

ENERGY COMMUNIQUE

EDITORIAL

Illusions of Cheap Solar

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

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

Heaven and earth

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

At an event organized by Energy

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

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

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

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



Mr. Bishal Thapa
Vice-Chairman
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A reporter from a business daily at the event quickly seized on this theme. “If auctions for solar power in India were producing INR 2.4 (NPR 3.84) per unit, why was NEA offering such high-prices at NPR 7.3 per unit,” he demanded to know.

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

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

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

NEA has yet to release a convincing study that documents the capability of the grid to absorb the intermittency of solar. NEA has yet to issue clear guidelines and procedural steps for net metering. Government has yet to release a clear policy on the process for solar plant development. Financial

Stairway to heaven

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

It is only in Nepal that solar has institutions have yet to finance a single MW of solar. Nepali engineers have yet to design and install a single large solar plant.

Without even the basics in place, the dedicated focus on bringing down the cost of solar energy is bit like trying to find the stairway to heaven. In case you are still searching: the stairway to heaven doesn't exist. It is an illusion. The decline in solar costs is not merely because of the fall in module prices. It is also because solar has been nurtured and enabled within reliable electricity grids where there are no, or negligible, blackouts, voltage is stable and overall power quality is high. For Nepal that is now trying to kick-start and catch up with the advances in solar, it is a tragic mistake to build a policy to promote solar motivated primarily by cost reductions in module prices.

One way to heaven

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

Nepali consumers must benefit from this. But how should policies balance the need to achieve low costs while also getting things started? Clearer processes, rules and regulations. Take India's story as an example. Prior to launching those solar auctions, India spent considerable time establishing the regulatory, policy and structural framework for solar. It established a separate power trading company to buy solar power and comele it with other generation sources. Once it got a critical mass of rules in place, there was an unrelenting commitment to using auctions and open markets. Their markets have delivered. The reporter that was in awe of

India's prices should have asked why it is that Nepal hasn't gotten its process on solar clear yet.

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

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

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

EDC ACTIVITIES

EDC successfully concluded the 5 day training workshop on “Hydropower Financing and Risk Management in Nepal, 2018”

EDC in association with International Centre for Hydropower (ICH), Norway and Nepal Bankers' Association (NBA), supported by USAID's Nepal Hydropower Development Project (NHDP), Norad, IFC, Butwal Power Company (BPC) successfully concluded the five days training workshop on "Hydropower Financing and Risk Management in Nepal, 2018" at Hotel Yak and Yeti, Kathmandu.

The program had many distinguished resource persons who shared their expertise and experiences in the field of Hydro Projects, Hydro financing and associated risks of such projects in Nepal. With 100+ participants for all 5 days, this training workshop was a huge success in achieving its aim to inform and capacitate the participants on hydropower project financing and how to identify and negate the associated financial risks for lenders, government, hydropower sponsors and insurance/ legal/ chartered accounting professionals.

Please find all related information and resources from EDC website at: <http://www.edcnepal.org/training-workshop-1/>



Welcoming Ambassador of Norwegian Embassy, H. E Mr. Lasse Bjorn Johannessen as the Chief Guest



A group photo with the chief guest, resource persons, participants and organizers

EDC ACTIVITIES

Meeting with DFID and DRC team

On 22nd November, 2018, EDC chairperson Mr. Sujit Acharya and CEO Ms. Itnuma Subba had a meeting with DFID Asia Regional Head Dr. Duncan Overfield, Economic Advisor Mr. Strahan Spencer, and other team member; Dr. Shankar Sharma, Mr. Ram Khadka, and Mr. Rabi Rayamajhi to discuss the SEZ electricity issues and EDC's assemble in Nepal campaign. The team also discussed the prospects and potentials of trans-Himalayan economic corridor with China and of using technologies like digital currency and blockchain in the energy sector.



Later, in the evening, EDC along with DFID team joined Development Resource Center of the State Council (DRC) team for dinner and talked about possible collaboration in the filed of research.

EDC welcomes Bhujung Hydropower Pvt. Ltd. as it's new member

Bhujung Hydropower Pvt. Ltd is developing a ROR type Upper Midim Khola Hydropower Project (7.5 MW) in Kwlosothar Gaupalika of Lamjung District.

After competing the PPA and DPR, company is currently dealing with banks for Financial Closure. The RCOD of project is 1st Shrawan 2078. Company is planning to start construction in Chaitra 2075.



NEPAL'S SCENARIO

Nepal, Bangladesh agree to build hydro projects

Nepal and Bangladesh agreed to counterpart Tofail Ahmed signed the pact an Indian joint venture company. develop hydropower projects with on the sidelines of the ninth South Asian “They said that they were close to government-to-government investment at Economic Summit in October 2016 to signing a power purchase agreement with an energy secretary-level meeting that execute the 1,110 MW Sunkoshi II and 536 the developer,” said the official. concluded in Kathmandu on Tuesday. MW Sunkoshi III located on the Bangladesh has signed a

The electricity produced by these Sunkoshi River in central Nepal. memorandum of understanding with India’s schemes will be exported to Bangladesh. The plan failed to move forward NTPC Vidyut Vyapar Nigam (NVVN) to

The two countries also decided to form a due to lack of coordination between the import electricity generated by the Upper joint technical team to identify potential Commerce and Energy ministries. “The joint Karnali Hydropower Project being hydropower projects for development. team will explore the possibility of executing developed with Indian investment.

The joint team will pick out these two projects along with a few others Nepal and Bangladesh formed a bankable projects and recommend them to under bilateral investment,” said the bilateral energy secretary-level joint steering the respective governments, according to a official. committee after signing an energy sector

high Energy Ministry official who Apart from developing the projects cooperation agreement in August. The participated in the meeting. with government-to-government investment, accord allows the two countries to initiate

“The two governments will then the meeting also discussed the possibility of power trading besides tapping foreign direct construct the project with bilateral invest- power trade between the two countries via investment from Bangladesh for the ment,” said official who asked not to be Indian territory. “The participants discussed development of hydropower projects in named. using Indian transmission lines to conduct Nepal.

Bangladesh has repeatedly power trade between the two countries,” The pact signed with Bangladesh expressed interest in developing said the official. “The two parties agreed will benefit Nepal only if they succeed in hydropower projects in Nepal. The two to form a trilateral committee including getting India on board as they have to use countries even signed an agreement more India to make this happen.” Indian territory to conduct electricity trade, than two years ago to develop several The Bangladeshi side informed the said energy sector experts.

hydropower plants capable of generating Nepali delegation about the headway made more than 1,600 MW. by Bangladesh to import 500 MW of

The then commerce minister Romi electricity from the 900 MW Upper Karnali

NEPAL'S SCENARIO

Forex reserves fall below eight months of imports

A ballooning current account deficit not enough to offset the trade deficit which has been instrumental in increasing imports, due to increasing imports and weakening reached Rs349.84 billion during the review according to Thapa. Credit disbursement to exports has taken a toll on Nepal's period, up 45.9 percent from before. the private sector by banks and financial vulnerable external sector with officials Economists say the overall picture looks institutions swelled more than 25 percent in saying that the existing foreign currency worse than expected a few months ago. the first three months of this fiscal year reserves won't be able to sustain imports Import covers from foreign exchange compared to the same period last year. for longer than eight months. reserves are fast declining, and if this Since the credit is used to import industrial

The current reserve of \$9.56 billion will only be enough to finance imports of merchandise goods and the country's overall output will suffer, will boost the import volume. Similarly, services for 7.9 months even though Nepal slowing economic growth, according to ongoing reconstruction works are fueling Rastra Bank regulations require it to economist Chandan Sapkota. "The central imports as they require a large quantity maintain a reserve enough for at least 8 bank and the Finance Ministry must inter- of imported construction materials. months, according recent statistics vene to stabilise the situation," he said. "If Thapa said the situation needed to released by the central bank. they don't act soon, it will be difficult to be watched cautiously but not immediate

As other sources of foreign manage the economy over the midterm." intervention as this might derail the currency like exports, tourism and foreign Central bank officials agreed that economy. "All imports are not bad as they direct investment are not significant, Nepal the country's external sector was under are necessary to keep the economy has to rely largely on migrant workers' pressure due to ever increasing imports, but moving," he said. "We should let the remittance to strengthen its foreign denied that a macroeconomic crisis was economy function on its own till there are exchange reserve. In the past, the country looming. According to Nara Bahadur enough foreign exchange reserves to pay for received adequate remittance to offset its Thapa, executive director of the central imports of goods and services for six massive trade deficit, but lately remittance bank, remittance itself is one of the major months." inflows are unlikely to sustain imports reasons behind the surge in imports. Sapkota said that it was high time despite growing at very healthy rate. "When people working in foreign the government acted to address the

According to the country's countries send back their earnings, their situation through stabilisation and macroeconomic report of the first three family members back home will use structural measures. Stabilisation measures month of the current fiscal year (mid- the money for consumption, and include removing key bottlenecks faced by October 2018), worker remittance this fuels imports," said Thapa. industries producing export goods or goods increased 37.3 percent year-on-year to The aggressiveness shown by the that can help substitute imports. For exam-

Source: <http://kathmandupost.ekantipur.com/news/2018-12-06/forex-reserves-fall-below-eight-months-of-imports-report.html>

le an adequate and reliable supply of electricity will help these industries to increase productivity,” said Sapkota.

In the long run, however, the authorities should address the situation through structural measures like policy reform that will attract foreign direct investment and increase industrial productivity to boost exports. fossil-fuel subsidies, funding research into green technologies, removing barriers to energy efficiency and reforming electricity markets.

GLOBAL PERSPECTIVE

Blockchain: A New Tool to Accelerate the Global Energy Transformation

Few technological innovations have captured the public interest in recent years as much as blockchain. Most of the attention has focused on the meteoric rise of the cryptocurrency Bitcoin, part of a total cryptocurrency market that, at its peak in January, rose to over USD 800 billion and then almost as rapidly fell to a quarter of its size.

But cryptocurrencies are only one application of blockchain (which is in itself an example of distributed ledger technology), and for many, the Bitcoin hype is merely a distraction from the transformative potential that blockchain technology could offer to a wide range of industries, including energy.

Blockchain was one of the big topics of conversation in September 2018 at IRENA Innovation Week, where more than 400 corporate leaders, government officials and experts at the forefront of energy gathered to discuss the innovations driving the energy transformation forward.

A blockchain is, in a basic sense, a secure, continuously growing list of records. It is constructed as a decentralised database that is distributed and managed by peers, rather than by a central server or authority. This technology is enabling a new world of decentralised communication and



coordination, by building the infrastructure to allow peers to safely and quickly connect with each other without a centralised intermediary. Cryptography ensures security and data integrity, while privacy remains intact.

Greater complexity requires greater network intelligence, transparency and visibility

To understand the disruptive potential of blockchain to the energy sector, consider how electricity is generated. By and large, most countries rely on large, centralised power plants that generate electricity and then send it across long distances over power grids that were built as a one-way street, sending electricity from the producer to your home. Moreover, the

markets in which grids operate are complex multi-party interactions involving grid operators, energy companies, and energy producers that run on a country-wide level.

Today, grids have become increasingly complex, with increasing shares of variable distributed generation (such as rooftop solar), increasing numbers of internet-connected devices (such as smart appliances), and increased loads from the influx of electric vehicles. Blockchain can help operate power grids with high penetration of variable distributed generation and flexible demand-side

resources in a more efficient, automated way, all with lower transaction costs.

Blockchain can allow system operators of distributed generation to optimise grid operation by managing all connected devices through automated smart contracts, enabling flexibility and

real-time pricing. Blockchain also empowers consumers to become 'prosumers' by enabling them to monetise their excess electricity (generated by rooftop solar for example) by securely recording data and sending and receiving payments automatically, through smart contracts built on platforms such as Ethereum.

Increased digitalisation and interconnection have led to increased risks with regards to security. Blockchain, due to its distributed nature, can greatly increase the security of a network if implemented correctly. In coordination with burgeoning technologies such as AI, blockchain can play an important role in securing networks and grids.

An explosion of startups, but a long road ahead

Since the start of 2017 alone, more than fifty new startups launched that are working specifically on energy, raising more than USD\$320 million. Today, there are more than 70 demonstration projects deployed or planned around the world, such as LO3's Brooklyn Microgrid project, where customers can choose to power their homes from a range of renewable energy sources, and people with their own solar panels can sell surplus electricity to their neighbours. The Energy Web Foundation (EWF) is building an open-source, blockchain-based digital infrastructure for the energy sector

with a growing portfolio of cutting-edge pilots. Innogy, a subsidiary of German power giant RWE, is using EWF's Energy Web Chain to authenticate users and manage billing at electric car charging stations.

But there's still a way to go before blockchain is mature enough to play a major role in the energy sector. One major hurdle is the fact that the energy sector is highly regulated and widespread adoption of blockchain will require a clear, stable regulatory framework. While there are early signs of progress, such as Ofgem's roundtable on UK blockchain regulation in September of last year, Singapore's launch of a sandbox for energy innovations, and new legislation in US states like Vermont to help apply blockchain technology, the regulatory environment still needs to be defined.

Another is a more fundamental question around the consensus mechanism that blockchains use. Because blockchains are decentralised, they need some way to make collective decisions that are quick, secure, and trustworthy. Right now, there are a number of different ways to do this, including 'proof of work', which relies on increasingly computationally expensive (and energy-intensive) puzzle solving, and 'proof of stake', which relies on those with the largest stake in the network to add the next block of transactions to the blockchain, and 'proof of authority', which relies on the iden-

tity of validators to function as their stake, among others. As yet, all of these mechanisms continue to be developed and none has been fully proven to be 100% reliable, secure, scalable and energy efficient, yet the potential risks—ranging from billion-dollar hacking losses to power-sucking coal-powered bitcoin mines—are huge.

However, new consensus protocols are being developed and tested all the time. As the technology matures, software platforms built on blockchain will be an increasingly attractive method to handle the increasingly complex and decentralised transactions between energy users, producers of various sizes, traders and utilities, and retailers. Furthermore, blockchain's ability to autonomously reconcile supply and demand between meters and computers based on smart contracts is a revolutionary efficiency improvement.

This makes it well-suited to support an energy system of the future that is renewables-based, decentralised and distributed, digital, and democratic. The real relevance and impact of blockchain in the energy sector remains to be seen. How the technology and its application matures in the coming years is going to be an exciting part of the story of the global energy transformation.

EnergyEV charging stations business open to individuals

Individuals may soon be able to open public electric vehicle charging stations without applying for licences, though there will be a cap on the tariff they can charge from EV owners. The government has not set any qualification criteria for opening public charging stations but these will be monitored and have to meet specifications and performance standards set by the power ministry, a senior government official said.



Automakers such as Mahindra &

Mahindra and Tata Motors and cab-hailing companies Ola and Uber, besides several state-run companies and startups have shown interest in setting up electric vehicle charging infrastructure in the country.

“Setting up public charging stations shall be de-licensed and any individual is free (to set them up) provided the stations meet standards of the power ministry. The person should apply for connectivity and the distribution company is bound to provide connectivity. Obtaining electricity from open access is also permissible,” the official said.

State electricity regulatory commissions (SERCs) will fix tariffs for electricity supply from distribution companies to the charging stations at a ceiling of 15% over the average cost of supply. The tariff charged by charging stations from electric vehicle owners will also be capped

by the state government, he said. The power ministry early this year issued a notification clarifying that setting up charging stations for electric vehicles will not require a separate licence

under the Electricity Act of 2003. “Service charges of 30-40% over and above notified electricity tariff for electric vehicles charging appear to be a viable business proposition for public charging stations,” said Alekhya Datta, a fellow and area convener of electricity and fuels division at The Energy & Research Institute.

The government official said the infrastructure aims to enable faster adoption of EVs and affordable charging infrastructure to the vehicle owners.

“It also targets generation of employment opportunities for small entrepreneurs,” he said. The government

wants to have public charging stations at every three kilometers and has identified nine cities including Delhi, Pune, Mumbai, Bengaluru and Ahmedabad where it will start pilot projects through some central public sector undertakings.

“The pilot rollout by CPSUs with some subsidy under Faster Adoption Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in (Fame India-II) scheme will help in boosting the demand for electric vehicles,” the official said.

The government has also identified 11 busy highways to set up charging stations at every 25 km. Public sector undertakings in energy sector such as NTPC, Power Grid Corp and Indian Oil Corp are likely to set up these charging stations in the nine cities.

Kenya wants to run entirely on green energy by 2020

Kenya's president has announced plans to move the country to 100% green energy by 2020, as it scales up renewable investment. With an eye on sustainable development, President Uhuru Kenyatta aims to help mitigate climate change by reducing Kenya's carbon footprint, while creating much-needed jobs.

The move comes as the country looks to triple the number of people connected to power grid, to reach 60% of population.

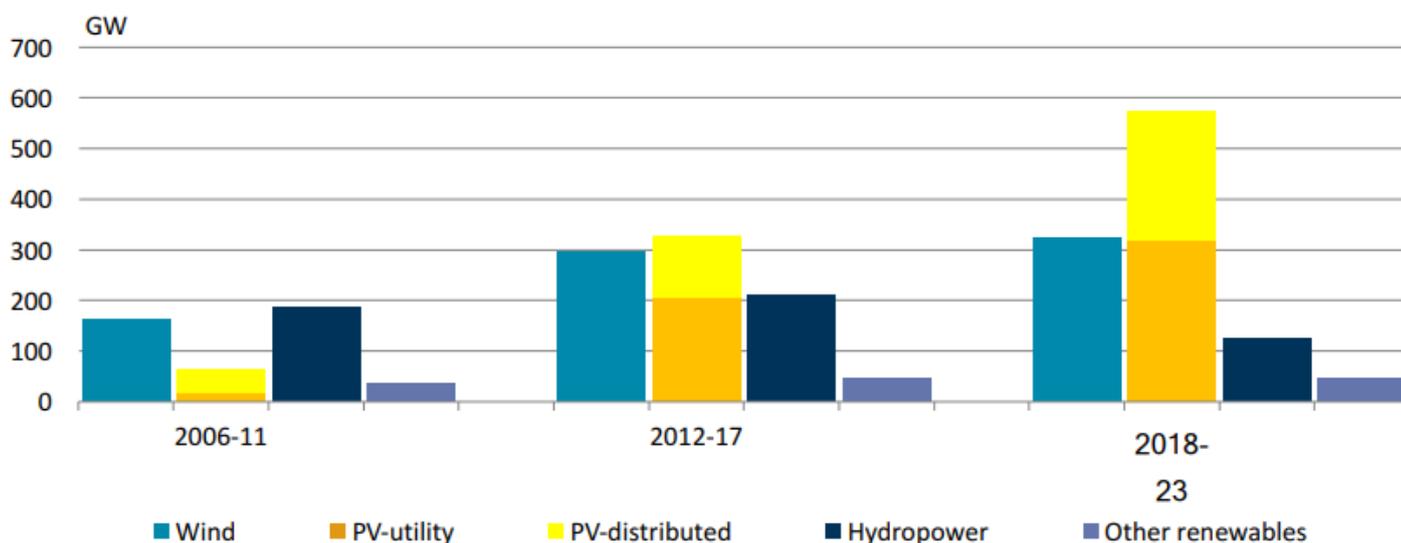
Kenya has invested heavily in geothermal power generation, which supplies low-cost, low-emissions energy. According to the Renewables 2018 Global Status Report, the nation ranks 9th in the world for its geothermal power generating capacity (700 megawatts). Africa's largest single wind power facility is currently being developed at Lake Turkana in Kenya's Rift Valley, with separate investments to develop other wind power plants.

co-hosted the Sustainable Blue Economy Conference with Canada and Japan, held in November.

WIND OF CHANGE

As the cost of renewable energy falls, more nations are committing to carbon-free energy generation. Improved governmental policy support for renewables is also paving the way for continued global growth in the sector. According to International Energy Agency (IEA) data the two clean energy sources with the biggest global

Renewable electricity capacity growth by technology



A GREENER FUTURE

Currently, 70% of the nation's installed electricity capacity comes from renewable energy sources, which is more than three times the global average.

The transition to fully renewable energy could further boost the population's access to the national power grid and

An estimated 9 million Kenyan households have access to off-grid renewable energy and this figure is set to rise. Speaking at the recent Paris Peace Forum in France, President Kenyatta called on Europe and other industrialized economies to recognize and support his nation's investment in green energy. Kenya

growth are solar power - which is expanding faster than all other renewables combined - and wind power.

China leads the world in absolute solar PV capacity and is projected to hold almost 40% of the world's installed solar capacity by 2023. It is followed by the US, while third-placed India is expected to increase its sol-

Source: <https://www.weforum.org/agenda/2018/12/kenya-wants-to-run-entirely-on-green-energy-by-2020>

ar capacity four fold in the same time frame.

Global investment in wind power reached \$160 billion in 2017. Spain has committed to switching its electricity-generating sector to fully renewable sources by 2050, with a further goal of fully decarbonizing its economy shortly after.

Over the coming decade, the Spanish government plans to generate an additional 3,000 megawatts of wind and solar power capacity each year.

The ambitious plan includes the phasing out of Spanish coal mines, reskilling workers for jobs in clean energy and implementing environmental restoration programmes.

Meanwhile the UK government has pledged to double the country's existing investment

in offshore wind generation. However, overall UK investment in clean energy has fallen by nearly 50% since 2015.

UN Sustainable Development Goals call for urgent action to combat climate change and

its impact. As awareness grows of the economic and environmental benefits of adopting cleaner energy sources, more policy-makers are joining the fight against climate change.

The World Economic Forum's Global Future Council on Energy white paper suggests policy-makers work towards clear agreement on which policies to prioritize, and on steps to implement them.

These areas of consensus include creating a stable long-term policy framework for clean energy, carbon pricing initiatives, removing fossil-fuel subsidies, funding research into green technologies, removing barriers to energy efficiency and reforming electricity markets.

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

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