

Blended finance solutions for scaling up sustainability investments: opportunities and challenges

Isabelle Zheng (UZH), Stefano Battiston (UZH), Christophe Nuttall (R20)

A joint study by UZH and R20

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REGIONS OF
CLIMATE ACTION

Executive summary

This white paper builds on a joint UZH-R20 event on Blended Finance at the World Austrian Summit in 2019¹. We combine literature review, original empirical and analytical work, and the consolidation of over 20 interviews with experts in the field to provide a balanced view on blended finance approaches to fill the investment gap towards sustainability objectives².

There is growing interest among DFIs, MDBs and in particular the Green Climate Fund for blended finance solution aimed at sub-national middle size sustainability infrastructures. There is a perception among practitioners that this is a relatively untapped market and it could represent a game changer towards achieving SDGs and Climate Action in particular. A number of commercial banks currently look with interest at long-term green finance investment opportunities for their institutional clients. The post-COVID era could reinforce the importance of the long-term and resilience dimensions in investments. According to many practitioners, appropriate finance vehicles for this purpose are lacking and a natural candidate to fill this gap are investment solutions based on blended finance, which are examined in this study.

This study has been carried out in the background of a very dynamic market and policy landscape, marked in particular by the COVID-19 pandemics. Going forward, the risk and opportunities analysed in this paper can inform the discussion in key events of 2021 featuring sessions devoted to blended finance initiatives, such as the World Economic Forum in January 2021, the 2020 IUCN congress (Marseille France, June 2021), the UNFCCC COP 26 (Glasgow, United Kingdom, November 2021).

Aligning society to sustainability is widely recognized today as an urgent challenge for humanity. It requires a paradigm shift in terms of development path, in particular for the developing countries. It also requires to fill a substantial gap both in terms of new investments and reallocation of capital. Few estimates of the sustainability investment gap are available. As an example, we carry out a simple estimate of the annual investment gap for decarbonizing the electricity generation sector based on the IRENA scenarios. For developing countries alone, the annual gap grows from 600 billion, to 1 trillion and 1.3 trillion, considering time horizons of 2030, 2040 and 2050, respectively.

The current COVID-19 crisis has revealed that our economic system is more fragile than previously perceived to shocks on the physical sphere. The available scientific evidence points to an increasing risk of pandemics in the future, making the sustainability transition more urgent and more visible to the broader public. The crisis has also revealed that it is

¹ The authors are grateful to the Rectorate of the University of Zurich for supporting the event UZH-R20 event on Blended Finance at the World Austrian Summit in 2019, where many of the experts interviewed in this study participated as speakers.

² We thank the over 20 field experts that have kindly accepted to participate to the interviews conducted in the preparation of this white paper. The list of experts is reported at the end. This report does not provide investment advice and no responsibility is born by the authors. The paper cannot be reproduced, even in portions, without the consent of the authors.

possible to change social norms of people at the planetary scale (e.g. social distancing and wearing masks), thus making less remote the possibility to change social norms also towards sustainability. While some countries are facing the economic crisis by taking the opportunity to foster a recovery-focused on low-carbon economic activities, other countries are betting on a business-as-usual recovery path which will increase the investment gap on sustainability.

A key role in delivering the low-carbon transition could be played by the strategy of scaling up the number of small to medium sized (5 – 75 M \$ USD) sustainability decentralized infrastructure. This type of infrastructures is managed mostly at sub national level, including States, Provinces, Regions, Cities, and municipalities. Sectors range from sustainable renewable energy, energy efficiency, to waste optimization and sanitation. UNDP estimates that the sub national level could represent 75 % of climate mitigation action³.

Indeed, the majority of existing sustainability infrastructure projects are in the small-medium size range even in developed countries, as illustrated by an example analysis of power plants in the Euro Area. In developing countries, some factors can make small-medium size projects preferable to large projects. They can score better in providing local populations with improved life standards and productivity, reduced dependency on resources import, and stable, affordable, and clean electricity. However, scaling up investments in small to medium size projects requires pooling projects together in order to provide financial products for long-term, non-speculative investors.

The demand for capital is heterogeneously distributed across geography, economic sectors, and social-economic groups. Low-income regions, adaption sector, and marginalized population have a steeper path in attracting funding, especially non-concessional foreign investments due to, small deal sizes, high regulatory complexity, and high country-specific risks. Meeting the demand for sustainability project requires a well-designed and robust partnership between the public and private. The past decade has seen the onset of development finance flows into sustainability relevant sectors in developing countries (mainly north-south flows). Recently, the local public actors from developing countries are taking an increasing role as well (e.g. south-to-south flows). Fostering the sustainable development path cannot rely solely on public resources. A more active engagement of private sector actors in this process could help them fulfil their own sustainability commitments, better utilize sector-specific skills and realize more resilient growth.

There are varying definitions of the term Blended Finance, but most share the notion of a public-private partnership to fund projects that have explicit sustainability objectives. Many approaches to blended finance also include the idea of de-risking, i.e. public finance reduces the risk of the investment for the private actors employing instruments such as a guarantee, a junior tranche in a fund, or capped returns. Arguments against de-risking include moral

³ Charting a new low-carbon route to development: a primer on integrated climate change planning for regional governments. UNDP 2009

hazard, while arguments in favour include the need of crowding-in in sectors/regions for which their investments have an insufficient track record.

There is an urgent need for research and data on blended finance in order to validate working models and address existing challenges. As an example of insights that more comprehensive data could provide, we have gathered a dataset of energy infrastructure projects with the characteristics of blended finance. The data allow to examine the relations between factors such as the number of public and private debt/equity providers and the ratio of domestic versus foreign actors concerning the size of the projects. Analyzing the characteristics of existing projects allows to understand better which models can be replicated in the future.

Since many sustainability projects (e.g. in the electricity) represent small-medium size investments, bundling projects together in securitized financial products can in principle support the objective of scaling up investments. However, the lessons learnt on securitization from the 2008 financial crisis impose prudence. The idea of combining de-risking with securitization thus poses new challenges. Combining blended finance with securitization can be a solution for scaling up investments only under the condition of a well-designed governance structure between the public and private, and a transparent and science-based assessment of risks.

A broader set of instruments, beyond the pure financial de-risking, could improve the scale and efficiency of blended finance. This includes climate-related policies and regulations that create enabling conditions for the projects, make the business environment less volatile in the renewable energy sectors, as well as signalling (which is zero or low cost) their commitment to the low-carbon transition. Indeed, industrial policy, institutional setting and regulatory guidelines can offer vital support at regional, sectoral and project level for sustainable development at a large scale. Their role seems critical for the scaling up of investments at the global level.

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1. Introduction: the gap revealed in 2020

The urgency of a more resilient and sustainable development has never been as evident as in 2020. The 2020 global pandemic has exposed the vulnerability of human society worldwide. As UN Secretary-General António Guterres stated on 3rd July 2020, "had we been further advanced in meeting the Sustainable Development Goals and the Paris Agreement on Climate Change, we could better face this challenge – with stronger health systems, fewer people living in extreme poverty, less gender inequality, a healthier natural environment, and more resilient societies."⁴

Considerable financial, technical and governance obstacles remain towards resilient recovery for a sustainable planet. Most countries around the world are not on track with Sustainable Development Goals (SDGs) in general and with the climate targets of the Paris Agreement in particular. At the same time, small/middle size sustainable infrastructure projects, such as renewable energy and energy efficiency, waste optimization and sewage, access to clean water, urban mobility, regenerative agriculture, particularly those in emerging markets and marginalized areas, for example, represent great potential but have remained mostly untapped. Indeed, an essential portion of building a resilient, inclusive, and sustainable economy could come from small-medium size projects (5 – 75 M \$USD) and investments. For instance, within many fast urbanizing areas, decentralised renewable power plants (such as waste to energy, solar PV, wind turbine), utility projects in water, sanitation and hygiene etc. are under subnational regional and municipalities authorities. Collectively they could have a significant impact in terms of GHG emission reduction and SDG. However, one difficulty reported by experts in this field is that these projects are individually too large (over 5 M \$USD) for philanthropies and local budgets but also too small (below 75 M \$USD) and undiversified to receive funding from large banks/investors, which aim at tickets at hundred million USD and above. The distress of the economy in 2020 has implied more challenging conditions for this type of projects, particularly in developing regions and in innovative business sectors.

Neglecting the sustainability gap is not an option, as both economic resurgence, ecological restoration and climate action require urgent measures. Months of lockdown in various countries has also weakened our economic growth and caused sharp fluctuations in the major financial markets. The response from the public sector, therefore, aims not only to rescue and heal the sick but also to protect the economic well-being of business and households. In addition to further expansionary monetary policies, social aid, guarantees in loans and credits have been introduced in many countries. Most of these measures, however, are of short-term nature and are not able to alter the development path from the pre-COVID time. Economic growth might be halted for a much more extended period without a long-term scope.

Closing the gap requires both a new type of thinking and a new type of financing. New funding mechanisms to support sustainable and resilient development must be identified

⁴ <https://www.un.org/sustainabledevelopment/blog/2020/07/amidst-covid-19-pandemic-un-high-level-forum-aims-to-chart-pathways-toward-a-sustainable-recovery/>

together with academic and market research. Years of academic research has shown the mixed yet central role of the financial sector in our modern-day economy. On the one hand, it is the core engine for economic growth. On the other hand, it can generate systemic risk. The financial sector much influences countries in the southern hemisphere: a large volume of foreign direct investment and development finance are channelled into local business and thus strongly affect the development course ahead. Therefore, the sustainable development scheme for the following decades cannot be separated from new thinking on finance at both the macro and micro level. One key question within this quest is how to reinforce the cooperation between the government and market, the public and the private.

There is little academic research on the opportunities and challenges of public-private partnerships to fund the sustainability investment gap. In particular, there is no quantitative work on the characteristics and success drivers of possible financial solutions. This paper is a contribution in this field. The white paper is organized as follows.

In section 2, we examine the multiple dimensions of the sustainability gap and the issues that this gap has created, and we then investigate the opportunities for change in both a new path for development and the resources required.

In section 3, we focus on the key actors that can play a role in closing the gaps: the current status and potential of both public and private actors institutions (e.g. development banks, development agencies, private sector organizations, etc.), particularly in the financial sector in providing the capital needed for investments aligned with resilient and sustainable development.

In section 4, we examine the potential and the challenges in financial mechanisms based on blended finance for scaling up sustainability investments and for bridging the public and the private sector.

2. A closer analysis of the gap: a demand for a new type of development

The sustainability gap is multi-dimensional. It is not only about the means but also about the destination. In this section, the first part list a few of the most acute issues and their potential causes, the second part identifies specifically where the opportunities for improvement might be.

2.1 Shifting the paradigm of development to resilience, sustainability, and inclusivity

The current economic development path is at odds with the principles of sustainability and the objective of a resilient society (Meadows, et al. 1972) (Maxton and Randers 2016). The development path must be re-evaluated not only to deal with the adverse consequences from decades of imbalanced carbon-intensive growth but also to point to the origins of such consequences so that a balanced path for the developing regions could emerge (Stiglitz 2011) (Tallis, et al. 2018).

In this regard, policies and business practices that are currently pursued to stimulate the recovery from the COVID 19 crisis, will have long-lasting implications for nature and societal well-being (IMF 2020) (ILO 2020) (Maxton und Maxton-Lee 2020). Below we list a few of the most acute issues and their underlying causes within the current development paradigm.

Fragmented global governance: Global issues requires some form of global governance. Climate change and the COVID-19 pandemic are the most prominent examples of the adverse outcomes of fragmented global governance.

Resource-intensive growth: energy-intensive growth is not a recent phenomenon but has been imprinted in the growth path since industrialization (Keay 2007) (Kander, et al. 2017) (Stern und Kander 2012). It has been a common shared path for many advanced economies to undergo the transition from agriculture-based to industrialized via a high aggregated amount of exhaustive resources, especially fossil fuels. Europe and the US together account for 60% of the cumulative CO₂ emissions (Peters, et al. 2011). Some studies show that this growth path comes with high prices including conventional subsidies and externalities caused by it (Coady, et al. 2019).

Deforestation and biodiversity loss: land use could potentially reduce a significant share of GHG emissions, preserve biodiversity and produce agriculture products for the local population and increase local employment (KOIS 2018). The downside risk could be disastrous as the ecological degradation could impose irreversible events, e.g. pandemic. The International Union for Conservation of Nature, together with the United Nations, support the idea of Nature-Based Solutions.

Inequality and poverty: inadequate public infrastructure for medical care and education only amplifies the divergence between the advantage and disadvantages through generations (Piketty 2014). The widening inequality gap pushes the most vulnerable population and society further in danger, especially under crisis time (Ahmed, et al. 2020). Policy framework

that addressed such issues could enable a realization of a more inclusive development path ahead (Maxton und Randers 2016).

Financial sector detached from the real economy: expansionary monetary policy (zero interest rate, quantitative easing) has provided a significant amount of resources via and to the financial sector yet whether these resources are channelled to the real economy effectively and efficiently remains to be examined. Few evidence suggests that sustainability-related risks have been internalized by the financial sector. For example, climate risk entails a significant amount of financial risk both for private issuers and also for sovereign issuers. Ignoring transition risk and physical risk will not only harm individual financial institutions but give rise to systemic risk (Battiston, Mandel, et al. 2017).

Capital concentration in large corporations: The financial sector would also need to rethink its financing role as the majority of financial resources have been concentrated in big corporations (Vitali, Glattfelder und Battiston 2011), and few have been allocated to smaller and more sustainable business models.

2.2 Measuring the funding gap in regional, sectoral and governance perspective

This part focuses on the demand side of achieving SDGs, particularly the funding demand. The main questions are as follows: how much resources, particularly capital, are needed to fund a trajectory to restore resilience, promote inclusive growth and ensure green development? Among all the sectors, regions, and different sizes of sustainable projects, are any of them of an acute need for a new form of funding?

Estimates of the funding gap vary. Before the outbreak of COVID 19, the funding gap of reaching the SDGs has been mentioned in several reports and action plans. For instance, in 2014, UNCTAD first pointed out a total funding gap at 2.5 trillion per year in developing countries (UNCTAD 2014), while the investment need in the power sector in developing countries is expected to rise to reach a level between \$370 and \$690 billions annually over the period 2015-2030. A few sources focused on specific regions and sectors: low-income countries are estimated to face a total annual funding gap of \$400 billion (SDSN 2019); emerging markets see an annual average of \$1.5 billion in climate-smart investment potential (IFC 2018).

We show that achieving SDGs at global level requires funding at trillions level, power sector alone will need at least 1.2 trillion in 2030 and 2.5 trillion in 2050. In this paper, Power sector is taken as an example here because it is one of the critical subsectors to deliver SDGs. In **Error! Reference source not found.**⁵, we present our own estimate for the annual electricity investment from renewable energy (RE) sources to illustrate the magnitude of one subsector in achieving the SDGs. This sector is crucial in delivering climate actions (SDG

⁵ The estimates here are constructed based on pre-CORVID data. The authors consider the short-term estimate might have a considerable change after COVID, but the long-term development trend and magnitude is likely to remain similar. More specifically, the author takes the REMAP case from IRENA for the global energy transition: by 2030, 2040, and 2050, renewable energy is estimated to reach 57%, 75%, and 86% of the electricity mix. The population growth forecast takes the medium variant from the UNSTAT.

17) and furthermore, providing electricity offers not only household use, in energy – water – agriculture – health nexus but also industrial development, thus other SDGs. The blue bars represent the RE investment needs to provide for the electricity production in each region from a low carbon mix per year by 2030, 2040 and 2050; the red bar shows the current (2019 level) RE investment. As the difference suggests, the annual global investment gap in the power sector is at a minimum level of 1.2 trillion and could potentially reach 2.5 trillion. For developing countries⁶, the funding gap in 2030 would reach 600 billion, which is almost twice as much as the current global annual investment in RE. The increasing investment need comes from two main drivers: the increasing RE share needed for the green transition (IRENA 2019) and the population growth (United Nations, Department of Economic and Social Affairs 2019). In order to obtain a complete and updated estimate of the funding for achieving all SDGs, further research needs to identify some other critical factors that would affect the level of capital demand in the coming years, including demographics, economic growth, policy background etc. Underestimating the role of these factors might put the funding gap at a wrong magnitude.

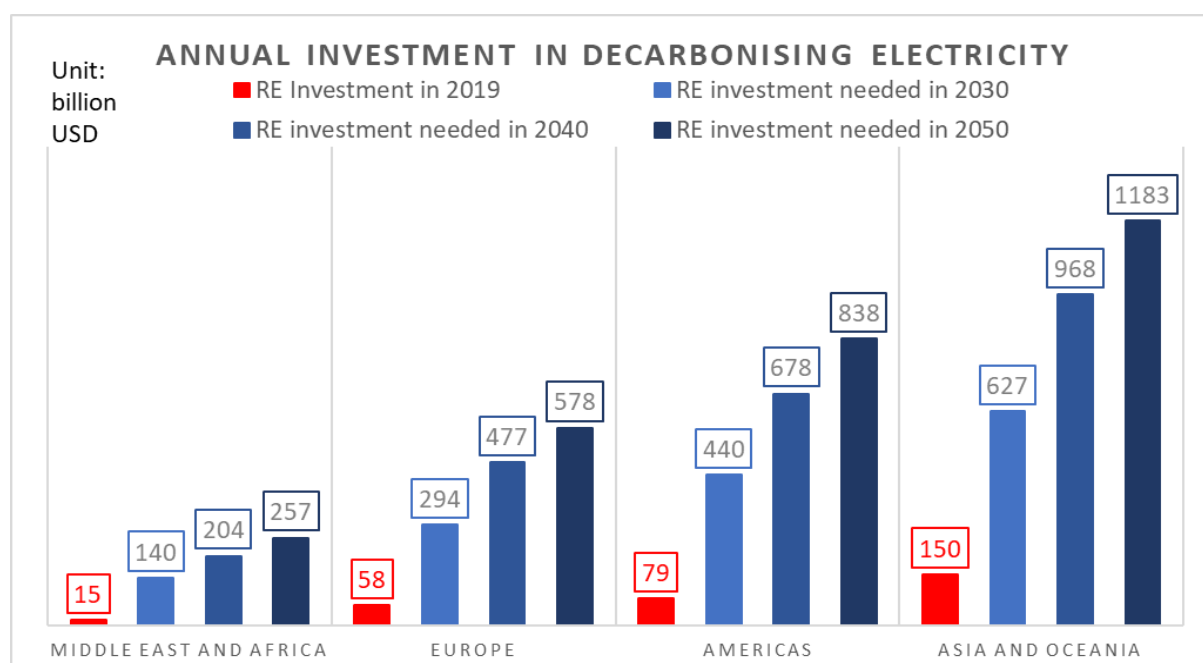


Figure 1. Annual investment in decarbonizing electricity. Region classification not fully harmonized for 2019 investment and investment need in 2030, 2040 and 2050. Source of data: Enerdata, IRENA and UNSD. Authors own calculation.

The demand for capital is not homogenous across geography, economic sector, and social groups. Low-income countries and adaption sector, for instance, have a steeper path in attracting funding, especially non-concessional foreign investments. On one side, the demand for capital and the urge to increase the participation of the private sector can be seen as a challenge. Key SDG sectors in developing countries see a substantial variation in

⁶ Developing countries here excluded Latin America because the aggregation of the current investment level does not provide a full coverage of Latin America. This means the potential funding gap could be higher than the current level presented.

the average private sector participation in current investment, with the highest around 90% and lowest at 10% (UNCTAD 2014)⁷. The IPCC report (IPCC 2014) has also pointed out that mitigation and adaptation have significant differences in finding funding resources. Annual adaptation costs have been estimated by UNFCCC (UNFCCC 2008), World Bank (Margulis and Narain 2010) and Oxfam International (OXFAM 2013), which arrive at a similar magnitude, i.e. tens of billions of dollars, perhaps even over \$100 billion – with a significant fraction of the total in developing countries. Academic research suggests similar magnitude (N. Stern 2009). On the other side, such a funding gap also presents unprecedented investment potential. As the study (IFC 2016) by International Finance Corporation (IFC) shows, global climate goal opens up nearly \$23 trillion⁸ in opportunities for climate-smart investments in emerging markets by 2030. Such opportunities exist predominantly in fast urbanizing areas, among which Jakarta, Rajkot, Belgrade, Amman, Nairobi and Mexico City were given particular deep dive into (IFC 2018).

Regions in focus: middle-income countries and low-income countries

The following insights emerge from the views of experts in the field of infrastructures in developing countries, including those interviewed in this study. Economies of different scale and income level naturally face different challenges. With a different question, the answer naturally differs. Higher income level is correlated with higher fiscal revenue and therefore, potentially a higher chance of self-financing compared to low-income countries. While at the same time, middle-income countries are more likely to have a higher population and thus require a total higher sum of funding. What both areas share are their difficulties in attracting foreign direct investment due to both perceived risk and actual risk.

- **Social unrest and instability:** Rising living cost and high unemployment rate are likely to linger longer in both Middle Income Countries (MICs) and Low Income Countries (LICs). This combination might increase the difficulty of attracting risk-taking funding both from domestic and foreign sources. The economic background of a country could influence both the project direction and investment environment: for example, in Chile, social movements in 2019 drew increasing attention to the social dimension along with the environmental/climate angle while investors might become more risk-averse.
- **Scattered population with high impact potentials:** Economics of scale sometimes does not apply in sustainable business, especially when the marginalized population would be prioritized. For instance, renewable mini grids in remote areas for community use (ca 100- 1000 people) could deliver high impact, and the decentralized nature brings down construction duration. However, the deal size might not reach a bankable level for business as usual commercial investors but still too big for a single charity project.
- **Existing regulatory and legislative environment:** middle-income countries have exiting legislation and regulation to comply to for foreign investments. For example, countries in South Asia have a heterogeneous regulatory environment with strong local capacity for project developing. The de-risking role of blended finance in this

⁷ We derive the average from the numbers offered by UNCTAD. It is worthy to note that between countries, the private sector participation varies greatly therefore the average number is only for relative reference in this context.

⁸ This number is updated to 29.4 trillion in the 2018 report by IFC in the same publication series.

context thus targets more towards the regulatory, sub-sovereign risks, which might be different for Africa.

- **Development potential:** Opportunity to save cost and introduce sustainable grounding for further development is at large. For instance, the energy system, industry structure and financial inclusion can benefit from technological progress and learnings from other countries.

A sector in focus: infrastructure

Infrastructure is the indispensable sector for long-term growth and sustainability.

Research has shown that growth is facilitated and enhanced by robust infrastructure financed through public capital by the end of the last century (Aschauer 2000). The empirical evidence concentrates mainly in North America and western Europe. This limitation indeed reflects the current infrastructure gap: the lack of infrastructure is still significant outside of the advanced economies; meanwhile, the need for future infrastructure and hence the funding demand has evolved from the traditional pattern.

Current infrastructure analysis varies. Energy, telecommunication, transportation, water and waste are the most widely recognized core sectors in infrastructure and also the most relevant for developing countries and SDGs⁹ (see to OECD technical notes¹⁰). Various institutions and researchers have conducted estimations on the needs of the infrastructure sector. The pre COVID forecast for the annual investment on the global infrastructure expenditure varies from 3.3 trillion to 7.9 (Woetzel 2016, Bhattacharya 2016, OECD 2017, Woetzel 2016, NCE 2014). Energy remains the most prominent sector and takes up to 50% of the total infrastructure need. In June 2020, Swiss Re released a post COVID analysis (SwissRe 2020) at 15 trillion annually, with emerging markets taking 10 trillion. International Energy Agency (IEA 2020) predicts that energy investment mainly is set to fall by one-fifth in 2020. Indeed, the energy sector in the first half of 2020 has been much disrupted by the low demand due to the standstill of international travel and trade flow. Telecommunication sector also sees sharp fluctuations due to lockdown, trade sanctions and increasing political tensions.

⁹ Education and medical care are also important infrastructure and often involve intangible capital, e.g. teachers and medical professionals in the public sector. The development of such often happens after the tangible infrastructure and therefore is still of crucial importance but often not included in many analysis.

¹⁰ <https://www.oecd.org/env/cc/g20-climate/Technical-note-estimates-of-infrastructure-investment-needs.pdf>

Assessments on the development trend of infrastructure could incorporate sustainability and the new economic outlook further. Previous assessment of development need relies on past infrastructure expenditure and projected GDP growth. There are two main concerns with this approach: lack of sustainability and misleading business-as-usual growth scenario. Core sectors in infrastructure have been experiencing revolutionary technological progress. Thanks to the scale effect, it has become feasible to offer green and low-carbon solutions to satisfy the infrastructure gap. It is, therefore, necessary to consider the generational difference between future infrastructure and infrastructure from the past. Besides, growth scenario could be further evaluated. Alongside the changes in growth rate projection, whether the recovery plan will be green can influence the infrastructure trend to a significant

Mason Wallick

Clime Capital, Managing Director

Blended Island Light and Water private sector funding plus funds through PIDG

“The first blended-finance structures of its kind used in conjunction with a long-term lease-co structure with a corporatized PPP JV (in this case a corporatized investment vehicle representing 20 co-ops, ie the ‘public’ with some management and equity from a private sector participant, Island Light and Power).

The first community we helped to electrify with a new microgrid technology allowed us to achieve 100% renewable penetration, which is almost unheard of for microgrids in terms of RE penetration. When COVID hit the Philippines, other communities lost power as the value chain for diesel fuels was disrupted. The community-owned microgrid we developed achieved bill payment as the community could keep on fishing and making money (now a very resilient local community, even in COVID). The community we served does not have a hospital. However, we were able to bring in reliable electricity so that medications could be refrigerated and fans kept in what became a community medical centre (a small house) ventilated with a computer.”

level.

Infrastructure and economic outlook are interlinked. On the one hand, infrastructure planned and built today has a strong implication on the productivity of the economy, the welfare of the citizens, and resilience of the society, especially in stressful times, as shown in the case below in the Philippines during COVID time. In particular, countries with low fossil fuel endowment could reduce their energy dependency by developing renewables. On the other hand, a healthy economy secures the well-functioning of the existing infrastructure and supports new infrastructure developments. This relationship is embedded in the Sustainable Recovery plan by IEA (IEA 2020) as to include strong support in clean energy and energy efficiency in the stimulus package. The following quotation box showcases that decentralized renewable infrastructure continued to support the local household, business and hospitals during COVID time while other fossil plants could not function due to the substantial fluctuation in the fuel market.

Therefore, investing in sustainable and resilient infrastructure is vital in the following decades. Thanks to the technological progress and economics of scale, renewable infrastructure enjoys the advantage of lower levelized costs for per unit electricity (IRENA 2019) and independence from the volatile prices of fossil-fuel. Nevertheless, there are also challenges. The following list is not meant to be exhaustive.

The distribution of renewable projects tends towards small to medium sizes (5-75 USD million). Contrary to nuclear, combustion-based generation or large-scale hydropower, solar

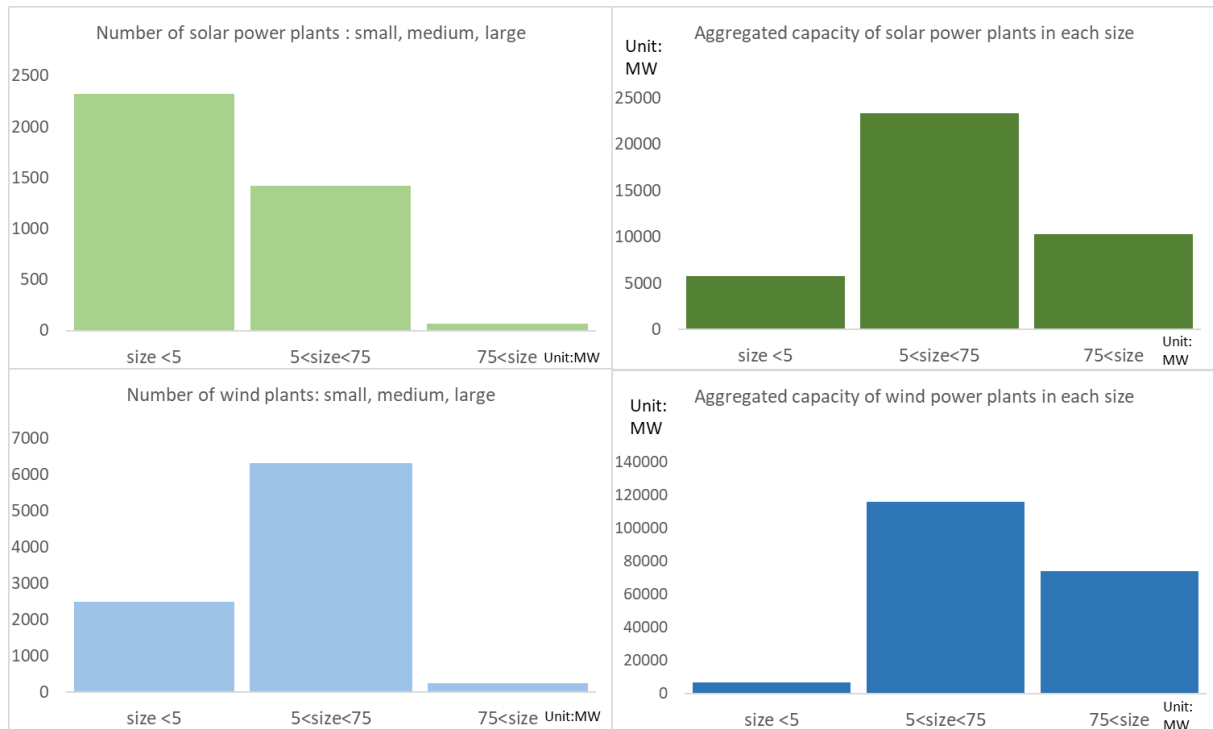


Figure 2. Size distribution of renewable power plants (solar and wind) in Euro Area. Source of Data: BNEF, calculations by the authors

and wind generation plants are often small in terms of installed capacity and therefore in terms of the investment ticket size. Figure 2 below shows the size histogram of existing power plants in the EU, based on data from Bloomberg New Energy Finance (BNEF). Note that the sample includes only power plants already commissioned and still operating. Thus the histogram may not fully reflect the potential demand. For both solar and wind power plants, there is a large number of small size projects (below 5 MW), but their aggregated capacity is small relative to the other size groups. The intermediate group size (5 – 75 MW) represents the largest share in terms of aggregated capacity in both technologies

Investments in energy infrastructure have been the object of financial innovation in the last decades, i.e. in *Project Financing*, aiming mostly at larger tickets. One characteristic of renewable energy is the possibility to be decentralized. Investments in this area thus require adapted funding mechanisms.

The infrastructure sector faces the following challenges.

- **The risk profile of renewables in developing countries has changed.** Compared to the long and risky construction period of large fossil fuel plants, small decentralized scale solar and wind projects have a very short construction period. However, they are

exposed to risk arising from the following sources: the regulatory environment (i.e. possibility of renegotiation of the project along the timeline), the duration and complexity of the counterparty relation, the fluctuation in the cashflow (including because of feed-in tariffs and currency change).

- **Data deficiency in developing countries could hamper investment.** High-quality data on, e.g. solar irradiance, wind speed, etc. and geographic information is crucial for the development of the renewable energy sector because it allows to forecast future cash flows (Cox 2018). However, the lack of reliable data can bias investment decision making.
- **In a low growth environment, infrastructure investment might encounter low investor confidence.** Traditional infrastructure projects are often financed via issuance of securities in the stock and bond market and have a strong track record (Blended Finance Taskforce 2018)¹¹. In contrast, sustainable infrastructure projects in developing countries are often financed via direct investments, unlisted funds, loans or debt notes which are less liquid than more standard securities.

¹¹ Page 121-123, data source from Russel Global, FTSE EPRA index, S&P global infrastructure

3. Joining forces: who could help to fill in the gap and what they have been doing by far

In the combat for public well-being and the economic recovery, the public sector has been taking a significant amount of pressure and efforts. Stimulus package via fiscal and monetary policies are supported by governments worldwide. The necessity of leveraging resources and expertise from both public and private sector becomes increasingly apparent. This partnership is not a temporary measure as to survive the consequences from COVID 19 but instead have a strong implication for the development road ahead. Indeed, internalizing the public goods along a resilient, sustainable and inclusive growth path requires the collaboration of the public and the private, not only financially, but also in terms of their expertise, their roles in the civil society and their organizational mandate.

In this section, we will discuss the current engagement of various institutions in sustainable development, especially their funding activities, and investigate their potential in playing a more substantial role in the following decades.

Emilio Cattaneo

Executive Director, The Emerging Africa Infrastructure Fund, Private Infrastructure Development Group

“The main challenge faced in trying to reduce the infrastructure gap in Africa, and promote greater alignment with the Paris Climate Agreement, is the shortage of private investor capital willing to participate in the sector. Currently the principal providers of debt to infrastructure projects are the DFIs and multilateral organizations, with participation from the commercial banking sector and traditional projects financiers having declined significantly after the 2008 global financial crisis. On the equity side, we are seeing a greater involvement of the private sector, from private equity funds, corporates and stock market listings. One way to reduce this reliance on DFI financing, is to promote investment into the infrastructure sector by local institutions such as domestic pension funds and insurance companies, in local currency. There is a growing pool of funds which can be tapped into, and mechanisms are being developed, such as credit enhancement and de-risking products, to stimulate the development of a new domestic asset class. Countries with deeper domestic capital markets, such as South Africa Nigeria, Kenya and Ghana are leading in this process.”

3.1 The public sector: development institutions, national and subnational governments

Closing the gap worldwide requires not only a significant amount of funding but also a strong alliance for governance. As Prof. Fukuyama pointed out, the determinant factor of

the resistance to the Coronavirus is the "effectiveness of governments to design and implement policy responses to the crisis and the level of public trust in the government." (Fukuyama 2020). The public sector is the critical factor in establishing, consolidating, and maximizing the potential of such governance in mapping the growth path, promoting sustainable recovery, inclusive growth and maintaining a strong capacity for the public body worldwide. In addition to international organizations, sup national governments, national governments, and subnational governments are showing their strategic role in combating COVID 19 and more.

Green recovery and long-term growth could benefit from strong leadership in the public sector. Indeed, without the orientation from the public, even if there would be an economic recovery back to the pre-COVID status, business-as-usual will not lead towards a sustainable future. On the contrary, the catching-up phase might lead to large-scale productivity injected into unsustainable sectors. A sudden and substantial increase in GHG emissions could trigger extreme weather events and materialize climate risk. This type of compound risk would be disastrous under weak and uninformed policymaking and therefore, must be avoided (Battiston, Billio and Monasterolo, *Pandemics, Climate and Public Finance: How to Strengthen Socio-Economic Resilience across Policy Domains* 2020).

Development finance has been the chief financier for the transition but could not fulfil the global gap solely. According to the new statistical framework put forward by OECD (OECD 2020), official development assistance from 59 official providers amounts to 169.2 USD billion in 2019. The majority of the ODA takes the form of grants, and less than one fifth takes the form of loans or concessional loans. On the provider side, the DAC (Development Assistance Committee) contributes over 80% of the total Official Development Assistance (ODA) annual flow¹². Bilateral development finance institutions (DFIs) and multilateral DFIs are the main channels for distributing financial support to the recipient countries. On the recipient side, the Least Developed countries and Lower Middle-Income countries received more than 90% of the allocated ODA¹³. Africa, in particular, South of Sahara, and infrastructure (social and economic infrastructure) (OECD 2020)¹⁴ are the most popular region and sector of ODA destination.

The limitation of development finance and development finance institutions (DFIs) are financial, organizational, and institutional. The 0.7% ODA/GNI target promoted by the UN since 1970 has not been met with only a few exceptions. In 2018, only Luxembourg (1.05%), Norway (1.02%), Sweden (0.99%), Denmark (0.71%) and United Kingdom (0.7%) were the only 5 DAC countries that have met the 0.7% target (OECD 2020)¹⁵. However, even if all countries double their financial commitment to development, it still falls far short in responding to the global capital gap. This limitation is not only due to the fiscal budget

¹² Please find the complete list of DFIs mentioned <http://www.oecd.org/development/development-finance-institutions-private-sector-development.htm>

¹³ Unallocated ODA according to income group at 39.2% level.

constraint for the donor countries but also due to the organizational and institutional features of DFIs. As a semi-public entity, DFIs are often large risk-averse institutions with strict compliance code. This leads to a concentration of resources in a few conventional financing channels, which often favours debt financing and more significant transactions. Besides, the coverage of the current ODA statistics do not offer a complete picture of the Non-DAC and/or non-reporting countries, non-concessional loans, for example, are also not included. The missing information leads to a downside estimation with increasing South-South cooperation and market-making investments with unclear market rate benchmarks.

Supranational and national have a strong potential in supporting sustainable and resilient development as well as the green recovery plan. Fiscal measures and monetary policies have been the most robust public support in this crisis time. In G20 countries, the magnitude of the fiscal measures via additional spending and forgone revenue alone ranges from 2.7% up to 12.3% of the GDP (IMF 2020). This expenditure goes to the next magnitude of the current ODA flow. The liquidity supports (i.e. equity injection, loans, asset purchase or debt assumptions) in advanced economies and other G20 countries go even further. It is therefore vital to ensure a green recovery direction that is embedded in all the public efforts.

Subnational governments have a unique role in green recovery and achieving SDG goals. Subnational governments have been playing a crucial role in the current crisis (OECD 2020) and will continue to do so in the long-term march towards sustainability and resilience. In the short term under the COVID-19 challenge, subnational governments are responsible for the provision of health-related services, water and sanitation, energy, and waste management. Also, as a prominent employer, Subnational governments stabilize employment and secure the demand side of the economy. In the mid-long term, the fiscal capacity of subnational might not be hampered by the substantial reduction in revenue via fiscal measures and an increase in expenditures for providing public services. "Indeed, subnational governments contribute almost 60% of total public investment in the OECD region and almost 40% worldwide. 64% of environment and 55% of climate-related public investment and spending respectively comes from subnational governments...." (OECD 2020). With the urbanization process in developing countries, this role will only be amplified. In addition, the environment for small-medium innovative business model is often at the subnational level and has a strong implication for scaling up sustainable projects.

3.2 The private sector: commercial banks, institutional investor, foundations, and philanthropic organizations

The financial sector has a critical potential for mobilizing resources for recovery and sustainable development. Not only for the large volume of the private sector but also the various functions carried by different financial institutions. Despite strengthening financial regulation worldwide (World Bank 2019), foreign direct investment (OECD 2008) and personal remittance have been growing steadily, which amount to almost 1 trillion USD together (OECD n.d.) with portfolio investment. Compared with this sum, ODA only counts less than one-sixth of the total resource flow. Meanwhile, there is still significant potential for institutional investors, local and international intermediaries to take an increasing stake in channelling resources to sustainable business, combating climate change and financing SDGs (OECD 2014).

The engagement of the private sector in SDGs aligned investment, including climate finance, is increasing but not enough as the momentum in lower investment-grade countries and non-debt assets are still lacking. With recent estimates updated in early 2020 (OECD 2019), private finance mobilized reached USD 48.4 billion in 2018. Energy, banking, and financial services together take up 55.5%, more than half of the two-year average, while social infrastructure and services including water supply and sanitation, health, education, etc. only account for 5.6%. Least developed countries only received 5.3% of the private financing, whereas ODA has a much higher dedication to LDCs (29%). Mobilization rate has been roughly estimated at 1:0.7, or 1:1 level (OECD 2015) in the renewable sector. Given the limitation of ODA mentioned in the previous chapter, achieving SDGs in these areas could benefit from new financing mechanisms such as those in blended finance. Furthermore, the mobilized private sector are more likely to be invested as debt instead of equity because both risk in equity holding and the cost of equity research is much higher than debt.

Climate finance and SDGs aligned investment could be an opportunity for financial institutions. Under the current near-zero-interest rate environment, liquidity is likely to seek for investment opportunities. Low-risk appetite investors might turn to conservative assets, i.e. green bonds. Despite the strong potential of the green bond market, other financing instruments could channel the resources from the private sector as well. Starting from 2012 until July 2019, 23 of the world's largest private sector banks have made sustainable finance commitments. Terms and definitions in these commitments vary from each other considerably. Though the annualized commitment from the largest banks is at billion units (World Resource Institute 2019), fossil fuel finance provided from the same bank often exceeds them (Banking on Climate Change 2020: Fossil Fuel Finance Report Card 2020). Meanwhile, the world's six largest asset managers by Asset Under Management (AUM) scored all in the bottom two categories in the recent responsible investing rating (Nagrawala and Springer 2020). In short, sustainable finance is not restricted to one specific asset class, or financial product, the difficulty in accessing this concept imposes challenges to both financial intermediaries and investors.

Economic transition translates to a new business model that requires updated risk management skills. For instance, project finance has been the answer from the financial sector to infrastructure demand, but the nature of infrastructure projects has shifted under the green transition. This shift asks the financial sector for a new response: smaller transaction size, different technological risk and various regulation risk. The downward risk avoidance and indifference to sustainable business finance might discourage innovative financing solutions. One step further, the strategic position of commercial banks and fund management lies in the matchmaking between assets and investors of different risk appetites in the form of project financing, Special Purpose Vehicle (SPV) or fund.

Investors, especially institutional investors, have a vital role in channelling resources to sustainable and responsible business. Sustainable growth requires long term investments, especially in infrastructure. Institutional investors, including pension funds, insurers and sovereign wealth funds, have assets at trillions scale and seeks a long-term return. Though listed infrastructure index shows attractive returns (Blended Finance Taskforce 2018, 121-123), the long-held position, smaller ticket, currency risk, regulation risk (e.g. continuation of a Power Purchase Agreement) might make investor reluctant to invest in small to medium

sized infrastructure in developing countries. Just like in ODA, the emerging markets see an increasing capital pool from its territory. Therefore, local pension funds and insurance could potentially play a role in endorsing its local, sustainable development by investing in them.

Marcelo de Andrade

Earth Capital Holdings Partner, President Earth Capital Brazil

“Over the last 38 years, I have dedicated my life to my mission. Between expeditions and developmental programs to the most challenging environments in the world, I have seen with my own eyes what humanity is capable of - the good and the bad. Humans are responsible for various creative solutions generating value and welfare for billions of people. However, our post-Industrial Revolution lifestyle is driving planet Earth to its limit. This developmental model, which has shown several signs of being unsustainable in recent decades, is generating never seen levels of social unrest and violence, as well as compromising not just nature but also our ability to survive as a species.

The good news is that we still have time to reverse the situation and use our human genius and creativity, fueled by the latest technologies and unprecedented volume of accumulated capital in the world, to discover a new path. A path where value isn't just generated, but shared amongst people; a path where wealth is generated by valuing people, valuing nature and its elements; a path where the systemic and complex relationship between people and the environment around us is taken into account with respect, pragmatism and wisdom.

We have developed our contribution towards tackling this challenge by taken an innovative approach based on financial and operational engineering applied together to the bottom of the pyramid forming a new approach to blended finance and impact investing; a new asset class: Hyper Impact.

The time for action is now.”

Philanthropy and foundations have contributed since long for the least developing countries in the form of financial support and groundwork. Due to the confidential reasons, the sum of private philanthropic resources is not exhaustive and has only available to a certain extent only recently. In 2018, the gross disbursements from 33 of the largest private philanthropic foundations reported 7.8 billion USD (OECD 2020). In health and education sectors, foundations support ranks as the top contributors (ranks third globally and sixth in Africa respectively). 84% was provided in the form of grants and 16% in the form of non-grant, mainly loans (OECD 2020). Another unique contribution from foundations and their partnering NGOs are their visionary thinking, dedicated groundwork and local knowledge, which could be partially reflected by the interview quotes from Dr. de Andrade. This could offer valuable knowledge sharing with DFIs and other foreign institutions, primarily in the early phase of entering or grant selection (OECD 2018).

4. Blended Finance

In this section, we first introduce definitions and shared ideas in relation to blended finance. Then, we report some available statistics on blended finance, and we provide some original figures on preliminary empirical study. Finally, we examine opportunities and challenges in developing blended finance solutions to fill the sustainability investment gap, also in the context of the on-going COVID-19 pandemics.

Organization	Definition	Keywords
Blended Finance Task Force	"Blended finance is the use of development capital to mobilize additional private finance for SDG related investments." (Blended Finance Taskforce 2018)	development capital, private finance, SDG
OECD	"Blended finance is the strategic use of development finance for the mobilization of additional finance towards sustainable development in developing countries." (OECD 2018)	development finance, additional, sustainable development, developing countries
Convergence	"Blended finance is the use of catalytic capital from public or philanthropic sources to increase private sector investment in sustainable development." (Convergence)	Public, philanthropic, private sector investment, sustainable development
IFC	"At IFC, Blended Finance refers to a financing package comprised of concessional funding provided by development partners and commercial funding provided by IFC and co-investors. Blended Finance solutions can provide financial support to a high-impact project that would not attract funding on strictly commercial terms because the risks are considered too high, and the returns are either unproven or not commensurate with the level of risk." (IFC 2019)	development partners, concessional funding, commercial funding, high impact projects
BlueOrchard	"Funding by development finance institutions (DFIs), multilateral development banks (MDBs), bilateral governments, and foundations (e.g. endowments and philanthropists) in de-risking instruments (e.g. guarantees, first loss or risk-sharing capital, technical assistance and capacity building) to crowd in private capital in frontier and emerging markets in order to accelerate the achievement of the SDGs by scaling-up activities." (BlueOrchard Academy 2018)	development organizations, foundations, SDGs, frontier and emerging markets

Table 1. Selected definitions of blended finance. Source of Information: Blended Finance Task Force, BlueOrchard, Convergence, IFC, and OECD.

4.1 The basics: definitions, principles, and mechanisms

Different stakeholders use different definitions of Blended Finance. However, most definitions share the following common elements: a partnership between public and private finance and sustainability objectives.

In Table 1, the definition of blended finance varies across stakeholders and organizations (Blended Finance Taskforce 2018) (BlueOrchard Academy 2018) (Convergence 2019) (IFC 2019) (OECD 2018). As mentioned above, a partnership between public and private finance and sustainability objectives seems to be the shared scope. Nevertheless, the definition of each element is different. For instance, the public actor is equated to development institutions in some definitions, while the sustainability objectives in some definitions are explicitly for SDGs and developing countries.

Blended finance can be viewed as a range of mechanisms to scale up the capital supply to fill the capital gap for the SDGs and climate change. The design of financial vehicles to deliver both financial and sustainability objectives may require new knowledge because of the interaction of multiple factors, including financial innovation, the regional policy context of the projects, and sustainability science.

The principles of blended finance are similar but still not uniform across different organizations. Different organizations follow different sets of principles concerning Blended Finance. Table 2 reports the BF for three selected organizations. Some commonalities can be identified, including 1) maximizing the resources available for sustainable purposes are the underlying goal for BF; 2) BF should never replace private investment; 3) BF should leverage private investment and function almost as `insurance` with a sustainability mandate.

IFC Blended Concessional Finance Principles	OECD principles	BlueOrchard
Additionality & Rationale for Blended Concessional Finance Crowding-in and Minimum Concessionality Commercial Sustainability Reinforcing Markets Promoting High Standards	Anchor BF to development rationale Design BF to mobilize commercial finance Tailor BF to local context Focus on effective partnering Monitor transparency and results	Blended finance = P P P P P: public and private partnership for people and the planet <ul style="list-style-type: none"> • Public and private partnership: maximizing synergies, leverage expertise, like-minded investors • People and the planet: achieve sustainability objectives, aim at measurable impact

Table 2. Selected definitions of blended finance based on principles from IFC, OECD, BlueOrchard. Source of information: IFC, OECD, BlueOrchard, adapted by the authors.

4.2 Available estimates of market size and trends

The following facts and trends emerge from a recent report of the agency Convergence (Convergence 2019), a reference in the Blended Finance space. The report covers over 3,700 financial commitments to more than 500 blended finance transactions.

- **Market size over a decade saw an increasing growth trend by 2019.** A share of 92% of deals was launched between 2006-2019, 79% between 2010-2018 and amount to around 149 USD billion. The median size of the transactions was steadily growing between 30 million in 2010 to 50 million in 2018¹⁶.
- **Development Finance Institutions, Multilateral Development Banks and development agencies still are the leading organizations** in channelling sources of financial commitments to blended finance transaction. The commercial investors take less than 30% of the total financial commitments despite a slow increase over the years.
- **Debt has been slowly taking over equity** as the leading investment instrument by development financiers in blended finance transactions in the past decade and reached 45% by 2018.
- **Sub-Saharan Africa** has been the most targeted region for blended finance, the percentage of which has, however, decreased from 44% at the beginning of 2010 to 37% in 2018.
- In terms of income level, **lower-middle-income countries** started at 66% of the total transactions' target and risen to 73%. All the other three income level countries have seen a decline in their attraction of blended finance, among which, low-income countries dropped the most, as from 43% to 26%. **Energy and financial services** together take up to 72% per cent of the total transactions between 2016 to 2018.

4.3 Empirical illustration: blended finance projects in Latin America

Analyzing the characteristics of existing Blended Finance projects allows to understand better successful models that can be replicated in the future. Many of the experts interviewed in this study have emphasized the importance of data and research in this regard. For instance, it is critical to understand how several variables interact to determine the success of the projects: the size of the project (i.e. the installed capacity in the case of power plants, or the volume of treated material in the case of waste management plants), its technology, and its financial structure (e.g. debt versus equity, and the type of guarantee or junior tranche). However, based on our conversations with various stakeholders, the availability of data for research on Blended Finance appears to be an issue at the moment. The data used in the Convergence report were not available for our study, nor other granular data at the deal level was available at this stage from other organizations engaging in Blended Finance.

In order to illustrate the type of insights that granular data on Blended Finance could provide, we have thus gathered ourselves a dataset of energy infrastructure projects with several characteristics of blended finance. Here we examine a collection of 419 deals in the region of Latin America (LAM), extracted from BNEF, struck between 1998 and 2018, concerning the building of new power plants, for which the following information is available: the identity of

¹⁶ Median size is used here because large scale single transactions easily pushes up the average size which does not offer too much reference in the market trend for replication purposes.

at least one debt providers, the size of the deal (in USD) and the installed capacity of the plant (in MW). We refer to this set as the deals universe. We then select from this universe a subset of deals that we assume can be considered as blended finance projects, i.e. projects in which at least one debt provider is a financial actor from the public sector (e.g. the state, a central bank, or a development bank)¹⁷. We refer to this as the blended finance deals universe. Having selected the projects in renewable energy, we assume that the choice of these technologies reflects at least some GHG emission reductions objectives by the stakeholders of the projects. However, the limitation of this data is that we do not have, at this stage, the specifications of the sustainability objectives pursued by the projects.

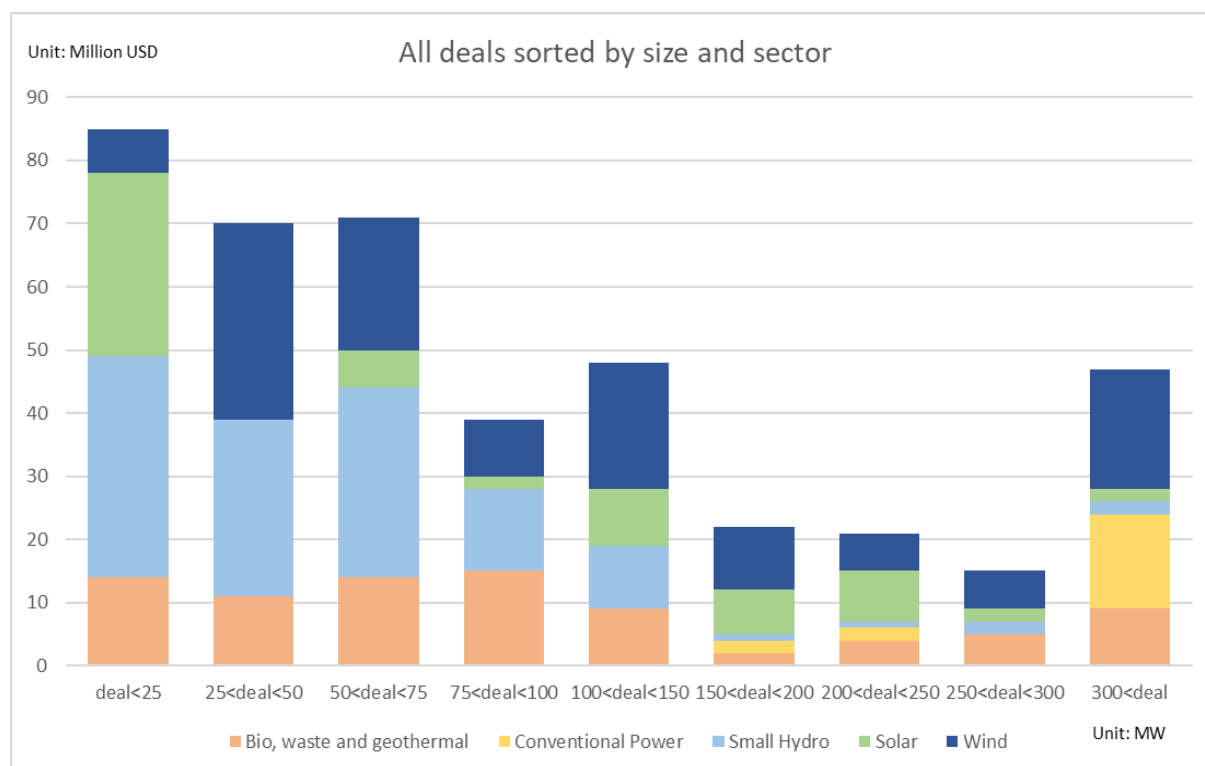


Figure 3. All deals sorted by size and sector. Source of data: BNEF, Author's own calculation

Small to medium size projects, both by deal value and capacity, take the largest shares.

Figure 3 shows the distribution of deal value and the breakdown by energy type. The median deal size is 67 million +/- 121 (interquartile range). 75% of the individual deals are below 150 million USD in size, with an average capacity of less than 30 MW in capacity. This fact could reflect structural limitations (e.g. legal, regulatory and technical issues could be harder to solve for larger power plants) and/or environmental issues (e.g. larger plants, as in the case of hydropower dams, face larger opposition). Further, larger projects may represent a challenge for risk management and for portfolio diversification. These motives are possible explanations for the distribution, but the question remain open at this stage.

¹⁷ In the following, we assume that the list of debt providers is complete. Further work should validate this assumption based on independent information on the deals.

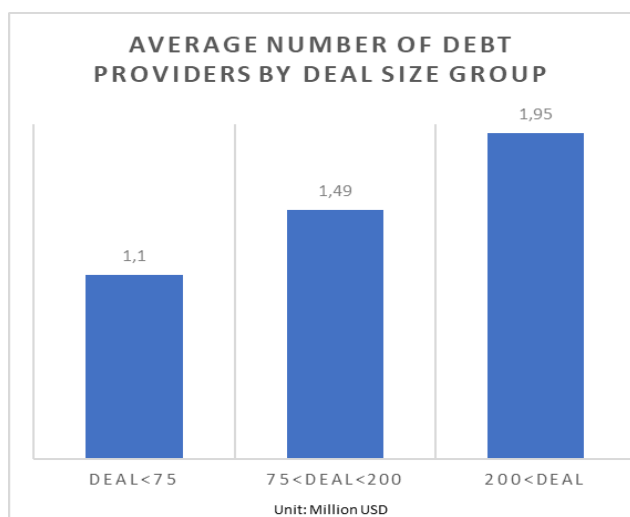


Figure 4. Average number of debt providers by deal size group. Source of data: BNEF, Author's own calculation

more complex to manage. This could also explain the lower share of bigger deals in the whole sample. At this stage, we cannot confirm or reject the explanation.

The number of debt providers increases with the deal size. As shown in **Error! Reference source not found.**, deals smaller than 75 USD million typically have only one debt investor. When the deal size exceeds 75 USD million and is below 200 USD million, the chances of two debt investors represent half of the sample. Deals above 200 USD million often require more than two debt providers. A plausible explanation is that investors are less keen on the role of the

sole debt provider for large infrastructure deals, therefore larger projects require larger consortia of investors, which are

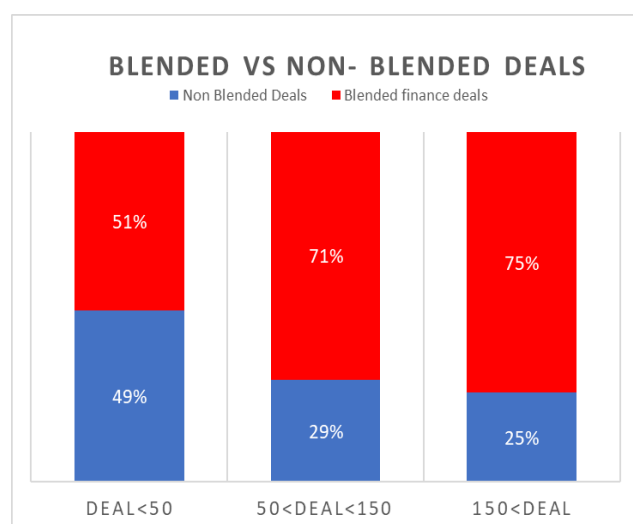


Figure 5. Blended vs Non-blended deals by deal size group. Source of data: BNEF, Author's own calculation

renewable sectors in Latina America are still perceived by the private sector as too risky to invest in them without some form of public guarantee or without the experience of an already established and large power generation firm.

Public actors play a non-negligible role, particularly for deal sizes larger than \$50 million. **Error! Reference source not found.** shows the distribution of deal value with a breakdown into blended finance deals versus non-blended finance deals. The trend shows that about 60% of the newly built plants in the renewable energy sector are realized thanks to the engagement of local or foreign public entities. In contrast, the set of deals that do not qualify as blended finance in the

examined collection tend to be funded via bonds and to be run by larger firms. A plausible explanation is that projects in the

Local public investors are still the main debt providers compared to foreign development institutions. Figure 6 shows the distribution of deal value with a breakdown by the region and the number of public entities involved. The blue bars stand for the sum of the deals invested by the given type (or group) of public debt providers while the red dots plot the average deal size in this category. Local investors (LAM) still takes the majority. Larger deals are associated with more numerous public investors, local or foreign. This finding is

consistent with the argument often made that a challenge in scaling up SDG investment in emerging markets is to attract foreign investors.

The figures are consistent with the hypothesis that risk perception arising from deal size, region and sector characteristics could currently be an important barrier to investment in sustainability projects. On the one hand, the examples reported in the above charts show the importance of conducting systematic empirical analyses on blended finance.

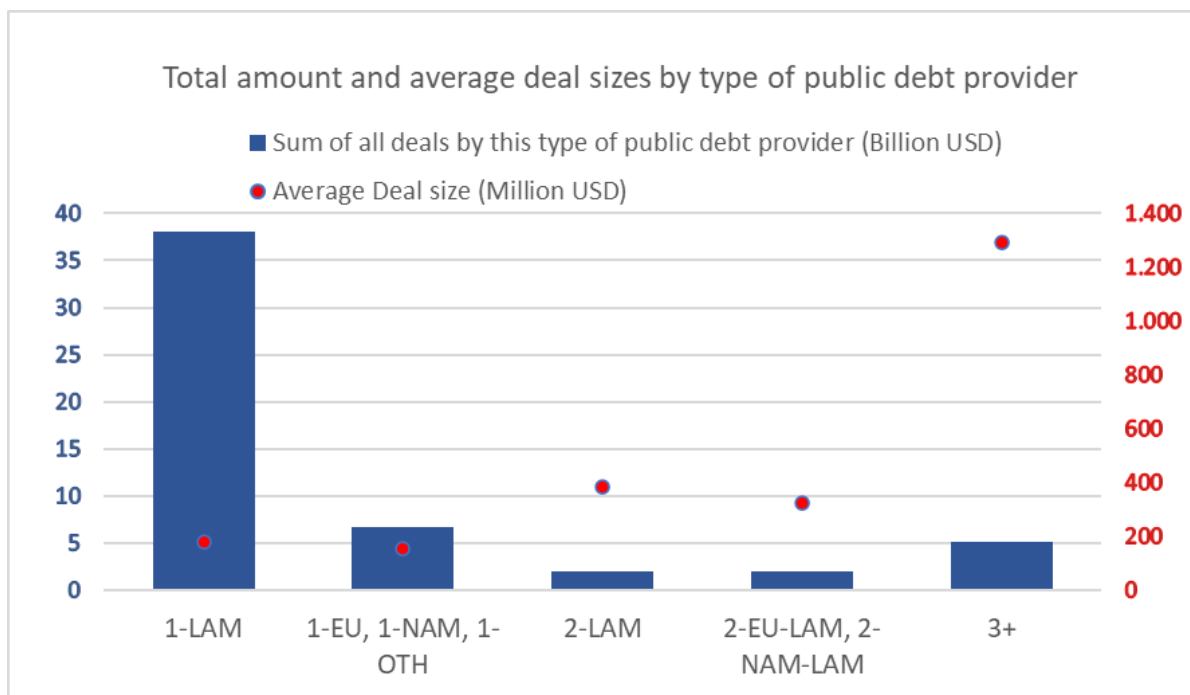


Figure 6. The total amount and average deal sizes by type of public debt provider(s). Source of data: BNEF, Author's calculation

4.4 Opportunities and challenges in blended finance solutions to scale up sustainability investments

Securitization and project bundling can deliver risk diversification, but only under appropriate conditions. The findings reported in the previous section are consistent with the hypothesis that in order to scale up investments in sustainability projects, it may be beneficial, at least in principle, to bundle many small-middle size projects together in securitized products.

However, the lessons learnt on securitization from the 2008 financial crisis impose prudence. Under appropriate conditions, that require scrutiny, bundling projects can have the following benefits: 1) improving diversification of the risk for the investor, 2) increase the ticket size that can be offered and 3) widen the range of risk profiles that can be catered for. Altogether these benefits can better attract the funding from large and traditional institutional investors. It is key to understand that, as we discuss more in detail below, this holds under certain conditions related to the risk dependence across projects, and the quality of the risk assessment.

De-risking. A two sided blade. Another feature often described by organizations engaging in BF, which can build on securitization, but not necessarily, is the adjustment of the financial risk/return profile of a project through a specific financial structure. Many approaches to blended finance also include the notion of de-risking, meant by many in a specific sense, i.e. the situation in which the public finance actor reduces the risk of the investment for the private actors employing instruments such as a guarantee, a junior tranche in a fund, or capped returns. For more details, please see to the report (Blended Finance Taskforce 2018). There are often two different groups of funding sources. Private commercial finance often refers to the non-concessional capital provided by private sector investors. The development capital often refers to concessional capital or grants from DFIs or philanthropic donors. The following are a few non-exhaustive examples of financial structures (Blended Finance Task Force 2018):

- Bond/note issuances: often for infrastructure projects, with guarantees or insurance from public/philanthropic funders.
- Equity/debt structures with preferred return: public or philanthropic funders providing a preferred return to institutional investors.
- Private equity or debt fund: concessional public or philanthropic funding attracting institutional investment.
- Grant funding: for capacity building and feasibility studies to assure bankability of a give infrastructure project by public or philanthropic funders for projects to attract institutional investments

Economic arguments against de-risking include moral hazard. Indeed, the same reason that attracts investors can also be a curse: the manager of the project and the private investors have lower incentive to monitor and assess the risk of the project than in the absence of the guarantee by the public actor. And these risks could be fatal for the sustainability objectives. The argument in favor of de-risking is that this is necessary to crowd-in the private sector into business sectors and regions for which there is insufficient track record in investments.

Securitization and de-risking. The idea of securitization and de-risking can be combined. A structure of interest in the following is referred to as "multi-layered Blended Finance fund" (BlueOrchard Academy 2018).

- Investments in the fund include the following forms: debt notes with low return and risk; senior and mezzanine equity tranche with intermediate level of risk and return; junior equity tranche with the higher risk.
- Debt notes and senior tranches are often held by qualified private investors (e.g. High Net Worth Individuals), foundations, family offices and institutional investors; the mezzanine tranche is often invested in by DFIs, IFIs and private investors. Junior tranche is for public investors with development mandate only.

The idea of combining de-risking with securitization poses the following challenges and opportunities:

- **Monitoring sustainability progress requires bigger effort than in traditional projects.** Risk diversification requires to bundle together multiple projects in different locations and possibly operating with different technologies (e.g. wind, solar and hydro). The deliverables in terms of sustainability objectives can be more difficult to assess because of the heterogeneity and the location. Tracking progress across multiple sustainability projects is more demanding than for a single project. Aggregating the progress across projects could lead to blind spots.
- **Monitoring operative and financial risk requires bigger effort than in traditional projects.** Similarly, assessing, tracking and aggregating operational risk and financial risk across multiple projects is more difficult than it is for a single project. Consider for comparison the sector of mortgages, where securitization has over two decades of history. In that sector, there is a very long track records of borrowers' risk profiles. And yet, in the years leading to the 2008 financial crisis the process of risk assessment and the originate-and-distribute model failed for many securitized products. Thus a securitized portfolio of projects poses a bigger effort in terms of quality and risk evaluation.
- **Economies of scale and scope.** At the same time, if the projects in the fund are monitored by an independent expert body, there can be economies of scale and scope in monitoring multiple projects. There are fix costs in acquiring the expertise to assess projects which can then be used more effectively when deployed on multiple projects. Thus, a professional evaluation of a bundle of projects, e.g. in the low carbon energy sector, could be more reliable than the evaluation of a single project. Moreover, best practices can be shared across the managers of the projects more effectively than if the various project managers would be working under separate monitoring bodies.
- **The key role of governance.** The governance structure in blended finance solutions is thus crucial, and it has to be designed in order to avoid conflicts of interest (in particular for those responsible for selling the product to investors).
- **Risk assessment of sustainability projects is knowledge intensive.** Sustainability and technical change are, in essence, structural breaks phenomena, i.e. in many cases, the risk assessment of sustainability project requires innovative and forward-looking approaches. In particular, risk assessment cannot be carried out using backward looking approaches based only on historical time series. Scientific knowledge about the sustainability domain of the project is required together with some modeling of the policy landscape and its impact. For instance, in the electricity generation sector there are important risks and opportunities from the transition to a low carbon economy which are currently assessed with innovative methodologies (Battiston et al. 2017; Battiston 2019). As a result, the risk assessment of bundles of projects across technologies and countries is very knowledge intensive.

From the arguments above, follows that combining blended finance with securitization can be a solution for scaling up investments only under the condition of a well-designed governance

structure between the public and private, and a transparent and science-based assessment of risks.

In the COVID-19 and post-COVID time, the fiscal budget might not be as abundant as before. It is thus necessary to look at a broader set of possible measures to ensure steady and robust growth of blended finance. The public sector could play the role of de-risking via different channels to best utilize their resource endowment and comply with their institutional mandate.

Indeed, the mobilization role of blended finance could be realized through a range of public interventions. In other words, the blending can happen at different levels with different structures. Public intervention can take in many forms to encourage specific industry or business. Traditionally, domestic measures are often under the category as industrial policy. In the sustainable development context, public intervention has already supported the provision of private finance via various channels (OECD 2017). There exist the following policy channels with decreasing distance to blended finance deals:

- non-climate policies and enabling conditions
- climate policies not providing financial support
- climate-related capacity building for the policy with financial support as a result for climate policies
- climate-related capacity building for projects
- public climate finance.

The closer the public measure is, the more direct effect it could be on encouraging the private sector to participate. However, the efficiency difference between the direct and indirect measures is not entirely determined by the length of the transmission channel. In other words, indirect public interventions, e.g. climate policies at the macroeconomic level, could have an overall influence on the private sector, to which might be challenging to attribute the mobilization effect.

Ensuring active engagement in blended finance at the subnational level is vital for long-term scaling up. The subnational government provides the environment for a large pool of bankable projects at the frontline of sustainability. A significant portion of sustainable business opportunity lies at the regional/subnational level because of their proximity to the local population and the sustainability challenge. Blended finance is indeed to access the invisible population and create an inclusive economic environment. It can be achieved by shared value embedded project creation with the local community on board right from the beginning. In other words, sustainable projects often deal with semi-public goods or goods that are often provided partially by the public sector to the local population, the market of which is often protected or highly regulated. For instance, the transportation sector in developing countries is often still under progress. Whether the current policymaking

prioritizes electricity-powered public transportation or highway plus parking lot and private transportation has a long-term implication: not only that private transportation is expensive and exclusive, but also an electricity-powered public transportation system would lay a solid ground for facilitating a future market of private electric bicycles, motorcycles or cars with existing charging stations. Besides, the implementation capability of the subnational governments often exceeds the centralized government at the top. For instance, the incubation for sustainable entrepreneurs and local regulations for small-to-medium-sized business is often in the hand of the subnational governments. To have a large pool of bankable projects, it is, therefore, crucial to have technical assistance at the origin of the projects. Lack of intermediaries to create and enhance an enabling environment could lead to insufficient numbers of bankable projects and thus severely hamper the long-term scaling up goal of blended finance.

Development funding sources could be blended as well, whether local or foreign, private, or public. Under the fiscal stress from combating COVID-19 and its socioeconomic implications in both short and long term (e.g. unemployment, low growth perspective), it might be too optimistic to expect a massive increase in the development capital. In addition, political will and global solidarity are viewed as the primary driver of development finance (OECD 2020), which does not give too much positive light at the international level with the polarising trends. For the public funds dedicated to sustainability and resilience, public entities could extend the funding resources, i.e. borrowing from the market, especially under this low interest and low confidence level. This offers another dimension of blending: at the organizational level of the public institution. Indeed, institutional investors might be constrained due to their local investment mandate but could nonetheless participate in the financing of local DFIs.

Incorporating sustainability into the development strategy could benefit the private sector as well. Active participation from the private sector, which includes project developers and financial institutions, e.g. banks, insurance, and fund managers, could bring advantages to both sustainability and the companies themselves. Banks, as the central allocator for resources within the real economy, are indispensable in blended finance. Understanding the specific risk and return profile of sustainable projects, the risk preference and sustainability mandate of different investors, the international and local financial regulation are the core tasks for banks as the intermediary in the blended finance vehicle. While for insurance, besides its institution investor role, the liability side of the business is directly exposed to sustainability risks. It is not only a challenge but also an opportunity to utilize its expertise. Likewise, blended finance also gives rise to new types of investment funds in addition to Environmental Social and Governance (ESG) themed equity funds.

Financial regulation could identify potential space for sustainability. The current financial system favours large creditors either as big companies or wealthy individuals. Part of the sustainability challenge is to give financing access to average households, especially in underdeveloped regions and small sustainable business. The difficulty of providing financial resources to the area mentioned above is still severe. One of the main obstacles is the lack of recognition and promotion of sustainability financing in the financial legislation and

regulation across the world, as mentioned in the interview quotation from Prof. Alexander, except for a few early movers, e.g. Brazil (Alexander and Fisher, Banking Regulation and Sustainability 2019) (Alexander, Greening banking policy 2016). The first and foremost measure to be taken is to collect sustainability relevant data from within the banking sector. This step lays the foundation of a possible improvement in the interpretation of sustainability relevant risks in the financial arena. Based on sufficient and internationally comparable data, banking supervisors could perform a much better-informed sustainability relevant (e.g. climate stress test) stress testing (Battiston, Mandel, et al. 2017), adjust regulatory measures for risk mitigation at a systemic level and create space for commercial banks to participate in financing sustainable economic activities actively.

Alexander, Kern

Kern Alexander, Professor of Law & Finance, University of Zurich

“Banking regulation is vital for influencing lending to developing countries and providing credits and loans for sustainable development projects. Our study in 2016 (link in reference) shows that current bank capital regulations do not unduly restrict lending for sustainable projects, but rather regulators should focus more on assessing the riskiness of bank governance and business models in respect to sustainable finance. For instance, regulators should require banks to collect sustainability relevant data in relation to their lending and credit activities.”

Blended finance requires data inputs from a wide range of stakeholders for both sustainability measurement and feasibility studies. This aim requires data inputs to be comprehensive, scientific, consistent, and standardized. The nature of sustainability implies that the measurement of sustainability has to be multi-dimensional. With the changing context of each project, varying geographical and sectoral features, it is inappropriate to have only one single score to cover the whole story. The implementation of such work could borrow expertise from academia and professional sustainability rating agency. The potential of such work could help to establish the performance indicator for sustainable investment as well, which could become a useful tool for project certification and fund-level sustainability tracking, especially for private sector investment with a certain public mandate, e.g. institutional investor. It is therefore essential to consolidate various theoretical frameworks of sustainability, development, impact, ESG score to lay a firm ground for various stakeholders to discuss and collaborate. The goal of this data work is to enable better decision making across financial instruments, across stakeholders and mobilize for both quantity and quality.

Data availability naturally leads to the evaluation of blended finance: **additionality and market making**. It is commonly perceived that sustainable business in developing countries has not been successful in attracting private sector investor (UNCTAD 2014) (UNCTAD 2020). The goal of blended finance is, therefore, to create more traffic volume on the way to

achieve SDGs in general, climate change in particular, in order to fulfil the funding gap. The quotation below from Maria Teresa Zappia, shares a similar message in the COVID context. This extra volume from the private sector mobilized by blended finance structure ideally should not be participating without the mobilization of blended finance if the so-called

Maria Teresa Zappia

BlueOchard, Deputy CEO, Chief Impact and Blended Finance Officer

“In the context of COVID19 we badly need to attract public and private sector resources for supporting and strengthening the development of a sustainable pool of assets that have the scale and impact footprint to meet the expectations of mainstream investors. Many are the lessons learned from financial inclusion and more specifically from microfinance impact investing funds over the past 15 years. The COVID19 impact on the real sector and the countercyclical role of development finance institutions and other government agencies in these unprecedented times call for an even more deliberate role to be played by them in terms of additionality and demonstration effect. Still the investment proposition needs to be financially attractive and the time frame appropriate for a blended finance offering to unlock the private commercial capital required to making the difference. A number of blended finance funds have shown how climate change can benefit from de-risking measures and I believe we will see much more happening across asset classes in the future.”

crowding-out effect is to be avoided. The verification of such causal link is however extremely challenging, if ever possible because there is no lab experiment possible for a proper "what if" comparison. It is, however, possible to keep track of regional and sectoral development with the above data standard. For instance, a panel data on environmental indices, the well-being of the local population (e.g. child mortality rate, employment etc.), overall economic performance could offer a base for attribution: whether blended finance vehicle altered the development path towards sustainability and resilience or not. One indicator could be whether the designated area has been improving its market-based participation and increasing its independence of concessional development finance and/or other public interventions.

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Appendix

Glossary

AUM	asset under management
BNEF	Bloomberg New Energy Finance
DAC	Development Assistance Committee
DFI	development finance institution
ESG	environmental, social and governance
GDP	gross domestic production
GHG	greenhouse gas
GNI	gross national income
IEA	International Energy Agency
IFC	International Finance Corporation
ILO	International Labor Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
IUCN	International Union for Conservation of Nature
LIC	low income country
MDB	multilateral development banks
MIC	middle income country
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
RE	renewable energy
SDGs	Sustainable Development Goals
SDSN	Sustainable Development Solutions Network
SPV	special purpose vehicle
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

Non- exhaustive list of contributors

Eszter Mogyorosy, Climate Finance Manager, ICLEI

Emilio Cattaneo, Executive Director, The Emerging Africa Infrastructure Fund, Private Infrastructure Development Group

Marion Verles, CEO, SustainCERT

Karen Wilson, OECD

Philipp Moss, Former Head of The Sustainable Development Investment Partnership, World Economic Forum

Paulus Gereadts, Team Leader EIP, European Commission

Weixi Gong, Chief Investment and Technology Promotion at UNIDO

Frannie Léautier, COO and Asset Management Executive, Trade and Development Bank

Dana Barsky, COO Impact Advisory and Finance Department, Credit Suisse

Kern Alexander, Professor of Law & Finance, University of Zurich

Lauren Carter, Engagement Advisor for Invest4Climate, UNDP

Hubert Ruzibiza, CEO FONERWA Rwanda

Ibrahim Sagna, Vice President AFREXIMBANK

Patrick Scheurle, ex CEO Blue Orchard

Melchior de Muralt, Founder BO, Senior Partner at de Pury Pictet de Turrettini

Pierre Rousseau, Senior Green Business Advisor to CEO BNP Paribas

Paulo Gaumez, ex-Director at World Bank, now working at AU building a 1 T\$USD blending infrastructure Fund

Charles Wilson, Director Partnership at Gold Standard for MRV at Fund level

Mason Wallick, Clime Capital

Maria Teresa Zappia, Deputy CEO, BlueOrchard

Marcelo de Andrade, Chairman/Founder, Pro Natura International /Partner, Earth Capital Holdings, President Earth Capital Brasil.