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D I A L O G U E

Green Finance: Leveraging Investment for Environmental Protection

Summary

Some political narratives describe the relationship between environmental protection and economic growth as two inherently incompatible goals. As the global community turns its attention to implementing international climate agreements, this story is ceding ground to the realization that the economy must facilitate a transition to sustainability. With limited government funding available, private investments offer an opportunity to dramatically increase and leverage funding to address daunting environmental problems. Green financing will play a critical role in the shift to a green economy.

Governments, intergovernmental organizations, financial institutions, corporations, and nongovernmental organizations (NGOs) are examining green financing mechanisms in earnest. Financial institutions are enabling investment in green infrastructure, and many have signed on to the Equator Principles, a risk management framework for determining, assessing, and managing environmental and social risk in projects. NGOs and governments are promoting public policies that encourage investments in sustainability, and developing public and private mechanisms to facilitate investments in environmentally beneficial projects, such as the Paris Climate Agreement's Green Climate Fund. With targets including pollution control, biodiversity protection, and materials management, as well as investments directly related to decreasing reliance on fossil fuels, the impacts of green financing could reshape the landscape for environmental professions. On June 6, 2017, ELI held a public seminar to present recent developments in this field. Below we present a transcript of the discussion, which has been edited for style, clarity, and space considerations.

Michael Gerrard (moderator) is Director of the Sabin Center for Climate Change Law at Columbia Law School. **Charles E. Di Leva** is a Visiting Scholar at the Environmental Law Institute.

John Rousakis is Counsel for O'Melveny & Myers LLP. **Douglass Sims** is Director of Strategy & Finance at the Natural Resources Defense Council's Center for Market Innovation.

Michael Gerrard: As is going to become abundantly clear, there is no one standard definition of “green finance” in terms of what's included or not. So, I'm going to talk about finance that is directly related to climate change mitigation and adaptation. In particular, what is it that will ultimately need to be paid for?

And so, of course, we start with mitigation and greenhouse gas emissions reductions—which is mostly migrating away from fossil fuels. That involves efforts to minimize energy use through a number of energy-efficiency measures, and efforts to decarbonize the electric power supply to move from fossil fuels toward clean sources of electricity like wind, solar, hydro, geothermal, and possibly nuclear—although that's a different debate. It also involves electrifying the vehicle fleet and converting space heating, space cooling, and water heating away from fossil fuels to electricity. All of that means that we essentially need to eventually double the supply of electricity, and all of the electricity needs to come from clean sources. Doing that will be enormously expensive. That is one of the important elements of green finance, paying for this massive decarbonization effort.

We also know that even if we were making our best efforts, there would be a lot of climate change happening. Therefore, a lot of adaptation would be needed. That's coping with the unstoppable climate change that will occur. An enormous number of activities will be needed to protect properties that are vulnerable to coastal hazards and to other climate-related problems, for example by putting buildings on stilts or retreating from the coastline or a variety of other methods that are needed for adaptation. In many parts of the country, the water supply system will need to be reconfigured. Many agricultural systems are going to need to be changed. Lots of other things are going to have to be done as well.

Not included in any of these are losses that will occur as a result of property destruction and lost productivity from climate change. But this is not monetized. It's not subject to green finance because really nobody pays for it, except sometimes insurance companies. Otherwise, these are just economic losses. In the ideal world, we, the developed world, would also be helping the developing countries cope with the losses that they will inevitably suffer as a result of climate change due largely to our greenhouse gas

emissions. And then there's the issue of what to do with the unspeakably large number of people who will ultimately be displaced.

None of this is conventionally thought of as a subject of green finance. But these are, in fact, costs that will be incurred by society. We know that the Paris Agreement essentially called for a complete transition away from fossil fuels. President Donald Trump is backing away from Paris, but the rest of the world is staying there. Hopefully, one day, the United States will return to the overall agreement and to this idea.

How much will all of this cost? There's no consensus on this. But a couple of figures will give you a sense of the number of zeroes involved. An important 2015 report by the Deep Decarbonization Pathways Project¹ indicated a whole range of costs for the United States. But the central estimate of the cost for the United States would be in 2050, \$320 billion, and ramping up to be in the hundreds of billions of dollars each year for the next several decades—all for this massive project to decarbonize the energy system.

Prof. Geoffrey Heal at Columbia Business School is using a set of different assumptions and definitions.² He had a somewhat lower estimate. But overall, we're talking about hundreds of billions of dollars per year. This does not count fossil fuel cost savings. The more we move away from fossil fuels, then the less we'll have to spend on fossil fuels, obviously. So, that is a massive offset that is not included in these numbers.

Bloomberg New Energy Finance has come up with some global estimates.³ For each five-year period, they compare what would be needed under a continuation of the business-as-usual scenario. Even under a business-as-usual scenario, you have a lot of clean energy, a lot of wind and solar being built. But then if we ramp up to a two-degree pathway, we see higher numbers. So, for these five-year increments going out to 2040, for each one, we have up to \$4.4 trillion over the course of five years. Thus, there's a lot of money that is going to be necessary. Bloomberg New Energy Finance has also estimated what portion of these expenditures will be used for what (e.g., solar, wind, biomass, and geothermal).

In terms of adaptation, again, this is not generally considered part of green finance, but it will have real costs. There are no good estimates for what these costs will be. But it's likely in the high tens or hundreds of billions of dollars per year, just for the United States for adaptation to climate change. In terms of global adaptation cost, the United Nations Environment Programme each year issues an adaptation finance gap report,⁴ which includes estimates

for the annual costs for adaptation in the developing world. This is just for the developing world, not the developed world, so this is on top of the cost that would be incurred by the United States and Canada and Europe and so forth. The ranges, again, are in the hundreds of billions of dollars per year out to 2050. In 2050, it doesn't stop. It keeps getting worse—and how much worse depends on the success we have in controlling temperatures.

In terms of what the actual economic costs would be, an important study headed by Tom Steyer and Michael Bloomberg and others had some very, very high estimates of what the economic cost would be just in the United States in the years to come as a result of climate change.⁵ All of this adds up to an enormous financial burden that we'll have to figure out how to pay for.

Joining us first is Charles Di Leva, a visiting scholar with the Environmental Law Institute. He retired as chief counsel for the Environmental and International Law Practice Group at the World Bank, where he advised on operational and policy matters related to sustainable development and climate change and its related roles and responsibilities. He's also an adjunct professor at both American University Washington College of Law and George Washington University Law School.

Charles Di Leva: Following on what Professor Gerrard has laid out as the scope and scale of the challenge, I will talk about some ways we might be able to help deal with this massive financial challenge by promoting green finance.

As Mike mentioned, there are different definitions and, depending on where you're acting, you may be using different sources of funding for dealing with climate or dealing with issues of gender support or indigenous communities or other kinds of biodiversity-related issues. There is sometimes an importance to the nuance in terms of the terminology we're using.

I want to talk about various incentives that help make finance green: rules, regulations, and guidance. They don't really fall into hard-and-fast binding and nonbinding categories. Depending on how you look at what I'll describe, there may be something that we'd look at as typically binding legislation, or there may be various incentives that can be what we'd call soft or guidance terminology. I'll look at some of the risks that can help promote green finance, and then some of the reputational issues as well.

On the harder binding requirements that incentivize green finance, I think, despite the U.S. pullout, we can look at the example of the Paris Agreement. Even though it's been in the news that the United States' nationally determined contribution (NDC) was not legally binding, when one looks at the 160+ NDCs that were submitted by the Paris Agreement, it's true in the context of Paris that governments can change. But beneath that is the fact that within many of those NDCs there already are binding

1. DEEP DECARBONIZATION PATHWAYS PROJECT, PATHWAYS TO DEEP DECARBONIZATION (2015), available at http://deepdecarbonization.org/wp-content/uploads/2016/03/DDPP_2015_REPORT.pdf.

2. Geoffrey Heal, What Would It Take to Reduce U.S. Greenhouse Gas Emissions 80% by 2050?, Working Paper 22525, National Bureau of Economic Research, Aug. 2016, <http://www.nber.org/papers/w22525.pdf>.

3. BLOOMBERG NEW ENERGY FINANCE, NEW ENERGY OUTLOOK 2017, <https://about.bnef.com/new-energy-outlook/#toc-download>.

4. UNITED NATIONS ENVIRONMENT PROGRAMME, *The Adaptation Gap Reports*, <http://web.unep.org/adaptationgapreport/content/adaptation-gap-reports>

(last visited Mar. 27, 2018).

5. *The Bottom Line on Climate Change*, RISKY BUSINESS, <https://riskybusiness.org/> (last visited Mar. 27, 2018).

commitments that will drive green finance. Mexico had already adopted a climate change law. China has put in place emission trading systems. Look at what California has done. Also, carbon pricing schemes, something that the World Bank has been working very hard to promote, are witnessed in the legally binding price regimes that you see, for example, in some of the major Canadian provinces—Alberta, British Columbia, Ontario.

Then, when it comes to large international financial institutions, the multilateral institutions such as the World Bank and other development banks like the new Asia Infrastructure Investment Bank, their criteria require impact assessments to look at greenhouse gas emissions and to try to reduce the emissions to the extent feasible.

In addition, there are other reporting requirements that are binding. There's a European Union (EU) directive on nonfinancial reporting that captures climate-related risks and programs of what are called "large companies" in the EU scheme—those that have more than 500 employees.⁶ It's interesting to see that the Shanghai and Shenzhen Stock Exchanges are also requiring climate reporting. We still have Regulation S-K in the United States for environmental disclosure, which is a requisite under the U.S. Securities and Exchange Commission.⁷ It's interesting to look at some of the new trade agreements and how they are specifically trying to protect climate regulation against claims by investors that new climate regulation could be seen as direct or indirect expropriation. All of these things are increasing leverage for climate requirements.

There's also a growing body of guidance or voluntary pledges that will make climate finance visible and part of the investment scheme. For example, Mike mentioned Mayor Bloomberg, who was the head of the Task Force on Climate-Related Financial Disclosures that was launched by the Financial Stability Board (FSB). The FSB consists of all of the world's central banks. All of their governors decided that it was needed to have a way to provide them with recommendations on climate disclosure. There is a new technical bulletin on climate risks issued by the Sustainability Accounting Standards Board (SASB).⁸ And then there are some major programs and projects and initiatives like the Global Reporting Initiative (GRI), CDP (formerly the Carbon Disclosure Project), and the Climate Registry.⁹ These will all track climate investments, climate programs, and climate emissions.

There are many other risks that drive finance to become green, including the growing volume of climate litigation all over the world. Many of us are aware of some cases in

the United States. But there are also some very high-visibility cases that Sabin Center has tracked in India and the Netherlands and other parts of the world that will help drive financial investments to look at the risks associated with not being climate-friendly.

Technologically, the World Bank has pointed out for many years that if there's deep investment in fossil fuels, there's the risk that these may become stranded assets over time. We see it today in the large fluctuating prices that are associated with various forms of fossil fuel that are more unstable than what one sees today very often in solar and wind. And there is the risk that environmental law, environmental regulations, are going to increasingly tighten carbon dioxide-type emissions. Then, of course, from the social standpoint, there is the possibility of boycotts to challenge fossil fuel-related investment.

Reputationally as well, the issue of a carbon footprint is almost a standard topic for major corporations today. Recently, there was the announcement by Walmart that they would launch an initiative to reduce greenhouse gas emissions by one gigaton by 2030.¹⁰ They enlist their major suppliers in the initiative. Therefore, some household names around the country will be participating in the tracking of greenhouse gases to reduce the amount of emissions and to enhance their reputations. Again, these initiatives are not legally binding on these entities, but they see it as necessary for customer reputational issues.

Shareholders as well are becoming increasingly involved in looking at climate impacts. And then from a regulatory and policy standpoint, of course, all of those present in Paris are aware of the fact that they need to look at how they are currently devoting national resources. Is there still too much being subsidized on the fossil fuel side as opposed to solar and wind? The Organisation for Economic Co-Operation and Development's (OECD's) statistics indicate that indeed that is the case still today.¹¹

The Green Climate Fund was first really identified in 2009 by President Barack Obama and then-Secretary of State Hillary Clinton. Today, the donors who many of us may have been counting on to support green finance are also caught up in the humanitarian crises that one sees in North Africa and Somalia and Syria, and that makes it all the more important to move away from harmful subsidies and to use the scarce public resources that we do have to try to de-risk renewable energy investment.

That is something that, I think, all of the multilateral development banks have been trying to do. It's interesting to see that the new Asia Infrastructure Investment Bank has developed an energy plan that is very much in line with the World Bank's Climate Change Action Plan,¹² to really

6. Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 Amending Directive 2013/34/EU as Regards Disclosure of Non-Financial and Diversity Information by Certain Large Undertakings and Groups (L 330/1).

7. 17 C.F.R. §229.19 (1982).

8. SASB, CLIMATE RISK—TECHNICAL BULLETIN, <https://library.sasb.org/climate-risk-technical-bulletin/> (last visited Mar. 26, 2018).

9. GRI, <https://www.globalreporting.org/Pages/default.aspx> (last visited Mar. 26, 2018); CDP, <https://www.cdp.net/en> (last visited Mar. 26, 2018); THE CLIMATE REGISTRY, <https://www.theclimateregistry.org/> (last visited Mar. 26, 2018).

10. *Walmart Launches Project Gigaton to Reduce Emissions in Company's Supply Chain*, WALMART (Apr. 19, 2017), <https://news.walmart.com/2017/04/19/walmart-launches-project-gigaton-to-reduce-emissions-in-companys-supply-chain>.

11. OECD, <http://www.oecd.org/unitedstates/> (last visited Mar. 20, 2018).

12. WORLD BANK GROUP CLIMATE CHANGE ACTION PLAN (2016), *available at* <http://pubdocs.worldbank.org/en/677331460056382875/WBG-Climate-Change-Action-Plan-public-version.pdf>.

use their resources to promote as much as possible renewable energy investment in their own targets that they have been setting. As well, all of them are advocating proper pricing of environmental goods and services, looking at including a social cost of carbon, which, of course, the Trump executive order removed from the U.S. calculation, but that still exists, and I think that is the way most multilateral financial institutions are looking at it.

And then perhaps the latest news of the day dealing with this are the very interesting shareholder climate initiatives, in which it's at least reported that Exxon had opposed a climate shareholder initiative to report on climate risk and climate disclosure that then prevailed by a 62% vote.¹³ While it may be nonbinding, it's interesting to see the large actors that have been supporting this kind of initiative, such as BlackRock Investment and some of the major U.S. pension funds.

Michael Gerrard: Thank you very much, Charles. We're now going to hear from Douglass Sims, who's an attorney with the Natural Resources Defense Council as Director of Strategy and Finance in their Center for Market Innovation. He works on a wide range of issues related to renewable energy deployment in the United States and abroad.

Douglass Sims: There was a good setup by Charles on the importance of leveraging limited public capital to drive investment in what we call low-carbon and resilient infrastructure, which includes energy and adaptation infrastructure. One concept that I've worked on for several years is the green investment bank (GIB). We're going to focus on that. The Green Bank Network is a group of green banks that have gotten together to help expand best practices around the world in green banking and also to help new green banks form. We think this institution or this function is key to accelerating investments not just in India, but everywhere.

So, we've heard the setup about the costs of the transition from fossil fuels to clean energy. But I think the important thing is to recognize that this requires a massive shift in investment from business-as-usual to new kinds of investments in resilience and in low-carbon infrastructure. This change requires a shift from not just centralized energy, but distributed energy both in the United States and in developed countries abroad. This is difficult because distributed energy is something that is new and it's small and it's a high transaction cost. So, it becomes a paradigm shift both for market mechanisms and also finance. I mentioned resilience. It is necessary to build changes in coastlines but also water, agriculture, and a whole variety of sectors, which aren't necessarily thought of when we think about climate change in the first instance.

Then, there's this concept of "greening finance" versus green finance. Greening finance we take to mean working with financial institutions and other investors to apply, essentially, climate filters and climate mechanisms and analysis to all their investments across the institutions. If you look at a food investment, you need to think about the supply of water and seeds and how it will be affected by climate change. Green finance is a more limited category that we term to mean investing in the infrastructure necessary to deal with climate change, energy, energy efficiency, and adaptation.

So, the GIBs are a part of the solution. It's a bit of a misnomer. A GIB is not a bank. It doesn't accept deposits like a bank does. It's not regulated like a bank. But it's a specialized financing vehicle designed to crowd in private capital to these sectors. There's a lot of interest in GIBs around the world. There are GIBs in Asia, Europe, and the United States. And there's interesting momentum in places like Canada, Chile, India, Mexico, the Philippines, and Ukraine.

What is a GIB? Essentially, it's a publicly capitalized financial institution dedicated to increasing private investment in these sectors. It's independent from government, meaning that even though government sets up the conditions of its equities, it makes investment decisions based on independent rigorous determinations of commercial viability. Also, it's got a narrow mandate. It only does green investments, which allows it to specialize and get the right kinds of people and resources. It's focused on cost-effectiveness, which means that it has to demonstrate that its investments will be, over time, replicable by the market and will also result in value to the government. We've seen a lot of this demonstrated in some of the early GIBs where, initially, they were only being subsidized by governments. And once the GIBs started entering into the system, there were many more dollars invested per public dollar, many more megawatts of energy, or negawatts, which is what we call energy efficiency leading to energy generation for a lesser cost.

Much like the multilateral development banks, transactions in which GIBs engage must be additional. They must actually catalyze more investment as a condition to investing. Not just maintain the status quo, but help deals become cheaper for investors or less risky for investors. There's a focus on accountability, meaning reporting—both financial, green, and other what we call environmental, social, and governance (ESG) issues, like jobs created. These are designed to crowd in private capital—as opposed to crowding out private capital. Crowding out private capital occurs when the government takes an activity that dominates the field and pushes away private investment; conversely, "crowding in" means bringing in more capital.

Very importantly, GIBs are built to serve local policy and market needs, be that at the retail or the wholesale level. When we say retail, we mean essentially direct loans or other interventions with end-users like homeowners and businesses. By wholesale, we mean interventions at

13. Marianne Lavelle, *Exxon Shareholders Approve Climate Resolution: 62% Vote for Disclosure*, INSIDE CLIMATE NEWS (May 31, 2017), <https://insideclimate-news.org/news/31052017/exxon-shareholder-climate-change-disclosure-resolution-approved>.

the financial institution level helping banks make more loans or other kinds of investments. And very importantly, the capital that comes in to the institutions needs to be patient, meaning that it has a long horizon, longer than the market would typically generate. Also, it has a different kind of return expectation than the market will anticipate in most cases.

The one question we often hear is, don't GIBs duplicate other institutions? The answer we give is no. There's a wide variety of institutions doing similar things—some of the same things in the market—but they have some different characteristics. Multilateral institutions and national development banks that are prominent public banks are really on the landscape in most places around the world outside of developed countries. These have broad mandates—anti-poverty, electrification, all kinds of things—which are developmental indicators that are very important but that aren't necessarily exclusive to green investments.

There are also quite large institutions and they deploy a lot of capital, whereas the GIBs are relatively smaller. They target things that are trying to crowd in private capital. There are also some entities that are just public-sector lenders or financing authorities. Those entities essentially operate very similarly to their private counterparts that provide loans. They don't necessarily do transformative things that share risks with the private sector to crowd them in.

Then there's the private fund sector, which has the same kind of expertise as GIBs. But essentially, that expertise is focused on private ends of profit, not on market transformation. That gives them a role that is not as transformative to the broader market. So, GIBs work with these institutions as well as utilities, banks, end-users of energy, equipment providers, contractors, and others to increase the flow of capital and information to the market because information is what transforms the markets.

I mentioned earlier GIB-like entities, meaning entities that do some of the things that GIBs do, but not all of these entities operate globally. The ones that we work closely with in the Green Bank Network are Connecticut Green Bank, New York Green Bank, United Kingdom (U.K.) Green Investment Bank, Japan Green Finance Organization, Green Tech Malaysia, Clean Energy Finance Corporation of Australia, and others that do some similar things. The newest GIB is the Montgomery County Green Bank near Washington, D.C., in Maryland. There's some interesting work being done in California at the iBank, which does some transformative things. But their client base is public-sector entities.

I've been traveling recently, particularly in Asia, working with folks in the Philippines and India around this concept. There's a lot of interest in it. In emerging markets in particular, there's a niche that banks can fill. I should point out that GIBs don't exist in any emerging markets right now other than in Malaysia. A paper¹⁴ about this was released at the 22nd Conference of the Parties, which is an

annual climate event, and last year was in Morocco. There are several areas where a GIB can make a difference.

First, earlier, we heard about NDCs. These are high-level commitments in many cases. But they aren't actually translated into investible projects. So, GIBs can help countries actually move from concept to investment, working with other actors in the market to help make those investible propositions.

Second, there's a lot of activity going on and a lot of players around how to deploy innovative tools to meet these needs. Sometimes these are dispersed around a country or state, as in the case of the East Coast and New York and Connecticut. GIBs can focus that activity in one institution to help innovation be demonstrated, tested, and pushed out to the market in a centralized way. In emerging markets as well, as was mentioned earlier, there are a lot of international climate funds being deployed, and they need local partners. Those funds don't always have access to local knowledge. Having a GIB that's built in understanding of local conditions will help them find opportunities and deploy their capital more efficiently. Similarly, there can be a conduit function between international and national parties, which we call upstream actors. Project-level downstream actors are contractors, homeowners, and building owners that design green banks.

So, what's the model in short? Different kinds of patient capital come in to the GIB and different kinds of products and tools get designed by the GIB to deal with specific market needs and they get invested in projects. Sources of capital include international investors, like the bond market, the green bond market, for example; private investors who want to invest in the space, philanthropy, and impact investors; and public sources, meaning international donors, bilateral donors, and multilateral donors like the Green Climate Fund. And, of course, the fundamental capitalization of some GIBs is often done by public sources, domestic budgets, or utility surcharges. Coming out of the GIB is a bunch of products built on crowding in private capital. But there is some straight co-lending, meaning lending side-by-side with the private sector without any kind of risk mitigation that has its value. Risk mitigation and credit enhancement takes some of the risks off of these investments to bring in new investors.

Aggregation, warehousing, and securitization—what does this mean? That, of course, means taking small projects that by themselves are nonstandardized with the high transaction cost, and putting them together in what's called the warehouse to give them scale. And then introducing them to the market in various formats. One format is called securitization.

Also, there is innovative financing, things that are needed to deal with specific problems and specific markets, whereas we have a market driven by tax credits. That's something that the GIBs can look at with appropriate and local conditions and design specific solutions for those con-

14. COALITION FOR GREEN CAPITAL ET AL., GREEN & RESILIENCE BANKS: HOW THE GREEN INVESTMENT BANK MODEL CAN PLAY A ROLE IN SCALING UP

CLIMATE FINANCE IN EMERGING MARKETS (2016), available at <http://green-banknetwork.org/portfolio/green-and-resilience-banks/>.

ditions. And then there can be money that is not money with returns, attached to grants that are deployed alongside investment capital and debt to provide technical assistance to contractors and banks to help them understand how these markets and transactions work.

So, how are GIBs created? They can be created by law, legislation, administrative action, and repurposing and consolidating existing entities. In Australia, there was a new legislative act passed by parliament. In Connecticut, there was also a law passed. But as part of that law, the existing entity that was a grantmaking entity was repurposed into the Connecticut Green Bank. And in New York, the New York Green Bank was formed through an administrative action as part of, essentially, the vision of the New York State Energy Research and Development Authority, which is an existing entity in New York that had the capacity to create subsidiaries and divisions within itself.

You can be capitalized in the industrialized countries by budget funds, by cap and trade, by utility surcharges. And then some forces have come in from emerging markets, national development banks or funds, international sources, and different kinds of investors. So, this will touch on the importance of the local specialization and local design of these entities. They also have the similar mission of crowding in private capital. But they also have particular features designed for local climate policy goals.

In Australia, interestingly, there's an emphasis on transforming into a more competitive economy in the green economy, which means that, in practice, Australia doesn't just do commercial investments, but also does venture investments, which actually allows them to take some additional risks on new technologies that could help the country gain an edge in the market. Malaysia is interested in spreading green technology around the economy. These programs are designed more to push out, to take some risk on by the government, to get more investors involved, particularly commercial banks in the sector. In Japan, interestingly, there's a very clear mandate to develop communities with some of these projects. That affects the kinds of investments they make.

There are also similar types of missions in other GIBs. The U.K. Green Investment Bank was the first GIB. Recently, it was privatized through its sale to Macquarie, which is an Australian bank. That was possible in some respects because U.K. GIB's focus has been to be green and profitable. Unlike other green banks, the U.K. GIB always strove to be at the same level of pricing and the same level of operations as private banks, really preparing it for such a privatization. So, the U.K. GIB's focus wasn't on providing necessarily long-term patient capital, but on providing specific expertise in areas where other banks hadn't invested.

Even though markets are different in terms of what they need and what the focus is, there are some problems that we know about that in every market tend to pose problems and on which the GIBs focus. One of those is that we know how to do big projects, usually with prior purchase agreements. But we don't know how to do projects that are

medium- and small-sized and are innovative. Typically in every market there's a focus on that. In the U.K., for example, offshore wind was a new and very large and expensive area where they had to make progress. And they wanted to satisfy their climate commitments. So, the U.K. GIB had a mandate to do offshore wind.

Small and medium enterprise projects are hard. These are projects where the so-called customers, the offtakers, are smaller. They don't have as much resources as larger companies. There is a high cost of structuring, and we need some special help in those areas too.

Distributed energy, as was already mentioned, is hard to finance. Also energy efficiency, which is really hard to finance, because basically you're telling someone that if they spend money now, they'll save money later, and that concept is very hard for a lot of actors to appreciate.

Some of the key strategies that GIBs use include credit enhancement, where the GIB provides essentially an insurance-type product to increase the attractiveness and decrease the risk of projects; co-investment needs investing alongside of investors, lending expertise, reducing some requirements for equity to raise more equity if you're making equity investments or debt; and then aggregation and warehousing and securitization, which means making small projects, adding them up, and then pushing them up to the market as a portfolio.

So, how do you measure the success of GIBs? There's this really important concept of leverage. That means, how much money do you bring into a particular transaction with the public money that you're utilizing? In other words, leverage ratio. If it's 2:1, it means you have twice as much money coming in from the private sector. If it's 10:1, you have 10 times as much money coming in. This is an important metric. But leverage isn't the only metric.

The metric that GIBs focus on is really something called market transformation, which is harder to measure. Market transformation occurs not in your transaction, but after your transaction. It's how the market responds without the GIB intervention and how fast. It's hard to measure. This is something that is being studied by both GIBs and multi-lateral developmental banks and others. How do you measure market transformation? The approach of a GIB should be evaluated in what they're trying to do in the market and not just by leverage.

Some of the folks we mentioned earlier in the Green Bank Network have been trying to collect their collective impact in their first, essentially, five years of operation. Essentially, there's been about \$8 billion invested or committed. That brings projects to market in the amount of about \$26 billion. And there's a wide variety of investments in renewables and efficiency and things like batteries, which are very innovative here.

These are starting to come in now and there are challenges in really making the data apples-to-apples and understanding things like leverage, how we should think about leverage. This is all part of what the Green Bank Network is working on to figure out how to measure our

actual progress in bringing in private capital in ways that are transforming the market.

There are examples of civic transactions that have been done by some of these GIBs. If you look at Malaysia, which, again, is an emerging economy, the banks there want to get involved in this space but have difficulty doing so. Therefore, Malaysia has deployed a specific sort of subsidy program that really isn't typical for most GIBs. It is a straight-up subsidy. But the goal is to increase financing at a lower financing cost to really get the market going. So, their scheme is to provide a government guarantee that is a kind of classic bilateral-type device or sovereign device, 50% of financing provided by financial institutions in Malaysia, local banks, plus a rebate on interest of 2%. There's going to be a savings to the end-user as well. As a result, as of last year, they've funded 248 projects, primarily renewables—80% of those have been renewable energy, solar, and biomass—and also in water. They brought a lot of new investors into the space. Twenty-seven banks and other institutions that would not have invested, invested because of the program.

In Japan, there's a real need to facilitate loan financing for developers by decreasing debt-to-equity ratio. That means that if a project costs \$100 and 80% of that needs to be provided by debt and 20% by equity, the 20% that the local developer has to provide is provided instead by the GIB. By doing that, the GIB actually brings more debt into the market. It also allows it to share managerial skills with the management of the small developer to help them do projects more efficiently going forward.

The U.K., as mentioned, looked at the offshore wind sector. Essentially, the U.K. had a couple different goals. They wanted to bring new investors into the sector and they wanted to allow the existing investors that were mainly in Germany, the Netherlands, and Scandinavia to be able to exit their investments because there wasn't a lot of liquidity in the market to get out of these investments. So, they invested first in operating wind projects. Then, they went upstream to invest in wind projects. Then, they created the first offshore wind fund. That fund allowed them to attract pension funds that otherwise wouldn't have invested in this area. Again, that line of investments created a valuable asset that the U.K. has now monetized in privatization.

In Australia, the green bond market really tries to get bond investors with the biggest pool of capital in the world into the green space by offering them investments that are verified green investments. To get that market started in Australia, the Australian Cooperative Finance Corporation has done some really interesting investments in what is called "cornerstone investments" to really catalyze these markets. A particular one was in solar and storage projects that have never been done before, so it was deemed as being risky.

There is some really interesting work in Connecticut around solar. Activating solar in Connecticut where the GIB in the state offered direct loans to customers that

were actually sized based on the amount of energy savings that the projects would yield, which is also very innovative and has now been taken up by other actors in the market in that market transformation measure that we talked about earlier.

There are several ways to create a GIB. There are four steps. First is figuring out what the market needs by scoping out what the barriers are to initial investment and by meeting stakeholders. Second is analyzing and investigating in more depth. Third is figuring out the legal structure and putting it in place. Then, fourth, is operations. The Green Bank Network is looking to expand, and we're hoping that we can get some emerging markets and some of the new GIBs in the United States to join us this year. We think we're going to be transformative both in the United States and abroad in helping catalyze private investment.

Michael Gerrard: Now we're going to hear from John Rousakis, who's an environmental attorney with O'Melveny & Myers. He represents private equity in financial, commercial, and industrial clients in transactions, litigation, and regulatory compliance matters.

John Rousakis: Thank you, Michael. I'm going to expand on a concept that both Charles and Doug mentioned, and that's greening finance. So, I'm not going to talk about green finance. But there has been a lot of activity in the field of greening finance over the past 10 years. I'll focus particularly on the private equity space.

When we talk about this, we're talking about how institutional investors and others have attempted to ensure that the companies they invest in are managed responsibly and sustainably with an eye toward reducing carbon footprints, with an eye toward reducing other environmental impacts and minimizing environmental risks, and with sensitivity toward community concerns and needs. I want to talk about where we came from, where we are now, and where we're going.

To give some context, this was driven by activity in the EU over 10 years ago. It was a really active time in the EU in terms of environmental legislation and other activity. The Kyoto Protocol was signed in 1997, and the EU was very active in implementing the Protocol in the 2000s through the Emissions Trading System. In the mid-2000s, they passed the Registration, Evaluation, Authorisation, and Restriction of Chemicals Regulation (REACH), the Waste Electrical and Electronic Equipment Directive (WEEE), and the Restriction of Hazardous Substances Directive (RoHS),¹⁵ which focused on product stewardship.

These rules sought to reduce carbon emissions and green the supply chain. In the private sector, companies like Walmart, General Electric, Hewlett Packard, and Apple were also looking to green their supply chains, and were

15. REACH, Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 Concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; WEEE, Directive 2002/96/EC, amended as Directive 2012/19/EU; RoHS, Directive 2002/95/EC, amended as Directive 2011/65/EU.

powerful in the sense that “we have these suppliers and we can influence them or we can do a lot of environmental good by basically imposing certain environmental and social standards on their activities.”

So, institutional investors thought about that, too. In 2003, banks got together and drafted the Equator Principles that influenced project finance.¹⁶ In 2006, the United Nations Principles for Responsible Investment (UN PRI) were drafted. At the time, a handful of institution investors signed on to the UN PRI. To give some perspective, now there are 1,700 investors that are signed on to the UN PRI. That represents \$60 trillion in assets under management that are under a framework or umbrella of responsible investing. That’s huge and really transformative.

So what are these principles? I’ll name the first three because they provide a good framework for what we’re going to discuss. The first one is that we will incorporate ESG issues into investment analysis and decisionmaking processes. That is diligence. That’s something we’ve done and it’s been enhanced in the past few years. The second one is we will be active owners and incorporate ESG issues into our ownership policies and practices. That is implementation. What do we do when we buy a company and how do we implement these ESG goals? The third is we will seek appropriate disclosure on ESG issues by the entities in which we invest. That’s reporting. What do we tell the world about what we’re doing? There’s a lot of discussion about whether or not public companies are doing that appropriately and sufficiently. Although, in the private equity space they’re not required to report publicly, there’s some discussion about how much they should be required to report publicly as opposed to just to their limited partners.

A private equity general partner sets up the fund and raises money for that fund. And then, limited partners, institutional investors, pension funds, sovereign wealth funds, and other investors put their money in the fund for 10 to 14 years or so. In that period, the private equity firm invests, buys companies, holds them for a while and manages them, and sells them.

Right now, in terms of the assets under management for private equity, we’re talking about several trillion dollars of assets. So a significant portion of those assets are now under this ESG umbrella.

Initially, when the UN PRI first came into effect, the process was more one of self-assessment. Limited partners essentially asked their general partners to report on what they were doing in terms of evaluating ESG risks and what they were doing to improve performance in that regard. It was more of a self-assessment framework. It was looser. Over time, it’s become more rigorous and comprehensive. Now, we have an effort to really dig more deeply into how the performance of companies can be improved from an environmental perspective and analyze what kinds of opportunities exist for cost savings and for actually capi-

talizing on, for example, opportunities in climate change adaptation and carbon reduction.

Another thing that was driving this in the 2000s was that we had the financial crisis. There were a lot of companies looking to save money, so they got pretty serious about energy savings. There were opportunities to cut costs, and there were grants being provided by state and federal governments for energy savings. So a lot of corporate America saw this as a way to improve their bottom line and also potentially get some public funding for it.

In 2009, the Private Equity Growth Capital Council—now called the American Investment Council—drew up their own guidelines for responsible investments that reflect most of what were in the UN PRI. They committed to incorporate these types of principles into their investments as well. Examples of the types of issues and questions that are incorporated into the frameworks include, for example, diligence. Due diligence process and scope-type questions. Whether or not portfolio companies have ESG policies. How do you implement these policies? What actions have companies taken to incorporate ESG into operations? And what impacts have those ESG programs had on the companies’ financials and their communities?

In terms of diligence, as you can imagine, we’ve always done diligence on companies and we’ve done deep environmental diligence. We do this to understand what risks are associated with investments. Now, we’re sort of evolving to look more toward carbon and climate change-related risks in diligence. We have banks asking us questions about climate change risks associated with a business, such as flood risks. These are things we’re asking companies. We’re asking companies what kind of sustainability programs they have and whether or not they have evaluated their climate change-related risks. It’s getting challenging, but we’re starting to develop deeper evaluative diligence tools to figure this out.

For example, some of the challenges relate to evaluating whether or not a company has a deep supply chain risk, how water-dependent the company is, and whether or not their suppliers will be able to supply them in the event of a climate catastrophe or flood or storm or other major event. So, that’s an evolving area. It’s particularly challenging as diligence often is abbreviated in transactions.

There’s been a significant evolution over the past 10 years in terms of implementation. Ten years ago, firms had not necessarily staffed up to help portfolio companies implement the types of ESG programs that are now expected, and there’s a wide range of sophistication in terms of implementing these types of programs. So, you have your large private equity firms that have staffed up considerably and have good-sized staffs and programs and actually go into their portfolio companies and help them identify environmental risks and find environmental opportunities.

For example, we’ve seen a large private equity firm bring together all their portfolio companies in one place to share best practices and to raise the level of sophistication of the smaller companies. Eighty-one percent of S&P 500

16. EQUATOR PRINCIPLES, <http://equator-principles.com/> (last visited Mar. 26, 2018).

companies now report on sustainability. There's variation in how informative the information they provide is, but it's generally accepted now that a big company will think about this stuff and tell the world what it's doing to reduce its carbon footprint, to improve its environmental performance, and be sensitive to social needs.

When you get down to the smaller and mid-cap companies, it's not something they're necessarily thinking about. So, I think what's happened in the private equity space is that you have information-sharing and you have the bigger companies influence the level of performance of the smaller and mid-cap companies just through an information-sharing process and by subjecting them to the rigors of an ESG framework that has been imposed by the limited partners and through the PRI-type framework.

We also see environmental consultants being used to evaluate the environmental and social performance at companies. Limited partners will see that and recognize that as a sign that there's a fairly high level of interest and concern at a company. That's a good sign to them.

Moving on to the next topic: reporting and disclosure. Under the private equity framework, the general partners are required to report on their ESG performance to their limited partners generally on an annual basis. There's been a bit of pressure for private equity to report in the way that public companies report. It's not necessarily going to happen, although some private equity firms do some public reporting. I believe KKR does. But for the most part, mid-sized and smaller private equity firms especially don't do a lot of reporting. But the substance of ESG reporting is interesting because we're seeing a movement to be more specific in terms of reporting, whether it's privately or publicly.

The SASB, which Charles mentioned, is developing specific metrics for reporting. The SASB has now developed 79 industry standards for reporting. What they've done, because this stuff has been so vague in a lot of ways, is they've developed standards for various industries but they kept it pretty tight. For each industry, they've developed about five disclosure topics and 13 metrics. Not hundreds. Not dozens. So, when you're looking at an industry, they've sort of focused in on what might be material to evaluating a company. They are now pushing that as a standard for public disclosure of environmental and social risks.

So, the big picture is that there's been a major cultural transformation over the past 10 years in terms of how seriously companies take sustainability, and how deeply they go into their operations to figure out risks and opportunities on the environmental and social side. When you think about this, especially in the financial world and in the private equity world, these aren't necessarily people you would have thought 20 years ago would have sensitivity toward these issues. There has absolutely been a much higher level of sensitivity, particularly at the large private equity firms. It's become part of their DNA. It has been pushed onto companies based initially on pressure from

limited partners, and now it's become sort of embedded in the culture.

Michael Gerrard: We now have time for questions. First, is a question from the audience. How is the green bond market in the U.S.?

Charles Di Leva: All I could say to that is at least the World Bank is very successful in selling green bonds, including into the U.S. market. Last year, I think, was the largest volume that they've ever sold, I think about \$9 billion. So, for those following the green bond market, I think it's interesting to look at the International Capital Market Association (ICMA) because they've set out principles for green bonds. When you go to their site, you can actually look at third-party auditor reviews of the different green bond projects that have been financed.

So, to the extent that groups like ICMA and the World Bank are publishing data on the different projects, we'll start to see a more transparent and a more robust market for green bonds. I think that, at least in my experience within the World Bank Group, for both the private-sector side and the public-sector side, there's a lot of optimism and a lot of support for moving ahead on green bonds.

Michael Gerrard: The next question for the panelists is: do you have recommendations or websites for individuals who want to invest in green banking?

Douglass Sims: There's the Green Bank Network at greenbanknetwork.org. It's the organization that has the most information about GIBs. They're currently given an opportunity to invest in the GIBs themselves generally because they are publicly owned institutions. There are of course transactions where the GIBs co-invest with private investors, so you can maybe invest in transactions that they're involved in. I think the New York Green Bank in particular has an open request for proposal process that is interesting to explore, about the opportunity to invest with New York Green Bank. Their website is greenbank.ny.gov. But greenbanknetwork.org is the place to start for GIB information.

Michael Gerrard: We have a question about the privatization of the U.K. GIB. Why did that happen and is that applicable in other places?

Douglass Sims: I should emphasize that it was not without extreme controversy and it wasn't, as far as I'm aware, the initial plan with the institution. It was a decision that was made by the government to do so at a certain time, but I think what enabled it was the fact that the return targets that it had were essentially market returns. So, now with the thing done, mostly it demonstrates that the investments that it was making could be replicated by the private markets without a lot of alteration. That was sort of

the strategy and the goal, to be as near as possible to the market, and that made it attractive to them.

You can imagine an institution that targeted different kinds of goals. If it had a lower return portfolio, it wouldn't be attractive. Is it a pathway for other green banks? I think to some extent. It depends. I think some of them are not set up to be privatized. I think many of them aren't selling portfolios, which is essentially just debt trading. It's on the portfolio of projects that Connecticut has done. So, institutionally I don't know if we'll see more of that, if it's good or bad. But I think that we are certainly seeing portfolio sales of GIB assets to private actors, and co-investments and other kinds of innovative public-private partnerships as it were.

Michael Gerrard: Let me ask a question. To what extent in the United States is the difficulty in getting financing a constraint on the construction of new renewable energy facilities? Is it the case that any renewable energy facility that has a viable economic model and likely has purchasers for its power is likely to be able to find the money for it, or is lack of financing a constraint? Any thoughts on that?

Charles Di Leva: I'll comment on how the U.K. was able to move forward with privatization. I think that the private market gets the incentive through the legal or regulatory change. So, the U.K. has some pretty strong climate change legislation. Of course, they're part of the EU's commitment through Paris. So, you can privatize when you're pretty clear that the market is getting the signals from the policy side.

In the United States now, in the current situation, we'll probably get a fragmented approach where you have some smaller banks in California and New York and other states looking to move forward. Just in D.C. recently is an interesting proposal to price carbon. So, if we have these kinds of measures, it's probably going to help the private sector see that there's the incentive to start using their capital because they'll know about the greater sense of return.

Douglass Sims: Also in D.C., as you mentioned, there's a thought to do a city-based GIB. But on the question of can you close financing gaps, I think there's no one answer to that question. I will say that we're seeing, not just in the United States, that the cost of renewable energy has really reached grid parity in some places—certainly in the wind sector there are some federal signals on the production tax credit, and things like that.

But there's an increasing number of cases where good parity has been reached and people are looking at what we call merchant risks. I mean most projects need what's called a power purchase agreement, a long-term purchase agreement to support financing. But in some places, increasingly, there's people willing to just take market prices on power and take a bet on the trend of the market. So, we'll see more of that as prices come down, assuming that demand for energy holds up.

Charles Di Leva: I think one of the concerns is maybe the price will come down too much, but that's another story. That would probably be a happy story.