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ENERGY COMMUNIQUE

EDITORIAL

EPC Plus Finance

Over the years, the construction and infrastructural modality has witnessed a visible shift of the risk of time and cost from owner-managed projects to the contractor with the responsibility of designing, procurement of material and construction transferred to the contractor. This model in short is referred to as Engineering, Procurement and Construction (EPC)arrangement. The contractor is fully responsible for Engineering, Procurement and Construction necessary for the Project. If in the EPC arrangement, the Contractor further undertakes to finance the Project, then such arrangement is called EPC plus (+) F. The '+F' implies that Contractor is additionally required to arrange the finance required to construct the undertaking.

The EPC+F model arguably receive prominence because of the adoption of this method by large Chinese construction companies, banks and insurance firms. The Chinese contractors have been very forthcoming to arrange money from Chinese banks to construct and deliver infrastructure facilities in developing countries and least developed countries. In an EPC+F contract, the project financing is generally tied and provided by a foreign country or banks of the foreign country/ development agencies affiliated to a foreign country. The Host Government is responsible for arranging the counterpart funding and for providing sovereign guarantees to the project and lenders.The Contractor is made responsible to arrange financing to develop the project. The funds will be mobilized in the form of soft or commercial loans as per the requirements of project, under the terms and conditions agreed with the government. Because in an EPC-F contract, the EPC contractor will be responsible to finance a large portion of the project it is considered pragmatic only when EPC Contractors have better access to low cost financing, including Export-Import (EXIM Financing).

Public Sector Owned Projects

The question now arises as how to select an EPC contractor who will be

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vested with the right to arrange funding requirements of a project. What should be the selection criteria of an EPC+F Contractor? Typically, owner of the large infrastructure projects generally is public sector company or an authority in the host country responsible for project development. Hence another question arises whether award of a project will need an open competitive bidding or sole source procurement can be justified. Or in simpler words should Public Procurement Act, 2063 (2006) be followed to conduct the tender.

The Public Procurement Act cites that a Public entity shall make procurements by inviting open bids, and provide equal opportunity to qualified bidders to participate in such procurement process without any discrimination. The Act further emphasizes that only the lowest substantially responsive bid shall be preferred. The same Public Procurement statute defines 'Bid' as a document setting out price, proposal or rate submitted by the bidder in a specified format. However, the selection criteria prescribed in the Public Procurement Act and selection criteria for the EPC+F contractor do not necessarily match. The bidding process outlined in the Public Procurement Act requires the price of contract to be set out in the bidding documents, whereas selection criteria for an EPC+F arrangement leaves the price submission, the tenor and the interest of the loan to contractor. In short, the Public Procurement Act does not envisage the selection process for awarding contract under EPC+F arrangement which could make bidding process for EPC+F under the said act infeasible. Further, the selection criteria for EPC+F is quite restrictive because it disables a contractor not having access to finance from banks out of the competition.

EPC+F for Private Sector Projects

To reiterate, the general structure of EPC+F in Nepal is such that the contractor shall arrange for the finances, while promoters of the private sector developer company will manage rest of the capital themselves. This consecutively leads to an important question, whether the capital availed through the foreign contractor will be channelized in the form of an FDI? Though we have witnessed that declarations have been made in the past to bring in the finance as FDI to develop a project in EPC+F modality, the disorientation is sustained because our law itself doesn't definitively assert the legalities for the same. This further supplements another concern, how shall the foreign contractor receive the payment from the private sector in Nepal. In addition to it, a due cognizance should also be taken corresponding to the liquidity of our banks, since we have a recent antecedent that our Banks had a difficult time managing funds for repatriation of the dividend. If not taken into consideration, this might even have a severe effect on the balance of payment of the nation when the entire investment has to be returned back at once.

In absence of a legal criterion in this regard, Nepal is still in search of an established machinery to regulate the EPC+F finance modality.

The growing interest in arranging finance for Nepal's infrastructure and hydroelectric capabilities cannot be underscored. In a way EPC+F model allows easy access to finance required to build multi-million infrastructure projects. However, EPC+F model in Nepal can swiftly take-off in case of public sector owned infrastructure projects only if the award process is competitive and robust and in case of private sector driven projects if the remittance of payment to the foreign contractor is not affected by legal impediments.

EDC ACTIVITIES

EDC invited for a seminar on "International Commercial Arbitration and the Singapore International Arbitration Center"

Ms. Itnuma Subba, CEO, EDC and Mr. Dheeraj Raya, Business Development Officer, EDC attended 2 day program on "International Commercial Arbitration and the Singapore International Arbitration Centre" on 6-7 September, 2018 organized by USAID Funded Nepal Hydropower Development Project (NHDP), Singapore International Arbitration Center (SIAC) and Abhinawa Law Chambers (ALC).

International Centre for Hydropower meets EDC

Mr. Tom Solberg, Project Director, International Centre for Hydropower (ICH) visited EDC office on 21st September, 2018 to discuss more about the content of training topics and identifying suitable local speakers that would contribute to the training on "Hydropower Financing and Risk Management" taking place from 26th-30th November in Yak and Yeti organized by EDC and ICH in association with Nepal Bankers' Association

Nepal Bankers' Association Agrees to Collaborate with EDC for conducting the training on "Hydropower Financing and Risk Management"

Nepal Bankers' Association

Ms. Itnuma Subba, CEO, EDC had a meeting with Mr. Gyanendra P. Dhungana, President of Nepal Bankers Association (NBA) on 1st October, 2018 to explore possible cooperation to organize the training workshop. NBA accepted the request proposed to be one of the partners.

British Hydropower Association visits EDC

Mr. Keiron Hanson, Director of Hydroplan and Board Member of British Hydropower Association visited EDC office and discussed about the possible cooperation among the organizations. Mr. Semanta Dahal, Executive Committee Member, Ms. Itnuma Subba, CEO and Mr. Dheeraj Raya, Business Development Officer of EDC were in the meeting. They also shared the current energy market, policy and other developments happening in the energy sector of Nepal.

EDC ACTIVITIES

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

Date : 1st September 2018 - 30th September 2018

S.No.	Notice Publisher	Description	Published Date	Notice Category	Product Service
1	Kankai Municipality, Office of Municipal Executive, Jhapa, Province No. 1	Operation of Biogas Project	9/30/2018	Application	Hydro Power/ Energy
2	SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal	Amendment Notice	9/29/2018	Amendment Notice	Other Product/ Services
3	Raghuganga Hydropower Limited, Rahughat Hydroelectric Project, Kathmandu	Amendment Notice	9/28/2018	Amendment Notice	Other Product/ Services
4	Upper Tamakoshi Hydropower Limited, Gyaneshwor, Kathmandu	Design, Manufacture, Supply, Transportation, Installation/Erection, Testing and Commissioning including Operation and Maintenance of Cable Car	9/27/2018	Tender	Other Product/ Services
5	Ministry of Federal Affairs and General Administration, Department of Local Infrastructure, Rural Village Water Resources Management Project, Project Coordination Office, Dadeldhura	Consulting Services for the Detailed Feasibility Study Survey, Design, and Preparation of Detailed Feasibility Study Report of Hydro Power Projects	9/24/2018	Expression Of Interest	Consulting
6	Raghuganga Hydropower Limited, Myagdi	Vehicle Rental Service	9/12/2018	Quotation	Automotive / Vehicles
7	Ministry of Energy, Water Resources and Irrigation, Budhigandaki Hydropower Project, Environment Compensation Distribution, Resettlement and Rehabilitation Unit (ECRRU), Gorkha	Shortlisting of Consultants to Prepare of Detailed Engineering Survey of Ring Road	9/7/2018	Proposal	Consulting
8	Tamakoshi Jalavidyut Company Limited, Kathmandu	Civil Works and Hydro-mechanical Equipment	9/4/2018	Pre-Qualification	Construction/ Building

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MEDIA COVERAGE

The Himalayan

Challenges for investors in hydropower sector

LEGAL AND POLICY HURDLES IN HYDROPOWER DEVELOPMENT IN NEPAL

Challenges for investors in hydropower sector

Anjan Neupane
Kathmandu

It has been often observed around the world that economic development and the legal framework of a country share a very close relationship. Good laws that incentivise and ease doing business helps rapid economic development. In Nepal, there are huge challenges for investors in the hydropower sector particularly because of major structural flaws in laws and regulations that do not create the right incentive, and implement complex legal framework with excessive red tape. Some of those problems and possible solutions are offered below:

hydrohighlight

FLAWED LICENSING MODEL

Electricity Act 1992 implements 'first come first serve' licensing (other than for projects reserved for the government). The Ministry of Energy (MoE) grants survey licenses to the first applicant who agrees to pay the survey royalty and meet other qualifications. The licensees have to complete the survey within five years and apply for the generation license. If the energy is to be sold in Nepal, then Power Purchase Agreement (PPA) has to be negotiated separately with Nepal Electricity Authority (NEA). It is unreasonable to expect any serious business to invest in a project where there is no certainty after years of hard work and investment that the product will be purchased. This results in an investment gap, misallocation of resources, and potential for corruption in negotiating power tariffs. Therefore, it has to be replaced with one where the government awards licenses through a competitive tariff bidding process. This will optimise risk transfers and investments in the power sector, and also reduce the prices for electricity through competitive pressures.

MULTIPLE AUTHORITIES

There is very low level of coordination between government agencies. The Investment Board grants concessions for projects above 500MW, but the MoE provides licenses and the NEA purchases power from the projects. These agencies function independently and while they sometimes cooperate, they usually don't. Recently, the MoE granted license of the Tamakoshi 3 (600MW) project, which the Investment Board was planning to invite bids internationally, to a local company. Therefore, either the Investment Board needs to be scrapped or it needs to be provided with authority over the MoE and the NEA. Even if competitive tariff bidding is not undertaken, MoE should provide license only if a power purchaser is willing to purchase the energy from the project.

UNNECESSARY APPROVALS

Doing business in Nepal, particularly in the hydropower sector, is filled with unnecessary red tape and approvals such as land ceiling waiver, and approval to lease government land. While it is the government's policy to not allow a person own/hold land more than land ceiling, there is a prejudice against power projects. Although the government recently relaxed the requirement for the decision to be made by the Council of Ministers through the implementation of the revised directive last year, approvals still needs to be taken. This system needs to be replaced with automatic approval allowing power companies to purchase land in the project area. Further, approvals to lease government land and mortgage land in favour of foreign banks also have to be passed by the Council of Ministers. Provision restricting mortgage of land above land ceiling to maximum 50 per cent has considerable negative impact on foreign and local lenders.

BANKABILITY

Foreign investors and lenders are looking for projects that are bankable. Essentially for a project to be bankable, the project company and the lender should be 'risk free', that is, the project should have a contractual risk allocation covering a range of issues that could potentially impact the project, including force majeure, change in law, currency risk, off-take default by the off taker; termination by the granting public authority et cetera. Nepal has not yet provided a bankable concession agreement or project development agreement of international standard. This is because government and often, their 'experts' do not understand the concept of bankability, risk allocation, and how private financing of infrastructure project works internationally. The current model and executed drafts of the project development agreement and the PPA impose a lot of burden but provide very little comfort.

CURRENCY RISK

Currency risk arises if loan or investment is in one currency and revenue in another. The risk is much higher in the power sector as foreign investors in the power sector have to commit to long-term investments. It is a good start that the government is willing to sign PPA in USD-NPR mixed tariff for 10 years. However, the conditions imposed are ambiguous. Currency hedging has not yet been implemented in the Nepali market and no financial institutions are currently offering such services. Our policy is the least attractive in South Asia and South-East Asia. The government now must take currency risks, as it is the best party in able to bear it. It should also be understood that all power projects would be nationalised following their concession term. To shorten the duration of exposure to the risk, we should look into whether it is better to increase in tariff and decrease the term of the concession.

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República
IN PURSUIT OF TRUTH

Priorities for power

For the last couple of years, things are moving toward positive direction in Nepal's power sector. As per the government's 2018 plans and programs, emphasis will be given to the development and expansion of hydroelectricity and all types of renewable energy to provide clean energy to all Nepali households within next three years and to avail electricity to all households as per the demand within the next five years. The government has announced to implement hydro and other energy-related projects with priority and celebrate 2018 -2028 as 'energy decade.' Ministry of Energy, Water Resources and Irrigation (MOEWRI) came out with the white paper in February 2018 focusing on power supply and electrification in the residential sector with the slogans 'one house, one energy house' and 'one house, one electric cooking stove'. But this might remain just the slogans if concrete steps are not taken to implement them.

As per Nepal Electricity Authority's

annual report, the expected power addition will be around 2,000 MW combined with NEA and Independent Power Producers (IPPs) within two to three years. This means, there will be surplus of power in wet season. But on demand side, things are moving very slowly.

For the last couple of years, due to enhanced technology innovation, thermal efficiency of electric cooking stoves such as induction cooktops has improved tremendously to even more than 80 percent, whereas LPG cooking stoves remain at around 50 to 60 percent and traditional firewood cooking stoves stand around 10 percent. Furthermore, due to this efficiency measure and increase in domestic prices of other fuels, cooking on electricity has become the most economically efficient. Yet, 80 percent of domestic consumers are deprived of cooking on electricity as they have five ampere connections which are not suitable for cooking on electricity as the induction cooktops have more than one KW power capacity and their meters get tripped off if they cook on these stoves.

Domestic needs first

NEA should first focus on developing domestic markets rather than seeking opportunities outside the country for power sales.

NEA has to get strongly involved in marketing activities in order to create awareness among customers and convince them to switch to high ampere connection because it is beneficial to customers as well as to NEA. NEA should revamp its current distribution system such as conductors and transformers. The current distribution systems are meant for lighting and low power purposes. We hear a lot about transformers burn these days. Since there is no power outage, people will try to use household electric appliances more than before and if distribution capacity is not enhanced the results will be frequent burnt-outs of transformers and distribution lines.

> Nepal can substitute almost 50 percent of imports of petroleum products and coal, if the government accords priority to development of hydropower and renewable energy

NEA has unveiled its plan of introducing smart meters and smart transmission lines, digitization of its network, optimization of its operations, and use of Enterprise Resource Planning (ERP). But it does not seem to have considered load forecast of 2030, which is lower than domestic consumption plan of 10,000 MW.

It is encouraging that NEA's performance is improving and its profits rising. Increase in sales due to reduction in load-shedding and power losses has made it possible. Thus rather than focusing on sales in the regional markets, NEA should concentrate its efforts on selling to domestic sectors like industries, services and transport.

During my recent visit to Duhabi industrial area of Biratnagar I found that one steel industry has switched to electric induction furnace replacing conventional fossil fuels- based furnace. We can imagine the requirements of power if all the steel and cement industries switch to electrification when the power supply becomes reliable and resilient. This is why NEA must put priority on creating domestic demand, making its distribution and transmission lines reliable and resilient.

Of course, we need to keep the option of regional trade of surplus power

open, but only after meeting its domestic demand. Nepal will need around 2,000 MW of power by 2035 to substitute Liquefied Petroleum Gas (LPG) in the domestic markets. And it does not cover the enhanced use of electric appliances in household sector for water heating, space heating and other end-uses if supply does not become reliable and resilient.

Similarly, services sector such as hotels and restaurants consume almost 50 percent of total LPG consumption in the country. We can imagine the increase in power required to substitute LPG in these sectors. Furthermore, Sajha Yatayat and other transport entrepreneurs are bringing in even large electric buses to cater to the city dwellers' mobility. The NEA's load forecast does not count these issues and increases in demand as its forecasting model is based on historical data and does not take into consideration the use of new energy-efficient technologies in end-use services and switching to electricity from fossil fuels in the household, industries, commercial services and transport sectors.

What NEA should do

Given all these business opportunities, NEA should take the following steps in order to develop domestic electricity markets.

First, NEA needs to revamp its distribution systems because current distribution systems are meant for lighting and use of small electric appliances at the household sector. If the household starts using electricity for cooking and using high- powered electric appliances such as washing machines, water heaters and micro-wave ovens since load-shedding has virtually stopped, the current distribution systems cannot support this.

Thus NEA has to immediately start switching the current five A connections in the domestic consumer segment to 15 A, or higher, without additional charges to consumers. NEA has to get into marketing activities such as advertisements in the visual media for creating awareness among consumers to switch to cooking on electricity rather than on imported fossil fuels. It has become cheaper to cook on electricity. These marketing activities will benefit both consumers and NEA. Consumers will be saving their energy expenses and NEA's domestic sales and financial performance will rise.

Second, it must start digitization of its network by using smart meters, net metering and smart distribution and transmission systems. Industries, services and transport sectors will be using electric equipment such as induction furnaces, electric boilers, electric cooking appliances, and electric vehicles as they are economically efficient and produce less emission. Power supply needs to be reliable and resilient.

If NEA starts solar net metering, almost 50 percent of the grid load in the domestic consumers can be reduced as consumers will be using solar rooftop PVs for generating electricity themselves for low powered household electric appliances and lighting. Surplus power to grid can be tapped by neighboring consumers.

International Renewable Energy Agency (IRENA) has predicted that rooftop solar PV power with battery can become competitive with hydropower by 2025. The extra grid load, thus generated, can be supplied to higher end consumer—such as hotels, restaurants, industries and transport.

Third, after completing digitization activity, NEA can have time of the day tariff systems for even domestic consumers and services sector. It will then reduce the peak

load during evening and morning periods and grid load will be smoothened out in the long run.

Fourth, NEA can consider supply of power in the regional markets once it has met the internal demand with reliable and resilient supply.

These recommendations, some of which are mentioned in NEA's annual report, should be implemented on priority basis for sustainable energy development and energy security in Nepal. Nepal can substitute almost 50 percent of imports of petroleum products and coal, if the government, together with NEA, accords priority to development of hydropower and other renewable energy. All hopes might fizzle out in lack of timely implementation.

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Source: https://myrepublica.nagariknetwork.com/news/priorities-for-power/?categoryId=opinion

NEPAL'S SCENARIO

Illusions of cheap solar

"Policy makers must offer a clearer set of regulations on solar for Nepali consumers to benefit from the significant reductions in the costs of solar power being achieved elsewhere"

Nepal's social media fondly refers to Kulman Ghising as the "God of Light." Ghising is the Managing Director of Nepal Electricity Authority (NEA), the monopoly state owned utility. He is widely credited for leadership in ending load shedding (forced blackouts).

At an interaction program for solar net-metering hosted by Energy Development Council (EDC), the main presenter Ashish Chalise, Chief Executive Officer of Saral Urja Nepal, an energy services company, reminded Ghising that in Hindu culture the "God of Light" was Surya Bhagwan (Sun God).

Chalise was attempting to draw Ghising into accelerating NEA's initiative on solar net metering. Like all Gods that are felicitated, Ghising remained stoically unmoved allowing himself only a faint smile at the corner of his lips.

The discussion that followed provided for heavenly reflections.

Heaven and earth

Solar net metering is the process by which electricity consumers can feed their excess solar generation [generation they don't consume] into the grid to offset consumption from the grid. It is like paying an advance and drawing against it.

Ghising remarked that NEA was keen to integrate solar energy and other forms of non-hydro generation within its generation mix. Thus far, NEA has signed power purchase agreements with 18 MW of solar power plants. The utility remains open to signing more power purchase agree-

ments, he said.

Ghising's remarks weren't specifically on solar net metering. The 18 MW of power purchase he referenced was for larger utility scale solar power plants.

Ghising explained that NEA was seeking to capitalize on the rapid decline in solar module prices. NEA's first solar tender resulted in prices of NPR 9.5 per unit. Following that NEA and the Ministry of Energy, Water Resource and Irrigation (MoEWRI) conducted a study and concluded that NPR 7.3 per unit would be a more appropriate power purchase tariff for solar.

There was pressure to keep prices low, Ghising reiterated, encouraging solar developers to do more to reduce prices further.

A reporter from a business daily at the event quickly seized on this theme.

"If auctions for solar power in India were producing INR 2.4 (NPR 3.84) per unit, why was NEA offering such high-prices at NPR 7.3 per unit," he demanded to know.

Solar developers fired back saying those prices were unsustainable, to which there were other counter claims of solar enterprises being thugs, to which there were even more counter claims and so on and so forth. A perfectly sensible discussion about the promise, potential and need for solar net metering rapidly degenerated into a hopeless distraction about costs, thus providing a stark reminder for why it is that gods live in heaven and human beings on earth.

From the heavens above, Sun God was probably looking down at us struck by the irony of the situation.

Without having installed a single MW of large scale solar plant, Nepal was already working towards reducing the costs of solar energy. It was a bit like preparing to get a baby to win gold in the 100 meters sprint at the Olympics when the baby hadn't even taken its first step, or in Nepal's specific case, the baby hadn't even been born.

Stairway to heaven

Solar in Nepal is currently in the process of a reincarnation. In the era of load shedding, solar was largely regarded as what you used to charge your batteries. When load shedding ended, the need for solar died.

It is only in Nepal that solar has now been reborn as an alternative generation source that can integrate into the grid and provide a diversified source of supply. In the rest of the world, where sharp decline in solar prices have been recorded, solar had always been about integrating with the grid.

The decline in solar costs is not merely because of the fall in module prices. It is also because solar has been nurtured and enabled within reliable electricity grids where there are no, or negligible, blackouts, voltage is stable and overall power quality is high. For Nepal that is now trying to kick-start and catch up with the advances in solar, it is a tragic mistake to build a policy to promote solar motivated primarily by cost reductions in module prices.

Such a policy would be like using the low international ocean shipping costs to infer the cost of transport between Birgunj and Kathmandu. If we had an ocean between Birgunj and Kathmandu, that would have been relevant. Modules are one part of the puzzle, but it needs many other things to work—most importantly, a stable reliable grid.

NEA has yet to release a convincing study that documents the capability of the grid to absorb the intermittency of solar. NEA has yet to issue clear guidelines and procedural steps for net metering. Government has yet to release a clear policy on the process for solar plant development. Financial institutions have yet to finance a single MW of solar. Nepali engineers have yet to design and install a single large solar plant.

Without even the basics in place, the dedicated focus on bringing down the cost of solar energy is bit like trying to find the stairway to heaven. In case you are still searching: the stairway to heaven doesn't exist. It is an illusion.

Only way to heaven

Solar module prices have dropped rapidly over the last few years, 20 percent alone since 2017. Auctions for solar power in India have resulted in eye-popping low prices, like the ones the reporter quoted. Solar prices are now regularly beating the

price of electricity from other conventional sources.

Nepali consumers must benefit from this. But how should policies balance the need to achieve low costs while also getting things started?

Clearer processes, rules and regulations. Take India's story as an example. Prior to launching those solar auctions, India spent considerable time establishing the regulatory, policy and structural framework for solar. It established a separate power trading company to buy solar power and comingle it with other generation sources. Once it got a critical mass of rules in place, there was an unrelenting commitment to using auctions and open markets. Their markets have delivered. The reporter that was in awe of India's prices should have asked why it is that Nepal hasn't gotten its process on solar clear yet.

Nepal's processes for solar power are a mess. It has been copied from whatever applied to hydro with a search, find and replace of 'hydro' to 'solar.' The resulting policy framework doesn't work.

Low prices on solar power, like the ones being observed in India, are achievable in Nepal. But for that, Nepal's policy makers must offer a clear set of rules, policies and guidelines on solar and then let markets do its work.

There is only one way to get to heaven: you must first die. You cannot have someone else die and you get to heaven. It is the same with solar. The cost reductions in the rest of the world are achievable in Nepal only if we first fulfill our own Karma (responsibilities).

Source: https://myrepublica.nagariknetwork.com/news/illusions-of-cheap-solar/

Time to go electric

"Breathing the Kathmandu air in the winter months is equivalent to four million citizens involuntarily smoking three to four cigarettes every day"

It's time to promote electric vehicles. Air pollution is a growing concern for all of us living in Nepal's urban spaces. The air we breathe in reaches hazardous levels for about half the year. Citizens breathing highly polluted air are destined to suffer from chronic lungs and heart diseases. In fact, it is believed that breathing polluted air is responsible for as many as nine deaths per day in Kathmandu Valley. Drishti Kathmandu has been monitoring the level of particulate matter (PM) 2.5 in the air of Kathmandu Valley for almost two years now. Its records show PM 2.5 levels got as high as 100 micrograms per cubic meter during the winter months of February and March. It is estimated that sustained exposure to air with 22 micrograms per cubic meter of PM 2.5 is equivalent to smoking one cigarette per day.

So, breathing the Kathmandu air in the winter months is equivalent to four million citizens involuntarily smoking three to four cigarettes every day. Awareness levels in Kathmandu have evolved to a point where most smokers do not smoke inside restaurants and homes, especially in the presence of non-smokers. The Kathmandu air has gotten so bad in the winter months that it is equivalent to living in a room full of smoke. This is how we've allowed polluters to pollute the air we breathe in.

The Ministry of Population and Environment conducted a study to understand the sources of pollution in the Kathmandu Valley about 12 years ago. It identified four primary sources of PM 10 pollution in the Valley: vehicle emissions, street dust, open burning of waste and agriculture products and brick kilns. Emissions from vehicles plying the roads of the Valley was responsible for 38 percent of the PM 10 emissions according to that study. Open burning, street dust and brick kilns still remain causes for concern, but it is vehicle emissions that the city needs to tackle at the earliest. Although a similar study has not

been done in the recent years, it is logical to assume that vehicle emissions occupy a larger portion of the air pollution now, since the dramatic increase in number of vehicles in the Valley in the last decade.

Cleaning the air

So, what can be done to help Kathmandu breathe in better air? If the solution to a room filled with smoke is to get rid of the smoker from the room, the solution to improving the Valley air has to be to remove the smoke emitting vehicles from the Valley. But people need to commute. How can people commute without vehicles? Through electric vehicles.

The problem with electric vehicles is that they are expensive and have certain limitations when compared to fuel-based combustion vehicles. But elsewhere it has been been aided by fiscal incentives from governments of those countries. The United States, the United Kingdom, Norway, the Netherlands, France, Japan, China and India are examples of a few countries that have promoted the use of electric vehicles through upfront cash incentives, tax-exemptions and credit facilities.

Nepal needs to design a suitable incentive package if it wants to promote electric vehicles. It is evident that lacking such incentives, electric vehicles will struggle to compete with traditional fuel-based vehicles and we will keep on adding smokers in the room we live in.

In addition to scrapping customs and excise duties on electric vehicles, the government should take a bold initiative to provide nothing less than cash incentives to a set number of electric vehicles. These promotional incentives should be provided to electric buses, electric vehicles to be used as taxis, private electric vehicles and electric scooters. A world-class 11-meter electric bus costs about Rs 30 million whereas a diesel bus with the same carrying capacity costs around Rs 3.5 million. Similarly, an average electric four-wheeler costs as much as Rs 3.5 million whereas similar petrol vehicles are available for about Rs 2.5 million. Electric two-wheelers also have close to a fifty thousand price disadvantage to its more polluting petrol cousins. Further reduction in import taxes and robust financial incentives are therefore required to make electric vehicles more price-competitive, at least at the initial phase.

Promotional programs cannot last forever. They need to be time bound. Therefore, the government can provide the promotional facility to a pre-determined number of vehicles insuring that all four types of vehicles mentioned above are provided cash incentive on a first-come-first-serve basis.

Provide incentives

An incentive program of three billion rupees can be used to ensure that 100 electric buses, 500 electric taxis, 500 electric private cars and 10,000 electric scooters ply the streets of Kathmandu in the near future. Such an incentive program will have a catalytical effect. It will normalize the presence of electric vehicles and encourage importers to bring in better electric vehicles into the country. It will, more importantly, reduce the emissions of cancer-causing pollutants into the air and into our lungs.

Where should a poor country like Nepal come up with three billion rupees to subsidize rich people that can afford vehicles? From the environment tax of 50 paisa charged to every liter of petrol and diesel consumed in the country. The environment tax policy was implemented more than eight years ago and has raised close to Rs five billion till date. The government is yet to decide on how to spend this money. An incentive package to promote electric vehicles is a good program.

The electric vehicle revolution is here to stay. It is up to the political leadership to decide when Nepal wants to partake in it. This is an excellent opportunity for the Environment Minister, the Finance Minister and the Prime Minister to forever etch their names in Nepali history as the leaders with the vision and will to jump start the Nepali electric vehicle revolution.

And, at any time one questions why the government should offer such favorable terms to promote electric vehicles, it should suffice to remind ourselves that the aim is to remove more smokers from the room we all live in.

Source: https://myrepublica.nagariknetwork.com/news/time-to-go-electric/?categoryId=opinion

GLOBAL PERSPECTIVE

What would happen if we removed cars from cities?

Air pollution is now the fourth biggest killer in the world after smoking, high blood pressure and diet. It contributes to more than six million deaths every year. The majority of these are in poorer nations. Worryingly, air quality may become increasingly worse with rapidly expanding urbanization.

More than half the world's population now live in cities. By 2050, this will reach two thirds. As more people move from rural areas to cities, there will be more cars on the roads, more traffic congestion hotspots near homes and workplaces, and less green space.

City dwellers are already suffering from fumes and smog on their daily commutes. It's outrageous that we've reached a point where it's healthier for some people to stay inside and not exercise, rather than walk outside and breathe polluted air.

Why do nations, political leaders, experts and campaigning organisations want to reduce air pollution? The main reason is to improve people's health. But we can be bolder than simply mitigating this problem by trying to reduce particle concentrations. There is an exciting opportunity to go much further, and fundamentally rethink the way cities work.

Paradoxically, air pollution can spur us to transform public health and infrastructure, and change how we design cities in the future.

We currently spend a lot of time focusing on ways to reduce emissions or develop cleaner and more efficient fuels. Lawmakers apply taxes and levies or ban older cars in cities. The car industry is seeing a boom in hybrid and electric vehicles, which are much more environmentally friendly.

Of course, these solutions play an important role in cleaning up our urban air. But we are missing a huge opportunity to take a more holistic approach to the health and well-being of people living in cities.

For example, what if we rethought the purpose of our streets. Are they really just meant for cars to get from A to B? Or can we see them as a place to walk and cycle, where children play and neighbours meet?

By removing cars from cities, you are not just reducing emissions - there are countless other benefits. Researchers in London studied the health impacts of cutting emissions by two different methods. The first scenario used a technology-led policy, while the second promoted walking and cycling instead of driving.

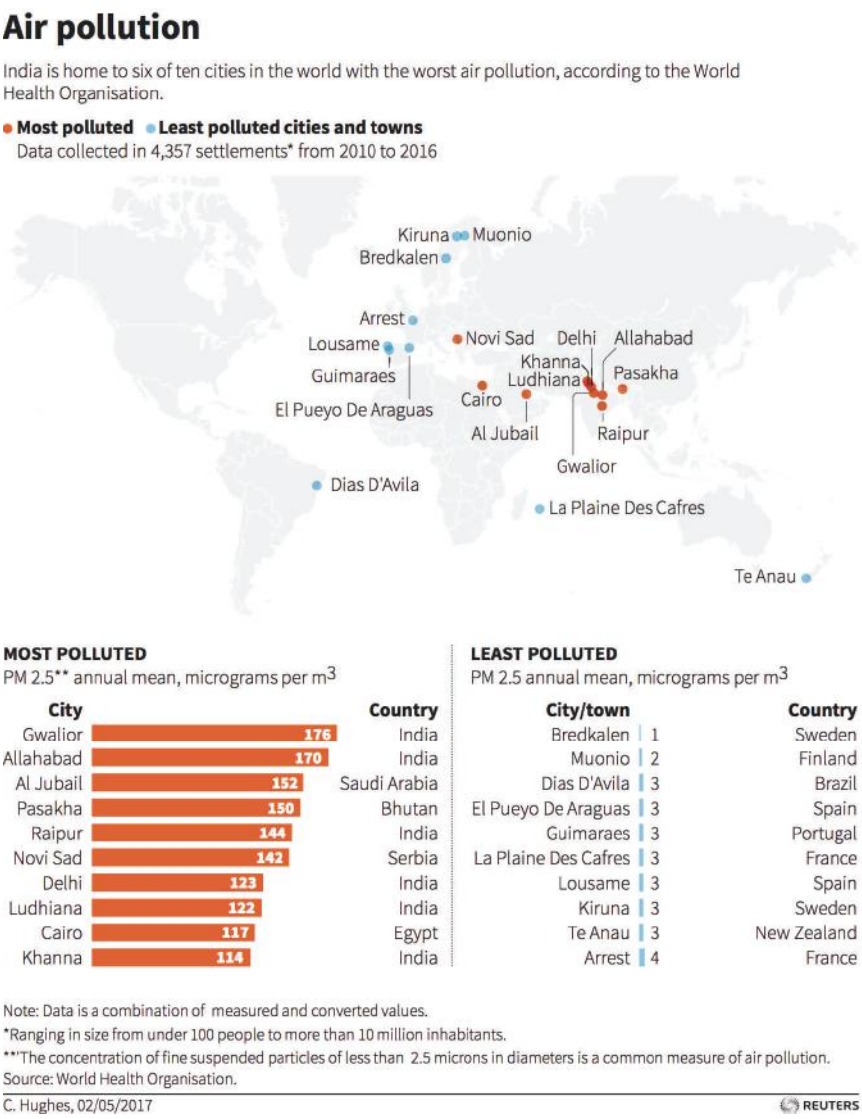
Both scenarios resulted in similar levels of improved air quality. But the method which encouraged people to walk and cycle generated up to 30 times more benefits, due to health improvements from increased physical activity. I have carried out similar research in other cities and reached the same conclusions.

Sadly, current levels of air pollution may be putting people off from enjoying the outdoors and getting regular physical activity. A recent study in London compared the health effects of a walk in Hyde Park against one along Oxford Street. For people over 60, toxic air pollution cancelled out some of the benefits they got from the light physical activity.

And in some of the world's most polluted cities, such as Delhi and Beijing, cycling for more than an hour every day can do more harm to you than good.

Some cities have announced car-free or car-less visions, including Milan, Copenhagen, Madrid and Paris. Oslo plans to ban all cars from its city centre permanently by 2019. Chengdu in China is designing a new residential area in which people will be able to walk everywhere easily, reducing the need for cars.

Although it was forgotten for a while, we do have some history of planning cities with public health in mind. The urban sanitarians in the mid-1850s called for new planning strategies that included more green space, better ventilation through streets and increased sunlight into homes, to combat the epidemics of the time - cholera and the plague.



These people made their mark on their respective cities through a conscious effort of planning for better health. We're hoping to make similar strides again. Imperial's Network of Excellence in Air Quality aims to identify the next big frontiers in air quality research, collaborating across disciplines to deliver new insights. Scientists and researchers from medicine, engineering, business and other disciplines are coming together to share expertise and find solutions to some of the biggest challenges.

My colleagues Dr Marc Stettler, Dr Laure de Preux and I will be exploring some of these issues with peers and global leaders at the World Economic Forum Annual Meeting of the New Champions in Tianjin in China later this year.

Like the urban sanitarians of nearly 200 years ago, we again have the opportunity to design our cities to improve public health. I have no doubt that we will get there, and that we will realize this new vision of what streets and neighbourhoods are for - a place for people to live in, not just cars. Why not start now, and start reaping the benefits?

Source: https://www.weforum.org/agenda/2018/08/air-pollution-opportunity-not-just-problem/

EVgo Gets Ready for 'Tsunami' of Electric Transport: Q&A

EVgo, which operates more than 1,000 electric-vehicle chargers in 66 U.S. markets, is preparing for "the tsunami we're about to see in the electrification of transportation," CEO Cathy Zoi said, as automakers, utilities, regulators and private charge-point operators gear up for millions of EVs to hit the road in the next decade.

The company made a big move in August when it agreed to build and operate a network of charging stations in Virginia in a partnership with the state. Virginia is using 15 percent of its share of the $15 billion from a legal settlement with Volkswagen for EV charging infrastructure.

On a smaller scale, it launched a commercial installation of second-life battery storage at a public DC fast charging station. The system in Union City, California, integrates two BMW i3 battery packs into a single housing. It began operating this summer, offering a potential use for batteries that outlive their cars.

Zoi and Jonathan Levy, EVgo's vice president of strategic initiatives, answered questions from Bloomberg NEF in a late August phone interview.

Q: How many of the second-life battery stations are in the works?

Jonathan Levy: We started with a pilot at University of California San Diego, where we integrated solar and storage with our second-life batteries as well as the fast chargers. We have the one out in Union City, and we have about five more that we're expecting to deploy by the end of the year. We want to see how it works in terms of footprint, economics and customer experience, and then we'll be looking to ramp those up elsewhere in 2019.

Q: Where did the idea come from?

Cathy Zoi: It's economics. There are places in the country where demand charges are high and where we can actually consume electricity at times when it makes sense, store it on site, and then use it to charge at times when it makes sense.

Q: What does the general decline in the cost of batteries mean for you?

Levy: That cost curve has already been so dramatic in helping reduce the cost of electric vehicles. That continued innovation on the supply chain, especially with scale happening in China and elsewhere, is going to put downward price pressure in a way that makes these longer-range, lower-priced vehicles even more affordable, which is one of those major accelerants, in addition to public fast charging, that helps mass penetration of electric vehicles.

Zoi: I've been in this sector for 30 years, and for the longest time, people looked at batteries and wondered, "When is something going to improve and change?" Fast forward to 2009, when I was at the Department of Energy and I had all the battery research programs in my purview, and the price of batteries per kilowatt-hour was about $1,200. Within two years, it was down in the $500s. Now we're talking about well under $100. Seemingly little substitutions in battery chemistry are accelerating the pace of this change.

It's happening in part because the sector has scaled up so much. The amount of investment, the seriousness with which the car companies are taking this, is driving money into all of those improvements to continue that cost optimization.

Q: Do you project car sales?

Zoi: We use the best available research on car sales. But one of the biggest telling factors for us is that the car companies have announced $100 billion that they're investing between now and 2022 to tool up factories to get EVs out into the marketplace. And that's real money. Those aren't airy-fairy announcements.

We're estimating that by 2022, at least 2.5 million EVs are going to be on the road in the U.S. Those are going to need to get charged. They're going to get charged at home, at work, and on the go, quickly. We are guessing that there will need to be 25,000 fast chargers to keep those cars going by 2022.

Q: How does ride-sharing fit into your plans?

Zoi: The rise of ride-share in the

economy is a big accelerant for us. We have a number of ride-share drivers that drive EVs who use our stations. They charge seven times more than the average personal EV driver does. That's a really big reason that we're going to see a lot more gigawatt-hour throughput on DC fast, because we've got that increase in ride-share, we've got that increase in electrification of delivery trucks and that sort of thing.

Q: How big is it going to get?

Zoi: The best analysis that we've seen forecasts that ride-share will account for 25 percent of vehicle miles traveled by 2030, up from 1 percent today. There's a generational thing happening with ride share. We have a lovely partnership with General Motors Maven (an on-demand car-sharing service). When Maven puts Chevrolet Bolts into a market, the utilization on our assets skyrockets. Those ride-share drivers, every minute they're not driving around, they're not making money, so they need DC fast. So we see that in our own data and we see it growing.

Q: How much does it matter to you who's driving the cars?

Zoi: It doesn't matter. When things are fully autonomous, we'll be able to pack our charging infrastructure more densely.

Q: You recently won a contract from the state of Virginia, which is going to use money from the Volkswagen settlement to pay for the network that you're going to build. Is the Virginia scenario going to be repeated in other states?

Zoi: We sure hope so. It's a wonderful public-private partnership because the state of Virginia has decided to allocate the 15 percent allowable amount of the settlement money to charging infrastructure. I often talk about (hockey star) Wayne Gretzky and his famous quote that you need to skate to where the puck's going to be. What we're trying to do is skate slightly ahead of where the puck's going to be, which is to build the infrastructure so that there's no way the availability of infrastructure is an inhibitor to somebody making a car-purchasing decision.

Q: What other regulatory changes are you hoping to see?

Zoi: Mostly, we want regulation to not get in the way of building fast. My biggest worry is that we can't build fast enough to meet the tsunami we're about to see in the electrification of transportation. We are happy to be partners with utilities and want to make sure that we have rate designs that actually recognize the benefits that electric vehicle charging infrastructure brings to the grid. Making sure that regulations don't unwittingly provide an obstacle is a key area.

Q: How are utilities preparing for the tsunami?

Levy: We have a huge interest from utilities in electric vehicles in part because it's a new customer load that they've been chasing for a long time, but it also provides both challenges and opportunities to the entire grid system. With that comes a need for really strong education and engagement with regulators.

Zoi: With the rise of distributed generation and distributed everything, the possibility exists that not only do we have batteries at stations for our own economic benefit, but also that those can become a resource that puts power back into the grid. You need a regulatory structure that allows for that. I'm trying to create a one-plus-one-equals-three scenario, where we're helping EV drivers charge their cars and providing a benefit to the grid so that in the modern world, where there's lots of distributed generation, the whole system operates more efficiently.

Q: What's the case for a retailer to have a charging station? Do retailers come to you or do you go to them?

Zoi: There's a benefit for both. Every single brick-and-mortar retailer in the U.S. right now is losing business to online shopping. They need to create more reasons to come to the store. Any additional amenity that they can provide attracts more foot traffic.

Levy: Those chargers are in the ground today at Walmart and Whole Foods and Save Marts and Lucky's. So they already have that experience and can see that their customers are benefiting from it. We're seeing increases in utilization, and it continues to be a good recipe for all sorts of brick-and-mortar retailers to attract custom-

ers.

Q: How does long-haul driving fit into the mix? How ready is the system for that?

Levy: We need more of everything. More needs to be done. EVgo has more than 1,000 public fast-charging stations across the country. We tend to focus on the urban and suburban, but we also have a number of stations right along corridors. That's one of the things we're doing with Virginia.

Frankly, the economics of corridors are sometimes more challenging because you often have to overbuild to reduce queuing, and the peak travel times are the only time you see high utilization. We need to have that high utilization, so sometimes a corridor is not optimal. That's why partnerships like the one that we have with Virginia are so important to make sure that we can support those corridors as well as the urban build.

Source: https://about.bnef.com/blog/evgo-gets-ready-tsunami-electric-transport-qa/

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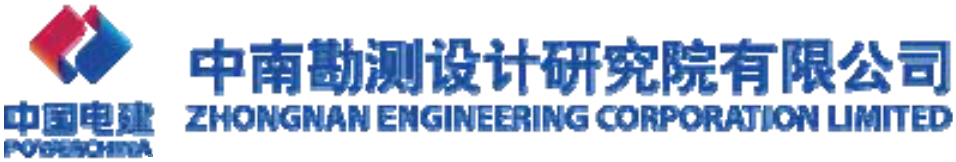

Energy Development Council (EDC) is a non-profit umbrella organisation of the entire energy sector of Nepal established to ensure every Nepali has access to energy and energy security by promoting favourable policies and investments. EDC consists of Energy Developers, Energy Associations, Energy Consumers,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

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