



# ENERGY COMMUNIQUE

## EDITORIAL

The festival season is upon us again.

This time last year, Nepalese were very anxious about the load shedding schedule. There has been a drastic improvement in reliability of our electricity supply over the last year.

The world is moving away from excessive reliance on a single source of energy towards a diversified energy mix. Nepal's energy mix is very vulnerable with high dependence on hydro and imports. The latter, can stop flowing to Nepal with a click of a button from across the border. As the blockade of 2015 illustrated, the impact on our economy and daily lives are huge but we have very little control over supplies.

Are we going to lurch from one crisis to another by simply adapting to it? It is time we put meaningful solutions in place to address the

key aspects of our energy vulnerabilities.

Nepal Electricity Authority (NEA) is seeking a variety of different solutions to maintain and improve the electricity situation of the country. The only way to keep the country load shedding free this coming dry season is to import more from India. The other option NEA has is to rapidly add new renewable energy generation.

The emphasis has been on large solar power plants. Such plants are relatively large (in comparison to distributed) and feed into to medium or high voltage grid.

If real full project cycle costs are compared, large solar has become competitive against hydro. But Nepal hasn't evaluated the merits and disadvantages on large solar and considered whether the unitary emphasis on large solar is the correct strategy for today –



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it is not!

Large solar plants though feasible may not currently be the best short-term option for Nepal because of intermittency and the state of the grid. Most likely, large solar plants if introduced into the grid without corrective modifications will lead to forced curtailment of solar, similar and larger than that currently being witnessed in India. To absorb solar, Nepal will have to make substantial investments in modifying its grid network capabilities, which will offset the quick start benefits of solar.

The better option for Nepal's immediate energy crisis will be **Small Distributed Captive Solar Plants (SDCSP)**. SDCSP refers to solar energy solutions that are smaller, placed at the source of the load, produces electricity onsite, is first used for the on-site load and only the excess is exported to the grid.

The case for SDCSP is strong relative to centralized large solar plants. They help reduce technical and commercial losses (it is almost 40% in Nepal) because generation is used on site.

Large solar places a heavy toll on land. Very little non-agricultural is

available for solar. Diversion of agricultural land has severe implications for livelihoods, local economy and food security. These concerns may be far more damaging than improved energy supply.

SDCSP have a much larger economic multiplier than large solar plants because it offers more employment and enables a wider trade and service ecosystem to emerge. Large solar would concentrate the economic benefits in the hands of a few.

Large solar plants are highly dependent on government tenders, policies and processes. These processes are so slow that it nullifies the gains of quick-start to solar. On the other hand, SDCSPs can be installed independent of government. Once the net metering policy is made practical, any-

one can easily install SDCSP at their site. Even without net metering or any policy, entities can generate their own electricity and use it for day time load (though they cannot export).

My case is not SDCSPs will solve all energy problems. The problem of peak load, storage systems and many more will still need to be solved. But in today's context, SDCSPs makes more sense as an immediate solution to our immediate problem.

As an Energy Service Company, we are focusing on awareness, marketing activities, financing and the right technology to encourage our customers to consider the benefits of roof-top solar even without government intervention. In most cases, on-site solar generation is high profitable for end-users.■

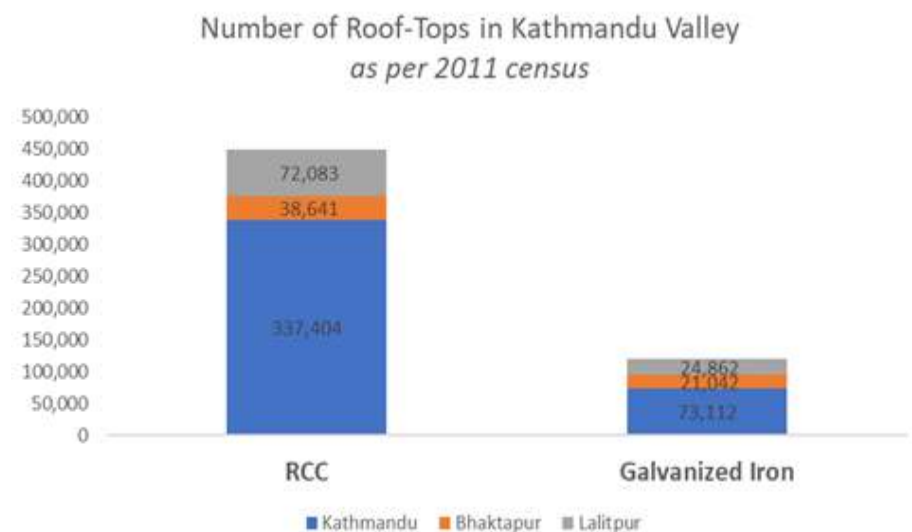


Figure 1 Kathmandu Valley Number of Roof-tops as per census 2011

## EDC ACTIVITIES

### Kantipur Media visits EDC office

**O**n September 5<sup>th</sup> 2017, a team from Kantipur media visited EDC office to discuss possible collaboration to become a local media partner for the upcoming Nepal Power Investment Summit (NPIS) 2018. The meeting ended on a positive note.

### EDC visits Commerce Counselor of India

**T**he EDC delegation led by Chairperson, Mr Sujit Acharya visited Mr. N. Ram Prasad, the Commerce Counselor of Embassy of India on 1<sup>st</sup> September 2017. The discussion was about the possible collaboration regarding the NPIS 2018. Mr. Prasad expressed that the Embassy of India would definitely be interested in participating actively in the summit.

**Water Power**  
& DAM CONSTRUCTION

### International Water Power as international media partner for NPIS

**I**nternational Water Power magazine has been finalized as one of the international media partners for the NPIS 2018. International Water Power & Dam Construction is one of the leading daily monthly international publications serving the interests and needs of those involved in dam construction and the hydro-electricity industries.



### EDC Visits the Ambassador of the Embassy of Sri Lanka

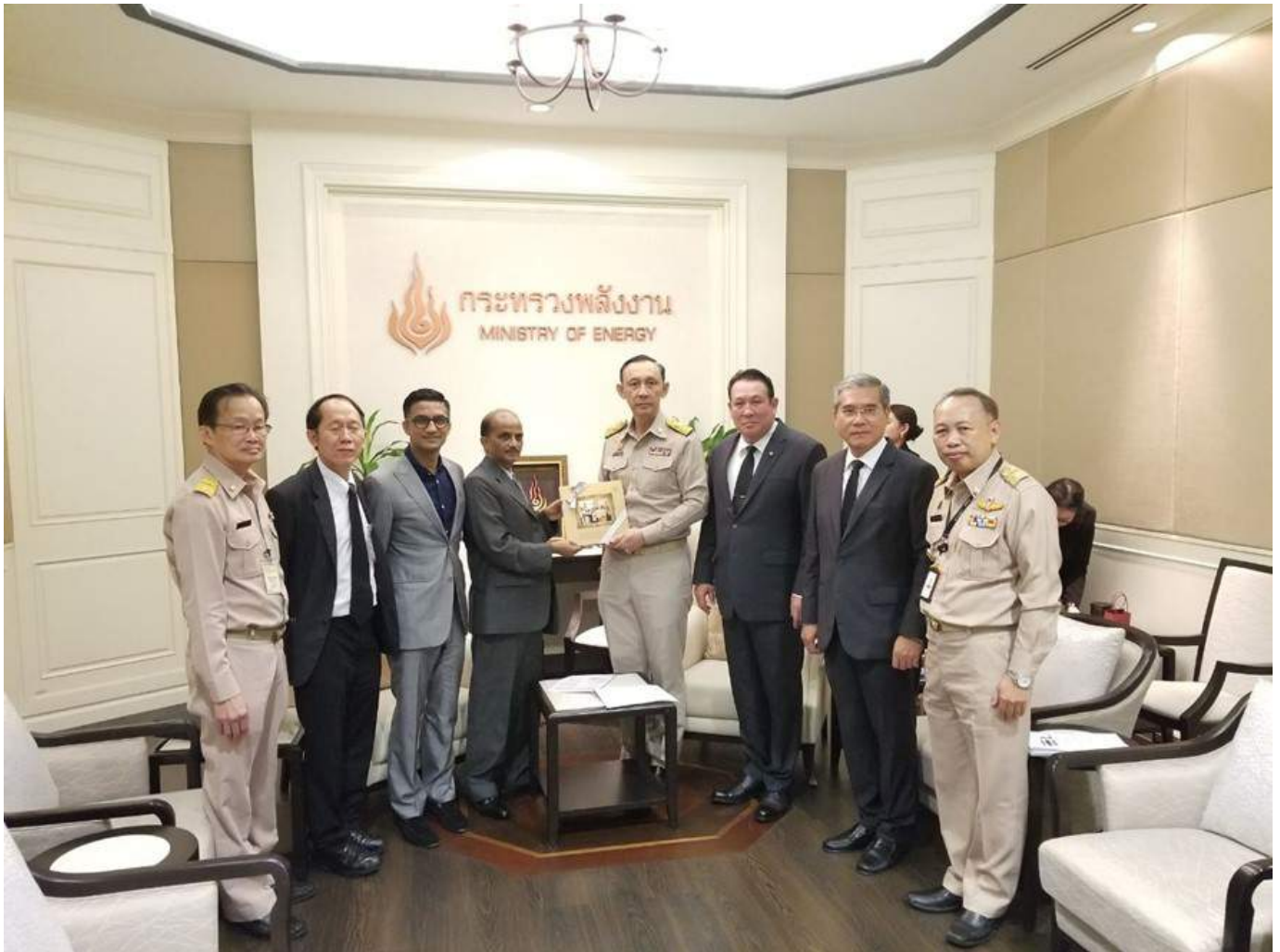
**O**n 20<sup>th</sup> September 2017, the EDC delegation led by Mr. Sujit Acharya visited the Honorable Ambassador of Sri Lanka to Nepal Her Excellency Ms. W.S. Perera at the Embassy of Sri Lanka. Mr Acharya extended an invitation to the Ambassador, requesting to chair one of the sessions of the summit and also discussed about the likely ways of co-operation for the summit.

**CHINA DAILY**  
中國日報

### China Daily to cover NPIS 2018

**C**hina's first national English-language website and one of the most distinguished English language web-portals, China Daily, has joined hands with EDC for the upcoming summit. It will be one of the global media partners for NPIS.

## EDC ACTIVITIES



### EDC Chairperson meets Energy Minister of Thailand

On September 25th 2017, Mr. Sujit Acharya, Chairperson of EDC along with H.E. Dr. Khaga Nath Adhikari, Nepal Ambassador to Thailand had a meeting with H.E. General Anantaporn Kanjanarat, Minister of Energy of Thailand and the team of Ministry of Energy, Thailand. The purpose of the meeting was to inform about NPIS 2018 and Mr. Acharya extended an invitation to the Honorable Minister to be the Guest of Honor and deliver a Special Address in the inaugural session in the summit. They further discussed about establishing the link between Nepal and Thailand for frequent energy related dialogues via EDC for Nepal-Thailand cooperation in the energy sector. Mr. Acharya also made a request to the Honorable Minister to lead a delegation of Thai based energy companies during the Summit to explore investment and collaboration opportunities with Nepal energy companies. A positive interest was expressed by the Honorable Minister.

## EDC ACTIVITIES

### EDC meets World Bank for NPIS 2018

**O**n 25<sup>th</sup> September 2017, Executive Manager from EDC Ms. Itnuma Subba met Senior Energy Specialists from World Bank Group, Nepal, Mr. Rabin Shrestha and Ms. Xiaoping Wang. The meeting was to discuss about possible ways of collaboration for the upcoming Summit. The team expressed a positive interest for cooperation and also suggested EDC to meet International Finance Corporation (IFC).

### EDC's preliminary success in lobbying for the promotion of electric vehicles

**E**DC lobbying has resulted in preliminary success in promoting the use of electric vehicles thereby reducing petrol and diesel. Dependency on fossil fuel must be removed so as to reduce the trade deficit of our country. Fossil fuel is also the main cause of air pollution having adverse impact on human health in Kathmandu. Nepal Electricity Authority, the power utility has called a tender to install charging stations in different places of major cities to encourage people to shift to electric vehicles. More information is available at <https://thehimalayantimes.com/business/nepal-electricity-authority-promote-electric-vehicles/>



## EDC ACTIVITIES

### EDC signs MoU with HARATI

**E**DC and Harati signed a MoU on September 7<sup>th</sup> 2017 at the EDC office, Kamaladi. EDC has agreed to provide a column for HARATI to publish a monthly tender notice for the E-Newsletter. HARATI is an IT company, working in several technologies based products, services and provides online service portal ([tendernotice.com.np](http://tendernotice.com.np)). Following is a list of tender notice provided by HARATI;

## TenderNotice.com.np

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

Month : September 2017

S.No.	Notice Publisher	Description	Published Date	Notice Category	Product Service
1	Ministry of Population and Environment, Alternative Energy Promotion Center (AEP), National Rural and Renewable Energy Programme (NRREP), Khumaltar Height, Lalitpur	Construction of Micro Hydro Project	9/21/2017	Tender	Construction/ Building
2	Nepal Electricity Authority, Generation Directorate, Chameliya Hydroelectric Project, Darchula	Rehabilitation and Reconstruction Works	9/14/2017	Tender	Construction/ Building
3	Nepal Electricity Authority, Kulekhani II Hydroelectric Center, Makawanpur	Construction of Boundary Wall, Barbed Fencing	9/10/2017	Tender	Construction/ Building
4	SJVN Limited	Design, Engineering, Manufacturing, Delivery at Site including Insurance, Unloading, Site Storage and Preservation, Erection/Installation, Testing Supervision and Commissioning etc. of Entire Electro-Mechanical Works	9/8/2017	Tender	Other Product/ Services
5	SJVN Limited	Design, Engineering, Manufacturing, Delivery at Site including Insurance, Unloading, Site Storage and Preservation, Erection/Installation, Testing Supervision and Commissioning of Electro-Mechanical Works	9/7/2017	Tender	Other Product/ Services
6	SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal	Amendment to the Notice Published on 16.07.2017	9/6/2017	Amendment Notice	Other Product/ Services
7	SJVN Arun-3 Power Development Company (P) Ltd., Khandbari, Nepal	Amendment Notice	9/1/2017	Amendment Notice	Other Product/ Services

## MEDIA COVERAGE

### Energy mix for better output



**E**nergy is a major driver of not only economic development but also human development and environmental sustainability. In Nepal, the energy mix is characterised by the dominance of traditional biomass sources (firewood and agricultural residue) with about 77 per cent of the total energy consumption in Nepal met through it. Likewise, 20 per cent of energy consumption is met through commercial sources (petroleum products, electricity and coal). Renewable energy contributes about three per cent to this energy mix.

As the country relies on a single power generation source of run-

of-river hydropower (accounting 91 per cent of 852 MW cumulative installed capacity), the state is facing a steady power crisis since 2005. Last year, Nepal made steady progress in easing load shedding in major cities primarily through load management and electricity imports from India. Currently, Nepal imports more than 380 MW from India through its cross border transmission lines. However, this arrangement is not sustainable and prone to risks and vulnerabilities. There is need of short, medium and long-term energy planning to have reliable, secure and sustainable electricity provided to households, businesses

and industries. Energy diversity is a very important component from the prospective of energy security of the country.

Power generation mix is a very essential strategy for Nepal. Due to effects of climate change, the flow in the rivers is decreasing every year. Thus, relying only on run-of-river hydropower may not be wise option in the long-run.

Energy mix has been also emphasised by the “National Energy Crisis Mitigation Plan and Ten Year Electricity Development Plan 2016”. It has envisioned energy scenario of 40-50 per cent from reservoir-type or pump storage hydro, 15-20 per cent from peaking run-of-river hydro, 25-30 per cent run-of-river and 5-10 per cent from other renewable energy sources like solar/wind.

There is a huge potential for distributed renewable energy systems in Nepal that could contribute to meet the national electricity demand. The contribution of renewable energy generation in the power generation mix will be

environmentally-friendly and reduces the dependency of imported oil products. The government has put renewable energy on top priority to combat the present energy crisis and impending issues on energy security. It has also taken steps to provide clean lighting and cooking solutions to all by 2017 and also joined the SE4ALL by 2030 initiative to assist Nepal's graduation from Least Development Country (LDC) to Developing Country by 2022. The last two decades of RE promotion has primarily focused on technology promotion. However, after so many systems promoted in the country, the issues of sustainability, applicability and impact is at the core of discussions these days. Studies have shown that smaller systems pose their own challenges to adequately address these issues. Smaller systems are mostly seen as a transitional form of energy provision and it is very difficult to be adapted into the mainstream energy mix of the country. There are increasing numbers of cases where community electrification systems, especially from micro hydro, are shutting down due to arrival of national grid in the pro-

ject area. Similarly, operations of the promoted systems are always a challenge in case of community owned systems due to lack of know-how and other local constraints. In many cases, it is also observed that 'everybody's property is nobody's property,' resulting in local conflicts and raising serious issues on sustainability and proper functionality of the systems. Building on the experiences and achievements of the decades, up-scaling of technology, ensuring sustainability and grid connection of promoted off-grid systems seem to be the only way renewable energy can maintain its vibrancy and play a significant part in the lives of the people, and consequently contribute towards national development.

On the financing aspect of large scale renewable energy promotion, active participation of the private sector and financial institutions is crucial. There is a need for private energy developers to actively drive the sector that ensures investment and profession-

al management. The role of the government is also very critical with the responsibility of creating a conducive environment for private and banking sector to participate through appropriate and acceptable policy formulation and facilitation. It is high time policies regarding Grid Interconnection, Renewable Portfolio Standard, Net Metering and Feed-in-Tariff are prepared and implemented if the private and banking sectors are to consider entering into renewable energy sector. We are at a crucial juncture considering state-restructuring and devolution of power to the local level. The present scenario calls for more coordination among stakeholders, including inter-governmental agencies, development partners and private sector for up-scaling and streamlining renewable energy development activities in the national energy mix. It is the right time to develop an integrated energy policy to incorporate both off-grid and on-grid energy systems



*The author is the Executive Director of Alternative Energy Promotion Centre (AEPC) Nepal, an EDC Member Organization.*



## NEPAL'S SCENARIO

### Hulas new electric car model put to road test



The company is currently testing the prototypes in Kathmandu and hilly areas. It said the car will be priced at around Rs 1.4 million, without divulging the launch date.

Hulas Motors Manager Prafulla Chandra Das said the cars are locally assembled, with parts imported from China.

The vehicle, which can accommodate five passengers, comes with features such as air conditioning, power lock, power steering, power windows and

reverse camera, among others, according to the company.

Das said the company is holding talks with government authorities for support, seeking subsidy on customs and excise duties in particular. "If the government subsidies the taxes, the car will be even cheaper," he said.

Hulas Motors has been manufacturing three- and four-wheelers since 1994. In 2015, it ended production of its famous "Mustang Max" jeep—which was used by former Prime Minister Babu Ram Bhattarai as his offi-

cial vehicle—after it failed to meet pollution standards.

Das said the company had no option but to stop the production after the government refused to give it adequate time to upgrade the vehicle to Euro-3 standards. "The government authority refused to extend the deadline although we were planning to upgrade to Euro-3," he said.

The company also produced a light commercial vehicle named "Hulas Sherpa" until 2002.

(For more information please visit the link below.)■

Source: <http://kathmandupost.ekantipur.com/news/2016-08-08/hulas-new-electric-car-model-put-to-road-test.html>

## NEA to promote electric vehicles



**B**etting on the surplus power in the system by the end of next year along with completion of the 456-megawatt Upper Tamakoshi Hydroelectric Project (UTHEP), Nepal Electricity Authority (NEA) is taking the initiative to promote electric vehicles for competent management of the surplus power. The power utility has called a tender to instal charging stations in different places of major cities to encourage people to shift to electric vehicles. According to the power utility, a charging station in the NEA office premises will be installed shortly and the authority is also mulling over making electric vehicles mandatory for top posts

from director level to spread the message that electric vehicles should be given due priority.

According to Prabal Adhikari, spokesperson for NEA, the power utility is planning to first instal charging stations in Kathmandu Valley and major cities and gradually expand to other areas after the flow of electric vehicles increases. Moreover, the power utility has said that it will also encourage use of induction heaters, other electric home appliances to increase consumption of generated power.

As per Adhikari, the country has to set a long-term vision to replace the use of liquefied petroleum gas and substantially reduce the consumption of petroleum products.

The power utility has said that it will set up high-capacity batteries to consume the surplus power during off-peak hours and supply the power to manage the load of peak hours. This is because increased use of inductions and other electric equipment will raise the demand in peak hours in the future.

The government has also reduced customs tariff on the import of electric vehicles through the fiscal budget of 2016-17. Customs tariff of big electric vehicles (bus, mini-bus) normally used as public transportation had been slashed to one per cent (of the total cost) from 30 per cent earlier. Similarly, electric four-wheelers used for individual purpose like jeeps, cars and vans need to pay only 10 per cent customs tariff against 30 per cent in previous years.

(Visit the link below to view the full article.)■

## GLOBAL PERSPECTIVE

### The New Tesla is Powering an Entire Island with Solar Energy



**S**olarCity, the company Tesla officially acquired on Monday, is powering nearly the entire island of Ta'u in American Samoa with solar power.

SolarCity developed a microgrid with 1.4 megawatts of solar generation capacity – enough to power nearly 100% of the island, according to a SolarCity blog posted on Tuesday. The microgrid is enabled by 60 Tesla Powerpacks, the company's large commercial battery, which can store solar energy at night.

The solar array is composed of 5,328 solar panels that can run the entire island on solar energy for three days. The system can fully recharge with just 7 hours of daylight.

The project – which was funded by the American Samoa Economic Development Authority, the Environmental Protection Agency, and the Department of Interior – was implemented within one year and commenced operations this week.

The island of Ta'u is composed of roughly 600 residents and is located about 4,000 miles from the

West Coast of the United States. The island previously relied entirely on diesel generators to power the island.

“I recall a time they weren't able to get the boat out here for two months,” Keith Ahsoon, a Ta'u resident whose family owns one of the food stores on the island, wrote in the SolarCity blog post. “We rely on that boat for everything, including importing diesel for the generators for all of our electricity. Once diesel gets low, we try to save it by using it only for mornings and afternoons.

Tesla is using its Powerpack for other solar projects. Before Tesla acquired SolarCity, the two companies agreed in February to use Tesla's 52 MWh Powerpack to bring 20 years of power to the Hawaiian island Kaua'i. SolarCity built a 12 MW solar farm to help supply the power.

(To view the full article, please visit the link below.)■

Source: <http://www.independent.co.uk/life-style/gadgets-and-tech/new-tesla-powering-entire-island-with-solar-energy-a7480156.html>

## Work begins in Japan on the world's biggest floating solar power plant



Japan is densely-populated and mountainous, and the large amounts of space needed to create renewable energy projects are scarce. Using otherwise unused space on the surface of the country's many lakes and reservoirs, however, could be a way to get around this problem.

The solution may have been borne out of necessity, but there's a number of advantages to building solar farms on water. It's much easier to attach the panels to each other and push them out from the bank than it is to assemble and elevate them on the land, and Kyocera says the panels will shade the water on the reservoir, significantly reducing evaporation and algae growth.

According to World Bank data, around 94 per cent of Japan's energy was imported from other countries in 2013 - by comparison, only 43 per cent of the UK's energy was imported in the same year. If Japan wants to decrease its reliance on other nations for energy, more floating power stations could be in order. (For more information please visit the link below.)■

**W**ork has begun in Japan on what is expected to be the world's largest 'solar farm', which will one day generate enough energy to power 5,000 homes every year.

In a joint project, electronics manufacturer Kyocera and the Century Tokyo Leasing Corporation began work on the giant solar farm on 21 January at the Yamakura Dam reservoir near Tokyo.

Scheduled to go into operation in 2018, the solar farm will be made up of around 51,000 solar cells, which will float on the surface of the reservoir.

Its manufacturers expect the plant to generate around 16,000 megawatt hours (MWh) a year, while offsetting around 8,170 cubic tones of CO2 annually - equivalent to the CO2

released by the consumption of approximately 19,000 barrels of oil.

Kyocera has previously embarked on similar projects, opening a large floating solar power plant in Hyogo Prefecture in the south of the country last year. However, the new plant at Yamakura will be more than seven times bigger than this one.

Japan's huge population consumes a lot of energy, much of which is generated through imported oil, coal and natural gas. The country invested heavily in nuclear power in an effort to produce its own energy, but all of the plants were taken offline after the Fukushima disaster in 2011. Some have since been restarted, but they haven't significantly lessened Japan's reliance on foreign power.



## China charges up: The world's biggest auto market just opened up for Tesla



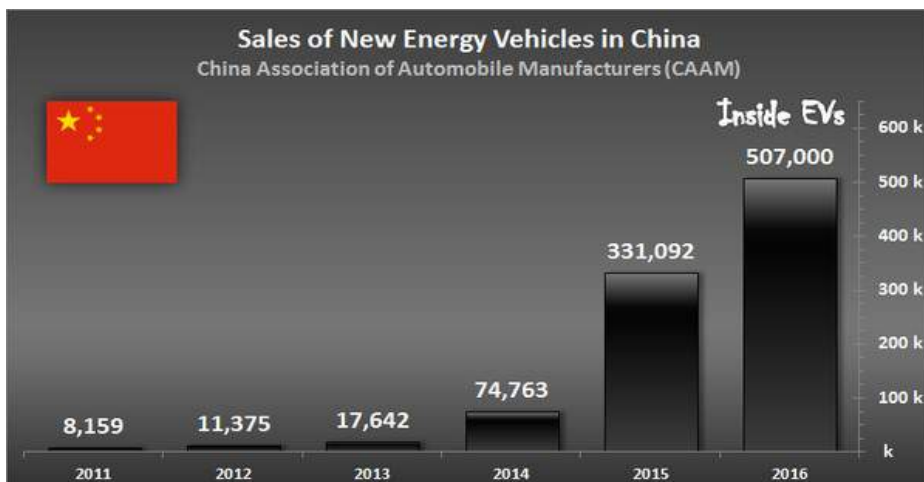
Above: Tesla owners charging up in China (Image: [Tech Drive](#))

A sleeping dragon is stirring. The world's largest auto market is going electric, and no company is in a better position to profit than Tesla. China is already a huge market for plug-in vehicles ("new energy vehicles" to the locals). [China Daily](#) (via [insideEVs](#)) reports that the country now has over a million plug-ins on the roads - the Ministry of Public Security (MPS) and the China dealers association (CAAM) offer different figures, but both agree that the million-vehicle milestone was surpassed some time earlier this year. Interestingly, the vast majority of these - more than 80% - were pure

electric vehicles, rather than plug-in hybrids. According to MPS, the production and sales of new energy vehicles is expected to exceed 5 million by 2020.

Even bigger things may be in store, however. A Chinese official recently announced that the government is working on a timetable to end "production and sales of traditional

energy vehicles," according to accounts from the Xinhua News Agency (via Electrek). No dates were mentioned, but Xin Guobin, the Vice Minister of Industry and Information Technology, said that regulators have begun the "relevant research," and that the policy will be implemented "in the near future."



Above: Cumulative sales of New Energy Vehicles just surpassed the milestone of one million vehicles in China (Source: [InsideEVs](#) via CAAM)

Several countries, including Norway the Netherlands, France, Britain and India, have already discussed plans to phase out fossil fuel-burners. Even Chancellor Angela Merkel, a reliable supporter of the diesel-loving German automakers, has hinted that a transition could be in the cards.

Even though most of these initiatives are pretty vaguely defined at this point, the fact that they're being seriously considered represents a sea change. If China really does go this route, the electric wave could quickly swell into a tsunami that sweeps away the internal combustion engine.

China already has an aggressive

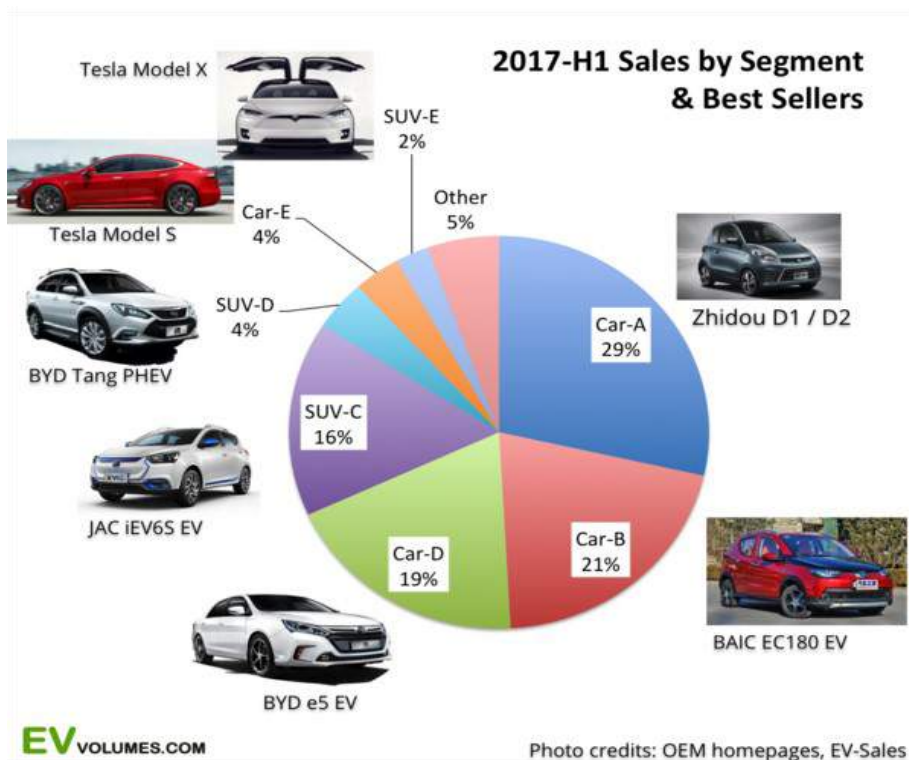
zero-emission vehicle (ZEV) mandate, which requires automakers to make ZEVs 12% of their sales by 2020. The policy is driving global automakers to invest large sums in local EV production (and at the same time, to lobby for the requirements to be watered down). GM, VW, Daimler, Toyota and Ford have all recently announced plans to develop new EV models for the Chinese market - in some cases many more models than they plan to offer in their home countries.

Tesla has been active in China since 2014 and, despite some early challenges, is now the leading foreign EV-maker in the market. The company is aggressively expanding its infra-

structure in the country - it plans to have 1,000 Superchargers in China by the end of 2017. As a recent article in Teslarati highlights, the Tesla lifestyle is starting to catch on with Chinese consumers.

As exciting as all these developments are, there's a policy change in the offing that could blow the Chinese EV market wide open - and confirm Tesla's position as the leader of the pack. Since 1994, foreign companies producing autos in China have been required to do so in collaboration with a Chinese partner. All the major automakers have established joint ventures to produce vehicles locally.

(To view the full article, please visit the link below.)■



Looking at the first half of 2017, Tesla is named the "leading brand" for high-end New Energy Vehicles in China (Source: [EV Volumes](#))

Source: <https://evannex.com/blogs/news/china-charges-up-the-world-s-biggest-auto-market-just-opened-up-for-tesla>

## China Smashes Solar Goals 3 Years Ahead of Target!

**R**enewable energy groups are urging Europe to follow China's example as Beijing more than doubles its solar power target for 2020 three years early.

Figures released by the Asia Europe Clean Energy (Solar) Advisory (AECEA) solar industry firm indicate that China has far surpassed its goal of 105 gigawatts by the year 2020 due to its expanded solar capacity. This makes China a world leader in solar power.

China isn't stopping there: the country has altered its solar installation forecast for 2017, saying now that capacity could reach 45GW this year. In light of this development, SolarPower Europe is urging Europe to shift its renewable energy target for the year 2035 from 27 percent to 35 percent.

The Global Market Outlook report recently released by SolarPower Europe suggested that unless targets are raised the region will have a hard time hitting its original goal of 27 percent, arguing that only a target of 35 percent target will give the industry sufficient momentum. China boasts the world's largest on-land and floating solar farms in the world, with the land-based one measuring 30 square kilometers, according to Euractiv. The newly opened floating facility comprises more than 160,000 solar panels spreading over 86 hectares (0.86 sq. km) of water surface. But Beijing's solar sector still has its issues outside of its capacity and ambitious projects.

Only 1 percent of the country's energy demand is met by solar power, despite China meeting its 2020 so-

lar power goal, as coal is still Beijing's chief source of energy.

The country's solar and wind energy power sectors are also facing a curtailment crisis. Curtailment in the wind industry refers to energy forms that exist but aren't used – wind that for some reason isn't caught. China's national wind curtailment rate stood at 13.6 percent for the first seven months of 2017.

Late subsidies are also a problem, as many energy firms have had their bottom lines negatively affected by the late arrival of funds from feed-in tariffs used to pay them for generating power.

(For more information please visit the link below.)■

Source: <http://www.pimagazine-asia.com/china-smashes-solar-goals-3-years-ahead-target/>



## E-bike startup Gogoro raises \$300m to expand its smart energy network



Battery swapping at a Gogoro GoStation. Photo credit: Gogoro.

**T**aiwanese company Gogoro is known for its “smart scooter,” an electric bike that stands out from the competition with its stylish look and geeky heart.

But the firm, founded in 2011 by HTC veterans Horace Luke and Matt Taylor, is thinking bigger than that. The team’s vision involves energy solutions that could end up powering a lot more than just their scooter. It hinted at this from the start: When the company launched, its product was only described as “a device around energy management.”

Gogoro created a network of charging stations called GoStations to support the bike’s energy needs. There, you can swap your vehicle’s spent batteries with fresh ones. The accompanying app shows you the closest battery station and allows you to book fresh batteries in advance. The service, which includes support and road assistance, is offered through a subscription fee.

At the moment, it has over 400 such stations in Taiwan, with more than 34,000 vehicles sold in the country. But in the future, the charging station model could be used to power other

types of vehicles and even serve other energy-related purposes.

“Vehicle makers see how many stations we have and how we can swap batteries anywhere,” Luke, Gogoro’s CEO, tells *Tech in Asia*. “Other potential industries include logistics and warehousing, or industrial applications.”

### Fully charged

Gogoro announced today it’s raised US\$300 million for its series C round. Investors include London headquartered Generation Investment Management, which is chaired by former US vice president Al Gore and invests long



-term in sustainability, clean energy, and mobility projects.

Gogoro wants to boost its station network so it can better predict demand spikes.

Also joining in are Singaporean state fund Temasek, Japan's Sumitomo Corporation, and French electric utility company Engie. Existing investors also participated, including founding investor Dr. Samuel Yin, Panasonic, and more.

Gogoro gains from its new investors' local and regional connections which include strategic benefits for expansion. While it's not making any announcements in terms of new markets, it's definitely looking at several regions with interest, including scooter-happy Southeast Asia.

The funding will also go into technology development and hiring. Gogoro wants to boost its station network so it can better predict demand spikes and know when it needs to get more batteries charged. This way, it doesn't waste energy charging batteries that aren't going to be used.

"It's not as simple as putting a battery [in the station] and charging it," Luke says. The company plans



to work on machine learning and big data applications to let the network make such decisions on its own.

#### Betting on Electricity

Trying to expand in more markets, Gogoro has remained flexible. While it's managed to get good traction and coverage with its GoStations in Taiwan, it's not easy to replicate that model elsewhere.

A partnership with Bosch that kicked off last year allowed it to bring its scooters to Berlin and, more recently, to Paris, but based on a bike-sharing model. Using an app called Coup, people can pick up the scooter closest to them and ride it to their destination.

The company doesn't use docking or charging stations in this scenario. Instead, it sends its team out to change the batteries of scooters that are running low, while at the same time hiding those scooters from the app.

(To view the full article, please visit the link below.)■

Source: <https://www.techinasia-com.cdn.ampproject.org/c/s/www.techinasia.com/gogoro-series-c-funding-smart-scooter/amp/>

## Switch to clean vehicles or be bulldozed: Nitin Gadkari to automakers



**N**EW DELHI: Carmakers producing vehicles that run on traditional fuel, take note – Union minister Nitin Gadkari has a clear message Go for alternative fuel, else he will not mind "bulldozing" them in his bid to check pollution and imports.

According to the road transport and highways minister, a Cabinet note on electric vehicles is ready that will take care of charging stations.

"We should move towards alternative fuel... I am going to do this, whether you like it or not. And I am not going to ask you. I will bulldoze it. For pollution, for imports, my ideas are crystal clear... The government has a crystal-clear policy to reduce imports and curb pollution,"

Gadkari said at SIAM's annual convention here.

He held out a veiled warning, saying those supporting the government will have an advantage and those busy "minting money" will be in trouble, asking them not to approach the government later on the ground that they have huge stock of vehicles that do not run on alternative fuel.

"Already, we are in the process of a Cabinet note where we are going to plan charging stations... It is in the last stage and will be done as early as possible," he disclosed, adding that the government will soon bring in a policy on electric vehicles.

Cautioning against any dilly-dallying tactics, he said the future is not of

petrol and diesel, but of alternative fuel.

"I urge you (carmakers) politely to do research. First, when I urged you for electric vehicles, you said battery is costly. I coaxed you to start at least. Now, the batteries cost 40 per cent less. And if you start now, cost will be reduced further on mass production. Teething trouble is everywhere," he explained.

The minister is clear that electric cars, buses, taxis and bikes are the future and India should move forward in this direction.

He sought to put the entire issue in perspective, saying imports and pollution are the twin problems as India's import bill stood at a huge Rs 7 lakh crore per annum, a big drag on the economy.

"Now, the government has decided to start 15 industries for second generation ethanol. Ethanol can easily be produced from agro-based cotton straw, wheat straw, rice straw, bagass and bamboo. Alternative fuel is import substitute, cost effective and pollution free," Gadkari added.

He promised that the proposed vehicle scrapping policy stuck due

to GST issues will be sorted out soon.

"Now, the GST Council is formed. We are preparing the note. I am going to the finance minister and after that, we will move this Cabinet note. In the GST Council, we will present the note and take opinion of stakeholders. There are some concessions we are expecting from state governments," the minister said.

The government is planning 2,000 driving schools on two acres each and called on the industry to join hands to make the skill development dream of Prime Minister Narendra Modi a big success.

Outgoing SIAM (Society of Indian Automobile Manufacturers) President Vinod Dasari hailed the government's move towards reducing imports and pollution, saying the industry fully backs it.

"Already, we are leapfrogging to BS

VI from BS IV within three years, which is the shortest time anywhere in the world. However, what we are asking is consistency in policy, which once formed must not be changed as the auto industry has long gestation period to introduce new technology," he said.

Asked why the BS IV norms were not implemented for 10 years across the country when the industry was ready with the technology, he cited non-availability of fuel.

"The government must ensure that when we move to BS VI, fuel is available," he added.

He called on the government to defend a policy once framed when external agencies like courts come into the picture; giving an example as to how last year BS IV compliant big cars and SUVs were banned in NCR despite being fully in conformity with laws.

"If the government wants to reduce pollution, then old polluting vehicles must be banned instead of targeting those new ones which comply with the latest emission norms of the country," Dasari suggested.

"All that we need is clarity in terms of implementation timeline, setting up of infrastructure to support it. If electric vehicles become cheaper than conventional ones, consumers on their own will go for them," he pointed out.

(For more information please visit the link below.)■

Source: [https://m-economictimes-com.cdn.ampproject.org/c/m.economictimes.com/news/economy/policy/switch-to-clean-vehicles-or-be-bulldozed-nitin-gadkari-to-automakers/amp\\_articleshow/60409299.cms](https://m-economictimes-com.cdn.ampproject.org/c/m.economictimes.com/news/economy/policy/switch-to-clean-vehicles-or-be-bulldozed-nitin-gadkari-to-automakers/amp_articleshow/60409299.cms)

## Bullet train, electric vehicles reality soon



The nation is estimated to see sales of 30.81 million electric vehicles by 2040.

**N**EW DELHI: High speed and clean air is the future of India.

While the Narendra Modi government has already put his weight behind electric vehicles in the country, saying it may even retort to bulldozing its way through to meet that goal, the foundation stone for the new-age of Indian railways was laid by Indian Prime Minister and Japanese counterpart Shinzo Abe on Thursday.

The country's first bullet train will run between Ahmedabad and Mumbai, and soon the country will travel in high speed mode.

In addition to this, rapid shift to electric vehicle by 2040 will reduce the burden on petrol and diesel which may improve our environ-

ment and decrease dependence on imports.

According to PM Modi most parts of the bullet trains will be assembled in India.

According to Amitabh Kant, CEO of NITI Aayog, the nation is estimated to see sales of 30.81 million electric vehicles by 2040.

Addressing the annual convention of auto industry body SIAM, Kant last week said electric vehicles trend is set to grow and India aims to reach zero emission by 2040.

The shift gives an opportunity to investors to look for some stocks, which are likely to make products for bullet train as well as electric vehicles.

We have tried to collate a list of companies which may benefit from

bullet train and electric vehicles push.

**Bharat Heavy Electricals:** Shares of the company surged over 7 per cent in morning trade on Thursday after reports that it will make rolling stock for bullet train.

**NBCC:** More railway stations will be required once bullet train will be operational. State owned-construction firm NBCC has recently got order to develop 10 stations.

There are reports that Railways may rope in the firm to develop 40 more stations.

**Ashok Leyland:** The city-based heavy commercial vehicle maker last year introduced the first 'Made in India' electric bus "Circuit"

**Graphite India:** Investors should keep an eye on Graphite Industries as graphite is used in electric batteries.

**Battery makers:** According to market analysts, battery producers like Eveready and Amara Raja Batteries may also benefit with the shift to electric vehicles.

**Nalco and Hindalco:** Aluminum is light in weight. There are expectations that the metal can be used to make body of electric vehicles.



**Maruti Suzuki:** With the government focusing on promotion of electric vehicles, Maruti Suzuki India will not hold back in the segment and will come up with models based on customer preference, according to company chairman R C Bhargava. Japan-based parent Suzuki Motor has also decided to

set up lithium ion battery plant in Gujarat with Toshiba Corporation and Denso.

**Mahindra & Mahindra:** The auto major is the only player that has commercially launched fully electric cars in the domestic market. The company has already launched four- and three-wheeler

electric vehicles in the market.

*(Stocks mentioned in the article are not recommendations. Please consult your financial adviser before taking any position in the stocks mentioned)*

*(For more information please visit the link below.)* ■

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## Two-wheelers to lead electric vehicle market in India

The two-wheeler segment, in fact, has gained a head start with companies such as Hero Electric.

NEW DELHI / MUMBAI: Two-wheelers are set to outpace four-wheelers in India's ambitious drive towards all-electric mobility, as all top scooter and motorcycle manufacturers have lined up their clean-energy products for launch starting next year.

**Hero Monocarp**, Honda Motorcycle & Scooter India, **TVS Motor**, Mahindra Two Wheelers, Yamaha and **Bajaj Auto** all have scheduled launches of electric two-wheelers from 2018. The government has a 2030 target to transition the country entirely to electric vehicles.



The two-wheeler segment, in fact, has gained a head start with companies such as Hero Electric, **Electrotherm** selling electric scooters in India for several years now – the mainstream companies, though, are yet to launch their own electric two-wheelers. In the passenger vehicle segment, while Mahindra &

Mahindra makes and sells electric cars, technology to commercially develop full-size electric vehicles is still at an early stage even globally. “It will take some time for electric cars to be sold en masse. But sales of electric two-wheelers can take off quickly,” said Sohinder Gill, director, Society of

Manufacturers of Electric Vehicles. “With cost of li-ion batteries coming down, performance of products has improved and more and more manufacturers have started work in the segment, which will give more choices to the consumer.”

Some 4,50,000 electric two-wheelers were sold in India in the past eight years. The potential of electric vehicles in this segment is massive, say industry executives, given that more than 17 million two-wheelers are sold annually in the country. Hero MotoCorp, the world’s largest motorcycle maker by sales volume, is working on developing electric two-wheelers in-house at its Centre for Innovation & Technology in Jaipur. This is in addition to its strategic investment in electric two-wheeler startup Ather Energy. Chennai-based TVS Motor is also developing an electric scooter (codename U218), which may hit the roads sometime next financial year. Bajaj Auto has reportedly announced plans to launch a new brand, Urbanite, for electric vehicles that will be launched by 2020. Bajaj also claims to be developing a premium

motorcycle, an equivalent of the Tesla in cars. Tork Motorcycles is planning to bring in an electric two-wheeler (codename P6X) early next year.

“Hero MotoCorp intends to enhance its participation in the EV space by pursuing its internal EV programme in addition to partnering with Ather,” RajatBhargava, head of strategy, performance transformation and global business at the company, told ET.

The company is looking at mobility solutions for the future and in accordance with this objective, it has started engaging with external players, including startups, he said. Hero MotoCorp had invested Rs 205 crore in Ather Energy in October 2016.

Ather Energy on its own is scheduled to launch India’s first indigenously designed and developed electric scooter (S340) next year. Chief executive Tarun Mehta had told ET that the S340 would be priced in the same range of 110-150 cc scooters.

TVS Motor CEO KN Radhakrishnan said the company had for some time been investing in electric

technology. “In a years’ time you will see an alternative from TVS and we may do both hybrid and electric, as the challenges on charging stations still remain,” he said. “It is not a pilot, it is serious marketable solution from the company.”

For Radhakrishnan and others in the industry, lack of public facilities to charge vehicle batteries is a major worry. The government, though, has promised to build infrastructure to address the concerns.

Honda and Yamaha, which already sell electric two-wheelers in markets overseas, have commenced discussions with stakeholders in India to bring down costs and ensure availability of adequate infrastructure to launch products here. “Cost competitiveness and infrastructure support are the big challenges right now,” said Minoru Kato, the Honda Motorcycle & Scooter CEO.

Globally, Honda has been making investment for over two decades in electrification of its two-wheeler models.

(To view the full article, please visit the link below.)■

## Nigeria announces \$5.8 billion deal for record-breaking power project



will finance 85% of the development, with the Nigerian government contributing 15%.

Minister Fashola claimed the project will deliver far-reaching benefits.

"(Mambila) will have a transformational effect on all of Nigeria's socio-economic development," he said through a government spokesman, "It will have considerable positive

**T**he government of Nigeria has announced the award of a \$5.8 billion contract to build what will be the largest power plant in the country.

The 3,050-megawatt Mambila hydroelectric power project in the state of Taraba will be delivered by a con-

sortium of Chinese state-owned construction firms.

The megaproject will feature four dams between 50 and 150 meters tall, and take six years to complete, the Minister of Power, Works and Housing, Babatunde Fashola, told reporters in Abuja.

The Chinese Export-Import Bank

impact on electricity supply nationwide, productivity, employment, tourism, technology transfer, rural development, irrigation, agriculture and food production."

**The Mambila Plateau in Taraba state. The project will cause considerable disruption and displacement, environmentalists warn.**



### False Starts

**T**he Mambila hydropower plant has been in development for over 30 years, but previous administrations have made little progress.

In 2007, the Nigerian government awarded a \$1.4 billion contract to two Chinese construction firms for a 2,600-megawatt plant, but the agreement broke down soon after.

Attempts were made to revive the deal the deal without success. But the deadlock was broken by conversations between the presidents



of China and Nigeria in 2016, according to the spokesman of Nigerian President Muhammadu Buhari. "The major breakthrough in the execution of this project was achieved when President Muhammadu Buha-

ri initiated discussions at the level of the President of the Peoples Republic of China in the course of his State Visit (in 2016)," [wrote](#) government official Garba Shehu.

The meeting resulted in the creation of a consortium of Chinese companies to deliver the project, according to Shehu, and an agreement that the Chinese government would commit finance to it.

## Power Shortage

Despite being one of the largest economies in Africa, over 40% of Nigerians live without access to electricity, according to World Bank [figures](#).

Hydropower, one of the cleanest and cheapest forms of power, is a key target for development as Nigeria is currently exploiting just a fraction of its potential resources.

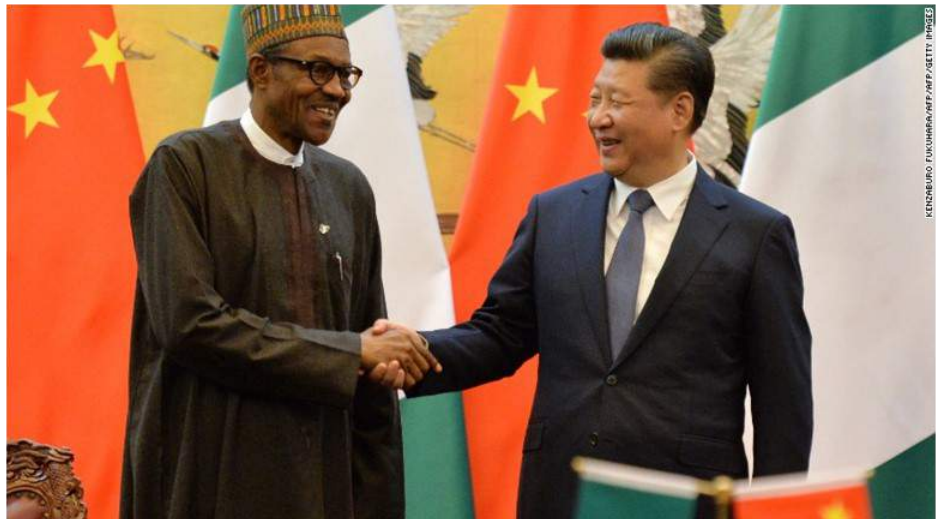
The country is also seeking to shift away from oil dependency, after plummeting oil prices triggered a recession.

The clear need for the Mambila project could make it more likely to succeed, some analysts believe.

"The prospects of project implementation starting are perhaps

stronger than in previous decades," says Elizabeth Donnelly, deputy head of the Africa Programme at UK think tank Chatham House. "Nigeria continues, albeit slowly, with its complex power sector reform and badly needs to generate - and more importantly distribute - more power for its 180 million people."

"Hydroelectricity is an important part of this mix, particularly for rural electrification."



Nigerian President Muhammadu Buhari and Chinese President Xi Jinping shake hands in Beijing, during the former's state visit in 2016.

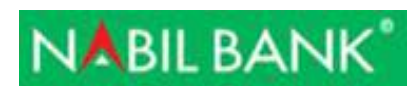


(To view the full article, please visit the link below.)■

Source: <http://edition.cnn.com/2017/09/14/africa/nigeria-china-hydropower/index.html>



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