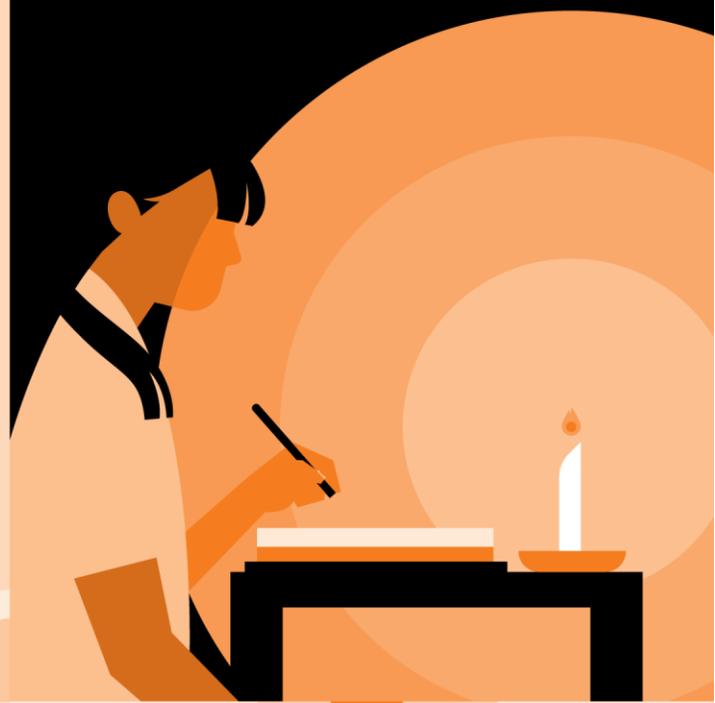


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Energy Sector

Myanmar Infrastructure Monitoring



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Preface and acknowledgments

This Energy Sector Monitoring Report, one of three reports in the Myanmar Infrastructure Monitoring series, presents a summary of major dynamics and challenges facing the energy sector in Myanmar. It first provides an overview of the energy sector developments and challenges in the last decade, followed by an analysis of major trends in the sector and their implications since the February 2021 coup. The report relies on data obtained from private sector and third parties as well as open-source data and news that was analyzed and cross-checked as part of the monitoring work. Where news reports are referenced, additional efforts were made during the monitoring process to triangulate reports from several reputed news media sources to ensure veracity of information presented.

Energy sector monitoring was produced by Myoe Myint, Joonkyung Seong and Sadig Aliyev under the guidance of Jie Tang (Practice Manager, Energy), Mariam J. Sherman (Country Director, Myanmar, Cambodia, and Laos) and Ranjit Lamech (Regional Director, Infrastructure, East Asia and the Pacific). Ulrich Schmitt (Operations Manager) and Kim Alan Edwards (Program Leader, Senior Economist) provided valuable advice. Arnold Marseille, Kyaw Soe Lynn, Tin Hninn Yu and the ECR team provided guidance on publication.

Myanmar Infrastructure Monitoring series comprises the energy, digital and telecommunications, and transport and logistics sectors in Myanmar. These reports are produced by a World Bank task team led by Sadig Aliyev (Program Leader, Senior Transport Specialist), Myoe Myint (Senior Energy Specialist), Rajendra Singh (Senior Digital Development Specialist), and Hongye Fan (Transport Specialist). The team includes Sharada Srinivasan (Digital Development Specialist), Joonkyung Seong (Senior Energy Specialist), Win Htein Lin (Consultant), Myint Kyaw (Operations Officer), May Oo Mon (Program Assistant), Thiri Maung Maung (Consultant) and Xuanyi Sheng (Consultant). The team appreciates valuable comments and suggestions received from peer reviewers Rome Chavapricha (Senior Energy Specialist), Yin Yin Lam (Senior Transport and Trade Logistics Specialist), and Kaoru Kimura (Senior Digital Development Specialist).

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Abbreviations and acronyms

CERP	COVID-19 Economic Relief Plan
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MMK	Myanmar kyat
MW	Megawatt
MWh	Megawatt-hour
MoEE	Ministry of Electricity and Energy
MOGE	Myanmar Oil and Gas Enterprise
TWh	Terawatt-hour

Executive summary

Myanmar's energy sector has been severely affected by the dual shocks of the February 2021 coup and COVID-19 pandemic. Developments in the energy sector after the coup have undermined nascent energy sector reforms over the last few years, including reforms that led to improved service delivery, restructured electricity tariffs, and increased electricity access.

Constraints in human resources resulting from the dismissal of over 4,400 staff in key entities and departments under the Ministry of Electricity and Energy (MoEE) has put power sector operation at risk.

Even if normal operations continue, the sector may not be resilient during emergencies. Reliability of power supply may be adversely affected by the lower water levels in hydropower dams during the dry season as well as understaffed power plants and system control. As a result, power outages are likely to become more widespread and last longer in duration.

Public boycott of electricity payments and rising costs of electricity due to dollar-denominated independent power producers have adversely affected the financial viability of the power sector.

The electricity bills collection rate sharply dropped in Yangon and Mandalay to less than 5 percent, down from the normal collection rate of over 95 percent. Constrained financial and human resources have led to the insufficient maintenance of and improvements to the power grid infrastructure, which was already weak and outdated. This also contributes to frequent power outages and unreliable power supply across the country.

Rising fuel prices have led to price increases for food and other essential commodities. Imports account for more than 98 percent of the country's total fuel consumption. Domestic gasoline and diesel prices have risen by more than 200 percent since February 2021, adversely affecting supply chains and payments. Fuel costs are much higher outside Yangon and in remote regions due to various restrictions. Disruptions to the banking sector, currency depreciation, and rising global oil prices have also pushed up domestic fuel prices.

Export revenues from oil and gas are anticipated to decline. Gas export earnings have dropped by 11 percent year-on-year between April 1, 2020, and March 31, 2021 (FY20/21) compared to FY19/20. Production is expected to drop in the coming years owing to its slowdown at existing onshore areas and delays in new developments. Some foreign energy companies have suspended their business activities.

Power outages are getting worse since December 2021, adversely affecting the economy. Several key challenges, including insufficient available generation capacity, insecure grid infrastructure, worsening human and fiscal resources, and deteriorating investment climate, are intensified by fuel and commodity price increase globally and political uncertainties within and outside Myanmar. People and businesses are suffering from unreliable power supply. Disruptions to electricity infrastructure can plausibly have spill-over effects on the productivity of firms, learning outcomes for students reliant on online education modes, and access to digital financial services and remittances.

Risks remain high for the energy sector. Power supply disruption will likely continue for the foreseeable future. The political instability in the aftermath of the coup has led to significant operational and financial burdens on the sector, affecting the sector financial viability and fiscal sustainability. Investor confidence has plummeted amid uncertainty and a worsening investment climate, jeopardizing the implementation of approved power projects, including renewable solar. While the global commodity rally continues, there are serious challenges ahead, including the need for skilled labor to ensure electricity reliability, maintain the security of power infrastructure, and increase electricity revenues.

Energy sector developments from 2011-2020 in the context of Myanmar

1. Myanmar's total energy supply per capita of 18.2 gigajoule per capita is among the lowest in the world,¹ in which biomass share (53 percent) is the largest followed by oil (34 percent), electricity (8 percent), natural gas (3 percent) and coal (2 percent). The total installed power capacity on the grid in 2020 was 7,091 megawatts (MW); of this, hydropower accounted for around 46 percent (3,297 MW), natural gas around 51 percent (3,634 MW), coal-fired power plants around 2 percent (120 MW), and solar power plant 0.6 percent (40 MW). Small off-grid diesel and mini-hydropower units dispersed across the country have an estimated total installed capacity of about 114 MW. The annual per capita electricity consumption in 2019 was only 420 kilowatt-hour, about one-tenth of the world's average. Access to modern fuels for cooking such as liquefied petroleum gas (LPG) is limited to urban areas, and traditional biomass (wood and charcoal) accounts for about two-thirds of primary energy consumption.
2. **Electricity consumption was growing fast prior to the COVID-19 pandemic and the February 2021 coup.** Peak load demand reached 3,878 MW in 2020, growing at an average of 11 percent per year over the past five years.² During this period, electricity supplied by the national grid grew about 15 percent per year and reached 23.9 terawatt-hour (TWh) in 2020. Due to the heavy reliance on seasonal hydropower with low firm capacity, the existing power generation system is unable to meet peak demand during the dry season.
3. **Myanmar sought to close an increasing supply-demand gap by procuring emergency rental plants and developing renewable solar power projects.** In 2019, Myanmar faced widespread power shortages with load shedding reaching approximately 300 MW during the summer months (March to June).³ With a limited pipeline of projects under construction, the supply gap is expected to increase substantially in the short-to-medium term (**Error! Reference source not found.**). To reduce the supply gap in the short term, in late June 2019 a tender was issued for five emergency rental plants totaling 1,040 MW.⁴

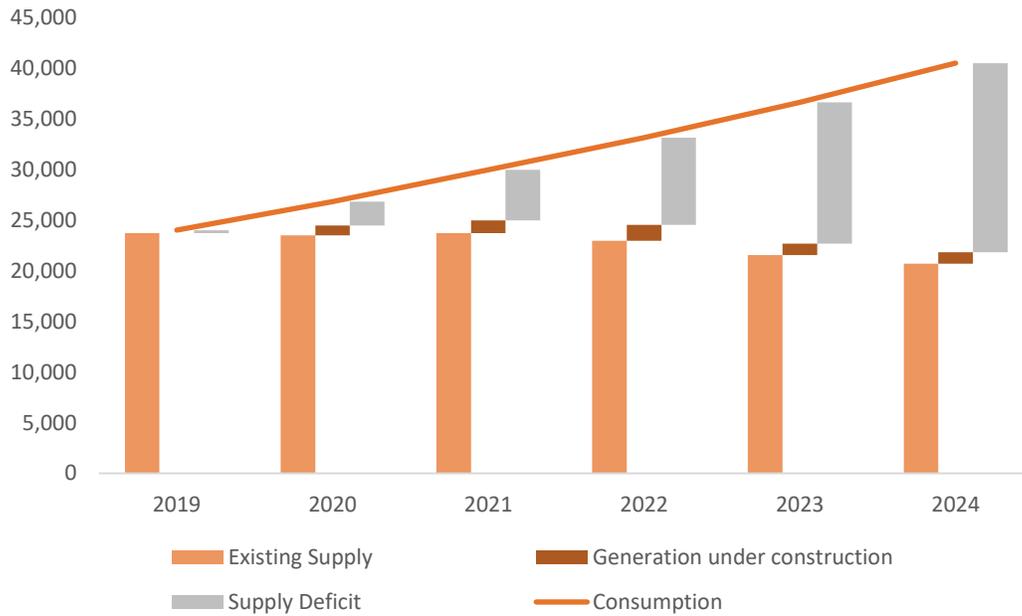
¹ IEA Data Services <https://www.iea.org/data-and-statistics/data-products>.

² Peak load demand was estimated at about 4,400 MW; but due to load shedding, the realized peak was 3,878 MW.

³ The supply gap is acute in Myanmar's largest city, Yangon, which accounts for over 40 percent of the total electricity demand while holding only 20 percent of the generation capacity. Limited transmission capacity prevents electricity supplies from being brought from the rest of the country to the city.

⁴ The tender included two smaller plants using domestic gas and three larger projects that would use imported liquefied natural gas. Implementation timelines were short and came with steep penalties in case the deadline was missed.

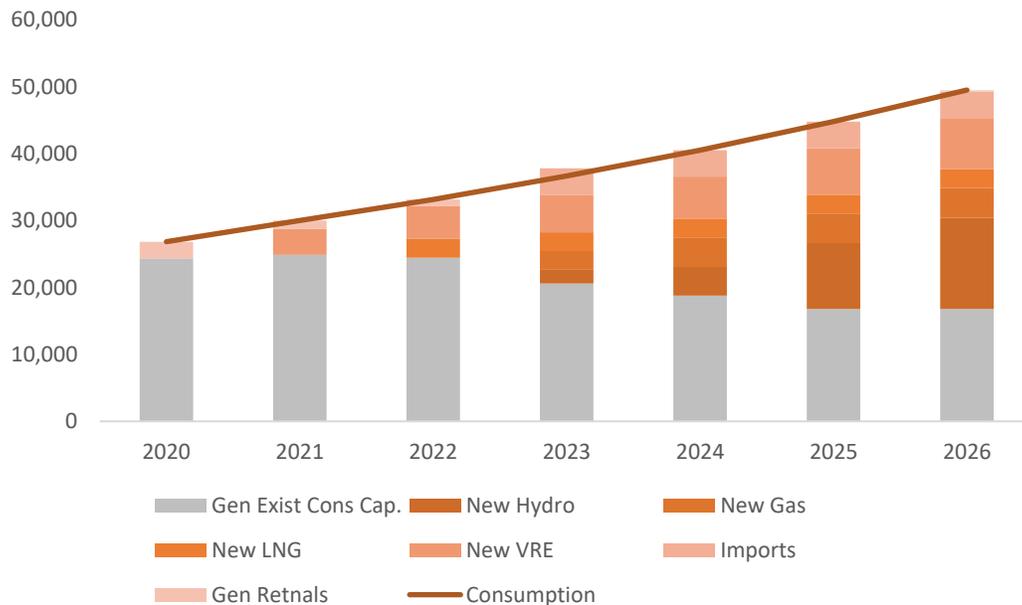
Figure 1: Forecasted supply/demand gap



Source: World Bank estimates based on data from MoEE

4. **Aiming to provide affordable and sustainable electricity as well as to improve efficiency of its gas-fired thermal power assets, the country floated a public tender for renewable solar power projects in 30 locations.** Development of renewable energy potential, according to an indicative least-cost generation plan (**Error! Reference source not found.**), was among priorities. Liquefied natural gas (LNG) imports for new power generation assets are also needed due to the declining output from maturing gas fields. Among existing generation options, improving energy generation efficiency is important. Existing gas-fired power plants, particularly state owned, have low thermal conversion efficiencies (15-27 percent) compared with modern gas-fired plants (52-55 percent). Such inefficiencies result in high system costs, wasteful natural gas consumption, and an increase in the energy sector’s environmental impact.

Figure 2: Indicative least cost generation expansion plan



Source: World Bank staff

5. **Myanmar doubled the electrification rate (access to the public national grid) from 25 percent in 2010-2011 to 50 percent in 2019-2020 through the implementation of the National Electrification Program.** However, Myanmar still had the largest access deficit in Southeast Asia and ranked among the top 20 countries globally in terms of its electricity access deficit. While grid extension expanded access to electricity in both urban and rural areas, off-grid solutions played a critical role in supplying electricity to those without access to the grid, particularly in rural areas. According to the Multi-Tier Framework, which takes stock of the status of energy access, about 11.4 percent of households had installed a solar home system, which provides lighting and can power televisions or fans, and about 8 percent relied on mini grids in 2019. One-third of Myanmar's rural households still rely on candles, kerosene, batteries, and diesel generators to meet their energy needs.⁵

6. **Despite the tariff reforms in July 2019, there remained a significant gap between the cost of electricity generation and revenues, which put the power sector in a financially challenging position.** In July 2019, electricity tariffs were increased for residential, commercial, and industrial consumers; this followed a five-year gap with no tariff adjustments. Residential consumers with the highest consumption levels (above 200 kilowatt-hour per month) were most affected; their tariff increased by 2.5 times, albeit from low levels.

7. **The upstream oil and gas sector was one of the main sectors for foreign direct investment, attracting over US\$22.8 billion since Myanmar's political and economic transition in 1989.** The offshore natural gas projects — Yadana, Yetagun, and Zawtika — have been exporting to neighboring Thailand since 1998, 2000, and 2014, respectively; whereas Shwe, which started production in 2013, sells its natural gas to China. The daily average production rate of the Yadana natural gas project is 910 million cubic-feet per day; 500 in Shwe, 360 in Zawtika, and 250 in Yetagun.⁶ Daily average domestic utilization is 450 million

⁵ ESMAP, 2019. Myanmar Beyond Connections, Energy Access Diagnostic Report based on the Multi-tier Framework.

⁶ Extractives Industry Transparency Initiative.

cubic-feet per day: 400 of this is produced from these offshore projects with an additional onshore production of 50 million cubic-feet per day.⁷

8. **The income from exporting oil and gas has been a significant source of the fiscal revenue.** Gas export earnings, for example, reached US\$3.5 billion in FY19/20. The aggregate export revenue of oil and gas accounted for more than 30 percent of the fiscal revenue in the same year.

9. **Myanmar relies heavily on imports of petroleum products (gasoline, diesel, jet fuel, LNG, LPG) from the regional market.** On the other hand, Myanmar is richly endowed with hydrocarbon resources and is the second-largest natural gas producer within Southeast Asia. Approximately, 98 percent of gasoline and diesel, which is about US\$3.5-4 billion annually, is imported from the regional market.

Effects of the dual shocks of the February 2021 coup and COVID 19

10. This section discusses the effects of the February 2021 coup and pandemic on electricity, petroleum products, and natural gas sectors.

Electricity

11. The electricity sector has been severely hit since the February 2021 coup. The group of experts, Independent Economists for Myanmar, reported on the numbers of jobs lost in the sector: 860 staff from the Yangon Electricity Supply Corporation; 900 from the Mandalay Electricity Supply Corporation; and 1,600 from the Electricity Supply Enterprise, which is responsible for electricity distribution in other parts of the country. Over 4,400 staff in key entities and departments under MoEE is estimated to have been dismissed, constraining human resources available for operating the power sector.

12. **Electricity subsidy under the COVID-19 Economic Relief Plan (CERP) reduced revenue billed for electricity services.** To support residential electricity customers who had been adversely affected by the pandemic, the government announced in April 2020 that the first 150 kilowatt-hour on each residential customer's monthly bill would be provided for free under CERP. After the February 2021 coup, the subsidy scheme was continued for two months until March 2021. Nevertheless, late payment fee has been waived and payment due dates have been adjusted to encourage electricity bill payment.

13. **Public boycott of electricity payments has further impacted revenue collection and cost recovery of electricity services.** Thousands of meter readers and MoEE office staff in townships/wards are not working. With an escalation in conflict, some armed groups have targeted strategic electricity and energy infrastructure such as substations. As a result, the bill collection rate has dropped significantly.

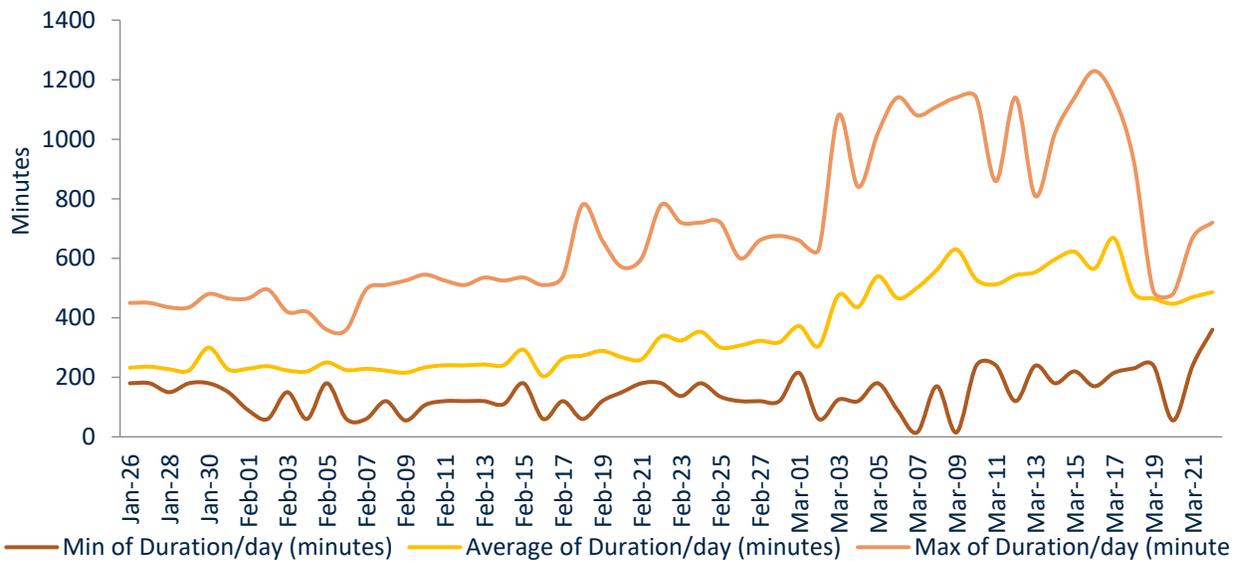
14. **In response to the electricity bill non-payment campaigns, power supply was cut to households and businesses.** In July 2021, MoEE warned consumers that electricity supply could be disrupted if they continue refusing to pay electricity bill. In early November 2021, for example, over 900 households in Tamwe, Mingalar Taung Nyunt, Hlaingtharyar, and Insein townships in Yangon faced power cuts after they refused to pay their bills. Power supply to several businesses in Mandalay, including factories, stores, and hotels, has also been interrupted. Escalating tensions between distribution companies and electricity customers continue to negatively affect households' standard of living and economic activities.

⁷ Oil and Gas Planning Department, MoEE.

15. **Power sector infrastructure has not been maintained, causing unstable power supply and frequent power outages.** The human resources shortage and insufficient electricity revenue collection have made it difficult to maintain and improve the electricity grid infrastructure, which was already weak and outdated before the coup. Unreliable power supply is anticipated to further hamper economic activity and the country’s recovery from economic downturns.

16. **Power outages have become prevalent in Myanmar since the coup and getting worse since December 2021.** In Yangon, the power outages lasted, on average, 4 hours per day in January and early February 2022 and 5 hours per day in late February and early March 2022 in residential areas (Figure 3). The maximum power outage was about 13 hours in some areas. Industrial zones in Yangon and Mandalay have also experienced blackouts, 5 to 12 hours per day. Unlike the past, the outages take place without any advance notice from MoEE.

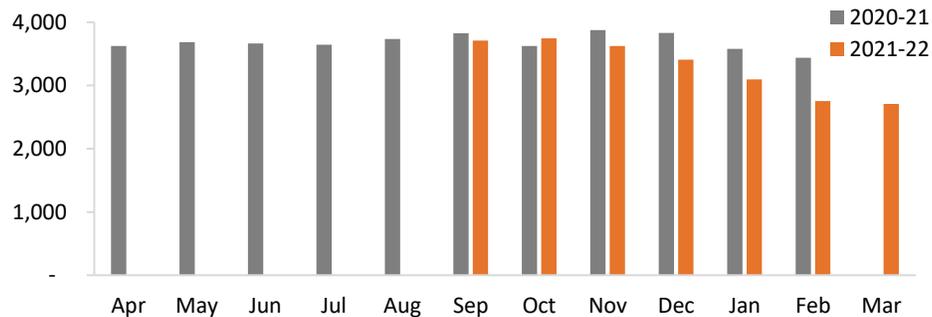
Figure 3: Duration of power outage per day in Yangon (Jan 26 – Mar 22, 2022)



Source: Third Eye Survey Data

17. **Available generation capacity and actual electricity generation declined significantly.** The peak electricity generation declined by about 30 percent, from 3,711 MW to 2,665 MW, between October 3, 2021, and March 7, 2022. During the same period, total electricity generation per day also dropped by 30 percent, from 73,137 MWh to 51,776 MWh. Since October 2021, both peak generation and total generation has declined significantly (Figure 4).

Figure 4: Average daily peak generation (MW)



Source: MoEE; Data is not available for March-August 2021.

18. **MoEE announced that the power outages will continue due to insufficient availability of generation capacity in the grid.** MoEE made a series of announcements — first on January 5, 2022, second on January 12, 2022, and more recently on March 7, 2022 — about insufficient generation capacity. The ministry announced that the maximum power generation capacity in Myanmar was about 4,200 MW, but the available capacity would be reduced by 970 MW. The available capacity is not sufficient to serve current electricity demand. MoEE also stated that load shedding plans will continue.

19. **Reduction in available capacity is largely driven by suspension of LNG power plants.** The 400 MW LNG power plant in Thaketa and 350MW plant in the Thilawa Special Economic Zone in Thanlyin, both rental power producers backed by Chinese investors, have halted electricity generation since fall 2021. Due to the surging LNG price and depreciating Kyat against the US dollar, these operations were not financially viable. Furthermore, revenue collection challenges in the power sector, cash shortages, and the banking sector crisis reduced the ability of the regime to pay the power producers.

20. **Currency depreciation⁸ and a worsening investment climate has further deteriorated the financial viability of the power sector and put independent power producers at higher risk.⁹** Most power purchase agreements in Myanmar are paid in Kyat equivalent of a US dollar denominated price while revenue is collected in Kyat. Currency depreciation increases power purchase agreement payments while the revenue is fixed in Kyat. This adversely affects the financial viability of the sector. Private independent power producers are also facing difficulties in currency conversion in the market for dollar-denominated debt service abroad.

21. **Damaged transmission lines further reduced 220 MW of the available generation capacity.** Three transmission lines connecting to Biluchaung Hydropower Plant — 230 KV Billuchaung (2)-Shwemyo Power Line, 230 KV Biluchaung (2)-Toungoo Power Line, and 132 KV Biluchaung (2)-Tikyit Power Line — were blown up due to sabotage of transmission towers by a People's Defense Force; security measures are being taken to repair the 3 lines. About 220 MW, which is normally supplied to the national grid from these 3 lines, has been cut off. In addition, lower water levels in hydropower reservoirs, caused by low precipitation in 2021, reduces generation capacity of hydropower plants.

22. **Efforts have been made to increase electricity supply to address frequent power outages.** Beginning June 2022, MoEE plans to operate the 150 MW Kyaukpyu gas-fired power plant at full capacity; it currently operates at only 60 MW. Another 135 MW combined-cycle power plant in Kyauphyu is

⁸ Myanmar Kyat sharply depreciated against US Dollar by 33% in March 2022 since end-January 2021.

⁹ Total installed gas-fired power plant in 2020 is 3,634 MW, of which only 1,219 MW is owned by public sector; the remaining 2,415 MW is operated by private sector by either independent power producer or rental power.

expected to commence operation by December 2022. To increase gas supply, MoEE announced construction of a new natural gas pipeline from two new wells drilled in the Shwe offshore gas project during March 12-18, 2022, but it will cause further reduction of available 334 MW generation capacity during the construction period. MoEE warned of continuing power outages which could be 24-hour load reduction in some places. Households and businesses increasingly rely on captive diesel generators for electricity supply, but surging fuel prices makes it expensive and unaffordable for many.

23. **The coup imposed a major strain on the state’s administrative capacity, including MoEE’s ability to implement its electricity strategy.** The 2020 bid tendering for 30 solar plants totalling 1,060 MW was an early bureaucratic casualty as the Electric Power Generation Enterprise invoked a *force majeure* clause after losing most of the working-level staff who had been assigned to the project. The Electric Power Generation Enterprise informed the bid winners that all bids would be terminated if no progress had been made. In the hydropower sector, Electricité de France withdrew from the large hydropower project, Shweli-3.

24. **Other sectors in Myanmar are adversely affected by blackouts and unreliable power supply across townships.** Evidence from other countries suggests that infrastructure investments are complementary across sectors and coordination raises impact such as, for example, investments in electricity and internet boost productivity, thus enabling districts to engage in trade facilitated by road transport.¹⁰ Several spill-over effects can result from disruptions to one type of infrastructure such as electricity infrastructure, for example, that could impact firm productivity, learning outcomes for students reliant on online education modes, and access to digital financial services and remittances.

Petroleum Products

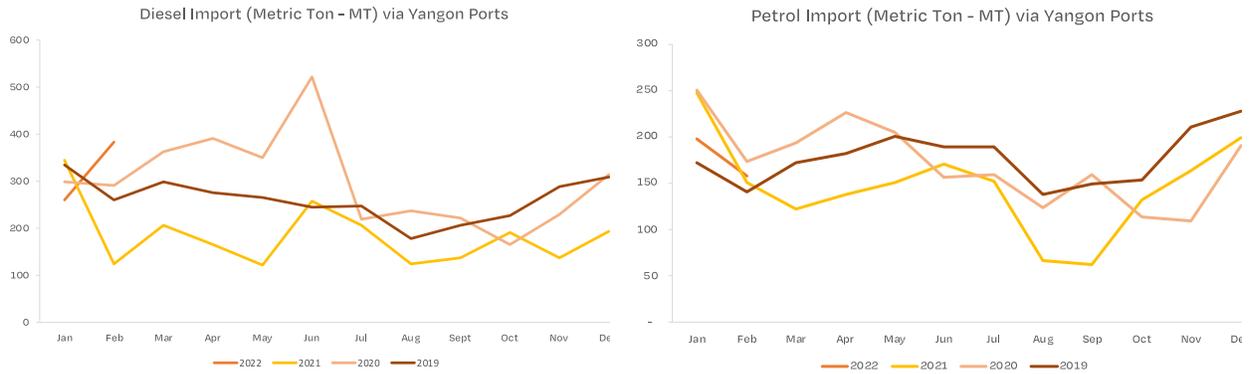
25. Myanmar has relied heavily on imports of petroleum products (gasoline, diesel, jet fuel, LNG, LPG) from the regional market since 2010.¹¹ This reliance exists despite being endowed with hydrocarbon resources and being the second-largest natural gas producer in Southeast Asia. Domestic production of crude oil was merely 7,000 barrels per day from onshore fields and 5,000 barrels per day of condensate from the Yetagun offshore project in 2020. The older oil refining plants in Myanmar utilize outdated technology, and the production capacity is too low to meet local demand. The country is almost entirely dependent on imported gasoline and diesel. Imports account for more than 98 percent of the country’s total fuel consumption.

26. **Fuel imports of diesel and petrol have continuously dropped.** Fuel imports saw a significant reduction in 2021. The import volume of diesel and petrol from January to December 2021 was lower by over 39 percent and 15 percent, respectively, compared with the same period of 2020 (Figure 5). Since the coup, demand for fuel consumption has reduced drastically. A sudden increase in diesel imports in February 2022 was driven by the increasing demand for diesel generators to cope with electricity supply shortages in the power system.

¹⁰ Matias Herrera Dappe, and Mathilde Sylvie Maria Lebrand. Infrastructure and Structural Change in the Horn of Africa (English). Policy research working paper, No. WPS 9870 (Washington, D.C.: World Bank Group, 2021).

¹¹ Economic Research Institute for ASEAN and East Asia (ERIA): Myanmar Energy Statistics 2019

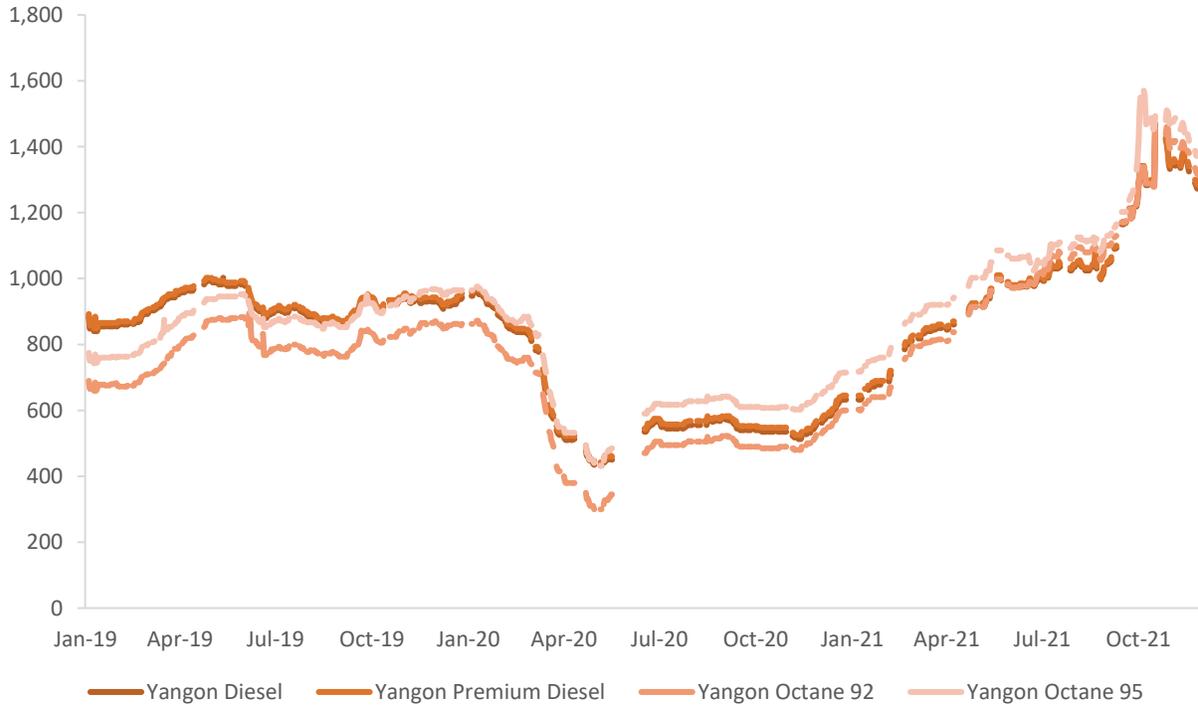
Figure 5: Diesel and petrol import



Source: Shipping operators

27. **Domestic fuel prices of both gasoline and diesel have tripled since the coup.** On February 1, 2021, the average retail price of 92 RON and 95 RON gasoline in Yangon was 650 MMK and 770 MMK per liter, respectively.¹² The average retail price of diesel and premium diesel was 688 MMK per liter and 700 MMK per liter, respectively. These retail fuel prices have significantly increased to more than three times the amount by mid-March 2022, peaking at 2,312 MMK per liter of 92 RON and 2,320 MMK for 95 RON, and 2,382 MMK for diesel and 2,422 MMK for premium diesel (Figure 6).

Figure 6: Retail fuel price trend in Yangon



Source: Data collected from retailers.

¹² 1 US\$ equals 1,776.44 MMK (March 29, 2022)

28. **A new subsidy scheme was introduced in September 2021.** Under the subsidy scheme, fuel is provided to selected fuel stations at subsidized prices. As of March 2022, US\$87.4 million in fuel had been purchased under the subsidy scheme. Small and medium fuel retailers have raised concerns that the subsidy scheme only allows military-aligned companies to participate, thereby introducing further distortions in the fuel market.

Natural Gas

29. The Yetagun offshore project ceased operation in April 2021 due to depletion of gas at the field and the production rate dropping below the technical threshold. Remaining gas reserves at the Yetagun field had long been estimated to be near depletion. The operation was resumed and exported extremely low volumes in July and August 2021, but it was suspended again as multiple workers contracted COVID-19. Except Yetagun, other offshore gas fields reportedly have been operating as usual.¹³

30. **Several foreign companies suspended their exploration activities.** Puma Energy, the operator of Myanmar's largest fuel import terminal at Thilawa Special Economic Zone, announced the suspension of operations in Myanmar. In May 2021, Total and Chevron announced their decision to stop making dividend payments from the pipeline tariffs of Moattama Gas Transport Company.¹⁴ The two companies have also stated that they would begin taking steps to withdraw from an offshore natural gas field in Myanmar. Woodside, the Australian energy company that discovered natural gas offshore in 2016, also reduced its presence in Myanmar, announcing it had placed all business decisions in the country under review and will pull out its offshore drilling team until the outlook for the country and its political stability improves.

31. **Gas export earnings, which account for a significant portion of the fiscal revenue, dropped by 11 percent year-on-year in FY20/21.** The earnings for FY20/21 are estimated to be about US\$3.1 billion, compared to US\$3.5 billion in FY19/20, according to the figures reported by the Ministry of Commerce. Myanmar's gas exports are expected to decline in the coming years as production at existing offshore areas begins to slow down and new investment developments are delayed.

32. **Average gas exports to Thailand in 2021 were flat year-on-year at 693 million cubic feet per day.**¹⁵ Myanmar's gas exports to Thailand have been in decline in recent years due to the anticipated slowdown in production from Yadana and Yetagun offshore fields. In the same period in 2020, average export volumes were 711 million cubic feet per day. Average exports from Yadana and Zawtika were higher in 2021 compared to 2020, while exports from Yetagun fell significantly. Between January and September 2021, average exports from Yadana were up around 4 percent year-on-year at 432 million cubic feet per day, while exports from Zawtika increased 8 percent to 258 million cubic feet per day. Meanwhile, exports from Yetagun fell 84 percent from 56 million cubic feet per day in 2020 to 9 million cubic feet per day between January-September 2021 (Figure 7).¹⁶

33. **The pipeline segment that transports natural gas from offshore fields to Yangon was damaged by bomb blasts in July and November 2021.** Although the pipeline was damaged, losses were not disclosed.

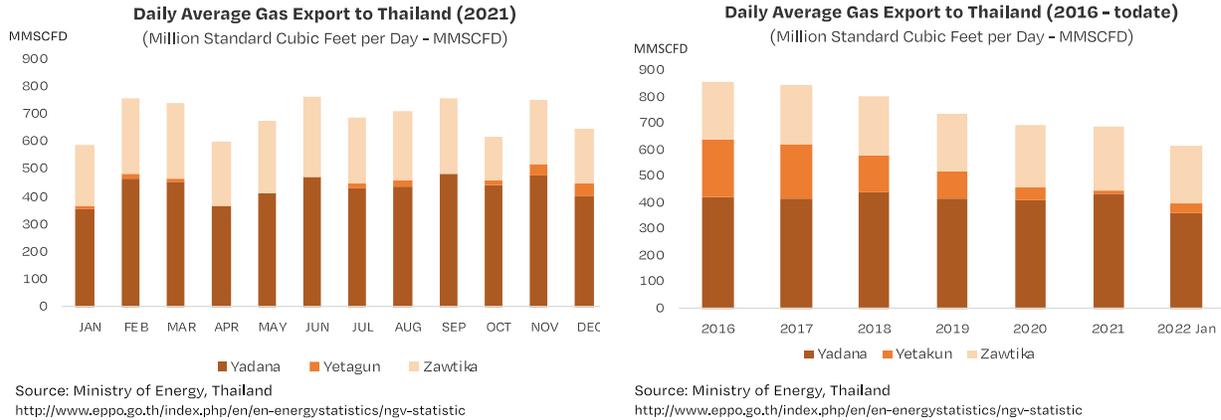
¹³ The daily average production rate of offshore fields in Yadana is 910 million cubic feet per day; in Shwe, 500; and in Zawtika, 360.

¹⁴ Moattama Gas Transport Company owns and operates gas pipeline system transporting natural gas produced from the Yadana to the Myanmar/Thailand border.

¹⁵ Frontier Myanmar Research, Myanmar Energy Brief dated November 16, 2021.

¹⁶ Thailand Ministry of Energy, <http://www.eppo.go.th/index.php/en/en-energystatistics/ngv-statistic>.

Figure 7: Gas export to Thailand



Outlook and risks

34. Risks remain high for the energy sector. Political instability in the aftermath of the coup has led to significant operational and financial burdens on the sector, affecting its financial viability and fiscal sustainability. Serious challenges include the need for a skilled labour force to ensure electricity reliability, maintain the security of power infrastructure, and increase electricity bill collection. Investor confidence has plummeted amid uncertainty and a worsening investment climate, jeopardizing the implementation and completion of approved power projects, including renewable solar, which have been put on hold.

35. **Power supply disruption will likely continue for the foreseeable future, undermining Myanmar's business environment and economic recovery.** Despite various efforts, the supply shortage could remain substantial. The power outages could continue for some time if the global commodity rally continues as a result of the war in Ukraine. Currency depreciation, electricity bill payment boycott, and a growing fiscal deficit will further undermine revenue income for maintenance and repair of grid infrastructure. And hydro availability may further deteriorate during dry seasons. Developing additional generation capacity will likely take time, particularly under the deteriorating investment climate. Power supply disruptions will have spill-over effects to other sectors, including telecommunication, education, health, and financial services.

36. **Continued local currency depreciation combined with the increase of crude oil prices in the global market further negatively impacts the retail prices of import-dependent petroleum products.** Current practices such as selling US dollars to selected fuel importers at favorable exchange rates and selling fuel at limited gas stations at lower than market prices will not be sufficient to resolve fundamental constraints facing the energy sector. With challenges related to imports and domestic gas production, the power sector may not have enough resources to generate electricity. Moreover, shortages and price increases of fuel and petroleum products will continue to impact the wider economy, especially by raising prices of essential commodities, including food.

