

Editorial

Dear readers,

As we tread toward the driest months, many of us must be crossing fingers hoping that there will be no loadshedding as have been promised by our NEA MD and the Energy Minister. And as of now it looks like loadshedding is becoming a history soon! And perhaps this might mean that it is time for NEA to focus on improving distribution system and more importantly implementing Feed-in-Tariff system to encourage distributed power generation to further strengthen the power supply source.

Many countries have implemented Feed-in Tariffs (FiTs) into their energy development plans, which are policy instruments designed to promote rapid deployment of renewable energy (RE) technologies by rewarding energy providers. Though these tariffs are not anything new or cutting-edge, they have proven to accelerate investment in RE technologies through the offering of long-term contracts to RE producers.

FiTs are applicable for a range of beneficiaries including households, enterprises, landlords, farmers, and even organizations such as hospitals, shopping malls and schools. Eligible energy providers are rewarded through payment of a cost-based price for any electricity they supply into the main grid using renewable technologies. The main purpose of the tariffs is to offer compensation to RE producers, providing price certainty and financial assistance for their RE investments. FiTs offer the energy producers guaranteed grid access, long-term contract security, and cost-based purchase prices. Implementation of these tariffs is very financially beneficial with energy producers being paid for all the energy produced including the amount that is used by themselves, bonus payments for exported electricity fed into the grid, and a significant reduction on conventional electricity bills. FiTs provide investors with a reasonable return on their renewable energy financings with policies being sanctioned in over 50 countries around the world, including Germany, India, Australia, China, Iran, Kenya, Thailand, and the United Kingdom.

Germany was the first country to introduce FiTs for RE electricity generation to encourage the utilization of novel energy technologies such as wind power, solar photovoltaics, biomass, and geothermal power. The motivation behind this decision was to meet the country's aim of having 40-45% of the electricity consumption provided from renewable sources by 2025 and 55-60% by 2035, whilst encouraging the development of RE technologies securing the nation's energy supply. Purchase prices of electricity are based on generation costs specific to varying RE technologies and their size capacities. The rates are also designed in a structure to decline annually based on expected cost reductions, which is known as 'tariff degression'.

In Germany, long-term contracts are tendered to all RE producers in an unbiased manner, and effectively run RE generation projects generate an acceptable rate of return in between 5-10%. This has resulted in the rapid advancements in RE technology and their deployment throughout the nation.

Likewise, our neighbour India too has decided to implement a methodical system of FiTs into its renewable energy market. In 2009, India's Central Electricity Regulatory Commission (CERC) announced new regulations initiating a FiT system for renewable energy including wind and solar energy technologies. Currently, CERC denotes the tariffs before tax varying the tariffs based on renewable resource intensity, i.e. low power yield sites get higher tariff. The current Indian program includes all renewables and the tariffs are based on cost of energy generation plus profit (19% Return on Equity). The contract terms for solar PV generation and hydro-power (<3MW) are 25 years and 35 years respectively, with the tariff for wind power generation based on



Mr. Zubin Shrestha
WindPower Nepal Pvt. Ltd
An EDC Member Organization

resource intensity as mentioned. The FiTs offered set to cover a number of fixed-cost components such as return on equity, depreciation, interest on loan capital, and any operation and maintenance expenses.

In countries where electricity generation from RE technologies is much more expensive than conventional methods, distribution companies are permitted to pass on additional costs to the consumers. In Nepal's case, this is a major obstacle as affordability of consumers may restrict the transfer and payment of these costs. From observing the implementation and operation of policy mechanism in various countries around the world, FiTs can be a means for Nepal to promote an interconnection of renewables to the grid.

In order to determine and regulate the tariffs in a systematic and efficient manner, it will be necessary for energy producers to have priority access to the grid. Private producers will be able to establish their energy investments to sell unused capacities to Nepal Electricity Authority (NEA), thus expanding use of renewable technologies around the country. However, for small energy generation projects, with current tariff NEA are offering, grid connection is not seen as a feasible proposal. For FiTs to be implemented in Nepal, the government must explore an alternative funding mechanism to meet the additional costs of generation as it would not be moral to burden the utility or increase consumer electricity bills to make up for the additional costs. A possible option to reduce the cost of generation could be the provision of subsidies on the grid interconnection equipment costs which are relatively expensive and primarily imported. With support from the government and FiTs in place, grid connected distribution will be possible, which in turn will reduce presently experienced line losses, as the electricity will be generated locally without having to be supplied over long distances from a centralized system.

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EDC 2nd Annual General Meeting



EDC successfully conducted its 2nd Annual General Meeting on January 11, 2017 at Embassy Restaurant, Panipokhari, Kathmandu. The meeting was chaired by Mr. Sujit Acharya, Chairperson of EDC with active participation from EDC members. The annual report containing the summary of the activities done in the last year and upcoming plans for coming year was shared. The annual report 2016 is available at EDC website: http://edcnepal.org/wp-content/uploads/2017/01/Annual-Report_2017.pdf

Interview with Mr. Neel Tamrakar, MD, Hira Ratna Hydropower Pvt. Ltd.

1) Please tell us about your organization?

Hira from different walks of life. Hira Ratna Hydropower Pvt. Ltd is now being Chaired by Mr. Badri Mainali, a local politician and I myself, Neel Tamrakar, is serving as the Managing Director of the Project. We have more than 50 promoters and so we are in the process of converting the organization to a Public Company. Ratna Hydropower Pvt. Ltd. was established by Late Ratna Kaji Tandukar in 2011 with the plans to develop a Hydro project at Tadi Khola, Nuwakot. The Company holds a License to develop 5MW Tadi Khola Hydropower Project and a Cascade Project of 3MW capacity at the same river. As a sole promoter of the project he tried his best to execute the project but suddenly he passed away and the Project suffered for some time. Then it was taken over by the new team which consists of many local individuals and professionals



2) Can you elaborate on the key current activities or projects that your company is executing?

We have two Hydro Projects at hand right now, as I told. The main project is the Tadi Khola Hydropower with 5MW capacity being built at Samundrata, Nuwakot and we are building its cascade project of 3MW capacity right next to the first project. We have already mobilized Civil Contractor for the first project and signed agreements for the supply and erection of Hydro Mechanical and Electromechanical components. whereas, our consultant is working on the Detail Project Report for the Cascade project.

3) What are the major challenges you have been facing during execution of your project?

We are trying to develop Hydro power in Nepal and our problems, I guess, are not any different from those face by other developers.

1. Few people from the local community creating issues out of nothing and playing with the sentiments of the people.
2. People trying to take undue advantages by asking unreasonable price for the land. etc
3. Power evacuation is another major problem. As the substation at Samundratar, where the power from our project is to be evacuated from is yet to be constructed and delay in the construction of the station is also causing delay in our project. Actually the delay is cutting into the licensing period of the project.
4. Our PPA rates are based on old rates of NEA. Keeping different rates for different projects is not justifiable and it is causing projects like ours to appear unattractive for investors.

But our project also had few inherent problems that took major portion of our time.

1. First of all, as we had taken over the project from another developer, we came to know latter that the documents of the project were not carefully prepared, so we had to redo the DPR and land survey completely. We also had to shift the Powerhouse in the design from its original position. That was not a big issue, but our EIA document itself turned out incomplete and we are asked by DoED to do a supplementary EIA. When we processed for Supplementary EIA, MoE would not give us the approval saying that there is no such provision in the act for supplementary EIA at all. We are still in the process of getting this approval.

2. Next the company had done financial closure with Clean Energy Development Bank Ltd. long time back. In the course of developing the project the Bank merged into NMB Bank Ltd. Suddenly, NMB told us that they will not be investing in our project and so we better find some other Banks for our financial requirements. We had to do lot of exercise to get another banking partner for the project, which disturbed the project significantly. We had already paid certain fees to the Bank and they would not give it back either. This caused significant financial and time loss.

4) How do you propose such issues can be resolved?

People need to have a level of awareness about the importance and impact of Hydro-power development for the economical progress of the nation and where required the Government should intervene in favor of Hydro Projects to resolve locally generated problems.

The Government should not be an obstacle in any form that hinders the development process of any Hydro power. There should not be any reason for delaying any Hydro project once the government has issued the license.

NEA should revise the rates and make investment in Hydro more attractive. Banks who decides against investment after they had committed to any of the Hydro-power as they did in our project should be penalized.

5) Can you also suggest the key changes you think will help take the energy sector forward?

In my opinion, major constrain of Hydro-power Development is access roads and transmission lines. Government needs to simplify the formalities of Licensing Procedure and make it hassle free, government should be more proactive towards the issues unduly created by local people and should make sure that delay in any project is not taking place due to the reasons of Government bodies. Acquiring government land should be simplified and clauses like having to replace the land and trees should be removed. Instead ask the developers to invest in creating forests once the projects start to generate revenue. Developers would happily contribute to local development and national development activities once the project starts earning. Why not ask them for mandatory investment of X% of net profit in government projects of any kind. I would be happy to abide by such clauses rather than the unreasonable and impractical conditions that exist today.

Media Coverage

Nepal has a long history of foreign aids supports from various countries. The aids are aimed to support the necessary instruments and tools that are pivotal for the country's development. Since 1952, billions of dollars in foreign aids are invested to provide support to the Nepal government in development activities across various sectors.

Nepal has been able to reap the benefits of these activities. In 1966, a Norwegian engineer established Butwal Power Company to build local capacity in the hydropower. The company currently is one of the leading independent power producer of the country. However, on the flip side, often questions are raised on the output and impact of the aid program.

The country has failed to have significant progress over the decades; and it remains to have the lowest Human Development index (2011) among the countries of the South Asian Association for Regional Cooperation, aside from Afghanistan.

"Where is the Nepal Aid Money Going?", an article published in BBC (May 2015) highlights several alarming issues such as, corruption, investments and implementation inefficiencies, poor enforcements, high salaries and many more. There is definitely a lot of things going wrong. One of the common reasons is to blame the Nepalese public system. One can linger on this excuse and another 6 decades will cross by or look into solutions. The prospective and fundamentals of the foreign aid design needs to be revisited.

Over the last two decades, donors have supported with millions of dollars of investment to power off-grid areas with solar home systems. More than 0.5 million households received the benefits and it created a solar business of over 50 million dollars per annum. From the donor's prospective, it is seen as a successful program since the success indicator was number of households benefited. However, this single-dimensional approaches the impact did not focus on sustaining the growth of a subsidy-less market over long-term. This was proved when, in the last two years, the subsidy was dropped and the whole solar industry suffered. This is a clear indication that in 20 years, the aid support didn't teach the market how to self-sustain, rather created a market that is hungry for subsidy.

How can aid money best be utilized to propel country towards sustained rapid growth? It is probably time to rethink on the missing links towards the long-term sustainability, efficient and effective use of the foreign aid. Involvement of private sector as a key player to achieve sustained growth is one of the key ingredient to this success. Focused private sector development can catalyze economic growth and reduce poverty in developing countries. This has been proven in countries like India, China, and Brazil, which over a period of time has been successful in reducing the development aid, but has maintained a sustained rapid economy growth over long period of time. This has benefited bulk of the population, either through job creation or increase in tax revenue, enabling finance for social protection to the people.



The author is Director of Sunfarmer Nepal, an EDC member organisation

(The article is available at the link: <http://edcnepal.org/wp-content/uploads/2017/01/page-6-22-jan.pdf> published on January 22, 2017.)

Nepal's Scenario Page

Bangladesh offers to invest \$2 billion for Nepal hydropower



Bangladesh Ambassador in Nepal Mashfee Binte Shams has announced the government's plan to buy hydroelectric power at a roundtable in Kathmandu.

She has said Bangladesh is ready to invest \$2 billion for hydropower projects.

She also shared Bangladesh's renewable energy experiences at the roundtable on Tuesday.

The Asian Institute of Diplomacy & International Affairs (AIDIA) and Alternative Energy Promotion Centre (AEPC) jointly organised it, the organisers said in a statement.

Minister for Population and Environment Jay Dev Joshi was the chief guest at the event titled "Opportunities and Challenges on Alternative Energy Investment in Nepal".

Experts at the discussion made "comprehensive rational analysis" about the opportunities and challenges on alternative energy investment in Nepal.

Issues like renewable energy promotional and investment policy, role of academicians on solving alternative energy investment's barriers in Nepal were also discussed.

AEPC Director Ram Prasad Dhital spoke about the role and strategy to increase the share of alternative energy resources on total energy demand of the country.

Nepal is aiming to have 10 percent alternative energy share by 2030.

Former minister for environment, science and technology Ganesh Shah highlighted the significance of research and development and suggested at least 1 percent of total energy budget should be invested on research and development.

Indian embassy's First Secretary N Ram Prasad also shared New Delhi's experiences.

AIDIA Founder and CEO Sunil KC moderated the event.

(The article is available at the link: <http://bdnews24.com/bangladesh/2017/02/01/bangladesh-offers-to-invest-2-billion-for-nepal-hydropower> published on February 1, 2017.)

NEA removes 'take and pay' provision

Nepal Electricity Authority (NEA) — the sole power off-taker of the country — has removed the 'take and pay' provision and implemented the 'take or pay' provision for power purchase agreement (PPA) with developers.

NEA will sign PPA on 'take or pay' basis for up to 10,000 megawatts of energy that will be generated within 10 years. This provision will be retrospective to the PPA signed since the endorsement of 'Energy Crisis Prevention and Electricity Development Decade', a 10-year vision document of the Ministry of Energy, by the Cabinet on February 18, last year.

The document has provisioned the 'take or pay' criteria while signing PPA for up to 10,000 megawatts of energy in 10 years. The NEA board of directors meeting led by energy secretary on Wednesday endorsed the 'take of pay' provision, which will encourage power developers to invest in hydroelectricity generation.

NEA board of directors meeting in August 2014 had decided to implement 'take and pay' in PPA for projects that were scheduled to be completed after 2017 citing there will be surplus energy with the country's only power utility. Under 'take and pay' provision the power off-taker is bound to pay only for the electricity used by NEA. However, in 'take or pay' provision NEA has to pay the power developer for the quantum of electricity mentioned in the PPA whether it is able to sell the electricity or not.

Independent power producers (IPPs) were consistently raising their voice against 'take and pay' provision that was introduced for projects scheduled to be completed after 2017.

Likewise, the NEA board meeting also removed the hydrology penalty for small hydroelectric projects of up to 10 megawatts. Henceforth, projects of up to 10 megawatts will not have to pay penalty if they fail to supply the quantum of electricity mentioned in the PPA. NEA still has the penalty provision on power generators of projects of over 10 megawatts if they supply less quantity than quoted in the PPA. IPPs were seeking a waiver of such penalty.

(The article is available at the link: <http://thehimalayantimes.com/business/nepal-electricity-authority-removes-take-pay-provision/> published on the Himalayan Times on 27 January, 2017.

विदेशमा रहेका नेपालीको पूँजी उर्जा क्षेत्रमा लगानी गर्ने प्रधानमन्त्रीको प्रतिबद्धता

- चन्द्रशेखर अधिकारी, काठमाडौं

माघ २, २०७३- राजनीतिक तरलतालाई बेवास्ता गर्दै युनाईटेड अरब इमिरेट्स (युएई) पुगेका प्रधानमन्त्री पुष्पकमल दाहालले आवुधावीमा रहेका नेपालीहरूको पूँजीलाई उर्जा क्षेत्रमा लगानी गराउने प्रतिबद्धता ब्यक्त गरे । दसौं विश्व भविष्य उर्जा सम्मेलन २०१७ मा सहभागी हुन शनिबार त्यहाँ पुगेका प्रधानमन्त्रीले आइतबार बिहान नेपाली कामदार तथा व्यवसायीहरूसमक्ष त्यस्तो धारणा ब्यक्त गरेका हुन ।



प्रधानमन्त्रीले आवुधावीमा रहेको नेपाली दूतावासमा नै नेपालीहरूसँग अन्तरक्रिया उद्घृत गर्दै भने, 'उर्जा सम्मेलन हाम्रा लागि धेरै महत्वको छ । जलविद्युतको प्रचुर सम्भावना भएर पनि हामीले सदुपयोग गर्न सकेका छैनौं । अहिले हाम्रो ध्यान यसमा छ । हामीले वैदेशिक रोजगारीबाट आएको पूँजीलाई विकास आयोजनामा केन्द्रित गर्न खोजेका छौं ।'

विकासका कामलाई केन्द्रमा राखेर विकासका आयोजनाहरूको अनुगमन गरिरहेको जानकारी उनले त्यहाँ रहेका नेपालीहरूलाई दिएको उनको सचिवालयले जनाएको छ । राजनीतिक विवादमा अल्झिएर विकासलाई उपेक्षा गरिँदै आएकोले विकासमा ढिलाई भएको भन्दै अब सबै मिलेर विकास प्रक्रियामा जान पर्ने समेत उनले जोड गर्दै भने, 'देशको विकास लागि केही गर्नेपर्छ ।'

अबुधावीबाट दुवाईतर्फ दुईपक्षीय भेटघाटमा जानुअघि उक्त अन्तरक्रिया भएको दूतावासले जनाएको छ । राजनीतिक रुपमा राष्ट्रिय एकताका लागि संविधान कार्यान्वयन, आर्थिक रुपमा पूर्वाधार निर्माण र समृद्धिमा सरकारले जोड गरेको पनि उनले बताए । सरकारले विदेशमा रहेका नेपालीहरूका समस्यालाई उच्च प्राथमिकता दिएको बताउँदै प्रधानमन्त्रीले भने, 'विदेशी भूमिमा हासिल अनुभव र पूँजी नेपालको विकासको लागि आधारशिला हो । तपाईंहरूले बगाएको पसिनाको सदुपयोग होस् भन्नेमा सरकार सचेत छ ।' उनले यसरी नेपालीहरूको समस्यालाई प्राथमिकतामा दिएको भनिरहँदा उनी गएको मुलुकमा राजदूत समेत नियुक्त गर्न सकेका छैनन् । यसअघि परराष्ट्रमन्त्री प्रकाशशरण महत कतार पुगे त्यहाँ पनि राजदूत नियुक्त हुन सकेका छैनन् । यसबाट पनि कार्यकारी तहबाट भाषण गर्ने र कार्यान्वयन गर्ने विषय आफैँमा फरक देखिएको छ ।

मुलुक संघीय लोकतान्त्रिक गणतन्त्रमा रहेको बताउँदै उनले भने, 'संविधानमा सबैका भावना छन्, राष्ट्रिय एकता हासिल गर्नुछ, कसैलाई पेलेर वा ठेलेर समस्याको हल हुँदैन । सरकार सबैसँग समान रुपले सम्वादमा छ । सम्वाद सकारात्मक दिशामा छ, राष्ट्रिय सहमति बनाएर संविधान कार्यान्वयन गर्नेमा सरकार छ ।'

कन्सुलर सेवालाई चुस्त बनाउने तयारी गरेको भनिएको लामो समय भए पनि त्यसको कार्यावन्धन अझै हुन सकेको छैन । ब्लड मनी, पासपोर्टको नवीकरण शुल्क घटाउने लगायतका केही महत्वपूर्ण काम भए पनि अझ गर्नपर्ने धेरै कामहरु बाँकी रहेका छन् । उनले आइतबार नै दुवईमा दुईपक्षीय उच्चस्तरको भेटभाट गर्नेछन् । उनी साइड सिन र भेटघाट पनि सोमबार अबुधावी पुग्नेछन् सम्मेलनलाई सम्बोधन गर्ने कार्यक्रम छ । मंगलबार साइडलाइन भेटवार्तापछि स्वदेश फर्कने कार्यक्रम रहेको छ ।

युनाइटेड अबर इमिरेट्स (युएई)का वातावरण मन्त्री थानी विन अहमद अल जायेदीले उद्घाटन भाषण गरेर सुरु हुने उक्त कार्यक्रममा कार्यकारी प्रमुखको रुपमा प्रधानमन्त्री पुष्पकमल दाहाल मात्र सहभागी हुनेछन् । अन्य कोष्टारिकाका राष्ट्रपति लुइस गुलेर्मी सोलिस, माल्दिभ्सका राष्ट्रपति अब्दुल्ला एमिन अब्दुल गयुम, पराग्वेका राष्ट्रपति होरासियो कार्टिज र मोन्टेनेग्रोका राष्ट्रपति फिलिप भुजानोभिकको सहभागिता रहने र विशेष वक्तको रुपमा सम्बोधन गर्नेछन् ।

प्रधानमन्त्री दाहाल युएईको युवराज तथा सुरक्षाको उपप्रमुख शेख मोहम्मद विन जैयद अल नाह्यदको निमन्त्रणामा त्यसतर्फ गएका हुन । नेपाल र युएईबीच कार्यकारीस्तरको भ्रमण समेत नभएको अवस्था यो भ्रमण परराष्ट्र अधिकारीहरुले चासोका साथ गराएका हुन् । राजदूत नभएको मुलुकमा युएई पनि रहेको छ । परराष्ट्रमन्त्रीले गत साता कतार भ्रमण गरे भने प्रधानमन्त्रीले अहिले युएई तर दुवै मुलुकमा राजदूत छैनन् ।

(The article is available at the link:

<http://kantipur.ekantipur.com/news/2017-01-15/20170115143944.html> published on January 15, 2017.)

खिम्ती-ढल्केबर प्रसारण लाइन निर्माण सम्पन्न

-रमेश लम्साल-

काठमाडौँ-विगत ११ वर्षदेखि विभिन्न बहानामा रोकिँदै आएको खिम्ती-ढल्केबर प्रसारण लाइनको निर्माण कार्य सम्पन्न भई परीक्षण प्रसारण समेत सुरु गरिएको छ ।

विश्व बैंकको सहयोगमा निर्माण सुरु भएको सो आयोजना सन् २००९ मा सम्पन्न हुनुपर्ने थियो । जग्गा प्राप्ति, मुआब्जा वितरण तथा विभिन्न स्थानीय समस्याका कारण निर्माणमा ढिलाइ भएको नेपाल विद्युत् प्राधिकरणका प्रवक्ता प्रवल अधिकारीले बताए ।

प्राधिकरणका तत्कालीन उपकार्यकारी निर्देशक कन्हैयालाल मानन्धर आयोजना प्रमुख हुँदा सन् २००३ मा सुरु भएको आयोजना उनी सेवा निवृत्त हुँदासमेत सम्पन्न नहुँदा सर्वत्र संसय पैदा भएको थियो । आयोजना प्रमुख श्यामकुमार यादवले आयोजनाको यही माघ १ गतेबाट नियमित परीक्षण भइरहेको बताए ।

“हामीले नियमति रुपमा प्रसारण लाइन परीक्षण गरिरहेका छौँ । खिम्तीको

“ प्रसारण लाइन घुमाउरो हुँदा प्राधिकरणलाई वार्षिक रु एक अर्ब बराबरको घाटा भएको छ भने प्रसारण लाइन बन्ने बित्तिकै १० मेगावाट बिजुली बचत हुँदा मुलुकभरको विद्युतभार कटौती आधा घन्टा कम हुने विश्वास लिइएको छ ।

सव स्टेशनमा सामान्य प्राविधिक परीक्षण भइराखेको छ । प्रसारण लाइनले आफ्नो क्षमताअनुसार भार बहन गरेको छ," उनले भने ।

सिन्धुलीको रतनचुरा, सिन्धुलीमाडीलगायतका स्थानमा स्थानीयवासीले मुआब्जाको विषयलाई लिएर पटक-पटक आयोजना अवरुद्ध गर्दै आएका थिए । अब भारतबाट आयात भएको विद्युत् काठमाडौं भित्र्याउने बाटो खुलेको छ ।

समयमै प्रसारण लाइन बन्न नसक्दा नेपाल विद्युत् प्राधिकरणले निर्माणको जिम्मा पाएको 'कालपत्रे पावर' ट्रान्समिसन र 'मुडभरी एन्ड जेभी'लाई मासिक रु ११ लाख हर्जना तिर्दै आएको थियो । सन् २०११ देखि हालसम्म प्राधिकरणले बैंक ग्यारेन्टी, बिमा, सामान भण्डारण शुल्कबापत रु ६ करोड ६० लाख तिरिसकेको छ । आयोजना सम्पन्न भएपछि उक्त भार समेत बहन गर्नुपर्ने भएको छ ।

प्राधिकरणका तत्कालीन उपकार्यकारी निर्देशक कन्हैयालाल मानन्धर आयोजना प्रमुख हुँदा सन् २००३ मा सुरु भएको आयोजना उनी सेवा निवृत्त हुँदासमेत सम्पन्न नहुँदा सर्वत्र संसय पैदा भएको थियो ।

विश्व बैंकको रु दुई अर्ब १५ करोड ६० लाख ऋण सहयोगमा उक्त आयोजना सन् २००६ मा सुरु भएको हो । प्रसारण लाइन सम्पन्न भएपछि बर्सेनि रु एक अर्ब प्राधिकरणलाई फाइदा हुनेछ ।

विद्युतको प्राविधिक चुहावटका कारण १० मेगावाटभन्दा बढी विद्युत् खेरगइरहेको छ । करिब ७३ किलोमिटर दुरी रहेको सो आयोजना निर्माण भएपछि खिम्ती काठमाडौं भरतपुर हुँदै तराई जोड्ने दुई सय ५० किलोमिटर लामो दुरी पार गर्नुपर्ने अवस्थाको अन्त्य भएको छ ।

प्रसारण लाइन घुमाउरो हुँदा प्राधिकरणलाई वार्षिक रु एक अर्ब बराबरको घाटा भएको छ भने प्रसारण लाइन बन्ने बित्तिकै १० मेगावाट बिजुली बचत हुँदा मुलुकभरको विद्युतभार कटौती आधा घन्टा कम हुने विश्वास लिइएको छ ।

प्रसारण लाइन नहुँदा सिप्रिड आयोजनाबाट उत्पादित बिजुली राष्ट्रिय प्रसारणमा जोड्न सकिएको थिएन । सो आयोजना निर्माण सम्पन्न भएपछि माथिल्लो तामाकोसी र दोलखालगायतका जिल्लामा उत्पादन भएको विद्युतसमेत राष्ट्रिय प्रसारण लाइनमा जोड्न सहयोग मिल्नेछ ।

माथिल्लो तामाकोसी जलविद्युत् आयोजनाले आयोजनास्थलबाट खिम्तीसम्मको प्रसारण लाइनको निर्माण सुरु गरिसकेको सन्दर्भमा सो प्रसारण लाइनमा करिब पाँच सय ५८ मेगावाट विद्युत् प्रवाह हुनेछ । प्रसारण लाइन दोलखाको सहरे गाविसबाट सुरु भई रामेछाप, सिन्धुली र महोत्तरीका विभिन्न गाविस हुँदै धनुषाको ढल्केबरमा रहेको सव स्टेशनमा जोडिएको छ ।

“ विद्युतको प्राविधिक चुहावटका कारण १० मेगावाटभन्दा बढी विद्युत् खेरगइरहेको छ । करिब ७३ किलोमिटर दुरी रहेको सो आयोजना निर्माण भएपछि खिम्ती काठमाडौं भरतपुर हुँदै तराई जोड्ने दुई सय ५० किलोमिटर लामो दुरी पार गर्नुपर्ने अवस्थाको अन्त्य भएको छ ।

आयोजनाले पाँच जिल्लाका १६ गाविस र एक नगरपालिका प्रभावित भएका छन् । विश्व बैंक, नेपाल सरकार र नेपाल विद्युत् प्राधिकरणको संयुक्त लगानीमा निर्माण सम्पन्न भएको सो आयोजना सम्पन्न भएपछि भारतबाट थप

आयात हुने ४० मेगावाट विद्युत् यही माघ १६ गतेबाट सहज रुपमा काठमाडौं ल्याउन सकिने प्राधिकरणका प्रवक्ता अधिकारीको भनाइ छ ।

- रासस

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लोडसेडिङ हटाएपछि ट्रान्सफर्मरतिर कुलमानको नजर

- बिजुली वितरण प्रणाली सुधारन थप १० हजार ट्रान्सफर्मर जोडिने



५ माघ, काठमाडौं । लोडसेडिङका दुईवटा कारण थिएः पहिलो- विद्युतको कालोबजारी र दोस्रो- प्रसारण लाइन, पोल, तार एवं ट्रान्सफर्मरको गएगुज्रेको अवस्था । प्राधिकरणमा कुलमान घिसिडले नेतृत्व सम्हालेपछि 'बिजुली चोर' हरुको निद्रा हरण भइसकेको छ । र, अब दोस्रो चरणको सुधार योजना अन्तरगत प्राधिकरणका

अधिकारीहरुको ध्यान विद्युतको वितरण प्रणालीमा सुधार ल्याउनेतिर केन्द्रित हुन थालेको छ ।

नेपाल विद्युत प्राधिकरणले वितरण प्रणालीमा सुधार ल्याउनका लागि थप १० हजार थान नयाँ ट्रान्सफर्मर जोड्ने भएको छ । देशलाई लोडसेडिङमुक्त बनाउने अभियान सुरु भएसँगै अबको दुई वर्षभित्र १० हजार नयाँ ट्रान्सफर्मर जडान गर्ने योजना बनाइएको हो ।

वितरण प्रणालीमा अत्यावश्यकिय सुधार एवं विस्तारका लागि थप १० हजार ट्रान्सफर्मर जडान गर्ने योजना बनेको प्राधिकरणका प्रवक्ता प्रबल अधिकारीले अनलाइनखबरलाई जानकारी दिए । विभिन्न चरणमा गरेर ट्रान्सफर्मर खरिद गर्न लागिएको उनले बताए ।

दूरगामी योजना

'अब हामी वितरण प्रणालीमा अग्रगामी सुधार चाहिरहेका छौं, ग्राहकसम्म बिजुली पुग्दा आउने अनेकन समस्याहरु छिचोल्न ट्रान्सफर्मरलाई बढाउनुपर्ने देखिन्छ' उनले अनलाइनखबरसँग भने ।

अबको दुई वर्षपछि लोडसेडिङको चुनौति समाप्त हुँदैछ । त्यसपछि प्राधिकरणले बिजुलीको गुणस्तरीयतामा समेत ध्यान दिने योजना बनाएको छ ।

‘अबको दुईवर्ष पछि नागरिकलाई कम बिजुली खपत गरिदिए न भन्ने अवस्था रहँदैन, त्यसो भयो भने प्राधिकरणको अवस्था झन खस्कनेछ’ अधिकारीले अनलाइनखबरसँग कुरा गर्दै भने, ‘अब हामीले लोडसेडिङ अन्त्य भएपछि नागरिकलाई जतिसक्दो बढी बिजुली खपत गर भन्ने हो, त्यसका लागि वितरण प्रणालीको पूर्वाधारमा पनि लगानी बढाउनुपर्छ ।’

ट्रान्सफर्मर खरिदको गृहकार्य हुँदै

वितरण प्रणालीको सुधारका लागि ट्रान्सफर्मर खरिदको खाका तयार गरेर त्यसलाई कसरी व्यवस्थापन गर्ने भन्ने पूर्वयोजना प्राधिकरणले बनाइरहेको अधिकारीले बताएका छन् ।

उनका अनुसार धेरै स्थानमा गुणस्तरीय ट्रान्सफर्मर नहुँदा बिजुलीको प्रावधिक चुहावट पनि त्यसैबाट हुने गरेको छ । यसैगरी मागअनुरूप ट्रान्सफर्मरको क्षमता कमजोर हुँदा धेरै क्षेत्रमा नागरिकले गुणस्तरीय बिजुली उपयोग गर्न पाएका छैनन् ।

कतिपय ठाउँमा बिजुली पुगे पनि मधुरो बत्तीमै बस्नुपर्ने बाध्यता विद्यमान छ । कतिपय शहरी क्षेत्र पनि यस्ता समस्याबाट अछुतो छैनन् । त्यसैले बिजुलीका उपभोक्तालाई अधिकतम बिजुली उपयोग गर्न प्रोत्साहित गर्न समेत ट्रान्सफर्मरको संख्या बढाउन आवश्यक रहेको निश्कर्ष प्राधिकरणको छ ।

खपत बढाउने चुनौति

पिक आवरमा बिजुलीको माग उच्च भए पनि अन्य समयमा बिजुलीको माग न्युन भएकाले प्राधिकरणले अबको दुईवर्षपछि बिजुलीको उपयोग दर बढाउन पनि आवश्यक ठानेको छ ।

त्यसका लागि नागरिकलाई गुणस्तरीय र निरन्तर बिजुली आपूर्तिको प्रत्याभूति दिनुपर्ने प्रवक्ता अधिकारी बताउँछन् ।

‘लोडसेडिङ अन्त्य भएपछि घर-घरमा बिजुलीका सामाग्रीको उपायेग बढ्नुपर्छ । नाकाबन्दीमा ग्यास अभाव हुँदा इन्डक्शन चुल्हो बालिएजस्तै बिजुलीको आपूर्तिप्रति नागरिक विश्वस्त भएर त्यस्ता उपकरणहरुको प्रयोग हुनुपर्छ’ अधिकारीले भने- ‘त्यसका लागि आवश्यक वातावरण तयार गर्न हामीले पूर्वयोजना बनाएका हौं ।’

अहिले काठमाडौँमा पिक आवरमा ३२० मेगावाट बिजुलीको माग छ । तर, त्यो मध्यरातपछि घटेर १२० मेगावाटको हाराहारीमा झर्छ । यसबाटै पनि बिजुलीको खपतमा नेपाली बजार कति कमजोर छ भन्ने प्रष्ट हुन्छ । रातमा चलायमान हुने देशको एकमात्र शहर मानिने काठमाडौँमै पनि रातमा बिजुली खपत निकै कमजोर देखिन्छ ।

‘अहिले पो बिजुलीको समस्या छ । अब हामीसँग माथिल्लो तामाकोशीको बिजुली आउनासाथ यो बिजुलीको खपत दर बढाउन आवश्यक हुन्छ’ अधिकारीले भने, ‘हामी अब प्राधिकरणका सबै संरचनालाई अधिकतम बिजुली उपयोगमैत्री बनाउन लागेका छौं । यसका लागि नयाँ ट्रान्सफर्मरहरु उपयोगी हुनेछन् ।’

प्रणाली विस्तार र सुधारको योजना

खरिद गरिने नयाँ ट्रान्सफर्मर ग्रामीण विद्युतीकरणमा पनि उपयोग हुनेछ । लोडसेडिङ अन्त्य भएपछि गाउँमा पनि साना उद्योगहरु खुल्ने वातावरण तयार हुने भएकाले त्यसका लागि पनि यो आवश्यक मानिएको छ ।

प्राधिकरणको अहिलेको वितरण प्रणाली निकै कमजोर र अवैज्ञानिक छ । स्थानीय क्षेत्रको माग र खपतको अवस्थालाई ट्रान्सफर्मरको क्षमता मेल नखाएका कारण पड्किने समस्या पनि यथावत छ । काठमाडौँमा यही अवस्था अन्त्य गर्न प्राधिकरणले प्रणाली सुधारका लागि पछिल्ला समयमा थुप्रै काम गरेको जनाएको छ । लोडसेडिङ हटाउने अभियानलाई पनि सबल प्रणालीले सहयोग गर्ने भएकाले आवश्यकता र औचित्यका आधारमा ट्रान्सफर्मरहरु फेर्ने काम तीब्र पारिएको प्रवक्ता अधिकारीले बताए । 'काठमाडौँको वितरण प्रणालीमा गरिएको सुधार पनि अहिले महत्वपूर्ण छ । वितरण प्रणालीलाई वैज्ञानिक रुपमा व्यवस्थापन गर्नु हाम्रो चुनौति थियो' अधिकारीले भने, 'हामीले प्रयत्नहरु गरेका छौं । यसले सकारात्मक नतिजाहरु पनि देखिएका छन् ।'

The article is available at the link: <http://www.onlinekhabar.com/2017/01/530373/> published on January 18, 2017.

Guest Corner

Wind costs heading in the right direction

Windpower Monthly's annual energy-cost comparison examines the latest trends in electricity capital and generation costs and finds wind energy well placed to take advantage of future price hikes in oil and gas.

Despite the low oil, gas and coal prices of the past two and half years, the renewable-energy industry has remained buoyant.

In November 2016 the International Energy Agency (IEA), in its World Energy Outlook, noted that low oil prices had discouraged the development of new oil fields, and so price rises are inevitable.



The outlook is bright for renewables, with the IEA noting that "as a result of major transformations in the global energy system that will take place over the next decades, renewables and natural gas are the big winners in the race to meet energy demand growth until 2040". It went on to assert: "The majority of renewables-based generation is competitive without any subsidies."

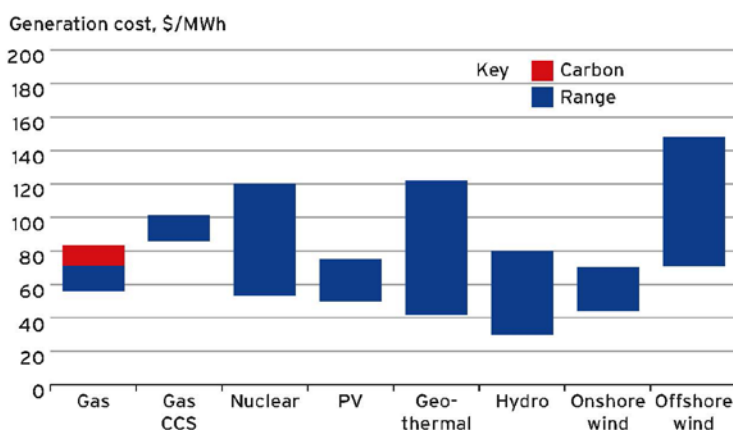
In December 2016 the oil price started to recover, climbing above \$50 a barrel, following a complex deal with Opec, so the prospects for renewables, particularly wind power, improved further.

Onshore wind energy is already proving to be commercially competitive in some markets. If the cost of electricity from conventional fossil-fuel sources increases, that process will accelerate.

The most dramatic price reductions in 2016 came with offshore wind. In November 2016, Swedish developer Vattenfall announced it had won a tender to build a 600MW offshore wind project in the Danish Baltic Sea at a price of €49.90/MWh (\$53/MWh). Allowing for grid connection cost, this puts offshore wind prices in the same range as those of nuclear.

ONSHORE WIND CHEAPEST WIDELY DEPLOYABLE SOURCE

Generation cost estimates for the principal thermal technologies and wind



Onshore wind

When setting representative costs for wind farms in 2016-17, the indications are that installed costs are now a little lower than one year ago, but there is some scatter in the data.

However, the latest quarterly report from turbine manufacturer Vestas suggests that turbine-selling prices in the third quarter of 2016 were \$941/kW, 8% lower than in the corresponding period in 2015.

If it is assumed that installed costs have come down by the same percentage, this suggests the average installed cost was around \$1,600/kW in 2016. The upper bound may be set at \$1,900/kW, consistent with the UK level that formed the basis of the research quoted in the January issue.

The lower bound can be set at \$1,250/kW, reflecting the average for China quoted by the Renewable Energy Policy Network (REN21). These upper and lower bounds attempt to capture roughly two thirds of all projects, but there are outliers as low as \$958/kW and as high as \$3,752/kW, according to the REN21 report. These figures reflect modest reductions since last year.

In contrast to American and European average turbine prices of around \$1,000/kW, typical Chinese wind turbine prices — from the Goldwind 2016 interim results — are around \$600/kW.

Offshore wind

The dramatic reductions in bid prices for recent Dutch and Danish wind projects have been documented in the monthly summaries. These prices do not include the grid connection costs.

Taking these into account, the total energy price for the Danish Kriegers Flak project is likely to be around \$80/MWh. This suggests that costs throughout the supply chain are falling more rapidly than originally anticipated.

An earlier announcement by Danish developer Dong Energy also confirmed the steeply falling trend. Its bid for two Dutch projects was \$72.7/MWh, which, allowing for the cost of the grid connection, corresponds to a little over \$90/MWh.

Both these projects are in very windy regions, which would have facilitated the low bids.

Vattenfall estimates that the cost of the Kriegers Flak wind farm alone will be around \$2,100/kW. Allowing for the grid connection costs and the preparatory studies that were carried out by the Danish system operator, this suggests that the total installed cost may be around \$2,600/kW.

However, according to the REN21 report cited earlier, lower costs (down to \$2,100/kW) apply in China and elsewhere. Recent reports from the UK - reviewed in the January column — suggest an average cost for projects commissioning in 2018 of \$3,100/kW, which can be used as a central value.

The upper bound may be taken as \$5,000/kW, although, as with onshore, there are higher-cost outliers. The interest rate used for the calculation of levelised costs this year is 7%. There are wide variations, with the UK tending to use higher rates, while lower rates are common in some parts of mainland Europe.



Natural gas

European gas prices fell by around 35% during the year, but were still about 30% higher than US prices, which fell by around 9%.

The current price range for gas-fired electricity generation is between \$56/MWh (US) and \$71/MWh (UK), excluding any carbon costs.

The corresponding range for onshore wind is approximately \$50/MWh (US) to \$80/MWh (UK), with this spread partly attributable to higher UK fuel and finance costs.

Generation cost estimates from the US Department of Energy do not include "carbon costs", but these are included in the recent estimates prepared for the UK energy department.

A premium of \$24/MWh is quoted for plant commissioned in 2020, somewhat higher than the estimates in a report by VGB Powertech in Germany, where the maximum estimate of carbon prices implies a CO₂ premium of about \$5/MWh.



Solar PV

Prices are falling rapidly — faster than for wind — and two projects that will be commissioned in 2019 have tendered prices at or just below \$30/MWh.

The Lawrence Berkeley National Laboratory suggests the latest power purchase contracts correspond to around \$54/MWh when the subsidy provided by the production tax credit (PTC) is stripped out.

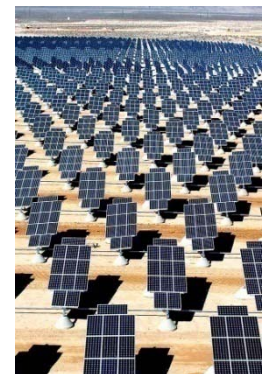
In sunny climes, PV may undercut wind and can compete with the fossil-fuel sources.

Capital costs for utility-scale installations fall mostly in the \$1,000-4,000/kW range, with outliers above and below.

Recent analyses of solar PV costs in the US suggest the average installed cost is between \$2,000 and \$2,400/kW, with an overall worldwide average of around \$2,000/kW. Capacity factors range from 0.1 to 0.4, depending on locations.

As in the case of wind, there are presentational issues that complicate cost and capacity-factor comparisons.

Some authorities use the net AC output as a reference level, which is lower than the DC rating, so capacity factors and prices per kilowatt will appear higher in these instances. Regrettably, it is not always clear which convention is being followed.



Hydro and Geothermal

These are similar inasmuch as the resource depends critically on the location.

Although there is scope for small-scale "run-of-river" hydro systems in many places, higher-powered systems need either a high head or space for a large reservoir.

The US DOE puts generating costs at \$64/MWh, although the National Renewable Energy Laboratory's annual technology baseline points to around \$80/MWh. Capital costs are mostly in the \$3,000-4,000/kW range with load factors of 50%.

Geothermal is even more restricted in its application. In zones where there is a good resource, electricity can be delivered at below \$100/MWh, but capital costs are generally high — averaging around \$3,500/kW. Capacity factors are generally good, however, at around 80%.

Comparing data from all the technologies with generation cost estimates for wind — onshore at 7.5m/s, offshore at 8.5m/s — shows just how competitive wind has become.

At higher wind speeds, or at lower interest rates, the renewable cost estimates would be cheaper, although the impact on gas would be modest.

(The full article is available at the link : <http://www.windpowermonthly.com/article/1421836/wind-costs-heading-right-direction> published on 31 January, 2017)



Solar parks with capacity of 7500 Megawatt to come up in Ladakh

JAMMU: The Jammu and Kashmir government has signed an MoU with the Centre for the development of two mega solar parks in the rocky mountainous region of Ladakh with a total capacity of 7500 MW.

Minister for Science & Technology, Sajjad Gani Lone today said the government has proposed development of one each Mega Solar Park in the districts of Leh and Kargil.

"The State Government has signed MoU with the Government of India for the development of two Mega Solar Parks of 5000 MW capacity in Leh district and 2500 MW capacity in Kargil district," Lone informed the House in reply to a Question by Congress Legislative Party Leader Nawang RigzinJora.



However, he said the work on these projects has not been started as yet in view of non-availability of land and lack of proper infrastructure in Ladakh for transmission of power generated from the proposed parks.

(The article is available at the link : <http://energy.economictimes.indiatimes.com/news/renewable/solar-parks-with-capacity-of-7500-megawatt-to-come-up-in-ladakh/56846251> published on January 29, 2017.

Virginia's Largest Solar Farm Will Help Power Amazon Operations

Amazon Web Services will purchase power from what will be Virginia's largest solar farm to power the company's data centers.

Gov. Terry McAuliffe last week announced that Community Energy Solar will build the 100-MW project, which will be located in south east Virginia in Southampton County.

"Once complete, the new Southampton facility will be the largest solar farm ever constructed in Virginia," McAuliffe said in a Jan. 25 statement. "The pace of solar deployment has increased exponentially in recent years and will continue to do so for the foreseeable future. With projects like this, we're building both the new Virginia economy and a better future for our children."

Amazon also holds a power purchase agreement for the 80-MW Amazon Solar Farm U.S. East — a Community Energy project — in Accomack County on the Delmarva Peninsula

"Amazon Web Services' leadership and continued commitment to large scale solar energy is a key catalyst for this exciting new industry in Virginia." Brent Beerley, executive vice president of Community Energy Solar, said in a statement. "Community Energy Solar is thrilled to join forces again with partners AWS and Dominion for this second project, following the path created with Virginia's first large-scale solar farm."

(The article is available at the link : <http://www.renewableenergyworld.com/articles/2017/01/virginia-s-largest-solar-farm-will-help-power-amazon-operations.html> published on January 30, 2017)

By Renewable Energy World Editors



Tesla's Battery Revolution Just Reached Critical Mass

Three new plants in California show how lithium-ion storage is ready to power the grid.

- Tom Randall



Tesla built the world's biggest battery power plant in just three months. Source: Tesla

Tesla Motors Inc. is making a huge bet that millions of small batteries can be strung together to help kick fossil fuels off the grid. The idea is a powerful one—one that's been used to help justify the company's \$5 billion factory near Reno, Nev.—but batteries have so far only appeared in a handful of true, grid-scale pilot projects.

That changes this week.

Three massive battery storage plants—built by Tesla, AES Corp., and Altagas Ltd.—are all officially going live in southern California at

about the same time. Any one of these projects would have been the largest battery storage facility ever built. Combined, they amount to 15 percent of the battery storage installed planet-wide last year.

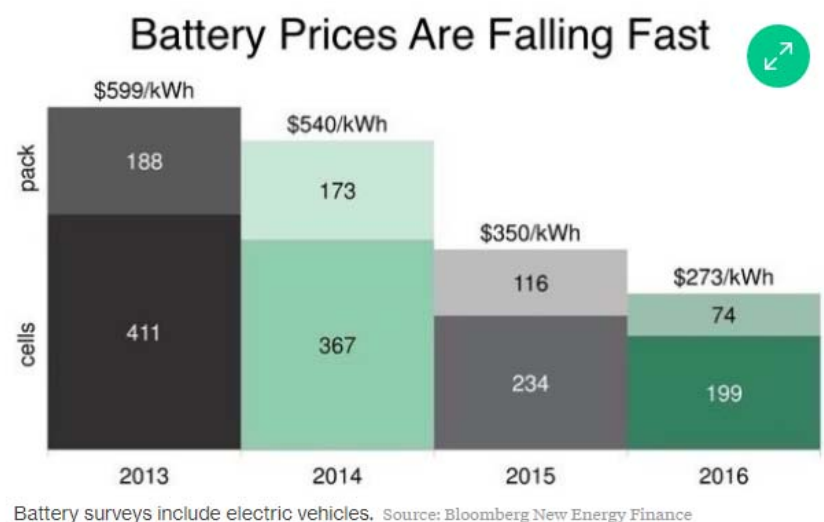
Ribbons will be cut and executives will take their bows. But this is a revolution that's just getting started, Tesla Chief Technology Officer J.B. Straubel said in an interview on Friday. "It's sort of hard to comprehend sometimes the speed all this is going at," he said. "Our storage is growing as fast as we can humanly scale it."

A Fossil-Fuel Disaster

The new battery projects were commissioned in response to a fossil-fuel disaster—the natural gas leak at Aliso Canyon, near the Los Angeles neighborhood of Porter Ranch. It released thousands of tons of methane into the air before it was sealed last February.

In its wake, Southern California Edison (SCE) rushed to deploy energy storage deals to alleviate the risk of winter blackouts. There wasn't any time to waste: All of the projects rolling out this week were completed within 6 months, an unprecedented feat. Tesla moved particularly nimbly, completing in just three months a project that in the past would have taken years.

"There were teams working out there 24 hours a day, living in construction trailers and doing the commissioning work at two in the morning," Straubel said. "It feels like the kind of pace that we need to change the world."



A Question of Price

The battery storage industry—a key part of the plan if wind and solar power are to ever dominate the grid—is less than a decade old and still relatively small. Until recently, batteries were many times more expensive than natural gas "peaker" plants that fire up to meet surging demand in the evening and morning hours.

But prices for lithium-ion batteries have fallen fast—by almost half just since 2014. Electric cars are largely responsible, increasing demand and requiring a new scale of manufacturing for the same battery cells used in grid storage. California is mandating that its utilities begin testing batteries by adding more than 1.32 gigawatts by 2020. For context, consider this: In 2016, the global market for storage was less than a gigawatt.

California's goal is considerable, but it's dwarfed by Tesla's ambition to single-handedly deliver 15 gigawatt hours of battery storage a year by the 2020s—enough to provide several nuclear power plants—worth of electricity to the grid during peak hours of demand. Not everyone, however, is that optimistic.

"I'm not convinced," said Yayoi Sekine, a Bloomberg New Energy Finance analyst who covers battery technology. The market is "moving faster than ever, but it's not on the gigawatt scale yet."

Battery costs and profitability for utilities are difficult to evaluate. Companies are reluctant to give up their pricing data, and the expense is highly variable. Nevertheless, battery plants take up a much smaller footprint than gas-powered plants, they don't pollute, and their instant response can provide valuable

services better than any other technology. In a small but increasing number of scenarios, batteries are already the most economical option.

But for the most part, according to a BNEF analysis, the costs of new projects would need to drop by half in order to be profitable on a wider scale in California, and that's not likely to happen for another decade. The total installed cost of a battery plant would need to fall to about \$275 per kilowatt hour. While Tesla declined to provide its pricing data, the similarly sized Altgas project was expected to cost at least \$40 million, or \$500 per kilowatt hour. It's possible that with the remarkable scope of Tesla's Reno operations, the company will be able to establish new floors for pricing, forcing the industry to follow, BNEF's Sekine said.

It's still early days, even with this week's announcements. It will probably be a few years before Tesla's battery-storage sales are material enough to break out separately from automotive sales on quarterly filings, Straubel said.

The End of the Gas Peaker

But the battery's day is coming, while those of natural gas peaker plants are numbered. That's the prediction of John Zahurancik, AES's president of battery storage. Zahurancik is one of the pioneers of energy storage, having cobbled together profitable edge-case storage projects since 2008, when battery prices were 10 times higher than they are today.

AES has completed installation and is doing final testing of a 30 megawatt/120 megawatt hour plant that's even bigger than Tesla's 20 MW/80 MWh. AES is also working on a longer-term project that will be five times the size of Tesla's project when complete by 2021. That's a scale that would have been unimaginable a decade ago.

"This is my fifth time doing the largest project in the world for energy storage, and each time people tell me, 'well this is the test, this is really the test'" Zahurancik said in an interview Friday. "The next big test is how do we scale this up broadly."

The biggest thing that sets Tesla and AES apart is that Tesla is building the components of its storage units itself at the company's Gigafactory in Reno, including battery cells with partner Panasonic, modules, and inverters. Tesla says this vertical integration will help reduce costs and make a seamless system. AES says that dealing with a diverse supply chain allows it to seek the cheapest price and the best technology on the market. It's the same debate going on in the electric-car business, where Tesla is manufacturing an unprecedented percentage of its own parts in-house.

For now, gas peaker plants still win out on price for projects that aren't constrained by space, emissions, or urgency, said Ron Nichols, President of SCE, the California utility responsible for most of the biggest battery storage contracts. But that may change in the next five years, he said.

"Long term, will large amounts of batteries be able to take over?" Nichols asked. "We'll need to get some hours under our belts to know for sure."

(The article is available at the link:







<https://www.bloomberg.com/news/articles/2017-01-30/tesla-s-battery-revolution-just-reached-critical-mass> published on January 30, 2017.)

Welcoming our new member





Hira Ratna Hydropower Private Limited Chaired by Mr. Badri Mainali and Neel Tamrakar is serving as the Managing Director of the Project. Hira Ratna Hydropower Pvt. Ltd have more than 50 promoters and so we are in the process of converting the organization to a Public Company. Ratna Hydropower Pvt. Ltd. was established by Late Ratna Kaji Tandukar in 2011 with the plans to develop a Hydro project at Tadi Khola, Nuwakot. The Company holds a License to develop 5MW Tadi Khola Hydropower Project and a Cascade Project of 3MW capacity at the same river.



List of EDC members

S. No.	Name of the Organization	Organization logo
1.	Nepal Electricity Authority	
2.	Alternative Energy Promotion Center	
3.	Chilime Hydropower Company Ltd.	
4.	Madhya Bhotekoshi Jalvidyut Company Ltd.	
5.	Rasuwagadhi Hydropower Company Ltd.	
6.	Sanjen Jalavidhyut Co. Ltd.	







S. No.	Name of the Organization	Organization logo
7.	Butwal Power Company Ltd.	
8.	Hydroelectricity Investment and Development Company Ltd.	
9.	IDS Energy Pvt. Ltd.	
10.	Arun Valley Hydropower Development Co. Ltd	
11.	Dantakali Hydropower Pvt. Ltd.	
12.	Reliable Hydropower Pvt. Ltd.	
13.	Himalayan Infrastructure Fund	
14.	Sanvi Energy Pvt. Ltd.	
15.	Dibyashwari Hydropower Ltd.	
16.	Shiva Shree Hydropower Co. Ltd	
17.	Chhyandi Hydropower Ltd	
18.	SaralUrja Nepal	
19.	Rara Hydropower Development Co. P. Ltd	

S. No	Name of the Organization	Organization logo
20.	Wind Power Nepal	
21.	Gham Power Pvt. Ltd.	
22.	Lotus Energy Pvt. Ltd.	
23.	Sun Farmer Nepal Pvt. Ltd	

S. No.	Name of the Organization	Organization logo
24.	CEDB Hydro Fund	
25.	Nabil Bank Limited	
26.	NMB Bank Limited	
27.	Global IME Bank Limited	
28.	Prime Commercial Bank Ltd.	
29.	Century Bank Limited	

S.No	Name of the organization	Organization logo
30.	Transweld Pvt. Ltd.	
31.	TSN Energy Pvt. Ltd.	
32.	Waibalnfratech Pvt. Ltd.	
33.	North Hydro & Engineering Pvt. Ltd	
34.	Nepal Hydro & Electric Ltd.	
35.	Nepal Hydropower Association	

S.No.	Name of the Organization	Organization logo
36.	National Association of Community Electricity Users Nepal	
37.	Dudhkoshi Power Pvt. Co. Ltd	
38.	ICTC Energy Pvt. Ltd	
39.	High Himalayan Hydro Construction Pvt. Ltd	
40.	Himalayan Bank	
41.	Ankhukhola Hydropower Pvt Ltd	

42.	Comtronics Pvt.Ltd	
43.	United Modi Hydropower	
44.	Source and Solutions Private Limited	
45.	Everest Equity	
46.	Hira Ratna Hydropower	
47.	SM Everest Electric Pvt. Ltd	



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