Turning Billions into (Green) Trillions: Tracking the Growth and Development of the Green Bond Market in China, France, India, and the United States

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I. BACKGROUND

The average news consumer can likely identify a litany of policy ideas for combatting climate change. Today, environmental policy conversations often focus on the implementation of a carbon tax, the development of a cap and trade scheme, and the promotion of renewable energy sources such as wind and solar. There is at least one agent of change that does not garner nearly enough attention: the rapidly developing green bond market. Green bonds are just one element, albeit a large one, of the wider green finance movement. Green finance "is a broad term that can refer to financial investments flowing into

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sustainable development projects on initiatives, environmental products, and policies that encourage the development of a more sustainable economy."[1] The green finance movement has taken off in recent years—catalyzed by the signing of the Paris Climate Accord (Paris), which classified green finance as one of the central mechanisms for combatting climate change. Now, countries have an imperative to promote green finance and pave the road towards a green economy. Green bonds provide an efficient and necessary vehicle to achieve this goal.

In the age of President Trump and an Environmental Protection Agency (EPA) led by Secretary Scott Pruitt, who is skeptical of climate change mitigation efforts,[2] not only have the gaps in U.S. environmental policy been illuminated, but attempts to address climate change have been rolled back. Many of the ideas that academics and experts agree will help mitigate the risks of climate change simply cannot make their way through the United States Congress or the administrative rulemaking process. Rules promulgated by the Obama Administration have been challenged in court, reversed, or have not been enforced.[3] Despite the political hand-wringing, the threat of climate change still poses tremendous risk to the stability of the national economy. Resource scarcity, stranded assets, water shortages, and extreme weather patterns still threaten the viability of companies and communities that play an integral role in the country's financial and economic well-being. Climate change, of course, affects energy companies like Exxon-Mobil, but it also affects the tourism industry,[4] the fishing industry,[5] and the agriculture industry,[6] and others in a myriad of ways. In addition to the

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1. Nanette Lindenberg, *Definition of Green Finance*, GERMAN DEV. INST. (Apr. 2014), https://www.die-gdi.de/uploads/media/Lindenberg_Definition_green_finance.pdf.

2. Coral Davenport & Eric Lipton, *Trump Picks Scott Pruitt, Climate Change Denialist, to Lead E.P.A.*, N.Y. TIMES (Dec. 7, 2017), https://www.nytimes.com/2016/12/07/us/politics/scott-pruitt-epa-trump.html.

3. Nadja Popovich et al., *67 Environmental Rules on the Way Out Under Trump*, N.Y. TIMES (Jan. 31, 2018), https://www.nytimes.com/interactive/2017/10/05/climate/trump-environment-rules-reversed.html.

4. *See, e.g.*, ELIZABETH BURAKOWSKI & MATTHEW MAGNUSSON, NAT. RES. DEF. COUNCIL, CLIMATE IMPACTS ON THE WINTER TOURISM ECONOMY IN THE UNITED STATES (2012), https://www.nrdc.org/sites/default/files/climate-impacts-winter-tourism-report.pdf.

5. *Climate Change Will Have Major Impact on Fishing Industry, Says UN Agency,* UN NEWS CENTRE (July 10, 2008), http://www.un.org/apps/news/story.asp?NewsID=27330#.Wm8rwpM-dp8.

6. *Agriculture: Climate*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/agriculture/agriculture-climate-change (last visited Feb. 23, 2018).

serious economic threat, the Department of Defense has expressed deep concern regarding the security threat posed by climate change.[7]

Climate change highlights the tragedy of the commons—it is a collective action problem faced by a community of nations ill-suited to handle it. The issue is large and amorphous, and its havoc to date has been most directly felt by vulnerable or minimally populated communities: coastal regions in Southeast Asia, islands in the South Pacific, Greenland, and Antarctica. Yet, with the passage of the Paris Climate Accord in December 2015, the global community announced a renewed resolve to tackle what may be the globe's most pressing challenge. The agreement sets concrete guidelines that aim to keep global temperature rise below two degrees Celsius.[8] Under the agreement, developed nations, the largest emitters of greenhouse gases, will need to make the greatest sacrifices and have a responsibility to help less financially developed nations take the necessary steps to achieve their obligations. In order to help developing nations reach their climate goals, developed nations pledged a total of at least $100 billion a year to the Green Climate Fund.[9] The initial reductions required by the Paris Climate Accord must begin by 2020 and the agreement requires countries to reevaluate their goals every five years in order to build on successes, address challenges, and implement necessary adjustments. Each signatory, which includes nearly all nations,[10] committed to reporting on its climate change mitigation efforts, limiting greenhouse

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7. Press Release, U.S. Dep't of Def., DoD Releases Report on Security Implications of Climate Change (July 29, 2015), https://www.defense.gov/News/Article/Article/612710/.

8. Global temperatures have already risen one-degree Celsius, relative to preindustrial levels. While two degrees Celsius represents the goal, the Paris Climate Accord further seeks to pursue efforts to limit the temperature increase to 1.5 degrees Celsius above preindustrial levels, recognizing that this would significantly reduce the risks and impacts of climate change. *See* Camila Domonoske*, 2 Degrees, $100 Billion: The World Climate Agreement: By the Numbers*, NAT. PUB. RADIO (Dec. 12, 2015), https://www.npr.org/sections/thetwo-way/2015/12/12/459502597/2-degrees-100-billion-the-world-climate-agreement-by-the-numbers.

9. *About the Fund*, GREEN CLIMATE FUND, http://www.greenclimate.fund/who-we-are/about-the-fund (last visited Feb. 5, 2018).

> The Green Climate Fund (GCF) is a new global fund created to support the efforts of developing countries to respond to the challenge of climate change. GCF helps developing countries limit or reduce their greenhouse gas (GHG) emissions and adapt to climate change. It seeks to promote a paradigm shift to low-emission and climate-resilient development, taking into account the needs of nations that are particularly vulnerable to climate change impacts.

10. Benjamin Hart, *Syria Leaves U.S. As Complete Outlier on Paris Climate Deal*, N.Y. MAG. (Nov. 7, 2017), http://nymag.com/daily/intelligencer/2017/11/syria-leaves-u-s-as-complete-outlier-on-paris-climate-deal.html.

gas emissions, increasing adaption, and promoting green finance.[11] This Comment will focus on the vital effort of the promotion of green finance. While the movement towards green finance began prior to the Paris Climate Accord, the agreement has spurred regulatory and/or legislative action from many of the world's largest emissions producers including China,[12] England,[13] France,[14] Germany,[15] and India,[16] and a number of U.S. states.[17]

Meanwhile at the United States federal level, domestic politics have prevented the government from adopting the types of comprehensive measures implemented or eyed by its global peers. In fact, the United States has announced its intention to leave the Paris Climate Accord, a decision roundly criticized by scientists, environmentalists, and policy experts[18] and to no longer contribute to the Green Climate Fund. In the absence of federal action, states such California[19] and New York[20] have attempted to fill the void and have begun implementing a range of policies aimed at combatting the issue on their own.

11. Green Finance is a broad term. The Green Bond Market, discussed in this Comment, represents a significant but not all encompassing element of the world finance. The Green Finance world includes other movements such as green insurance, green bank loans, and environmental reporting. For more details on the overall green finance movement, see generally LAURA BERGEDIECK ET AL., INT'L FIN. CORP. WORLD BANK GRP., GREEN FINANCE: A BOTTOM-UP APPROACH TO TRACK EXISTING FLOWS (2017), https://www.ifc.org/wps/wcm/connect/48d24e3b-2e37-4539-8a5e-a8b4d6e6acac/IFC_Green+Finance+-+A+Bottom-up+Approach+to+Track+Existing+Flows+2017.pdf?MOD=AJPERES.

12. *See id.* § 3, at 30.

13. "I have found that insurers are among the most determined advocates for tackling climate change sooner rather than later. And little wonder. While others have been debating the theory, you have been dealing with the reality." Mark Carney, Governor, Bank of Eng., & Chairman, Fin. Stability Bd., Speech at Lloyd's of London: Breaking the Tragedy of the Horizon—Climate Change and Financial Stability (Sep. 29, 2015) https://www.bis.org/review/r151009a.pdf.

14. *See* BERGEDIECK ET AL., *supra* note 11, § 3, at 30.

15. *See* CLIMATE BONDS INITIATIVE, GERMAN GREEN BONDS: UPDATES AND OPPORTUNITIES (2017), https://www.climatebonds.net/files/files/Germany_GreenBondsReport_MAY2017.pdf.

16. *See* BERGEDIECK ET AL., *supra* note 11, § 3, at 30.

17. *See* text accompanying *infra* notes 149-151.

18. Phillip Rucker & Jenna Johnson, *Trump Announces U.S. Will Exit Paris Climate Deal, Sparking Criticism at Home and Abroad*, WASH. POST (June 1, 2017), https://www.washingtonpost.com/politics/trump-to-announce-us-will-exit-paris-climate-deal/2017/06/01/fbcb0196-46da-11e7-bcde-624ad94170ab_story.html?utm_term=.02d36cbdc94b.

19. Coral Davenport & Adam Nagourney, *Fighting Trump on Climate, California Becomes a Global Force,* N.Y. TIMES (May 23, 2017), https://www.nytimes.com/2017/05/23/us/california-engages-world-and-fights-washington-on-climate-change.html.

20. Samantha Page, *New York Becomes Latest State to Take Climate Action into Its Own Hands*, THINK PROGRESS (May 18, 2017), https://thinkprogress.org/methane-new-york-plan-83706b89be3c/.

It is highly unlikely in the current United States political environment that the President, Congress, or the EPA will affirmatively act to combat climate change. In their absence, the question remains which regulatory body, or bodies, can fill the void. Looking at other nations for guidance, the two obvious options would be the United States' central bank, the Federal Reserve (Fed), or its securities regulator, the Securities and Exchange Commission (SEC). Foreign central banks and financial regulatory agencies have shown a willingness to regulate the rapidly developing green finance sector and more specifically the green bond market. Despite the reticence of policymakers today, strategies must be prepared in the United States for the day when climate change takes its place atop the political agenda.

Part II of this Comment will explore the history of green bond movement, the institutional actors involved, and the key challenges faced by green bonds. Part III of this Comment will analyze the regulatory approaches taken by some of the world's largest economies and greenhouse gas emitters: China, France, and India. It will include a description of the actions taken by each country, the important policy tradeoffs, and various institutional designs. Part IV will focus on the United States. It will include a background on green bonds in the United States, the current regulatory framework, and potential pathways forward.

II. INTRODUCTION TO GREEN BONDS

Green bonds are debt instruments, similar to traditional bonds, in which "proceeds are earmarked for environmentally beneficial purposes."[21] The European Investment Bank (EIB) issued the first green bond in 2007.[22] In 2008, the World Bank issued its first green bond. Since the market first launched, its growth has been exponential. In 2017, the green bond market exceeded the expectations of ratings agencies like Moody's,[23] and issue-area experts, such as the Climate

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21. RYAN PRECLAW & ANTHONY BAKSHI, BARCLAYS, THE COST OF BEING GREEN 1 (2015), https://www.environmental-finance.com/assets/files/US_Credit_Focus_The_Cost_of_Being_Green.pdf.

22. Press Release, European Inv. Bank, EIB Highlights 10th Anniversary of the EIB Issuing the World's First Green Bond and Confirms New Green Bond Tree Planting Scheme (June 30, 2017), http://www.eib.org/infocentre/press/releases/all/2017/2017-173-eib-highlights-10th-anniversary-of-the-eib-issuing-the-worlds-first-green-bond-and-confirms-new-green-bond-tree-planting-scheme.htm

23. Chris Flood, *Green Bonds Need Global Standards*, FIN. TIMES (May 7, 2017), https://www.ft.com/content/ef9a02d6-28fe-11e7-bc4b-5528796fe35c.

Bonds Initiative, in reaching a record $155.5 billion in total issuances[24] with the United States, China, and France representing 56% of that sum.[25] India, a recent entrant to the market, doubled its own green bond issuance and now places in the top ten globally in total issuance.[26] The rapid growth of the green bond market has excited both investors, with demand for green bonds outpacing supply, and climate activists, who see green finance as a vital tool in the fight against climate change. Despite this growth, the challenge persists. Carbon emissions are believed to have risen by 2% in 2017 and the global community is not yet on pace to achieve its objective of limiting global temperature rise below two degrees Celsius.[27]

To make a lasting impact in the fight against climate change, the green bond market will need to represent a significantly larger share of the overall bond market. Green bonds are a growing, yet still fractional portion of the total global bond market. In 2016, the global bond market represented over $92 *trillion* in assets.[28] In that same year, the green bond market represented approximately $85 *billion* in assets, less than 1/1000 of the total bond market. This share must be increased, and increased rapidly. Some estimates find that the global bond market must exceed $800 billion to $1 trillion by 2020, which would represent approximately a five to seven fold increase from the $150+ billion in issuances in 2017.[29] Growth will need to nearly double each year in order to achieve that goal. The Climate Bonds Initiative estimates that total green bond issuance will grow by at least 60% in 2018 to between $250-$300 billion.[30] Sustained growth will need to exceed the 60% projections to reach a target of $1 trillion by 2020. Worldwide, analyses estimate that $93 trillion in infrastructure spending will be needed to meet Paris

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24. CLIMATE BONDS INITIATIVE, GREEN BOND HIGHLIGHTS 1 (2018), https://www.climatebonds.net/files/reports/cbi-green-bonds-highlights-2017.pdf [hereinafter GREEN BOND HIGHLIGHTS].

25. *Id.*

26. *Id.* at 2.

27. *Id.* at 5. By one estimate, in order to achieve this goal, the green bond market must reach $1 trillion by 2020.

28. SEC. INDUS. & FIN. MKTS. ASS'N, 2017 FACT BOOK 55 (2017), https://www.sifma.org/wp-content/uploads/2016/10/US-Fact-Book-2017-SIFMA.pdf (emphasis added).

29. Christina Figueres et al., *Three Years to Safeguard Our Climate*, NATURE (June 28, 2017), https://www.nature.com/news/three-years-to-safeguard-our-climate-1.22201; *see also* GREEN BOND HIGHLIGHTS, *supra* note 24.

30. Andrew Whiley, *2017 GB Issuance: USD155.5bn: New Record! All the 2017 Number that Count in Our Green Bond Highlights Report: Plus Our Seven Super Trends and 2018 Green Bonds Forecast*, CLIMATE BONDS INITIATIVE (Jan. 10, 2018), https://www.climatebonds.net/2018/01/2017-gb-issuance-usd1555bn-new-record-all-2017-numbers-count-our-green-bond-highlights.

targets, and one analysis estimates that the United States alone will need to commit $8 trillion by 2050 to achieve its obligation.[31] While these figures are daunting, there is cause for cautious optimism. Studies have shown that 89% of all investors have expressed interest in sustainable investments and are familiar with it, while 65% already hold sustainable investments.[32] Among high net worth individuals, 66% practice sustainable investing.[33] Among the next generation of investors, millennials, and young professionals, 92% expressed awareness of sustainable investment opportunities.[34] In order to reach this goal, it is important to assess the risks in the market, the challenges to growth in the market, and ways to bolster additional demand, and more importantly, increase issuance.

Initially, development banks and international financial institutions were the primary issuers of green bonds. Domestic banks, corporations, and municipal entities followed suit and began to issue green bonds around 2013.[35] With the success of the initial public movement, private institutions have now entered the market as well. ING, HSBC France, and Apple Inc. have all issued green bonds in the private marketplace.[36] The expansion in the number of green bond issuers has increased largely because of skyrocketing investor demand.[37] Oversubscription means that investors are unable to purchase as many green bonds as they desire. Often, this leads to investor willingness to pay a premium to incorporate green bonds into their larger portfolios.[38] Hundreds of institutional

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31. JOHN CHIANG, OFFICE OF THE CAL. STATE TREASURER, GROWING THE U.S. GREEN BOND MARKET VOLUME 1: THE BARRIERS AND CHALLENGES 6 (2018), http://www.bcdc.ca.gov/fwg/20170601GrowingTheUSGreenBondMarket.pdf.

32. Enrico Lo Giudice, *The Green Bond Market, Explained*, WORLD ECON. F. (July 25, 2017), https://www.weforum.org/agenda/2017/07/what-are-green-bonds-explainer/.

33. *Id.*

34. *Id.*

35. *Green Bonds: Financing the Transition to a New Economy,* BMO GLOBAL ASSET MGMT. 1, 2 (2015), http://bmogamviewpoints.com/green-bonds-financing-the-transition-to-a-new-economy/.

36. Kevin Talbot, *What Does 'Green' Really Mean: How Increased Transparency and Standardization Can Grow the Green Bond Market*, 28 VILL. ENVTL. L.J. 127, 132-33 (2017).

37. The Climate Bonds Initiative notes that when new green bonds are offered, they are often oversubscribed. Maria Mancuso, *Green Bond Pricing in the Primary Market—Is There a Greenium? Latest Analysis from Climate Bonds*, CLIMATE BONDS INITIATIVE (Aug. 4, 2017), https://www.climatebonds.net/2017/09/green-bond-pricing-primary-market-there-greenium-latest-analysis-climate-bonds.

38. "Today's green bonds are oversubscribed, attracting new investors, and trading at a premium. Demand for a green bond at times exceeds five or six times the initial issuance. An example of this high demand is Sound Transit's $900 million offering, which sold out in its first morning." Scott Breen & Catherine Campbell, *Legal Considerations for a Skyrocketing Green Bond Market*, 31 NAT'L RES. & ENV'T 16, 17 (2017).

investors have integrated green bonds into their portfolios in order to satisfy the mandates that many of them have to make socially responsible investments.

Expansion of the green bond market requires addressing its challenges. First, bond issuers face the challenge of standardization. Currently, the standards for what constitutes a green bond varies by jurisdiction, and international harmonization has not been achieved. While some governments and central banks have made hard-law commitments to regulating the green bond market, issuers in the United States look to soft guidelines, such as the Green Bond Principles (GBP).[39] The complicated nature of the current standardization framework has led a number of issuers to not bother labeling their bonds as "green" despite the fact that many bond-financed projects do in fact have a climate-related focus. According to the Climate Bonds Initiative, only 17% of outstanding $694 billion in climate-aligned bonds are labeled green.[40] "We need to harmonize [sic] definitions as much as possible but total alignment will not be possible," said Anna Creed, the Head of Standards at the Climate Bonds Initiative, "we need to help investors, issuers and policymakers really understand the similarities and differences between green bond definitions to ensure transparency."[41]

Another key loophole in the current "framework" is the lack of a definition of "green." This has led to a concern about "green-washing" and "false positives." Green-washing "is defined as the superficial or insincere display of concern for the environment."[42] Green-washing could lead to two different types of risks: reputational and legal. The reputational risk is clear: a bank or corporate issuer sees the demand for green bonds, the financial opportunity presented, and an easy way to guarantee positive publicity. Then, investors or reporters notice that the "green bond" is not as green as marketed and suddenly the green bond market, and the issuer, face burgeoning skepticism. These false positives could stymie growth and stem the promise of the market. Additionally, many companies are actively avoiding labeling bonds as green due to the increased reporting requirements and expectations among investors, and potential legal risks associated with those expectations. The marketing and sale of a green bond could carry securities law risks, for example, if

39. *Id.*

40. CLIMATE BONDS INITIATIVE, BONDS AND CLIMATE CHANGE: THE STATE OF THE MARKET IN 2016, at 3 (2016), https://www.climatebonds.net/files/files/CBI%20State%20of%20the%20Market%202016%20A4.pdf.

41. *See* Flood, *supra* note 23.

42. *Greenwash*, DICTIONARY.COM, http://www.dictionary.com/browse/greenwash (last visited Apr. 3, 2018).

an investor claims a label was misleading.[43] As green finance continues its rise as a central force in infrastructure investments, improving the percentage of green-labeled bonds will be vital to increase consumer confidence and excitement and to gauge the impact of the green bond market on climate risk mitigation efforts.[44]

With these concerns in mind, it has become increasingly important for governments to seriously consider approaches to regulate the green bond market. Smart regulation could spur the growth necessary for the movement to make a tangible impact on climate change. As briefly noted above, other nations have demonstrated a proactive approach and stepped in. In China, the People's Bank of China (PBoC) has taken the lead using the development banking model, with the support of two other national entities involved in the securities arena.[45] In France, the French Parliament has recently placed responsibility in the hands of the private sector to build on a preexisting, climate-conscious regulatory infrastructure.[46] And in India, the country's securities regulator, the Securities and Exchange Board of India (SEBI), has recently issued green bond guidelines for issuers and investors. While the Indian bond market faces a number of unique challenges that have imperiled its growth compared to similar economies, new laws have renewed hope for increased international investment.[47] An open question remains as to whether private market forces alone can sustain, strengthen, and grow the green bond market to its full potential, or whether official government intervention is beneficial or needed. This Comment addresses the broad themes shaping the marketplace to date and explores how various approaches can be applied to the United States as it develops its green bond market.

III. CASE STUDIES: THE VARIED APPROACHES OF CHINA, FRANCE, AND INDIA

Green finance has been embraced by global actors and green bond markets have spurred much of the growth. China and France are widely viewed as the two countries that have taken the most comprehensive

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43. "Typically, this involves misleading disclosure with respect to, or a failure to disclose, a liability or risk to the profitability, cash flows or financial condition of a business." Aaron Franklin, *How to Minimise the Legal Risks of Green Bonds*, ENVTL. FIN. (May 29, 2017), https://www.lw.com/thoughtLeadership/minimize-legal-risks-green-bonds-environmental-finance.

44. Breen & Campbell, *supra* note 38, at 18.

45. *See* Section III.A.

46. *See* Section III.B.

47. *See* Section III.C.

action and have publicly acknowledged their cooperation on a number of challenges facing the market.[48] India is a new entrant to the green bond market and has been lauded for its commitment to ensure that projects financed by green bonds that actually accomplish the "green" goals they outline. Prior to the adoption of standards by national bodies, nongovernmental organizations authored guidelines for regulators and green bond issuers that have served as the baseline for the policies that have been adopted by individual nations.

The GBP, issued by the International Capital Markets Association (ICMA), provide the basis for most national green bond certification programs.[49] These principles "are voluntary process guidelines that recommend transparency and disclosure and promote integrity in the development of the Green Bond market by clarifying the approach for issuance of a Green Bond."[50] The GBP have four central components: (1) Use of Proceeds; (2) Process for Project Evaluation and Selection; (3) Management of Proceeds; and (4) Reporting.[51] The Use of Proceeds requirement provides a transparency mechanism for investors to understand how their investment will be allocated. The latest report by ICMA, updated in June 2017, lists the type of projects intended to be financed by green bonds. These include, but are not limited to: renewable energy, energy efficiency, pollution prevention and control, clean transportation, and climate adaptation.[52] Notably, the GBP do not take a position on which "green technologies, standards, claims, and declarations are optimal for environmentally sustainable benefits," which leaves room for uncertainty and variance among regulations.[53] The Process for Project Evaluation and Selection must communicate to investors: "the environmental sustainability objectives," "the process by which the issuer determines how the project fits within the eligible Green Projects categories," and "related eligibility criteria."[54] To satisfy the third component, management of proceeds, GBP "encourages a high level of transparency and recommend[s] that an issuer's management of proceeds be supplemented by the use of an auditor, or other third party, to verify

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48. *See generally China-France Joint Fact Sheet on the 4th High Level Economic and Financial Dialogue*, FRENCH MINISTRY FOR ECON. & FIN. (2016), https://www.economie.gouv.fr/files/files/PDF/china-france-joint-fact-sheet-2016.pdf.

49. *See* INT'L CAP. MKTS. ASS'N, THE GREEN BOND PRINCIPLES (2017), https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/GreenBondsBrochure-JUNE2017.pdf.

50. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

54. *Id.*

the internal tracking method and the allocation of funds from the Green Bond proceeds."[55] This step adds a significant cost for issuers that could be mitigated by stringent standards and oversight. Lastly, the GBP suggests annual reporting about the status of green financed projects.[56] The GBP also recommend the use of an external review potentially including consultant review, verification, certification, or rating, while the guidelines stop short of endorsing a specific course or depth of action.[57] Despite their sophisticated design, the GBP do not include an enforcement mechanism.

As evidenced below, the GBP have been interpreted and regulated upon differently across the globe. While many global actors such as China, France, and India have acted upon them, the United States and its financial regulatory bodies have yet to endorse specific standards.

A. China's Development Banking Approach

As the Chinese economy has developed over the past few decades, so has its pollution problem. To fuel its rapid progress, China relied on technology and energy sources regardless of their environmental impacts. But in recent years, China has made sustainable development a core tenet of its economic strategy. This radical departure from earlier practices led to China's entrance into the world of green bonds in 2015.[58] The importance of China's entrance into the marketplace cannot be overstated; despite the fact that China only issued its first green bond in late 2015, by the end of 2016, China represented 39% of global issuance with $36.2 billion in green bonds financing a wide range of projects.[59]

In China, the catalyst most responsible for the green bond market's success is its central bank. Central banks play a critical role in the promotion of climate finance. Without the financial sector's active involvement in the transition to a green economy, efforts to avert the worst effects of climate change will likely fall short of expectations. Central banks (and other financial regulatory agencies) have the power to

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55. *Id.*

56. *Id.*

57. *Id.*

58. CLIMATE BONDS INITIATIVE, CHINA GREEN BOND MARKET 2016, at 4 (2017), https://www.climatebonds.net/files/files/SotM-2016-Final-WEB-A4.pdf [hereinafter CHINA GREEN BOND MARKET 2016].

59. *Id.* For scale, The People's Bank of China estimates that China will need $320 billion in capital to achieve the government targets for pollution mitigation. In 2016, Chinese entities issued seven of the top ten largest green bonds. Ken Hu, *China Is Shifting the Green Bond Market with "Green Financing*," SOUTH CHINA MORNING POST (Oct. 30, 2017), http://www.scmp.com/business/banking-finance/article/2117507/china-shifting-green-bond-market-green-financing.

influence credit allocation, capital and reserve requirements, and countless other micro- and macro-economic drivers.[60] The role of central banks is increasingly pronounced in underdeveloped economies. Despite having the world's second largest economy, China's economy is not considered fully developed, and accordingly PBoC has remarkable influence to guide the Chinese economy in a direction of its choosing.[61] Its decision making can stymie or bolster an entire industry. When it comes to sustainable development, the PBoC has a range of policy tools at its disposal to promote investment in the green economy.

In 2015, the Chinese central bank, with active participation by other financial regulatory bodies, embraced these powers.[62] It addressed the need for green capital and the growing trend in Western markets by announcing formal guidelines for the issuance of green bonds. The announcement followed a decision earlier that year by Communist Party of China to release a policy paper addressing the country's green finance system. The government announced its hopes that green finance will help it stimulate economic growth during what it calls the "13th Five-Year-Plan."[63] In addition to the PBoC's guidelines, the Chinese National Development and Reform Commission (NDRC) has also released green bond standards. The NDRC standards apply to the state-owned enterprise sector.[64] These guidelines are less comprehensive than the guidelines issued by the PBoC; for example, the NDRC does not provide guidance on how issuers should manage proceeds or report their findings. In 2017, the China Securities Regulatory Commission (CSRC), the agency that oversees publicly traded companies in China, issued its own guidelines.[65] The CSRC guidelines, the Guidelines for Supporting Green Bond Development, follow much of the PBoC's but add that "green bond issuers shall not be those who are high polluters or

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60. For a more in-depth analysis of the role of central banks in green finance, see generally THE U.N. ENVTL. INQUIRY, ON THE ROLE OF CENTRAL BANKS IN ENHANCING GREEN FINANCE (2017), http://unepinquiry.org/wp-content/uploads/2017/02/On_the_Role_of_Central_Banks_in_Enhancing_Green_Finance.pdf.

61. *China: Overview*, WORLD BANK, http://www.worldbank.org/en/country/china/overview, (last visited Apr. 21, 2018).

62. Reuters Staff, *China Central Bank Unveils Rules on Green Bond Issues*, REUTERS (Dec. 22, 2015), https://www.reuters.com/article/us-china-economy-bonds-idUSKBN0U518Q20151222.

63. Yao Wang & Ricco Zhang, *China's Green Bond Market*, INT'L CAP. MKT. FEATURES (Q1 2017), https://www.icmagroup.org/assets/documents/About-ICMA/APAC/China's-Green-Bond-Market-Jan-2017_110117.pdf.

64. *See* CHINA GREEN BOND MARKET 2016, *supra* note 58, at 4.

65. CLIMATE BONDS INITIATIVE, CHINA GREEN BOND MARKET MID YEAR REPORT 2017 (Jan.-June 2017), https://www.climatebonds.net/files/files/China%20Mid_Year_Report_2017_25082017_Final_Eng.pdf [hereinafter CHINA GREEN BOND MARKET MID YEAR REPORT 2017].

are in industries that conflict with the national industrial planning policy."[66] Therefore, the PBoC, the NDRC, and the CSRC all maintain different standards for what constitutes a green bond. Depending on the institution issuing the bond, different standards may be used as guidance. For example, the NDRC allows 50% of funds raised through bonds to be used to repay bank loans and other nongreen functions,[67] while PBoC guidelines require the entire bond to be focused towards the green project.[68] In addition, the agency promised to take proactive steps to encourage capital flow into green industries.[69] Stock exchanges in China have also taken proactive steps to secure the growth of the green bond market, such as the Shanghai Stock Exchange when it published its *Notice on Carrying Out the Pilot Program of Green Corporate Bond Issuance*. While many local provinces have also issued guidelines to grow their markets, many have yet to be converted into specific actions. The Climate Bonds Initiative credits the decisions by various regulatory authorities and stock exchanges with fueling the rapid growth in the Chinese market.[70]

To help both issuers and investors, the PBoC released a Green Bond Endorsed Project Catalogue,[71] which lists the various types of projects that may be funded with green bonds under its guidelines. The Green Bonds Endorsed Projects Catalogue (EPC) divides green projects into six categories: (1) Clean Energy; (2) Clean Transport; (3) Resource Conservation and Recycling; (4) Pollution Prevention and Control; (5) Energy Conservation; and (6) Ecological Protection and Climate Change Adaptation.[72] The current green bonds framework in China allows for a number of projects to receive green financing, including

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66. Andrew Whiley, *China Issues Special Green Bonds Guidelines for Listed Companies + New China Local Govt Green Bond Policy Recommendations*, CLIMATE BONDS INITIATIVE (May 3, 2017), https://www.climatebonds.net/2017/05/china-issues-special-green-bonds-guidelines-listed-companies-new-china-local-govt-green-bond.

67. CHINA GREEN BOND MARKET 2016*, supra* note 58*,* at 4.

68. *Id.* at 7.

69. *China Securities Regulator Releases Guidelines to Boost Green Bonds*, XINHUA (Mar. 3, 2017), http://english.gov.cn/state_council/ministries/2017/03/03/content_281475583659044.htm.

70. The "Guidelines for Establishing the Green Financial System" were jointly released by the People's Bank of China (PBoC), Ministry of Finance, Ministry of Environmental Protection, China Banking Regulatory Commission (CBRC), China Securities Regulatory Commission (CSRC), and China Insurance Regulatory Commission (CIRC). CHINA GREEN BOND MARKET 2016, *supra* note 58, at 5.

71. *Preparation Instructions on Green Bond Endorsed Project Catalogue (2015 Edition)*, PEOPLE'S BANK CHINA (Oct. 2015), https://www.bourse.lu/documents/brochure-GB_endorsed_project_catalogue_2015.pdf.

72. *Id.*

upgrades to coal-fired power plants, large hydropower electricity generation greater than fifty megawatts, and bonds with more than 10% of proceeds allocated to general corporate purposes rather than specified green assets, even though they would not satisfy international standards.[73] The definition of "green" as it applies to green bonds in China does not necessarily fit the accepted definition of "green" in other nations. Partly due to the nature of the Chinese economy, the PBoC permits green bonds to finance the retrofitting of fossil fuel power stations, "clean" coal projects, electricity grid transmission, infrastructure that transports both fossil fuels and renewables, and large hydropower electricity generation.[74] The Climate Bonds Initiative estimates that 34% of China's green bond investments, representing approximately $12.6 billion, would not satisfy international green standards.[75]

As briefly noted above, China's green bond issuance soared in 2016 as issuance from financial institutions represented nearly 80% of the bond offerings.[76] Green projects were distributed almost evenly among the six categories in the EPC with clean energy projects (21%) leading the way.[77] The fewest investment dollars were applied to ecological protection and climate change adaptation (8%).[78] By the end of 2016, green bond issuance in China outpaced the international marketplace; green bonds represented 2% of the total Chinese bond market, and they only constituted 0.2% of the world market.[79] The bonds were issued in all regions of the country with a majority issued for projects in Shanghai, Beijing, and Fujian. Bonds were issued for twenty-three different projects in Beijing alone.

A study prepared by SynTao Green Finance and the Climate Bonds Initiative outlined the policy toolkit available in China to further catalyze the green bond market.[80] The study breaks down the options into four categories: (1) Sending Policy Signals; (2) Providing Supporting Incentives and Creating Local Platforms; (3) Introducing Financial

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73. *China Definitions*, CLIMATE BONDS INITIATIVE, https://www.climatebonds.net/market/explaining-green-bonds/china-definitions (last visited Jan. 29, 2018).

74. CHINA GREEN BOND MARKET 2016, *supra* note 58, at 4.

75. *See id.*

76. SYNTAO GREEN FIN. & CLIMATE BONDS INITIATIVE, STUDY OF CHINA'S LOCAL GOVERNMENT POLICY INSTRUMENTS FOR GREEN BONDS 6 (2017), https://www.climatebonds.net/files/reports/chinalocalgovt_02_13.04_final_a4.pdf. This number dropped to 74% in 2017. GREEN BOND HIGHLIGHTS, s*upra* note 24,.

77. CHINA GREEN BOND MARKET MID YEAR REPORT 2017, *supra* note 65, at 4.

78. *Id.*

79. *See* CHINA GREEN BOND MARKET 2016, *supra* note 58, at 2.

80. SYNTAO GREEN FINANCE & CLIMATE BONDS INITIATIVE, *supra* note 76.

Incentives; and (4) Recognition and Awards.[81] The report provides examples for each. As the report puts it, sending policy signals—such as creating a green bond steering group or task force—is "the most convenient" step a government can take.[82] These steps send the message to investors and issuers that the government is taking the expansion of the green bond marketplace seriously. In addition, the report argues that governments can stimulate demand by creating special support funds, fast-tracking initiatives and green industrial zones.[83] The report also suggests the creation of green bond project pipelines or green bond alliances as a way to connect stakeholders with potential issuers.[84] Further, the government can create financial incentives to cover the costs related to green bond issuance. Some suggestions from the study include issuance subsidies to issuers, underwriters or third-party evaluation and certification agencies; credit enhancement programs; and tax benefits such as income tax deductions.[85] Last, jurisdictions may provide recognition and awards such as the "Top Green Securities Companies" list.

China took another step forward in December 2017. The PBoC and the CSRC, reacting to the growth of the green bond market and the remaining obstacles to the market, jointly released standards for the qualifications of ratings and verification entities. The *Green Bonds Ratings and Verification Guidelines* include both pre- and post-issuance obligations.[86] The latest reforms demonstrate China's continued commitment to achieve its climate objectives. Near the end of 2017, the three largest Chinese banks, the Bank of China, the Industrial and Commercial Bank of China, and the China Development Bank, offered green bonds that indicated the "internationalization" of the Chinese green market.[87] This development led Sean Kidney, the Chief Executive Officer of the Climate Bonds Initiative, to opine that "China is likely to

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81. *See id.*

82. *Id.* at 11. There are numerous examples of such entities in China. For example, senior government officials lead task forces in Huzhou, Quzhou, and Datong.

83. *Id.*

84. *See id.* at 9.

85. *Id.* at 13. The Futian District in Shenzhen City announced a 2% interest subsidy for corporate issued green bonds.

86. *Central Bank Pushes for Standisation of China's Green Bond* Market, CHINA BANKING NEWS (Dec. 27, 2017), http://www.chinabankingnews.com/2017/12/27/central-bank-pushes-expansion-chinas-green-bonds-market/.

87. *China's Green Bond Market Goes to Internationalization: Expert*, CHINA DAILY (Nov. 18, 2017), http://www.chinadaily.com.cn/business/2017-11/18/content_34683643.htm.

stay at the head of the league table for global bond issuance and green bond issuance will accelerate in 2018."[88]

B. France's Parliamentary Approach

France is the largest issuer of green bonds in Europe and the second largest issuer in the world.[89] The French have been leaders in the green bonds space and have been responsible for a number of firsts, including Île-de-France becoming the first municipality to offer a green bond. Recently, France announced a €7 billion sovereign green bond, the largest single green bond issued to date.[90] The French, like many of their European counterparts, have long taken climate change seriously, adopting a number of reforms throughout the past few decades. Most recently, in the lead-up to the 2015 United Nations Climate Change Conference in Paris, the French government adopted article 173-VI of the Law on Energy Transition for Green Growth (article 173-VI).[91] The law adopted a multipronged approach to climate change, which sought to achieve the objectives that would soon after be promoted by the Paris Climate Accord. Recognizing the vital role of the finance sector in achieving the goals set out by the Paris Climate Accord, the law "strengthened mandatory carbon disclosure requirements for listed companies and introduced carbon reporting for institutional investors, (including asset owners and investment managers)."[92]

At the time of its passage, article 173-VI was hailed as a groundbreaking measure and attracted the attention of business leaders, climate activists, and foreign governments. France became the first country to call on its financial sector to proactively contribute to a green energy transition. "One country has clearly taken the lead and did not wait for our final recommendations . . . . To our knowledge this is a pioneering piece of regulation," stated Christian Thimann of the Task Force on Climate-Related Disclosure.[93]

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88. *Id.*
89. *See* GREEN BOND HIGHLIGHTS, s*upra* note 24, at 2.
90. *Success for France's First Sovereign Green Bond*, GOV'T FRANCE (Jan. 25, 2017), http://www.gouvernement.fr/en/success-for-france-s-first-sovereign-green-bond.
91. *See Article 173-VI: Understanding the French Regulation on Investor Climate Reporting*, FORUM POUR L'INVESTISSEMENT RESPONSIBLE 2 (Oct. 2016), http://www.frenchsif.org/isr-esg/wp-content/uploads/Understanding_article173-French_SIF_Handbook.pdf [hereinafter *Understanding Article 173-VI*].
92. *Breakout 1. Dialogue with Asset Managers and Owners on Climate Disclosure*, CTR. ON GREEN FIN. & INV. 2 (Oct. 25, 2017), http://www.oecd.org/cgfi/forum/session-note-dialogue-with-asset-managers-and-owners-on-clilmate-disclosure.pdf.
93. *See Understanding Article 173-VI, supra* note 91, at 2.

Article 173-VI applies directly to asset managers and institutional investors and all asset classes: listed assets, venture capital, bonds, physical assets, and others.[94] The law relies on four basic principles: (1) transitioning from voluntary to mandatory requirements for institutional investors; (2) placing climate at the center of ESG criteria; (3) focusing investors on the impact of their investments; and (4) allowing for flexibility and experimentation. It includes different requirements for listed (public) companies, banks and credit providers, and institutional investors. Listed companies are now required in their annual reports to (1) disclose financial risks related to climate change, (2) list the measures adopted by the company to reduce those risks, and (3) explain the consequences of climate change on the company's activities and the goods and services it produces.[95] Banks and credit providers must disclose in their annual reports the risks, both carbon- and non-carbon-related, of excessive leverage.[96] Lastly, institutional investors must disclose in their annual report (1) information on how environmental, social, and governmental (ESG) criteria[97] are factored into investment decisions, and (2) how the firm's policies align with the national strategy for energy and ecological transition.[98] Firms must either "comply" with the law or "explain" why they cannot. As the law is in its infancy, there is not yet an understanding about what type of explanation would constitute a satisfactory response. Asset managers with less than €500 million of assets under management are exempt and must only provide an overview of how they integrate ESG factors into investment decisions.[99]

Principles for Responsible Investing has assessed the French law and concluded why it believes passage was possible in France: (1) a strong regulatory environment that included a history of "extra-financial reporting regulation"; (2) willingness on behalf of French investors who had already adopted other ESG approaches to address climate risk; (3) global momentum and civil society support in France;[100] (4) political

94. *See id.*
95. *Id.* at 7.
96. *Id.*
97. ESG standards have a long history in the world of international finance. *See What Is Responsible Investment*, PRINCIPLES FOR RESPONSIBLE INV., https://www.unpri.org/about/what-is-responsible-investment (last visited Feb. 23, 2018).
98. *French Energy Transition Law: Global Investor Briefing*, PRINCIPLES FOR RESPONSIBLE INV. (2016), https://www.unpri.org/download_report/14573.
99. *See Understanding Article 173-VI*, *supra* note 91.
100. *Id.* (citing the international divestment movement led by 350.org and a number of Paris-based think tanks).

feasibility;[101] and (5) a key political event—the Paris Climate Conference. These conditions could be useful in assessing the future of a similar regulation in the United States.

Article 173-VI built on existing French willingness to actively regulate and incentivize the green finance marketplace. The French government also publicly sponsors a social responsible investment (SRI) label. The label was adopted "to bring about compliance with a set of criteria aimed at making economic performance compatible with positive social and environmental impacts through the financing of companies and public entities that contribute to sustainable development, whatever their activity may be."[102] To obtain an SRI label from the Finance Ministry, financial products must satisfy certain criteria and must receive certification from a labeling organization preapproved by the government.[103] The labels are awarded for three-year periods with intermittent auditing to verify compliance. In addition to the SRI label, France sponsors an Energy and Ecological Transition for Climate label (TEEC) "to spotlight the investment funds that finance the green economy, to spur the creation of new funds, and to encourage companies to report the 'green share' of their activities."[104] TEEC-labeled investments must have more specific environmental benefits and can only be issued for investments in certain sectors, such as transportation and renewable energy. It forthrightly excludes any investment activity related to "the exploration, production, and use of fossil fuels," as well as the entire nuclear industry. TEEC specifically includes green bonds in its labeling criteria for bond funds, specifically requiring that such bonds comply with the Green Bond Principles and strictly finance 90% of its projects based off a list of approved projects.[105]

Article 173-VI does not commit investors and affected institutions to specific means of compliance. The Forum for Responsible Investment notes that "[t]he best way to respect the spirit of article 173-VI is to interpret its openness and flexibility as a way of inciting investors to

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101. Former French President Francois Hollande had a vision to make France "the nation of environmental excellence." *What Can We Expect from French President Macron on Climate Change*, LONDON SCH. ECON. & POL. SCI. (May 11, 2017), http://www.lse.ac.uk/GranthamInstitute/news/what-can-we-expect-from-french-president-macron-climate-change/.

102. *SRI: The French Government Creates Official Labels for Financial Products*, NOVETHIC (Jan. 12, 2016), http://www.novethic.com/responsible-investment-news/sri-the-french-government-creates-official-labels-for-financial-products.html.

103. *Id.*

104. *Id.*

105. *'Energy and Ecological Transition for the Climate' Label*, FRENCH MINISTRY ENV'T, ENERGY, & SEA 7 (2015), http://www.novethic.com/fileadmin//user_upload/divers/labels/1605-LabelTEEC_Referentiel-ENG.pdf.

reflect on the methods and objectives of their investment policy as well as on the social and environmental issues they consider to be a priority in light of these objectives."[106] Yet, the law is viewed as giving increasing power to shareholders to discuss climate-related issues with companies. "Disclosure requirements by companies is a major change, especially in France, where traditionally it is difficult for investors to file resolutions at [shareholder meetings]," said Annie Degen, UNEP FI Energy Efficiency Coordinator.[107] Degen added that one of the expected outcomes of article 173-VI is "an increased willingness of companies to discuss energy and environment related topics with their shareholders, as those shareholders anticipate mandatory disclosure." One of the challenges for the law is the lack of clear enforcement mechanism:

> The implementation decree does not cover the details of the enforcement of the law, leading to some ambiguity as to the extent to which the financial regulator (AMF) will take responsibility. The French government is yet to confirm whether it will publish a PPE (Programmation Pluriannuelle de l'Energie) to give direction on consumption scenarios. There is also no mention in the decree of third party certification of the information provided in the annual reports. Therefore, there is no formal system for monitoring and ensuring compliance.[108]

France has set up working groups to assist in the implementation of the reforms. The Ministry of Finance and Ministry of Ecology, for example, have supported collaboration between investors, issuers, NGOs, and service providers to develop best practices. Professional associations have also played a role in guiding the approach of institutional investors and asset managers.[109] The implementation of the law will be evaluated by the end of 2018 to assess how the law has worked in practice and if there are best practices that should be more widely adopted.

The European Commission's High-Level Expert Group on Sustainable Finance (HLEG) recently released its 2018 report in which it hails article 173-VI as a model for other European nations to follow.[110] It recommends following the provisions of article 173-VI in the implementation of national standards for disclosure and reporting requirements.[111] The HLEG developed a number of additional

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106. *See Understanding Article 173-VI*, *supra* note 91, at 15.

107. *Id.* at 8.

108. *French Energy Transition Law: Global Investor Briefing*, *supra* note 98, at 8.

109. *Id.* at 9.

110. EU HIGH-LEVEL EXPERT GRP. ON SUSTAINABLE FIN., FINANCING A SUSTAINABLE EUROPEAN ECONOMY 25 (2018), https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report_en.pdf.

111. *Id.*

recommendations for European nations to follow including the creation of a uniform European sustainability taxonomy and individualized recommendations for various sectors of the European financial system such as banks, pension funds, and asset managers. The goal of the group's report is "to inspire and guide the Commission's action plan on sustainable finance."[112]

C. Sino-French Relationship

Analysis of the Chinese and French approach to green bonds makes clear that the green finance industry faces a number of upsides and challenges. If the green bond market is to reach its full potential, governments, central and development banks, and nongovernmental organizations will need to settle on an as-close-to-harmonized framework as possible that uses uniform terminology and standards. In the global financial market, investors, ideally, should be able to invest in a Chinese green bond to finance wind turbine construction with the same knowledge and confidence as an investor purchasing a green bond to expand solar energy farms in France. Understanding this necessity, the EIB and the Green Finance Committee of China Society for Finance and Banking published a report to track, map, and compare their divergent standards.[113]

In November 2013, China and France held their first "High-Level Economic and Financial Dialogue" as a mechanism for "bilateral communication and policy coordination on strategic, overarching and long-term issues in the economic and financial fields."[114] During one of the most recent discussions, co-chaired by Chinese Vice-Premier Ma Kai and French Economy and Finance Minister Michael Sapin, the two sides included talks on "using the Paris agreement and Chinese G20 presidency momentum to bolster a low-carbon climate-resilient development, provision and mobilization of climate finance and the

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112. *Id.* at 5.

113. G20 GREEN FIN. STUDY GRP., G20 GREEN FINANCE SYNTHESIS REPORT (Sept. 5, 2016), http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf; EUROPEAN INV. BANK, THE NEED FOR A COMMON LANGUAGE IN GREEN FINANCE (Nov. 11, 2017), http://www.eib.org/attachments/press/white-paper-green-finance-common-language-eib-and-green-finance-committee.pdf; Francesco Guarascio, *EU Eyes Capital Offer for Banks to Boost Climate Financing*, REUTERS (Dec. 12, 2017), https://uk.reuters.com/article/uk-climatechange-summit-eu-banks/eu-eyes-capital-offer-for-banks-to-boost-climate-financing-idUKKBN1E60RW.

114. *China-France Joint Fact Sheet on the 5th High Level Economic and Financial Dialogue*, GOV'T. FR. 1 (Dec. 1, 2017), http://www.gouvernement.fr/sites/default/files/locale/piece-jointe/2017/12/china-france_joint_fact_sheet_on_the_5th_high_level.pdf.

promotion of green finance."[115] The sides committed to furthering cooperation, sharing their experiences with green finance, and encouraging French and Chinese Institutions to offer energy-transition credits. China and France, representing two of the world's largest economies, have recognized not just the social impetus behind climate policy, but that growth depends on green growth.

D. India's Vital Reform Measures

India has long struggled with pollution and environmental quality. At one point, India was home to thirteen of the world's twenty most polluted cities.[116] Over the years, the Indian government has responded with hundreds of pieces of environmental legislation, which it has struggled to enforce due to a lack of strong institutions. For example, India has attempted to institute a number of command and control policies that seek to incentivize a shift to cleaner technology.[117] Indian cities have been forced by the Supreme Court to implement pollution action plans over the years.[118] These actions have represented a start, but now green bonds have presented a new, possibly more effective model.

The Indian bond market contrasts starkly with that of China and France. Until recently, the Indian bond market was relatively nascent, dragged down by arduous bankruptcy laws that left many investors fearful that they would be unable to recoup an investment in the event a project went south. Typically, one benefit of taking on a debt security is the ability to take collateral. Yet, in India with insolvency taking an average of 4.3 years[119] to resolve, short-term investors simply did not have a mechanism to offset the risk of being unable to recover debt.[120] Occasionally, the Indian government would guarantee repayment, but to avoid overexposure the government only took on these obligations in

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115. *China-France Joint Fact Sheet on the 4th High Level Economic and Financial Dialogue*, FRENCH MINISTRY FOR ECON. & FIN. 6 (2016), https://www.economie.gouv.fr/files/files/PDF/china-france-joint-fact-sheet-2016.pdf.

116. Shibaji Roychoudhury, *Thirteen of the 20 Most Polluted Cities in the World Are Indian*, QUARTZ INDIA (Dec. 7, 2014), https://qz.com/307176/thirteen-of-the-20-most-polluted-cities-in-the-world-are-indian/.

117. *See* Michael Greenstone et al., *The Solvable Challenge of Air Pollution in India*, NAT'L COUNCIL APPLIED ECON. RES. 2 (July 11-12, 2017), http://www.ncaer.org/Events/IPF-2017/IPF-2017-Paper-Greenstone-Harish-Pande-Sudarshan-Conf-version.pdf.

118. *See, e.g.*, M.C. Mehta v. Union of India & Ors. (2018), No. 13029/1985, http://admin.indiaenvironmentportal.org.in/files/COMPREHENSIVE%20ACTION%20PLAN%20Delhi%20NCR%20Supreme%20Court%20Order.pdf (India).

119. By contrast, insolvency resolution takes an average of 1.7 years in China. Debiprasad Nayak, *What India's New Bankruptcy Law Means*, WALL ST. J. (May 12, 2016), https://blogs.wsj.com/briefly/2016/05/12/what-indias-new-bankruptcy-law-means-the-short-answer/.

120. *Id.*

limited circumstances, such as late-stage infrastructure projects. In other scenarios, major corporations with strong accounting could get access to bond markets, although they would rarely do this in India, often looking to countries like Luxembourg.

The fate of the Indian Bond Market changed two years ago when the Indian government adopted a new law seeking to streamline the morass of confusing bankruptcy and insolvency laws on the books.[121] At the time, India ranked 136th in the World Bank's ranking of insolvency resolution.[122] The Insolvency and Bankruptcy Code sought to create a single law encompassing the entire process. Supporters of the legislation believe it will increase the ability of small, domestic, and foreign investors to conduct business in India. Under the new law, the bankruptcy process will speed up dramatically. In the case of a default, a company will have 180 days to wind up (with the possibility of additional ninety days being tacked on by the bankruptcy adjudicator).[123] India's current Prime Minister Narendra Modi has pledged to make it easier to conduct business in India, the world's fastest-growing major economy, and this reform is now seen as a critical milestone towards accomplishing that goal.[124]

The reduction of risk for foreign investors associated with the new Bankruptcy and Insolvency Code has had an impact on the green bond market. While young, the Indian Green Market is growing rapidly. The market took off in 2015 with issuances by entities such as the Export-Import Bank of India and the Industrial Development Bank of India. As of April 5, 2017, issuers in India had sold $3.2 billion worth of green bonds, and the Climate Bonds Initiative has recognized Indian issuers as "leaders in demonstrating best practice by having most labelled green bonds receive a review or certification from an external body."[125] Of the green bonds issued by Indian entities, six have been listed in Singapore

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121. *Lok Sabha Passes Bill to Fast Track Debt Recovery*, ECON. TIMES (Aug. 2, 2016), https://m.economictimes.com/news/economy/lok-sabha-passes-bill-to-fast-track-debt-recovery/articleshow/53495364.cms.

122. *Id.*

123. *Id.*

124. Unni Krishnan & Jeanette Rodrigues, *India Wants to Make Business Easier*, BLOOMBERG BUSINESSWK. (Oct. 19, 2016), https://www.bloomberg.com/news/articles/2016-10-20/india-wants-to-make-business-easier; *The Fastest-Growing and Shrinking Economies in 2018*, ECONOMIST (Jan. 5, 2018), https://www.economist.com/blogs/graphicdetail/2018/01/daily-chart-3.

125. CLIMATE BONDS INITIATIVE, BONDS AND CLIMATE CHANGE: THE STATE OF THE MARKET/UPDATE 2017 INDIA (May 2017), https://www.climatebonds.net/files/files/CB-HSBC-2017-India-Final-01.pdf [hereinafter BONDS AND CLIMATE CHANGE: THE STATE OF THE MARKET/UPDATE 2017 INDIA].

with others dual-listed in London and Berlin.[126] Most of the bonds have been issued in U.S. dollars, which reduces risk for foreign investors, and the average size of the bonds outpaces that of other domestic bonds.[127]

India currently ranks eighth in outstanding green bonds.[128] The Climate Bonds Initiative argues that India's certification mechanism has been "instrumental in ensuring international investor confidence in . . . [the market's] green credentials." Most Indian Green Bonds receive certification under the Climate Bonds Standard.[129] The Climate Bonds Standard is the Climate Bond Initiative's certification scheme. Sixty-two percent of green bond issuances in India went towards renewable energy projects, followed by allocations for low-carbon transport and low-carbon building projects. India has the second-highest sustainable energy target, trailing only China, with a goal of 175 gigawatts by 2022.[130] Yet, China had nearly ten times as many green bonds issued in the first five months of 2017 to help it reach its goal.[131]

The birth and rapid development of the green bond market in India required the attention of regulators. In 2016, SEBI proposed a new framework for the issuance and listing of green bonds.[132] In April 2017, SEBI finalized its rules after receiving feedback from various ministries and departments.[133] The SEBI regulations seek to provide a framework under which investors and issuers can work towards a goal of $2.5 trillion in green investment by 2030 in order to reach India's climate goals.[134] SEBI believes that the regulations will help broaden the investor base and therefore benefit issuers. In India, Green Bonds are regulated under the same framework that governs the issuing and listing of other debt securities known as the ILDS regulations. Yet, the agency wanted to provide further clarification as to what can be classified as a green bond.

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126. *Id.* at 2.

127. *Id.*

128. *See* GREEN BOND HIGHLIGHTS, *supra* note 24, at 2.

129. *See generally* CLIMATE BONDS INITIATIVE, CLIMATE BONDS STANDARDS VERSION 3.0 (Dec. 2017), https://www.climatebonds.net/files/files/Climate%20Bonds_Standard_Version%203_0_December%202017.pdf.

130. *Surging Demand for Indian Green Bonds*, INST. FOR ENERGY ECON. & FIN. ANALYSIS (July 20, 2017), http://ieefa.org/surging-demand-indian-green-bonds/.

131. *Id.* China had $7.3 billion in outstanding bonds while India had $629 million. *Id.*

132. *Sebi Finalises Norms for Listing of Green Bonds*, ECON. TIMES (Apr. 30, 2017), https://economictimes.indiatimes.com/markets/stocks/news/sebi-finalises-norms-for-listing-of-green-bonds/articleshow/58444005.cms.

133. *Id.*

134. *Id.*

A memorandum issued to SEBI board members acknowledged concerns about "greenwash[ing]" and the need for harmonized standards.[135]

The SEBI regulations are considered to be a direct response to the Paris Climate Accord and indicate India's seriousness in addressing climate change.[136] SEBI permits proceeds from green bonds to be spent on projects such as renewable and sustainable energy, clean transportation, sustainable water management, climate change adaptation, energy efficiency, sustainable waste management, sustainable land use, and biodiversity conservation—although the board maintains power to include other types of projects at its discretion.[137]

India's green bond issuers have stood out for their commitment to outside certification.[138] For example, four of the seven green bonds issued in India in 2016 received Climate Bonds Standards certification while another received review from a firm named Sustainalytics.[139] So far, demand for green bonds in India has been high, and its market is anticipated to grow despite some challenges. According to the Institute for Energy Economics and Financial Analysis, "Indian renewable energy developers face the highest nominal cost of debt in local currency across key markets in Asia and the Pacific region."[140] Moving forward, one of the challenges for India will be reducing these costs. In addition to India's work in the green bond space, India is anticipated to enter the emerging "blue bond" space in 2018, which focuses specifically on water resource projects that currently only account for 2.2% of green investment in India.[141]

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135. Memorandum from the Secs. & Exch. Bd. of India to the Bd., Disclosure Requirements for Issuance and Listing Green Bonds, https://www.sebi.gov.in/sebi_data/meeting files/1453349548574-a.pdf (last visited May 9, 2018).

136. Sean Kidney, *India's Securities Regulator Finalises Official Green Bond Listing Requirements + Says Green Bonds Are a Tool to Finance INDC (National Climate Change Plan)—Yes They Are!*, CLIMATE BONDS INITIATIVE (Jan. 12, 2016), https://www.climatebonds.net/2016/01/india%E2%80%99s-securities%E2%80%99-regulator-finalises-official-green-bond-listing-requirements-says-green.

137. *Id.*

138. *See* BONDS AND CLIMATE CHANGE: THE STATE OF THE MARKET/UPDATE 2017 INDIA, *supra* note 125, at 1.

139. *Id.*

140. Anindya Upahyay, *India's Blue Sky Pledge Gives Power to Country's Green Bonds,* BLOOMBERG MARKETS (June 18, 2017), https://www.bloomberg.com/news/articles/2017-07-18/india-s-blue-sky-pledge-gives-power-to-country-s-green-bonds.

141. Rana Kapoor, *Looking Toward a Greener Future*, HINDU (Jan. 9, 2017), http://www.thehindu.com/opinion/op-ed/Looking-towards-a-greener-future/article17009199.ece.

IV. WHAT'S GOING ON IN THE UNITED STATES?

A. Background

In light of the Paris Climate Accord, countries have taken serious steps to address the threat of climate change. Paralyzed by political polarization, the United States stands out among its global peers for its lack of serious discourse surrounding climate change, particularly at the federal level. With the Trump administration threatening the viability of the Clean Power Plan,[142] the appointment of climate change- and administrative power-skeptic Scott Pruitt to helm the Environmental Protection Agency, and a President that believes climate change is a Chinese-orchestrated hoax,[143] the chances of positive climate policy seem as unlikely as ever. Yet, the political tide in the United States will eventually turn and policymakers must be ready to make up for lost time.

Despite the lack of action on a federal level, American businesses, states, and municipalities have taken their own initiatives and have played a vital role in the development of green bonds. Major American corporations, such as Walmart and Google, have decided that "bypassing the politics"[144] on the climate agenda serves their economic interests. In the green space, Apple Inc. has issued two green bonds, and both have been announced at politically opportune moments. Apple's first green bond—a \$1.5 billion offering[145]—followed the signing of the Paris Climate Accord. Its second—a \$1 billion offering[146]—followed the President's decision to withdraw from that agreement. United States-based banks have also played a vital role in the development of the green bond market. Citibank, Bank of America Merrill Lynch, and JPMorgan Chase were three of the four banks that served on the drafting committee for the Green Bonds Principles and have been some of the largest

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142. Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 28, 2017).

143. Dylan Matthews, *Donald Trump Has Tweeted Climate Change Skepticism 115 Times. Here's All of It*, VOX (July 1, 2017), https://www.vox.com/policy-and-politics/2017/6/1/15726472/trump-tweets-global-warming-paris-climate-agreement.

144. Julia Pyper, *How Corporations 'Bypassed the Politics' to Lead on Clean Energy in 2017*, GREENTECH MEDIA (Dec. 29, 2017), https://www.greentechmedia.com/articles/read/corporations-bypass-politics-lead-clean-energy-2017#gs.FhiOBa8.

145. Valerie Volcovici, *Apple Issues \$1.5 Billion in Green Bonds in First Sale,* REUTERS (Feb. 17, 2016), https://www.reuters.com/article/us-apple-greenbonds/apple-issues-1-5-billion-in-green-bonds-in-first-sale-idUSKCN0VQ2K2.

146. Alex Webb, *Apple Issues a Second Green Bond to Finance Clean Energy*, BLOOMBERG TECH. (June 13, 2017), https://www.bloomberg.com/news/articles/2017-06-13/apple-issuing-a-second-green-bond-to-finance-clean-energy/.

backers of green finance initiatives.[147] These private entities have helped guide the framework for green finance in the United States, but their efforts have not been followed up by regulatory bodies such as the SEC and Federal Reserve.

On the state level, Massachusetts became the first U.S. state to offer a green bond in 2013.[148] The $100 million bond was purchased by a mix of individual and institutional investors and funded water quality, energy efficiency, and pollution mitigation efforts.[149] California became the first U.S. state to surpass $5 billion in green bond issuances, which included a large number of municipal bond offerings including from Bay Area Rapid Transit (BART), the Los Angeles MTA, and the City and County of San Francisco.[150] The state has more municipal green bonds outstanding than any other state. New York follows California with just under $5 billion funding similar projects.[151] With the support of large states like California, Massachusetts, New York, and Washington, the green bond market has grown rapidly despite the lack of federal incentives or pressure.

Even with the growth and support of corporate, state, and municipal issuers, the share of green bonds in the overall U.S. bond market lags behind international peers. While 2% of all bonds issued in China are green, the green bond market in the United States represents less than one-tenth of 1% of the $40 trillion U.S. bond market. Growing this share will have a tremendous impact on the overall green movement, and regulation could be useful in bolstering the necessary growth. Currently, the drawbacks from the lack of a regulatory framework are apparent in reports and advisories issued by accounting firms and investment banks. For example, a 2016 Ernst & Young (EY) report titled *Green Bonds: A Fresh Look at Financing Green Projects* discusses the challenges related to investment in green bonds such as "evolving guidelines," additional costs for issuers in developing green bonds, and the lack of a formal

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147. Press Release, Citigroup, Inc., Green Bond Principles Created to Help Issuers and Investors Deploy Capital for Green Projects (Jan. 13, 2014), http://www.citigroup.com/citi/news/2014/140114a.htm.

148. Mike Cherney, *Massachusetts Goes 'Green,'* WALL ST. J. (June 4, 2013), https://www.wsj.com/articles/SB10001424127887324563004578525762271478512.

149. *Id.*

150. Andrew Whiley, *California Green Bond Issuance Passes $5 Billion: New US Green Finance Record*, CLIMATE BONDS INITIATIVE (Nov. 30, 2017), https://www.climatebonds.net/2017/11/california-municipal-green-bond-issuance-passes-5-billion-new-us-green-finance-record.

151. *Id.*

definition for "green."[152] EY classifies the need to define a product as green as the "most daunting" challenge for issuers.[153]

Policymakers are the key for unleashing the private sector to invest in green bonds. Governments have a unique ability to enable and encourage forms of investment. They can create "steerage tools and policies" to push investors towards green investment. In order to expand the market, particularly its availability to low-risk investors, governments can regulate the market to ensure green investments are "investment-grade" and therefore less likely to solely draw the attention of investors with the capacity to take on novelty investments. Investors are increasingly concerned about climate risk in their investments. Currently, the extent to which corporations need to make climate-related disclosures is managed by a hodge-podge of federal laws dating back decades. In the absence of clear, harmonized standards on climate disclosure, there has been an increase in the amount of voluntary disclosure undertaken by corporations. Elizabeth Lewis, Head of Sustainable Investing at the World Resources Institute, notes that pension funds, family offices, and religious funds have taken the lead in pushing corporations towards greater disclosure and taking a deeper look at climate change when undertaking investments.[154] She notes that Paris was a big wake-up for the U.S. companies: "You can't just say anymore 'The Europeans are really out front on this, but the United States doesn't have a carbon tax, so I don't need to pay attention to this.'"[155]

B. Does a Framework Already Exist in the United States?

The answer to this question is unclear. Of the U.S. regulatory agencies, the SEC has been the most responsive to the investor concern about climate, despite taking a far from active role.[156] In 2010, the SEC issued guidance for public companies regarding what it considered to be the agency's existing climate-related disclosure requirements.[157] At the time, climate change legislation and administrative action received

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152. *Green Bonds: A Fresh Look at Financing Green Projects*, ERNST & YOUNG (2016), http://www.ey.com/Publication/vwLUAssets/Green_bonds-a-fresh-look-at-financing-green-projects/$FILE/EY-Green%20bonds-a-fresh-look-at-financing-green-projects.pdf.

153. *Id.*

154. *Informing Investors of Climate Risk: The Impact of Securities Laws in the Environmental Context*, 46 ENVTL. L. REP. NEWS & ANALYSIS 10,455 (2016).

155. *Id.* at 10,456.

156. *See SEC Clarifies Environmental Disclosures: Climate Change*, TAFT STETTINIUS & HOLLISTER LLP (Nov. 22, 2010), https://www.taftlaw.com/news-events/law-bulletins/sec-clarifies-environmental-disclosures-climate-change.

157. *Interpretative Guidance, 17 CFR 211, 231, and 241*, SEC. & EXCH. COMM'N (Feb. 8, 2010), https://www.sec.gov/rules/interp/2010/33-9106.pdf.

significant attention from the Democratic President and Democratic-controlled Congress, and the SEC expressed concern that public companies could be affected by the potential new laws and regulations. Additionally, shareholders of public companies increasingly called for climate disclosures. Therefore, the SEC provided the public with an overview of rules requiring disclosure of climate change issues as they currently existed. The guidance mainly focused on the implementation of an agency regulation known as Regulation S-K.[158]

Regulation S-K requires a number of items related to climate change: (1) Item 101 "requires a registrant to describe its business and that of its subsidiaries" and "expressly requires disclosure regarding certain costs of complying with environmental laws"; (2) Item 103 "requires a registration to briefly describe any material pending legal proceeding to which it or any of its subsidiaries is a party," and Instruction 5 to Item 103 states "specific requirements that apply to disclosure of certain environmental litigation"; (3) Item 503(c) applies to risk factors affecting the business; (4) Item 303 requires "Management's Discussion and Analysis of Financial Condition and Results of Operations [MD&A]" and also "includes a broad range of disclosure items that address the registrant's liquidity, capital resources and results of operations."[159] The guidance goes on to further explain how each of the rules and regulations listed could apply directly to climate change, but as the threat of climate change manifests itself more and more, it is clear that stronger requirements are needed. In a press release at the time, then-SEC Chairwoman Mary Schapiro noted:

> We are not opining on whether the world's climate is changing, at what pace it might be changing, or due to what causes. Nothing that the Commission does today should be construed as weighing in on those topics . . . . Today's guidance will help to ensure that our disclosure rules are consistently applied.[160]

The chairwoman's remarks reflected general sentiment about the SEC's backseat approach to climate change. In fact, the agency has been often criticized for its failure to enforce climate reporting requirements under the existing framework.[161] In 2016, members of Congress

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158. *See id.*

159. *Id.* § III.

160. Mary Schapiro, Chairwoman, U.S. Sec. & Exch. Comm'n, Statement Before the Open Commission Meeting on Disclosure Related to Business or Legislative Events on the Issue of Climate Change (Jan. 27, 2010), https://www.sec.gov/news/speech/2010/spch012710mls-climate.htm.

161. In the year after the guidance was issued, the agency issued forty-nine letters to public companies expressing concern about the adequacy of the company's climate disclosures. In the

including Hawaii Senator Brian Schatz and Rhode Island Senator Jack Reed called out the SEC and then-chairwoman Mary-Jo White. Schatz took the agency to task for "underreacting in the extreme," while Reed expressed his skepticism in stating that "[o]ur markets work best when investors are provided with the necessary disclosures, and the S.E.C. needs to take action by enforcing the disclosure rules on the books."[162] Schatz, Reed, and others have shrewdly framed their arguments to reflect the economic risk presented by climate change. Issues such as resource scarcity and stranded assets could directly impact the long-term viability of public companies shaping the landscape for investors. In the view of those pushing for stricter enforcement, the current regulatory environment fails to sufficiently address the threats posed to businesses.[163]

Later, the SEC issued a concept release addressing a range of issues.[164] According to the release, the agency received a number of comment letters concerned with climate disclosure. Some discussed the agency's failure to assess stranded assets and regulatory risk, while others focused on the agency's reticence in enforcing its own interpretative guidance. Further, the release acknowledged some of the other responses received on climate change:

> A few commenters suggested that we adopt new line-item disclosure requirements for climate change matters. One suggested . . . a requirement to disclose anticipated full-cycle costs of future capital expenditures and a requirement to disclose the carbon content of a registrant's reserves and resources. Another suggested . . . oil and gas companies to disclose carbon costs alongside the company's disclosure of proved reserves. A third commenter suggested . . . annual reporting of the risks to the registrant of the effects of climate change, if any. We also received many letters recommending the Commission adopt a rule requiring disclosure of political spending.[165]

These public comments could provide a basis for future reform, but for now, SEC action looks unlikely. The Federal Reserve System has also played a hands-off role in the green bond market. Neither current

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following years, those numbers dropped precipitously. David Gelles, *S.E.C. Is Criticized for Lax Enforcement of Climate Risk Disclosure*, N.Y. TIMES (Jan. 23, 2016), https://www.nytimes.com/2016/01/24/business/energy-environment/sec-is-criticized-for-lax-enforcement-of-climate-risk-disclosure.html.

162. *Id.*

163. *Id.*

164. *Concept Release, 17 CFR Parts 210, 229, 230, 232, 239, 240 and 249*, SEC. & EXCH. COMM'N (2016), https://www.sec.gov/rules/concept/2016/33-10064.pdf.

165. *Id.* at 208.

chairman Jerome Powell nor his predecessor Janet Yellen have made public remarks on the green bond market.

C. The Path Forward for the United States

In light of this background, the question remains what the path forward for the United States will be. While this Comment does not make specific recommendations, it seeks to find areas where the United States can draw upon policies adopted globally. In contrast to China, France, and India, the United States has a more vibrant corporate private sector and a strong commitment to federalism, wherein the federal government has a constitutional obligation, and oftentimes a political willingness, to yield power to states. This is particularly true in the environmental space that frequently utilizes the "cooperative federalism" approach. Under the cooperative federalism model, federal agencies work in close contact with their state-level counterparts to develop policies that best achieve federal goals.[166] It is under this model that policymakers in the United States must take on the challenge of catalyzing the green bond market. The Climate Bonds Initiative sees six potential roles for policymakers to play in scaling the green bond market: (1) ensuring market integrity, (2) incentivizing strategic issuance, (3) promoting market development, (4) improving the risk-return profile of projects, (5) increasing tax incentives for issuers and investors, and (6) boosting market demand. Eventually, the United States will need to take action. It is not even a matter of if; it is a matter of when. When that moment arrives, the United States must be prepared with a menu of policy ideas to implement.

On February 12, 2018, the Trump administration unveiled its long-awaited infrastructure investment plan.[167] Many experts noted the plan's unique funding mechanism.[168] The proposal—to spend $200 billion in federal dollars to upgrade the country's roads, railways, airports, and more—seeks additional money from states, localities, and private investors to achieve a goal of $1.5 trillion in total investment to achieve

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166. *See generally* Assistant Attorney General John Cruden, *Cooperative Federalism: A Central Concept of Environmental Law*, DEP'T JUST. (July 27, 2016), https://www.justice.gov/archives/opa/blog/cooperative-federalism-central-concept-environmental-law.

167. *Building a Stronger America: President Donald J. Trump's American Infrastructure Initiative*, WHITE HOUSE (Feb. 12, 2018), https://www.whitehouse.gov/briefings-statements/building-stronger-america-president-donald-j-trumps-american-infrastructure-initiative/.

168. *See, e.g.*, Patricia Cohen & Alan Rappeport, *Trump's Infrastructure Plan Puts Burden on State and Private Money*, N.Y. TIMES (Feb. 12, 2018), https://www.nytimes.com/2018/02/12/business/trump-infrastructure-proposal.html.

the plan's goals.[169] If approved, the plan would represent a shift in the federal government's approach towards financing infrastructure. The decision to focus on private infrastructure funding has rightly caused derision and concern among environmentalists and non-environmentalists alike, but with a boost from the federal government, there at least exists a possibility that green bonds could play an outsized role in financing the myriad of new projects. Under a future Democratic administration and Congress, there could be movement on two nascent bills in both the House of Representatives,[170] sponsored by Rep. Elizabeth Etsy (D-CT), and the United States Senate,[171] sponsored by Sen. Chris Murphy (D-CT), seeking $10 billion in green bond issuance from the United States Treasury and the creation of a United States Green Bank.

Despite the concern about the Trump administration, there are a number of encouraging trends in the United States' green economy that indicate states, municipalities, and businesses are moving forward with their green initiatives with or without government advocacy. It is noteworthy that the tax reform billed signed by President Trump in December 2017 preserved a production tax credit[172] and an investment tax credit[173] that support wind and solar energy production, respectively.[174] In 2017, the largest green bond issuer in the United States was Fannie Mae, the government-state enterprise that provides housing finance.[175] Fannie Mae is the largest provider of thirty-year fixed mortgages in the United States and has placed a focus on selling "green mortgage-backed securities (green MBS)," issuing $27.6 in green MBS in 2017.[176] Fannie Mae plays a vital role in adding liquidity to the bond market, allowing for banks and other entities to underwrite more bonds.

Adding additional liquidity to the market is just one of the goals of California State Treasurer John Chiang. Chiang is the treasurer for a

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169. *Id.*

170. H.R. 2995, 115th Cong. (2017).

171. S. 1406, 115th Cong. (2017).

172. *Renewable Electricity Production Tax Credit (PTC)*, DEP'T ENERGY, https://energy.gov/savings/renewable-electricity-production-tax-credit-ptc (last visited Feb. 25, 2018).

173. *ITC Fact Sheet*, SOLAR ENERGY INDUSTRIES ASS'N, https://www.seia.org/sites/default/files/ITC%20101%20Fact%20Sheet%20Feb17.pdf (last visited Feb. 25, 2018).

174. *U.S. Green Finance Sees a Clearer (and Brighter) Year Ahead*, S&P GLOBAL RATING 3 (Jan. 30, 2018), https://www.spratings.com/documents/20184/1634005/US_GreenFinance_013017.pdf/ab80a2c4-1696-4f8c-ac8e-e995d480cc38. The report noted that the bill passed without a single Democratic vote, indicating the value of the tax credits for growth that can withstand partisan pressures. *Id.* at 4.

175. Press Release, Fannie Mae Wins Recognition as Largest Issuer of Green Bond by the Climate Bonds Initiative (Mar. 20, 2018), http://www.fanniemae.com/portal/media/corporate-news/2018/green-bond-award-6680.html.

176. *Id.*

state with the fifth largest economy in the world—giving him tremendous power to influence the green bond marketplace. In anticipation of the first "Treasurer's Green Bonds Symposium" in late February 2018, the state treasurer's office compiled a report on the barriers and challenges to growing the green bond market by speaking to stakeholders and institutional actors in major U.S. financial markets.[177] The report, one of the broadest publicly available analyses by a policymaker, found that the pressure felt by potential issuers in the United States simply did not reach the levels of pressure felt in Europe and Asia.[178] In 2014, institutional investors, money managers, and investment entities that applied some sort of ESG criteria held $6.2 trillion in assets, which could possibly heighten the demand for green investment instruments.[179] Chiang's report notes that "official support for green bonds [in the United States] is fragmented" and that several additional factors dissuade U.S. issuers from seeking green labels, such as perceptions about cost, complexity, and legal risk.[180] In the United States, bond issuers are committed to, and often legally required to, seek the best price and cost of execution, and laws and the market generally allows for less consideration of sustainability. The report argued that a change in corporate fiduciary responsibility could also galvanize the market.[181] Additionally, participants in the report favored subsidies from the federal government that would state a preference for green bonds.

Chiang's report and the overall approach of states like California leave observers with reason to remain hopeful. With the near-universal condemnation of the Trump's administration decision to pull out from the Paris Climate Accord, U.S. states, municipalities, and corporations appear not just resilient but encouraged, both socially and economically, to continue deepening their commitments to a green economy. With thoughtful policy decisions, the United States could greatly expand its share of green bond issuance and be a leader on the path to a trillion-dollar future.

V. CONCLUSION

To fulfill its climate change mitigation potential, the green bond market will likely need to exceed $1 trillion by 2020 and continue to grow into the future. Increasing the supply of green bonds in the

177. CHIANG, *supra* note 31.
178. *Id.* at 5.
179. *Id.* at 9.
180. *Id.* at 10.
181. *Id.*

marketplace requires the cooperation of various actors including central banks, financial regulatory agencies, states, and the business community. While national governmental entities in China, France, and India have taken an active role in the green bond space, the United States federal government has not. Rather, U.S. states and corporations have taken the initiative and have made significant strides. Yet, it is not enough. The United States is the most consequential actor in global bond markets and has the potential to lead and define the marketplace. Policymakers in the United States should harness the potential of green bonds and take the lead in the transition to a green economy.