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In this issue

Editorial

Mainstreaming Energy Efficiency — *The Most Effective Generator*

Mr. Ashish Chalise

CEO, SARAL URJA NEPAL

AN EDC MEMBER ORGANIZATION

As a child, I saw elders paying respect when a light bulb was lit by touching the forehead and then the chest. After spending several years in the energy sector, I understand the reason behind the respect for light, electricity and energy. People respected it because it was a scarce resource, they respected its value.

Nepal has set goal to graduate from Least Developed Country (LDC) by 2022. For this, it should focus equally on Energy Efficiency (EE) as it does on energy generation. Energy demand and economic growth are closely corelated. Energy efficiency has become the first

fuel source of a sustainable energy system. Today, globally, investments in energy efficiency are equaling investments in energy generation. Similarly, in Nepal where energy efficiency has not even started, there is a great opportunity to formulate and implement energy efficiency policies to use energy efficiently, enhance productivity and drive economic growth.

Energy efficiency is generator agnostic. Whatever the source of energy, we should be able to get more output by using less energy. Energy efficiency is mostly about demand side interventions, for example, using LED bulbs instead of CFL. Saving energy by applying energy efficiency is as important as developing a hydro power or any other power plant of the same size.

Energy efficiency helps in energy reliability, sustainability and access. Energy efficiency is the cheapest form of energy, a recent study conducted by Lazard puts energy efficiency to be cheaper than renewable resources. So next time you adopt an energy efficient appliance, be proud of yourself, you are helping the nation and the entire world.

Nepal recently adopted a national energy efficiency strategy. The Government has given Alternative Energy Promotion Center (AEPC) the mandate of implementing energy efficiency. AEPC which pioneered and mainstreamed off grid renewable energy across the country now has the task of implementing an energy efficiency program which is 100% on grid.

The main goal of Nepal's energy efficiency strategy is to "To double the average improvement rate of energy efficiency in Nepal from 0.84% per year, which existed during the period of 2000 -2015 AD to 1.68% per year in 2030 AD". Declining energy intensity means that less energy will be required to produce the same level of output. The strategy's goal means that over the period 2016 to 2030, the strategy seeks to double the annual average rate of decline in energy intensity from the level observed between 2000 and 2015. To achieve this goal Nepal needs to invest heavily on energy efficiency: it needs to invest equally on energy efficiency as it does on energy generation to achieve the goal set by energy efficiency strategy.

A study by the International Energy Agency finds that we could have saved 2.2 million barrels of oil per day if all countries adopted the best passenger fuel economy standards; reduced 16% of industry electricity use if all countries adopted the strongest electric motor standards and achieved consumer

savings of USD 20 billion if everyone was purchasing the top 10% most efficient refrigerators. It is the policy that drives the input and outcome of energy efficiency. Nepal has a unique opportunity, we are at a very nascent stage of formulating energy efficiency policy, developing implementation strategy and scaling energy efficiency. Global lessons are very valuable and should be taken into consideration by policy makers.

Energy efficiency strategy of Nepal revolves around five pillars. The major input focus is on creating awareness around energy efficiency, to incentivize, help institutions achieve energy efficiency goals and create energy efficiency standards. The major output focus is to increase overall productivity of the nation and to decrease energy imports through energy efficiency. How the program is designed and implemented around these pillars are yet to be seen.

Why energy efficiency when we have so much potential for energy generation, one wonders? Implementing energy efficiency does not mean that we reduce our focus and investment from generations side. In Nepal, Energy efficiency and energy generation must supplement each other for environmental and economic growth.

Main streaming energy efficiency is need of the hour not only in Nepal but globally. As Nepal is at the threshold of implementing energy efficiency policy it would be interesting to follow the development in the days to come. We hope that the policy makers and implementors learn from cases around the world to put forward a very progressive energy efficiency policy as well as implementation framework.

Energy efficiency should be owned by the government and led by the private sector. If we respect our resources, we are at the best position to deliver the best results. Like the respect our elders paid to energy, we would do the same, this time by saving it.

EDC ACTIVITIES

11th June, 2019

Presentation on Nepal Electricity Regulatory Commission's Jurisdiction

On 11th June, an EDC member meeting was held at its office premise. Mr. Hari Prasad Subedi, ACCA, Electricity Sector Financial Specialist at USAID's Nepal Hydropower Development Project, Deloitte Consulting Overseas Projects LLC was invited to make a presentation on the jurisdiction of Nepal Electricity Regulatory Commission (NERC). The meeting discussed on how regulatory commissions around the world have developed and explained Nepal's enacting ERC. Mr. Subedi and his team stated that ERC in Nepal is still taking shape and once it is beyond the initial startup phase, there will be additional clarity on how it will proceed. ERC is expected to play an important role in the future. Present in the meetings were Mr. Bishal Thapa, Vice- Chairman, EDC, Kushal Gurung, Head of Executive Committee, EDC, Ms. Itnuma Subba, CEO, EDC, EDC members - Mr. Dije Shrestha, CEO, ICTC Energy Pvt. Ltd, Mr. Roshan Silwal, CEO, Comtronics Pvt. Ltd, Mr. Bijaya Man Sherchan, Chairman, Pashupati Energy Development Co. Pvt. Ltd, and Deloitte team - Mr. Ram Hari Dhakal, Ms. Susma Giri and Ms. Needika Adhikari.

EDC ACTIVITIES

21st June, 2019

Presentation on Overview of Taxation FY 2076/77 in Energy Sector

Mr. Anjan Neupane, Partner, Neupane Law Associates, an EDC member shared a presentation on overview of taxation FY 2076/77 in energy sector on 21st June at EDC office. He touched upon overview of Finance Act 2019 which introduced new tax rates, exemption, concession and reliefs. Some attractive provisions are: 100% exemption in income tax for the first 10 years of commercial operation in hydropower and companies generating electricity from solar or wind, VAT exemption in goods and services such as solar panel and modules, electric transformers, static converts etc, complete exemption of custom duty on motors and battery charger required to manufacture three or four wheeler vehicles operating only with electricity, solar or battery, and many more. Present in the meeting were Mr. Kushal Gurung, Wind Power Nepal, Mr. Sushil Timilsina, NEA Engineering Co. Ltd, Mr. Biraj Khanal, Sunfarmer, Mr. Kabin Maharjan, Anak Hydropower Co. Pvt. Ltd. and Ms. Itnuma Subba, EDC.

EDC ACTIVITIES

26th June, 2019

Electric Vehicle Promotion Conference 2019

Energy Development Council (EDC) has successfully conducted "Electric Vehicle Promotion Conference 2019" on June 26, 2019 at Hotel Himalaya, Lalitpur. The conference aimed to promote electric vehicle use and the proper utilization of the available energy in Nepal. Hon. Mr. Barshaman Pun, Ministry of Energy, Water Resources and Irrigation (MoEWRI), chief guest of the program, inaugurated the program at 09:39 NPT after a welcome address by Mr. Sujit Acharya, Chairman of EDC. The chairman noted that Nepal has a hydropower potential of more than 400,000 MW and thus Nepal is inevitable to go electric in the future.

He also noted the pressing need to convert all petrol scooters and motorcycles into electric. Converting two and four-wheeler private vehicles from petrol to EV creates 6000 MW market for Nepal's electricity. He said it saves Nepal more than 2.5 billion USD in petroleum and petroleum product bills thereby reducing the trade deficit drastically. Nepal's petrol shall thus be called electricity. All Nepalis therefore should boycott petroleum-based products to ensure no future blockades affect them like it did in the past because then, our transport would be powered by Nepal's electricity and not foreign-imported fuels. Petrol and petroleum products are a likely threat against our national security, our economy and our environment which adversely affects our main resource sectors of hydropower, tourism and herbal sectors.

The minister remarked that the government is working towards maximizing use of electric vehicles in Nepal. Along the keynotes of his speech, he noted the need for Nepal to switch from non-renewable fossil fuels to sustainable and clean energy. He added that the government is gearing up to introduce policies promoting clean energy to replace traditional energy sources. He claimed that 50% of the vehicles plying will be electric by 2030 and the electricity generated by the under constructed hydropower projects will be easily available for supply. This would ultimately reduce the dependency of imported energy resources.

This was followed by special remarks by Mr. Madhusudan Adhikari, Executive Director, Alternative Energy Promotion Center (AEPC), who noted that we should be prepared for alternative energy replacing traditional energy sources for a better future.

The speech was followed by a panel discussion on Conductive Legal Framework and Policies for Mainstreaming EVs, moderated by the Editor of Republica Mr. Subhash Ghimire. Panelists included:

- Pramila Devi Shakya Bajracharya, Joint Secretary, Ministry of Physical Infrastructure & Transport (MoPIT)
- Ramji Bhandari, Director, Nepal Electricity Authority (NEA)
- D.E. Mr. Raju Maharjan, Ministry of Energy, Water Resources and Irrigation (MoEWRI)
- Kartika Yadav, Planning Officer, Economic Management Division, National Planning Commission

The discussion yielded several points. Several points noted in the discussion include difficulty in passing favourable legislations and the complicated bureaucratic processes in addressing the introduction of EVs in Nepal. Key focus was on the implementation of easy-charging access points and the introduction of a favourable environment for EVs including tax rebates and subsidies.

After the discussion, Rowan Fraser, Country Representative, GGGI provided a presentation on the topic "Policy and Investment projects for electric mobility". He noted the need to identify various barriers and need to work together with various stakeholders to overcome these barriers to establish electric mobility within the country. Mr. Awashis Ojha, Head of Marketing and Communication, Laxmi Hyundai Pvt. Ltd. also gave a productive presentation on the topic "Electric Vehicles", where he discussed the trends of electric vehicles in Nepal and the global arena, and the role Hyundai is playing in introducing EVs in the country. The program then adjourned for lunch.

After the short break, a panel discussion on the topic "Scaling Use of EVs through Market-based Intervention" followed, moderated by Mr. Kunda Dixit, Editor of Nepali Times. Panelists included:

- Umesh Raj Shrestha, President, Electric Vehicle Association of Nepal (EVAN)
- Rajan Rayamajhi, Managing Director, Thee-Go Group, Future Green Energy Pvt. Ltd
- Suman Basnet, Energy and Management
- Barsha Shrestha, Business Head, ICRA Nepal Limited

The panel discussed about the requirement of EVs in Nepal in light of public health and environment benefits as compared against traditional fossil fuel vehicles. The discussion also made note of the importance of energy independence and self-reliance. Key points include the acceptance of electric vehicles by customers and the need for a change of attitude of the government and consumers towards EVs.

EDC ACTIVITIES

This was followed by a short discourse by Mr. Bijaya Man Sherchan, Chairman, Electric Vehicle Manufacturers' & Importers Association – Nepal (EVMIAN) on "Relevance of Clean Energy: Electric Transportation in Cosmopolitan Kathmandu". He gave an overview of the history and achievements of EVs in Nepal and shared his experience working with EVs. Later, Prof. Bhim Prasad Shrestha, Dept. of Mechanical Engineering, KU & Vice Chancellor's Office of External Affairs and local Engagement of Kathmandu University gave a presentation on the topic "Research and Development Activities on Electric Vehicle at Kathmandu University".

Hon. Dr. Bimala Rai Paudyal, MP, National Assembly at Federal Parliament of Nepal adjourned the session with a short keynote speech. She noted her campaign in the parliament against petroleum-based policies and a push for an alternative energy source for environmental and public health reasons. She suggested pushing electric-vehicle policies as economic issues so that the government takes it more seriously in a ground-framework basis.

Mr. Kushal Gurung, Head of EDC executive committee member gave the vote of thanks and thanked everyone for participating in making this conference successful and encouraging a fruitful discussion.

Presentation & video of conference is available at: http://www.edcnepal.org/electric-vehicle-promotion-conference-2019/

6th June, 2019

Visit of Marsh India to EDC

Mr. Gautam Pant, VP- Infrastructure, Marsh India Insurance Brokers Private Limited and his colleague Mr. Singh visited EDC office on 6th June. They expressed their interest to partner with EDC to create customized solutions for its member partners and advise them on managing their risk efficiently. They extend their willingness to educate our members to insure their risks with Reinsurers having good security ratings that can stand by them during a claim scenario. They shared they can create specific solutions for lenders/banks, EPC contractors, IPPs and Utility companies (Generation/ Transmission/ Distribution), tunneling projects, telecom sector, railway developers and telecom infrastructure. Present in the meetings were Ms. Itnuma Subba, CEO, EDC, Mr. Sushil Bajracharya, CEO & Mr. Ratan Lama, DGM of Himalayan General Insurance.

EDC ACTIVITIES

TenderNotice.com.np

Tender, Bids and Notices related to Hydro and Energy segments in Nepal

Month: June 2019

S.No.	Notice Publisher	Description	Published Date	Notice Category	Product Service
1	Power Grid Corporation of India Limited	Supply of ACSR Moose	6/28/2019	Tender	Electronics/ Electric Utilities
2	Unitech Hydropower Company Pvt. Ltd., Mid Baneshwor, Kathmandu	Prequalification of Civil Works, Hydro-Mechanical Works, Electro-Mechanical Works and Transmission	6/28/2019	Pre-Qualification	Electronics/ Electric Utilities
3	Betan Karnali Sanchayakarta Hydro	Time Extension Notice	6/26/2019	Time Extension	Other Product/ Services
4	Nerude Laghubitta Bittiya Sanstha Limited, Central Office, Biratnagar	Sale of Shares	6/25/2019	Tender	Other Product/ Services
5	Upper Tamakoshi	Construction of Reservoir	6/24/2019	Quotation	Construction/
6	Chilime Hydropower Company Limited, Chilime	Design, Manufacture, Supply, Installation and	6/24/2019	Quotation	Other Product/ Services
7	Hydroelectricity Investment and Development Company Limited, Kathmandu	Procurement of Server with Rack and Power Management	6/20/2019	Quotation	Electronics/ Electric Utilities
8	Jagdulla Hyrdopower Company Limited, Buddhanagar, Kathmandu	घर भाडामा लिनेसम्बन्धी	6/20/2019	Proposal	Real Estate
9	Bhairabkunda Hydropower Pvt. Ltd., Kamalpokhari	Headrace Tunnel Maintenance Works	6/19/2019	Tender	Construction/ Building
10	Butwal Power Company Ltd., Buddhanagar, Kathmandu	Standing List for Supply and Delivery of Office Accessories and Other	6/19/2019	Standing List	Enlistment-Multiple Category
11	Deprosc Laghubitta Bikas	Auction Sale of Jeep	6/18/2019	Tender	Automotive /
12	Sayapatri Hydropower Limited, Chabahil, Kathmandu	Sale of Vehicle	6/18/2019	Tender	Automotive / Vehicles
13	Sanima Mai Hydro Power Limited, Naxal, Kathmandu	Standing List for Supply and Delivery of Office Accessories and Other Services	6/16/2019	Standing List	Enlistment-Multiple Category
14	Api Power Company Limited, Thapathali, Kathmandu	Design, Fabrication, Supply, Installation, Commissioning and Testing of Electro Mechanical Equipment on Water to Water Basis	6/12/2019	Expression Of Interest	Electronics/ Electric Utilities
15	Raghuganga Hydropower Limited, Myagdi	Notice for Opening of Price Bids	6/11/2019	Notice	Other Product/ Services
16	SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal	Observing Discharge and Silt Load Data, Hiring of Catering, Housekeeping and	6/6/2019	Tender	Other Product/ Services
17	Tanahu Hydropower Limited, Thapathali, Kathmandu	Addendum Notice	6/5/2019	Amendment Notice	Other Product/ Services
18	Trishuli Hydroelectricity Company Limited, Vansthali, Kathmandu	बोलपत्र स्वीकृत गर्ने आशय	6/4/2019	Award Notice	Other Product/ Services

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MEDIA COVERAGE

26th June, 2019

GOVERNMENT COMMITTED TO PROMOTING ELECTRIC VEHICLE

The government has said it is committed to and fully supports promotion of electric vehicles and the proper utilisation of available energy in Nepal for reduction of carbon gas, as well as fossil fuel import.

Minister for Energy, Water Resources and Irrigation Barsha Man Pun, speaking at a programme titled 'Electric Vehicle Promotion Conference' organised by Energy Development Council (EDC) in the Capital today, said the government is working towards maximizing use of electric vehicles in the country.

Nepal will switch from non-renewable fossil fuel to sustainable and clean energy very soon," he claimed, adding that the government is gearing up to introduce policies promoting clean energy to replace traditional energy sources.

He also noted the pressing need to phase out all petrol scooters and motorcycles.

Replacing all two- and four-wheeler private vehicles with electric vehicles will create 6,000 MW market for Nepal's electricity. He further said it will save Nepal more than $2.5 billion in petroleum bill, thereby reducing the trade deficit drastically.

Speaking at the programme, Sujit Acharya, chairman of EDC, highlighted the need to promote EVs in Nepal in light of public health and environmental benefits as compared to traditional fossil fuel vehicles.

In the conference, the panellists emphasised on the importance of energy independence and self-reliance.

Bijaya Man Sherchan, chairman of Electric Vehicle Manufacturers' and Importers' Association – Nepal, highlighted the history and achievements of EVs in Nepal. "The government should create a favourable environment for the electric vehicles in Nepal, but it is yet to even introduce the guidelines to regulate the EV sector."

MEDIA COVERAGE

26th June, 2019

MINISTER PUN STRESSES FOR PROMOTION OF ELECTRIC VEHICLE IN NEPAL

Barshaman Pun, Ministry of Energy, Water Resources and Irrigation (MoEWRI) inaugurated the program Electric Vehicle Promotion Conference 2019 amid a function.

Minister Pun said that the government is working towards maximizing use of electric vehicles in Nepal. He said that there is a need for Nepal to switch from non-renewable fossil fuels to sustainable and clean energy.

Sujit Acharya, Chairman of EDC noted that Nepal has a hydro-power potential of more than 400,000 MW and thus Nepal is inevitable to go electric in the future.

He said that the pressing need to convert all petrol scooters and motorcycles into electric. Converting two and four-wheeler private vehicles from petrol to EV creates 6000 MW market for Nepal's electricity.

Acharya said it saves Nepal more than 2.5 billion USD in petroleum and petroleum product bills thereby reducing the trade deficit drastically. Nepal's petrol shall thus be called electricity. All

Nepalis therefore should boycott petroleum-based products to ensure no future blockades affect them like it did in the past because then, our transport would be powered by Nepal's electricity and not foreign-imported fuels.

Madhusudan Adhikari, Executive Director, Alternative Energy Promotion Center (AEPC), said that all should be prepared for alternative energy replacing traditional energy sources for better future.

The speech was followed by a panel discussion on Conductive Legal Framework and Policies for Mainstreaming EVs, Pramila Devi

Shakya Bajracharya, Joint Secretary, Ministry of Physical Infrastructure & Transport (MoPIT), Hara Raj Neupane, DMD, Nepal Electricity Authority (NEA), Senior Divisional Engineer Raju Maharjan, Ministry of Energy, Water Resources and Irrigation (MoEWRI) and Kartika Yadav, Planning Officer, Economic Management Division, National Planning Commission. The program was moderated by Subhash Ghimire, editor-in-chief of Republica.

During the program various issues were raised including difficulty in passing favorable legislations and the complicated bureaucratic processes in addressing the introduction of EVs in Nepal. The participants gave key focus on the implementation of easy-charging access points and the introduction of a favorable environment for EVs including tax rebates and subsidies.

After the discussion, Rowan Fraser, Country Representative, GGGI provided a presentation on the topic "Policy and Investment projects for electric mobility". He noted the need to identify various barriers and need to work together with various stakeholders to overcome these barriers to establish electric mobility within the country.

Awashis Ojha, Head of Marketing and Communication, Laxmi Hyundai Pvt. Ltd. also gave a productive presentation on the topic "Electric Vehicles", where he discussed the trends of electric vehicles in Nepal and the global arena, and the role Hyundai is playing in introducing EVs in the country. The program then adjourned for lunch.

Moderated by Kunda Dixit, Editor of Nepali Times, panelists Umesh Raj Shrestha, President, Electric Vehicle Association of Nepal (EVAN), Mr. Abhisek Karki, Research Engineer, Suman Basnet, Energy and Management Professional (EV Users) and Barsha Shrestha discussed about the requirement of EVs in Nepal in light of public health and environment benefits as compared against traditional fossil fuel vehicles.

Bijaya Man Sherchan, Chairman, Electric Vehicle Manufacturers' & Importers Association – Nepal (EVMIAN) highlighted on "Relevance of Clean Energy: Electric Transportation in Cosmopolitan Kathmandu".

He gave an overview of the history and achievements of EVs in Nepal and shared his experience working with EVs.Later, Prof. Bhim Prasad Shrestha, Dept. of Mechanical Engineering, KU & Vice Chancellor's Office of External Affairs and local Engagement of Kathmandu University gave a presentation on the topic "Research and Development Activities on Electric Vehicle at Kathmandu University".

Dr. Bimala Rai Paudyal, MP, National Assembly at Federal Parliament of Nepal adjourned the session with a short keynote speech. She noted her campaign in the parliament against petroleum-based policies and a push for an alternative energy source for environmental and public health reasons. She suggested pushing electric-vehicle policies as economic issues so that the government takes it more seriously in a ground-framework basis.

Keshab Prasad Chapagai gave the vote of thanks and thanked everyone for participating in making this conference successful and encouraging a fruitful discussion.

Organized by EDC, The conference aimed to promote electric vehicle use and the proper utilization of the available energy in Nepal.

EDC is an umbrella organization representing the entire energy sector of Nepal consisting of Energy Developers, Energy Associations, Energy Consumers, Energy Financiers and other funds, Consumer Institutions, Energy Contractors from both private and government sectors involved in hydropower, solar, wind and other renewable, generating more than 80% of the nation's total electricity.

Nepal's Perspectives

3rd June, 2019

Renewable Solutions to Nepal's Power Problems

In this interview with the Post's **Alisha Sijapati**, Chalise talks about the positive changes that have occurred thanks to his organisation's initiatives and shares the difficulties of running a start-up. Excerpts:

How did Saral Urja come about?

Saral Urja is the brainchild of Bishal Thapa, who is our mentor, managing director and the main investor of the company. He has the technical expertise and is very experienced in the energy supply chain.

He started the company through his own will and finance. Although this is primarily his idea, we are all working towards making it a better organisation by partnering with the government, financial institutions, rural communities and energy users.

Can you explain how Saral Urja works?

There are different ways of using solar energy. We have based our projects through three different revenue drivers--first, off-grid projects, in rural areas where there is no electricity at all. Second, we have rooftop solar and the third is a large project, through which we plan to sell electricity to the National Electricity Authority (NEA).

For our first project, we have built a few operative micro-grids in Tanahun and Raksirang. We apply for tenders from the government, sometimes we get it, sometimes we don't. The second model is now functioning at NMB Bank where we have installed a 50kW system at our own cost. The bank has been purchasing the electricity generated from the system. For the third model, we have partnered with Golchha Organisation. Apart from the equity investment, our project is based in Parasi on land owned by them. You can say that it is similar to a hydro plant.

Many companies that invested in solar energy shut down after the end of load-shedding. How has Saral Urja managed to stay afloat in the market?

When the company was registered in 2013, there was a huge problem of power cuts. Nepalis had to endure through 18 hours of load-shedding, which was definitely not a joke. Solar was the best alternative solution for such an electricity crisis. So, when the load-shedding crisis ended in 2016, many solar energy companies were forced to shut their businesses.

But we didn't start Saral Urja to cater solely to this problem. A solar company doesn't evolve if it does not come up with innovative ideas and implement them. We had to restructure our business model.

We also offer better prices. For example, you pay Rs 13 per unit to NEA while our rate is Rs 11 for the same. This helps us build long-term partnerships.

What sort of challenges do you face when pitching your ideas to your potential clients? How did you overcome them?

When the power cuts ended, people were no longer attentive towards solar energy. But we are trying to change that attitude. We market a different kind of solar--it is grid-connected solar. This will reduce electricity costs. But there is so much resistance from business houses. Even in rural areas, we invest so much time just to convince the communities of the benefits of solar energy. But we are confident in our model, so that drives us to face any challenge that comes our way. We want to engage and build relationships with the community.

Renewable resources are one of the keystones of sustainable growth. How effective has they been in the projects Saral Urja have worked on?

We can't just focus on sustainability. We set up a micro-grid in 2015--a solar power plant that provides electricity for 150 households in Tanahun. With that model, we created a new company there, Baidi Micro Grid, and gave a 40 percent stake to the locals as well. The power plant has been running successfully for the past five years. People have moved back from Kathmandu to their village due to access to electricity. It has also created avenues for entrepreneurship.

We focus on creating such positive ripple effects.

How do you collaborate with NEA?

We work with NEA in rooftop projects. In such projects, there is a system called net metering, which is basically a billing mechanism that credits solar energy system owners for the electricity they add to the grid.

Although we have a policy in place, net metering is still in its nascent stage. It's been three months that I have been trying to get net metering for one project, so it has been frustrating. Even NEA authorities are not really clear about it. There is a potential to generate electricity from every rooftop in Kathmandu, so it should be a priority for the government.

What advice do you have for the youth who would like to work in the field of sustainable energy?

It is not enough to just have theoretical knowledge to get a job. The youth are excited to bring something new to the table, but they need to understand practical problems. I would suggest that it is important to give 100 percent in what you do or just don't do anything at all.

14th June, 2019

Gautam Buddha Airport Slated to be Successfully Solar-Powered Airport In The World

Gautam Buddha International Airport in Bhairahawa could become the second fully solar-powered airport in the world when it opens in early 2020, after India's Cochin International Airport which earned the distinction in 2015.

A fully solar-powered airport means that the entire airport—from the air traffic control room, baggage claim and runway lights to ground control rooms and passenger terminals—operates on energy from the sun.

"The airport premises contain plenty of vacant space that can be used to set up solar panels. The Asian Development Bank has agreed 'in principle' to fund the 'green airport' project," said Naresh Pradhan, project officer-transport at the Asian Development Bank. The multilateral lending agency may provide a separate grant for the project. The airport covers an area of 787 bighas.

The project aims to create a power neutral airport which means that it can produce as much energy as it consumes. A round of discussions with the Tourism and Finance ministries, Nepal Electricity Authority and Nepal Civil Aviation Authority of Nepal have been completed, said Pradhan.

The stakeholders may also visit some airports operated by solar power. According to Pradhan, the

project aims to produce 10 MW of solar power. "The surplus energy will flow into the national grid."

The solar plant is estimated to cost nearly $10 million, or $1 million per MW, and take around six months to complete. The airport will not have to pay any electric utility bill, and it can earn revenue by selling extra energy. Its only expenses will be repair costs.

"The green airport can set an example for the rest of the world by contributing to the protection of the environment," said Pradhan. "It's a preliminary plan. But we expect to see it materialise within the next six months when the airport comes into operation."

Located in south central Nepal, the airport is the gateway to the international pilgrimage

destination of Lumbini, the birthplace of Gautam Buddha.

The civil works contract worth Rs6.22 billion was awarded to China's Northwest Civil Aviation Airport Construction Group in November 2013. The airport was initially slated to be ready by December 2017. However, fuel and building material shortages due to the months-long Tarai banda in 2015 delayed the upgradation work by six months, and its operation deadline was revised to June 2018.

Subsequently, a dispute over payment between the Chinese contractor and the Nepali sub-contractor, Northwest Infra Nepal, stalled work at the construction site for more than six months. As a result, the project deadline was extended many times after the initial extensions. The project is expected to come into operation by early 2020.

In March, the Civil Aviation Authority of Nepal awarded a $4.83 million contract to install communications, navigation and surveillance and air traffic management systems at the airport to Aeronautical Radio of Thailand.

The Thai company needs to complete the navigation system by December. After the equipment is installed, tested and commissioned, flight calibration of the navigation and communication systems needs to be done. This will take at least two more months, according to the Civil Aviation Authority.

Two weeks ago, the cabinet had given an in-principle approval to the Tourism Ministry to appoint international firms for the operational readiness and airport transfer (ORAT) operation of the airport in Bhairahawa through a government to government deal.

ORAT is the best way to ensure that every aspect of a new facility functions flawlessly right from day one. ORAT consultants work with airport stakeholders to formulate new processes, train staff, and test every single new system and procedure from passenger and baggage handling to airside operations.

29th June, 2019

Two Wheeler Assembly Plant: A prospective Venture

The enterprise of assembling two-wheelers within the country is gradually growing, with three assembly plants already in operation and one in the process of establishment.

The assembly plants of Bajaj, Bela, and Benling brands are already well into the production process, whereas Jagadamba Motors has announced that its assembly plant for TVS is under construction for the last seven months.

Khil Prasad Sharma, marketing officer of Benling Motors, an electric two-wheeler company, said that their assembly plant was established in April 2018 and it has produced 400 bikes till now.

According to a report of Hulas Auto Craft, Bajaj Auto's Nepal distributor, the company has opened a state-of-the-art assembly plant for its HH Bajaj Unit, in Ramgram, Nawalparasi. This plant has a capacity of producing 300 bikes per shift, the report says.

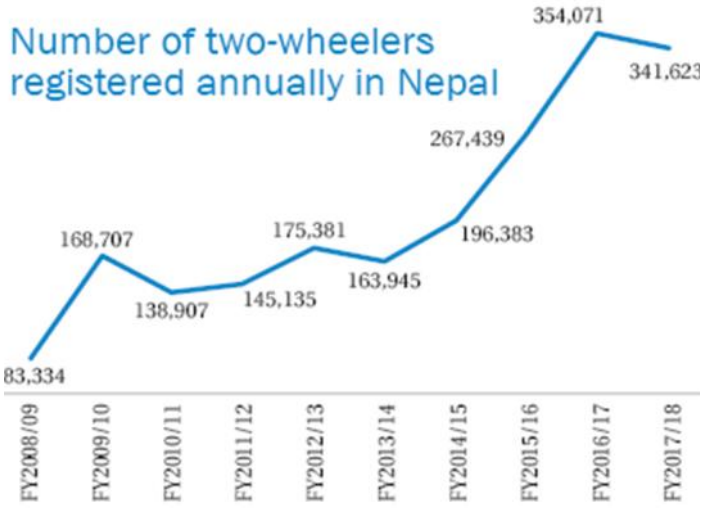
Jagadamba Motors, whose assembly plant is in the final phase of establishment in Simra, has a target to start producing bikes by mid-September. The assembly plant is being established with the cost of Rs 1billion. Jagadamba has plans to manufacture 100,000 bikes per year. More than a decade ago, an assembly plant of Anna Lifan, a Chinese bike, was opened in Nepal. It has already been closed.

Shambhu Dahal, President of Nepal Automobile Dealers Association (NADA), said that the prospect was high for popular two-wheeler brands to establish their assembly plants in Nepal. "Brands like TVS are already established and self-sustainable, so their assembling in Nepal will further foster their business," he said.

Bela Motors, which is an electric two-wheeler brand, has also been assembling bikes for the last one year. According to Rajesh Maharjan from the accounts department of the company, Bela has been running a plant in Baluwatar of Kathmandu at the initial phase; and the company is planning to shift the plant to Hetauda very soon.

"We have assembled around 200 bikes till now," he said. "One challenge for the company is the lack of skilled human resource for assembling electric vehicles."

Besides, availability of spare parts is also an issue for the company. "We import all the spare parts because parts suitable for different kinds of two-wheelers are not available here. Also, they may not be available all the time," he said.



He said that it was around 20%-30% cost efficient to assemble bikes here than import them from abroad. Two-wheelers have been a convenient mode of transport in Nepal for basically two reasons: poor public transport system and poor road conditions. For that reason, establishing two-wheeler assembly plants within the country may give lots of opportunity for entrepreneurs.

Data from the Department of Transport Management shows that 2,530,722 motorcycles have been registered till mid-February 2018. According to the department, only 34,576 two-wheelers were registered until 1990-1991. The massive increase of imports in this period shows the immense market of two-wheelers in Nepal.

the lack of skilled human resource for assembling electric vehicles."

Besides, availability of spare parts is also an issue for the company. "We import all the spare parts because parts suitable for different kinds of two-wheelers are not available here. Also, they may not be available all the time," he said.

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Global Perspectives

1st June, 2019

Government Wants Petrol Station to Charge Your Electric

The government is looking to put in place a framework for a mega battery manufacturing and charging infrastructure — including the use of petrol pumps for electric charging points — to push electric vehicles (EVs) in the country.

The finalisation of plans comes amid resistance from the powerful auto lobby to the mandate to sell only electric three-wheelers by 2023 and that all new two-wheelers with engine capacity of up to 150cc may have to be electric-powered by 2025.

To counter this opposition, the government is contemplating a phased rollout of the EV programme for two- and threewheelers and initially limit their sale to the metropolitan cities, especially those that are highly polluted. This will be akin to the implementation of emission standards such as BSIV and may partly help address concerns of the industry, which has described the government's move as "unrealistic" and "ill-timed".

"There is the question of lack of charging points across the country. We are looking at how we can get petrol pumps to have charging stations. Once you have a network of charging

stations across the country, it will promote the use of electric vehicles," a senior official said.

Currently, there are around 60,000 petrol stations operated by state-run firms and there are plans to add nearly the same number. Several private players also operate gas stations across the country. The industry has complained that the charging infrastructure is missing and the use of existing fuel stations is seen as a win-win deal.

Besides, the government wants to use the EV rollout to turn India into a manufacturing base for vehicles as well as batteries and avoid a situation like the one for electronic goods and

mobile phones where a late entry has resulted in China emerging as the global manufacturing hub.

As part of that move, Niti Aayog, the government think tank, has floated a Cabinet proposal on "giga-scale" cell and battery manufacturing facilities in the country, suggesting a variety of sops, including income tax incentives to promote investment and a customs duty matrix that encourages domestic production.

3rd July, 2019

Why the Age of Electric Flight is Finally Upon Us

Aerospace firms are joining forces to tackle their industry's growing contribution to greenhouse gas emissions, with electric engines seen as one solution. But will this be enough to offset the growing demand for air travel?

This week's Paris Airshow saw the launch of the world's first commercial all-electric passenger aircraft - albeit in prototype form.

Israeli firm Eviation says the craft - called Alice - will carry nine passengers for up to 650 miles (1,040km) at 10,000ft (3,000m) at 276mph (440km/h). It is expected to enter service in 2022.

Alice is an unconventional-looking craft: powered by three rear-facing pusher-propellers, one in the tail and two counter-rotating props at the wingtips to counter the effects of drag. It also has a flat lower fuselage to aid lift.

"This plane looks like this not because we wanted to build a cool plane, but because it is electric," says Eviation's chief executive Omer Bar-Yohay. "You build a craft around your propulsion system. Electric means we can have light

weight motors; it allows us to open up the design space."

Eviation has already received its first orders. US regional airline Cape Air, which operates a fleet of 90 aircraft, has agreed to buy a "double-digit" number of the aircraft.

The firm is using Siemens and magniX to provide the electric motors, and magniX chief executive Roei Ganzarski says that with two billion air tickets sold each year for flights of under 500 miles, the business potential for small electric passenger aircraft is clear.

Crucially, electricity is much cheaper than conventional fuel.

A small aircraft, like a turbo-prop Cessna Caravan, will use $400 on conventional fuel for a 100-mile flight, says Mr Ganzarski. But with electricity "it'll be between $8-$12, which means much lower costs per flight-hour".

"We're not an environmentalist company, the reason we're doing this is because it makes business sense."

MagniX is now working with seaplane operator, Vancouver-based Harbour Air, to start converting their existing fleet to electric.

The future also looks reasonably bright when it comes to medium-range flight - a range of up to about 1,500km.

Unlike Alice, aircraft targeting this range would use a mix of conventional and electric power, enabling them to cut CO2 emissions significantly by switching on the electrical component of their propulsion at the key points in a flight - take-off and landing.

Several demonstration projects are now nearing fruition.

For example, Rolls-Royce, Airbus and Siemens are working on the E-Fan X programme, which will have a two megawatt (2MW) electric motor mounted on a BAE 146 jet. It is set to fly in 2021.

"There are huge amounts of energy involved here, the engineering is absolutely leading-edge - and our investment in electrification is ramping up rapidly," says Rolls-Royce's chief technology officer Paul Stein.

United Technologies, which includes engine-maker Pratt & Whitney in its portfolio, is working on its Project 804, a hybrid electric demonstrator designed to test a 1MW motor and the sub-systems and components required.

The firm says it should provide fuel savings of at least 30%. It should fly in 2022 and is forecast to be ready for regional airliners by the mid-2020s.

Zunum Aero, backed by Boeing, is using a engine turbine from France's Safran to power an electric motor for a hybrid craft. And low-cost airline EasyJet is working with Wright Electric, saying it will start using electric aircraft in its regular services by 2027. This is likely to be on short-haul flights, such as London to Amsterdam - Europe's second busiest route. "Electric flying is becoming a reality and we can now foresee a future that is not exclusively dependent on jet fuel," says EasyJet

chief executive Johan Lundgren.

It's a statement underscored by a report from investment bank UBS which predicts the aviation sector will quickly switch to hybrid and electric aircraft for regional travel, with an eventual demand for 550 hybrid airliners each year between 2028 and 2040.

But the prospects for electric long-haul flights are not so rosy.

While electrical motors, generators, power distribution and controls have advanced very rapidly, battery technology hasn't.

Even assuming huge advances in battery technology, with batteries that are 30 times more efficient and "energy-dense" than they are today, it would only be possible to fly an A320 airliner for a fifth of its range with just half of its payload, says Airbus's chief technology officer Grazia Vittadini.

"Unless there is some radical, yet-to-be invented paradigm shift in energy storage, we are going to rely on hydrocarbon fuels for the foreseeable future," says Paul Eremenko, United Technologies chief technology officer.

The big problem with this is that 80% of the aviation industry's emissions come from passenger flights longer than 1,500km - a distance no electric airliner could yet fly.

Yet the UK has become the first G7 country to accept the goal of net zero carbon emissions by 2050 - a huge challenge for the air travel business with 4.3 billion tickets sold this year and eight billion expected to be sold by 2037. Regulators are also piling on the pressure.

In Europe, the European Aviation Safety Agency says it will start categorizing aircraft based on their CO2 emissions, while Norway and Sweden are aiming to make short-haul flights in their airspace electric by 2040.

So logically, is the only answer is to ditch long-haul flights? This obviously isn't an appealing prospect for the industry. Rolls-Royce's Paul Stein says starkly that the world would be in a "dark place" if we stopped travelling. He argues that in a global economy "where peaceful co-existence comes about from travelling and understanding each other, if we move away from that I am very concerned it's not the direction mankind should be going in".

Toyota Speeds Up Electric Vehicle Schedule as Demand Heats Up

Toyota Motor Corp aims to get half of its global sales from electrified vehicles by 2025, five years ahead of schedule, and will tap Chinese battery makers to meet the accelerated global shift to electricity-powered cars. The change illustrates the breakneck growth in the electric vehicle (EV)

market, which is transforming the auto industry, and is also an acknowledgment by Japan's top car maker that it may not be able to meet demand for batteries on its own. Toyota is now faced with a higher-than-expected demand for cars that use batteries, rather than gasoline, Executive Vice President Shigeki Terashi told a briefing on Friday.

Also, increasingly stringent emissions regulations require more lithium-ion batteries in the next five years than the automaker plans to produce, he added. "We consider ourselves as a maker of electric vehicle batteries, going back to when we developed the battery for the Prius," he said, referring to the pioneering gasoline hybrid. "But there may be a gap between the amount of batteries we can produce, and the amount of batteries we may need."

Toyota, which already makes batteries for hybrids and hybrid plug-ins, said it will partner with China's Contemporary Amperex Technology Co Ltd (CATL) and EV maker BYD Co Ltd for battery procurement. It also announced an ultra-compact two-seater designed for short-distance trips, with a maximum speed of 60 km (37 miles) per hour and 100 km range on a single charge. However, Terashi said while demand for EVs grows, profits will be slower in coming, given the economies of scale. EV technology has come a long way since 2010, with battery technologies improving and costs coming down. Still, EV sales are expected to trail gasoline hybrid vehicle volumes by 2025, with the former expected to be fewer than 1 million vehicles, Terashi added. The key to creating a profitable battery EV operation could be in combining new mobility technologies, including on-demand ride services, with battery-powered electric cars, he said. Tapping CATL signals a widening of Toyota's procurement pool. The Chinese firm already has relationships with other automakers such as Honda Motor, Nissan and a multi-billion dollar battery supply deal Volvo Car Group. Toyota has for decades been developing its own lithium-ion EV battery technology and has partnered with Panasonic to develop and make rectangular-shaped prismatic batteries. The automaker, which launched the Prius, the world's first mass-market "green car" over two decades ago, has led in technologies for hybrid and fuel cell vehicles (FCVs). Its cars account for more than 80% of the global hybrid vehicle market. But it has trailed rivals such as Nissan Motor, Volkswagen and Tesla in bringing all-battery EVs to showrooms. Toyota is looking to partnerships with rival automakers and tech firms as it seeks to reduce its capital outlay for developing new-vehicle technologies.

On Thursday, it announced it was teaming with Subaru Corp to develop a battery-electric SUV on a platform produced together as they seek to split costs. Toyota is, however, not changing its long-held belief that hydrogen FCVs will be the ultimate zero-emissions vehicles in the future, Terashi said. "We haven't changed our policy towards battery EVs," Terashi said. "We are not shifting our focus to prioritise battery EVs, nor are we abandoning our FCV strategy." The firm has also long espoused the benefits of hybrids and how they are an effective alternative to all-battery EVs, given a fuel efficiency roughly double that of gasoline cars, lower cost and that they do not need charging infrastructure.

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ZHONGNAN ENGINEERING CORPORATION LIMITED

ENERGY™
DEVELOPMENT COUNCIL

Main Office

Heritage Plaza II (Block C & D),
Kamaladi,
Kathmandu, Nepal
P.O Box no. 516
Phone: +977-1-4169116/ 4169117/ 4169118
Fax: +977-1-4169118
Email: info@edcnepal.org

Contact Office

RM 316/3 F Chinese Overseas Scholars Venture Building, South District
Shenzhen Hi-tech Industry Park,
Shenzhen, China

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