ENERGY DEVELOPMENT COUNCIL

Energy Communique

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Editorial

Dear Reader,

Mr. Zachary Smith
CEO, Radiance Renewable Technologies (Pvt) Ltd

As Nepal ramps up its efforts to attract international investors to aid in its energy crisis, it might do well to consider lessons from other nations. These other countries are the ones with whom Nepal is competing for investment dollars, after all. One such country is Sri Lanka, and it provides a useful and appropriate comparison. It is also a small South Asian country that is geographically isolated and has recently experienced a civil war. But unlike Nepal, it has had success in developing its renewable energy resources.

Traditionally, we are told that stability is one of the primary factors which international investors look for when entering a country. But despite having a thiry-year civil war, Sri Lanka began a very successful campaign to increase private sector investment in its hydropower from the 1990s onwards. As late as 2009, there were more deaths in Sri Lanka's war than in Afghanistan's war at the same time. In the last decade of their respective civil wars, Nepal suffered only a fraction of the deaths compared to Sri Lanka – both combatant and civilian. If so, why were investors still ready to develop hydropower resources in Sri Lanka? The answer is simple: because the returns were high enough to justify the risk.

Their war consolidated state power, decisions could be made quickly, and policy enacted decisively. This is one of the few advantages of a protracted war. In addition, Sri Lankan institutions joined with the World Bank to offer policies that helped keep development relatively simple, and offer good standardized power purchase agreements and increasing FiT rates. During the past two decades, Sri Lanka has added hundreds of privately-funded run-of-the-river hydro projects.

Nepal's power sector remains famously complicated in its policy and the beautiful Himalayan geography which creates the blessing of potential hydropower must be approached with extreme care. The tariff rate, which averages about 5.4 NPR/kWh (USD 0.05) for hydropower in Nepal, simply cannot excite investors in the face of these challenges. If investors are seeking high returns for their capital, they would likely consider swapping Mt. Everest for Mt. Kilmanjaro instead, where many PPA's in East Africa are given in USD, for example, and not local currency.

Other policies specifically make it difficult to justify for investors to enter Nepal. Various royalties, complex payments, and local conflicts hamstring hydropower projects. For example, while it may be convenient for Nepal's grid managers, the requirement of an "availability declaration" in some PPA's is an incomprehensible demand to developers. The "availability declaration" demands that project owners predict their output every month within a small margin of error, and face reduced revenue for over-producing or penalties for under-producing targets. It is one added layer of complexity of many that is not demanded in other countries who are asking for those same investment dollars. Other countries, like Sri Lanka, are content simply with an annual minimum requirement.

Nepal is unquestionably a high-potential country for hydropower, but for so long, it has remained only potential. This is not primarily because of political instability or difficult geography. It is the lack of attractive incentives and clear development and operational paths, exacerbated by poor facilitation of investor-stakeholder relations. With the chance at selling power as a profit-earning export, Nepal is losing opportunities, while investors are stuck waiting anxiously for conditions to become bearable to justify such large investments into Nepal – or taking their projects elsewhere. The experience of Sri Lanka should be a regional inspiration to how a nation can manage private sector hydropower investment well, to comfort those in Kathmandu who might still have doubts.

Increase economic incentives in a streamlined and simplified way, and all subsequent challenges (whether technical, geographical, or political) can be overcome. These lessons of successful hydropower investment, whether in Sri Lanka, Laos, Bhutan, Uganda, or elsewhere, should be a clear message to Nepali policymakers. This message is a variation on the saying "build it, and they will come", which Nepal's policymakers would be wise to hear: "incentivize it, and they will build!"

In this Issue

EDC Activities

EDC delegation visits to Rt. Honorable Prime Minister of Nepal, Embassies, Government and Non-government organizations in Nepal

The EDC delegation paid visits to Rt. Honorable Prime Minister of Nepal, various embassies, government and non-government officials to introduce about the "Nepal Power Investment Summit 2016" that is organized by EDC from May 31st to June 3rd, 2016. Mr. KP Sharma Oli accepted to be the Chief Guest and inaugurate the Summit. Various ambassadors of strategic embassies in Nepal along with the government officials showed positive response to the summit and committed for active participations.

EDC Chairperson Mr. Sujit Acharya meets Mr. K. P. Sharma Oli, Rt. Honorable Prime Minister of Nepal to invite him to be the Chief Guest of the Summit.

EDC Chairperson Mr. Sujit Acharya meets Mr. Madhav Kumar Nepal, leader of CPN UML and former Prime Minister of Nepal to brief him about EDC.

EDC meeting with Mr. Suman Sharma, Secretary of Ministry of Energy and Mr. Mukesh Raj Kafle, Managing Director of Nepal Electricity Authority. During the meeting, MoE has accepted to co-host the Nepal Power Summit 2016 with EDC as well as host the business trade mission to the foreign delegates.

EDC Meeting with H.E. Mr. Glenn White, Ambassador of Australian Embassy

EDC meeting with H.E. Mr. Ranjit Rae, Ambassador of Embassy of India.

EDC Meeting with H.E. Mrs. Rensje Teerink, Ambassador of Head of Delegation of the European Union to Nepal, Andreas Rottger, First Counsellor, EU & Mr. Madhav P. Khakurel, Nepal Consultant, EIB.

EDC Meeting with H.E. Matthias Meyer, Ambassador of Embassy of the Federal Republic of Germany.

EDC Meeting with H.E. Mr. Choe Yong-Jin, Ambassador of Embassy of the Republic of Korea.

EDC Meeting with the Dr. Himesh Dhungel, Country Director, MCC, Embassy of the United States of America, Mr. Michael Boyd, Senior Energy Policy, USAID and Strategy Advisor & Ms. Stephanie Reed, Deputy Political and Economic Chief, US Embassy.

EDC Chairman, Mr. Sujit Acharya meets Mr. Dhana Bahadur Tamang , Secretary of Water and Energy Commission Secretariat

EDC Meeting with Mr. Ashish Sinha, First Secretary (Commerce), Embassy of India

EDC Chairman, Mr. Sujit Acharya meets Honorable Energy Minister Mr. Top Bahadur Raimajhi.

EDC meeting with Mr.Nigel Hall, Managerial Adviser, Project Directorate, European Investment Bank and Mr. Madhav P.Khakurel, Nepal Consultant EIB

Interview of Mr. Sujit Acharya, Chairman of EDC and Prof. Dr. Govinda Nepal, Chief Economic Advisor of Ministry of Finance

On April 7, 2016, Mr Gopal Basnet of Mountain Television interviewed Mr. Sujit Acharya, Chairman of EDC and Prof. Dr. Govinda Nepal, Chief Economic Advisor of Ministry of Finance on his energy related talk show 'Urja Bahas'. The topic of discussion was implementation part of recently declared 'Energy Crisis Reduction and Electricity Development Decade (2016-2026)' action plan to mitigate energy crisis in Nepal. And what are policies that the government should adopt to foster the development of hydropower sector on upcoming budget speech.

The link of the interview is available at*: https://www.youtube.com/watch?v=hss3Yja46TY)*

Nepal Power Investment Summit 2016 (31st May to June 3rd)

Rt Honorable Prime Minister KP Oli inaugurated a four-day long summit 'Nepal Power Investment Summit 2016' organized by Energy Development Council - the umbrella organization of the entire energy sector of Nepal, with the government partnership Ministry of Energy and Investment Board of Nepal at Hotel Yak & Yeti, Kathmandu. With the theme, Nepal — the future battery of South Asia the summit aimed to deliver the message to the world that Nepal is emerging market for renewable energy projects.

Prime Minister Oli in his remarks said that the conference can be a milestone and turning point history of hydropower development in Nepal. "Nepal has the best investment opportunities and the government will support to create favourable investment environment." He further said that after the promulgation of new constitution in Nepal, the government took clear policy on development of energy sector. "Transformation of the country's economy is important sector to transform economy," he added.

"Nepal is the number one destination in South Asia for investment in renewable energy projects. And through this summit we will prove it," said Sujit Acharya, Chairman at Energy Development Council, adding that Nepal is among the top three emerging markets in Asia. He further said, "Through the summit, we want to send message to the world that the investment climate is improving and Nepal is ready for business." According to him, Nepal offers higher rewards than in other South Asian countries.

"This is the right opportune moment to conduct the summit and invite investors to acknowledge about the investment opportunities," said Radhesh Pant, CEO at IBN. Welcoming the investors in the country and assuring that the government will support in every way possible, he said, "Nepal is all set for business and we assure you that the government will assist you for developing projects without bureaucratic delays." IBN was also the government organizer of the Summit.

According to him, political consensus, stable government, already signed Project Development Agreements to export oriented projects, bilateral and multilateral agreements for energy market have made Nepal as lucrative market for business. Moreover, Pant said that Nepal offers power purchase agreement rates higher than other South Asian countries.
"This event is the best platform to meet all the key decision makers of the energy sector, investors, contractors, manufacturers and technicians," said Kushal Gurung, Summit Director of NPIS.

There were more than 200 participants from China, USA, Canada, Bulgaria, Norway, India, Bhutan, Slovenia, Czech Republic, Thailand, Vietnam, France, Austria, UK among others. Allard Nooy, CEO of Infraco Asia, Radhesh Pant, CEO of IBN, SC Agrawal, CEO of SAPDC, Deepak Amitabh, CMD Power Trade Corporation India Limited, William Pegues OPIC and Kuenga Namgay, Director of O&M Druk Green Power Corporation are among the prominent speakers.

Altogether 40 speakers will discussed about Nepal power market, policy updates and financing methods for power development in Nepal, power transmission and distribution in Nepal, role of Nepal's decentralized renewable in the energy mix and various hydropower project showcased in the two-day conference. Besides the conference, there was also a Project Expo where national and international energy related companies showcased their projects and products.

WAPCOS India, Infraco Asia Singapore, Dragon Capital Thailand, Power Trade Company India, China International Water and Electric Corporation along with other companies are prominent participant investment companies. Out of 40 national and international high-powered speakers, at first day 20 speakers shared their expertise, views and experiences on Nepal power market, opportunities and challenges of rebuilding Nepal's power market, policy updates and financing methods for Nepal power development, experience sharing from leading utilities and private sector perspectives.

The Summit declared that Nepal requires USD 20 billion to develop 10,000 MW on grid hydropower projects in next 10 years, and there is the need of USD 5 billion dollar requires investment in high voltage transmission line projects to complete within 2035. Budhigandaki 1,200 MW, Nalsingad 410 MW, Tamor 762 MW, Andhikhola 180 MW, Tamakoshi V 87 MW, Upper Tamor 415 MW, Tamakoshi III 650 MW and Thuli Bheri 530 MW projects were identified as prominent opportunities for investors.

Investors expressed interest to explore investing in mid and large scale power projects in Nepal worth billions of dollars provided the investment environment improved and Nepal's ranking in the ease of doing business increased. They expected to soon have a one-window policy to get all necessary approvals and permits for doing business.

While Under the NEA and PPP model, NEA is under constructing 1046 MW hydropower projects. NEA is conducting feasibility of projects such as Dudhkoshi, Upper Arun, Tamor, Uttar Ganga, among others.

EDC also launched the book 'Inventory of Rivers of Nepal' in the summit that identified 11,614 rivers and rivulets. And the organization will soon carry study of the potential of hydropower projects of those rivers and rivulets in second phase.

In the conference, 40 speakers from India, Singapore, Thailand, Bhutan, China, US, UK among others highlighted about the investment challenges and opportunities on energy and infrastructure development in Nepal. Speakers also stressed on the need to develop alternative source of energy.

Aliana B Teplitz, Ambassador of USA Embassy for Nepal stated, "Despite of having a huge potential of generating more than 40,000 MW electricity, the installed capacity of Nepal is merely at 780 MW. There is still a huge room for development." She stressed on the need to have better policy and legislation to improve the present scenario.

Nepal Electricity Authority presented that altogether 1,330 MW projects are under construction and will be completed on 2020. "We need to invest about USD 20 billion in the next ten years for generating 10,000 MW in a decade," said Lila Nath Bhattarai, Deputy Managing Director at Engineering Services Directorate, NEA. NEA also said that they faced various geological problems, contractors not working efficiently, technical problems in structures and other natural calamities.

"Tedious and elongated process of acquiring necessary approvals and permits for doing business in Nepal is one of the biggest hindrances for investors," said Allard Nooy, CEO at Infraco Asia.

Allard Nooy, CEO of Infraco Asia presented about the challenges for investment in the energy and infrastructure sector in Nepal. Nooy said, "No coordinated approach to get necessary approvals and permits and lack of adequate background information required of projects and related risks are major challenges for the investors." Stating that hydroelectric projects are in great need for the country, he said, "The government needs to introduce more transparent regulatory framework with more satisfactory return in order to attract foreign direct investments to have economic transformation." According to him, the generation of electricity has increased by two folds during 2001 to 2013 period while the import from India has become four times high.

Another speaker from Sri Lanka Zachary Smith, CEO of Radiance Renewable Technologies said that foreign investors look for lower political risks, ease of doing business, long term incentives packages and policy that bridges between investors and locals to better understand the environment. According to him, the government policy has to be precise and clear and also have a framework that allows flexibility in order to allure investors.

Important declaration of the Nepal Power Investment Summit 2016

- Nepal requires USD 20 billion to develop 10,000 MW on grid hydropower projects in next 10 years
- USD 5 billion dollar requires investment in high voltage transmission line projects to complete within 2035
- EDC launched the book 'Inventory of Rivers of Nepal' in the summit that identified 11,614 rivers and rivulets.

- Under the NEA and PPP model, NEA is under constructing 1046 MW hydropower projects
- NEA is conducting feasibility of projects such as Dudhkoshi, Upper Arun, Tamor, Uttar Ganga, among others
- Budhigandaki 1,200 MW, Nalsingad 410 MW, Tamor 762 MW, Andhikhola 180 MW, Tamakoshi V 87 MW, Upper Tamor 415 MW, Tamakoshi III 650 MW and Thuli Bheri 530 MW projects are identified as prominent opportunities for investors

•Investors expressed interest to explore investing in mid and large scale power projects in Nepal worth billions of dollars provided the investment environment improved and Nepal's ranking in the ease of doing business increased.
•Investors expect a one-window policy to get all necessary approvals and permits for doing business.

The after-event Trade Mission (2nd and 3rd June) was a significant activity for Nepal Power Investment Summit 2016, which would create a perfect platform between concerned industrial players and Nepal Government/key players for exchanging technical know-hows. Highlights of the trip were as follows:
- Ideal platform for industrial players and Nepal Government/key players to exchange technical know-hows
- In-depth understanding of Nepal power market and formulating detailed investment plan from both sides
- Exclusive networking hours for Nepal Government/key players and international potential investors

• Mr. Suman Prasad Sharma, Secretary of Ministry of Energy led the team from the ministry and hosted the foreign delegates Discussion of Master Plan of Nepal Power Development in the following 5-10 Years was carried out.

• Mr. Radhesh Pant, CEO of Investment Board of Nepal greeted and hosted the delegates. Foreign Direct Investment (FDI) Policy, investment environment in Nepal, power generation plant investment policy and process, resettlement problem was discussed during the meeting.

•Mr. Mukesh Raj Kafle, Managing Director of NEA hosted the delegates and the meeting included Specific hydro and Transmission & Distribution (T&D) project planning, focal investment projects showcase.

On 3rd June, the delegates were taken to visit Pharping hydroproject, the old project of Nepal. They were brief about the important history and the technology of the project.

EDC's public advocacy

Creating a congenial atmosphere

By Surya Nath Upadhyay

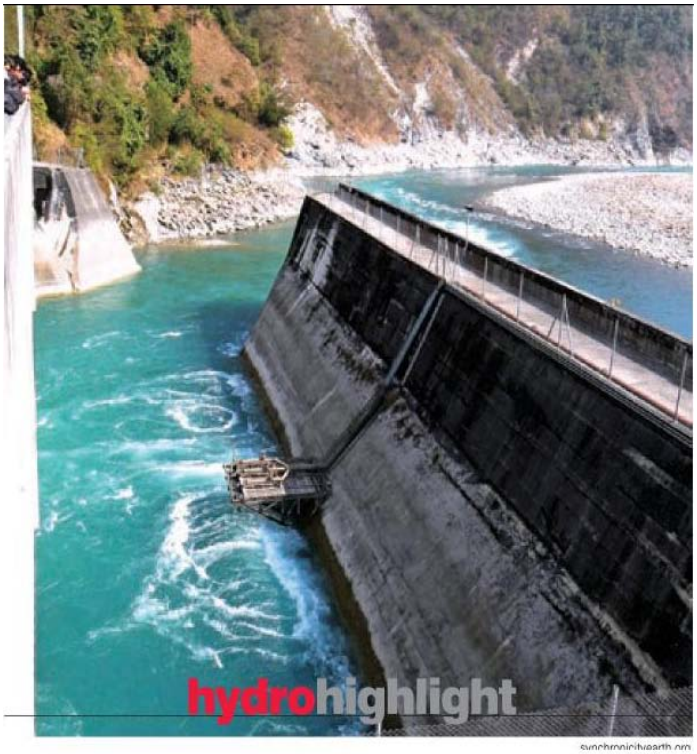
In the due course of the development of hydropower, quite often the ILO Convention 169 is dragged in by locals to substantiate their various claims to the project ranging from compensation and employment to share holding and many other communal facilities. The argument for such claims is that the indigenous groups and tribes have their right to the natural resources on which they depend upon. In case of the hydropower development projects, locals right on the water resource that the project uses. Due to various claims which the proponents of project cannot fulfill, locals create obstructions and the project gets delayed causing enormous cost over- run.

> Land ownership of the natural resources and more particularly of water resource rests with the state

Having a close look on the convention suggests that it may be correct to compensate locals who are affected by project activities while many kinds of benefits based on the ownership of the resource cannot be advanced. In fact, the scope of the convention and more particularly the definitions of tribe and indigenous people are not relevant to the situation of Nepal. Unlike USA, Australia and Canada, Nepal was not discovered nor new settlers came in here by pushing the inhabitant tribes and indigenous people to the brink.

In fact, the whole population of Nepal is composed of a mosaic of various ethnic groups inhabiting harmoniously for centuries. It is a country of the people who have been there since the inception of Nepal as a country. Outsiders did not invade and drive out locals.

Moreover, under the law of the land ownership of natural resources and more particularly on water resource rests with the state. Being fluvial in nature and a vital need for sustenance, it cannot and should not belong to a particular tribe or community. The convention does not accord Veto right to the locals in the project. It allows the ratifying countries to apply the provisions of the convention ' flexibly' in the national context. Under the convention the proponent of the hydro project has to ensure transparency and participation of locals if such project affects their habitat and livelihood.There needs to be smooth sharing of information and ' where possible' participation in the benefit arising out of such project.



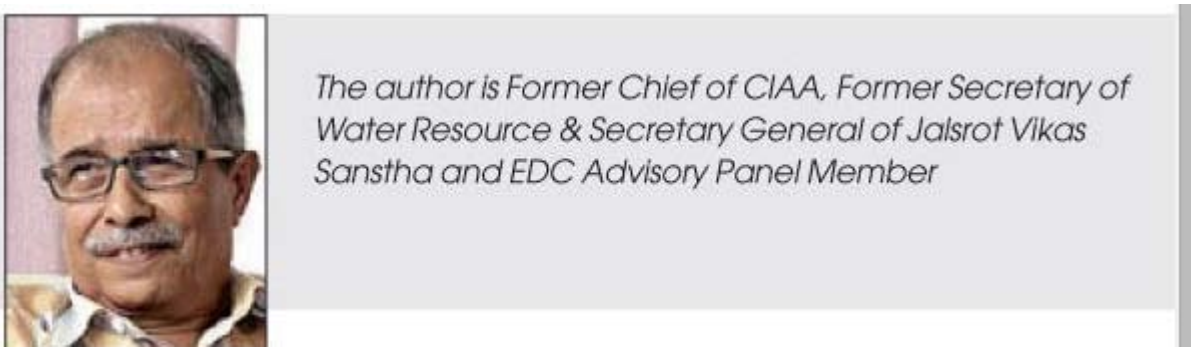
People may also be relocated from their place if it is necessary for the execution of the project. In such situation appropriate procedure as determined by national policy has to be followed and appropriate compensation is to be paid. In the context of our socioethnic situation there cannot be any differentiation between communities belonging to one or the other ethnic groups.

The norms and standards for ' participation', ' exchange of information', ' involuntary resettlement' and ' compensation' are also to be applied on equal basis without any regard to the cast or ethnic group. The definition of ' tribe' and ' indigenous people' in the convention is so wide that all Nepalis fall either in one or the other group and hence the provisions of convention cannot be applied to a particularly ethnic group.

No ethnic group can claim for special right against another and hence the convention which purports to address the rights of a special category of people in any country becomes irrelevant in the case of Nepal for it loses its specialty.

Therefore, it is the duty of the social mobilisers and all those who are involved in the construction of hydropower to take the convention in its rightful meaning and dispel the confusion. We need to clear the fog of misinterpretation of the convention and help creating a congenial atmosphere for the smooth execution of projects which we need desperately.

Creating a congenial atmosphere ILO Convention 169 used wrongly The author is Former Chief of CIAA, Former Secretary of Water Resource & Secretary General of Jalsrot Vikas Sanstha and EDC Advisory Panel Member Land ownership of the natural resources and more particularly of water resource rests with the state hydro highlight



The article was published on April 10, 2016 at The Himalayan Times. The link is available at:***http://epaper.thehimalayantimes.com/Details.aspx?id=9382&boxid=7126219&dat=05/15/2016***

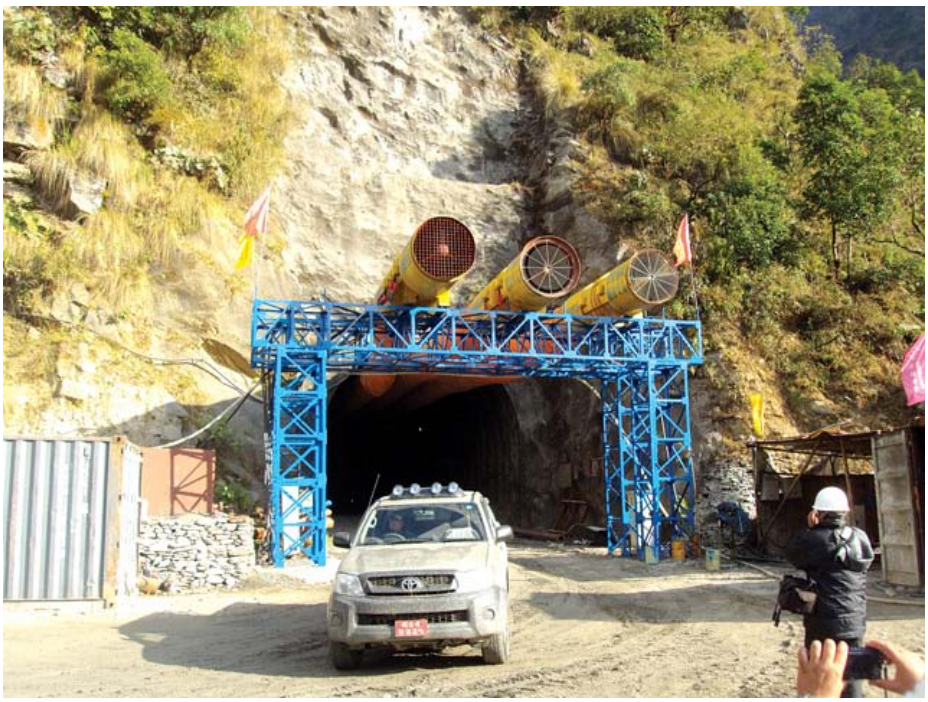
Future power house of South Asia

The Nepal Power Investment Summit next week will send a message to the world that Nepal is ready for foreign investment in renewable energy projects.

Mr. Sujit Acharya

To send a key message to the world that Nepal's energy sector is open for business, the Energy Development Council with the Investment Board of Nepal and the Ministry of Energy are organizing the Nepal Power Investment Summit from 31 May to 3 June in Kathmandu.

For the first time ever, the entire energy sector of Nepal has come together to convey the message to the world that Nepal is ready to attract investors and partners in the development of our renewable energy resources.



This is also one of the first times that a meeting is being held that will bring together foreign investors, contractors, consultants and high powered speakers from all over the world. Large scale projects will be showcased and both foreign and Nepali companies will be exhibiting their products and projects at the event.

Nepal has always wanted foreign investment in energy, but it has not always been able to make a persuasive argument about why they should choose us. Investors do not put money in out of a sense of altruism, or just because a symbolic red carpet is laid out for them. They look at hard numbers, and if they add up and match the desired rate of return, only then will they show interest. Next week's Summit will present a clear case for Nepal as the number one destination in South Asia and the top three emerging markets in Asia to make renewable energy investments.

We want to promote Nepal as the future power house of South Asia, but large-scale investors have been discouraged by political instability and government hurdles. Yes, doing business in Nepal is risky. The frequent change of governments is one of the pitfalls. But along with such risks investors find correspondingly higher rewards here than they would in other countries. Therefore, via this Summit we are clearly stating that we are seeking those investors in particular that are looking to make the highest returns in South Asia and also willing to take on such risks to achieve returns. But we are also acknowledging that we have to mitigate the risks and let investors know that we know where the problems lie. Higher risk-taking investors seeking higher returns will not pulloutofNepal.

Nepal has large scale opportunities in the renewable energy sector. The urban solar opportunity in the country could easily cross the $1 billion mark. Hydropower projects from both the government and private sector showcased during the Summit are in a similar range.

Nepal offers the highest power purchase rates offered in South Asia for hydropower and solar energy. The highest electricity generation per unit from both hydropower and solar plants are again found in Nepal. We will prove that Nepal is the place in South Asia offering the highest returns on investments in renewable energy projects.

We are going to continue to make our case to investors and improve our regulatory environment. Next time, we plan to take the Summit overseas to where the investors are located. We will also be presenting the findings for policy improvements requested by our foreign delegates to the relevant stakeholders in the government, who will also be attending.

(This article is published on 27th May, 2016 in Nepali Times. You can find the article on the link ***http://nepalitimes.com/regular-columns/GUEST-COLUMN/nepal-future-power-house-of-south-asia,724*** **)**

Solar energy micro-grids

There exists ample opportunities for rural entrepreneurs to innovate and come up with solutions

Anjal Niraula

Since the installation of the first solar PV plant in Nepal by NTC in 1974, the solar energy market has come a long way. Especially in the last two decades where the Nepal government through its solar subsidy scheme has managed to deploy over 200,000 Solar Home system (SHS) to rural parts of Nepal, which has provided people an access to clean source of lighting and mobile charging services.

But, it is well established now that access to energy is much more than just basic lighting and mobile charging, people accessing energy for productive end use load is what makes a difference to people's lives. As rural communities climb up the energy ladder and demand more energy for productive end use and community services, mini-grid technology has in certain contexts emerged as a more economical solution when compared to grid extension or such stand-alone systems.

One such solar micro-grid has been developed by Gham Power Nepal, where private capital has been mobilised to initiate rural energy projects, rather than relying on subsidies alone. The equity investment for the project was made by the local community and also by the company into a SPV (Special Purpose Vehicle).

The rural communities view themselves as not just customers but also investors, which provides the platform for longer-term economic growth and development.

There exist ample opportunities for rural entrepreneurs to innovate and come up with solutions that will help them generate revenue which in turn will help them pay for energy. The community has already started setting up cyber centres, poultry farms, milling machines, gas-stations and water pumps which generate substantial revenue for the SPV. In addition to this, a couple of Ncell BTS stations are also purchasing power from the micro-grid on a fixed PPA basis.

In the coming months, as more operational data on the micro-grids are gathered, a better understanding could be developed regarding how micro-grids could be better structured to facilitate private investment, provide opportunities for further innovation, achieve efficiency and growth.

There are still uncertainties in government policy regarding micro-grids, especially concerning exit options for private investors in case the grid arrives within the project period. High project development costs for developers and high transaction costs for investors have also been deterrents for private investors. Uttar Pradesh recently came up with a micro-grid policy of their own where clear emphasis has been provided on exit options in case the grid arrives, different business models that developers could adopt, technical standards to be adhered to and safety measures. But, as the micro-grid landscape grows in the near future in Nepal, the government needs to come up with clear policy framework to incentivise private investment.

There are also some, who argue that these approaches may just be a stop gap solution and divert money from 'ideal' forms of grid electrification through large scale hydro power projects, they overlook the fact that investment in such projects cost many times more than decentralised generation through micro-grids and also has a long project development cycle. The micro-grids bring immediate value to the users. Furthermore, savings from kerosene expenditure could be diverted to other use, revenue generated through appliances could reinvigorate the local economy and working hours are extended, which in turn increases productivity.

These decentralised solutions, such as the micro-grids incorporating productive end use have faster payback for investors and provides safer, cleaner and cheaper energy for the people. This might be the right approach in moving forward as we try and provide energy access to rural Nepal.

filler: As the micro-grid landscape grows in the near future in Nepal, the government needs to come up with clear policy framework to incentivise private investment.

The article was published on April 10, 2016 at The Himalayan Times. The link is available at: ***http://epaper.thehimalayantimes.com/Details.aspx?id=8690&boxid=4387408&dat=4/10/2016***)

Media Coverage

Nepal Seeks Investors for 10 GW of Hydropower Projects by 2026

By Sujata Awale

With the keynote that Nepal requires US$20 billion to develop 10 GW of on-grid hydropower projects in the next 10 years, the largest power investment conference concluded successfully today in Hotel Yak & Yeti, Kathmandu.
The Energy Development Council (EDC) — the umbrella organization of the entire energy sector — organized the four-day summit 'Nepal Power Investment Summit 2016' with the government partnership Ministry of Energy and Investment Board of Nepal.

The summit also declared the need for a US$5 billion investment in high-voltage transmission line projects to complete by 2035. Budhigandaki 1,200 MW, Nalsingad 410 MW, Tamor 762 MW, Andhikhola 180 MW, Tamakoshi V 87 MW, Upper Tamor 415 MW, Tamakoshi III 650 MW and Thuli Bheri 530 MW projects were identified as prominent opportunities for investors.

Investors expressed interest in exploring investing in mid- and large-scale power projects in Nepal worth billions of dollars provided the investment environment improved and Nepal's ranking in the ease of doing business increased. They have also expected to soon have a one-window policy to get all necessary approvals and permits for doing business.

While under the Nepal Electricity Authority (NEA) and private power producer (PPP) model, NEA is construct 1,046 MW of hydropower projects. NEA also is conducting feasibility studies for projects, such as Dudhkoshi, Upper Arun, Tamor and Uttar Ganga, among others.
EDC at the summit launched the book "Inventory of Rivers of Nepal," which identifies 11,614 rivers and rivulets. In addition, the organization will soon carry out the study of the potential of hydropower projects of those rivers and rivulets in a second phase.

During the summit, 40 speakers from India, Singapore, Thailand, Bhutan, China, the U.S., and the U.K., among others, highlighted the investment challenges and opportunities on energy and infrastructure development in Nepal. Speakers also emphasized the need to develop alternative source of energy.
Aliana B Teplitz, Ambassador of the U.S. Embassy for Nepal said: "Despite having a huge potential of generating more than 40,000 MW of electricity, the installed capacity of Nepal is merely at 780 MW. There is still [a lot of] room for development."

She also said there is a need to have better policy and legislation to improve the present scenario.
NEA presented that altogether 1,330 MW projects are under construction and will be completed on 2020.
"We need to invest about US$20 billion in the next 10 years for generating 10,000 MW in a decade," Lila Nath Bhattarai, Deputy Managing Director at Engineering Services Directorate, NEA, said.
NEA also said that it faces various geological problems, contractors not working efficiently, technical problems in structures and other issues.

"Tedious and elongated processes for acquiring necessary approvals and permits for doing business in Nepal is one of the biggest hindrances for investors," Allard Nooy, CEO at Infraco Asia, said.

In a presentation at the summit, Nooy outlined the challenges for investment in the energy and infrastructure sector in Nepal. Nooy said: "No coordinated approach to get necessary approvals and permits and lack of adequate background information required of projects and related risks are major challenges for the investors."
Noting that hydroelectric projects are in great need for the country, he said that "the government needs to introduce a more transparent regulatory framework with more satisfactory return in order to attract foreign direct investments to have economic transformation."

According to Nooy, the generation of electricity increased twofold from 2001 to 2013, while the import from India has increased by four times.

Zachary Smith, CEO of Radiance Renewable Technologies, said that foreign investors look for lower political risks, ease of doing business, long-term incentives packages and policy that bridges between investors and locals to better understand the environment. According to him, the government policy has to be precise and clear and also have a framework that allows flexibility in order to allure investors.
There were more than 200 participants at the summit, hailing from China, the U.S., Canada, Bulgaria, Norway, India, Bhutan, Slovenia, Czech Republic, Thailand, Vietnam, France, Austria, and the U.K., among others.

Lead image: Inaugurating the summit in Kathmandu on Tuesday, Prime Minister KP Oli urged investors to put their money in Nepal's energy sector. Credit: Nepal Energy Form.

(This article is derived from Renewableenergy.com published on June3, 2016 and the link is available at: ***http://www.renewableenergyworld.com/articles/2016/06/nepal-seeks-investors-for-10-gw-of-electricity-by-2026.html*** **)**

Is Nepal ready for investment?

Sujata Awale

Nepal Power Investment Summit 2016 will showcase projects for foreign investment and provide a platform to meet, interact and conduct business

With an aim to attract foreign investors in renewable energy projects, Energy Development Council (EDC) is organizing the largest international energy summit 'Nepal Power Investment Summit 2016' (NPIS) in Kathmandu. The Investment Board of Nepal (IBN) is the government organiser and the Ministry of Energy (MoE) is co-host of the summit that intends to send the message that Nepal is ready for business. The conference offers business-to-business and business-to-government opportunities and a match making platform for foreign investors with potential energy related projects in Nepal.

ABOUT NPIS

Foreign investors across the globe will be participating in the four-day long summit scheduled for May 31 to June 3. China International Water and Electric Corporation, Infraco Asia Singapore, WAPCOS India, Dragon Capital Thailand and Power Trade Corporation of India among others are some of the significant companies participating in the summit. The government and private sectors from Nepal will showcase various hydropower projects totaling 2,500 MW capacity, 20 high voltage transmission line projects and other clean and renewable energy projects. At the conference, national and international high-ranking delegates and speakers will share their expertise, views and experiences on various topics related to the energy sector. Allard Nooy, CEO of Infraco Asia, Radhesh Pant, CEO of IBN, SC Agrawal, CEO of SAPDC, and Kuenga Namgay, Director of O&M Druk Green Power Corporation are among the prominent speakers. The summit also includes a 'Project Expo' where national and international energy related companies will showcase their projects and products. According to organisers, the summit is the best platform to showcase, meet, interact and conduct business with key decision makers from the energy sector from South Asian countries. "This is probably the first time a summit will bring together foreign investors, contractors, consultants and high powered speakers from all over the world," said Sujit Acharya, Chairman at EDC. Citing that this summit is a combination of conference and exhibition, he said, "This event is an initiation for business deals where investors and project developers can interact on a project level."

While every year the country hosts various conferences on hydropower and other related issues, the question of actual outcome is always questionable. When asked what is different about this summit and how it will actually

attract investment, Acharya said, “Through this summit, EDC will present why Nepal is the number one destination in South Asia for investment and among the top three emerging markets in Asia for renewable energy investments.” Furthermore, he said, “If any investor finds a showcased project attractive, EDC will definitely help facilitate invetsment at every step.”

IMPROVING INVESTMENT ENVIRONMENT

It is a fact that investors will not come to Nepal for the love of the nation. The investment climate and rate of returns should be attractive, comparative and competitive with other countries. Process of getting license, approvals, risk mitigation schemes, ease of doing business, clear policies and other rewards should be highlighted to attract investments. Acharya stated that the risk lies in the frequent change of government and the hassles it brings in doing business in Nepal. He also pointed out that with such risks investors also certainly find corresponding higher rewards than in other countries. He is of the opinion that it is the responsibility of the government and private organisations to step in to mitigate risks in required areas. He claimed that Nepal offers the highest power purchase rates in South Asia for hydropower and solar energy. And the country offers immense scope for urban solar and hydropower projects development. EDC plans to take NPIS overseas next year where the investors are located. “There is no doubt that development of the energy sector can only transform the nation and we will continue our duty to invite and assist foreign investors to Nepal,” he added.

(This article is derived from Himalayan Times Perspective published on May 29, 2016. The link of the article is ***http://epaper.thehimalayantimes.com/epaperpdf/2952016/2952016-md-hr-17.pdf*** *)*

‘लगानी सरक्षा गर्न सरकार तयार’

गोरखापत्र संवादाता

काठमाडौ जेठ १८ गते । प्रधानमन्त्री केपी शर्मा ओलीले नेपालको विघुत विकासको लागी स्वर्णीय युग सुरु भइसकेको बताउनुभएको छ । संविधानपछि नेपालमा जलविघुत् विकासपछि लगानीमैत्री वातावरण सिर्जना हुदै गएको र त्यसका लागि सरकारले आवश्यक बाकी काम पनि पूरा गर्ने तयारी गरिरहेको उहाँले बताउनुभयो ।

इनर्जी डेभलपमेन्ट काउन्सिलद्वारा आयोजना गरिएको ऊर्जा लगानी सम्बन्धी दुईदिने अन्तराष्ट्रिय सम्मेलनको मंगलबार उद्घाटन गर्दै प्रधानमन्त्री ओलीले लगानी अनुकूल वातावरण भएका बेला लगानी गरेर प्रतिफल सुरक्षित राख्न र नेपालको उर्जा विकासमा योगदान पूऱ्याउने मौका नगुमाउन वैदेशिक लगानीकर्तालाई आग्रह गर्नुभयो ।

२४ राष्ट्रका प्रतिनिधिको सहभागिता रहेको बताइएको सम्मेलनमा प्रधानमन्त्री ओलीले “नेपाल जलविद्युतको सुरक्षित लगानी गन्तव्य हो । ऊर्जा विकासका प्रचुर सम्भावना र बजार पनि स्रश्ताव रहेकाले नेपालमा लगानी गर्दा लगानी डुब्दैन भनेर लगानीकर्ताले निसङ्कोचपूर्ण ढङगले लगानी गर्न सक्नुपर्छ । लगानीको सुरक्षा गर्ने दायित्व सरकारको भएको उल्लेख गर्दै प्रधानमन्त्री ओलीले भन्नुभयो , लगानीको सुरक्षाका लागि थप नीतिगत व्यवस्थाका लागि सरकार संवेदनशील छ । यसमा सरकारले लगानीकर्तालाई सहजीकरण गर्न तयार छ ।

सरकारले १० वर्षमा १० हजार मेगावाट जलविद्युत उत्पादन गर्ने लक्ष्य लिएको बताउनुहुँदै प्रधानमन्त्री आलीले भन्नुभयो,ऊर्जा क्षेत्रमा लगानी गर्नेको लागि यो भन्दा अरु सुवर्ण अवसर के हुन सक्छ र ? आउनुहोस नेपालमा लगानी गर्नुहोस सुरक्ष दिन सरकार तयार छ ।

उर्जा विकासका थुप्रै आकर्षक कार्यक्रम बजेटमा समेटिएको प्रसङग उल्लेख गर्दै प्रधानमन्त्री ओलीले भन्नुभयो,उर्जा विकासका योजना सरकारले अगाडी सारिसकेको छ र अब कार्यान्वयनमा गई उर्जा विकामा नेपालले चाँडै नै फड्को मार्ने दावी गर्नुभयो ।

सो कार्यक्रममा राष्ट्रिय योजना आयोगका उपाध्यक्ष डा. युवराज खतिवडाले ऊर्जा विकासमा नीतिगत व्यवस्था स्पष्ट रुपमा सरकारले गरिसकेकाले ऊर्जा क्षेत्रमा लगानीकर्तालाई ढुक्क भएर लगानी गर्न आग्रह गर्नुभयो ।लगानी बोर्डका कार्यकारी प्रमुख राधेश पन्तले ठूला जलविद्युत आयोजनामा नेपाल सरकारले पनि लगानी गर्न थालेकाले ऊर्जामा भएको लगानीमा आशङका गर्नुपर्ने ठाउँ नाहेको धारण राख्नुभयो । बोर्डले लगानीको वातावरण अनुकूल बनाउने काममा लागिरहेको बताउँदै पन्तले भन्नुभयो, नेपालमा जलविद्युत क्षेत्रका लाग प्रचुर सम्भावना बोकेको ठाँउ हो ।

(This article is derived from Gorkhapatraonline published on 1st June, 2016 and is available at: ***http://gorkhapatraonline.com/epaper/showimage?img=uploads/epaper/2016 01/8bd377c892ab16973ac10ed3c53c3b33.jpg)***

What investors want?

Nepal's first power investment summit highlighted the gap between what investors want and what the government talks about but seriously lacks in implementation

Sujata Awale

Nepal's first power investment summit ' Nepal Power Investment Summit 2016' concluded with the realisation and declaration that Nepal requires USD 20 billion to develop 10,000 MW on grid hydropower projects within the next 10 years.

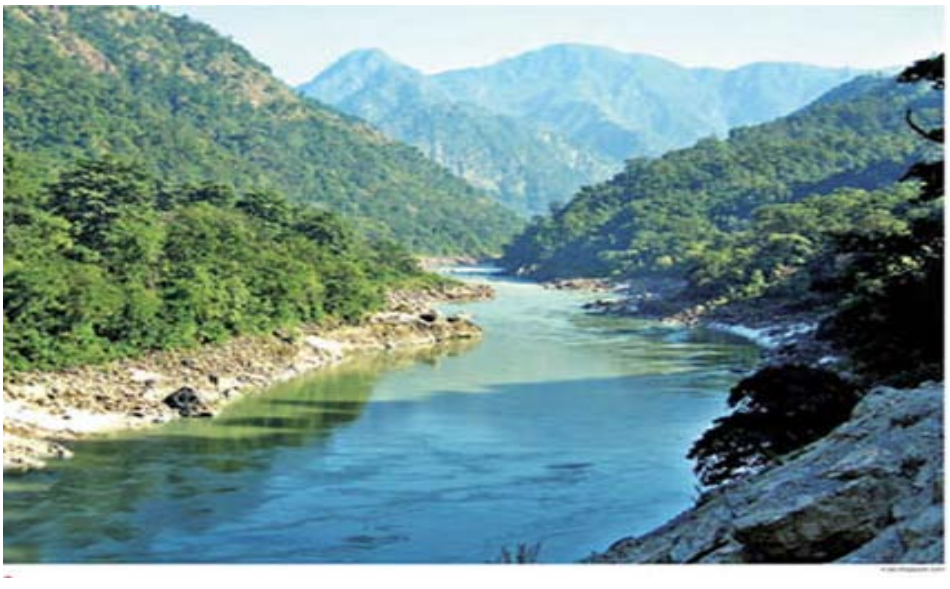
At the summit organised by Energy Development Council and Neoventure, the government announced that Nepal needs as much as USD five billion in order to invest in high voltage transmission line projects and substations to be completed within 2035. According to the government, altogether 3,800 MW hydropower projects are waiting investment, including projects such as Budhigandaki 1,200 MW, Nalsingad 410 MW, Tamor 762 MW, Andhikhola 180 MW, Tamakoshi V 87 MW, Upper Tamor 415 MW and Tamakoshi III 650 MW among others.

Despite all these facts that Nepal needs investment and has huge potential for investment opportunities, investors pointed out that they are facing difficulties in making decisions to invest.They stressed the need for investment friendly policies, one- window system for necessary permits and approvals and improving Nepal's 'Ease of doing business' ranking.

Conducive environment

Lengthy process that stretches out for years to get necessary approvals to initiate hydropower projects is one of the major roadblocks.Moreover, lack of coordination among authorities to get approvals is another challenge. " In Nepal, there is no single authority responsible for providing necessary approvals. There is uncoordinated approach between authorities and that makes the whole process tedious and lengthy," said Allard Nooy, CEO at Infraco Asia, Singapore. Talking about their experience with financing, he said, "When we initiated Kabeli A (38 MW) project, we faced insufficient liquidity in local banks in order to obtain dead financing in projects.This is why we have to turn to multilateral agencies. However, the situation has changed and local banks now have liquidity but the risk of finance is still present."

Nooy stressed on the need to have sufficient background information on construction cost, geological conditions and overall operational cost. He said, " As investors, developers and stock investors, we require sufficient and reliable data that provides us detailed information about higher risks of overruns or others factors to project in lifetime costing."



He suggests the government have a more collusive policy framework to implement hydroelectric projects in the country and break down barriers between various different authorities. " It is important to have one agency to coordinate with Ministry of Finance, NEA, Department of Electricity Development, Ministry of Environment and other responsible bodies for public private partnership and foreign direct investments (FDIs)." According to him, working on an Energy Policy and transparency on tariff setting is must to attract investment and develop the sector.

Nooy said that Nepal should realise they are competing with other nations and that the more difficult it is to get projects approved here, lesser the appetite there will be for FDIs. He is of the opinion that the government must plan for building transmission line projects and substations as ultimately generated power needs to be supplied."Access to the project site and dealing with local people also emerges as challenge while implementing the project," he added.He further said, "One should not forget that private sector is spending significant development capital in terms of structuring projects. And time is money for investors."

On the other hand, according to him, no restriction on foreign investment and foreign ownership unlike other countries, improved liquidity status in local banking institutions and requirement of hydropower projects are positive signs to invest in Nepal.

Returns and incentives

Lucrative returns and incentives are required for developers to invest in Nepal. Zachary Smith, CEO at Radiance Renewable Technologies said that foreign investors look for lower political risks, ease of doing business, long term incentive packages and policy that bridges between investors and locals to better understand the environment. According to him, the government policy has to be precise and clear and also have a framework that allows flexibility in order to allure investors.

He also stressed that the government provide updated background information to easily analyse the risk. Citing that good economic incentive is key to attract investors, he said, " The government should provide long term incentives to mitigate risks for long term investors otherwise there will be the risk of inviting wrong kind of investors."

Nepal has some of the finest policies. However implementation through Parliament is weak and the biggest challenge for the government. At the summit Prime minister stressed his commitment to creating a favourable condition for FDIs. However it is yet to be seen about how committed is this government about bridging these gaps in the development of hydropowersector.

" It is well known fact that Nepal has huge hydro potential which is not something new. The job of the government should be implementing policy to bridge the gap between investors and locals," said Smith. He further said that the government should plan to mitigate financial risk by introducing PPA in dollar denomination for the first couple of years so that investors could recover their equity. According to him, long term vision is required to invite investors in the country.

Commitment in action not talk

While the government is tall in promises about creating a conducive investment environment, Statkraft a Norwegian investment company has given up on developing Tamakoshi III (650 MW) project a few months ago. The decision came as a result of a thorough assessment of all aspects of the project, including commercial, technical and regulatory factors. The company got survey license in 2007 and completed feasibility studies, environment impact assessment and other required studies in 2011. The project started to negotiate with the government for Project Development Agreement in 2011, however it could not conclude the negotiations and decided to quit the project.

" Lack of viable power off take option, lower electricity price forecasts, insufficient transmission capacity for power evacuation and absence of necessary policies and regulatory framework for operational power sales are to blame," said Dr Sandip Shah, Vice President and Country Director Nepal for Statkraft. He further said, " It also reflects the increased bureaucratic hurdles for foreign investments, a fragile political situation and a geo- political situation leading to a non- conducive project development environment."

" According to Dr Shah, the project incurred a USD 10.7 million loss in the project. When asked government about commitment of the government to create a favourable environment for investment, he said, " In 2006- 07, the government promised us the same commitment to a favourable environment and we were ready to invest. However, no real improvement has been felt till date." He further said, " Implementation of signed policy's and agreements is the weakest part of the government," adding that " Due to lack of proper coordination between various ministries and the Investment Board of Nepal, we could not conclude our PDA and had no option than to give up the project."

Citing that 2014 was positive year for hydropower sector, he said, " Two projects got PDAs, PTA was done with India and Nepal signed the SAARC Framework, however even after two years also the government has not been able to introduce regulatory regime to implement those commitments."

He further said that the government needs to revise the regulatory framework in order to make the investment process easy. He said that the investors should focus on domestic supply rather than export oriented projects.

(This article is derived from The Himalayan Times published on june 5, 2016. The link of the article is ***http://epaper.thehimalayantimes.com/Details.aspx?id=9761&boxid=2375309&dat=6/5/2016***)

Guest Corner

Solar windows offer view of low carbon future

Windows of the future will not only generate solar power, but will also provide greater temperature control in buildings. This is the goal of a new research programme by the Centre for Process Innovation, a UK-based technology innovation centre that's part of a consortium developing building-integrated photovoltaic (BIPV) devices.

The project aims to develop a BIPV window that is capable of both generating power and controlling temperature. Commercialisation of this type of device would reduce building energy costs and offer architects greater freedom in structural design.

However, in order to aid the mass-market adoption of BIPV, developmental work is needed to progress the technology from prototype to the manufacturing volumes and performance characteristics that industry requires.

The consortium behind the project, called Power Generating & Energy Saving Windows, also includes materials supplier Merck and BIPV producer Polysolar.

The project will focus on organic PV technology, rather than conventional silicon. The aim is to achieve similar installation costs, transparency, performance and lifetime to that of high performance glazing currently used in industry, whilst providing energy yields comparable to those delivered by conventional photovoltaics in a vertical orientation.

Low carbon in the high rise: a building integrated photovoltaic window

Dave Barwick, principal scientist at the CPI explained: "Once concluded, the project will provide the industry with the required lifetimes, dimensions and price points needed to evaluate how to take this emerging technology to market."

(The article is derived from ii Energy website published on 1st April, 2016 and the link is of the article is ***http://www.ii-energy.com/index.php/2016/04/01/solar-windows-offer-view-of-low-carbon-future***)

The solar-powered plane Solar Impulse 2 just made a historic trip across the Pacific

Updated by Libby Nelson

The Solar Impulse 2, a plane fueled only by solar panels, spent two days flying across the Pacific and landed triumphantly in California on Sunday, completing the latest leg of the first attempt to circumnavigate the world using only solar power.

It was a gorgeous landing:

Jean Revillard via Getty Images
The Solar Impulse 2 comes in for a landing in Silicon Valley.

The Solar Impulse 2 has had a long trip so far, even longer than you'd expect given that it travels just 43 miles per hour.

The journey started in March 2015 in Abu Dhabi. In July, after delays and setbacks in Asia, the plane's batteries overheated during the most important stretch of its trip so far, the five-day journey from Japan to Hawaii. The plane and its two-person crew spent 10 months in Oahu repairing the aircraft.

Now that it's back in the air, the next step is to fly across the US, then the Atlantic, with a stop in southern Europe or northern Africa, before completing the loop in Abu Dhabi.

The goal of the journey, besides setting a new world record, is promoting clean energy. As Vox's Brad Plumer wrote when the plane took off in 2015, its slow speed and the fact that it can only hold two passengers means that solar-powered aircraft might not have many practical implications for air travel in the foreseeable future. (Biofuels, not solar power, are the aircraft industry's big hope for cutting emissions.)

One of the pilots comes from a long line of explorers

The flight of the Solar Impulse 2 feels like an old time adventure, or at least a steampunk one — a throwback to the early days of flight, when making it across the ocean was a harrowing feat.

One of the plane's two pilots, Bertrand Piccard, is a direct descendent of those earlier inventors, carrying on a family tradition of breaking records.

He's the grandson of Auguste Piccard, a Swiss physicist who took a hydrogen balloon to the stratosphere in 1931 — the highest a human being had ever traveled. (Auguste Piccard became the model for Professor Calculus in the Tintin comics, an absent-minded professor who invents spectacular devices.)

Then, in 1960, Auguste's son, Jacques Piccard, was the first person to explore the deepest part of the ocean, the Mariana Trench, in a capsule called a bathyscaphe that he had designed himself — going deeper than any human being before.

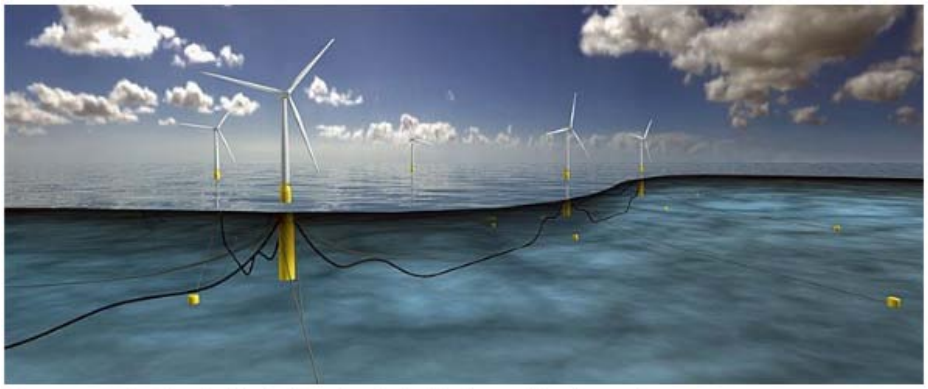
And Bertrand Piccard has already added his own record to the family's pile: He was the first to complete a nonstop air balloon flight around the world. If all goes well, he and his co-pilot, André Borschberg, will become the first to circumnavigate the world in a solar plane as well.

(The article is derived from Vox published on 25th April, 2016. The link of the article is available at: ***http://www.vox.com/2016/4/25/11501318/solar-impulse-pacific-plane***)

Scotland gives go-away for world's largest floating wind farm

A five-turbine floating windfarm has gained final approval to set up 25km off the east coast of Scotland in 2017, and is expected to become the world's most powerful floating windfarm of its kind once it starts churning out a combined 30MW.

A floating steel tube anchors each 6MW spar design turbine, with a ballast mixture enabling it to stay in place, while remote controls allow fine tuning of the turbine's positioning.



Concept art showing the Hywind Scotland Pilot Park, near Peterborough

Lindsay Roberts of Scottish Renewables described floating offshore wind as "an exciting technology with huge, global potential," while Statoil's project director Leif Delp identified the area, near Peterhead, as a "region with a huge wind resource and an experienced supply chain from oil and gas."

Offshore wind turbine installations provide a rich source of renewable energy while remaining hidden from land-based human populations, which can ease the planning permission process; they can also help power conventional undersea oil and gas projects, as Windpower Offshore pointed out on May 16, the same day that Statoil's license was granted.

The Hywind Scotland flotilla will soon face competition for the title of world's most powerful, with similar large-scale projects also under construction around the world, including Principle Power's farms off the coasts of Oregon, USA, and northern Portugal.

(This article is derived from ***https://www.yahoo.com/tech/scotland-gives-ahead-worlds-largest-floating-wind-farm-163110423.html*** published in May 16, 2016)

We Just Completed A Full Year Of Record-Hot months

"I'm just in shock," says one climate scientist. "I wish it weren't so."

For the 12th month in a row, the National Oceanic and Atmospheric Administration has announced record-high global temperatures — marking a yearlong heat streak that scientists say is grim sign of climate change in action.

April 2016 was the hottest ever recorded by NOAA since it started tracking global temperatures in 1880, the agency announced Wednesday. This is the 12th consecutive month the agency has identified a monthly global temperature record. That's the longest such streak NOAA has ever recorded.

"The April temperature across global land and ocean surfaces was 1.98°F above the 20th century average of 56.7°F," NOAA announced. "This was the highest for April in the 1880-2016 record, surpassing the previous record set in 2010 by 0.50°F."

Those temperatures are staggering, climatologists say.

"It's pretty striking," said Astrid Caldas, a climate scientist with the Union of Concerned Scientists and a Huffington Post contributor. "I'm just in shock. I wish it weren't so."

Caldas noted that she didn't expect the planet would arrive at this point so quickly.

"I think most climate scientists are surprised at the speed that it's happening," she said. "But at the same time, with emissions peaking again last year... everything was pointing to an increased temperature. It's the amount by which the records are being broken, not the fact that the record's being broken, that's really striking."

(The article is derived from the link: ***http://www.huffingtonpost.com/entry/one-year-record-heat_us_572fbc91e4b0bc9cb047312c on May 18,2016***)

Municipal Solar and Microgrids: A PV Market Outlook

By Jennifer Runyon
Chief Editor

Whether driven by the desire to be more disaster-proof or just to save money, municipalities are turning to the promise of solar PV and microgrids all over the world.

Small cities and towns are prime off takers for solar power and solar developers are hoping to delve further into that market in 2016.

Solar Because It is Green and a Good Deal

Located in the northeast of the U.S., Peterborough, New Hampshire took on the title of "The Greenest Town in New Hampshire" in late 2015 after it turned on a 1-MW solar array that will power its townhouse, fire station and library through a group net-metering arrangement. Borrego Solar developed the project and served as the engineering, procurement and construction provider before selling it to SunEdison with whom Peterborough signed a power purchase agreement (PPA).

Peterborough purchases the solar energy at a rate of US $0.08 per kilowatt-hour, less than what it pays for power from Eversource, the local utility. A $1.2 million grant from the public utilities commission also helped fund the project.Other proactive cities and towns across the U.S. can seek grants that help pay the cost of installing solar and then work with developers such as Borrego to figure out how to complete the project.

"Solar projects like this one save taxpayer's money and bring new economic activity to the area in the form of construction jobs and land lease payments," said SunEdison VP of partner development Tom Leydon in a press release.

Image: Solar array at the town of Peterborough, New Hampshire wastewater treatment facility. Credit: Renewable Energy World

Solar Because It Isn't Nuclear

According to Paula Mints' latest market update, Japan is still one of the hottest markets for solar PV. The country turned to renewable energy after the Fukishima disaster five years ago, pledging to shut down all nuclear power plants in the country.

The market today is mostly driven by a generous Feed-in Tariff (FIT) that the government enacted to help kick start the transition to renewable energy. Mints pointed out the government is committed to solar PV and "is looking to develop a sustainable model for doing so."

One such model might just be found in the Japanese city of Miyama (Fukuoka Prefecture) where the local government has just rolled out Miyama Smart Energy, a program that lets homeowners in the town purchase locally-produced clean energy from the city itself at a rate that is lower than what they can get from the local utility.

Miyama is home to the 23-MW Kyushu Solar Farm 7, which produces energy for the town and for which it receives FIT payments from the federal government. In turn, Miyama sells that power to its interested citizens using the incumbent utility's system. If more power is needed, the city "buys additional electricity at the wholesale market," said analyst Junko Movellan. She added that the city hopes to "meet all electricity needs from local renewable energy, including hydro and geothermal in the future."

Image: Large-Scale PV System that provides electricity to Miyama Smart Energy. Credit: Courtesy of Miyama City.

"It's business model is very similar to that of CCA [Community Choice Aggregation] here in the U.S.," said Movellan.

Bundling other benefits such as a Home Energy Management system (HEMs) that includes a tablet so that homeowners can track their energy use and a reward system that gives them points that can be redeemed for other city services, Miyama is the first in the county that is authorized to sell electricity to its customers. But it most likely won't be the last. At least 12 other local governments in Japan are looking to do the same thing.

Microgrids Because of Resiliency

The memory of Hurricane Sandy in the U.S. Northeast still brings shudders to city and town administrators who watched as their citizens went days, and in some cases weeks, without power, water, and heat after the disaster struck. In all, some 8 million households in 17 states were affected by the storm and its path of destruction. While some buildings and homeowners had back-up generators powered by diesel, as the fuel to power them ran low, anxiety about what could happen next increased.

To help alleviate some of the anxiety and bring more resiliency to municipalities, Schneider Electric is offering solar-powered microgrids to those cities and towns that may want them.

In the town of Fairfield, Connecticut, Schneider built a 300-350 kW microgrid that uses 60 kW of combined heat and power, a 47-kW solar photovoltaic system and a 300-kW natural gas generator along with a control and distribution system, energy efficiency measures and on-grid and island modes to bring peace-of-mind that future storms won't as heavily impact the town.Most of the time, the microgrid is connected to the larger grid but should disaster strike, the police and fire stations, an emergency communications center, a cell phone tower and a public shelter will remain energized 24/7.

When a power outage cascades through the grid the microgrid is alerted to electrically separate and protect itself from the disturbance. At that time, it uses its own distributed generation resources to distribute power to the town's identified critical facilities.

Fairfield paid for its microgrid through a $1.1 million grant from the state of Connecticut and put in $130,000 from its own coffers to fund the project.

Solar, Storage and Microgrids for the Rest of Us

The towns of Peterborough, Miyama and Fairfield are all early adopters of new technology — towns who understood its benefits and then went out and explored funding opportunities, appliying for grants and taking

advantage of incentives in order to bring green energy and resiliency to their municipalities. But grants and incentives are not intended to fund the whole world's transition to renewables.

In order to make it more simple for the mainstream market, Schneider Electric is working on how to make microgrids "modular, scalable and repeatable," said Mark Feasel, Vice President of the Electric Utility Segment & Smart Grid. Feasel said Schneider believes the technology exists today but the "chasm" that has to be crossed in order to attract more municipalities is related to business models.

"The main market is a community that has some plans around sustainability and reliability and they have energy bills to worry about and need some help on how to figure that out."

To that end, Schneider has deployed a new sales force within the company to go out and engage with communities and other potential end-users that might want a microgrid. Feasel said while Scheider can supply the equipment and expertise, it is "working with select partners that would finance and own the assets." Under that model the municipality would receive the microgrid as a service. "They wouldn't have to put capital up to do it," said Feasel.

The company is working with Duke Energy on a pilot project at its own headquarters near Boston, MA. "We do believe that the non-regulated arms of utility holding companies make great partners because they understand how to own and operate assets and, by the way, they aren't going out of business anytime soon."

For Schneider's microgrid, Duke Energy will finance the project and sell the power to Schneider through a PPA. Schneider will not have to come up with any capital upfront but will use its own equipment to power the microgrid. The microgrid will include a 400-kW photovoltaic system built and operated by REC Solar. A portion of the PV will be on carports at the campus. Schneider Electric's microgrid controller StruxureWare demand side operation will optimize the photovoltaic energy, storage and the facility's existing natural gas generator during grid-connected and islanded operation. It will also store up to 1 MWh of electricity using EcoBlade, the company's energy storage system powered by lithium-ion batteries.

Expect to continue to see announcements related to municipal solar and microgrids in 2016 and beyond.

(This article is extracted from the link ***http://www.renewableenergyworld.com/articles/2016/05/municipal-solar-and-microgrids-a-pv-market-outlook.html published on May 18 ,2016)***

NY Energy Czar at Microgrid Knowledge Conference: "There are Going to be a Lot More Microgrids."

Microgrids will play a key role as New York strives to make renewable energy 50 percent of its electric supply by 2030, said New York State's Energy Czar Richard Kauffman at the Microgrid Knowledge conference yesterday in Manhattan.

"The good news is that there are going to be a lot more microgrids. The challenge is that we need your help in adding projects in a different way than we've added distributed resources in the past," said Kauffman, the chairman of energy & finance for New York Gov. Andrew Cuomo.

Kauffman, who spoke to a standing-room only crowd, offered details about the state's next move in Reforming the Energy Vision (REV), the state's radical remaking of the power industry to align it with a more consumer-focused digital age.

Later in the day, the Public Service Commission approved the plan that Kauffman had described (CASE 14-M-0101), which creates new ways for utilities to earn revenue. The state hopes to incentivize the utilities to work with competitive partners, such as microgrid developers, to bring new services to customers, increase efficiency, improve economics, and green the energy supply.

"The current system is not only energy inefficient; it is financially inefficient. If we can do things better, we have the opportunity to add many more microgrids," said Kauffman, who was the keynote speaker for the Microgrid Knowledge conference.

Today's electric grid was built for a different age when large centralized power plants moved electrons many miles. Through REV, New York hopes to remake it into a dynamic "hybrid grid," which has both the benefits of central station production with the "innovation and flexibility" of distributed energy that is typically smaller and built closer to the user, he said.

The state's new policy direction is making it a mecca for not only microgrids, both also other forms of distributed energy, such as solar and energy storage.

What New York realized, Kauffman said, is that remaking the grid to accommodate more distributed energy requires not so much more technology innovation, but a change in policy and regulations.

"The policy regime was designed to build the old system; if we want to build a new system, we need new policies. And that is, of course, what REV is all about," he said. "We must do things differently if we are to achieve scale and build a market on a cost-effective basis."

Relies on Private Sector

The pacing will depend largely on what the private sector does, he said.

"Policy only takes you so far. The way things happen is through engagement with private sector actors. And that's where you come in," he told the more than 160 microgrid insiders who gathered at the Manhattan conference.

He noted that other capital intensive industries have changed in the last three decades, but "not in the utility sector; not until now. This is not a fault of the utilities, but the result of a regulatory system that largely bases utility compensation on the quantum of capital that is deployed, not on the efficiency of capital that is deployed."

He added: "So we really can't be surprised that we have a system that is capital inefficient. We also can't be surprised that utilities have been less aggressive in making investment in software and technology than in other industries. From the utilities standpoint, IT is not capital on which a utility can make a financial return."

Utilities can't own microgrids or other distributed energy in New York because of regulations created several year ago to promote competition. So they will have to work in partnership with competitive companies to earn the revenue offered under the new order.

The state plans to create a locational pricing system to attract microgrids and distributed energy to grid constrained areas – a system that state policymakers hope will take the place of net metering.

"Utilities will send a price signal by location which will drive deployment of DER and microgrids – should drive deployment — in certain locations where those resources will be good not just for those DER customers, not just those microgrid customers, but all customers," Kauffman said.

"If utilities get paid for achieving cost savings for all customers, they will work with all of you to originate projects in particular locations where these solutions have the most value for the system as a whole. They will have a financial incentive to do so," he said.

He noted that the 50 percent renewables goal is likely to result in several large solar and wind projects. Smoothing their intermittency will require installation of demand side solutions, such as microgrids, according to Kauffman.

"None of these changes are going to happen over night. But the sooner all of you in the microgrid industry can engage with government and utilities on how to better integrate projects into the system of the future, the faster we can move. Utilities will have financial incentive to do this. But they are going to need to know how they can monetize the value. They are not going to automatically know how to do that without your engagement," he said.

Other states likely to follow, says Kauffman at Microgrid Knowledge conference

He added that other states are likely to follow New York's lead.

"The sooner you can demonstrate new ways of financing and developing projects in New York, the more scale we will get. And if we get more scale in New York, other places are going to notice," he said.

More details about the state's new approach to utility payment are below.

Under the REV order approved by the PSC May 19, investor-owned electric utilities must file proposals by Dec. 1, 2016 to show how they will reduce power generation during times of peak energy demand.

In the plans, utilities must identify ways they will make their systems more efficient with distributed energy. They receive financial rewards for achieving such results as:

- Reducing greenhouse gas emissions through cost-effective means
- Energy efficiency above and beyond current targets
- Customer engagement in innovative energy management programs
- Faster pace of interconnections between the electric grid and new solar and other renewable power projects
- Reductions in carbon emissions through such investments as conversion to electric vehicles and geothermal heat pumps
- Reductions in costs related to meet the state's 50 percent renewables goal.
- Utilities will have four ways to achieve earnings:
- Traditional cost-of-service earnings
- Earnings tied to achievement of alternatives that reduce utility capital spending and provide definitive consumer benefit
- Earnings from market-facing platform activities
- Transitional outcome-based performance measures

"New York is taking a new direction today by creating the most-advanced and forward-thinking business model for electric utility rates anywhere in the country," said Audrey Zibelman, PSC chair. "By aligning utility profits with market-enabling activities, residential and business customers can lower their energy bills through advances in digital technology and power-saving systems built for private homes and apartments, as well as entire neighborhoods."

This article is derived from MICROGRID website and the link is ***http://microgridknowledge.com/microgrid-knowledge-conference-kauffman/*** published on May 20, 2016.

China International Hydropower Association

China

China statistics
Area:
9,326,410 km²
Population:
1,356,000,000
Installed hydropower capacity:
319,370 MW, including 23,060 MW pumped storage (2015)
Hydropower generation:
1,126,000 GWh (2015)

For the tenth consecutive year, China added more new installed hydropower capacity than the rest of the world combined, cementing the country's leading role in global hydropower development.

In 2015, China added 19,370 MW of new hydropower capacity*, including 1,230 MW of pumped storage, bringing the total installed capacity in the country to 320 GW. The country remains the world's leading producer of renewable energy. China is also a world leader in clean energy investments, which now exceed total investments in fossil fuels and nuclear power combined.

In its intended nationally determined contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC), China reaffirmed the terms of its bilateral agreement with the USA, pledging to reach peak total emissions by 2030, or earlier, and to reduce power sector emissions by 60 per cent before 2020. China has also shown a determined effort to combat urban air pollution by reducing coal consumption and bolstering the carbon efficiency of transport and industry.

In order to achieve these ambitious goals, China is rapidly expanding low-carbon generation technologies, including nuclear, wind and solar power. The flexible characteristics of hydropower, including pumped storage, facilitate the increased grid penetration of wind and solar.

Pumped-storage hydropower is also complementing the growing nuclear power capacity in the country. In 2015, China produced over 1,126 TWh of hydroelectric energy, a 5 per cent increase from 2014, while fossil fuel production dropped by almost 3 per cent. Hydropower accounts for 20 per cent of the country's total power production.

China has largely met the ambitious goals for hydropower development set out in its twelfth five–year plan (2011–15). However, it has not developed pumped storage capacity at such a rapid rate as conventional hydropower. Installed pumped-storage capacity reached 23 GW in 2015, which is far from the plan's 41 GW target.

Nearly one-fifth of China's installed wind power output was curtailed in 2014, i.e. electricity that could have been generated by wind farms was not accepted, due to excess power in the system. Some of this curtailment can be attributed to the lack of pumped-storage capacity. This situation also reflects the need for improved transmission and distribution interconnections.

The slower rate of pumped storage development can be attributed in part to the lack of fair remuneration for grid services by the market. The Chinese government has now reformed policies to encourage further pumped storage development.

New policy instruments include a two-part feed-in tariff, which is specific to pumped-storage plants. This mechanism reflects the value of pumped storage's ancillary energy services, and acknowledges the technology's important role in providing reserve capacity.

Further policies put the onus on the two Chinese grid companies, China State Grid and China Southern Grid, to construct and manage new pumped-storage stations.

An estimated 27 GW of pumped storage capacity is currently in development across the country. Notable pumped storage projects include the 3,600 MW Fengning plant in Hebei province, which is currently under construction. When completed in 2021, it is expected to be the largest pumped storage station in the world.

Pumped storage projects that are expected to commission turbines in 2016 include Tianchi (1,200 MW) and Jixi (1,800 MW).

Notable capacity additions in 2015 include the addition of the first two 650 MW turbines at the Dagangshan hydropower station on the Dadu River in Sichuan. When fully commissioned in 2016, this project will have a total installed capacity of 2,600 MW. The Guanyinyan project (3,000 MW) on the Jinsha River added three more 600 MW turbines in 2015; one remains to be installed before the project is completed.

In the Tibet Autonomous Region, the 510 MW run-of-river Zangmu station was fully commissioned, having added its first two 85 MW turbines in late 2014. Zangmu, located some 140 km away from Lhasa, will be the largest hydropower station in the region. The 120 MW Niyang station, also in Tibet, close to the Indian border with Arunachal Pradesh, was fully commissioned.

Elsewhere, the 558 MW Mamaya hydropower station, situated on the Beipangjiang River, a tributary of the Pearl River, in Guizhou province, was connected to the grid. It will supply power through newly constructed transmission lines to Guangdong provinces.

The article is extracted from the link ***http://www.hydropower.org/country-profiles/china published on May 2016***.

PAKISTAN

THE VOICE OF RENEWABLES

Pakistan to spend Rs163.554 billion on hydropower projects.

- With planning macroeconomic targets including GDP growth at 5.7 percent, inflation below 6 percent, exports $24.7 billion, imports $45.2 billion and current account deficit hiking to $4.8 billion in upcoming budget 2016-17, the government proposed allocation of Rs163.554 billion for hydropower projects including Rs32 billion for Diamer-Basha Dam for land acquisition as well as for its construction of five lots.

- The government also plans allocation of Rs27.560 billion for Pakistan Atomic Energy Commission (PAEC) including allocation of Rs500 million for acquisition of land and development of basic facilities and detailed studies of nuclear power plant site at Sukkar.

- The Annual Plan Coordination Committee (APCC), scheduled to meet today (Friday) is all set to approve Rs1,675 billion for both federal PSDP and provincial development outlays in the next budget as well as according approval to macroeconomic framework. However, the Planning Commission envisages GDP growth target at 5.7 percent for upcoming financial year which is lower than the Cabinet's approved figure of 6.2 percent tabled by the Finance Ministry under Budget Strategy Paper (BSP) for 2016-17.

- Finance Minister Ishaq Dar is reported to say that after GDP loss of 0.5 percent due to cotton crop in outgoing financial year, the GDP growth target of 5.7 percent may be more realistic target and consequential changes in framework can be addressed.

- For land acquisition of Basha Dam, the proposed allocation stands at Rs14 billion, construction of Basha Dam from lot 1 to 5 with estimated cost of Rs18.3 billion, Dasu Dam Rs42 billion, Neelum-Jhelum Hydropower project Rs61.4 billion, Tarbela Extension-IV Rs16.487 billion,

- According to macroeconomic framework going to be considered by APCC approval and recommending to National Economic Council(NEC) which was scheduled to meet on May 30 under chairmanship of Prime Minister Nawaz Sharif, the Planning Commission projected GDP growth at 5.7 percent with contribution from agriculture 3.48 percent, industry 7.69 percent and services 5.73 percent in 2016-2017.

- Nominal GDP (market price) is targeted to grow by Rs33,063 billion and GNP per capita is projected at Rs179,900. The growth target, according to summary, is subject to risks such as extreme weather fluctuations, interruption in envisaged reforms and non-aligned monetary and fiscal policies. The inflation level is expected to remain below 6 percent providing leeway for fiscal acumen monetary adjustment and stable exchange rate.

- Investment is targeted at 17.7 percent of GDP in order to realise the targets of sustained, indigenous and inclusive growth. National savings as percentage of GDP is targeted at 16 percent. The investment under CPEC is expected to improve the overall investment climate. Further, the improvement in investment friendly environment as a result of affordable energy, increased profitability, high capacity utilisation and reduced political and economic uncertainty will help attain investment target for 2016-17. Fixed investment is expected to grow at 16.1 percent of GDP by 2016-17.

- Average inflation during 2016-17 is projected at 6 percent on the basis of anticipated low oil and commodity prices and stable exchange rate. Though oil prices have started inching up, the increase remains sluggish and the effect of imported inflation is expected to remain low (below 6 percent).

- Global outlook for commodities' prices remains cautionary for 16-17 with little expectation of quick resurgence. Given the declining trend in exports, concerted effort is required for its rebound. Hence, trade balance is projected to be in deficit by $20 billion in 2016-17. However, given the completion of CPEC projects and pickup for industrial sector, the exports and imports are expected to gain momentum. Exports projected to grow by 10.8 percent ($24.7 billion) while imports projected to increase by 14.8 percent ($45.2 billion). The current account is projected to be in deficit by $4.8 billion in 2016-17 (1.5 percent of GDP) as against a deficit of $1.7 billion (0.6 percent of GDP) estimated for 2015-16.

This article is derived from ***link*** ***http://voiceofrenewables.com/hydro/pakistan-to-spend-hydropower-projects/*** published on June 16, 2016.

The Man, who brought internet to 60,000 villagers of Nepal, The Mahabir Pun

While Internet is considered a basic requirement in the Western world, it is still a far off dream to the millions of people. Nepalese are many of them. Poverty, and difficult land structure are reasons why Internet reach is low in the mountainous areas of Nepal.

However, one man made it a mission to bring Internet to the rural masses of Nepal and he was successful in providing 60,000 Nepalis living in villages.

Meet Mahabir Pun. Fed up with the fact that he had to hike for two days whenever he wanted to check his email, he decided to connect his home town of Nangi to the Internet. This video explains how he did it.

Produced by Clemens Purner, the video describes how Pun struggled, and succeeded, in the face of criticism and lack of hardware to build a wireless network in rural Nepal. In the process, he's raised the region's standards of health, education and prosperity—as well as its ability to send email. It's a wonderful and inspiring video, that's well worth a watch.
Resource: Gizmodo / Techworm

This article was published on December14, 2015 and the link is:
http://royalmt.com.np/news/the-man-who-brought-internet-to-60000-villagers-in-nepal-the-mahabir-pun/

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.	Hydroelecticity 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.	Saral Urja 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.	Waiba Infratech 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	

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