

Asian Council on Water, Energy and Environment



Confederation of Asia-Pacific Chambers of Commerce and Industry

Message from the Chairman

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

Out of the 4.2 billion people living in the Asia-Pacific region, 615 million have no access to electricity while 1.8 billion have no access to clean cooking. By 2035, developing Asia's share in primary global energy consumption is expected to increase to as much as 56%. The region is extremely dependent on imported petroleum to meet its energy needs, particularly the Pacific Islands, which accounts for the highest of any region in the world. Asia-Pacific, under threat from climate changes, and faced with growing dependence on energy imports, has no option but to turn to renewable to meet the energy demand.

There is a need to accelerate and facilitate our efforts to transform energy systems for a sustainable, prosperous future by mobilizing partnerships to catalyze concrete actions. Forging partnerships with diverse groups of institutions and at the regional front is crucial in addressing energy challenges facing the region. Partnerships mobilize resources (financial, human, and others), leverage knowledge, meet unique needs for highly specialized development projects, and make aid more effective throughout Asia and the Pacific. The Asia Pacific should work to seek new partners to support inclusive, environmentally sustainable growth and development in the region.

It is positive to note that Energy infrastructure investment is booming in the Asia Pacific region as electricity demand and access grow and policy-makers push for better air quality, power reliability and home-grown industry. The region has strengthened its position as the manufacturing hub for the global industry even as it develops into the fastest-growing end market for energy and transportation technologies. This needs to continue and it will for sure.

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.biz for more information.

Mr. Gyanendra Lal Pradhan

Executive Chairman, Hydro Solutions
Chairman, SAARC CCI Council on Climate Change, Energy and Water Resources
Chairman, Energy Committee, Federation of Nepalese Chambers of Commerce and Industry

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Climate change losses for Southeast Asia well above previous estimate: ADB



The study notes reducing emissions will require a sharp cut in the rate of deforestation.

Economic losses from the impacts of climate change in Southeast Asia could be 60% higher than previously estimated, reducing the region's gross domestic product (GDP) by up to 11% by 2100, according to a new Asian Development Bank (ADB) study. The analysis is an update to a 2009 ADB report that estimated a 7% annual reduction in economic output due to climate change.

"The economic costs of reining in greenhouse gas (GHG) emissions are more serious than we previously estimated," said ADB Chief Economist Shang-Jin Wei. "At the same time, this new study also shows that reducing emissions and stabilizing the climate will produce benefits and avoid losses for Southeast Asia, which in the long run sharply outweigh the costs of action."

An ADB Brief which summarizes these findings, Southeast Asia and the Economics of Global Climate Stabilization, was released during the COP21 conference on climate change in Paris. The study looks at the economic impact of climate change across a range of scenarios, including business-as-usual, and another which sees countries take steps to limit their

GHG emissions to keep temperatures from rising above 2 degrees Celsius. The global analysis focuses on the region's five largest economies, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam, which account for 90% of the region's emissions.

The study quantifies the net benefits to the region from acting to stabilize the climate, which are estimated at as much as five to 11 times more than the net costs. It assessed direct benefits from less climate change, such as improved crop yields, as well as the effects of improved air quality and better transportation that come directly from steps to reduce emissions. Those steps are also found to cost less as a share of GDP than the region has already been spending on energy policies, such as fossil fuel subsidies.

Reducing emissions will require action on a number of fronts, including a sharp reduction in the rate of deforestation, which accounts for the majority of Southeast Asia's current emissions. Averting deforestation represents the lowest cost opportunity for emissions reductions and could generate half of the cumulative regional mitigation through the mid-2030s.

The region must also step up efforts on energy efficiency with

technologies that improve and reduce power use, which is found as the biggest source of long-term emissions reduction. The study notes that without changing existing energy use patterns, which include fast growing use of coal and oil, GHG emissions are likely to be 60% higher in 2050 than in 2010.

Reducing emissions is also contingent on developing and introducing low-carbon energy technologies, which would allow the GDP cost of decarbonization to peak within 20-25 years. Carbon capture and storage is a key technology to reduce emissions that the region should explore further.

The study notes that costs of climate stabilization will rise by 60% in 2050 if a global climate agreement to curb carbon emissions is delayed by just a decade.

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 2014, ADB assistance totaled \$22.9 billion, including cofinancing of \$9.2 billion.

Asian Development Bank ■

CACCI calls for 2nd Hydropower and Clean Energy Excellence Award nominations

CACCI is inviting all primary members to submit nominations for the 2nd CACCI Hydropower and Clean Energy Excellence Award. The Award will be presented at the 30th CACCI Conference Gala Dinner in Taipei on November 24, 2016.

Initiated by CACCI Asian Council on Water, Energy and Environment (ACWEE) under the chairmanship of Nepal, the Asia-Pacific Hydropower and Clean Energy Excellence Award is presented as a mark of appreciation and recognition to the person or institution that has contributed significantly to the sustainable promotion, support and development of hydropower and clean energy in the Asia Pacific region.

The nominees could be

individuals in the domain industry (entrepreneurs, subject specialists, researchers, academicians, advocates/activists, independent power producers, inventors, media personnel, bankers, authors) or institutions (private organization, public corporation, financial institution, research institution, civil society organization or media agency).

This award– which was first presented in 2015 to ESNA Power Pvt Ltd from Sri Lanka during the 29th CACCI Conference held in Hong Kong last year– aims to recognize their efforts and to honor them for encouraging further endeavors.

For a complete list of criteria, nomination rules and process, kindly email the CACCI Secretariat at cacci@cacci.biz ■



Mr. Manjula Perera, Director/CEO of Esna Power receives the 1st CACCI Hydropower and Clean Energy Excellence Award from ACWEE Council Chairman Mr. Gyanendra Lal Pradhan at the 29th CACCI Conference in Hong Kong.

UN chief wants clean energy investments doubled by 2020

The UN secretary-general on January challenged investors around the world to at least double their investments in clean energy by 2020, saying that “we must begin the shift away from fossil fuels immediately.”

Ban Ki-moon told an investor summit on climate risk that increasing investment in clean energy is critical in following up on the landmark agreement to tackle climate change reached in Paris last year.

Ban said about \$330 billion was invested in clean energy last year, but that is far from what he calls the “clean trillion” needed per year in the decades to come.

The UN chief also said he has invited all of the world’s heads of states and government to attend an April 22 signing ceremony for the climate agreement, and that 55 countries’ signatures are needed to put the agreement into effect.

The UN and some world leaders have been reaching out to the business community since the Paris

agreement, urgently seeking financial support for efforts to slow rising global temperatures.

“Sustainable, clean energy is growing, but not nearly fast enough to meet energy demand,” Ban said.

The head of the International Energy Agency, which advises oil-importing countries, told global leaders and business executives at the World Economic Forum in Davos that the plunge in oil prices is a growing threat to the world’s goal to reduce emissions through the increase in renewable energies.

Fatih Birol said energy efficiency has been driven largely not so much by environmental concerns but an interest in saving money, which is disappearing as fossil fuels become cheaper.

And the head of the International Chamber of Commerce, John Danilovich, told The Associated Press in Davos that adapting investment to meet the lower-emissions goals in the Paris agreement will be among several struggles for global businesses this year.



A large video monitor shows former New York mayor Michael Bloomberg, the UN Secretary-General’s special envoy for cities and climate change, address the biennial “Investor Summit on Climate Risk” on Jan. 27, 2016 at UN headquarters.

But France’s environment minister, Segolene Royal, told the investor summit that lower oil prices make the search for more oil less attractive. She said the “time is ripe” to remove subsidies for fossil fuel and introduce a price on carbon dioxide pollution. She said 60 countries and regions are now paying for such emissions through taxes or carbon markets.

The UN chief also called for carbon pricing and the removal of fossil fuel subsidies. *Associated Press* ■

2015 a ‘tipping point’ for climate change

When future generations write the history of humanity’s faltering quest to repair Earth’s climate system, 2015 will have its own chapter. Nature, along with the usually fractious family of nations, conspired to make it a landmark year: almost certainly the hottest on record for the planet as a whole, and a rare moment of unity when 195 states pledged to curb the carbon pollution that drives global warming.

Whether the Dec. 12 Paris agreement is the key to our salvation or too-little-too-late depends on what happens starting now, experts and activists said.

“The most compelling thing you can say about Paris is not that it saved the planet, but that it saved the chance of saving the planet,” said Bill McKibben, founder of the grassroots organization 350.org and an architect of the worldwide movement to divest from fossil fuel companies.

Robert Stavins, director of the Harvard Environmental Economics Program at the Harvard Kennedy School, was also chary. “We will only be able to judge whether it is truly a success years, perhaps decades, from now,” Stavins said.

However, whatever lies ahead, they all agree, the last year has been a “tipping point” on climate change.

“Paris represented a real sea change in seriousness in coming to grips with the issue,” said Alden Meyer, a veteran climate analyst from the Washington-based Union of Concerned Scientists who has followed the U.N. process for nearly three decades.

Much of that seriousness was driven by a crescendo of deadly extreme weather and the growing confidence of science in connecting the dots with long-term shifts in climate.

The U.S. National Oceanic and Atmospheric Administration reported lately record-breaking heat in 2015.

They could point to the most powerful hurricane ever registered; freakish, above-freezing temperatures — if only for a day — at the North Pole in December; or life-threatening droughts

in eastern and southern Africa.

Some of that will be chalked up to El Nino, a natural weather pattern that creates havoc along the tropical and southern Pacific Rim every five or six years. But the very fact that this El Nino is the most intense ever measured may itself be a by-product of global warming.

Scientists reported on Jan. 14 that climate change has probably pushed back the next Ice Age by 50,000 years.

That may sound like good news, but more than anything it is a stunning testament to the extent to which human activity — mainly burning fossil fuels — has played havoc with the planet’s thermostat.

Experts have also come a step closer to concluding that our impact on Earth’s bio-chemical systems has been so massive as to justify the christening of a new geological era.

The “golden spike”, or start date, for the Anthropocene — the “age of man” — will probably be the mid-20th century.

What Saleemul Huq, director of the International Center for Climate Change and Development in Dhaka, calls a “greater planetary consciousness” on climate has shown up in business and politics as well.

In the World Economic Forum’s annual survey on global risks over the coming decade, released recently, some 750 experts put “failure of climate change mitigation and adaptation” at the top of the list for the first time.

“Mitigation” means cutting greenhouse gas emissions, and “adaptation” refers to coping with the consequences of climate change.

In third and fourth position are “water crises” and “large-scale involuntary migration.”

In the business arena, the balance of investment is shifting away from fossil fuels and toward renewables, Bloomberg New Energy Finance wrote in a report recently.

Despite tumbling oil and gas prices, global investment in clean energy reached \$329 billion in 2015, a



Standing up for the planet: Activists hold up a giant banner during a demonstration in Paris on Dec. 12, 2015. | AFP

new record, Bloomberg said.

U.S. President Barack Obama has dealt the U.S. coal industry — already reeling from bankruptcies — another body blow in announcing a freeze on new coal mine permits on federal land.

The 2015 watershed on climate change has crystallized a gradual shift from debate over the reality and extent of global warming, to a discussion on what to do about it.

“After having concentrated for years on the problems generated by climate change, we are seeing across the globe solutions responding to the crisis,” said Pascal Canfin, a former French government minister and the new head of WWF France.

However, Canfin and others caution against undue optimism.

“There’s a huge amount of resistance and inertia built into the system,” Huq said. “Changing the global economy is not a trivial matter.”

Much of that resistance will come from the fossil fuel industry, faced with the fact that 80 percent of known reserves must stay in the ground to have even a shot at holding global warming to “well below 2 degrees Celsius” above mid-19th century levels, much less the 1.5-degree target climate-vulnerable countries fought so hard to include in the Paris agreement as an aspirational goal.

“The writing is on the wall for coal. But the oil and gas industry is much bigger and more powerful,” Meyer said. “You don’t want to delude yourself that they are going to go away quietly.” *The Guardian*

Nepal imports additional 80 megawatts of electricity from India

Nepal started importing an additional 80 megawatt (MW) electricity from India from February 17 through the newly completed 400 kV Dhalkebar-Muzaffarpur cross-border transmission line.

The Nepal Electricity Authority (NEA) will import the power for the next four and half months.

With the NEA and India's National Thermal Power Corporation (NTPC) settling the price for the electricity to be imported, the two sides on February 15 signed a temporary power supply agreement.

The agreement, signed by NEA managing director Mukesh Kafle and NTPC general manager AK Maggu — will expire in June-end, subject to potential extension.

After signing the agreement, Kafle said the import of additional power from India would give some relief to the people facing extended power outage hours.

“It could help reduce load shedding by two hours,” said Kafle. “But we cannot be sure about it as water levels in rivers and Kulekhani Reservoir are decreasing.” He, however, confirmed the long shedding hours would not increase further.

NEA will test-distribute the imported electricity for a week, which will give a clear picture of whether load shedding hours would reduce,

NEA officials said. The country is currently facing 13 hours of



power outage every day.

The country's power demand stands at 1325MW in peak hour, but only 500MW electricity is currently available (300MW domestic production and 200MW imported from India), according to NEA.

NEA will pay 5.5 Nepalese rupees per unit, which is 3.44 Indian rupees (0.04 cents), to NTPC for the electricity to be imported.

Earlier, NTPC had demanded 8.8 rupees per unit (0.12 cents). “This is the cheapest rate Nepal will be paying after 70 million units of free power the country has been receiving from India as per the Mahakali Treaty (signed by the two countries for sharing water of a river by the same name),” said Sher Singh Bhat, deputy managing director of NEA.

He said Nepal would have

to pay around 300 million rupees (US\$2.8 million) to the Indian company for importing 80MW in 2014-15, Nepal paid around 10 billion rupees (US\$90 million) to India for importing electricity, according to NEA statistics.

As the price maintained now is for the next four and half months, the rate may vary after that period if the agreement is extended.

“The price will be determined by the demand and supply situation at that time. But we will try our best to offer best possible price to Nepal,” said NTPC's Maggu.

He expressed hope new relations established between NEA and NTPC would grow. “We are committed to providing more support to Nepal as we are a 45,000MW generating company,” he said.

Business Standard ■

Taiwan President vows support for new energy industries

President Tsai Ing-wen pledged that her administration will take steps to improve the environment for the development of new energy industries.

The Democratic Progressive Party (DPP) government will revise unreasonable bidding mechanisms and increase the installed capacity limit of renewable energy facilities to improve the environment for the green energy sector, Tsai said during a green technology forum in Tainan.

Her government, which took

office on May 20, will also assist in building infrastructure such as the piers needed for offshore wind farms, and smart grids to support the development of renewable energy, Tsai said.

It will also incorporate renewable energy systems into the construction of affordable housing units and transportation systems, she said.

In addition, the DPP legislative caucus will prioritize an amendment to the Electricity Act to break the state's energy monopoly and allow private

green energy companies a fair chance for growth, Tsai said.

The new government also hopes to encourage Taiwanese companies to build up their own green energy brand, Tsai said, adding that she has confidence in Taiwan's industrial technologies.

She reiterated the DPP's goal to phase out nuclear power in Taiwan by 2025. Nuclear power has accounted for nearly 20 percent of the country's electricity consumption in recent years. *The China Post* ■

Global oil supply glut to 'shrink dramatically' this year: IEA

A global oil glut that has sent prices tumbling is set to “shrink dramatically” later this year, as wildfires have disrupted Canada’s output and demand in India soars, the International Energy Agency (IEA) said on May 12.

Demand for oil worldwide is set to grow at a “solid” rate in 2016, with India the “star performer” after making up nearly 30 per cent of the global increase in demand in the first quarter of the year, the IEA said.

“This provides further support for the argument that India is taking over from the China as the main growth market for oil,” the 29-nation IEA said in its closely watched monthly report.

The oil market has for months been depressed by vast oversupply, badly hurting producers but meaning lower prices at the pump for consumers.

In Canada devastating wildfires near Fort McMurray forced a shutdown of 1.2 million barrels a day (bpd) of production in early May. The IEA said the events in Canada, however, had not sent oil prices sharply higher, as would have been expected some years ago, with crude having shown little reaction amid overall improved market sentiment. Iran, the IEA said, had provided the other surprise.

Its oil production and exports increased slightly faster than expected following Iran’s return to the market after the lifting of sanctions in January under its nuclear deal.

‘Dramatic increase’

Iranian oil production in April was nearly 3.6 million bpd, a level last achieved in November 2011 before Western sanctions against

Tehran were tightened, the IEA noted.

“Even more important for global markets, oil exports reached 2 million bpd, a dramatic increase from the 1.4 million bpd seen in March,” it added.

The rise in Iran helped push production within Opec (Organization of the Petroleum Exporting Countries) 330,000 b/d higher in April, the group’s highest level in more than seven years.

The flow out of Iran also offset concerns about falling production in Libya, Nigeria — which is facing pipeline sabotage and security issues — and Venezuela, grappling with power cuts and other shortages, the agency said.

All eyes will be on Opec kingpin Saudi Arabia, which has just replaced oil minister Ali al-Naimi after two decades in the post, at the June 2 Opec meeting for signs of major policy changes on its oil supply. Riyadh held production steady, IEA said.

Heading towards ‘balance’

Outside of Opec, the IEA said it now forecasts a bigger fall in production, of 800,000 million bpd, from its initial estimate of 700,000.

The agency said the latest figures confirmed “the direction of travel of the oil market towards balance”.

Global oil stocks are now expected to increase by 1.3 million bpd in the first half of 2016 with a “dramatic reduction” in the second half, to 200,000 million bpd.

The Paris-based IEA said it was leaving unchanged its outlook for global oil demand growth in 2016, at



1.2 million bpd.

Furthermore, on prices, the IEA said further rises were likely to be “limited” due to plentiful stocks.

Stocks within the Organisation for Economic Cooperation and Development (OECD) countries grew at the start of the year at the slowest pace since the fourth quarter of 2014, the IEA said. They declined in February for the first time in a year.

“This lends support to our view that the global supply surplus of oil will shrink dramatically later this year,” it added. *Agence France Presse* ■

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.

Environmental groups hail Delhi's controversial car ban

Environmental groups recently lauded the Delhi government's move to drastically reduce the number of private vehicles on the capital's roads in a bid to clean up the city's notoriously toxic air, as a political row erupted over the controversial decision.

According to the new measure passed in December last year, private vehicles will only be allowed on the capital's roads on alternate days starting in January. The Delhi government also vowed to improve public transportation, shut down a coal-fired power station and start vacuuming roads to reduce dust.

Anumita Roychowdhury, executive director at the Delhi-based Centre for Science and Environment, said the decision was a milestone.

"The city has little choice when there is at least one death per hour due to air pollution related diseases and the lung of every third child is impaired," Roychowdhury said in a statement.

The temporary measures are seen as a desperate attempt to cut down alarming pollution levels during the winter months as cooler air and clouds



trap pollutants creating a smoggy layer over the city.

The issue has been in the spotlight as negotiators from 195 nations haggle in Paris over a planned universal accord to slash the greenhouse-gas emissions that trap the Sun's heat.

Greenpeace's Sunil Dahiya said the decision would bring down daytime pollution levels significantly but added that more steps are needed for a long-term solution.

"This is going to have a wonderful impact on pollution but we cannot ignore the burning of crop waste

in neighboring states," Dahiya told AFP.

However, political opponents lashed out at the new ruling.

The opposition Congress party, which ruled the capital for more than a decade before losing in municipal elections earlier this year, said the decision would hurt "the common man" in Delhi.

"This is not practical and will harass the common man," Congress leader Shakeel Ahmad told reporters.

Agence France Presse ■

PH Senate ratifies amendments to Kyoto pact on greenhouse gas cuts

The Philippine Senate in early February this year concurred in the ratification of the Doha Amendment to the Kyoto Protocol, which seeks to strengthen the country's commitment to the reduction of greenhouse gases as part of global efforts to address the effects of climate change.

A total of 144 countries need to ratify the amendment for it to be in force. As of December 21, 2015, 59 countries have ratified it.

The Kyoto Protocol is the only legally binding agreement for emission reductions for developed countries, according to Sen. Loren Legarda, chair of the Senate Committee on Climate Change.

Under the protocol, 39 developed countries committed to reduce emissions of six greenhouse

gases by an average of five percent below 1990 levels. The commitment period was from January 1, 2008 to December 31, 2012.

The Doha Amendment set a second commitment period for development countries to reduce their emissions of seven identified greenhouse gases by an average of 18 percent below 1990 levels. The new period would be from January 1, 2013 to December 31, 2020.

"Acceptance of the Amendment ensures that the Philippines can continue to benefit from the Clean Development Mechanism (CDM) and the Adaptation Fund during the 2013-2020 commitment period, and consequently create new employment as it pursues sustainable development and implements adaptation projects," Legarda said in a statement.

The CDM allows emission-reduction projects in developing countries to earn emission reduction credits. The credits could be traded and sold and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol.

Legarda also said the Philippines has been in the best position to demand action from developed nations, as it has always been vulnerable to the effects of climate change but has not been a major cause of the phenomenon.

The developed nations, according to Legarda, have the historical responsibility for climate change and for cuts in greenhouse gas emissions, and should provide financial and technical assistance to developing countries affected by it.

Philippine Daily Inquirer ■

Heatwaves, drought may curb global power output: study

Thousands of power plants worldwide face sharp reductions in electricity output by mid-century due to more frequent heatwaves and drought driven by global warming, according to a study published in early January.

“We need to be concerned as electricity will become more expensive and less reliable in the future due to climate change,” co-author Keywan Riahi of the International Institute for Applied Systems Analysis in Austria told AFP.

If warming continues unchecked, higher temperatures and water shortages could, by 2050, cut capacity in hydro-electric plants by nearly 4 percent, and in thermoelectric plants — powered by fossil fuels, nuclear power or biomass — by 12 percent.

Even if the target embraced at the Paris climate summit in December is met — limiting global temperature rise to less than 2 degrees Celsius compared to pre-industrial levels — power capacity would still drop significantly, according to the research.



Hydro- and thermoelectric plants, which together provide 98 percent of the global electricity supply, both depend on water to cool machinery or generate power.

Improvements in efficiency and switching types of fuel, however, would be one way to avoid future shortages of water and power, the study said.

Especially vulnerable regions include the United States, southern South America, southern Africa,

central and southern Europe, and southeast Asia.

The study analyzed data from nearly four-fifths of the world’s hydro-electric plants, and more than a quarter of thermoelectric ones.

“Many of the plants that we couldn’t include in our analysis will be vulnerable to climate change as well, but we simply didn’t have the information,” Riahi said by email.

Agence France Presse

Photo: media.nbcwashington.com

Electric planes aim to soar high for cleaner aviation sector

Ultra-light, fast and cheap: more than a century after the Wright brothers flew the world’s first powered aircraft, a small Slovenian company now hopes to revolutionize the aviation industry with its award-winning electric planes.

Pipistrel’s pioneering Taurus Electro is seen as a breath of fresh air in a sector responsible for 13 percent of CO2 emissions from all transport sources.

Launched in 2007, around 20 orders are now put in every year for the two-seater plane, which is produced in a factory in the town of Ajdovscina, close to the Italian border.

The 110,000-euro (\$120,770) price tag is offset by the plane’s inexpensive maintenance: at 70 cents an

hour, the Taurus is 10 times cheaper to run than traditional twin-seater planes, according to Pipistrel.

Simplicity is key: you charge the battery, hop inside the cockpit and hit the “on” button to activate the fuselage’s propeller.

The large-winged aircraft can thrust itself to an altitude of 2,000 meters (6,500 feet), after which the engine is retracted and the Taurus glides across the sky as a sailplane.

“You have just two buttons, up and down and full power, but you can always switch off immediately when you need to slow down the aircraft,” explained pilot Nejc Faganelj, soaring high above the Slovenian countryside on a sunny winter’s day.

But behind the deceptively easy usage lies a highly complex design. The



most crucial element — and biggest challenge — is the lithium battery, which needs to be light yet sturdy so that it doesn’t catch fire if overheats.

“To copy a design from the car industry is not that difficult. But to make something that is lighter, more efficient — that is definitely something that has not been done before,” said Pipistrel engineer Jure Tomacic.

Agence France Presse

Turkmenistan in race against time to become global gas player

While the golden domes of Turkmenistan's presidential palace hint at the country's fantastic gas wealth, the reclusive Central Asian country remains a slumbering giant in the high stakes game of energy politics. An ex-Soviet republic of five million, Turkmenistan boasts more gas reserves per capita than any other country bar Qatar. But it has so far proved unable to bring its energy bounty to a competitive market as low prices and technological improvements have expanded options for importers elsewhere.

And time may be slipping away for the authoritarian regime in Ashgabat with pressure coming not only from more producer nations but also the growth of liquefied natural gas (LNG).

Once hailed as a missing piece in energy security puzzles from Brussels to Delhi, only China has established a firm grip over the hermit-like country's strategic hydrocarbon wealth, while former chief buyer Russia has seemingly turned away.

Beijing's China National Petroleum Company (CNPC) imports over 30 billion cubic meters of Turkmen gas annually via a pipeline it threaded through neighboring nations Kazakhstan and Uzbekistan in 2009.

Russia's Gazprom, meanwhile, announced earlier this year its decision to wind down long-standing energy imports from its former Soviet ally, leaving the undiversified Turkmen economy pegged to Chinese demand.

"Here the leverage in terms of any future contract negotiations is very much in favor of the buyer," says Andrew Neff, senior energy analyst at the global IHS Energy consultancy.

"As long as China keeps ramping up imports, the Turkmen government will keep buying itself marble palaces. If it stops or decides to drive the price down, that country will face real problems."

Low prices for hydrocarbons and the rise of alternatives to piped gas such as shale and LNG have cast a shadow over two multi-country pipeline projects analysts say would establish Turkmenistan as a key player on the



global energy market.

The \$5 billion-plus Trans-Caspian pipeline that would funnel gas along the seabed of the Caspian Sea towards markets in Europe and the \$10 billion Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline slated to feed energy-starved populations in South Asia would have a combined capacity of over 60 billion cubic metres of gas annually.

While both links have been endorsed by participating countries they lack critical commercial backing and face competition from other potential links originating in gas-rich Russia and Iran.

At an annual investment conference held in Ashgabat this month, Turkmen officials tried to restore faith in both mega-projects.

Oil and Gas Minister Muhammetnur Halylov described Turkmenistan as a "reliable, stable and responsible partner with a good reputation and high international standing."

Speaking on the sidelines of the conference Charles Hendry, Britain's former energy and climate change minister, credited "the drive of the Turkmen government" in moving to complete its own sections of both links.

"Europe is going to go on needing gas well into the future," Hendry, who now chairs the London-based Eurasia Partners Ltd consultancy, told AFP of the Trans-Caspian proposal.

"The more we have that through

established, stable routes of supply, the more that will be beneficial."

But other industry analysts, like Laurent Ruseckas, a senior advisor at Veracity Worldwide, remain skeptical.

"Political will alone does not bring multi-billion dollar projects into fruition. What is the gas price? Subtract from that the transportation costs and factor in construction," Ruseckas told AFP by telephone.

"Both projects face significant challenges right there before questions of political risk even enter the equation."

The glut on the global gas market is particularly significant for Turkmenistan, which counts on hydrocarbons for over 80% of total exports and has a debt to CNPC for the construction of the Central Asia-China pipeline still outstanding.

Turkmenistan's economy has been struggling and earlier this year it devalued its manat currency by a fifth, mirroring central bank strategies in other energy-rich ex-Soviet economies.

In November last year, an International Monetary Fund (IMF) mission urged the Turkmen government to diversify and create conditions for private entrepreneurship.

It also predicted a growth slowdown of four percentage points over the next two years on the back of low hydrocarbon prices. In 2014, Turkmenistan's economy expanded by 10% and it is forecast to see growth slow to about 7.0% this year and 6.0% in 2016, according to the IMF. **AFP** ■

SOUTH ASIA'S WATER, ENERGY AND CLIMATE CHANGE CHALLENGES: NEPAL'S OPPORTUNITY

by Er. Gyanendra Lal Pradhan

Chairman

SAARC CCI Council on Climate Change, Energy & water Resources

CACCI Asian Council on Water, Energy and Environment

Energy Committee, FNCCI



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 and environmental degradation. 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, (ranging around 563kWh per capita as compared to developed economies (13,246kWh per capita in the USA, China 4000kWh, and with the developed countries averaging around 15,000 kWh of per capita consumption), 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 are and will be facing 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.** Over the last two decades, South Asia has been one of the fastest growing regions in the world, with an average annual growth rate of six percent as measured by GDP per Capita. To sustain high level economic growth in the long run, it is imperative that the electricity sector grows in a sustainable manner, as power is one of the fundamental inputs to the economy. However, despite this impressive macroeconomic growth, the power sector in the region has not been able to keep pace. The existing power shortages and growing import of fossil fuels impose a high cost to energy insecurity to the region. *Thereby, the need to ensure energy security in today's economic climate is imperative and urgent as the gap between the latent demand and supply of energy is a major concern for the South Asian Region.*

Here Nepal's role deserves a special mention. 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-the fourth in richest hydroelectric rich country in the world and the second in Asia after China is the golden investment gateway to enter the huge energy craving and emerging power markets with the highest market price. **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. 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.

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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. For example, India and Nepal have finalized the Pancheswar Multipurpose Project (6400MW), a bi-national hydropower project. Pancheswar 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 Pancheswar Project, to invest in other large infrastructural projects. The countries will also benefit from power production, fishery, irrigation, navigation and tourism

Instead of going for expensive Thermal Plants, storage projects like Koshi High Dam (3500MW), Karnali (Chisapani) 10800MW are attractive options. Similarly constructing high dams in the Northern Nepal valleys will significantly increase dry months water supply and electricity generation. Focusing on export projects will optimize the usage of Nepali rivers and decrease the cost per unit which is beneficial for those sharing it, i.e., 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. In a country blessed with Himalayan mountains and rivers, Hydropower is a natural energy source. But when the dry season sees river-flow diminish, reliability of power supply is an issue since most existing or under

construction HP projects are of run-of-river type. Budhi Gandaki (+/- 600 MW storage dam and HPP) has long been foreseen as the answer and provide seasonal water regulation. This project would result into multiple benefits downstream in India. Nepal can also be able to reap downstream benefits. We can irrigate an additional 100,000 hectares of land in Chitwan and Nawalparasi districts in the dry season from the water coming out of the project. Not to forget, 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.

The Government of India has earmarked Rs 20,000 crore for the Ganga Cleaning Project. This 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. When Nepal releases water into India during the lean flow period, it would help in cleaning / diluting the polluted waters of downstream Ganga river up to Farakka barrage.

In recent years, the notion of the Water, Energy, Food and Climate nexus has gained immense traction in the domain of natural resource governance. With the growing desire to diversify energy production to renewable realm, the South Asian Countries is showing an increased vigor. The Indian Government is planning to significantly boost the renewable energy capacity addition target for the medium term as part of its national climate change policy. India aims for 350 GW renewable energy capacity by 2030. Although this is promising, there are a number of challenges and setbacks in the government's way to achieving these targets, including land acquisition, grid infrastructure, and financing and peaking power complexities. But these alternative sources cannot be a long term sustainable solutions to the power



woes in the region, rather they may serve as an adjuvant. Hydro power development of Nepal can contribute to the long term energy security of India and on the regional front, and reduce dependence on fossil fuels that put a strain on foreign reserves and the ecology as well

As energy demand increases year after year, there is a need to promote scaling up of investments in renewable energy in the South Asian region. Nepal could be a good start. The resources of the South Asian region pooled together through an interconnected grid could help South Asia secure its energy supplies. Cross border energy cooperation can be seen in the context of efficient management and use of resources. This will help economies to meet domestic demand as well as it is a good revenue option for countries like Nepal and Bhutan. Cross border energy collaboration can also boost regional trade.

Energy in today's world is recognized as the most essential staple food for a nation's economic growth. As the accepted formula goes – for 1% growth in gross domestic product to occur, a 1.5% energy infusion is required. Maybe this is the reason why the paradox of energy strategy can be found omnipresent. Energy is the engine of growth, and can play an important role to reverse the trend of import-based economy to export-based economy, which is not possible without enough power supply for industrialization. Nepal's hydropower holds colossal promise and hope to achieve this. ■