wind power, take the lead in exploring transformation of institutions and mechanisms, and exert itself to give impetus to its strategic pillars of industry such as manufacture of large-scale offshore wind turbine and offshore wind turbine installation units while maintaining expansion of the scale of development and utilization.