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RENEWABLE ENERGY OPPORTUNITIES IN NEPAL

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OUR COLLABORATION

I met with Bhagirath Yogi, a former multimedia journalist with the BBC Nepali Service, at a recent investment event at London's Mansion House, focusing on Nepal's vast renewable energy opportunities with a twin focus on Information and communication technology (ICT). The Embassy of Nepal organised the October 2023 event in the context of the long-standing bilateral relationship between the UK and Nepal, which dates back over 200 years. Nepal established its first diplomatic relationship with the UK in 1816, making it the first country to do so. In 2023, the two countries celebrated the 1923 Treaty of Friendship Centenary. That is what I call Partnerships for the Goals (SDG 17).

Bhagirath Yogi has worked with the BBC in Kathmandu and London for over two decades. He is a media consultant and chief editor of www.southasiatime.com, a London-based online news portal. His compelling enthusiasm for his country and his descriptions of Nepal's exciting prospects for domestic and overseas businesses and individuals captured my attention. As a result, we decided to collaborate and co-author a short publication on Nepal's renewable energy opportunities, hoping to provoke thought on the subject.

Nepal's clean energy generation targets are tangible and ambitious. By 2030, the country aims to expand clean energy generation from approximately 1,400 MW to 15,000 MW, of which 5-10 % will be generated from mini and micro-hydro power, solar, wind and bio-energy. This ambitious target is dependent upon the provision of funding by the international community (and yes, that means all the banks, asset managers, and insurance funds that form part of the UK's financial ecosystem).

If you would like to discuss how you can get involved in Nepal's energy and climate finance transition, please do not hesitate to get in touch.

Best wishes
Rick and the greenCrowd Team
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CONTEXT

Nepal exported around 452 MW of hydropower to India on the Day-Ahead basis through the Indian Energy Exchange (NEA, 2023). The Himalayan nation aims to export 10,000 MW of power to India – its southern neighbour - within the next ten years.

But things were quite different only seven years ago.

At the end of the fiscal year (FY) 2016, Nepal had a total installed capacity of only 802.4 MW or less than 2% of the total commercially exploitable generation potential. The country was suffering from a severe shortage of power. Load shedding (power outage) was frequent, and since most of the hydropower plants were run-of-the-river, electricity generation fluctuated and was highly seasonal (ADB, 2017).

The country presently has a total installed capacity of nearly 2,800 MW, and some 5,000 MW of power projects are under construction. As the country aims to export excess renewable power to its neighbours, India and Bangladesh, there could not be a better time to invest and participate in the renewable energy sector in Nepal.

ENERGY SCENARIO IN NEPAL

The state-owned Nepal Electricity Authority (NEA) is solely responsible for distributing and selling electricity within the country across borders. Besides generating hydropower itself, it procures power generated by the private sector.

Independent Power Producers (IPPs) play a significant role in electricity generation in Nepal. By the end of 2022, IPPs in Nepal had completed power projects with a total capacity of 1,709 MW. Furthermore, 134 ongoing projects have achieved financial closure, with a combined capacity of 3,253.3 MW. According to reports, there are 89 projects under development, currently without financial closure but with a capacity of 1,857.4 MW.

The government aims to achieve 100% electricity access nationwide by 2024 (WECS, 2022).

SOLAR AND WIND ENERGY

According to the Solar and Wind Energy Resource Assessment (SWERA) by the Alternative Energy Promotion Centre (AEPC), Nepal has an estimated commercial potential of around 2,100 MW for on-grid solar PV systems. As of 2022, 974,000 residential solar PV systems have been installed, mainly concentrated in remote districts of Western Nepal where access to grid electricity is limited.

The NEA has announced that it will purchase 100 MW of solar power through competitive bidding.

Despite having a significant potential for wind energy, there has been limited development in the wind energy sector in Nepal. With 10% of Nepal's area having a wind power density of 300 W/m2, the country can produce up to 3,000 MW of electricity from wind. However, the total capacity of solar-wind hybrid mini-grid systems reached 1,500 kW as of 2022 (WECS, 2022).

SELLING POWER TO INDIA

In October 2023, the Power Ministry of India announced a new quota of renewable energy that distribution companies should meet starting from the fiscal year 2024-25.

Minimum quotas related to wind energy, hydro renewable energy, distributed renewable energy, and other renewables have been set. The Power Ministry of India also announced that the distribution companies can meet the quota by importing hydropower. They were told to fulfil the quota by buying only domestic power.

Officials say that the new rule, which will come into force on April 1, 2024, will benefit Nepal.

In September 2023, the government of India announced that it would buy 10,000 megawatts of electricity from Nepal over ten years with the endorsement of a long-term inter-government power trade agreement. The 25-year long-term agreement was initiated when Nepal's Prime Minister Pushpa Kamal Dahal visited India from May 31 to June 3, 2023.

Both countries signed the agreement during Indian Foreign Ministers. Jaishankar's visit to Kathmandu on 4th January 2024.

NEA has enhanced electricity trading with India, exporting up to 364 MW of power from six hydropower projects to India in the Day Ahead Market of the Indian Energy Exchange. This helps manage seasonal surplus energy and reduces the trade deficit with India.

NEA completed the construction of crucial transmission lines such as 220 kV Marshyangdi-Kathmandu, 132 kV Solu Corridor, 220 kV Koshi Corridor and various substation projects. Nepal and India agreed to construct a 400kV Butwal-Gorakhpur transmission line during Prime Minister Pushpa Kamal Dahal's visit to India in June 2023. The Dhalkebar-Muzaffarpur 400 kV cross-border transmission line is already operational.

These projects have enhanced grid connectivity and facilitated the transmission of increasing electricity generation.

SELLING POWER TO BANGLADESH

In July 2023, officials from Nepal and Bangladesh agreed to sign a long-term agreement to export 40MW electricity from Nepal to Bangladesh. This will ensure a long-term market for Nepal's electricity in Bangladesh.

"We have agreed to sign a 25-year power sale agreement with Bangladesh," said Kul Man Ghising, managing director of Nepal Electricity Authority (NEA).

The understanding will be formalised once Nepal, India and Bangladesh sign a tripartite agreement on power sale from Nepal to Bangladesh using the Indian territory.

Earlier, Bangladesh had issued a letter of intent to purchase 500 MW of power from the Upper Karnali hydropower project being developed by GMR, an Indian company (TKP, 2020). In May 2023, Nepal and Bangladesh agreed to develop the 683 MW Sunkoshi 3 hydropower project by setting up a joint venture company. Both the countries are also discussing the prospect of involving India to develop the project (TKP, 2023).

ENERGY DEMAND IN INDIA

With a population of over 1.4 billion, India is the third-largest energy-consuming country worldwide. With the increase in the economy and living standards, energy use has doubled since 2000. Universal energy access was obtained in 2019, with 900 million people accessing electricity.

The energy consumption patterns in India show the primary energy consumption of 929 Million Tons of Oil Equivalent (MTOE) in 2019, which is expected to grow to 1,237 MTOE in 2030. Currently, coal is the major contributor to the primary sources of electricity, which covers more than 60% of the total energy demand.

According to “India Energy Outlook 2021,” India’s energy demand is expected to increase by 35% by 2030. If it continues at this pace, India will likely have the most significant global energy demand increase by 2040. According to the report, coal accounts for nearly 70% of total electricity generation, and solar accounts for only 4%. India expects to reach 450 GW of renewable energy generation by 2030

ENERGY DEMAND IN BANGLADESH

Bangladesh is also one of the fastest-growing economies in the world.

Due to rapid urbanisation and industrialisation, energy demand is constantly increasing. In 2018, the country's energy consumption pattern showed a primary energy consumption of 37.6 MTOE. This demand is now expected to rise to 85.3 MTOE in 2030.

Natural gas significantly contributes to the country's direct energy, covering two-thirds of its immediate energy consumption. The current statistics show that gas production within the country is decreasing, and its energy security is at high risk due to its dependency on imported coal and LNG.

In recent decades, Bangladesh has substantially improved its economy and energy sector. Electricity generation capacity has increased from 5 GW (2009) to 25.5 GW in 2022. The Bangladesh Government claimed in March 2022 that 100 per cent of the population had access to electricity.

ENERGY MIX

Solar

Nepal has an advantageous location, and its high-altitude topography with slopes facing south receives ample solar radiation for harnessing solar energy. The average solar radiation ranges from 3.6 to 6.2 kWh/m2 /day and approximately 300 sunny days yearly. This makes the development of solar energy technology up-and-coming in many parts of the country.

According to AEPC, the commercial potential for grid-connected solar power is estimated at 2,100 MW.

Wind

Despite the abundant availability of wind, Nepal has yet to harness its potential as a clean energy source.

According to the Solar & Wind Energy Resource Assessment in Nepal (SWERA) published by the AEPC in 2008, there is a potential area of 6074 sq. km with a wind power density greater than 300 watts/m2. If 10% of this area were considered feasible for wind energy production, Nepal has a potential of 3,000 MW of wind energy, assuming a rate of 5 MW per sq. km.

The study indicates that the areas with the most potential are located in the high and middle mountains of the country. However, the commercially viable wind potential is only about 448 MW.

Several wind-solar hybrid projects, including a 20 kW power system, have been implemented in different locations, providing electricity to rural households.

Hydropower

The theoretical potential of hydropower in Nepal has been estimated at 83,000 MW. The technical and economically feasible possibility is about 45,000 MW.

The study by WECS in 2019 to estimate Nepal's hydropower potential shows a gross hydropower potential of 72,544 MW. This potential is distributed among three major river basins- Koshi, Gandaki, and Karnali which account for 94% of those above total gross potential.

NEA has received an AA++ rating from the International Credit Rating Association (ICRA), Nepal, establishing itself as a highly secure organisation with sound financial capacity.

MAJOR MILESTONES

MCC project kicks off

In August 2023, the implementation of the US-funded Millennium Challenge Corporation (MCC) projects kicked off. The compact includes two projects, namely the 315-km 400kV Electricity Transmission Project and the East-West Highway Road Maintenance Project, which will increase the reliability of electricity and lower the cost of transportation in Nepal.

The programme is co-funded by the MCC Compact grant of USD 500 million and the Government of Nepal's (GoN) contribution of USD 197 million. (MCA Nepal 2023)

INVESTMENT NEEDS

A study conducted by The World Bank in 2019 said that electricity sector investments in Nepal will need to accelerate substantially to an average of USD1.3–USD2.1 billion annually between 2019 and 2040. Nepal needs not only to use existing sources of financing efficiently but also to develop the capacity to access new sources of financing from domestic and international capital markets and investors, including institutional investors. The study said a scale-up in both public and private funding is needed. (The World Bank, 2019)

From 2010 to 2017, Nepal's electricity sector achieved average investments of USD 527 million annually. More than 70 per cent of this investment was concentrated in the power generation segment, almost all of which went to hydropower projects. Two-thirds of the investment in generation was undertaken by NEA subsidiary companies, followed by local IPPs and the NEA. Although significant, the sum falls short of the annual investment requirement up to 2040.

To keep pace with demand, electricity sector investments will need to accelerate substantially to an average of USD1.3–USD2.1 billion annually between 2018 and 2040.1 The total investment need in the power sector for the forecast period of 2018–40 is estimated at USD29–USD46 billion. This includes investments of more than USD16 billion in T&D and USD2 billion in solar and wind energy during 2018–40. Moreover, incremental investments of USD0.5–USD1.0 billion may be required annually in large, export-oriented hydropower projects.

The takeoff of export-oriented projects will depend on the underlying economics of these projects and the development of a practical institutional and regulatory framework for electricity trade. (The World Bank, 2019, pp 13-14)

WHY INVEST IN NEPAL

According to the Ease of Doing Business Report 2023, Nepal has the third most favourable environment for business in South Asia (after India and Bhutan).

https://archive.doingbusiness.org/en/rankings?region=south-Asia

According to the Nepal Investment Guide 2021, Nepal offers a tax holiday of up to 100% for the first ten years and 50% for the next five years for energy projects, depending upon the date of financial closure and the date of commercial operations. Repatriation of capital and profits is permitted by law. Land ownership is allowed in the company's name. On arrival, visitor visas are granted for visitors, while business visas are granted to investors through a simplified process.

The general income tax rate is 25% (20% in priority sectors like Energy, Transport Infrastructure and Manufacturing), and Value Added Tax (VAT) is 13%. The government offers income tax concession on profits from exports and interest income on foreign loans, withholding tax rate of 15% on royalties and technical and management fees. Similarly, customs, excise duties, and VAT levied on raw materials and auxiliary raw materials of export-oriented industries are reimbursed to the exporter based on the amount of exports within 60 days of application.

https://ibn.gov.np/uploads/documents/nepal-investment-guidepdf-1483-845-1657610856.pdf

Nepal has signed the Bilateral Investment Promotion and Protection Agreement (BIPPA) with India, Finland, Germany, Mauritius, the UK, and France. Similarly, Nepal has signed a Double Taxation Avoidance Agreement (DTAA) with Austria, China, India, Korea, Norway, Pakistan, Qatar, Sri Lanka and Thailand. It is negotiating a DTAA with many other countries, including the UK and the USA.

There are a vast number of opportunities for foreign investors in Nepal. The country's labour force is young, educated, and easy to do business with compared to nearby countries (InvestAsian, 2023).

https://www.investasian.com/country-guides/investing-in-nepal/

The Constitution of Nepal guarantees the protection of private property. Moreover, Nepal has never defaulted on its domestic or foreign debt obligations. Nepal holds a comfortable level of foreign currency reserves to allow full repatriation of profits and the principal of FDI after completing the necessary procedures.

CONCLUSION

The renewable energy sector in Nepal is one of the attractive sectors for international investors and has the full backing of the Nepali government. Most renewable energy generation is currently hydropower, but with further investment in the electricity transmission infrastructure, ground-mounted solar, rooftop solar and wind. Nepal could become a critical regional clean energy producer and exporter.

Nepal has a democratically-elected government that welcomes foreign direct investment. It is macroeconomically stable, with a low debt-to-GDP ratio and strong institutions. It has a robust banking sector, a highly educated and motivated workforce, and a strong policy and regulatory framework. The country's nationally determined contribution (NDC) targets are tangible and ambitious.

In summary, Nepal delivers and we encourage investors and developers to make this beautiful country a key destination for renewable energy investment and development.

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