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BELIZE

CLIMATE CHANGE POLICY ASSESSMENT

November 2018

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CLIMATE CHANGE POLICY ASSESSMENT

October 18, 2018

Approved By
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Glossary

BAU	Business As Usual
BCRIP	Belize Climate-Resilient Infrastructure Project
CARICOM	Caribbean Community
Cat DDO	Catastrophe Deferred Drawdown Option
CBB	Central Bank of Belize
CCCCC	Caribbean Community Climate Change Centre
CCPA	Climate Change Policy Assessment
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CCRIF SPC	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company
CERC	Contingency Emergency Response Component
DANA	Damage Assessment and Needs Analysis
DRM	Disaster Risk Management
GCCA	Global Climate Change Alliance
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas
GSDS	Growth and Sustainable Development Strategy 2016–19
IDB	Inter-American Development Bank
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
IPSAS	International Public-Sector Accounting Standards
KPI	Key Performance Indicator
MoA	Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development
MEDP	Ministry of Economic Development, Petroleum, Investment, Trade and Commerce
MoF	Ministry of Finance
MoT	Ministry of Tourism
MoNR	The Ministry of Natural Resources

NCCO	National Climate Change Office
NCCPSAP	National Climate Change Policy, Strategy and Action Plan
NCRIP	National Climate Resilience Investment Plan
NDC	Nationally Determined Contribution
NEMO	National Emergency Management Organization
NEMS	National Environmental Management Strategy
OECS	Organization of Eastern Caribbean States
PEFA	Public Expenditure and Financial Accountability (Assessment)
PFM	Public Financial Management
PIMA	Public Investment Management Assessment
PPP	Public-Private Partnership
PSIP	Public-Sector Investment Program
PUC	Public Utilities Commission
REDD+	Reducing Emissions from Deforestation and Forest Degradation, including fostering conservation, sustainable forest management and enhancement of forest carbon stocks
SNC	Second National Communication
SPCR	Strategic Programme for Climate Resilience
TNC	Third National Communication
TSA	Treasury Single Account
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Belize is exceptionally vulnerable to natural disasters and climate change. It already faces hurricanes, flooding, sea level rise, coastal erosion, coral bleaching, and droughts, with impacts likely to intensify given expected increases in weather volatility and sea temperature. Hence, planning for resilience-building, and engagement with development partners on environmental reforms, have been central to Belizean policymaking for many years, since well before Belize submitted its Nationally Determined Contribution (NDC) to the Paris Accord in 2015.

This Climate Change Policy Assessment (CCPA) takes stock of Belize's plans to manage its climate response, from the perspective of their macroeconomic and fiscal implications. The CCPA is a joint initiative by the IMF and World Bank to assist small states to understand and manage the expected economic impact of climate change, while safeguarding long-run fiscal and external sustainability. It explores the possible impact of climate change and natural disasters on the macroeconomy and the cost of Belize's planned response. It suggests macroeconomically relevant reforms that could strengthen the likelihood of success of the national strategy and identifies policy gaps and resource needs.

- **General preparedness for climate change.** Belize's planned climate response is well-articulated. Its NDC includes a clear strategy with relatively well-developed costing for its mitigation and adaptation activities. But while climate planning is advanced and consistent with the broader development strategy (GSDS), implementation capacity remains a challenge. Belize has strong physical emergency planning but receives comparatively little disaster aid and falls short on longer-term financial provisioning.

- **Mitigation.** Belize plans to meet its NDC mitigation goals by expanding its already relatively high share of renewable energy further (from 57 percent to 85 percent of electricity supply), reducing energy intensity and fossil fuel use in transport, and protecting forest reserves and improving sustainable forest management. Given its already-reduced dependence on fossil fuels, and its need to preserve competitiveness with Caribbean neighbors, it has limited scope to raise carbon taxes unilaterally; however, feebates could improve the mitigation incentives in the tax system.

- **Adaptation.** Belize has clearly-specified adaptation priorities and has identified necessary actions to achieve these priorities. Priority sectors identified under its National Climate Change Policy, Strategy and Action Plan (NCCPSAP) are: agriculture/food, forestry, fisheries, coastal management and water—for which actions have been costed; and tourism, land resilience, transport, energy, health and waste—for which costing remains to be completed (but with some investments already under way). Investment in strengthening the resilience of infrastructure connectivity—roads and bridges—was flagged as the most urgent priority and has been prominent in recent budgets. An estimated one-third of budget investment already goes to resilience-building projects. However, Belize falls short on its legal and regulatory framework, where key enabling frameworks for climate action remain to be developed; this is an urgent and

low-hanging-fruit priority. The financial sector is small and is constrained by Belize's financial difficulties; it has been little involved in supporting climate response.

- **Financing.** Despite Belize's severe fiscal constraints, it should be able to execute the climate response strategy outlined above without additional deficit-financing. A broad-brush estimate of its cost puts the envelope in the order of 28 percent of FY2018–19 GDP, meaning a bill of about 2½ percent of GDP a year between now and 2030. If, as intended, mitigation investments are covered by the private sector, adaptation plans could be achieved by maintaining the current pace of budget investment over the period. However, Belize's high dependence on foreign financing makes success heavily dependent on continued support from the international community (including climate funds)—as well as on attracting adequate private investment, despite challenges. If further fiscal tightening were to become unavoidable, it would be important to protect resilience-building investment, since reducing long-term economic damages is likely to be a prerequisite for long-run macroeconomic sustainability.

- **Risk management.** Despite good physical emergency planning, risk management on the financial side in Belize is almost non-existent. Ad hoc responses to post-disaster financing can be time-consuming and costly. Belize needs to build up better fiscal and international reserve buffers. While increasing taxes and borrowing for recovery costs do not always require advanced planning, they do rely on strong capacities in areas like tax administration and debt management. As a best practice, however, advanced planning is advised for contingent borrowing so that concessional rates can be secured, and financing is available immediately after a disaster. In building buffers, Belize should apply a risk-layering approach, identifying instruments to cover or transfer risk with an envelope of about 7 percent of GDP. These should include a budgetary contingency fund, agreement with development partners on contingent lines of credit, and various risk transfer mechanisms. A continency fund of around 1 percent of GDP would provide cost effective coverage for emergency post disaster contingent liabilities of the government. Opportunities for risk transfer include optimizing the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC) coverage and developing the traditional insurance industry for better coverage of not only private but also key public assets.

- **National processes.** Planning for development and climate response has been a strong point in Belize, with clear linkages through the public-sector investment program (PSIP) to the budget. The budget is relatively credible and comprehensive, despite shortcomings identified in Belize's 2014 PEFA (which are common in small states lacking institutional capacity). However, public investment management tools are lacking (such as climate screening), the legal and regulatory framework needs fundamental strengthening, and the absence of a PPP framework risks shutting off potential new sources of investment funding.

- **Priority needs.** To meet its adaptation and mitigation plans, Belize will need to mobilize substantial private investment—and here official sector financial involvement could play a useful supporting role, to create bankable projects. Investment needs for adaptation require the continuation of budget foreign financing, preferably concessional, at current levels or higher. Contingent financing arrangements and expansion of insurance coverage should also play an expanded role. Given the serious gaps in enabling legislation and supporting frameworks,

capacity-building to help fill these is a top priority. Capacity-building would also be valuable to help strengthen public investment management skills.

A. Recommendations—Summary

This summary list of recommendations includes only priority actions that can/should be started immediately. A fuller list is included at the end of each chapter. Asterisked recommendations are currently being supported by technical assistance from the World Bank and other institutions.

General Preparedness

1. Formalize a disaster risk financing strategy and implementation plan, including clarifying budget processes and engaging with development partners on financing modalities. *
2. Translate overarching plans and commitments (including NDC) into implementable and 'finance-ready' sectoral strategies
3. Review and update the NDC to reflect progress with Belize's climate response, and new needs identified, since the Paris Accord.
4. Strengthen capacity (institutional readiness) to implement the commitments

Mitigation

5. Continue to expand, cost-effectively, hydro, biomass, and solar power to meet the renewables commitment in the NDC.
6. Develop a national REDD+ strategy and strengthen the capacity to benefit from possible future systems of positive incentives for REDD+. *
7. Bring in a system of taxes and subsidies (or fees and rebates known as 'feebates') to promote use of more efficient/less emissions-intensive vehicles and electricity-consuming products as well as forest carbon storage.

Adaptation

8. Continue to implement priority actions in the NDC and related plans (for example, NCCPSAP), under the umbrella of the GSDS.
9. Adopt the Public Investment Law, the Fisheries Resources Bill, National Waste Management Plan, National Adaptation Strategy to Address Climate Change in the Agriculture Sector of Belize, and the mangrove protection legislation; and finalize energy legislation for renewables that includes grid infrastructure resilience. *
10. Update the Tourism Master Plan and Land Use Plans to reflect sustainability considerations and the impact of sea-level rise. *

Financing

11. Clarify remaining financing needs, by updating the NCRIP and completing costing.
12. Maintain the foreign-financing pipeline, with emphasis on ensuring maximum concessionality (including access to climate finance) and consistency of new borrowing with restructuring commitments.
13. Protect the current level of resilience-building investment (at least), within the feasible fiscal envelope outlined in the 2018 Article IV staff report.
14. Build fiscal buffers by implementing revenue enhancement and current expenditure control measures that gradually raise the primary fiscal surplus to about 4 percent of GDP and reduce public debt to about 60 percent of GDP over the long term.

Risk Management

15. Identify risk financing instruments which would deliver resources of up to 7 percent of GDP to cover or transfer risk. These should include a budget contingency fund, contingency financing arrangements with development partners, and insurance (traditional and/or parametric). *
16. Deepen collaboration with CCRIF SPC and/or other Caribbean efforts to strengthen the insurance industry and tailor it better to member needs. *
17. Explore options for improving accessibility of affordability of catastrophe insurance for residential, and commercial needs, including agriculture and fisheries sectors. *

National Processes

18. Build capacity for effective appraisal of public investment and PPPs, climate screening of PSIPs and monitoring, in the Ministry of Finance and other relevant ministries.
19. Pass a Procurement Law which reflects international green, resilience or sustainability standards.
20. Introduce a framework for PPPs; and identify the safeguards needed for Belize to be comfortable with considering this diversified source of investment funding and know-how.

Box 1. Priority Needs to Be Met[1]

Government Financing or External Support

- A public investment envelope of US$376 million, by 2030, in:
  - Food security ($16 million)
  - REDD ($3.5 million)
  - Fisheries and reefs ($1.2 million)
  - Coastal management ($10 million)
  - Water management ($1.5 million)
  - Other priority sectors
    - Transport
    - Land resilience
    - Tourism
    - Energy/Power
    - Health
    - Waste management
- Possible government financial involvement to resolve problems impeding private investors, such as seed financing or guarantees
- A budget contingency fund of US$15–20 million
- Contingency financing arrangements of US$50–60 million
- Expansion of insurance to cover US$50–60 million in potential losses

Private Investment

- Private investment of US$172 million by 2030, in:
  - Hydro-power ($58 million)
  - Bagasse ($39 million)
  - Solar ($45 million)
  - Transmission/distribution/other ($30 million)

Capacity-Building

- Development of a damage and loss data collection system and reporting, systematized across all ministries
- Formalization of a national disaster risk financing strategy
- Development of a feebate scheme within the excise tax framework
- Updated costing of priority sector projects and climate screening of PSIPs
- Development and refinement of enabling legal documents such as the building code, legislation for renewable energy, procurement law, PPP law
- Development of public investment management tools, and an inventory of public assets
- Reform of budget classification and reporting, to identify disaster- and climate-related spending, in alignment with the chart of accounts.

[1] Estimates based on the NDC and World Bank for NCRIP component. As discussed later in this report, the costing of projects is unavoidably preliminary and subject to change, given data limitations and the evolving understanding of climate risks.

INTRODUCTION

This report for Belize is the third pilot Climate Change Policy Assessment for Small States. The CCPA is a joint initiative by the IMF and World Bank to assist small states to understand and manage the expected economic impact of climate change, while safeguarding long-run fiscal and external sustainability.

1. This joint World Bank-IMF Climate Change Policy Assessment was prepared in collaboration with the Government of Belize. It reviews the government's plans for mitigating and adapting to the effects of climate change, in line with Belize's Nationally Determined Contribution (NDC) under the Paris Agreement and gives recommendations on how to strengthen policies while maintaining a sustainable macroeconomic framework. Considering that countries have also committed to monitor and report on the progress made in implementing their NDCs, as well as to regularly review, update, and resubmit them, the Climate Change Policy Assessment can also help inform the preparation of subsequent NDCs of Belize, in order to allow for increased ambition and climate action.

2. Belize faces somewhat different challenges than most small island states. Despite meeting the population criterion for small states (below 2 million), Belize has a relatively large landmass compared to other Caribbean countries (fourth after Cuba, Dominican Republic and Haiti). Not being geographically small in relative terms means it is less vulnerable to disasters than most other Caribbean states, in the sense that it faces less risk that any single disaster will engulf the whole country. Its extensive forest, mangrove swamps, and agricultural area provide intriguing options for climate change mitigation. However, its low-lying topography makes it exceptionally vulnerable to sea-level rise: the capital city was moved inland to Belmopan after the inundation of Belize City during Hurricane Hattie (1961). Home to the second largest coral reef system in the world (after Australia's Great Barrier Reef), its habitats are particularly vulnerable to global warming, thereby threatening the local economy and livelihoods (for example, tourism, fishing). Belize also differs from many small island states in having a much higher share of renewable energy (57% of electricity supply)—which limits the scope for using carbon pricing to achieve mitigation goals. These differences mean that Belize's CCPA pilot (and future CCPAs) must extend its focus beyond disaster management to address also slow-onset climate-related damages and carbon pricing in a case where the carbon tax base has already been much reduced.

An Overview of the Report

3. For easy reference, the report broadly replicates the recommended structure of the NDC: it first discusses general preparedness for climate change; the mitigation commitment and strategy; adaptation needs and strategy; national processes; and financing. However, the focus of the report is on the macroeconomic and fiscal challenges that may be confronted in dealing with climate

change, and policy recommendations for responding adequately to these.[1] The common template used for all CCPAs is attached as Appendix I.

Table 1. Belize: Expected Climatic Developments and Consequences

Temperatures	• Belize is expected to be warmer by up to 2^{0}C by the 2030s, and up to 4^{0}C by the end of the century.[1/] • Sea surface temperatures in the Caribbean are projected to go up by as much as 2 degrees Celsius by the end of the century. • Rising temperatures could exacerbate both the activity of and the damage caused by tropical cyclones. Average annual damages in the Caribbean could increase between 22 and 77 percent by 2100.[2/] • Disruptions to marine ecosystems (including coral bleaching, seaweed invasion, and fish populations) are likely to exact significant costs to the tourism and fisheries sectors.
Precipitation	• General Circulation Models (GCMs)[3/] predict a median decrease of up to 22 percent for annual rainfall between 2020 and 2039.[4/] • Changes in rainfall patterns are projected to increase the likelihood of water shortages and heighten the risk of drought.
Sea Level Rise	• Sea level rise is projected to exceed 10 cm by the 2030s in low, medium and high emission scenarios, with rises of 22, 23 and 38 cm respectively by 2050 and 34, 56 and 120 cm respectively by end-century.
Extreme Weather Events	• Projections show increased inter-annual variability, with more intense effects of each severe weather event (particularly strong winds from storms, tropical depressions and hurricanes).[5/] • Greater intensity could accelerate soil erosion, leading to the contamination of groundwater, the salinization of water sources, and the sedimentation of dams and reservoirs, adversely impacting the quality of the country's water resources.

[1/] World Bank Climate Change Knowledge Portal (http://sdwebx.worldbank.org/climateportal/).
[2/] Acevedo, S., "Gone with the Wind: Estimating Hurricane and Climate Change Costs in the Caribbean," IMF WP/16/199.
[3/] General Circulation Models are climate models used to simulate the response of the global climate system to increasing greenhouse gas concentrations.
[4/] World Bank Climate Change Knowledge Portal.
[5/] World Bank Climate Change Knowledge Portal.

[1] The CCPA will be attached to the papers for the IMF's 2018 Article IV Consultation, and—[since the Government of Belize has agreed to publication]—will be available for public distribution after the Article IV Board meeting.

BELIZE'S CLIMATE CHANGE RISKS AND EXPECTED IMPACTS

Belize is high on the list of vulnerable small states. It is low-lying and will face severe damages from inundation if the sea level rises and storm surges intensify. Coastal erosion and coral bleaching will undercut tourism and the blue economy. Changes in temperature and precipitation will disrupt agriculture, affecting the availability and cost of food. The potential loss to GDP would threaten prospects for debt sustainability.

A. Impact of Climate Change Risks on the Macro-Framework/Long-Term Outlook

How Vulnerable is Belize's Economy to Climate Change?

4. Belize is highly exposed climate change and natural disasters risks. Among small states, Belize ranks 3rd at risk for natural disasters, and 5th at risk from climate change.[2]

- Of the 182 countries in the Climate Risk Index, Belize was in the top 5 percent for losses to climate-related natural disasters during 1997–2016 (Figure 1) and in the top 12 percent of climate-related disaster fatalities.[3]

- Belize's annual average loss from of wind-related events and floods averages just under US$123 million, or 7 percent of GDP. This amount includes total direct and indirect losses the public and private sector, on average in any given year over the long-run. Of that US$123 million, roughly US$88 million is the estimated replacement values associated with direct, physical damage. Further, of that 88 million, the government will experience direct damage to its own assets amounting to about US$30 million (1.5 percent of GDP). Once every 100 years, on average, these costs are expected to exceed US$1,857 million, or more than 105 percent of GDP. That is, even before climate change, there is a 1 percent probability in any year that a disaster will impose direct and indirect losses of more than 105 percent of GDP.[4]

- Much of Belize is at sea level, and the primary impact of climate change is expected to be large-scale inundation from sea-level rise and from more severe storm surges. Belize's major infrastructure such as public buildings, health, commercial and transportation facilities are located on or near the coast which makes them extremely susceptible to sea level rise. Besides potential destruction of life and property, and disruption of linkages, sea-flooding and more

[2] *Small States' Resilience to Natural Disasters and Climate Change* – Role for the IMF. IMF, November 2016.

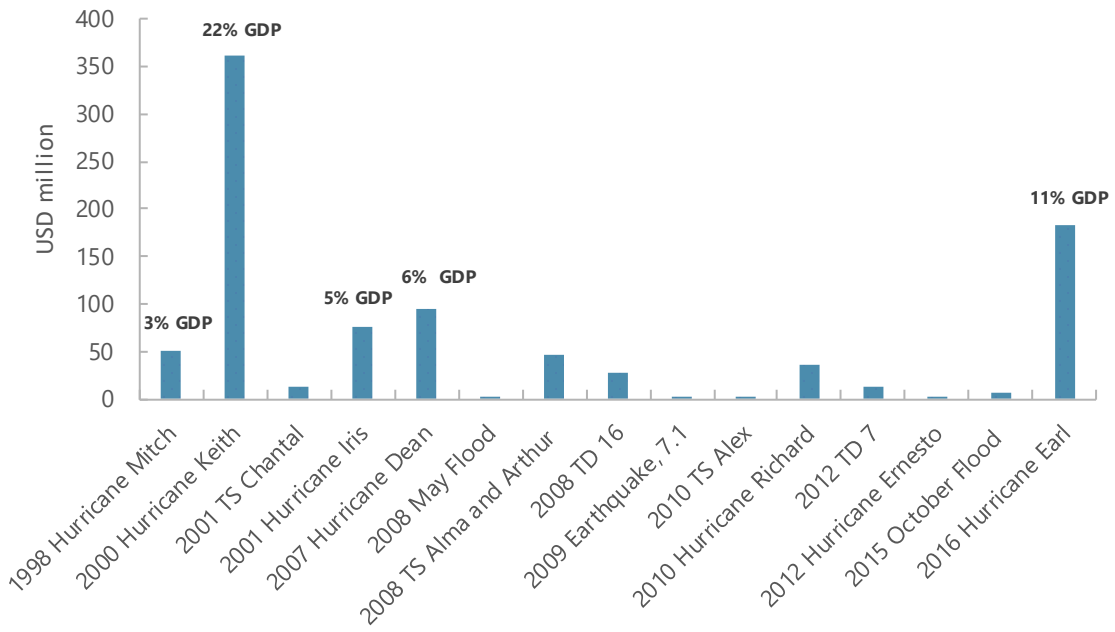
[3] Global Climate Risk Index 20172018. *https://germanwatch.org/en/14638*.

[4] Estimates based on actuarial analysis of historical direct and indirect damage to each sector from wind and flood-related events. "World Bank Group. 2018. Advancing Disaster Risk Finance in Belize." World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/29748 License: CC BY 3.0 IGO.

variable rainfall are expected to exacerbate existing water supply problems and undermine the profitability of agriculture and tourism.

- In October 2010, Hurricane Richard (Category 1) led to extensive forest destruction leaving much dry debris which accumulated and caused forest fires. Consequently, Belize experienced extensive forest fires across the country during the 2011 dry season. In addition to the estimated 25,092 ha of cleared lands, another 33,129 ha were estimated to have suffered from fire/hurricane damage between 2010 and 2012.[5]

Figure 1. Belize: Losses From Natural Disasters in Belize Since 1995
(millions of 2015 US dollars)



Source: World Bank (2018) based on Desinventar, the Caribbean Disaster Emergency Management Agency.

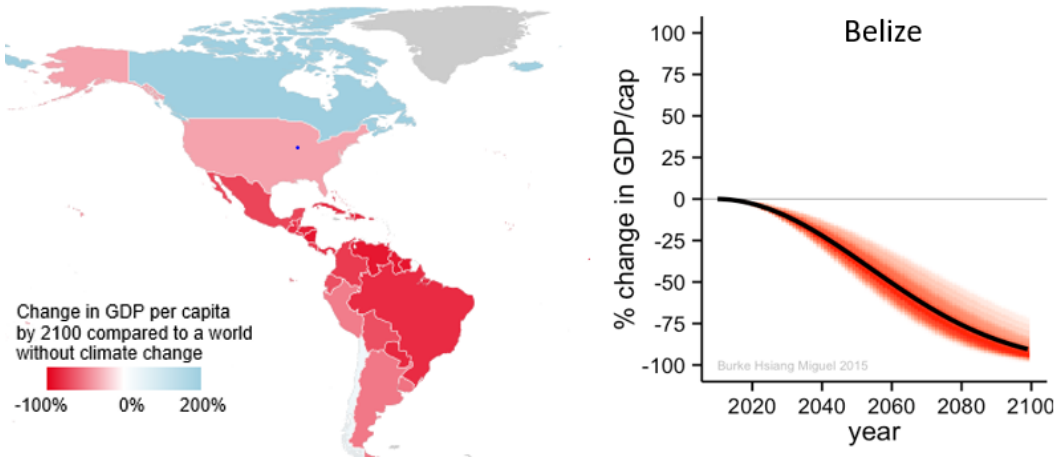
- On natural disasters, Belize is close to the boundary of three tectonic plates and faces minor seismic and tsunami risk. There are no records of a major earthquake; however, a significant seismic event cannot be completely ruled out (for example, the submarine volcano Kick-em-Jenny, near Grenada has had frequent eruptions and generated tsunamis around 2-meter-high that affect the coast of Belize).

[5] Forest damage from fire/hurricane was not included in the deforestation estimate of 2012, because deforestation implies land use change. Cherrington et al. 2012.

What Impact Could Climate Change Have on Macroeconomic Sustainability?

5. As in the rest of its surrounding region, Belize's economic activity is expected to be severely affected by climate change. An influential world study (Burke, Hsiang, and Miguel, 2015) predicts a loss of 75–100 percent of GDP for Belize by 2100, with high probability, relative to the no-climate-change scenario (Figure 2).[6] Since the study is based on historical relationships between temperature and growth, it may underestimate the costs associated with sea-level rise.[7] In 2000, Hurricane Keith caused damages exceeding 45% of GDP, and one year later Hurricane Iris submerged Belize City in 14-feet storm surges and destroyed about 4,000 homes. Tropical Storm Arthur in May 2008 caused extensive damages to critical infrastructure and the agriculture sector, and an average of 3.3% of GDP was lost annually between 1993 and 2012 from disasters. The fiscal impacts of disasters require significant capital expenditures to repair and reconstruct damaged infrastructure, resulting in increased debt, large budgetary deficits and unreliable funding streams, which collectively can limit sound macroeconomic growth. At the same time, as discussed in IMF (2017), estimates regarding the effects of climate change on economic activity are subject to important caveats. Extrapolating from the near-term effects of weather shocks estimated from historical data to the long-term impact of potential global warming may overstate the size of the effects if households, firms, and governments adapt to the new environment. In addition, the results are sensitive to the estimation approach adopted. For example, by adopting a conservative approach and assuming that weather shocks affect only the level of output over the long term, and not its growth rate, IMF (2017) estimates a substantial negative effect of climate change for Belize, but one that is smaller than that estimated by Burke, Hsiang, and Miguel (2015).

Figure 2. Expected Economic Loss from Climate Change



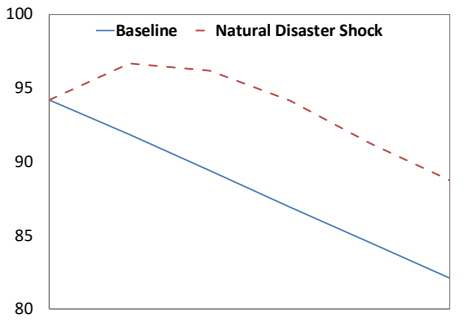
Source: Burke, Hsiang, and Miguel (2015). Impact under RCP 8.5 scenario.

[6] Burke, Hsiang, and Miguel, 2015, "Global Non-linear Effect of Temperature on Economic Production," *Nature*.

[7] See for instance, http://globalfloodmap.org/Belize.

6. Belize's debt is elevated (about 94 percent of GDP at end-2017) and its sustainability is vulnerable to the impact of natural hazards and climate change. In the past, hurricanes have both reduced growth in GDP, and required an increase in debt-financed government spending for emergency assistance and reconstruction. The afore-mentioned effects of lower GDP growth from rising temperatures would further exacerbate pressures on government debt. For Belize to maintain its macroeconomic sustainability, it must build enough resilience to lower the economic costs of climate change.

Figure 3. Government Debt
(Percent of GDP)



7. Building natural hazards into the baseline projection in the 2018 Article IV Staff Report illustrates the threat that they pose to debt sustainability. The illustrative staff scenario (Figure 3) assumes that a hurricane causes 6 percent of GDP in economic damages, about half the size of the economic damage inflicted by Hurricane Earl in 2016. Following a disaster of such magnitude, real GDP growth is assumed to decline by 3 percentage points in the year of the disaster, compared to baseline, by 1 percentage point in the next year, and to grow faster than baseline by ½ percentage point in the following two years (reflecting reconstruction activity).[8] The scenario assumes that the cost borne by the government is, based on historical accounting, ⅔ of the economic damage, corresponding here to 4 percent of GDP. The associated government recovery and reconstruction expenditure is assumed to be spread over 3 years: 2 percent of GDP in the first year, and 1 percent of GDP in each of the next two years, respectively. The shock would have a material impact on government debt, shifting the entire trajectory up by around 7 percent of GDP above the baseline, with government debt at 92.1 percent of GDP by end-2023.

8. Climate change could also have a severe impact on electricity generation in Belize, particularly hydropower that provides around half the country's electricity. Changes in precipitation and evaporation would affect river flows, reservoir inflows and ultimately, power production. Therefore, climate change is also likely to lead to greater uncertainties over the availability of water for many uses, including energy production, and will pose challenges to Belize's capacity to manage water infrastructure effectively. Future reductions in inflows due to climate change could see hydropower production decrease by up to 10%, as early as the 2020s. In addition, significant elements of the fossil fuel supply, electricity generation and transmission infrastructure of Belize are on, or close to, the coast. These include power stations, substations, and sections of the transmission lines. Storage depots for fossil fuels at Belize City Port and Cala Grande in the south are vulnerable to coastal storm surges, inundation, sea level rise and coastal erosion.

[8] These assumptions are consistent with estimates of the relation between growth and natural disasters in IMF (2017) (Chapter 2).

9. Finally, Belize's export economy is centered on tourism and natural resources, with a substantial part of the population also depending heavily on fisheries and traditional agriculture.[9] With the tourism sector estimated to employ around 28% of Belize's workforce, and responsible for 21% of its GDP in 2014; and fisheries employ around 15% of the population, the economic impacts of climate change could be significant.

10. Belize's NDC has a costed mitigation strategy (though some baselines and policy actions are missing), and a partly-costed adaptation strategy. The NDC[10] includes a target for emissions reduction, conditional on technology, capacity, and financial support, with an indicative quantified mitigation strategy to meet the reduction target (Belize's Sustainable Energy Action Plan is to conditionally mitigate GHG emissions by 24 million tons between 2014 and 2033). It also includes a discussion of adaptation needs and appends costed information on mitigation and adaptation needs in key sectors from Belize's 2014 National Climate Change Policy, Strategy and Action Plan (NCCPSAP). While the authorities emphasize that the NDC is a work-in-progress, which will need to be amended, it already provides a good, relatively comprehensive foundation for funding and implementing a climate-change response.

Is the Climate Response Strategy Consistent With Broader Development Goals?

11. Yes. A strong point of Belize's NDC is its close links to other climate change strategy documents and national development documents. The NDC quotes, and is closely built on, the NCCPSAP, which in turn refers to the more detailed 2013 *National Climate Resilience Investment Plan* (NCRIP). The 2016–19 *Growth and Sustainable Development Strategy* (GSDS) prescribes moving forward with the implementation of these plans. The GSDS and *Horizon 2030: National Development Framework for Belize 2010–30* specify environmental stewardship as one of four critical success factors for development.

B. Disaster Planning and Other Contingency Plans

How Well-Prepared is the Country to Cope With Possible Intensified Disasters?[11]

12. Belize has matured and well-understood institutions for physical emergency response, but lacks adequate institutional, legal and financial architecture that can link relief to sustainable recovery in order to implement disaster risk reduction for adequate protection from disasters. The Disaster Preparedness and Response Act (2000 and 2003) established a National Emergency Management Organization (NEMO); this is a whole-of-government committee

[9] A WRI study in 2008 estimated that the value of the reef and fisheries, tourism and shoreline protection contributed $700 million annually to Belize; higher estimates peg the value of the reef closer to one billion dollars annually. Tourism alone brings in $680 million annually and by far the biggest and most popular attractions for visitors are the marine protected areas, according to the government's own statistics, as compiled by the Belize Tourism Board. Commercial fishing brings in only about US$14 – $16 million annually for about 4,500 licensed fishermen and their families, but sport fishing already provides 2,000 jobs, and the Bonefish Tarpon Trust estimates sport fishing contributes about $100 million annually to the Belizean economy.

[10] https://unfccc.int/files/focus/ndc_registry/application/pdf/belize_ndc.pdf

[11] This section draws heavily on *Advancing Disaster Risk Financing in Belize*, World Bank Group, February 2018.

backed by a small permanent office. Ministries' responsibilities in emergencies are fully articulated; for instance, the Ministries of Natural Resources and Agriculture are responsible for post-disaster Damage Assessments and Needs Analysis (DANA). NEMO's website defines emergency plans and identifies local committees. While this provides the legal basis for marshalling the human resources necessary to confront disasters, there is no corresponding legislative clarity on funding the human resources or disaster response activities. As discussed in Section VII below, there is little financial planning or provisioning. Moreover, organizational and legislative frameworks mainly support emergency management, rather than also addressing comprehensive risk management. The National Hazard Mitigation Policy (not yet officially adopted) lacks a focus on risk mitigation—a gap which needs to be amended.[12]

13. Budget planning for damages is hindered by shortcomings in historical data management at NEMO and the Ministry of Finance. Systems are in place for DANA, but they lack procedural standardization across the ministries where NEMO committees operate to capture disaster events of all magnitudes and provide uniform estimates of associated economic loss in a publicly available and continually updated database. Tracking subsequent expenditures for relief and reconstruction is also difficult and lacks specificity (e.g., traceability to the spending unit and funding source). CARTAC is assisting Belize with a revision of the chart of accounts which is intended to address this problem; a corresponding reform of budget classification would then also be important.

14. Aid flows for disaster response have been low. Since 1990 Belize has experienced an estimated US$ 557 million in disaster losses,[13] while AidData records only US$ 80 million in loans and grants received by Belize for disaster response since 1990 (of which US$ 59 million from the IDB and US$ 16 million from the CDB and EU). The government has tended to rely on debt financing to cover recovery and reconstruction costs. For instance, debt peaked at 85 percent of GDP after Hurricane Dean cost US$ 89 million in damages in 2007, then declined until re-peaking at 100 percent of GDP after Hurricane Earl in 2016. Damages associated with Hurricane Earl are estimated at 11 percent of GDP.

15. The institutional framework needs strengthening to enable it to systematically assess and quantify the economic and fiscal impact associated with disasters. Priorities include better information collection and use, and a more strategic approach to disaster financing (as discussed further in Chapter VI). Belize would benefit substantially from a data-rich environment to inform decision making for disaster risk financing. This includes ensuring that DANAs uniformly and consistently record direct damages and economic losses from all magnitudes of disasters, and that

[12] The Sendai Framework for Disaster Risk Reduction recommends prioritizing the strengthening of disaster risk governance in the country for prevention, mitigation, preparedness, response, recovery and rehabilitation. The institutional approach to reduce disaster risks can empower national as well as local authorities through regulatory and financial means to work and coordinate with civil society, communities and indigenous peoples and migrants in disaster risk management at the local level. Furthermore, disaster risk governance system can also strengthen investments in climate change adaptation for resilience building. Sendai Framework for Disaster Risk Reduction 2015-2030, United Nations, March 2015

[13] EM-DAT: The Emergency Events Database - Université catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium.

post-disaster expenditures are easily traceable to accurately assess the cost of disasters to the government The World Bank's February 2018 report on *Advancing Disaster Risk Financing in Belize* included the following institutional recommendations:[14]

- Streamline and institutionalize a damage and loss data collection and reporting system across ministries for all severities of events.
- Reinforce the role of budgetary planning for disaster-related contingencies at the ministry level and institutionalize the strategy to encompass line ministries as well as MED.
- In budget reporting, identify expenditure for disaster response, categorized by sector and event.
- Formalize and implement a disaster risk financing (DRF) strategy, including a budgetary process for financing disaster response, and engagement with development partners on contingent financing.
- Prepare a manual for post-disaster financing, that captures the actors, the systems, the various sources of financing, and the process to disburse and utilize funds across ministries.

Recommendations for General Preparedness

1. Review and update the NDC to reflect developments since the Paris Accord, including changes in cost estimates and records of progress.

2. Maintain Belize's good emergency response procedures, with NEMO as a leading actor, while extending disaster management processes to encompass a more strategic approach to comprehensive risk management—meaning more focus on ex ante preparedness.

3. Improve information collection on the costs of disasters, disaster response expenditure, and sources of financing.

4. Formalize a national disaster risk financing strategy, including improving availability of data on losses from disaster, inventorying public assets, clarifying budget processes and engaging with development partners on financing modalities.

CONTRIBUTION TO MITIGATION

Belize plans to meet its mitigation targets by expanding renewables, reducing energy intensity and fossil fuel use in transportation, and protecting forest reserves and improving sustainable forest management. It has limited scope to raise carbon taxes unilaterally, but feebates could improve the mitigation incentives in the tax system.

Belize's NDC aims for a reduction in carbon dioxide emissions by 62 percent from business as usual levels, and an increase in the share of renewable energy (RE) in its electricity mix to 85 percent, by 2030. These targets are conditional.

[14] The report's recommendations on contingent financing are addressed in Chapter VI.

How Does Belize Plan to Meet its Emissions Reductions Targets?

16. Belize's contribution to global greenhouse gas emissions (GHGs) is tiny, but mitigation is nonetheless important for small states. It gives them credibility in dialogue on the Paris process, potentially leverages external finance, mobilizes domestic revenues through good carbon pricing, and promotes energy security.

Table 2. Belize: Mitigation Objectives and Proposed Actions in Belize's NDC

Sector	Mitigation objective 1/	Proposed actions
Renewables	Expand share in electricity supply from 57% to 85% by 2030.	PUC contracts.
Electricity	Reduce per capita consumption by at least 30% by 2033.	Reduce trans./dist. Losses from 12% to 7% by improving energy efficiencies (policies TBD)
Transport	Reduce fossil fuel use by at least 20% by 2030.	TBD
Forestry	Reduce annual CO_2 (currently 3.3 mn tons)	TBD
Other	Reduce emissions from mangroves, wate, fuel wood.	TBD

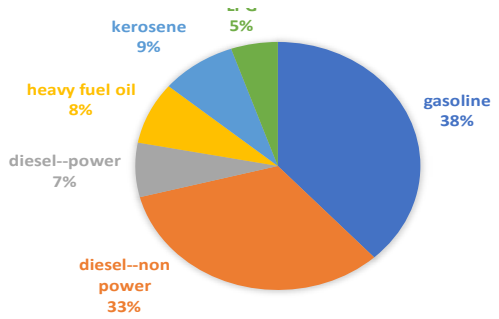
Source: Belize NDC.
1/ Baseline years against which targets will be measured are to be determined.

17. Belize's NDC contains several mitigation commitments, though baselines for some of the targets need to be developed, as well as policy actions to implement the targets (Table 2). The main commitments are: (i) to scale up renewables from 57 to 85 percent of electricity supply by 2030; (ii) to reduce electricity use per capita by at least 30 percent by 2033; (iii) to reduce fossil fuel use in transportation by 20 percent by 2030; and (iv) to reduce CO_2 emissions from forest and land use changes (currently estimated at 3.3 million tons a year due to forest clearance). Baseline years against which most of these targets can be measured will need to be specified in future revisions to the NDC—for example, whether the reductions in electricity intensity and transportation fuels are relative to their projected business as usual (BAU) levels in some future year, or their levels in some historical year. And policy instruments for implementing the commitments are largely to be determined, aside from the renewables expansion which is to be implemented through PUC contracts with private investors. Other mitigation commitments in the NDC include reducing fuel wood consumption among rural households, protecting and restoring mangrove forests, and improving waste management to reduce methane emissions.

18. There could be significant benefits to making headway on these mitigation targets. A successful scaling up of renewable energy, and reduction in fossil fuels for transportation, would promote energy security and create significant savings in the bill for imported energy (currently about 5.5 percent of GDP). Meeting the renewables target would reduce the energy import bill (from fossil fuels and imported power) by 12 percent in 2030 (to 5.0 percent of GDP) and cut nationwide 2030 CO_2 emissions by 5 percent below BAU levels—see below for details. Promoting the sustainable intensification of agriculture would slow the rate of deforestation, helping to preserve biodiversity and creating new opportunities for eco-tourism.

A. Clean Energy Plans

Figure 4. Energy-Related CO_2 Emissions by Fuel Type



Source. IMF spreadsheet.

19. Expanded use of renewable energy is potentially feasible, but support may be needed for project development, and it would have a modest impact on nationwide CO_2 emissions.[15] Unlike in some other small states, substantial renewable generation is already established in Belize. Hydro accounts for about 40 percent of domestic electricity supply and biomass another 17 percent (bagasse from sugar production). Both sources, along with solar PV (given ample sunlight and land availability), could be scaled up with a relatively modest premium above imported supply from Mexico, which currently provides about 35 percent of domestic supply and is typically priced at around US 6 to 12 cents per kWh.[16] A potential obstacle appears to be the high upfront costs incurred by private bidders in conducting needed assessments (cost, environmental, and other) during proposal development; partial public funding of these costs may be needed.[17] Currently diesel plants account for 8 percent of electricity supply and CO_2 emissions from the power sector are only 7 percent of nationwide (energy-related) emissions—gasoline accounts for 38 percent, and other diesel uses 33 percent (Figure 4).

20. Options for policy instruments, and their design specifics, for achieving other commitments—for reducing electricity intensity, transportation fuels, and forestry emissions—need to be studied. An immediate priority is to establish modelling capacity for projecting business-as-usual (BAU) fuel use by sector, and hence emissions, and the impacts of policies on fuel use/emissions. This capability would help policymakers understand the trade-offs between different instruments, in terms of their impacts on energy use, energy prices, emissions, revenue, and import bills, and the needed stringency of policies. A simplified spreadsheet tool is used for some preliminary analysis here (see below). Policy proposals will then need to be fleshed out in consultation with stakeholders and supporting legislation put in place.

21. Some of the needed investments, most notably for the expansion of renewables, will need refinements to their costing, screening and prioritization. A preliminary assessment for the NDC put cumulative investment costs at US $58 million (in net present value) for hydro projects, US$39 million for bagasse projects, and US $45 million for solar PV over the period 2015–2030. The

[15] This paragraph is based on discussions with PUC.

[16] For example, five potential sites for new hydro plants have been identified and developing three of them would meet objectives for hydro expansion by 2030. A consolidated project plan for the energy sector is being developed in partnership with the Rocky Mountain Institute (RMI) and the Clinton Climate Initiative (CCI) to identify investment opportunities in energy efficiency and renewable energy resources.

[17] The mission heard conflicting views on the potential for rooftop solar in contributing to the renewables target. One view is that allowing households and business to sell power back to the grid would provide strong incentives for deployment of solar panels, while another is that incentives would be weak (apart from businesses wanting to brand themselves as environmentally friendly) as the upfront installation costs, expressed per kWh over the panel life, currently exceed the cost of power available from the grid.

goal is to mobilize this mainly from private investors seeking PUC contracts, but the government is likely to have to incur ancillary costs. In addition, climate resilience considerations affecting water supply for hydropower need to be taken into account.

B. Fuel/Carbon Taxation and Fuel Subsidy Policies

22. Belize's mitigation strategy does not include any adjustments to its carbon pricing, given its starting position. Fuel taxes are already significant; energy prices are higher than in most Caribbean/Central American countries; and emissions are less sensitive to carbon pricing than in other countries with more emissions-intensive power generation. These considerations may limit the scope for future unilateral increases in energy taxation or carbon taxation.

- Current excises are US$1.81 per gallon[18] for premium gasoline, US$1.64 per gallon for regular gasoline, US$1.49 per gallon for diesel, US$0.53 per gallon for kerosene and heavy fuel oil. Exempt from excises are liquified petroleum gas (LPG) (principally used by rural households for cooking but comprising a small share of fossil fuel use) and diesel fuel for power generation. Fuels are subject to normal procedures under the GST.[19] Gasoline and diesel account for three-quarters of fossil fuel consumption in Belize. As of 2015, 10 of 18 countries in the region (Figure 5) had lower gasoline and diesel prices than in Belize.

- Electricity prices in Belize are generally set to cover supply costs,[20] and electricity is also covered by the GST, although with a distortionary provision for low consumption.[21] As of 2015, only 2 countries in the region (Figure 6) had higher electricity supply costs than Belize.

- The power sector in Belize contributes only 7 percent to nationwide CO_2 emissions and therefore carbon pricing may be relatively less effective at reducing emissions than in other countries with greater opportunities for decarbonizing the electricity sector.

Does the Current Tax/Subsidy System Deliver Appropriate Carbon Pricing?

23. Current fuel taxes fall short of delivering mitigation commitments. To deliver the NDC commitments, policy actions are needed to reduce Belize's electricity consumption per capita by 30 percent, and transport fuel use by 20 percent, regardless of whether these targets are defined relative to 2015 or projected BAU fuel use in 2030 (or an intermediate year).

[18] Gallons are US, not imperial.

[19] Fuels are also subject to a modest environmental tax of US $0.08 per gallon.

[20] There are cross-subsidies for elderly and rural households.

[21] No GST is paid on electricity bills up to BE $50, but full GST is applied to bills exceeding BE $50, creating incentives to limit consumption below this threshold (e.g., by installing multiple meters in one building). Ideally, this provision would be removed.

- According to spreadsheet modelling by IMF staff[22] electricity consumption per capita will decline only to 85 percent of 2015 levels by 2030 without changes in energy taxes or additional mitigation policies (Table 3).[23]

- And the projected use of transport fuels remains approximately stable, as growth in demand for vehicle travel (from rising GDP) offsets gradual autonomous fuel efficiency improvements and the dampening effect on fuel demand of higher (real) international oil prices (assumed to rise 25 percent between 2018 and 2030).

- In the BAU scenario, fuel tax revenues decline as a percent of GDP, from 3.6 in 2017 to 2.9 percent in 2030, with the decline in fuel use relative to GDP, while the imported energy bill remains at 5.6 percent of GDP (the extra costs of rising international oil prices offset the decline in fuel intensity of GDP). Meeting the renewables target would reduce the import bill to 5 percent of GDP, although it would not help lost tax revenue.

Figure 5. Road Fuel Prices and Taxes, Selected Countries, 2015 (or nearest year)

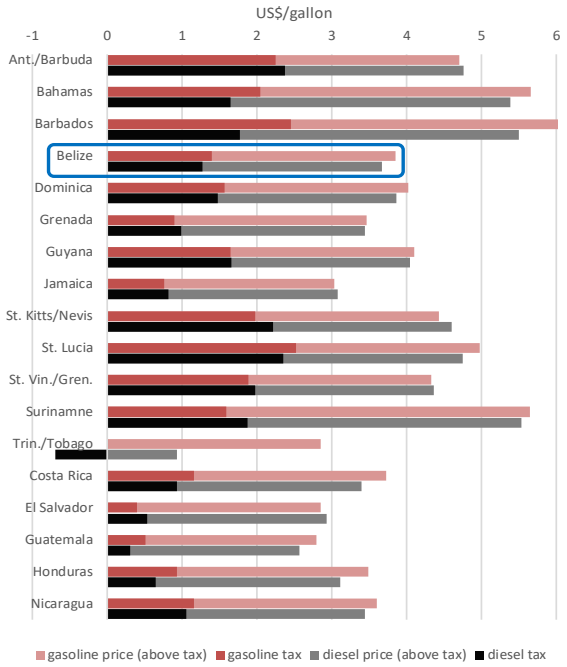
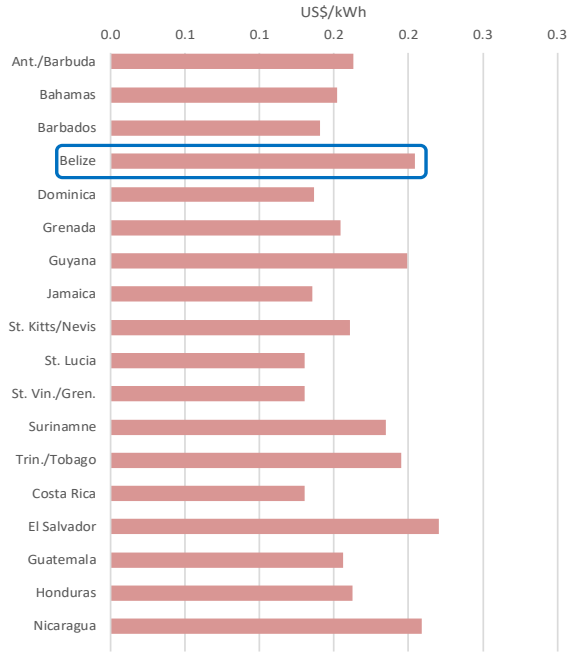


Figure 6. Electricity Supply Costs, Selected Countries, 2015 (or nearest year)



Source: IMF staff estimates from 2015.

[22] Annex I contains a description of the model and its parameterization for Belize.

[23] This decline reflects gradually improving energy efficiency (as older, less efficient capital is retired) and a standard assumption that electricity demand rises somewhat less than in proportion to GDP.

Table 3. Belize: Comparison of Alternative Mitigation Policies

Policy scenarios	Electricity consumption per capita, rel. to 2015			Fossil fuel use in transport, rel. to 2015			Energy import bill, % GDP			Revenue from energy taxes, % GDP			CO_2 emissions from energy/transport, rel. to 2015		
	2020	2025	2030	2020	2025	2030	2020	2025	2030	2020	2025	2030	2020	2025	2030
NDC target, rel. to 2015			0.70			0.80									
BAU	0.89	0.86	0.85	0.95	0.96	0.96	5.6	5.6	5.6	3.4	3.1	2.9	0.95	0.95	0.96
Renewables	0.89	0.86	0.85	0.95	0.96	0.96	5.5	5.2	5.0	3.4	3.1	2.9	0.94	0.93	0.91
Elect. tax/renewables	0.88	0.82	0.79	0.95	0.96	0.96	5.5	5.2	4.9	3.5	3.6	3.6	0.94	0.93	0.91
Road fuel tax	0.89	0.86	0.85	0.94	0.92	0.91	5.5	5.5	5.4	3.5	3.6	3.6	0.94	0.93	0.92
Elect. feebate/renewables	0.86	0.78	0.73	0.95	0.96	0.96	5.4	5.2	4.9	3.4	3.1	2.9	0.94	0.92	0.91
Vehicle feebate	0.89	0.86	0.85	0.93	0.88	0.85	5.5	5.3	5.2	3.3	2.9	2.6	0.93	0.90	0.88
Renew./feeb. combination	0.86	0.78	0.73	0.93	0.88	0.85	5.3	4.9	4.4	3.3	2.9	2.6	0.92	0.87	0.83

Source: IMF staff spreadsheet model, drawing on fuel use, price, and tax data from the Belize authorities.

How Could Belize's Tax System be Reconfigured for More Effective Carbon Pricing?

24. Higher fuel taxes would be effective at mobilizing revenue but would not help much to achieve the mitigation targets. Their energy and emissions savings are relatively modest and higher taxes could be politically challenging. Progressively increasing excises on gasoline and (non-power) diesel by US $0.80 per gallon by 2030, or about another 50 percent, would raise extra revenues of 0.7 percent of GDP in 2030, but reduce fossil fuel use in the transport sector by only around 5 percent below BAU levels in 2030 (Table 3). The increases would raise 2030 pump prices by around 15 percent, but the resulting behavioral responses—people driving less, switching to more fuel-efficient vehicles—are probably limited.[24]

25. Imposing an excise tax on electricity consumption has similar pros and cons. Excises on electricity consumption (both residential and industrial/commercial) are routinely imposed in some countries, partly on environmental grounds, for example in EU member states. Phasing in an excise rising to US 4 cents per kWh on electricity consumption in Belize (which could be collected by PUC) would raise user prices by approximately 20 percent in 2030 and raise new revenues of 0.7 percent of GDP (Table 2). The energy/security/emissions benefits would be limited however—electricity consumption per capita would fall by around 7 percent in 2030 (based on a standard assumption about the price responsiveness of electricity demand) and the energy import bill by only 0.05 percent of GDP. And the tax could make electricity in Belize the most expensive in the region (Figure 6) with significant implications for the country's overall competitiveness. A carbon tax (a tax on all fossil fuels in proportion to their carbon content) would promote similar behavioral responses

[24] Investment in a sugar plant, for power generation from bagasse and production of ethanol for use in the vehicle fleet, could cut transportation fuel use by around 10 percent (the limit on ethanol blending in regular vehicles), though this investment would be essentially determined through the tender process for power contracts rather than market responses to higher fuel taxes.

as higher road fuel taxes and electricity taxes combined. It would also raise the relative cost of generation from diesel, thereby increasing the competitiveness of renewables in the tender process.

26. 'Feebates' could play a more effective role than stand-alone tax increases in achieving mitigation commitments. Feebates are sliding scales of fees/rebates designed to shift demand towards more energy-efficient vehicles and products. They increase the price of products with relatively low energy efficiency while decreasing them for products with relatively high energy efficiency. They forgo the new revenues from higher energy taxes and are less effective than carbon pricing since they do not increase average product prices—in other respects, however, they provide similar incentives to fuel taxes (and similar rewards/penalties for products with high/low energy efficiency). It may be politically feasible to provide stronger incentives for improving energy efficiency under feebate schemes than from raising fuel taxes however, through more aggressive fees on inefficient options.[25] Finally, while conceptually feebates are revenue-neutral, they allow the average tax rate in the scale to be set at whatever level generates the desired revenue.

27. Compared with regulatory approaches, feebates are more flexible and less administratively burdensome. The regulatory alternative is energy-efficiency standards for different product categories. However, standards can limit consumer choices by prohibiting less efficient (but cheaper) products from the market; are difficult to design in a way that provides uniform rewards for improving efficiency across different product categories; and would require administration by a new agency (rather than modifying existing excise collection). Feebates are in line with IMF and World Bank advice internationally, which is to favor more effective, cost-effective, and flexible price-based instruments over regulatory approaches for meeting environmental objectives.[26]

28. A comprehensive system of feebates applied to vehicles and electricity, along with the renewables expansion, would go a long way to meeting mitigation pledges, though reduced fuel excise collections would need to be offset. A system of feebates providing four times the price incentive for improving energy efficiency as under the above fuel/electricity tax scenarios, when combined with the renewables expansion, would cut 2030 electricity consumption per capita by 27 percent, and transportation fuel use 15 percent, below 2015 levels, while reducing the energy import bill by 22 percent to 4.4 percent of GDP in 2030 (Table 3). Annex II provides more detail on how feebates might best be designed for the transport and electricity sectors.

29. Feebates would not however be a panacea. Some sectors may need transitional assistance. Moreover, more stringent, or additional policies (e.g., ethanol blending in transportation) would still be needed to fully meet mitigation pledges, and more so, if targets are defined relative to

[25] Unlike fuel taxes, feebates do not encourage less intensive use of energy-consuming products, for example, less use of vehicles—in fact, by lowering average energy costs per unit of product use they may encourage greater use of energy-consuming products, the so-called 'rebound effect'. Empirical studies suggest this effect is generally modest however. See, for example, Kenneth Gillingham and others, 2016, "The Rebound Effect and Energy Efficiency Policy," *Review of Environmental Economics and Policy*, 10: 68–88.

[26] The incentive feebates create for shifting to more energy-efficient products can be strengthened by product labelling requirements informing consumers about the lifetime energy costs of different models.

the BAU in 2030 rather than 2015. Furthermore, fuel tax revenues in 2030 decline to 2.6 percent of GDP in this scenario due to shrinkage of the tax base for fossil fuel excises, suggesting the need for offsetting revenue increases; a higher average vehicle excise within a feebate structure would be one possibility.[27]

C. Forestry and Agriculture

30. Forest cover in Belize decreased from 73 percent in 1989 to 60 percent in 2014 and, in the absence of mitigating measures, the trend is expected to continue with expansion of agriculture, housing, and tourism. In addition to providing a wide range of economic and social benefits, 95% of the country's emission of GHGs come from Land Use, Land Use Change and Forestry (LULUCF).[28] Interventions to avoid deforestation and to promote reforestation of degraded forests would significantly enhance the country's potential for climate change mitigation.

31. Against this background, Belize is in a unique position to reduce emissions from deforestation and forest degradation and to increase carbon stocks through enhancement of conservation and sustainable management of forests (REDD+). Through an ongoing REDD+ Readiness process to be completed by 2020,[29] Belize is assessing the drivers of deforestation and forest degradation and establishing a baseline inventory of forest carbon storage for different parcels of land, thereby strengthening the capacity to participate in future REDD+ carbon payment transactions.[30]

32. A feebate program targeted at marginal changes in sequestered forest carbon could provide nationwide incentives on private lands for carbon storage and other environmental objectives. A feebate applied to the forestry sector would provide a sliding scale of subsidies for increases in sequestered carbon relative to that in the baseline and impose taxes on carbon releases relative to baseline storage. Carbon benefits from expanding forest coverage relative to baseline levels are potentially significant[31] and forest protection more generally can also prevent degradation of watersheds, soil erosion, flooding, and loss of biodiversity.

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[27] This would be in line with the NCCPSAP's proposal for a vehicle efficiency levy (p. 127).

[28] The Third National Communication to the United Nations Framework Convention on Climate Change, 2016.

[29] World Bank, 2016. *Readiness Preparation Proposal Assessment Note on a Proposed (Loan/Credit) in the Amount of US$ 3.80 million to Belize for a Forest Carbon Partnership Facility.* REDD+ Readiness Preparation Project P152415. Belize currently has 103 protected areas covering 36 percent of the country's total land area.

[30] Satellite imagery can reveal visible land use changes (e.g., clear cutting), low-level aerial photography along forest boundaries (using technologies like Light Detection and Ranging) can go a long way in measuring wood volumes, and on-the-ground sampling (perhaps once every several years) can be used to infer weight and hence carbon content. See, for example, R. Mendelsohn, R. Sedjo and B. Sohngen, 2012. "Forest Carbon Sequestration" in I. Parry, R. de Mooij, and M. Keen (eds), *Fiscal Policy to Mitigate Climate Change: A Guide for Policymakers*, IMF, Washington, DC.

[31] Increasing nationwide forest coverage in Belize by 1 percent might sequester an extra 0.23 million tons of CO_2 per year (though changes in forest practice might add significantly to this). 1 percent of land area in Belize is about 40 square miles, or about 22,500 hectares. In moist tropical regions new forests can sequester up to about 11 tons of CO_2 per hectare per year in above-ground biomass and about another 3-4 tons below ground (see Mendelsohn and others 2012 above).

33. Feebates avoid the narrower effectiveness and higher transactions costs of project-based approaches, large budgetary costs, complications posed by measuring 'additionality', and (within country) carbon leakage. A nationwide program provides incentives for all landowners to increase carbon storage through changes in forest practice[32] to sequester more carbon per hectare and convert marginal lands to forests—in contrast, project-based approaches have a narrower focus (e.g., high transactions costs exclude small-scale landowners). The feebate limits payments to carbon storage that is additional, that is, it avoids paying for a lot of carbon that would have been stored anyway without the program. The feebate can be designed to be revenue-neutral, or revenue-raising, through simple formulas for adjusting the baseline (e.g., relating fees/rebates to the baseline carbon scaled up by, say, 10 percent, would increase prospects for raising revenue on net). And land clearance in one region of the country in response to reduced deforestation/afforestation elsewhere in the country is automatically penalized, unlike under a project-based approach focusing only on the latter region. Landowners potentially deserving of subsidy payments have strong incentives to help program administrators with the monitoring and verification process. The scheme would be operationally similar to the Payment for Environmental Services Program established by Costa Rica in 1996 under which landowners receive payments related to ecological services.[33]

34. Feebates should involve annual tax/subsidy, or 'rental', payments, rather than large one-off payments when the change in land use occurs. The problem with the latter is that changes in land use may not be permanent (e.g., a new tree farm receiving an upfront subsidy may be subsequently harvested), requiring complex, ex-post re-payment procedures. And once upfront payments have been made, landowners may lack sufficient incentives to manage risks of accidental tree loss (e.g., through fires). Ideally, the rental payment would equal the implicit CO_2 price imposed in the energy sector times the (real) interest rate.[34]

35. There is also a slightly different case for feebates in agriculture. Incentives could be provided to reduce expansion of the agricultural frontier and to adopt management practices that result in reduced emissions (e.g., no burning of crop residues, reduced mechanical cultivation, adoption of improved livestock feeding practices) and carbon sequestration (e.g., incorporation of crop residues).

D. Regional Carbon Pricing

36. Belize would benefit from a regional carbon price floor. Unilateral increases in energy taxes in Belize would raise concerns about competitiveness (e.g., for tourism and agricultural

[32] This includes converting forests to plantations, postponing timber harvests, tree planting rather than natural regeneration, thinning to increase forest growth, fighting forest fires, and fertilizing.

[33] See, for example, S. Pagiola, 2008, "Payments for Environmental Services in Costa Rica," Ecological Economics 65, 712–724.

[34] For example, if the implicit CO_2 price in the energy sector is $50 per ton, the rental payment should be $2.5 per ton of sequestered CO_2 per year, assuming a 5 percent discount rate.

exports) and burdens on vulnerable households.[35] However, better carbon pricing is needed. Its benefits could best be reaped by a regional carbon price floor arrangement, based on the model for Canadian provinces and territories.[36] Although carbon pricing schemes—charges on fossil fuels in proportion to carbon content—are proliferating elsewhere,[37] they are yet to be meaningfully introduced in Caribbean and Central American countries; regional policymakers should consider doing so to reinforce their NDCs without incurring tax disadvantages.

Recommendations for Reducing Energy Intensity/Emissions

1. Progressively, and cost-effectively, expand hydro, biomass, and solar power to meet the renewables commitment.
2. Consider the need for some government financial involvement to cover costs that inhibit private investors in mitigation projects (e.g., assessment costs for new generation sites).
3. Modify the excise tax system for passenger, bus, and goods vehicles to include a feebate with the implicit CO_2 price rising over time, and an ad valorem component set to maintain revenue.
4. Modify the excise tax system for electricity-using products to include a feebate with the reward for energy efficiency rising over time and an ad valorem component set to maintain revenue.
5. Consider a feebate system to promote carbon storage in the forestry sector, following completion of the forest carbon inventory.
6. Discuss with other countries the possibility of introducing a carbon price floor arrangement for the Caribbean region to support the NDC process.

ADAPTATION PLANS

Belize has clearly-specified adaptation priorities and has identified necessary actions. Some further costing is needed for large infrastructure projects.

Has Belize Developed an Adequate Strategy to Adapt to Climate Change?

A. Policy Framework and Sectorial Strategies

37. Belize has a well-articulated policy framework and sectoral strategies for resilience-building, though some gaps in costing remain. As outlined in Chapter III, the NCCPSAP built on the costing and stakeholder-consultation exercise carried out in 2013 with the help of the World Bank (NCRIP), and the main components of the NCCPSAP fed into Belize's NDC. Despite differences between the documents (including in vintages and time-periods covered, specificity of interventions described, cost estimates), the headline priorities in each key sector come out clearly and are justified by prior identification of the climate-related vulnerabilities facing each sector. These

[35] The cross-border mobility of the tax base is less of a concern, given the limited number of households with short driving distances to petrol stations in Guatemala and Mexico.

[36] See I. Parry and V. Mylonas, 2018. "Canada's Carbon Price Floor," IMF Working Paper 18/42.

[37] There are now 51 carbon pricing schemes (taxes and trading systems) at the regional, national, and sub-national level. See World Bank Group 2018, *State and Trends of Carbon Pricing 2018*, Figure 2.

priorities were reiterated in Belize's Third National Communication to the UNFCC (2016), which appends a concrete list of activities needed/planned to address each key sector's vulnerabilities. Broadly-equivalent costing is carried through all documents (with a caution that it is indicative and will need updating).[38] Costs are estimated for the key sectors of agriculture/food, forestry, fisheries, coastal management and water management. Tourism, land resilience, transport, energy, health and waste management are also flagged as key sectors, with qualitative strategies outlined, but costing is missing.

38. Key priority actions include the following:[39]

- *Agriculture:* diversify to more resilient breeds of livestock, increase access to drought resistant crops—including forage crops—and livestock feeds; adopt better-suited soil, and water management practices; adopt improved pest-management practices and provide early warning/meteorological forecasts and information to maintain the regional competitiveness of Belize's agricultural sector. Climate-smart agriculture practices are a priority for Belize (Box 2).

- *Forestry:* Maintain and restore healthy forest ecosystems by sustainable forest management, increasing afforestation and reforestation in order to increase the resilience and improve livelihoods of forest-dependent communities.

- *Coastal management:* early warning systems for storm surges; restore mangroves and strengthen other sea and river defenses against coastal erosion. Effective implementation of the Integrated Coastal Zone Management Plan.

- *Water management:* strengthen the protection of water catchment areas (including groundwater resources) and improve the management and maintenance of existing water supply systems. Protect and restore ecosystems and water management infrastructure; adopt forest management plans to prevent and control soil erosion; introduce water harvesting; prevent and control water pollution; and raise awareness to promote the effective and efficient use of water. Undertake water policy reform including pricing and irrigation policies; develop flood controls and drought monitoring.

- *Land use:* develop infrastructure risk assessment, as well as strategic land-use and settlements policy to adapt to potential rise in sea level, and integrate with land use, flooding and drainage plans; build infrastructural defenses to protect communities from flooding; improve drainage and sanitation facilities. Create marshlands/wetlands as buffer against sea level rise; evaluate the feasibility of relocating vulnerable communities; review and modify housing designs and building codes to climate-proof existing and future infrastructure.

[38] Costing in the NCRIP cannot be reconciled with the later documents, partly because the classification of financial needs was not done by sector (but broken out by funding needs for physical interventions, knowledge transfer, regulatory interventions, and so on) and partly because of the different vintages of estimates. The NCRIP includes the largest costed envelope, and so is used as the basis for analysis of potential financing needs (see Chapter VI).

[39] This is a telegraphic summary; see pp. 150–157 of the Third National Communication for the specifics.

- *Tourism:* do a sea level rise vulnerability mapping exercise, with attention to areas for tourism development and sites of cultural importance. Review regulations for setback requirements, mangrove and coral reef conservation, beach nourishment, and property decommissioning. Enhance the resilience of coral to climate change by reducing pollution and overfishing; implement maximum carrying capacity limits for areas impacted negatively by excessive human activity. Improve infrastructure for access to sites as the coast changes.

- *Transport:* review and update standards for construction and maintenance of transportation infrastructure to include an additional protective margin for expected risks from natural disasters and climate change; implement key infrastructure reinforcements and relocations. Promote energy efficiency in the transport sector, including by upgrading bus fleet maintenance, and the industrial fleet, and promoting use of bio-fuels.

- *Energy:* assess exposure of power system to key climate risks; investigate climate vulnerabilities of existing power system, and identify solutions to climate proof the existing infrastructures; evaluate long term energy planning with consideration of climate change, and engineer solutions to make entire power system climate resilient, with a focus on new investments/infrastructures; assess bottlenecks in disaster preparedness procedures and institutional , and propose solutions to remove barriers for more efficient and effective disaster response and recovery.

- *Health:* assess impacts of climate change on human health, establishing baseline conditions and the public health policies and programs that address the risks. Improve the capture, management and monitoring of diseases and vectors affected by climate change and related forecasting and early-warning systems; develop education awareness program; enhance health sector's capacity to address epidemics/ outbreaks. Improve disease control and prevention.

- *Waste management:* develop a country-wide Integrated Solid Waste Management Program that addresses: waste segregation, storage, collection and transport, minimization, reuse and recovery; cost recovery; education and communications. The plan (which includes mitigation as well as adaptation elements) should include capping and closing open dumps, capturing and utilizing landfill gas, and ensuring proper waste handling and organics management.

Box 2. Climate Change Adaptation and Mitigation in the Agriculture Sector

Agriculture in Belize is susceptible to weather variability and vulnerable to climate hazards, such as hurricanes, floods, and droughts. Weather variability caused by climate change is likely to increase over time, along with changes in precipitation and temperatures that will be detrimental to agriculture. These changes will increase stress on crops and livestock, impacting farming systems and forcing changes in management practices to avert threats to food production.

Agricultural technologies and practices are considered "climate smart" if they enhance food security while addressing at least one of three additional objectives: (1) sustainably increasing agricultural productivity and farmers' incomes, (2) adapting and building resilience to climate change, and (3) reducing and/or removing greenhouse gas (GHG) emissions. Most climate-smart agriculture (CSA) practices have potential to deliver "triple wins" for the agricultural sector by sustainably increasing productivity, enhancing resilience, and reducing or removing GHGs. Although the concept of CSA is new and still evolving, many of the practices and technologies that make up CSA already exist worldwide and are currently being used to cope with a range of climate-related production risks. Many farmers in Belize are practicing CSA to some degree, but more widespread adoption of CSA technologies has been hindered by a lack of information and technical knowledge, as well as by a lack of resources to pay for initial investment costs.

A national CSA Country Profile, as well as CSA Prioritization Framework, are currently being finalized. These documents identify a set of promising CSA practices and technologies whose efficacy has been demonstrated in Belize. These include: cover structures, drip irrigation systems, water-harvesting, adjustment of planting dates, crop rotation, intercropping, conservation tillage, use of improved planting material, agroforestry systems, use of improved livestock breeds, pasture improvement, and production of hay and silage. The two documents also highlight the slow progress in CSA take-up to date and identify the underlying barriers to adoption. These include lack of information about promising CSA practices, lack of technical knowledge, as well as lack of access to finance to cover initial investment costs of technology adoption, among others.

CSA concepts and approaches can be used to inform the design of policies and programs relating not only to primary agriculture production, but also to a number of related areas, such as land and water use, disaster risk reduction, energy, forestry, and aquaculture. Mainstreaming CSA requires a critical mapping of technically effective, financially profitable, and environmentally sustainable CSA practices, diagnosis of barriers to adoption and strategies for overcoming those barriers, and the identification of institutional and financial enablers. In addition, careful planning is needed to capture synergies and address trade-offs among the three CSA pillars of productivity, adaptation, and mitigation. The context-specific nature of CSA points to the need to ground efforts to promote CSA in holistic food system analysis, integrating landscape, ecosystem, and value chain approaches.

Current levels of investment in the agricultural sector are insufficient to achieve Belize's national development goals and are slowing the uptake of CSA practices.

The National Adaptation Strategy to Address Climate Change in the Agriculture Sector estimates the cost of the enabling actions needed for the implementation of CSA at approximately US$ 13.4m. In addition to the enabling actions, investments will be needed at farm-level and throughout the value chain to adopt CSA practices. Since agriculture is predominantly a private business, individual producers and agribusiness firms can and must play a central role in advancing the CSA agenda, so it is essential that the government find ways to leverage private investment in pursuing the transformational opportunities offered by agriculture and food systems in general and CSA in particular. A recent analysis revealed that many of the promising CSA investments identified with the help of a prioritization framework will require initial investments that are beyond the reach of most farmers and agribusiness firms, suggesting the need for innovative financing mechanisms.

B. Public Investment

39. Belize is already undertaking a significant program of resilience-building investments. Table 7 shows a broadbrush picture of these projects, as budgeted for 2018–19.[40] Resilience-related spending is about one-third of the (modest) capital budget, with allocations of around 1.7 percent of FY2018–19 GDP (BZ$66 million, or US$25 million).

What is Missing From the Adaptation Investment Strategy?

40. Resilience-building so far is concentrated in physical infrastructure and relies heavily on international support. The predominance of physical infrastructure projects in Table 4 reflects the sequencing preferred by stakeholders in the NCRIP exercise, during which they identified the need to reinforce access linkages as Belize's most urgent priority. Sustainable tourism, land use, and waste management were seen as medium-term priorities. The international community responded constructively by committing financing to some important road and energy projects.[41] Although these were welcomed, their prominence in the capital budget underscores Belize's heavy dependence on external support, without which more than 4/5ths of current resilience-building efforts would be unfinanced. Ecosystem resilience-building is also essential for a country such as Belize that is heavily dependent on its natural resources. The linkage between natural resource conservation and climate change adaptation remains crucial having fundamental impact on the country's ability to move to a position of higher economic resilience.

C. Other Public Programs (Regulation Reform—Zoning and Beyond)

Adaptation is Not Just a Matter of Investment Spending; What Regulations Support it?

41. Despite a relatively clear vision of resilience-building strategy, Belize lags in developing a supportive regulatory framework. Various officials identified several important gaps in their relevant areas that need to be addressed. The Public Investment Law remains to be passed. There is no national procurement law or PPP law. The Ministry of Housing is beginning to develop a national building code, which will have to confront complex issues such as management of the coastal zone; also, requirements for permits need to be harmonized and adequate attention to 'building back better' standards. A supporting national housing policy is also needed, which should confront potential resettlement challenges. Legislation for solar energy needs to be reviewed (to ensure it adequately covers grid tie-ins and net metering) and finalized. The legal framework for the management of marine protected areas and coastal zones need to be strengthened through the adoption of the Coastal Zone Management Act, Fisheries Resources Bill, and implementation of the Integrated Coastal Zone Management Plan. While the National Master Transportation Plan has been finalized, and agreement on a transport investment plan is a step forward. Implementation has lagged, and the Tourism Master Plan and Land Use Plan need to be revised to consider a sea level

[40] Table 4 should be taken as indicative only, since it is based on a staff desk survey of the draft budget. Moreover: (i) it includes sustainable energy projects and waste management, some part of which serve mitigation objectives; and (ii) it assumes all road projects will contribute to resilience-building, which may not be the case.

[41] Belize Climate Resilient Infrastructure Project (World Bank) and Climate Vulnerability Reduction Program (Inter-American Development Bank, Belize Energy Resilience for Climate Adaptation Project.

rise vulnerability mapping exercise (also still pending). The Land Use Plan being developed under BCRIP Technical Assistance a key part of the regulatory framework to guide climate investment. Regulations governing mangrove protection are awaiting finalization, and marine dredging regulations are also needed. Measures need to be taken to ensure the implementation of the National Adaptation Strategy to Address Climate Change in the Agriculture Sector of Belize.

Table 4. Belize: Resilience—Building Projects in the Capital Program of the 2018–19 Budget
(in BZ and US$ millions)

	Budget	Domestic-financed	Foreign-financed	*in US$m*	in % GDP
Total Capital Budget	**171.0**	**75.0**	**97.0**	***85.5***	**4.4**
Total Resilience-Building Projects	**66.4**	**8.9**	**57.5**	***33.2***	**1.7**
Ministry of Agriculture, Fisheries, ...	**9.5**		**9.5**	***4.7***	**0.2**
Marine conservation and climate ada	1.0		1.0	*0.5*	**0.0**
Post-hurricane assessment	0.1		0.1	*0.0*	**0.0**
Forest management	3.4		3.4	*1.7*	**0.1**
Waste management	5.0		5.0	*2.5*	**0.1**
Ministry of Tourism...	**2.8**		**2.8**	***1.4***	**0.1**
Sustainable tourism project	2.8		2.8	*1.4*	**0.1**
Nat. Sust. Tourism Master Plan	0.0		0.0	*0.0*	**0.0**
Ministry of Works	**46.4**	**8.1**	**38.4**	***23.2***	**1.2**
Macal Bridge	2.3	0.3	2.0	*1.2*	**0.1**
N Hwy feasibility study + design	7.0	2.0	5.0	*3.5*	**0.2**
George Price highway rehab	14.3	1.3	13.0	*7.1*	**0.4**
Hummingbird highway rehab	15.0	4.0	11.0	*7.5*	**0.4**
New Haulover bridge	3.0	0.0	3.0	*1.5*	**0.1**
Caracol road upgrade	4.9	0.5	4.4	*2.4*	**0.1**
Min. Economic Development...	**2.5**	**0.0**	**2.5**	***1.3***	**0.1**
Resilience to CC project	1.0	0.0	1.0	*0.5*	**0.0**
Resilient rural Belize	1.5		1.5	*0.8*	**0.0**
Ministry of Housing	**0.2**	**0.2**		*0.1*	**0.0**
Home improvement	0.2	0.2		*0.1*	**0.0**
Min. Labour and Local Govt.	**4.5**	**0.2**	**4.3**	***2.2***	**0.1**
Energy for sustainable development	1.6		1.6	*0.8*	**0.0**
Resilient energy for climate adaptati	1.3		1.3	*0.6*	**0.0**
Sustainable energy, national indic pr	1.5		1.5	*0.8*	**0.0**
Rural water supply	0.2	0.2		*0.1*	**0.0**
Ministry of Defence	**0.5**	**0.5**		***0.3***	**0.0**
Roads and drains	0.5	0.5		*0.3*	**0.0**

Source: 2018-19 Draft Revenue and Expenditure Estimates

D. Financial Sector Preparedness

How is the Financial Sector Contributing to the Climate Response Effort?

42. The predominant view of financial agents was that the sector is too small to make a meaningful contribution to the climate change effort. Local banks do little, if any, climate-related lending, with risk capital needs considered too great a barrier, and the local market too small. Likewise, domestic private insurance companies see little scope for expanding business to vulnerable homeowners or farmers, or to government, because of limited ability to lay off risk or reinvest profitably, and a perception that premia will be too high. For both banks and insurance companies, gaps in information about firms, conditions facing them, and exposure data, are impediments to extending engagement. Within these confines, Belize City's government-

guaranteed bond issue (for post-flooding street construction, and possibly for drainage in future) was seen as an important vehicle for mobilizing domestic finance. International development partners have also started to work in collaboration with domestic companies to increase the affordability and accessibility of insurance for vulnerable populations (Box 4 in Chapter VI).

43. It was seen as over-optimistic to plan for early bank re-openings to deliver cash in the wake of a disaster. However, the social security system is examining the scope for advancing pension payments when a disaster is forecast, with a view to alleviating cash constraints.

44. As regards the macro-financial framework, Belize's international reserves are below the IMF staff's adequacy metrics and hence are not providing a sufficient buffer against disasters or climate change. Gross international reserves are projected at 2.7 months of imports of goods and services over the medium term, below the Fund staff's risk-weighted adequacy metrics (see 2018 Article IV Staff Report, Annex I).

Recommendations for Adaptation

1. Update and complete the costing exercise for key sectors begun in the NCRIP.
2. Continue to make balanced progress with implementing priority actions identified in the NDC and related plans, under the umbrella of the GSDS.
3. Adopt the Public Investment Law, the Fisheries Resources Bill, National Waste Management Plan, and the mangrove protection legislation.
4. Review and finalize energy legislation that accommodates Belize's plans to develop renewable energy.
5. Identify any additional climate vulnerabilities in the existing power system and in proposed future power infrastructures so that entire Belize's power system becomes climate resilient.
6. Update the Tourism Master Plan and Land Use Plans to reflect sustainability considerations and the impact of sea-level rise.
7. Develop a national procurement law and PPP law.
8. Engage with financial agents and development partners to seek solutions for risk-capital financing and FX constraints.

FINANCING STRATEGY FOR MITIGATION AND ADAPTATION PROGRAMS

Belize should be able to execute its climate response strategy without additional deficit-financing. However, its high dependence on foreign financing makes success heavily dependent on continued support from the international community, and on attracting adequate private investment.

A. Current State of Financing

Does Belize Have Adequate Financing to Meet the Needs of its Climate Change Strategy?

45. Belize's strategy can feasibly be financed, if foreign support continues at the level of 2018 and private investment is mobilized in renewables. Belize's high debt and the commitments to fiscal adjustment required by creditors leave it little fiscal space to expand climate-related spending. However, maintaining the current pace of investment with appropriate prioritization would allow it to meet all of the resilience-building needs identified in the NDC and NCRIP by 2030 at latest (see Table 5 below).[42]

Table 5. Belize: Financing Needs for Climate Change

Needs				
Mitigation (NDC)	172	14.3	0.70	*The greater the*
Hydro power	58	4.8	0.30	*share from*
Bagasse	39	3.3	0.20	*private investors,*
Solar	45	3.8	0.20	*the lower the*
Transmission/distrituion	20	1.7	0.10	*impact on the*
Other	10	0.8	0.04	*budget.*
Adaptation (NCRIP)	376	31.3	1.63	*Appears*
Of which: identified in NDC				*affordable when*
Enhanced food security	16.0	1.3	0.07	*compared with*
REDD	5.2	0.4	0.02	*2018 budgeted*
Fisheries and reef resilience	1.2	0.1	0.01	*spending of 1.7% of*
Coastal zone management	6.0	0.5	0.03	*GDP on resilience*
Water management 1/	1.5	0.1	0.01	*building.*
Tourism	TBD			
Land resilience	TBD			
Transport	TBD			
Health	TBD			
Waste management	TBD			
Total	548	46	2.4%	Annual "bill" for climate response

Source: NDC, and World Bank for NCRIP component.
1/ Funding costed only for regulatory and institutional reforms.

- **The total estimated cost for mitigation and adaptation needs comes to US$548 million, or 28 percent of FY2018–19 GDP.** This amount is based on the combination of the NDC and NCRIP estimates outlined in table 8 above and is subject to the footnoted caveats. Spread over 12 years, the envelope implies an annual bill of about 2.4 percent of GDP. However, Belize intends its mitigation projects (around 9 percent of GDP over the period) to be covered by

[42] The exercise described in Table 8 assumes that all NCRIP projects remain to be implemented between now and 2030 (i.e., the full US$376 million envelope). This assumption is unduly conservative, meaning that the exercise should be seen as indicative only (the mission did not have resources to reconcile 2014–17 capital spending with the NCRIP, and any imputation would have been still more arbitrary). It is heavily weighted towards conservatism in that: (i) the NCRIP was issued in 2014, so some priority projects have already been implemented; and (ii) the NCRIP end-date was 2023, so spreading the spending across 2018–30 implies a slower pace of implementation than envisaged (over 12 years instead of 9).

private investment (see Chapter IV above). Full mobilization of private financing would reduce the total climate response bill to 19 percent of GDP, or 1.6 percent of GDP annually.

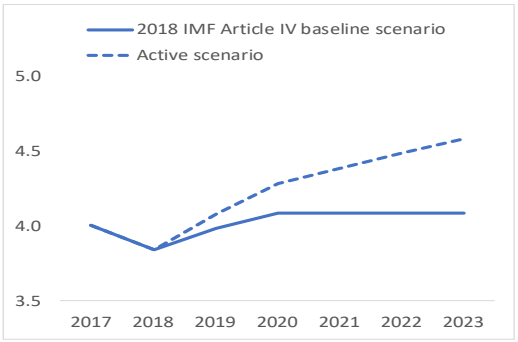
- **For adaptation, as discussed, significant investment is already ongoing—an estimated 1.7 percent of GDP each year, with more than 80 percent of this foreign-financed.** This suggests that maintaining this level of investment going forward would allow Belize to cover all of the needs identified in the NDC and the more comprehensive NCRIP (though of course getting roll-over financing will require continued effort), and without worsening its fiscal accounts.

- **These conservative estimates risk painting a too-rosy picture of Belize's capacity, given its serious financial vulnerabilities.** The fact that NCRIP spending is already underway, and the assumption that the investment will be spread over a longer period than intended, suggest that NCRIP goals should be easy to meet (see footnote 43). Moreover, successful resilience-building should provide some support to growth, as discussed below. While this is difficult to quantify, and will depend on the quality of investments made, it could reduce the burden of financing as a share of GDP. On the other hand, the fact that the strategy relies so heavily on continued support from the international community puts a heavy burden on Belize to continue to mobilize significant concessional financing. Moreover, if private investment falls short in renewable energy, the authorities may find they need to bear some share of the cost—e.g., to make the level of risk-capital tolerable. If so, this would have to be added to the bill.

B. Consistency of Climate Change Spending and Financing Plans With Fiscal and External Debt Sustainability

Are Belize's Climate Change Plans Consistent With Fiscal and External Debt Sustainability?

Figure 7. Capital Expenditure, 2017-2023
(percent of GDP)



46. Belize's starting point makes achieving macroeconomic sustainability challenging, but a feasible path does exist for achieving both climate goals and sustainability. Belize faces the challenge of reducing debt to prudent levels over the long term. The 2018 Article IV Staff Report estimates that reducing government debt to below 60 percent of GDP in 10 years, from its current level of about 94 percent of GDP, would require measures that gradually raise the primary surplus to about 4 percent of GDP from the current projected level of 2 percent of GDP, alongside reforms that enhance potential growth.[43] At the same time, the 2018 Article IV Staff Report recommends (as part of an "active scenario") implementing the required fiscal adjustment through current spending restraint and revenue-enhancing measures, while protecting and gradually *expanding* capital

[43] In the staff's "active" policy scenario, described in the 2018 Article IV Staff Report, medium-term fiscal consolidation measures are conservatively estimated to yield savings of 3 percent of GDP. They are partially offset by additional priority spending of 1 percent of GDP, including additional resilience-building public investment, resulting in a 2 percent of GDP net rise in the primary fiscal surplus compared to the "baseline" policy scenario.

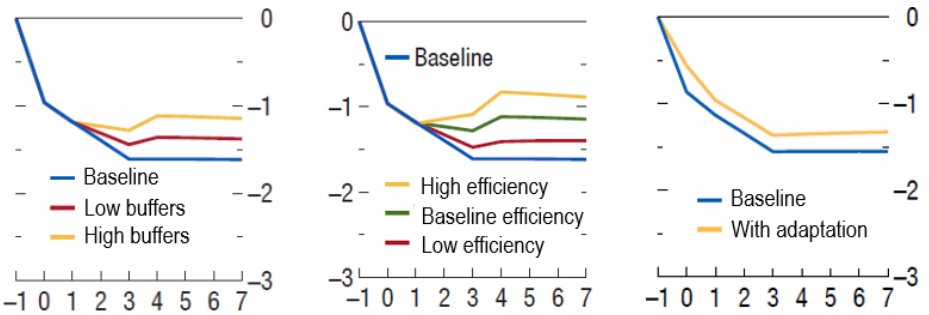
expenditure to near 5 percent of GDP over the medium term (Figure 7). It also emphasizes that structural reforms that strengthen Belize's resilience to natural hazards and that raise growth over the medium term are essential to facilitate the task of debt reduction and reduce the overall risk envelop that Belize has to plan for. The fact that the government has successfully maintained adequate resilience-building investment within the existing tighter capital program, as already mentioned, suggests that it can meet the needs of the NDC and NCRIP within the projected budgetary envelope, while adhering to a fiscal path consistent with ensuring debt sustainability. Continuing to protect these priority investments over the medium term will be important to make attainment of Belize's climate goals feasible.

Box 3. Scope for Policies to Offset the Impact of Weather Shocks

To explore how policies can help moderate the consequences of weather shocks in vulnerable countries, IMF (2017) applies the IMF's Debt, Investment, and Growth (DIG) general equilibrium model to a representative small economy broadly comparable to Belize. The impact of climate change on economic activity is, in the model, calibrated to broadly match the non-linear empirical relation between temperature and productivity that the authors estimate. See IMF (2017) and Buffie and others (2012) for further details regarding the model. The model's features, such as the government sector that supplies public infrastructure capital that firms use, in combination with labor and private capital to produce output, allow it to explore the role of policies in offsetting the effects of climate change.

The analysis considers a scenario in which a 1°C increase in temperature damages productivity and private capital. It examines the extent to which the baseline damage from an increase in temperature which leads to lower output can be reduced by macroeconomic and structural policies. The analysis sheds light on the following policy dimensions:

Model-based analysis (real GDP; % deviation from baseline)



Source: IMF (2017). DIG model simulations of impact of temperature increase by 1°C. Years on x-axis. Baseline scenario: no additional buffers, no adaptation. Additional buffers: 0.5% of GDP (low), 1% of GDP (high). Panel 2 assumes high buffers.

- *Role of fiscal buffers (panel 1).* Having larger buffers (contingency fund) can help offset adverse effects from climate change by protecting public investment. In the DIG model simulation, additional buffers of 1 percent of GDP used to support public spending reduce the depth of the recession by about 0.5 percent.
- *Role of investment efficiency (panel 2).* The size of the benefit in scenario 1 depends crucially on the efficiency of investment in public sector infrastructure, which relates to the quality of public sector governance. The simulations show that, the higher is public investment efficiency, the more the additional buffers used to finance rebuilding offset the adverse consequences of climate-related shocks.
- *Role of adaptation (panel 3).* If the investment is used to finance adaptation and resilience-enhancing infrastructure, this lowers the sensitivity of output, productivity, and private investment to

temperature increases. Thus, improving resilience through public adaptation spending can significantly reduce weather-driven downturns and accelerate recoveries.

47. Indeed, for Belize, the success of resilience-building efforts is vitally linked to its prospects for financial and physical sustainability. Chapter II outlined how climate change, without a policy response, will undermine sustainability as temperature rise reduces GDP (and land area). Investment now to forestall such large future damages must be a key part of the strategy for preserving sustainability. Box 2 explores in more detail the scope for effective government policies to cushion GDP. Specifically, application of the IMF's DIG model (Box 2) points to the potential gains from: (i) fiscal buffers; (ii) effective investment; and (iii) success in building resilience (although the magnitudes generated by the model must be taken as indicative only, given the generality of the specification).

C. Other Macroeconomic Considerations

Would Implementation of the Climate Change Plans Have any (Good or Bad) Spillover Effects to the Macroeconomy?

48. The implementation of the climate change agenda would have other positive macroeconomic effects.

- **Balance of payments.** Despite Belize's shift to renewables, its energy import bill remains sizeable, at 5.6 percent of GDP. Table 3 in Chapter IV shows how the application of a comprehensive mitigation strategy (scaling up of renewable energy, and reduction in fossil fuels for transport), could save a further 1 percent of GDP in energy imports.

- **Revenue.** As also estimated in Chapter IV, a coordinated increase in carbon-relevant feebates could help offset the projected revenue decline, generating substantial additional revenues which would ease Belize's fiscal pressures.

D. Institutional Issues

49. Unlike many other small states, Belize has had longstanding success with accessing climate funds. It was an early client of the Global Environment Facility, and reportedly the first to access the Special Climate Change Fund (established in 2001). Like its peers, however, Belize has been frustrated by the heavy technical demands of the newer climate funds; it has found applications to be demanding and to take long—with difficulties particularly challenging for private sector involvement.

50. Belize had been exploring innovative climate-response financing, but the debt restructuring interrupted the negotiations. The government was considering a large debt-for-climate swap to finance coral reef protection. Given Belize's substantial environmental assets (not only its large and renowned reef, but also forests and mangroves), it would be helpful if the authorities find a way to remove any restructuring-related incumbrances that prevent future deals of this type. That said, the usual caveat applies: innovative financing packages are worth constructing

only if they are value-for-money or eliminate bottlenecks; care will be needed to avoid swapping an old liability for a new set of obligations that entail higher costs.

51. In all discussions of financing, the lack of legal frameworks for private involvement has come up as a serious impediment to mobilizing investment. As discussed in Chapters V and VIII, filling key gaps in laws and regulations is surely a vital prerequisite for, and cost-effective path to, attracting private financing for climate response.

Recommendations for Financing

1. Clarify remaining financing needs, by updating the NCRIP and completing costing.
2. Prioritize the maintenance of the foreign-financing pipeline, with emphasis on ensuring maximum concessionality and consistency of new borrowing with restructuring commitments.
3. Protect the current level of resilience-building investment (at least), within the feasible fiscal envelope outlined in the 2018 Article IV Staff Report.
4. Ensure all relevant policy and legal frameworks are in place for attracting private investment in the energy sector and other relevant sectors (e.g., sustainable tourism).

RISK MANAGEMENT STRATEGY

Despite good physical emergency planning, risk management in Belize is almost non-existent on the financial side. A budgetary savings fund and contingency lines of credit would provision for retained risk. Opportunities for risk transfer include re-commitment to CCRIF SPC and development of the traditional insurance industry both for private and key public assets.

A. Risk Assessment Procedures

How Well Does Belize Assess Risk?

52. Belize, with the help of development partners, has well-identified disaster and climate risks, but this falls short of a comprehensive risk and contingent liability assessment. Belize has an impressive set of technical assessments of vulnerability (see for instance, the Third National Communication, 2016), followed up with clear analysis. However, it lacks a framework that defines government's contingent liabilities in case of disaster.[44] The government does not quantify risks associated with climate-related hazards, nor prepare a fiscal risk statement.

53. A World Bank study compiled a historical database of natural disasters affecting Belize in the last two decades, from 1996 to 2016. Because hydrometeorological events (floods, tropical

[44] The World Bank has developed a risk-layered framework for optimizing disaster financing. Countries need a mix of financial instruments addressing their contingent liabilities at the lowest economic cost. In practice, this means that—having taken stock of their risks—governments should provision for the costs of small, frequent disasters through reserve funds; moderate disasters will require financing beyond reasonably-sized domestic savings and can be financed by ex-ante contingent financing arrangement and sovereign insurance instruments; the largest disasters can be partially covered by insurance, and remaining risk will be addressed by ad hoc grants and loans from the international community. See *"Financial Protection Against Natural Disasters: An Operational Framework for Disaster Risk Financing and Insurance,"* World Bank, 2014.

storms, hurricanes, etc.) constitute the major natural disaster risk in Belize, actuarial analysis on the historical losses was conducted for hydrometeorological events and did not include earthquakes. This analysis was intended to adjust the results of the World Bank's probabilistic hurricane risk profile for recurrent losses, e.g., low return periods, and to extrapolate the risks on Belize's building stock to determine the entirety of public sector losses faced by the GoB. The actuarial analysis shows that direct damages to the public sector from hydrometeorological events are approximately US$ 30 million, or 1.7 percent of the GDP. Direct and indirect annualized average damage and losses to the government, including implicit contingent liabilities will amount to US$ 123 million, or about 7 percent of GDP. [45]

B. Self-insurance and Risk Retention (Government Financial Buffers, Including Contingency Provisions, Reserves, and Beyond)

To What Extent Does the Government Self-Insure Against Risks?

54. There are important gaps in Belize's approach to risk management, both in risk retention and risk transfer instruments. Figure 9 below shows the options in the World Bank's risk-layering framework, including both instruments used and not used by Belize. In sum, Belize retains almost all its risk, with little risk transfer, but does not make advance financial provision to cover realized risks.

- For small, higher-frequency disasters, Belize has legal provisions to reallocate and expand budget spending, including by taking on more debt. However, it has not done any planning for financing to cover potential costs, either by building its own buffers in a contingency fund, or by seeking contingent lines of credit (such as the World Bank's CAT DDO).

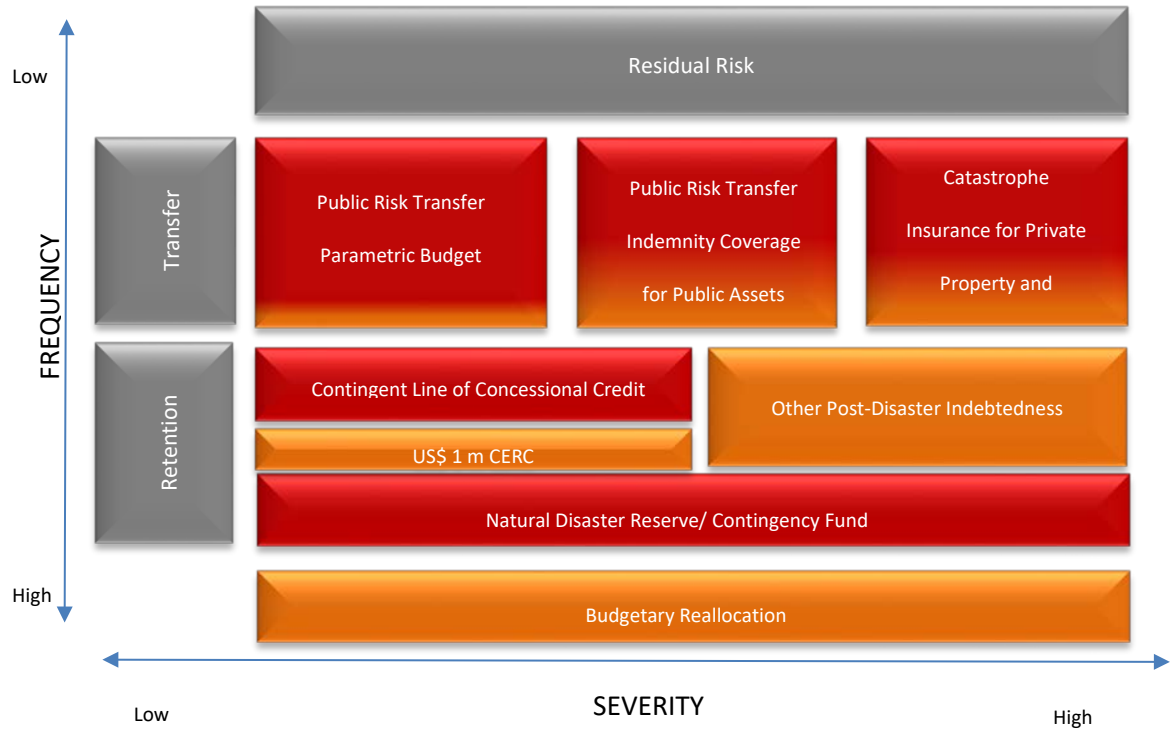
- For more severe, lower-frequency disasters, Belize has almost no insurance for public assets.[46] Both the private and public sector is underinsured, with coverage falling far short of expected damages, and the domestic non-life insurance industry is struggling to expand due to low demand, low product supply, and minimal investment opportunities.

- Belize renewed its excess rainfall policy with CCRIF SPC, the regional risk-pooling arrangement, in the 2018–19 season, but there is a need to further optimize coverage parameters, to address future risk cost-effectively.

[45] The World Bank 2017 report, *Advancing a National Disaster Risk Financing Strategy in Belize*, includes quantification of the potential costs of earthquakes, hurricanes, and floods and includes the methodology and assumptions used in the study

[46] The electricity provider Belize Electricity Limited (BEL), 63% publicly owned, has a Catastrophe BEL Catastrophic Reserve Fund. The GoB addresses the need for insuring assets through its utility regulator, the PUC, which mandates the BEL to maintain a reserve fund of US$5 million on its balance sheet. During a natural-disaster led emergency, the BEL, in consultation with the PUC, may draw down on the reserve fund to cover costs toward response and recovery of the power system. Subsequently, the BEL may agree with the PUC to augment its future electricity tariffs to replenish the catastrophic reserve fund.

Figure 9. Fiscal Risk Management Instruments for Belize



Source: Authors, based on Advancing Disaster Risk Finance in Belize, World Bank 2017

55. Belize has legal provisions for the budget to finance disaster response, but no contingency funds or plan for fast-disbursing financing. Under the Disaster Preparedness and Response Act (2000, revised in 2003), departments redeploy personnel and equipment for disaster response when needed. This crowds out previously budgeted uses (although officials emphasized that a request for disaster-related funding would be treated as supplementary and additional, rather than by reallocation from existing budget lines).

56. Belize would also likely benefit from contingent financing arrangements with development partners. Belize's only current contingent financing arrangement is a US$1 million Contingency Emergency Response component (CERC) in an IDA loan for the Climate-Resilient Infrastructure Project (BCRIP). World Bank calculations suggest value in having contingent financing arrangements equal to government losses from a hydrometeorological event of a 10 year-return period, or about US$ 42 million, to supplement or substitute for draw-downs from the savings fund in case of a larger disaster. The Bank's CAT-DDO is one vehicle designed to serve this function, as well as the Inter-American Development Bank (IDB) Development Sustainability Contingent Credit Line.

C. Risk Reduction and Transfer, Including Other Insurance and Pooling Arrangement

To What Extent Does Belize Transfer Risk?

57. Risk-transfer in Belize is under-developed.[47]

- **The public sector makes little use of traditional non-life insurance to protect itself from damage due to natural hazards.** The central government does not uniformly or consistently insure its buildings, and indeed, lacks an inventory of assets. Ministry of Works equipment is insured, as are the central bank building and some municipal buildings, as well as utilities. The World Bank has recommended that Belize establish a robust catastrophe risk insurance program for public assets and parastatals, which would be best established based on a continuously updated inventory of public assets.

- **The government has decreased its coverage from CCRIF SPC, the regional parametric insurance pool.** After disappointments regarding expected payouts for Hurricanes Richard and Earl, Belize declined to renew its hurricane and earthquake policies and instead invests minimally in CCRIF SPC's excess rainfall product. The perception is that the current design of the parametric is better suited to small island conditions, and less relevant to Belize. In response, CCRIF SPC is further developing options to customize its excess rainfall policy to the needs of Belize. CCRIF SPC is also seeking to extend its membership to the much larger risk-pool of Central America (with Nicaragua as its first central American member in 2016, though the risk of Nicaragua and future other Central American members is held in segregated portfolio). Despite the unavoidable drawbacks of parametric insurance (see Box 3 below), a regional risk-pool such as CCRIF SPC can fill a gap in catastrophe parametric insurance coverage that would not be covered by the traditional insurance market—and hence the longer-term costs to Belize for having decreased coverage may outweigh the savings.

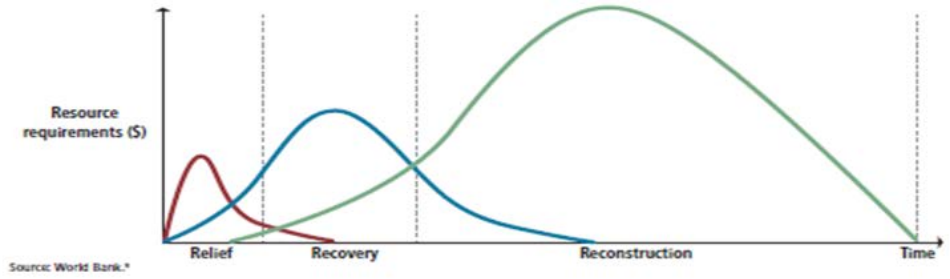
- **The private insurance market has stagnated.** Although Belize has nine non-life insurance companies, real premium growth has stagnated and density decreased, with non-life insurance penetration only 2.5 percent (below the also-inadequate Caribbean average of 3.3 percent). Mandatory mortgage insurance is the only growing area. Insurers point to lack of private sector awareness and low incomes as constraints on the demand side, and to the impediments to expanding supply flagged earlier in this report (uncertainties of having foreign exchange to pay reinsurers, and lack of profitable domestic portfolio investment opportunities). The World Bank recommends exploring public-private partnerships to provide affordable insurance for housing and agriculture that requires a combination of technical know-how and public-sector support to fill these socially-desirable gaps in the market. Over time, growth in scale would be expected to reduce the need for public support.

[47] This section draws heavily on World Bank (2017).

Applying the Risk-Layering Approach to Belize

58. Belize needs to build a risk buffer large enough to provide timely financing for the fiscal costs of disasters without endangering debt sustainability. IMF Staff estimates suggest that the total buffer needed would be in the order of 7 percent of GDP, maintained on a rolling basis.[48] This finding is congruous with the World Bank actuarial analysis. Reflecting the components of the recommended risk-layering approach, the first element of the buffer should be a contingency fund to cover immediate recovery and response costs from high frequency, low-severity events, ensuring that liquid resources are immediately available for emergency relief and recovery operations until other contingent financing and insurance payouts are received, reducing threat of disruption of ongoing development projects. Making such a fund larger could then support reconstruction and rehabilitation as well but covering these needs through ex-ante risk retention and risk transfer instruments would be more cost-effective—particularly important with Belize's currently limited fiscal space—and consistent with the more extended timing of reconstruction needs (Figure 10).

Figure 10. Timing of Post-Disaster Financing



59. Table 6 indicates an illustrative comprehensive risk buffer, based on the World Bank's 2017 recommendations. These envisage a contingency fund of around 1 percent of GDP, and contingent financing arrangements of around 3 percent of GDP for risk retention. Risk of around 3 percent of GDP should be transferred through insurance mechanisms. Over the longer term, expected damages should be reduce to the extent that resilience building is successful, this would reduce the envelope that needs to be covered.

Table 6. Belize: Building the Risk Buffer—An Illustration

	US$m	%GDP
Risk envelope to cover (7% GDP)	**115–140**	**7**
Contingency Fund	15–20	1
Contingency Financing	50–60	3
CCRIF SPC	25–30	1.5
Private insurance mechanisms	25–30	1.5

Source: staff estimates, and World Bank (2017)

[48] The conceptual exercise for calculating the size of the needed buffer is to estimate how big a savings fund would be needed to cover all expected costs with a 95 probability of avoiding new debt creation at the time of the disaster. Then this envelope can be allocated as the government chooses between the various risk-management instruments. The methodology for estimating the 'savings fund envelope' is explained in Guerson, A., "Assessment Government Self-Insurance Needs Against Natural Disasters: An Application to the ECCU," Eastern Caribbean Currency Union, 2016 Discussion of Common Policies of Member Countries, Annex VIII, IMF Country Report No. 16/333.

Box 4. Insurance Innovations Relevant to Belize

The Caribbean Catastrophe Risk Insurance Facility

The Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC) is the world's first regional catastrophe risk pooling mechanism that allows countries to pool their hurricane and earthquake risk and collectively approach the international reinsurance market to purchase cheaper coverage. The CCRIF SPC utilizes parametric insurance—which is designed to offer immediate liquidity in a disaster's aftermath, by basing pay-outs not on actual damages but by approximations using parameters such as wind-speed. The initiative is supported by the World Bank and the international donor community, and has allowed countries in the Caribbean to enjoy reduced insurance premia. The sixteen current members of the Facility are Anguilla, Antigua & Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, Nicaragua, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Trinidad & Tobago, and Turks & Caicos Islands. CCRIF SPC is currently expanding geographically to include Central America and is also expanding in terms of products offered.

There have been some disappointing pay-outs in the face of basis risk (the reason for Belize's decrease in coverage). However, CCRIF SPC is considered a model for other risk pools and—as the insurance industry gains experience with disaster insurance for governments—is expected to expand while managing premia so they remain competitive.

Mesoamerican Reef Fund – Reef Rescue Initiative

The Mesoamerican Reef (MAR) is of great economic important to Belize for tourism, food security, and for coastal protection, among other reasons, and it highly vulnerable to climate change. The impacts of climate change on the coral ecosystems include an increase in the frequency and intensity of hurricanes, ocean acidification and abnormally high ocean temperatures that cause coral bleaching. However, recovering damaged and degraded reefs in the region, is a tangible possibility through the Mesoamerican Reef Rescue Initiative.

The overall objective of the Reef Rescue Initiative is to contribute to the conservation of the MAR by increasing the resilience and recovery ability, and the RRI aims to do this through piloting a parametric reef insurance mechanism to cover the cost of coral reef restoration after damage caused by hurricane and ship groundings and to train and equip rapid response teams to carryout emergency activities.

The Mesoamerican Reef Rescue Initiative supported by the German government and is governed by a Technical Supervisory Committee (TSC) and executed by the MAR Fund, and the Central American Commission on Environment and Development (CCAD), with the participation of the four countries that share the reef system: Belize, Guatemala, Honduras and Mexico.

The Caribbean Oceans and Aquaculture Sustainability Facility (COAST)

Coastal fishing communities in the Caribbean are particularly vulnerable to climate events, because of their location in low-lying coastal areas and dependence for their livelihoods on accessing wild natural resources. The need for insurance coverage to help protect the physical and financial assets of these communities has been recognized by national and regional governments and the G7. The link between physical and economic resilience of fishing communities and the size of the impact of extreme weather events means an opportunity to exploit economic incentives for improving coastal zone resilience, building natural capital and translating savings into better fisheries management. As with automobile insurance, where drivers with better records pay lower insurance premiums, a well-designed actuarial model should be able to link improved fisheries and marine habitat management to lowered vulnerability, and to translate that into lower premiums. How that can be done for Caribbean fisheries and climate risk insurance is the subject of the COAST Design Phase.

Box 4. Insurance Innovations Relevant to Belize (concluded)

COAST is a partnership between the US State Department, the PROFISH Multidonor Trust Fund at the World Bank, the Caribbean Catastrophe Risk Insurance Facility (CCRIF SPC), and the Caribbean Regional Fisheries Mechanism (CRFM). The mechanism to drive sustainable finance for Caribbean fisheries is envisioned as a sovereign parametric insurance product at a scale relevant to vulnerable fishing communities. To be triggered by high winds, storm surge and/or excessive rainfall, the COAST insurance product aims to put money and human resources rapidly into the recovery effort, to provide immediate economic relief. The Belize Government has expressed interest in purchasing this instrument to reduce the vulnerability and enhance resilience of its fisheries sector.

60. Given the size of the envelope for the risk buffer, it may need to be built up gradually. However, though the sooner it can be put in place the better—especially for the urgently needed contingency fund. Likewise, a conversation with external development partners on their willingness to engage on developing contingent lines of credit or comparable instruments need not be postponed. Table 6 also illustrates the sizeable role insurance needs to play, and hence the value of seeking to resolve the shortcomings of Belize's engagement with CCRIF SPC rather than attempting to construct a comprehensive risk buffer without any reliance on parametric insurance. Belize can also invest in other regional sector-specific risk transfer products to complement CCRIF SPC, such as the Reef Rescue Initiative (Box 4). Finally, Table 9 signals the role that successful resilience-building investment can eventually play in reducing expected damages (and perhaps also creating a growth dividend), and hence lowering the long-term cost of maintaining an adequate risk buffer.

Recommendations for Risk Management

1. Develop a fiscal risk statement as an input to better budgeting, with attention to costing government's likely contingent liabilities from disasters and climate change.

2. Develop a comprehensive risk buffer for natural disasters. A risk buffer of 7 percent of GDP, replenished on a rolling basis, would give Belize a 95 percent probability of being able to cover the fiscal costs of disasters without incurring additional debt.

3. As part of the risk buffer, establish a budget contingency fund of around 1 percent of GDP as soon as possible, to be accessible for immediate post-disaster relief.

4. Engage with development partners to establish contingent financing arrangements of at least US$ 50 million.

5. Over the medium term, expand public sector insurance to include key buildings and infrastructure, based on an inventory of public assets.

6. Regional initiatives for insurance are likely to be relatively cost-effective, given Belize's small economic size. Collaboration with CCRIF SPC and other Caribbean efforts to deepen the insurance industry should be re-explored, with a dialogue on how to make CCRIF SPC best-tailored to its members' needs.

7. Explore with private insurers the options for expanding the traditional market, both for housing and socially-desirable services such as flood and agriculture insurance, which may require public sector involvement.

NATIONAL PROCESSES

Planning is a strong point in Belize, and the budget is credible and comprehensive. However, public investment management tools are lacking, the legal and regulatory framework needs strengthening, and the absence of a PPP framework shuts off potential new sources of investment funding.

A. Integration of Climate Change into National Planning Processes

Having Climate-Related Projects Been Mainstreamed into National Planning?

61. Yes. Belize is a good example of effective mainstreaming of climate-related projects, with the support of the international community. As described in Chapter III, the 2013 NCRIP identified priority climate-resilient projects and costed them—with transport, forestry, mangrove, and flood management flagged as top-priority, given Belize's vulnerability to sea-level rise. These priorities were re-emphasized in the NCCPSAP and the GSDS. The PSIP and the capital budget since 2015 show a ramping up of transport and land-use projects (some explicitly linked to climate resilience, some not), largely supported by external funding. While the authorities note that fiscal constraints have drastically limited the pace of investment, and also that the choice of projects is dictated by the availability of external finance, there is a clear picture of a constructive collaboration between the government and the international community to deliver on mutually-recognized resilience-building goals.

62. The allocation of climate-related responsibilities across agencies appears to be well-understood and coordinated. As in other countries, the assignment of climate-related functions may be an accident of history (the Ministry of Finance is responsible for natural resources, the Ministry of Economic Development for investment and petroleum, the Ministry of Agriculture for sustainable development, and the Ministry of Labor and Local Government for energy) but functions are clearly grouped in a relatively small number of ministries, all of which are represented on the coordinating National Climate Change Committee, while technical inter-ministerial steering committees manage projects. Cross-ministerial collaboration will be a pre-requisite of success for implementing the agenda.

63. The PSIP framework appears to be functioning well, but basic tools for project selection need to be developed. The PSIP project pipeline broadly reflects national priorities, and once projects are approved they are included in the budget. The lack of in-house capacity for project specification and appraisal exacerbates Belize's dependence on whatever investments donors prefer to prioritize.

B. Adequacy of the Public Investment Management System

Are Adequate Public Investment Management Systems in Place (Effective Procedures for Identifying, Evaluating, Selecting and Implementing Projects), to Ensure Climate-Related Investments Will be Well-Spent?

64. Beyond the well-developed planning stage, Belize has large gaps in its public investment management (PIM) system. Few components of good public investment management are in place, with Belize remaining heavily reliant on donor project procedures.

65. Lack of capacity to actively manage public investment partly explains the authorities' reluctance to seek public-private partnerships (PPPs). There is no legislation or policy framework for PPPs, and only two PPPs are on record. This leaves Belize at a serious disadvantage if it seeks to scale up investment and diversify funding sources.

66. A summary of a recent assessment of Belize's PIM practices using the IMF's evaluation tool, PIMA, is reported below (and see Annex III):[49]

Planning

- Belize has no formal fiscal framework or rule, and fiscal policy is currently guided by commitments to creditors in the 2017 debt restructuring. When consolidation is necessary, capital spending tends to suffer, to achieve the adjustment. Moreover, capital spending includes disguised recurrent items.
- As described above, investment planning and prioritization are well-coordinated, but with allocation decisions driven largely by ODA financing. The government has not developed in-house capacity for selecting and appraising projects.
- The lack of a PPP framework disadvantages Belize from attracting new sources of investment.
- While the legislation and regulations leave open the possibility of competition and private sector involvement in infrastructure—notably renewable energy—the gaps and outdatedness of the legal framework are a deterrent to investment which urgently needs to be remedied.

Allocation

- A strong point of Belize's PIM is that capital spending is almost all undertaken transparently through the budget, including foreign-financed projects. Unfortunately, domestic and foreign-financed capital expenditures are presented in separate budget chapters—though this shortcoming is alleviated by a clearer PSIP presentation, and the useful introduction of program budgeting, both of which offer policymakers a more comprehensive overview of the investment envelope and composition.
- Belize does multiyear planning, but probably not far enough ahead: the budget has a three-year horizon. The full cost of projects with longer life can be seen only in the PSIP. In principle, recurrent costs are budgeted for (sometimes incorrectly in the capital budget), but under-funding is often serious. Appropriations are annual, which somewhat undermines the certainty aimed at by forward planning.

[49] The PIMA tool is a detailed questionnaire covering 15 aspects of public investment management (see http://www.imf.org/external/np/fad/publicinvestment/pdf/PIMA.pdf). The assessment described in the text was not a full PIMA evaluation, because it did not take stock of the effectiveness of the procedures but used interviews to determine what has/has not been put in place.

- The current and capital budgets are prepared and presented together, though not in line with international standards. The Chart of Accounts is not in line with international standards either but is undergoing a reform.
- Cost-benefit analyses are conducted mainly for foreign-financed projects, usually in line with the specific project appraisal processes used by the donors involved and are not systematically published.
- There are no standard criteria for project selection, although projects must be in line with the 'critical success factors' identified in the GSDS.
- There is a realistic pipeline of projects pending approval. On rare occasions, the pipeline may be bypassed, with another government project selected for budget financing.

Implementation

- Project outlays are appropriated annually, and unspent appropriations cannot be rolled over to future years. However, officials say that ongoing projects are given priority in annual allocations. Transfers of appropriations from capital to current spending are prohibited.
- Cash for project outlays is normally released in a timely manner, and for the most part, agencies can plan and commit expenditure in advance based on reliable cash flow outputs, particularly for donor-financed projects.[50]
- With the exception of EU financing, all ODA is integrated into national treasury management processes.
- Externally-financed projects are tendered competitively, following donor procedures. In the absence of a procurement law, there are no systematic procedures for tendering domestic projects. Externally-financed projects and major domestic projects are monitored during implementation. Ex-post audits are undertaken when required by donors.

C. Adequacy of PFM Systems for Managing Climate Financing and Outlays

Are Adequate Public Financial Management Systems in Place to Protect Climate-Related Funding?

67. Belize's budget system has been strengthened over the past decade but still suffers from gaps often found in small states. A PEFA in 2014 found some important improvements since Belize's 2009 PEFA, and no deterioration; however, Belize's scores remain low, as is usual for small states lacking the capacity and safeguard institutions of advanced countries. In line with PIMA findings, the PEFA identified budget credibility, comprehensiveness, and transparency as strong points, while deploring the absence of procurement law. It cautioned about the need for clearer financial relations with municipal governments if they begin to borrow or expand their own donor relations. While commending Belize on good protection of donor funds, notably a high and growing share of donor funding deposited at the central bank and subject to national financial oversight, and with only rare instances of borrowing not approved by the Minister of Finance, the PEFA regretted

[50] The 2014 PEFA, however, found limitations to Belize's cash forecasting (see below).

the persistence of some donor financing in commercial bank accounts. It emphasized the need for improvements in accounting and external scrutiny (audit and legislative oversight).

68. The budget system would benefit from further development to facilitate implementation of a resilience-building strategy. The introduction of program budgeting features provides a valuable tool for moving the strategy forward—though it will be important to enforce reporting requirements (where gaps are evident). Up to now, the budget and the PSIP have no systematic approach to tagging climate-change related projects, other than by project title. Hence, budget classification would benefit from some rethinking, in alignment with the chart of accounts reform.[51] More attention should be paid to strengthening the treatment of NDC actions within medium term expenditure framework planning processes. Finally lack of project appraisal capacity and systematic monitoring means that the climate-change mitigation and adaptation impact of proposed investments cannot be evaluated.

Recommendations for National Processes

1. Build capacity for effective public investment appraisal and monitoring, in the Ministry of Finance and other relevant ministries.

2. Pass a Procurement Law which reflects international standards.

3. Introduce a framework for PPPs; and identify the safeguards needed for Belize to be comfortable with considering this diversified source of investment funding and know-how.

4. Upgrade the regulatory framework for economic infrastructure, to clarify the scope for competition.

5. Continue the development of program budgeting, in particular, by enforcing reporting requirements and systematizing the identification of climate-related programs.

TAKING STOCK: PRIORITY NEEDS TO BE MET

Belize has made important strides in confronting climate change, despite its difficult fiscal constraints. Success will require significant private investment in renewables, the maintenance of external budget project financing at current levels (as concessional as possible), contingent financing arrangements, and capacity-building to fill serious gaps in the legal, regulatory, and administrative frameworks.

What Resources Does Belize Need to Mobilize, to Achieve its Climate-change Strategy?

69. An indicative tally of the priorities identified in this Assessment points to the following resource needs (this list is not intended to be exhaustive and will evolve with time and experience):

General preparedness (see Chapter III for more detail)

- Development of a damage and loss data collection system and reporting, systematized across all ministries (capacity-building).
- Formalization of a national disaster risk financing strategy (capacity-building)

[51] For example, The Philippines is relatively advanced and publishes a "climate budget brief" to accompany its budget paper. This identifies the share of national expenditures that responds to the national climate change action plan.

Mitigation (see Chapter IV for more detail)

- Private investment of US$172 million by 2030, in:
  - Hydro-power ($58 million)
  - Bagasse ($39 million)
  - Solar ($45 million)
  - Transmission/distribution/other ($30 million)
- Public or private investment in REDD ($5.2 million).
- Possible government financial involvement to resolve problems impeding private investors, such as seed financing or guarantees (financial support)
- Development of a feebate scheme within the excise tax framework, adequate to achieve planned reductions in energy consumption, while calibrated to delivering required revenue (capacity-building) and a similar scheme for forestry.

Adaptation (see Chapter V for more detail)

- A public investment envelope of US$376 million, by 2030 (requiring concessional foreign financial support), in:
  - Food security ($16 million)
  - Fisheries and reefs ($1.2 million)
  - Coastal management ($6 million)
  - Water management ($1.5 million)
  - Other priority sectors
    - Transport
    - Land resilience
    - Tourism
    - Health
    - Waste management
- Updated costing of priority sector projects (capacity-building)
- Development and refinement of enabling legal documents such as the building code, legislation for renewable energy, procurement law, PPP law (capacity-building)

Risk management (see Chapter VI for more detail)

- A budget contingency fund of US$15–20 million (financial support)
- Contingency financing arrangements of US$50–60 million (contingent financial support)
- Expansion of insurance to cover US$50–60 million in potential loss (financial support, either contingent or to underwrite premia costs)

National processes (see Chapter VII and Annex III for more detail)

- Development of public investment management tools (capacity building)
- Reform of budget classification and reporting, to identify disaster- and climate-related spending, in alignment with the ongoing reform of the chart of accounts (capacity-building).

Annex I. Spreadsheet Model to Assess the Impact of Mitigation Policies for Belize

1. The spreadsheet model of fossil fuel consumption used to assess mitigation possibilities for Belize is similar to models applied recently to carbon mitigation policies in China and India; and the reader is referred to these studies[1] for a more detailed (mathematical) description on the model and data sources used to justify typical parameter assumptions (e.g., the price responsiveness of fuels and the responsiveness of energy products to higher income)—though some simplifications and other adjustments were made in applying the model to Belize. Basic data on fuel use, prices, and fuel excises were obtained in meetings with the authorities.

2. The model specifies demand functions for electricity consumption by households; electricity consumption by the industrial/commercial sector;[2] premium gasoline; regular gasoline; road diesel; heavy fuel oil (HFO); kerosene; and liquified petroleum gas (LPG). The model does not incorporate capital of different vintages (which would require considerable analytical complexity) and therefore does not distinguish between responses to fuel price changes in the shorter and longer term, but this is not a major drawback given the focus on medium to longer term targets (e.g., for 2030).

3. The demand for electricity and fuels rises over time in the business as usual (BAU) case relative to 2017 levels[3] with increases in GDP, which expands by 25 percent between 2017 and 2030 based on IMF forecasts and extrapolation. The income elasticities for these products (i.e., the percent increase in electricity or fuel demand in response to a one percent increase in GDP) are taken to be between 0.6 and 0.75 based on empirical literature. However, electricity and fuel use are assumed to decline autonomously by 0.75 percent a year due to gradual retirement of older, less efficient capital.

4. Electricity prices are constant in real terms over time in the BAU,[4] though the retail prices of fuels increase by between 18 and 31 percent between 2017 and 2030[5] due to an

[1] See Ian W.H. Parry, Baoping Shang, Philippe Wingender, Nate Vernon, and Tarun Narasimhan, 2016. "Climate Mitigation in China: Which Policies Are Most Effective?" Working paper 16-148, International Monetary Fund, Washington, DC and Ian W.H. Parry, Victor Mylonas, and Nate Vernon, 2017. "Reforming Energy Policy in India: Assessing the Options." Working paper 17–103, International Monetary Fund, Washington, DC.

[2] Electricity use in street lighting is also accounted for, though this is relatively modest.

[3] 2017 electricity consumption by households and industry/commerce is 231 and 154 million kWh respectively. And 2017 fuel use in million gallons is 8 for premium gasoline, 17 for regular gasoline, 19 for road diesel, 4 for diesel in power generation, 5 for HFO, 5 for kerosene, and 3 for LPG.

[4] 19 and 17 cents per kWh for households and industry/commerce, respectively.

[5] 2017 prices in $ per gallon are 4.57 for premium gasoline, 4.24 for regular gasoline, 3.97 for road diesel, 2.49 for power sector diesel, 2.98 for HFO, 2.99 for kerosene, and 2.45 for LPG.

assumption of gradually rising international energy prices,[6] which has a modest impact on depressing fuel demand.

Higher electricity and fuel prices affect energy demand through changes in average energy efficiency (e.g., due to shifting of demand towards more efficient appliances and vehicles) and from reductions in the demand for fossil energy-using products (e.g., from adoption of solar panels, less vehicle use). Each 1 percent increase in electricity or fuel prices is assumed to reduce electricity/fuel demand by 0.45 percent, with two-thirds of the response from efficiency improvements and one-third from reduced product use.[7]

5. In the BAU scenario, the share of domestic diesel, hydro, and biomass generation in electricity supply remain constant at 0.08, 0.40, and 0.17 respectively, while the remaining supply share (0.35) comes from imported sources. Changes in electricity demand lead to changes in generation from diesel, hydro, and biomass equal to the change in demand times the respective supply shares for these fuels—and an expansion of the renewables supply share leads to a corresponding reduction in the diesel fuel generation share.

6. CO_2 emission rates are taken to be 0.0088 metric tons per gallon for gasoline and 0.0103 (metric) tons per gallon for diesel and other fuels. Total emissions in a year is fuel use times the emission rate and aggregated over fuels. Revenues are computed by fuel use times the relevant excise tax[8] and aggregated over fuels.

[6] Oil price forecasts average over IMF forecasts (which are essentially flat as they are based on futures markets) and those by the International Energy Agency (where prices rise over time as predicted by a global oil demand and supply model).

[7] The vehicle driving response, for example, is limited due to limited possibilities for using other travel modes like public transport, cycling, and walking.

[8] Excises in $ per gallon (which are fixed to 2030 in the BAU) are 1.81 for premium gasoline, 1.65 for regular gasoline, 1.49 for road diesel, 0.53 for HFO and kerosene, and 0 for power sector diesel and LPG.

Annex II. Applying Feebates to Key Sectors in Belize

1. This Annex provides some detail on how feebates might be applied in Belize. For Belize, where tax hikes are likely to be politically difficult, and, if undertaken unilaterally, potentially damaging to competitiveness, the CCPA (Chapter IV) recommends introducing feebates—which achieve the price-incentive effects of good carbon taxation without pre-determining the overall tax rate. Feebates are potentially:

- Effective at reducing energy use, if they are comprehensively applied across imported products—cars, buses, washing machines, light bulbs, air conditioners, refrigerators, and so on—set to provide continuous (rather than discrete) rewards for higher efficiency (see below), and appropriately scaled;
- Cost-effective, if there is a uniform reward for saving energy across different types of products;
- Limit administrative burdens, as they can be incorporated into existing procedures for collection of excise on imported products;
- Consistent with fiscal objectives, as an ad valorem component of excises (unrelated to energy efficiency) can be retained to meet revenue needs;
- Limit burdens on vulnerable households and firms, as they do not involve a first-order pass through of new tax revenues in higher fuel, electricity, or product prices.

Transportation

2. The current excise tax system for vehicles provides very limited incentives for purchase of fuel-efficient vehicles. Imported passenger vehicles with cylinder capacity exceeding 3,000 are subject to excises of 5 percent, and import duties of 5 or 45 percent,[1] while buses are subject to excises of 5 percent and import duties of 5 to 10 percent. This tax system does not provide comprehensive incentives for vehicles with small engine capacity, and does not reward vehicle characteristics (including smaller cabin size, lighter body materials, better aerodynamics), that also lower emission rates.

3. The standard Fund recommendation is to shift towards a vehicle excise tax system with an ad valorem and a feebate component.[2] The proportional tax in the ad valorem component can be set to meet a revenue target and does so without distorting the choice among different vehicles (because it leaves the relative price of different vehicles unaffected). The feebate involves levying a tax on relatively fuel-inefficient vehicles in proportion to the difference between their fuel consumption rate (i.e., the inverse of fuel economy) and a 'pivot point' consumption rate,

[1] The lower rate applying for vehicles knocked down for assembly in approved plants.

[2] See, for example, I. Parry, 2011, "Reforming the Tax System to Promote Environmental Objectives: An Application to Mauritius," Working Paper11/124, International Monetary Fund, Washington, DC.

and conversely providing a subsidy to relatively efficient vehicles in proportion to the difference between the pivot point and their fuel consumption rate (or, equivalently, the fees and rebates can be levied on CO_2 emission rates). That is, a vehicle receives a fee/rebate according to the simple formula $t \cdot (fuel/mile - \overline{fuel/mile})$, where the bar denotes the pivot point fuel per mile, and t is a charge per gallon per mile (which accounts for expected use of the vehicle—see below). The feebate component can be made (approximately) revenue-neutral by setting the pivot point equal to the average fuel consumption rate of vehicles sold in the previous year and updating it over time as the average fuel consumption rate of the vehicle fleet progressively declines. The tax/subsidy rates in the feebate can be set as aggressively as needed to induce shifting to more efficient vehicles without eroding the revenue base (which depends on vehicle prices). Implementing this tax change would require data on the fuel per mile (the inverse of fuel economy) for different models, but this is readily available.[3] Alternatively, the tax/subsidy rates can be levied on differences between a vehicle's CO_2 emission per mile and a pivot point CO_2 per mile.[4]

4. A number of countries have recently introduced feebates, including Denmark, France, Mauritius, the Netherlands, and Norway (and many others have elements of feebates). The pivot points in these schemes are typically equivalent to between about 200 to 250 grams of CO_2 per mile, although the feebate prices differ significantly: for example, about US$10 per gram of CO_2 in France and up to US$155 in Norway.[5] In Mauritius, the feebate introduced in 2011 helped to lower the average fuel consumption rate of imported vehicles from 7 liters/100km in 2011 to 5.8 liters/100km in 2014, while new hybrid vehicle sales registrations rose from 337 to over 1,400.[6] For illustration, a feebate with a pivot point of 250 grams of CO_2 per mile, and a price of US $100 per gram of CO_2, would provide a subsidy of US $5,000 to a vehicle with fuel economy of 45 miles per gallon while imposing a tax of $10,000 on a vehicle with fuel economy of 25 miles per gallon.

Public Transport

5. In principle, there is some justification on economic efficiency grounds for subsidizing public transport fares as a complementary policy for the transport system. These subsidies would deter automobile use, implying less road congestion, carbon emissions, and accidents, and may be warranted by various scale economies, including reduced wait times from more frequent service, greater load factors (lowering average operating costs), and greater density of service

[3] See www.fueleconomy.gov.

[4] Fuel economy can be converted to CO_2 per mile by inverting and multiplying by CO_2 per gallon—8,850 grams per gallon for gasoline and 10,250 grams per gallon for diesel.

[5] See Bunch, David S., David L. Greene, Timothy Lipman, Dr. Elliot Martin and Dr. Susan Shaheen, 2011. Potential Design, Implementation, and Benefits of a Feebate Program for New Passenger Vehicles in California, pp. 59–61, prepared for the State of California Air Resources Board and the California Environmental Protection Agency. In some cases, however (e.g., Denmark), the implicit price on CO_2 is substantially higher for vehicles receiving rebates than for vehicles subject to fees, which results in net revenue losses from the feebate and violates the principle of providing the same reward for reducing emissions across all vehicle classes.

[6] Global Fuel Economy Initiative, 2016. "Fuel Economy State of the World 2016: Time for Global Action."

(lowering costs to passengers of accessing the system).[7] At present fares are set to recover operating costs, and in fact public transport is (moderately) taxed in the sense that GST paid on diesel inputs is not rebated. Any subsidies for public transport would need careful design however, to expand the system rather than encourage inefficiency—one possibility would be to provide fixed subsidies per passenger mile (though this is a longer-term option as it would require electronic metering capacity for tracking passenger mileage).

Electricity Sector

6. An analogous excise to that described above for vehicles, with both ad valorem and feebate components, could be applied to imported appliances and other electricity-using capital. Again, the ad valorem component could remain at the current excise tax rate to maintain revenue. The feebate would involve taxes on products with relatively low energy efficiency in proportion to the difference between their electricity consumption rate and a pivot point consumption rate and conversely provide a subsidy to relatively efficient models in proportion to the difference between the pivot point and their consumption rate. For example, refrigerators would receive a fee/rebate according to the simple formula $t \cdot (kWh/(cubic\ foot\ cooled) - \overline{kWh/(cubic\ foot\ cooled)})$, where *kWh/(cubic foot cooled)* is the electricity consumption rate, a bar denotes the pivot point consumption rate, and t is the charge per kWh/(cubic foot cooled). To illustrate, if the pivot point consumption rate were 5 kWh/month, and the feebate price was $30 per kWh/month, then a refrigerator with an energy consumption rate of 8 kWh/month would be subject to a tax of $90 while a refrigerator with an energy consumption rate of 2 kWh/month would receive a $90 subsidy.[8] And again the feebate component can be made (approximately) revenue-neutral by setting the pivot point equal to the average electricity consumption rate of models within a product class sold in the previous year, with updating over time as the consumption rate progressively declines. To minimize the cost of reducing electricity use across a range of different product classes, the same incremental reward on kWh (i.e., the tax rate *t*) should be uniform across products.

Agriculture

7. On the resilience side, feebates might be used to promote widespread adoption of Climate Smart Agriculture practices and technologies. A feebate approach could be effectively deployed to increase incentives for CSA adoption by reducing the cost of financial instruments. Feebate elements could be integrated into tools such as matching grants, guarantee mechanisms or index-based rainfall insurance and area/yield-based index insurance. Based on farmer adoption of a CSA technology, the feebate scheme could subsidize the costs of these instruments to generate positive climate outcomes both on the resilience and emission sides. A forthcoming WB study Climate Smart Agriculture in Belize is exploring financing strategies for CSA investment in Belize and will provide recommendations, as well as identify needed supporting investments.

[7] For example, I. Parry and K. Small, 2009. "Should Urban Transit Fares be Subsidized?" *American Economic Review* 99: 700–724.

[8] To take another example, the fee/rebate for air conditioners would be $t \cdot (kWh/(BTU\ of\ heat\ removed) - \overline{kWh/(BTU\ of\ heat\ removed)})$.

Annex III. PIMA Institutional Questionnaire—Interview Responses from Belize

1	**Fiscal Principles or Rules: Are there permanent fiscal principles or rules that support sustainable levels of capital spending?**	
1.a	Is fiscal policy guided by one or more permanent fiscal principles, or rules?	No. However, fiscal policy is currently guided by multi-year commitments under the terms of the 2017 debt restructuring, which are aimed at improving debt sustainability.
1.b	Do fiscal principles or rules protect capital spending over the short term or medium term?	No. Capital spending is included under a target or limit for the overall fiscal balance or aggregate expenditure. Fiscal constraints have led to cuts in capital spending allocations.
1.c	Is there a target or limit for government liabilities, debt, or net worth?	Target for public debt ratio to GDP
2	**National and Sectoral Planning: Are investment allocation decisions based on sectoral and inter-sectoral strategies?**	
2.a.	Does the government publish national and sectoral strategies for public investment?	Yes. The GSDS and strategies for key sectors are on government websites. The PSIP is published.
2.b.	Are the government's national and sectoral strategies or plans for public investment costed?	Some sectoral strategies are costed (for example, NCRIP).
2.c.	Do sector strategies include measurable targets for the outputs and outcomes of investment projects?	KPIs are being developed for the GSDS. The budget documents specify KPIs for programs and track them.
3	**Central-Local Coordination: Is there effective coordination of central and sub-national governments' investment plans?**	
3.a.	Are there limits on subnational government (SNG) borrowing?	No pre-set limits but Cabinet approval was required for Belize City infrastructure bond issue.
3.b.	Is capital spending by SNGs coordinated with the central government?	There is no mechanism for doing so, but there appear to be case-by-case coordination, including notably under the World Bank Municipal Development Project.
3.c	Does the central government have a transparent, rule-based system for capital transfers to SNGs, and for providing timely information on such transfers?	No. A formula-based transfer system was designed but has not been adopted. Transfers are reported with the budget documentation.
4	**PPP: Is there a transparent framework for the scrutiny, selection and oversight of PPP projects?**	
4.a.	Has the government published a strategy for PPPs and issued standard	No. The Government's stated strategy is not to engage in PPPs, given likely challenges in managing

	criteria for entering into PPP arrangements?	the fiscal risks. Two energy sector PPPs are recorded in the World Bank's PPP knowledge lab.
4.b.	Are PPPs subject to value for money review by a dedicated PPP unit prior to approval?	n.a.
4.c.	Is the accumulation of explicit and/or contingent PPP liabilities systematically recorded and controlled?	n.a.
5	**Regulation on Infrastructure Companies: Is there a favorable climate for the private sector and SOEs to participate in infrastructure provision?**	
5.a.	Does the regulatory framework support competition in contestable markets for economic infrastructure (e.g., power, water, telecoms, and transport)?	Provision of economic infrastructure is restricted to renationalized monopolies. A law envisages competition in power generation but needs to be updated.
5.b.	Are there independent regulators who set the prices of economic infrastructure services based on objective economic criteria?	The Public Utilities Commission (PUC) sets the prices based on criteria of quality, affordability, and sustainability of supply.
5.c.	Does the government oversee the investment plans of infrastructure SOEs and monitor their financial performance?	No formal oversight of SOE investment plans. SOEs are required to submit financial reports; the 2014 PEFA reported that government monitoring of SOEs has improved.
6	**Multi-Year Budgeting: Does the Government prepare medium-term projections of capital spending on a full cost basis?**	
6.a.	Is capital spending by ministry forecasted over a multiyear horizon?	Yes; there are two-year forward estimates for capital spending in the budget.
6.b	Are there multiyear ceilings on capital expenditure by ministry or program?	Yes; rolling multi-year ceilings.
6.c.	Are projections of the full cost of major capital projects over their life cycles published?	The budget includes only three-year costs; however, the PSIP includes estimated lifetime projected costs.
7	**Budget Comprehensiveness: To what extent is capital spending undertaken through the budget?**	
7.a.	Is capital spending mostly undertaken through the budget?	Yes, with the exception of EU-financed projects.
7.b.	Are externally funded capital projects included in the budget documentation?	Yes, but in a separate chapter (Capital III)
7.c.	Is information on PPP transactions included in the budget documentation?	No; n.a.
8	**Budget Unity: Is there a unified budget process for capital and current spending?**	
8.a.	Are capital and recurrent budgets prepared and presented together?	Yes, but not in line with international standards.

8.b.	Does the budget include appropriations of the recurrent costs associated with capital investment projects?	Yes, but due to fiscal constraints the O & M budget is underfunded
8.c	Does the budget classification and chart of accounts distinguish clearly between recurrent and capital expenditure, in line with international standards?	The distinction between recurrent and capital spending is clear but not according to international standards (e.g., maintenance is included in the capital budget); the CoA is being revised.
9	**Project Appraisal: Are project proposals subject to systematic project appraisal?**	
9.a.	Are capital projects subject to standardized cost-benefit analyses (CBAs) whose results are published?	CBAs are prepared for externally-financed projects (but often not for domestic projects); publication is the choice of the donor.
9.b.	Is there a standard methodology and central support for the appraisal of projects?	There is no published methodology or central support for project appraisal, although projects are chosen with reference to the 'critical success factors' in the GSDS. Project appraisal is not systematic and usually adopts the specific appraisal processes of the donors involved.
9.c.	Are risks taken into account in project appraisals?	No, unless donors prepare a risk assessment.
10	**Project Selection: Are there institutions and procedures in place to guide project selection?**	
10.a.	Does the government undertake a central review of major project appraisals before decisions are taken to include projects in the budget?	No.
10.b.	Does the government publish and adhere to standard criteria for project selection?	No. The intention is to include such criteria in new Public Investment legislation.
10.c.	Does the government maintain a pipeline of approved investment projects for inclusion in the annual budget?	A pipeline is maintained of projects being considered for approval; once approved they are automatically included in the budget. On rare occasions, a project can be included in the budget without having been in the pipeline.
11	**Protection of Investment: Are investment projects protected during budget implementation?**	
11.a.	Are total project outlays appropriated by parliament at the time of the project's commencement?	No. Outlays are appropriated on an annual basis
11.a.	Are in-year transfers of appropriations (virement) from capital to current spending prevented?	Yes.
11.c	Can unspent appropriations for capital spending be carried over to future years?	No; they are cancelled.

12	**Availability of Funding: Is financing for capital spending made available in a timely manner?**	
12.b	Are ministries/agencies able to plan and commit expenditure on capital projects in advance on the basis of reliable cash flow forecasts?	Yes.
12.b	Is cash for project outlays released in a timely manner?	Yes; cash for project outlays is normally released in a timely manner according to the appropriation
12.c	Is external (donor) financing of capital projects integrated into cash management and the TSA?	Yes, except for EU financing.
13	**Transparency of budget execution: Are major investment projects executed transparently and subject to audit?**	
13.a	Is the procurement process for major capital projects open and transparent?	Yes, for externally-funded projects. For locally-funded projects, a Procurement Law is awaited.
13.b	Are major capital projects subject to monitoring during project implementation?	Yes, for all externally-funded projects; these have monitoring provisions.
13.c	Are ex post audits of capital projects routinely undertaken?	Yes, because required by donors.
14	**Management of Project Implementation: Are capital projects well managed and controlled during the execution stage?**	
14.a.	Do ministries have effective project management arrangements in place?	Practice varies with ministry; some but not all apply effective procedures.
14.b.	Has the government issued rules, procedures and guidelines for project adjustments that are applied systematically across all major projects?	No; for donor projects, donor approval is sought before any adjustment
14.c.	Does the government systematically conduct an ex post review and evaluation of a project that has completed its construction phase?	Yes, for externally-funded projects.
15	**Monitoring of Public Assets: Is the value of the assets properly accounted for and reported in financial statements?**	
15.a	Are surveys of the stocks, values, and conditions of public assets regularly conducted?	No
15.b	Are nonfinancial asset values recorded in the government balance sheets?	No
15.c	Is depreciation of fixed assets captured in government operating statements?	No

Appendix I. CCPA Template

1. Climate change risks and expected impacts

Impact of climate change risks on the macroeconomic framework/long-term outlook

- How vulnerable is the economy to climate change?
- What impact could climate change have on macroeconomic sustainability?

Table of recent and expected climatic developments

2. General preparedness for climate change

The NDC and other national resilience-building strategies

- Does the NDC present a comprehensive and costed strategy for climate change response?
- Is the climate change strategy consistent with broader development goals?

Disaster planning and other contingency plans

- How well-prepared is the country to cope with possible intensified disasters?

***3*. Contribution to mitigation**

Statement of NDC pledge

- How does the country plan to meet its emissions reduction target?

  Clean energy plans

  Carbon taxation and fuel subsidy policies
- Does the current tax/subsidy system deliver appropriate carbon pricing?
- What would the tax system look like with recommended carbon pricing?

  Other carbon pricing strategies
- What other carbon-pricing strategies could usefully contribute to mitigation?

  Other macroeconomically relevant policies for mitigation
- Are any further large-scale mitigation policies relevant to the country?

4. Adaptation plans

- Has the country developed an adequate strategy to adapt to climate change?

Public investment plans

Table of Costed Climate Change Projects (if costing has been done)	*US$*	*%GDP*
Total		
Mitigation		
Adaptation		

- What, if anything, is missing from the adaptation investment strategy?

Other public programs (regulation reform, zoning…)

- Adaptation is not just a matter of investment spending; what regulations support it?

Financial sector preparedness

- How is the financial sector contributing to the climate change effort?

5. Financing strategy for mitigation and adaptation programs

Current state of financing

- Does the country have adequate financing to meet the needs of its climate change strategy?

Consistency of climate change spending and financing plans with fiscal and external debt sustainability

- Are the country's climate changes plans consistent with fiscal and external debt sustainability?

Other macroeconomic considerations

- Would implementation of the climate change plans have any (good or bad) spillover effects to the macroeconomy?

Institutional issues

6. Risk management strategy

Risk assessment procedures (e.g., fiscal risk statement)

- How well does the government assess risk?

Self-insurance (including government financial buffers including contingency provisions, rainy-day funds, NIR)

- To what extent does the government self-insure against risks?

Risk reduction and transfer (including other insurance and pooling arrangements)

- To what extent does the economy transfer risk?

7. National processes

Integration of climate change into national planning processes

- Have climate-related projects been mainstreamed into national planning?

Adequacy of public investment management system (effectiveness of procedures for identifying, evaluating, selecting, and implementing projects)

- Are adequate public investment management systems in place, to ensure climate-related investments will be well-spent?

Adequacy of PFM systems for managing CC financing and outlays (including transparent on-budget treatment of CC activities, multi-year budgeting)

- Are adequate public financial management systems in place, to protect climate-related funding?

8. Taking stock: priority needs to be met

- What resources does the country need to mobilize, to achieve its climate-change strategy?

Annexes *contain information important to one or other institution, but which have not necessarily been fully reviewed by both.*