

SAARC Dissemination Workshop for the Study on "SAARC Energy Outlook 2030"

Nepal: Strong economic growth to drive energy demand

Presenter: CRISIL Research

Research

Approach and Methodology

5-step framework towards energy outlook 2030



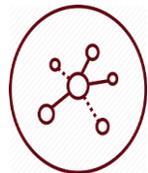
Data collection

Annual government data, energy reports for multilateral funding agencies, press releases



Long-term demographic and economic trends

Economic and demographic forecasts and impact on energy requirement due to impending changes



Sector deep dives: Power, residential, industrial, transport

Demand outlooks and forecasts, underlying factors leading to change



Fuel supply outlook

Domestic production and import of fuels, changing fuel mix owing to supply constraints, price rises, government policies



Recalibrating unconstrained demand in line with fuel supplies

Changing fuel mix, matching demand with constrained supply



Data-driven bottom-up and top-down approach, to derive demand and supply outlook of SAARC member-states until 2030

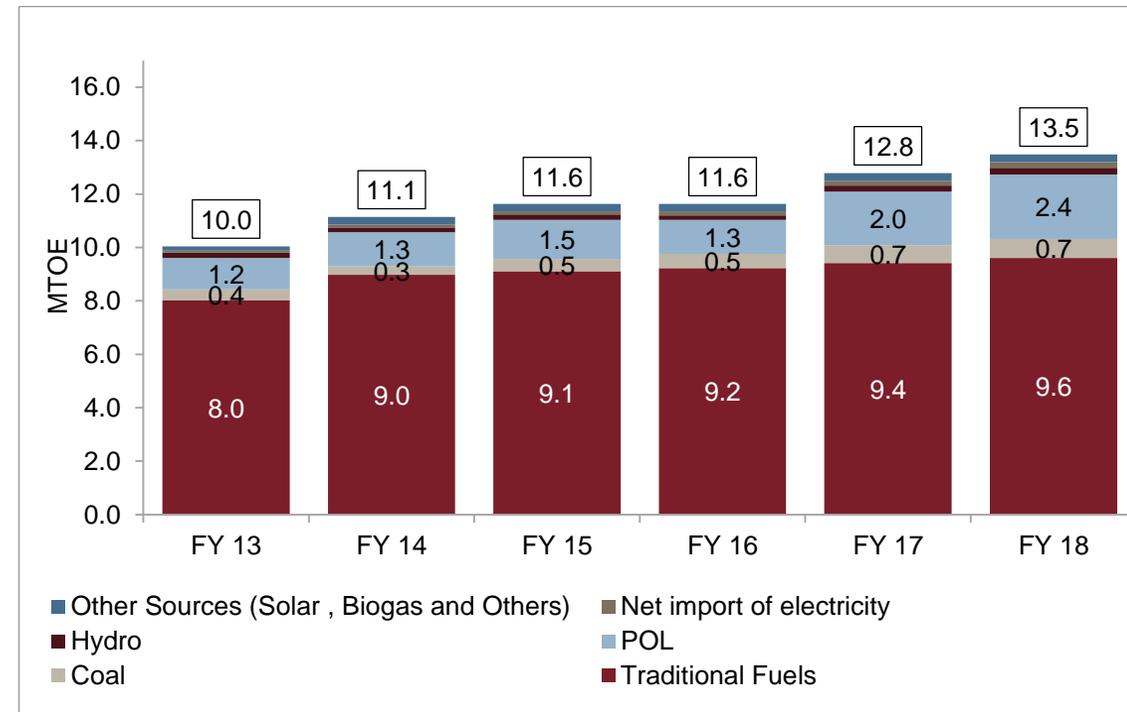
Nepal: Introduction

COUNTRY OVERVIEW

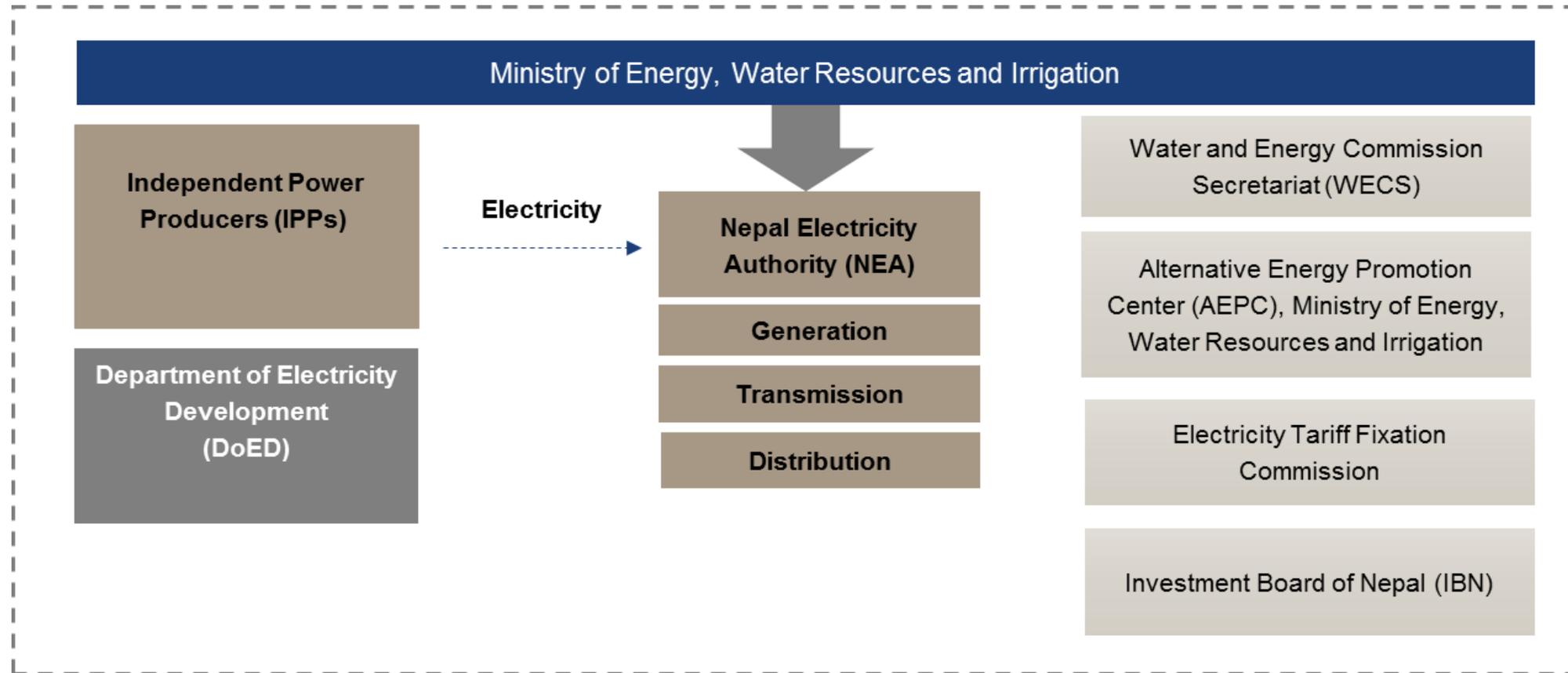
- Landlocked between India and China, Nepal's area measures ~147,181 sq km. Its population has grown at ~1.7% CAGR between fiscals 2013 and 2017. In this period, GDP has grown ~ 4.3% CAGR.
- Nepal's economy saw significant rebound from a growth rate of 0.6% in fiscal 2016 to ~6.9% in fiscal 2019

ENERGY SECTOR OVERVIEW

- Nepal's per capita energy consumption grew at ~4.5% CAGR between fiscals 2013 and 2017, to ~0.44 TOE.
- The energy supply is dominated by traditional fuels such as fuelwood, animal dung, and agricultural residue.
- Overall primary energy consumption demand grew ~7.7% CAGR between fiscals 2013 and 2015, to ~11.6 MTOE.
- Consumption stagnated in fiscal 2016. This was mainly owing to a decline in POL product imports and consumption, owing to road blockage issues. Subsequently, consumption picked up to grow at ~5.5% in fiscal 2018 on-year.



Institutional framework of power sector: Nepal



The Water and Energy Commission Secretariat is a key administrative body that supports the MoE in the formulation of policies and planning of projects in the water and energy resources sectors.

The Alternative Energy Promotion Centre (is responsible for promotion of renewable and alternative energy technologies.

The Department of Electricity Development (DoED) assists in implementation of overall government policies related to power/electricity sector.

IBM Is responsible for creating a framework for the selection and evaluation of projects, providing incentives to encourage investments, negotiating concession/project development agreements, and carrying out investment promotion activities.

Nepal: Power Demand-Supply Position

POWER DEMAND SUPPLY REVIEW

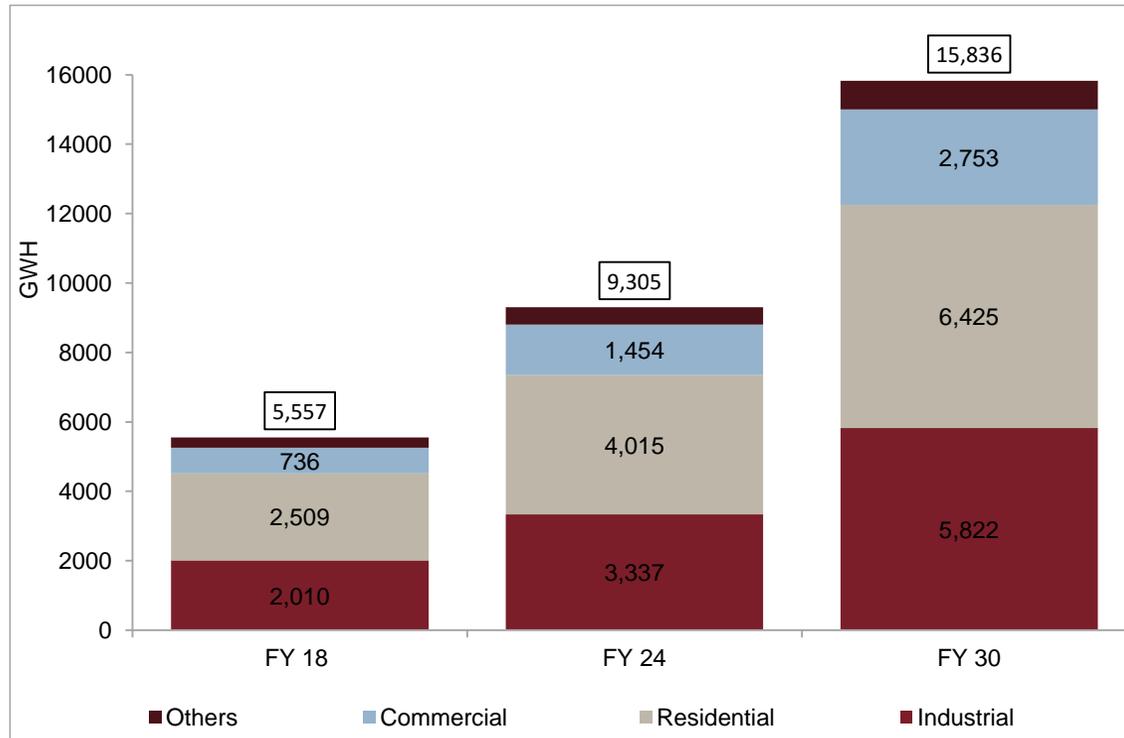
- Electricity sales in Nepal have grown ~12% CAGR between fiscals 2013 and 2018 (estimates). About 5,557 MU were sold in fiscal 2018, with residential and industrial categories accounting for ~45% and ~36% share, respectively, in the total power sales.
- Hydro stations are the key source for electricity supply, accounting for ~95% of the total power installed capacity of the country.
- In addition to hydro, solar (0.1 MW) and oil-based thermal power plants (53.4 MW) also contribute to total electricity production in Nepal
- Nepal's total power installed capacity stood at 1074.14 MW. At present, Nepal has an installed capacity of 1,020.6 MW of hydro power stations. IPP hydro power plants contribute to 512.6 MW of hydro capacity

POWER DEMAND SUPPLY OUTLOOK

- Power demand is expected to increase from ~5,557 MUs in fiscal 2018 to ~15,836 MUs in fiscal 2030, driven by rising demand from residential and industrial sectors.
- As against the total demand of ~15,836 MUs in fiscal 2030, total domestic power supply (minus system losses) is estimated at ~15,646 MUs, with total installed power capacity of ~4,457 MW
- About 3,256 MW of new hydro capacity is expected to be commissioned by Nepal by fiscal 2030. Hydro power plants to contribute ~96% share in the total installed capacity
- Present installed hydro capacity is only ~2% of the country's total potential of 43,000 MW. Development of more hydro plants will not only help Nepal meet the increasing power demand from existing consumers, but also help supply to consumers who do not have any access to electricity (which was ~40% of the population in 2017)

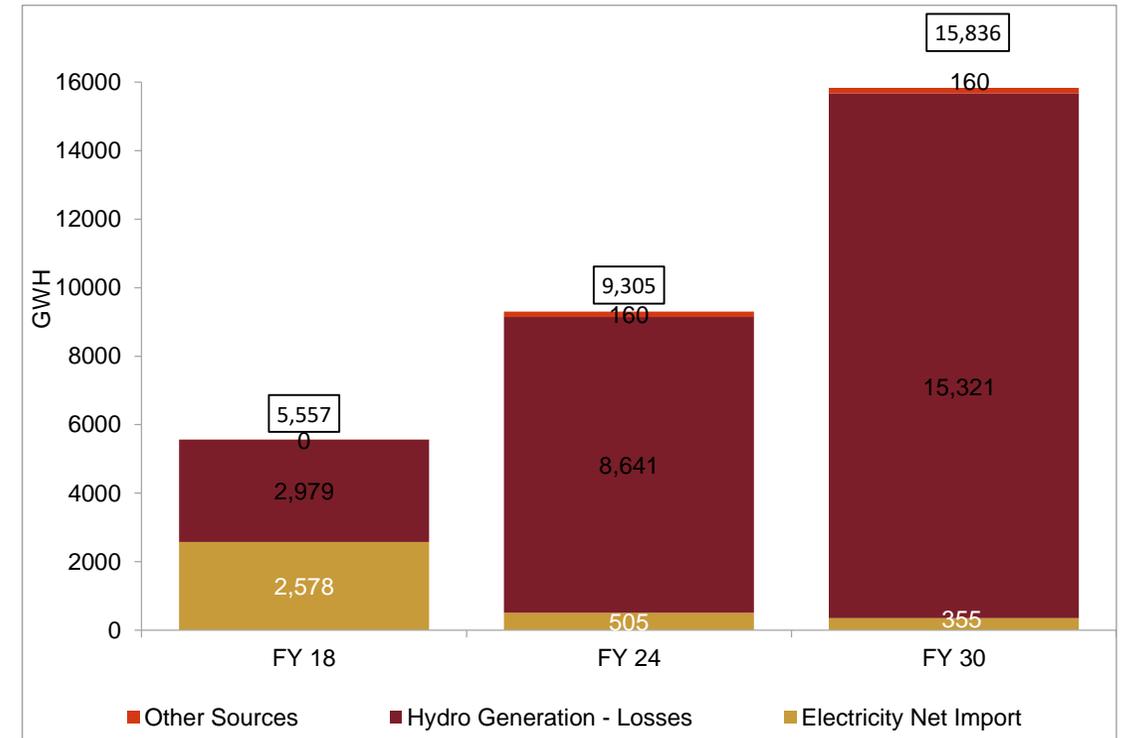
Nepal: Power Demand-Supply Position

POWER DEMAND OUTLOOK



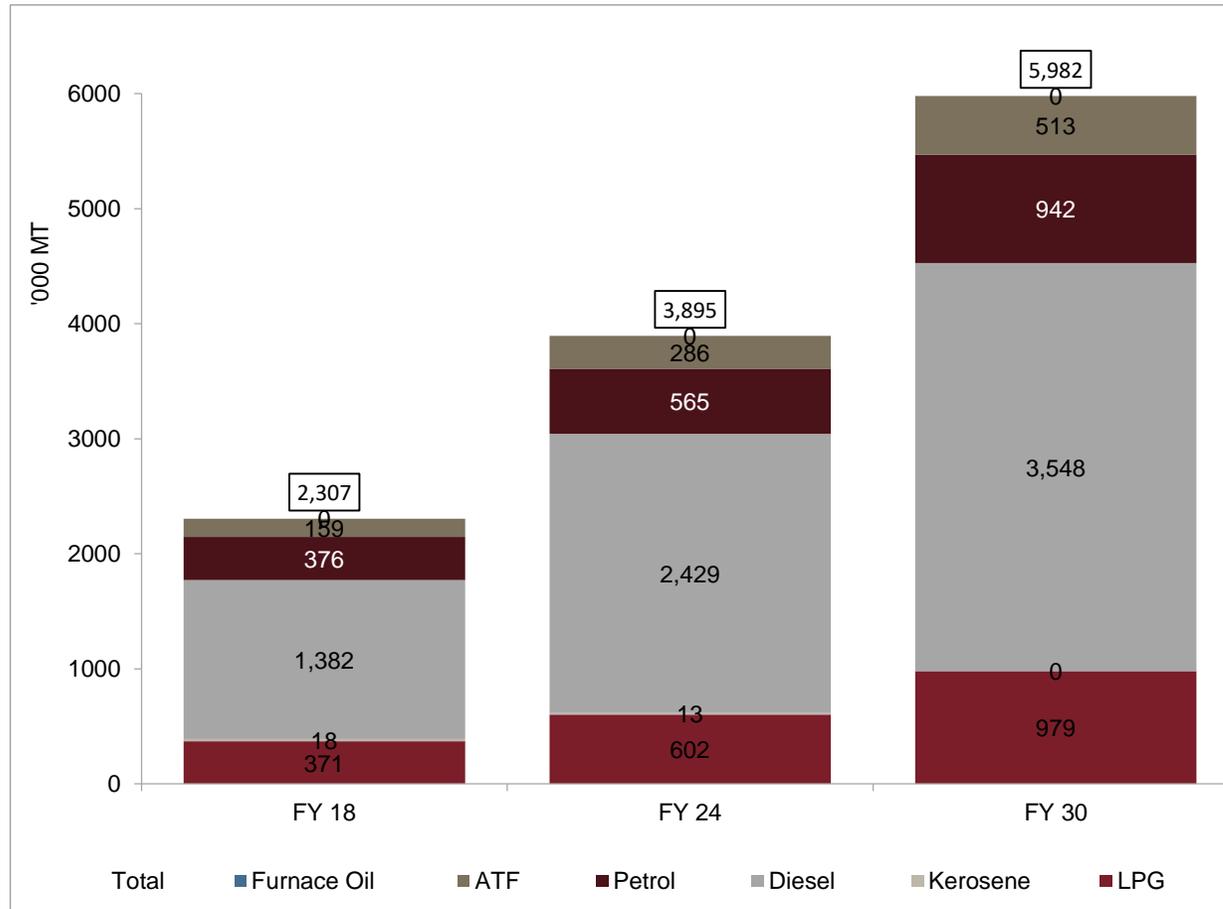
- In terms of growth rate, power demand is estimated to grow at ~9.1% CAGR, which is close to the electricity demand forecast projected by the Water and Energy Commission Secretariat under BAU scenario.

POWER SUPPLY OUTLOOK



- It is estimated that net electricity import will reduce considerably, but the country might still need to import power to meet the load requirement in the dry season.

Nepal: POL demand Outlook



- Consumption of POL products in Nepal is expected to clock 8.3% CAGR from fiscal 2018 to 2030, mainly driven by strong growth in the transport and industrial sectors
 - Diesel consumption by the transport sector, which constitutes around 80% of the country's total diesel demand, is expected to clock 9% CAGR, led by the growth in commercial vehicles.
- The overall import of POL products is expected to rise from ~2.3 million tonne in fiscal 2018 to ~6 million tonne in fiscal 2030.
- Nepal is a net importer of POL products with majority of the demand being met by Imports from India

Nepal : Non-Conventional Energy (1/2)



Hydro

- Power generation from hydropower plants accounted for ~99.9% of total power generation in fiscal 2018.
- Hydro power plants are expected to remain a significant contributor to power generation, with ~96% share in the total installed capacity. About 3,256 MW of new hydro capacity is expected to be commissioned by Nepal by fiscal 2030.
- Going forward, with the commissioning of the new hydropower capacity, the share of hydro energy in the overall primary energy consumption of the country is expected to grow from ~2% in fiscal 2018 to ~6% by fiscal 2030.

Present (FY18)

~1,020 MW

Outlook (FY30)

~4,300 MW



Solar

- There are no major solar installations in the country.
- Based on targets set up by renewable energy targets, LOI/ LOA issued and realistic estimates, solar installed capacities are expected to reach ~125 MW by 2030

<10 MW

~125 MW



Wind

- There are no major wind installations in the country
- Going forward, no significant wind capacity additions are expected due to mountainous terrain and technological challenges

<10 MW

<10 MW

Nepal : Non-Conventional Energy (2/2)



Biomass

- Traditional fuels, in the form of fuel wood, animal dung and agricultural residue, contributed ~71% of the total primary energy consumption of Nepal in fiscal 2018 (E). Overall, traditional fuel consumption clocked ~3.7% CAGR over fiscals 2013-2018
- Traditional fuels are mostly consumed by the residential sector for heating and cooking purposes. In fiscal 2018 (E), the residential sector accounted for more than 85% of total traditional fuel consumption, the rest by the commercial and industrial sector
- Fuel wood is the largest contributor to the primary energy demand of the commercial sector. At present, fuel wood accounts for ~55% of the overall energy consumption of the commercial sector.
- With increased availability of clean energy in the form of electricity, traditional fuel consumption is expected to witness slow growth of ~1.6% CAGR from fiscal 2018 to 2030. The overall share of traditional fuels in the total primary energy consumption of Nepal is expected to decline, but not significantly so, as this fuel is cheap and easily available, especially in rural Nepal.

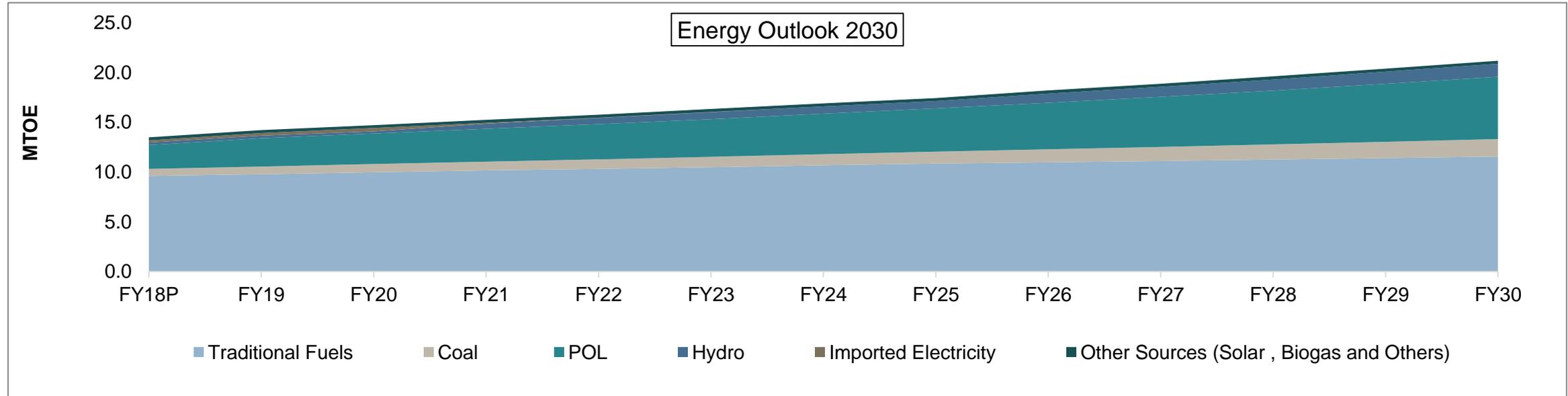
Present (FY18)

9.6 MTOE

Outlook
(FY30)

11.6 MTOE

Nepal: Energy Outlook 2030



- The country's overall primary energy consumption is expected to reach ~21.2 MTOE by fiscal 2030, an increase of 1.6 times as compared with fiscal 2018.
- **Traditional fuels**, which met around 71% of total primary energy requirement of Nepal in fiscal 2018, are expected to see their share decline to 54% by fiscal 2030 with the share of cleaner fuels rising.
- Power supply, which is dominated by **hydro** power plants, is expected to grow by around 4.1 times to 4,457 MW during the period, mainly driven by the addition of new hydel plants.
- Growth in industrial activities is expected to increase the total **coal** demand by around 2.5 times to 2,993 kilo tonne by fiscal 2030 compared with 1206 kilo tonne in fiscal 2018.
- Consumption of **POL** products is expected to grow at a CAGR of 8.3% between fiscals 2018-2030 to reach ~6 million tonne, mainly driven by strong growth in the transport and industrial sectors led by a GDP growth of 4.5-5.0%.



Thank You