September 2013, Edition 1

Asian Council on Water, Energy and Environment

Confederation of Asia-Pacific Chambers of Commerce and Industry

Message from the Chairman

It is with great pleasure that we announce the publication of the first Asian Council on Water, Energy and Environment (ACWEE) newsletter.

As the climate changes, and in the context of rapid demographic growth, world's population rapidly expanding, economies growing and the competition for limited energy supplies intensifying, Asia Pacific region's woe on water, energy and environment shall proliferate in the future. Serious environmental degradation, unsustainable practices, rapid industrialization and development in the region shall put immense pressure and misery to the expanse. Energy is the underbelly of any region's progress with lack of water and environmental considerations a real threat to regional peace and security. There is therefore, a need to seriously discuss, educate, advocate, prepare and plan for issues related to energy and water security and the imminent agenda for increased use of environment friendly compatible clean sustainable renewable form of energy, now made even important due to the global warming menace.

This maiden issue features a brief summary of the second ACWEE meeting held during the sidelines of the 27th CACCI Conference in Cebu City, Philippines on March 14-15, 2013.

During the session, I was joined by three distinguished local speakers who shared their insights and expertise in various topics such as water scarcity, investment opportunities, and the host country's electric power industry. This issue also includes ADB and World Bank reports, as well as feature stories on the water, energy and environment sector.

We hope you will find the ACWEE newsletter interesting and informative. You are invited to contribute articles for future issues.Please email the CACCI Secretariat at cacci@cacci.org.tw for more information.

Mr. Gyanendra Lal Pradhan
Chairman, Energy Committee FNCCI
Executive Chairman, Hydro Solutions

INSIDE

ACWEE breakout session takes place at the Cebu CACCI Conference

From left to right: Mr. Lito Maderazo, Mr. Urbano Mendiola, Mr. Jose Alejandro and Mr. Gyanendra Lal Pradhan

The Asian Council on Water, Energy and Environment (ACWEE) held another successful and well-attended breakout session during the 27th CACCI Conference held on March 14-15, 2013 in Cebu City, Philippines. It was the second gathering of the ACWEE following its establishment in 2011 at the CACCI Conference in Istanbul. The first one was held in October last year during the 26th CACCI Conference in Kathmandu, Nepal.

Gyanendra Lal Pradhan, chairman, Energy Committee of the Federation of Nepalese Chambers of Commerce and Industry (FNCCI) and executive chairman of Hydro Solutions, presided the Cebu session, which featured four speakers.

Pradhan gave the first presentation on the topic fresh water availability on earth and the hydropower potential of countries in the South Asia and Southeast Asia regions. He called on all countries to make good use of their resources, especially the hydropower. He discussed the key drivers of regional cooperation and the existing energy projects between and among countries in the region. He also encouraged countries like the US, China, Russia, India and Japan to reduce CO2 emissions to mitigate the impact of climate change.

Lito Maderazo, president of Mactan Rock Industries and newly-elected president of Cebu CCI, talked about water scarcity and the role of business in mitigating its ill effects. He presented some figures on global water crisis and freshwater consumption breakdown.

Maderazo noted that 75% of Asia-Pacific countries are facing imminent water crisis due to water pollution and other factors, noting that 37 to 49 countries assessed were "suffering from low levels of water security." He also identified some measures to alleviate water stress, among others, by monitoring water use and managing water consumption, and by entering into partnerships with relevant organization.

Vice president for corporate affairs at the National Power Corporation (NPC) Urbano Mendiola, discussed investment opportunities in the Philippines in off-grid areas for 2013-2022. He made a presentation on the power supply-demand outlook in the country and the Missionary Electrification Plan of NPC. He also outlined activities undertaken by NPC to promote the country's investment opportunities, particularly those that include private sector participation, and some of the current challenges. He said that NPC's major focus moving forward is to ensure energy supply and security, electricity price reasonableness, and operations sustainability.

Mr. Jose Alejandro, vice president for power at the Philippine Chamber of Commerce and Industry, gave an introduction on the Philippine electric power industry.

Alejandro covered the legal and institutional framework of the industry, introduced the independent power producers, a government entity called the National Power Corporation (NPC), and the small power unit groups under NPC which are in charge of the electrification of missionary areas or island grids. He also provided an overview of the power supply-demand outlook.

The individual presentations were followed by an open forum, during which the other delegates asked questions from the speakers, and shared their own comments and perspectives on the topics under discussion.

The ACWEE is expected to hold its next breakout session in Kuala Lumpur during the 28th CACCI Conference to be held in mid-September 2014. ■

Efficiency: the power of energy thrift

Demand-side energy efficiency is highly cost-effective and has the potential to be a main driver for enhancing energy security in Asia and the Pacific.

Asia is on track to becoming the world's largest energy-consuming region by 2025. This means that the region will increasingly be exposed to energy security and climate change risks unless measures are taken to contain energy consumption.

Making end-users realize that energy is a scarce, valuable resource might not be as simple as it sounds. Yet, if realized, demand-side efficiency gains have the potential to be a main driver for enhancing energy security.

Demand-side energy efficiency means increasing efficiencies at the point of final energy consumption, mainly for industry, buildings, vehicles, and machinery. ADB Senior Energy Specialist Aiming Zhou explains that it is also gaining importance as a means to maintain electric system reliability.

"In developing Asia, where energy demand is growing rapidly, energy efficiency can be a tool to cut energy use where the electricity system is under significant pressure. This approach can prevent blackouts and brownouts, and extend the operational lifetime of existing transmission and distribution infrastructure."

According to an ADB evaluation report, Review on Energy Efficiency Interventions, "improving energy efficiency is a highly cost-effective alternative to increasing energy availability. A megawatt of power capacity saved—for example, by retrofitting energy-efficient industrial equipment—costs about half that of adding the equivalent coal-fired power-generating capacity."

So far, countries in Asia and the Pacific have responded to energy efficiency programs with policies and programs to guide specific changes in energy use across sectors.

Energy for all

In 2012, ADB invested US$2.3 billion in clean energy projects, of which US$1.3 billion went to renewable energy. Around US$974 million went to investments in energy efficiency with the remainder invested in clean energy funds.

The goal of ADB's Energy for All Partnership is to provide 100 million people with access to modern energy by 2015. This will be achieved by encouraging cooperation between the private sector, financial institutions, governments, and non-government organizations to scale up investments in energy access.

The Philippine Energy Efficiency Project shows the benefits of demand-side energy efficiency. The project improved energy use in the Philippines, through actions ranging from lighting retrofits of government buildings to the installation of 9 million compact fluorescent lamps (CFL) in the residential sector.

Responding to challenges

Investing in energy efficiency programs will have long-term rewards despite the initial higher costs and challenges of setting it up. This is one hurdle that governments need to realize at the outset.

"Energy efficiency is an investment, and should be evaluated accordingly," says Zhou. "Interventions that deliver real savings over the long term will entail upfront costs for households or businesses. These types of hurdles or inconveniences can be termed as 'transaction costs' that can limit energy efficiency interventions, even when cost-benefit analysis justifies their use."

However, Zhou explains that in order to scale up funding in this sector, there must be a concerted approach at several levels.

Changing mindsets

Clearly, energy efficiency programs depend heavily on end-users and efforts should be channeled to educating, informing and encouraging them to do their part.

Energy prices that reflect the true cost of energy can nudge households and businesses to make more energy efficient choices. Government can promote programs that incentivize conservation and promote awareness of its benefits.

"The key is to promote a fundamental shift in the general public's attitudes, toward instilling recognition that energy is a scarce, valuable resource for us all," says Zhou. ■

ADB News Release

Dangerous global warming could be reversed, scientists say

by Natalie Starkey, The Guardian

Global warming could be reversed using a combination of burning trees and crops for energy, and capturing and storing carbon dioxide underground (CCS), according to an analysis by scientists. But experts cautioned that trying such an approach after temperatures had passed dangerous levels could be problematic, as climate change reduced the number of trees available for "bioenergy."

The bioenergy and CCS method was the most cost-effective way of tackling carbon emissions, said the team Chalmers University of Technology in Sweden, publishing their research in the journal Environmental Research Letters on July 11, 2013. Such an approach could offset and even reverse other emissions from fossil fuels, they claimed.

The lead author of the study, Prof. Christian Azar, said it could help bring temperatures down even if they rose above the 2C level that world leaders have agreed to avoid: "Even if current political gridlock causes global warming in excess of 2C, we can reverse the temperature trend and reach targets later. This means that 2C targets, or even more ambitious targets, can remain on the table in international climate negotiations."

He said that to achieve a reversal of temperatures, the combination of bioenergy and CCS would need to be combined with a huge expansion in renewable energy or nuclear power, in order to reduce emissions almost to zero. He also admitted that there was a political risk that the proposal's ability to reverse rises at a late stage could be used as an excuse for short-term inaction on emissions.

CCS technology has been tested successfully on small-scale trials, but is still unproven at commercial scale anywhere in the world. Environmentalists have also questioned the carbon benefits of burning trees for power, saying that in some cases the "lifecycle" emissions are worse than coal.

Dr. Vivian Scott of Scottish Carbon Capture Storage at the University of Edinburgh, who was not involved with the research, said that the basis for the research's conclusion was sound, but he warned it should not be interpreted "as a 'get out of jail free' card in 50 years' time" and the idea could be hamstrung by climate change itself.

"As shown in this work, Beccs [Bioenergy with Carbon Capture and Storage] could offer a way back from exceeding climate targets. However, there are potentially huge consequences to allowing an overshoot [of those targets]. A warmer climate for even a limited period could profoundly alter meteorological and ecological systems – changes which could perhaps even restrict the ability to produce the biomass on which we might be reliant to reduce the atmospheric carbon dioxide content," he said.

He also said that reducing carbon emissions to zero could be a major challenge, given the track record of previous efforts to cut carbon: "Progress in addressing emissions has been woefully slow - the International Energy Agency recently announced that the average amount of carbon dioxide produced for each unit of energy generated has barely changed in the period 1990 - 2010 … in essence all the emissions mitigation efforts to date have achieved almost nothing." ■

Bringing clean efficient heat to homes in China

A central heating project in nine cities in the northeastern province of Heilongjiang, People's Republic of China (PRC), will use private sector efficiency to warm homes and improve public health.

Residents of Heilongjiang province, an underdeveloped northeastern border in the PRC, will soon be getting respite from the hazardous coal-fired smoke and other air pollutants. ADB is providing US$150 million assistance under the Heilongjiang Energy Efficient District Heating Project to expand and upgrade district-heating systems to make them more energy efficient.

A central heating project in nine cities in the northeastern province of Heilongjiang, China has improved the living conditions of the people through adequate and reliable heating services.

"Heating service is one of the basic needs of the province, where the winter temperatures fall down to -40 degrees celsius, and lasts for six months," said ADB Senior Energy Specialist Teruhisa Oi.

Traditionally, poor households use coal stove for heating and cooking in Heilongjiang province. Some well-off people receive heat from a district heating system but this is a small-scale district heating system located in the neighborhood and equipped with heat boilers that burn coal.

"Most of these lack emission control equipment," said Teru. "The burning of coal indoors and outdoors worsen air quality and is a major cause of air pollution and respiratory diseases."

The project is introducing centralized heating system networks that will supply heat from large boilers and energy-efficient combined heat and power plants located away from the neighborhoods. "The project will also remove the small, inefficient and polluting coal-fired boilers and stoves from the neighborhood and homes, which will bring tremendous health benefits," he said.

The Project is targeting poor cities with low district heating coverage. "We will cover an additional 270,000 households without increasing net emission," explained Teru. "This will improve living conditions of the people through adequate and reliable heating services."

Learning from the private sector

Heating service in Heilongjiang province is primarily provided by the state. The project is bringing in two private companies to provide the heating service in two cities to encourage private sector participation in the area and to enhance the viability of the heating business.

"Private enterprises are strong in financial management, including ensuring profits for the company, and have strong client orientation," Teru said.

"We want the state-owned enterprises to learn and benefit from the good practices of the private sector to increase the viability of the heating business."

The project will organize yearly knowledge-sharing sessions between these private companies and the state-owned enterprises to ensure state-owned companies learn from the private sector expertise and experience.

A woman's touch

The project will promote women in employing bill collectors, targeting at least 50% of the heating bill collectors to be women.

"It will also ensure heating assistance to 1,300 poor households headed by women by subsidizing 70% of the heating tariff and waiving off connecting fees," said Teru. "We will also organize energy conservation awareness campaigns targeting women in coordination with women's federations." ■

ADB Media Release

Thirsty Energy: Will water constrain our energy future?

What is the water-energy nexus?

The world's water and energy systems are inextricably linked. Significant amounts of water are needed in almost all energy generation processes, from generating hydropower, to cooling and other purposes in thermal power plants, to extracting and processing fuels. Conversely, the water sector needs energy – mainly in the form of electricity – to extract, treat and transport water. Both energy and water are used in the production of crops including those used to generate energy through biofuels.

With both of these vital resources coming under greater pressures over the next few decades, evaluating the tradeoffs and encouraging cross-sectoral planning is crucial for their sustainable management and development.

Thirsty energy: A World Bank initiative

Focusing on the water needs of the energy sector

Water constraints have already had a negative impact on the energy sector in many parts of the world. In the U.S., several power plants have been affected by low water flows or high water temperatures. In India, a thermal power plant recently had to shut down due to a severe water shortage. France has been forced to reduce or halt energy production in nuclear power plants due to high water temperatures threatening cooling processes during heatwaves. Recurring and prolonged droughts are threatening hydropower capacity in many countries, such as Sri Lanka, China and Brazil.

However, current energy planning and production is often made without taking into account changes in water availability, due to increased use across sectors or the impacts of climate change.

A joint energy - water initiative

In order to support our client countries' efforts to address the challenges in energy and water resources development, the World Bank has embarked on a global initiative, Thirsty Energy, which will help governments break disciplinary silos that prevent cross-sectoral planning to avoid future unsustainable scenarios. The objective of this initiative is to quantify and evaluate the tradeoffs and synergies between water and energy planning and to identify potential constraints resulting from their interdependency.

Building on the UN's Sustainable Energy for All (SE4All), the initiative will offer stakeholders the necessary tools to assess the economic, environmental and social implications of water constraints in energy security and power expansion plans and to improve the sustainability of energy and water investments. The World Bank will work closely with countries to evaluate current energy and water sector trends and foster the incorporation of water constraints into energy planning.

The initiative will facilitate knowledge exchange between the two sectors, advocate globally and regionally for more consideration of energy-water interdependencies and produce a series of technical tools and policy-oriented material and guidance

Thirsty Energy, the first publication of the Energy-Water initiative, introduces the energy-water nexus, examines the water requirements of power generation and outlines some potential technical and institutional solutions for improving the management of the nexus. *World Bank Feature*

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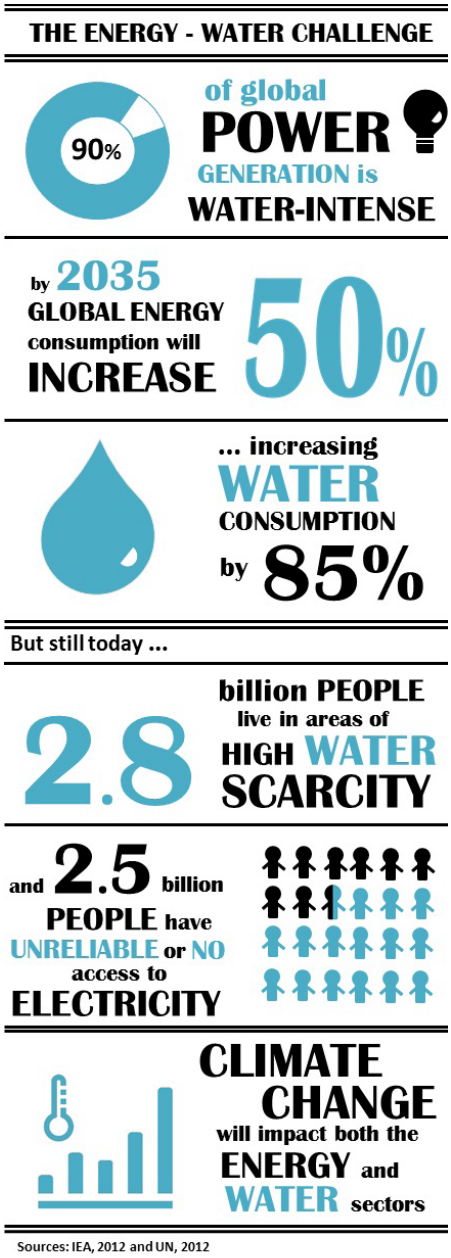


12 things to know on energy investment needs in the Asia Pacific

Large investments are needed to secure cheap, clean and sustainable energy to power the fast-rising economies of developing Asia, and for the region's poor to access safe, clean and affordable modern energy. Here are 12 things to know about energy investments in the Asia-Pacific region.

1. From about a third in 2010, Asia's share of world energy consumption may rise rapidly to as high as 56% by 2035, making it the largest energy consumer in two decades. *ADB Publication Asian Development Outlook 2013*

2. Yet, as of 2010, there are 628 million people living in Asia without access to electricity. *ADB Publication Asian Development Outlook 2013*

3. The 2012 World Energy Outlook estimates that total investment of nearly US$1 trillion (US$979 billion) would be required to achieve universal energy access by 2030, an average of US$49 billion per year from 2011 to 2030. *2012 World Energy Outlook*

4. The same report, the World Energy Outlook states that achieving universal access to electricity by 2030 would require new investment of US$602 billion, with developing Asia needing 36% of that, or over US$200 billion. Additional investment of US$76 billion would ensure universal access to clean cooking facilities by 2030. *2012 World Energy Outlook*

5. ADB founded the Energy for All Initiative to maximize energy access, especially for the region's rural poor. Within the initiative, ADB launched the Energy for All Partnership to provide access to safe, clean, affordable modern energy to an additional 100 million people by 2015. *Energy for All Initiative*

6. Only three countries in developing Asia - Azerbaijan, Brunei Darussalam, and Kazakhstan - are energy self-sufficient, thanks to indigenous oil supplies. *ADB Publication Asian Development Outlook 2013*

7. In comparison, by 2035, the rest of Asia will be even more dependent on energy imports, particularly oil. Most Asian countries will produce less than half the energy they need from indigenous sources, and many will produce only a tiny fraction. Securing an adequate and reliable energy supply will be a persistent challenge across the region. *ADB Publication Asian Development Outlook 2013*

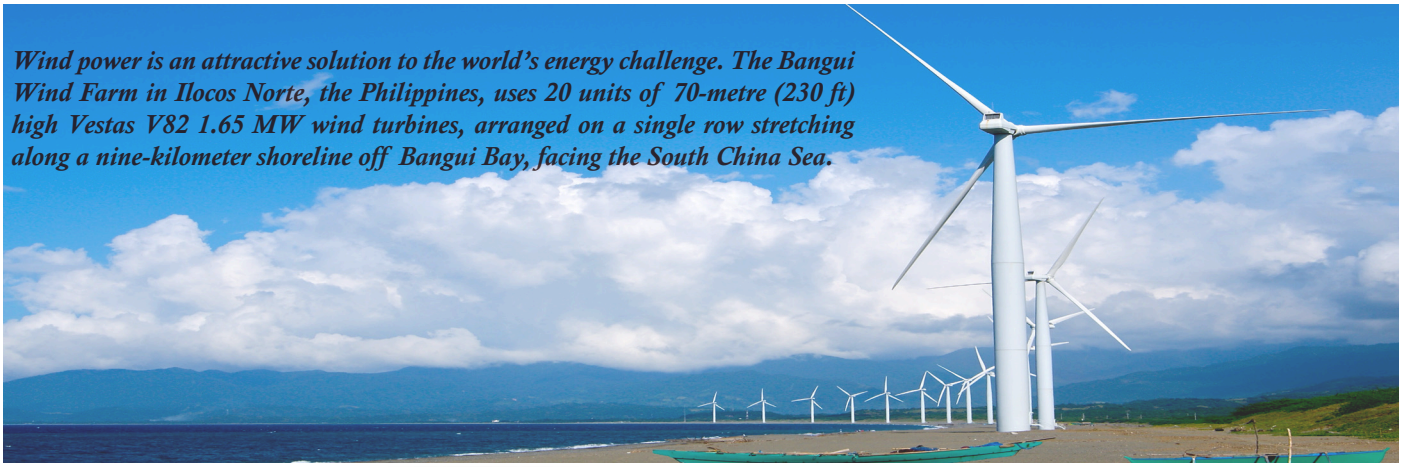
8. Most countries cannot meet all their power requirements on their own, so Asia must accelerate cross-border interconnection of power and gas grids to improve efficiency, cut costs, and take advantage of surplus power. With increased cooperation, a pan-Asia energy market is achievable by 2030. *ADB news Asia's Future Prosperity Requires Major Change in Energy Use*

9. Managing energy demand more efficiently, as in the case of Japan, can make a positive impact on energy security. Promising demand management strategies are eliminating consumer subsidies and taxing greenhouse gas emissions; green innovation, such as smart cities and clean transportation; and changing behavior to curtail wasteful consumption. *ADB Publication Asian Development Outlook 2013*

10. Though the use of renewable energy sources is growing, all renewables together will account for only 13% of the power generation mix in 2035, unless opportunities are found to substantially strengthen their role. *ADB Publication Asian Development Outlook 2013*

11. The massive energy market in Asia provides opportunity and room to introduce and develop new energy technologies. The region is already a world leader in the manufacture of state-of-the-art equipment for renewable technologies, including photovoltaic cells for solar generation. *ADB Publication Asian Development Outlook 2013*

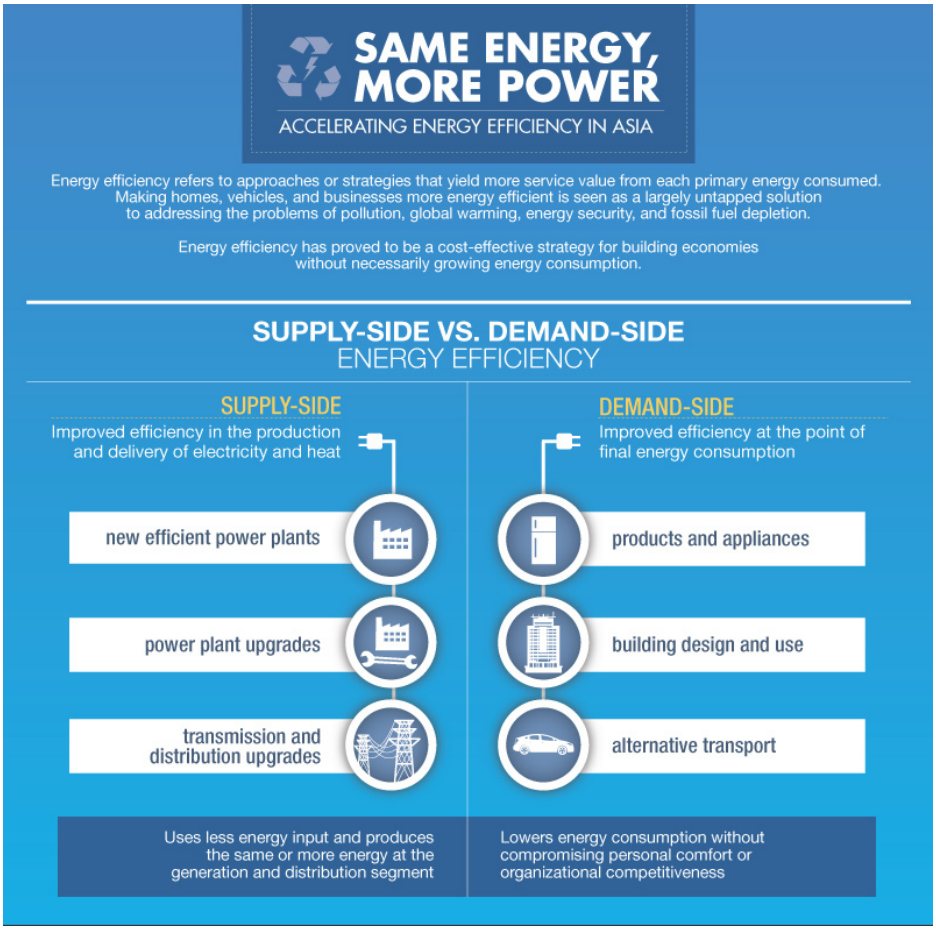
12. In 2012, ADB achieved clean energy investments of US$2.3 billion, with renewable energy investments making up the largest share at US$1.3 billion. *ADB Report 2012 Clean Energy Investments: Project Summaries* ■



Wind power is an attractive solution to the world's energy challenge. The Bangui Wind Farm in Ilocos Norte, the Philippines, uses 20 units of 70-metre (230 ft) high Vestas V82 1.65 MW wind turbines, arranged on a single row stretching along a nine-kilometer shoreline off Bangui Bay, facing the South China Sea.

Accelerating energy efficiency in Asia

The following is the foreword by Mr. Bindu Lohani, Vice President, Knowledge Management and Sustainable Development, Asian Development Bank, for the ADB publication entitled "Same Energy, More Power: Accelerating Energy Efficiency in Asia."



Asia's remarkable economic expansion over the last 2 decades has lifted millions out of poverty. With continued growth, by the middle of this century, an additional 3 billion Asians could enjoy living standards similar to those in Europe today. This future, however, is not preordained, and must be strategically supported by an energy system that is sustainable, affordable, and accessible for all Asians. New energy resources must be developed to include low-carbon renewable options, and greater emphasis must be given to energy efficiency, the lowest-cost energy resource of all.

Energy efficiency is a key solution to meeting energy and economic challenges in developing Asia. Unlike approaches that simply expand energy supply, such as building new power plants, energy efficiency prioritizes actions that first reduce the need for energy.

Such reductions may occur by decreasing energy losses in the supply chain, an approach known as supply-side energy efficiency (SSEE). Another approach is to consume less energy for the same level of service, for example, when operating buildings, tools, products, and machinery. This strategy is known as demand-side energy efficiency (DSEE).

SSEE imperatives often take precedence in resource planning and related investment decisions. DSEE, by contrast, which may require interventions at hundreds or thousands of homes, businesses, industrial sites, and government facilities, can appear daunting.

As a result, inertia often limits efforts to act on energy's potential, in both developed and developing countries. Yet its value cannot be ignored in a finance- and resource-constrained world. The continued rise in global carbon dioxide (CO_2) levels and the implied threat of climate change, as linked to reliance on fossil fuels, add still greater urgency to calls for a new emphasis on energy efficiency, as a key strategy by which to curb burgeoning energy demand.

A 1%-4% investment in energy efficiency, as a share of overall energy sector investment, can meet as much as 25% of the projected increase in primary energy consumption in developing Asian countries by 2030. This cost-effective investment, in turn, can boost regional energy security by tempering the need for imported energy, as most countries in the region, 2 decades from now, will produce 50% or less of the energy they require.

More generally, robust deployment of energy efficiency can relieve pressure on existing energy infrastructure while reducing emissions and other pollutants that harm air quality and contribute to climate change.

Over the past decade, the Asian Development Bank (ADB) has succeeded in quickly scaling up its investment in energy efficiency and the development of renewable resources within its developing member countries (DMCs), through its Clean Energy Program.

In recent years, ADB has been channeling approximately 50% of its energy sector investments into clean energy.

ADB achieved an initial target of US$1 billion in clean energy investment per year by 2008, then reached US$2.1 billion in 2011-realizing its 2013 target 2 years ahead of time. In 2012, ADB achieved clean energy projects, while SSEE investments (US$252.4 million) accounted for 11%. These results for 2012 show a significant role for DSEE, overall, in ADB's clean energy investments.

A more in-depth analysis of ADB's investments in energy efficiency, based on comprehensive data available on projects through 2011,

Continued on page 9

Mine-dependent Mongolia to push renewables

Mongolia, which is banking on a mining-led investment boom to develop its economy, is aiming to turn itself into a regional renewable energy hub as it tries to fight off the pressures of global warming, the country's president said.

"Mongolia is regarded as one of the centres of this region for wind power. We have high mountains and the Gobi. We have great potential to generate power," president Tsakhia Elbegdorj told reporters.

"We have some ideas of how Mongolia can be Asia's super grid for wind power and solar power, and other renewable energies. If we use all the wind power (potential) in the country, we can enhance the energy supply of China and all over Asia."

Mongolia was chosen to host the U.N.'s World Environment Day on June 5, and at a news conference to mark the occasion, officials said the country also planned to better regulate a mining sector that is polluting an already fragile environment.

The mining sector, with dozens of projects in coal, gold, copper and iron ore, has helped the country to record one of the highest rates of economic growth, at 12.3 percent last year and 17.5 percent in 2011.

But land around the country is being dug up by both licensed and unlicensed miners, causing pollution and poisoning some lakes and rivers.

"There are some countries that developed their resources in good ways, and Mongolia wants to be one of those countries by learning from others, building relations and introducing new policies," Elbegdorj said.

The World Bank ranked the capital, Ulan Bator, among the world's most polluted cities during winter, a consequence mostly of coal burned by residents to stave off temperatures often reaching -30 degrees Celsius (-22 Fahrenheit).

Mongolia is suffering "more pasture degradation, permafrost thawing, and glacial melt", Sanjaasuren Oyunm, minister of environment and green development, told Reuters.

Achim Steiner, head of the U.N. Environment Programme told Reuters during a visit this week that Mongolia had seen average temperatures rise 2.1 degrees Celsius (3.8 F) in the past 60 to 70 years - about three times faster than the global average.

Its high altitude and sparse vegetation in many regions made the nation vulnerable.

The government hopes to use tax revenue from mining to promote other businesses such as fine cashmere production.

Environment Minister Oyun said she was introducing new environmental regulations, including obliging companies to pay compensation for the use and consumption of non-extracted resources such as water and timber.

She said money would go to communities where those resource were consumed, with a portion dedicated to environmental issues such as reforestation or repair of mined lands.

Reuters ■

Accelerating Energy Efficiency
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sheds greater light on the types of initiatives and funding levels supported over the years as part of this investment. While the general trend in ADB's clean energy investments has been positive, investments in energy efficiency have lagged behind, particularly on the demand side. Building sector interventions, in particular, have been underutilized relative to their potential.

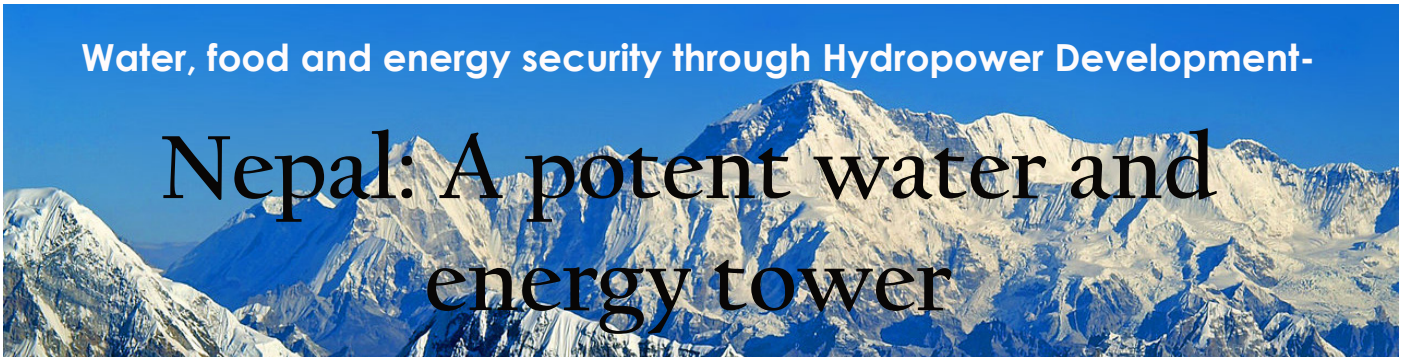
ADB has significant scope to scale up its technical assistance and funding for energy efficiency in Asia toward a more even portfolio of SSEE and DSEE interventions. Energy efficiency improvements at the level of households, commercial businesses, and industrial facilities may in turn be complemented by a focus on "green city" design.

As Asia continues to urbanize, integrated planning for infrastructure can maximize efficiencies across the built environment, for mixed-use development in combination with renewable energy, new public transport options, and more efficient vehicles. Together, these changes promise to capture the next level of dramatic energy savings, toward vast economic and environmental gains.

This effort is critical in meeting growing regional energy demand in a sustainable manner, according to ADB's Strategy 2020. Based on recent in-depth analysis, further support for an expansion of ADB's energy efficiency investment and lending in its DMCs will be considered.

Asia's future is one of near limitless possibilities. But cost-effective, low-carbon energy resources must be tapped to end poverty, expand energy access, and improve the quality of life for all. As a growing number of countries in Asia turn to energy efficiency as a least-cost, priority solution to meet energy demand, ADB stands ready to build on- and ramp up- its existing achievements in the sector. The cost of doing otherwise is simply too high. ■

ADB News Release



Water, food and energy security through Hydropower Development-

Nepal: A potent water and energy tower

South Asia, endowed with the world's greatest water towers and with its resplendent biological diversity, has unimaginable potential for Asia's water and food security if it is effectively mobilized and used. Known as the "Water Towers of South Asia", Nepal's water bodies include about 200 lakes, 3,252 glaciers, 2,315 glacial lakes, and over 6000 rivers. In the context of world's population rapidly expanding, economies growing and the competition for limited energy supplies intensifying, Nepal stands rich and tall with an annual 224 billion cubic meter of surface run-off. As per Hydro Solutions' estimate, the total hydropower potential of Nepal stands at around 200,000 MW against the popularly assumed figure of 83,000MW. With more than 6000 rivers and rivulets, around one million GW hour of electricity can be generated. This potential is adequate to meet the total domestic and part of the regional energy demands for many years.

Nepal is the water and energy tower for the world. Glaciers of the Himalaya Mountain Range are an enormous reservoir of fresh water and their melt water is an important resource for much of the region. Due to global warming the storage capacity of clean water needs to be augmented. Let alone the cumulative potential of the SAARC Countries, Nepal alone has a storage capacity of over 140 bil. m3 which is outstanding in the region.

Nepal- the fourth richest hydroelectric rich country in the world and the second in Asia after China is the golden investment gateway to tap the ever-increasing domestic and emerging energy craving market in India and Bangladesh with the highest market price.

If 'health for all' and 'education for all' are valid approaches to striking at the root causes of poverty so also we need, as SAARC, seek 'electricity for all' and 'sanitation and irrigation for all' as well as 'drinking water for all' by 2020. None of this can be imagined without electricity.. Energy is a top priority, and no economy can grow to their full strength due to lack of substantial energy resources. The region is immensely rich with this natural gift, with Nepal's clean water and renewable hydropower energy potential alone being adequate to meet the regional water and energy demand for many years.

Changes in water levels in rivers and lakes, in ice sheets and even under the ground has been one of the key consequences of global warming. It is said that effect of global warming on hydropower is seen in the form of dry month's flow going down and wet months flow increasing. Nepal is lucky on this. Due to its huge storage capacity, dry month production can be significantly augmented if properly regulated. This is also associated with other multiple benefits such as flood control, increased regulated flow facilitating navigation and increased area under irrigation in lean season for regional benefit. Thus in case of Nepal, global warming has minimum impact on hydropower. With giant population neighbors like India with around 1.2 billion population across the Gangetic basin, without sustainable water management and global warming considerations, the situations can be remarkably chaotic for all. Not to forget, the multipurpose, secondary and tertiary benefits of hydropower development is colossal. Hydropower should be rapidly developed so that the ever increasing industrial energy demand and domestic electricity supply of the country and region can be effectively met. It is also important taking into account the ever increasing global warming menace. The potential commercial renewable energy hydropower generation facilities and projects have the potential to create carbon credits thus contributing to renewable energy and greenhouse gas emission reduction markets and effectively combating global warming.

Around 84% of hydro under construction is in Asia (mainly in China, Vietnam) but this does not lend enough reasons for the SAARC countries to be happy about. Energy per capita is low in the countries where energy is surplus. For a two digit growth economies like India, the energy needs are ever increasing and a substantial hefty amount of national resources is used to buy energy and fuels from the Gulf countries making domestic energy very expensive. Presently, energy crisis has been a major problem faced by the SAARC countries. As per a tentative calculation, 10,000MW of electricity generated can stop ~2.5 billion dollar equivalent of oil import in the country. If we analyze the hydro potential of three countries-Nepal, India and Bhutan, 3 lakh MW of commercially viable energy can be generated. With this generation capacity, every year, 100 billion dollar worth of oil import can be restricted, immensely helping the domestic as well as the regional economy to thrive and grow.

Nepal is the best destination for investment in hydropower and offers a lot to the developers. SAARC should dialogue through participation and should work together to enhance, preserve and protect environmental, energy and water security to all through regional cooperation and integration. It should promote and address South Asia's collective water security interests by adopting a common position in promoting the development of hydropower and environment friendly compatible clean sustainable renewable form of energy in view of the ecological unity of South Asia as one region bound by one civilization facing akin problems. ■

Sweden: a leader in fostering green energy

Wind, solar, geothermal and other green power sources have long been championed by people in Northern Europe such as Swedes; but until recently most governments believed such technology was too costly to compete.

Swedish companies such as Volvo, IKEA, Ericson, ABB, Saab, H&M, are at the forefront of this new environmentally friendly business trend, which aims at creating profitable growth in harmony with environmental sustainability.

Tetra Pak, the global leader in liquid food processing and packaging, for instance, has promoted environmental action for decades under four eco-friendly principles: social responsibility, carbon dioxide reduction, recycling and renewability. They allow the company to better evaluate the impact of its industrial activity on the environment, while setting up goals for continuous improvement.

Today, some 70 percent of all paper consumed in Sweden is recycled, placing the nation of 9 million among the world's top five countries.

The official target to end oil dependency by 2020 does not imply that oil must be completely replaced; it demonstrates how Sweden is developing energy alternatives that are technologically and economically viable.

In the electricity field in particular, Sweden has had an innovative system of trading in "green electricity certificates" since 2003, aimed at supporting renewable electricity production, mainly by encouraging companies to utilize biofuels instead of fossil fuel.

The policy includes both a carrot and a stick. The carrot is that producers of renewable electricity receive a certificate entitling them to extra compensation depending on production. The stick is that electricity traders that do not sell enough renewable electricity have to pay fines. The system will further contribute 17 twh of new renewable energy by 2016, based on further research in new technologies.

Thanks to these forward-looking policies, Sweden is well placed to thrive in today's business environment, where success in innovation requires partners to collaborate across multiply knowledge disciplines such as the robotics sector.

At the same time, Sweden is a welfare state, in which the government provides for education and health care as a "safety net" for the sick and unemployed. But Sweden also boasts one of the most deregulated systems in the world, including the country's postal service as well as taxation and education systems.

Sweden is very much a model of deregulation; a unique combination of the welfare system and the free market economy. ■

The China Post

Photo shows the Maevaara wind farm in Northern Sweden. Allianz Capital Partners, the alternative asset investment platform of the Allianz Group, has recently signed agreements to acquire the 72 megawatt (MW) Maevaara wind farm in Northern Sweden from Swedish renewable energy developer O2.

*The **Confederation of Asia-Pacific Chambers of Commerce and Industry (CACCI)** is a regional grouping of apex national chambers of commerce and industry, business associations and business enterprises in Asia and the Western Pacific.*

It is a non-governmental organization (NGO) serving as a forum for promoting the vital role of businessmen in the region, increasing regional business interaction, and enhancing regional economic growth. Since its establishment in 1966, CACCI has grown into a network of national chambers of commerce with a total now of 29 primary members from 27 Asian countries. CACCI is an NGO granted consultative status, Roster category, under the United Nations.