ENERGY
CATALYST

Country Guide: Nepal

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Nepal is a landlocked country in South Asia bordered by China in the north and India in the south, east and west. It stretches 800 km from 80° East to 89° East. It has a large diversification in ecology and demography. The country can be divided broadly into three ecological zones: the lowland (Terai), the midland (Hilly), and the highland (Himalayan), covering 23%, 42% and 35% of the total land area, respectively. It is endowed with natural water resources with around 6,000 rivers and 163 wetlands. Nepal is highly susceptible to natural disasters such as earthquakes, floods, and landslides due to its geological structure.

Figure 1: Map of Nepal. Source: d-maps

Geography and climate

The climate of Nepal is comprised of a wide range of weather conditions across a varied topography from the tropics to the alpine region. It can be classified into five climatic zones based on elevation: tropical and sub-tropical, temperate, cold, sub-arctic, and arctic. The warmest region is Terai, with the average temperature subsequently decreasing by 6^0C for an altitude gain of 1,000 metres. The department of hydrology and meteorology has demarcated five seasons in the country that include winter (December - February), spring (March, April), summer (May - July), monsoon (June - September), and autumn (October and November). Nearly 80% of the annual precipitation happens during the annual monsoon season.

Government

Nepal is a federal republic and adopted a new constitution in 2015. The governance and political structure in Nepal are based on the principles of a parliamentary republic with a multi-party system. The constitution of Nepal defines the distribution of administrative and executive functions between the federation, the state, and the local level. The administrative division comprises of seven provinces and 77 districts, further divided into 753 local units which include 6 metropolitan municipalities, 11 sub metropolitan municipalities, and 276 municipalities. It is a member of the South Asian Association for Regional Cooperation (SAARC), South-Asia Cooperative Environment Program (SACEP), the United Nations and G77, among other global associations.

Economy

Nepal is one of the least developed countries in the world with a GDP per capita amounting to USD 1,380 as of 2023.[5] The GDP is USD 40.83 billion in current prices as of 2023.[6] As per World Bank projections, GDP growth declined from 5.6% to 4.1% in FY23 and is expected to slowly rise to 4.95 in FY24 and further to 5.5% by FY25.[7] The services sector is expected to the primary driver of GDP growth.

Table 1: Nepal at a glance[1]	
Capital	Kathmandu
Total Area	147,516 km^2
Population	30.5 million (2022)
Official languages	English, Nepali
Rural Population	79% (2022)
GDP	USD 40.83 billion (2022)
GDP Per Capita [2]	USD 1,380 (2023)
Currency	NPR (Nepalese Rupee)
Exchange rate 01/03/2023[3]	1 USD = 131.83 NPR
Exchange rate 01/03/2018	1 USD = 104.28 NPR
Access to Electricity[4]	94% (2022)

Slow domestic job creation, high vulnerability to natural disasters and large infrastructure gaps are some of the key challenges impeding growth, compounded by the COVID-19 pandemic. The pandemic also triggered a surge in debt levels. Crucially, remittances, a significant source of foreign exchange earnings, have not grown during the pandemic due to restrictions on international travel. Tourism earnings also remain lower than usual as tourist inflow levels are yet to return to pre-pandemic levels.

In 2022, the proportion of employed population below USD 1.90 purchasing power parity per day (PPP/day) was 5.1%.[8] Between 1990 and 2021, Human Development Index (HDI) value for Nepal changed by 50.9%, from 0.399 to 0.602.[9] As of 2022, Nepal has achieved 143rd rank as pet the HDI.[10] The country's life expectancy at birth changed by 13.6 years between 1990 and 2021, mean years of schooling by 2.8 years and expected years of schooling by 5.4 years.[11]

The energy sector in Nepal

Nepal's energy needs are met through three sources, namely, traditional fuels (fuelwood, agricultural residue, and animal waste), commercial fuels (electricity, coal, petrol, diesel, LPG, kerosene etc.), and renewables (biogas, solar, wind and micro/pico hydro). The country consumed 174 TWh of energy in 2021, of which 66.26% came from traditional fuels, 31.34% from commercial fuels and only 2.40% from renewables.[12] The households in Nepal predominantly use solid fuels (firewood) or LPG as a source for their energy needs. This over-dependence on solid fuels and LPG imports has put Nepal at risk in terms of energy security.

As of 2022, 94% of the population had access to grid and off-grid electricity.[13] Nepal aims to achieve 100% electricity access by 2023.[14] However, electricity constitutes less than 5% of energy consumption in the country with a per capita electricity consumption of 265 kWh/year. Total electricity generation increased by 30.9% to

[1] Nepal: The World Bank Data (As of July 2023)
[2] GDP Per Capita (USD Current Prices): Nepal, IMF (As of April 2023)
[3] CIEC Data Nepal US exchange rate, CIEC (as of March 2023)
[4] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[5] GDP Per Capita (USD Current Prices): Nepal, IMF (As of April 2023)
[6] Nepal: The World Bank Data (As of July 2023)
[7] Nepal Development Update, World Bank Group, April 2023
[8] Nepal: Poverty Data, ADB (As of Aug 2023)
[9] Nepal HDI Rank 2022, UNDP, September 2022
[10] Ibid.
[11] Ibid.
[12] Nepal Energy Sector Synopsis Report 2022, Water and Energy Commission Secretariat, June 2022
[13] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[14] Nepal Energy Sector Synopsis Report 2022, Water and Energy Commission Secretariat, June 2022

2,205 MW in 2022, as compared to the previous fiscal year.[15] Out of the total generated electricity, 92% of electricity is contributed by hydroelectricity, 2% each from solar plants, and thermal plants, and the remaining is contributed from other sources which include renewables and co-generation.[16]

Nepal can increase the contribution of renewables in the energy mix by harnessing energy from sources such as solar, wind, micro hydropower, and waste-to-energy, etc. The potential of on-grid solar PV system is about 2100 MW.[17] The installed capacity of micro hydropower plants is 38 MW whereas the potential supply is more than 50 MW.[18] The country also has a supply potential of 3000 MW from wind energy, but the yield is limited.[19] It produces about 1,200 tons of organic waste per municipality which can be used to produce biogas.[20] The government has adopted several plans and policies to facilitate the development of renewable energy in the country.

The Fifteenth Periodic Plan adopted by the government in 2019-20 until 2023-24 aspires for a 12% contribution of renewables in the total energy, which includes the installation of 0.2 million household biogas plants, 0.5 million improved cooking stoves and thermal gasifiers, 20 thousand metric ton annual production of bio briquette and pellets, and annual replacement of 40 thousand metric ton of liquefied petroleum gas through installation of 500 large biogas plant. The country has also adopted its second Nationally Determined Contributions in 2020 which lay great emphasis on transitioning to renewable energy sources. As per its NDCs, Nepal will ensure 15% of the total energy demand is supplied from renewable energy sources by 2030. The country has adopted an RE subsidy policy to provide financial and technical assistance to consumers in off-grid areas. The government has also adopted a National Renewable Energy Framework to coordinate and monitor various RE initiatives, improve stakeholder engagement, and mobilise finance.

The Alternative Energy Promotion Centre (AEPC), which is the nodal body for renewable energy technologies, operates the Central Renewable Energy Fund (CREF) for effective delivery of subsidies and credits to the renewable energy sector. The government has also established the Sustainable Energy Challenge Fund mechanism under the CREF with support from British embassy funded Nepal Renewable Energy Programme (NREP). The SCEF seeks to provide financial support to RE technologies that can be commercialised. Provisions of financial support under SCEF include capital investment, subsidy on bank's interest rate, and loan loss guarantees, among others.

Problems and challenges faced by the APEC in promotion of renewable energy technologies include:

- Knowledge gaps at local and provincial governance level to carry out responsibilities related to RE promotion.
- Lack of proper operations and maintenance of off-grid RE infrastructure.
- Limited awareness about RE technologies and financing options.

Factors like rising economic growth, a growing rate of urbanisation, improving standards of living, and increasing use of transportation have contributed to the increasing demand for energy in the country. Thus, the Government of Nepal is making significant efforts to narrow the gap in future and is planning to enhance the generation of electricity through all available means. Nepal's electricity demand projection based on the total

[15] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[16] Ibid.
[17] Nepal Energy Sector Synopsis Report 2022, Water and Energy Commission Secretariat, June 2022
[18] Ibid.
[19] Ibid.
[20] Ibid.

population of 39 million and GDP growth rate of 4.5% for 2040 stands at 1536 kWh.[21] As the country attempts to achieve its target production of 6500 MW by FY24, a continued expansion of hydroelectricity production capacity is expected to drive industrial sector growth over the medium-term. To support the industrial growth, supply of electricity to other industrial sub-sector and increased public capital spending is also being envisioned.

Solar power

Nepal has a PV power production potential of approximately 3.6-6.2 kWh/m^2 per day in most regions, with 300 sunny days and 6.8 sunshine hours per day.[22] The potential of on-grid solar is estimated to be 2100 MW, according to the Solar and Wind Energy Resource Assessment (SWERA) by the AEPC, with the hills and lower elevation mountains preferred geographies.[23] 25% of Nepal's area is suitable for concentrated solar power (CSP) systems.[24]

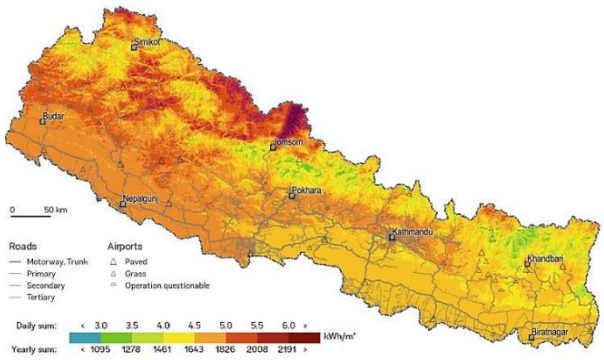

Figure 3: PV Potential for Nepal. (Nepal Energy Sector Synopsis Report 2022 The World Bank, Source: SolarGIS)

Large scale utility solar: Many large-scale projects are being constructed and are under construction. The Nepal Electricity Authority (NEA) operates 1.35 MW plants and IPPs operate about 21 MW of solar plants. In 2022, the government has floated tenders to develop 100 MW of solar PV capacity in the country.[25]

Off-grid solar: To date, around 974,000 residential solar PV systems have been installed in Nepal.[26] The installed share of SHSs in the hilly region is the highest at 68.5%, followed by 16.5% in the mountain region and 15.1% in the Terai region.[27] The remote districts of Western Nepal (especially Karnali and Lumbini provinces) have the largest number of SHSs due to distance from the national grid. The average capacity of these systems ranges from 1.47 kWp to 2.83 kWp.[28] The country has 3,817 institutional solar PV systems[29], with the average capacity ranging from 1.4 kWp to 2.41 kWp.

Solar Rooftop: The current installed capacity of solar rooftop is 10,080 kW installed by AEPC. The government plans to increase the capacity to 969 MW by 2030. All commercial, institution and private houses with plots larger than 3422.5 sq ft and roofs larger than 2,500 sq ft were mandated to install solar power plant to generate 25% of their total energy requirement by the Ministry of Federal Affairs and Local Development. AEPC is Implementing an 'Urban Solar Rooftop Programme' which provides capital subsidy to domestic, institutional, and commercial customers for installation of a system of capacity of greater than 200 Wp.

Some of the key challenges impeding development of the solar rooftop segment are:

- **Low adoption by consumers**: The consumers lack awareness about existing government programs and schemes with capital subsidies for installing solar rooftops. They have concerns regarding high upfront cost of solar rooftop systems, low battery life and poor after-sales service which further hampers adoption.

[21] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[22] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[23] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[24] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[25] RFP-Grid Connected Solar PV Power Projects, NEA, November 2022
[26] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[27] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[28] Ibid.
[29] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022

- **Lack of investments solar rooftop projects:** The majority of the investments in the solar segment are directed towards utility scale or decentralized solar systems. Limited awareness among financiers on the feasibility of the technology and relevant business models restricts financing of the rooftop solar segment.
- **Limited clarity on the net metering policy:** The government had introduced a net metering policy for solar rooftop in 2018 with a feed-In-tariff of NPR 7.30/kWh (~USD 0.05/kWh) for an initial period of 3 years. However, in July 2022, the Nepal Electricity Authority halted implementation of the net metering policy. This has led to uncertainty in the market regarding potential of grid interconnectedness, private financing of solar rooftops, and reliability of the technology.

Solar irrigation: Solar pump systems for drinking water and irrigation are installed mostly in the hilly belts. 3,129 pumps have been installed till 2022. In terms of irrigation pumps, nearly 90% are installed in the Terai plains, as it is a major agricultural area of Nepal.[30] Under the 'Promotion of Energy Efficiency and Renewable Energy program', the German development bank (KfW) is providing EUR 5.7 million to the government for the implementation of 188 solar water pumps for drinking water, 185 institutional solar PV systems at schools and 188 institutional solar PV systems at health posts. The most prevalent challenges hindering growth of solar irrigation are lack of subsidy for operations and maintenance, limited number of solar companies, poor technical capacity of resources on design and installation, lack of functionality on undulated terrains, among other factors.

Some of the key off-grid solar solution providers in Nepal include Saral Urja, Gham Power, SunFarmer Solar Nepal, Lotus Energy, Everest Solar Energy etc.

The solar sector, especially decentralized technologies are gaining greater importance in government programs. However, many barriers exist which impact the growth of the solar sector, such as lack of technical knowledge and skilled personnel, limited testing of viable business models, difficulty of transporting panels to remote areas, and high instalment and maintenance costs. Poor awareness at the community, cooperative and even local government levels about subsidies for solar technologies (like solar pumps and mini grids) hamper adoption. For example, the government of Nepal provides a 60% grant to farmers and 70% grant to women owned solar pump projects, however this scheme is not well known.

Hydropower including small hydropower (SHP)

The government plans to increase the generation capacity from hydropower by 5000 MW till 2025 and 15000 MW till 2030.[31] As of 2021, the total installed capacity developed by National Electricity Authority (national organisation responsible for operation and distribution of electricity in Nepal) stands at 582 MW. As of February 2022, the total installed capacity from independent power producers (IPPs) was about 1,440 MW.[32] NEA's hydropower plants generated the highest ever recorded annual energy of 3,259 GWh in FY 2021/22, an increase by 16.23 % over the generation of 2,804 GWh in FY 2020/21.[33]

There are several hydropower projects at different stages of development - Chainpur Seti HEP, Aandhi Khola Storage HEP and Begnas Rupa Pump Storage HEP. NEA has also signed an MoU with Satluz Jal Vidyut Nigam (SJVN), India for the joint development of Arun 4 HEP with an indicative capacity of 490.2 MW. Arun 4 (490.2

[30] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[31] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[32] Ibid.
[33] A Year in Review-Fiscal Year 2021/2022, Nepal Electricity Authority, 2022

MW), West Seti (750 MW), Arun III (900 MW) and Lower Arun (769 MW) are major hydropower projects which will start distribution between 2030 and 2035.

Nepal has the potential to develop at least 50 MW of power from micro-hydropower plants (MHPs).[34] As of 2022, 37.7 MW of installed capacity came from mini, micro, and pico hydropower projects in Nepal.[35] Micro and pico hydropower plants generate power below 100 kW and 1 kW, and mainly service communities in weak-grid or off-grid areas. Majority of the MHPs are concentrated in hilly and mountainous regions of Province 1, Bagmati and Gandaki. As of 2021, there were 1800 MHPs providing electricity to more than 340,000 households across remote rural areas of Nepal.

AEPC is supporting implementation of multiple programs that provide financial assistance for development of mini, micro or pico hydropower plants such as (i) a credit line by ADB of USD 5 million to establish 4.3 MW of mini-hydro power plants under the South Asia Sub-Regional Cooperation program, and (ii) a micro hydro debt fund by GIZ of EUR 542,000 to provide credit for off-grid micro hydropower plants in rural areas.

Bioenergy

About 1.9 million households in Nepal (42% of total households) have the potential for the installation of a household biogas system.[36] The government plans to increase installation of household biogas plants to 200,000 and large-scale biogas plants to 500 as part of its Second Nationally Determined Contribution submitted to the UNFCCC.[37] As of 2022, AEPC installed ~440,000 domestic biogas plants and more than 350 industrial, commercial, and urban biogas plants. Domestic biogas plants range from the capacity of 2 cubic meter to 8 cubic meter. The Terai and Hilly region of Nepal have the highest number of biogas plants installed mainly due to significant availability of feedstock, conducive warm temperature, and skilled human resources.

There are various programs being funded by multi-lateral/bi-lateral organizations for promoting biogas in Nepal such as (i) USD 7.9 million Extended Biogas Program by the World Bank to develop large-scale commercial biogas and Municipal Solid Waste (MSW) to energy projects, and (ii) EUR 5 million biogas credit fund by kfW to enable low-cost debt to farmers for developing biogas plants.

Key barriers to adopting and scaling biogas in Nepal have been the difficulty of installing and operating biogas in mountain and hilly areas, a lack of financing and the limited number of biogas suppliers. The government is prioritising biogas technology as a low-cost sustainable energy that can provide many benefits to households.

Wind power

In Nepal, the commercially viable wind energy potential is estimated to be 448 MW. Despite this huge potential, there has not been any significant developments of wind energy. Only 113.6 kW has been harnessed as of 2018 and 5 MW capacity is under construction[38]. At present, AEPC is promoting wind-solar hybrid systems for the generation of electricity. The solar wind hybrid mini grid system installed in Nepal reached 1500 kW in 2022.[39] The 15th period plan of GoN aims at 10 MW wind energy at the local level in Nepal by 2024.[40]

[34] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[35] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[36] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[37] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[38] Ibid.
[39] Nepal Energy Sector Synopsis Report-2022, Water and Energy Commission Secretariat, June 2022
[40] 15th Plan Document, National Planning Commission, 2023/24

RE mini grids

Isolated mini and micro grids based on hydro, solar PV and wind technologies are required, especially in remote areas, where the grid has not yet reached. As of 2022, AEPC has supported development of more than 2900 kW solar mini grid and solar-wind hybrid mini grid systems.[41] The government is implementing a 'Private Sector-Led Mini Grid Energy Access Project (MGEAP)' with support from the World Bank to enhance electricity generation from renewable energy projects. This program promotes greenfield mini grid projects with cumulative capacity of 2.8 MW, and upgradation and grid interconnection of mini grids with cumulative capacity of 0.5 MW each.

Barriers and challenges that impact the scaling of the mini grid sector in Nepal are operation and maintenance of systems after installation, lack of sustainable revenue streams which don't cover the operating costs, and the perception of the system as a 'community asset' rather than a profit making social enterprise. There is also a lack of awareness on energy and financing options, and lack of knowledge about global best practices, innovation, and latest technologies for renewable mini grids in Nepal.

AEPC has been implementing multiple other programs to support energy access in Nepal, including:

South Asia Sub-Regional Economic Cooperation (SASEC): This program is supported by the Asian Development Bank (ADB), with a credit line of USD 5 million from ADB's Special Funds to user communities/developers for mini-hydro power plants and (ii) USD 11.2 million grant from the Strategic Climate Fund (SCF) administered by ADB. The off-grid component focuses on increasing the access to renewable energy for improving the livelihoods of people and create employment opportunities especially in rural areas.

Nepal Renewable Energy Program (NREP): It is a four-year program (2019-2023) with a value of GBP 9.2 million from DFID. The main objective of the program is to lead and manage the National Small-Scale Renewable Energy Framework—a blueprint for the off-grid electricity and clean cooking sector.[42]

[41] Alternative Energy Promotion Centre- Progress at a Glance 2021/22, Ministry of Energy, Water Resources and Irrigation, 2022
[42] Nepal—Renewable Energy Programme (NREP), DAI (as of July 2023)

Key government institutions

Institution	Role
Ministry of Energy, Water Resources and Irrigation (MoEWRI)	Formulates policies and strategies for the power sector and water resource development. This includes promotion of the government's private power policy, regulation of the National Electricity Authority (NEA), management of the IPP bidding process, deployment of technical assistance to the regulator for fixing tariff rates, and provision of guidance to private investors. **Website:** http://moewri.gov.np/en/
Water and Energy Commission (WECS)	The overall objective of the WECS is to support government departments and agencies in preparation of policies and projects for water and energy resource planning and development. It is also responsible for the implementation of strategies in the water and energy sectors. **Website:** https://www.wecs.gov.np/
National Electricity Authority (NEA)	This state-owned utility operates the electricity supply and distribution system, including generation to transmission across urban and rural areas. It is solely responsible for management of all power purchase agreements for energy exchange with India and purchase of electricity from the independent power producers. **Website:** https://www.nea.org.np/
Nepal Electricity Regulatory Commission	The commission is mandated to establish rules and regulations regarding power distribution and grid development, ascertain competition in the market for electricity and set rates for tariff and power purchase.
Alternative Energy Promotion Centre (AEPC)	AEPC is responsible for the development and promotion of renewable energy or alternative energy-based technologies across Nepal. It implements the renewable energy projects or programmes funded by donor and government agencies and ensures compliance with the national level policies and strategies in the sectors of renewable energy, climate change mitigation and adaptation. It has an independent function with representation from the industrial sector, government, and NGOs on its board. **Website:** https://www.aepc.gov.np/
Renewable Energy Test Station (RETS)	This is an autonomous body mandated to test renewable energy technologies and ensure compliance with established quality standards. Currently, the laboratory has testing facilities for solar PV systems, biogas, solar dryer, solar cooker, and improved cookstoves. **Website:** https://retsnepal.org/
Vidhyut Utpadan Company Limited (VUCL)	This is a state-owned company formulated to construct, own, and operate large scale hydropower projects based on a public-private partnership model. This would help the GoN to achieve its potential of electricity generation through hydropower. **Website:** http://vucl.org/
Rastriya Prasaran Grid Company Limited (RPGCL)	This state-owned company is responsible for operationalisation of the hydropower sector by supporting development of the transmission line system across Nepal. **Website:** http://www.rpgcl.com/
Hydroelectricity Investment and Development Company Limited (HIDCL)	The main objective of HIDCL is to mobilise funds from international and domestic sources to foster investment for middle to mega hydroelectricity generation, transmission, and distribution projects. **Website:** http://www.hidcl.org.np/

Industry associations

Industry Association	Features
Nepal Micro Hydropower Development Association	This association comprises private companies and firms involved in the development and planning of strategies for the micro-hydropower sector. The members of the association also support implementation of diverse types of micro hydro projects, focusing on project survey, identification, design, installation, manufacturing of turbines and accessories, repair and maintenance and research. **Website:** https://microhydro.org.np/
Solar Electric Manufacturers Association Nepal (SEMAN)	This is a non-profit, non-governmental business association of solar electric manufacturing and trading companies in Nepal. Its core activities include conducting trainings for solar electric technicians, organising orientations for schoolteachers and government stakeholders on solar PV and coordinating with the AEPC and other relevant government agencies on matters related to development of the solar sector in Nepal. **Website:** https://www.semannepal.org.np/
Nepal Biogas Promotion Association (NBPA)	This is an umbrella organisation of biogas appliance manufacturers and biogas construction companies comprising of around 114 members. Its main objective is to innovate new and improved technologies for the development of the biogas sector and provide technical knowledge on solutions related to bio-slurry. The NBPA provides a wide variety of services, such as technical training to stakeholders and beneficiaries and legal assistance to member biogas construction companies in the case of conflicts. **Website:** https://sites.google.com/site/nepalbiogas/about
Independent Power Producers' Association Nepal (IPPAN)	The overall aim of IPPAN is to foster investment in a competitive market for power development. Its core activities include lobbying for private sector responsive policies and regulations, ensuring effective implementation, disseminating information amongst government stakeholders and beneficiaries, capacity building of IPPs and stakeholders, developing linkages for multi-regional cooperation and fostering strong collaboration between the private and government sector. **Website:** http://www.ippan.org.np/public/
Energy Efficiency Centre (EEC)	EEC is a central nodal agency established under the Energy and Environment Division (EED) of the Federation of Nepalese Chambers of Commerce and Industry (FNCCI), to enhance energy efficient use in the industrial and business sector. This includes facilitating adaption of energy efficient technologies in enterprises and industries and enhancing competitiveness in the market. **Website:** http://www.eec-fncci.org/
Kathmandu Alternative Power and Energy Group (KAPEG)	A research organisation with expertise in wind engineering and hydro engineering technologies and projects. It undertakes research and development in new renewable energy technologies for local industry and academia. **Website:** https://online.kapeg.com.np/home

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