

Asian Council on Water, Energy and Environment



Confederation of Asia-Pacific Chambers of
Commerce and Industry

Message from the Chairman

This is our third edition of the Asian Council on Water, Energy and Environment (ACWEE) newsletter.

To meet the growing aspirations of the people and economies of the Asia Pacific region, each of the countries are under immense social and political pressure to secure reliable, sustainable, and reasonably priced energy supplies to meet the ever-increasing demand for commercial energy. Energy security and water security are thus no longer merely a catchphrase but an indisputable reality for vital economic development throughout Asia Pacific region. Though each of these countries is trying to evolve its own strategy to address the issue, there is a growing realization of the need to address energy and water security from a regional perspective. A regional approach facilitates a more comprehensive, cost-effective, and sustainable set of solutions to the challenges of energy security.

The countries of Asia Pacific and South Asian region have reasonable levels of energy resources, adequate and even surplus high-quality human resources, and fairly well established administrative and governance systems. These advantages could be leveraged to move quickly toward developing an efficiently functioning, regional energy market system. The players in the energy market would ensure that the Energy Security for Asia Pacific energy investments and transactions are commercially and economically optimal for the region.

Parallel to these, environmental issues have come to be focussed on, in particular in these countries as the consequence of real life problems of degradation, urbanization and an associated activism. Asia Pacific is a rich region in natural resources; however, the region's vulnerability to the negative effects of climate change has increased lately. We need to recognize the fact that most of the environmental issues of Asia Pacific region are inextricably linked, and working to ameliorate one will often have added benefits for the others.

This issue presents before you a rich assortment of articles. We believe that you would find them useful and informative. You are invited to contribute articles for the future editions. Please email the CACCI Secretariat at cacci@cacci.org.tw for more information.

Mr. Gyanendra Lal Pradhan

Executive Chairman, Hydro Solutions

Chairman, SAARC CCI Council on Climate Change, Energy and Water Resources
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Cheap oil can benefit Asia: ADB report

The growth outlook for developing Asia remains steady, even though momentum slowed in the second half of 2014, but the declining oil prices represent a golden opportunity for many beneficial reforms, the Asian Development Bank (ADB) says in a new report.

In a supplement to its Asian Development Outlook 2014 Update, ADB forecasts gross domestic product (GDP) growth for the region of 6.1% in 2014, down from 6.2% expected in September, and 6.2% in 2015, down from 6.4%. Developing Asia, comprising the 45 ADB developing member countries, grew 6.1% in 2013. Growth projections for Central Asia, East Asia, and Southeast Asia are revised downward. There is no change for South Asia. The Pacific region's growth outlook is adjusted upward.

"While growth in the first three quarters of this year was somewhat softer than we had expected," says ADB Chief Economist Shang-Jin Wei, "declining oil prices may mean an upside surprise in 2015 as most economies are oil importers."

Recovery in the major industrial economies of the United States (US), euro area, and Japan has been revised down slightly since the Update, as weak third quarter performance in Japan overshadows unexpected strength in the US. GDP growth in the advanced economies is now forecast to average 1.4% in 2014, down from 1.5% forecast in the Update, before picking up to 2.1% in 2015.

The growth moderation in the

People's Republic of China (PRC) is seen extending into the fourth quarter due to a continued real estate market correction and its spillover to the related sectors like construction. The PRC growth forecast is revised downward to 7.4% in 2014 from 7.5% in the Update, and to 7.2% from 7.4% for 2015.

India is on track to reach the Updated growth forecast of 5.5% in FY2014 (ending 31 March 2015) after expanding by 5.7% in the first quarter and 5.3% in the second quarter. By eliminating diesel fuel subsidies, the government has demonstrated its willingness to tackle contentious reforms, but it must extend its efforts to reach the forecast 6.3% growth in FY2015. Somewhat stronger-than-expected performance in Maldives and Sri Lanka in 2014 is balanced by softness in Afghanistan and Bhutan. Strong domestic demand, supported by healthy remittance inflows, may lead to an upside surprise in Bangladesh in fiscal year (FY) 2015 (ending 30 June 2015).

Growth in several large Southeast Asian economies has been softer than anticipated in the first nine months of 2014, with slight reductions to the projections for Indonesia, Philippines, Singapore, and Thailand. GDP in the subregion is expected to expand by 4.4% in 2014, down from 4.6% forecast in the Update, and 5.1% in 2015, down from 5.3%.

The slowdown in the Russian Federation is weighing on growth in Kazakhstan and other Central Asian economies. Reduced remittance flows and muted external demand are undermining

growth in Armenia, the Kyrgyz Republic, and Uzbekistan. The aggregate growth projections for Central Asia are revised down to 5.1% from 5.6% for 2014 and to 5.4% from 5.9% for 2015.

The Pacific economies are expected to accelerate to 13.4% growth in 2015, led by a burst of output in Papua New Guinea as it enters its first full year of liquefied natural gas exports. The subregion is forecast to grow 5.4% in 2014, modestly higher than expected in the Update as prospects have improved in some economies including Fiji, Solomon Islands, and Palau.

With oil and commodity prices falling, most developing Asian economies have revised their inflation forecasts downward. The forecast for the region is lowered to 3.2% in 2014 and 3.5% in 2015, from the Updates 3.4% and 3.7%.

"Falling global oil prices present a golden opportunity for importers like Indonesia and India to reform their costly fuel subsidy programs," Mr. Wei emphasized. "On the other hand, oil exporters can seize the opportunity to develop their manufacturing sectors as low commodity prices tend to make their real exchange rates more competitive."

ADB, based in Manila, is dedicated to reducing poverty in Asia and the Pacific through inclusive economic growth, environmentally sustainable growth, and regional integration. Established in 1966, it is owned by 67 members—48 from the region. In 2013, ADB assistance totaled \$21.0 billion, including cofinancing of \$6.6 billion. ■

Asian Development Bank

Price for LNG in Asia falls to lowest level in nearly four years

The price of liquefied natural gas in Asia has fallen to its lowest level in nearly four years, and the timing is unusual as winter sets in throughout much of the region.

The slump mirrors this year's broad decline in energy markets, but has also been triggered by a number of new producers coming to market, which has pushed prices down.

LNG prices have sunk below \$10 per million British thermal units, down nearly 50% from a year earlier. The region's largest buyers—Japan and South Korea—are already stocked up for winter and supply is pouring in from new gas producers, according to Singapore-based traders. Also, crude oil is down 40% this year.

About 235 million metric tons of LNG are traded globally each year and about 75% of that is bought and consumed in Asia.

LNG is used mostly for power generation and transportation, because it is a cleaner alternative to coal and oil.

Demand from Japan and South Korea has largely stagnated. Two of Japan's nuclear-power reactors are expected to restart next year, further lowering LNG demand. Traders said Japanese and South Korean buyers are so well-stocked that they aren't able to take advantage of the low LNG prices. Other countries including India, China and Thailand have been purchasing LNG, although supply has outstripped demand.

Papua New Guinea was the newest producer to add fresh LNG supply to the market this year. BG Group PLC's Queensland Curtis project in Australia will further increase supply when it exports its first cargo in December.

It has a 20-year supply contract with China National Offshore Oil Corp., or Cnooc.

As winter sets in, LNG prices are expected to rise, but aren't likely to see the surge seen in previous years.



“The first quarter [of 2015] could be the last hurrah for LNG prices for a while, but if winter weather is mild even that could be a pretty tame affair,” analysts at consulting firm Energy Aspects said in a report.

Energy Aspects said a mild winter would also hurt any rebound in LNG prices, adding that it would be the precursor for “a couple of years of oversupply where it is hard to know what might rescue prices.”

The spot market signals the easing of LNG prices in Asia after the price surge that followed the Fukushima nuclear disaster in Japan in March 2011, Singapore-based traders said.

The spot price for Asian LNG is about \$9.60 per million British thermal units for January delivery into North Asia. It had touched a high of about \$20 in February because of winter demand.

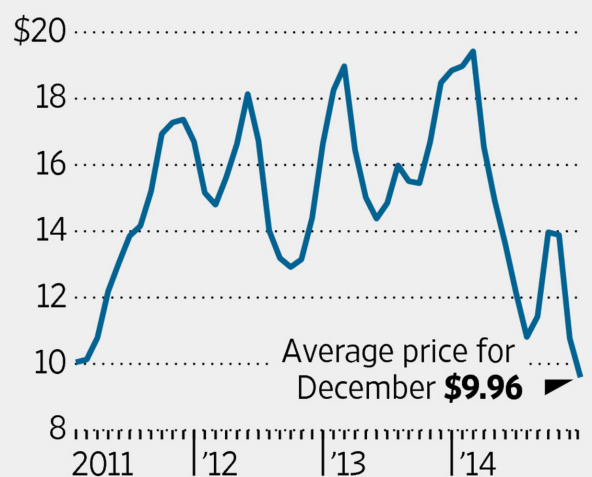
The largest new supplier in 2015 will

be Australia, which is expected to add LNG supplies from at least three new projects—Chevron Corp.'s Gorgon project, Santos Ltd.'s Gladstone project and Origin Energy Ltd.'s Australia Pacific LNG project.

By Eric Yap, *The Wall Street Journal*

Gas Glut

The price of LNG in Asia has slumped to a near four-year low.



Source: Platts Japan Korea Marker
The Wall Street Journal

Transforming the economy to achieve zero net emissions

A year from now, climate negotiators representing countries worldwide will be in Paris finalizing an international agreement to reduce greenhouse gas emissions and begin slowing the impacts of climate change. Their success will depend heavily on how leaders over the next year shape their economic policies to respond to the risks.

To stabilize warming at under 2 degrees Celsius, as the international community agreed in 2009, the world will have to cut greenhouse gas emissions to net zero before 2100. Economic policy will be the key to mobilizing that global response, World Bank President Jim Yong Kim said in a speech today to the Council on Foreign Relations in Washington, D.C., that outlined steps ahead.

“Paris must be where we make the rallying cry for effective management of local, national and global economies,” Kim said. “Unlike treaties of the past, the Paris agreement needs to speak as loudly of economic transformation as it does of carbon emissions targets.”

Transforming the economy

Over the next year, countries will be developing their national commitments and contributions for the Paris agreement for lowering emissions and building resilience to climate change. To decarbonize economies on a trajectory necessary to reach net zero emissions before 2100, their commitments for mitigation and adaptation efforts will have to be ambitious.

“We understand that many of our clients still face huge development challenges and many countries will reach their own peak emissions at different moments,” Kim said.

“Managing their economies to ensure that they can, for example, decarbonize their energy sectors over time, while having the energy they need for development constitutes a challenge no developed country had to face in its history. Nevertheless, every country no matter its stage of development can strive to effectively manage their economies, to decarbonize while ending poverty and boosting shared prosperity.”

Policies

All countries should commit to put a price on carbon, the president said. Carbon pricing, whether through emissions caps and market trading mechanisms like those being developed in China, carbon taxes like British Columbia uses, or through regulations, provides the economic signal to businesses to help drive innovation and investments in clean energy technology.

Other instruments are also needed to redirect investments toward clean technology: energy efficiency and renewable energy targets; performance standards for buildings, vehicles and appliances; and a price on carbon can all provide investors and businesses with the policy certainty to invest in clean development.

Phasing out harmful fossil fuel subsidies, which are typically captured far more by the wealthy than the poor, is also overdue, the president said. That spending can be redirected to provide targeted support for the poor.

Effective management of the economy also means finding ways to invest in resilience. With science showing that about 1.5 degrees Celsius of warming is already locked, adaptation and mainstreaming disaster risk management become essential. The World Bank Group will use its track record for financial innovation to raise a one-time injection of funds, strengthen insurance coverage for those most at risk and build resilience immediately, Kim said.

Agreement

Several components are essential for a successful Paris agreement, each requiring ambitious commitment to building cleaner economies for the future. Kim highlighted four in his address:

Binding language that should reinforce our collective ambition and provide a clear pathway to zero net emissions before 2100.

Individual country contributions and policy packages that should comprehensively address how to use all available fiscal and macroeconomic policy levers to



form of networked carbon market based on the market mechanisms, taxes and enabling environments.

Working coalitions, not just of governments working with governments, but of private enterprises and countries and cities and CSOs moving forward together where their interests are aligned. Coalitions have been forming in support of carbon pricing and around reducing deforestation, building low-carbon cities, and establishing climate-smart agriculture practices and will be critical to reaching net zero emissions.

“If each of these components reflects an ambition equal to the challenge before us, Paris could send a powerful signal to economic actors around the globe,” Kim said.

Finance

The binding part of a Paris agreement would not come into force until 2020, however, and action is necessary now, both on building resilience and the mitigation efforts and economic policy changes that can sustainably reduce emissions.

“For these efforts to coalesce and bring us to zero net emissions, we will have to find sufficient financing. It is the critical component of a Paris agreement,” Kim said.

Right now, climate finance flows into clean energy, other mitigation efforts and adaptation are far short of the \$700 billion to over \$1 trillion a year estimated to be needed. It is clear that public finance alone will never be enough. Public finance is helping catalyze private funding and can do more.

The Climate Investment Funds, for example, are leveraging about \$7 for every \$1 of their \$8.3 billion in pledges,

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Running the engine of growth with water

Cross-border collaboration and cooperation on water can reduce water-war rhetoric, writes Cecilia Tortajada.

In March 2012, the Office of the Director of the National Intelligence in the United States published a report on global water security. The report noted that during the next 10 years, “many countries important to the United States will experience water problems that will risk instability, state failure and increase regional tensions”.

The report considered that, “while a water-related states conflict is unlikely during this time, water shortages, poor water quality and floods combined with poverty, social tensions, environmental degradation, ineffectual leadership and weak political institutions contribute to social disruptions that can result in state failure”.

Water wars have been the “flavour” of the month for years. However, so far there has not been one water war between two countries in the entire history of humankind. An objective and comprehensive assessment will indicate that the world not only has enough water now, but could also have enough water to meet all the human needs by 2050, when the global population is estimated to be around 9.3 billion people.

The real problem in the world is not physical scarcity of water but that management of the resource in all countries is dismal at present and has been for decades, in both developing and most developed countries. The fact is that the world’s water problems can be resolved with existing knowledge, technology and available investment funds. It has been the “human” factor that has failed for decades and unfortunately may continue to do so for years to come.

Per capita consumption

For example, it is commonly believed that there is likely to be water wars in the Middle East because the countries are some of the driest in the world. Let us consider some facts. If one considers per capita water consumption in the world, the highest

can be found in cities of the Gulf Cooperation Council, some of the driest in the world. One of the highest per capita water consumption globally is in Doha, Qatar, at 430 litres per day. Since the city loses at least 35 per cent of water from the systems due to leakages (contrary to Singapore which loses less than 5 per cent, one of the lowest in the world) and poor management policies and practices, this means that Kahramaa, the water utility of the city, must produce over 580 litres of water per person per day.

In other words, for an average person of Doha, one of the world’s driest cities, it is necessary to produce more than five times more water than in cities with significantly more rainfall and better management practices. These include Hamburg or Barcelona, where consumption per person is 105 litres.

A comprehensive assessment of the global water situation will indicate that, in the future, there is likely to be increasing cooperation on water and other related natural resources between countries because this will result in very significant win-win situations for the countries concerned.

An excellent but little-known example of cooperation at present is that between Bhutan and India. This cooperation has lasted more than three decades and significantly benefited both the countries.

Bhutan has very limited agricultural potential but has enormous hydropower potential. Since nearly all of its water is transboundary in nature, it has wisely developed its water resources in close collaboration with and support of its southern neighbour, India, with whom it shares its transboundary waters.

Around 1980, Bhutan started a plan to develop its hydropower potential jointly with India under a bilateral agreement. Several hydropower projects have now been constructed with overwhelming positive results. The agreement between these two countries



The real problem is not scarcity of water but its dismal management globally. The world’s water problems can be resolved with existing knowledge, technology and available investment funds.

is that the electricity generated is used by Bhutan to cover its internal uses and the excess is sold to India as peak power through the eastern electricity grid at an agreed price that is revised from time to time.

As a result of this cooperation, Bhutan has become a net exporter of electricity to India and, in exchange, most of the funds and expertise for hydropower development in Bhutan have been provided by the Indian government.

Hydropower in Bhutan has thus become the primary source of energy for domestic use and local industrial consumption, and is also by far the major export and revenue earner for the country. The revenue Bhutan has received from India has along the years accelerated the economic and social development processes of the country. At present, the hydropower sector drives the economy in Bhutan and contributes to almost 25 per cent of its gross domestic product (GDP) and around 40 per cent of total national revenue. The country has also the highest per capita consumption of electricity in South Asia.

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Earning a living by preserving the environment in Vietnam



Protecting forest land is a source of livelihood for farming communities that were displaced to make way for hydropower projects. In Vietnam and other countries in the Greater Mekong Subregion, hydropower is promoted as an alternative to fossil fuel-based power, central to solving the subregion's energy supply challenges. Hundreds of dams have been constructed across Vietnam, as it races to keep pace with galloping demand for electricity, which is growing annually by 14%.

However, the surge in hydropower plants over the past 10 years is not without controversy. The dams have resulted in a wide range of problems, including flooding, forest loss, and environmental destruction. The impact on displaced people is another concern, with conditions in resettlement areas often worse than their original lands.

A Ral Son and A Lang T'koot, middle-aged farmers and ethnic Co Tu minority, were among the 1,100 people resettled in 2006 to make way for the 210-megawatt (MW) A Vuong hydropower project in Quang Nam province. In their new village of Thou Ta Reng, most resettled households were allocated 1.2 hectares of land, part of which they use to rotate one season of upland rice with two seasons of fallow. Most resettled families appreciated the modern amenities of their new home but have struggled with the lack of livelihood opportunities.

Increased support for affected households

For many years, the ADB has been working with the Electricity and

Regulatory Authority of Vietnam to design benefit-sharing mechanisms as part of continuing efforts to improve social safeguards in the Asia and Pacific region. Payments are made to compensate households that have been physically displaced or whose economic activities have been disrupted by a hydropower investment.

The A Vuong project provided ADB with an opportunity to help resettled people improve their living conditions even further. Through a pilot project supported by the Poverty and Environment Fund, ADB did so by combining a benefit-sharing approach with another method - payments for forest environmental services (PFES) - a market-based mechanism.

Under this PFES, resettled villagers are entitled to receive payments for patrolling assigned forest areas to prevent logging and other illegal activities, thus providing a reliable source of additional income to improve their livelihoods. The funds for these payments are provided by hydropower companies, which benefit from the improved forest cover through reduced erosion and silt build-up in the reservoirs, which in turn reduces operating costs.

Pilot project on ecosystem services

Through the project from 2011 to 2013, ADB piloted a PFES approach in Quang Nam that could be scaled up at a provincial level. The project set out to tackle key challenges in implementing the project, particularly a lack of reliable forest information, and a shortage of financial resources and manpower.

It did so by piloting two innovations. First, the project promoted

a group approach, whereby 10 or more households from the same village team up to take responsibility for forest protection and maintenance services. Second, it utilized satellite imagery and geographic information systems to provide a quicker and more accurate method of calculating forest quality than detailed ground surveys. In addition to saving costs and time, these approaches helped build better social cohesion and opened the way for communal livelihood activities.

Positive impact on the community

Due in part to the new PFES scheme, A Ral Son and A Lang T'koot have fashioned a diverse livelihood since they have moved to Thou Ta Reng. Aside from their livestock, which they expanded with the help of the start-up funds from the project, they grow bananas and bamboo shoots for day-to-day income and acacia trees as a longer-term investment.

A Ral Son already notices an attitude change in the new village. The forests they once exploited with little regard for formal ownership or environmental sustainability are now viewed as the moral property of their community.

"When we moved here, everyone tried to acquire more land in addition to the land allocated by the government," A Ral Son recalls. "The quicker you were, the more land you acquired. Such practices have been dramatically reduced since the new policy of forest management and protection. We are now responsible for forest protection." ■

ADB Feature Story



New service aims to speed flow of low-carbon technologies to Asia

A new service set up by the Asian Development Bank (ADB) aims to match buyers and sellers of low-carbon technologies to speed technology transfer to developing Asia.

“Asia is the tip of the spear as far as climate change impacts are concerned. We need to ensure a swifter flow of tested and up-and-coming low-carbon technologies to the region so that it can mitigate and adapt to the changing climate,” said Bindu N. Lohani, ADB Vice-President for Knowledge Management and Sustainable Development.

The first-of-its-kind technology exchange was launched on the sidelines of the United Nations Framework Convention on Climate Change (COP20) meeting here.

The pilot service will initially focus on clean energy and energy efficiency technologies with the average transaction size expected to be \$2 million-\$5 million. Called

IPEX Cleantech Asia, the exchange will broker technology transfers from developed countries to developing Asia and between developing Asian nations, as well as provide a platform for knowledge sharing.

The service will be run by a Singapore-based joint venture comprising DNVGL’s Clean Technology Center in Singapore, part of Norway-headquartered, global advisory firm DNVGL AS, and ReEx Capital Asia, a Singapore clean energy investment banking and consulting firm.

“We have already pulled together a consortium of partners to join our intellectual property technology transfer marketplace. We are committed to making a positive impact in developing Asia in line with the objectives of ADB through this pilot and beyond,” the two private sector firms said in a joint statement.

Developing Asia has an urgent need for country-specific technologies to

help it to reduce carbon emissions from energy, industry, and agriculture, and to adapt to climate change impacts such as rising sea levels, more water salinity, and uncertain weather conditions. Many technologies, whether nascent or mature, are available in developed countries but developers struggle to connect with those who could best use them in developing countries.

ADB expects buyers of the technologies to include manufacturers, project developers and governments while sellers would likely be innovation design companies, university laboratories, and multinational firms selling intellectual property rights.

The new mechanism is co-funded by ADB, the Government of Japan, the Global Environment Facility, and Belgium-based VITO-Flemish Institute of Technological Research. Over time, the venture is expected to evolve into a full-fledged independent business. ■

ADB News Release

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and they will continue supporting projects as the Green Climate Fund is scaled up and put into operation. Other innovative finance is growing, such as green bonds, which went from \$11 billion in issuances last year to about \$35 billion so far this year and broadened the investor base for clean development.

World Bank Group

For the World Bank Group, getting to net zero emissions before 2100 will require a continuing shift in the direction

of our energy portfolio to support energy access for all and increase investment in renewable energy and energy efficiency, Kim said.

It will require continued support for clean transportation and building low-carbon, livable cities, particularly in the fast-growing cities of the developing world where development today will lock in growth patterns for decades to come, Kim said. It will also require shifting toward climate-smart agriculture and increasing the World Bank Group’s financial innovation.

“We know that if we don’t confront climate change, there will be no hope of ending poverty or boosting shared prosperity,” Kim said. “Furthermore, the longer we delay in tackling climate change, the higher the cost will be to do the right thing for our planet and our children.”

“I will drive our institution and all its capabilities – financial, technical and human – to support this development transition that we must support together, toward the goal of preserving our planet for all future generations,” the president said. ■

The World Bank

Building energy efficient cities: new guidance notes for mayors

Story Highlights:

- Improving the energy efficiency of cities not only helps to save energy and reduce emissions, but also can help budget-constrained cities expand and improve services and increase competitiveness.
- A new series of World Bank guidance notes for mayors offers practical advice and examples on how to integrate energy efficiency into procurement, financing, buildings, transport, energy assessments, and urban planning.

Harnessing the “hidden fuel” of energy efficiency offers many opportunities to help rapidly growing cities achieve energy security, energy savings, and reduce costs and emissions. To tap this potential, the World Bank is releasing a new series of guidance notes to help city leaders integrate energy efficiency options into their planning, as well as design and implement successful programs.

“Because of the critical role cities play in economic growth, urban energy efficiency measures and planning can help put national economies on a path toward green growth, with many subsequent economic, health, and environmental benefits,” said Anita Marangoly George, Senior Director of the World Bank’s Energy and Extractives Global Practice.

The notes, developed by the World Bank’s Energy Sector Management Assistance Program (ESMAP), focus on six key topics: procurement, financing, buildings, transport, assessments, and urban planning.

Integrating energy efficiency can also contribute to improving municipal services and increasing competitiveness, making cities more inclusive and sustainable. For example, improving public transport not only lowers energy consumption, but also reduces congestion and pollution, and increases people’s mobility – which is especially critical for people in the bottom 40 percent of income levels who need access to jobs, schools and public services.



The guidance notes give mayors and urban policymakers a range of practical options and strategies to make municipal services and city administrations much more efficient. For example, the note on procurement encourages municipalities to prioritize purchasing of energy efficiency products such as lighting and office equipment, and to explore energy savings performance contracts for renovations of energy-intensive public facilities.

Buildings are the world’s largest consumers of electricity, but it is estimated that 80 percent of the energy efficiency potential of buildings is untapped. The guidance note on buildings offers approaches to capture this potential, such as through improved design and construction techniques, efficiency upgrades, replacing energy-intensive equipment, and active management of energy use.

A number of cities that have embraced such approaches have seen measurable improvements in energy use and quality of life. In Kiev, Ukraine, retrofits to public buildings in the mid-2000s resulted in a 26 percent reduction in heat consumption, as well as more comfortable buildings. A long-term transport-oriented development program in Curitiba, Brazil, has saved an estimated 27 million car trips a year. As a result, Curitiba has lower greenhouse gas emission levels, less traffic congestion, and more livable urban spaces when compared with similar Brazilian cities.

Another note takes a close look at city-wide energy assessments, which allow decision-makers to identify energy efficiency gaps and potential solutions, and evaluate the costs and benefits of

various interventions.

“Cities have to make hard decisions on investments, so it is important to go back to the basics and understand where the opportunities are, what measures offer the greatest potential for energy efficiency improvements, which sectors to prioritize, and what the implementation constraints are,” said Anita Marangoly George.

The guidance notes build upon ESMAP’s Tool for Rapid Assessment of City Energy (TRACE), which has been deployed in 30 cities around the world to identify potential savings through improvements in energy efficiency. In Belo Horizonte, Brazil, TRACE assessments helped the city identify close to \$20 million in annual energy savings through LED improvements in street lighting.

With special emphasis on urban planning, the sixth guidance note advises municipalities in urbanizing developing countries on how to shape the spatial distribution of cities, as well as the dimensions of streets, buildings and parks of cities to make them more livable and energy efficient. It recommends strategies in design standards and regulations that promote compact and mixed-use neighborhoods, optimized distribution of space, and prioritization of walking, cycling, and public transportation.

The notes are designed to complement and support the World Bank Group’s cross-cutting initiatives on energy efficient cities. These include the IFC EDGE program, Low Carbon Livable Cities, and ESMAP’s City Energy Efficiency Transformation Initiative. ■

World Bank

ASEAN chief justices take action on environmental law and enforcement

Justices from the Association of Southeast Asian Nations (ASEAN) have agreed to measures to strengthen environmental law adjudication and enforcement in the region.

During the Fourth ASEAN Chief Justices' Roundtable on Environment, held in Hanoi, Vietnam from December 12-14, 2014, justices from Indonesia, Myanmar, Thailand, and Vietnam indicated they had established national judicial working groups on environmental law, while most agreed to develop national environmental law bench books for use in courts and tribunals.

"As champions of the rule of law, ASEAN judiciaries' have a unique and critical role in tackling the region's key environmental challenges such as the illegal forestry and illegal wildlife trades," said Kala Mulqueeny, Principal Counsel, in ADB's Office of General Counsel. "What is exciting is how seriously these judiciaries are taking this role, while also calling for improvements at the police and prosecution levels."

The roundtable meeting was hosted by ADB and the Supreme People's Court of Vietnam. It was attended by chief justices from Indonesia, Lao People's Democratic Republic and Vietnam; senior judges; senior members of national judiciaries; and ADB's General Counsel, Christopher L. Stephens.

Among the key issues discussed at the event were balancing the rights of indigenous peoples and environmental protection, wildlife trafficking, deforestation, and the role of the judiciary as a champion of the environmental protection mandate. The roundtable also highlighted the significant progress made in greening benches and building capacity for environmental adjudication.

The meeting closed with strong support from the Supreme Court of Indonesia and the Supreme People's Court of Vietnam for the proposed Hanoi Action Plan, which enumerates concrete steps on how judges can take a more proactive role in environmental law enforcement. The plan, which provides a guiding



document for ASEAN judiciaries for environmental dispute resolution, is to be formally adopted by January 2015.

ASEAN member countries include Brunei Darussalam, Cambodia, Lao PDR, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

ADB is dedicated to reducing poverty in Asia and the Pacific through inclusive economic growth, environmentally sustainable growth and regional integration. Established in 1966, it is owned by 67 members—48 from the region. In 2013, ADB assistance totaled \$21.02 billion, including cofinancing of \$6.65 billion. ■

Asian Development Bank

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Additionally, the unit cost of energy has declined because of economies of scale in production. Gradual expansion of the electric network to different parts of Bhutan has meant reduced use of fuelwood than would otherwise have been the case, as well as of diesel which had to be imported at a very high cost. Reduced fuelwood has also brought positive environmental impact.

The sustained growth of the hydropower sector in Bhutan has been possible because of good water and environment management practices at the river basin level. In addition, hydropower projects in the country have not resulted in any major displacement of communities or significant inundation.

Intuitively, one would expect environmental protection to be a challenge for a country with such a large hydropower development. But Bhutan has succeeded in promoting

socio-economic development consistent with good environmental management. These benefits are in themselves an economic rationale for the long-term use of hydropower resources.

While hydropower has radically changed Bhutan's social and economic profile, the development has also been of immense benefit to India. The country is assured of steady electricity supply from a reliable source. India now imports nearly 90 per cent of hydropower generated in Bhutan. Bhutan is now considering developing some 10,000MW of hydropower, which will add significantly to its GDP and also vastly increase India's power import.

The Bhutanese development policy in recent decades has been to ensure that national economic development proceeds parallel to the country's social, economic and institutional capacities. Water

projects, when properly planned and implemented, can become engines for regional development and this has been the case in Bhutan.

The collaboration between the two countries provides an excellent example of how transboundary waters can be used as an engine for economic growth or development of an impoverished region with concomitant benefits to both countries.

The successful collaboration and cooperation between countries such as Bhutan and India will gradually contribute to the decline of the rhetoric of water wars.

Acknowledgements

Cecilia Tortajada is president of the Third World Centre for Water Management in Mexico. Previously a visiting professor at the Lee Kuan Yew School of Public Policy, she has worked extensively on transboundary resource issues. This article was originally published in the Business Times on May 28, 2014.

Biogas: China's solution for energy, health and environment

Farmer Ou Yuqun, 57, is a member of the Yao ethnic group in Gongcheng, located in the Guangxi Autonomous Region in southwest China. All her three children are grown up. Last year she moved to a new house where she feels relaxed and happy.

There is something else that makes her even happier—the new biogas system installed in her house.

She cooks with biogas; some of the lights in her house are powered by biogas; the house's toilet waste goes to a digester; and the slurry from the digester fertilizes the vegetables she plants in the backyard.

"This biogas system is great!" she says.

Bringing Sufficient Energy and Better Health

The "great" system Ou talks about is part of the World Bank-supported Eco-farming Project. Since 2008, the project has benefited around 500,000 rural households in 64 counties in five provinces—Anhui, Chongqing, Guangxi, Hubei, and Hunan. Through the project, biogas digesters and stoves were installed in homes, animal sheds, toilets and kitchens built or rehabilitated to accommodate the system.

Tang Fuluan, director of Gongcheng's Bureau of Agriculture, said the biogas project is very much suited to local conditions. Ou's and neighboring villages plant persimmon trees which produce high-value specialty fruit. Households also raise poultry and pigs and the year-round warm and humid weather is conducive for growing many plants.

Residue from processing persimmons, weeds pulled from the groves, animal manure, and human waste are all thrown into biogas digesters, delivering vital energy to rural communities, said Tang.

"I use biogas to cook all the three meals of the day," Ou said.

Jiang Liangde, also a villager of Gongcheng, shares the sentiment.

Jiang, 60, lives by himself. His three sons have all moved to cities and his wife recently went to stay with one

of them to help take care of a newborn grandchild.

He grows rice, tangerines, peanuts, and watermelon and uses slurry from the biogas system as fertilizer.

After work, he makes "oil tea" (a local drink similar to broth) for himself using biogas.

"It is very efficient," he said. "In just a few minutes, I can enjoy the tea. And what I get every day is more than I can use."

Thanks to the project, Jiang also got a new toilet. "The toilet used to be a small shed. Lots of flies flew around. Now it is modern and clean. The flies are gone," he said.

Before switching to biogas, local farmers used firewood they collected from the persimmon groves as fuel for cooking.

"I still remember the days when I picked up firewood while my bulls grazed. Very tough work! It took me 2-3 hours a day," Ou said. "There was lot of smoke when we burned firewood. The smoke made my grandchildren cry. Now my kitchen is clean and smoke-free, which is also good for our health."

Environmental benefits

For Ou and her fellow villagers, biogas means convenience, less work and less smoke. But the project has even more benefits.

"In the bigger picture, it means using less fossil fuel and reducing the emission of greenhouse gases," said Cao Wendao, a senior agricultural specialist with the World Bank.

On average, a biogas digester would annually reduce 2.83 tons of CO₂ emission. Assuming that in carbon trade, per ton of CO₂ emission is priced at RMB79 (\$12), biogas unites at the mature stage of the project would displace about 1.55 million tons of greenhouse gases, generating a value of RMB 122.7 million (US\$ 20 million) per year, Cao said.

Biogas replacing firewood also helps prevent deforestation. And using slurry from the digesters as fertilizer reduces farmers' use



of chemical fertilizers and helps maintain soil quality, according to Tang, the Gongcheng agricultural official.

The environmental benefits do not stop there.

In Gongcheng, like many rural areas in China, animal farms are a growing industry. But the improper disposal of animal waste poses a big problem: it pollutes waterways and the waste naturally emits methane, a greenhouse gas 23 times more potent than carbon dioxide.

So "biogas management companies" were established to solve this problem.

"For example, just in our township alone, there are about 50 pig farms. Without treatment, pig waste causes pollution," said Fan Jiaqiang, who works with a biogas management company. ■

World Bank

About CACCI

Established in 1966, the Confederation of Asia-Pacific Chambers of Commerce and Industry (CACCI) (www.cacci.org.tw) is a regional grouping of apex national chambers of commerce and industry, business associations and business enterprises from 26 Asian countries.

About ACWEE

Organized under the CACCI umbrella, the Asian Council on Water, Energy and Environment (ACWEE) aims to serve as a grassroots vehicle for encouraging a regular exchange of information and promoting regional cooperation among businessmen in the water, energy and environment sector and help contribute to the economic development of the region as a whole.

Regional approach to energy security:

SAARC perspective

By Engr. Gyanendra Lal Pradhan

Chairman

SAARC CCI Council on Climate Change, Energy and Water Resources

CACCI Asian Council on Water, Energy and Environment

FNCCI Energy Committee

South Asia, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, is a region of stark contrasts. One of the most populous regions of the world, it has a relatively small land mass and a high incidence of poverty. The countries of the region range in size from India, with a population of over 1 billion, to the Maldives with a population of just 340,000. The per capita GNP ranges from over \$1,800 in the Maldives to less than \$186 in Afghanistan.

Globalization has brought the region to a crossroads. While growing populations have kept the per capita income in the countries of South Asia stubbornly below the world average, their economies are expanding and the demand for energy has soared. These nations are trying to meet ambitious poverty reduction goals while their growing industrial, commercial, and transport sectors and urban and middle-income consumers are using energy at unprecedented rates. To unleash the region's economic potential, every country in South Asia will have to face critical decisions, ranging from depleting indigenous energy resources to developing long-term plans to secure national and regional energy needs.

South Asian countries are highly dependent on imported crude oil and petroleum products. The imports range from 25% of commercial energy consumption in the case of Bhutan to 100% in the case of Maldives. The recent volatility and sharp increase in world oil prices has placed an unexpected and

enormous burden on foreign exchange reserves, to the detriment of national economies. While countries like Sri Lanka and Maldives, which lack indigenous fossil fuel sources, are especially hard hit, even countries like India, Pakistan, and Bangladesh now meet less of their demand with indigenous fuel sources and face mounting energy import bills.

Energy security is an indisputable reality for vital economic development throughout South Asia. A regional approach facilitates a more comprehensive, cost-effective, and sustainable set of solutions to the challenges of energy security.

Here Nepal's role deserves a special mention. In the area of regional clean – water supply and hydropower energy Nepal is the only potent place where the storage capacity of the clean water can be affectively augmented. Nepal is immensely rich in hydropower with annual 224 billion cubic meter of surface run – off and over 20,000 liters of water available to a person per day. 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- the fourth in richest hydroelectric rich country in the world and the second in Asia after China is golden investment gateway to enter the huge energy craving and emerging power

market with the highest market price.

Indian Prime Minister Narendra Modi's recent visit to Nepal in August 2014 have ignited robust optimism in the field of mutual cooperation between the two countries. If both can sustain this in the days ahead, it would open a new chapter in bilateral relations leading towards a win-win situation, which will also serve as a model and catalyst for South Asian partnership for prosperity.

PTA in the context of Nepal has great benefits for it. India and Nepal have finalized the Pancheshwar Multipurpose Project, a bi-national hydropower project. Pancheswor project being successfully implemented would irrigate about 15 lakhs hectares of agricultural land, 3400MW of produced energy will be going to India's side and another 3400 MW of surplus energy can be traded by Nepal to illuminate India. Nepal will have sufficient capital from the revenue of sale of power from Pancheswor Project, to invest in other large infrastructural projects. Nepal will also benefit from power production, fishery, irrigation, navigation and tourism.

Indian Prime Minister Mr. Modi has allocated 40 billion dollars to establish Varanasi as a major election campaign hub. His popular project to develop Varanasi-Haldiya Waterways, if successfully implemented is believed to ameliorate the lives of more than 10,000 populations across the Gangetic basin. This cannot be achieved without mutual resource sharing and building high dams in the Nepal Rivers.

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Constructing high dam in the Northern Nepal valleys will significantly increase dry months water supply and electricity generation. Instead of going for expensive Thermal Plants, storage projects like Koshi High Dam (3500MW), Pancheswor Multipurpose (6400MW), Karnali (Chisapani) 10800MW should be built. Focusing on export projects will optimize the usage of Nepali rivers and decrease the cost per unit which is beneficial for both India and Nepal. This will also ensure food security like the Bhakra Nangal Dam Project located in Bilaspur district of Himachal Pradesh that changed the whole economy of Northern India. Nepal expects from India tangible support through concessional loans and equity loans. Therefore, Hydropower for Water, Energy & Food Security through Bilateral Cooperation would create a win-win situation for both the countries and for regional benefits at large.

The following collaborative steps that could be taken by the eight countries of South Asia—Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka—to provide energy security for each individual country and for the region as a whole include:

- Diversify the sources of fuel supply
- Develop an energy sector master plan, including a hydropower master plan, for South Asia
- Develop a regional power grid for power exchanges/trading within the region and with neighboring countries around the region
- Develop a regional gas grid and promote regional trade in natural gas
- Establish a South Asia Infrastructure Development Financial Institution to promote and facilitate inter-country energy development opportunities
- Strengthen the SAARC Energy Centre as an institutional mechanism to share information; facilitate regional planning; provide training, database and research facilities; and promote a common strategy to address regional energy concerns
- Establish mechanisms for joint procurement and transportation of crude and oil products from new sources of supply to take advantage of economies of scale
- Explore development of regional and in-country strategic oil reserves

The SAARC has not been very successful to promote and address South Asia's collective regional interests by adopting a common position in view of the ecological unity of South Asia as one region bound by one civilization facing akin problems.

There is a need felt on to enhance **CONNECTIVITY** in various other sectors such as:

Water and Energy

As energy is a prime mover of almost all economic and technological advancement, and water and energy security a strategic challenge in the SAARC region, to help realize the full potential of SAARC in the Water and energy security theme, there is a need to seriously discuss and advocate for issues related to energy security and the imminent agenda for increased use of clean sustainable renewable form of energy, now made even important due to the global warming menace.

Energy trade, development of energy markets, creation of a Power Exchange Company, development of Storage projects to utilize the monsoon season flows to have regulated flow with multiple benefits such as irrigation, flood control, fishery, navigation, hydropower etc, constructing of high dams in Nepal valleys to help significantly increase dry month's water supply and electricity generation etc could be potent options for exploration

Transportation

Exploration of mediums such as waterways, optimal utilization of neighboring ports etc with due priority to improved infrastructure development.

Information and Communication Technology (ICT)

Exploration on how to leapfrog the communication infrastructure divide and connect with the rest of the global community through cheap affordable reliable and expanded access to ICT and strengthening its role in advancing sustainable development in the region.

Tourism

Address the tourist markets both in the volume and value approach, expansion of destination areas and activities with a linkage Chain with other regional neighbors and sectors to boost the tourism development.



Culture and Tradition

Promotion of mutual understanding and cultural exchange with SAARC country states.

Three Regional Subgroup as indicated below can be plausible arrangements that can identify the key issues and solutions surrounding the CONNECTIVITY issues in various sectors particularly water and energy, and can examine the policies and investments required for sustainable system.

No. Sub group Countries

- | | | |
|----|---|-------------------------------------|
| 1 | A | Nepal, Bangladesh, India and Bhutan |
| 2. | B | India, Pakistan and Afghanistan |
| 3. | C | India, Sri Lanka and Maldives. |

SAARC should dialogue through participation whose strategic goals should be sustainable development through regional cooperation and integration. Various strategies pursued independently in the countries of the region are in the right direction and can improve the energy security of the country involved. As the energy security of different countries improves, the energy security of the region will also improve. However, unilateral actions may sometimes negatively impact regional energy security. Energy security efforts made by individual countries can result in conflicts of interest. For example, the struggle to secure uninterrupted oil or natural gas supply could give rise to serious inter-country competition and conflict.

Furthermore, it is obvious that the cost of unilateral national efforts to ensure energy security would be greater than the cost of collective efforts to achieve the same result. The energy situation in South Asia presents a great opportunity to design and implement a regional energy security strategy that fully supports the evolving plans for such security at the national level in the countries of the region. This could be a real win-win proposition. ■