

Advanced energy technologies for developing countries (Speech)

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Mr. Chairman,

Distinguished participants, ladies and gentleman:

It is a privilege for me to participate in the Second International Forum on Hydrogen Technologies for the Developing World and address such a distinguished audience. I congratulate the Russia Federal Agency of Science and Innovation for organizing this remarkable event to discuss issues related to the "hydrogen economy" for sustainable development particularly for developing countries.

Energy for sustainable development

Energy is at the very core of economic life and is indispensable for sustainable development. The international community has pondered the nexus of energy and sustainable development since the 1992 Earth Summit. Over the last few years, increasing concerns about energy security and climate change have highlighted the importance and urgency of striking a balance between energy development and environmental sustainability. Today I wish to share some of our views concerning the role of clean energy technologies in promoting sustainable development and recent progress with devising a framework to strengthen international technology cooperation to combat climate change in the context of sustainable development.

From the perspective of the United Nations, we believe that energy for sustainable development is not an esoteric subject for pundits to debate but a critical challenge posed to the wellbeing of humanity and the planet. Effectively tackling this challenge requires adhering to two basic principles: First, everyone should have access to reliable and affordable modern energy services; and Second, the production and consumption of energy must be carried out in an environmentally responsible manner. The development and deployment of appropriate energy technologies is a first pathway to solutions.

Energy access

The world energy situation is confronting many challenges: soaring oil prices have passed the threshold of hundred dollars per barrel for the first time and will remain high for the foreseeable future; Increasing awareness of the environmental impacts of fossil fuels, including local pollution and climate change, demands a de-carbonization of what was expected to be a fossil fuel future. However, at no time, can we neglect a cruel fact: There are currently more than 2 billion people in the world without access to modern energy services. A United Nations study (Modi) points out that a minimum energy consumption level for a human to live would be 500 kilograms oil equivalent per year. Sadly the bottom billion of the poorest people in the world consume only one-fourth of a ton of oil equivalent of energy per capita annually. Some people, such as those in Niger and Mali, consume as low as 50 kilograms oil equivalent per year. Energy poverty is greatly hamstringing efforts to achieve the United Nations Millennium Development Goals and to preserve the fragile natural resource base. Providing adequate, affordable and clean energy services for the poor people should be Priority No. One for the international community when we discuss energy issues both in and outside the United Nations. Providing this segment of population with electricity for lighting, clean fuels for cooking and heating and necessary power for economic activities will considerably improve their welfare and empower them to live a productive and decent life without causing any global environmental challenge.

There is a wide range of energy technologies available to do so. They include: the

construction and extension of electricity grids powered by conventional energy sources and hydropower wherever appropriate, the development of decentralized energy systems using locally available, often renewable, energy resources such as wind, solar, biomass, and use of traditional knowledge based but modernized technologies and techniques, for instance, efficient stoves and jatropha for bio-fuels. Here the top priority should be: the technologies must be reliable and cost-effective and energy services affordable and sufficient for productive use so that the deployment of technologies could achieve a transition from traditional to modern energy use for poor households and isolated communities. Technologies should also be environmentally benign and contribute to the protection of biodiversity.

De-carbonize energy production and use

We all know that a sustained and equitable economic growth is the most effective way to lift people out of poverty. Over the last two decades alone, the proportion of people in poverty in the world fell by half — from 40 percent to 21 percent. Life expectancy in developing countries has increased by 20 years and adult illiteracy has been halved to 22 percent. This achievement is largely attributed to development in emerging economies such as Brazil, China, India, South Africa and Vietnam, etc.

Economic growth requires energy among other natural resources. However the current way in which energy is produced and consumed is less efficient and polluting, which is true everywhere but particularly in developing countries. Thus we are grappling with the inherent trade-offs between energy use, economic growth and environmental protection.

On the issue of environmental sustainability, a basic principle is that everyone in the world has the same right to a high standard of living as those in the industrialized countries. Today's world witnesses a stark disparity in energy consumption: the one billion people in the rich countries consume more than half of world's energy and emit six times the carbon dioxide per capita per person as poor ones. If it is understandable that the richer countries, while welcoming economic progress in the developing world, do not want to make any tangible sacrifices in their own wellbeing, it is simply unreasonable and unrealistic to expect developing countries to halt or significantly slow down their economic development and poverty reduction process for the sake of "the common good".

However, equality does not mean that developing countries as a whole or per capita should consume the same level of energy as rich countries do, which would far exceed Earth's environmental carrying capacity and represent an unsustainable trajectory of development. For instance, if, over the next 50 years, developing countries, with current technologies, achieve the present energy consumption and production patterns of the OECD countries today, greenhouse gas emissions will more than quadruple from current levels. A business-as-usual approach on the part of developed countries, combined with a growth along the same patterns by developing countries, could have potentially catastrophic effects on the global climate and in turn on economies and health. We need to find ways to de-carbonize energy supply, use less for more, and decoupling economic growth and environmental degradation. Clean and advanced energy technologies, although not a panacea, could certainly lay a physical foundation.

Now, more than ever, environmentally sound technologies are recognized to be essential to meeting the mounting challenges of abating climate change while supporting economic growth and poverty eradication. Those technologies could be categorized into three groups, each requires different policy support and market instruments to get deployed.

1. There are a large number of technologies that are technically mature but require an enabling policy climate primarily at the national level to scale up. Those technologies include energy efficiency in industry, building and

transportation, CHP (combined heat and power), clean coal technologies, solar thermal and hydropower, etc.

2. Many technologies are technically viable but need more efforts to improve their performance and reduce costs before being deployed in a large scale and at an affordable price. It seems to me that advanced combustion technologies such as CFBC (circulate fluidized bed combustion), IGCC (integrated gasification combined cycle), some renewable energy technologies such as multi-megawatt wind turbine and PV power generation, hybrid vehicles, etc. belong to this category. In this area, the transfer of technology from industrial to developing countries is essential because it will considerably shorten the process of reducing costs and bringing them on stream.
3. Unlike the conventional wisdom, those clean technologies that are readily available are far from enough if we want to reduce CO₂ emission and stabilize GHG concentration in the atmosphere to the level anticipated by the IPCC/AR4. According to IEA, fossil fuel will dominate world energy structures until the middle of this century and beyond. Carbon capture and sequestration has been widely heralded for its potential to clean up and transform the conventional electric power industry but in a demonstration stage. Cellulose based bio-fuels, centralized solar power plants and next generation nuclear technologies are still in their infancy. Early uptake of those technologies in the energy market requires much accelerated R&D, demonstration and improvement. Public-private partnerships, joint-research and collaborative development between developed and developing countries are crucial.

A technology development process involves many partners from research/invention to demonstration, from commercialization to diffusion. In past, invention and research are largely financed and organized by governments based on recommendations of the scientific community. As technologies approach certain maturity, the private sector starts to chip in to test their economic efficiency and make incremental improvements. At the deployment and diffusion stage, it is the private sector that plays a leading role in commercializing technologies and expanding their market share. As a result, the private sector ultimately monopolies new technologies, and the market fundamentals, in particular profitability, drive the process and pace of technology application and dissemination. Depending on market response, this process may take years and even decades. Faced with the pressing challenges to eliminate energy poverty, fuel sustained economic growth in the world, particularly in developing countries, arrest environmental degradation including climate change, this business-as-usual approach is untenable. We must create an innovative policy framework, together with effective financial and implementation mechanisms, to speed up the development, transfer and deployment of clean and advanced energy technologies.

International cooperation

The international community has long emphasized the importance of technology cooperation. Agenda 21 adopted at the Earth Summit in 1992 and the Johannesburg Plan of Implementation at the World Summit on Sustainable Development ten years later have provided a blueprint for action on transfer of environmentally sound technology.

There has been a reluctance and resistance on the part of industrial countries to technology transfer due to the concerns about the competitiveness and protection of intellectual property rights. Pressed by the industry, some developed country governments were often ambiguous, saying that technologies belong to the industry not government. As a result, agreements and resolutions contain more rhetoric than specific measures and their implementation has failed to meet the expectation of the international community. Triggered by the climate change crisis, this situation is changing. The development, transfer and deployment of technology will constitute one cornerstone of a future international agreement and lay a solid foundation for its implementation.

For the first time, the Bali Action Plan highlights the development and transfer of technology in an explicit and specific manner. It states that “nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported by technology and enabled by financing and capacity-building, in a measurable, reportable and verifiable manner”.

Although the specific arrangements of such an agreement very much depend on the outcome of negotiations under the auspices of the UNFCCC, a few key elements have surfaced from discussions and deliberations before, during and after COP13.

1. Technology development and transfer is a prerequisite for developing countries to contribute to mitigation and adaptation and to pursue sustainable development; the international community’s support, like appropriate mitigation actions to be taken by developing countries, should be measurable, reportable and verifiable;
2. International cooperation should be enhanced to mobilize the scientific, engineering, economic and environmental communities to review and assess the status of various types of clean energy technologies, their potential impacts on climate change and sustainable development in general under different situations in different countries. As a result of such assessment, we should be able to reach a much clearer understanding about the availability, affordability and environmental effectiveness of technologies and chart a course of actions to bring existing technologies to commercial deployment, to identify bottlenecks and work on breakthroughs on medium-term technologies, and coordinate international efforts on laboratory research and R&D on future technologies (such as fusion, ocean energy systems and gas hydrates, etc.).
3. It has been widely recognized that many clean energy technologies, such as centralized solar power, environmentally sustainable bio-fuels, carbon capture and sequestration, hydrogen and next generation nuclear, while holding a great potential for mitigation, need breakthroughs that will only be possible with an infusion of public funds. It is therefore important to reverse the decline of public expenditures on R&D and demonstration to improve the reliability and performance of technologies and considerably lower cost. Some experts suggest, such as the Stern Review, that public expenditures should be doubled to US\$20 billion per year. The public-private partnership approach is effective to support the private sector to invest more in post R&D phases of energy technologies and to accelerate a shift from “policy driven to commercially driven”. Specific supporting measures could include: loan guarantees, guaranteed purchase or procurement, tax credits, equity investments, and so on.
4. To remove the concerns and obstacles of industry competitiveness and intellectual property protection, a clean technology fund should be established to pay for licensing fees and patents to facilitate the transfer and deployment of clean energy technologies. A review should also be conducted to look into possible improvements required in the international trade regime and regulation in order to reduce tariffs for the cross-country trade of environmentally sound technologies.
5. Strengthen developing countries’ capacity to create an enabling climate for the transfer and deployment of clean technologies and to absorb clean technologies. In terms of operational modality, it is recognized that, as opposed to a project approach, the sectoral or programme approach such as for power, transport, building, aluminum, steel, cement, home appliances sectors, is more effective. South-South and South-South-North triangle cooperation should be expanded. Early participation of developing countries in R&D and demonstration will facilitate the adoption and tailoring of technologies to their specific needs.

Hydrogen technologies

The emerging structure of international technology cooperation will provide an

excellent opportunity for the development of the hydrogen economy. Facilitated by the International Partnership of Hydrogen Economy, we have developed a broad network among government agencies, relevant industries and international organizations and assembled a great number of professionals dedicated to this promising area. We should continue to share experience and information and to establish technical standards and codes. We should work together to develop a clear vision and roadmap and to have the voice of this community heard loud and clear in the international arena.

Finally, let me say that it is very fitting that this meeting is being held in Moscow. Russia, with its abundant energy resources and outstanding education and research capacity, is an important player not only in the world energy security but also in the international technology cooperation in order to face up to the energy and environmental challenges and support developing countries in their endeavour to pursue sustainable development. In this regard, the United Nations would like to strengthen our cooperation with the Russian Federation.

Thank you for your attention.