World Bank prioritizes Fossil Fuels and Energy Exports instead of Renewables and Energy Access in Mozambique

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The Africa Coalition for Sustainable Energy and Access (ACSEA) is a Pan-African alliance of various organizations drawn from the civil society, business, academia and research institutions promoting renewable energy, energy transformation and access in Africa.

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Executive Summary

The world is faced with an accelerating climate crisis and is already experiencing unprecedented extreme weather events. In 2019, for the first time in recorded history, Mozambique was hit by two strong cyclones, Idai and Kenneth, in the same season.[1] It was the worst natural disaster to hit southern Africa in over two decades, causing over 1.8 million people to need assistance.[2] People living in poverty are the most vulnerable to climate change impacts. The World Bank warns:

> **"Climate Change is an acute threat to global development and efforts to end poverty. Without urgent action, climate change impacts could push an additional 100 million people into poverty by 2030."**

The World Bank Group (WBG)[3] has pledged to assist countries to meet the goals of the United Nations (UN) Paris Climate Agreement (2015), which include limiting global average warming to well below 2°C; and making financial flows consistent with a pathway towards low greenhouse gas (GHG) development. The core of the climate crisis is the energy sector´s burning of fossil fuels, since it is the largest contributor to GHG emissions. A rapid transformation of the energy sector, from fossil fuels to renewable energy, is needed to combat climate change.

At the same time, the energy transformation must address the energy needs of the poor. Mozambique has one of the lowest rates of electrification in Africa at only 28 percent.[4] This leaves over 22.7 million people without access to electricity.[5]

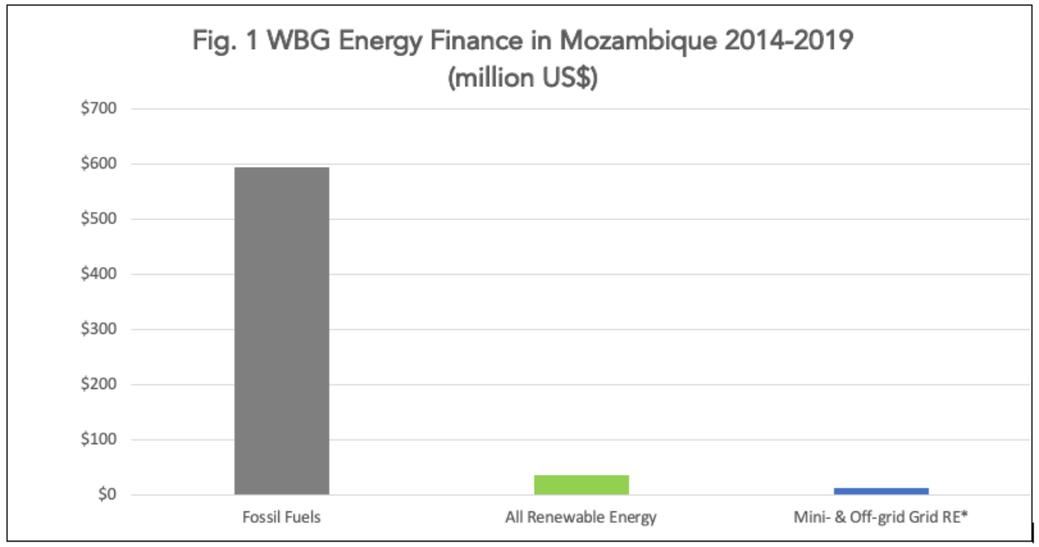
Both the UN and the WBG emphasize that access to energy is essential to reducing poverty. Correspondingly, the UN's Sustainable Development Goal 7 aims for universal access to affordable, reliable and sustainable energy by 2030. Likewise, in 2013 the WBG pledged that its energy practice would be centered on the achievement of the UN's universal energy access goals.[6]

Poverty reduction, energy access and climate goals are inextricably linked and require urgent and bold action. Given Mozambique's severe climate change risks and substantial electricity deficit, the following paper details an assessment of WBG assistance to Mozambique from 2014 to 2019 against achieving climate change goals and universal energy access by 2030.[7]

Main Findings

Overall, the WBG's energy sector assistance in Mozambique undermines the Paris Climate Agreement goals and falls considerably short in what is necessary to meet Mozambique's energy access goals. Main findings include:

WBG prioritizes fossil fuels over renewable energy: Mozambique has vast undeveloped renewable energy resources with 7.5 GW identified as priority projects and renewable technologies are already available and cost competitive with fossil fuels. However, as shown in Figure 1, instead of prioritizing finance for renewable energy, the WBG's finance is 16 times greater for fossil fuels than for renewable energy. The WBG is not supporting any wind and only a small amount of solar – $23 million for a 40 MW grid-connected solar plant and only $13 million for off-grid solar. Furthermore, World Bank technical assistance supported tax breaks for coal and gas to increase investments into these fossil fuel sectors.



Note: Does not include WBG finance through financial intermediaries.
*Mini- & Off-grid RE is included in All Renewable Energy

WBG facilitating high-GHG development path, non-alignment with Paris Agreement: Ninety-four percent of WBG support for power generation in Mozambique is for fossil fuels. In addition, the WBG has multiple policy reform and capacity building operations aimed at increasing investments in coal mining, coal exports, gas production and LNG exports. Mozambique is on a path to becoming Africa's largest LNG exporter and one of the world's largest coal exporters. This high GHG-development path was enabled by WBG public finance. As a result, the WBG is not in alignment with the Paris Climate Agreement's goal of making financial flows consistent with a pathway towards low-GHG development.

Electrification rate is significantly inadequate to reach universal access goal: The WBG's Energy for All project in Mozambique ($82 million), in conjunction with bi-lateral donors ($66 million), expects to reach 272,000 household connections by 2023. This is 928,000 short of Mozambique's National Electrification Strategy (NES) target of 1.2 million by 2023, which requires at least 300,000 new connections a year from 2020-2024. Mozambique is aid-dependent for its energy access expenditures. Thus, it is unclear how the 928,000 gap will be filled.

Inadequate Funding for Energy Access: Only 10% of WBG energy sector project finance in Mozambique ($82 million out of $850.4 million) is targeting new energy connections. Despite the WBG's 2013 pledge, it does not appear the WBG's energy practice in Mozambique is centered on achieving universal access by 2030. Mozambique's National Electrification Strategy calls for $6.6 billion or about $507 million per year on average (if spread over 2018 to 2030) to reach universal energy access by 2030.

Exports Prioritized Over Domestic Energy Access: Mozambique has a history of exporting its power generation (see Box 1 below), while 70 percent of its people still need access to electricity. The WBG continues this same pattern of energy development. The bulk of its energy sector funding, $420 million, is for the Temane Regional Power Transmission Project involving a gas power plant and high voltage transmission lines, which serve to evacuate the power for export and in-

dustry, including for energy-intensive liquefied natural gas (LNG) processing facilities. The WBG's energy sector policy reform and capacity building operations are also largely focused on coal and LNG exports.

WBG assistance to gas power plants and energy exports depresses availability of finance for energy access: The WBG's support of expensive independent power producers (IPP), gas-based power generation and to energy exports have exacerbated Mozambique's state-owned power utility's, Electricidade de Mocambique (EdM), financial difficulties. The WBG's own assessment found that EdM's availability of finance for energy access was constrained by increasing cost of new and more expensive thermal-based IPPs and non-payment from bi-lateral trade.

Recommendations

The WBG has committed to assist countries to meet the goals of the Paris Climate Agreement, and to center their energy practice on achieving universal access to energy by 2030. In order to help Mozambique reach these goals, the WBG should:

- **End all WBG public assistance for fossil fuels:** No WBG public assistance should be used to develop fossil fuels, which further exacerbate the climate crisis responsible for intensifying droughts, floods and cyclones in Mozambique. This includes assistance for associated facilities; financial intermediaries; policy-based finance (e.g., fossil fuels excluded from all forms of tax breaks and investment incentives); guarantees; general budget support (i.e., fossil fuels must be added to excluded expenditures); technical assistance and advisory services.
- **Scale up funding for renewable energy solutions, especially mini- and off-grid:** In Mozambique, the vast majority of people without access to energy live in rural communities, where mini- and off-grid renewable solutions are the most cost-effective and climate-safe options. As such, the WBG needs to exponentially scale up funding for mini- and off-grid renewable energy solutions. In addition, the WBG should assist the government of Mozambique to adopt a comprehensive regulatory framework for renewable energy, including mini- and off-grid solutions and a plan to integrate renewables and mini-grid operations into the main grid.
- **Reduce future fossil fuel reliance – Update Power Generation Plan:** The WBG should assist Mozambique to adopt an updated Power Generation Plan with no coal options, a substantial reduction in gas options, and a significant scale up in renewable energy that reflects the changes in the cost effectiveness and rapid technological advances of renewable energy sources. In addition, the WBG should assist Mozambique to prioritize domestic energy needs ahead of energy exports.
- **Provide more and sustained funding for new household connections:** Given the WBG's finance directed at new household connections represents only 10% of its overall energy sector finance in Mozambique, the WBG can and should direct more finance to connections. To reduce uncertainty in funding for Mozambique's National Electrification Strategy, the WBG should commit to long-term (e.g., 10-year), sustained funding for new household electricity connections. The 10-year WBG funding commitment needs to be reflected in an updated Country Partnership Framework for Mozambique. The WBG needs to transparently report direct WBG contributions to new household connections within the context of other sources of energy access funding. In addition, the WBG should continue to provide adequate grant-based finance to cover the initial installation costs for poor urban and rural households in Mozambique.
- **Perform a gap analysis on universal access by 2030:** Given that the electrification rate is inadequate, the WBG should assist the government to identify where gaps exist and how the gaps will be addressed in order for them to achieve annual electrification targets necessary to reach universal access by 2030.

Introduction

The world is faced with an accelerating climate crisis and is already experiencing unprecedented extreme weather events. In 2019, for the first time in recorded history, Mozambique was hit by two strong cyclones, Idai and Kenneth, in the same season.[8] It was the worst natural disaster to hit southern Africa in over two decades, causing over 1.8 million people to need assistance.[9]

Mozambique is the only country in Africa considered to be at 'high risk' from three major weather-related shocks – floods, drought and coastal cyclones. These major weather shocks are intensified by climate change. Furthermore, people living in poverty are the most vulnerable to climate change impacts. According to the World Bank's Country Partnership Framework for Mozambique (2017):

- Climate change and extreme weather-related shocks pose a significant risk to growth, poverty reduction, and shared prosperity. The country's economic gains continue to be significantly undermined because of recurrent climate-related disasters.
- It is estimated that climate change could cost Mozambique between US$2.3 billion and US$7.4 billion from 2003 to 2050.

The World Bank Group (WBG)[10] has pledged to assist countries to meet the goals of the United Nations (UN) Paris Climate Agreement (2015), which include limiting global average warming to well below 2°C; and making financial flows consistent with a pathway towards low greenhouse gas (GHG) development. The government of Mozambique is a signatory to the Paris Agreement.

The core of the climate crisis is the energy sector´s burning of fossil fuels, since it is the largest contributor to GHG emissions. It is important that the development of Mozambique´s energy sector does not aggravate the climate crisis further.

At the same time, Mozambique is in critical need of increasing access to energy. Mozambique has one of the lowest rates of electrification in Africa. As of November 2018, only around 28 percent of the population had access to electricity, up by only 3 percent since October 2016. This leaves over 22.7 million people without access to electricity in Mozambique.[11] In addition, there are vast disparities between urban and rural communities with 54% access in urban compared to only 6% in rural areas.[12] This is especially concerning given 70 percent of Mozambique's population lives in rural areas.[13]

Both the UN and the WBG emphasize that access to energy is essential to reducing poverty. Correspondingly, the UN's Sustainable Development Goal 7 aims for universal access to affordable, reliable and sustainable energy by 2030. Likewise, in 2013 the WBG pledged that its energy practice would be centered on the achievement of the UN's universal energy access goals.[14]

Unfortunately, Mozambique has a history of energy exports taking priority over domestic energy needs for its citizens. Nearly 70 percent of Mozambique's power generation is exported to South Africa and additional exports go to other regional countries (see Box 1). Meanwhile, over 22 million people remain without electricity in Mozambique.

It is essential for Mozambique to receive assistance to develop non-GHG emitting energy resources to reach universal energy access. Fortunately, Mozambique has vast undeveloped renewable energy resources. According to Mozambique's Renewable Energy Atlas (2014), Mozambique has a potential of 23,000 GW of solar power (2.7 GW identified as being "easily developed"), 19 GW of hydro, 5 GW of wind, and 0.1 GW of geothermal.[15] In fact, all domestic energy demand, estimated to reach 8,000 MW in 2043[16], could be supplied with renewable energy sources.

Poverty reduction, energy access and climate goals are inextricably linked and require urgent and bold action. Given Mozambique's severe climate change risks and substantial electricity deficit, the following paper examines WBG assistance to Mozambique from 2014 to 2019 against achieving climate change goals and universal energy access by 2030.[17]

Mozambique's Disconnected National Grid and Exported Power

Mozambique's power system was developed as three separate systems: northern, central and southern. Currently, the northern and central systems are connected, while there is no internal connection with the southern system, where most of the power demand exists, including significant demand from the Mozal aluminum smelter. Electricity from the Cahora Bassa hydropower plant, Mozambique's main power plant representing 85% of total power generation (2017), is located in the northern system and is routed to the southern system through South Africa's grid. This means Mozambique has to pay South Africa to transport domestically produced power. South Africa's state-owned electricity company, Eskom, sells electricity back to Mozambique largely to power the Mozal aluminum smelter.

The main power plant, Cahora Bassa hydropower plant has an installed capacity of 2,075 MW. Under a firm contract, 1,150 MW are supplied to Eskom. Due to drought Cahora Bassa often does not run at full capacity, with the annual capacity factor closer to 75-80 percent. This means Eskom gets approximately 70 percent of the electricity produced by Cahora Bassa.

Methodology of Assessment – The assessment reviewed the WBG's energy portfolio for Mozambique, including project finance (excluding financial intermediaries[18]), development policy finance, technical assistance, advisory services, and the country partnership framework. In assessing the WBG Mozambique portfolio, the case study focused on reviewing:

- WBG contributions to sources of power generation (e.g., fossil fuels, renewable energy, grid, and off-grid);
- WBG direct contributions to new electricity connections and the pace of electrification needed to meet universal access by 2030; and
- WBG actions addressing the availability of finance for energy access and affordability of electricity for the poor.

It is important to note that the assessment only covers access to electricity and does not cover access to clean cooking solutions, which is also of great importance regarding energy access for the poor.

The Mozambique case study includes the following sections: Mozambique's National Electrification Strategy; Plans for Power Generation; WBG Assistance for Mozambique's National Electrification Strategy; WBG's Country Partnership Framework; Proposed WBG Operations; and Conclusions and Recommendations.

Mozambique's National Electrification Strategy

In Mozambique, there are two important state actors involved in the electricity sector: Electricidade de Mocambique (EdM), the state-owned power utility in charge of electricity generation, transmission, and distribution; and Fundo de Energia (FUNAE), the public entity in charge of development of low-cost power options for off-grid electrification, including renewable energy. According to EdM, in order to reach universal access by 2030, Mozambique needs to connect approximately 7 million households (including population growth).[19] Mozambique's National Electrification Strategy 2018-2030[20] (NES) calls for investments of $6,587 million in grid and off-grid solutions, with 25 percent ($1,647) reserved for rehabilitation works and the reinforcement of the existing grids.[21] This means from 2018 to 2030, the annual average funding needed for energy access equals approximately $507 million a year. It is unclear what amount of investment is planned for off-grid solutions.[22] However, given 70 percent of Mozambique's population reside in rural areas distant from existing grid infrastructure, and 94 percent of the rural population does not have access, a significant amount of the investments should be directed for off-grid energy solutions.

The NES targets an electrification rate of 38 percent by 2020 and 50 percent by 2023.[23] This means new connections need to ramp up from 135,000 connections achieved in 2018 to an increase of 300,000-350,000 a year by 2020 and 450,000-500,000 a year between 2025 and 2030.[24] It should be noted that the estimated household connections needed assumes 5 people per household (e.g., 450,000 new household connections equals 2.25 million people).

The World Bank's Mozambique Energy Sector Policy Note (2015)[25] identified main challenges to increasing energy access in Mozambique, including:

- **Availability of financing –** EDM is financially constrained due to a significant amount of debt relative to its earnings. According to the World Bank, EDM will not be in a position to finance energy access related capital expenditures (CAPEX) in the short- to medium-term because all surplus revenue from the operational activities will be devoted to the repayment of its short-term liabilities.
- **Government capacity –** The government needs to strengthen its capacity in investment planning and implementation of investment projects. The WBG specifically points out that there is a need for the government to take a more proactive approach to funding energy access related investments instead of treating access as "simply part of regular operating activities."
- **Operational inefficiencies -** integration of the domestic network (see Box 1 above); and network reliability (high level of electricity losses = 27 percent or about $50 million in 2016).
- **Clean, affordable rural solutions -** Seventy percent of Mozambique's population resides in rural locations making it difficult and costly to connect to the national electric grid. The Bank states that solutions need to concentrate enough money and appropriate options for rural communities, i.e., off grid renewables.
- **Legal framework for renewables –** Mozambique needs to address barriers and risks to renewable solutions, especially off-grid solutions.

Mozambique Plans for Power Generation

In October 2018, the Mozambican government approved the Integrated Master Plan for Energy Infrastructure for 2018 to 2043.[26] The Master Plan seeks to budget $18 billion for power generation and $16 billion for transmission and distribution. It aims to bring installed generation capacity from 2,638MW to 17,720MW with the largest portion coming from gas and secondly hydropower (see Table 1).[27]

During the 2018-2043 time period, Mozambique's domestic electricity demand is expected to reach approximately 8,000 MW[28] according to the Master Plan, indicating that of the overall target, 7,000 MW[29] would be for export (current export level is 1,500 MW).[30] This significant export target is concerning because Mozambique currently exports more than 70 percent of its electricity (see Box 1),[31] while over 70 percent of its own population does not have access to electricity. In order for Mozambique to meet its universal energy access goals, energy exports cannot continue to take priority over energy access for Mozambicans.

Solar and Wind are Not Prioritized. The Master Plan puts forth a power generation mix of 66 percent fossil fuels; 29 percent hydropower; and less than 5 percent from solar and wind resources. Mozambique's 2014 Renewable Energy Atlas identified 1.1 GW of priority wind power projects and 600 MW of priority solar projects, plus over 8 GW of additional solar and wind resources. The cost structures for solar and wind power and the technologies surrounding renewable energy have improved substantially in just the last couple years. It does not make economic or climate sense for Mozambique to only aim for 530 MW of solar power and only 150 MW of wind.

Table 1. Integrated Master Plan of Energy Infrastructure: Planned Power Generation out to 2043

Power Generation	Hydropower	Coal	Solar	Wind	Gas
Total: 14,830 MW	4,300 MW	1,350 MW	530 MW	150 MW	8,500 MW

Source: Website of Electricidade de Mocambique (EdM) as viewed on December 1, 2019: https://portal.edm.co.mz/en/website-mobile/article/news/integrated-master-plan-energy-infrastructures-approved

Coal Plans Contradict Paris Climate Agreement: In 2013, 27 leading climate and energy scientists from 15 countries determined that in order to remain below 2°C warming the world cannot build any "new unabated coal power plants, even highly efficient ones." Thus, any planned increase in coal power generation is not in alignment with the Paris Climate Agreement.[32] Mozambique has enough renewable energy resources to cover domestic power demand.

Increasing reliance on gas undermines Paris Climate Agreement: The production and burning of more gas and the associated increase in GHG emissions is a significant threat to the climate. The global gas sector is one of the largest industrial sources of methane emissions,[33] a potent greenhouse gas that in the first two decades has an atmospheric warming effect approximately 80 times greater than carbon dioxide.[34] Methane leakage is a problem across the entire value chain of gas production and distribution and thus, largely offsets the perceived climate benefits of gas relative to coal.[35] Global methane emissions have substantially spiked in recent years.

Outdated Power Generation Plan: As already stated, the current power generation scenario for Mozambique is not in alignment with the Paris Climate Agreement. Mozambique's Master Plan is outdated and the future mix of power generation sources needs to be updated to reflect the significant changes in the cost effectiveness and rapid technological advances (e.g., battery storage) of non-hydropower renewable energy sources.

World Bank Group Assistance for Mozambique's National Electrification Strategy

The following section reviews how WBG assistance is contributing to Mozambique's NES as well as addressing alignment with climate goals. In 2013, the WBG pledged to prioritize its energy portfolio to assist countries to reach universal access by 2030.[36] This study reviews what the WBG has done since 2013.

Table 2 lists WBG project finance operations in the energy sector in Mozambique from FY2014 to FY2019. The WBG project documents for each operation were reviewed to determine if the operation had targets specifically designed to increase energy access. The last column specifies if the assistance directly contributes to new energy connections, which is an indication of direct support for NES access goals.

Table 2. Mozambique: World Bank Group Energy Sector Project Finance (FY2014-FY2019)

Project	Amount (million US$)	WBG Instrument	Approval Date	End Date	New Energy Connections
Gigawatt Mozambique SA (120 MW gas power plant - IPP)	$115.4	MIGA guarantee	3-Dec-15	active	No
Mocuba Solar (40.5 MW linked to Northern grid)	$23	IFC loan ($21 million); Risk Management ($2 million)	27-Oct-16	active	No
Central Termica de Ressano Garcia (175 MW gas power plant - IPP)	$60	IFC loan	7-Jul-17	active	No
Power Efficiency and Reliability Improvement Project	$150	IDA project loan[37]	28-Sep-17	30-Dec-22	No
Mozambique Energy for All (ProEnergia)	$82	IDA grant	28-Mar-19	31-Dec-23	Yes
Temane Regional Electricity Project (transmission line for 400 MW Temane gas power plant)	$420	300 IDA grant and 120 IDA guarantee	20-Jun-19	31-Dec-23	No
Total	$850.4				

Out of six current WBG energy sector projects in Mozambique, only one project directly targets increasing energy connections - the Mozambique Energy for All project ($82 million IDA grant). A second project, Power Efficiency and Reliability Improvement Project ($150 million IDA loan[38]) is largely devoted to rehabilitating and constructing transmission lines and installing meters to improve EdM's revenue collection. While rehabilitating the existing grid and constructing new transmission lines are necessary for energy access, this project does not directly connect any new households, so it is difficult to determine how much it contributes to increasing household electrification rates.

In addition, four of the WBG energy sector projects involve new power generation plants (3 natural gas plants and 1 solar plant). While the WBG may argue that these new plants contribute to supplying more power for energy access, rising domestic energy demand is largely due to growing energy intensive industries, like coal mining and liquefied natural gas (LNG) processing facilities, and to a much lesser extent, households.

For example, energy consulting firm Frost and Sullivan point out that residential consumption in Mozambique, and southern Africa as a whole, constitutes a very small percentage of the total natural gas demand, and as such industrial entities have to be developed in order to create enough stable demand for gas. Frost and Sullivan state that this is the only way that natural gas could be adopted as an energy source across residential consumers.[39] In other words, natural gas power plants are not a cost-effective power source to supply Mozambique's population with access to energy. This also points to the fact that these three gas power plants are largely being built to supply energy to the growing coal mining, LNG processing facilities and exports and not in response to household demand.

How does WBG project finance measure up to the NES?

After the WBG's 2013 pledge to prioritize its energy sector assistance on reaching universal access by 2030, Mozambique's electrification rate slowed down in the first few years. During 2014 to 2016, Mozambique's pace of electrification significantly dropped – from 120,000 new connections in 2014; dropping to 90,000 in 2015; and dropping even further to only 43,000 new connections in 2016.[40] In 2018, the progress was better with 135,000 new connections. Given the inconsistent progress, it is important to take a closer look at the coverage of the WBG's Energy for All project as it is the only current operation that directly contributes to new energy connections.

The WBG's Energy for All Project was approved on March 28, 2019 covering a period of five years with a closing date of December 31, 2023. It involves an IDA grant for $82 million. According to the WB's June 2019 Implementation Status and Results (ISR) report for the Energy for All operation, the finance is allocated across three components: component A) On-grid Urban, Peri-urban and Rural Electrification receives the vast majority of funding at $126 million ($60 million IDA grant & $66 million Multi-Donor Trust Fund grant); component B) Off-grid Electrification receives only $13 million (IDA grant); and component C) Technical Assistance and Implementation Support gets $9 million (IDA grant).

According to the Bank's project Appraisal Document, as part of component A, grid electrification, the project will finance all activities needed to connect around 250,000 households, of which the Bank states that about 185,000 (74 percent) will be in rural areas and 65,000 will be in peri-urban areas.[41] What is counted as rural versus peri-urban areas is unclear.

In addition, the project aims to mobilize 2 private companies to provide off-grid energy products. The off-grid component B targets the building of six mini-grids to connect approximately 4,000 households. The project also targets 18,000 households to receive new electricity connections by stand-alone systems. Lastly, Component C covers technical assistance with one target including the adoption of global lighting quality standards for solar home systems by December 2021 (Also see technical assistance discussion below).

Electrification rate is significantly too slow to meet NES targets: The WBG operation expects to provide access to a total of 272,000 households over a 5-year operation 2019-2023.[42] This amounts to an average of 54,400 households per year, which is well below the 300,000 a year NES target. According to the NES, from 2020 to 2023 there needs to be approximately 1,200,000 new household connections, which means the

WBG-supported operation is 928,000 connections short. Such a substantial gap threatens Mozambique's ability to reach universal access by 2030. Given the WBG operation is already jointly funded by bi-lateral donors, and Mozambique is an aid-dependent country, it is unclear how the gap will be closed. Currently only a small portion of WBG energy sector finance is directed to new electricity connections, so there is room for the WBG to do more.

Too little funding for energy access: Mozambique's NES calls for $6.6 billion or about $507 million per year on average (if spread over 2018 to 2030) to reach universal energy access by 2030. It is important to note, money for utility-scale power generation and transmission is not part of the NES's funding target. Mozambique's Master Plan seeks to budget $18 billion for power generation and $16 billion for transmission.[43]

The WBG's Energy for All project involves an IDA grant of $82 million over 5 years. In addition to the WBG's finance, the Energy for All multi-donor trust fund is contributing $66 million. Thus, total assistance equals $148 million or an average of $29.6 million per year from 2019 to 2023. The WBG and donor funding falls well short of what Mozambique needs to reach universal access. The Bank's finance of the Energy for All project represents only 3 percent of the approximate $2.5 billion[44] needed for energy access in Mozambique over 5 years.

Furthermore, the WBG's Energy for All project only represents 10% of its energy sector project finance in Mozambique. This small portion of funding does not align with the Bank's 2013 commitment to give priority to energy access.

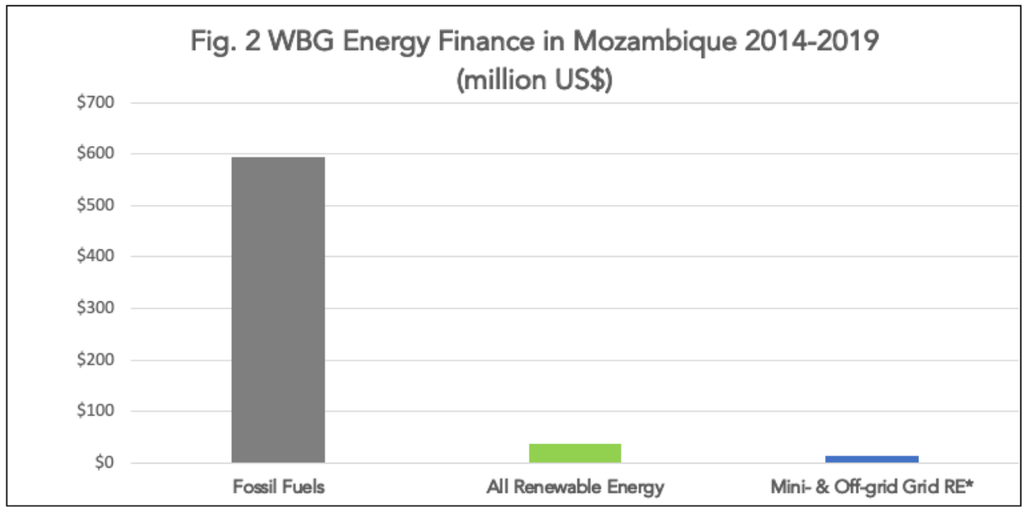
WBG-assisted gas power and energy exports exacerbate Mozambique's lack of financing for energy access: The more than $2 billon energy access financing gap over the next five years has very little chance of being filled by the government of Mozambique. As assessed by the World Bank in a 2015 Energy Sector Policy Note,[45] EDM is financially constrained and will not be able to finance energy access related expenditures for several years largely due to its short-term liabilities.[46] More recently in an August 2018 paper,[47] the World Bank assessed that EDM's financial difficulties are caused by: 1) increasing cost of new and more expensive thermal-based independent power producers (IPPs) compared to the cost of supply from the Cahora Bassa hydropower plant. The Bank specifically noted the Central Termica de Ressano Garcia (CTRG) and the Gigawatt gas plants as part of the financial difficulties. Both of these gas plants received funding from the WBG (see Table 2 above); 2) retail tariffs not recovering the cost of power, [which is exacerbated by more expensive thermal power supported by the WBG]; and 3) non-payment risks from bi-lateral trade, e.g. Zambia ZESCO owes EdM at least $60 million. In conclusion, the WBG's support of expensive IPP gas-based power generation and energy exports depresses EDMs availability of finance for energy access.

Heavy reliance on Conventional Grid – Off-grid Solutions not Prioritized: As noted, the WBG is only providing $13 million for off-grid solutions. The vast majority of WBG energy access funding, 85%, is for grid expansion with less than 9% of funding for off-grid solutions. Given only 6% of the rural population has access[48], it seems reasonable that the WBG should have provided substantially more money for off-grid solutions. According to the World Bank's Mozambique Energy Sector Policy Note (2014) – "the optimal way to increase [energy] access is likely to include significant off-grid, mini-grid and pico-grid developments..."[49]

Fossil fuels prioritized: As stated above, Mozambique has vast undeveloped renewable energy resources. According to Mozambique's Renewable Energy Atlas (2014), 7.5 GW have been identified as priority projects, including: 5.6 GW of hydro, 1.1 GW of wind, 0.6 GW of solar and smaller quantities of biomass and geothermal.

According to the most recent statistics released by the International Renewable Energy Agency (IRENA), Mozambique has just 17 MW of total installed solar photovoltaic capacity as of December 2018, with only 2 MW deployed in 2018. The Atlas identified priority solar projects consisting of 189 locations for solar grid-connected power plants, close to existing substations, with a total capacity of 599 MW. To date, the WBG has only supported one solar project ($23 million for 40 MW Mocuba Solar, see Table 1 above). It is the only large-scale solar power plant under construction. No other priority renewable projects have received WBG finance.

Moreover, even though the vast majority of Mozambique's population without access to energy live in rural areas where mini- and off-grid renewables are the most cost-effective solutions, the WBG has only provided $14 million for such solutions in Mozambique. As Figure 2 illustrates, the WBG clearly prioritized fossil fuels providing 16 times more finance for them than for renewable energy. Currently, the WBG has $595.4 million supporting the construction of 695MW of new natural gas power plants.



Gas Power for Industry and Export: The bulk of the WBG's natural gas finance is $420 million for the Temane Regional Energy Project (TREP), which is largely aimed at providing new transmission lines to evacuate power from a new 400 MW gas power plant (see Box 2). The gas power plant is being developed as an Independent Power Producer, which will largely serve industrial supply, including energy-intensive LNG processing facilities, and power exports. As noted above, there is not enough demand from residential consumers to justify the development of natural gas as a power generation source in Mozambique. Furthermore, the Bank's TREP project is not providing any low voltage network that would allow for the connection of households.

Very limited IDA grants should not be used to support private sector, fossil fuel projects. IDA grants should be used for new electricity connections and renewable energy projects. The Bank only provided $82 million for new household connections, while providing $420 million in grant assistance for fossil gas largely to serve industry and electricity exports.

World Bank Group Policy Reform and Capacity Building Assistance

In addition to direct project finance, the WBG provides development policy finance (DPF), technical assistance (TA) and advisory services (AS), which involve the drafting and adoption of new laws and regulations, and capacity building of government institutions. As noted above, the World Bank assessed several challenges to reaching universal energy access in Mozambique, including: constrained EdM finances; lacking government capacity; operational inefficiencies; and deficient legal framework for renewable energy, especially off-grid solutions.

Table 3 below lists recent and/or active DPF, TA and AS operations addressing the energy sector in Mozambique. WBG documents for each operation were reviewed to determine if the operation had targets specifically designed to address the challenges to increasing energy access. The last column specifies if the assistance directly addresses Mozambique's NES or barriers to new energy connections and/or off-grid renewable energy solutions.

Box 2. World Bank's Temane Regional Energy Project: Gas Power and High Voltage Transmission for Industry and Exports

The Temane Regional Energy Project (TREP) involves $420 million from the World Bank consisting of $300 million IDA grant and $120 million IDA guarantee. An additional $24 million grant comes from the Norwegian Trust Fund. The TREP objective is "to increase electricity generation capacity with private sector participation and to enhance transmission capacity for domestic and regional markets" across southern Africa.[63]

The total project cost is listed at $1.4 billion. The Components of the project include: 1) Construction of Temane Transmission Project; 2) construction of 400 MW Mozambique Gas-to-Power Plant (also known as Central Termica Temane); 3) EdM financial strengthening; and 4) technical assistance for project implementation.

The Temane 400 MW gas power plant is being developed as an Independent Power Producer (IPP) and will utilize gas from the Temane gas fields, which are owned and being developed by Sasol Petroleum Mozambique. The plant is planned for commercial operation by 2023. The Bank claims that the Temane 400 MW gas power plant is needed to help provide adequate electricity supply to the country and surplus for exports.

The Temane Transmission Project is a high-voltage transmission line from Temane to Maputo specifically to evacuate power from the planned 400 MW Temane gas power plant. The second phase of high-voltage transmission line will be from Temane to Tete (location of new large-scale coal mining operations). The World Bank states that the new Temane transmission will connect the new Temane gas power plant and will serve towards integrating the national power system.

However, it is important to note that there are no activities funded in this WB project that will result in any new household connections or development of a low voltage network to connect households. Moreover, the Temane gas power plant is yet another expensive IPP fossil fuel power project, which will add to EdM's financial difficulties and exacerbate EdM's inability to pay for energy access.

Table 3. Mozambique: World Bank Group Policy Reform and Capacity Building Operations

Project	Amount (million US$)	WBG Instrument	Approval Date	End Date	Energy Access Targets
EdM Treasury[50]	$1.72	IFC -Advisory Services	19-Apr-18	30-Jun-20	No
Mining and Gas Technical Assistance	$50	IDA - TA grant	1-Mar -13	31-Dec-21	No
Mining and Gas Technical Assistance -additional finance	$28	IDA - TA $20.4 grant	1-Nov-17	31-Dec-21	No
Poverty Reduction Support Credit 10 (PRSC 10)	$110	IDA - DPF	1-Dec-14	31-Mar-15	No
Poverty Reduction Support Credit 11 (PRSC 11)	$70	IDA - DPF	22-Dec-15	31-Dec-16	No
Climate Change Development Policy Operation II	$50	IDA - DPF	23-Dec-14	30-Jun-15	No

Note: World Bank Group divisions – IFC=International Finance Corporation; IDA=International Development Association. TA = technical assistance; DPF = development policy finance

None of the WBG's policy reform and/or capacity building operations (DPF, TA and AS) contain activities aimed at Mozambique's electrification strategy; increasing household connections; or addressing barriers to off-grid renewable energy solutions. However, it should be noted that $3 million is provided towards technical assistance as part of the Energy for All project finance operation (see above) and the Climate Change DPO II supported a renewable energy feed in tariff (REFIT) aimed at on-grid renewable energy (see below).

Benefits to coal and gas projects. Since 2013, the WBG's policy reform and capacity building operations in the energy sector largely focus on assisting the further development of fossil fuels, namely coal and gas. The World Bank's Poverty Reduction Support Credits 10 and 11 focused on measures to increase investments in the coal and gas industries.[51] Required policy reforms tied to the disbursement of funding, included the adoption of new mining and petroleum tax laws and regulations. The new mining tax law includes subsidies for coal such as custom duty exemptions, low royalty rate (3%) and lower taxes for coal utilized for domestic activities (e.g., power generation, and cement production). The new petroleum tax law includes hyper-accelerated rate of depreciation[52] for oil and gas exploration, and VAT exemptions for oil and gas investments. These findings were informed by a previous detailed analysis of the WBG's policy operations produced in 2017.[53]

Benefits to PPP and Mega projects. The WBG operations also required new laws on the investment frameworks for public-private partnerships (PPP) and "Mega-projects". These laws provide subsidies in the form of project preparation costs, land acquisition costs, and potential government finance and guarantees. Priority PPP projects that stand to benefit from these laws include critical coal exporting infrastructure (e.g., two coal railway and port projects: the Nacala Corridor (now called Northern Logistics Corridor) and Moatize-Macuse) and at least 4 proposed coal plants.[54] Priority Mega-projects that stand to benefit from these new laws include several mega Tete Province coal mining operations (e.g., Ncondezi integrated mine and power plant, and ENRC coal mines) and several mega natural gas operations (e.g., Rovuma basin operations of Anadarko[55] (now Total Area 1), ENI (Area 4), Statoil and PETRONAS).

In addition to the DPF operations, the World Bank is providing $78 million in IDA grant funding for the Mining and Gas Technical Assistance project (MAGTAP) with an end date of December 31, 2021.[56] According to the World Bank, with respect to the additional finance approved on November 1, 2017, "MAGTAP remains critical to support the GoM [Government of Mozambique] in (a) moving the current pipeline of LNG [liquefied natural gas] projects toward production while ensuring that they provide economic growth and are sustainable in the long run; and (b) supporting new investment into its minerals sector, including coal." Box 3 provides key activities and outcomes illustrating the breadth of WBG support towards increasing gas and coal mining development.

Sources: World Bank, 2013. Mining and Gas Technical Assistance Appraisal Document. March 1, 2013. World Bank Implementation Status and Results Report for Mozambique Mining and Gas Technical Assistance Project (December 2018).

*Area 1 LNG is owned by: Total 26.5% (France), Mistui 20% (Japan), ENH 15% (Mozambique state company), ONGC Videsh10% (India), 10% Oil India, Gharat Petroleum Resources 10% (India) and PTT 8.5% (Thailand).

Public Assistance for Coal and LNG Exports: WBG assistance specifically targeted increased investments in infrastructure to further develop coal mining, coal exports, gas extraction and LNG exports. One of the development outcomes of the WBG's public assistance is Mozambique is expected to become Africa's largest LNG exporter and in 2018 had already reached the top 10 coal exporters in the world.[57]

Tete Province has several mega coal-mining operations, including the Vale-operated Moatize coal mine, which is the world's 4th largest coal mine with 954 million tons of coal. Vale is also part of a consortium that built and operates the new coal railway, the Northern Logistics Corridor, which was one of the government's priority PPP projects that benefitted from the WBG-supported new PPP investment law. According to Vale, the new coal rail line is key to helping them increase coal production and exports. The new line links Moatize mine to the port of Nacala with five 120-wagon trains departing daily to Nacala. According to Vale, each train carries 7,560 tons of coal, which is then exported to India, Japan, Brazil and elsewhere.[58]

Box 3. World Bank's Mozambique Mining and Gas Technical Assistance Project

Key activities and outcome indicators include, inter alia:

- drafting/adoption of legal and regulatory frameworks for mining and hydrocarbons,
- assessing and structuring potential public-private partnership (PPP) arrangements for gas infrastructure, including upstream developments;
- preparation and negotiation of agreements for onshore and offshore LNG, specifically includes funding evaluations for offshore Area 1 LNG* and financial adviser to offshore gas block 4 (ENI);
- target outcome of at least 5 new mining or gas infrastructure related contracts that benefitted from the TA developed frameworks;
- provision of technical, legal, economic and financial advice for mining and infrastructure development plans and agreements, including a Coal Price Benchmark; and
- target outcome of 20 small and medium enterprises providing goods and services to gas and/or mining operations

On August 6, 2019 construction began on the Offshore Area 1 LNG project. This project was one of the Mega projects benefitting from the WBG-supported new Mega-projects law and WBG technical assistance, MAGTAP, funded feasibility studies and contract negotiations for this project. The $23 billion project will pipe gas onshore to be liquified for export. The Area 1 LNG gas liquefaction and export terminal project is the largest single LNG project approved in Africa to date.[59] The Area 1 LNG project, together with another LNG export terminal planned by Exxon Mobil nearby, will turn Mozambique into a top global LNG producer and the largest producer and exporter of natural gas in Africa.[60] It should be noted that Exxon Mobil now owns 24% of the Area 4 gas block, which the Bank's MAGTAP also targeted and provided assistance to (see Box 3 above) and was also a priority Mega-project.

In addition to the methane and other GHG emissions associated with gas, converting gas into LNG by cooling it to minus 160 °C for transport is a highly energy-intensive and thus GHG-intensive process.

LNG and coal represent a high GHG-development path – a path the WBG should not be enabling with its public finance. The WBG should not be giving limited public assistance to develop energy resources that significantly contribute to the climate crisis responsible for intensifying droughts, floods and cyclones in Mozambique.

Support for renewable energy feed in tariff. To support the development of renewable generation, in October 2014, Mozambique introduced a regulation for renewable energy feed-in tariffs (REFIT).[61] The WBG's Climate Change DPO II required the establishment of the REFIT. The REFIT scheme only applies to generation plants of 10MW or less, connected to the main grid and using four types of renewable technology: hydropower, solar, biomass or wind.

WBG Country Partnership Framework

The Country Partnership Framework (CPF) lays out the World Bank Group's current and planned program of engagement in a member country. The CPF places individual WBG activities into an overall strategic context for a country and lays out the country-specific development goals. As such, the CPF is intended to be linked to a country's national development strategies, such as poverty reduction strategies; national electrification strategies; and climate change strategies.

Bank staff, in consultation with country authorities, develops a CPF for each country normally every four years. Mozambique's current CPF was published in March 2017 and covers the period FY2017 to FY2021. The following section focuses on determining if the WBG's CPF specifically targets universal energy access by 2030 and provides adequate guidance and criteria for portfolio selection towards reaching universal energy access for Mozambique.

This section does not go back over the CPF list of projects because these are largely the same projects already discussed above, rather this section focuses on the Results Framework and the indicators linked to relevant development objectives. Each country's CPF includes a Results Framework of country-specific targets and indicators to monitor World Bank Group and country performance in achieving the CPF-specified development objectives. For the Mozambique CPF, development objective 4 is to expand access and improved reliability of electricity. Table 4 below provides the CPF indicators of progress towards expanding energy access.

Table 4. Mozambique Country Partnership Framework: Results Framework FY2017-FY2021

CPF Objective 4: Expand Access and Improved Reliability of Electricity		
CPF Objective Indicators	**Supplementary Progress Indicators**	**WBG Program**
Average interruption frequency per year (System Average Interruption Frequency Index) Baseline 2014: 52 interruptions per delivery point per year Target 2020: 30 interruptions per delivery point per year Percentage of households with access to electricity	Capacity of generation available to Mozambique Baseline 2014: 679 MW Target 2020: 1,254 MW Rate of electricity losses Baseline 2014: 23.2% Target 2020: 18% Electricity of Mozambique (EDM) cash recovery index	-Power Efficiency and Reliability Improvement Project (PERIP) -Energy Access Project [Energy for All Project] -Regional Power Transmission Development [Temane Regional Energy Project] -CTRG (# 33020 - IFC) [Central Termica de Ressano Garcia 175 MW gas power plant] -Gigawatt (# 35359 – IFC, MIGA) [120 MW gas power plant]
Baseline 2014: 25.2% Target 2020: 33%	Baseline 2015: 69% Target 2020: 79%	-Mocuba Solar (# 36787 - IFC) [40.5 MW] -TA (SE4ALL TF) Development of National Electrification Plan -TA (SE4ALL TF) Development of Options for Regional Power Trade -IFC Advisory Services

Source: International Development Association, International Finance Corporation, and Multi-lateral Investment Guarantee Agency Country Partnership Framework for the Republic of Mozambique for the Period FY17-FY21, March 30, 2017.

CPF electrification target lower than Mozambique NES: In reviewing the Mozambique CPF's Results Framework, the first concern that stands out is that the CPF's indicator of progress for percentage of households with access to electricity do not align with Mozambique's NES electrification targets. The CPF is aiming for 5 percent less electrification than the NES requires (NES requires 38 percent by 2020 and 50 percent by 2023). As stated earlier, the CPF is intended to be linked to the national development strategies, and thus, should aim for and be measured against the same electrification development targets as Mozambique's National Electrification Strategy.

The CPF also did not budget adequate funding for energy access. According to Mozambique's National Electrification Strategy, $6.5 billion is needed to reach universal access by 2030. From FY18-FY30 that would be $500 million a year. For FY17 to FY21, the CPF only budgets at most $230 million (adding together $80 million for Energy Access Project and $150 million for Power Efficiency and Reliability Improvement Project, which only partially address rehabilitation of existing grid) or only $58 million a year at the very best.

CPF prioritizes energy exports over energy access: The CPF states:
"IFC intends to focus on regional projects which will boost the country's export potential, thus creating a sound base for foreign exchange earnings and job creation. In particular, IFC is developing export-focused energy projects that would connect Mozambique with the Southern Africa subregion and would significantly increase Mozambique foreign exchange earnings."

This brings into question how much the IFC's power projects intend to contribute to domestic household access, when the IFC's focus is clearly on projects to increase exports. In addition,

the World Bank's planned funding in the CPF also prioritizes exports with the bulk of funding, $300 million, dedicated to the Regional Power Transmission Project (i.e., Temane Regional Energy Project; the final amount was $420 million), while the CPF only planned $80 million for the Energy Access project (final amount was $82 million) – the only project assisting new energy connections.

CPF decouples energy development from climate goals: Under CPF objective 4: Expanding Access and Improved Reliability of Electricity, the CPF states "In particular, the WBG energy engagement in Mozambique will seek to strengthen domestic gas utilization for power and other downstream usage in agribusiness and industry." The CPF also included additional money to continue the Mining and Gas Technical Assistance, which aims to increase investments in coal mining/coal export and gas/LNG projects (see Box 3 above). Even though the CPF points out the significant climate change risks faced by Mozambique and has an objective of: Improving Management of Climate Risk and Natural Resources[62], there is zero recognition of the relation of WBG-supported development of gas and coal to climate change. With the assistance of the WBG, Mozambique is slated to become Africa's largest LNG exporter and one of the world's largest coal exporters. The CPF does not address the link between climate change risks and the WBG's high GHG energy sector development path for Mozambique.

CPF warns LNG investments perpetuate previous development pattern – rapid growth without significant poverty reduction:

> "Looking ahead, planned investments in natural resource extraction are expected to cause public revenues to rise dramatically in the coming years, to as high as 7 percent of gross domestic product (GDP). However, these capital-intensive megaprojects could also further accentuate Mozambique's current development pattern in which rapid growth is not generating significant poverty reduction or expanded employment opportunities.
>
> …At full-scale development, planned liquefied natural gas (LNG) investment could reach upward of US$40 billion, generating annual resource revenues of as much as US$15 billion by 2032, representing a full 20 percent of GDP and make a major contribution to addressing the country's debt situation. However… these capital-intensive investments will make a greater contribution to growth while contributing much less proportionately in direct and indirect employment growth, there is a risk of accentuating Mozambique's current development pattern, in which rapid growth is not generating significant poverty reduction."

Conclusions and Recommendations

Overall, the WBG's energy sector assistance in Mozambique undermines the Paris Climate Agreement goals and falls considerably short in what is necessary to meet Mozambique's energy access goals. Main findings include:

WBG prioritizes fossil fuels over renewable energy: Mozambique has vast undeveloped renewable energy resources with 7.5 GW identified as priority projects and renewable technologies are already available and cost competitive with fossil fuels. However, as shown in Figure 1, instead of prioritizing finance for renewable energy, the WBG's finance is 16 times greater for fossil fuels than for renewable energy. The WBG is not supporting any wind and only a small amount of solar – $23 million for a 40 MW grid-connected solar plant and only $13 million for off-grid solar. Furthermore, World Bank technical assistance supported tax breaks for coal and gas to increase investments into these fossil fuel sectors.

WBG facilitating high-GHG development path, non-alignment with Paris Agreement: Ninety-four percent of WBG support for power generation in Mozambique is for fossil fuels. In addition, the WBG has multiple policy reform and capacity building operations aimed at increasing investments in coal mining, coal exports, gas production and LNG exports. Mozambique is on a path to becoming Africa's largest LNG exporter and one of the world's largest coal exporters. This high GHG-development path was enabled by WBG public finance. As a result, the WBG is not in alignment with the Paris Climate Agreement's goal of making financial flows consistent with a pathway towards low-GHG development.

Electrification rate is significantly inadequate to reach universal access goal: The WBG's Energy for All project in Mozambique ($82 million), in conjunction with bi-lateral donors ($66 million), expects to reach 272,000 household connections by 2023. This is 928,000 short of Mozambique's National Electrification Strategy (NES) target of 1.2 million by 2023, which requires at least 300,000 new connections a year from 2020-2024. Mozambique is aid-dependent for its energy access expenditures. Thus, it is unclear how the 928,000 gap will be filled.

Inadequate Funding for Energy Access: Only 10% of WBG energy sector project finance in Mozambique ($82 million out of $850.4 million) is targeting new energy connections. Despite the WBG's 2013 pledge, it does not appear the WBG's energy practice in Mozambique is centered on achieving universal access by 2030. Mozambique's National Electrification Strategy calls for $6.6 billion or about $507 million per year on average (if spread over 2018 to 2030) to reach universal energy access by 2030.

Exports Prioritized Over Domestic Energy Access: Mozambique has a history of exporting its power generation (see Box 1 below), while 70 percent of its people still need access to electricity. The WBG continues this same pattern of energy development. The bulk of its energy sector funding, $420 million, is for the Temane Regional Power Transmission Project involving a gas power plant and high voltage transmission lines, which serve to evacuate the power for export and industry, including for energy-intensive liquefied natural gas (LNG) processing facilities. The WBG's energy sector policy reform and capacity building operations are also largely focused on coal and LNG exports.

WBG assistance to gas power plants and energy exports depresses availability of finance for energy access: The WBG's support of expensive independent power producers (IPP), gas-based power generation and to energy exports have exacerbated Mozambique's state-owned power utility's, Electricidade de Mocambique (EdM), financial difficulties. The WBG's own assessment found that EdM's availability of finance for energy access was constrained by increasing cost of new and more expensive thermal-based IPPs and non-payment from bi-lateral trade.

Recommendations

The WBG has committed to assist countries to meet the goals of the Paris Climate Agreement, and to center their energy practice on achieving universal access to energy by 2030. In order to help Mozambique reach these goals, the WBG should:

- **End all WBG public assistance for fossil fuels:** No WBG public assistance should be used to develop fossil fuels, which further exacerbate the climate crisis responsible for intensifying droughts, floods and cyclones in Mozambique. This includes assistance for associated facilities; financial intermediaries; policy-based finance (e.g., fossil fuels excluded from all forms of tax breaks and investment incentives); guarantees; general budget support (i.e., fossil fuels must be added to excluded expenditures); technical assistance and advisory services.
- **Scale up funding for renewable energy solutions, especially mini- and off-grid:** In Mozambique, the vast majority of people without access to energy live in rural communities, where mini- and off-grid renewable solutions are the most cost-effective and climate-safe options. As such, the WBG needs to exponentially scale up funding for mini- and off-grid renewable energy solutions. In addition, the WBG should assist the government of Mozambique to adopt a comprehensive regulatory framework for renewable energy, including mini- and off-grid solutions and a plan to integrate renewables and mini-grid operations into the main grid.
- **Reduce future fossil fuel reliance – Update Power Generation Plan:** The WBG should assist Mozambique to adopt an updated Power Generation Plan with no coal options, a substantial reduction in gas options, and a significant scale up in renewable energy that reflects the changes in the cost effectiveness and rapid technological advances of renewable energy sources. In addition, the WBG should assist Mozambique to prioritize domestic energy needs ahead of energy exports.
- **Provide more and sustained funding for new household connections:** Given the WBG's finance directed at new household connections represents only 10% of its over-

all energy sector finance in Mozambique, the WBG can and should direct more finance to connections. To reduce uncertainty in funding for Mozambique's National Electrification Strategy, the WBG should commit to long-term (e.g., 10-year), sustained funding for new household electricity connections. The 10-year WBG funding commitment needs to be reflected in an updated Country Partnership Framework for Mozambique. The WBG needs to transparently report direct WBG contributions to new household connections within the context of other sources of energy access funding. In addition, the WBG should continue to provide adequate grant-based finance to cover the initial installation costs for poor urban and rural households in Mozambique.

- **Perform a gap analysis on universal access by 2030:** Given that the electrification rate is inadequate, the WBG should assist the government to identify where gaps exist and how the gaps will be addressed in order for them to achieve annual electrification targets necessary to reach universal access by 2030.

Endnotes

1 https://www.unicef.org/mozambique/en/cyclone-idai-and-kenneth

2 https://www.unicef.org/mozambique/en/cyclone-idai-and-kenneth

3 The World Bank Group includes: International Development Association (IDA), International Bank for Reconstruction and Development (IBRD), International Finance Corporation (IFC), and Multilateral Investment Guarantee Agency (MIGA).

4 According to Mozambican President, Filipe (Jacinto) Nyusi quoted in XinhuaNet, 2018. Mozambican gov't launches electrification program to cover all the population by 2030. XinhuaNet, November 12, 2018. http://www.xinhuanet.com/english/2018-11/12/c_129992191.htm

5 Based on United Nations estimates the current population of Mozambique is 31,493,880 (up from 28,751,000 in 2016). This would mean approximately 22,675,594 people do not have access to electricity (72% * 31,493,880 = 22,675,594). Note: This study does not cover access to clean cooking solutions.

6 World Bank Group, 2013. Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector. July 2013. http://documents.worldbank.org/curated/en/745601468160524040/Toward-a-sustainable-energy-future-for-all-directions-for-the-World-Bank-Group-8217-s-energy-sector

7 This assessment reviews access to electricity and does not cover access to clean cooking solutions, which is also of great importance.

8 https://www.unicef.org/mozambique/en/cyclone-idai-and-kenneth

9 https://www.unicef.org/mozambique/en/cyclone-idai-and-kenneth

10 The World Bank Group includes: International Development Association (IDA), International Bank for Reconstruction and Development (IBRD), International Finance Corporation (IFC), and Multilateral Investment Guarantee Agency (MIGA).

11 Based on United Nations estimates the current population of Mozambique is 31,493,880. This would mean approximately 22,675,594 people do not have access to electricity. Note: This study does not cover access to clean cooking solutions.

12 World Bank, 2018. Project Information Document: Mozambique Lighting and Grid Access Project (P165453). World Bank, March 8, 2018.

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15 https://www.get-invest.eu/market-information/mozambique/renewable-energy-potential/

16 As noted on the website of the Mozambique state-owned power utility, Electricidade de Mocambique (EdM) as viewed on December 1, 2019: https://portal.edm.co.mz/en/website-mobile/article/news/integrated-master-plan-energy-infrastructures-approved

17 This assessment reviews access to electricity and does not cover access to clean cooking solutions, which is also of great importance.

18 The WBG does not provide information on sub-projects funded by financial intermediaries. The WBG's private sector arm, the International Finance Corporation (IFC) invests over half its annual budget through financial intermediaries, including commercial banks and investment funds.

19 Website of Electricidade de Mocambique (EdM) as viewed on December 1, 2019: https://portal.edm.co.mz/en/website-mobile/article/news/integrated-master-plan-energy-infrastructures-approved

20 The National Electrification Strategy was supported by an ESMAP funded technical assistance. ESMAP is managed by the World Bank and funded by donor governments, i.e., the funding does not come from the World Bank Group's budget.

21 Website of Electricidade de Mocambique (EdM) as viewed on December 1, 2019: https://portal.edm.co.mz/en/website-mobile/article/news/integrated-master-plan-energy-infrastructures-approved

22 The amount specified for grid vs off-grid in the NES is unclear because the original document was

unavailable. This report relies on news articles about the NES and summaries available in World Bank documents.

23 Mozambique Ministry of Mineral Resources and Energy, see footnote 8 from http://documents.worldbank.org/curated/en/135711468180536987/ACS17091-REVISED-PUBLIC-Mozambique-Energy-Sector-Policy-Note.pdf

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26 Website of Electricidade de Mocambique (EdM) as viewed on December 1, 2019: https://portal.edm.co.mz/en/website-mobile/article/news/integrated-master-plan-energy-infrastructures-approved

27 Ibid. and ESI Africa, 2018. Mozambique approves Integrated Master Plan for electricity infrastructure. October 19, 2018.

28 It should be noted that this figure excludes power used by the MOZAL aluminum smelter.

29 Website of Electricidade de Mocambique (EdM) as viewed on December 1, 2019: https://portal.edm.co.mz/en/website-mobile/article/news/integrated-master-plan-energy-infrastructures-approved

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32 Metz, Bert (Dr.), et al, 2013. New unabated coal is not compatible with keeping global warming below 2°C. Coal and 2 degrees C statement. European Climate Foundation, The Netherlands. October 2013.

33 See https://www.iea.org/reports/methane-tracker-2020

34 See http://www.ccacoalition.org/en/initiatives/oil-gas

35 See http://www.yaleclimateconnections.org/2016/08/is-natural-gas-a-bridge-fuel/.

36 World Bank Group, 2013. Toward a sustainable energy future for all: directions for the World Bank Group's energy sector. Washington DC; World Bank Group, July 9, 2013. http://documents.worldbank.org/curated/en/745601468160524040/Toward-a-sustainable-energy-future-for-all-directions-for-the-World-Bank-Group-8217-s-energy-sector

37 WB website references $109 million as grant.

38 According to the World Bank's Implementation Status and Results Report (June 28, 2019) for the Power Efficiency and Reliability Improvement Project: $117 million is for rehabilitation and upgrade of network infrastructure; $29.5 million is for enhancement of EDM operational and commercial operations; and $3.5 million is for capacity building.

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40 World Bank, 2018. Project Information Document / Integrated Safeguards Data Sheet: Temane Regional Electricity Project (P160427). World Bank, August 7, 2018.

41 World Bank, 2019. Appraisal Document for Mozambique Energy for All Project, March 7, 2019.

42 Assuming an average of 5 people per household the operation will result in approximately 1.36 million people gaining access to energy.

43 ESI Africa, 2018. Mozambique approves Integrated Master Plan for electricity infrastructure. October 19, 2018. https://www.esi-africa.com/industry-sectors/finance-and-policy/mozambique-approves-integrated-master-plan-for-electricity-infrastructure/

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45 World Bank, Mozambique Energy Sector Policy Note. World Bank, November 30, 2015. http://documents.worldbank.org/curated/en/135711468180536987/ACS17091-REVISED-PUBLIC-Mozambique-Energy-Sector-Policy-Note.pdf

46 World Bank, Mozambique Energy Sector Policy Note. World Bank, November 30, 2015. http://documents.worldbank.org/curated/en/135711468180536987/ACS17091-REVISED-PUBLIC-Mozambique-Energy-Sector-Policy-Note.pdf

47 World Bank, 2018. Project Information Document / Integrated Safeguards Data Sheet: Temane Regional Electricity Project (P160427). World Bank, August 7, 2018,

48 It is estimated that currently only 240,000 rural households are electrified. World Bank, 2019. Appraisal Document for Mozambique Energy for All (ProEnergia) Proejct, March 7, 2019.

49 World Bank, Mozambique Energy Sector Policy Note. World Bank, November 30, 2015. http://documents.worldbank.org/curated/en/135711468180536987/ACS17091-REVISED-PUBLIC-Mozambique-Energy-Sector-Policy-Note.pdf

50 This TA involves assistance for the management of EdM accounts to streamline power purchasing and enable more EdM commercial lending.

51 Poverty Reduction Support Credits are a type of Development Policy Loan for low-income countries and is intended to provide assistance to achieve targets contained in a country's poverty reduction strategy.

52 Coupled with a loss carry forward allowance of 5 consecutive years.

53 https://www.re-course.org/wp-content/uploads/2017/11/Study-3-Mozambique-case-study.pdf

54 Coal plants include: 600 MW Moatize, 300 MW Ncondezi, 180 MW Jindal, and 200 MW ICVL.

55 In 2019, Anadarko was acquired by Occidental Petroleum

56 The TA operation also includes $1 million DFID Free-standing Co-financing Trust Fund Grant – approved November 1, 2017 with a closing date of December 31, 2021. The project completion date has been extended from May 31, 2020 to December 31, 2021 (19 months extension) to accommodate scaled-up activities. The additional finance continues and builds upon original TA objectives and targeted outcomes.

57 http://worldstopexports.com/coal-exports-country/

58 Club of Mozambique, 2017. Vale Mozambique doubles coal production in just 10 months. November 21, 2017. https://clubofmozambique.com/news/vale-mozambique-doubles-coal-production-in-just-10-months/

59 Reuters, 2019. Anadarko approves $20 billion LNG export project in Mozambique. June 18, 2019. https://www.reuters.com/article/us-mozambique-anadarko-lng/anadarko-approves-20-billion-lng-export-project-in-mozambique-idUSKCN1TJ2DI

60 Reuters, 2019. Update 1-Anadarko's final investment decision on Mozambique lng project due on June 18. May 8, 2019. https://www.reuters.com/article/anadarko-petrol-mozambique-lng/update-1-anadarkos-final-investment-decision-on-mozambique-lng-project-due-on-june-18-idUSL5N22K66Y

61 Regulamento que Estabelece o Regime Tarifário Para as Energias Novas e Renováveis (Refit)

62 The focus is on agriculture, forests, and water.

63 World Bank, 2018. Project Information Document / Integrated Safeguards Data Sheet: Temane Regional Electricity Project (P160427). World Bank, August 7, 2018.

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