COUNTRY PRIVATE SECTOR DIAGNOSTIC

CREATING MARKETS IN MAURITIUS

Increasing Private Sector Participation in an Innovation-Led Economy

December 2023

WORLD BANK GROUP
THE WORLD BANK IBRD • IDA
IFC International Finance Corporation

About IFC

IFC—a member of the World Bank and member of the World Bank Group—is the largest global development institution focused on the private sector in emerging markets. We work in more than 100 countries, using our capital, expertise, and influence to create markets and opportunities in developing countries. In fiscal year 2022, IFC committed a record $32.8 billion to private companies and financial institutions in developing countries, leveraging the power of the private sector to end extreme poverty and boost shared prosperity as economies grapple with the impacts of global compounding crises. For more information, visit www.ifc.org.

For more information, visit www.ifc.org.

2121 Pennsylvania Avenue, N.W.
Washington, D.C. 20433
www.ifc.org

Cover Photos: World Bank/Dominic Chavez, Shutterstock.com/Myroslava Bozhko, Shutterstock.com/Wang An Qi, istockphoto.com/MmeEmil.

CONTENTS

ACKNOWLEDGMENTS

The Mauritius Country Private Sector Diagnostic (CPSD) was prepared by a joint World Bank–IFC team co-led by Cristian Quijada Torres, Pilar Salgado Otónel, and Marcos Vaena under the supervision of Douglas Pearce, Consolate Rusagara and Stephan Dreyhaupt. The team included Ram Akers, Iwona Borowik, Dinesh Surroop, Bob Hodgson, Deoraj Caussy, and Jamil Salmi. The team is grateful for the contributions and comments provided by Pedro Antmann, Lara Born, Philippa McLaren, Charles William Dalton, Pauline Deschryver, Delphine Divan, Zanele Hlatshwayo, Zayra Romo, Imraan Solwa, and Lianqin Wang.

The report was prepared under the leadership of Idah Pswarayi-Riddihough (Country Director for Mozambique, Madagascar, Mauritius, Comoros and Seychelles in the Eastern and Southern Africa Region), Claudia Conceição (IFC Regional Director for Southern Africa), and Mona Haddad (Global Director for Trade, Investment and Competitiveness in the Equitable Growth, Finance and Institutions Practice Group Vice Presidency). The team is grateful to peer reviewers Ganesh Rasagam, Daniel Street, and Joshua Wimpey. Superb administrative support to the team was provided by Mariella Beugue and Katia Arguello. The report was edited by Sharon Fisher and by Jean Greaves and Sara Proehl, Publications Professionals LLC, and designed by YoonSook Chung.

The team would like to express its sincerest gratitude to the many government officials and private sector representatives in Mauritius who generously shared their knowledge and insights with the CPSD team during the preparation of this report.

ABBREVIATIONS AND ACRONYMS

AML/CFT	anti-money-laundering/countering the financing of terrorism
CEB	Central Electricity Board
CPSD	Country Private Sector Diagnostic
EDB	Economic Development Board
EEMO	Energy Efficiency Management Office
ESCO	energy service companies
FATF	Financial Action Task Force
FDI	foreign direct investment
fintech	financial technology
FiT	feed-in tariff
GDP	gross domestic product
GII	Global Innovation Index
GNI	gross national income
GVA	gross value added
GW	gigawatt
HEC	Higher Education Commission
HEI	higher education institution
ICT	information and communication technology
IDI	ICT Development Index
IFC	International Finance Corporation
IP	intellectual property
IPP	independent power producer
IPR	intellectual property rights
IT	information technology
MARENA	Mauritius Renewable Energy Agency
MCIA	Mauritius Cane Industry Authority
MEPU	Ministry of Energy and Public Utilities
MID	Maurice Ile Durable
MRIC	Mauritius Research and Innovation Council
MS	Mauritius Standard

MSDG	medium-scale distributed generation
MUR	Mauritian rupee
MW	megawatt
NSIS	National SME Incubator Scheme
OECD	Organisation for Economic Co-operation and Development
PPA	power purchase agreement
PPP	public-private partnership
PV	photovoltaic
Rs	Indian rupee
QAA	Quality Assurance Authority
SDG	Sustainable Development Goal
SME	small and medium enterprise
SOE	state-owned enterprise
SSDG	small-scale distributed generation
STEM	science, technology, engineering, and mathematics
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
URA	Utility Regulatory Authority
VC	venture capital
VRE	variable renewable energy
WDI	World Development Indicators

All currency is in US dollars unless otherwise noted.

EXECUTIVE SUMMARY

Mauritius has defied the typical obstacles small island states face by transforming from a monocrop agricultural producer to a diversified, upper-middle-income economy. In the past 50 years, Mauritius has undergone major structural changes to become a diversified economy by exporting textiles, promoting tourism, and providing financial, information, and business services. Export-led industries have translated into substantial employment creation while subsequent productivity gains supported rising salaries and welfare improvements. The country has experienced robust economic growth, with real gross domestic product (GDP) growing at an average of 4.4 percent from 1977 to 2019.[1]

Several challenges have emerged during the past decade that affect Mauritius's long-term growth model. The COVID-19 pandemic exposed long-standing structural challenges affecting key sectors, including retail, finance, tourism, professional services, transport, and manufacturing; it also highlighted gender and youth disparities in labor force participation. Increasingly driven by household consumption, the economy has seen stagnating productivity gains and a sustained loss in overall export competitiveness. In addition, the economy is still geared toward traditional sectors, exposed to external shocks, and threatened by the surge in climate change risks.

Efforts to promote transformational investment, such as subsidies and tax incentives, have not yet translated into more substantial attraction of private investment in technologically advanced sectors with high-growth potential. Mauritius successfully attracts foreign direct investment (FDI) in the traditional finance, real estate, accommodation, and construction sectors, which accounted for 85 percent of gross direct investment flows between 2016 and 2018.[2] In 2022, Mauritius received net FDI of $250 million, equivalent to 1.9 percent of GDP.[3] But real estate accounted for one-third of the investments between 2009 and 2019, even though it contributed to only 10 percent of total value-added growth. Mauritius's competitiveness has declined across established export sectors, and it lost market share in its six largest export sectors. The manufacturing sector also declined in contribution to GDP and employment—from 112,900 jobs in 2007 to 85,000 jobs in 2021.[4]

Challenges faced by small and medium enterprises (SMEs) partially explain this difficulty to innovate, increase productivity, and diversify into more technologically intensive sectors. SMEs account for 99 percent of all businesses in Mauritius.[5] They contribute 35.7 percent to gross value added (GVA) and 12 percent to exports; they are responsible for 49 percent of employment. SMEs face several challenges, including employees with limited technical skills, lack of capital for digitalization, difficulties in accessing financing, lack of market intelligence, and competition from imported products. Only 15 percent of the country's SMEs are involved in high-growth sectors such as information and communication technology (ICT) and financial services. Many SMEs operate at almost subsistence levels: 47 percent operate with five or fewer employees and annual turnovers of less than MUR 2 million.[6]

Climate change presents a significant challenge to a small island state such as Mauritius, but it also provides opportunities for innovation. More than 10 years after the *Maurice Ile Durable* policy strategy and action plan was introduced to make Mauritius a world model for sustainable development, significant work is still needed to realize that vision. Despite initiatives to increase renewable energy, Mauritius heavily depends on imported fossil fuels, which account for 79 percent of its total primary energy supply, while renewable sources contribute only 21 percent. Mauritius continues to face challenges in water management, solid waste management, and protection of its biodiversity. Further promotion of sustainable tourism practices is needed to address climate change impacts. To adapt to climate change and reduce emissions, Mauritius has set an ambitious plan to increase the use of renewable energy sources for electricity generation to 60 percent by 2030 and phase out the use of coal. Increasing climate resilience and reducing Mauritius's carbon footprint will help reduce its exposure to external shocks. All of these areas offer opportunities for innovation and knowledge-based solutions that can and should come from both private and public actors. Prioritizing and fostering these links will be essential.

CHALLENGES AND OPPORTUNITIES FOR PRIVATE SECTOR–LED GROWTH

The Country Private Sector Diagnostic (CPSD) is a joint IFC-World Bank analytical tool that identifies opportunities for private sector investment and financing to drive development. The Mauritius CPSD comes amid an opportunity to rethink Mauritius's previously successful growth model, the legacy of the COVID-19 pandemic, and the rising impacts of climate change. Strong private sector participation is needed to shift the country to a new, innovation-led economic model based on increasing the productivity of existing sectors and developing new, high-growth economic activities that can also contribute to the country's sustainability. Three sectors (education, renewable energy, and health care) and a cross-cutting theme (innovation) were prioritized for analysis after consultations with local private and public stakeholders and World Bank and IFC experts. This CPSD (a) identifies the sector-specific and cross-cutting policy issues that undermine the role of private sector solutions to development challenges, (b) highlights and discusses the sectoral opportunities that can catalyze private sector investment in Mauritius, and (c) suggests policy actions to unlock these sectors for greater private sector participation that can drive the country's next stage of economic development.

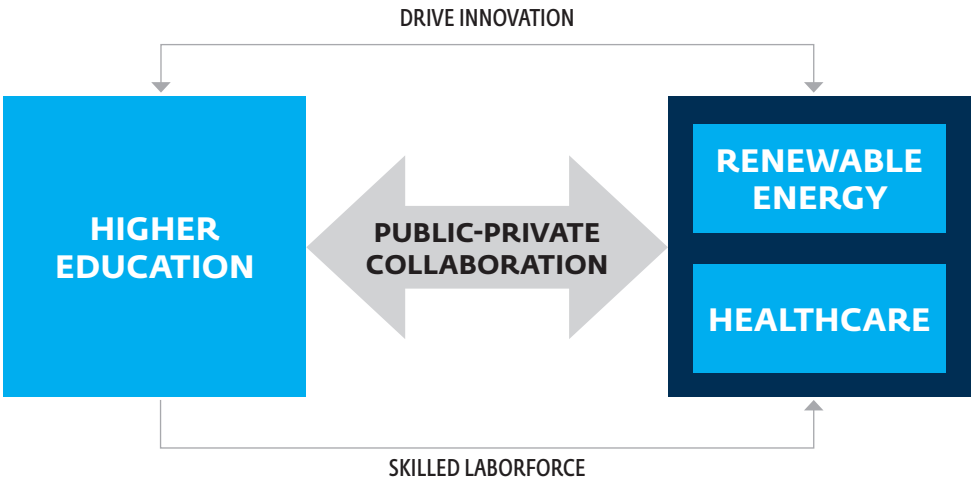
Innovation capacity

Mauritius must do more to improve its innovation[7] system to support its desired transition to a higher value-added economy. Innovation can and should play a leading role in moving Mauritius to a new development model. Among the challenges the country needs to address for this to happen are: (a) lack of prioritization of innovation at the highest levels of government, (b) underinvestment (both public and private) in research and development (R&D) and technology transfer efforts, (c) higher education institutions (HEIs) that do not produce enough knowledge that can be transferred to the real economy, and (d) uncoordinated and dispersed efforts to promote innovation. Mauritius possesses assets that make it a desirable destination for entrepreneurs and researchers, including a stable and enabling business environment—including helpful regulations to start a firm, hire workers, and import talent; good infrastructure and internet connectivity; and a safe and attractive place to visit or live. The CPSD recommendations suggest actions the country can take to better leverage innovation and support diversification goals to become a more knowledge- and technology-driven economy.

Sectoral analysis

An assessment of existing sectoral data and consultations with Mauritius's private sector and policy makers suggest that three sectors—education, renewable energy, and health care—can help drive the export-led private sector growth model. Though many technologically driven sectors contribute to an innovation-led economy, this CPSD prioritized and analyzed the sectors where Mauritius has distinct comparative advantages, there is demand for more of these services, an existing private sector is interested in expanding its presence, and there is value-added growth potential. Other filters used to prioritize sectors were (a) potential for leveraging and expanding into regional markets (to take advantage of free trade agreements, among others); (b) potential to address climate change challenges; (c) potential to mobilize FDI; and (d) potential to create better-paid jobs in Mauritius. The filters also considered the value added of including the sector in the CPSD, excluding sectors with more recent IFC or World Bank analytical engagements, such as the tourism and financial sectors. In addition, the selected sectors are either geared to support the supply side of an innovation-driven economy (education) or to encourage the shift in the demand side with increased private sector participation in technologically advanced and innovative activities (health care and renewable energy). The CPSD recommendations aim to increase the investments in, and competitiveness of, these sectors.

FIGURE ES.1 RATIONALE FOR SECTOR SELECTION



Source: World Bank.

Lack of a clear strategy, challenges in effective coordination with the private sector for policy design and implementation, and skills gaps are common constraints across the three sectors. Mauritius is able to articulate policy goals it seeks to achieve; however, strategies to achieve these goals can lack depth and clear identification of structural issues. Mauritius's education hub policy is an example. Consultations with public and private higher education stakeholders reveal that there is no shared vision, strategy, or structured consultation process. Similarly, the Health Sector Strategic Plan 2020–24 could benefit from more focus and prioritization. Detailed operational plans developed by Thematic Working Groups are a positive step, providing more focused coverage of sector-specific priorities which are being implemented at the Ministry of Health and Social Welfare (MOHW). In the renewable energy sector, the private sector reported that in the past, dialogue with the government had been intermittent—although there are current efforts to remedy this through regular meetings with Business Mauritius. Extensive consultations were undertaken to produce the Renewable Energy Roadmap 2030 and the National Biomass Framework, but the private sector was not consulted on major target revisions. Finally, there are not enough local experts to fill the skill gaps identified in the three sectors. Both the education and health care sectors face challenges in hiring specialized professionals from abroad, especially because of difficulty obtaining visas.

Higher education

Drawing on the future mobility trends of Sub-Saharan students and considering Mauritius's comparative advantages as a destination for studies, the country has a great opportunity to become an education hub for the region. Yet Mauritius is far from achieving the features of an education hub or of a knowledge hub whose goal is the production and distribution of knowledge and innovation. The private sector already plays a crucial role in the higher education sector, which has both private and public providers. Education contributes 4.6 percent to GVA and is responsible for 5.7 percent of total employment.[8] To realize the ambition of an education hub will require developing a common vision and strategy among higher education stakeholders, aligning the Mauritian and foreign higher education systems to ease admission of international students, promoting research excellence, and building relationships between the research community and industry at public universities. It is imperative to first focus on attracting international students to existing schools by simplifying the visa issuance process, reviewing admission criteria, and improving welcoming conditions. To attract more high-quality Higher Education Institutions, clearer policies and incentives are needed. The country could also explore public-private partnerships (PPPs), illustrated by multiple international examples, to fund additional investments in higher education.

Renewable energy

The private sector has opportunities to participate in utility-scale projects for public provision of renewable power supply and to support businesses in industry and commerce for self-generation and increased energy efficiency. The electricity sector contributes modestly to GDP and employment; its expansion could bring Mauritius closer to its goal of sustainability, create demand for skilled labor in well-paying jobs, and create spillovers by making electricity-dependent industries sustainable. The government aspires to increase the supply of renewable energy to approximately 700 megawatts by 2030 through private participation in generation. The private sector is poised to fill the gap; it already operates solar photovoltaic and wind farms on the island, and tenders for new large-scale projects have been awarded. There are also opportunities to participate in distributed generation schemes, which allow companies to lower electricity costs by self-generating renewable energy. There is also potential to develop market opportunities for energy service companies. However, obstacles remain to increase the use of renewable energy, including a need to develop further details to implement the Renewable Energy Roadmap 2030 to prevent delay in private sector investments; to make improvements to ensure competitive auctions and the stability of the grid; and to provide updated information on the potential impact of integrating renewable energy sources on electricity tariffs currently being prepared by the Central Electricity Board (CEB).

Health care

Mauritius aims to become a regional health care hub catering to patients from continental Africa, in addition to expanding medical services for the emerging medical tourism industry. Private investments have fueled the growth of the health care sector, with an increasing number of private health care providers. Opportunities exist to expand PPPs in the provision of health care services, particularly in specializations that require higher levels of capital investment and skills, such as oncology, renal dialysis, and diagnostic imaging services. In addition, Mauritius is developing greater capacity to provide clinical trial services through locally based contract research organizations, which serve international biomedical and pharmaceutical clients globally. However, the country faces challenges in becoming a health care hub because of a lack of specialized health care skills and no conducive policy, legal, and regulatory frameworks to support its vision. The country also faces uneven quality of health care infrastructure; limited investments in R&D; and strong competition from well-established international medical hubs such as India, Singapore, and South Africa. To address these constraints, the government should create an action plan to promote the growth and better coordination of the health care ecosystem and to consolidate the technical, legal, and institutional foundations for the medical tourism and biopharmaceutical industries. This needs to be followed by a plan to better leverage existing supporting institutions for new private investments.

PRIORITY REFORM RECOMMENDATIONS

The CPSD provides a series of actionable recommendations across the sectors covered in the report. Table ES.1 summarizes recommendations for increasing private sector investment in Mauritius's economy to spur greater competitiveness, diversification, and growth. The CPSD prioritizes policy actions likely to be achieved in the short or medium term and policies that have high development impact. The actions are feasible for a country with an excellent track record of development and reform and that desires to reach greater heights through "a modern, vibrant and innovative economy that delivers sustainable and inclusive growth."[9]

TABLE ES.1 KEY RECOMMENDATIONS IN MAURITIUS

SECTOR	RECOMMENDATIONS	RESPONSIBLE ENTITY	PRIORITY	TIME FRAME (SHORT 1–2 YEARS; MEDIUM 3–5 YEARS)
INNOVATION				
Establish a coherent, coordinated vision for innovation	Develop a national innovation strategy with a clearly stated vision, objectives, and up to three priority sectors	Ministry of Finance, Economic Planning and Development	High	Short
	Ensure interinstitutional coordination by establishing an Innovation Council led by the Prime Minister	Prime Minister's Office	High	Short
	Transform MRIC into a national innovation agency with strategic priorities and enhanced budget allocations to accelerate change	Prime Minister's Office	High	Short
Support entrepreneurship and direct engagement with VC	Strengthen entrepreneurship initiatives, including the existing incubator and accelerator programs	Mauritius Research and Innovation Council	High	Short
	Encourage the VC industry based in Mauritius to stimulate deal flow and accelerate new technology-based firms in priority areas	Ministry of Finance, Economic Planning and Development	Medium	Medium
Increase collaboration and funding for research initiatives	Boost private and public sector expenditure on R&D in the priority areas defined by the national innovation strategy	Ministry of Finance, Economic Planning and Development; Mauritius Research and Innovation Council	High	Medium
	Pursue reforms of HEIs to promote research excellence and build relationships between the research community and industry	Ministry of Education, Tertiary Education, Science and Technology	High	Short
Follow good practice for effective program design and the intellectual property agenda	Strengthen the national intellectual property framework and enforcement mechanisms	Mauritius Intellectual Property Office	Medium	Short
	Ensure that all entities responsible for public support programs apply good practice in design and implementation, including monitoring and evaluation	Relevant program implementation institutions	High	Short

Note: HEI = higher education institution; MRIC = Mauritius Research and Innovation Council; R&D = research and development; VC = venture capital.

SECTOR	RECOMMENDATIONS	RESPONSIBLE ENTITY	PRIORITY	TIME FRAME (SHORT 1–2 YEARS; MEDIUM 3–5 YEARS)
HIGHER EDUCATION				
Develop a shared vision for higher education	Create a Higher Education Advisory Council for a structured consultation process	Ministry of Education, Tertiary Education, Science and Technology	High	Short
	Develop a common vision of the education hub by private and public higher education representatives and stakeholders	Ministry of Education, Tertiary Education, Science and Technology	High	Medium
Promote research excellence and collaboration	Increase and reform R&D funding at HEIs so they can be channeled into multidisciplinary and multiyear programs	Ministry of Education, Tertiary Education, Science and Technology	High	Short
	Create links with international knowledge organizations and tap into international research funding from the private sector	Ministry of Education, Tertiary Education, Science and Technology	High	Medium
Attract international students	Align the Mauritian and foreign education systems by recognizing prior learning and using the National Credit Value and Transfer System	HEC	High	Medium
	Strengthen the attraction of existing private education providers by improving the visa issuance process, admission criteria, and welcome conditions	Ministry of Finance, Economic Planning and Development; Ministry of Labour, Industrial Relations and Employment	High	Medium
Attract high-quality higher education providers	Set up clear policies and incentives to attract high-quality HEIs	Ministry of Education, Tertiary Education, Science and Technology; HEC	High	Medium
	Establish a legal framework to distinguish between for-profit and nonprofit institutions to avoid questionable practices	HEC	High	Medium

Note: HEC = Higher Education Commission; HEI = higher education institution; R&D = research and development.

SECTOR	RECOMMENDATIONS	RESPONSIBLE ENTITY	PRIORITY	TIME FRAME (SHORT 1–2 YEARS; MEDIUM 3–5 YEARS)
RENEWABLE ENERGY				
Improve the institutional setup and processes	Provide greater clarity and transparency on the process, status, and timeline for issuing policy decisions on biomass, energy generation schemes, and energy efficiency.	MEPU	Quick win	Short
	Set up a coordination mechanism to implement the Renewable Energy Roadmap 2030, with representation from relevant stakeholders	MEPU	Quick win	Short
Support the CEB for inclusion of renewable energy	Modernize CEB's power purchase agreements and tendering process to align with international good practice	CEB	High	Short
	Perform a variable renewable energy integration study and develop a least cost generation plan	CEB	High	Medium
	Support the development of the Utility Regulatory Authority (URA)	MEPU, URA	Medium	Medium
Prepare for new markets to fulfill renewable energy goals	Diagnose opportunities for SMEs in the supply chain for biomass	Agro-industry, MCIA, MEPU, MARENA	Medium	Medium
	Improve the framework and implementation of energy efficiency	EEMO, MARENA	Medium	Medium
	Prepare and implement a strategy to anticipate the demand for green jobs	MEPU, MARENA	Medium	Medium

Note: CEB = Central Electricity Board; EEMO = Energy Efficiency Management Office; MARENA = Mauritius Renewable Energy Agency; MCIA = Mauritius Cane Industry Authority; MEPU = Ministry of Energy and Public Utilities; SME = small and medium enterprise; URA = Utility Regulatory Authority.

SECTOR	RECOMMENDATIONS	RESPONSIBLE ENTITY	PRIORITY	TIME FRAME (SHORT 1–2 YEARS; MEDIUM 3–5 YEARS)
HEALTH CARE				
Improve strategic, legal, and regulatory frameworks	Establish mutual recognition agreements with international health insurance companies	Ministry of Health, EDB, Mauritius Institute of Biotechnology, private health care insurance providers	High	Short
	Refine the health care sector strategy, including prioritization of initiatives, to align with becoming a regional medical hub	Mauritius Institute of Biotechnology	High	Medium
	Establish internationally aligned accreditation criteria and strengthen the local accreditation capacity of health care providers	Ministry of Health, EDB, Mauritius Institute of Biotechnology, private health care insurance providers	High	Medium
Invest in infrastructure and human capital	Strengthen the quality of physical infrastructure and technologies to meet international standards and for more specialized services	Ministry of Health, EDB, private health care providers	High	Medium
	Enhance the capacity of the health care workforce by introducing uniform accreditation and licensing requirements	Ministry of Health, Ministry of Education, private HEIs, private health care providers	High	Medium
Improve collaboration and R&D for innovation	Strengthen intersectoral coordination and collaboration for R&D and PPP opportunities among health care sector stakeholders	Ministry of Health, Ministry of Education, private HEIs, private health care providers	High	Short
	Promote incentives for greater resource allocation and investments in R&D and biotechnology	Ministry of Health, Ministry of Education, private HEIs, private health care providers	Medium	Medium
Boost private investments and opportunities for PPPs	Establish PPP models to help develop a regional medical hub	EDB, Board of Investment, Ministry of Tourism, Ministry of Foreign Affairs	High	Medium
	Leverage preferential trade agreements to boost health care sector investments	EDB, Board of Investment, Ministry of Tourism, Ministry of Foreign Affairs	High	Medium

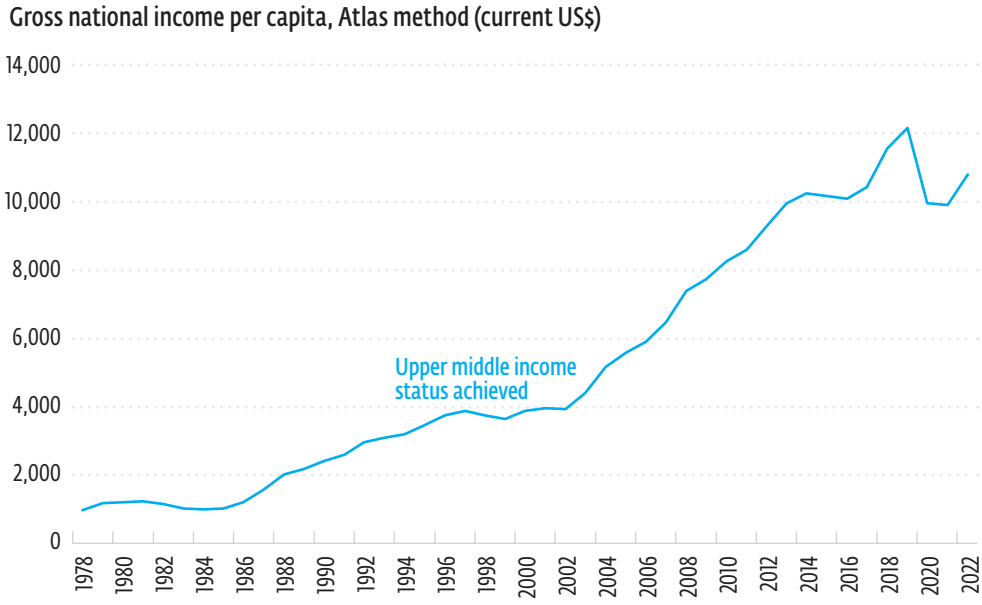
Note: EDB = Economic Development Board; HEI = higher education institution; PPP = public-private partnership; R&D = research and development.

1. COUNTRY CONTEXT

1.1. THE "MAURITIUS MIRACLE" AND MORE RECENT CHALLENGES

Mauritius, with a population of 1.3 million people, has transitioned from a low-income, agriculturally based economy to a diversified, upper-middle-income economy over the past 50 years. Known as the "Mauritius Miracle,"[10] this transition was underpinned by robust economic growth, with real gross domestic product (GDP) growing at an average of 4.4 percent from 1977 to 2019. (figure 1.1). The liberalization of the industrial model in the mid-2000s brought a services boon that further diversified the Mauritian economy. According to Statistics Mauritius, the current economy is driven by manufacturing (13.4 percent of value added in 2022), financial and insurance activities (13.2 percent), wholesale and retail (11.7 percent), accommodation and food service activities (6.5 percent), and construction (5.2 percent). The COVID-19 pandemic caused a GDP contraction of 14.9 percent in 2020 (the largest in Africa), affecting all top six sectors responsible for growth between 2009 and 2019: retail, finance, tourism, professional services, transport, and manufacturing.

FIGURE 1.1 SUSTAINED GROWTH IN MAURITIUS BRINGS UPPER-MIDDLE-INCOME STATUS, 1980–2021

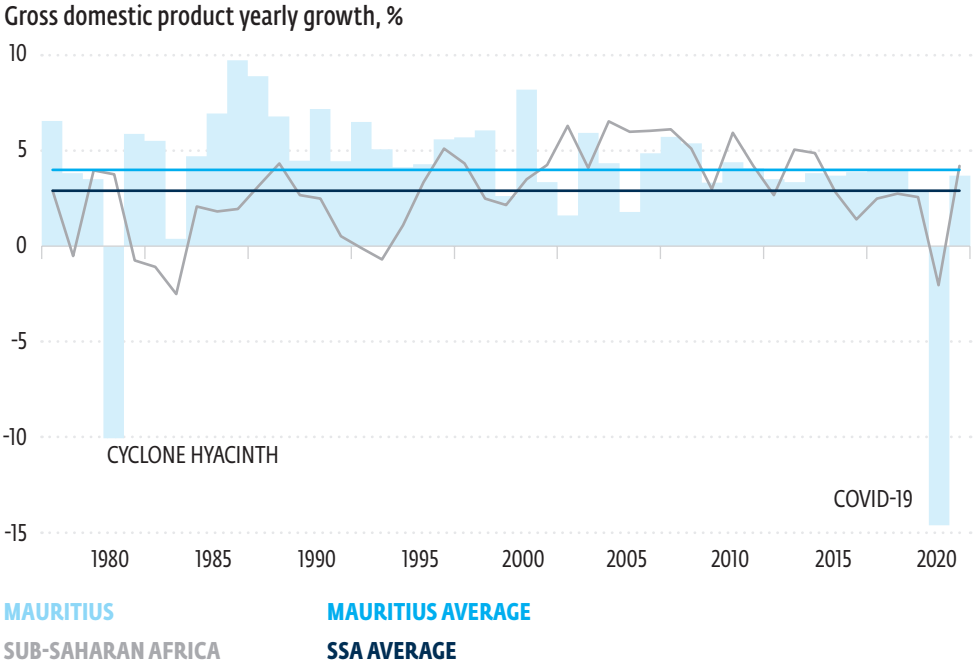


Source: World Bank, WDI (World Development Indicators).
Note: The upper-middle-income range in 1992 started at $2,696 and stopped at $13,305 in 2021.

Economic growth was widely shared, lifting most of the population out of poverty and creating a large middle class. Export-led industries translated into substantial employment creation; subsequent productivity gains supported rising salaries and welfare improvements. Progress in quality of life was complemented with human capital development growth through strong public investment in free education and health programs. Public services were expanded for all, and social protection programs supported the most vulnerable.[11]

After much success, Mauritius's long-term growth model shows structural problems that challenge its continued development. Growth has become increasingly driven by household consumption, with a declining share of investment and stagnating productivity gains. Its star sector, exports, began to lose competitiveness as reflected in the declining market share of traditional exports of goods and services and the failure to quickly develop or scale up new export opportunities. Investments (including foreign direct investment [FDI]) have continued to focus on traditional, lower value-added sectors. An aging population and increasing friction in the labor market are creating high structural unemployment and inactivity rates, rising skills shortages and labor income inequality, and the exclusion of women and youth with lower levels of education. Women with lower levels of education are less likely to be employed than those with higher education levels. Of the employed population with only primary education, only 22 percent are women, compared to 45 percent of those with a tertiary education.[12] Continuous fiscal deficits, combined with limited growth from public expenditure, cause a rising public debt-to-GDP ratio. Mauritius's vulnerability to external shocks and climate change compound these factors (figure 1.2).

FIGURE 1.2 MAURITIUS'S GROWTH SURPASSES THE SUB-SAHARAN AFRICAN AVERAGE BUT IS HEAVILY AFFECTED BY EXTERNAL SHOCKS



Source: WDI (World Development Indicators).

In 2022, GDP grew by 6.1 percent, a healthy rebound from the COVID-19 crisis; however, projections for 2023 are lower (5.6 percent) as the economic outlook for Mauritius remains uncertain. The country's GDP contracted by 14.9 percent in 2020, the worst performance since it attained independence in 1968. Real GDP growth bounced back to 4 percent in 2021, led by a strong rebound in construction and manufacturing.[13] The recovery in 2022 was driven by the rebound in the tourism sector. Tourist arrivals grew almost fivefold in 2022, to about 72 percent of 2019 levels, and tourist arrivals in Mauritius in mid-February 2023 were up by 169 percent year on year. Though the recovery will continue, the pace of annual growth is expected to slow markedly in 2023.[14] Russia's war on Ukraine has affected growth projections for Mauritius as a result of lower growth in trading partners, less optimistic prospects for global tourist flows, and worsening terms of trade.

Mauritius's small and open economy makes it prone to external shocks. Its heavy reliance on external markets makes it vulnerable to global economic downturns and shifts in demand and supply patterns. Dependence on foreign investment, particularly in its financial and real estate sectors, exposes the country to fluctuations in global capital flows and investment sentiment, increasing its susceptibility to external shocks, such as changes in global interest rates, geopolitical instability, and shifts in global economic policies. Moreover, natural disasters, such as cyclones, can significantly affect the economy, particularly in the agricultural and tourism sectors. The COVID-19 pandemic severely affected the tourism industry, a critical contributor to the Mauritian economy, causing a steep decline in foreign exchange earnings. Tourism receipts dropped 73.8 percent in 2020 compared with the previous year.[15]

Imported fossil fuels contribute to external shock vulnerability and pose a challenge for Mauritius to achieve its sustainability goals. Imported fossil fuels account for 79 percent of the country's total primary energy supply, while renewable sources contribute the remaining 21 percent (2021). As a result, the country has incurred substantial costs, importing over $1 billion worth of oil in 2019 alone, thereby contributing significantly to its trade deficit. Such high reliance on imported fossil fuels also renders Mauritius vulnerable to oil price shocks, which can cause inflationary pressures and negatively affect consumer spending and business investments. The high cost of fuel imports also translates into high electricity costs, with the average retail price of electricity in Mauritius exceeding $0.15 per kilowatt-hour, higher than the Sub-Saharan African average.

1.2. COVID-19 IMPACTS

The pandemic led to a decline in investment and exports, an increase in unemployment and poverty, and a sharp decline in tourism, which is a major driver of economic growth for the country. To mitigate the economic impact of the pandemic, the authorities implemented a large and comprehensive stimulus package. Key budget measures included—in addition to the already robust prepandemic safety net—a wage subsidy and income support for the self-employed (initially provided for the whole economy and subsequently largely targeted to the tourism sector), redirected spending toward various initiatives to limit unemployment, and support to the national airline.[16] The government's measures helped mitigate the worst impacts of the pandemic. According to some estimates, without this support, the output could have been even worse. For example, the fall in tourism would have led to an additional fall in GDP of about 9 percent in 2020 relative to 2019, corresponding to 51,000 jobs at risk.[17]

Mauritius struggled with high unemployment even before the COVID-19 pandemic, particularly among women and youth. Structural unemployment is especially high among those with lower levels of educational attainment (12 percent for women and 7 percent for men in 2020) as the labor market continues to evolve toward the services sector and more skill-intensive activities. Though large-scale job losses caused by the pandemic were prevented through government support measures, women and informal workers were nonetheless hit particularly hard. The unemployment rate rose from 7.1 percent to 10.4 percent between March and December 2020, with the increase roughly proportional between men (5.2 percent to 8.6 percent) and women (9.8 percent to 13.1 percent) but starting from a much higher level for the latter. Gender inequities in labor force participation (30 percentage points difference between men and women) and pay (18 percent) point to ongoing challenges in incorporating women into the labor force more effectively.[18] Further, about 32 percent of the youth population age 16–29 is not in employment, education, or training. These percentages are even higher among young women with a lower level of educational attainment: almost 65 percent for women with no education or with only a few years of primary education and about 30 percent for those with a certificate of primary education. [19]

1.3. AN ECONOMIC MODEL IN NEED OF A OVERHAUL

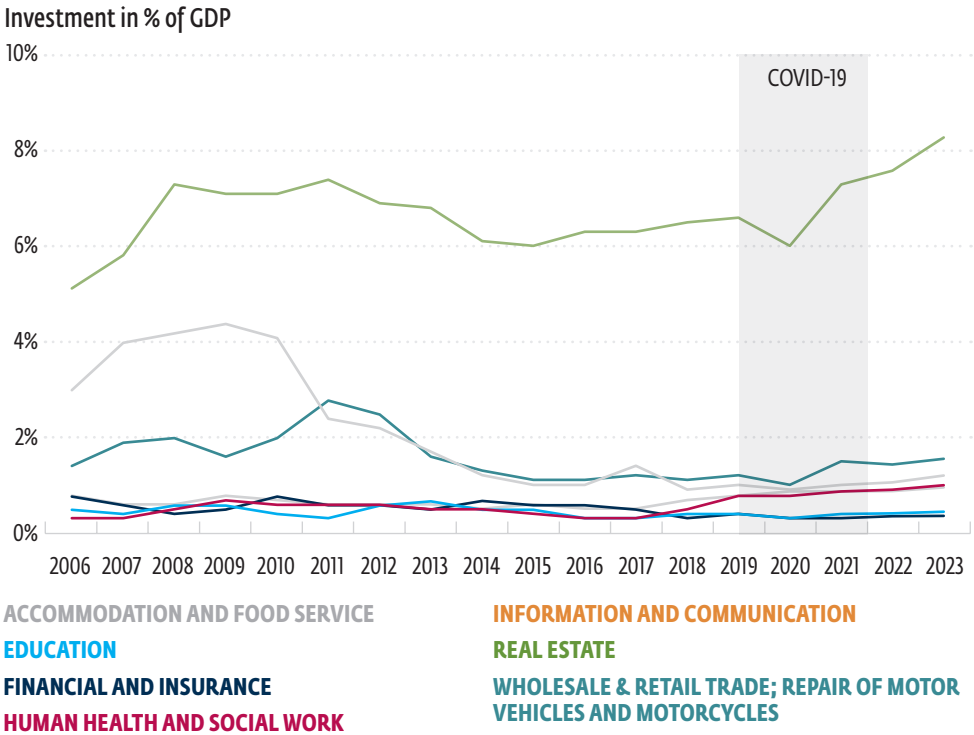
Mauritius' policy measures have not yet translated into more substantial attraction of transformational private investment. Private investment has declined as a share of GDP in the last 20 years[20]; further, many state support measures favor traditional activities and "business as usual." Support measures geared toward transformational activities, such as the R&D tax credit, the Mauritius Africa Fund, and a series of tax holidays targeting specific economic sectors have met limited uptake by the private sector.[21] In 1997, Mauritius's Vision 2020 strategic plan proposed shifting the economy toward higher value-added, knowledge-intensive, and skill-intensive activities; it identified potential areas that included information technology, biotechnology, and medical services. Implementation measures tended to pick winners and promote them through special incentives and targeted public investments. This approach had yielded results in the past for the sugar industry, economic processing zones, and financial services,

but it did not show the same success for higher value-added activities. The Government Programme 2020–2024 also aims to consolidate key economic sectors and foster emerging ones. In broad terms, its aspirations focus on achieving economic growth that is driven by technology and innovation. However, government efforts to facilitate private sector investment in these areas, such as competitively priced infrastructure, simplified regulatory burden, and ensuring a supply of skills, have met with limited results.[22]

Investments in Traditional Sectors

Over the past decade, investment has gone toward sectors with low productivity and technological sophistication, most notably real estate. Investment decreased to 20 percent of GDP in 2022.[23] Real estate, for example, accounted for one-third of investments between 2009 and 2019, even though it contributed to only 10 percent of total value-added growth (figure 1.3). Other traditional sectors, such as tourism, transport, and manufacturing, also accounted for large shares of investment; these sectors made proportionate contributions to growth. However, there was limited investment in technologically advanced sectors, such as finance or ICT (3 percent each), administrative services (1 percent), and professional services (less than 1 percent), which contribute more to growth than traditional sectors.[24]

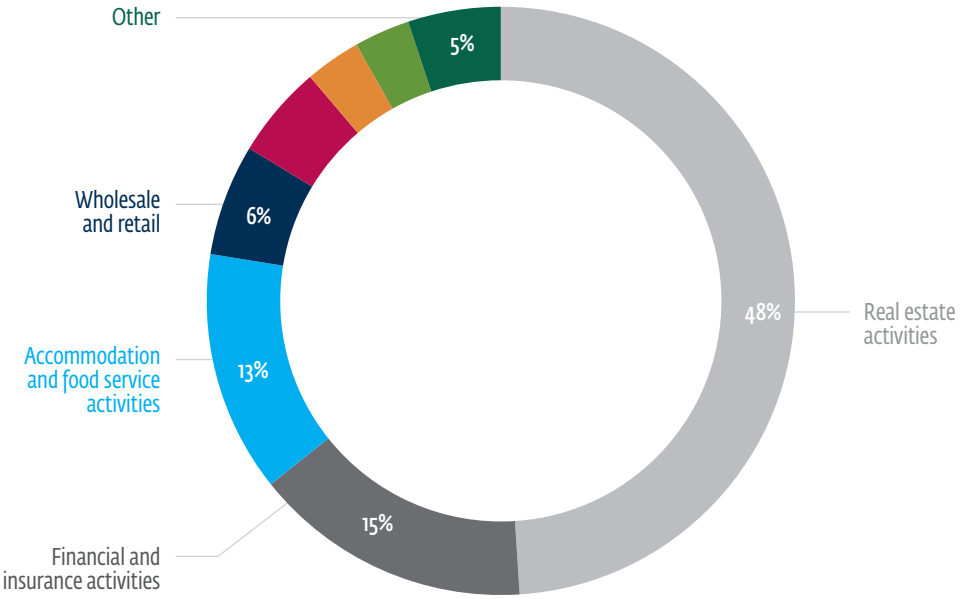
FIGURE 1.3 TRADITIONAL SECTORS IN MAURITIUS CONTINUE TO RECEIVE MORE INVESTMENT



Source: Statistics Mauritius and IFC staff calculations.
Note: Data for 2023 is a forecast. ICT= information and communication technology..

Although Mauritius is still successful in attracting FDI, foreign investment is also still concentrated in traditional sectors. Mauritius received net FDI of $250 million in 2022, equivalent to 1.9 percent of GDP.[25] This was an increase of 12.7 percent from the previous year. However, foreign investors are still mostly active in the finance, real estate, accommodation, and construction sectors—together these accounted for 85 percent of gross direct investment flows between 2016 and 2018.[26] As a result of policies such as the Integrated Resort Scheme, FDI inflows veer toward the residential real estate sector, which attracted 48 percent of all inflows in 2021 (figure 1.4). Two-thirds of foreign investment for the real estate sector came aided by government schemes.[27] Only a small share of FDI went to economic sectors that are strong conduits for international technology transfer and have higher R&D spending as a share of revenue, such as the IT, pharmaceutical, biomedicine, and energy sectors. Moreover, FDI is underperforming in quantity and contribution to productivity growth. In the absence of a comprehensive FDI strategy, isolated growth spurts are found in sector-targeted government initiatives, such as in ICT and film.

FIGURE 1.4 FOREIGN DIRECT INVESTMENT INFLOWS BY ECONOMIC SECTOR, 2021



Source: Bank of Mauritius.

Most Mauritian investment abroad is "market-seeking," that is, Mauritian companies invest to gain access to local markets. From 2009 to 2018, most outward FDI flows from Mauritius went to Sub-Saharan African countries, leading with regional neighbors: Madagascar (23 percent of total Sub-Saharan Africa outflows), Kenya (13 percent), Réunion (9 percent), Seychelles (7 percent), and Mozambique and South Africa (each 5 percent).[28] Market-seeking investment is important for services exports, where delivery often requires a local presence. The garment sector is an example of efficiency-seeking investment; Mauritian firms use offshore production locations to reduce costs of export to the global market.[29]

Declining Competitiveness

The manufacturing sector, a key contributor to the Mauritian economy, faces declining competitiveness.[30] The sector has declined in contributions to GDP (from 19.2 percent in 2005 to 14.7 percent in 2022), employment (from 118,500 jobs in 2005 to 65,792 jobs in 2019), FDI (outward FDI stock has contracted since 2013), and labor productivity (though wage rates increased over 10 percent in 2018). Mauritius's global market share in textiles dropped from 0.18 percent in 1995 to 0.04 percent in 2020, and its global market share in electronics stagnated over the previous decade.[31] Competitiveness is decreasing because of the inability of firms in the sector (especially locally owned firms) to adopt new technologies or upgrade to higher value-added products. The sector's employment structure relies on low-skilled and difficult-to-retrain workers. Moreover, the textile and garment sectors depend on foreign workers (over half of their total workforce), indicating that Mauritians may be less willing to do low-skilled tasks in those sectors.

Mauritius's export performance has mirrored this decline, and competitiveness has declined across most of the established export sectors. Between 2009 and 2019, exports dropped from 57 percent to 40 percent of GDP. Over the same period, the country lost market share in its six largest export sectors. In terms of export complexity,[32] Mauritius's largest shares of export goods are in low- and moderate-complexity products: agriculture and textiles, respectively. The tourism sector—although it showed growth prior to the COVID-19 pandemic—performed below its regional competitors. For sectors such as apparel and business services, Mauritius's export growth was negative. Mauritius gained market share in some nontraditional manufacturing activities (including fertilizer, medical devices, and optical glasses), but these gains were too small to make a strong contribution to total export growth.[33] The greatest contributions to export growth came from moderate- and low-complexity products, particularly insurance, finance, and fertilizers. [34]

1.4. ADAPTING TO CLIMATE CHANGE RISKS

Mauritius ranked 72nd out of 140 countries in transport infrastructure in the 2019 Global Competitiveness Report, with road connectivity and airport connectivity lagging at 136th and 86th, respectively. Although over 95 percent of the island's 1,910 kilometers of roads are paved, road traffic congestion and increasing traffic are growing issues. Further, the 2018 Logistics Performance Index ranked Mauritius 78th out of 167 countries, partly as a result of the high cost of freight, which is related to the country's geographical location and remoteness. Inadequate port facilities to accommodate large vessels are also a contributing factor.[35]

The public utility infrastructure is among the best in Sub-Saharan Africa. The entire Mauritian population has access to safe water and managed sanitation services.[36] The 2020 Africa Infrastructure Development Index for water and sanitation development ranked Mauritius first among 54 African countries. Nevertheless, declining rainfall has led to water shortages and interruptions in some regions during dry seasons, leading some private businesses in the tourism industry to seek alternative, decentralized water supply and wastewater solutions.[37] Climate change is affecting the distribution and seasonality of rainfall on the Island. In addition, there are water losses through leaks due to aging distribution system and also un-metered take-off. Poor capacity for collecting and treating sewage and effluent contributes to polluted surface and groundwater sources and coastal zones. Access to electricity is at 99.7 percent coverage, with a high quality of transmission (only 6 percent losses in 2014). Although the electricity supply has met growing demand, challenges lie ahead—including rising demand from the hospitality, manufacturing, and commercial sectors as well as from new sectors such as ICT, fisheries, and financial services. The ICT Development Index ranked Mauritius first among African countries and 72nd out of 176 countries worldwide in development of the utility sector.[38] The number of cellular phone subscriptions per 100 inhabitants was 151.8 in 2020 (compared with the Sub-Saharan Africa average of 92.6), and fixed broadband subscriptions per 100 inhabitants reached 25.3 (compared with the Sub-Saharan African average of 0.7).[39] In a survey of large establishments employing 10 or more people, 98.6 percent reported having internet connection and 51.9 percent reported placing orders over the internet.[40]

Climate change risks put increased pressure on Mauritius's infrastructure. Solid waste management and water and sanitation infrastructure require upgrading to mitigate climate risks. Mauritius is highly vulnerable to the adverse impacts of climate change, ranking 51st of 181 countries in the 2021 World Risk Report.[41] Heavy rains and insufficient drainage infrastructure cause roads and buildings to be flooded, resulting in frequent interruptions to services and economic activity as well as causing school closures. Access to piped sewerage infrastructure and drainage systems is weak; only about 28 percent of the population is connected to the country's sewerage network. Mauritius's disaster risk profile by the Global Facility for Disaster Reduction and Recovery highlights flooding as the second largest risk after cyclones, causing 20 percent of the direct economic losses associated with disasters.[42] By some estimates, Mauritius suffers $100 million annually in combined direct losses from natural

disasters, 80 percent of which are caused by tropical cyclones. Severe tropical cyclones can produce significantly larger losses. Analysis by the South West Indian Ocean Risk Assessment and Financing Initiative[43] suggests that a 100-year return period tropical cyclone event could produce direct losses of $1.9 billion. In addition, most of the primary and secondary road networks, and the entirety of the tertiary network, are not engineered roads; instead, these road networks have been constructed by paving former tracks across sugar cane production areas, leaving them highly exposed to climate change impacts. Also, a high percentage of the economy's infrastructure is located on the coasts of Mauritius, areas that are particularly exposed to erosion and disaster risks.

Mauritius was an early proponent of modeling sustainable development. Introduced in 2008, the *Maurice Ile Durable (MID)* policy strategy and action plan proposed to make Mauritius a world model for sustainable development, particularly in the context of small island developing states. Although some sectors have seen significant progress, more than 10 years after the MID concept was introduced there is still significant work to be done. The initial impetus for MID was to minimize dependency on fossil fuels through increased use of renewable energy and a more efficient use of energy in general. The concept soon widened to include all aspects of the economic model, society, and the environment. Initiatives increased renewable energy generation and sustainable transportation, but challenges remain in the areas of water management, sustainable tourism practices, solid waste management, and protection of biodiversity. The lack of a broad strategy for sustainable development and sustained or coordinated efforts to implement the strategy obstruct the addressing of climate change issues. Five years after the MID concept started, the MID commission launched an action plan.[44] However, the commission was dismantled a year later.[45] Government efforts to become a sustainable island continue, most notably in the energy sector. The Government Programme 2020–2024 aims to achieve an "inclusive, high income and green Mauritius," but a national coordinating mechanism is absent, and coordination is only across thematic areas.[46]

Mauritius is taking strides to adapt to climate change impacts and to reduce emissions by increasing its use of renewable energy sources for electricity generation. The country set an ambitious target of 60 percent share of renewables in its electricity mix by 2030 while simultaneously phasing out coal usage. In addition to the environmental advantages, these efforts will bolster energy independence and reduce the outflow of foreign currency. In 2021, renewables accounted for 21 percent of electricity generation, far from the stated goals. This highlights the need for significant investment in the country's electricity infrastructure to achieve greenhouse gas reduction. The government has announced initiatives to promote the adoption of biomass, wind, and solar energy sources with strong private sector participation.

1.5. STRATEGY FOR A NEW SUSTAINABLE GROWTH PATH

With most traditional growth sectors facing decline or significant uncertainty in the medium term, developing productive new economic activities and raising the productivity in mainstay sectors are more urgent than ever. This requires a change in the pre-COVID-19 consumption-led growth pattern, along with declining the private sector investment focused on traditional sectors. The Government Programme 2020–2024 focuses on consolidating and modernizing the traditional engines of growth, such as cane sugar production, manufacturing, and tourism, as well as promoting growth in new sectors, such as the blue economy (marine biotechnology, industrial and semi-industrial fisheries, and aquaculture), creative industries, and the circular economy. The plan refers to the role of innovation for certain activities, such as improving manufacturing competitiveness, promoting innovation as part of entrepreneurship, and developing innovation labs. A better-articulated and more specific strategy for how exactly innovation will help promote this growth of new, more technology-driven sectors is needed. A stronger focus on reforming the enabling environment to increase private investments in education, R&D, infrastructure, and skills to develop these new growth activities and upgrade existing ones is indispensable for Mauritius to return to a sustainable growth path and develop the economy in line with its aspiration to be a technology- and innovation-driven, high-income economy.[47]

2. STATE OF THE PRIVATE SECTOR

Conglomerates and large companies—some of which were established as far back as the 1800s in the sugarcane sector—play a leading role in the Mauritian economy. Over the years, these companies extended their operations into new industries across agribusiness, apparel manufacturing, tourism, retail, logistics, and others. Today, these companies compete across sectors and are often vertically integrated across value chains. They are important conduits for "new-to-the-country" and "new-to-the-firm" innovation, working in tandem with rapid economic diversification and integration into global value chains. With a more sophisticated business organization, strong market position, and access to funding, they continue to innovate by (for example) investing in plants and equipment, joint ventures, and acquisitions of high-growth local companies. At the same time, their outsize presence and first-mover advantage in product markets in which Mauritius has a competitive advantage can create market barriers.[48]

2.1. CRUCIAL ROLE OF SMALL AND MEDIUM ENTERPRISES

Small and medium enterprises (SMEs) play a pivotal role in the country's development, comprising 99 percent of all enterprises. According to the Census of Economic Activities 2018, approximately 138,553 registered SMEs operate across all sectors in Mauritius; 81 percent of these are micro enterprises, 18 percent are small, and 1 percent are medium. In 2019, SMEs were responsible for 35.7 percent of contributions to GVA, 12 percent of exports, and 49 percent of employment. Twenty-seven percent of SMEs operate in wholesale and retail trade, repair of motor vehicles and motorcycles; 27 percent in agriculture, forestry, and fishing; 12 percent in transportation and storage; 9 percent in manufacturing; and 8 percent in construction. In many cases, SMEs are family owned, with a wide variation in their managerial capabilities, competitiveness, and productivity. Among the key challenges SMEs face are lack of employee technical skills needed to diversify products, lack of capital to digitalize operations, constraints on access to finance, lack of market intelligence, overdependence on imported raw materials, and unfair competition from imported products.

Despite the increase in their value addition, SMEs in Mauritius highly skew toward enterprises that are labor intensive with low value addition. Forty-seven percent of SMEs operate at almost subsistence levels, with five or fewer employees and annual turnovers of less than MUR 2 million. Only 15 percent of SMEs are involved in high-growth sectors, such as ICT and financial and professional services. Although the performance of SMEs has increased in Mauritius since 2013, their contribution toward its GDP is just 40 percent, a typical situation in a country caught in the middle-income trap.[49] Further, SME exports have not increased compared with other sectors since 2014, when they contributed 10 percent to total domestic exports.[50]

2.2. MANUFACTURING AND ITS WANING TRAJECTORY

Manufacturing, despite productivity declines, continues to be the largest contributor to the economy. In 2019, Mauritius's manufacturing sector contributed about a 12.5 percent share of value added in the economy and accounted for 10 percent of employment.[51] The manufacturing sector comprises 587 large establishments (firms with at least 10 employees), including 239 export-oriented enterprises[52] and 348 domestic-oriented enterprises. Export-oriented enterprises are characterized by limited diversification and concentration in the textile, apparel, food, and jewelry subsectors. In 2020, export-oriented enterprises were responsible for 53 percent of exports. Domestic-oriented enterprises accounted for 8.1 percent of value added in the economy and produced a more diversified range of products than export-oriented enterprises.

Mauritian manufacturing firms face challenging gaps in managerial skills and technology adoption. A survey of businesses reveals that 70 percent face difficulties in finding employees with sufficient managerial skills.[53] Only about 20 percent of companies use automated manufacturing and inventory management systems, with the remainder using mostly manual processes or machines controlled without computers. Productivity varies among subsectors. Garment manufacturing's total factor productivity trails that of comparable high-income and upper-middle-income countries—the subsector is 40 percent more productive in high-income economies and 20 percent more productive in upper-middle-income economies. The lagging performance of the sector coincides with China's surge in apparel exports after the Multifiber Arrangement phaseout. The limited export orientation of Mauritian manufacturing firms is tied to their limited product variety, low complexity, and poor connectivity to markets. Although Mauritian manufacturing is on a flat or declining productivity trajectory, food manufacturing stands out in growth and investment. However, the food manufacturing sector is still characterized by low value-added goods, low labor cost share, and low foreign investment.[54]

2.3. STRONG UPTAKE OF FINANCIAL AND DIGITAL SERVICES

Mauritius's robust and diversified financial sector is the biggest contributor to GDP (13.5 percent in 2022).[55] The financial sector includes banking, insurance, and offshore financial services. The sector is a key driver of economic growth, attracting FDI and supporting the development of other sectors. However, it only contributed 2.7 percent to employment in 2021. Fourteen of the 19 banks operating in Mauritius are international banks that use the country as a springboard for investments across Africa and beyond. Financial inclusion is high, with over 93 percent of adults using formal or informal financial services, although SMEs face difficulties in accessing finance. Banks typically require property and fixed assets as collateral, and the absence of a centralized movable collateral registry exacerbates the bias toward businesses with land and buildings.[56] Meanwhile, nonbank financial institutions are expanding rapidly to meet the rising demand for insurance and pension services. Mauritius is committed to strengthening the sector through comprehensive reforms that aim to enhance the anti-money-laundering/countering the financing of terrorism (AML/CFT) framework and ensure compliance with Financial Action Task Force (FATF) standards, which reinforce the country's reputation. Mauritius is rated as compliant or largely compliant in all 40 FATF recommendations.[57]

Mauritius's use of financial digital services surpasses the regional average by a considerable margin. As of 2021, 80 percent of Mauritians over the age of 15 had either made or received digital payments and 20 percent owned credit cards, a sharp contrast to the Sub-Saharan African average of 50 percent and a mere 3 percent, respectively.[58] Recent regulatory reforms are expected to facilitate the development of the financial technology (fintech) industry, further bolstering the country as a digital hub for innovation.[59] The Bank of Mauritius envisions a shift toward a cash-light society, better delivery of banking services through fintech, and development of a digital and innovation hub that serves as a gateway for fintech and start-up companies seeking to expand into Africa.[60]

The Government Programme 2020–2024 seeks to transform Mauritius into a digital economy and innovation hub, propelled by an impressive digital infrastructure. This ambition is reflected in the Digital Mauritius 2030 strategy to boost the digital economy and broaden access to public services. In 2017, the International Telecommunication Union's ICT Development Index ranked Mauritius first in Africa because of its high levels of ICT access. The country boasts an island-wide fiber network; a tier-4 data center; full 4G LTE coverage; and resilient subsea optical fiber connectivity to Africa, Asia, and Europe; and it has plans for 5G networks.

Despite these advantages, over the past 17 years the ICT sector's contribution to the economy has remained constant at about 4.5 percent.[61] Obstacles to its growth include a shortage of ICT skills, weak collaboration between research institutions, and the need for increased public-private partnerships (PPPs). The government introduced the Smart Mauritius five-year ICT strategic plan to address these issues and establish Mauritius as a technological hub in Africa. The development of intelligent cities and techno-parks is part of this broader digitalization agenda and has been underway since 2015.[62]

2.4. CONTRIBUTIONS OF TOURISM, HIGHER EDUCATION, AND HEALTH CARE SECTORS

Tourism significantly contributes to the Mauritian economy and employment. According to the World Travel and Tourism Council, the direct and total contribution of tourism to Mauritius's GDP was 7.1 percent in 2019. However, when indirect effects of tourism are considered, the total contribution was estimated to be about 19.5 percent of GDP. Tourism is a major source of employment in Mauritius, with about 106,000 people employed in the sector in 2019, accounting for approximately 19.2 percent of total employment.[63] The sector provides employment opportunities across a range of skill levels, including jobs in hotels, restaurants, transportation, and other tourism-related businesses. The sector has rebounded well from the COVID-19 crisis, driving the country's economic recovery.

The tourism sector is well placed to capitalize on new global trends and to share its benefits more broadly.[64] Recent changes in consumer (tourism) behavior, enabled by new technology (online bookings) provide Mauritius with a generational opportunity to change the traditional model of enclave coastal resorts and develop a more inclusive, green and democratic tourism sector which supports economic transformation. In the last few years, a significant and growing number of international tourists are choosing to stay outside of the beach resorts, often in villas and other rental properties. Future growth will likely be driven by this new segment of tourists, leading to important changes in strategy that will be required to meet the needs of these tourists and safeguard the Mauritius brand. This provides the opportunity to develop a greater offer of products and services from local SMEs and start-ups, increasing the amount of revenue that is spent outside of resorts. This also provides an opportunity to decrease the pressure of new investments in coastal areas, already affected by beach erosion and climate change. This also means that both public and private sector will need to increase investments to improve the tourist experience outside of enclave resorts, including enhanced public beach access and improving and renovating the offer of cultural sites and nature-based activities, among others.

Mauritius's higher education sector comprises 42 private tertiary education providers and 10 public tertiary providers. The entire sector contributes 5.1 percent to GDP and 29,500 jobs to total employment. The private sector plays an important role in higher education: private providers were responsible for 29 percent of enrollment (14,300) in 2021, but the numbers have decreased since 2019. Among the shortcomings in private sector development in tertiary education are the lack of a common vision of the higher education hub by private and public higher education institutions (HEIs), barriers in admission of foreign students (such as a bureaucratic visa issuance process and constraints on opening bank accounts), misalignment between Mauritian and foreign education systems that limits access by foreign students, and scarce research opportunities for students.

Mauritius's health care sector attracts significant private investments, with a growing number of private health care providers. Private health expenditure as a percentage of GDP increased from 2.81 percent in 2014 to 3.32 percent in 2019.[65] The number of private clinics increased from 13 in 2006 to 18 in 2021. Currently, the private network consists of 18 private hospitals and clinics; 395 pharmaceutical retail outlets; six dialysis centers; nine sugar estate dispensaries; and four specialized centers for cosmetic medicine, dentistry, fertility, and rehabilitative medicine. Similarly, the hospital bed capacity increased from 562 to 773 between 2006 and 2021. Human health and social work activities accounted for 4.7 percent of GDP in 2021[66] and have remained stable over the past four years. After decreasing by 0.7 percent in 2020, GVA growth rates for the health care sector increased 5.1 percent in 2021 and 5.6 percent in 2022.

2.5. PROMOTING ENTREPRENEURSHIP, COMPETITION, AND INCLUSION

Mauritius's small entrepreneurship ecosystem has gained momentum in recent years. The government has implemented policies and programs to encourage the entrepreneurship sector's growth, which has benefited from start-up incubators and accelerators; funding through venture capital (VC), angel grants, and government grants; and entrepreneurship start-up organizations. The National SME Incubator Scheme (NSIS), managed by the Mauritius Research and Innovation Council (MRIC), promotes the development of innovative start-ups, facilitated by a network of private sector–led and accredited business incubators. NSIS has accredited seven incubators (including Turbine Incubator, Future Females Foundation, and Trampoline), with 50 percent cofunded by the private sector. Twenty-two start-ups have graduated from NSIS and are operating independently. Start-ups are not attracting necessary follow-on investment because of their lack of investment readiness, reflecting a need to improve the selection process and the quality of the incubation process. Investment funds domiciled in Mauritius mostly invest elsewhere, with many focusing in the African region.

State-owned enterprises (SOEs) participate in various sectors, including telecommunications, transport/logistics, and energy, raising competition concerns. In some sectors, SOEs compete on an equal level; however, in other sectors they are quasi-regulators—crowding out the private sector. In the information and communication technology (ICT) sector, which accounts for just over 4 percent of GDP, Mauritius Telecom dominates the fixed broadband market, holding a market share of about 80 percent. The regulatory framework does not allow other operators or entrants access to the infrastructure owned and operated by Mauritius Telecom. Both air and port transportation experience inadequate competition. Air transportation companies with significant state ownership—such as Air Mauritius, Airports of Mauritius, and Airport Terminal Operations—provide services to and compete with private competitors in airline, ground handling, and terminal services. Unclear roles limit entry and expansion, such as in the provision of licenses and in access to slots. In ports, the state-owned Cargo Handling Company is seen as inefficient and not innovative. In energy (electricity), a new Utility Regulatory Authority (URA) has been established, ending decades of having the parastatal Central Electricity Board (CEB) act as a quasi-regulator. Independent power producers (IPPs) also participate in the generation of electricity in Mauritius. They provide 60 percent of the electricity consumed on the island. This share is bound to increase with the introduction of more renewable energy to the electricity mix.

The Competition Commission of Mauritius has a solid track record in the enforcement of competition law in Mauritius since its establishment in 2009. Although its tenure is brief, the commission has demonstrated a commendable record in addressing anticompetitive behavior across diverse sectors of the Mauritian economy. Recently, the commission experienced success in anti-cartel enforcement, marking a welcome acceleration of its activities.[67] Nonetheless, the commission's remit is limited, and it lacks the authority to review the anticompetitive regulations of network industries or SOEs.[68] Linked to the prime minister's office, the commission enjoys independence in its decision-making processes, which are carried out by a panel of five commissioners. In 2019 and 2020, the commission issued five decisions each year. The influence of a handful of conglomerates on key sectors of the Mauritian economy, including agriculture, trade, and telecommunications, remains a challenge.[69]

Women are active in business ownership and the labor force in Mauritius, with nearly half of businesses having at least some degree of female ownership. Women also make up about 32 percent of workers. However, women account for only 13 percent of top managers in Mauritius, and only 9 percent of businesses are majority female owned.[70] According to 2020 data, the proportion of women holding senior positions in the private sector was about 38.2 percent. Data indicate that in the largest companies the glass ceiling remains impenetrable; in 2020, there were no female chief executive officers among the top 100 companies.[71]

Data on Mauritius's informal sector is scarce. The estimated size of Mauritius's informal economy is approximately 20.4 percent, which represents about $5 billion of GDP (based on purchasing power parity).[72] Findings from the Enterprise Survey 2020 indicate that the informal sector is the main competitor for 1 in 10 firms, though over one-half of the firms surveyed reported competition from unregistered businesses. In line with global trends, informality in Mauritius is concentrated in the construction, transport, and food sectors. Firms that are younger, smaller, or less productive more likely see unregistered businesses as their main competition.

In spite of ongoing efforts, the level and pace of PPP project development and operation has been lower than expected and below what is required to fulfill the need in Mauritius for an improved, expanded, and a more competitive economy. PPPs and (more broadly) public-private dialogue and collaboration can be viewed as one of the key factors behind Mauritius's relatively rapid development since its independence due to the country's successful economic diversification over the years. Mauritius has developed a PPP Framework composed of several different statements, acts, and guidelines that have emerged in the past years. Encouraging more private sector participation in the economy via PPP mechanisms has been a goal pursued by Mauritius since the early 2000s. Despite this intention, a clearer, more strategic, and more inclusive PPP vision is needed to build solid regulatory frameworks that will serve as a base for cooperation across all key strategic focus sectors, including renewable energy, education, health care, and innovation. A recent example of PPP best practices that could be developed across sectors is that of the Build Operate Transfer Projects Act 2016 (the BOT Projects Act), which has provided for simpler, more transparent, and more efficient PPP procedures and competitive public procurement processes for large infrastructure projects—namely the development of the Smart Cities concept in Mauritius.

3. CROSS-CUTTING CONSTRAINTS ON PRIVATE SECTOR INVESTMENT

Mauritius faces several constraints on growth that affect many of its industries, including the sectors selected for review under this CPSD. The country's capacity to innovate falls below what is expected for its level of development as an upper-middle-income economy. Chapter 4 presents a review of the innovation system in Mauritius. Other constraints on economic growth and sustainable development include (a) gaps in adequate skills in key domains, (b) lagging regulatory framework and clear policies and strategies to enable PPPs, (c) inefficient commercial air and maritime access infrastructure, and (d) inadequate access to finance for SMEs and entrepreneurs.

3.1. LABOR MARKET CONSTRAINTS

The private sector cites talent gaps across all sectors and lack of technology talent as the most severe challenges to growth. Skills deficiencies, including in ICT as an enabling sector for technological transformation, directly translate into low levels of innovation, technology absorption, creation of competitive jobs, and economic diversification. Skills provision by polytechnics supports increased automation at the industry level. The private sector estimates that Mauritius will require 10,000 technology specialists over the next two to three years to accelerate the modernization and digitalization of the economy.[73] The country currently produces 1,000 technology specialists annually, pointing to a potential opportunity for private sector investment to help close the talent gap.

The limited supply of technical and soft skills hinders Mauritius's ability to upgrade its economy and attract higher value-added investment. Mauritian university curricula do not always match requirements from sophisticated industries. Education and training institutions[74] do not produce workers with the required job skills, and training programs do not align with industry needs or reflect the latest trends. As a result, emerging sectors in scientific and technical research, including those focused on R&D activities, struggle to find skilled staff in Mauritius. The longer-term picture is even more worrisome and is explored in the education sector chapter. The rapid decline in population and high rate of dropouts in primary and secondary education put pressure on the higher education system and will make the availability of qualified workers even more challenging in the future.

Though migration has helped to address bottlenecks, especially in export-oriented firms, the number of foreign (especially highly skilled) workers remains small. Foreign workers made up about 8 percent of Mauritius's labor force in 2018, with nearly 90 percent being semi- or low-skilled workers. The manufacturing sector is the main employer of semi- and low-skilled workers (particularly export-oriented enterprises in the textile and apparel manufacturing segment). Among small countries, Mauritius is an outlier, with a migrant share of only 2.3 percent (not including short-term migrant workers); this is comparable to the migration levels of most low-income small countries. All small countries with similar or higher per capita gross national income levels exhibit much higher levels of inward migration. Migration shares are high among small countries that perform well in innovation outcomes, such as Luxembourg (47 percent), Singapore (37 percent), and New Zealand (22 percent).[75]

3.2. LIMITED COMPETITION AND PUBLIC-PRIVATE DIALOGUE

Limited competition and public-private dialogue curtail investments in key sectors. The landscape of competition and market contestability in Mauritius has improved in the past 13 years. For example, the share of formal businesses that constructed or retained a monopoly position in their main market dropped from 24 percent in 2009 to only 6 percent in 2020.[76] However, private sector stakeholders consistently point to limited dialogue with the government, causing inefficient allocation of public and private resources in sectors such as education, health care, logistics, and renewable energy. Private sector firms want to partner with the government in joint ventures through PPPs, however, they cite unclear or lagging public policy direction, inadequate regulatory frameworks, and ineffective implementation mechanisms. Worthy of note are the successful IPPs concluded with the private sector for the provision of electricity. Further, the absence of national strategies or lack of clear policy implementation in education, innovation, and (more broadly) sustainable development stifle private investments in human skills development, education, innovation, blue economy, waste management, and renewable energy.[77]

The lack of competitive pressure leads to poor market connectivity.[78] Both air and sea transportation are characterized by the predominant role of SOEs, such as the Mauritius Ports Authority and Air Mauritius. This SOE presence limits competition from the private sector and results in management inefficiencies and low innovation. The issue is amplified by global supply chain disruptions and increasing fuel costs. The long-term objective is to increase the "servicification"[79] of Mauritius's economic structure, but traditional economic activities, such as the sugar and textile industries, still depend on competitive logistics solutions. Enhancing connectivity is a strategic necessity expressed by the private sector and requires a more suitable policy framework and upgraded regulatory measures. The Competition Commission of Mauritius has helped make the situation fair for all firms; however, its mandate is narrow and does not extend to anticompetitive regulation of network industries or SOEs. Further, it cannot impose fines for abuse of monopoly cases and does not enjoy mandatory notification of mergers.[80]

Policies and institutions need strengthening to support the growth of emerging green sectors. Because of its environmental risks, Mauritius needs to develop capacities and knowledge in environmental goods and services, including waste and water management, recycling and the circular economy, renewable energy, and waste-to-energy solutions. This could bring growth in new economic activities while simultaneously increasing resilience against natural hazards and climate change. However, supporting policies need to be adjusted to allow for greater private sector participation in this space. Examples include (a) supplying an enabling regulatory framework for IPPs and pricing policy issues for private sector renewable energy providers; (b) revisiting management of the water sector, currently managed by multiple agencies with no coordination; and (c) revisiting regulations on the recycling of e-waste and the use and export of secondary (recycled) materials.

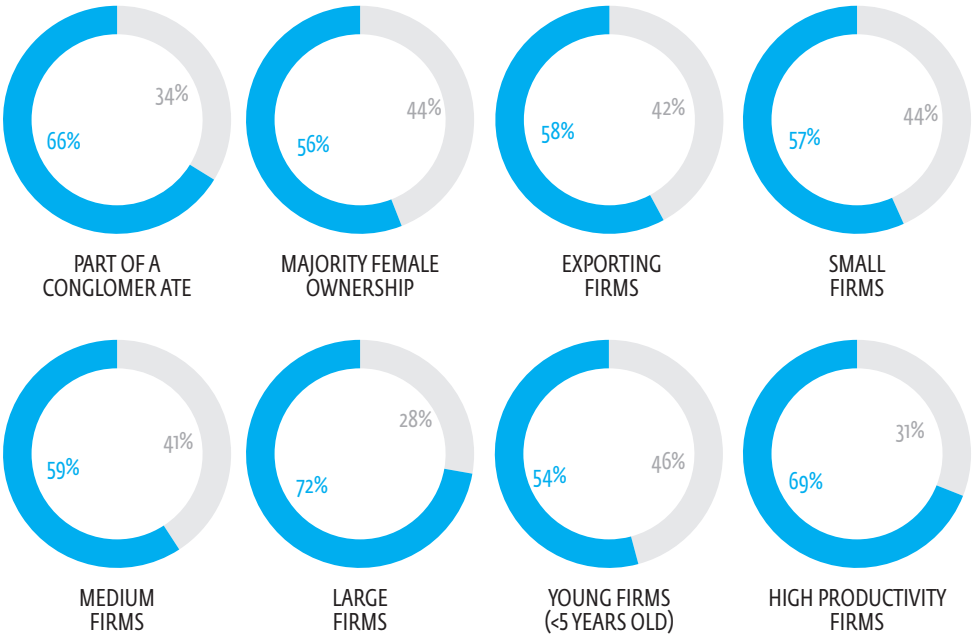
There is still untapped potential in PPPs for project development and operation to fulfill the need in Mauritius for an improved, expanded, and a more competitive economy. PPPs and (more broadly) public-private dialogue and collaboration can be viewed as one of the key factors behind Mauritius's rapid development since its independence as well as its successful economic diversification over the years. Mauritius has developed a PPP Framework composed of several different statements, acts, and guidelines that encourages more private sector participation in the economy via PPP mechanisms; this has been a goal pursued by Mauritius since the early 2000s. Despite this intention, a clearer, more strategic, and more inclusive PPP vision is needed to build solid regulatory frameworks that will serve as a base for cooperation across all key strategic focus sectors such as renewable energy, education, health care, and innovation. A recent example of PPP best practices that could be developed across sectors is that of the BOT Act, which has provided for simpler, more transparent, and more efficient PPP procedures as well as competitive public procurement processes for large infrastructure projects—namely the development of the Smart Cities concept in Mauritius.

3.3. LACK OF ACCESS TO FINANCE

SMEs have limited access to finance Access to finance is the most commonly cited constraint; about 40 percent of businesses identify it as an obstacle, with the highest concentration in younger, smaller firms and in the garment manufacturing and hotel and accommodation sectors (figure 3.1). Businesses that are part of a multinational corporation or Mauritian conglomerate are less affected by access to finance, as are higher-productivity firms. SMEs are more likely to face financing constraints, with 30 percent reporting credit constraints compared with 20 percent of medium firms and less than 10 percent of large firms. The owner's gender does not make a significant difference in access to finance. This result is consistent with the Global Findex 2017 survey, which showed that Mauritius has a low gender gap—the lowest in the Africa region. Leveraging digital financial services to foster financial inclusion among SMEs is an obvious course of action toward making short-term progress. Because the country has high internet penetration rates, fintech solutions could play a bigger role in expanding access to finance. For example, digital technologies, such as automated credit scoring, can partially address the screening and processing of SME loans, which incur high administration costs.[81]

FIGURE 3.1 ACCESS TO FINANCE IS A TOP CONSTRAINT ON ALL FIRMS, 2020

Share of firms reporting access as a major or very severe constraint



Source: World Bank Enterprise Surveys 2020.

Obstacles remain for the expansion of next-generation financial services firms to enter the market. The financial sector contributes to approximately 13.9 percent of GDP in Mauritius. The government has developed a 10-year blueprint for the sector and aims to double its contribution to GDP.[82] This requires new products and regulations. For example, the Economic Development Board (EDB) Regulatory Sandbox has been applied in the fintech sector, yet it is still a challenge for start-ups is to obtain the final license, which can take several years because of the traditional regulatory approach of the banking sector. Growth of the financial sector is also hampered by the lack of modernization of the legal framework, harmonization with international good practice, and institutional capacity. Reforms are needed to promote stability in the financial system and to remove the main obstacles in accessing finance for small business operators; such reforms can include movable collaterals in lending products and strengthening digital financial services.

4. OPPORTUNITIES TO SUPPORT AN INNOVATION-DRIVEN ECONOMY

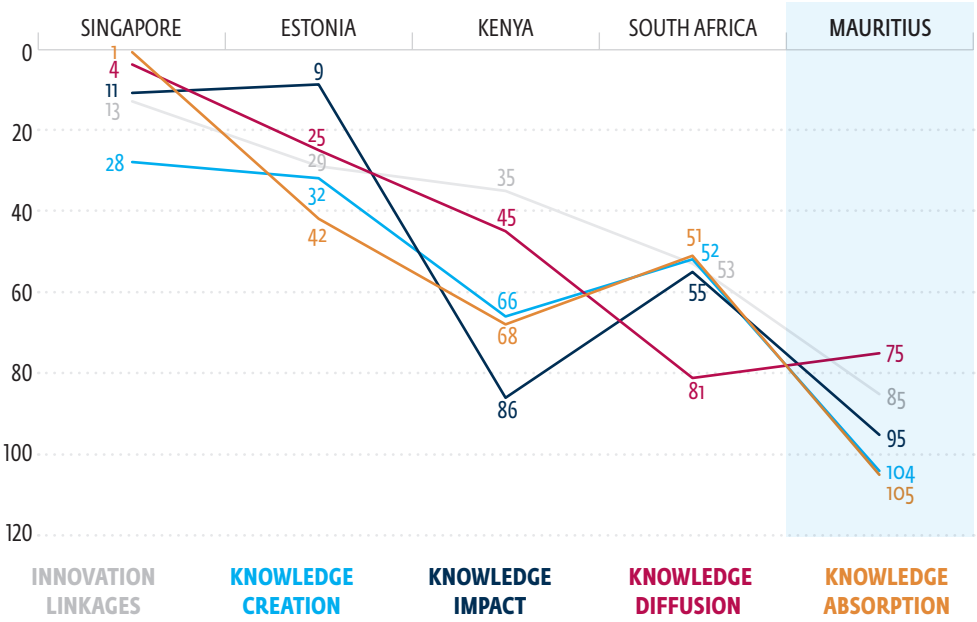
4.1. CHALLENGES IN INNOVATION IN MAURITIUS

Mauritius must do more to improve its innovation[83] ecosystem to support its transition to a higher value-added economy. Among the challenges the country needs to address are (a) lack of prioritization of innovation at the highest levels of government, (b) underinvestment (public and private) in R&D and technology transfer efforts, (c) HEIs that do not produce enough knowledge transfer, and (d) uncoordinated and dispersed efforts to promote innovation. However, Mauritius does have assets that make it a desirable destination for entrepreneurs and researchers to work on innovative projects. It offers a stable and enabling business environment to set up a business, hire workers, and import talent. The island also offers good infrastructure and connectivity and a safe place to live and operate.

Mauritius is considered an innovation leader in the Africa region; however, it lags in outputs compared to African peers that invest more in innovation. Mauritius has improved its ranking in the Global Innovation Index (GII), from 52 in 2021 to 45 in 2022, and leads the 27 economies in Sub-Saharan Africa. However, these rankings mask several weaknesses in the country's performance. The areas where Mauritius ranks well relate to aspects that, although important, do not directly translate into innovation outputs: business regulation, the rule of law, and investments in secondary education. VC is a strength, but the industry, while domiciled in Mauritius, conducts its investments in Africa and is largely disconnected from the entrepreneurship ecosystem in Mauritius. Deficiencies in the GII relate to innovation outputs and are illustrated by poorer rankings in innovation linkages (such as university–industry R&D collaboration), knowledge creation (such as intellectual property rights, or IPR), knowledge impact (such as high-tech manufacturing), knowledge diffusion (such as high-tech exports), and knowledge absorption (such as research talent in businesses). The country already lags some of its African peers, for example Kenya and South Africa (figure 4.1), which invest more in innovation, and lags well behind other small nations, for example Estonia and Singapore.

FIGURE 4.1 MAURITIUS LAGS ITS PEERS IN GLOBAL INNOVATION INDEX RANKINGS, 2021

(A higher number means a poorer ranking and thus poorer performance)

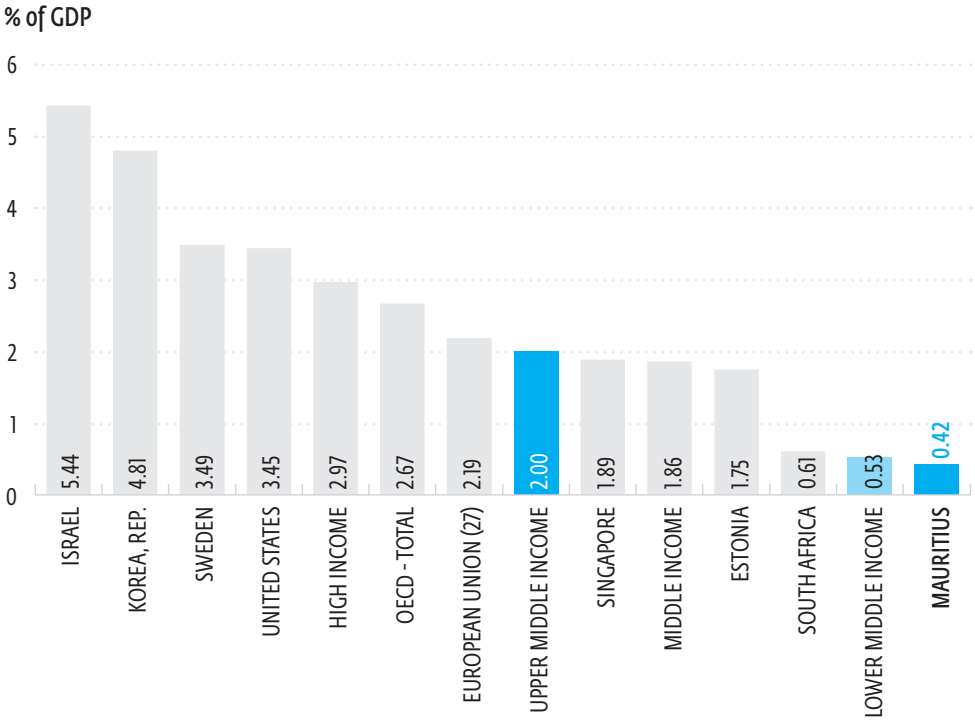


Source: Global Innovation Index 2021.

Note: Innovation linkages are measured by university–industry research collaboration, expenditure on R&D financed from abroad, cluster development and depth, and others. Knowledge creation is measured by national and international patents, utility models, scientific and technical articles, and citable documents (H-index). Knowledge impact is measured by labor productivity growth, new businesses, software spending, and others. Knowledge diffusion is measured by intellectual property receipts, production and export complexity, high-tech exports, and others. Knowledge absorption is measured by intellectual property payments, high-tech imports, research talent, and others.

Underinvestment in R&D partly explains the gap in innovation performance. As an upper-middle-income economy, Mauritius severely underinvests in R&D, which is a precondition to building a knowledge-based economy supported by higher value-added sectors. The most common measure of commitment in support of the knowledge economy is gross expenditure on R&D, measured as a percentage of GDP. Mauritius spends only 0.4 percent of GDP, while Mauritius´s comparator group of upper-middle-income countries spends about 2 percent. Mauritius's R&D effort is also lower than the average for lower-middle-income countries (0.5 percent). Global innovation leaders, such as Israel or the Republic of Korea, spend about 5 percent of GDP on R&D (figure 4.2); high-income countries spend 3 percent on average. Most Mauritian spending on R&D comes from the public budget, with the private sector's contribution at a low 4.4 percent. In innovative economies, the private sector is typically responsible for most R&D expenditure. For example, in Korea and Japan, the private sector contributes 79 percent of R&D spending.

FIGURE 4.2 MAURITIUS LAGS PEERS IN GROSS EXPENDITURE ON RESEARCH AND DEVELOPMENT, 2020



Source: World Development Indicators; UNESCO; OECD; Eurostat database.
Note: Data for Singapore and South Africa are for 2019. GDP = gross domestic product; OECD = Organisation for Economic Co-operation and Development.

The current market structure plays a role in preventing greater private sector investment in innovation. Data from the World Bank's latest Enterprise Survey (2020) confirms that it is mainly conglomerates and large firms that invest in R&D. The prevalence of traditional sectors and that only a small share of FDI goes into economic sectors that are strong conduits for international technology transfer and have higher R&D spending also affect demand for innovation in the country.[84] The data also indicate that lack of competition in some sectors discourages innovation by diminishing competitive pressures—that is, firms are happy with the current state of things and see no need to innovate.

Eighty percent of SMEs are classified as subsistence entrepreneurship, so they are less likely to innovate. For SMEs with the potential to invest in innovation, Enterprise Survey 2020 data show that only 6 percent of surveyed firms applied to MRIC programs. About 58.6 percent of firms said the programs were not relevant to their operations, 34.3 percent said they had little or no knowledge of the MRIC grant, and 7.2 percent said that application procedures were difficult. These responses point to, among other things, a need for awareness-raising activities around the importance of innovation and for MRIC to better promote its programs.

Not surprisingly, low levels of investment in R&D lead to poor innovation outcomes. The filing of patent applications can serve as a proxy for "new-to-the-world" commercial innovations that create new markets. Although imperfect, this indicator does provide one way to look into a country's ability to develop new ideas. In 2021, Mauritius filed 65 international patent applications. Although this was an increase over the 46 patents filed in 2020, it still compares unfavorably to the 162 and 4,254 patents filed by Estonia and Singapore, respectively. The low number of patents is a result of scarce expenditures on R&D; low enrollment in science, technology, engineering, and mathematics (STEM) careers at private and public universities; a lack of collaboration between universities and industry on applied research projects; and a lack of policies fostering research excellence in the universities.

4.2. ADDITIONAL REASONS FOR MODEST INNOVATION PERFORMANCE

Lack of coordination for innovation

Mauritius still needs to define an overarching innovation strategy. In 2022, MRIC led a significant effort to draft a *National Roadmap for Research and Innovation 2023–27*. This effort was commendable for its highly participatory process and its breadth of consultations. However, the final report provides more a summary of the consultations held than a clearly articulated strategy of how innovation will be supported in the country, including needed interactions between institutions and agencies. Such a strategy would serve as an umbrella document for other strategies, including development of SMEs, skills, higher education, and priority sectors. This lack of a shared understanding, vision, and strategy on how to foster innovation in the country has led to a proliferation of small and scattered innovation programs and initiatives under several ministries and agencies, with little coordination and interaction (see the next section on innovation support).

MRIC's *National Roadmap for Research and Innovation* does not prioritize areas for investment. The roadmap defines six thematic areas including Blue and Green Innovation; Health and Wellness Innovation; Financial Innovation; Social and Grassroots Innovation; Travel, Tourism and Entertainment Innovation; IT, Emerging and Enabling Innovation. Each thematic area is then subdivided into numerous smaller subthemes with limited funding. The concern with this roadmap is that it does not allow the government and other actors to pool efforts on one to three priority themes to reach scale and build research and innovation capacities in specific areas. Resources in Mauritius, both financial and human, are too limited to support innovation-led development of globally competitive sectors in all the proposed thematic areas.

Innovation support in Mauritius

Numerous institutions provide support to the private sector in Mauritius, indicating a high level of fragmentation and duplication. A 2023 public expenditure review carried out by the World Bank in Mauritius[85] identifies at least 105 programs launched in recent years targeting the private sector, with $1.055 million (or 9 percent of GDP) of earmarked budgetary funding. The leading institutions in charge of private sector support include the Development Bank of Mauritius (34 percent), Industrial Finance Corporation of Mauritius (11 percent), MRIC (11 percent), EDB (6 percent), SME Mauritius Ltd (5 percent), SME-Equity Fund (3 percent), and National Transport Corporation (3 percent). The types of support offered include loans (41 percent of total funding), cost subsidies (11 percent), grants (9 percent), leasing (9 percent), tax breaks (5 percent), and others (12 percent). This fragmentation of institutions and their respective programs ultimately impacts the effectiveness of state support for SMEs and likely leads to overlaps and inefficiencies, given the similarity in program objectives, targeted sectors, and pool of enterprises.

Most funding supports firms' survival and upgrading, not innovation. Although significant, this $1.055 million (or 9 percent of GDP) of earmarked budgetary funding has mostly gone to initiatives that aimed to support businesses during the COVID-19 pandemic or to help businesses modernize.[86] This support, though important, does not substitute for providing targeted support for innovation. The support for more radical, disruptive innovation based on R&D was mostly insignificant during this period: of the 105 programs analyzed under the 2023 Public Expenditure Review, only 11 programs funded innovation.

MRIC is the main stakeholder that funds innovation programs in Mauritius. MRIC was established in September 2019 with a mandate to advise the government on applied research, innovation, and R&D. It is the only stakeholder that is funding innovation and entrepreneurship in Mauritius; it manages eight flagship matching grant programs targeting business innovation (appendix A, table A.1). MRIC also implements other programs, such as "Fighting Diabetes at the Workplace" and "Public Sector Transformation Scheme."

Results from these innovation programs are modest. Though these programs incorporate many design features that are good practice for these types of initiatives, a few issues impede them from having a significant impact.

1. Budget: None of the five initiatives most linked with supporting business innovation allocates sufficient budgets on a per-project basis. For example, collaborative research and innovation grant schemes are usually multiyear efforts that require much higher amounts than the $70,000 allocated by MRIC. Also, $5,000 for start-up seed funding is usually not enough to help an entrepreneur develop a business.

2. Technological input: Universities and research centers play a key role in helping companies to innovate through R&D. To fulfill this role, universities and research centers must have the research capacity and quality to be of strategic interest for the private sector to partner with (see the higher education sector section). With one exception (University of Mauritius), this is not the case in Mauritius, where HEIs focus on training and instruction responsibilities and not on research.[87] The government needs to address this large gap between priority themes and subjects so that R&D expertise is built in the country and can then feed into the innovation ecosystem.

3. Institutional support: In addition to improving the quality of R&D, universities need to implement institutional mechanisms that promote the transfer of that knowledge. Currently, no technology transfer units can effectively play this role. Incentives for faculty to engage in technology transfer need to be reviewed, not only to allow for it but also to encourage it to happen.

MRIC has built capacity over the past few years, but overall, it lacks enough resources to be more effective. Since its establishment in 2019, MRIC has been able to build some capacity in managing innovation programs, as illustrated in a steady increase of committed funding (appendix A, table A.2). Limited funding for its programs, however, has led MRIC to reduce its program promotion budget; as a result, the number of applications for funding substantially decreased, from 395 applications in 2020–21 to 21 applications in 2021–22.

Incubation and funding of entrepreneurs

NSIS is funded and managed by MRIC, and it is the main instrument supporting entrepreneurship in the country. Under NSIS, seven incubators were accredited in 2018–19, with six of them providing business incubation services since then. In total, 230 start-ups were incubated between 2018 and 2022, with 59 still in operation. In 2023, only three incubators expressed their intention to continue operations. Cofounded by the ENL Group, the prominent Turbine Incubator received accreditation in 2018. Through April 2023, it has supported 144 start-ups through an ideation stage (participation in a 3-month program), with 42 of these moving on to an incubation phase (12-month program) and 7 being accelerated (6-month program). As of 2023, 33 of the supported start-ups continue to run their businesses, and eight have raised additional funding from external resources. La Plage Factory is another incubator that was accredited by MRIC in 2018. It has already graduated 12 start-ups (seven of which are still operating) and is currently incubating another 15 entrepreneurs. It recently launched a new pre-incubation program, with a first cohort of 12 projects from the African Leadership University. This program aims to build a better pipeline of entrepreneurs that can then be incubated and accelerated.

Incubators and other actors in the entrepreneurship ecosystem consulted during the CPSD research cited the limited scalability of business ideas being presented as a common bottleneck to further growth of start-ups in Mauritius. Services and support for entrepreneurs are delivered by local industry consultants that often lack international exposure and connections to external economies and expertise. In addition, Mauritian entrepreneurs lack exposure to and knowledge about global market challenges and opportunities. Thus, business models proposed by entrepreneurs and incubatees are typically suitable only for the Mauritian market, which is limited in size. As a result, most start-ups are unable to attract external funding, including angel or VC capital, limiting their growth (table 4.1).

TABLE 4.1 MAURITIUS START-UPS LACK EARLY-STAGE FINANCING

Number of financing deals

YEAR	MAURITIUS	ESTONIA	SINGAPORE
2022	9	207	1,064
2021	7	273	1,205
2020	7	180	814

Source: World Bank.
Note: Early-stage financing refers to pre-/accelerator/incubator, angel, seed, early and late venture capital, and grants. Of Mauritius's nine financing deals in 2022, only four are related to venture capital.

Although Mauritius ranks first in VC deals globally, funds domiciled in Mauritius invest almost entirely in external markets, with little VC invested in start-ups located in Mauritius. Moreover, VC funds operating in the country are disconnected from the emerging local innovation ecosystem. They lack any mechanisms that would enable spillover effects between VC funds and local entrepreneurs in knowledge sharing on global business opportunities and capacity building. The low investment readiness of local start-ups is another potential reason for the lack of VC investment, and there are too few investment readiness programs available in the country.

Quality research for innovation

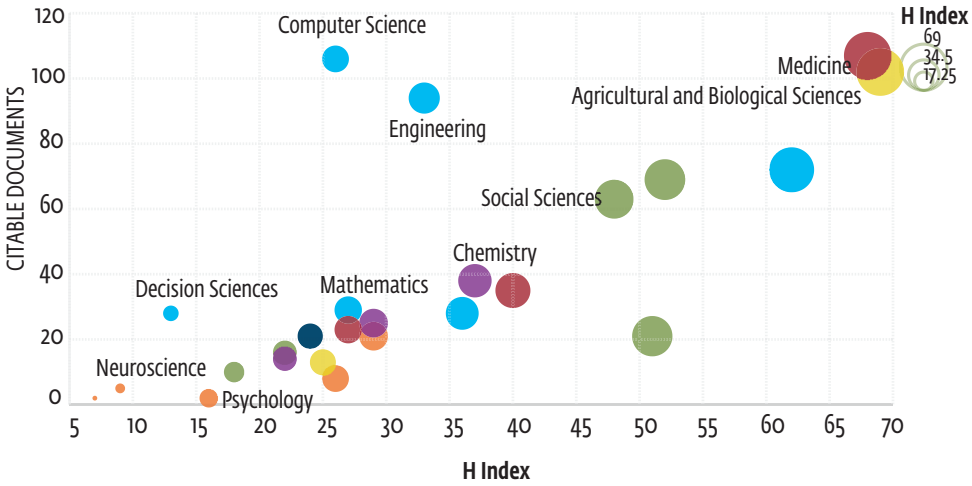
Mauritius needs to increase the quality and relevance of the research it produces. Public HEIs in Mauritius focus on their teaching responsibilities, while research and knowledge transfer lag. Globally, universities have been encouraged to become innovation-driven centers and contribute directly to local, regional, and national socioeconomic development, the so-called "third mission" in addition to traditional teaching and research. Many of these activities directly relate to engagement with the private sector, and include providing entrepreneurship courses, incubation of start-up firms, knowledge commercialization, and knowledge transfer mechanisms.

Mauritius must improve both the quality and quantity of its intellectual production. The 2021 GII ranked Mauritius 104th (of 132) in knowledge creation, and its number of researchers is less than one-half the average number for other upper-middle-income countries. Research is funded through 13 research schemes managed by the Higher Education Commission (HEC), yet the annual research budget is limited and not well-used. For example, in 2021–22, the total budget HEC devoted for research in Mauritius was $1.5 million, of which only $0.4 million was used. This indicates a need to improve the design of these research fund programs to ensure the demand and the capacity for implementation. Support for relevant and effective research is one of the objectives of the HEC strategic plan for 2022–25, a welcome development. It will be critical to develop an action plan, design research programs according to international good practices, ensure engagement with international evaluators, and support implementation with a sufficient budget.

Mauritius achieves better research results in the fields of biological sciences and medicine, likely due in part to the research done at the Centre for Biomedical and Biomaterials Research (box 4.1). Research quality is often measured by the H-index, which is a proxy for the impact of scientific publications through their total number of citations. Scientific disciplines with the highest quality of research are agricultural and biological sciences and medicine (figure 4.3). The latter represents a potential asset from which to build on competitiveness for one of the sectors highlighted in this CPSD.

FIGURE 4.3 AREAS OF SCIENCE IN MAURITIUS WITH THE BEST SCIENTIFIC OUTPUT, 2021–22

According to H-index



Source: SCImago Journal and Country Rank https://www.scimagojr.com/mapgen.php?maptype=bc&country=MU&y=item_p&z=h&year=2021
Note: The H-index measures the quality and impact of publications and is defined as the maximum value of H such that the given author or journal has published at least H papers that have each been cited at least H times.

BOX 4.1 EXAMPLE OF HIGH-LEVEL SCIENCE COOPERATING WITH INDUSTRY: CENTRE FOR BIOMEDICAL AND BIOMATERIALS RESEARCH MODEL

The Centre for Biomedical and Biomaterials Research (CBBR) offers a model for other fields to build scientific excellence and critical mass in niche areas in which Mauritius could become a regional leader. The CBBR focuses on research at the frontiers of materials science, biological science, medicine, and pharmacy using enabling technologies such as biotechnology and nanotechnology.

To ensure globally relevant quality research, the CBBR developed strong international collaborations with partners in the European Union, India, South Africa, and the United Kingdom. It runs an international researchers exchange program with the distinguished Max Planck Institute for medical research in Germany. The CBBR also cooperates with African countries and partnerships, such as the United Nations Economic Commission for Africa on nanotechnology and the African Materials Research Society, and participates in international prestigious trainings, such as thematic conferences organized by the Materials Research Society of Singapore.

Because of the high level of research that the CBBR carries out and a vision from the center's director to engage with industry, the CBBR has been able to attract interest from private companies in Mauritius and beyond to implement collaborative R&D projects. The CBBR is funded by these industry research contracts while also benefiting from participation in European Union international research programs. However, minimal support from the University of Mauritius and a lack of funding from the Higher Education Commission hampers the center's growth. Additional resources would allow the CBBR to, among other things, hire more postdoctoral fellows and expand its facilities to implement more research projects.

In the energy sector, Mauritius generates limited research impact and presents lower quality output compared to medicine. The average citations per document published between 1996 and 2021 is 14.25 for the energy sector; for the medicine sector the average is 23.86. Research in medicine is largely international, with 90 percent of publications in 2021 based on international collaboration, compared with 67 percent of international collaboration in the energy sector. The number of citable documents in medicine has grown since 2017, while the trend for energy over the same period has been mixed.[88]

Public HEIs in Mauritius lack the mechanisms needed to promote applied research and cooperation with the private sector. Research fund programs fund projects for individual academic researchers and not for collaborative research projects between business and academia (a common tool in fostering application of new solutions in the business sector). Although launched in 2016, the Knowledge Transfer Office at the University of Mauritius does not fulfill its responsibilities regarding the promotion of collaborative university–industry research and creation of intellectual property (IP).

The country´s IPR system is in the initial stages of development. In 2019, Mauritius adopted the Industrial Property Act, which was proclaimed on January 31, 2022. The new regulations make provisions for the Patent Cooperation Treaty for the international registration of patents, the Madrid Protocol on facilitation of registration of trademarks, and the Hague Agreement for the international registration of industrial designs. Nonetheless, the Mauritius Patent Office does not have expertise in patenting, including evaluation of patent applications; rather, it uses foreign patent offices for IP examination. Public universities do not have a framework for IP ownership, management, and technology transfer. The Centre for Biomedical and Biomaterials Research's (CBBR) IP protection rules for its inventions demonstrates for the country and universities how developing their own IP policies is conducive to IP protection and investment attraction.

4.3. CONCLUSIONS AND RECOMMENDATIONS

Mauritius should compare itself with and aspire to the achievements of other upper-middle-income or even high-income economies when defining its innovation vision, goals, and policies for the medium and longer term. Aspirational economies in this regard should include Estonia and Singapore, which transformed into two of the most innovative countries, driven by bold reforms supported by adequate resources.

Mauritius has done incredibly well thus far, and its journey from a monocrop economy to a well-diversified one is a development success story recognized around the world. Yet many stakeholders consulted during the CPSD research mentioned that times have changed, and the economy has reached a point where something different needs to be done, likely related to innovation. Unfortunately, awareness of this need has not yet translated into a well-articulated vision nor understanding of how innovation should drive this process. The specifics of how to do this matter, and the country should seek knowledge of other countries' successful processes and adapt that to Mauritius. More broadly, Mauritius should not be satisfied to top performance lists for the African continent. The ambition should be higher.

Becoming an innovation-driven society and country requires a change of attitude and vision from all actors: public, private, civil society, and learning institutions. The recommendations in this report are not a to-do list for the government only, although its role is critical. The role of the private sector is also important, and it needs to engage more and create initiatives to support the innovation ecosystem by establishing accelerators, spurring angel investment, and organizing technology and entrepreneurship challenges, among other initiatives. The network of interactions among stakeholders in Mauritius needs to thicken for the innovation system to work more effectively and efficiently. The road ahead for Mauritius to achieve its ambitions is challenging, but the country's history demonstrates that it can rise to meet the challenge.

Based on consultations held in-country and virtually and considering international good practices and lessons learned, this report suggests the following recommendations for Mauritius to improve its support for innovation.

Establish a coherent, coordinated vision for innovation

- **Using MRIC's National Roadmap as a starting point, develop a national innovation strategy with a clear vision, objectives, and fewer priority sectors.** To drive Mauritius toward a knowledge economy, it is essential to choose a few priority sectors and then develop strategic competencies and international excellence supported by R&D and innovation in these sectors first. The strategy should concentrate new investments in R&D and knowledge transfer in the priority areas. These projects should be led by a consortium based in Mauritius but operationally connected to global centers of excellence and take advantage of outreach programs in technologically advanced blocs (such as the European Union, Japan, and the United States). In other words, connect research excellence and innovation to national priorities.
- **Ensure interinstitutional coordination by establishing an innovation council led by the prime minister.** Innovation councils can facilitate alignment between policies oriented to business innovation and policies seeking to promote science and technology and advance human capital formation. Such a council in Mauritius could help ensure a coherent approach for prioritizing policies, allocating resources, and assigning responsibility and accountability for policy implementation. Private sector participation is key in the council and in building a collaborative agenda on innovation with public institutions. The council should be led by the prime minister, who would encourage ministries and private sector leaders to commit to collaborative work and hold them accountable for delivery of given tasks. Moreover, the council would facilitate policy coordination between several ministries and other institutions that are important for innovation, including the Ministry of Information Technology, Communication and Innovation; Ministry of Education, Tertiary Education, Science and Technology; Ministry of Energy and Public Utilities; and the Ministry of Industrial Development, SMEs and Cooperatives, among others. Box 4.2 presents examples of coordination councils around the world.
- **Turn MRIC into a national innovation agency.** Leveraging on the important experience already gained, MRIC should be converted into a national innovation agency with strategic priorities and enhanced budget allocations to accelerate the change that will be envisioned through a targeted innovation strategy. Being appointed as the secretariat for the Mauritian innovation council would further enhance its role and authority to drive and orchestrate the changes needed and implement programs to promote cross-sectoral innovation in Mauritius.

BOX 4.2 INTERNATIONAL EXAMPLES OF COORDINATION COUNCILS

The Council for Science and Technology of the United Kingdom[a]

The council provides strategic advice for the prime minister and helps coordinate ministries in defining innovation policies that require a consistent science, technology, and research approach to policy making. Since its establishment in 2010, the principal areas of expertise are high-level priorities for science and technology on a national level; the development of a science, technology, engineering, and mathematics (STEM) academic ecosystem; and horizontal analysis of opportunities and risks associated with technological advancement. The council includes up to 20 members who are academics and directors of research institutes and is supported by a dedicated secretariat based in the government Office for Science. One of the council's most important achievements is establishing the Chief Scientific Advisers network, whose members provide ongoing R&D advice in each governmental department, facilitating interdepartmental coordination.

Finnish Innovation Council[b]

The Research and Innovation Council is an advisory body chaired by the prime minister. The council discusses issues relating to research and innovation policy that support well-being, growth, and competitiveness. The vice chairs and three additional ministers are appointed by the government (for example, the ministers of education, justice, and the interior). In addition to the ministers, the council has seven members appointed by the government for the duration of the parliamentary term, including university rectors and chief executive officers of private sector firms. Council members must provide extensive expertise in R&D and innovation activities.

Japanese Council for Science, Technology and Innovation[c]

In 2001, Japan redefined the role of the Japanese Council for Science and Technology Policy, bringing together five ministries with academia and the private sector. The head of the council is an independent member of the Council of Ministers. The secretariat has more than 100 professionals. The council has become a horizontal ministry of innovation, with strong coordination and detailed policy making across all sectors linked to research, technology development, and innovation. It is responsible for publishing the Science and Technology Basic Plan every five years, which sets national priorities and annual strategic documents that track its implementation. The council manages the science and technology budget, allocates human resources, and evaluates nationally important R&D initiatives.

a. See the Council for Science and Technology of the United Kingdom website at https://www.gov.uk/government/organisations/council-for-science-and-technology/about#who-we-are.

b. See the Finnish Innovation Council website at https://valtioneuvosto.fi/en/research-and-innovation-council.

c. See the Council for Technology, Science and Innovation website at http://www8.cao.go.jp/cstp/english/policy/index.html.

Support entrepreneurship and direct engagement with VC

- **Strengthen entrepreneurship initiatives, including the existing incubator and accelerator programs.** As the leading entity responsible for the incubation programs, MRIC should ensure closer supervision of the incubators, including key indicators, such as the number of start-ups that are able to raise follow-on capital. In addition, internationalization of the incubators should be promoted, encouraging incubators to connect with global incubation programs (and other stakeholders, such as investors) to recruit new mentors and to expand the network of technical consultants. As a critical mass of start-ups is reached, acceleration programs should be encouraged, tying the technical assistance more directly with investors (and investments) and improving the investment readiness of SMEs.
- **Encourage the internationally oriented VC industry based in Mauritius to play an active role in stimulating deal flow and accelerating the foundation and growth of new technology-based firms in priority areas in the country.** While the issue preventing local VCs from investing locally is mostly the quality of SMEs in the pipeline, a more purposeful and direct engagement with the VC industry should be undertaken. Local VCs can partner, or at least engage, with accelerators that should set up operations in the country.

Increase collaboration and funding for research initiatives

- **Boost private and public sector expenditure on R&D in the priority areas defined by the strategy.** The goal of this effort should be to gradually catch up with the level of R&D expenditure as a percentage of GDP in upper-middle-income economies. To boost private sector expenditure on R&D, funding for private sector–led R&D projects should be expanded. Science and technology programs should be built to encourage the private sector to add its weight to the selection of national priorities for investment, to contribute a much bigger share of the investment for advanced R&D, and to take up the output from collaborative R&D between business and knowledge institutions in its business development strategy. When increasing R&D funding, consider expanding the best-performing programs led by MRIC in priority sectors and based on strong monitoring and evaluation (M&E). As highlighted by the Public Expenditure Review, efficiency and effectiveness need to be central in program design.
- **Pursue reforms of HEIs to promote research excellence and relevance and build relationships between the research community and industry.** Reform R&D funding at HEIs according to best international practices by (a) allocating resources toward applied research projects that can be channeled into multidisciplinary and multiyear programs for teams of local and international researchers to build a critical mass of work that can sustain priority research areas for the future; and (b) encouraging universities to develop a "commercialization agenda," that is, clear rules and procedures specifying university IP policy, IP management, and revenue sharing, and how a university intends to support commercialization of scientific results.

Follow good practice for effective program design and the intellectual property agenda

- **Strengthen the national IP framework and enforcement mechanisms.** Build the institutional capacity of the Mauritius IP office, which will enable enforcement of the Industrial Property Act. Promote IPR through awareness-raising and capacity-building activities among HEIs, the business community, and policy makers to recognize the relevance of IPR in shaping the long-term vision for Mauritius as a knowledge economy. Intensify the involvement of the World Intellectual Property Organization office in promotion of the IP agenda in the country through training programs and workshops. Explore the experience of the CBBR in IP management and apply it where relevant, especially at public universities.
- **Ensure that all entities responsible for public support programs for innovation apply international good practices in design and implementation, with an emphasis on a sound M&E framework.** For each program design, consider the following elements: reference to country strategic policies and objectives, relation to the overall policy mix, alternative policy instruments, explicit and measurable objectives, logic model, selection criteria, and a sound M&E mechanism integrated into the program design.

5. SECTOR ASSESSMENTS

5.1. HIGHER EDUCATION

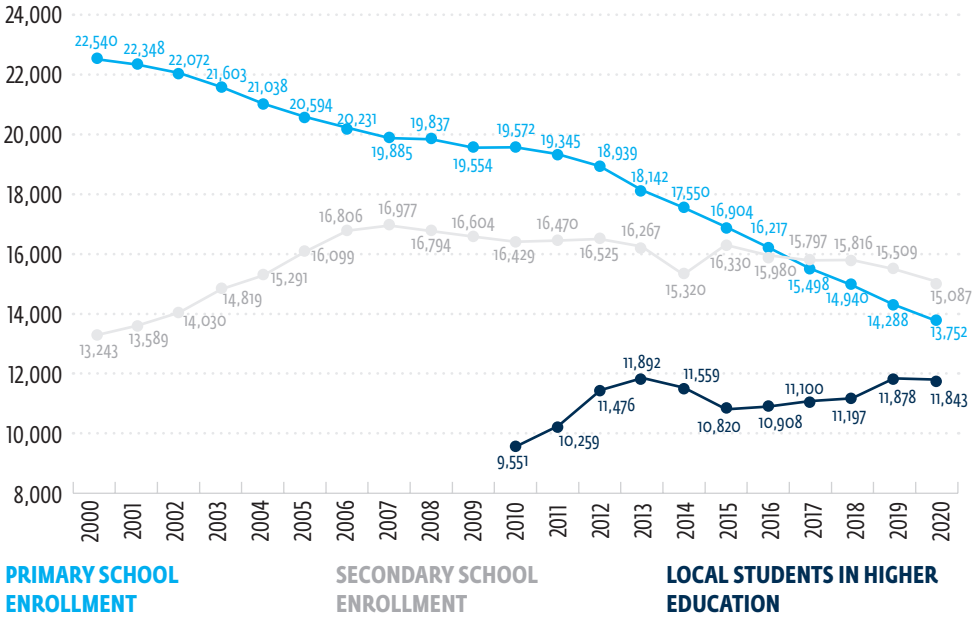
Overview

Mauritius's gross tertiary enrollment ratio lags other upper-middle-income economies. The higher education sector is composed of 10 public HEIs and 31 private HEIs. In 2021, about 50,000 students were enrolled in HEIs, with 57 percent in public HEIs and 29 percent in private HEIs.[89] Mauritius's gross tertiary enrollment ratio is 48 percent, which is ahead of the African average of 10 percent but lags the ratios of upper-middle-income economies (58 percent) and high-income economies (80 percent).[90]

The Free Tertiary Education Scheme[91] introduced in 2019 has led to an increase in enrollment in public HEIs, while enrollment in private HEIs has decreased. In the academic year 2021/22, over 24,500 students benefited from the scheme (86 percent of students at public HEIs).[92] Private HEIs experienced a 19 percent drop in enrollment between 2019 and 2021. The scheme also likely affected the number of students studying overseas: 6,900 students studied abroad in 2021 compared with 11,100 in 2015, a 38 percent drop. The main destinations for overseas studies in 2021 were Australia (19 percent), Canada (17 percent), France (17 percent), and the United Kingdom (14 percent).

The rapid decline in population and high rate of dropouts in primary and secondary education has put pressure on the higher education system. Mauritius is seeing a continuous drop in enrollment of local students because of the declining population: between 2015 and 2021, the number of students in primary and secondary schools in Mauritius decreased by 13 percent (figure 5.1). In addition, the country's high dropout rate (about 45 percent between primary and tertiary education) affects the number of students enrolling in full-time undergraduate university programs.[93] Among students that enroll in HEIs, full-time enrollment in 2021 fell to 52 percent (from 62 percent in 2015), and participation in part-time studies fell to 14 percent (from 19 percent in 2015). However, enrollment in distance education is increasing; it accounted for 34 percent of HEI students in 2021 (up from 19 percent in 2015).

FIGURE 5.1 AVERAGE ANNUAL PRIMARY, SECONDARY, AND TERTIARY ENROLLMENT IN MAURITIUS, 2000–20



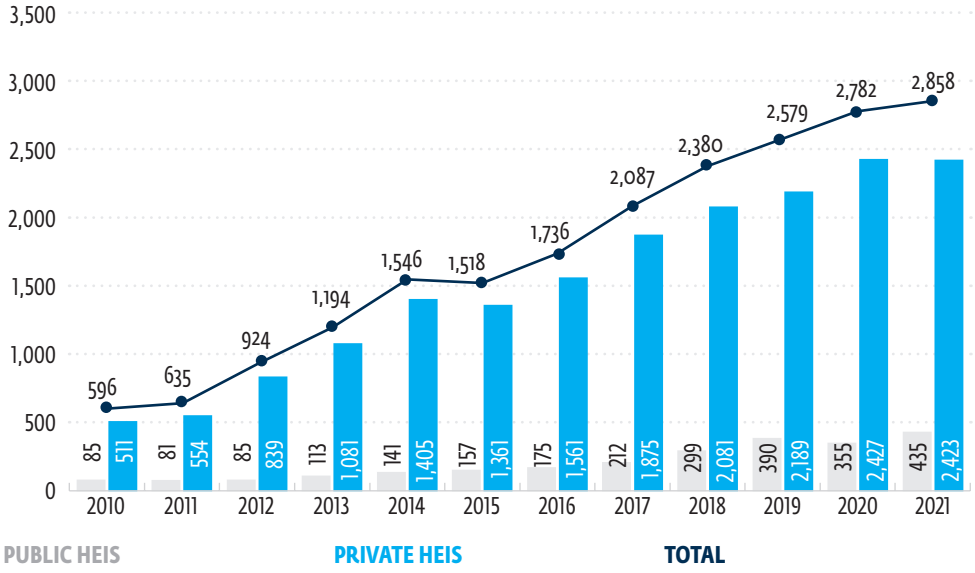
Source: Elaborated by Prof (Dr) Kiran Bhujun, Director of Tertiary Education and Scientific Research, Ministry of Education, Government of Mauritius, based on data from Statistics Mauritius. .

Three private HEIs—London College of Accountancy, Charles Telfair Campus, and Middlesex University—account for 55 percent of total enrollment. Private providers represent a mix of international institutions from Africa, Asia, Australia, and Europe, with significant variation in their academic programs, enrollment, infrastructure, and physical facilities. They comprise international branch campuses, institutions with awarding powers, and institutions having franchises with awarding bodies based locally, overseas, or both.

International student enrollment

International students comprise only 5.8 percent of total enrollment in tertiary education. In total, 2,858 international students were enrolled in 2021 in Mauritius private and public HEIs (figure 5.2). This number is far from the target of 100,000 international students by 2020 set in 2010 by the then Ministry of Education, Culture and Human Resources. Eighty-five percent of the students are enrolled in private HEIs and 15 percent are enrolled in public HEIs. Four of the 31 private HEIs account for 73 percent of international student enrollment, with some of these institutions catering almost exclusively to international students.[94] About 36 percent of international students come from India, 10 percent from Madagascar, 9 percent from Nigeria, 6 percent from Zimbabwe, and 5.5 percent from Kenya. The remaining 33.5 percent come from a mix of other countries. Women represent about 50 percent of this enrollment.

FIGURE 5.2 INTERNATIONAL STUDENT ENROLLMENT ACROSS PUBLIC AND PRIVATE TERTIARY PROVIDERS, 2010–21



Source: Participation in Tertiary Education 2021. Higher Education Commission of Mauritius, November 2022.
Note: HEI = Higher Education Institution.

Private HEIs provide a global education experience closely linked with private sector needs, while public universities are not as internationally connected. For example, at Middlesex University, students can spend their second or third year at one of the university's counterpart campuses around the world. Charles Telfair Campus provides students with exchange programs and research opportunities at its locations in Dubai, Malaysia, Perth, and Singapore. In contrast, international exchange opportunities at public universities are limited in part because of incompatible education credit systems between Mauritius and other country systems. Private HEIs also cooperate more with industry and perform market research to ensure that their programs produce the skills needed by employers. For example, Middlesex University annually reviews its program qualifications to establish local market share and consider enrollment trends. Public HEIs struggle to maintain a similar system to ensure relevance and adapt to market needs.

Legislative framework for higher education

The Higher Education Act of 2017 provides a legislative framework for higher education to support the country's vision of becoming an education hub.[95] In 2020, two new statutory bodies became operational: the HEC and the Quality Assurance Authority (QAA). HEC, under the Ministry of Education, Tertiary Education, Science and Technology, is responsible for performance monitoring, program accreditation, funding, and the promotion of higher education, including research funding. Since June 2021, HEC has had a mandate to regulate the country's 31 private HEIs through institutional registration and program accreditation. The QAA is responsible for quality assurance of higher education in line with international standards. Both the HEC and the QAA face capacity challenges to implementing their respective missions.

Concept of the knowledge hub

Becoming an education hub

Mauritius aims to become a knowledge hub for the region. In 2010, the then Ministry of Education, Culture and Human Resources set a goal to increase the tertiary enrollment rate from 43 percent to 70 percent by 2015 and to attract 100,000 international students to Mauritian HEIs by 2020. The HEC strategic plan for 2022–25 set forth a national vision of "transforming Mauritius into a Regional Knowledge Hub and making higher education a pillar of the Mauritian economy." Several countries have established education hubs around the world through targeted strategies and policy frameworks. In addition, by engaging with industry and research partners, education hubs can be part of a strategy to diversify the local economy.[96]

Education hubs can be complex and diverse, ranging from student hubs to talent hubs to knowledge (innovation) hubs. Education hubs can start as student hubs to increase the student enrollment capacity of a country's tertiary education system through modernization and internationalization. Examples of student hubs are Hong Kong SAR, China; Malaysia; and the United Arab Emirates. The next level of sophistication is a talent hub, where the vision is broadened to include human resource development for the local economy and retention of international students and workers to support economic development. Examples of talent hubs are Botswana and the United Arab Emirates. The most sophisticated model is the knowledge (innovation) hub, which aims to generate knowledge and innovation that contributes to a country's competitiveness. The most prominent example of a successful knowledge hub is Singapore.[97]

Mauritius is still developing a student hub. The low number of international students and institutions shows that the country is still developing critical mass. To progress, the country must introduce reforms to increase the capacity of the tertiary system. As it reaches critical mass and a higher degree of internationalization, Mauritius should deliberately attract specific talent, given the country's need for new skills and a qualified labor force. This transition toward a talent hub would support its economic diversification into sophisticated industries based on knowledge. Finally, the hub could evolve into a knowledge hub with a strong national innovation ecosystem, similar to that of Singapore, which graduated from a student hub into a global knowledge hub by attracting outstanding researchers and scientists and heavily investing in a strategic national research agenda.[98]

Government incentives for developing education hub

The government of Mauritius provides numerous tax incentives to attract international HEIs. The incentives include (a) value-added tax exemptions for the construction of purpose-built buildings for primary, secondary, TVET and tertiary education, (b) land conversion tax exemptions for the construction of purpose-built buildings for preprimary, primary, secondary, and tertiary education, and (c) registration duty exemption on the purchase of land and buildings for primary, secondary, and tertiary education. In addition, expansion of the education hub is supported by the Smart City scheme.[99] As of 2023, 13 projects have received a Smart City Certificate. The exemplar smart city is the Uniciti Education Hub, launched in 2017, with an integrated and international campus geared toward Africa. As of 2023, the Uniciti Education Hub hosts six foreign HEIs and provides higher education to about 2,000 students.[100]

The government has introduced new incentives to attract international students to study and work in Mauritius. Mauritius provides (a) part-time work permits for international students enrolled in a recognized HEI that allow for working 20 hours per week; (b) Young Professional Occupation Permits for a maximum of three years, and (c) scholarships for African students for studies at public universities. Because these measures are recent, time is needed to assess their effectiveness. For instance, only 20 out of 50 available scholarships for African students were awarded for the 2022/23 academic year because many candidates did not meet the eligibility criteria.

Constraints on the private sector

Lack of coherent strategy for the education hub

Mauritius lacks a common platform and vision among private and public HEIs and stakeholders to collaborate on the education hub. A strategy is needed to transform Mauritius into an education hub and to select the type (that is, student, talent, or knowledge hub). Developing this strategy requires close cooperation between the Ministry of Education, Tertiary Education, Science and Technology; HEC; QAA; EDB; private and public HEIs; industry; and other relevant stakeholders. However, higher education system actors operate in silos, without a platform or established processes in which to exchange views. A clearer strategy and common vision would enable private and public universities to adapt curricula, formulate expansion plans, and subsequently attract FDI.

Poor quality of public higher education

Mauritius public higher education lags in quality as a result of chronic underinvestment. The country spends 4.9 percent of its GDP on education, which is above the average of upper-middle-income economies (4.1 percent of GDP). Yet only 0.3 percent of GDP is spent on higher education, which is one of the lowest proportions in the world.[101] For comparison, upper-middle-income and high-income countries spend 0.8 percent and 1.2 percent of GDP on tertiary education, respectively. Because of underinvestment, Mauritius public HEIs have deficient access to modern laboratories, research centers, grant programs for international research programs, and international scholarships, among others.

The performance of the University of Mauritius has deteriorated since 2012. Although Mauritius´s GDP per capita is the highest across Sub-Saharan Africa economies, only the University of Mauritius is among the top 100 universities in Africa. Yet it still ranks 39th among the first tier of universities in Sub-Saharan Africa; its position has also declined when compared with leading African universities, such as Addis Ababa University in Ethiopia, Makerere University in Uganda, and the University of Nairobi in Kenya. These rankings consider research and innovation results, and it is notable that although Mauritius leads in the quantity of citable documents per million inhabitants, it ranks last compared with its peers when analyzing the quality of publications based on citations.[102]

Barriers in attracting international students

Challenges with living arrangements, finances, and research opportunities discourage international student enrollment. Several areas require attention to attract more international students: lack of accommodation facilities offered by public HEIs; a bureaucratic visa application process; no possibility of converting a tourism visa into a student visa; and the lengthy amount of time required for opening a bank account to pay admission fees. Another major challenge is not enabling students to participate in international research projects: private HEIs do not provide research degrees, R&D at public HEIs is negligible, and universities lack the instruments needed to foster international research collaboration.

Lack of mutual recognition agreements between Mauritian and foreign education systems limits international students' access to higher education. The lack of recognition for education standards from foreign education systems and qualification frameworks limits international students from accessing higher education in Mauritius. Interviews with education system stakeholders confirmed the need to adjust the accreditation system so that it recognizes new, innovative courses and their delivery modes.

Opportunities for the private sector

Developing a shared vision

Ministries of higher education and related bodies are more effective when they inform their policy decisions through consultations with relevant stakeholders. By ensuring continuous dialogue among public and private education representatives and other relevant stakeholders, one coherent strategy can be achieved to guide the development of both public and private education in the country. One approach for establishing a structured consultation process is to set up a Higher Education Advisory Council, which is a permanent consultative body for higher education composed of representatives from the higher education community, former university leaders, and higher education experts from Mauritius and other countries. The main role of the Advisory Council would be to guide the Mauritian government by sharing relevant information about key international trends and good practices on how higher education systems and institutions are transforming themselves to address new challenges and provide constructive feedback on policy initiatives to improve the quality and relevance of the Mauritian higher education system.

Aligning with foreign education systems

The country is addressing misalignment between Mauritian and foreign education systems. HEC is working on a new regulatory framework that recognizes prior learning to facilitate international enrollment for education providers operating in Mauritius. It has also taken the lead in designing the National Credit Value and Transfer System, which aims to ease the transfer and mobility of students across programs and institutions. This work involves defining how academic credits can be accumulated and transferred in the Mauritian higher education system and across Southern African Development Community countries. Steps have been taken towards the ratification of the UNESCO Addis Convention, and there is ongoing consideration for ratifying the UNESCO Global Convention for the recognition and equivalence of qualifications, which would create a more conducive higher education environment and advance academic mobility.[103] Although Mauritius has agreed in principle to join, the government has not committed to a specific timeline because the clause on refugees may encounter objections by the immigration authority.

Promoting research and its impact on education and the economy

Building research excellence helps achieve the vision of an education hub by attracting international students, researchers, and a highly skilled workforce. Investing more in research excellence will help develop universities' internal capabilities to understand the knowledge produced by innovation leaders and participate in the global scientific system. This will improve the quality of education by developing new multidisciplinary curricula, promoting international exchange of researchers, initiating international research partnerships and projects, and upgrading laboratories. Increased research excellence will also make universities more attractive for the private sector. Prioritization is key, as limited resources will need to be allocated for areas where there is higher economic and social priority. Collaborative research grants or Centers of Excellence are common trends across OECD economies and increasingly in non-OECD countries, including in Africa.[104] Mauritius's Research Fund (the main instrument for funding research at Mauritius's universities) can be redesigned to promote research excellence based on international partnerships and joint projects with the private sector.

The model developed by the CBBR demonstrates how to build internal capacities and critical mass in niche areas. CBBR creates links with international knowledge organizations for training and research (such as with Australia and South Africa), taps into European Union and international research funding, moves closer to the market by introducing clinical trials that can lead to IP, and eventually develops services for the private sector. The new approach would increase the role of research in education, create a platform for international collaboration, and provide common ground for collaboration with the private sector.

Attracting more international students

The international mobility of Sub-Saharan Africa students is a major opportunity for Mauritius. The number of outward mobile students from Sub-Saharan Africa will double by 2050 as a result of a dynamic population increase and expected student mobility.[105] Attracting international students is essential for expanding the country's education system, given a decreasing population that is causing increased competition among HEIs for local students. Private education providers recognize that their expansion plans depend on international student enrollment. Mauritius offers multiple advantages for international students: international HEIs offering foreign degrees at a fraction of the cost when compared with education providers in the European Union or the United States; a multicultural and tolerant environment; political stability and a safe environment; and common use of French and English in tertiary education institutions.

The higher education competition for Sub-Saharan African students is intensifying. Only 20 percent of Sub-Saharan African tertiary students stay in the region. The main destinations for studies are France (14 percent), the United States (10 percent), South Africa (7 percent), the United Kingdom (7 percent), Canada (6 percent), and Morocco (5 percent). Türkiye, with 19,700 students, has almost tripled the number of Sub-Saharan African students it hosts and is experiencing the strongest growth—an increase of 183 percent between 2016 and 2021.[106] As the top destination of Sub-Saharan African students, France presents an interesting approach to be considered by Mauritius, with its "welcome to France" strategy to improve conditions and promote quality in support services that affect the daily lives of international students.

Attracting more and specific international schools

Clear priorities and policies are needed to attract more HEIs. Attracting more, and in some cases specific, HEIs is key for the country to achieve its goal to become an education hub. Attracting HEIs of higher quality will also help the country diversify its economy, move to more knowledge-intensive sectors, and make the country more attractive to international students. Mauritius should target a few first-tier universities that can also connect with its economic and social priorities, as Singapore and (more recently) Rwanda have done. Second-tier private HEIs are less selective in admissions. The third tier consists of open access private institutions (nonselective in their admission standards) that are frequently of dubious quality and should not be allowed to operate in Mauritius. Other countries use legal status and degree of selectivity in admissions to distinguish categories of HEIs.

A favorable legal framework is needed to attract more private HEIs and increase their enrollment. It is important to assess how the existing regulatory framework can be amended to eliminate legal and administrative hurdles that constrain the establishment and development of domestic and international private HEIs, including easing land and infrastructure requirements. Consultations with HEC and private providers operating in Mauritius point to several bottlenecks that should be addressed: (a) the ease and speed of obtaining a visa for international students and academics; (b) the documentation and process required to register new institutions and obtain all necessary permits and an operating license; and (c) the length of the program accreditation process (because of lack of sufficient capacity at the HEC). The search for academic thoroughness must not prevent authorities from applying flexible and efficient procedures that do not burden institutions.

The expansion of private tertiary education needs to avoid potential negative social impacts. The growth of private tertiary education in many countries—notably in Africa, Asia, and Latin America—in the absence of an appropriate legal and regulatory framework has led to the growth of commercial enterprises, barely disguised as nonprofit universities, that do not prioritize education. This can lead to serious negative consequences: inferior program offerings that do not meet minimum standards and that saddle students with heavy debt and meager employment prospects; profits realized under a nonprofit status may be seen as tax evasion; and the possibility of money laundering through these institutions. Legislation that allows private universities to be for-profit, if properly designed, can bring some of these questionable practices into the open and allow the profits to be properly taxed. Thus, the regulatory framework should distinguish between for-profit and nonprofit private HEIs based on certain criteria, such as motive, ownership, profit distribution, and tax liability.

Mauritius also needs to monitor the socioeconomic distribution of students enrolled in and graduating from private HEIs to avoid social segmentation between the public and private subsectors. The higher education system is usually highly polarized, with less wealthy people attending free public universities and wealthier people (representing employment in top companies) sending their children to private universities. In some countries, private providers are legally obligated to provide financial support to a mandated minimum proportion of low-income students. In addition, many countries set up scholarships or student loans to cover economically challenged students' costs for attending private institutions.

Attracting private sector investments through PPPs

The government can explore PPPs to fund investments in higher education to mobilize additional resources from the private sector and complement public investment. Most major PPP-supported infrastructure investments in higher education focus on student accommodations and cafeterias developed on a build-operate-transfer basis. This has been the case in OECD countries, such as France, the United Kingdom, and the United States, and in developing countries, such as Nigeria and South Africa. But there are also new dimensions or variations of PPPs. One example is using PPPs to build renewable energy facilities that generate solar and wind power on university campuses in exchange for funding for academics and energy-related research. Another example is several public and private universities forming a partnership to share services and educational and scientific facilities, such as Comuna 8 ("Group of 8") in Medellin, Colombia.[107]

The few examples of private universities that were created as the result of PPPs, individual donors, or both represent a new trend in innovative funding (box 5.1). The best-known cases are in Malaysia, where three public corporations each sponsored the establishment of a private university. In each case, the public sponsor financed all of the initial investment costs and the first three years of operating expenditures. Afterward, the new universities had to function as independent private entities without further public support except that used for student aid.

BOX 5.1 EXAMPLES OF DEVELOPING TERTIARY EDUCATION THROUGH PUBLIC-PRIVATE PARTNERSHIPS

Malaysia: Malaysia allowed the operation of private tertiary education institutions as public-private partnerships (PPPs) or through partnerships with foreign providers—mainly Australian and British. One of the goals of this new policy was to transform Malaysia into an educational hub with a substantial international student intake.[a] Today, 10 foreign branch campuses—including one from a Chinese university—operate in Malaysia, attracting over 100,000 international students.[b]

China: Shantou University is a public institution in Guangdong Province that operates with funding from the state. It was originally established through a donation by a Hong Kong SAR, China philanthropist who was born in Shantou and who continues to provide funding. Under his influence, Shantou University has developed many innovative education practices.[c]

Morocco: Al Akhawayne University, the first institution in North Africa that operates like a US university (that is, with a curriculum, academic and administrative staff, and accreditation by a US regional accreditor), was initially funded by an investment grant from the king of Morocco and the king of Saudi Arabia in 1995. Today, it operates as a private university fully accredited by the New England Association of Schools and Colleges.

Zambia: The National College of Management and Development Studies was transformed into a full-fledged public university (Mulungushi University) through a PPP with Konkola Copper Mines, one of Africa's largest integrated copper producers. The private partner provided half of the $35 million investment to set up the university.[d]

a. World Bank Group, Malaysia and the Knowledge Economy: Building a World Class Higher Education System (Washington, DC: World Bank Group, 2007).

b. See Malaysia's website about universities at http://www.easyuni.my.

c. S. Bjarnason, K. M. Cheng, J. Fielden, M. J. Lemaître, D. Levy, and N. V. Varghese, A New Dynamic: Private Higher Education (Paris: UNESCO, 2009).

d. C. Manyukwe, "Zambia: Third Public University Opens." University World News, Africa Edition, September 14, 2008. http://www.universityworldnews.com/post.php?story=20080911163812433.

Mauritius can also explore the idea of raising resources through social impact bonds, which are PPPs that fund social services through a performance-based contract. Development impact bonds are a promising variation, in which external donor agencies step in on behalf of developing country governments to pay the investors or providers of social services if the program achieves its objectives and targets following an independent evaluation. In higher education, social impact bond programs can finance access for students from underrepresented groups. Progress could be assessed by looking at increased enrollment and completion rates for equity target groups.

Recommendations: Higher education

Mauritius has a great opportunity to become a higher education hub for the African region and potentially beyond. The mix of a beautiful island with good infrastructure and a safe environment provides the country with important assets to attract students and professors. Developing a shared vision and strategy that seeks to attract more international students and high-quality institutions is key, as is reforming the regulatory and administrative issues highlighted in this section.

Develop a shared vision for education

- **Establish a structured consultation process by creating a Higher Education Advisory Council.** The council should be composed of representatives from the higher education community, former university leaders, and higher education experts, as well as a few international members and people from the diaspora.
- **Develop a common vision of the education hub.** The national vision to transform Mauritius into a Regional Knowledge Hub requires collaboration among all stakeholders, including industry, to provide inputs for and design education reforms. Engage private and public higher education representatives and other relevant stakeholders and define the type of education hub desired (student, talent, or knowledge hub).

Promote research excellence and collaboration

- **Increase and reform R&D funding at HEIs.** Allocate resources to applied research projects on a competitive basis, to be channelled into multidisciplinary and multiyear programs for teams of local and international researchers. Prioritize incentives for increasing the quality of education through investments into research and international research collaboration.
- **Multiply CBBR's collaborative model.** Create links with international knowledge organizations and tap into international research funding from the private sector. Redesign Mauritius's Research Fund to promote research excellence based on international partnerships and joint projects with the private sector.

Attract international students

- **Align the Mauritian and foreign education systems.** Recognize prior learning to facilitate international enrollment and use the National Credit Value and Transfer System to ensure effective accumulation and transfer of credit in the Mauritian education system. Ratify UNESCO's Global Convention on the Recognition of Qualifications concerning Higher Education.
- **Ensure more efficient regulations for student admissions and a welcoming environment.** Strengthen the attraction of existing private education providers by increasing the efficiency of the international visa issuance process and existing admission criteria for international students. Improve welcome conditions by, for example, enhancing services, welcome facilities, accessibility of courses, and quality of campus life.

Attract high-quality higher education providers

- **Put in place clear policies and incentives to attract HEIs of high quality.** These institutions should be fully accredited in their countries of origin. The programs offered should respond to specific economic and social development goals.
- **Establish a clear legal framework to distinguish between for-profit and nonprofit institutions** to avoid questionable practices by low-quality private universities.
- **Amend the existing regulatory framework to eliminate legal and administrative hurdles for domestic and foreign private HEIs, including easing land and infrastructure requirements.** The criteria to register and license new providers and accredit their programs should be simple and the process should be agile.

Attract private sector investment through PPPs

- **Explore PPPs to fund investments in higher education that complement public investments.** Enable education hub growth through new trends in PPPs, such as private universities created through PPPs, and individual donors or social impact bonds that fund access for students from underrepresented groups.

5.2. RENEWABLE ENERGY

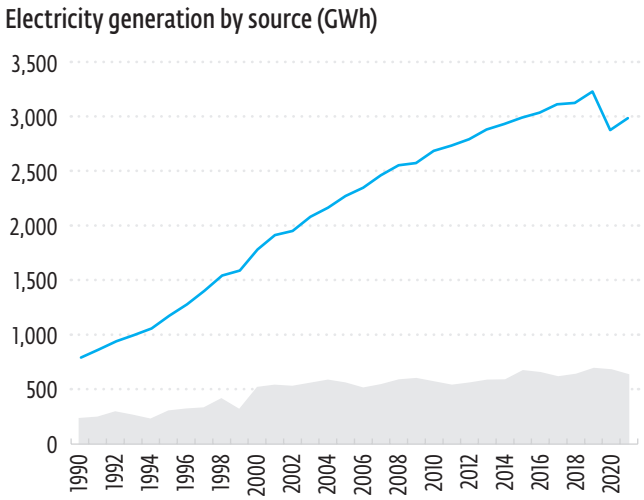
Overview

The Mauritius electricity sector is characterized by its high level of coverage and stability. Nearly all the country's population had access to electricity in 2020 (99.7 percent coverage).[108] Mauritius enjoys a high quality of transmission: only 6 percent losses in 2014.[109] All Mauritians report having quality connection with limited to no blackouts.[110]

CEB, the public utility responsible for the generation, transmission, and distribution of electricity in Mauritius and Rodrigues Island, is one of the best-performing utilities in Sub-Saharan Africa. CEB boasts high levels of transparency and accountability and a strong financial performance. Between 2012 and 2018, CEB was one of the top five utilities in the region that consistently reported a net profit and recovery of operating costs and debt-service costs.[111] However, the COVID-19 pandemic, the drawing of reserves to fund the Solidarity Fund, the increase in the price of coal and heavy fuel, the increase in freight cost, foreign exchange fluctuations, and other financial decisions (such as the creation of unprofitable subsidiaries)[112] have strained CEB's financial position.

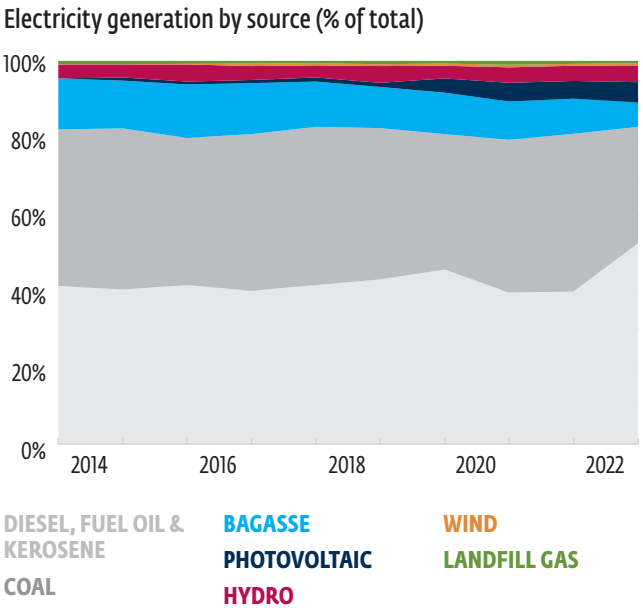
Mauritius faces challenges in meeting growing energy demands while achieving its renewable energy goals. So far, Mauritius has been able to meet growing energy demands; however, growth in the hospitality, manufacturing, and commercial sectors re-engineered the economy and put pressure on demand, as did new economic sectors—such as ICT, fisheries, and financial services. The COVID-19 pandemic decreased demand for electricity by 11 percent in 2020;[113] however, demand is expected to continue to grow. Mauritius has set ambitious goals of having a 60 percent share of renewable energy in its electricity mix and a complete phaseout of coal by 2030. The most cost-effective and attractive generation opportunities lie in solar photovoltaic (PV) and local biomass.[114] Although electricity generated by solar PV has increased in recent years, it has been unable to offset the decline of renewable energy sourced from bagasse (figures 5.3 and 5.4). It will be difficult to reach an increased use of renewable energy without the private sector's participation in energy generation.

FIGURE 5.3 GENERATION INCREASES; RENEWABLES HAVE NOT KEPT UP



Source: Statistics Mauritius.
Note: GWh = gigawatt-hour

FIGURE 5.4 EXPANSION OF SOLAR PV IS UNABLE TO OFFSET THE DECLINE OF BAGASSE



Source: Statistics Mauritius.
Note: PV = photovoltaic.

The private sector, which already generates renewable energy, has indicated its interest in meeting new demand. To meet the government's goals, the private sector will be called upon to expand the renewable energy capacity in Mauritius eightfold (from about 100 megawatts of variable renewable energy to 800 megawatts). In June 2021, CEB launched a request for information, inviting potential bidders to propose the deployment of renewable energy technologies to provide firm power to the CEB grid. With 49 proposals received from local, foreign, and mixed-ownership firms, proposed additional capacity surpassed the government's stated goals.[115]

However, obstacles remain to significantly increasing the use of renewable energy. Mauritius needs to provide the private sector with a reliable and transparent path to commercial viability. The required utility-scale renewable energy projects call for the participation not only of local firms, which have dominated the landscape, but also of international players. Also, the tendering process does not yet meet all best international standards regarding process and power purchase agreement (PPA) terms, which could limit the number of firms that compete.

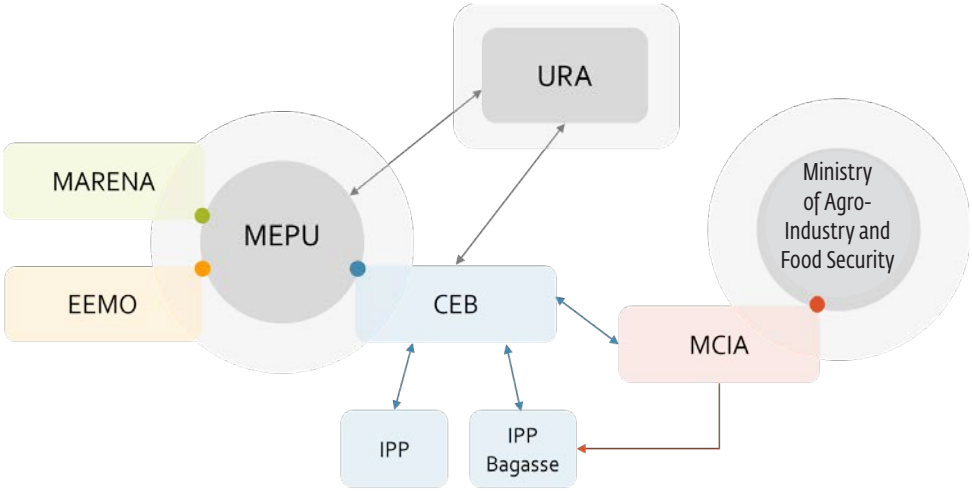
The expansion of renewables and an increase in energy efficiency will contribute to private sector growth in the energy sector, green job creation, and the greening of nonenergy sectors. The government estimates that an increase in renewable energy can result in an additional 7,000 jobs by 2030.[116] The manufacturing and tourism sectors have the most to gain from the green energy transition because it allows those sectors to cater to environmentally conscious consumers. Increasing renewable energy will also help Mauritius achieve a greater degree of energy independence, ease pressures on the availability of foreign currency, and reduce its exposure to external shocks.

Status of energy legal framework, governance, and management

Mauritius's institutional framework for the power sector rests on a state ownership model. MEPU ensures that policies and strategies are defined and implemented for energy security and the development of renewable energy (figure 5.5). MEPU oversees CEB, Mauritius Renewable Energy Agency (MARENA), and Energy Efficiency Management Office (EEMO). CEB, a vertically integrated national power utility, is governed by the CEB Act of 1963. MARENA's primary goals are to encourage the use of renewable energy in support of the Sustainable Development Goals (SDGs) and to promote research and knowledge sharing on renewable energy. EEMO was established in 2011 to raise awareness of energy efficiency as a means of lowering carbon emissions and protecting the environment. Various government initiatives and regulatory frameworks have supported green energy generation, with set targets for the development of renewable energy and reduction of carbon dioxide emissions (appendix B).

Other key players in the energy sector are the URA and Mauritius Cane Industry Authority (MCIA). Created in 2016, URA's mandate is to ensure the sustainability and viability of utility services, protect consumer interests, and promote efficiency and fair competition in the utility services industry. With the creation of the URA, CEB no longer determines the price of electricity and is now required to file a tariff proposal for each electricity service to the URA, which then determines the final tariff. MCIA, created under the aegis of the Ministry of Agro-Industry and Food Security, oversees the sugar industry, including promoting the production of energy from biomass.[117] MCIA led the drafting of the National Biomass Framework (launched June 2023), which sets the price for bagasse and other biomass for energy production.

FIGURE 5.5 STRUCTURE OF MAURITIUS'S ELECTRICITY SECTOR

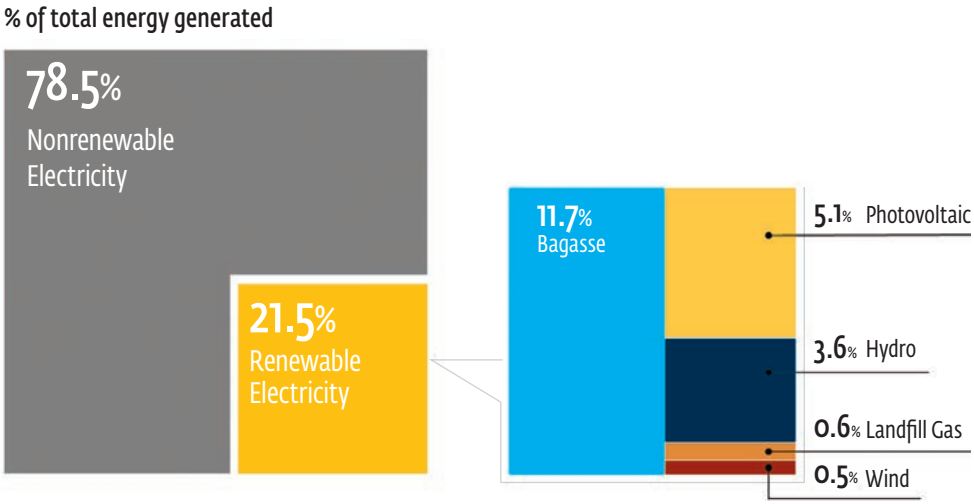


Source: IFC Staff based on country interviews.
Note: CEB = Central Electricity Board; EEMO = Energy Efficiency Management Office; IPP = independent power producer; MARENA = Mauritius Renewable Energy Agency; MCIA = Mauritius Cane Industry Authority; MEPU = Ministry of Energy and Public Utilities; URA = Utility Regulatory Authority.

Generation and the shift to renewables

The private sector, through IPPs, produces 60 percent of the electricity in Mauritius. CEB produces about 40 percent of the country's total power requirements from its four thermal power stations and 10 hydroelectric plants; the rest is purchased from IPPs.[118] The island generates most of its electricity using fossil fuels, such as coal and oil, followed by renewable sources, such as bagasse, hydropower, solar, wind, and landfill gas (figure 5.6).

FIGURE 5.6 ENERGY GENERATION MIX IN MAURITIUS, 2021



Source: Statistics Mauritius.

High dependence on imported sources for energy generation is costly with regard to foreign currency outflows and challenges the country's energy security and ability to meet sustainability goals. Imported petroleum products and coal made up 86 percent of the country's total primary energy requirement in 2017.[119] Sixty-two percent of Mauritius's total greenhouse-gas emissions come from the energy sector. The price of fossil fuels strains its foreign currency reserves and can affect the final price to consumers. Though Mauritius has maintained the price close to the global average at $0.135 kilowatt-hour, it still is more expensive than most other Sub-Saharan African economies.[120] For example, the sharp increase in the price of coal in 2022 caused the an IPP generating electricity from coal and bagasse to halt operations.[121] This IPP was responsible for 17 percent of the electricity generation in Mauritius. To avoid electricity shortages, other plants had to increase their production to full capacity.

CEB mostly generates electricity based on fossil fuels, while the private sector drives green electricity generation. CEB owns the power plants that generate electricity using heavy fuel oil at Fort George, Fort Victoria, and St. Louis. Base load power stations use heavy fuel oil, which plays a significant role in the generation of energy in Mauritius. Coal and bagasse are used in the cogeneration facilities of IPPs, including Alteo, Terragen, and Omnicane La Baraque (appendix B, table B.1). During the six-month crop season, IPP power plants use bagasse and cane trash as a biomass source for power generation; coal is used in the other months.[122] The only wind farm on the island is run by an IPP and located at Plaines des Roches, with a total installed capacity of 9.35 megawatts—enough to power 10,000 households in Mauritius.

Opportunities for the private sector

The private sector can participate in utility-scale projects for public provision of power supply and support businesses for self-generation and increasing energy efficiency. CEB plans for the private sector to fill the renewable energy gap. In terms of business services, there are opportunities in providing renewable energy self-supply systems for industrial and commercial companies, with the possibility of net metering and contracting or build, own, operate, transfer models, as well as in providing energy efficiency services (appendix B, table B.2). Although there are 43,300 commercial customers and 5,500 industrial CEB customers in Mauritius, conservative estimates point to approximately 2,400 potential customers for renewable energy and energy efficiency goods and services.[123]

Private sector participation to meet the increased demand for generation of clean energy has already begun, especially for solar PV and wind. With the tender in March 2022 to install nearly 140 megawatts of additional capacity from hybrid solar PV plus battery,[124] CEB has taken a major step in the expansion of renewable energy generation.[125] Mauritius boasts excellent solar and wind power potential,[126] yet the Renewable Energy Roadmap 2030 plans for a broader basket of renewable energy sources to meet its goals, such as innovative green energy generation in marine renewables, floating solar PV, and waste-to-energy. However, since solar and wind energy production is most advanced in technology and affordability, these represent the main opportunities for private sector participation in the short term.[127]

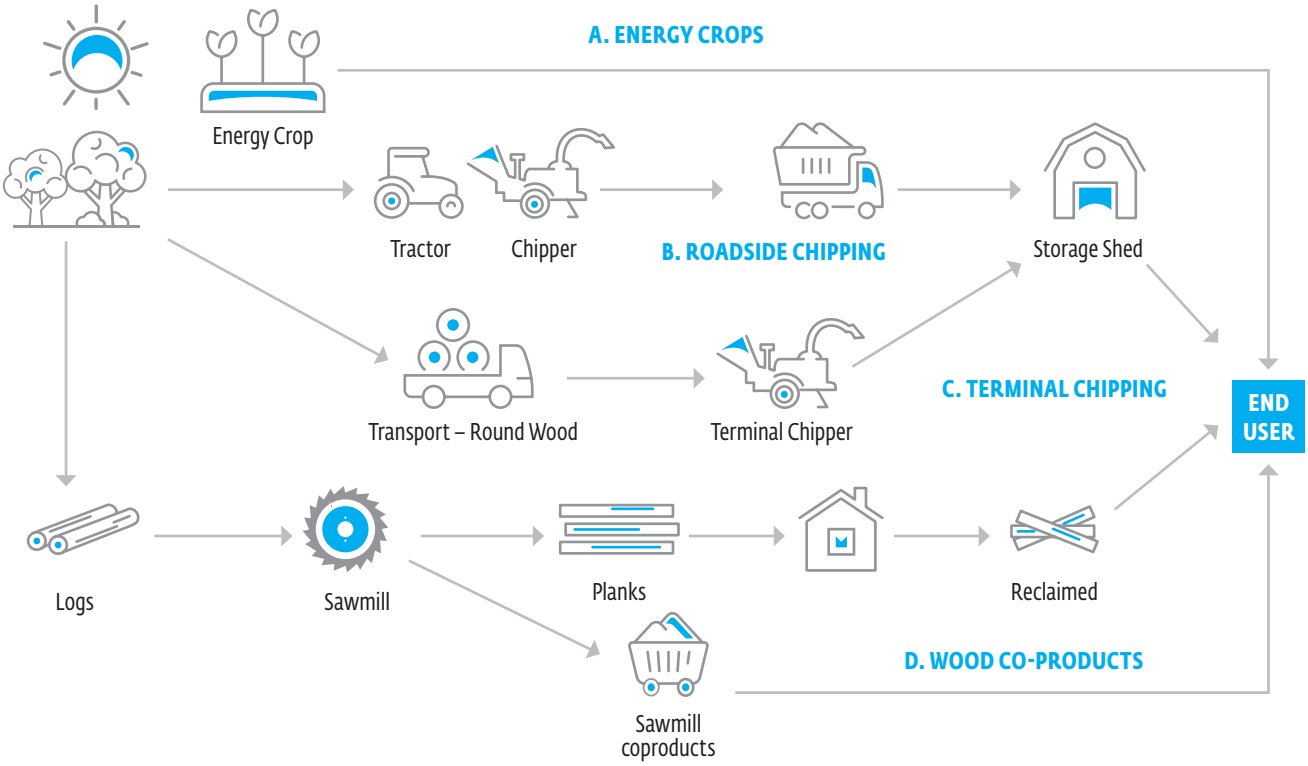
The private sector wants to continue participating in green energy generation schemes, given the right conditions. Medium-scale distributed generation (MSDG)[128] schemes allow customers to set up solar PV projects to generate electricity on a gross-metering model, with CEB as the off-taker. Launched in 2016, about 200 customers expressed interest, and there was a waiting list to participate.[129] Various financial incentives, such as feed-in tariffs (FiTs),[130] exemption of import duties and value added tax on PV systems, tax incentives, and favorable terms on green loans, make the schemes attractive. MSDG schemes are complemented by small-scale distributed generation (SSDG) schemes, which have helped create good conditions for the commercial development of the solar PV sector; the number of solar PV vendors increased from a few in 2011 to over 20 by 2017.[131] Combined, these two schemes expand opportunities for the private sector to sell, install, and maintain solar PV systems to small and large customers. Although gross and net metering schemes help attract renewable energy players and create a market for solar PV, the cost of renewable energy obtained through energy auctions has plummeted recently, making electricity generated from large-scale renewable projects more competitively priced, on average.

Although the demand to participate in MSDG and SSDG schemes is high, the implementation rate and connection to the CEB grid has not followed. Currently, less than 6 percent of the target has been met, and only 10 percent more is under implementation.[132] CEB expected projects for a total capacity of 70 megawatts to come online by 2025, but little progress has been made toward that goal. The private sector points to rising costs that make the initially offered FiT not viable. The government responded by raising the FiT, aligning it more with what the private sector had indicated would be viable. Initially only applicable to the Smart City and Public Sector Entities schemes, it has recently been extended to MSDG schemes for domestic customers, religious bodies, nongovernmental organizations, electric vehicles, and educational institutions.

Investment opportunities are emerging for private sector participation in the biomass supply chain. Injecting large amounts of variable renewable energy (VRE)—such as solar and wind—to the grid threatens grid stability and security. This is problematic on an island with no interconnected networks. Biomass, a controllable renewable energy source, is responsible for 11.7 percent of energy production[133] and balances the energy mix.[134] A significant increase (100 megawatt installed capacity) of biomass-produced energy is needed. Although IPPs indicate that only a small investment is needed to retrofit high-pressure boilers to burn more biomass, if a capacity increase is needed, large amounts of additional biomass will be required to meet demand. MCIA is considering biomass production on abandoned land that is not suitable for cane production. Finding alternatives to bagasse is necessary because sugar cane production has declined, threatened by the decrease in global sugar prices and increase in production costs. Commonly used species for biomass production, such as eucalyptus and bamboo, are being considered by MCIA because of their fast growth and high productivity. However, use of these species comes with its own set of risks, such as the displacement of native plant species, intense water requirement, soil degradation, and deforestation.

The Cabinet of Mauritius recently approved the Biomass Framework,[135] which can open investment opportunities in various stages of the supply chain (figure 5.7). According to the framework, cane trash and woody biomass will be remunerated at Rs 3.50 per kilowatt-hour, similar to the remuneration for bagasse.[136] New opportunities in cultivation, harvest, transport, storage, and treatment will be created for private sector investment.[137] Biomass will take, at a minimum, four years to be produced (and most likely seven years). During this time, there will be a market for firms to import biomass to sell to IPPs, which may continue if Mauritius does not produce all of the biomass required for energy generation. In the case of the French overseas territory of La Réunion, the conversion to power plants running solely on biomass will combine local sourcing of biomass with sustainable import of biomass. To make a quick green transition, one electricity producer plans to import 800,000 tons of biomass and source 100,000 tons locally.[138] This contrasts with the vision of the government of Mauritius, which desires to maximize local biomass, with positive spillovers to the local economy.

FIGURE 5.7 WOODY BIOMASS SUPPLY CHAIN OFFERS OPPORTUNITIES FOR LOCAL COMPANIES



Source: Based on Forestry Commission Scotland 2016, in WBA (World Bioenergy Association), "Biomass Supply Chains" (fact sheet, Stockholm: WBA, 2018), https://www.worldbioenergy.org/uploads/Factsheet%20-%20Biomass%20Supply%20Chains.pdf.
Note: Example of different paths from forest feedstock to energy conversion.

There is potential to focus on increased energy efficiency. There also could be market opportunities for energy service companies (ESCOs) to help attain energy goals. The government wants to increase energy efficiency by 10 percent by 2030;[139] however, there are no details yet as to how this will be accomplished. An energy efficiency master plan elaborated in 2016 is serving as the basis for an action plan up to 2030. A study conducted in 2012 revealed that energy efficiency measures in large industries and buildings can lead to saving an estimated Rs 1.1 billion per year.[140] The Energy Efficiency (Energy Consumer and Energy Audit) Regulations 2017 created a mandatory energy audit requirement for large energy consumers[141] within a five-year period. In 2015, approximately 300 commercial (55 percent) and industrial (45 percent) enterprises were considered large customers: manufacturing facilities (including textiles, food and beverages, chemicals, and plastics); hotels; shopping malls (including supermarkets); and large buildings (such as banks, hospitals, and government facilities).

Increased energy efficiency will also benefit the tourism and manufacturing sectors. The tourism industry reduced its energy use 53 percent between 2002 and 2009.[142] With the growth of environmentally conscious travelers, there is a push to certify the industry as green to attract more visitors. The Mauritius Standard (MS) 165 for sustainable tourism considers energy use and contribution to greenhouse gases as part of its process to award certification. Similarly, buyers of manufactured goods are increasingly incorporating environmental considerations in their terms of engagement with manufacturers. These agreements include standards promoting energy efficiency to ensure lower carbon dioxide emission.[143] Movement toward green production methods helps producers to meet international buyers' environmental and social compliance requirements.[144]

Constraints on the private sector

Lack of clarity for the implementation of measures envisioned under the Renewable Energy Roadmap 2030 is delaying private sector investments. The roadmap outlines the strategy for the greening of energy production. However, this document alone does not provide all the details required for implementation. Key aspects need to be developed for the private sector to carry out investments. The National Biomass Framework and clarification on the FiT for MSDG schemes were subject to significant delays; other details are yet to be defined, such as the implementation of energy efficiency goals and the timing of new projects to accommodate new energy generation.

CEB needs to provide greater visibility on the FiT for MSDG schemes. The private sector welcomed the increase of the MSDG FiT; however, subsequent announcements limiting the new tariff to the first seven years of operation, after which it would drop, sowed uncertainty.[145] Similarly, CEB formally implemented the MSDG tariff in December 2022,[146] but it limited the new tariff to the Smart City scheme and the Public Sector Entities scheme, and it did not mention how long the FiT would last. Since then, it has been clarified that the tariff for the MSDG scheme will be for the duration of the contractual terms and the new tariff was be extended to other schemes. The uncertainty created by the initial announcements was considered by the private sector as a factor for investment delays.

Mauritius does not have a detailed strategy for operationalizing energy savings initiatives. EEMO is working on a new strategy for energy efficiency, but it has not been issued. EEMO is receiving technical assistance from the Global Environment Facility and the United Nations Development Programme to operationalize energy savings measures and enforce energy audits and their recommendations. EEMO is also interested in studying the viability of developing a local ESCO market. ESCOs would help private sector and public sector institutions enact energy savings measures to reduce their energy bills and comply with energy audit legislation. The effectiveness of the audits is undermined by a lack of technical capacity at EEMO, insufficient local expertise and awareness of energy efficiency measures, and lack of awareness in the private sector.[147] Although preferential electricity tariffs for industrial enterprises could dampen the financial incentive to pursue energy efficiency, there is strong interest in the Carbon Neutral Industrial Sector Renewable Energy (CNIS RE) scheme, which requires energy audits. Further, performance-based energy contracts are not regulated, which can create an obstacle to private sector entities seeking to enter the market. EEMO has not yet been successful in proposing a viable legal framework for these contracts. The Master Plan for Energy Efficiency 2016–30 lacks concrete next steps to implement an energy efficiency strategy in the short term.

Gaps exist between CEB's tendering process and PPA terms and international good practices. Recent tenders for renewable energy projects have bankability issues that have led to drawn-out processes, lack of participation, and tender cancellation in some cases. PPA terms that had been palatable to local banks in the past are not considered bankable by foreign financial institutions because they do not contain standard international provisions. Larger projects can no longer be financed (at least completely) by local banks, which have foreign exchange constraints. Issues arise during the call for proposal stage (tender), including requests for letters of commitment with terms that are difficult to meet. Other issues occur with PPA terms, for example, the failed process to purchase renewable energy from a 40-megawatt wind farm. Interested companies expressed their disappointment that the tender terms did not reflect the reality of establishing a wind farm project and that CEB lacked flexibility in addressing their concerns. The energy auction had only two bidders, and the CEB ended up cancelling the call for proposals.

Better coordination among government agencies is needed to increase renewable energy in the energy mix. Several government agencies, most importantly CEB, are called to implement renewable energy expansion plans. However, given the multiplicity of players and components of the energy mix required to reach the targets, greater coordination is needed to ensure success. Currently, a MEPU committee oversees progress toward achieving the goals of the Renewable Energy Roadmap 2030. The committee engages with stakeholders on an ad hoc basis; regular meetings or exchanges of information do not take place among those involved in implementing the roadmap.

The rapid expansion of renewable energy in Mauritius has increased the need for qualified workers to operate and maintain these systems. In the short term, this affects project implementation because of delays in hiring project staff and a significant increase in staff or consultant salaries.[148] SSDG schemes have led to an increasing number of suppliers of solar PV systems, a clear example of government policy leading to a demand for green jobs and skills. It also demonstrates how the lack of such skills can create obstacles for SSDG rollout. For example, only 15 SMEs had the trained staff and technical skills to install PV systems, leading to overwhelming demand.[149] At times, delays of 12 months occurred between a household PV system request and installation. Energy efficiency is another area in which green jobs are in high demand, and mandatory energy audits have set up a demand for energy auditors.[150]

Recommendations: Renewable energy

Mauritius has attainable energy goals to build a greener, inclusive economy that will benefit numerous sectors and improve climate change adaptation. The private sector is poised to meet the increased demand for renewable energy, especially if greater clarity is provided regarding regulations, cost-effectiveness, and the viability of various energy sources. To address the constraints described, it is critical to capitalize on emerging investment opportunities, such as biomass; find the right balance in the electricity generation mix; and better anticipate market demand for supply and skills.

Improve the institutional setup and processes

- **Provide greater clarity and transparency on the process, status, and timeline for issuing policy decisions that influence private sector decisions.** To have a successful transition to green energy, a balance must be struck between infrastructure and grid security, financial costs, and capacity of the public and private sector for execution, among other things. The timing of policy decisions is also important considering the long lead time needed to execute large-scale energy projects or to build a market for self-generation.
- **Set up a technical coordination mechanism for implementing the Renewable Energy Roadmap 2030, with representation from all relevant stakeholders**. Given the tight timeline and multiplicity of the actors involved, closer and more frequent coordination among all actors is needed to avoid misalignment and overlap. Regular technical meetings can help harmonize efforts and monitor progress.

Support CEB for inclusion of renewable energy

- **Modernize CEB's PPAs and tendering process to align it with international good practices**. Doing so will increase Mauritius's credibility in the international market and attract greater competition for the purchase of renewable energy. The World Bank's PPP Legal Resource Center provides the key features PPAs should have, as well as many international good practice examples. In addition, CEB may want to hire experienced international counsel to advise and review its template PPA and tendering process. Mauritius has enlisted the World Bank and the African Legal Support Facility to review its PPA.
  In particular, the following issues have been identified as areas for improvement for the power purchase agreements: introduction of mitigants to cover foreign exchange risks for ongoing and termination payments; and settlement of disputes clauses to align with international standard (ICC arbitration, for example). For the request for proposals stage, priority issues include (a) having a transaction adviser that can collect feedback and flag issues early on; (b) considering the introduction of a prequalification stage; (c) easing the terms of the letters of interest requested from potential lenders; and (d) opening technical envelopes first to ensure an unbiased technical review prior to opening financial envelopes.
- **Identify the best options for integrating VRE in the grid by 2025**. A grid integration study simulates operation of the power system under different VRE integration scenarios, identifies reliability constraints, and determines the cost of actions to integrate VRE.[151] This could point to opportunities for participation of IPPs and prepare CEB for greater growth of VRE supply. VRE integration studies can also help to reduce the cost of renewable energy technologies by optimizing their deployment and integration and increase investor confidence by demonstrating the feasibility of integrating high levels of renewable energy into the grid.
- **Develop a least cost generation plan (LCP) to determine the most cost-effective mix of electricity generation sources to meet current and future energy demand.** An LCP will provide CEB with a long-term view of the costs for increasing renewable energy in the generation mix and help it avoid inadvertently raising electricity costs. An LCP considers fuel availability, environmental impacts, expected life span of each energy source, and infrastructure constraints, as well as the costs of different energy sources and transmission and distribution infrastructure.

- **Support the URA's institutional capacity, including the skills of personnel, to ensure that the new agency can grow to fulfill its mandate to regulate the energy sector.** The government needs to develop the expertise of the URA—it only recently started its operation; CEB previously fulfilled this task.

Prepare for new markets to fulfill renewable energy goals

- **Diagnose opportunities for SMEs emerging from the supply chain for biomass.** Focus on upstream processes, including collection or cultivation, storage, preprocessing, and transport. There are also opportunities in the supply of machineries for processing biomass, sale of by-products from biomass processing, and construction of processing plants. A study can help prepare SMEs' market entry and raise awareness about the use of biomass.
- **Improve the framework and implementation of energy efficiency, assessing the feasibility of providing a legal framework for the provision of performance-based contracting.** Currently, the government has limited capacity to follow up on recommended energy savings measures from audits. Encouraging increased demand for performance-based energy efficiency contracts with private sector providers can help curb energy usage and create a new area for private sector growth.
- **Prepare and implement a strategy to anticipate the demand for green jobs in the renewable energy and energy efficiency sectors.** The government, industry, and private sector educational institutions should coordinate to identify skill gaps for the provision of a qualified workforce. The lag between market demand and supply of green skills creates bottlenecks for the private sector and delays the creation of new local green jobs.

5.3. HEALTH CARE

Overview

The COVID-19 pandemic disrupted the Mauritian economy, exposing its overreliance on the tourism sector and highlighting the private sector's role as a partner in health care service delivery. In 2020, the country's GDP contracted 14.9 percent as a result of the pandemic crisis, exposing the precarious nature of the hitherto thriving tourist industry.[152] Meanwhile, the number of medical consultations at the primary health care level jumped from 2 million in 2019 to 4.2 million in 2021. Mauritius's response to the COVID-19 shock included collaborative initiatives with the local private sector that focused on testing, treatment, and vaccination facilities to cope with the surge in demand for health care.

According to the World Health Organization (WHO), Mauritius ranked third in the Africa region in health workforce density in 2021. Mauritius reached a density of 7.3 workers per 1,000 population, compared with the average regional health workforce density of 2.9 workers in Africa.[153] This was below that of Seychelles (14.5) and Namibia (7.6) and above that of South Africa (6.5). These are the only countries in the region that reached or exceeded the SDG density threshold of 4.45 health care workers per 1,000 population.

Mauritius's health care system is transforming because of the changing pattern of diseases, aging demographics, and climate change effects on epidemic-prone diseases. Mauritius has undergone an epidemiologic transition from predominantly communicable diseases to noncommunicable diseases (NCDs), punctuated by frequent epidemic-prone diseases such as dengue and COVID-19. NCDs are the leading cause of premature mortality and disability in Mauritius, requiring chronic care for an aging population. Cancerous tumors, diabetes mellitus, mental and substance use disorders, cardiovascular diseases, and other NCDs accounted for 84.2 percent of disability-adjusted life years loss in 2019,[154] corresponding to a total monetary value of $9.46 billion (65 percent of GDP).[155] In addition, Mauritius faces vulnerabilities to epidemic and pandemic-prone diseases because of prevailing climatic hazards.

Despite significant government investment in the health sector, fiscal constraints limit further public investment. According to Mauritius's National Health Accounts report for 2020, health care expenditure accounted for only 7.18 percent of general government expenditure (GGE). This is less than the pledge taken under the 2001 Abuja Declaration to allocate at least 15 percent of the national budget to the health sector. Fiscal constraints limit further public investments in upgrading health-related infrastructure and human resources, illustrated by the marginal increase in government health care expenditure from 2.67 percent of GDP in 2014 to 2.85 percent of GDP in 2019. Meanwhile, private health expenditure as a percentage of GDP increased from 2.81 percent in 2014 to 3.32 percent in 2019. Total health expenditures reached 6.16 percent of GDP in 2019, above the Sub-Saharan Africa average of 4.71 percent.

Mauritius is a signatory of the Abuja Declaration on Health (2001) which demands countries to allocate 15 percent of GGE to the health budget. Moreover, Mauritius' performance against the three benchmarks of the Africa Scorecard on Domestic Health Financing in SADC countries is also important. Mauritius has a per capita government spending on health of US$311, which is well-above the target set of US$86.30. However, as for the other two health financing indicators, namely government spending on health being at least 5 percent of GDP and 15 percent of general government expenditure, the country is still midway.

At the AU Africa Leadership Meeting on Investing in Health in 2019, member states recommitted to increase domestic investments and urged the private sector and global health financing mechanisms to increase investments to address health priorities in African countries. At the same time, it was also recognized that increased health spending is necessary but insufficient on its own to improve Universal Health Coverage (UHC). Tackling health systems inefficiencies (notably related to health workforce and medical products procurement and supply management) was identified as an area where member states were requested to take immediate steps to ensure spending of available funds is optimized.

Because of the perception that it provides higher-quality services, the Mauritius private sector is surpassing the public sector as a health care service provider. Since 2005, the share of private health care expenditure has outpaced that of public health care. About 27 percent of health care needs are catered by the private sector on a fee basis, either through out-of-pocket payments (OOP), including deductibles, or payments affected by private health insurers. Households spend a significant amount on health care. According to the *2020 Mauritius National Health Accounts* report, private health expenditure is 53.8 percent of total health expenditures in Mauritius. Private insurers estimate that payments amount to $60.2 million (Rs 2.17 billion) on behalf of approximately 160,000 lives covered by private voluntary health insurance policies.[156,157]

The trend in private spending indicates that many Mauritians opt for private health care even though it is more expensive. The private provision of health care is perceived as of higher quality by the general population when compared to the public sector. It is also believed that high household OOP expenditure on health may be mainly attributed to the increasing per capita income, a rise in the standard of living of the population and rising and unregulated prices for healthcare services in the private sector.[158] The NHA study revealed that, in 2019, one of the major drivers of OOP payments on health by households were pharmaceutical products. The mean service quality gap score (i.e. the discrepancy between patients' expectations and perceptions) is 1.23 for the public sector, compared with 0.52 for the private sector. Thus, The Mauritian population is willing to pay a premium for higher-quality, private health care services. However, it should be noted that the total volume of healthcare services provided by the private sector is lower than that in the public sector, as per the latest Household OOP Expenditure Survey undertaken in Mauritius, which indicates that approximately 72.8 percent of the health needs of the population are catered by public health institutions for outpatient and inpatient services, while 27.2 percent are catered by the private sector.

Significant investment in health care is needed to reach universal health coverage by 2030.[159] This goal calls for new PPP approaches to higher-quality health care and treatment, including upgraded technological capabilities and specialized skills, which will help Mauritius build a more resilient and sustainable health care sector. PPPs can also help alleviate bottlenecks in the public health sector by introducing private health insurance solutions. An appropriate PPP framework can (a) improve the efficiency of public resources by leveraging private sector capabilities, (b) attract new investments, (c) pool resources and skills to improve service delivery, and (d) include domestic residents and foreigners seeking treatment.

Health care PPPs in Mauritius increased the coping capacity of the public health sector during the pandemic. Several private clinics played a crucial role in providing isolation units, clinical care, laboratory testing, and vaccination for COVID-19 and influenza when the government's surge capacity was exceeded. Other services demanded from private clinics include renal dialysis and diagnostic imaging services. In addition, the government used private firms for services such as specialized cleaning of medical facilities, catering, security, and laundry. The PPPs were mutually beneficial to the private and public sectors in obtaining relevant training and experience.

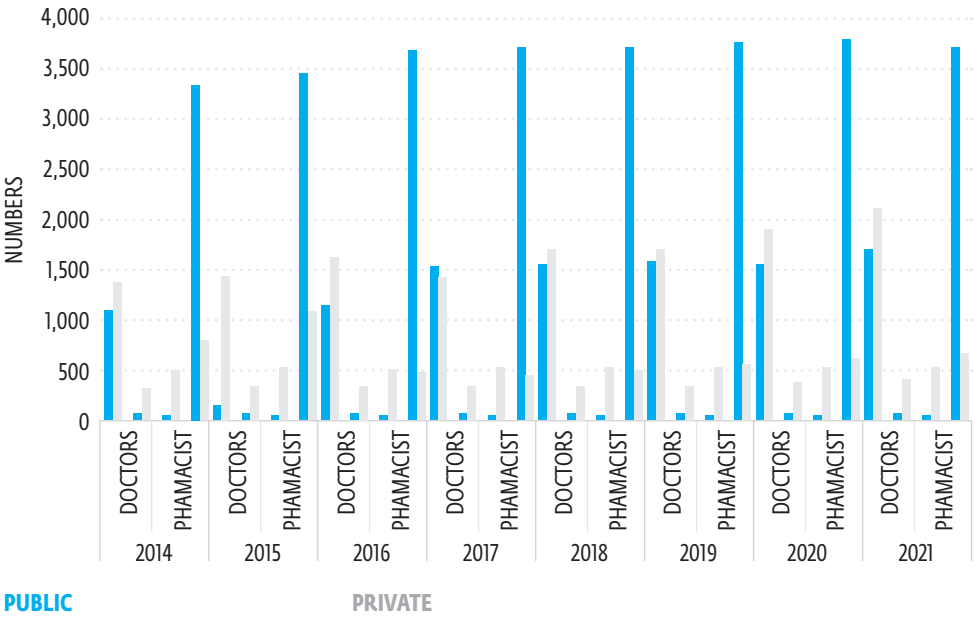
Mauritius's aging population, rising income levels, and changing health care preferences have led to an increased demand for private health care services. In addition, the potential for medical tourism, technological advancements, specialized and niche services, and PPPs are key opportunities to be seized. Expanding services, leveraging technology, attracting international patients, and collaborating with the government can contribute to the health care sector's success and advancement.

Structure of the health care sector

Mauritius's public health care system follows a welfare state model, with free health care services to all citizens. The public health system is organized as a three-tiered level of primary, secondary, and tertiary care. At the primary level are 141 community and area health centers. Each primary health care center serves about 9,000 people and is located within a radius of three miles from any residential area to make it equally accessible to all. At the intermediate level are two district and five regional hospitals. The tertiary level comprises five specialized health care institutions covering cancer; cardiac; eye; ear, nose, and throat; and psychiatric needs.

The private sector infrastructure is slowly growing, along with health care providers that serve local and international patients. The number of private clinics increased from 13 in 2006 to 18 in 2021. Similarly, the bed capacity increased from 562 to 773 from 2006–21. The number of doctors in the private sector increased from 1,352 in 2014 to 2,094 in 2021 (figure 5.8). In comparison, the number of nurses and pharmacists in the public sector remained static. Demand is high for nurses in the public sector, and it is lower in the private sector.

FIGURE 5.8 COMPARATIVE HEALTH CARE WORKFORCE IN PUBLIC AND PRIVATE SECTORS, 2014–21



Source: Mauritius National Health Accounts

In 2021, the private health sector received 207,849 admissions and performed several medical interventions related to cardiovascular diseases and cancers. The most common interventions were for gastrointestinal conditions (20.8 percent of all interventions), followed by eye disorders. Mauritius benefits from the latest technologies in cosmetic surgery, dentistry equipment, and dental aesthetic services (performed in a participating chain of five-star hotels). In 2021, dermatological and plastic surgeries accounted for 7.4 percent of all interventions. Before the COVID-19 pandemic, an estimated 12,000 foreign patients arrived in Mauritius annually as medical tourists, primarily from Comoros, France, Madagascar, Réunion Island, Seychelles, South Africa, and the United Kingdom.

Workforce and training

Mauritius struggles with a shortage of skilled health care professionals, including doctors, nurses, and allied health personnel. This shortage is driven by emigration of health care workers seeking better opportunities abroad, limited domestic training capacity, and insufficient recruitment and retention strategies. The shortage creates a strain on existing personnel, leading to increased workload, burnout, and compromised quality of care. Moreover, the limited availability of specialized health care professionals hinders the provision of care and the development of advanced technologies and treatments.

Mauritius faces challenges in aligning the skills of health care professionals with evolving health care needs in digital health, geriatric care, and NCD management. The country's training capacity is insufficient to meet the growing demand for health care professionals. Enhancing the quality and relevance of health care education and training programs, promoting continuous professional development, and fostering partnerships between educational institutions and health care providers are critical to bridging the skills gap and improving the overall quality of health care services.[160]

Another significant challenge is the uneven distribution of health care workers across different regions of Mauritius. Most health care professionals are concentrated in urban areas, leaving rural and remote regions with limited access to essential health care services. This disparity exacerbates health inequities and reduces health care access for vulnerable populations. The density breakdown of health personnel per 100,000 inhabitants is 13.3 doctors, 29.4 nurses, 0.6 dentists, and 0.3 pharmacists.

Regulation of the private health sector and health insurance

The regulatory framework for the private health sector is insufficient. Private health institutions are governed by the Private Health Institutions Act (1989) in licensing, registration, and regulation. Section 11 of this Act empowers the Minister of Health and Wellness to make financial policy tools to regulate and steer service delivery in the private sector, including nursing homes. Deficiencies in the regulatory framework for the private health sector have resulted in price differentials for health interventions across facilities. The absence of a harmonized rate and asymmetric information on the rates imposed have contributed to rising catastrophic payments and impoverishment from out-of-pocket payments.

Mauritius's public health insurance structure centers on the national health insurance (NHI) scheme. The NHI scheme ensures universal health care coverage for all citizens and legal residents. Contributions to the scheme are made by individuals, employers, and the government, with rates based on income brackets. The scheme offers a network of health care providers and comprehensive benefits, including primary health care, hospitalization, specialist care, diagnostic tests, and medication. NHI promotes collaboration between the public and private sectors to ensure that individuals receive necessary and affordable health care services.

The Financial Services Commission and Insurance Regulatory Authority oversee the private health insurance sector in Mauritius. The Insurance Act 2005 forms the foundation of the regulatory framework, covering licensing, solvency requirements, consumer protection, and market conduct. The regulatory framework aligns with the International Association of Insurance Supervisors' standards and principles. Private health insurers need to obtain licenses from the Financial Services Commission and meet criteria related to financial stability and risk management. Insurers also must comply with solvency requirements and undergo regular financial reporting and auditing. In 2019, private insurers estimated payments amounted to $47.7 million for about 160,000 lives covered by private voluntary health insurance policies.[161]

Low affordability and limited accessibility make it difficult to afford private health insurance. Limited standardization of policies and coverage makes it challenging for consumers to compare and choose suitable insurance options. Insufficient consumer protection measures, inadequate regulation of benefit packages, and incomplete risk pooling mechanisms further impact the regulatory environment. Strengthening consumer protection, standardizing policies, regulating premiums, improving risk pooling mechanisms, and enhancing oversight and enforcement would ensure a more robust private health insurance sector.

Constraints on the private sector

Weak, fragmented, or nonexistent policy, legal, and regulatory framework

Despite Mauritius's reputation as a pro-business destination, it lacks a conducive policy, legal, and regulatory framework to support its vision of becoming a regional medical hub. Sector-specific policies, legislation, and regulations, backed by guidelines, procedures, and a well-formulated strategy are needed.[162] Key deficiencies in the framework include (a) a sweeping and nonspecific health care strategic plan, running the risk of overextending scarce resources; (b) lack of provision for liability for negligence in medical tourism; and (c) fragmented governance of the biopharmaceutical industry that risks misalignment between the public and private sectors and inadequate regulation.

Legislation and regulations pertaining to the biopharmaceutical industry are fragmented and not aligned with international standards of the industry, such as manufacturing, laboratory, and clinical good practices. In addition, the absence of certification agencies in the country hampers the accreditation of local medical and biopharmaceutical industries to international standards. Despite the Clinical Trial Act,[163] informed consent and coercion of patients has not been addressed. Potential competitor countries, such as India, Malaysia, or Singapore, have sector-specific policies that address these issues, and Mauritius can draw on them when updating their policies.

Uneven quality of health care infrastructure

The country's medical tourism industry's infrastructure is inadequate to operationalize a medical hub. Although Mauritius has some advanced private health care centers, it faces major capability constraints in high-end, specialized care resources, such as for advanced cancer treatment, robotic-assisted surgeries, and advanced diabetic treatments. In addition, the existing laboratory infrastructure does not have the appropriate equipment to cater to the needs of the pharmaceutical industry.

Inadequate collaboration and R&D

A medical hub requires inputs and support from different local and international stakeholders. The roles of stakeholders in operationalizing the medical hub are not clearly identified. The operation of the medical hub involves the collaboration of the EDB, Mauritius Tourism Authority, the Ministry of Health and Wellness, private health care players, and hotel chain industries. However, there is no formal mechanism for intersectoral collaboration, resulting in a lack of coordination and administratively cumbersome processes of obtaining approvals for health care licenses and permits.

The biopharmaceutical industry is fragmented across many institutions, which have varying administrative procedures and regulatory powers. For instance, the EDB, Mauritius Board of Investment, Ministry of Health, and MRIC do not have a formal arrangement for collaboration, resulting in a slow start for this industry. Currently, phase 2 and 3 clinical trials do not have an established national network and process or common network for access to patients' records in public and private health care systems.

Multidisciplinary research and collaboration that drive innovation are absent domestically and internationally. Most foreign companies operate in isolation and without collaboration with local ones, with negligible investments in R&D activities. Mauritius has the legislation, enabling environment, and infrastructure to facilitate greater investments in R&D, but so far little innovation is produced because of a lack of multidisciplinary collaboration and targeted investments in R&D.

Limited human capital

Mauritius lacks qualified health care professionals resulting from a disconnect between demand and supply in the available number of qualified workers, certification, training, and registration. Despite numerous public and private HEIs, and many health professionals having been trained in world-class institutions, Mauritius suffers from workforce attrition in several health sector areas. This is partly because of competition from overseas markets and lack of sustainable medical education partnerships in core competencies.

A major challenge is the shortage of specialized medical professionals, especially in vascular surgery, renal transplantation, plastic surgery, spinal surgery, pediatric surgery, and general surgery. The number of local patients sent to India for treatment is steadily increasing; this includes those seeking specialized care. Similarly, export of biopharmaceutical products and services, such as clinical trials and outsourcing of medical documents, have remained limited. This is in part because of the lack of a skilled and experienced workforce in aspects of the biopharmaceutical industry, including pharmacy, biomedical engineering, laboratory technicians, clinical trials, settling disputes, and trade negotiations.

The shortage of specialized professionals also exists in many regulatory committees, thereby impeding the sector's development. For example, the Ethics Committee of clinical trials had to postpone approvals because of a lack of sufficient full-time staff or lack of quorum. Because of a lack of competencies, some clinical research areas are not being addressed, such as inspection of research sites, auditing of clinical trial sites, and follow-up of pharmacovigilance reports.

Insufficient investment and lack of PPPs

Developing a medical hub requires substantial financing from the public and private sectors. Public expenditure in the health care sector, at about 2.85 percent of GDP, is insufficient to develop the medical tourism sector. Current fiscal constraints, which were exacerbated during the COVID-19 pandemic, further hampered the public sector's ability to allocate discretionary spending for this purpose. Despite the government's attempts to promote medical tourism, this segment has not significantly grown. The arrival of medical tourists has flattened at about 12,000 patients annually since 2011.[164] In the biopharmaceutical industry, Mauritius has not yet conducted phase 1 or 2 clinical trials, obtained more than a couple of patents, or started locally manufacturing vaccines. As such, targeted private investments in the health care sector are needed, including through PPPs, to overcome current investment gaps.

PPPs in health care face several challenges but hold many potential benefits. PPPs can leverage private sector resources and expertise to improve health care service delivery and achieve sustainable and inclusive health care outcomes for citizens. However, Mauritius should first establish a transparent and enforceable regulatory framework to effectively govern PPP agreements. Second, Mauritius needs to find ways to achieve financial viability while ensuring cost recovery, affordability, and quality of service provision. Other challenges include aligning and building capacity among stakeholders, maintaining quality standards and efficient service delivery, and addressing public perception and accountability. Overcoming these challenges requires comprehensive guidelines and legislation, stakeholder collaboration, risk assessment and management strategies, robust M&E, and transparent communication.

Weak sector competitiveness

Despite its tax incentives,[165] combined with preferential access to markets in Africa, Asia, and Europe, Mauritius has not attracted a significant number of medical tourists to economically stimulate the sector. Similarly, the number of foreign or local biopharmaceutical industries is small, with limited economies of scale. To fulfill its ambitious vision for the sector, Mauritius must be able to compete on par in price and quality of service with established players in the region or globally, such as India, Malaysia, Singapore, South Africa, and Thailand. For medical tourism, the lack of adequate regional transportation connectivity puts Mauritius behind South Africa in the attraction of patients from other African countries. This also applies to European destinations that do not have direct flights to Mauritius.

Opportunities for the private sector

Medical tourism

Mauritius's natural endowments and geographic location is conducive for it to become a premier hub for medical tourism. The country is strategically located between Asia and Africa. Mauritius is sought for its exoticism, remoteness, bilingual features, and spectrum of medical treatment available. The scenic beauty and chains of hotels with links to health centers offer medical tourists a serene environment for medical recovery. Medical tourism activities in Mauritius focuses on cosmetic surgery, dentistry, in vitro fertilization, detox centers, and hair transplant. The island's serenity also lends itself to the wellness tourism niche, including holistic therapies and sports-related medical services, in addition to the growing segment of senior care.

Mauritius can leverage its resources, including available private health care infrastructure and its status as a regional financial center, to transform itself into a regional medical hub. The country is capable of offering state-of-the-art medical services to foreign patients, both regionally and internationally. The country can also tap into the emerging biotechnology services sector, including expanding its clinical trial capabilities and investments in the manufacturing of medical devices, to serve as drivers of economic growth for the health care industry and manufacturing sector. Toward this end, Mauritius has drawn inspiration from similar efforts in Dubai, India, and Singapore to develop its vision for a medical hub.

As part of its economic diversification strategy, the government outlined its vision to become a regional medical hub in its *Health Sector Strategic Plan (2020–24)*.[166] A medical hub needs to have several preconditions in place: a health care system capable of providing advanced medical services; robust and pro-business regulatory governance; a skilled workforce; supporting network and infrastructure; and cost-sharing between the private and public sectors, driven by revenue-generating pharmaceutical industries.

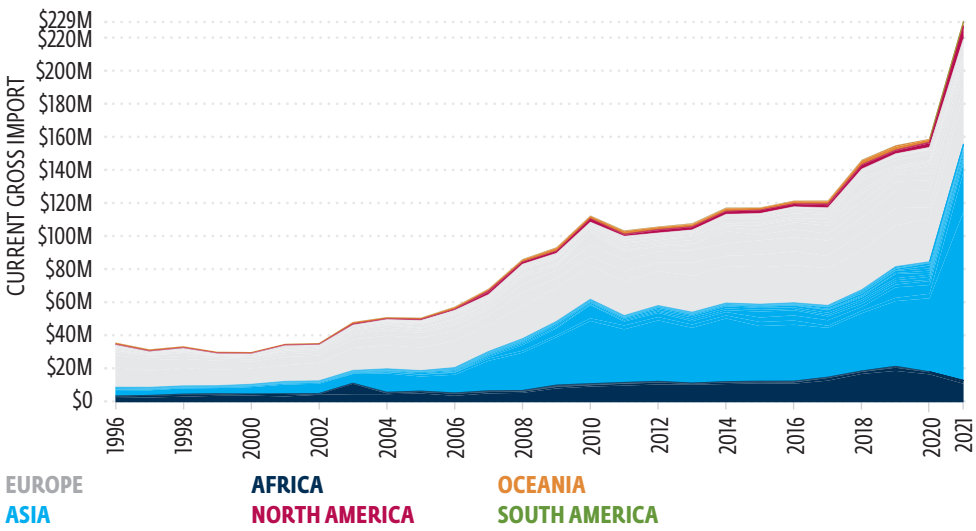
Medical tourism creates synergies between public and private institutions. The public sector involves the Ministry of Health and Wellness, Mauritius Tourism Authority, and EDB, while the private sector involves nonhealth and health sectors. The nonhealth sectors focus on hospitality and service components consisting of chains of hotels, transportation, and travel agencies. The combined private and public health sectors comprise five major public hospitals, six specialized public hospitals, 20 private clinics, eight specialty centers, and 30 private medical laboratories—together providing 4,500 beds. The network is staffed by local and foreign health professionals, including more than 3,700 medical doctors. All medical staff involved in medical tourism are bilingual in English and French.

Medical devices and biotechnology

The continued growth of the medical device manufacturing industry is driven by the preferential market access that Mauritius enjoys with the European Union. In 2021, Mauritius exported $42 million worth of medical equipment, mainly to France (48 percent) and India (38 percent), while only 5 percent of 2021 exports were to the United States. In 2021, Mauritius also imported $39 million worth of medical equipment, mainly from China (15 percent), the United States (15 percent), India (11 percent), Germany (10 percent), and Ireland (8 percent). As of 2022, seven medical device manufacturers in Mauritius employ about 800 people.

In 2021, Mauritius imported an estimated $230 million in pharmaceutical products from around the world (figure 5.9). India remained the main supplier of pharmaceuticals with 58 percent of the market, followed by France (9 percent), Germany (6 percent), and the United States (4 percent). Mauritius does not manufacture pharmaceuticals, patent knowledge, or create companies, products, and services that would address the unmet needs of the Mauritian population and broader African continent. This imbalance between the import and export of sophisticated pharmaceutical products shows potential for growth but also illustrates the need to increase the competitiveness and capabilities of the local manufacturing sector.

FIGURE 5.9 MAURITIUS IMPORTS OF PHARMACEUTICAL PRODUCTS BY COUNTRY OF ORIGIN, 1996–2020



Source: https://oec.world/en/visualize/stacked/hs92/import/mus/all/630/1996.2021

There are opportunities to encourage more investment and growth of emerging biotechnology capabilities. Companies could export laboratory supplies and biotechnology equipment; set up preclinical and clinical trial laboratories; conduct R&D in nutraceuticals;[167] and engage legal policy experts for regulation, agreements, and resolution of trade-related barriers. In the short term, potential opportunities include expanding the role of Mauritian institutions in clinical trials and extrapolating Mauritius's assets and experience as a successful financial hub to being a regional or global medical headquarters for international biopharmaceutical companies or for the distribution of high-value services, including managing telemedicine and digitalized medical records.[168] According to the Economist Intelligence Unit, the digitalization of the health care sector will continue, but concerns over the protection of data will increase.

Recently, the Ministry of Health and Wellness and the United Nations Development Programme signed an e-health initiative to digitalize the Patient Administration System in all Mauritius public health institutions. This creates more opportunities for PPPs to upgrade health care information systems in the country, as many processes around management of patient information are still paper based and lack a centralized overview of medical history. Further, private information technology solutions aimed at improving patient information management can help improve the efficiency of public resources, translating into cost savings for public finances.

Mauritius's unique epidemiological profile with high prevalence of NCDs in a multiethnic population provides excellent clinical research opportunities through contract research organizations.[169] It can also help position the country as a reference center for R&D in NCDs, including clinical trials of polypills and other drugs for NCDs, as well as innovative treatments by bilingual staff trained in NCD management. An emerging cluster of private contract research organizations provides services to international cosmetics and pharmaceutical companies, which signals a niche market potential for Mauritius to scale up.

Other attributes that add to Mauritius's attractiveness is its reliable internet connectivity, dependable air connectivity, bilingual workforce, and broad market access. These attributes position Mauritius as a potential destination for regional or global headquarters for the administration of health care and offshore distribution of high-value biopharmaceutical items, like the way the Mauritian financial sector hub operates. Mauritius is also a member of the Common Market for Eastern and Southern Africa, the East African Common Market, and the Southern African Development Community, and it has bilateral agreements with important trading partners, including China and India.

Recommendations: Health care sector

Mauritius can fully realize the window of opportunity to become a regional medical hub and medical tourism destination by developing its infrastructure and capabilities. Private sector investments and intersectoral coordination are needed to upgrade health care services and facilities, increase R&D collaboration and the use of technologies, and improve specialized skills and services. Having such a network of world-class public and private health care centers and research laboratories can be a strong, enduring driver of economic growth.

Refine and develop strategic and regulatory frameworks

- **Refine the national health sector strategy.** The strategy needs to be better aligned with the country's aspiration of becoming a regional medical hub, while simultaneously developing the biotechnology and pharmaceutical industry. The strategy should have defined, attainable, and measurable outputs. Conduct a feasibility study to position Mauritius as a competitive regional health care hub.
- **Transform fragmented, sector-specific policies for medical tourism and biopharmaceutical development into a single law to reassure investors and end users of protection.**
- **Develop a regulatory framework to bolster medical tourism and biopharmaceuticals in accordance with international standards.** Introduce a one-stop e-platform to ease cumbersome administrative processes, such as for visa applications, work permits, or registration in the medical tourism and biopharmaceutical industries.

Invest in infrastructure and human capital

- **Strengthen the infrastructure needed for development of the medical hub.** This includes laboratory infrastructure, laboratory animal facilities for clinical trials, and laboratory equipment for high-end support services. Consolidate and construct new health centers for more specialized, high-end health services and medical tourism. Adopt digital and telehealth technologies to provide seamless access to medical records and telemedicine.
- **Enhance the capacity of the health care workforce.** Introduce uniform accreditation and licensing requirements for national and international staff. Standardization of minimum academic qualifications, training, and experience is needed for physicians, dentists, nurses, and others.
- **Bridge skill gaps in the health care workforce.** Reform actions should include matching required skills with skills development in tertiary education; introducing local postgraduate medical training in specialized health care; streamlining visa and work permit processing; evaluating the compensation package for health care professionals; and creating a medical education partnership with an established sponsor country.

Improve collaboration and R&D for innovation

- **Strengthen intersectoral coordination and collaboration among all stakeholders.** This can include increasing synergies among the ministries of finance, health care, industry and commerce, and tourism, and domestic and international private sector stakeholders. Create a local network of assets in biopharmaceutical expertise by designating centers of excellence. Improve sector-specific public-private dialogue to better align the medical tourism and biopharmaceutical industries.
- **Promote R&D for innovation and leverage modern technologies to improve health service delivery.** Efforts can include evidence-based research for setting priorities and allocating resources; targeted incentives for greater R&D investments by the private sector; and new technologies, such as telemedicine.

Boost private investments and opportunities for PPPs

- **Establish PPPs to help the country become a regional medical hub.** Efforts include defining the private sector's role, exploring synergies in treatment options, coordinating with private health care providers to contract out services, developing new health insurance products, and increasing the recognition of international health insurance plans.
- **Leverage Mauritius's competitive advantage as a gateway for health care investment in the broader African region, including for the manufacture of medical devices and biopharmaceuticals.** The country's advantages include a safe medical tourism destination, multinational health care players, and preferential trade agreements to boost health care sector investments. Conduct an in-depth international market and competition analysis to identify key drivers for attracting medical tourists, which can then be used for commercial promotion efforts.

APPENDIXES

APPENDIX A. MAURITIUS RESEARCH AND INNOVATION COUNCIL FUNDING FOR INNOVATION

The Mauritius Research and Innovation Council is the only stakeholder funding innovation and entrepreneurship in Mauritius.

TABLE A.1 MAURITIUS RESEARCH AND INNOVATION COUNCIL GRANT PROGRAMS, 2018–22

PROGRAMS	NUMBER OF APPLICATIONS	NUMBER OF APPROVED APPLICATIONS	NUMBER OF APPROVED AND FUNDED APPLICATIONS DURING THE FINANCIAL YEAR	TOTAL BUDGET COMMITTED	AVERAGE COMMITMENT PER PROJECT
Pole of Innovation (Center of Excellence)	16	4	4	$710,053.60	$177,513.40
National SME Incubator Scheme	246	236	143	$663,554.80	$4,640.20
Proof of Concept Scheme	77	14	14	$314,209.60	$22,443.50
Collaborative Research and Innovation Grant Scheme	15	7	6	$416,657.00	$69,442.80
Research and Innovation Bridges	16	3	3	$427,090.70	$142,363.60
Social Innovation and Research Grant Scheme	24	9	9	$105,031.90	$11,670.20
Special Call for Proposals	537	66	59	$1,091,167.10	$18,494.40
Public Sector Transformation Scheme	24	4	4	$103,856.40	$25,964.10
Rodrigues Research and Innovation Grant Scheme	0	6	6	$59,639.30	$9,939.90
Fighting Diabetes at the Workplace	4	4	4	$125,573.40	$31,393.30
TOTAL	**959**	**353**	**252**	**$4,016,833.80**	**$15,939.80**

Source: MRIC.
Note: SME = small and medium enterprise.

TABLE A.2 MAURITIUS RESEARCH AND INNOVATION COUNCIL BUDGET ALLOCATION AND FUNDING FOR RADICAL INNOVATION PROGRAMS

FINANCIAL YEAR (JUNE–JULY)	TOTAL MRIC CAPITAL BUDGET SPENT (BUDGET VOTE AND AMOUNT FROM PREVIOUS YEAR CARRIED FORWARD), MUR	MRIC BUDGET VOTE FROM GOVERNMENT, MUR	FUNDING COMMITTED FOR ONGOING AND NEW PROJECTS, MUR	FUNDS FOR IN-HOUSE PROJECTS, MUR	OTHER EXPENDITURE, MUR
2022/23 (forecast)	79,328,017	70,000,000	62,316,724	14,894,251	9,328,017
2021/22	96,468,183	50,000,000	60,877,384	35,590,799	-
2020/21	84,927,972	83,000,000	57,237,004	6,593,540	53,630,663
2019/20	59,333,916	100,000,000	32,095,898	20,786,316	13,548,010
TOTAL	**320,058,088**	**303,000,000**	**212,527,010**	**77,864,906**	**76,506,690**

Source: MRIC.
Note: The high number of applications in 2019/20 and 2020/21 is a result of special calls for proposals during COVID-19 and a dedicated promotion campaign. There are an additional six applications in the evaluation process. MRIC = Mauritius Research and Innovation Council; MUR = Mauritian rupee.

APPENDIX B. MAURITIUS ENERGY POLICY MILESTONES AND CURRENT STATUS

Regulatory and Policy Milestones in Mauritius's Electricity Sector

- Integrated Electricity Plan 2003–12
- Outline of Energy Policy 2007–25
- Mauritius Ile Durable Levy
- Long-Term Energy Strategy 2009–25
- Grid Code for Small Scale Distributed Generation 2010
- Feed-in Tariff Scheme 2010
- Energy Efficiency Act 2011
- Integrated Electricity Plan 2013–22
- Net-Metering Scheme and Grid Code for MSDG 2016
- Mauritius Renewable Energy Agency starts operations in 2016
- Utility Regulatory Authority starts operations in 2016
- Green Energy Scheme for small Cooperatives 2017
- Renewable Energy Roadmap 2030 launches in 2019
- 2020 amendments to Electricity Act 2005 and Central Electricity Board Act of 1963
- 2022 update to the Renewable Energy Roadmap 2030

TABLE B.1 INSTALLED CAPACITY OF POWER PLANTS IN MAURITIUS

POWER PLANTS	OPERATING FUEL	INSTALLED CAPACITY (MW)	EFFECTIVE CAPACITY (MW)
Saint Louis	HFO/Jet A1	110.00	102.70
Fort Victoria	HFO/Jet A1	109.60	103.00
Fort George	HFO/Jet A1	140.00	127.00
Nicolay	HFO/Jet A1	78.40	70.00
Alteo Ltd	Coal/Bagasse	36.70	27.00
Terragen Ltd	Coal Bagasse	71.20	62.00
OTEO (Saint-Aubin) Ltd	Coal	32.50	30.00
OTEO (La Baraque) Ltd	Coal/Bagasse	90.00	74.00
Champagne	Hydro	30.00	28.00
Ferney	Hydro	10.00	10.00
Tamarind Falls	Hydro	11.40	9.50
Magenta	Hydro	1.00	1.00
Le Val	Hydro	4.00	4.00
Cascade Cécile	Hydro	1.00	1.00
Réduit	Hydro	1.20	1.00
La Ferme	Hydro	1.20	1.20
La Nicolière F.C.	Hydro	0.35	0.35
Midlands	Hydro	0.35	0.35
Sotravic Ltée	Waste	3.45	3.00
Sarako and other IPP – PV	Solar PV	87.20	76.29
SSDG and MSDG	Solar PV	19.06	19.06
Eole Plaines des Roches Ltée	Wind	9.35	9.35

Source: CEB, *Annual Report 2020–2021: Boosting Our Renewable Energy Generation* (CEB, 2022).
Note: HFO = heavy fuel oil; MSDG = medium-scale distributed generation; MW = megawatts; PV = photovoltaic; SSDG = small-scale distributed generation.

TABLE B.2 CURRENT ENERGY STRATEGY ROADMAP FOR MAURITIUS

RENEWABLE ENERGY TECHNOLOGY	CAPACITY (MW) IN 2020	PLANNED CAPACITY (MW) IN 2030
Solar (Utility)	77	106
Solar (Rooftop)	19	233
Solar (Floating PV)	0	32
Onshore Wind	9.35	0
Offshore Wind	0	50
Marine Renewables	0	20
Energy from Waste	0	10
REHF Solar and Battery Storage	0a	100
REHF Biomass	0	100
REHF Small Scale	0	40
REHF Solar and Wind and Battery Storage	0	100
TOTAL	**105.35**	**800.35**

Source: Ministry of Energy and Public Utilities (MEPU) database 2022.
Note: MW = megawatts; PV = photovoltaic; REHF = renewable energy hybrid facility.
a. enders were awarded in September 2022 to two different bidders for 3x30 megawatts and 4x10 megawatts. Power purchase agreements are expected to be signed soon.

REFERENCES

AfDB (African Development Bank). 2022. *Mauritius Country Strategy Paper 2022–2027.* Abidjan, Côte d'Ivoire: African Development Bank Group.

Albioma. 2021. "Biomass conversions in La Reunion." Presentation, December 9. http://www.transportevents.com/Webinar/presentations/9Dec2021/Albioma_BenjaminCOUSIN.pdf

Balabanyan, A., Y. Semikolenova, A. Singh, and M. A. Lee. 2021. *Utility Performance and Behavior in Africa Today.* Washington, DC: World Bank.

Bertelsmann Stiftung. 2022. *Bertelsmann Transformation Index 2022 Country Report — Mauritius*. Gütersloh: Bertelsmann Stiftung.

Bjarnason, S., K. M. Cheng, J. Fielden, M. J. Lemaître, D. Levy, and N.V. Varghese. 2009. *A New Dynamic: Private Higher Education*. Paris: UNESCO.

Campos, F., L. Moraes, R. D. Coleman, A. Conconi, et al. 2019. *Profiting from Parity: Unlocking the Potential of Women's Business in Africa*. Washington, DC: World Bank Group.

Campus France. 2022. *Les grandes tendances de la mobilité étudiante en Afrique Subsaharienne*. Novembre. http://www.campusfrance.org

CEB (Central Electricity Board). 2021. "Closing of CEB Renewable Energy Schemes (MSDG, Smart City & Public Sector Entities Renewable Energy Schemes)." Communiqué, December 4.
2022. "Revised Tariffs for Energy Exported Under CEB's MSDG - Smart City/Public Sector Entities Schemes." Communiqué. December 8.

CEB Facilities, CEB Fibernet, and CEB Green Energy. CEB Energy no longer exists. https://mauritiushindinews.com/defimedia/cebs-precarious-financial-situation-could-the-crash-have-been-avoided/

Court, D., M. Crawford, P. Darvas, F. Golladay, L. Holm-Nielsen, R. Hopper, A. Markov, R. M. Van Meel, B. Millot, P. R. Moock, H. Mukherjee, W. Saint, J. Salmi, S. Shrivastava, and F. Steier. 2002. *Constructing Knowledge Societies: New Challenges for Tertiary Education*. Directions in Development. Washington DC: World Bank Group.

Demirgüç-Kunt, A., L. Klapper, D. Singer, and S. Ansar. 2022. *The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*. Washington, DC: World Bank.

EasyUni, Malaysia's website about universities, http://www.easyuni.my

EIU (Economist Intelligence Unit). 2023. "January Arrivals in Mauritius Point to Recovery in Tourism." February 27.

Financial Services Commission, Mauritius. 2018. *Innovating and Transforming the Mauritius IFC of 2030: A Blueprint for Success*. Highlights.

GCR (Global Competition Review). 2019. "Mauritius: Competition Commission." Deshmuk Kowlessur, Executive Director, July 12. See https://globalcompetitionreview.com/review/the-european-middle-east-and-african-antitrust-review/2020/article/mauritius-competition-commission

GII (Global Innovation Index). *2021 GII 2021 Results*.

HEC (Higher Education Commission). 2022. Participation in Tertiary Education 2021. Pakistan.

IEA (International Energy Agency) and OECD (Organization for Economic Cooperation and Development). 2020. *Projected Costs of Generating Electricity*. Paris: OECD Publishing.

ILO (International Labour Organisation). 2018. *Skills for Green Jobs in Mauritius*. Geneva: ILO Publications.

IMF (International Monetary Fund). 2021. Article IV Consultation Report.
2022a. Article IV Consultation. Selected Economic and Financial Indicators, 2018–27.
2022b. Mauritius Staff Report for the 2022 Article IV Consultation. Country Report No. 22/223.

Jeetoo, J., and V. C. Jaunky. 2021. "Willingness to Pay to Improve Quality of Public Healthcare Services in Mauritius." *Healthcare (Basel)* 10 (1): 43.

Katz, J., and Chernyakhovskiy, I. 2016. "Grid Integration Studies: Advancing Clean Energy Planning and Deployment." *Greening the Grid*. July. National Renewable Energy Laboratory.

Knight, J. 2014. *International Education Hubs: Student, Talent, Knowledge-Innovation Models*. Dordrecht, Netherlands: Springer Publishers.

Knight, J., and J. Lee. 2014. "An Analytical Framework for Education Hubs: Student, Talent and Knowledge/Innovation." *In International Education Hubs: Student, Talent, Knowledge-Innovation Models,* edited by J. Knight. Dordrecht, Netherlands: Springer Publishers.

Lari, A, and WAN Consulting. 2017. "Removal of Barriers to Solar PV Power Generation in Mauritius, Rodrigues and the Outer Islands." *Terminal Evaluation Report of the UNDP-GEF Project*. GEF Project ID 4099.

Louis, L. 2022. "Reunion Island plans to go green." Deutsche Welle online, January 10. https://www.dw.com/en/reunion-island-plans-to-go-green/a-60359013.

Manyukwe, C. 2008. "Zambia: Third Public University opens." University World News, Africa Edition. September 14. http://www.universityworldnews.com/post.php?story=20080911163812433

MARENA (Maritius Renewable Energy Agency). 2018. *Renewable Energy Strategic Plan 2018–23*.

Maxwell Stamp PLC. 2016. *Energy Efficiency / Demand Side Management Master Plan and Action Plan*. Technical Support to the Ministry of Energy and Public Utilities. May 6.

Ministry of Education, Tertiary Education, Science and Technology and the Higher Education Commission. 2022. "Higher Education Report: [Mauritius]." UNESCO National Commission Country Report. UNESCO World Higher Education Conference, Phoenix, Mauritius, March 15.

Ministry of Social Security, National Solidarity, and Environment and Sustainable Development (Environment and Sustainable Development Division). 2016. "Greening the Economy Country Implementation Plan." Switch Africa Green.

Musango L., A. Nundoochan, P. Van Wilder, and J. M. Kirigia. 2021. "Monetary value of disability-adjusted life years lost from all causes in Mauritius in 2019." [version 1; peer review: peer review discontinued]. *F1000Research* 10: 63.

OECD (Organisation for Economic Co-operation and Development) and World Bank. 2012. *Reviews of National Policies for Education: Tertiary Education in Colombia*. OECD Publishing.

PAGE (Partnership for Action on Green Economy). 2015. *Green Economy Assessment Mauritius*. United Nations Environment Programme.
2021. P*AGE Mauritius Sustainability Plan: Country Programme Narrative*. February 5.

Republic of Mauritius. 2013. *Maurice Ile Durable Policy, Strategy and Action Plan*. Final Report. Ministry of Environment and Sustainable Development.
2017. *10-Year Master Plan for the SME Sector in Mauritius*. Ministry of Business, Enterprise and Cooperatives.
2020. *Government Programme 2020–24: Towards an Inclusive, Green and High Income Mauritius Forging Ahead Together.* January 24.

Shea, R. P., and Y. K. Ramgolam. 2019. "Applied levelized cost of electricity for energy technologies in a small island developing state: A case study in Mauritius." *Renewable Energy* 132 (3): 1415–24.

Sidhu, R., K. C. Ho, and B. Yeoh. 2011. "Emerging Education Hubs: The Case of Singapore." *Higher Education* 61 (1): 23–40.

Statistics Mauritius (database), http://statsmauritius.govmu.org/

Stiglitz, J. 2011. "The Mauritius Miracle." Project Syndicate, March 7. https://www.project-syndicate.org/commentary/the-mauritius-miracle-2011-03

Thomas, S. M. 2022. "Strategy for development of the pharmaceutical and biotechnology sectors in Mauritius." *Business magazine*, December 16. https://www.business-magazine.mu/rencontre/interview/strategy-for-development-of-the-pharmaceutical-and-biotechnology-sectors-in-mauritius/

UNDP (United Nations Development Programme). 2015. *Mid-Term Review: UNDP Mauritius Country Programme 2013-2016*. Final Report. J. P. Christensen and L. Muneesamy. October 16.
2021. *The Socio-Economic Impact Assessment of COVID-19 in Mauritius*. New York: UNDP.

UNESCO (United Nations Educational, Scientific and Cultural Organization). Global Convention on the Recognition of Qualifications concerning Higher Education, http://www.unesco.org/en/higher-education/global-convention

Unicity Masterplan, http://www.medineproperty.com/master-planning-communities/

WDI (World Development Indicators) (database), World Bank, Washington, DC, http://databank.worldbank.org/source/world-development-indicators

Webometrics (database), Ranking of Universities, Sub-Saharan Africa, http://www.webometrics.info/en/Sub-Saharan

WHO (World Health Organization). 2021. *The State of the Health Workforce in the WHO Africa Region*. Survey Report. Brazzaville, Congo: WHO Regional Office for Africa.

World Bank Group. 2007. *Malaysia and the Knowledge Economy: Building a World Class Higher Education System*. Washington, DC: World Bank Group.
2017. *South West Indian Ocean Risk Assessment and Financing Initiative (SWIO-RAFI) Summary Report*. Washington, DC: World Bank Group.

World Bank. 2020a. "Building Centers of Excellence in Africa to Address Regional Development Challenges." Results Brief. October 14. http://www.worldbank.org/en/results/2020/10/14/building-centers-of-excellence-in-africa-to-address-regional-development-challenges
2020b. "Innovation and Technology Adaptation." Mauritius. *Country Economic Memorandum*. Washington, DC: World Bank Group.
2021a. *Mauritius Productivity Study and Report 2020/2021*. June 8. Washington, DC: World Bank Group.
2021b. "Mauritius - Through the Eye of a Perfect Storm: Coming Back Stronger from the Covid Crisis." *Country Economic Memorandum*. Washington, DC: World Bank Group.

World Economics (database), https://www.worldeconomics.com/Informal-Economy/Mauritius.aspx

WTTC (World Travel & Tourism Council). 2022. *2022 Annual Research: Key Highlights*. London: WTTC.

NOTES

1 World Bank, WDI (World Development Indicators).

2 Bank of Mauritius.

3 World Bank, WDI (World Development Indicators).

4 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

5 Ministry of Finance, Economic Planning and Development, Ministry of Industrial Development, SMEs and Cooperatives, Economic Development Board. Handbook on Schemes & Incentives for MSMEs & Entrepreneurs. September 2020.

6 UNCTAD (United Nations Conference on Trade and Development), *Industrial Policy and Strategic Plan for Mauritius 2020–2025* (UNCTAD, 2020).

7 Innovation in this context means any new idea that, when implemented, can help address an existing challenge or spur the development of a new product or service. These are new ideas that are developed to have a tangible economic and/or social impact.

8 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

9 MCCI (Mauritius Chamber of Commerce and Industry), *Government Programme 2020–2024: Towards an Inclusive, High Income and Green Mauritius – Forging Ahead Together* (Port Louis, Mauritius: MCCI, 2020).

10 J. Stiglitz, "The Mauritius Miracle," *Project Syndicate*, March 7, 2011, https://www.project-syndicate.org/commentary/the-mauritius-miracle-2011-03.

11 World Bank, *Mauritius Systematic Country Diagnostic* (Report No. 92703-MU, Washington, DC: World Bank, 2015).

12 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

13 IMF (International Monetary Fund), "Mauritius: Staff Report for the 2022 Article IV Consultation, and Press Release," (Country Report No. 22/223, IMF, Washington, DC, 2022).

14 EIU (Economist Intelligence Unit), "January Arrivals in Mauritius Point to Recovery in Tourism," February 27, 2023.

15 IMF (International Monetary Fund), "Article IV Consultation: Selected Economic and Financial Indicators, 2018–27" (IMF, Washington, DC, 2022).

16 IMF (International Monetary Fund), *Article IV Consultation Report* (Washington, DC: IMF, 2021).

17 UNDP (United Nations Development Programme), *The Socio-Economic Impact Assessment of COVID-19 in Mauritius* (New York, NY: UNDP, 2021).

18 F. Campos, L. Moraes, R. D. Coleman, A. Conconi, et al., *Profiting from Parity: Unlocking the Potential of Women's Business in Africa* (Washington, DC: World Bank Group, 2019).

19 World Bank, *Country Economic Memorandum* (Washington, DC: World Bank, 2022).

20 Statistics Mauritius has forecast at 10% increase in investment (Gross Fixed Capital Formation) to GDP ratio for 2023.

21 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm* (Washington, DC: World Bank, 2021).

22 World Bank, *Mauritius Country Economic Memorandum: Managing Change in a Changing World* (Washington, DC: World Bank Group, 2007).

23 Statistics Mauritius (database), "Gross Fixed Capital Formation," http://statsmauritius.govmu.org/.

24 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm*.

25 World Bank, WDI (World Development Indicators).

26 Bank of Mauritius.

27 Bank of Mauritius, "Integrated Resort Scheme/Real Estate Scheme/Invest Hotel Scheme/Property Development."

28 World Bank Group staff estimations based on data from the Bank of Mauritius.

29 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm*.

30 World Bank, "Reimbursable Advisory Services on the Manufacturing Sector in Mauritius," 2020.

31 Growth Lab, The Atlas of Economic Complexity (research and data visualization tool), Harvard University.

32 Research from the Growth Lab at Harvard University finds that countries whose exports are more complex than expected for their income level grow faster. Growth can therefore be driven by diversifying know-how to produce a broader and increasingly complex set of goods and services.

33 World Bank, WDI (World Development Indicators), Foreign Direct Investment, net inflows.

34 Growth Lab, The Atlas of Economic Complexity.

35 AfDB (African Development Bank), *Mauritius Country Strategy Paper 2022–2027* (Abidjan, Côte d'Ivoire: African Development Bank Group, 2022).

36 Twenty-eight percent of the population is connected to the wastewater network. The government, through the Wastewater Management Authority, aims to connect 50 percent of the population to the public sewer by the year 2030. The remaining population has access to adequate sanitation through an onsite disposal system (improved pit and septic tanks). See UN OHCHR (United Nations Office of the High Commissioner for Human Rights), "Special Rapporteur on the Human Rights to Safe Drinking Water and Sanitation," December 21, 2021.

37 AfDB (African Development Bank), *Mauritius Country Strategy Paper 2022–2027*.

38 The latest available figures date back to 2016.

39 World Bank, WDI (World Development Indicators).

40 Statistics Mauritius (database), Economic and Social Indicators ICT Statistics – 2020, 2021, http://statsmauritius.govmu.org/.

41 M. Aleksandrova, S. Balask, M. Kaltenborn, D. Malerba, P. Mucke, O. Neuschäfer, K. Radtke, R. Prütz, C. Strupat, D. Weller, and N. Wiebe, *WorldRiskReport 2021* (Bündnis Entwicklung Hilft and Ruhr University Bochum, Institute for International Law of Peace and Armed Conflict, 2021).

42 UNEP (United Nations Environment Programme), "Reducing Climate Change and Disaster Risk in Mauritius," December 17, 2019, https://www.unep.org/news-and-stories/story/reducing-climate-change-and-disaster-risk-mauritius.

43 World Bank Group, *South West Indian Ocean Risk Assessment and Financing Initiative (SWIO-RAFI) Summary Report* (Washington, DC: World Bank Group, 2017).

44 Government of Mauritius, "Maurice Ile Durable: Policy, Strategy and Action Plan, Final Report," Ministry of Environment and Sustainable Development, 2013.

45 J. P. Christensen and L. Muneesamy, *Mid-Term Review: UNDP Mauritius Country Programme 2013–2016*, Final Report (New York, NY: United Nations Development Programme, October 16, 2015).

46 PAGE (Partnership for Action on Green Economy), "PAGE Mauritius Sustainability Plan: Country Programme Narrative," February 5, 2021.

47 MCCI (Mauritius Chamber of Commerce and Industry), *Government Programme 2020–2024: Towards an Inclusive, High Income and Green and Mauritius – Forging Ahead Together* (Port Louis, Mauritius: MCCI, January 24, 2020); World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm.*

48 World Bank, *Mauritius Productivity Study and Report 2020/2021* (Washington, DC: World Bank Group, June 8, 2021).

49 PACE Green SMEs; Government of Mauritius, *10-Year Master Plan for the SME Sector in Mauritius* (Port Louis: Ministry of Business, Enterprise and Cooperatives, 2017).

50 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

51 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

52 Export-oriented enterprises are enterprises formerly operating with an export certificate and export manufacturing enterprises holding a registration certificate issued by the ex-Board of Investment, an agency accountable for investment promotion until 2018.

53 World Bank, *Enterprise Surveys, Mauritius* (Washington, DC: World Bank, 2020).

54 World Bank, *Mauritius Productivity Study and Report 2020/2021*.

55 Statistics Mauritius (database), http://statsmauritius.govmu.org/; Mauritius International Financial Centre, "Economy: A Promising Financial Services Sector," https://mauritiusifc.mu/our-ecosystem/economy-a-promising-financial-services-sector#:~:text=overpercent209percent2C900percent20professionals.

56 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm* (Washington, DC: World Bank Group, 2021).

57 In February 2020, the European Union's FATF identified Mauritius as a high-risk country with strategic deficiencies in its AML/CFT regime, which led the country to be placed on the European Union blacklist in May 2020 and soon after on the United Kingdom list of high-risk third countries. In recognition of the government's efforts to implement the FATF recommendations, Mauritius was removed from the FATF "grey" list in October 2021 and subsequently by the United Kingdom in November 2021 and the European Union in February 2022.

58A. Demirgüç-Kunt, L. Klapper, D. Singer, and S. Ansar, *The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19* (Washington, DC: World Bank, 2022).

59 Government of Mauritius, The Finance (Miscellaneous Provisions) Act 2021, *Government Gazette of Mauritius* No. 121, August 5, 2021; AfDB (African Development Bank), *Mauritius Country Strategy Paper 2022–2027* (Abidjan, Côte d'Ivoire: African Development Bank Group, 2022).

60 Bank of Mauritius, *Annual Report for the Year Ending June 30, 2022*.

61 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

62 AfDB (African Development Bank), Mauritius Country Strategy Paper 2022–2027.

63 WTTC (World Travel & Tourism Council), *2022 Annual Research: Key Highlights*. (London: WTTC, 2022).

64 Findings presented here come from a World Bank assessment of the tourism sector, which is part of a report being prepared for the Government of Mauritius to help design a new strategy for the sustainable development of the sector.

65 Mauritius National Health Accounts 2020, latest data available.

66 Statistics Mauritius, Mauritius in Figures, 2021.

67 Deshmuk Kowlessur, "Mauritius: Competition Commission," GCR, July 12, 2019, https://globalcompetitionreview.com/review/the-european-middle-east-and-african-antitrust-review/2020/article/mauritius-competition-commission.

68 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm*.

69 Bertelsmann Stiftung, *Bertelsmann Transformation Index 2022 Country Report — Mauritius* (Gütersloh: Bertelsmann Stiftung, 2022).

70 World Bank, *Mauritius Productivity Study and Report 2020/2021* (Washington, DC: World Bank Group, June 8, 2021).

71 La Sentinelle, "The Top 100 Companies, 2020 Edition"; Government of Mauritius, "Statistics in Mauritius, Gender Approach 2020."

72 World Economics, "Mauritius's Informal Economy Size as a Percentage of GDP," https://www.worldeconomics.com/Informal-Economy/Mauritius.aspx.

73 CPSD consultations held in March 2022.

74 Only 47 percent of education and training institutions consult industry experts when a new program or course is offered, 43 percent of curricula are based on private sector standards, and 50 percent of curricula are delivered by industry experts (World Bank, 2021).

75 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm* (Washington, DC: World Bank Group, 2021).

76 World Bank, *Mauritius Productivity Study and Report 2020/2021* (Washington, DC: World Bank Group, June 8, 2021).

77 World Bank, *Mauritius Productivity Study and Report 2020/2021*.

78 Digital connectivity is not an issue in Mauritius. The country has become a competitive ICT destination, steadily positioning itself as a regional ICT hub.

79 Defined as turning existing processes or systems into a service or adding a service to an existing process or system.

80 Deshmuk Kowlessur, "Mauritius: Competition Commission," GCR, July 12, 2019, https://globalcompetitionreview.com/review/the-european-middle-east-and-african-antitrust-review/2020/article/mauritius-competition-commission.

81 World Bank, Enterprise Surveys 2020; World Bank, *Mauritius Productivity Study and Report 2020/2021*.

82 Financial Services Commission, "Innovating and Transforming the Mauritius IFC of 2030: A Blueprint for Success (Highlights)," September 28, 2018.

83 This report considers innovation to be any new idea that, when implemented, can help to address an existing challenge or spur the development of a new product or service. That is, new ideas that are developed to have a tangible economic and/or social impact.

84 World Bank, Mauritius Country Economic Memorandum: Innovation and Technology Adaptation (Washington, DC: World Bank Group, 2020).

85 World Bank, "Mauritius Public Expenditure Review – From Resilience to Performance: Modernizing Fiscal Policies to Boost Mauritius's Growth Post-pandemic," World Bank, Washington, DC, forthcoming).

86 Business modernization was promoted through the Leasing Equipment Modernization Schemes, Business Loan Schemes, and Internal Capability Development Programs, among others.

87 This statement strictly refers to STEM subjects.

88 SCImago Database.

89 The other 14 percent were enrolled at overseas tertiary education providers. Overseas refers to self-study with an awarding body overseas (through distance education and open learning) or pursuing studies overseas. Higher Education Commission.

90 WDI (World Development Indicators) (database), http://databank.workbank.org/world-development-indicators.

91 The scheme grants free tuition to Mauritians attending undergraduate programs at public HEIs in the country.

92 UNESCO (United Nations Educational, Scientific and Cultural Organization), *National Commission Country Report, Higher Education* (UNESCO, 2022).

93 Government of Mauritius, Ministry of Education, Tertiary Education, Science and Technology, database, , 2022.

94 International students account for 70 percent of enrollment at Medical College, 100 percent at Anna Medical College, and 97 percent at African Leadership University. Although Middlesex University enrolls a large number of international students (455), it still attracts most of its students from Mauritius (63 percent).

95 This chapter uses the terms higher education and tertiary education interchangeably, following the country's use.

96 Qatar and United Arab Emirates implemented education hubs to decrease their dependence on extractive industries and develop knowledge-based economies through investment in education, research, and innovation.

97 J. Knight and J. Lee, "An Analytical Framework for Education Hubs: Student, Talent and Knowledge/Innovation," in *International Education Hubs: Student, Talent, Knowledge-Innovation Models*, ed. J. Knight (Dordrecht, Netherlands: Springer Publishers, 2014).

98 Smart Cities are defined as "large-scale mixed-use developments in cosmopolitan conurbations with smart technology and pioneering innovation at their core." See the Economic Development Board website at *http://www.edbmauritius.org/schemes*.

99 See the Uniciti Masterplan, http://www.medineproperty.com/master-planning-communities/.

100 WDI, 2018 data for percentage of GDP spent on HE for Mauritius.

101 The H-index measures quality and impact of publications and is defined as the maximum value of H such that the given author/journal has published at least H papers that have each been cited at least H times.

102 See the UNESCO website at http://www.unesco.org/en/higher-education/global-convention.

103 The African Centers of Excellence is a regional program funded by the World Bank in Africa's higher education sector to promote collaborative research. Since its initiation in 2014, the program has supported over 80 centers in more than 50 universities across 20 countries (none of the centers are based in Mauritius); World Bank, "Building Centers of Excellence in Africa to Address Regional Development Challenges" (Results Brief, World Bank, Washington, DC, October 14, 2020), http://www.worldbank.org/en/results/2020/10/14/building-centers-of-excellence-in-africa-to-address-regional-development-challenges.

104 Campus France, *Les grandes tendances de la mobilité étudiante en Afrique Subsaharienne*, November 2022, http ://www.campusfrance.org.

105 Campus France, *Les grandes tendances de la mobilité étudiante en Afrique Subsaharienne*.

106 OECD (Organisation for Economic Co-operation and Development) and World Bank, *Reviews of National Policies for Education: Tertiary Education in Colombia* (Washington, DC: OECD Publishing, 2012).

107 WDI (World Development Indicators) (database), http://databank.workbank.org/world-development-indicators., Access to electricity (percent of population), 2020.

108 WDI (World Development Indicators) (database), http://databank.workbank.org/world-development-indicators, Electric power transmission and distribution losses (percent of output), 2014.

109 Afrobarometer, Round 6 Survey, 2014–15.

110 A. Balabanyan, Y. Semikolenova, A. Singh, and M. A. Lee, Utility Performance and Behavior in Africa Today (Washington, DC: World Bank, 2021).

111 CEB Facilities (ongoing concern), CEB Fibernet, and CEB Green Energy, https://mauritiushindinews.com/defimedia/cebs-precarious-financial-situation-could-the-crash-have-been-avoided/.

112 CEIC data, 2022.

113 R. P. Shea and Y. K. Ramgolam, "Applied Levelized Cost of Electricity for Energy Technologies in a Small Island Developing State: A Case Study in Mauritius," Renewable Energy 132 (3): 1415–24, March 2019.

114 MARENA (Mauritius Renewable Energy Agency), *Renewable Energy Roadmap 2030* (MARENA, 2022).

115 MARENA, *Renewable Energy Roadmap 2030*.

116 Biomass is considered climate-neutral, as it absorbs the same amount of carbon dioxide during its growth that it emits in the burning process.

117 Statistics Mauritius (database), http://statsmauritius.govmu.org/.

118 MARENA (Mauritius Renewable Energy Agency), Renewable Energy Strategic Plan 2018–23 (MARENA, 2018).

119 Recent price increases on residential and commercial customers affect only high consumers, who make up 15 percent of residential households and 27 percent of commercial customers. See GlobalPetrolPrices.com, electricity prices for households, September 2022 (US dollar per kilowatt hour).

120 A provisional agreement to continue operations pending the results of arbitration has allowed Terragen to continue to provide electricity to CEB.

121 Médine was the only power plant that used bagasse exclusively. In 2020, the power plant was shut down.

122 Southern African-German Chamber of Commerce and Industry and Mittlestand Global Exportiniative Energie, *Mauritius Erneuerbare Energien für die öffentliche Stromversorgung Zielmarktanalyse 2021 mit Profilen der Marktakteure*. A conservative estimate of 5 percent interest in self-sufficiency was used, resulting in a potential average system capacity of 500 kilowatts.

123 100 megawatts from renewable energy hybrid facilities (REHFs) and 40 megawatts from small-scale REHFs.

124 CEB (Central Electricity Board), "Request for Proposal for the Purchase of Electrical Energy from REHF (Solar PV plus Battery Storage)," (OAB Ref. No.: OAB-RESP-22-0811, CEB, March 2022). This includes a large-scale tender for an aggregate of 100 megawatts with projects between 10–40 megawatts, alternating current, and a small-scale tender for an aggregate of 40 megawatts with projects up to 10 megawatts alternating current.

125 The number of hours of sunshine is stable throughout the year at about 7.6 hours per day. On about 75 percent of the country's surface, including the smaller islands, the potential annual generation per kilowatt peak of installed PV is between 1,600 and 1,800 kilowatt-hours. Eighty percent of the country has a wind power density at a height of 100 meters from 420 to 560 watts per square meter. IRENA (International Renewable Energy Agency), "Energy Profile Mauritius, 2021," https://www.irena.org/IRENADocuments/Statistical_Profiles/Africa/Mauritius_Africa_RE_SP.pdf.

126 Solar farms will face limitations because of the limited available land for this purpose in Mauritius.

127 See CEB energy schemes at https://ceb.mu/projects/energy-schemes.

128 CEB (Central Electricity Board), "Closing of CEB Renewable Energy Schemes (MSDG, Smart City, and Public Sector Entities Renewable Energy Schemes)," Communique, December 4, 2021.

129 A feed-in tariff is designed to accelerate investment in renewable energy technologies by offering long-term contracts to renewable energy producers, to include price certainty and guaranteed grid access.

130 A. Lari and WAN Consulting, "Removal of Barriers to Solar PV Power Generation in Mauritius, Rodrigues and the Outer Islands," (GEF Project ID 4099, UNDP and GEF, 2017).

131 In 2022, a total of 19.5 gigawatt-hours of electricity was being produced under SSDG–FiT, SSDG Net Metering, and MSDG–Net Metering programs, and projects that have a generation capacity of 33.5 gigawatt-hours are currently under implementation. However, the total amount of power generation forecast to meet the Renewable Energy Roadmap 2030 goals is 346.5 gigawatt-hours.

132 Statistics Mauritius (database), http://statsmauritius.govmu.org/, 2022.

133 Acknowledging the limitations of VRE integration, CEB is investing in technologies to support the integration of VRE, such as battery energy storage systems, automatic generation control, a wide area monitoring system, and an advanced distribution system.

134 Highlights of Cabinet meeting, May 26, 2023.

135 Economic Development Board Newsletter, Budget 2023–24.

136 WBA (World Bioenergy Association), "Biomass Supply Chains" (fact sheet, WBA, Stockholm, 2018), https://www.worldbioenergy.org/uploads/Factsheet%20-%20Biomass%20Supply%20Chains.pdf.

137 L. Louis, "Reunion Island Plans to Go Green," Deutsche Welle, January 10, 2022, https://www.dw.com/en/reunion-island-plans-to-go-green/a-60359013; Albioma, "Biomass Conversions in La Reunion," presentation, December 9, 2021, http://www.transportevents.com/Webinar/presentations/9Dec2021/Albioma_BenjaminCOUSIN.pdf.

138 The figure of 10 percent energy savings is based on the list of energy efficiency projects/initiatives at the time of preparation of the Nationally Defined Contributions 2021 report for Mauritius.

139 United Nations Environment Programme. Mauritius National Energy Programme - Programme National d'Efficacité Energétique (PNEE) (2012); PAGE (Partnership for Action on Green Economy), Green Economy Assessment Mauritius (United Nations Environment Programme, 2015).

140 Large consumers are public sector customers consuming more than 15 tonnes of oil (equivalent to 174,418 kilowatts per hour) and private sector customers consuming more than 100 tonnes of oil (equivalent to 116,000 kilowatts per hour).

141 PAGE, *Green Economy Assessment Mauritius.*

142 The standard for ecolabeling textile products, MS 188:2016, was implemented in 2016 by the Mauritius Standards Bureau. The criteria are reduction of the use of environmentally harmful substances, reduction of water and air pollution, reduction of energy consumption and greenhouse-gas emissions, minimization of waste generation, and use of environmentally friendly procedures.

143 PAGE, *Green Economy Assessment Mauritius*.

144 Republic of Mauritius, Seventh National Assembly Parliamentary Debates (Hansard), June 13, 2022.

145 CEB (Central Electricity Board), "Revised Tariffs for Energy Exported Under CEB's MSDG - Smart City/Public Sector Entities Schemes," Communiqué, December 8, 2022.

146 Maxwell Stamp PLC, "Energy Efficiency/Demand Side Management Master Plan and Action Plan," Technical Support to the Ministry of Energy and Public Utilities, May 6, 2016.

147 Southern African-German Chamber of Commerce and Industry and Mittlestand Global Exportiniative Energie, *Mauritius Erneuerbare Energien für die öffentliche Stromversorgung Zielmarktanalyse 2021 mit Profilen der Marktakteure*. A conservative estimate of 5 percent interest in self-sufficiency was used, resulting in a potential average system capacity of 500 kilowatts.

148 Ministry of Social Security, National Solidarity, and Environment and Sustainable Development, "Greening the Economy Country Implementation Plan," Switch Africa Green, 2016.

149 ILO (International Labour Organisation), Skills for Green Jobs in Mauritius (Geneva: ILO Publications, 2018).

150 J. Katz and I. Chernyakhovskiy, "Grid Integration Studies: Advancing Clean Energy Planning and Deployment, Greening the Grid," National Renewable Energy Laboratory, July 2016.

151 IEA (International Energy Agency) and OECD (Organisation for Economic Co-operation and Development), *Projected Costs of Generating Electricity* (Paris: OECD Publishing, 2020).

152 World Bank, *Mauritius Country Economic Memorandum: Through the Eye of a Perfect Storm* (Washington, DC: World Bank Group, 2021).

153 WHO (World Health Organization), *The State of the Health Workforce in the WHO Africa Region* (Brazzaville, Congo: WHO Regional Office for Africa, 2021).

154 One disability-adjusted life year (DALY) represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost due to premature mortality and the years lived with a disability due to prevalent cases of a disease or health condition in a population.

155 L. Musango, A. Nundoochan, P. Van Wilder, and J. M. Kirigia, "Monetary Value of Disability-Adjusted Life Years Lost from All Causes in Mauritius in 2019" (version 1; peer review: peer review discontinued), *F1000Research* 10 (2021): 63.

156 Mauritius Ministry of Health and Quality of Life, National Health Accounts, 2020.

157 Rate of Exchange 2019: 1 USD = MUR 36.02.

158 J. Jeetoo and V. C. Jaunky, "Willingness to Pay to Improve Quality of Public Healthcare Services in Mauritius," Healthcare (Basel) 10, no. 1 (2021): 43.

159 SDG Target 3.8 is "achieve universal health coverage."

160 Basic undergraduate physicians are produced locally and overseas. Undergraduate medical degrees are offered by the University of Mauritius, which also awards the degree for the private SSR Medical College; the University of Technology is the awarding body for the private Anna Medical College. There are limited postgraduate medical degrees. Undergraduate training of nurses is done by the School of Nursing at Victoria and SSRN Hospitals. The University of Mauritius also offers a two-year diploma in sanitary science for the public health inspectorate; the diploma in medical laboratory technology for laboratory personnel is offered by the University of Technology.

161 Source: Insurers Association of Mauritius - www.insurersassociation.mu

162 For example, the guiding principles of a medical hub are currently derived from several sources, including the EDB, Mauritius Tourism Authorities, and Ministry of Health and Wellness.

163 The Clinical Trials Act provides the legal framework for the registration of contract research organizations and the conduct of clinical trials for discovering or verifying the effects of investigational medicinal products and medical devices.

164 According to the Mauritius Board of Investment.

165 These incentives include tax holidays that exempt private health care institutions from income tax for a specified period; capital allowances that allow for deductions on qualifying capital assets; customs duty exemptions or reductions on medical equipment and supplies; and investment tax credits for significant investments in infrastructure, R&D, or training programs.

166 This initiative is spearheaded by the Ministry of Finance, Planning and Economic Development, with technical assistance by the European Union's Africa RISE (Reform for Investment and Sustainable Economies).

167 Nutraceuticals are also known as dietary supplements. These are extracts, concentrates, or combinations of vitamins, minerals, botanicals, herbs, or dietary substances for human use to supplement the diet by increasing total dietary intake.

168 S. M. Thomas, "Strategy for Development of the Pharmaceutical and Biotechnology Sectors in Mauritius," *Business*, December 16, 2022, https://www.business-magazine.mu/rencontre/interview/strategy-for-development-of-the-pharmaceutical-and-biotechnology-sectors-in-mauritius/.

169 A contract research organization is hired by another company or research center to take over certain parts of running a clinical trial. The organization may design, manage, and monitor the trial and analyze the results.

IFC
2121 Pennsylvania Avenue, N.W.
Washington, D.C. 20433 U.S.A.

CONTACTS

Cristian Quijada Torres
cquijadatorres@worldbank.org

Pilar Salgado Otonel
psalgadootonel@worldbank.org

Marcos Vaena
mvaena@ifc.org

Ram Akers
rakers@ifc.org

ifc.org

WORLD BANK GROUP
THE WORLD BANK IBRD • IDA | IFC International Finance Corporation