

Editorial

Dear Reader,

The last month has been a busy one for energy sector. We were delighted by the news of successful completion of the 50MW Upper Marsyangdi A hydro project. As half of the project has already begun generating power to the grid, it is likely to reduce the loadshedding hours during the festival seasons. The Energy Ministry concluded an initial signing of the Project Development Agreement (PDA) for 216MW Upper Trishuli-1 Hydroelectric Project. This could be of great significance for foreign investors, as in the PDA there is a provision to sign PPA in convertible currency for 10 years to cover the foreign debt and also government has agreed to provide guarantee payment in case the NEA defaults. Our new Energy Minister also came up with a 38-point plan to eliminate load shedding in the next two years.

Among different things, he has a plan to generate 800MW from hydropower, 150MW from solar, 50MW from other sources and as well as import 500MW of electricity from India. We have no shortages of plans, each government comes with new plans and ambitions, but what we actually lack is the execution of those plans. The last government also came up with energy crisis prevention and electricity development decade plan, however before they could implement the policy, the government changed. Hence, we have to see what actually this new government would achieve during its tenure. But looking at our track record, it is very hard to believe that the loadshedding would be eliminated in the next two years. Our transmission lines and distribution system are not sufficient to bring the generated power to load centers. Hence, it seems we still have to depend on decentralised options like using diesel generators, solar panels and battery backups.

While many of us are arguing if decentralised energy system is actually a viable option, despite the power deficit, some developed countries like US where they barely have any loadshedding are actually already adopting this concept. Last year, when Tesla launched its powerwall system, which is basically a home battery that charges using solar PV or grid electricity, they received \$800 million worth booking within the first week that they were completely sold out for one year! Likewise, there is also growing trend for micro-grid, localized grid that can disconnect from the traditional grid to operate autonomously. Back in the days, microgrids were mainly built for rural and isolated communities where it was very expensive to build the national grids. However, nowadays with advancement in transmission technology and renewable energy systems, it is increasingly becoming popular even in urban areas too, especially among schools, hospitals, gated communities, fire departments and other emergency service areas. This shift in paradigm is redefining the concept of electric utility from being cheaper and centralised to reliable and decentralised. And Nepal, with all the constraints that have been hindering our power development sector, is definitely not going to stay immune from this paradigm shift.

Hence, it might be about time that the government think of bringing rules and regulations for urban Microgrids too.



Mr. Kushal Gurung
EDC Executive Committee Member
and
CEO, Windpower Nepal

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EDC Activities

Interview of Mr. Sujit Acharya, Chairperson of EDC and Prof.Dr.Triratna Bajracharya, Dean, Institute of Engineering with Mountain Television

On September 1, 2016, Mr. Gopal Basnet of Mountain Television interviewed Mr. Sujit Acharya, Chairperson of EDC and Prof.Dr.Triratna Bajracharya, Dean, Institute of Engineering, Tribhuvan University and Director at Center for Energy Studies, Tribhuvan University on his Energy related talk show 'Urja Bahas'. The topic of discussion was about the scope of renewable energy in our country and various challenges and problems in this sector.



The interview is available at the link: <https://www.youtube.com/watch?v=le5bViqzWvY&app=desktop>

EDC Meeting with European Union

On 19th September, 2016, EDC had a meeting with Head of Cooperation – Mr.Andreas Roettger and Sr. Program Manager – Mr. Ranjan Prakash Shrestha at EU Delegation Office, Uttardhoka Sadak, Lainchaur.

The discussion was about exploring cooperation in the field of Microgrid, Electric Vehicle and Power Summit.

Media Coverage

प्यानल डिस्कशनमा व्यक्त विचार

भाडा खाने सोचबाट माथि उठ्नु जरूरी



सुजित आचार्य

अध्यक्ष, इनर्जी डेभलपमेण्ट काउन्सिल
सस्थापक, आईडीएस इनर्जी प्राप्ति

हाम्रो सोच भाडाबाट आउने आम्दामीमा आश्रित सोच छ । व्याज खाने, व्यापारबाट रातारात कमाउने, भन्सारको आम्दामी बटुलेर देश चलाउने सोचले ग्रसित छौ । हाम्रौ अहिले सम्मको सोच आयातमुखी र केही मूल्य अभिवृद्धि गरेर व्यापार गर्ने भन्दम माथि उठेको छैन । राष्ट्रकै क्षमता अभिवृद्धि गर्ने गरी उत्पादनमूलक क्षेत्रमा लगानीको आवश्यकता छ । हामी बजारमा हेरौ, दुनियाका सबै ब्राण्ड उपलब्ध छन् । तर खोई नेपाली ब्राण्ड कहाँ छ ? हामी व्यापार घाटा भनिरहेका छौ । तर व्यापार घाटाको ४० प्रतिशत इन्धन ग्यास तथा आयात गर्नमै ओगटिएको छ । अब हाम्रा लागि उर्जा सुरक्षा नै राष्ट्रिय सुरक्षा हो । नेपाललाई सार्वभौम राष्ट्रका रूपमा उभ्याइ राख्न पनि हामीले जलविद्युतमा पूर्ण निर्भर हुनु परेको छ । यसका लागि देशमा नयाँनयाँ प्रविधिको विकास गर्नु तथा भित्रयाउनु पनि अत्यावश्यक छ ।

जलविद्युतमा नेपाल दक्षिण एशियाकै सबैभन्दा आकर्षक गन्तव्य बजार को । यस क्षेत्रमा धेरै भेन्चर क्यापिटल र लगानी कर्ता आएका छन् । तर सरकारमा बस्नेहरु संग जलविद्युतका लागि लगानी कसरी आकर्षित गर्ने न सोच छ न योजना बनाउने क्षमता नै । यदि जलविद्युतमा व्यापक लगानी आउने बन्ने हो भने भोली हामीले पुनः कुनै प्रकारको नाकाबन्दी वा अफ्ठ्यारो बेहोर्नुपर्दैन । भोलि कसैको भरमा बाच्नुपर्ने दिनको अन्त्य हुनेछ ।

This article is derived from Abhiyan published on August 25, 2016. The link is available at <http://www.abhiyan.com.np/new/Articles/view/83908>

Guest Corner

The Trillion Dollar Business Opportunity in Infrastructure

Infrastructure represents one of the world's largest investment opportunities—developers are clamoring for projects and investors are eager to partner. Government leaders have the power to launch infrastructure initiatives that can spur economic activity and improve the lives of millions.

Take Senegal, for example. Poor road infrastructure and severe traffic congestion were costing Senegal nearly 5% of its annual GDP every year. The Dakar-Diamniadio Toll Road, which now links Dakar to surrounding cities, reduces commute time from more than two hours to less than 30 minutes, impacting more than two million Senegalese. In Australia, the construction of Sydney's Westlink M7 motorway sparked industrial activity. In 2005, more than two-thirds of the two million square meters of industrial land under development in Sydney was around the M7 corridor. The motorway has served as an anchor project in the government's plan to develop western Sydney into an industrial and employment hub.



And yet, over the next 15 years, global investment in infrastructure is projected to fall short by approximately \$1 trillion per year.

In its 2016 meeting, the B20 (a coalition of international business leaders that develop policy recommendations for G20 leaders) assembled an infrastructure taskforce to identify what should be done to reinvigorate private investments in public infrastructure and close the infrastructure gap.

Here are the top takeaways.

1. It's Not About the Money

Investors are ready to allocate funds—but there's a shortage of attractive, bankable projects in the pipeline. To increase and accelerate the pipeline, governments need to map out a long-term vision, rigorously prioritize projects, prepare solid go-to-market strategies, and invest in key capabilities. The South Korean Public and Private Infrastructure Investment Management Center (PIMAC) is an example of how a country successfully took steps to strengthen its pipeline. PIMAC, an independent and professional entity, vets proposed infrastructure projects, assesses return on investment, and provides advice on improving project design.

Through rigorous analysis, PIMAC has screened out almost 50% of potential projects (versus just 3% previously), saving South Korea an estimated \$103 billion over the past 15 years. This kind of rigorous analysis helps ensure that a strong portfolio of high-quality projects is available to potential investors.

2. Accelerate, Accelerate, Accelerate

To pave the way for high-impact infrastructure growth, it's critical to eliminate the costly bottlenecks in preparation, procurement and approval processes that routinely delay infrastructure projects. The Development Bank of South Africa (DBSA), for example, created a specific advisory business to assist project owners in de-bottlenecking high-priority infrastructure projects. The DBSA is currently working with several governments in southern Africa to accelerate infrastructure projects in the North-South Corridor, an economic route connecting Durban to Dar es

Salaam. This Corridor is creating 574,000 jobs in the region and uplifting thousands of citizens caught below the poverty line.

3. Brown Is the New Black

Private investors are keenly interested in brown field assets, and governments can sell brownfield projects in order to fund green field projects. By pursuing this strategy, Australia is expected to free up \$24 billion for new infrastructure investments over the next five years (through its Australia Asset Recycling Initiative). The Australian Capital Territory Government, for example, plans to sell nearly \$300 million worth of public assets and reinvest the proceeds in the Canberra Capital Metro light-rail project, which is expected to deliver approximately \$750 million in economic benefits in stage one alone. Similarly, the Indian government recently announced that it will auction the rights to collect tolls on portions of its national highways in order to finance new highways (and maintain existing highways as well). Selling brown field projects to fund green field projects is a clear win-win for governments and investors.

4. De-Risk to Enable Private Finance

Industry leaders see massive potential in infrastructure—but they also see risk, especially in emerging and frontier markets. The key is to allocate risk to the contracting party best equipped to handle it. Industry leaders are also looking to multilateral development banks (MDBs) to identify whether their risk mitigation programs (such as political risk insurance, policy guarantees, and project guarantees) can be expanded, and whether private-sector arms of MDBs can increase co-investment with private investors. This provides additional comfort for investors and improves their chances of gaining a seat at the table if governments make regulatory or policy changes.

5. Digital Technology Is Here

Digital innovation is redefining what's possible in construction and infrastructure projects. Widespread use of digital technology can reduce lifecycle costs by almost 20%. Innovative materials, smart equipment, automated processes, 3D printing, and big data are poised to help companies build better, cheaper, faster and safer than ever before. Skanska, a multinational construction company, created "Flying Factories", establishing temporary factories close to construction sites to reduce construction time by 65% and slash labor costs by 50%.

To foster such innovation, governments need to establish innovation-friendly regulations and policies and reward technology solutions that reduce lifecycle costs. Singapore, through its Construction Productivity and Capability Fund, partially reimburses companies that deploy building information modeling (BIM) software, hardware, equipment, and machines that improve productivity by at least 30%.

6. Interconnectivity Is the Next Big Frontier

Interconnected infrastructure projects can integrate economic clusters across multiple countries, remove trade barriers, and optimize asset networks. Existing initiatives like the Trans-European Networks and the Central American Electrical Interconnection System have delivered tremendous benefits in their respective regions, while new initiatives, such as One Belt, One Road, have the potential to transform economic prospects for dozens of countries by laying down critical, integrated infrastructure. The planning and execution of these projects is a major challenge because they involve wide-ranging stakeholder interests, varying regulatory, legal, and political environments, and engineering complexity. Yet the potential gains from these initiatives require that we find ways to tackle the challenges. Industry can work with governments to turn challenges into opportunities by developing innovative solutions through strategic partnerships.

By working together, business and governments can turn the annual trillion dollar infrastructure gap into a trillion dollar opportunity. Now is the time—for both governments and businesses—to move from identifying issues to initiating change.

The article is available at the link: <https://www.linkedin.com/pulse/trillion-dollar-business-opportunity-infrastructure-jeffrey-chua?trk=v-feed&trk=hp-feed-article-title-share> published on Sep 5, 2016.

50MW Solar PV Plant Shaped Like A Giant Panda

United PV and the United Nations Development Program (UNDP) have partnered to jointly launch the “Panda Solar Power Plant” that promotes both youth engagement and sustainable development.

The “Panda Solar Power Plant” will be designed and constructed in accordance with the image of “Chinese national treasure” – a giant panda. It will cover a total area of about 1,500 acres, with a total installed capacity of 50 MW. The black part will be composed of monocrystalline silicon solar PV cells, and the grey part will be composed of the thin-film solar cells. The project will be funded and constructed by United PV.



The inauguration of the program was held in the Beijing office of the UN on 1 September and was attended by many party officials including Agi Veres, country director of UNDP in China, Sarah Kemp, minister-counselor of commerce from the US Embassy in China and Li Junfeng, director of the National Centre for Climate Change Strategy and International Cooperation.

Through the 'Panda Solar Power Plant', United PV and the UNDP aim to carry on the ambitions displayed at the Paris Agreement and promote the popularization of sustainable development, in particular, amongst the younger generation. The program is not only a direct vehicle for UN incentive on climate change, but will also be promoted by government groups, enterprises and the wider community.

More importantly, the Panda Solar Power Plant will stimulate teenagers' interest and investment in sustainable development, and thus become the main force in response to global climate change. The early join of the young will definitely further promote all social forces to address climate change.



The project received considerable international support, including participation from First Solar, SunPower, IBM, Apple Inc, Huawei, Sungrow, Powerchina and LONGI, according to a statement by United PV.

Last year, US utility Duke Energy Florida said it would construct a Mickey Mouse-shaped solar facility near the Walt Disney World resort in Florida.



This article is derived from the link: http://www.ledpv.com/blog/50mw-solar-pv-plant-shaped-like-a-giant-panda_b102 published on September 7, 2016.

TIBET

The bizarre world of bitcoin 'mining' finds a new home in Tibet

By Simon Denyer

Inside a metal shed in the Tibetan highlands of western China, thousands of microprocessors flank narrow corridors, generating a constant hum and stifling waves of heat.

Outside, the sky is clear and blue, with a mountain peak looming at the top of a narrow wooded valley. A flock of goats ambles idly past a pile of discarded foam packaging. Inside, though, tranquility is transformed into clamor. Red, blue and green lights constantly flash; cooling water trickles down the walls, and large ventilation fans thrum as they struggle to shift the hot air produced by all this concentrated computing power.



Set in remote mountains on the edge of the Tibetan Plateau, the bitcoin "mine" is strategically placed next to a hydroelectric power plant. (Paul Ratje/For The Washington Post)

This is a bitcoin "mine," the engine room of the world's leading digital currency. The microprocessors here approve and record all the transactions that keep the bitcoin system running. They also compete to solve complex mathematical problems and are rewarded with bitcoins: That's a way of putting fresh digital currency into circulation and incentivizing more people to set up "mining" operations.

Bitcoin began as a utopian, libertarian dream, a decentralized currency outside the control of governments, a system that gives its users the anonymity of cash and the instant, global power of email. This was a system built not just for convenience but also for those who can't bring themselves to trust the global financial system, created by a programmer whose identity remains a mystery.

Across Tibet, China is busy pulling mineral resources out of the ground; there is even a gold mine close by. But here in Kongyu, most of the mining is virtual. It is here because of extremely cheap hydropower, cheap wages — and perhaps because Chinese entrepreneurs have a knack for the business.

For a while, bitcoin was effectively kidnapped by drug dealers, becoming the anonymous payment backbone of the Silk Road, a black market in illegal drugs that flourished on the dark Net — until the FBI closed that market down in 2013.

Today it is an industry that is starting to come of age, but whose center of gravity has shifted to China, and away from utopian dreamers toward venture capitalists.

"When bitcoin was invented, the people dedicated to it were mostly crypto-punks and libertarians," said Eric Mu, the chief marketing officer with HaoBTC, which operates the bitcoin "mine" in this township in China's western Sichuan province. "Now they are more like bankers and lawyers who see opportunities in the industry. And as they join, the industry is changing."

What is a bitcoin?

The virtual currency enables direct payment over the Internet between two individuals by skipping the middle man, such as a bank or credit-card company. Bitcoin transactions — with fees that are much lower than what financial institutions charge — rely on cryptography to prevent double spending, counterfeiting or theft.

HOW ARE BITCOINS CREATED?



Bitcoins are awarded to companies that use computers to solve complicated mathematical problems. This process is called “mining.” These are the same computers that manage the bitcoin system.

HOW DO YOU BUY A BITCOIN?



To buy a bitcoin, real money must either be deposited through an online payment company or transferred directly from a bank account into an account on a third-party Web site that connects bitcoin buyers and sellers.



Once the funds are available, a buyer can place an order for a bitcoin, similar to trading stocks, through an exchange. Bitcoins can also be purchased from third parties which send the coins directly into a virtual wallet.

WHAT CAN YOU DO WITH A BITCOIN?



Bitcoins can be used to buy from online vendors and are bought and traded as investments.

Sources: bitcoin.org; blockchain.info; MIT Technology Review

THE WASHINGTON POST

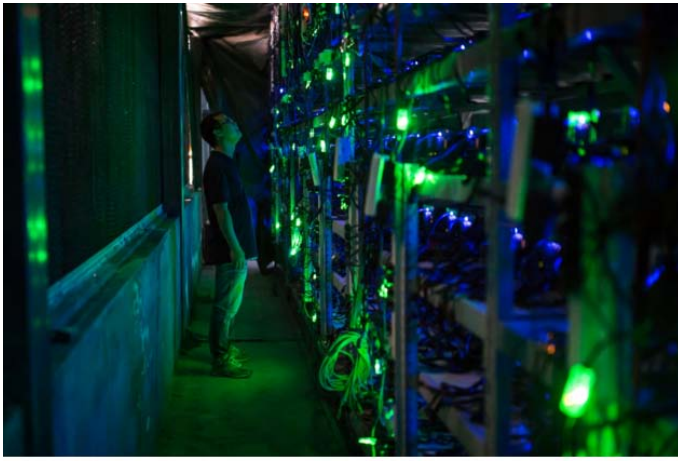
In this case, changing also means moving to China.

Today, mines run by Chinese companies account for about 70 percent of the world’s bitcoin processing power, its factories produce the cheapest microprocessors to run these mines, and its exchanges account for about 70 percent of the world’s bitcoin trade.

It is increasingly big business. Altogether there around more than 15 million bitcoin in existence: Each is worth \$615 at current prices, with a market capitalization of \$9.2 billion.

For some, Chinese domination of an industry once controlled by libertarian crypto-punks is a rich irony. For others, it is more practical threat: Chinese miners, some argued, have been standing in the way of reforms needed to speed up transaction speeds on bitcoin’s fast-expanding network of users.

But those concerns might be overblown.



Guo Hua, a site manager, checks equipment in a center in China's Sichuan province, on Aug. 12. (Paul Ratje/For The Washington Post)

“Some people in the Western world were painting Chinese miners with too broad a brush,” said Emin Gün Sirer, a computer science professor at Cornell University. “It’s not the case that all Chinese miners are part of the same enterprise or are colluding.”

But Sirer identifies one risk with the concentration of mining power here: If the Chinese government wanted, it could in theory crack down on miners and force them to block certain bitcoin accounts.

“They would not be able to usurp funds, but they could stop the motion of funds,” he said, describing exactly the sort of government control bitcoin was supposed to guard against.

These are concerns that have parallels with the way China is using its digital market power to reshape the Internet and influence the global debate about censorship and surveillance.

But here, in the mountains of Sichuan, it is hard to see much evidence of a Chinese plot to bring bitcoin to heel.

The Chinese government has employed a fairly light touch. Although it banned banks from taking part in bitcoin trading in 2013, it left ordinary people free to buy and trade the crypto-currency, and miners free to operate.

The industry is run by a disparate mix of investors and dreamers, and manned by electricians and IT experts. There are people like Ryan Xu, an infectiously enthusiastic Chinese-born Australian who first became interested in libertarian economics while working as a reactor operator in a nuclear power plant. He now describes himself as “both a utopian and a venture capitalist.”

“We need to foresee the next five or 10 years,” he said in a wide-ranging conversation over dinner in the western city of Kangding. “All the governments are printing money and diluting people’s wealth. Is that justice or robbery? The financial system also keeps crashing every five or 10 years. I think that’s an illness in the monetary system and it needs a cure.”

He says he is not sure bitcoin is the answer, but it is at least an experiment that might work.

So why China?

Running microprocessors sucks electricity. Competition is intense, and profit margins are narrow: Xu has moved his mines around the world in search of the cheapest power, from Iceland to Georgia, and then to Washington state, from the coal fields of China’s northern Inner Mongolia province and now to the mountains of Sichuan.

His latest mine is still under construction, between a hydroelectric power plant and the concrete shell of a disused power transmission station, between Kongyu and the city of Kangding.

As China’s economy boomed, private companies set up hydroelectric plants in western Sichuan; then, as the economy slowed, they found themselves unable to sell to the national grid, elbowed out of the market by more politically powerful state-owned firms.

“It took a lot of money to build the plants, but it doesn’t cost that much to maintain them,” said HaoBTC’s Mu. “So it makes sense for them to sell the power to anyone



Thousands of microprocessors approve and record all the transactions that keep the bitcoin system running. (Paul Ratje/For The Washington Post)

willing to buy, even at a low rate.”

Maintenance staff are cheaper here than in the West. Mu says his company employs 10 people at three mines in the mountains, paying them around 6,000 yuan (\$900) a month, a “decent salary” for this part of the world. HaoBTC runs one other mine in Sichuan and one farther west in Xinjiang, with more than 11,000 machines, earning more than 80 bitcoin a day — a daily income stream worth more than \$745,000.

But it is not only Chinese entrepreneurs who have taken to bitcoin. Deprived of good investment opportunities at home, and burned by a volatile stock market, a growing number of Chinese people have begun speculating and investing in bitcoin.

Bobby Lee, a former Silicon Valley engineer who founded China’s first bitcoin exchange, BTCC, attributes it partly to a natural instinct to buy and sell.

“If you look at Las Vegas or Macau or casinos worldwide, how come most of the clientele are of Asian descent, or Chinese specifically?” he asked. “It has to do with some cultural instinct. Chinese people like to gamble.” Yet as bitcoin matures, it is also experiencing some significant growing pains.

On Aug. 2, the Bitfinex exchange in Hong Kong was forced to admit that hackers had stolen nearly 120,000 bitcoin worth \$72 million from customers’ accounts. That news caused the bitcoin price to fall by more than 20 percent, and underlined the safety concerns that many ordinary people feel about owning digital money.

At the same time, the system is showing signs of overloading. Bitcoin’s current technology can only process around three digital transactions a second — minuscule compared with the roughly 24,000 transactions per second that Visa can manage

Delays in processing transactions have grown, as have transaction fees, and the industry has become deeply divided about how to reform the system to solve the problem.

Jeff Garzik, a leading bitcoin developer based in Atlanta, argues that a technological fix is in the pipeline that will allow soon bitcoin to process tens of thousands of transactions a second.

“I think that with new technologies coming down the pipeline, it can scale up to everyone buying their coffee with bitcoin in the entire world,” he said. “It really can be the first really good substitute for physical in-your-hand cash.”

Like Sirer, he isn’t too worried about the current concentration of mining power in China, partly because the market is so dynamic and the dominant players change every year.



Ryan Xu shows his company’s equipment in part of his latest mine, still under construction. (Paul Ratje/For The Washington Post)

“It’s much easier to challenge the dominant players in this space because market entry is so easy,” he said. “If the Chinese miners suddenly power off their rigs, within 24 hours we’ll see the emergence of another competitor.”

Here in the mountains, miners while away their free time playing mah-jongg or poker, smoking cigarettes or surfing on their smartphones. Site manager Guo Hua used to run a small camera-repair shop and still likes fiddling around with machines. Marketing manager Mu, who spends only a few weeks of the year here, likes to translate books in his free time or run to the nearest town to buy cigarettes for his colleagues. Sometimes he hikes into the mountains,

toward a remote Tibetan village or a looming peak, a welcome change of change of pace from Beijing and its polluted air.

And all the time, the microprocessors keep on running.
Xu Yangjingjing contributed to this report.

This article is derived from the link : https://www.washingtonpost.com/world/asia_pacific/in-chinas-tibetan-highlands-the-bizarre-world-of-bitcoin-mining-finds-a-new-home/2016/09/12/7729cbea-657e-11e6-b4d8-33e931b5a26d_story.html published on September 12,2016.

USA

Electric Chevrolet Bolt to go 238 miles on a charge

By Peter Valdes-Dapena

General Motors' all-electric Chevrolet Bolt compact car will be able to go 238 miles on a single charge, the automaker announced Tuesday.



The Bolt is powered by a 200 horsepower electric motor which will enable it to go from zero to 60 in under seven seconds, which is quick for a small car. Top speed will be about 91 miles per

That's enough to drive from New York City to Washington DC or nearly enough to make a round trip between Los Angeles and San Diego.

Perhaps more importantly to GM, it beats the 215 miles Tesla has promised for its upcoming Model 3, a similarly-priced electric car that's expected to go on sale next year.

"Chevrolet showed the world the production version Bolt EV earlier this year and in a few short months we've moved from that vision to a reality," said GM North America President Alan Batey.

Sales of the Chevrolet Bolt are scheduled to begin before the end of this year.

While the Bolt's name is very similar to that of another GM (GM) plug-in car, the Chevrolet Volt, the two cars operate very differently. While the Volt can go over 50 miles on a charge, it has a gasoline engine to generate power for longer drives. The Bolt is purely electric. The Bolt's price will start at under \$37,500, GM has said, a price that would effectively make it cost under \$30,000 with federal tax incentives.

The Model 3 will be priced about \$35,000, Tesla has said. Tesla has already received hundreds of thousands of pre-orders for its car.

The Bolt is powered by a 200 horsepower electric motor which will enable it to go from zero to 60 in under seven seconds, which is quick for a small car. Top speed will be about 91 miles per hour.

To help maximize the Bolt's range, it's made from lightweight materials such as aluminum, magnesium and carbon fiber.

Like some other plug-in and hybrid cars, the Bolt has a one-pedal driving mode which will extend its driving range by about 5%, GM has said. When that mode is selected, lifting a foot off the accelerator pedal immediately initiates regenerative braking, in which electric motors are used to slow the car. That also generates a small amount of electricity that slightly recharges the battery. Ordinarily, regenerative braking is only initiated by pressing on the brake pedal. One pedal operation eases driving in slow moving or stop-and-go traffic in addition to increasing energy efficiency.

Related - Coolest cars under \$18,000

GM classifies the Bolt as a "crossover SUV," although the EPA, which does not have a "crossover" classification, calls it a "small wagon."

Beating the Model 3 to market will give GM bragging rights for marketing the first "affordable" long-range electric car. Other lower-cost electric cars from major manufacturers, such as the Nissan Leaf or GM's own Chevrolet Spark EV, have had driving ranges of less than 100 miles.

The article can be derived from the link: <http://money.cnn.com/2016/09/13/autos/chevrolet-bolt-range/index.html> published on September 13,2016 on CNN Money (New York)

Electric cars preferred for millennial buyers

More than three quarters of millennials see using a green car as the single biggest action to reduce their environmental impact according to a new survey from Nissan. Results said that 76 per cent of the generation group - aged 18 to 34 - saw eco-friendly cars as the transport of choice going forward.

More than 50 per cent of those questioned would also consider buying an electric car, or own one already. The survey involved 2,500 millennials across the UK, France, Italy, Germany, and Spain.

According to Nissan's findings, which were presented at the company's FutureFest event in London, the environmental concerns topping the agenda were climate change and air pollution. As such, wholesale changes in lifestyle were seen as ideal ways to combat these problems, with a switch to green motoring topping the bill.

Other considerations included switching energy providers to dedicated eco-friendly companies, and only buying products from brands that are committed to improving the environment.

Gareth Dunsmore, Director of Electric Vehicles at Nissan Europe, said: "We've always known that millennials are the challenger generation but our European study has also revealed that they're the future 'change-makers' – willing to make drastic lifestyle choices to make a meaningful difference to the world they live in.

"It gives me immeasurable hope to see that millennials believe electric vehicles, such as the Nissan Leaf and e-NV200 that are already on the road today, are part of the solution for a more sustainable future. As an industry we must work harder to engage the interests and needs of this group."

Sarwant Singh, Senior Partner at Frost & Sullivan and member of Nissan's Intelligent Motoring Advisory Board, said: "The millennial demographic surveyed here has the potential to be hugely influential in determining the future of transport and sustainability.

"We have consistently found in our own research that they are early adopters of new technology, much more environmentally friendly than previous generations and generally willing to make sacrifices and lifestyle changes in line with their personal values and beliefs."



Perhaps one of the most surprising results to come out of the survey is that the majority of millennials questioned owned a car (77 percent). It might well be the last generation to see such high levels of ownership as many market analysis experts predict increased car sharing and subscription services, rather than conventional car ownership models.

Although they might not be driving electric vehicles now, they are in the market for future driving technology with nearly two out of three likely to buy a hybrid car in the next 10 years, and over half saying they would buy an electric car in that time span.

This article is derived from the link: <http://www.nextgreencar.com/news/7814/electric-cars-preferred-for-millennial-buyers/> published on September 20, 2016.

India Wants to Build 10 Giga watts of Pumped Hydro Storage to Support Solar

The country expands its hydro storage plans as PV capacity soars.
by Jason Deign

India is embarking on a plan to build out gigawatts of pumped hydro facilities to help store the massive levels of renewable energy it will be producing within a decade.

S.D. Dubey, chairperson of India's Central Electricity Authority, last month confirmed plans for 10 gigawatts of pumped hydro storage across the country. The plan will cost 80,000 crore rupees (about \$17.2 billion) over the next five to six years according to *The Economic Times*.

Dubey said pumped hydro storage costs could be a fraction of the cost of lithium-ion batteries. He said the capital costs of the plants would be between 6 and 8 crore rupees (\$1.3 million and \$1.7 million) per megawatt.

This compares to a per-megawatt capital cost for solar projects between 5 and 6 crore rupees (\$1.1 million and \$1.3 million). India has a potential for up to 90 gigawatts of pumped hydro storage, said the report.

Although supporting solar is a goal, Indian renewable energy analyst Madhavan Nampoothiri said the pumped hydro reserves would be a boon for the grid in general.

“Considering a target of 175 gigawatts of renewables capacity by 2022, India will need to be ready with all technologies at its disposal to manage the grid, which will have to handle a progressively increasing quantum of intermittent solar and wind energy,” he said.

“These 10 gigawatts of pumped storage will complement, and not replace, chemical storage. Both can co-exist.”

Pumped hydro would be useful not just for storing excess renewable energy, he noted, but even thermal power produced during periods of solar or wind overload.



“In addition to providing grid flexibility, these plants can use cheap off-peak power to pump up the water and generate power during peak hours, at higher rates,” he said.

Brett Simon, energy storage analyst with GTM Research, said there were advantages and drawbacks to the pumped hydro concept.

“Today, pumped hydro accounts for the bulk of deployed electrical energy storage capacity worldwide and is often cheaper than other forms of storage, such as batteries,” he commented.

“However, pumped storage is location-dependent, and unlike battery systems, cannot easily be expanded. Also, given the permitting process needed for pumped hydro, such projects often have a longer development timeline compared to other forms of energy storage.”

For now, it is unclear which locations are being studied for pumped hydro development by the Indian government, although a number of projects are already underway, and the concept has been alive in India since well before the current solar boom.

For instance, in Tamil Nadu, India’s top state for PV installations, “pumped storage projects were envisioned long before solar became mainstream in India, and were apparently meant for storing excess wind power,” Nampoothiri said. “Wind has a 20-year history in India, and specifically in Tamil Nadu, which was the pioneer.”

One of the most significant pumped hydro storage projects currently underway is Sillahalla, a 7,000-crore-rupees (\$1.5 billion), 2-gigawatt plant in the Nilgiris District of Tamil Nadu.

The plant is being developed by the Tamil Nadu Generation and Distribution Corporation and involves construction of a dam across the Sillahalla River and a 2.75-kilometer tunnel connecting it to the existing Avalanche-Emerald reservoir.

The dam is scheduled for completion in 2018 or 2019, while the rest of the project is due to start operation in 2022, according to news reports last year. A tender is currently open for laboratory tests on borehole core and bedrock samples at the site.

Other pumped hydro projects known to be under consideration include the 1-gigawatt Turga project in West Bengal, the 600-megawatt Upper Indravati plant in Odisha, and a 450-megawatt development based around the existing Kundah hydro stations in Tamil Nadu.

Storage is likely to become a pressing issue across the country as it moves forward with ambitious solar targets. According to GTM Research's latest Global Solar Demand Monitor, India is set to have a cumulative PV demand of 46.1 gigawatts between 2016 and 2020.

The soaring level of installations will take the country from its current eighth place worldwide in terms of PV demand to third globally in 2020.

This article is derived from the link:

http://www.greentechmedia.com/articles/read/india-to-build-pumped-hydro-storage-for-solar?utm_source=Daily&utm_medium=Newsletter&utm_campaign=GTMDaily published on September 12, 2016.

Adani unveils world's largest solar plant in Tamil Nadu

Adani Group's solar power plant at Kamuthi, Tamil Nadu, is built at a cost of around Rs.4,550 crore and will generate 648MW of electricity

-By Maulik Pathak



File photo. The plant has been connected to a 400 kilo volts substation of Tamil Nadu Transmission Corp. Photo: Bloomberg

Ahmedabad: The Adani Group on Wednesday opened the world's largest single location solar power plant in Tamil Nadu, which will produce 648MW of electricity.

Adani Green Energy (Tamil Nadu) Ltd said in a statement that it built the plant at Kamuthi in Ramanathapuram district at a cost of around Rs.4,550 crore. The plant has been connected to a 400 kilo volts substation of Tamil Nadu Transmission Corp.

The company said the plant was built in a record time of eight months with equipment and machinery from around the world. Around 8,500 personnel worked on the project, installing an average of 11MW a day.

Calling it a "momentous occasion" for Tamil Nadu and the entire country, Gautam Adani, the billionaire chairman of Adani Group said a plant of this magnitude reinstates the country's ambitions of becoming one of the leading green energy producers in the world. In a statement, he also thanked the chief minister and the government of Tamil Nadu "for their valuable support and guidance in achieving this gigantic feat".

This article is derived from the link: http://www.livemint.com/Industry/EvOim3hnJ7hHHwQ3MColxO/Adani-unveils-worlds-largest-solar-plant-in-Tamil-Nadu.html?utm_content=bufferd0516&utm_medium=social&utm_source=linkedin.com&utm_campaign=buffer published on September 21, 2016.

World's Highest Conversion Efficiency of 26.33% Achieved in a Crystalline Silicon Solar Cell

Kaneka Corporation has achieved in a NEDO project the world's highest conversion efficiency of 26.33% in a practical size (180 cm²) crystalline silicon solar cell....

Kaneka Corporation has achieved in a NEDO project the world's highest conversion efficiency of 26.33% in a practical size (180 cm²) crystalline silicon solar cell. This record-breaking result will advance technical development of crystalline silicon solar cells and contribute significantly to reducing the cost of power generation through use of high-efficiency solar cells.

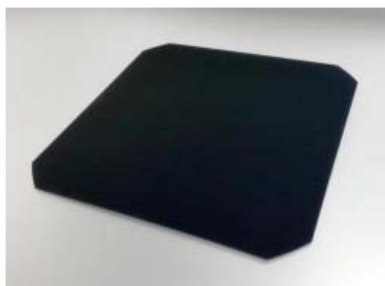


Figure 1. Crystalline silicon solar cell (heterojunction back-contact type)

1. Summary The levelized cost of electricity (LCOE)¹ using photovoltaic technologies is still high compared with other power generation methods, and cost reduction is a continuous challenge. A number of companies and research organizations around the world have been carrying out technological development to improve the conversion efficiency of solar cells, which will contribute to a considerable reduction in LCOE. Kaneka Corporation developed a high conversion-efficiency crystalline silicon solar cell (heterojunction back-contact type)² in NEDO's Development of High-Performance and Reliable PV Modules to Reduce LCOE project, and has achieved the world's highest³ conversion efficiency⁴ of 26.33% in a crystalline silicon solar cell having a practical size⁵ (180 cm²). This achievement breaks the world record of 25.6% by ~0.7%, exceeding 26% for the first time in the world.

2. Project Results NEDO and Kaneka Corporation have been working to develop high conversion efficiency crystalline silicon solar cells targeting LCOE reduction. The desired result was achieved by means of a combination of heterojunction technology using high-quality amorphous silicon, low resistance electrode technology, and a back-contact structure that captures more solar energy, all of which were developed by Kaneka Corporation.

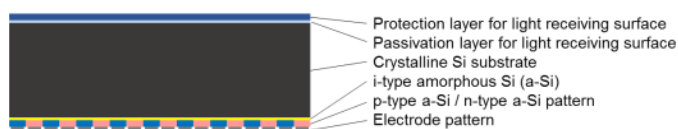


Figure 2. Schematic device structure of record-breaking crystalline silicon solar cell (heterojunction back-contact type)

Improvement in solar cell conversion efficiency will increase electric power generation and lead to a reduction of the cost to introduce photovoltaic power generation systems as less space will be needed to generate the same amount of solar power. Achieving

a conversion efficiency of over 26% in crystalline silicon solar cells, which are the most widely used solar cells, will make a great contribution to LCOE reduction and is expected to lead to even more widespread use of photovoltaic power generation in residences which have installation space restrictions.

3. Future Plans NEDO and Kaneka Corporation will continue to develop solar cell technology for reducing cost and improving performance and reliability to achieve the target electric power generation costs of 14 yen/kWh in 2020 and 7 yen/kWh in 2030. Kaneka Corporation is planning to commercialize high-efficiency solar cells that utilize the results of NEDO's project and will move ahead with development for practical use.

This news release is derived from the link: <http://www.eqmagpro.com/worlds-highest-conversion-efficiency-of-26-33-achieved-in-a-crystalline-silicon-solar-cell/> published on September 20,2016.

Welcoming new EDC member







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