6. Investment framework for green growth

This chapter describes Myanmar's policy framework to support investment for green growth, providing an overview of the state of play and progress made in supporting green investment. It revises the current policy framework in place to promote green growth and climate change, including policies that help to improve the environmental quality of investments in general, and examines existing efforts and the potential to engage the private sector to scale up investment in renewable energy. It also highlights issues related to financing green projects in the country.

Green growth offers Myanmar an opportunity to foster economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which the well-being of its people relies. A critical aspect of green growth is catalysing investment and innovation in environmentally sound technologies and infrastructure which both helps to sustain growth and gives rise to new economic opportunities (OECD, 2011). In addition, with the increasing need for global action to address climate change, investment for green growth must promote a transition to a low-emissions, climate resilient development pathway (OECD, 2017). Investment for green growth includes, among other things, investment in infrastructure – such as renewable energy, energy efficiency, water purification and distribution systems, transport and housing – as well as in conservation and efficient usage of natural resources, and waste management (OECD, 2015).

A green investment framework has much in common with a general policy framework for investment, but an investment-friendly policy framework does not necessarily result in green investment unless certain elements are also in place. These include: a strong governmental commitment at both the national and international levels to support green growth and to mobilise private investment for green growth; policies and regulations to provide a level playing field for more environment friendly investments; policies to encourage more environmentally responsible corporate behaviour; an institutional capacity to design, implement and monitor policies to foster green growth objectives; financial mechanisms for green investment (OECD 2015).

Currently, Myanmar is facing several environmental and development challenges. It has seen year on year economic growth since its transition to a democracy, but the unsustainable use of natural resources is exacerbating development challenges. Primary sectors support employment and GDP growth, and the poorest populations live in rural and remote areas where livelihoods rely on small-scale agriculture, fisheries and use of forest resources. Illegal logging and other economic development activities have resulted in widespread degradation of natural resources, with Myanmar estimated to have lost 10 million hectares of forest cover between 1990 and 2015 (Fodor and Ling, 2019). Increasing air and water pollution in urban areas is exacerbated by poor waste management, including of hazardous waste in industrial zones, uncontrolled construction activities and growth in vehicle usage. Myanmar is also one of the most vulnerable countries globally to climate change.

Promoting green investment is an opportunity for Myanmar to avoid locking in environmentally and economically unsustainable development. The country faces a major gap in infrastructure provision, with an estimated 40% of its roads being paved (Asian Development Bank, 2017a) and 50% of the population having access to electricity from the national grid in December 2019 according to the authorities. These gaps present an opportunity for Myanmar to invest in greener infrastructure alternatives and avoid locking-in environmentally unsustainable infrastructure for the next two decades. Utility scale, on-grid renewables can help reduce the carbon intensity of the electricity supply, and off-grid solutions can support increased access to energy while grid expansion takes place.

The government has taken steps towards promoting green investment, with several new strategies and actions being put in place in the last year. The Myanmar Sustainable Development Plan 2018-2030 clearly integrates environment and climate change as one of five pillars for development. The country's Climate Change Strategy and Action Plan 2018-2030 promotes climate action, and Myanmar's Nationally Determined Contribution outlines mitigation and adaptation priority actions. The National Environment Plan 2018-2030 promotes integration of environmental issues across sectors, and the Environment Conservation Law 2012, underpinned by the Environment Conservation Rules 2014 and other regulations, promotes the greening of investments by assessing and mitigating against negative environmental impacts.

Taken together these policies represent a coherent framework for green growth in Myanmar, however, inclusion of targets or clear goals on specific areas relevant to green growth (e.g. renewable energy, emissions reductions) could present a stronger signal to investors. Significant efforts will be needed to

implement these policies, and to raise public and private resources for green investments. All government agencies, and especially those in close contact with investors, such as the Directorate of Investment and Company Administration (DICA) among others, need to be well-aware and educated about these strategies, as well as disseminate them and integrate them early-on in their services and interactions with investors. This helps to clarify expectations and facilitates policy implementation and compliance.

Main policy recommendations

- Ensure that environmental considerations are included in early screening of proposed investments by MIFER, MONREC and line ministries, and that this is a joined-up process involving all relevant Ministries (see related recommendation in Chapter 3).
- Promote the greening of investments by continuing to strengthen the implementation of environmental impact assessment (EIA) systems, including by building capacity at national and subnational levels to review EIAs and reduce delays in this process, and improving the transparency and information systems supporting EIAs.
- Integrate environmental criteria in the future development of Myanmar's project bank. Myanmar is developing a project bank to prioritise investments in infrastructure and attract investors. In the future, integrating environmental considerations into the identification of projects, including through strategic environmental assessments, could help catalyse investment for greener projects.
- Promote utility-scale solar and wind-based electricity generation more aggressively within the country's energy plans, including through the formal recognition of the role of non-hydro renewables in the countries power expansion plans, the introduction of standardised power-purchase agreement templates, facilitating the land acquisition process etc.
- Support roll-out of off-grid renewable energy solutions, including by promoting opportunities for private companies and impact investment.
- Improve access to climate finance and other concessional environment-related finance, and target the use of these strategically to develop projects and build capacity for green investment, and improve climate resilience.

Green growth and investment in Myanmar: seizing the opportunity to transition to an environmentally sustainable development pathway

Myanmar's path to green growth faces both challenges and opportunities. Challenges include a heavy dependence on natural resources and unsustainable use of these resulting in degradation of land and water, a major investment gap for basic infrastructure and increasing vulnerability to climate change and extreme weather. Addressing these challenges also presents an opportunity for Myanmar to promote green investment. The imperative to urgently scale up access to electricity and promote energy security, the country's high renewable energy potential and the need to improve the efficiency of how natural resources are used illustrate the potential for green investment in Myanmar. A measured and inclusive approach, based on a sound policy framework that promotes investment in green sectors and facilitates the greening of investment overall, can help address challenges and promote sustainable development in Myanmar.

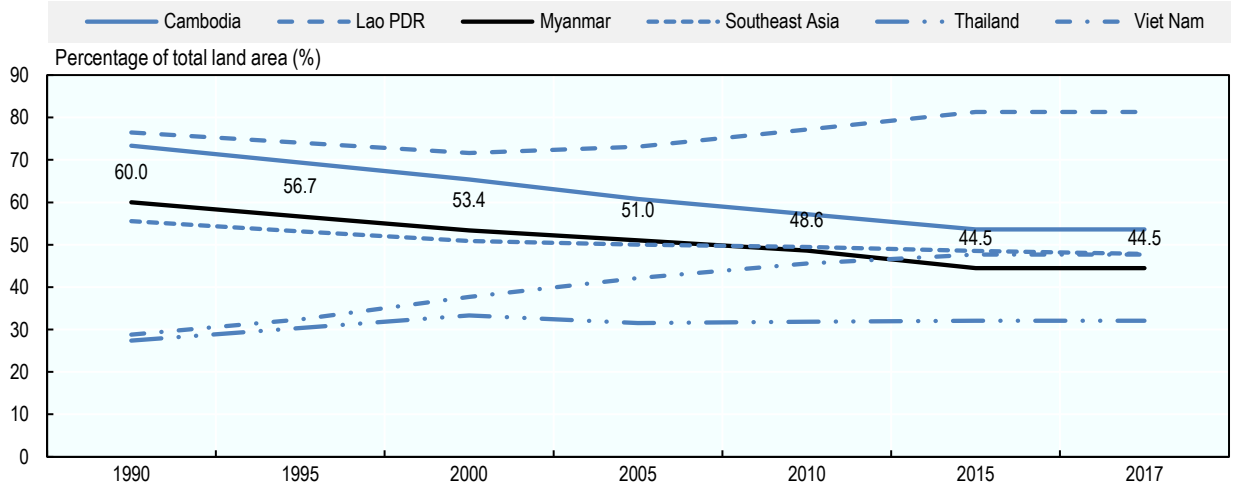
Natural resources and the environment are critical for continued development and poverty reduction in Myanmar

Myanmar has relied heavily on natural resources to support development in past decades, and since the transition to a democracy, the country has seen year on year economic growth. Primary sectors continue to contribute substantially, despite the increasing importance of industry and services sectors in recent years. Agriculture, forestry and fishing, made up 23% of GDP in 2017 compared with 57% in 2000 (Asian Development Bank, 2019). In addition, due to the informal and unregulated use of natural source, such as illegal logging and export of timber, the impact of forestry and fishing on the economy is underestimated in national statistics. Some studies estimate that the value of Myanmar's ecosystems could be 10 times higher than is reflected in formal statistics for forestry and fisheries (Fodor and Ling, 2019).

Myanmar's land, forests, rivers and coasts also support employment and livelihoods for most of the country's people and are especially critical for continued progress on reducing poverty (Mandle et al., 2016). Around a third of the population still lives in poverty, with the majority - 87% - located in rural areas (Fodor and Ling, 2019). The number of people living in poverty is seen to be more prevalent in hilly, mountainous and coastal zones of the country where peoples' livelihoods are reliant on rely on small-scale agriculture, fisheries and use of forest resources.

The heavy reliance on natural resources for development, coupled with unrestricted and unstainable use of these resources means that the environment costs of Myanmar's growth has been high. Myanmar has been estimated to have lost over 10 million hectares of forest in the last 25 years (Fodor and Ling, 2019). Forest cover in the country has shrunk faster than other countries in the region, declining from 60% of land area in 1990 to 44% in 2017 (Figure 6.1). Urbanisation has brought its own environmental challenges, and Myanmar was ranked 138 out of 180 countries on a global Environmental Performance Index in 2018 (Wendling et al., 2018). Greater vehicle ownership, burning of agricultural and other waste and constriction activities has increased air pollution in urban areas, and mining activities accompanied by the discharge of untreated wastewater and solid waste into water bodies is impacting water quality in rivers and lakes. Myanmar will need to improve environmental management and the way natural resources are used in order to continue growing and improving human development.

Figure 6.1. Forest cover as % of total land area in selected Southeast Asian countries, 1990 to 2017



Source: FAOStat, Agri-environmental indicators – Land use, http://www.fao.org/faostat/, accessed 13.12.09

Significant gap in investment needed for sustainable infrastructure

Myanmar faces a major gap in infrastructure provision and investment. Access to electricity in Myanmar is much lower than other countries in the region (Staples and Qiu, 2017), with roughly 50% of the population lacking access to the national grid according to the authorities. The efficiency of the network in the country is also poor, with over a quarter of electricity generated lost in transmission and distribution in 2013 (Asian Development Bank, 2107b). As highlighted in Chapter 5, the quality of transport and logistics infrastructure in the country is poor, and poses a significant challenge to trade and competitiveness.

Infrastructure weaknesses are further hampered by a significant gap in investment. Cumulative infrastructure investment needs for the country are estimated at USD 224 billion between 2016 and 2014, and with current investment levels much less than what is needed, the total investment gap is estimated at USD 112 billion, in the same period (Oxford Economics, 2017). The scale of the investment required means that public finance will need to catalyse private flows. So far, the primary source of financing for development projects has been public budgets supported by public revenues, with FDI comprising the second largest source, which illustrates the potential to mobilise greater volumes of private investment within the country (UNDP, 2017). While bridging existing infrastructure gaps in Myanmar will be critical to ensure continued economic growth, they also present an opportunity to promote investment in greener infrastructure alternatives and avoid locking-in environmentally unsustainable infrastructure for the next decades. Off-grid renewable energy can support increased access to energy while grid expansion takes place, and utility scale, on-grid renewables can help reduce the carbon intensity of the electricity supply, as well as sometimes allow for power cost savings (IRENA, 2019).

High vulnerability to climate change

Myanmar is one of the most vulnerable countries globally to climate change. The Global Climate Risk Index ranks Myanmar as the second most affected country in the world to extreme weather-related events between 1999 and 2018, with resulting losses estimated at 0.83% of GDP over the same period (Eckstein et al., 2019). Against this background, future climate projections to the middle of the century paint a worrying picture. Temperatures are expected to rise between 1.3 to 2.7 degrees above historical levels (with higher increases associated with highest increases in global greenhouse gas emission) (Horton et al., 2017). By the middle of the century, Myanmar could observe between 4 and 17 days of extreme heat each month, compared with one day per month observed between 1981 and 2010. These changes will have impact almost every sector of the economy, with sea level rise affecting coastal cities and critical energy, transport, water and telecommunications infrastructure, and changing rainfall patterns affecting agricultural productivity and livelihoods. Preparing for and adapting to climate change, and integrating climate resilience into policy making, planning and investments will be critical for Myanmar to safeguard the progress it has made on growth and development so far.

Policy framework for green growth and climate change

A strong government commitment to support green growth, underpinned by a coherent policy framework and clear targets, provides investor with encouraging signals regarding the government's ambitions for green growth. Setting clear, long term, and legally binding policy and regulatory frameworks to mainstream and encourage green growth are key to attracting private investment. Such frameworks are critically important to mitigate the risks related in investment in green infrastructure and new technologies. Such a framework should include a comprehensive and coherent framework of policies related to the environment and green growth, integrating of environmental targets and ambitions into sector policies and plans, and engagement and commitments towards multilateral environmental agreements.

Myanmar's international commitments to green growth

Myanmar has ratified most major multilateral environmental agreements (Table 6.1), including the three Rio Conventions: the Convention on Biological Diversity (CBD) in 1994, UN Convention to Combat Desertification in 1997, and United Nations Framework Convention on Climate Change (UNFCCC) in 2003. Most recently Myanmar ratified the Nagoya Protocol to the CBD in 2014, and the Paris Agreement under the UNFCCC in 2017. In the run up to the Paris Agreement, Myanmar submitted its Nationally Determined Contribution to the UNFCCC in 2015.

Table 6.1. Multilateral environmental agreements (MEAs) ratified by Myanmar

MEA	Year of ratification / accession
ASEAN Agreement on the Conservation of Nature and Natural Resources	1997
ASEAN Agreement on Trans boundary Haze Pollution	2003
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	2015
Cartagena Protocol for Bio-safety	2008
Convention on Biological Diversity	1994
Convention on International Trade of Endangered Species of Wild Fauna and Flora	1997
Copenhagen Amendment on to the Montreal Protocol on Substances that Depletes the Ozone Layer	2009
Kyoto Protocol to UNFCCC	2003
Montreal Protocol on Substances that Depletes Ozone Layer	1993
Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD	2014
Paris Agreement under UNFCCC	2017
Ramsar Convention on Wetlands	2005
Stockholm Convention on Persistent Organic Pollutants	2004
UN Convention on the Law of the Sea	1996
UN Convention to Combat Desertification	1997
United Nations Framework Convention on Climate Change (UNFCCC)	2003
Vienna Convention for the Protection of the Ozone Layer	1993

Source: Adapted from https://www.informea.org/en and Raitzer, Nuella Samson, and Nam (2015).

Policy framework for green growth and climate change

Due to the relatively recent political, economic and social transition in the country, many of Myanmar's policies have been revamped and put in place in the last five years (Table 6.2). As a result, Myanmar's overall policy framework covering green growth objectives is coherent and well-aligned. The Myanmar Sustainable Development Plan (MSDP) 2018 is structured to a large extent around the Agenda 2030 framework and makes clear references to how strategies and actions align with different SDGs. The third pillar of the MSDP is 'People and Planet', and one of five policy goals of the plan is related to the environment. Despite having a comprehensive coverage of environmental issues, the plan stops short of adopting any specific targets related to environmental protection or climate change.

Against the backdrop of the MSDP, Myanmar has put in place several complementary policies and strategies on environment and climate change, including overarching the National Environmental Policy (2019), the Myanmar Climate Change Strategy and Action Plan (MCCSAP) 2018–2030, and the Environmental Conservation Law 2012 (and associated underlying policies and guidance). The NEP 2019 has a strong focus on mainstreaming environmental issues into development policies and planning, while the MCCSAP covers Myanmar's strategic response on climate change mitigation and adaptation. While both policies are well aligned with each other, like the MSDP, neither adopt any clear targets with relation to the environment. Myanmar's Nationally-Determined Contributions (NDC) to the Paris Agreement

outlines its contribution to combatting global climate change, and includes several sectoral climate change targets for the forestry and energy sectors. Despite this, Myanmar does not include an overarching emissions reduction estimate in its NDC and is one out of only two countries in ASEAN to not adopt an economy-wide target (IEA, 2019a).

Table 6.2. Policy framework related to green growth and the environment in Myanmar

Type	Policy / regulation	Description
Cross-cutting	Myanmar Sustainable Development Plan 2018	The MSDP provides a long-term vision for the country. The Plan recognizes 'Myanmar's natural endowments' as crucial for development and includes sustainability as a cross cutting theme. The MSDP is organized around three pillars and five goals. Pillar 3 'People and planet' includes Goal 5 'Natural Resources & the Environment for Posterity of the Nation'. Six strategies and action plans are included under the Goal 5, spanning environment and ecosystems (Strategy 5.1), climate resilience (Strategy 5.2), access to water and sanitation (Strategy 5.3), provision of energy (Strategy 5.4), natural resources and land management (Strategy 5.5), and sustainable cities (Strategy 5.6).
Core environment and climate policies and strategies	National Environmental Policy (NEP) 2019	NEP 2019 sets out a long-term strategy for environmental sustainability in the country, spanning environmental protection and management, as well as mainstreaming of environmental issues int social and economic development policy and planning. The plan includes 23 Principles under three areas (a) clean environment and healthy and functioning ecosystems, (b) sustainable economic and social development, and (c) the mainstreaming of environmental protection and management.
	Myanmar Climate Change Strategy and Action Plan (MCCSAP) 2018–2030	MCCSAP outlines a roadmap to guide Myanmar's 'strategic responses and actions to address climate related risks and opportunities', within a 15-year time period. The Strategy covers climate change adaptation and mitigation, and sets out sector level outcomes and indicators for the main sectors contributing to climate change: agriculture and natural resources, infrastructure sectors, cities, education and health etc.
	Myanmar's Nationally Determined Contribution to the Paris Agreement	The NDC adopts sector level targets for climate change mitigation and outlines priorities for climate change adaptation. Mitigation targets are as follows: *Forestry sector*: Reserved Forest (RF) and Protected Public Forest (PPF) = 30% of total national land area and Protected Area Systems (PAS) = 10% of total national land area *Energy sector*: (a) Increase hydropower to 9.4 GW by 2030 (b) Rural electrification through the use of at least 30% renewable sources (c)To realise a 20% electricity saving potential by 2030 of the total forecast electricity consumption.(d)To distribute approximately 260 000 cook stoves between 2016 and 2031. For adaptation, the NDC outlines four priorities in order of importance: resilience in the agriculture sector and development of early warning systems, public health protection and water resource management, protection of coastal areas, and infrastructure and biodiversity conservation.
	Environmental Conservation Law 2012	ECL (2012) sets out the legal framework for the implementation of the country's environmental plans and strategies. Its aims to systematically integrate environmental conservation into the development process. It includes specific articles regarding the institutional framework for environmental conservation in Myanmar, establishing environmental quality standards, restoration and protection of ecosystems, and management of natural resources.
	Environmental Conservation Rules (ECR) 2014	ECR 2014 supports the implementation of the ECL 2012 by providing more details on the various articles under the Law.
	Environmental Impact Assessment (EIA) Procedure (2015)	Details the EIA process and framework in Myanmar.
	National Environmental Quality (Emission) Guidelines (2015)	Regulates and controls noise and vibration, air emissions, and liquid discharges from various sources to prevent or reduce pollution and protect environmental and human health. The Guidelines apply to projects that generate noise or air emissions, and / or that have either direct or indirect discharge of process water, wastewater from utility operations or storm water to the environment.

In addition to the above, the government is also currently preparing a Green Economy Policy Framework, which, according to the authorities, will focus on the efficient utilization of natural resources, reduction of carbon emission, use of renewable energy and systematic waste management. Eleven priority areas for green economy investments have been identified, including (1) Sustainable and productive agriculture and livestock; (2) Clean air and clean and sufficient water; (3) Clean and accessible energy; (4) Healthy forests and biodiversity; (5)Sustainable urban and rural development and buildings; (6) Sustainable fisheries; (7) Sustainable consumption and production; (8) Sustainable waste management; (9) Sustainable transport infrastructure and services; (10) Lower impact from extractives, and (11) Sustainable tourism.

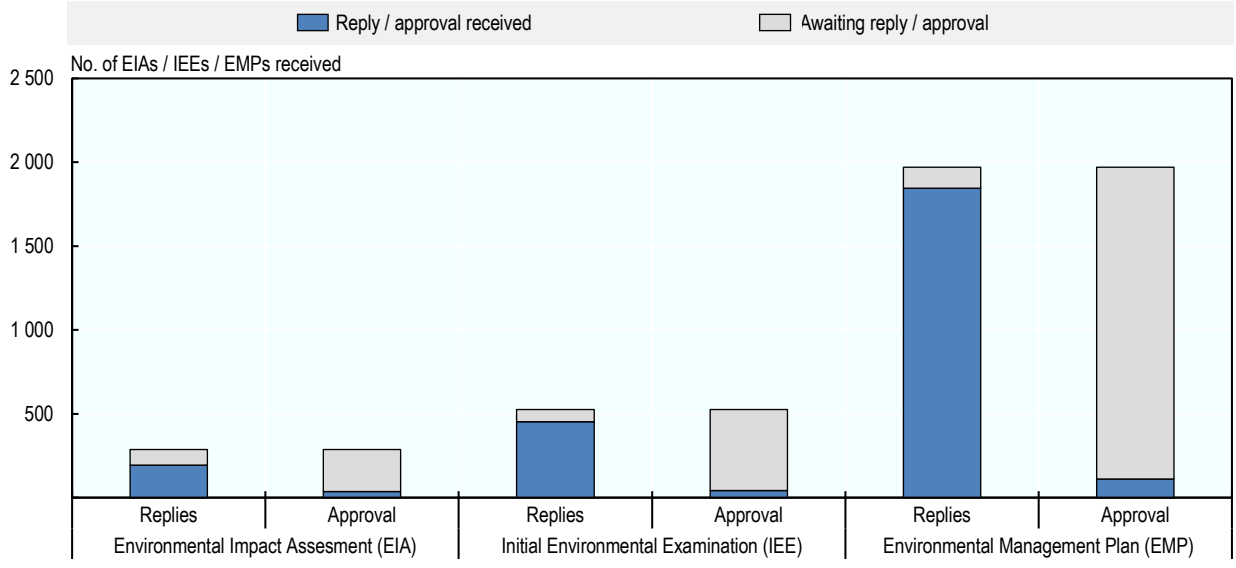
Policy framework for environmental protection

Since 2012, Myanmar has steadily built up a national environmental safeguards system to promote the greening of investment. The Environmental Conservation Law 2012 and the Environment Conservation Rules 2014 together outline clear actions to be taken to promote environmental management, including initiating the establishment of specific environmental quality standards for the country, and the use of environmental impact assessments (EIAs) to screen development activities. To support these policies, specific EIA Procedures and National Environment Quality (Emission) Guidelines were published in 2015. Guidelines to support the use of EIA have been developed for various sectors such as mining and hydropower.

As per the EIA Procedures (2015) investment activities either require an EIA or an initial environmental examination (IEE) depending on their scope, size and potential impact on the environment. Depending on the results of the EIA or IEE process, a comprehensive environmental management plan (EMP) may also be required. The Environmental Conservation Department (ECD) under the Ministry of Natural Resources and Environmental Conservation (MONREC) oversees the national environmental safeguards system, including reviewing and monitoring EIAs, and issues environmental compliance certificates (ECCs).

Myanmar's progress on establishing a comprehensive policy framework for environmental management in the span of only a few years is commendable, however, the implementation and scale up of the system requires significant resources and is likely to take time. A comprehensive diagnostic of Myanmar's safeguards system in 2019 by the World Bank highlights significant challenges in its operationalization (Fodor and Ling, 2019). Investment proponents face major delays in the review and approval of EIAs and IEEs, due to a significant lack of manpower and human resources in MONREC. The number of documents received by the Ministry for review have increased hugely every year, with over 2700 EIA, IEEs and EMPs received in 2017-18, against around 250 in 2014-15 (Fodor and Ling, 2019). According to ECD data presented in Fodor and Ling (2019), as of early 2019, only 13% of EIAs submitted had been approved (Figure 6.2).

Figure 6.2. Backlog of responses to and approvals for EIAs, IEEs and EMPs



Note: Data is as of 31 January 2019.
Source: Fodor and Ling (2019).

Another factor exacerbating delays is the lack of quality of EIA documents submitted to the ministry which illustrates the lack of capacity in the environmental assessment industry in Myanmar. Beyond the ex-ante EIA approval process, relevant authorities at national and subnational levels also lack the capacity to monitor and audit implementation of investments to ensure compliance with EIA results. While some of the above issues are expected due to the relatively recent establishment of Myanmar's safeguards system, urgent steps are needed to unblock critical areas. The government needs to prioritise the functioning of the country's EIA system by strengthening MONREC's staff resources, capacity and budget – at national and subnational levels.

According to the authorities, to keep pace with demand, ECD has increased its staff capacity in recent years and is continuingly working towards reducing the system backlog with the financial and technical assistance of development partners, such as UNDP, JICA, IFC and World Wildlife Fund (WWF). This has involved, for instance, the hiring of hiring outsource reviewers if cost of review is borne by project proponent, building the capacity of all staffs in EIA department, using specific checklists for ease and consistency of assessment and save the time, and refreshing the organizational structure among others.

Efforts are also underway to enhance the monitoring process. According to the authorities, although ECD has not yet been able to carry out systematic and regular monitoring – aside from checking monitoring reports submitted by project proponents every six months according the condition of approval letter or Environmental Compliance Certificate – some state and regional offices have started monitoring and inspection processes for approved projects. Authorities also reported that ECD is starting to prepare a monitoring guideline and is training staff for this purposes with the support of the Norwegian Environmental Agency and UNDP.

Beyond project-level environmental safeguards processes, it is also important for the county to pursue more proactive integration of environmental management across sectors at the strategy and planning level. Myanmar has implemented pilot Strategic Environmental Assessments (SEA), most notably in the hydropower sector in 2018, however there is no existing policy framework or guidance in place to drive this more systematically across sectors. Myanmar's new project bank (see Chapter 5) could be an important starting point for initiating a new phase of green investments in the country by integrating environmental considerations during the prioritization of investments, either through SEA or by integrating specific criteria to screen projects.

Promoting investment in priority areas for green growth: renewable energy

Growing need for power

Myanmar's energy sector, especially power generation, lies at the heart of its development ambitions, and will also be critical in determining whether the country can avoid locking-in environmental challenges for the next decades. Today, the country faces a major gap in proving access to electricity which is hindering poverty reduction and the growth of businesses and industry. Electricity consumption per capita in Myanmar is the lowest in the region, estimated at 0.3 MWh per capita in 2017, compared with 0.5 MWh per capita in Cambodia, 1.9 MWh per capita in Viet Nam and 2.9 MWh per capita in Thailand (IEA, 2019b). While the National Electrification Master Plan (2014) aims to provide universal access to electricity by 2030, about half of the population lack access to electricity, and even where there is access, the reliability of electricity provided to industries and businesses needs to be improved.

Looking forward, demand is expected to increase exponentially, with projections estimating electricity demand could be as high as 15 GWh by 2030 against 3.1 GWh in 2017 (Staples and Qiu, 2017). Improving electricity access and meeting increasing demand will require increased investment to expand and improve the transmission and distribution network of the country, as well as expanding power generation. On-grid renewable energy can could offer cost savings while also reducing the carbon intensity of the grid. For

example, the installation of rooftop solar in commercial buildings may allow for savings on electricity bought from the grid. Off-grid solutions for power could also provide a quick, and potentially environmentally sustainable, option to increase access and offer some cost saving opportunities.

Abundant renewable energy resources that are yet to be tapped

Myanmar has extensive renewable energy potential that could support the increasing need for electricity, but only a fraction of these have been exploited so far. Hydropower has historically been the main source of electricity in the country and is likely to remain important in coming years. The magnitude of hydropower resources in the country dwarfs the capacity of plants currently operating. In 2015, 29 large scale dams and 32 mini-hydro plants were operating, with a combined capacity of over 3330 MW, compared with the estimated 45GW of hydropower potential in Myanmar, though this potential takes into account potential harmful mainstream dams (IFC, 2018). Large-scale hydropower development across the region, including in Myanmar, has been associated with significant environmental and social costs which must be factored into future development of the sector. Projections for power development show that 53% of the energy generation mix of the country to 2030 is likely to be from hydropower, and a recent SEA of hydropower advocates for a 'whole-of-basin' approach when selecting sites for development to avoid cumulative impacts from multiple dams (IFC, 2018).

Beyond hydropower, other renewable sources of electricity generation have also not been exploited so far. The solar industry is at its infancy, and while two utility-scale solar plants with a combined capacity of 300MW are being developed, and a further 990 MW of plants are in discussions for development, these are still only a fraction of the estimated 26.9 GW of solar potential in Myanmar (Tun, 2018; Staples and Qiu, 2017). Myanmar also has untapped potential to generate electricity from wind along its coast, and has significant geothermal potential (Tun, 2018).

Challenges in mobilizing green investment for renewable power

Power development in Myanmar has historically dominated by public investment, however, this has changed in recent years, and in 2016, 50% of power generated was from private sector power generation plants (Staples and Qiu, 2017). Despite the potential for renewables in the country, and the prevalence of private actors, investment in renewables remains low due to several barriers. At the outset, there is a lack of clarity on the government's ambitions towards renewable energy, beyond hydropower, going forward.

Myanmar has only recently publicly adopted a formal power development plan which outlines the planned power generation mix for the next decade. The National Electricity Master Plan (2014) was formally approved in May 2019 by the Congress, but there is some ambiguity as to whether this plan has been updated since its development. The plan, developed in 2014 with technical assistance from the Japanese International Cooperation Agency (JICA), estimates that 9% of electric power capacity would be from non-hydro renewable sources by 2030. An ADB-supported analysis published in 2015 and compiling technical inputs for a broader Energy Masterplan, however, estimates that non-hydro renewables will make up only 1.2% of Myanmar's overall energy supply by 2030 (Emmerton et al., 2015). Both plans foresee an increase in coal-fired power in Myanmar which raises concerns about the environmental sustainability of electricity generation for the medium- to long-term. With major international investors divesting away from coal-fired power generation worldwide, any investments in coal power are likely to run the risk of being stranded or requiring significant public support to be financially viable.

For utility scale renewable projects, the lack of a standardized Power Purchase Agreement (PPA) that caters to foreign investors and project developers is another barrier to investment. Draft PPAs have been developed for some subsectors (e.g. hydropower, solar) with support from development partners, however, these have not been formally adopted yet. The solar projects currently being developed have been supported by PPAs in the local currency, which is not attractive for independent power producers (IPPs)

who may be backed by external sources of investment. There has been lack of a transparent tendering process so far, and most projects have been submitted to the government as unsolicited proposals, which risks impairing value-for money expectations.

Another issue preventing further investments in solar energy, for example, is the government unwillingness to provide risk sharing or facilitate access to land. This has attracted considerable attention during the government's tender for solar projects in June 2020. Disregarding the difficulties in obtaining land for such projects in a responsible manner, the government initially imposed a one-month deadline for potential investors to submit their bids for 30 solar power projects adding 1 060 MW in generating capacity to the grid. This combined with the government's initial reluctance to extend the tender period (later conceded) received strong criticism by investors who argued impossible to obtain all needed documentation within the given timeframe under the current pandemic COVID-19 context (Myanmar Times, 2020). Altogether these substantive and procedural issues end up adding significant challenges for private proponents of renewable power projects.

The Myanmar government is, nonetheless, keen in fostering clean energy and has established a National Renewable Energy Management Committee in 2019 under the President's mandate to spur the development of faster, cleaner and cheaper energy sources.

Opportunities for investment in off-grid electricity

The National Electricity Master Plan (2014) provides a road map for Myanmar to achieve universal access to electricity by 2030 by adopting a phased approach. Easier connections covering 50% of households will be prioritised, followed by two additional phases of investment supporting 25% of grid connections each. In the plan, off-grid technologies, including those supported by renewable energy sources, are included as an interim solution in areas where the grid is not expected to reach for another 5-10 years. However, as grid expansion is expected to be both time and resource intensive, an alternative approach would be to facilitate off-grid technologies through, for example, mini-grids, to play a more central role in the electricity system going forward. The Ministry of Agriculture, Livestock and Irrigation, supported by the World Bank, is deploying mini-grids and solar home systems for 500 000 households, in a complementary effort to grid expansion (Vivid Economics, 2017).

An assessment of the market potential for mini-grids highlights there is an immediate potential market for 2 300 mini-grids covering a total 2 million people, with an associated investment opportunity of around USD 537 million (Roland Berger, 2019). However, one the main challenges for off-grid systems is the continuation of their business model, particularly once transmission lines are connected, and a lack of clarity about how off-grid systems will be integrated into the grid. Despite the challenges, initial private investment is being seen in this area. For example, in March 2019, Engie invested in Mandalay Yoma Energy, a company working to deliver solar off-grid systems in areas which lack access to electricity[1]. Another example is Yoma Micropower, which is working to connect off-grid telecommunications towers to solar plants. Greater support from the government through a dedicated strategy or plan on promoting off-grid electricity solutions could increase confidence in the market and help it to scale up.

Financing for green growth

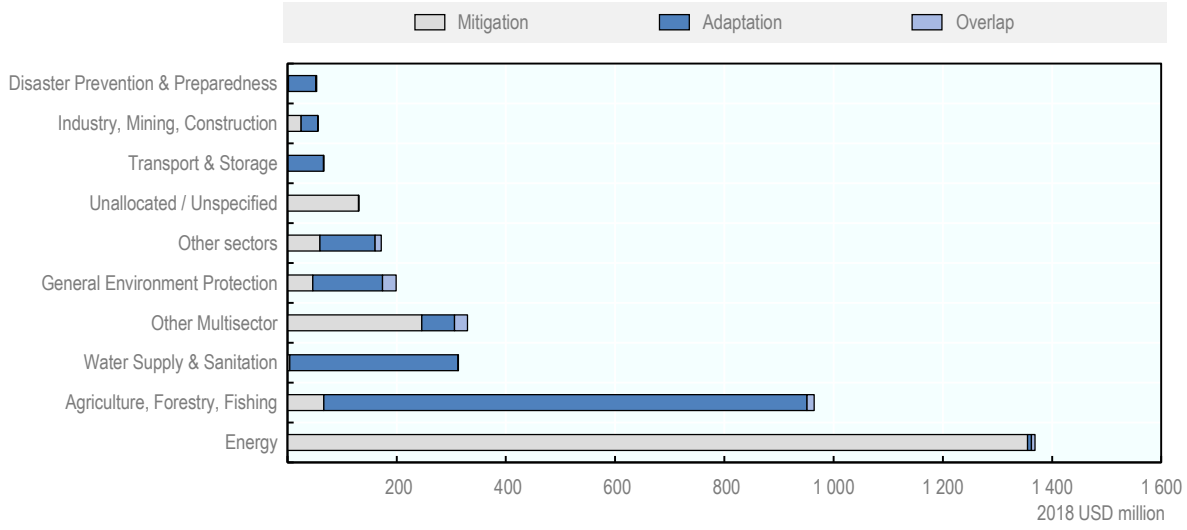
Financial policies and instruments are key to promoting green investment as they can help increase access to finance, mitigate the risks associated with new green technologies and demonstrate their viability, and reduce the cost of capital associated with green investments to increase their viability (Corfee-Morlot et al., 2012).

Development finance can support the green growth agenda in Myanmar

International public development finance and technical support provided by development partners has played an important role in supporting the development agenda of Myanmar. Despite being a relatively small share of financing for development in the country when compared with government budget and FDI, having a core focus on development issues has meant that Official Development Assistance (ODA) has supported progress in social and environmental sectors, and on institutional and economic reform (UNDP, 2017). In the case of environmental management and climate change, allocations of public budgets have grown in recent years but remain modest, with MONREC receiving 0.23% of the union budget in 2016/17 (Fodor and Ling, 2019). The MCCSAP 2018 and Myanmar's NDC both identify the need to identify and broaden sources of finance for these areas, and to develop financing mechanisms and modalities for green growth.

According to OECD Development Assistance Committee statistics, since 2013, climate-related development finance to Myanmar has increased year on year up to 2017, reaching just over USD 800 million in climate-related development finance committed to projects in the country in 2017. It then declined to nearly USD 600 million in 2018. Of the climate-related development finance to Myanmar in the last five years (2013-18), 53% support climate change mitigation, 45% support adaptation, and 2% support projects contributing to both mitigation and adaptation objectives. The top five development partners in terms of volume of support for climate change between 2013 and 2018 were Japan, World Bank, IFC, Germany and UK. Myanmar has managed to access climate finance from a diversified mix of funds, with projects support by seven out of the 11 bilateral and multilateral climate funds it is eligible for in 2014 (UNDP, 2017).

Figure 6.3. Climate-related development finance to Myanmar, 2013 to 2018, by sector



Source: OECD DAC Statistics.

The volume of climate-related development finance that Myanmar can access, however, will still only be a fraction of what is needed in the country, especially considering the pace at which the economy is growing. International public funds must be used strategically to build the systems need to spur domestic sources of financing, as well as financing from the private sector. One key area will be using climate-related development finance to build up Myanmar's response to the impacts of climate change, by supporting the development of early warning systems, strengthening data and information systems on climate impacts, supporting hazard mapping and community-level adaptation responses, and climate-proofing large scale and critical infrastructure.

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Notes

[1] See https://www.engie.com/en/news/mandalay-yoma-energy-mini-grid-rural-households-myanmar/