



MYANMAR



## COUNTRY OVERVIEW

With the largest standing forests on mainland Southeast Asia, Myanmar currently absorbs more greenhouse gases (GHG) than it emits, thereby already making a significant contribution to global efforts to tackle climate change. However, since 2011, Myanmar has been in the process of rapid industrialisation and increasing urbanisation which is leading to an increase in GHG emissions, and the government has pledged to tackle the negative environmental effects associated with development. In terms of sustainable energy policy development, environment is one of the key pillars of strategic importance to the government under the National Comprehensive Development Plan (2011–2030). And the government has also launched the Environmental Conservation Law (2012) and the Myanmar Climate Change Master Plan (2018–2030).

Myanmar has considerable renewable energy resources and the greatest solar energy potential in the Greater Mekong Subregion, but this potential remains largely untapped. As of 2020, the country's electrification rate was 50%, the lowest in ASEAN, while the demand for electricity is growing by 15% a year. Half the electricity produced in Myanmar is consumed in Yangon, its largest city and commercial hub, although the Myanmar National Electrification Plan (NEP) aims to bring electricity to the whole population by 2030 and has included renewable energy as part of the plan. The share of renewable energy in the energy mix is expected to rise from less than 1% in 2020 to 12% in 2025. In addition to expanding electricity access, renewable energy could also stimulate much-needed employment and economic growth in Myanmar. While Myanmar is taking up its commitments to the global community under the Paris Climate Agreement and the UN Sustainable Development Goals, due to Myanmar's being vulnerable to climate change and its Least Developed Countries status, the government has highlighted its priority to seek support for climate change adaptation, collaborating with international development and financing organisations to attract foreign investors.

(Source: "Myanmar: How to Become an Attractive Destination for Renewable Energy Investment?")



## SECTOR OVERVIEW

Within the cleantech sector, hydropower, rural electrification, and industrial and domestic energy efficiency are key areas for merging socio-economic development with decoupling of environment and economy. Myanmar is in the beginning of its development journey, and it has a chance to include sustainable technologies into the process from early on. Small business in Myanmar plays a small role in the sector, and the market is largely dominated by domestic state-owned and large international companies. The latter bring the investment, technology, and know-how. Initially, China was the main stakeholder, but also Thailand, Malaysia, Indonesia, India, as well as the US and some European countries are considering cleantech projects in Myanmar.

### Renewable energy

Only 3 GW of Myanmar's potential of 100 GW of hydropower has been developed as of 2021, and hydropower still makes up 2/3 of the country's energy mix. Interestingly, hydropower is not officially categorised as a renewable energy in Myanmar. The largest potential is to be found in the Kayin, Shan, and Kayah states, with the Salween River as the dominant hydropower resource. Development projects have also been planned for the development of the Irrawaddy River basin. By 2030, Myanmar's hydropower capacity is expected to triple to 9000 MW, compared to 2014 levels. Myanmar's 2014 Electricity Law aims specifically to encourage international investment in electricity infrastructure. As of 2019, Myanmar had 27 hydropower plants / dams across the country, with the largest ones being projects dominated by large international companies, such as Toshiba Hydro Power, Asia World and China's Hanergy Group. Large-scale hydro projects are also state-controlled assets, with market entry difficult for smaller companies. There is scope for small, mini, and micro hydropower plants, however, these are often challenged, or never even get to exploitation because of difficult logistics due to remoteness, lack of public support policies, as well as reluctance of the local communities, due to perceived negative or limited positive effects of the hydropower plants. (Source: [hydropower.org](http://hydropower.org) / "Review of Hydropower in Myanmar")

To increase access to clean sources of electricity amongst communities and households currently without access to an electric power grid system, **rural electrification** is high on the government's agenda. The plan is for renewable energy, such as solar, wind and biomass, to account for at least 30% of rural power needs. **Solar** energy is largely seen as a companion to hydropower, although it is mostly untapped, but has extensive potential. Myanmar has the highest solar potential in the Mekong region and solar is expected to offer some balance to the generation of renewable energy and ensuring the continuation of renewable power supply during the dry season when hydro-power may be restricted. The International Growth Centre has estimated Myanmar's solar potential to be 51.973 TWh annually. Following an initial MOU signed in 2014, in 2019, Myanmar launched the initial phase of the country's first commercial solar-power plant in central Myanmar, developed by the Thai company Green Earth Power. US firm ACOS Energy was the second foreign solar company to enter the market. As of January 2021, the government was running 29 solar power projects, mostly delivered by Chinese companies, including a floating solar station, intended to take solar power's share of energy generation to 14%. As with hydro, funding for solar projects can be hard to come by, with most projects relying on Chinese funding, or support from the Asian Development Bank and other international development finance organisations focusing on household-solar and mini-grid power generation in rural areas (source: Solar Power Europe / Global New Light of Myanmar).

As of late 2020, Myanmar does not have any **wind** energy projects generating electricity. In 2016, the Ministry of Electricity and Energy (MOEE) signed a memorandum of understanding for the private construction of a 30 MW wind turbine project, following successful feasibility studies. Similarly, late 2018, the MOEE signed an agreement with a developer to carry out feasibility studies for several wind power projects, with research confirming the potential of wind power in many parts of the country.

Myanmar has an agriculture-based economy and almost half of the country is covered by forest. **Biomass** is therefore one of the major renewable energy sources, contributing considerably to total energy consumption, and is used for energy for heat generation by most of the population. The main sources of biomass energy are agricultural, including residues from paddy, maize, sugarcane, coconut, cassava, oil palm, cattle and poultry, wood residues and fuelwood, which are most popular, as they are used by most of the rural population, and municipal solid waste, which is increasing due to urbanisation and population increase. Biomass is largely used for heating households and cooking and is not utilised in other ways. Biogas, bioethanol, and biodiesel do not play a significant role in the energy sector. Several civil society organisations have made attempts to build and operate biogas plants in the country, but experienced high consumption of raw materials and low efficiency rates. A further challenge in the country is that some raw materials like paddy husk and animal manure are not freely available, as they are in demand in agriculture and horticulture, as well as in construction as a fuel for making bricks.

On an industrial scale, biomass powerplants have been built by international corporations, such as China's Dongfang Electric, which generates biomass energy for grain processing, and Japan's Fujita generating energy from rice husks. However, such projects are large scale, with sizeable investments. The market for SMEs generating energy from their own supply of biomass and the centrally managed biomass energy generation plants is not developed yet.

As a developing country, in order to increase the **energy efficiency of industrial processes**, the government is partnering with UNIDO as well as some domestic private investors, to implement a project called "Improvement of Industrial Energy Efficiency". The objective is to promote sustained GHG reduction in the industry by improving policies and regulations, building the institutional capacity of industrial energy efficiency, implementing ISO 50001 based energy management systems, and optimising energy systems in industry. However, at the industrial level, waste-to-energy powerplants, using municipal waste, are not yet very common. A potential investment area is within the **energy efficiency of households**. The Ministry of Environmental Conservation and Forestry, as part of an initiative to reduce the amount of fuel wood used for cooking, is working on project disseminating more energy efficient cook-stoves used in individual households, compared to the traditionally used ones.



## REGULATION

Myanmar does not have a legal framework nor specific laws related to the **procurement of power projects** of power projects. All projects more than MMK 10 million must be tendered, and the development of medium and small power projects with capacity lower than 30 MW, that are not connected to the national electricity grid, requires the permission of state and regional governments. In practice, most projects in Myanmar have been approved through of government-to-government negotiations or have started as unsolicited proposals by private companies. In 2018, the government launched a central database of key projects, which are prioritised as part of the Myanmar Sustainable Development Plan, with the intention to enhance transparency and attract investment to those particular projects. The cleantech projects dominating the list revolve primarily around solar power plants and photovoltaic systems. The project list can be accessed here: <https://projectbank.gov.mm/en/>.

**Incentive schemes** for renewable energy projects are also yet to be established, but under Myanmar's investment law, foreign investors can typically receive a tax incentive package, after they have obtained a Myanmar Investment Commission permit. Import tax waivers for products made in ASEAN countries and China may also apply. There is no predetermined **Feed-in Tariff (FiT)** in Myanmar, and tariffs for all renewable and non-renewable energy projects are negotiated on a case-by-case basis. Similarly, there are no regulations for solar rooftop power generation and there is no net metering scheme, allowing consumers to generate own electricity and sell it to the grid. Lack of such regulation and FiT, and case-by-case basis negotiations can make the process uncertain and time-consuming for power generators.

Since 2012, projects waiting for approval need to also pass the **Environmental Impact Assessment (EIA) Procedure**, which states that: "All projects undertaken by any enterprise which may impact on environmental quality are required to undertake an EIA to develop a project document to avoid, protect, mitigate and monitor adverse impacts caused by operation of a project." In the energy sector, local regulations are covering control measures to reduce GHG emissions and improve air quality. International guidelines providing commentary on reducing GHG emissions highly recommend the use of less carbon-intensive fuels, combined heat, power plants, higher conversion efficient technology as well as high monitoring levels.

Myanmar's EIA Procedure is gradually developing in the face of increasing public expectation. Climate change-related issues, impacts on biodiversity and sensitive habitats are among other matters of growing significance. As there has been reluctance to support some energy projects among local communities, due to perceived or real threat of loss of livelihood, health concerns, land grabs, or need to relocate communities, social impact is also a factor alongside EIA. Therefore, proposed projects also go through Social Impact Assessment.

Until 2019, one of the challenges of attracting foreign investments was low electricity tariffs charged to the consumers, which allowed the government to increase the national electrification rates. The low tariffs made investments in energy generation unattractive to foreign businesses, as reaping returns was limited. In 2019, in an effort to accelerate and strengthen the pipeline of power projects by reducing the necessity to subsidize the market, the government increased the tariffs charged to consumers by just under 73% (source: The Law Reviews). Concrete effects of this change have not been reported yet.

Another challenging factor is also that while Power Purchasing Agreements (PPA) involving international organisations have been signed in USD, end-consumers in Myanmar are charged in MMK. The Myanmar government prefers to make payments in MMK, in order to avoid currency exchange risks, which, however, is not usually agreeable to the international sponsors. This increases the market opportunities for domestic companies, but can also curb faster development, due to foreign technologies and know-how not being transferred into the country.

Currently, the governance of the Myanmar renewable energy sector is fragmented between different agencies, making the system difficult to navigate and unclear at times. To solve the situation, a single renewable energy agency, with expanded responsibilities, could be formed instead. Not only would this create more efficiency and reduce complexity in the renewable regulations, but this would also boost investor confidence that Myanmar is committed and a long-term player that prioritises renewable energy.



## MARKET ENTRY

Market entry procedures in the renewable energy sector could be simplified and prioritised. The Directorate of Investment and Company Administration and the Myanmar Investment Commission are efficient in processing company registration and investment licences, however, because of limited transparency in the permitting process and delays in land acquisition, the process gets complicated when it's time to obtain a power sector licence and agree on off-taker arrangements. Market entry for foreign companies in the renewable sector does not have a common streak, and each case and process will be different, so newcomers cannot rely on the case studies of companies before them. The first step for foreign businesses is to do as much market research as possible, and it is imperative to be present in Myanmar for some time and learn from the inside. Companies do their own market research by establishing small offices with employees who spend time in the country, gathering information and data, mainly through informal sources and networks. Informal networks and sources of information are preferred over formal. This approach is deemed to work the best by foreign businesses in Myanmar, although it is not necessarily easily attainable to SMEs, who are often restrained by capacity and finances. Cooperation with a local partner, often means having to create a joint venture with a government enterprise as private local firms often lack the necessary technology and know-how to properly support and collaborate in the project. As a mitigating manoeuvre, as of 2021, the requirement for bidding solar power developers to have had a minimum annual turnover of USD \$20 million over the last three years has been reduced to \$5 million. This somewhat opens the door to others than just very large and global companies. Although not entirely easy, Myanmar's industry is learning quickly, and both the industry and the government are interested in engaging with foreign suppliers. The country's location is also strategically important and there is a lot of untapped potential for clean and green technologies and businesses.

There is a Renewable Energy Association of Myanmar (REAM) (<https://www.reamyanmar.org/>), which could be a way to make initial enquiries, before visiting the country. However, REAM is not supported as much by the government as the Myanmar Oil and Gas Services Society. There is also the Union of Myanmar Federation of Chambers of Commerce and Industry: <https://www.umfcci.com.mm/>.

For solar specifically, the German Chamber of Commerce in Myanmar has strong industry insights: <https://myanmar.ahk.de/>.



## RECOMMENDATIONS AND TRENDS

A positive factor in Myanmar is the latecomer advantage, with renewable technologies currently becoming less expensive worldwide, more competitive solutions allow entry into the Myanmar market at relatively low cost, making it more commercially viable, and offering more for investors. Similarly, the low level of electrification in the country, reduces the cost disadvantages of off-grid solutions, particularly in rural areas. These, and the strong civil society actors promoting renewable energy development, all contribute to creating opportunities for foreign businesses, albeit more so for the larger ones.

In terms of making an impact and to speed up renewable energy generation, solar energy has the biggest potential in Myanmar, but as a small-scale production, and mainly for off-grid applications, such as solar-powered battery-charging stations, solar home systems, village mini-grids with solar components. This will be relevant across the country, but especially in rural communities.

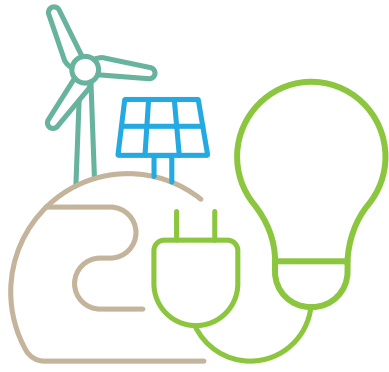
Another way for investors to look at Myanmar is to invest in power plants based in Thailand to sell electricity to Myanmar's industrial estates in border areas. These industrial estates near the Thai border are continuously developing. Projects in these areas benefit from being able to sell electricity to Thailand as well as Myanmar.

As Regional Governments have now been also given small additional budget allocations from the central Government, suddenly e.g., off-grid biomass power solutions utilising locally grown energy wood, forest- or agriculture-waste, have become viable option. As biomass solutions are new to Myanmar, so foreign expertise, technology, and investment support will be needed.

There is also potential in dredging existing hydropower dams to increase the water storage capacity, to increase power generation during the hot summer when power consumption is highest. Small hydro has also been a preferred solution for rural off-grid electrification, and there will always be opportunities in this for technology providers.

Waste-to-energy solutions can also provide opportunities. With industrialisation increasing, foreign technology providers from Poland and Japan have signed agreements for the development of municipal waste-to-energy projects in Yangon. The potential of this is just being discovered. Mandalay and a couple of smaller regional capitals, have their own plans to restructure their waste management and utilise waste to energy solutions.

In summary, although entering the Myanmar cleantech market can be complex and time consuming, and there is more scope for larger companies, smaller companies could consider collaboration with larger ones. Myanmar still needs to improve and streamline the regulatory framework of renewables, create subsidies and tax incentives, especially for smaller businesses and households. At the same time, the country offers notable untapped potential, with considerable resources to be used, with fast growing demand and development of the industry, businesses, and the society.



## CLEANTECH SECTOR BRIEF