



# Energy Industry in Myanmar



## General State of the Economy

Myanmar, officially the Republic of the Union of Myanmar (called Burma until 1989), is a country in Southeast

Asia bordered by Bangladesh and India to its northwest, China to its northeast, Laos and Thailand to its east and southeast, and the Andaman Sea and the Bay of Bengal to its south and southwest.

Myanmar/Republic of the Union of Myanmar		
Capital: Naypyidaw	Density: 76/km <sup>2</sup>	Currency: Kyat (K) (MMK)
Official languages: Naypyidaw	Life expectancy at birth: 66.80 years	GDP (PPP): \$277.767 billion (2023 est.)
National Day: 04 January	Area (land): 676,570 km <sup>2</sup>	GDP - per capita (PPP): \$5,124 (2023 est.)
Population: 57,526,449 (2022 est.)	Coastline: 2,227 km	Internet country code: .mm

According to 2023 statistics, Myanmar, which ranks 42<sup>nd</sup> in the world in terms of the size of its territory, is home to around 58 million people. In terms of population density, the country occupies the 135<sup>th</sup> place in the world. The length of the country's coastline is 1,930 km. Myanmar is defined de jure as a parliamentary republic, de facto the country is controlled by the military junta called State Administrative Council. Myanmar is divided into 7 regions, 7 states and 1 union territory. The national capital is the city of Naypyidaw and the largest city is Yangon [1,2,3,4,5].

The rating positions of Myanmar relative to other countries have been determined for an extensive list of economic, energy, innovative and educational indices, as well as for metrics reflecting the state of the environment. The economic indices include, for example, GDP per capita, annual average GDP growth, high-technology exports, and others. The list of energy indices includes proven reserves of oil, gas and coal, production-consumption ratio combined, and energy use, etc. Each

of the indices has a ranked list of included member countries. Since the number of countries in each rating is different for each index, the positioning of the country of interest is displayed on a special chart, where the vertical axis is a uniform relative scale from 0 to 1, whereas the horizontal axis denominates the various indices and respective numbers relating to the descriptions given underneath.

Thus, in such a relative "0-1" diagram, the country's position is marked with a dot in proportion to its location in the original rating list. If the country is among the leaders regarding the selected indicator, it will be marked close to 1 in the upper green zone on the relevant chart "0-1", if the country is an outsider in the rating list, then it will be marked in the lower red zone of the chart "0-1", etc.

Ranking position of Myanmar for list of economic indices:



Sources:

1. GDP (purchasing power parity), 2020 est. / The World Factbook/Library/Central Intelligence Agency \*228
  2. GDP - per capita (PPP), 2020 / The World Factbook/Library/Central Intelligence Agency \*229
  3. Inflation rate (consumer prices), 2019 est. / The World Factbook/Library/Central Intelligence Agency \*228
  4. Charges for the use of intellectual property, receipts (BoP, current US\$), 2020 / International Monetary Fund, Balance of Payments Statistics Yearbook, and data files. / License: CC BY-4.0 \*88
  5. The Global Competitiveness Index 2019 / Rankings / Reports / World Economic Forum \*141
  6. High-technology exports (current US\$) 2019-2020 / United Nations, Comtrade database through the WITS platform / License: CCBY-4.0 / Data \*134
  7. 2021 Index of Economic Freedom / International Economies / The Heritage Foundation \*178
  8. Reserves of foreign exchange and gold, 2017 est. / The World Factbook / Library / Central Intelligence Agency \*195
  9. Annual average GDP growth in %, for the last 10 years (2011-2020) / World Bank national accounts data, and OECD National Accounts data files / License: CC BY-4.0 \*206
  10. Public debt (% of GDP), 2017 est. / The World Factbook / Library / Central Intelligence Agency (from smallest to largest) \*210
- \* Total number of countries participating in ranking

Figure 1. Economic indices of Myanmar

The highest indicators for Myanmar depicted in the ranking are the Annual average GDP growth (0.84) and Public debt as % of GDP (0.74). Gross domestic product based on purchasing power parity is relatively high (0.73), which is not the case for GDP per capita (0.22).

## Energy resources

Myanmar has significant proven reserves of fossil fuels in the form of natural gas. The share of natural gas is 0.31% of the world's total, the share of oil is 0.008%. The country's coal reserves are only 0.0006% of the world total. The share of Myanmar's population makes up about 0.7% of the world's population. However, at the same time,

The weakest spots in Myanmar economic indicators is Inflation rate (0.11). Data concerning the use of intellectual property is unavailable and Myanmar is not included into the Global Competitiveness Index.

gas reserves in the country are significantly lower than those of the world leaders. For instance, they are about 36 times less than in Qatar and about 10 times less than in United Arab Emirates [6].

In terms of tons of oil equivalent, according to 2024 data, conventional proved reserves by fuel type were: 96.1% – natural gas, 3.2% – oil, and 0.7% – coal (Fig.5).

Table 1. Fossil energy resources of Myanmar

Resource/explanations	Crude oil*	Natural gas*	Coal	Oil shale (kerogen)**
<b>Value</b>	0,14(0,008%)	22,5(0,31%)	7(0,0006%)	2000
<b>Unit</b>	billion barrels	Tcf	million short tons	million barrels
<b>Year</b>	2021	2020	2021	2008
<b>Source</b>	[6]	[6]	[6]	[7]

\*share of the country's reserves in world total is provided in brackets

\*\*in-place resources

Hydropower plays a significant role in Myanmar's power generation, contributing about 97% to all renewable electricity produced in 2021, followed by bioenergy (2.1%) and solar PV (0.7%). However, the country does

not completely use its overall hydropower potential (140,000GWh per year [12]). Moreover, Myanmar has tremendous potential to develop renewables beyond hydropower. The solar potential of the country is estimated at

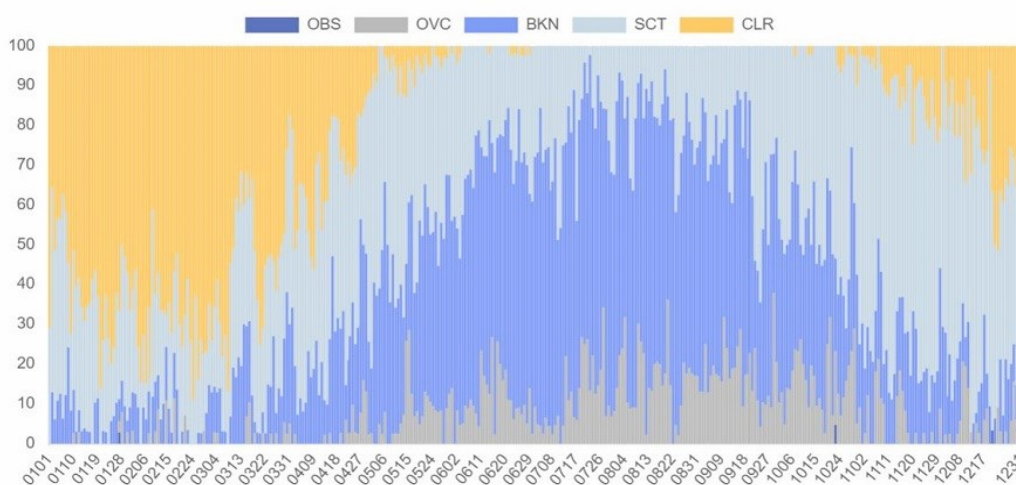
**Table 2. Renewable energy resources of Myanmar**

Resource/ explanations	Solar Potential (GHI)*	Wind Potential (50 m)*	Bio Potential Agricultural area	Bio Potential Forest Area	Geothermal Potential**	Municipal Solid Waste
<b>Value</b>	4.7-5.2	3.0-5.0	19.9	43.7	140	0.39
<b>Unit</b>	kWh/m <sup>2</sup> /day	m/s	% of land area	% of land area	GWh/year	kg/per capita/day
<b>Year</b>	2020	20120	2020	2020	2013	2018
<b>Source</b>	[8]	[9]	[10]	[11]	[12]	[13]

\*for most of the territory of the country

4.7-5.2 kWh/m<sup>2</sup>/day, in the central dry zone up to 5.5 kWh. Along the coast in the western part of the country and in the Tanintharyi Region there is a good potential for wind power with the wind speed reaching 6 m/s at a

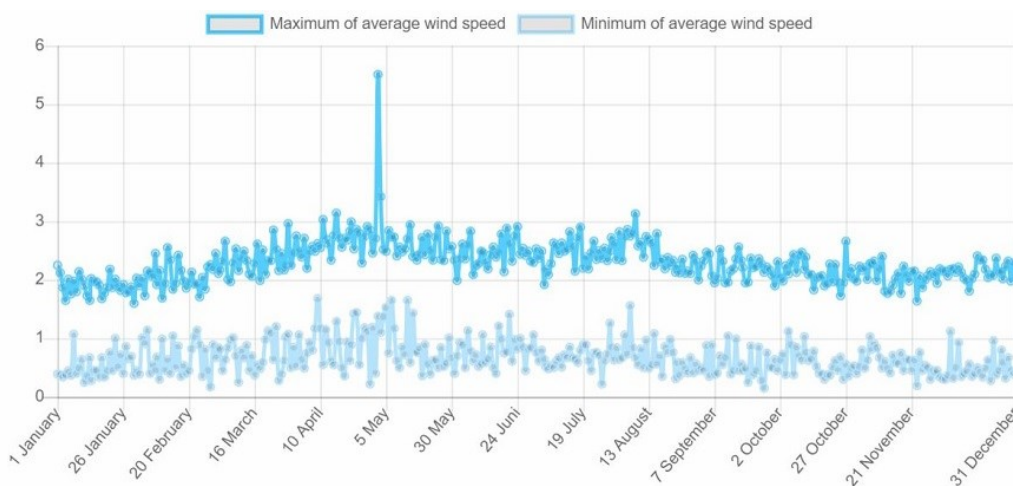
**NYAUNG-U.** Country: Myanmar. Latitude: 21.2. Longitude: 94.92 Sky cover, %



CLR - clear, SCT - scattered from 1/8 TO 4/8, BKN - broken from 5/8 TO 7/8, OVC - overcast, OBS - obscured, POB - partial obscuration

Please see details [here](#).

**YANGON INTL.** Country: Myanmar. Latitude: 16.91. Longitude: 96.13. 10 m. Wind speed, m/s



Please see details [here](#).

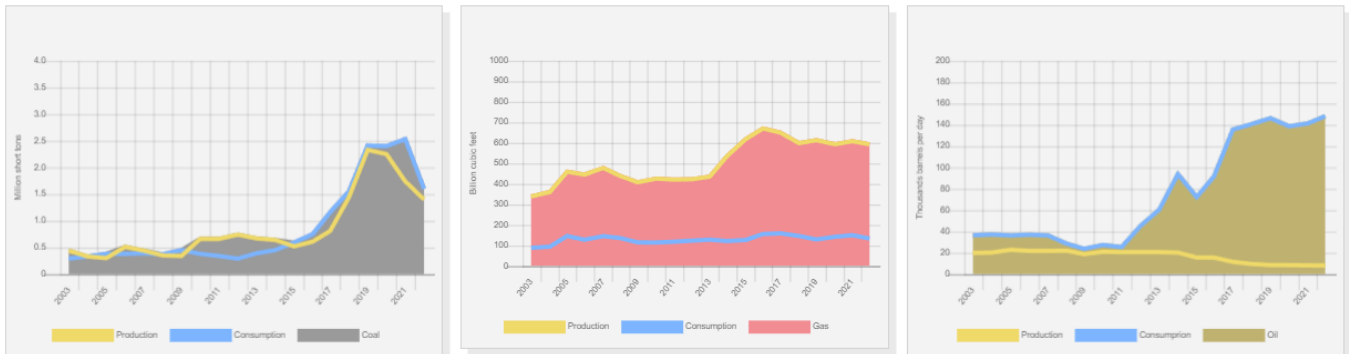
height of 50 m. The biodiversity of Myanmar, namely the rather vast agricultural and forested area, forms a worthy resource base for the development of a number of bio-energy technologies. Today, biomass plays an important

role in Myanmar's energy sector, but this area is extremely low-tech and currently uses mainly traditional methods of consuming biomass sources, such as heating and cooking, open burning, animal feed, etc.

## Energy balance

According to [6], in 2022 in Myanmar, the total production of primary energy was 0.699 quadrillion Btu, while

consumption was at the level of 0.501 quadrillion Btu. Thus, the share of domestic consumption in primary energy production was 71.7%. This makes Myanmar a country independent of energy imports.

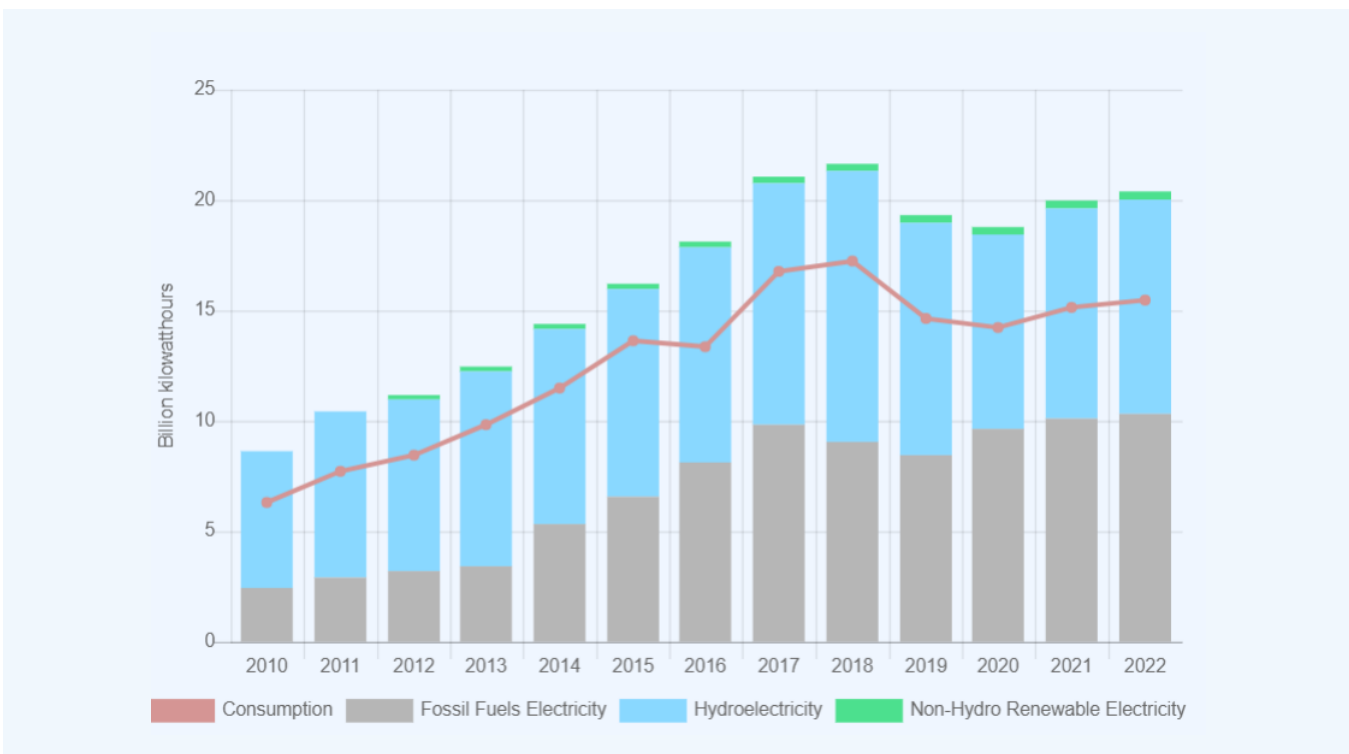


Source: U.S. Energy Information Administration (Mar 2024) / <https://www.eia.gov/>

Figure 2. Production and consumption of fossil fuels in Myanmar (left–coal, in the center– gas, right–oil)

As for the ratio of production to consumption of fossil fuels in Myanmar, the picture is contrasting. For example, oil production lags far behind demand: in 2022, oil consumption was more than eighteen times higher than production. With gas, the picture is quite the opposite: gas production is four times higher than its domestic consumption. Coal is a fossil fuel whose production and consumption are roughly at the same level, with a nearly three-fold increase in production compared to 2015.

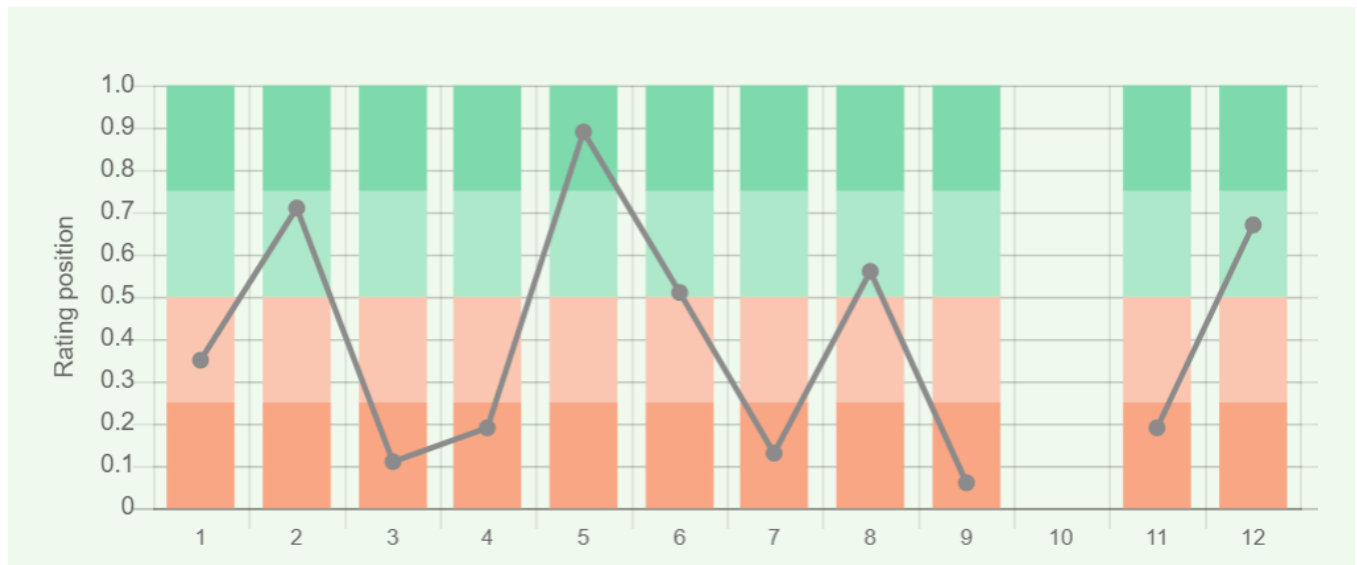
Total electricity generation in Myanmar has grown by almost 200% over the past ten years. In 2022, approximately 58% of electricity was produced by thermal power plants and 40% – by hydroelectric power plants. Renewables also contribute to the overall balance of electricity generation, reaching a share of almost 2% in 2022. This is not a very high figure, but by comparison, in 2010 there were no renewable sources other than hydro in the total mix of electricity produced.



Source: U.S. Energy Information Administration (Mar 2024) / <https://www.eia.gov/>

Figure 3. Electricity production in Myanmar

The volume of electricity generation in Myanmar exceeds the volume of consumption. However, it should be taken into account that only 51% of the population has access to electricity. In addition, due to the bad state of electric grids and other problems, there are large distribution losses, exceeding 3.4 billion kWh per year [3].



Sources:

1. Crude oil proved reserves, 2021 / International Energy Statistic/Geography / U.S. Energy Information Administration (Nov 2021)\*98
  2. Natural gas proved reserves 2021 / International Energy Statistic / Geography / U.S. Energy Information Administration (Nov 2021) \*99
  3. Total recoverable coal reserves 2019 / International Energy Statistic / Geography / U.S. Energy Information Administration (Nov 2021) \*81
  4. Combination production-consumption for Crude oil 2018 / International Energy Statistic / Geography / U.S. Energy Information Administration (Nov 2021) \*219
  5. Combination production-consumption for Natural gas 2019 / International Energy Statistic / Geography / U.S. Energy Information Administration (Nov 2021) \*123
  6. Combination production-consumption for Coal 2019 / International Energy Statistic / Geography / U.S. Energy Information Administration (Nov 2021) \*128
  7. Electricity – from other renewable sources (% of total installed capacity), 2017 est. / The World Factbook / Library / Central Intelligence Agency \*170
  8. GDP per unit of energy use (PPP per unit of oil equivalent), 2020 \*66
  - Primary energy consumption - BP Statistical Review of World Energy 2021/BP/GDP (purchasing power parity) - The World Factbook/Library/Central Intelligence Agency
  9. Energy use (primary energy use of oil equivalent per capita) 2020 \*127
  - Primary energy consumption – BP Statistical Review of World Energy 2021; Population - United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, custom data acquired via website. Retrieved 15 November 2021\*66
  10. The Global Energy Architecture Performance Index Report (EAPI) 2017 / Rankings / Reports / World Economic Forum
  11. Electric power consumption (kWh per capita), 2016 \*217
  - Electricity Consumption - The World Factbook / Library / Central Intelligence Agency; Population - United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, custom data acquired via website. Retrieved 15 November 2021
  12. Combination of electricity production-consumption (kWh)/The World Factbook/Library/Central Intelligence Agency \*216
- \* Total number of countries participating in ranking

Figure 4. Energy indices of Myanmar

Myanmar is well positioned (0.71) in terms of natural gas reserves and the ratio of gas production to consumption (0.19). Myanmar is not included in the Global Energy Architecture Performance Index Report, leaving this indicator blank. In terms of such indicators as Electricity – from other renewable sources (0.13), Energy use per capita (0.06), Myanmar’s rating positions are substantially lower than the world average. According to the primary statistics, the country has a relatively good electricity generation to consumption ratio (0.67). However, as mentioned above, without taking into account the large losses in the distribution of electricity and the limited access of the population to electricity, these data do not reflect the real picture of energy supply. Against this background, Myanmar

## Energy Infrastructure

A territorial map showing distribution of the largest infrastructure projects of the fossil fuel sector in Myanmar is displayed in Figure 5. As previously mentioned, natural

gas reserves account for 96.1% of conventional proved reserves, oil for 3.2% and coal for 0.7% (Fig.5). The main gas fields under development are offshore and located in the southwestern part of Myanmar, while the main oil fields are located closer to the center of the country.

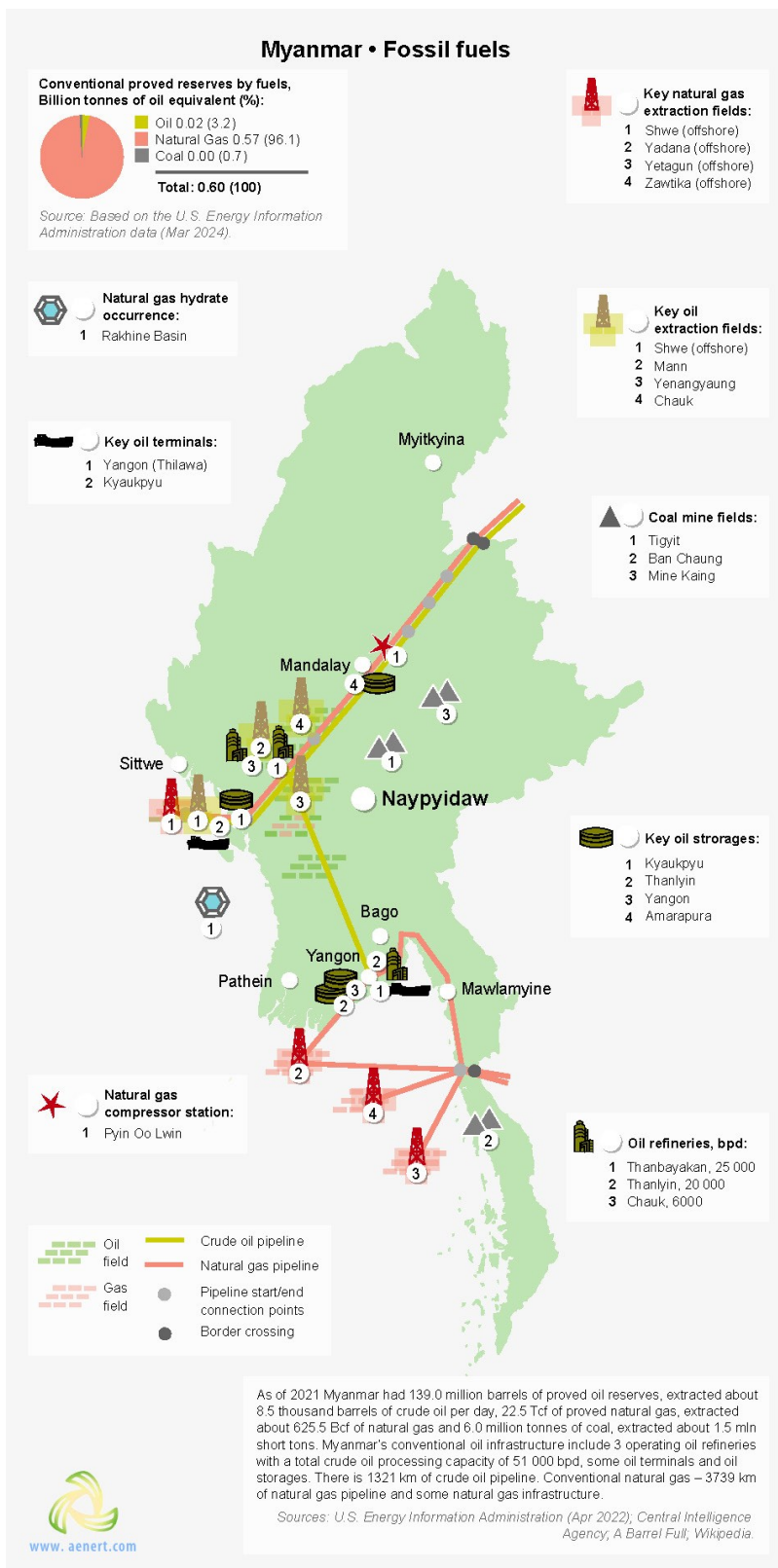


Figure 5. Basic infrastructural facilities of the fossil fuel sector in Myanmar

Myanmar's conventional oil infrastructure includes several refineries in operation, some oil terminals and oil storages. There is 1321 km of crude oil pipelines and 3739 km of natural gas pipelines. Two of them, Myanmar-China Natural Gas Pipeline and the Myanmar-China Oil Pipeline,

start from the West coast in Myanmar's Rakhine State and end in China's Yunnan region. Coal mining is carried out mainly in the center and in the south of the country. About 58% of Myanmar's electricity is generated by power plants running on fossil fuels, most of which are gas-fired.

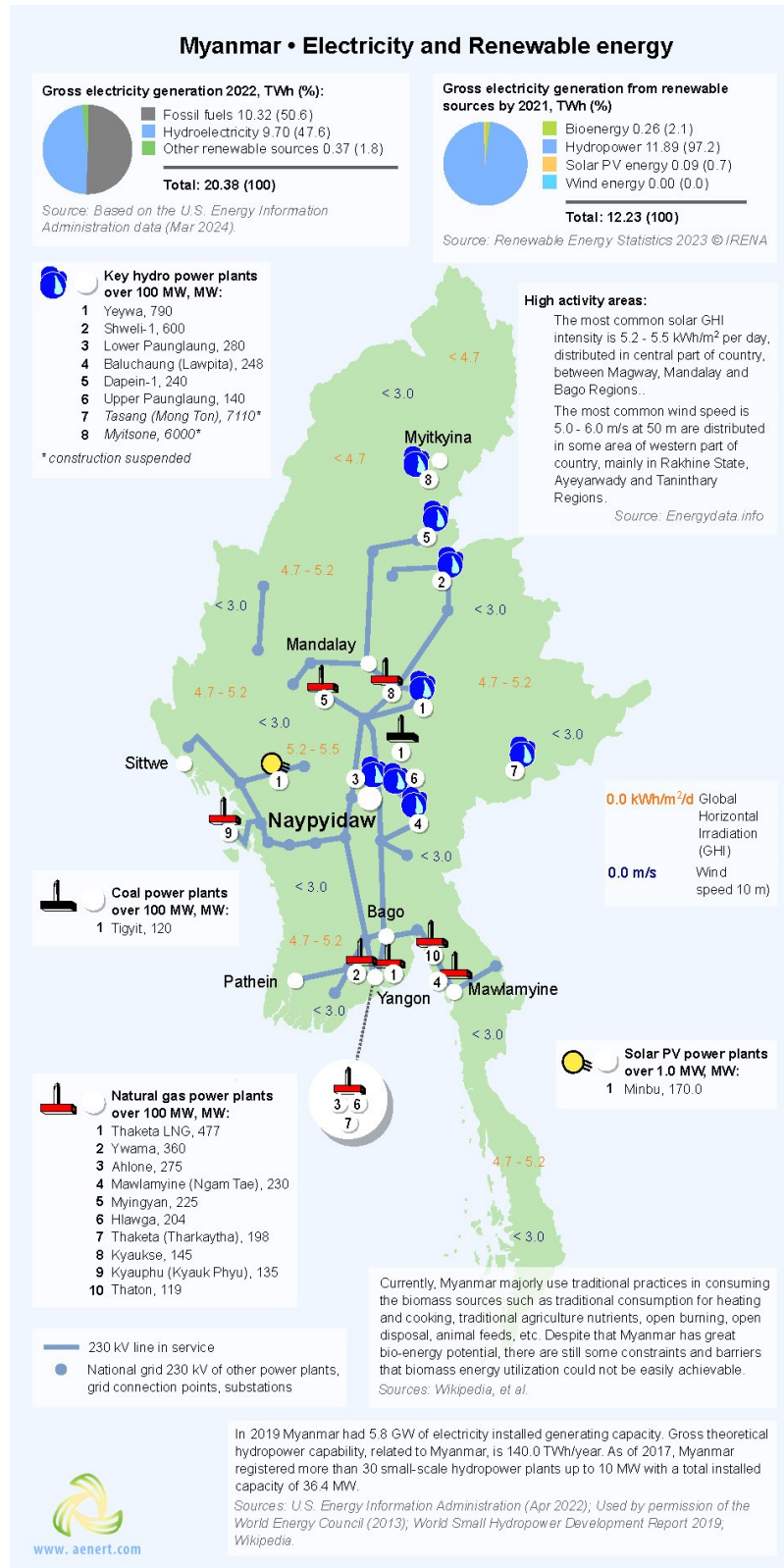


Figure 6. Electricity production and renewable energy in Myanmar

The largest gas-fired power plants are located around the bordering area of Yangon region and Mon State in the south of the country. In Yangon region is also located the 477-megawatt LNG power plant Thaketa, the first LNG-to-power commissioned in Myanmar.

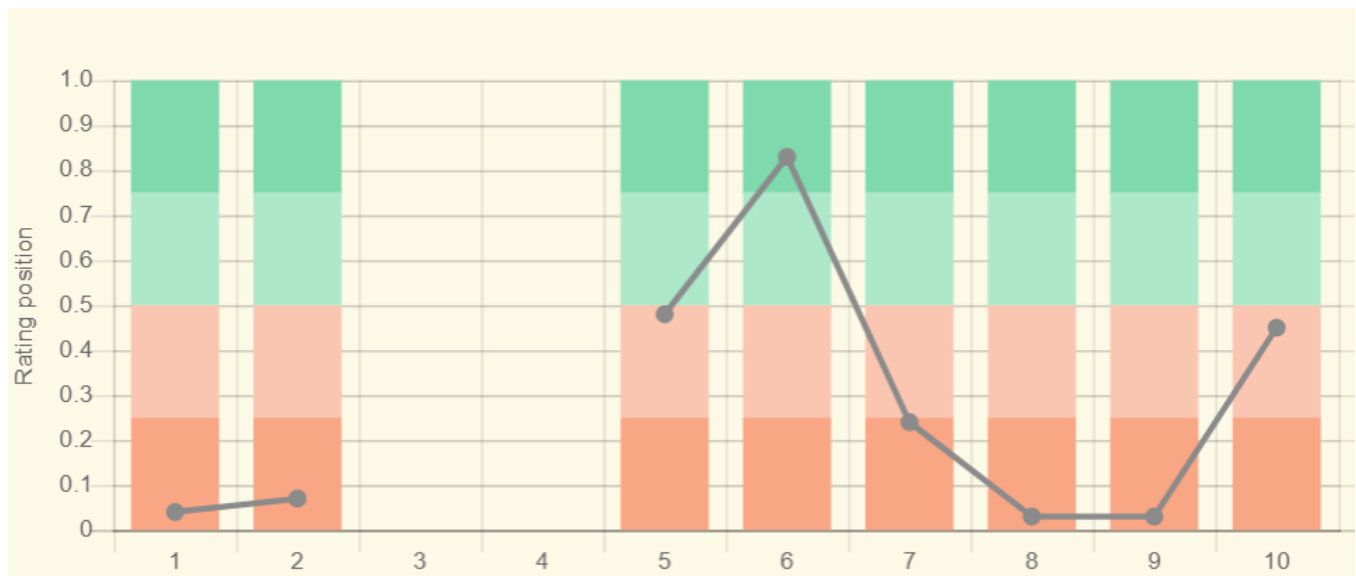
Myanmar has an extensive network of hydroelectric power plants. They produce more than 40% of electricity. The largest of them is the Yeywa, is a 790MW hydroelectric power plant located in central Myanmar on the Myitnge River. Looking at all renewable energy sources, in 2020, hydropower plants dominated the volume of electricity generated (over 97%), followed by bioenergy (2%) and solar photovoltaics (about 0.6%). The Minbu Solar

Power Plant in the Mgway Region is considered to be one of the largest solar plants in Southeast Asia.

The Myanmar government's energy policy aims to ensure the country's energy independence by both increasing national production of available primary energy resources and developing renewable energy. One of the important challenges to be addressed in the country is to ensure the universal electricity supply that would be possible if the rich potential of renewable energy sources, including biomass, solar and wind, were harnessed. According to Myanmar's Energy Master Plan, the government planned for 87% electrification by 2030, although the state of things today shows that this goal will not be achieved [14].

## Education and Innovation

The following chart shows Myanmar's positions in terms of education and innovation:



Sources:

1. The Global Innovation Index 2021, Rankings / Knowledge / World Intellectual Property Organization / Cornell University, INSEAD, and WIPO (2021): Energizing the World with Innovation. Ithaca, Fontainebleau, and Geneva \*132
  2. Patent Grants 2011-2020, resident & abroad / Statistical country profiles / World Intellectual Property Organization \*185
  3. Patents in Force 2020 / Statistical country profiles / World Intellectual Property Organization \*109
  4. QS World University Rankings 2022 \*97
  5. SCImago Country Rankings (1996-2020) / Country rankings / SCImago, (n.d.). SIR-SCImago Journal & Country Rank [Portal]. Retrieved 17 Nov 2021 \*240
  6. Internet users in 2018 / The World Factbook / Central Intelligence Agency \*229
  7. Internet users in 2018 (% Population) / The World Factbook / Central Intelligence Agency \*229
  8. Government expenditure on education, total (% of GDP), 2019 / United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics. License: CCBY-4.0 / Data as of September 2021 \*177
  9. Research and development expenditure (% of GDP), 2018 / UNESCO Institute for Statistics. License: CCBY-4.0 / Data \*119
  10. Scientific and technical journal articles, 2018 / National Science Foundation, Science and Engineering Indicators. License: CCBY-4.0 / Data \*197
- \* Total number of countries participating in ranking

Figure 7. Indices of education and innovation in Myanmar

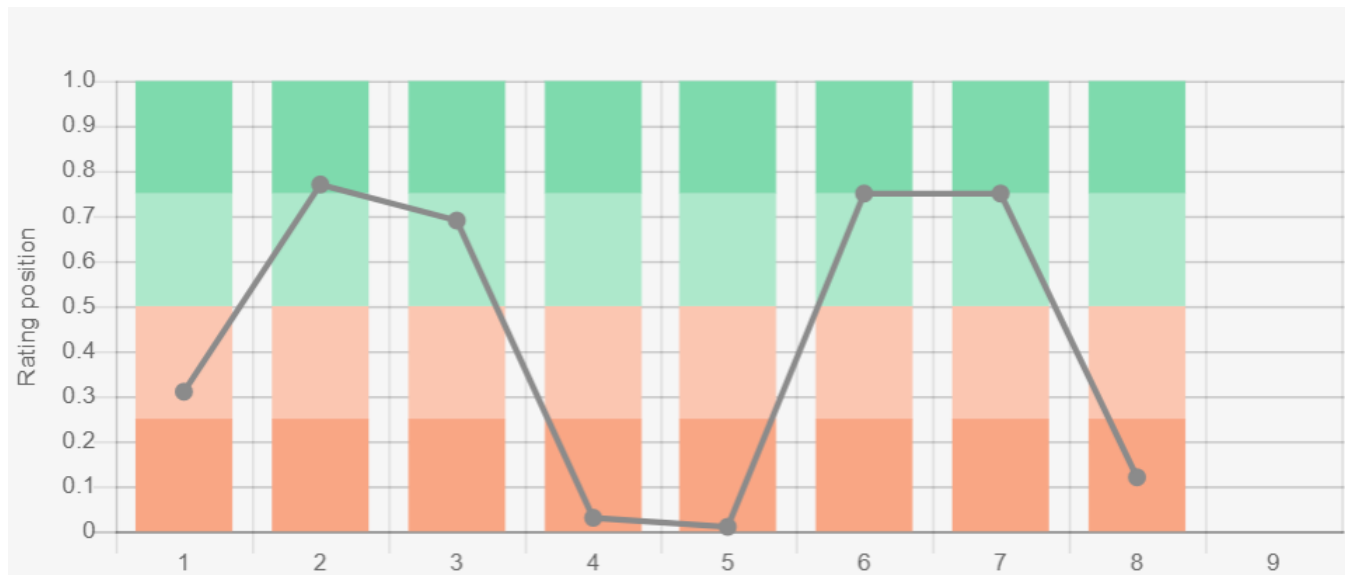
The majority of indexes describing Myanmar's positioning in various international ranking lists related to education and innovation are below the world average. The country's lowest positions are in the Global Innovation Index 2021 (0.04), Government expenditure on education (0.03) and Research and development expenditure (0.03). In addition, there is no information on Patents in Force in the country and Myanmar universities are not included in the QS World University Ranking, so these two positions

appear empty in the chart above. Because of its large population, Myanmar has a good score on the absolute number of Internet users (0.83), but if you look at the number of users in proportion to the entire population, the country is among the outsiders in this regard (0.24). Myanmar has an average score in SCImago Country Rankings (0.48) and Scientific and Technical Journal articles (0.45).



## Ecology and Environment Protection

Indicators related to environmental issues are presented in the following diagram:



Sources:

1. CO2 total emission by countries 2020 / European Commission / Joint Research Centre (JRC) / Emission Database for Global Atmospheric Research (EDGAR)\*208
  2. CO2 per capita emission 2020/European Commission/Joint Research Centre (JRC) / Emission Database for Global Atmospheric Research (EDGAR) \*208
  3. Forest area 2020 (% of land area) / The Global Forest Resources Assessment 2020 / Food and Agriculture Organization of the United Nations \*234
  4. Forest area change 2010-2020 (1000 ha/year) / The Global Forest Resources Assessment 2020 / Food and Agriculture Organization of the United Nations \*234
  5. The Environmental Performance Index (EPI) 2020 / Rankings / Yale Center for Environmental Law & Policy / Yale University \*180
  6. Annual freshwater withdrawals (m3 per capita), 2017 \*179  
Annual freshwater withdrawals, total (billion m3), 2017 – Food and Agriculture Organization, AQUASTAT data. /License: CC BY-4.0;
  7. The National Footprint Accounts 2017 (Biocapacity Credit / Deficit) / Global Footprint Network \*188
  8. Methane emissions (kt of CO2 equivalent), 2018 / Data for up to 1990 are sourced from Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States. Data from 1990 are CAIT data: Climate Watch. 2020. GHG Emissions. Washington, DC: World Resources Institute. Available at: License : Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) \*191
  9. The Climate Change Performance Index (CCPI) 2022 / Overall Results / Jan Burck, Thea Uhlich, Christoph Bals, Niklas Höhne, Leonardo Nascimento / Germanwatch, NewClimate Institute & Climate Action Network \*60
- \* Total number of countries participating in ranking

Figure 8. Environmental indices of Myanmar

Myanmar belongs to the group of countries with the large amount of carbon dioxide (0.31) and methane emissions (0.12). These facts are also responsible for its low ranking in the Environmental Performance Index (0.01). In addition, among the problematic environmental issues of the country should be noted the negative trend in the change in the area of forests in 2010-2020 (0.03). However, thanks to the still large amount of forest resources (0.69) and overall biological diversity, Myanmar ranks fairly well in The National Footprint Accounts (0.75). The country is not included in the Climate Change Performance Index (CCPI) 2022, so this position in the chart remains unfilled.

In general, the environmental situation in Myanmar requires significant improvement.

## References

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- [1] List of sovereign states and dependencies by area / Wikipedia / [https://en.wikipedia.org/wiki/List\\_of\\_sovereign\\_states\\_and\\_dependencies\\_by\\_area](https://en.wikipedia.org/wiki/List_of_sovereign_states_and_dependencies_by_area)
- [2] List of countries and dependencies by population density / Wikipedia / [https://en.wikipedia.org/wiki/List\\_of\\_countries\\_and\\_dependencies\\_by\\_population\\_density](https://en.wikipedia.org/wiki/List_of_countries_and_dependencies_by_population_density)
- [3] Myanmar / The-world-factbook / Library / Central Intelligence Agency / <https://www.cia.gov/>
- [4] GDP, PPP (constant 2011 international \$) / World Bank, International Comparison Program database. License: CC BY-4.0 / Data / The World Bank / <http://www.worldbank.org/>
- [5] GDP per capita, PPP (current international \$)/ World Bank, International Comparison Program database. License: CC BY-4.0 / Data / The World Bank / <http://www.worldbank.org/>
- [6] International Energy Statistic / Geography / U.S. Energy Information Administration (Dec 2022) / <http://www.eia.gov/>
- [7] 2010 Survey of Energy Resources (PDF) / 2010 / Uploads / World Energy Council / <https://www.worldenergy.org/>
- [8] Solar resource data obtained from the Global Solar Atlas, owned by the World Bank Group and provided by Solargis / Global Solar Atlas / <http://globalsolaratlas.info/>
- [9] Wind Map / Global Wind Atlas 2.0, a free, web-based application developed, owned and operated by the Technical University of Denmark (DTU) in partnership with the World Bank Group, utilizing data provided by Vortex, with funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information: <https://globalwindatlas.info>
- [10] Agricultural land (% of land area) / Food and Agriculture Organization, electronic files and web site. License: CC BY-4.0 / Data / The World Bank / <http://www.worldbank.org/>
- [11] Forest area (% of land area) / Food and Agriculture Organization, electronic files and web site. License: CC BY-4.0 / Data / The World Bank / <http://www.worldbank.org/>
- [12] Hydro (PDF) / World Energy Council / <https://www.worldenergy.org/>
- [13] What a Waste 2012 (PDF) / Resources / The World Bank / <http://www.worldbank.org/>
- [14] Myanmar Energy Master Plan (EMP) / Asia Pacific Energy Portal / <https://policy.asiapacificenergy.org/node/2923>

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The sources of charts and curves are specified under the images.

[For more information about the energy industry in Myanmar see here](#)