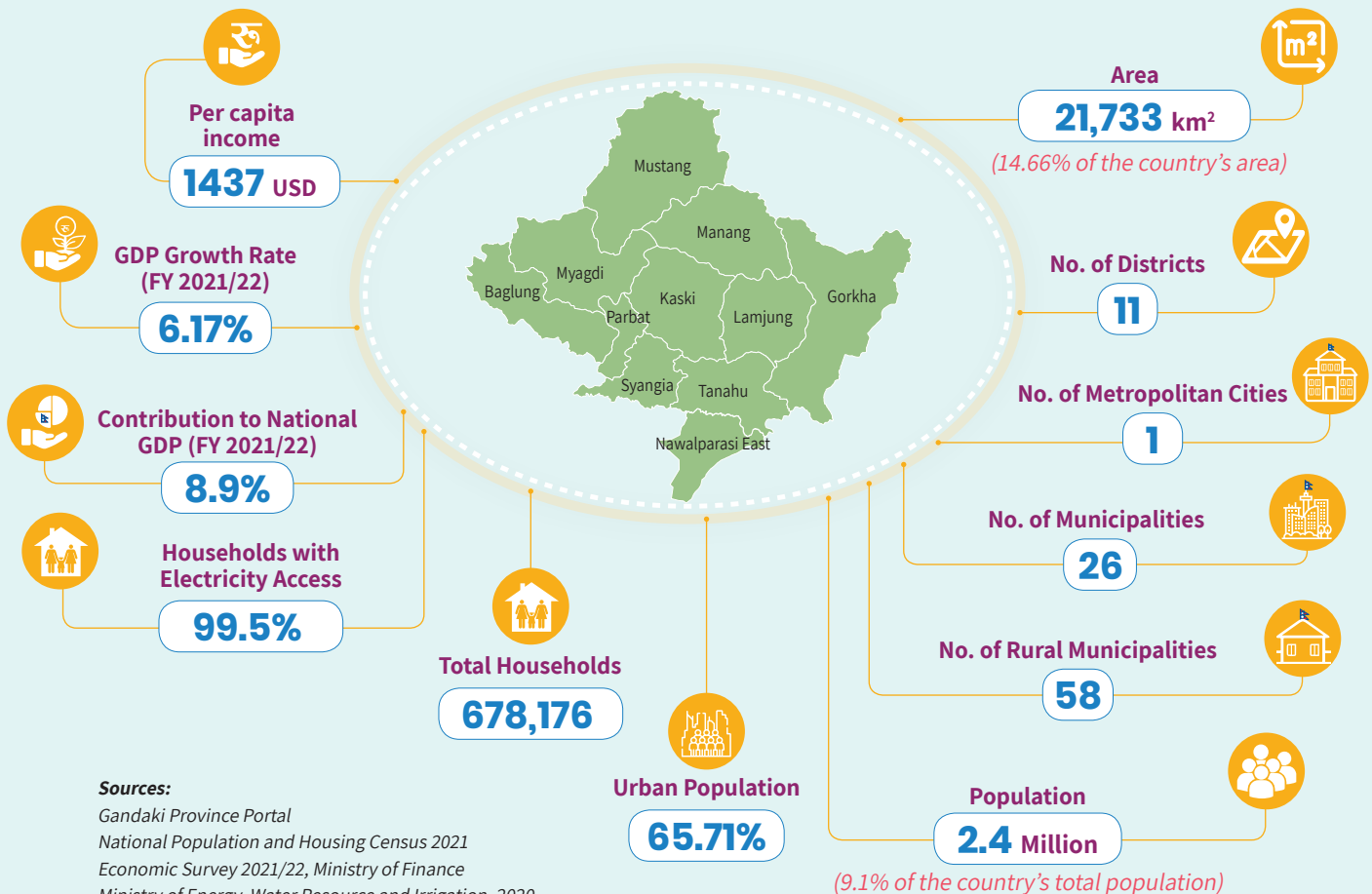


Energy Factsheet Gandaki Province

March 2023



Gandaki Province



Sources:

Gandaki Province Portal
National Population and Housing Census 2021
Economic Survey 2021/22, Ministry of Finance
Ministry of Energy, Water Resource and Irrigation, 2020
Annual Report of Policy and Planning Commission FY 2078/79, Gandaki Province

Energy Status

Gandaki province is the second-largest producer of hydroelectricity with a total generation of 687 MW. Hydropower Potential of Nepal 2019 report of Water and Energy Commission Secretariat shows, out of a country's total generation capacity of 72,544 MW, Gandaki province has a gross hydropower potential of about 14,981 MW, which is 20.7% of the total hydropower potential of the country.

According to the Energy Sector Inventory of Gandaki Province, the province consumed 42.1×10^{15} joule of energy in 2020. The per capita energy consumption is 4,723 kWh of which the per capita electricity consumption is 216 kWh. The domestic sector is the largest consumer of energy, with 79.10% of the total energy consumption, followed by commercial (10.19%) and transportation (5.23%) sector.

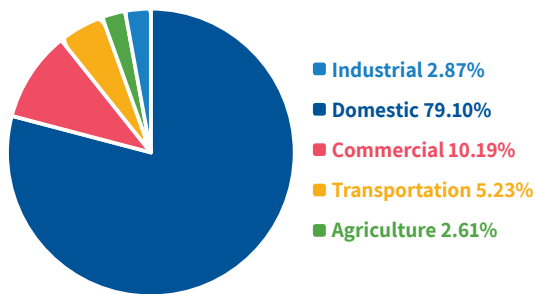


Figure 1: Share of Energy Consumption in Gandaki Province by sector, 2020

Source: Energy Sector Inventory of Gandaki Province

The majority of the population relies on traditional and fossil fuel-based energy to fulfill their daily energy needs. National Population and Housing Census, 2021 shows, Liquefied Petroleum Gas (LPG) is a primary fuel for cooking followed by firewood. 51% of the households use LPG and 47.14% use firewood for cooking. Less than 2% of the households use electricity, biogas, and other energy sources. The chart shows households by types of fuel used for cooking.

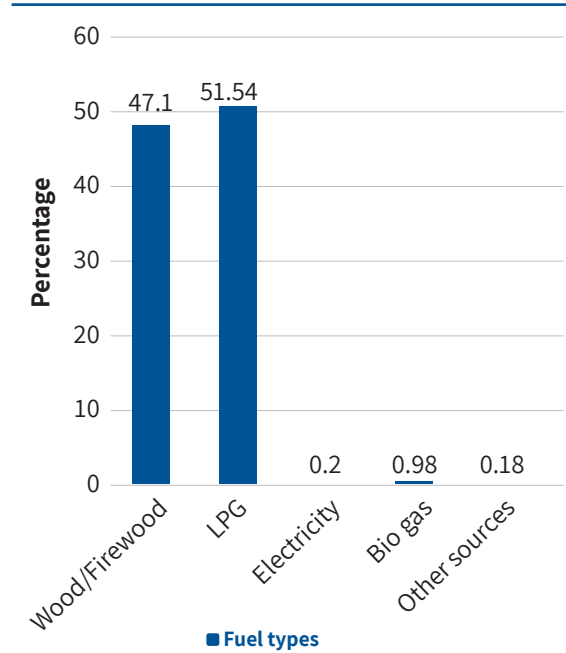


Figure 2: Household energy consumption for cooking

Source: National Population and Housing Census 2021

Out of 85 local governments in the province 51 are fully electrified and 32 are partially electrified. Two of the rural municipalities, Chumanuwari Rural Municipality of Gorkha and Narpa Bhumi Rural Municipality of Manang are not electrified¹. The census 2021 shows that most households in the province use electricity as the primary lighting source, with 97.6% followed by 1.9%, 0.2%, and 0.2% using solar PV systems, kerosene, and other sources, respectively. (Population Census, 2021).

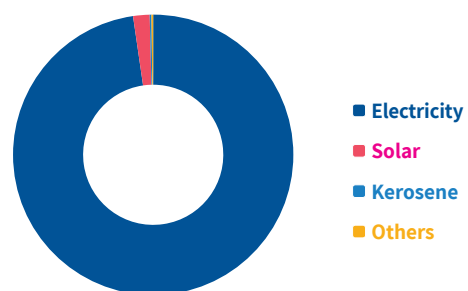


Figure 3: Source of lighting in percentage

Source: National Population and Housing Census 2021

1 A year review, Fiscal year 2020/21, NEA

Hydropower Projects

Out of 139 small and large operational hydropower projects in Nepal, With a total capacity of 687 MW, 40 projects are located in the Gandaki province.² Another 40 projects are in the construction phase with a total installed capacity of 869.85 MW, of which 807.85 MW is expected to be connected to the national grid by 2024. There are about 212 large and small hydropower projects in different licensing, construction, and study phases.

Mini and Micro Hydropower

A total of 401 mini and micro hydropower projects (capacity less than 1 M.W.) with an installed capacity of 8.479 MW are operating in the province. About ten micro hydropower projects with a total installed capacity of 635 kW are under construction phase³.

Solar Energy

Eight commercial and institutional solar PV projects with a total capacity of 9.543 MW are currently operational in Gandaki province. Four solar power projects with a combined capacity of 7.5 MW have received the survey license from the Department of Electricity Development (DoED).

Table 1: Expected hydropower projects in Gandaki Province

S.N.	Status of the Project	Number	Installation Capacity (MW)
1	Hydropower projects with construction license	76	2328.06
2	Hydropower project they have applied for a construction license	11	1665.92
3	Hydropower projects with survey license	77	2586.96
5	Projects in the basket of the Government of Nepal with completed study	32	2077.58
Total		196	8658.52

Source: Department of Electricity Development, 2022

Table 2: Expected solar projects in Gandaki province

District	Local Level	Number of Projects	Installed Capacity (kW)	Energy Generation (MWh/year)
Tanahun	Shuklagandaki M	1	5000	8250
	Rishing RM	1	18	30
Kaski	Pokhara MC	3	423	698
	Rupa RM	1	4,000	6,600
Mustang	Lomanthang RM	1	70	115.5
Nawalparasi (East)	Hupsekot RM	1	2	3
Total		8	9,513	15696.5

Source: Department of Electricity Development, 2022

² Department of Electricity Development (<https://www.doed.gov.np/license/53>)

³ <https://www.doed.gov.np/license/21>

Table 3: Survey Completed Wind Energy Projects in Gandaki Province

District	Local Level	Number of Projects	Installed Capacity (kW)	Energy Generation (MWh/year)
Mustang	Gharpajhong RM	1	0.45	739.1
Parbat	Modi RM	1	1	1635.93
Total		2	1.45	2375.03

Source: PPPC, Gandaki Province

Home-based solar PV system has contributed significantly to the electrification in rural areas not connected to the national grid. 43,013 households in the province have been electrified by installing solar panels, with an aggregated capacity of 1,298 kW and annual energy generation of 2,176.83 MWh.

Wind Energy

A wind energy project of 10 kW capacity with 2 kW of solar hybrid system has been installed in Nawalpur, and 3 kW of the hybrid system was installed in Mustang. Surveys have been completed for two wind power projects, one in Mustang and one in Parbat, with a combined capacity of 1.45 MW. Three projects in Mustang with a total capacity of 5 MW have received survey licenses from DoED.

Fossil Fuel Consumption

In the fiscal year 2020/21, Gandaki province consumed 9 % of Nepal’s total petroleum products sales. In the last three fiscal years, the sales of petrol, diesel, and LPG are in increasing trend in the province. Kerosene and Aviation Turbine Fuel (ATF) sales are constant.

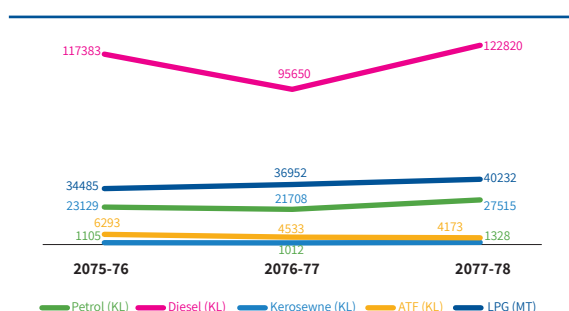


Figure 4: Petroleum product sales in Gandaki Province (Source: NOC, 2021; DOC, 2021)

Source: Energy Sector Inventory of Gandaki Province

Provincial Policies and Plans on Energy and Climate Change

Nepal’s “Long-term Strategy for Net-zero Emissions” aims to achieve net zero emissions by 2045. The second Nationally Determined Contributions (NDC) targets to generate 15,000 MW of clean energy by 2030, of which 5-10 % will be generated from mini and micro-hydro power, solar, wind, and bio-energy, and ensure 15% of the total energy demand is supplied from clean energy sources. It also targets to use electric stoves as the primary mode of cooking in 25% of households by 2030; and install 500,000 improved cookstoves, 200,000 household biogas plants, and 500 large-scale biogas plants by 2025. On transportation, targets are to increase sales of e-vehicles to cover 90% of all private passenger vehicle sales, including two-wheelers and 60% of all four-wheeler public passenger vehicle sales (excluding electric-rickshaws and electric-tempo) and construction of 200 km of electric railways by 2030. These targets are aligned with the Ministry of Energy, Water Resources and Irrigation’s Energy Whitepaper published in 2018.

Gandaki province is implementing the “Ujaalo Gandaki Pradesh” initiative intending to connect all households with electricity. The First Five-Year Plan of the province has made specific targets for hydroelectricity generation, electric transport, and electric cooking. These targets are aligning with the targets in the Nationally Determined Contribution. The province has also drafted Energy Strategy and Action Plan.

Electricity generation from hydro, solar, wind, and bioenergy, electric transportation, electric cooking, and biogas are the priority activities in the province’s five-year periodic plan (FY 2019/20 – 2023/24). The details of the periodic plan are listed below,

Table 4: Gandaki Province Energy-related Targets--First Five-Year Plan (2019/20-2023/24)

S.N.	Energy-related indicators	Targets (by FY 2023/24)
1	Energy generation	<ul style="list-style-type: none"> 1500 MW from hydroelectricity, an additional 90 kW from micro hydro 25 MW from solar, wind and bioenergy.
2	Electric vehicle charging station	26
3	Electric vehicle	30
4	The electric rail network in Nawalpur as a part of the Narayangadh-Butwal railway	80 km
5	Mass transit electric vehicles	30
6	Households with access to electric cooking	125,000
7	Large Size biogas	Additional 40
8	Household biogas Plant	Additional 1000

Source: Source PPPC, Gandaki Province, 2019

Gandaki Province's SDGs related targets aim to decrease reliance on traditional bio-mass-based energy sources for cooking and increase hydroelectricity generation. The details of the SDGs targets are listed below

Table 5: SDGs targets by Gandaki Province on energy

Targets and Indicators	2015	2023	2030
SDG 7: ensure access to affordable, reliable, sustainable, and modern energy for all			
The proportion of the population with access to electricity	82.5	100	100
Electricity consumption (kWh per capita)	190	750	1,700
Households using solid fuel as the primary source of energy for cooking (percent)	69.3	59	45
People using LPG for cooking and heating (percent)	34.4	36	40
Installed capacity of hydropower (M.W.)	448	3,000	6,000
Electric vehicles in public transport systems (percent)	0	10	50

Source: PPPC, Gandaki Province, 2019

Provincial Governance Structure

The Ministry of Energy, Water Resources, and Water Supply is a focal government agency responsible for advancing the province's policy, discourse and coordination for energy-related work. There is an energy section under the Ministry for energy-related work. The section needs to be strengthened further with dedicated human resources and budget to meet the ambitious energy-related targets of the province.

Provincial Policy and Planning Commission is responsible for formulating long-term policies and plans, monitoring and evaluation, and coordinating among the province's federal and local government on development, including energy-related matters. Provincial Sustainable Development Goals Coordination Committee has been formed to implement and monitor the activities related to SDG implementation in the province.

Ministry of Industry, Tourism, Forests and Environment is a focal ministry of the province to work on climate change. Under the ministry, the Watershed Management Division is responsible for climate change-related work. The provincial Climate Change Coordination Committee envisioned in National Climate Change Policy to integrate and coordinate the sectoral ministries' climate change works is yet to be established.

Climate Change Budget of the Province in FY 2022/23

In FY 2022/23, 42% of the total budget was allocated as climate change highly relevant and 32% as climate change relevant in Gandaki province. The trend of climate change-relevant budget allocation shows that in the last four fiscal years, both directly benefiting

(highly relevant) and indirectly benefiting (relevant) budgets are in increasing trend.

The following pie chart shows the climate change budget allocation in FY 2022/23 and bar shows the climate change budget allocation trend in the last four years.

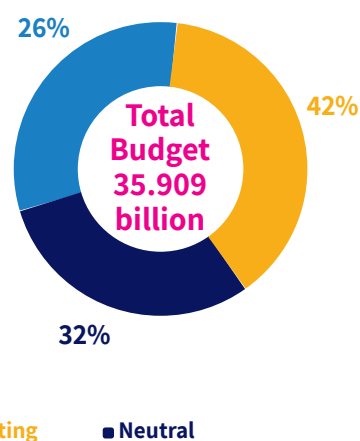
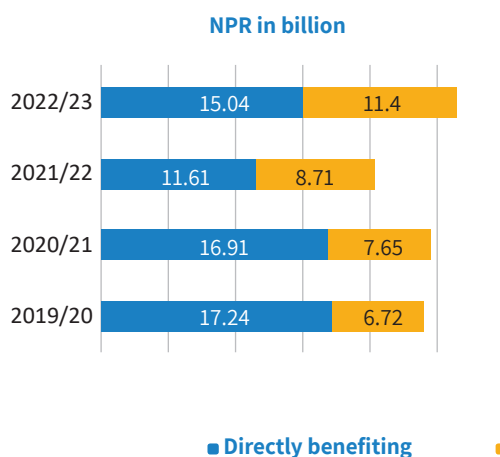


Figure 5: The trend of climate change budget in the last four years

Source: Budget speech of Gandaki Province, FY 2022/23

Figure 6: Climate change budget of Gandaki Province of FY 2022/23

Source: Budget speech of Gandaki Province, FY 2022/23

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Note: This factsheet is published under the "Multi-Actor Partnerships (MAPs) for Implementing NDCs with 100% Renewable (RE) for all in the Global South". This is made possible by the support of Federal Ministry for Economic Cooperation and Development (BMZ), Germany



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