

EDITORIAL

Reliable and affordable electricity is crucial for sustainable economic growth, social development as well as poverty reduction. It is impossible to maintain the growth of the economy without reliable energy supply. This is very true in the case of Bangladesh also and in this context, the Government of Bangladesh has set 'Vision 2021' for the nation which aims to elevate Bangladesh to the status of a middle-income country while providing affordable and quality electricity to everyone. The Power Division under the Ministry of Energy, Power and Mineral Resources has accordingly set a target of generating 24,000 MW, 40,000 and 60,000 MW electricity within 2021, 2031 and 2041 respectively in order to achieve that objective. Since 2009, under the prudent guidance of Hon'ble Prime Minister Sheikh Hasina, the power and energy sectors have grown tremendously achieving power generation capacity of 15,295 MW (including captive) in December 2016. Access to electricity has reached 78% with 22.2 million consumers.

In order to achieve the 'Sustainable Development Goals (SDG)' adopted by the UN, the government of Bangladesh has prepared the 'Power System Master Plan-2016' which has focused on diversification of fuels for power generation and implementation of renewable energy. The 'Power System Master Plan' also emphasizes on regional cooperation for the development of power sector. According to PSMP-2010, 3,500 MW and 6,500 MW electricity within 2021 and 2030 respectively is planned to be imported through regional cooperation. The fuel mix plan for 2041 envisages that 35% gas, 35% coal, 5% oil 5% renewable energy, 10% nuclear energy and 10% would be met from regional cooperation.

The countries of the South Asian region have huge resources that may be harnessed for the socio-economic development of the region – all the countries have common developmental challenges and share a vision of future prosperity for their peoples. Bangladesh, India, Nepal, Bhutan, Maldives and Sri-Lanka have been working under SASEC in order to accelerate the socio-economic



H.E. Mrs Mashfee Binte
Bangladesh Ambassador to Nepal
Guest Column

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progress of these countries harnessing the potentials of geographical location and seasonal diversity for electricity trade. The signing of the SAARC Framework Agreement during the Kathmandu Summit in 2014 is a major step towards establishing cross-border electricity trade and facilitating integrated operation of the regional power grid. A similar agreement is expected to be signed under the aegis of the BIMSTEC during a forthcoming meeting of the BIMSTEC Energy Ministers in Kathmandu. Taking advantage of logic of geography, four countries within SAARC and BIMSTEC, Bangladesh, Bhutan, India and Nepal, have formed a sub-regional initiative, the BBIN, to cooperate in the areas of, among

All the countries of the South Asian region are achieving impressive results in poverty reduction, economic growth and in attaining the MDGs.

others, power/hydro-power. In order to facilitate smooth regional cooperation in the power sector, the government of Bangladesh has kept provisions for open access grid and cross-border electricity trade in the 'Electricity Act 2016'.

In January 2010, a historic MoU was signed between Bangladesh and India for regional cooperation to develop the power sector. During the visits of the Hon'ble Prime Minister of Bhutan in 2011 and Hon'ble Minister of Energy of Nepal in 2014 and 2016 to Bangladesh, discussions were held to facilitate joint investment and cross-border among these countries.

Though it would sometimes appear that there is hardly any forward movement of the various initiatives taken by the government, some of the major milestones in this respect are listed below:

- Bangladesh has been importing 500 MW power from India through Bheramara-Baharampur 400 kV transmission line and Bheramara 500 MVA HVDC substation since October 2013. Upgradation of Bheramara substation from 500 MVA to 1000 MVA is under process which will facilitate import of additional 500 MW power.
- Hon'ble Prime Minister of Bangladesh, Sheikh Hasina and the Hon'le Prime Minister of India, Mr. Narendra Modi, inaugurated import of 100 MW power from India (Tripura) to Bangladesh (Comilla) through video conferencing. Additional 60 MW power is expected to be imported through Tripura-Comilla interconnection from March 2017.
- The 2nd Bheramara-Baharampur 400 kV transmission line is planned to be constructed for import of 1000 MW power from India.
- Katihar-Parbotipur/Barapukuria-Boronogor 765 kV transmission line is also planned to be constructed for power import.
- Plans have also been taken to import 500 MW power through the establishment of Surjamaninagar (India)-Comilla (Bangladesh) 400 kV transmission line.

- A sub-regional grid line construction is being planned to allow import 2000 MW power from Bhutan.
- Discussions are ongoing about investment in the power sector and import power from Nepal.
- Discussions are ongoing about possibilities of import of power from Myanmar.

Besides these, there is also significant progress in planning and executing joint venture projects such as the Rampal 1320 MW coal based power plant being implemented as a Bangladesh-India joint venture project in Bangladesh, a solar power plant being planned at Rampal and a 1125 MW hydro-power project being planned in Bhutan as a trilateral Bangladesh, India and Bhutan joint venture.

To sum up, it may be recalled that all the countries of the South Asian region are achieving impressive results in poverty reduction, economic growth and in attaining the MDGs. However, this region still remains one of the poorest in the world, with the largest concentration of people living below the poverty line. Access to affordable, clean, sustainable sources of energy remains one of the major stumbling blocks to socio-economic upliftment of the peoples of this region. Bangladesh firmly believes that cooperation in the power sector with the countries of the region should be an essential element of its development narrative. However, this cooperation must be for mutual benefit, taking all stakeholders into confidence to achieve a win-win and sustainable solution. ■

ACTIVITES

Interaction Program on Transmission Network System of Nepal

Energy Development Council organized “Interaction Program on Transmission Network System of Nepal” on 15 March, 2017 at Baber Mahal Revisited.

The interaction program was inaugurated by Managing Director of NEA, Mr. Kul Man Ghising. The discussion featured talks from various stakeholders in the energy sector of Nepal. It saw officials from NEA and Independent Power Producers brainstorm on an outline on the current power scenario of Nepal delivered by Mr. Ghising.



On the program, NEA highlighted the current structure of the transmission network in Nepal. As part of its strategy to optimise the energy grid, NEA has identified and planned six cross-border Interconnection corridors and 11 transmission lines, with a proposed 22,000 MW generation within 2035. A review is in process and will study the requirements and feasibility of major transmission projects such as East-West transmission highway of 400 kV and 765 kV, Mid-hill transmission corridors of 400 and 220 kV and North-South corridors of 220 and 400 kV.



Mr. Rabin Shrestha, Energy Specialist of World Bank also expressed his desire to extend aid and cooperate with all concerned stakeholders should the transmission project go ahead as planned. He also suggested that if a benefit sharing mechanism is provided to the local communities by the transmission line project owners, then there would be more cooperation in the local community level in the construction of the transmission line.

IPPs also put forward issues on the discrimination by NEA while evacuating power and the differing compensations rates for different hydro-power projects, ranging from 40 percent to 90 percent. As such, IPPs called for NEA to be more transparent and equal to power producing

companies. They also called for the ending of special provisions for the transmission lines to foreign producers while not providing such for national producers. Dr Ghimire, MD of Liberty Energy Co. Ltd, stressed the need for a stable policy and a more coherent approach from NEA. He gave the example where the construction of a double circuit instead of a single circuit could evacuate more energy and avoid duplication. He further said that IPPs are ready to adopt BOOT model or even take the responsibility in land acquisition and procurement, if NEA would allow. He said that IPPs are ready to adopt any favourable modality and open to help NEA built transmission lines. ■

(Download presentation [here](#))



Participation in the Interaction Seminar on Small Hydropower Development Planning– for South Asian Countries

EDC participated in the Interaction Seminar on Hydropower Development Planning for South Asian Countries jointly organized by Hangzhou Regional Centre for Small Hydro Power (HRC) and Nepal Academy of Science and Technology (NAST) held from March 28-30, 2017 in Kathmandu. Mr. Sujit Acharya, Chairperson of EDC, gave a remark on the glorious history of South Asia in the hydropower sector, highlighting an immense potential and an opportunistic presence.

Asia's first hydropower plant was built in Darjeeling, India; the second was built in Karnataka, India while the third one in Pharping, Nepal. He stated that the combined hydro potential of South Asia is more than 650,000 MW; Nepal leads with 300,000 MW, India with 200,000 MW, Pakistan with 100,000 MW, Bhutan with 23,000 MW, Sri Lanka with 2,000 MW and Bangladesh with 750 MW. He further explained that less than 7 per-



cent of all these combined potential have been developed so far and therefore a tremendous opportunities is all for us. This immense potential needs to be developed rapidly to propel South Asia from world's fastest developing region into a developed region. In order to reduce poverty, small hydropower projects are absolutely necessary to

solve the number one problem all South Asian countries face; imported energy, mainly imported petroleum and gas which continues to be the single biggest hurdle to the economic development of this region. For example, Nepal spends 45 percent of its entire annual budget in importing petrol, diesel, gas and petroleum products. So, for every one rupee revenue we raise, 45 paisa goes to importing these four things. He stressed that South Asia must use hydropower as the key source to secure regional supply. However, problems remain in transmission and distribution losses around the entire world; financing also remains an issue. Hydropower projects in South Asia cost 30 percent more than they would cost anywhere else in the world because of higher terms and conditions on interest and debt.

However, we have amazing stories in South Asia: Bhutan in 2016 grew at 6.4 percent GDP from 3.6 percent in 2013 all because of hydro-



power exports. Nepal today is considered the most attractive investment destination in SAARC for hydropower and top three in investment destinations within Asia along with Myanmar and Laos. Lastly, he also invited all the guests to the Power Investment Summit to be organized by EDC this September.

In the same program, Mr. Jannardhan Sharma, energy minister

of Nepal gave an inaugural remark with the aim of generating 8000 MW within five years if the storage hydro projects start at once. He stressed that the country should be independent and electricity consumption should increase from 130 kW per capita to 1000 kW per capita. He further said that the electricity should be exported to neighbouring countries and electric appliances should be used in homes and

office. He also announced that an MoU has been established where NEA will build transmission lines to rural areas, and AEPC will support micro hydro.

Other EDC participants were Ms. Itnuma Subba and Ms. Sudeshna and they shared that the seminar gave them an opportunity to interact and exchange knowledge with China, Afghanistan, Bangladesh, India, Pakistan, and Sri Lanka. ■

Hangzhou Regional Centre for Small Hydro Power (HRC) delegation visit to EDC

HRC delegation led by Prof. Huang Jianping, Deputy Director visited EDC office on March 31, 2017 to discuss about how to deepen our MOU. ■



Ambassador of Sri Lanka visits EDC



Her Excellency Ms W.S. Perera attended a meeting organized by Energy Development Council (EDC).

The meeting started with the exchange of the scope of work between the two parties to find a common point of collaboration.

H.E. highlighted the ties between the two countries and expressed her wish on behalf of Sri Lanka to improve bilateral ties and economic trade. She also expressed her interest in engaging in high level talks about the energy sector development between the two parties. ■

Princess Maria Amor Torres visits EDC

EDC organized a meeting with H.H Maria Amor Tores, Princess of Philippines on EDC office, Kamaladi on March 9, 2017. HH Maria is the founder and president of We Care for Humanity (WCH) and the Special Advisor to the Director General of Philippines Economic Zone Authority (PEZA). The meeting discussed possible collaboration opportunities between our two countries in energy and economics.

She also stated WCH's interest to participate in the Power Investment Summit of 2017 as a partner, which is being organized by EDC in September. On the proposal given by EDC, Princess Maria stated that she will recommend Ghising to the Ramon Magsaysay Foundation. ■



MEMBER ARTICLES AND MEDIA COVERAGE

Our Energy Future

Bishal Thapa

It may have been ‘the handshake’ that salvaged the summit. But it was the drama in the closing minutes that could have the most enduring impact.

As it wound down, leaders at the 18th South Asian Association for Regional Cooperation (SAARC) summit held in Kathmandu on November 2014 signed the framework agreement for regional energy cooperation (electricity). The agreement offers a vision that seizes on the “common benefits of cross border electricity exchange and trade,” though it says little about how it will be achieved.

Regional energy cooperation is a bit like seeing God. Everyone talks about it, everyone prays to it, Every one wishes for it but no one has quite seen it or expects to see it in their lifetime.

Cross border electricity trade, particularly with India, has become the centerpiece of Nepal’s energy strategy. In the short term, Nepal wants to export excess generation during the wet months when its hydro plants are producing plenty. It wants to import in the dry winter months to supplement the drop in domestic hydro generation.

In the long term, Nepal believes its hydro generation (for example with 10,000-MW plants) cannot be absorbed by domestic markets alone and so it seeks external markets, such as India. Bangladesh has also recently emerged as a potential market, if there is a right of way via

India.

Whatever your view on Nepali electricity exports, there should be no disagreement that regional interconnected electricity markets offer positive benefits. For Nepal, the SAARC framework agreement represented an important milestone in its goal to connect with India’s electricity markets. Earlier it had signed a bilateral Power Trade Agreement (PTA) with India, which sought to create an open framework for electricity trade between the two countries.

With these two agreements, Nepal felt that it was making great progress towards a meaningful framework for cross-border electricity interconnectedness. But last December India unexpectedly appeared to pull the rug from under Nepal’s feet.

In December 2016, India’s Ministry of Power issued the “Guidelines for Cross Border Trade of Electricity.” The specific objectives of guidelines were unclear except it appeared to want a consolidated common framework underlying all of the different bilateral power trade agreements it had with Nepal, Bangladesh and Bhutan along with the regional SAARC framework agreement.

The puzzling aspect in India’s guidelines was the requirement that electricity imports into India would only be possible if the generation source was owned by government of India or an Indian entity held the majority share (at least 51 percent). The overall guideline is

ambiguous, offering room for case by case decision on all imports and exports.

Nevertheless, the spirit of the guideline appeared to be against the general intent to move to an open market for cross-border electricity trade.

Nepal is reportedly reviewing the guidelines to see if it is in violation of the PTA. Even if Nepal finds that to be the case, it shouldn’t seek to correct India’s transgression—it should instead seek to capitalize on the opportunity that it offers.

Cross-border electricity trade as envisioned in the power trade agreement between India and Nepal or in the SAARC framework agreement is impossible to achieve. These agreements are predicated on the notion of harmonization, that countries will evolve domestic rules and regulations that are consistent with those of the trading partner. The idea is that such harmonization will enable seamless transfer of electricity across borders.

Harmonization, at least in the context of India and Nepal, is an illusion. It can never be achieved. Electricity trading requires a wide set of rules and regulations (for example on financial transactions and contract enforceability) not just in the technical codes governing electrical flows. It is unreasonable to expect Nepal will be able to harmonize its broader set of economic rules and policies to the level of complexity and maturity of India any time soon.

In the absence of harmonization, the power trade agreement is reduced to a relationship reliant on the generosity of the dominant partner and the subservience of the weaker partner. It cannot evolve into a partnership of equals—certainly not an open market.

Nepal needs to evolve a modern outlook on how to fulfill its energy potential. It cannot do so by staying within its own shell as an under-confident, nervous and uncertain country relying solely on the generosity of its neighbor. It needs to break out of its cocoon.

One way to do that would be for Nepal to incorporate an energy trading company in India. If structured correctly, such a company could accelerate achievement of Nepal's 10,000 MW hydro vision, enhance energy security, increase foreign investment in Nepal's energy sector, reduce government interference and foster lasting enabling environment for private participation.

In short, it could solve just about every problem that currently plagues Nepal's energy sector (not just in electricity, but energy more broadly). Nepal's energy trading company must be incorporated as an Indian entity, governed by and protected by the laws of India. Almost every other country has set up shop in India, so why aren't we there yet?

Nepal's energy trading company must serve as the aggregator of all energy transactions into and out of Nepal. In other words, it must be the single vehicle for import and export of all forms of energy (electricity, fuel oil, LPG and coal)

for Nepal. If this entity is set up correctly, there will be no energy blockade—official or unofficial—in the future.

Nepal's energy trading company must also be a conduit for investments into Nepal's energy sector. All private foreign investments in Nepal's energy should flow through the company. The company, for instance, could be structured as a holding company with project-specific special purpose vehicles located in Nepal. No Indian guideline on cross-border electricity trading will ever again be an impediment for Nepal. The biggest constraint to foreign private investment in Nepal's energy sector is its antiquated financial regulations. Using the energy trading company in India as an investment gateway would unlock foreign investments without having to wait several decades to modernize our financial regulations.

Nepal's energy trading company must be part owned by the govern-

ment of Nepal, part by the people of Nepal and must be listed in Nepal's and India's stock exchanges. One way to minimize political interference will be to keep the company under the oversight of an entity that has the authority to tell politicians to stay out. Listing it in the stock exchange is such way. This way, it will also be one of the most profitable and valuable companies in the region.

In developing our energy future, we can sit gloomily within our cocoons in Kathmandu and fret about how our neighbors are not being generous. Or we can set out boldly and take our aspirations straight into our neighbor's courtyards. We can wait to harmonize with our neighbors, or we can simply begin to use our neighbor's rules to meet our goals.

Our future demands boldness consistent with our big aspirations. ■

The author is the Vice Chairperson of EDC)



Source: <http://www.myrepublica.com/news/15975/>

Rediscovering the Sun

Bishal Thapa

These days I can't go out without everyone feeling sorry for me. You see, I work in the solar business and life has not been good ever since Kulman Ghising (Managing Director, Nepal Electricity Authority) ended load shedding (forced black-outs).

Over the last few years, sales of 'solar package,' the typical combination solar panels, inverter and batteries, dominated the market. Alternative Energy Promotion Centre (AEPC) actively promoted such sales, offering subsidies and grants. Many solar companies, thus, reoriented from rural (which were about energy access) to urban (which were about electric reliability) markets. New large firms joined, emerging as stockists, wholesalers and retailers.

There was little innovation in product design or deployment models.

But business was good. In Kathmandu alone, approximately 100,000 households have installed such system, totaling an estimated 20 MW. The market potential was easily in the hundreds of MWs. It was said that when mothers looked for husbands for their daughters, they wanted doctors, engineers or guys in the solar business.

Then Ghising arrived and ended load shedding. And all hell broke loose.

An estimated NPR 150 crores of solar equipment is currently lying idle in warehouses across Nepal. Companies are struggling to avoid bankruptcies. In these hard times for the solar business, I'm just glad

that I am already married because I probably would not be able to find a bride now.

The sudden challenge to the solar business (or for that matter, distributed renewable energy) isn't because Ghising ended load shedding. Instead, it represents a colossal failure of Nepal's distributed renewable energy policy.

A correction first: it is wrong to say "a colossal failure of Nepal's distributed renewable energy policy." Nepal has never had a distributed renewable energy policy – it has only had a subsidy distribution policy.

Nepal's entire approach to renewable energy is around subsidy distribution. The subsidy distribution processes have created an eco-system that has favoured retail and trading, killing innovation in technology adoption, deployment, financing and business models. The most worrisome part is that the distributed renewable energy sector in Nepal has degenerated into a complex web of political interference, patronage, corruption, deceit and conspiracy.

The tragedy in all this is that Nepal has been robbed of two decades of the most promising innovations in distributed renewable energy technologies from around the world. We have a lot to catch up on.

The end of load shedding offers Nepal a second chance. We shouldn't squander this new chance like we did the last one.

With the end of load shedding and more reliable electricity supply, the best time for solar is finally here. No country has been able to rapidly grow its solar (or distributed renewable energy) portfolio without

reliable electricity on the grid. Nepal will be no exception.

Thus far, we have been solving the grid supply problem. We haven't really had a distributed renewable energy expansion strategy. Now, with reliable grid electricity we finally have the environment for rapid expansion of distributed renewable energy.

We should use this opportunity to explore grid connected distributed renewable energy, particularly rooftop solar. We can't just fixate on net metering – we also need to explore other innovative methods for integrating distributed renewable energy sources within the energy mix.

We should use this opportunity to explore distributed micro-grid systems that not only offer local supply but also supplement and make the grid more robust.

We should shift our focus from piloting technology to piloting implementation approaches, particularly around financing and business models.

We should require AEPC to change from being a Santa Claus that happily hands out subsidies to being an enabler and manager of a truly distributed renewable energy market.

Ghising may have announced that he ended load shedding in some places. But with distributed renewable energy, he could really end load shedding all over Nepal.

For that, Nepal's distributed renewable energy sector needs to step up and lead the way. ■

(The author is the Vice Chairperson of EDC)

Source: <http://edcnepal.org/wp-content/uploads/2017/03/page6march26.pdf>

‘Robust transmission and distribution system must for reliable supply’

Nepal Electricity Authority (NEA) — the sole power off-taker of the country — has said that a robust transmission and distribution system is the need of the hour for reliable power supply.

Speaking at an interaction programme organised by Energy Development Council (EDC), Kulman Ghising, managing director of the power utility, said that NEA has given top priority to install double circuit high capacity transmission network to enhance the quality of power supply. As part of its strategy to optimise the energy grid, NEA has identified and planned six cross-border interconnection corridors and 11 transmission lines, with a proposed 22,000 MW generation within 2035.

A review is in process and will

study the requirements and feasibility of major transmission projects such as East-West transmission highway of 400 kV and 765 kV, Mid-hill transmission corridors of 400 and 220 kV and North-South corridors of 220 and 400 kV, according to NEA.

Independent power producers (IPPs) also put forward issues on the discrimination by NEA while evacuating power. The compensation rate is different for different hydro projects, with some getting 45 per cent and some 90 per cent. NEA has to be transparent and treat all power producer companies equally when dealing with power producer companies, they said and further asked why NEA cannot evacuate power timely.

There is a special provision for

transmission line for foreign producers but not for national producers and that needs to end, said IPPs. Atma Ram Ghimire, MD of Liberty Energy Co Ltd, stressed the need for a stable policy and more coherent approach from NEA. He gave an example where construction of double circuit instead of a single circuit transmission line could evacuate more energy and avoid duplication. “So, NEA has to synchronise the effort and have better coordination.”

He further said that IPPs are ready to adopt BOOT model or even take the responsibility for land acquisition and procurement if NEA allows them to do so. He said that IPPs are ready to adopt any favourable modality and are open to help NEA build transmission lines. ■

Source: <https://thehimalayantimes.com/business/robust-transmission-distribution-system-must-reliable-supply-nepal-electricity-authority/>

EDC signs MOU with China Energy Storage Alliance (CNESA)

Energy Development Council entered in memorandum of understanding with China Energy Storage Alliance (CNESA). The agreement was signed by Ms. Itnuma Subba, Executive Manager of EDC and Ms. Vivian Liu, Deputy General Secretary of CNESA.

This agreement will create a healthy environment that will promote development of energy sector of Nepal.

CNESA is member based storage industry association in China supported by coalition of energy storage manufacturers, power produc-

ers, investors and new energy developers that promotes the development of all types of energy storage technology and applications. CNESA collaborates with leading energy solution companies such as Panasonic, Hitachi, General electric etc. ■

Source: <https://thehimalayantimes.com/business/energy-development-council-china-energy-storage-alliance-sign-pact/>

Philippines Princess vows support for Nepali economy

The visiting princess of Philippines, Maria Amor Torres, has pledged to support Nepal by conveying a message to investors in her network across the globe that Nepal is a potential destination for investment.

In an interaction organised by the

Energy Development Council (EDC), here today, Princess Maria, who is the founder president of We Care For Humanity (WCH) and special adviser to the director general of Philippines Economic Zone Authority (PEZA), said that she will connect Nepal with the solar in-

dustry in the Philippines and explore ways to extend humanitarian aid, since one of the mottoes of WCH is to promote green environment.

She also stated WCH's interest to participate in the Power Investment Summit of 2017 as a part-

ner, which is being organised by EDC in September.

She has also expressed her willingness to engage actively in the summit and has asked EDC to give a call of action. As the princess has good connections with her home country's government and community, EDC Chairperson Sujit Acharya, has nominated Kul Man Ghising, MD of Nepal Electricity



Authority, for the Ramon Magsaysay Award in light of his contribution in eliminating load-shedding from the country.

In response, Princess Maria stated that she will recommend Ghising to the Ramon Magsaysay Foundation.

Earlier, two Nepalis Dr Sanduk Ruit, founder of Tilganga Institute of Ophthalmology, and social entrepreneur Mahabir Pun have been felicitated with the prestigious Ramon Magsaysay Award. ■

Source: <https://thehimalayantimes.com/business/philippines-princess-maria-amor-torres-vows-support-nepali-economy/>

Lankan envoy meets EDC team

Ambassador of Sri Lanka to Nepal WS Perera expressed interest in engaging in high-level talks on energy sector development between the two parties in a meeting organised by Energy Development Council (EDC), on Friday.

Perera stressed the need for regu-

lations and acts that protect and facilitate investment in Nepal, as per a media release.

On behalf of EDC, Chairperson Sujit Acharya invited delegates from Sri Lanka to attend the Power Summit scheduled to be held in September.

The scheduled Power Summit will

include numerous power projects and investors representing various national and international stakeholders in the energy sector.

The ambassador highlighted the ties between the two countries and expressed her wish on behalf of Sri Lanka to improve bilateral ties and economic trade. ■

Source: <https://thehimalayantimes.com/business/sri-lankan-envoy-ws-perera-meets-energy-development-council-team/>

NEPAL'S SCENARIO

Air too dangerous to breathe

Air quality in Kathmandu was very bad in the month of Magh. It had the highest levels of pollution since Drishti Kathmandu started collecting data on concentrations of fine particulate matter that is smaller than 2.5 microns (PM2.5) eight months ago. The monthly average concentration for Magh was $79 \mu\text{g}/\text{m}^3$ which is double of Nepal Government's Standard of $40 \mu\text{g}/\text{m}^3$ and more than three times the World Health Organization's (WHO) daily guidelines of $25 \mu\text{g}/\text{m}^3$.

In fact, recommended annual exposure to PM2.5 is $10 \mu\text{g}/\text{m}^3$. Mornings were exceptionally bad. PM2.5 concentration levels were 6 times higher than the WHO guidelines between 8 to 10 am. The only day PM2.5 levels were below the Nepal

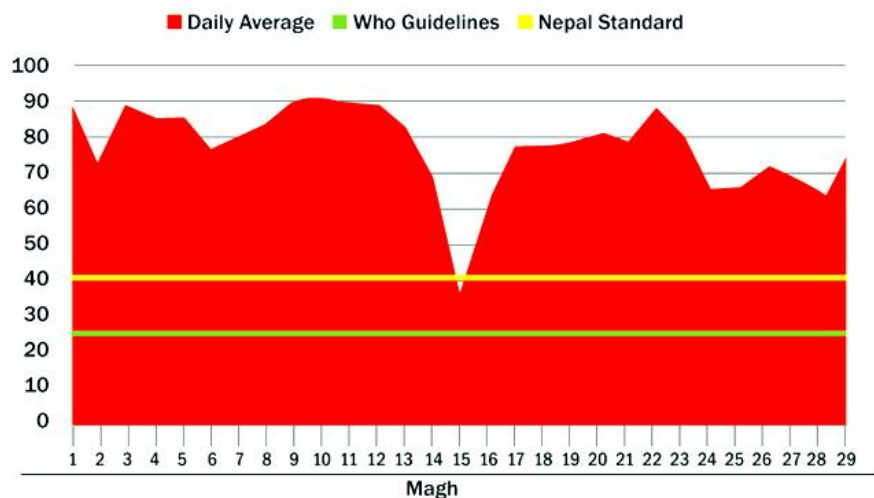
Standard was on Saturday, Magh 15. It rained in Kathmandu on Friday and the rain helped clear the air of the PM2.5 pollutants. Whereas average PM concentrations were as high as $185 \mu\text{g}/\text{m}^3$ between 9 am to 10 am Friday morning, the rain in the evening caused it to drop to $22 \mu\text{g}/\text{m}^3$ between 9 pm to 10 pm. Other than that day, PM2.5 concentrations far exceeded Nepal's Standard for the month of Magh.

But citizens have no choice. No human should be breathing such low quality air but do we really have a choice? We are all forced to breathe this air. It is like being in a prison room full of smoke and no windows. All of us were forced to breathe this smoky air every day and night in the month of Magh.

At least cigarette smokers choose to smoke and harm their bodies. The rest of us are forced to harm our bodies without choosing to. We had no other option but to breathe the filthy air in Kathmandu.

Such exposure to PM2.5 levels are extremely dangerous to all citizens liv-

Magh: Daily Air Pollution Average (PM2.5)



ing in the Valley. Unlike larger dust particles, the PM2.5 particles are too small for our nose hair and our saliva in our throat to block it entering our lungs. It can go deep into our lungs and from there into our blood. Long-term exposure to these particles may cause asthma, chronic bronchitis and heart diseases.

It is even more dangerous to infants and senior citizens already facing pulmonary and cardiovascular problems.

When will we be able to breathe fresh air? The Government already knows the sources of air pollution. A high-level committee headed by a National Planning Commission member with the involvement of all the necessary stakeholders submitted an action plan to the government on Magh 25, 2073. So, the government also knows what needs to be done to improve air quality.

A month has since passed. What has been done? Why aren't the prime minister, the environment minister and the health minister actively pursuing the implementation of the suggested reforms? When are we going to see some action? How is the government going to ensure that next Magh will be better than this Magh?

Let's start here. Proper use of Pollution Tax – The government has been collecting 50 paisa per liter of petroleum products since 2064-65. Billions of rupees are lying in the government vaults because the Environment Ministry along with the Department of Environment has not developed regulations on how and what to use that money on. Why? Are they waiting for the air quality to get worse?

Green Sticker system – Everyone knows that this is an ineffective and useless system. The environment minister openly admits that you can buy green stickers for Rs 200. Has a red sticker ever been issued? Why can't we have a proper monitoring system? How about introducing effective green stickers for motorbikes as well. How about having government officials/pollution police stop vehicles on the road and measure the level of pollution coming out of tail pipes of vehicles (as with MaPaSe)? Polluting vehicles need to be fined.

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There is a lot that can be done. It requires willingness and commitment from our political as well as bureaucratic leadership. ■

Source: <http://www.myrepublica.com/news/16134/>

“We shall phase out LPG”

The following is a translation of a Nepali Article

Energy Minister Mr Janardan Sharma restates the same thing EDC has been talking about replacing the LPG gas with electric cooking induction stoves. This along with the domestically assembled electric vehicles and micro grids can easily replace the petroleum products which is the largest import in Nepal. Hence, making our country economically independent and vastly reducing our trade deficit. And thus, ultimately investing the national budget in the one and only crucial developmental sector i.e. energy.

The opinion of Minister Sharma is published in Annapurna Post. The English version is translated by EDC which is summarised in the paragraph below:

Kathmandu: Energy Minister Mr Janardan Sharma has recently announced the phasing out of Liquid Petroleum Gas (LPG) and formulation of a governmental policy that prioritises domestic energy to meet demands within the next two years.

Minister Sharma outlined working to replace LPG with electricity within the next two years on ‘National Energy Crises and Development Decade 2072 and Jantako Pani Janta ko Lagani’, an interaction program hosted by Water Resources & Energy Journalists Society Nepal (WAREJ) in the capital on Wednesday.

Currently, Nepal imports 65.0 billion NPR (608 million USD) worth of LPG annually. Dr. Amrit Man

Nakarmi, Professor at the Institute of Engineering, Tribhuvan University ascertained that in order for electricity to displace LPG, Nepal needs to add around 600 MW to the national grid. Even though Minister Sharma did not elaborate further on the plan to replace LPG with electricity, he mentioned that the government has been working fully on the project to add not 10,000 MW but 20,000 MW to the national grid. Minister Sharma stated that he expressed prioritising meeting Nepal’s energy needs during his meeting with the President of Asian Infrastructure Investment Bank (AIIB) Mr Jin Lique in the Ministry on Wednesday. Expressing interest on Nepal’s various projects, Mr. Jun Lique stated that after meeting one’s energy needs, Nepal could sell any surplus electricity to neighbouring countries such as India, China and Bangladesh.

Minister Sharma stated that the government has moved forward ‘Nepal ko Pani, Janata ko Lagani’ with a vision of entitling Hydropower shares to each Nepali household and has collected more than seven billion NPR in investment commitment to the same. Construction of East-West 765 kV Transmission Line, River basin-based different high voltage transmission lines and substations have been boosted by the ministry, stated Minister Sharma. ‘There is no need to that the generated electricity would be lost, as 10,000 MW electricity would be readily consumed.’

Mr Dinesh Kumar Ghimire, Joint Secretary of the Energy Ministry

stated that the success in reducing load-shedding can be credited to the collaboration of all the concerned stakeholders in the energy sector. He further stated that the ministry looks forward to deploy a 37-point program to implement the Energy Crisis plan put forward by the government last year.

Joint Secretary of the Ministry Mr Chiranjibi Chataut, who presented the plan and project declared by the ministry, announced its gradual implementation. On the topic of its implementation in the coming days, he mentioned the task force assembled for its implementation, the report that has been prepared and the discourse relating to its progress.

Managing Director of Nepal Electricity Authority (NEA) Mr Kul Man Ghising reiterated on the success of ending load-shedding in the capital and all the other major cities of Nepal and stated prioritising curbing energy leakage on the coming days. He stated that NEA in the past six months has averted the loss of 250 million NPR (2.34 million USD) worth of electricity by curbing energy leakage. He further stated that NEA plans to avert the loss of 2.50 billion NPR (23.4 million USD) worth of electricity by curbing energy leakage within the next one year.

President of Independent Power Producers’ Association, Nepal (IPPAN) Mr Shailendra Guragain suggested the Energy Minister and the Managing Director that the focus should be on the growth of electricity consumption in the coming days. ■

Source: <http://www.annapurnapost.com/news/65618>

NEA to save Rs 2.5 billion

There is something to cheer for Nepal Electricity Authority (NEA), the power utility steeped in huge loss, as it has achieved substantial progress in loss reduction.

NEA has reduced leakage to 23 per cent in the first six months of this fiscal as compared to 27.78 per cent in the corresponding period of last fiscal, according to Kulman Ghising, managing director of NEA. "We have generated Rs 1.25

billion revenue from leakage control in six months of this fiscal and if we maintain this progress we will have additional Rs 2.5 billion revenue at the end of this fiscal from leakage control." As per Ghising, NEA has been trying to control leakage to the best of its ability except for unavoidable technical losses.

The power utility has been losing around Rs 15 billion (as per the

current tariff structure) every year through leakage. He also said that NEA is going to obtain a loan of \$120 million from Asian Development Bank to enhance the distribution system to end load shedding in a sustainable manner. "Our distribution system in Kathmandu cannot bear a load of above 400 megawatts. This is why we are going to enhance the distribution system eyeing the electricity demand in Kathmandu in the future." ■

Source: <https://thehimalayantimes.com/business/nepal-electricity-authority-save-rs-2-5-billion/>

Lack of grid synchronisation affects power supply in Valley

Lack of proper protection system in Nepal-India power grids for electricity trade has been causing repeated technical glitches in the central grid.

As Khimti-Dhalkebar transmission tower started tripping on Tuesday night, power supply to the central grid was affected and it took around an hour to recover supply.

Until Nepal Electricity Authority (NEA) installs all required protection measures, which is called power grid synchronisation, more of such technical glitches can be expected in the coming days whenever big consumers (industries) stop using power and there is suddenly high current flow to the central grid.

Currently, NEA has been bringing imported power to Kathmandu via Dhalkebar-Khimti transmission line without carrying out grid synchronisation between the power grids of India and Nepal. The repeated technical glitches in the central grid due to lack of proper protection system has posed a risk of the central grid collapsing.

Nepal has been importing 145 megawatts of electricity through Muzaffarpur (India) to Dhalkebar (Nepal) cross-border transmission line. A large chunk of the imported electricity is being supplied to Kathmandu and when the problem occurs in Dhalkebar-Khimti transmission towers the whole power supply system in the central grid gets affected.

As per its plan to end load-shedding, NEA started bringing imported power to Kathmandu after completion of Khimti-Dhalkebar transmission line. However, the power utility overlooked the possible risks like system failure due to lack of grid synchronisation.

The Nepal-India joint committee has already finalised study on grid synchronisation at 220 kV level, which has suggested the need to install df/dt relay (a special system used to identify abnormal changes in frequency and take remedial actions to prevent overload and the resulting blackout) and direct communication system between Dhalkebar Substation and load

dispatch centre of Nepal.

However, the 220 kV substation in Dhalkebar is yet to be completed. According to NEA officials, it will take another three months for the Dhalkebar substation to be completed. "Without completion of 220 kV substations, we cannot carry out power grid synchronisation as recommended by the joint study team," one high level official at NEA told The Himalayan Times on condition of anonymity.

Though it will take several months before the grid synchronisation process can be carried out, the power-starved NEA decided to bring imported electricity to Kathmandu by installing only normal protection measures within a short period of time to end the rolling blackouts of Kathmandu Valley from this dry season (December to May).

NEA officials have said that the grid synchronisation will be conducted during wet season when country itself has sufficient power as generation of run-of-the-river (RoR) projects increases. ■

Source: <https://thehimalayantimes.com/business/lack-grid-synchronisation-affects-power-supply-kathmandu-valley/>

Additional 100 MW to be imported

Following the transmission line upgradation of Kataiya-Kusaha and Raxaul-Parwanipur transmission line, Nepal Electricity Authority (NEA) is preparing to import additional 50 megawatts electricity from each for this dry season (till May or June).

The power utility has proposed NTPC Vidyut Vyapar Nigam Ltd (NVVN) to sign power purchase agreement for up to 100 MW more. NVVN is the nodal agency appointed by Indian government for cross-border electricity trade. Currently, NEA is importing 130

MW from Kataiya-Kusaha and 10 MW from Raxaul-Parwanipur. “We have written to NVVN and negotiations will be held soon,” said Prabal Adhikari, chief of Power Trade Department of NEA. “We are trying to import 100 MW additional power by this dry season.” ■

Source: <https://thehimalayantimes.com/business/lack-grid-synchronisation-affects-power-supply-kathmandu-valley/>

Improving power lines next on NEA's agenda

After achieving the miraculous feat of eliminating load-shedding at major places in the country, the Nepal Electricity Authority (NEA) has prioritized the upgradation of old transmission lines and the construction of new ones in a bid to ensure smooth distribution of power.

The state-owned power utility has been mulling to erect a number of power lines in the country along with a few cross-border transmission lines connecting neighbouring countries.

“We have put our focus on the development of transmission lines as they are very essential for efficient distribution of electricity throughout the country,” said NEA Managing Director Kulman Ghising, speaking at an interaction programme on Nepal's transmission network system on Wednesday. “We are considering building different transmission lines for different river basins.”

Likewise, NEA Director Hitendra Dev Shakya outlined the power utility's strategy to optimize the national energy grid by constructing six cross-border interconnection corridors and 11 transmission lines considering the projected

power output of 22,000 MW by 2035.

“A review is in progress and it will study the requirements and feasibility of major transmission projects such as the east-west transmission highway of 400 kV and 765 kV, mid-hill transmission corridors of 400 kV and 220 kV and north-south corridors of 220 kV and 400 kV,” said Shakya.

Representatives of independent power producers (IPPs) participating in the programme complained that national power producers were discriminated against by the NEA.

“There is a special provision for transmission lines for foreign power producers, but there is no such provision for national producers,”

said Atma Ram Ghimire, managing director of Liberty Energy. “Domestic power producers are finding it difficult to evacuate their energy due to lack of transmission lines.”

Ghimire said that double circuit transmission lines could evacuate more energy than single circuit transmission lines. He added that IPPs were ready to adopt a build, own, operate and transfer (BOOT) model to develop power lines.

The interaction programme was organized by the Energy Development Council with the objective of identifying major problems to create an effective transmission line system and various measures to remove bottlenecks in the system resulting in a more effective and beneficial power system. ■



Source: <http://kathmandupost.ekantipur.com/news/2017-03-17/improving-power-lines-next-on-neas-agenda.html>

GLOBAL PERSPECTIVE

The link between Alzheimer's and Air Pollution

Alzheimer's disease is a progressive brain disease that eventually strips sufferers of their ability to remember, communicate and live independently. By 2050, it is projected to affect nearly 14 million Americans and their families, with an economic cost of one trillion dollars – more than the estimated combined total for treating heart disease and cancer.

Of the leading causes of death in America, Alzheimer's disease is the only one that we currently cannot prevent, cure or even stall. Our latest research seeks to change this situation by providing a better understanding of the environmental causes and mechanisms behind the disease.

Our findings lead us to conclude that outdoor air pollution, in the form of tiny particles released from power plants and automobiles that seep into our lungs and blood, could nearly double the dementia risk in older women. If our results are applicable to the general population, fine particulate pollution in the ambient air may be responsible for about one out of every five cases of dementia.

This study, the first to combine human epidemiologic investigation with animal experiments, adds to a growing body of research from around the world that links air pollution to dementia. It also provides the first scientific evidence that a critical Alzheimer's risk gene, APOE4, interacts with air particles to accelerate brain aging.

Where there's smoke

Previous research at the University of Southern California has already established that air pollution accelerates the risk of having a heart attack. Based on this work, we established the AirPollBrain Group to examine whether and how exposure to fine particulate matter – known as PM2.5 because the particles measure 2.5 micrometers or less in diameter – impacts the aging brain.

We designed this study to answer three broad questions. First, we wanted to know whether older people living in locations with higher levels of outdoor PM2.5 have an increased risk for cognitive impairment, especially dementia. We also wanted to know whether people who carry the high-risk gene for Alzheimer's disease, APOE4, are more sensitive to the damage potentially caused by long-term exposure to PM2.5 in the air.

Our third question was whether similar findings could be observed with controlled exposures to particles in mice modified to carry human Alzheimer's disease genes. If we found similar effects in mice, it could shed light on possible mechanisms underlying what is happening in human brains.

We focused on older women and female mice because APOE4 confers a greater Alzheimer's disease risk in women than in men.

Human subjects

For the human epidemiologic study component, we collaborated with

investigators from the Women's Health Initiative Memory Study, or WHIMS, which followed a large group of older women nationwide, starting in the late 1990s when these women were 65 to 79 years old but did not have dementia or any significant cognitive impairment.

We combined EPA monitoring data and air quality simulations to build a mathematical model that allowed us to estimate the everyday outdoor PM2.5 level in various locations where these women lived from 1999 through 2010. Because the WHIMS followed its study participants very closely, we were able to gather detailed information on other factors that may affect an individual's risk for dementia, such as smoking, exercise, body mass index, hormone therapy and other clinical risk factors like diabetes and heart disease. This allowed us to account for these other factors and better isolate the effects of air pollution exposure.

We found that women exposed to higher levels of PM2.5 had faster rates of cognitive decline and a higher risk of developing dementia. Older women living in places where PM2.5 levels exceeded the U.S. Environmental Protection Agency's standard had an 81 percent greater risk of global cognitive decline and were 92 percent more likely to develop dementia, including Alzheimer's. This environmental risk raised by long-term PM2.5 exposure was two to three times higher among older women with two copies of the APOE4 gene, compared

with women who had only the background genetic risk with no APOE4 gene.

Mouse Models

For the laboratory studies, we exposed female mice with Alzheimer genes to nano-sized air pollution for 15 weeks. The air particle collection technology, invented by our colleague Constantinos Sioutas from USC's Viterbi School of Engineering, collects air particles from the edge of USC's campus as a representative air sample from urban areas.

The experimental data showed that mice systematically exposed to this particulate matter accumulated larger deposits of proteins called beta-amyloid in their brains. In humans, beta-amyloid is considered as a pathological driver of neurodegeneration and is a major target of therapeutic interventions to prevent the onset of Alzheimer's or slow its progress. Similar to our epidemiologic observation in older women, these effects were stronger for APOE4 female mice, which are predisposed to Alzheimer's disease.

Future studies

Our future studies will look at whether these findings also apply to men, and whether any drugs under development may provide protection against air pollution exposure. More work is also needed to confirm a causal relationship and to understand how air pollution enters and harms the brain.

Brain aging from exposure to air pollution may start at development, so we also want to look at early life exposure to air pollution in relation to Alzheimer's disease. We already know that obesity and



diabetes are Alzheimer's risk factors. We also know that children who live closer to freeways tend to be more obese, an effect that is compounded if adults in the household are smokers.

Based on existing mouse models, one would predict that developmental exposure to air pollution could increase risk for Alzheimer's disease. This is an important piece of the scientific puzzle that we'd like to better understand.

Air pollution, public health and policies

Air pollution knows no borders. This gives our study global implications that should be taken seriously by policymakers and public health officials.

The Clean Air Act requires the Environmental Protection Agency to develop National Ambient Air Quality Standards that provide an adequate margin of safety to protect sensitive populations, such as children and the elderly. In 2012 the EPA tightened the U.S. standard for PM2.5. Nonetheless, in 2015 nearly 24 million people lived in counties that still had unhealthy year-round levels of particle pollution, and over 41 million lived in counties that experienced short-term pollution spikes.

Recent studies have shown that the prevalence of dementia in the United States declined between 2000 and 2012. However, we don't know whether this trend is connected to air pollution regula-

tions, or if exposures to lower levels of PM2.5 in recent years still pose some degree of long-term threat to older Americans, especially those at risk for dementia.

If long-term PM2.5 exposure indeed increases the risk for dementia, this would imply that public health organizations are underestimating the already large disease burden and health care costs associated with air pollution. For instance, the World Health Organization's latest assessment of the global burden of disease caused by PM2.5 does not include dementia. Air pollution levels are much higher in India, China and many other developing nations than U.S. levels.

Similarly, EPA has estimated that the Clean Air Act will provide almost US\$2 trillion in benefits between 1990 and 2020, much of it from reduced deaths and illnesses. If there is a connection between particulate pollution and dementia, the Clean Air Act may be providing even larger benefits than EPA's estimate.

The U.S. National Plan to Address Alzheimer's Disease, which was mandated by legislation enacted in 2011, aims to prevent or effectively treat Alzheimer's disease by 2025. We believe any measures that undermine EPA's operation or loosen clear air regulations will have unintended consequences that will make it challenging to meet this goal. ■

Source: <https://www.weforum.org/agenda/2017/03/this-is-the-link-between-air-pollution-and-dementia>



EU Backs 600-MW Kriegers Flak Wind Farm in Danish Waters

The European Commission on March 28 determined that its support of the 600-MW Kriegers Flak offshore wind farm in Danish territorial waters is in line with EU state aid rules. The commission said the project will help Denmark reduce CO2 emissions, in line with EU energy and climate goals, without unduly distorting competition.

"The Kriegers Flak offshore wind farm will help to cut carbon dioxide emissions while the support is carefully designed to avoid distorting competition in electricity

markets. I'm glad to be able to approve state support for this project," Margrethe Vestager, commissioner in charge of competition policy, said in a statement.

According to the commission, Denmark in February submitted a notice to the commission for a state support measure consisting of a competitive bidding process for the design, construction and operation of Kriegers Flak.

The support will be granted as a premium on top of the electricity price in the Nord-Pool market, the commission said. The tender was

carried out in 2016 and the winning bid was DKK 0.372/kWh (around US\$53/MWh) to be paid for a total of 30 TWh of production. No aid will be granted when prices are negative.

In addition, a new interconnector will be established to link the Danish island of Zealand to Germany via the Kriegers Flak offshore wind farm and two German offshore wind farms — Baltic 1 and Baltic 2. The commission said that the interconnector will allow for an increased exchange of electricity between Denmark and Germany. ■

Source: <http://www.renewableenergyworld.com/articles/2017/03/eu-backs-600-mw-kriegers-flak-wind-farm-in-danish-waters.html>

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Energy Development Council (EDC) is a non-profit umbrella organisation of the entire energy sector of Nepal established to ensure every Nepali has access to energy and energy security by promoting favourable policies and investments. EDC consists of Energy Developers, Energy Associations, Energy Consumers, Energy Financiers and other funds, Consumer Institutions, Energy Contractors from both private and government sectors involved in hydropower, solar, wind and other renewables, generating more than 80 percent of the nation's total electricity.



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