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Green Bonds – Sovereign

Sovereign green bond market on course for critical mass, but challenges remain

Sovereign green bond issuance will accelerate in the coming years as governments seek to raise capital for climate mitigation and adaptation activities. A diverse deployment of green bond proceeds will attract investors, but sovereigns face challenges in terms of their ability to provide granular impact reporting and [1] effective proceeds management. Ultimately, the scaling up of sovereign green finance will require sustained political support.

» **Climate policy considerations support growth in supply of sovereign green bonds.** The pace of issuance will accelerate as governments signal their commitment to the Paris Agreement, seek to promote sustainable policy agendas, and encourage private capital into low-carbon and climate-resilient infrastructure.

» **Diverse deployment of sovereign green bond proceeds will support investor demand**. Sovereigns tend to spend a higher proportion of proceeds on clean transportation, waste management, land use, and climate adaptation projects, compared to the broader market which predominantly funds energy-related projects. This trend will support market growth and maturity as it allows green investors to diversify exposure and non-sovereign issuers to consider financing a broader suite of projects.

» **Consistent impact reporting is a challenge as project portfolios diversify**. In contrast to renewable energy-related projects, there is less consensus around how to measure environmental impact for other projects, which can challenge comparability and aggregation of impact. Furthermore, sovereigns often allocate proceeds towards intangible spending, weighing on their capacity to provide granular reporting.

» **Governments are taking steps to manage green bond proceeds more effectively**. The intricacies of central government financing make it difficult to effectively segregate and track green bond proceeds, and increase the potential for double counting issues. Nevertheless, sovereign issuers are addressing these challenges in a variety of ways, including enacting legislation to ring-fence funds, on-lending proceeds to public investment companies, and committing to independent audits by external parties.

» **Large-scale green bond issuance will require sustained political support.** Organisational structures set up to manage green bond programmes require effective collaboration across multiple stakeholders, underlining the importance of strong support from executive leadership. While green bond issuance represents an important signal of commitment to Paris Agreement implementation, large-scale mobilisation of government green finance may be exposed to shifting policy priorities or political landscapes.

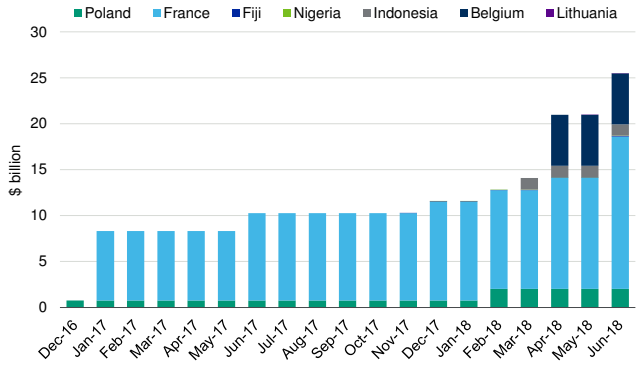
Climate policy considerations support growth in supply of sovereign green bonds

An increasing number of sovereigns – across both developed and emerging markets – are turning to green bonds as a means to raise capital for climate mitigation and adaptation activities.[2] To date, seven sovereigns globally have tapped the green bond market for a combined total of $25.5 billion in US dollar equivalent terms (Exhibit 1). The governments of Poland (A2 stable) and France (Aa2 positive) first established the market for sovereign green bonds, announcing inaugural transactions in December 2016 and January 2017, respectively. Since then, the governments of Fiji (Ba3 stable), Nigeria (B2 stable), Belgium (Aa3 stable) and Lithuania (A3 stable) have all debuted green bond issuances, while the government of Indonesia (Baa2 stable) unveiled the first sovereign green sukuk in early 2018. Both France and Poland have since followed up with additional green bond offerings, with France's green Obligations Assimilables du Tresor (OATs) accounting for almost two thirds of all sovereign green bond volumes outstanding (Exhibit 2).

Exhibit 1

Sovereign green bond issuance has surpassed $25 billion since December 2016

Cumulative sovereign green bond issuance by country, $ billion equivalent

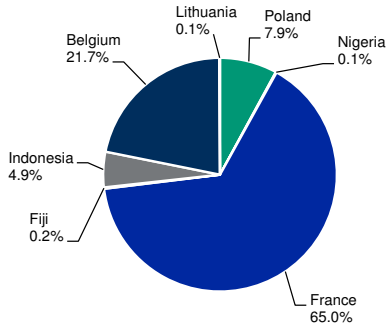


Sources: Climate Bonds Initiative, Moody's Investors Service

Exhibit 2

France accounts for the largest share of outstanding green bond issuance

Total outstanding sovereign green bond issuance by country, % of total



Sources: Climate Bonds Initiative, Moody's Investors Service

We expect the pace of sovereign green bond issuance to accelerate over the coming years.[3] Firstly, green bond issuance provides a strong signal of a government's commitment to its climate and environmental policy agenda and, in particular, how it intends to raise capital to implement its Paris Agreement commitments. For example, the eligible project categories stated under Nigeria's and Lithuania's green bond programme are explicitly linked to their respective nationally determined contributions (NDCs) submitted under the Paris Agreement. The focus on Paris Agreement execution will be a pertinent theme in the second half of 2018, as signatories are scheduled to begin formal discussions to take stock of progress on the global climate accord, with a view towards ratcheting up targets in the future. Indeed, Lithuania's green bond framework specifically alludes to this fact.

Sovereign green bond issuance also represents an important tool, alongside green tax incentives and formal market guidelines, for governments to facilitate greater private sector capital flows into green and sustainable investments. By providing a high-quality benchmark, sovereigns can enhance market liquidity and encourage other prospective green bond issuers to come to market. Indeed, France's inaugural green bond came after the government implemented Article 173 of the law on energy transition and green growth, which requires investors to disclose how they factor sustainability criteria and carbon-related aspects into their investment policies.[4] As a result of such measures, issuance from entities domiciled in France was the third largest globally last year, behind only the US and China. Looking ahead, the government of Hong Kong (Aa2 stable) has announced a planned HKD100 billion ($13 billion) green bond programme in its most recent budget as part of its broader strategy to position the economy as a regional hub for green finance.[5]

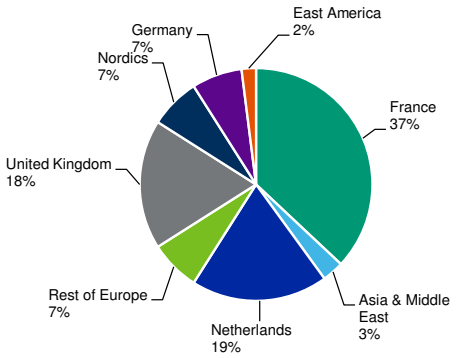
Public financing will be also critical in enhancing an economy's climate resilience, given that governments (both at a national and sub-national level) are typically the first line of defence in dealing with the aftermath of extreme weather events and/or natural disasters. We recently stated that the credit profiles of small agriculture-reliant sovereigns are most susceptible to the physical effects of climate change, and highlighted Fiji as one of the most vulnerable islands across our rated sovereign universe.[6] Other sovereigns, particularly in emerging markets, may also look to green bonds as an attractive means to finance large-scale climate adaptation and resilience investments.

Finally, prospective sovereign issuers are likely to be attracted by the growing body of evidence that green bond issuance will attract a broader and more diverse investor base. Exhibits 3 and 4 illustrate the significant geographical distribution of investors in Poland and France's maiden sovereign bonds. According to the Polish authorities, dedicated green investors accounted for 61% of final allocation of the December 2016 issuance. In France, meanwhile, foreign investors made up the lion's share of investors, at 63%. This compares to a 55% share for non-resident holders of France's total government debt.

Exhibit 3

Diverse investor distribution seen for France's maiden green bond...

Distribution of investors involved in France's January 2017 green bond

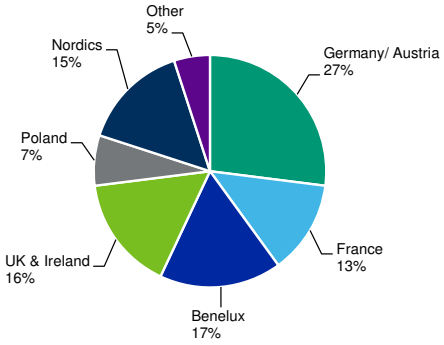


Source: Agence France Tresor

Exhibit 4

...and similar trends observed in Poland

Distribution of investors involved in Poland's December 2016 green bond



Source: State Treasury of the Republic of Poland

Diverse deployment of proceeds supports investor demand

Sovereigns are universally exposed to environmental risks and opportunities either directly (e.g., dealing with the aftermath of natural disasters) or indirectly (e.g., via policies and incentives for renewable energy investments). They also have a duty of stewardship towards citizens to safeguard against environmental hazards, such as air pollution and water shortages. Additionally, the investment gap to transition to a lower carbon economy will require large-scale public financing in sustainable infrastructure. Indeed, global infrastructure investment needs are projected to be as high as $90 trillion by 2030, much of which will need to be channelled into investments aligned with the UN Sustainable Development Goals.[7]

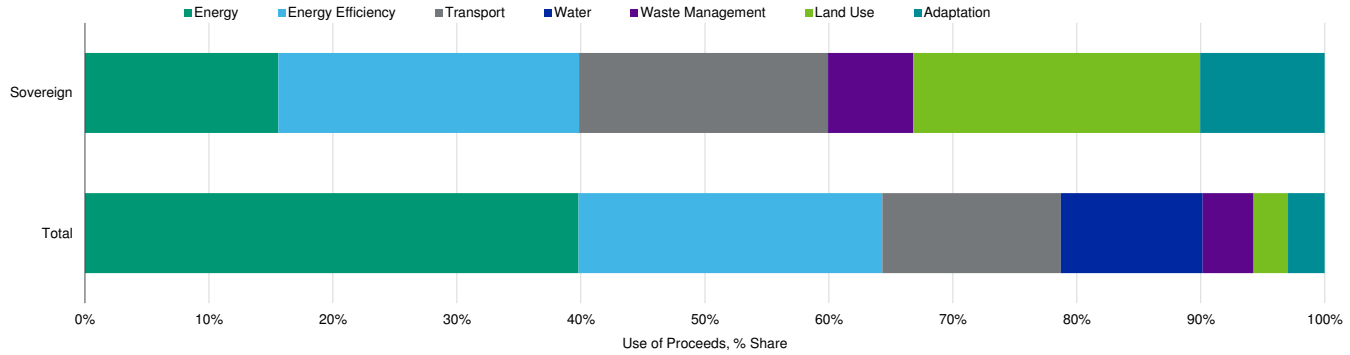
As a consequence, sovereign green bond proceeds are likely to be deployed to a more diverse array of eligible projects than other sectors of the green bond market. We see this as positive in terms of supporting market growth and maturity, as it allows green investors to diversify exposure away from largely renewable energy and energy efficiency projects, and provides a roadmap for other issuers to consider financing a broader suite of environmental projects.

Despite the small number of issuances to date, sovereign green bonds are already showing signs of greater proceeds diversity. Using granular project information where available, Exhibit 5 provides estimates for the relative share of use of proceeds for sovereign issuers versus the broader market. While we recognise that these figures are subject to estimation issues, the broad trend is instructive.[8] Not only are sovereigns financing relatively fewer renewable energy and energy efficiency projects, but projects related to transportation, waste management, land use and climate adaptation account for around 60% of allocated proceeds, compared to just 24% for the broader market.

Exhibit 5

Sovereigns use green bond proceeds more diversely than the wider green bond market

Estimated breakdown of use of proceeds, % of total



Note: Total refers to all data from 2013 onwards.
Source: Climate Bonds Initiative, Moody's Investors Service

Fiji, for example, has placed climate resilience expenditure at the core of its green bond programme, with projects including flood mitigation, drought management and disaster reconstruction. Belgium and Indonesia's green bond programmes will finance a variety of sustainable land use activities, including investment in soil rehabilitation and biodiversity initiatives (in the case of Belgium), and habitat conservation and green tourism (in the case of Indonesia).

Sovereigns typically use green bonds to finance indirect or intangible expenditures, such as subsidies, reflecting a central government's principal role in stimulating market conditions for green finance, rather than providing direct funding for specific environmental projects. For example, roughly one fifth of the proceeds from Poland's maiden green bond were allocated towards the financing or refinancing of excise tax exemptions for renewable projects. Furthermore, the green bond frameworks of both France and Indonesia permit expenditure on research and development and technological innovation.

The update to the Green Bond Principles (GBP) last year (and confirmed in the 2018 edition) to explicitly include research and development (R&D) expenditure will support the allocation of sovereign green bond proceeds to intangible expenditures, which are typically more in keeping with standard budgetary and debt management practices for central governments.[9]

Consistent impact reporting is a challenge as project portfolios diversify

The challenge of impact reporting on a more diverse set of project types is reflected in the wide variety of impact metrics cited in sovereign green bond frameworks, limiting the ability to compare or aggregate the environment benefits derived from green bonds (please see the Appendix for more information on our current Green Bond Assessments).

For renewable energy and energy efficiency, which account for the largest share of projects financed by green bonds, core indictors for measuring environmental impact are widely accepted and employed. These include annual greenhouse gas (GHG) emissions reduced or avoided in tonnes of CO_2 equivalent (for both categories), annual renewable generation in megawatt or gigawatt hours (renewable energy), and annual energy savings in megawatt hours or gigajoules (energy efficiency). Furthermore, a broad group of leading international financial institutions have sought to harmonize GHG accounting methodologies for relevant sectors.[10]

In contrast, there is less consensus around what to report for many other project types. The Green Bond Principles, for instance, has yet to publish impact reporting guidelines for land use and climate adaptation, two areas of focus for sovereign issuers.[11] Furthermore, a recent position paper on green bond impact reporting by Nordic public sector issuers noted that a number of qualitative and quantitative indicators may be relevant for waste management, clean transportation, sustainable land use and adaptation projects, with many metrics likely to be asset-specific and subject to variation depending on location.[12]

Exhibit 6 lists the indicative impact metrics cited in the respective green bond frameworks (where available) of the seven green bond issuers to date. While impact metrics for renewable energy and energy efficiency are generally well aligned, there is a much broader assortment of indicators listed for other project categories.

Exhibit 6

Sovereign green bond frameworks illustrate broad assortment of impact metrics

	Renewable Energy	Energy Efficiency	Transport	Water	Waste Management	Land Use	Adaptation
Poland	Total capacity (MW/GW)		Location and miles of track			Number of farms/ farmers supported	
	# wind turbines/ solar panels		# passengers transferred to train			Area of farmland supported (e.g. acres)	
	Location of production		GHG emissions avoided (tCO2eq)			Location, area of forest planted/ preserved	
						Trees and species of plants planted	
France	Avoided carbon emissions	Avoided carbon emissions	Avoided carbon emissions		Recyling-efficiency indicators (TBD)	Biodiversity-related indicators (TBD)	
						Pollution-related indicators (TBD)	
Fiji	*No breakdown by project type*						
Nigeria	Total MW/GW capacity produced		Location and # of buses deployed			Areas of forest planted/preserved (e.g. acres)	
	GHG emissions avoided (tCO2eq)		# passengers transferred to buses			Trees and species of plants planted	
			GHG emissions avoided (tCO2eq)			GHG emissions avoided (tCO2eq)	
Indonesia	*No breakdown by project type*						
Belgium	GHG emissions avoided (tCO2eq)	Energy savings (MWh/GWh)	Energy savings (MWh/GWh)		Amount of waste diverted from landfill	Area of land remediated/ rehabilitated	
	Energy generation (MWh/GWh)	GHG emissions avoided (tCO2eq)	GHG emissions avoided (tCO2eq)		Product value (e.g. from recycling)	Area conserved or protected	# of adaptation/ resilience projects
	Total installed capacity (MW/GW)		# train lines created/ maintained				
			# people in [new] clean transportation				
Lithuania		Energy performance (buidlings)					
		GHG emissions					
		# modernised buildings					

Sources: Moody's Investors Service, government green bond frameworks

In the case of France's green bond framework, we note that indicators for recycling efficiency, biodiversity and pollution-related projects were all 'to be determined'. And at the time of writing, the French government had yet to publish their first annual report on the use of proceeds from the January 2017 issuance.

The Green Bond Assessments (GBAs) assigned to Poland's €1.75 billion of green bonds underline the challenges associated with impact reporting. We scored both transactions as "fair" for the sub-factor of "Ongoing Reporting and Disclosure" in our methodology, in part due to the fact that the large majority of performance metrics cited reflect aggregate government expenditure for eligible environmental categories, rather than for projects specifically financed by the green bond. In addition, the issuer's first green bond report did not include quantitative data related to GHG emissions reduced or avoided as a result of the projects.[13]

Sovereigns taking steps to manage green bond proceeds effectively

An important commitment associated with green bond issuance is the segregation and management of proceeds. On this front, we note that sovereign issuers are taking steps to manage green bond proceeds effectively despite the budgetary complexities of public finances. The intricacies of central government financing, such as intergovernmental fiscal transfers, make it difficult to ensure effective segregation and tracking of green bond proceeds and raise potential double counting issues. This is particularly the case where concerns over transparency and accountability of public finances are typically more acute.

Nevertheless, sovereign issuers are addressing the challenge of proceeds management in a variety of ways. Some governments have ring-fenced proceeds into dedicated green bond accounts. In Poland, this required the parliamentary approval of an amendment to the Polish Public Finance Act, reinforcing the issuer's commitment to effective proceeds management.

Lithuania, on the other hand, has sought to address management of proceeds issues by on-lending green bond proceeds to relevant public investment authorities that will segregate and track proceeds on behalf of the sovereign's Ministry of Finance.

The governments of Belgium, Fiji and France have also committed to independent audits by external parties on the use of proceeds. Such efforts enhance transparency and accountability that green bond proceeds will be channelled effectively into eligible environmental projects and expenditures.

However, not all issuers have chosen to use external audits. In the cases of Nigeria and Poland, external assurance over the use of green proceeds may only take place as part of a general audit undertaken by national audit offices on government accounts, and only if the green proceeds are deemed to be material to the overall financial condition of the issuer.

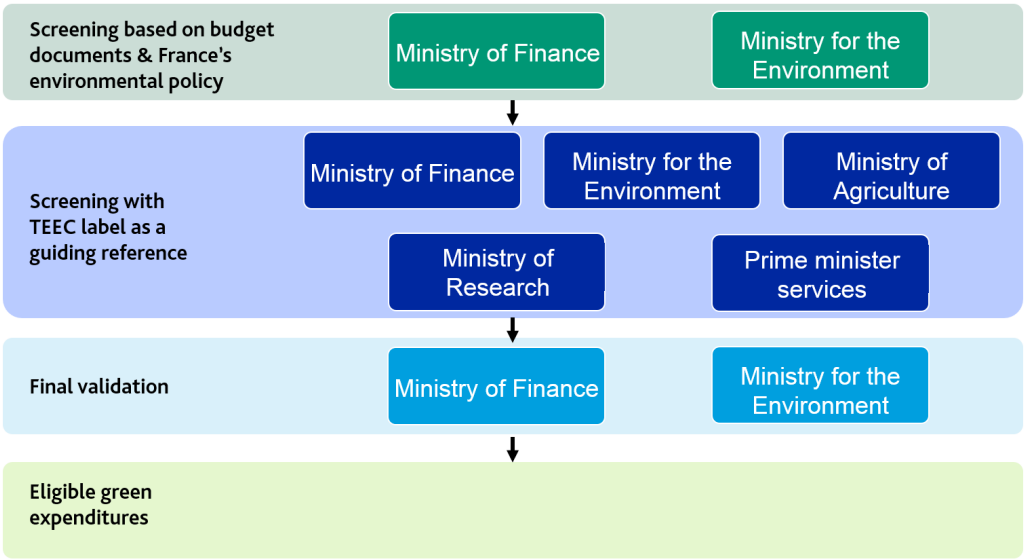
Large-scale green bond issuance will require sustained political support

Sovereign issuers typically set up comprehensive organisational structures to manage green bond programmes that often involve multiple ministries, departments and external institutions. While such structures are complex, collaboration across stakeholders enhances governance and oversight of project selection, as well as management of and reporting on green bond proceeds. Moreover, inter-ministerial coordination can bolster a government's efforts to implement its climate and environmental policies.

Exhibit 7 shows the organisation structure for the government of France's green bond programme, where the issuer has established an inter-ministerial working group to identify and select eligible project expenditure that is aligned with the "Transition Energétique et Ecologique pour le Climat" (TEEC) label aimed at promoting the country's energy and environmental transition. The TEEC label was created in 2015, leveraging both the Green Bond Principles and the Climate Bond Initiative's Climate Bond Standard.

Exhibit 7

France has established an inter-ministerial working group for its green bond programme



Note: TEEC refers to the "Transition Energétique et Ecologique pour le Climat" (TEEC) label created in 2015 with the aim of promoting the country's energy and environmental transition.
Sources: Moody's Investors Servive, Agence France Tresor

Nigeria's organisational approach is similar in nature. In addition to an inter-ministerial institutional framework, the government has established a green bond technical advisory team to support programme implementation and also set up a green bond private-public sector advisory group – which includes the World Bank, International Finance Corporation, African Development Bank, the UN

Environment Program (UNEP) and the Climate Bonds Initiative. The scope of the advisory group is broad based – including monitoring, compliance, technical and capacity-building responsibilities.[14]

In addition, all sovereigns in the market have crafted explicit green bond frameworks that enshrine the required processes and procedures for issuance, reinforcing the governance structures in place.

Strategic coordination across a variety of stakeholders underlines the importance of strong, sustained support from executive leadership in scaling up green bond programmes. To date, green bond programmes remain a small fraction of sovereign balance sheets. Green bonds account for just 1.4% and 0.6% of outstanding sovereign debt in Belgium and France, respectively, despite being the largest issuers to date.[15] More importantly, green bonds issued to date will not be sufficient to meet Paris Agreement financing needs. The aggregate economy-wide cost of implementing Nigeria's NDC is estimated at $142 billion, vastly exceeding the government's target green bond programme of NGN150 billion ($417 million). As such, the further mobilisation of government green finance, both directly (via sovereign issuance) and indirectly (through incentives and policy measures), is potentially exposed to shifting policy priorities or changing political landscapes.

Appendix: Moody's Green Bond Assessments (GBA) on sovereign green bonds

Moody's has assigned Green Bond Assessments (GBAs) to four sovereign green bond transactions to date, covering a total of $2.1 billion of assessed debt in US dollar equivalent terms. In terms of market share, assessed sovereign transactions account for approximately 11% of our global GBA portfolio. A summary of our outstanding sovereign GBAs is provided in Exhibit 8.

Exhibit 8

Moody's Green Bond Assessments on sovereign green bond transactions

	Country	Poland	Nigeria	Poland	Lithuania
	Transaction Date	Dec-16	Dec-17	Feb-18	May-18
Factor 1	Organization	2	1	2	2
Factor 2	Use of Proceeds	1	1	1	1
Factor 3	Disclosure on the Use of Proceeds	2	1	2	1
Factor 4	Management of Proceeds	2	2	2	1
Factor 5	Ongoing Reporting and Disclosure	4	1	4	1
	Weighted Score	**2.00**	**1.15**	**2.00**	**1.15**
	Assigned GBA	GB2	GB1	GB2	GB1

Source: Moody's Investors Service

We assigned a GB1 (Excellent) to the Government of Nigeria's Series 1 green bond issuance, which launched in December 2017 for the amount of NGN10.69 billion ($29.7 million).[16] The green notes represented the Nigerian government's debut offering under its NGN150 billion green bond program. The GB1 grade was supported by a full allocation of proceeds to renewable energy and afforestation projects; the government's comprehensive organization and governance structure that included oversight from external organizations; attainment of pre-issuance assurance that complies with the Climate Bonds Initiative's (CBI) Climate Bond Standards; and robust disclosure practices providing detailed information, applied methodologies and intended environmental, economic and social benefits on eligible projects. One area of slight weakness is the lack of an unequivocally independent internal audit of the centralized green bond account.

Green Bond Assessments of GB2 (Very Good) were assigned to the Government of Poland's senior unsecured fixed-rate green notes, including the debut €750 million offering in December 2016 with a maturity of 2021, and a second issuance of €1 billion of senior unsecured fixed-rate notes issued in February 2018 with a maturity of eight and a half years.[17] The GB2 grade on both green bonds is supported by exclusive proceeds allocation towards the financing and financing of expenditures within six eligible sectors; the adoption of a green bond framework that establishes clear project eligibility guidelines for use of proceeds, as well as explicit exclusion criteria; and the implementation of new processes to manage the segregation of green bond proceeds. A lack of quantitative criteria for project evaluation and disclosure on expected environmental benefits, and the absence of granular reporting over the life of the bonds, constituted weaknesses in our assessments.

We assigned a GB1 (Excellent) to the Government of Lithuania's debut green bond issuance, which closed in May 2018 in the amount of €20 million ($24 million).[18] The GB1 overall assessment was supported by proceeds being fully allocated to energy efficiency improvements in multi-apartment buildings, consistent with the Green Bond Principles and supporting the country's goals under the Paris climate agreement; good organization and governance around the green bond issuance process with multiple government agencies involved in overseeing the use of proceeds and reporting on the associated environmental benefits; strong disclosure on expected use of proceeds; proceeds on-lended to a government agency responsible for opening a separate green bond account and allocating proceeds to eligible projects; and post-issuance reporting expected to continue over the life of the bond and contain annual updates on the use of proceeds and environmental benefits achieved.

Moody's related publications

Methodology:

» Green Bonds Assessment (GBA), March 30, 2016

Green Bond Assessment:

» Government of Lithuania: Green Bond Assessment – May 2018 issuance, July 5, 2018

» Poland, Government of: Green Bond Assessment – February 2018 issuance, June 1, 2018

» Poland, Government of: Green Bond Assessment – December 2016 issuance, June 1, 2018

» Nigeria, Government of: Green Bond Assessment – Series 1 Green Notes, December 13, 2017

Sector In-Depth:

» Environmental Risks - Sovereigns: Credit profiles of small, agriculture-reliant sovereigns most susceptible to climate change risk, May 15, 2018

» Green Bonds – Global: Modest Q1 2018 issuance a speed bump on the road to market growth, April 30, 2018

» Green Bonds - Global: Global municipal green bond issuance will continue to rise, March 19, 2018

» Green Bonds - Global: Global green bond issuance set to eclipse $250 billion in 2018, January 31, 2018

Issuer Comment:

» Government of Belgium: Large green bond issuance highlights strong investor demand, March 6, 2018

» Government of France: Sizeable and Long-Dated Green Bonds Improve Market's Liquidity, January 30, 2017

» Government of Poland: Issuance of World's First Sovereign Green Bond Supports Poland's Energy and Investor Diversification Efforts, December 22, 2016

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

Endnotes

1 An impact report helps investors to quantify the expected environmental impact of eligible projects to which green bond proceeds have been allocated and disbursed.

2 For more information on green bonds and Moody's Green Bond Assessments, see Global: FAQ: The green bond market and Moody's Green Bonds Assessment, November 2017.

3 See Green Bonds – Global: Global green bond issuance set to eclipse $250 billion in 2018, January 2018.

4 See www.gouvernement.fr/en/energy-transition.

5 See https://www.budget.gov.hk/2018/eng/budget14.html.

6 See Environmental Risks – Sovereigns: Credit profiles of small, agriculture-reliant sovereigns most susceptible to climate change risk, May 2018.

7 See The Sustainable Infrastructure Imperative, New Climate Economy, 2016.

8 We have used project level information as disclosed by respective sovereign issuers, where available. Where such information has yet to be disclosed, we use the methodology applied by the Climate Bond Initiative whereby the amounts issued in US dollar equivalent is equally divided between the eligible categories listed under the issuer's framework. We recognise that this may lead to significant estimation errors in our approximation.

9 See Green Bond Principles 2018, International Capital Markets Association, June 2017.

10 See International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, World Bank, November 2015.

11 See www.icmagroup.org/green-social-and-sustainability-bonds/resource-centre/. The GBP resource centre includes reporting guidelines for renewable energy, energy efficiency, water and wastewater, waste management, and clean transportation.

12 See Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting, October 2017.

13 See Green Bond Report on the Use of Proceeds, Ministry of Finance of the Republic of Poland, December 2017.

14 See Nigeria, Government of: Green Bond Assessment - Series 1 Green Notes, December 2017.

15 See https://www.debtagency.be/en/datafederalstateoutstanding and http://www.aft.gouv.fr/rubriques/outstanding-government-negotiable-debt_159.html.

16 See Nigeria, Government of: Green Bond Assessment - Series 1 Green Notes, December 2017.

17 See Poland, Government of: Green Bond Assessment – December 2016 issuance, June 2018, and Poland, Government of: Green Bond Assessment – February 2018 issuance, June 2018.

18 See Government of Lithuania: Green Bond Assessment – May 2018 issuance, July 2018.

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