



ENERGY COMMUNIQUE

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EDITORIAL

Dear Reader,

Over the past year, Nepal took important steps to end its chronic energy deficit. New hydropower projects (HPPs) began commercial operations, construction continued on new transmission lines, and by importing electricity from India and strengthening management at the Nepal Electricity Authority (NEA), Nepal's persistent load shedding was greatly reduced. Additionally, three large HPPs are moving toward financial closure. Although this is significant progress, the most important steps to fulfill Nepal's energy potential lie in the immediate future. While the construction of new projects and transmission lines is important, the most critical work now is to establish and

implement the policies and regulations that make the private sector feel confident about investing in Nepal's hydropower sector. And why is this critical? Because reliable, affordable, and sustainable energy that can meet domestic and regional demand is the key to Nepal's economic future.

The first step in constructing better policies and regulations is establishing an independent regulator. A bill to do just that was tabled in Parliament. Nepal is one of only a handful of countries in the world without a regulator for the electricity sector, despite the benefits that are universally acknowledged to flow from strong, capable regulation. Establishing an independent electricity regulator is critical for a number



H.E. Ms. Aliana Teplitz
US Ambassador to Nepal

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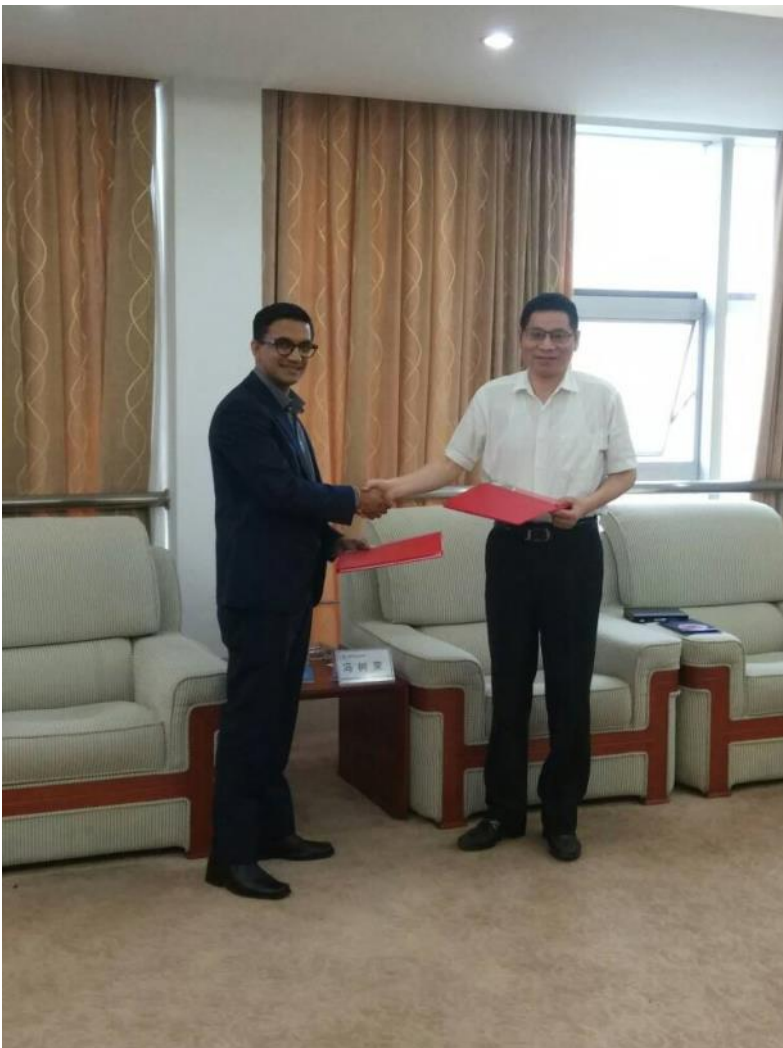
of reasons. Sector regulators help curb the power of natural monopolies to control market access, prices, and service quality. When monopolies flourish, customers suffer. By limiting the power of existing monopolies, the regulator makes the market more attractive to private investors because only a regulator can ensure a level playing field. Regulators contribute to a more effective and efficient sector by promoting transparency and good governance in all sector activities. Increased transparency has many benefits: it means that data and other information will be publicly available, that there will be public meetings to discuss sector developments and that there will be advance public notice of the regulator's proceedings and intentions. By operating under transparent procedures, the regulator reduces some of the risks that drive away investors. The regulator would also work closely with its counterparts in India, Bangladesh and other neighboring countries on cross-border tariff matters, developing and enforcing technical standards including grid codes, market rules, disciplinary mechanisms, and other matters of cross-border integration. By establishing benchmarks for the financial parameters of hydropower projects, such as return on equity, depreciation, capital costs and expenses for operation and maintenance, the regulator also provides important data points, more consistent guidelines and clearer policies, resulting in increased confidence levels for foreign and domestic companies looking at Nepal's hydroelectricity sector. In addition to establishing a regulator, the second step is for the Government of Nepal (GON) to take additional actions to reform the sector. Unbundling the NEA into three separate entities, for generation, transmission and distribution, each under the oversight of the regulator, will help create a more attractive environment for investors. Currently, NEA is the monopoly provider of transmission services in Nepal. NEA also sets the prices and is the single buyer of electricity produced by private and state-owned generators. NEA is the owner, operator, and executor of all of the activities necessary to produce, transport, and sell electricity, operating without independent supervision with the potential – and the power – to give preferential treatment (better grid access, lower rates) to state-owned power generators, freezing out the private sector. Such unfettered power could drive private developers away from Nepal's unmatched opportunities. Step three is building capacity and confidence within the GON. With dozens of proposed hydropower projects, the GON will need to be adept at drafting and negotiating Project Development Agreements (PDAs) and Power Purchase Agreements (PPAs). Through the U.S. Department of Commerce's Commercial Law Development Program (CLDP), the U.S. Government has been assisting decision makers within the Ministry of Energy (MoE) and NEA through a series of workshops to learn how to negotiate PPAs and mitigate risk for power projects. A third workshop next month will delve into

procurement issues, including of energy on its hands. Better on improving Nepal's transmis- contract and tender preparation and more efficient transmission sion sector. Developing Nepal's for power projects. USAID's Ne- lines and can play a vital role in energy resources is achievable. pal Hydropower Development providing energy throughout The ingredients are in place for Project is providing policy and South Asia, and Nepal is in a Nepal to finally create reliable, legislative advice, transactional unique position to supply elec- affordable, and sustainable elec- assistance, and capacity building tricity for millions of people and tricity, meeting the energy needs for the MoE, the Department of to reap the benefits of these ex- of Nepal and the region and cre- Energy Development, the Invest- ports. In order to help Nepal re- ating a bright economic future ment Board of Nepal, and the alize this opportunity, the Millen- for the country. ■

NEA. As more projects come nium Challenge Corporation is online, Nepal will have a surplus developing a program focused

EDC ACTIVITIES

EDC signs MOU with Zhongnan Engineering Corporation Limited



EDC and Zhongnan Engineering Corporation Limited has entered into a MoU to cooperate closely in the fields such as water treatment, renewable energy and infrastructure construction. Mr. Sujit Acharya, Chairperson of EDC and Mr. Feng Shurong, President of Zhongnan Engineering signed the agreement. Zhongnan Engineering Corporation Limited is a part of Powerchina "World's largest energy company with involvement in 50 percent of all the worlds hydro projects". ■

EDC Chairperson meets Ambassador of Nepal to Thailand at the Embassy, Bangkok

Mr. Acharya pays visit to His Excellency Dr. Khaga Nath Adhikari, Ambassador of Nepal to Thailand and discussed about how to bring energy cooperation closer between the two countries. ■



Announcement Of Nepal Power Investment Summit 2017

EDC is organizing Nepal Power Investment Summit 2017 from 10th November to 12th November, 2017 in Hotel Hyatt, Nepal to be inaugurated by Rt. Honorable President of Nepal. This is the largest energy investment Summit happening in Nepal with the main attraction of having an Energy Mart bringing more than hundred investors, financiers & contractors of over 10 billion US dollars capacity. They would be coming

from around the world and make deals with the Nepali energy developers/companies who would be showcasing over 100 ready to be invested energy projects.

As there is an utmost need of financing in Nepal, a two days training session on EPFC would be conducted by two well recognized institution from Norway and China. Energy ministers from SAARC countries and high level delegates from both national and international govern-

ments as well as private sector from all parts of the world would be delivering key note speeches in the conference with approx. 500 participants. There would be a strong presence of national and international media throughout the Summit. The Council invites all the interested stakeholders to join such a grand event and welcomes suggestions that will enhance in making the summit a grand success.■

“Inventory of Rivers in Nepal” – Books Available For Sale

The book is a detailed study of the numbers of rivers and rivulets of Nepal. The newly findings show that there are more than 11,614 rivers and rivulets in Nepal.

The book was inaugurated by Dr. Yubaraj Khadiwada, Vice Chairperson of National Planning Commission during Nepal Power Investment Summit held on May 31st to June 3rd, 2016 organized by EDC and Neo Venture, Government Organizer IBN and Ministry of Energy, Nepal. The copies are available at EDC Office, Kamaladi, Kathmandu, Nepal. For further information, you may please contact at our office number +977–4169116/17 or e-mail us at info@edcnepal.org.■

Inventory Of Rivers In Nepal



Prepared By



Compiled By



Experience sharing from participating EDC members on Smart Grid Seminar, Changsha, Hunan Province, China.

Mr. Jiwan Mallik, Solar Power Expert. AEPC

Smart Grid is one of the well-liked topic in the Power Market globally. It is seen that World's Powerful Leaders often talk about this topic. Though, I am Power System professional, I always eager to learn recent trend on Smart Grid. Fortunately, Smart Grid Workshop 2017 organized by Power china Zhongnan Engineering Corporation Limited has given immense opportunity to learn how the Smart Grid technologies has been implemented in China and other countries. It is perceived that the Generation and Transmission sector has implemented the smart technologies since decades long. Such as, the introduction of Flexible AC Transmission System (FACTS) and Wide Area Measurement System (WAMS) in the power grid has added more flexibility and adaptability in the power grid. Similarly the SCADA system

which includes Energy Management System (EMS), Unit Commitment, Optimal Power Flow, Load Flow, Fault Analysis, Contingency Analysis, Economic Load Dispatch etc. Besides this, the challenges was in the distribution system, more precisely the data communication between utility and individual household is foremost challenge. I learnt that China has already developed and implemented smart technology for distribution system as well. For example, charging/discharging of Plug in Electric Vehicle (PEV) with the grid, penetration of distributed renewable energy sources in the grid, time-scheduling of electric appliances according to real time pricing of electricity etc were the challenges that Smart Grid sector was facing. The recent research and development has overcome such problems and China has already piloted Smart Cities. The experiences shared with the case study during the event

was key learning for me. The Concept of "Energy Internet" has been presented in during the workshop. Which was new terminology for many Power System Engineers participated in the workshop. The Energy Internet is basically interconnection of national and regional power grid to form a interconnected global grid network. China has initiated this work already like One Belt One Road (OBOR) idea. Moreover, the concept of Combined Cooling Heating and Power (CCHP) has been already piloted for manufacturing industry and few airports which was also very novel thing I learnt. In nutshell, this workshop has given immense learning opportunity on the topic of Smart Grid. Before, participating in this workshop, I had a belief that people won't get enough learning from the workshop/seminar in China. However this visit has changed my perception. Moreover, the site visit to on-shore wind farm, Gas

commercial office of Power china company in Changsha has given practical experience on the power and renewable energy sector. I am confident that I will be able to use the knowledge gained during the workshop to the development of Smart Grid in Nepal. Lastly, I will be remain indebted to Energy Development Council (EDC) for recommending my participation to organizer. I highly recommend Engineers to participate in this particular workshop if you get chance.■

Mr. Prabal Bhattarai, Engineer (Butwal Power Company)

As an electrical engineering working in the utility side, I have been fascinated by smart grid technology ever since I came across this subject a couple of years back. I had been poring over materials in the internet regarding smart grid system and associated technology. Fortunately, I got an opportunity to delve in this subject matter. Through Energy Development Council, I attend a seminar of 19 days in Changsha China on “Smart Grid Planning and Construction for Developing Countries”. The seminar was sponsored by The Ministry of Commerce of the People’s Republic of China and operated by Power China Zhongnan Engineering Corporation Limited. I was looking forward to this opportunity where I expected to get some detailed exposure on recent developments, application and future trends in smart grid technology. The course on smart grid was comprehensive and covered a wide range of renewable energy sources and associated technology to integrate them to the conventional power grid. Furthermore, the seminar provided us with an opportunity to interact with manufactures and leaders in the field of smart grid technology. In addition, field visits to wind farm and high voltage substation allowed us to understand field application side of smart grid system. With growing concern for global warming, most of the developed nations have already pledged to cut down on carbon emission via replacement of conventional energy source based on fossil fuel with renewable energy sources. In order to accommodate fickle renewable energy resource and micro-grids in the conventional grid system, smart grid technologies are imperative. Further, with smart grid technology and energy internet, grid companies will be in a better position to harness the benefit of renewable energy and address climate concern. During the seminar we visited 128 MW wind farm situated in Shaoyang of Hunan Province was quite interesting as I was visiting a wind farm for the first time. It was interesting to note that both over and under speeding of turbine runners is not appropriate for energy generation. We also visited a 500 kV smart substation. It was remarkable in terms of scale (had seven 110 kV bays and two 500 kV bays) and used the latest in the field of smart technology. Further, they have area provisioned for future augmentation as well. A visit to NARI Technology at Nanjing in Jiangsu Province allowed

us to keep abreast with the latest advancement in micro grids and smart grid technology whereas visit to Waison Group near Changsha allowed us to closely monitor devices and

equipment used in smart grid. All in all, an indirect perk of this seminar was interaction among experts from diverse countries like South Africa, Georgia, Bangladesh, Panama, Malawi, Paki-

stan, and others. This seminar provided us a platform to share our experience and discuss on how to use smart grid technology in our own homeland. ■

Some important visits in China

Visit to MDKA Factory



Just a year, the magic emperor card cool car has successfully developed a knight, pedal, cross country, street running and other different styles of products, high power power configuration, front and rear disc brake system, fashion cool design, the whole Aluminum carved modified to upgrade, the whole body of stainless steel screws and other details of the quality, by the industry dealers and market consumers alike. ■

Visit to GCL Power Group Co. , World's biggest solar company

GCL power (Group) Co., Ltd. Is a subsidiary of GCL (Group) Holdings Co.Ltd. Our business scope incorporates power generation of all kinds, including efficient thermal power , pumped storage, hydropower and nuclear power, with an installed capacity of 8540MW (including units in operations, in our manage-

ment and under construction). GCL Power is also developing electricity allocation and distribution, as well as carbon asset management. GCL Power is an intergrated international energy group and a leading private power enterprise in China. Adhering to its philosophy of “bringing green power to life”, GCL Power Provides the society with efficient clean energy and

improves the living environment for mankind. Driven by innovations and in pursuit of excellence, we take “becoming the most respected global clean energy company” as our vision. GCL Power is committed to become the most influential and competitive clean energy developer and operator , and strive to maximize the values of our stakeholders..■



MEDIA COVERAGE



— Rajan Tiwari

CBG- A potential Substitute for LPG

The term, Gobar Gas, referring to biogas generated from cattle manure (Gobar) is not new in Nepal. Since the first biogas system was installed at St. Xavier's School in Godavari in 1955, biogas has been synonymous to cooking gas in rural part of Nepal. With support of various international donors and the private sectors, Alternative Energy Promotion Center (AEP) has

been constantly working for the development of biogas sector in Nepal with over 300,000 installations. Although, biogas has found great popularity in rural areas, the urban centers are heavily dependent on Liquid Petroleum Gas (LPG) for cooking, and thus had to endure acute shortage during the economic blockade of India in September 2015. This blockade was an eye-opening moment for Nepalese people on how dependent we are on our southern neighbor

for petroleum products to meet our energy demand. While it might not be possible for us to find alternatives of petrol and diesel in near future, Nepal can certainly try to reduce its dependency of LPG cylinders for daily cooking and heating by looking into an alternative fuel. One such potential substitute could be compressed biogas (CBG).

The CBG is produced by the compression of biogas after purification and stored in suitable

MANAGE ORGANIC SOLID WASTES EFFECTIVELY

cylinders for distribution. Biogas, produced by decomposition of organic materials in absence of oxygen in a digester, consists of about 55-70% Methane (CH₄), and remaining 30-45% consist of other gases like water vapor, Carbon dioxide (CO₂), and hydrogen sulfide (H₂S). Since Methane can be burned to generate energy, the biogas must undergo upgradation and purification to remove the impurities like water vapour, CO₂ and H₂S and significantly increase the concentration of CH₄. Owing to the constant advances and improvements in technology, it is now possible to enrich biogas with over 90 percent methane concentration. After purification, the enriched biogas undergoes multiple stages of compression and is stored in suitable cylinders and can be distributed to residential as well

as industrial sectors, just like the LPGs. The CBG has energy content of 52.5 MJ/kg (Methane) compared to 49.58MJ/kg (Propane based LPG) can also find its application for electrification with suitable gas generator and also in the transportation sector. Although the technology associated with the compressed biogas plant is fairly new in Nepal, the biogas plant have been effectively used for waste management throughout the world. An example of municipal waste management in Nepal can be seen in Kathmandu Metropolitan city, which piloted a waste to energy plant at Teku to produce 14KWs of electricity by processing 3 tonnes of organic solid waste each day. Thus, Nepal could certainly bring the proven technologies for setting up CBG plants through suitable

technology providers from neighboring countries. Since the associated costs for developing CBG plants are significantly high, the government of Nepal should incentivize the businesses to install commercial CBG plants for effective waste management, for organic fertilizer production and also promote the use of CBG as substitute of LPG.

With the increasing number of commercial livestock farms to cater the need of meat and dairy products in Nepal, the businesses could look into installation of biogas plant as an effective way to manage their waste, more significantly the excreta of animals. The biogas plant will not only help in waste management but also open avenues for economic development through the sales of CBG and organic fertilizer. However, since the CBG plants are capital intensive, it might not be economically feasible for small livestock farms to operate their own plants with purification and bottling system. Nevertheless, few farms can form a cluster and operate one CBG plant at a suit-

able location. Alternatively, the livestock farms can sell their substrate at a minimum cost to other commercial CBG plant operators.

Following the successful implementation of household biogas plants in the rural areas of Nepal, AEPC is now supporting the development of large scale commercial as well as municipal biogas plants. AEPC also provides subsidy to developers and businesses to set up biogas plant for effective management of solid wastes. In spite of the subsidy from AEPC, it is still difficult for the business to create a market for CBG. Even with a 20% reduction in cost of CBG per kilogram compared to LPG, it could be difficult to penetrate the market due to exorbitant cost of CBG cylinders. An empty CBG cylinder capable of storing

equivalent amount of LPG would cost about 10 times the cost of an empty LPG cylinder.

In addition to the effective and efficient solid waste management, the biogas plant produce CBGs and organic fertilizers as valued products and aid to the overall economic development of the nation. The CBGs can not only provide clean energy for cooking and heating in household and industries but also be used for electrification. Thus, the government should bring in more supportive policies and regulations to promote the development of large scale commercial and municipal biogas plants. The successful implementation of policies like import duty and VAT exemption on imported technology and materials for biogas plant installation would certainly incentivize the

developers and builders to construct biogas plants. Other schemes to subsidize CBG cylinders and tax relaxation to business using CBGs would certainly attract hotels, restaurants and industries, etc. to use CBGs to meet their cooking and heating needs. With supporting policies and public private partnerships to install compressed biogas plants, Nepal could certainly one day be able to effectively manage the organic solid wastes and also reduce its dependency of LPG from neighboring countries to some extent, if not fully. ■



The author is renewable energy officer at WindPower Nepal

NEPAL'S SCENARIO

- Surya Bhakta Pokharel and Bishnu Prasad Bhandari

OBOR initiative: Its implications for Nepal

It may be a great opportunity for Nepal to play a bridging role between two big countries and to have global connectivity. Attracting FDI into the country with flexible policies and legislation could be the need in the initial period of economic transformation

The initiative is inspired by Silk Road, the medieval trade routes between Europe and Asia, will be a vast network of sea and land routes across dozens of countries impacting 4.4 billion people. Boosting global trade along with building infrastructure in the countries that they cannot afford themselves is the main expectation of OBOR concept. It is said that China is making investments of USD 1 trillion on this mega project which includes building of railways, roads, ports and other infrastructure.

The main reason for China on the OBOR initiative could be; (i) falling exports, (ii) sluggish economic growth both globally and locally, (iii) persistent need for China to structurally transform its economy from being driven

by government investments and exports to a more consumer driven model.

Due to the nature of its economic growth model, China has created a problem of serious overcapacity in many of its industries. China's enduring emphasis on heavy industries over the past two decades, as well as government being a decisive force in the country's economy, are two of the key reasons for this overcapacity.

In terms of infrastructure and trade, the participating countries who have no or less capacity to build the infrastructures which they cannot make themselves, will definitely be benefited. Besides, such countries will have easy and fast access to those projects and their products are easily tradable in the international market.

On the other hand, the trade

routes will give China new markets. It can put its infrastructural footprints in dozens of countries in Asia and Africa. Its presence in many small countries in the long term way will give China an edge over its rivals in trading with these small countries.

It will be easier to China to impart its manufacturing process into those small developing countries at cheaper labor costs. Also, OBOR initiative could create a vast economic empire in Asia and Africa, if turned into reality.

Nepal has ample opportunities to be in between two big giants in terms of global trade. Anything produced can easily be traded in the global markets. Nepal is touted as a transit bridge for the second biggest economy in the world to reach South Asia.

Nepal, though a poor underdeveloped nation, is rich in terms of natural resources. Hydropower, tourism and agriculture are three prominent sectors for converting the country from poor to developing and then ultimately a developed nation.

To best utilize those natural resources it needs huge investments in mega infrastructural projects. Development of those sectors is only possible with wide network of seas and land routes across many countries.

For example, there is possibility and technical feasibility to generate 42,000 MW electricity from various rivers of Nepal. With access to dozens of countries through OBOR, the produced electricity can easily be saleable in the global market.

Similarly, even if a small fraction of people from the two big giant neighboring countries entered Nepal as tourists it would be a milestone achievement for Nepal to lift the economy.

There will be a positive environment for Foreign Direct Investment (FDI) wherein the confidence of international investors

increases along with access to a wide network. Nepal can take benefit of FDI and can be a user of global products. Joining the OBOR will bring Nepal investments and experience from across the world.

Every coin has two sides. OBOR is also not an exception. It is criticized that China will lend money for OBOR projects to host countries at high rates of interest which the countries may not be able to repay.

This can lead to China acquiring equity and then controlling stakes in these projects, getting a permanent footprint in several small countries which is nearly impossible for it to achieve otherwise.

Another criticism is that China's plan to build ports, roads and railways in under-developed Eurasia and Africa is out of political motivation rather than real demand for infrastructure.

Nepal has entered into a Memorandum of Understanding (MoU) with China for participation in OBOR which aims at promoting cooperation on promoting connectivity of facilities, trade con-

nectivity, financial integration and connectivity of people.

Irrespective of criticized factor of OBOR, Nepal is in need of investment to build the infrastructure which may take years to build by itself. Also, it should plan, design and start building infrastructures directly linked to the OBOR projects.

Economic transformation is only possible once mega projects materialize. It may be an opportunity for Nepal to convert from a 'land locked' county to a 'land linked' country.

Though some SAARC countries like India and Bhutan are unwilling to participate in OBOR, it may a great opportunity for Nepal to play a bridging role between two big giant countries, and to have global connectivity.

Attracting FDI into the country with flexible policies and legislation could be the need in the initial period of economic transformation which in turn will change the economic prospect of the country. ■

NEA to sign PPA with 22 projects for solar energy



— **Bibek Subedi**

Nepal Electricity Authority, the state owned power utility is gearing up to sign power purchase agreement (PPA) with 22 projects for generation of 61 MW of solar energy. Currently, the NEA board is reviewing the PPA template to be signed with various developers to install solar plants at 22 different locations. Once the board approves the PPA template, the power trading department of the NEA will sign PPA with the developers to purchase the solar electricity produced at their plants

for 25 years. The NEA in a bid to diversify its energy mix had published a request for the proposal in June 2016, seeking bids from interested parties to install solar plants and supply electricity to the power utility at a base price of Rs 9.61 per unit. The NEA selected more than half a dozen companies bidding for the installation of such plants. “We have selected parties that have quoted prices ranging from Rs 8.45 to Rs 9.61 per unit of electricity at different locations,” said Prabal Adhikari, chief of power trading department of the NEA.

“Since the template of PPA is ready and the developers have already quoted their price, the PPA will be signed immediately after the board approves it.” Upon signing PPA with NEA, the developer will install solar plant of installed capacity ranging from 0.5 MW to 8.5 MW at 22 different locations in the country. The largest solar power plant will be built at Butwal with an installed capacity of 8.5 MW whereas the smallest plant will be placed at Kawasoti with an installed capacity of 0.5 MW. The developers will have to complete installation of the

power plant within 18 months connected to the national grid in line with the government's policy after the signing of PPA with the power utility. "Although we have given a maximum time frame of 18 months to the developer to complete the installation and start supplying electricity, it will not take that long," said Adhikari. "Majority of the projects will be commissioned as early as 10 months." The electricity generated from the solar plants will be

via nearby substations of the power utility. "Although we have given a maximum time frame of 18 months to the developer to complete the installation and start supplying electricity, it will not take that long," said Adhikari. "Majority of the projects will be commissioned as early as 10 months." The electricity generated from the solar plants will be

NEA. According to the NEA, the developer will be responsible in evacuating the power to the nearest substation. The power renewable energy sources like solar and wind to 10 percent of total installed capacity in the country. ■

The NEA's diversification plan is

Source: <http://kathmandupost.ekantipur.com/printedition/news/2017-07-03/nea-to-sign-ppa-with-22-projects-for-solar-energy.html>

Nepal inks deal with US agency for \$500 m grant

The grant will be for 400 KVA transmission line and for maintaining 300 km of roads

KATHMANDU, July 2: Nepal and the US government have agreed to instal a mega electricity transmission line and carry out maintenance on 300 km of roads. Negotiations with Millennium Challenge Corporation (MCC), a US government foreign aid agency, on US \$500 million in grants for the two projects concluded on Friday, according to a tweet posted from Washington DC by Joint Secretary at the Ministry of Finance Baikuntha Aryal.

Officials at the Office of Millennium Challenge Nepal (OMCN) in Kathmandu confirmed the conclusion of the negotiations but details are not yet available.

The assistance provided by MCC will be a record high for Nepal from a single development partner. The Nepal government's commitment amount for the two projects is \$ 130 million. A total amount of \$ 630 million will be mobilized for the projects.

An amount of \$ 580 million is to be allocated for the double circuit 400 KVA transmission line

connecting Hetauda and Butwal via Naubise and Damauli. Another US \$ 50 million is for road maintenance.

The 278 km transmission line will smoothen the national electricity supply system and enable electricity import from and export to India.

Likewise, the road projects picked for maintenance include parts of the Mechi Highway and the Hetauda-Bhimphedi road. It took about two years for carrying out a rigorous feasibility study on the short-listed projects before entering into final negotiations for

the grant. All the projects should be completed within five years from the declared date of entry into force (EIF). Otherwise the allocated funds may return to the MCC. OMCN can count the EIF date from the completion of prerequisites such as land acquisitions. National coordinator for OMCN Tulasi Prasad Sitaula and about a dozen high-level officials are in the US for the grant negotiations. "We have information that the deal has been signed

but we are yet to receive details of the negotiation amount and budget allocations under different heads for execution of the project," informed Jay Nishaant, core team member of OMCN. Officials believe implementation of the transmission line project will be both an opportunity and a challenge. It's an opportunity because the transmission line will improve the electricity distribution system and also facilitate power exports and imports. Maintenance of

the roads enhances connectivity. With the past poor record of time and cost overruns, implementation of these projects within the set time will be a challenge. Several transmission line projects implemented by Nepal Electricity Authority have encountered resistance from both private land owners and government offices dealing with forest issues. Nepal was selected as eligible for MCC funding in December 2014. ■

Source: <http://www.myrepublica.com/news/22951/>

2017 to see record hydropower generation

NEA, independent developers adding more than 240 MW to national grid.

KATHMANDU, Jan 4: The year 2017 will set a record in power generation, people involved in the hydropower sector say.

National Energy Crisis Prevention and Electricity Development Decade (2016-2026) document.

Others say that power generation in 2017 could go even higher. "If Upper Trishuli 3A (60 MW) starts generation this year, the figure will go even higher" Gokarna R Pantha, spokesper-

Hydropower plants across the country are generating 846 MW at present, according to details updated in the website of Department of Electricity Development on December 28, 2016. Plants promoted by private sector added 121.5 MW to the national grid in 2016. NEA has not made any contribution to the



Two plants of Nepal Electricity Authority (NEA), having combined capacity of 44 MW, are starting generation in 2017, while projects developed by independent power producers will add a minimum of 200 MW to national grid this year, according to a projection made in the

son of the Ministry of Energy, said, quoting the document.

The 99-point document was unveiled in February last year with the target of eradicating load-shedding in two years, and generating 10,000 MW in the next 10 years.

national grid since 2008 when Mid-Marshyangdi Hydropower Project (70 MW) started generation.

NEA hopes to complete the Rasuwa-based Upper Trishuli 3A plant this year. Officials of Independent Power Producers' Association, Nepal

(IPPAN) said 2017 could set a record in hydropower generation. "If work of all plants progresses as per the schedule, the year will set a record in power generation," Shailendra Guragain, newly elected president of IPPAN, said. Arun Kabeli A (25 MW), Upper Chaku A (22.2 MW), Thapa Khola (11.2 MW), Khani Khola 1 (40 MW), Lower Hewa (21.6 MW) and Solu Hydropower project (23.5 MW) are some of the projects that could start power generation this year, according to IPPAN officials.

The decade-long action plan for power generation has listed all the projects that could come into generation this year. But officials say Upper Tamakoshi Hydropower Project (456 MW), which was projected to begin generation this year, won't start generation until July 2018.

"Though many projects are preparing to start generation, the chances of energy going waste are high as transmission lines are not being developed in the same pace," added Guragain. He, however, is hopeful that Minister for Energy Janardan

Sharma will put focus on transmission line projects many of which are already behind schedule.

NEA is the only authority in the country to build transmission line. From acute energy shortage to end of load-shedding Energy crisis was at its peak when the year 2016 began. Amid shortage of cooking gas, people switched to electricity for cooking. Now, life has improved with the end of load-shedding which was been in place for over a Decade. With load-shedding coming to end, industries, though barred to operate during evening peak hours, are mulling over expanding their capacity. Similarly, hotels are reported rise in profits with diesel consumption to power big generators coming to zero with the end of load-shedding. Ministry of Energy has estimated that saving from diesel will be worth Rs 16 billion year. a year Taking a leaf from the fuel crisis that the country saw during last year's Indian blockade, the government has pledged to generate more energy for self-reliance. In the decade-long

plan announced earlier this year, the government announced to end load-shedding in two years and generate 10,000 MW within a decade. The plan document drew positive response from all quarters. The country started importing additional 80 MW through Dhalkebar-Mujaffarpur Transmission Line as a contingency plan as the substation at Dhalkebar was not ready to import electricity. The country started seeing positive changes after Minister for Energy Janardan Sharma promoted Kulman Ghising to the post of managing director of NEA. Ghising brought unexpected changes in electricity supply and uninterrupted power supply in October caught many by surprise. He focused on demand-side management and strengthened existing supply systems, among others. Meanwhile, two major plants – Upper Marshyangdi Hydropower plant (50 MW) and Upper Madi Hydropower plant (2--MW) - promoted by the private sector came into generation in 2016. Minister Sharma has also instructed officials to expedite

undergoing hydropower projects. The Dhalkebar substation, temporarily. A recent agreement like Kulekhani III, Upper Trishuli which is expected to be completed within few months, will enable NEA to import additional 40 MW through Dhalkebar substation and several other transmission lines. NEA to import additional Dhalkebar-Muzaffarpur transmission line from Sunday. ■

Source: <http://www.myrepublica.com/news/12403/>

GLOBAL PERSPECTIVE

California breaks energy record with 80% of state's power generated using renewable methods

Golden State generated 67% of its energy from renewables in one day



Renewable output rose to 80% when combined with hydropower facilities George Rose/Getty

The Golden State has soaked up enough rays to generate 67.2 per cent of its energy from renewable sources last month, smashing previous records. When combining California's largest grid with hydropower facilities, renewable energy rose even further to 80.7 per cent of total energy generation on 13 May.

Thanks to ample sunshine, full water reservoirs and more solar facilities, the California Independent System Operator, the largest grid in the state, beat previous records.

LEGO reaches 100% renewable energy target three years early

California also set a new record on 16 May for wind power, producing 4,985 megawatts on one day.

"It's going to be a dynamic year for records," CISO spokesperson Steven Greenlee told SF Gate. "The solar records in particular are falling like dominoes."

Within the liberal west coast state, San Francisco is on track for its public transit system to run on clean energy by 2054.

While it leads the way in terms of renewable energy, it is also one of the hardest hit states in terms of natural disasters and climate change, including devastating droughts and forest fires.

Other states and cities are following the renewable energy trend. ■

Source: <http://www.independent.co.uk/news/world/americas/california-renewable-energy-record-80-per-cent-state-power-green-methods-water->

China is now getting its power from the largest floating solar farm on Earth

China is one of the most polluted countries in the world, according to the World Health Organisation. Beijing in particular is known for its 'smog' or extreme pollution. Recently, China's been on a mission to turn this around and become a leader in renewable energy.

The Chinese Government has announced that they've completed the construction of the world's largest floating solar farm, and it's now producing energy.

A local government official said, ***"The plant not only makes full use of this area, reducing the demand for lands – but also improves generation due to the cooling effects of the surface."***

Sungrow Power Supply have created a 40-megawatt solar power plant, which sits atop of a flooded former coal-mining town in China's eastern Anhui province. The Chinese government is committed to increasing its use of non-fossil fuels by 20% and become a super green power. ■



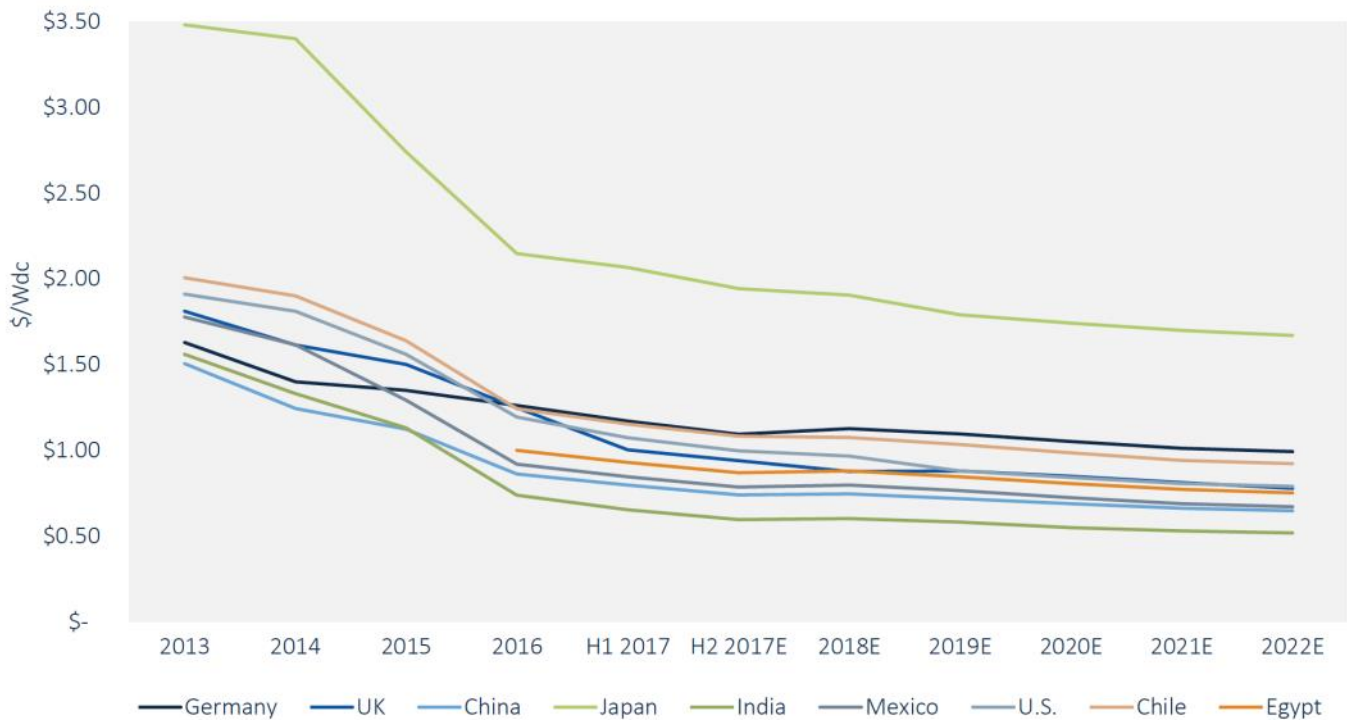
Picture: SUNGROW POWER SUPPLY CO.

Source: <https://www.Indy100.com/article/china-powered-largest-solar-power-farm-earth-renewable-fossil-fuel-floating-7759346>

Solar Costs Are Hitting Jaw-Dropping Lows in Every Region of the World

- Eric Wesoff, Stephen Lacey

Historical and Forecasted Utility PV System Pricing, 2013-2022E



Source: GTM Research

This may sound a little repetitive, but it's impossible to ignore: The decline in solar costs is not slowing down.

GTM Research expects a 27 percent drop in average global project prices by 2022, or about 4.4 percent each year. Those improvements are not limited to the U.S. They are occurring globally, and in some cases resulting in even sharper price declines than those America is experiencing.

The data comes from a new PV system pricing forecast from

GTM Research Solar Analyst

Ben Gallagher.

The plunges in system pricing won't just come from modules – they'll come from reductions in inverters, trackers and even labor costs. And every region will benefit.

"Component prices are beginning to lose their price variance from country to country," writes Gallagher. "Beyond a handful of local content requirements, many of the policies that created regional hardware pricing have been eroded by market forces."

In the U.S., it's only stubborn soft

costs such as customer acquisition that have actually risen.

And it's seemingly only trade disputes that can derail the price-decrease train.

65 cents per watt?

GTM Research finds that India's system of tenders has produced extremely competitive bidding, and, as a result, almost unimaginably low system pricing. India is seeing the lowest system prices of any major solar market in the world, ever.

The report finds that India has utility PV system pricing of 65 cents per watt.

cents per watt.

cerns about the viable lifetimes costs.

The secret to these low prices? It turns out that a great way to reduce your soft costs is to pay your labor force and engineers next to nothing. (Markets with low-cost labor are more likely to use fixed-tilt systems, lowering turnkey system prices even more.)

of many of the systems currently installed, as it is suspected that many were hastily constructed using poor-quality components. Developers will look to [engineering, procurement and construction providers] to safeguard their investment by raising installation and procurement

The U.K. has the lowest-priced solar in Western Europe, largely because of common adoption of string inverters, which shaves a few pennies per watt.

As the report points out, even in China soft costs are 11 cents per watt higher than in India.

quality-control standards reduce long-term O&M headaches," writes Gallagher.

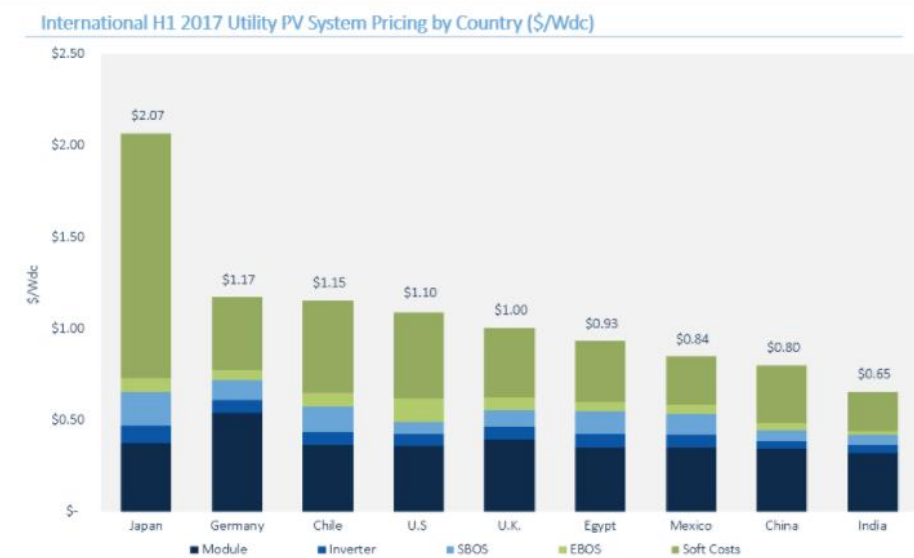
America's new trade case is a crapshoot

The compression in India's soft costs is well illustrated in the following chart.

The report also takes a close look at price trends in China, Mexico, India, Germany and the

The Section 201 trade complaint from Suniva and SolarWorld hangs like the sword of Damocles over the solar industry's head.

Pricing for multicrystalline modules fell by 12 percent from H2 2016 to H1 2017. But in H2



Source: GTM Research's PV System Pricing H1 2017

Is that sustainable? Or even a U.K.

positive thing? The reports Japan is the highest-priced market, with systems landing at \$2.07 per watt, driven by heavy

"The competitive tender process has a harmful side effect: There are reportedly widespread con-

ditional engineering scrutiny and

2017, module pricing will increase: The U.S. market will see pull-in as buyers look to build up inventory before the final ruling. Although the result of the case won't be known until much later in the year, the filing suggests a possible penalty on all imported silicon PV modules of \$0.78 per watt – \$0.41 cents higher than current U.S. module pricing. Suniva advises that the floor price step down to \$0.72, \$0.69 and \$0.68 per watt in years two, three and four, respectively. It is also asking for a minimum price of \$0.40 per watt on imported cells.

GTM Research also just released a brand-new analysis on the potential impact to demand. According to Cory Honeyman, the associate director of GTM's solar practice, those penalties could result in the destruction

of tens of gigawatts of solar installations in the U.S. through 2022. "In our latest report, we found that between 2018 and 2022, total U.S. solar installations would fall from 72.5 gigawatts

cumulatively to just 36.4 gigawatts under a \$0.78 per watt minimum module price scenario," writes Honeyman. Here's how pricing for utility-scale solar would be impacted:

Figure 1.3 U.S. Utility Fixed-Tilt System Price Forecast



Source: GTM Research

Figure 1.4 U.S. Utility Single-Axis System Price Forecast



Source: GTM Research

The trade case awaits a determination and recommendation by the ITC, followed by a decision from President Trump, who is entertaining the installation of solar panels on his border wall. ■

Source: <https://www.greentechmedia.com/articles/read/Solar-Costs-Are-Hitting-Low-Dropping-Lows-In-Every-Region-of-the-World>

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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 per cent of the nation's total electricity.



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