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Lessons and Innovations to Spur Green Investment in Developing Countries

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About CPI

Climate Policy Initiative works to improve the most important energy and land use policies around the world, with a particular focus on finance. An independent organization supported in part by a grant from the Open Society Foundations, CPI works in places that provide the most potential for policy impact including Brazil, China, Europe, India, Indonesia, and the United States.

Our work helps nations grow while addressing increasingly scarce resources and climate risk. This is a complex challenge in which policy plays a crucial role.

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1. Introduction - Green Investment in a Post-Paris World

In the last years, governments around the world have set collective climate and development goals that go far beyond previous agreements in terms of scope and ambition. The Sustainable Development Goals adopted in September 2015 focus on boosting economic growth and reducing poverty, recognizing the necessity of using natural resources sustainably, protecting the environment, and taking strong action on climate change.

Major green investment is needed between now through 2030 to limit global temperature rise to below 2°C. This brief shares lessons from low-carbon and climate-resilient programs, interventions, and innovations around the world to speed up the transition to zero net emissions.

The Paris Agreement reached in December 2015 at the 21st United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP21) reinforced these objectives and set unprecedented goals for climate change mitigation and adaptation based on plans — Intended Nationally Determined Contributions (INDCs) — submitted by nearly every nation. By the conclusion of the 22nd COP in Marrakech in November 2016, 114 countries covering around 80% of global emissions had ratified the Paris Agreement, transforming intentions into commitments.

While the pace with which these national blueprints were made accurately reflects the urgency of the climate challenge, they remain intentions, and are not yet sufficient to reach the intended targets for halting global temperature rise. Much will depend on quick and ambitious action and implementation in the near-term.

Low-carbon economic growth will require significant private investment, which, in many cases will not flow without substantial improvements to the way public policies and finance are targeted. This is especially so in developing countries where the lack of access to

sufficient capital (and particularly patient capital), and the presence and perception of risks, continues to limit investor engagement.

The International Energy Agency projects that investment needed just in the energy sector to meet commitments comes to USD13.5 trillion by 2030 (IEA, 2015), while the International Finance Corporation (IFC) estimates that nearly USD23 trillion in climate-smart investment opportunities are available in emerging markets alone between now and 2030 (IFC, 2016). This compares to annual global climate finance which reached just USD392 billion in 2014.

Estimates suggest that the world needs to invest about USD90 trillion in infrastructure between now and 2030 or about USD6 trillion per year. This is approximately double current global investment levels and around two thirds of this investment is needed in emerging economies and other developing countries. The additional investment required to make infrastructure low-carbon and resilient is estimated to be a small share of overall investment (about 5%). However, a major shift is required in the choice and design of infrastructure (NCE, 2014; NCE, 2016).

A shortage of capital is thus not the problem: sufficient capital exists to fund the transition to the low-carbon climate-resilient economy. Rather, it is that the public and private pension funds, insurance companies, Sovereign Wealth Funds, mutual funds and foundations that held an estimated USD93 trillion of assets in 2014 in the OECD alone (OECD, 2014), as well as mainstream private investors, are not yet investing at scale in the green economy, or in what they perceive to be more risky emerging markets.

We know that governments can promote this green investment in multiple ways, including through driving demand for green finance by planning and commissioning green and climate-resilient infrastructure (Corfee-Morlot et al., 2012). With substantial policies, investment, and programs now in action, we can also learn from what has worked and what has not.

Making adjustments based on lessons learned will be critical if governments and public finance institutions are to increase the impact of their limited resources, secure the best return for taxpayers, and build toward a low-carbon, climate-resilient future within the very short time available.

This brief compiles together for the first time some of the key lessons observed by Climate Policy Initiative (CPI) in original, peer reviewed reports and briefs that were published in 2015 and 2016. For over five years, CPI has documented, assessed, and designed a range of public finance interventions and inventions that aim to boost low-carbon, climate-resilient investment, especially in developing countries. This brief brings together lessons from our work tracking investment in the [Global Landscape of Climate Finance](#), analysing the effectiveness of investments around the world, and designing innovative new mechanisms that can unlock private finance through the [Global Innovation Lab for Climate Finance](#).

Section 2 takes the perspective of the private sector and investors to discuss the **key gaps** that public policies and resources can address in order to help scale up green investment efficiently.

Section 3 shares insights about **effective policy design** and tools based on what works and what does not. It shares opportunities for governments to take concrete, effective, and efficient action to improve regulation, strengthen enabling environments, and change incentives for sub-national governments and private investors in developing countries.

Section 4 synthesizes lessons learned regarding **alternative public approaches** to leverage private investment, based on existing programs from the Climate Investment Funds.

Section 5 discusses the next phase of green financing, and specifically, **innovations** developed through new public-private partnerships being forged through initiatives such as the Global Innovation Lab for Climate Finance and the India Innovation Lab for Green Finance. The two Lab programs bring together experts from governments, development banks, private financial institutions, renewable energy companies, and infrastructure developers to tackle barriers and develop replicable and scalable finance instruments to unlock significant private green investment.

2. Key Gaps to Unlocking Investment

In its [Global Landscape of Climate Finance](#) reports, CPI has repeatedly found that public finance drives private investment (Buchner et al., 2015, Mazza et al., 2016). In 2014, the latest year for which data is available, public investment grew by 6% to reach USD151 billion. Most came from multilateral, bilateral and national development finance institutions (DFIs), which contributed 89% of public flows using a variety of tools and instruments (Mazza et al., 2016).

This public finance often makes private investment possible by increasing project revenues, reducing project costs, or developing the frameworks that enable investment. Where private investors can balance risks, costs, and returns, investment will follow. CPI analysis has highlighted three of the most important challenges, from the private sector perspective, currently blocking investment (Buchner et al., 2012):

- **Risk gaps:** Private actors perceive a range of difficult-to-manage risks in green investments that threaten their ability to access returns especially in developing countries. These include real and perceived policy risks (Frisari et al., 2013) such as retroactive regulatory changes, incoherent legal and institutional systems, and corruption; technology risk; financial risks including currency risks; and sovereign risks including political instability.
- **Viability gaps:** Inadequate access to finance, complex financing arrangements, unsuitable terms and conditions, the relatively higher cost of investments for immature technologies, uncertainty about returns, and risk aversion, all inhibit support green investments (Falconer, 2014).
- **Knowledge and awareness gaps:** Given the lack of a long and established track record for many green investments, knowledge gaps can limit access to opportunities and finance, as well as the appetite of potential investors and end users. These knowledge gaps extend to a lack of familiarity with new technologies, approaches, investment opportunities, or countries, and the inability to evaluate and incorporate climate change risks into investment or financial decision making (Trabacchi et al., 2015).

The question is, then, how can we overcome these gaps to deliver investment at scales that encourage cost reductions, and more efficient resource management?

Public actors positioned to play key roles include finance ministries, national and international development finance institutions, and line ministries and agencies responsible for overseeing action on the ground. The latter include those involved in urban planning, land and resource management including forestry, agriculture, water and mining, and ministries of energy and environment.

Private actors include commercial financial institutions, institutional investors, venture capitalists, private equity and infrastructure funds, project developers, philanthropists, and critically, end users including corporates and households.

Clear and enforceable legal and policy frameworks, targeted incentives, dedicated institutions and financial instruments that address specific investors' needs, and better alignment between public and private interests are beginning to unlock a growing stream of green investment for mitigation and adaptation (Buchner et al., 2012, Mazza et al., 2016).

In addition, innovations at both the country and global levels are helping to enhance the understanding of the next phase of green financing and design a new set of investment vehicles to unlock finance at scale (CPI, 2017).

3. Effective public policy design

In 2015 and 2016, CPI case studies and analysis identified where opportunities are being both successfully exploited and missed, offering lessons to those seeking to transform their economic development and boost green growth. The following case studies look at how effective enabling environments and policy frameworks, including fiscal policies, regulation, and risk mitigation instruments, can address gaps and barriers to green investment, encourage better governance, and integrate sustainability into supply chains and business practices.

Even with continuing pressure on constrained public budgets, there is an array of opportunities for governments and public actors to help investors balance risks and returns, and to encourage business models that encourage socially inclusive, sustainable economic growth.

3.1 Smarter Fiscal Policies - Lessons from Indonesia

Fiscal policies can reinforce business-as-usual behaviours and management models, or alternatively, encourage a shift toward sustainability and optimal resource management by altering where private actors allocate resources across value chains to achieve growth.

For example, taxes levied at different points of agricultural production can radically impact decisions about how to achieve productivity gains. Governments can earmark state revenue to lower high upfront costs

associated with large-scale replanting of high-quality seeds and make revenue-sharing between federal and state governments and tax subsidies contingent upon meeting sustainability criteria. These actions all provide regional governments and/or businesses tangible benefits for shifting to greener business and growth models.

Indonesia's land use sector — including forestry, oil and gas, mining, and agriculture — is growing rapidly. It contributes almost a third of Indonesia's national revenue and nearly half of Indonesia's GDP. However, the land use sector is also Indonesia's leading driver of deforestation and greenhouse gas emissions. With land and land use the cornerstone of Indonesia's planned reductions in greenhouse gas emissions (29% by 2030) and of its economic growth targets (7% per annum), finding ways to simultaneously optimize productivity and ensure the protection of high-value natural capital is critical. CPI calls this balance 'production and protection'.¹

For more than five years, CPI analysis in Brazil has examined the relationship between various policies and rates of deforestation there. Building on this, CPI has expanded work to consider the existing and likely impacts of fiscal policies in Indonesia on the decisions of business and local administrators, to identify if there is potential for adjustments to encourage socially inclusive economic growth without resulting in emissions and environmental losses (Falconer, 2015., and Mafira et al., 2015). We examined:

- Adjustments to existing revenue collection instruments;
- Increases to revenue-sharing from central to local government; and
- Ear-marking more revenues to support reduced deforestation.

[Improving Land Productivity through Fiscal Policy: A Framework for Analysis](#) offers the following data insights and recommendations (Mafira et al., 2015).

¹ Go to CPI Brazil's web page for a full list of relevant publications available in English and Portuguese: <https://climatepolicyinitiative.org/brazil/publications/>

3.1.1 REVENUE COLLECTION



Lesson 1: Taxing production area rather than production volumes or profits may encourage adoption of new methods and more sustainable and efficient agriculture, achieving higher productivity per hectare.

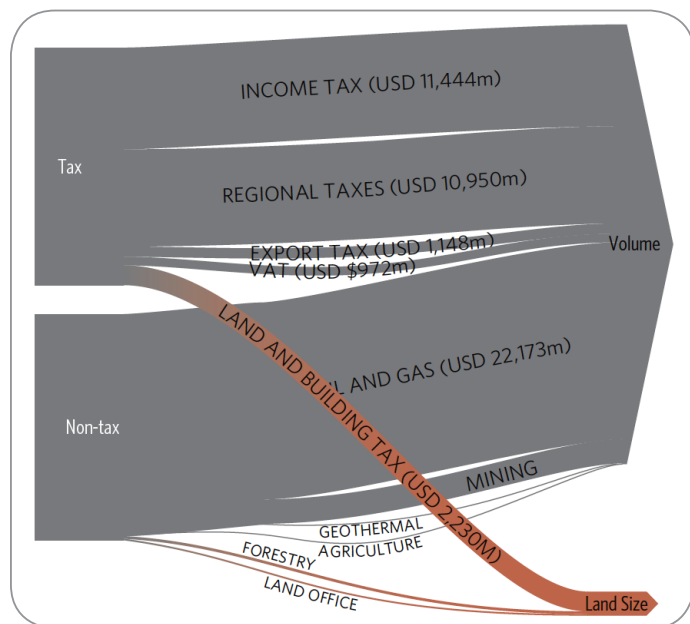
Lesson 2: Introducing sustainability indicators into tax holiday eligibility criteria, for example, or linking tax rates to sustainability criteria, could also reward environmentally sustainable behaviour and decision making.

While there is obvious GDP growth in Indonesia’s land use sector, government revenue is not growing at the same rate. The tax-to-GDP ratio in agriculture is underperforming at only 1.2%, well below Indonesia’s average tax-to-GDP ratio of 12%.

In addition, a disproportionate amount of revenue comes from production-based levies, instead of land-size-based levies, meaning there is no incentive for producers to use land more efficiently. In fact, 93.5% of all land use revenue (IDR400 trillion) comes from taxing profitability instead of taxing land size.

as sectors eligible for tax holidays. However, the regulation has no regard for industries’ sustainability or lack thereof, upstream. The failure to make tax breaks contingent on meeting sustainability regulations may be a missed opportunity that would provide an easy win-win for Indonesia’s goals.

Figure 1: The vast majority of Indonesia’s land-use tax revenues are levied on profitability, with no regard for land size.



Source: Mafira et al., 2015

3.1.2 REVENUE SHARING



Lesson 3: Reallocating tax revenue to local governments with land management decisions could encourage a shift away from agriculture based upon land expansion.

Revenue transfers from central to regional governments are often an important part of regional government revenues and can impact local administrative decision making. In Indonesia, for example:

- Land and building taxes, and non-tax collection from certain sectors, e.g. forestry and mining, play a minor role in overall revenues but provide large percentages of revenue to regions;
- Oil and gas revenues remain one of the largest sources for regional governments; and

There is high potential for Indonesia’s government to adjust fiscal incentives to encourage more efficient, sustainable, and socially inclusive land and agricultural management.

Furthermore, current revenue instruments – both tax and non-tax – do not include any sustainability criteria nor do they incentivize sustainable corporate behaviour. A case in point, the latest Finance Ministry Regulation 159/2015 on Tax Holidays covers renewable energy including biofuel, and downstream agriculture industry

- VAT, corporate, and export taxes, which provide the bulk of government revenue, and agriculture non-tax revenue, are spent entirely by the central government and are not recycled to regions despite being a potential tool to boost down-streaming and supply-chain efficiency.

In terms of impact, these three factors mean regional governments gain revenue as they grant more land permits, and have few fiscal incentives to increase productivity on existing land. These conditions may encourage local governments to support the expansion of extractive industries, agricultural lands, and land-clearing, rather than productivity increases.

3.1.3 REVENUE EARMARKING



Lesson 4: Governments can improve incentives for sustainable land use by linking regional and local governments' access to revenue support to performance standards that require them to implement sustainability programs, demonstrate financial accountability, and social benefits.

Governments sometimes use earmarking mechanisms to support sectors that are considered a development priority. In Indonesia, the central government-managed Adjustment Funds can be earmarked, and have previously been used to finance strategic sectors such as infrastructure and education, and to channel performance-based transfers to local governments. Such payments can fund direct investments and help close viability gaps for private actors.

Importantly, because disbursements of the Regional Incentives Fund (*Dana Insentif Daerah* in Bahasa Indonesia) are calculated based on performance against public financial management, economic, and welfare indicators, there is an incentive for local governments to meet and out-perform minimum standards. The Adjustment Fund has also gained popularity over the years due to its relatively flexible allocation process. Currently, there is no earmarking for sustainable land use management. This could provide another opportunity to support green investment.

4. Alternative public approaches to effective risk mitigation

To unlock new sources of private and international public investment, it may be necessary for governments to move beyond traditional policy tools to mitigate persistent risks

4.1 Impactful Public-Private Partnerships – Lessons from Kenya

In 2015, CPI conducted analysis on behalf of the Climate Investment Funds to better understand the role of public finance in enabling fast and cost-effective deployment of geothermal power plants in developing countries (Micale et al., 2015b), focusing on three projects in Indonesia, Kenya, and Turkey. This section shares lessons from the Olkaria III geothermal plant in Kenya, which offers insights for policy makers on options they can deploy to lower costs per unit of geothermal power generated (Micale et al., 2015a), including through partnerships with and targeted use of the risk mitigation tool box offered by DFIs.

In the case study [Using Public Finance to Attract Private Investment in Geothermal: Olkaria III](#), CPI noted that geothermal energy holds significant promise for the low-carbon energy systems of developing countries (Micale et al., 2015b). This is because geothermal has the ability to meet baseload power demand, and to backstop fluctuating supply from other renewable sources.

Kenya enjoys significant geothermal resources which the government recognizes as an important option for reducing the country's reliance on expensive fossil fuel and weather-dependent hydro power generation, as well as for improving energy access. The government has an ambitious target to increase its geothermal power capacity from 600 MW to 5,000 MW by 2030, taking the share of geothermal in the power mix from 15% to 27%. To meet ambitious deployment targets it has introduced a series of reforms, financial, and

fiscal incentives. While annual deployment rates have increased significantly the sector still is not attracting the level of investment necessary to achieve national deployment targets, mainly because of long timeframes required to confirm geothermal resources, high upfront risks related to exploration, and significant capital investment costs.

In this context, Olkaria III is interesting because it was the first privately funded and developed geothermal project in Africa. It also represents an example of phased development strategy, and a good mix of financing and risk mitigation instruments made available by the public sector. These three elements were central to unlocking the required investment.

4.1.1 DOMESTIC PUBLIC ACTIONS CAN MITIGATE SIGNIFICANT DEVELOPER RISKS

Lesson 5: Novel government approaches and actions can be crucial to address fundamental risk barriers and unlock finance that would otherwise prevent private developers from investing in some developing countries.

Olkaria was developed on a field previously explored and proven by state-owned generator KenGen, which transferred the field to Ormat Technologies in 1998 when it was awarded a 'build, own and operate' public tender to develop the field. This transaction which amounted to a donation of two existing wells with an estimated potential of 8 MW, overcame a risk impeding geothermal deployment everywhere—the high exploration risk that private developers are often unwilling and unable to bear. By progressively exploiting the steam power generated to expand production from 8 MW in 1998, to 139 MW in 2016,² Ormat reduced its investment exposure in the initial, more risky years in a series of phased investments. In 2009, after 48 MW had been commissioned, Ormat successfully renegotiated a 20-year power purchase agreement with public company Kenya Power and Company Lighting Company Limited (KPLC), to access debt to fund further expansion. Crucially, the PPA included a government security package to back off-taker purchases, providing the project with a guaranteed future revenue stream.

2 At <http://www.thinkgeoenergy.com/ormat-starts-operation-of-29-mw-expansion-at-olkaria-iii-plant-in-kenya/> accessed on 23 February 2017.

4.1.2 DOMESTIC PUBLIC RISK MITIGATION CAN UNLOCK INTERNATIONAL PUBLIC FINANCING

Lesson 6: Well-designed Power Purchase Agreements can include government backed assurances such as letters of credit, and letters of comfort, which can prove crucial to unlock the long-term debt finance needed to develop large projects.

Government-backed risk mitigation included purchase guarantees and clauses in the PPA that shielded Ormat's exposure to external risks such as consumer price index and currency fluctuations, and the presence of MIGA Political Risk Insurance³ unlocked significant debt financing at tenors and rates that helped to lower financing costs funded expansion and lowered overall levelized cost of electricity (LCOE).

Table 1 shows the combination of equity and debt elements that together, mobilised USD 635 million including in refinancing. Ormat technologies invested USD 220 in equity into the phased expansion of Olkaria. The German Investment and Development Corporation (DEG) and KfW Development Bank headed a financing consortium that refinanced Ormat's full equity stake in Phase I. The Overseas Private Investment Corporation (OPIC) provided a 19-year tenor senior loan of USD 310 million in three tranches over Phase II and III, to refinance part of Ormat's equity investment, to pay part of the DEG loan which became subordinated, and to finance part of Phase III.

Similar combinations of national government support, in the form of early-stage exploration grants, security packages guaranteeing power purchase, power purchase agreements addressing key operational risks, and international public finance in the form of loans and political risk insurance, are likely to play important roles in attracting private investors in other developing countries to help meet individual government's strategic priorities.

Table 1: Financial inputs at each phase of expansion (USD million)

FINANCIAL STRUCTURE OLKARIA III			PHASE I		PHASE II	PHASE III	TOTAL	
ACTORS	TYPE	INSTRUMENT	12 MW	+36 MW	+36 MW	+16MW (OPTIMIZED TO 26 MW)	FINANCE MOBILIZED	PROJECT COSTS (EXCLUDING REFINANCING)
Ormat	Private	Equity	40	110	43	27	220	220
DEG & KfW	Public	Syndicated Loan (Refinancing)	105				105	
OPIC	Public	Senior Loan (Refinancing)	85				85	
OPIC	Public	Senior Loan			180	45	225	225
Total							635	445

Sources: Own estimates based on Climate Finance Options WB (2013); Ormat Technologies (2014c); OPIC (2011); SEC (2012c); World Bank (2000); World Bank (2014).

3 The World Bank Groups' Multilateral Investment Guarantee Agency political risk insurance protected against political risks including transfer restriction, war and civil disturbance, and expropriation.

5. Developing innovative financial solutions

Facilitating a focused and fluid exchange between public and private actors to develop innovative instruments that mobilize private finance at scale in developing countries is a key objective of CPI's mission. In this section, we first share general lessons from the process of working on the [Global Innovation Lab for Climate Finance](#), the [India Innovation Lab for Climate Finance](#), and the [Fire Awards](#). We then provide examples of Lab and Fire Awards instruments that are helping to unlock private investment in developing countries by reducing risks and costs, and building knowledge and technical capacity.

Private investors who experience investment barriers first-hand have valuable insights into what is needed to overcome them. To create innovative, actionable, and transformative solutions that can bring forward the next phase of green financing, their ideas sometimes require development and stress-testing.

5.1 Innovative Public-Private Partnerships

[The Global Innovation Lab for Climate Finance](#) (The Lab) is a public-private partnership that aims to mobilize billions for climate action in developing countries. The Lab brings together a unique group of public and private organizations with a combination of political, technical, institutional, and financial resources to identify and accelerate the development of promising financial instruments into implementation-ready projects that address investor and recipient country needs.

5.1.1 BESPOKE SOLUTIONS

Lesson 7: Targeted consultations between public and private actors can encourage identification of particular barriers, and support the prioritization of bespoke solutions that address real risks, costs and knowledge barriers.

Members of the Lab include high-level representatives from governments, insurance companies, investment banks, project developers, and development finance institutions from across the world. They bring different qualities, assets, and influence to the initiative. Its consultative working process ensures proposals are thoroughly stress-tested from a variety of perspectives, building confidence in their design and ensuring they are attractive to public and private investors alike (CPI, 2017).

5.1.2 CROWDSOURCING

Lesson 8: Crowdsourcing ideas to overcome investment barriers helps illustrate where risks and gaps exist across value-chains, and where action should be prioritized.

The Lab begins with an international 'Call for Ideas' to crowd-source innovative ideas for concept development. The ideas are screened and shortlisted against the Lab's four overarching criteria, which have been designed to encourage innovation, maximize impact and accelerate deployment. Ideas must be:

- **Actionable**, by identifying a clear strategy and necessary partnerships to implement ideas within a few years without facing major barriers;
- **Innovative**, by addressing barriers to private climate finance that have not been addressed yet, or could be addressed more effectively;
- **Catalytic**, by demonstrating the potential to mobilize private investment, and offering clear socioeconomic, development and environmental impacts;
- **Financially Sustainable**, by identifying a strategy to phase out public financial support, thereby achieving market viability.

5.1.3 INCUBATION, ENDORSEMENT, AND ACCELERATION

Lesson 9: Innovative climate finance solutions may need additional assistance to incubate their development and accelerate their implementation. During this time additional benefits such as socialization, exposure to new technologies and geographies, endorsement, outreach about the potential short and long-term rewards of such approaches, can help refine ideas and introduce solution proponents to potential partners and funders.

Lab Members select which ideas proceed to the next phases where CPI conducts analysis, drawing upon inputs and feedback from formal working groups that include Lab Members and external experts. After instruments are stress-tested, their design improved, and implementation pathways developed, they are ready for endorsement by the most senior members of The Lab, who include government ministers, heads of banking divisions, and CEOs. This is important because Lab Members each commit to make available a variety of resources to support the development of instruments, including political, financial, and technical support. Successful instruments go forward to the piloting phase and may also be replicated and scaled up in other locations.

The Lab distinguishes itself from similar initiatives by quickly moving ‘from talk to action’ to deliver effective pilots of Lab-tested financial instruments, and encouraging the replication of such pilots in different sectoral, technological, and geographical contexts. It has already delivered results. The G7 has endorsed Lab instruments, pilots have already attracted more than USD600 million in start-up finance, have ‘broken ground’ and are unlocking finance and action in key sectors in developing countries.

5.1.4 THE LAB IS A RESPONSIVE MODEL

Lesson 10: A flexible and responsive model allows public and private partners to redirect resources to prioritize emerging challenges, take advantage of opportunities within a meaningful time frame, and tailor support to investors and proponents’ needs.

One of the most important features of the Lab model is its flexibility and responsiveness to the interests and direction of Lab Members, country- and sector-driven demand. This helps set its thematic and geographical focus and exposes partners to new opportunities. Endorsed instruments cover sectors ranging from renewable energy, off-grid renewables, and energy efficiency, through to adaptation, land use, and climate resilience. The Lab has also developed approaches to address investment barriers that exist across sectors, such as currency risk.

Launch of the Global Lab in 2014 was followed in 2015 by the [India Innovation Lab for Green Finance](#), established to enable special focus on India’s low-carbon transition. It includes representatives of India’s Ministry of New and Renewable Energy, local businesses and investors, and DFIs with specific expertise in India. Hosted and funded by Shakti Sustainable Energy Foundation, with additional financial support from the David and Lucile Packard Foundation, Oak Foundation, and the UK Government, CPI’s Delhi office serves as its Secretariat and analytical provider (CPI, 2015).

In 2017, the Global Lab also assembled a [Brasil Lab Panel](#). Drawing from ideas submitted from around the world, it decided to take forward three instruments that apply specifically to Brazil’s context.

[The Fire Awards](#), a window of The Lab, supports *proven* business models that need further support to achieve impact at scale. Where the Lab focuses on early concept ideas that require analysis, design, and implementation planning, the Fire Awards target later-stage instruments that are moving towards commercialization. As the business and finance models are often quite advanced, Fire Awards’ proponents rely less on CPI analytical support, and more upon networking, convening, and communications inputs that prepare proponents for introductions to large investor networks.

The Lab incubates ideas, while the Fire Awards accelerate proven approaches. As such, they complement each other and some proponents may progress from The Lab to the Fire Awards as their ideas are developed, piloted, and become ready for scale up (e.g. [Global Renewable Independent Power Supplier](#)).

5.2 Case Study from the Lab: Energy Savings Insurance

Lesson 11: Instruments to guarantee the promised savings from energy efficiency investments can address viability and risk gaps by assuring investors of their returns.

Energy efficiency upgrades can make small and medium-sized businesses (SMEs) in developing countries more competitive and productive, saving them money while reducing their emissions of harmful greenhouse gases. However, the market for such upgrades is typically limited to those such as lighting that have very short payback periods. This is particularly true in some developing countries and sectors where SMEs and local banks lack both the technical capacity to assess the potential of more capital-intensive energy efficiency investments and the confidence that they will achieve the energy savings promised and thereby provide a return on their investment.

In the first Lab cycle from 2014-15, Lab Members identified and endorsed the [Energy Savings Insurance \(ESI\)](#) instrument. It addresses barriers to the uptake of energy efficiency measures by de-risking investments. The insurance pays out in the event that projected value of energy savings is not met and can absorb up to 80% of the underperformance risk (Micale et al., 2015).

A USD47.5 million pilot of ESI is moving ahead in Mexico with a target to stimulate USD25 million of investment in 190 energy efficiency projects in the agro-industry sector through 2020. An additional pilot was launched in Colombia, and expansion is being considered throughout Latin America. The Inter-American Development Bank (IDB) is implementing the Mexican and Colombian pilots with local partners through funding from the Clean Technology Fund and the Danish Energy Agency. Replicated on a global scale, the Energy Savings Insurance instrument could drive USD10-100 billion in investment and provide annual emission reductions of 27-234 MtCO₂ by 2030.

The Green Climate Fund (GCF) committed USD21.7 million in June 2016 to implement a further pilot in El Salvador (CPI, 2016a). Other institutions are currently considering replicating ESI in Africa and Asia.

5.3 Case Study from the Lab: Climate-smart Financing for Smallholder Farmers

Lesson 12: Globally, a significant gap in adaptation finance exists. There are opportunities to increase private investment in climate-smart agriculture, including in small-scale agriculture businesses, where knowledge, risk and viability gaps prevent the uptake of climate-smart practices. Public-private instruments can incentivize this by addressing knowledge gaps and de-risking investments.

In its second cycle in 2015-2016, the Lab made a special call for ideas focusing on adaptation and climate resilience, to create new opportunities for private investors to support climate-resilient action in developing countries.

Millions of smallholder farmers in Africa lack the necessary finance, information, and technical capacities to implement climate-smart agricultural practices, making them more vulnerable to climate impacts such as drought, increased water scarcity, flooding, and soil erosion.

Local banks, microfinance institutions, and agribusinesses on the other hand, lack metrics to measure the climate risks in their portfolios, making them reluctant to lend to this sector, especially to farmers who may have difficulty demonstrating creditworthiness.

In its second cycle, the Lab selected and developed an innovative instrument designed to address knowledge, viability, and risk gaps that are preventing the take-up of climate-smart agriculture in developing countries.

[The Climate-Smart Lending Platform](#) will bring together the tools, actors, and finance necessary to reduce climate risk in lending portfolios and scale up climate-smart lending to smallholders around the world. Proposed by F3 Life in Kenya and now being taken forward by a coalition including International Union

for Conservation of Nature (IUCN), F3Life, Financial Access, Clarmondial, and CPI; the platform's long-term goal is to mainstream climate-smart agriculture metrics into the potentially USD 200 billion smallholder lending market. By mainstreaming Climate-smart Agriculture (CSA) metrics into the credit scoring systems of local financial institutions, initially with concessional backing, the goal is to prove the business case for increased agricultural lending, increasing banks' portfolio resilience and creating strong incentives for farmers to adopt CSA practices (Falconer et al., 2016).

5.4 Case Study from the India Lab: The FX Hedging Facility

Lesson 13: A currency hedging solution, developed in a public-private partnership, can help address foreign exchange risk, reducing the cost of renewable energy and making it more competitive.

Currency risk is one of the biggest and most persistent barriers to renewable energy and other climate-relevant investments in developing countries. In countries with underdeveloped capital markets, the only viable option is to finance projects in a foreign currency – such as dollar or euro. Indeed, many DFIs only provide concessional finance in these currencies.

However, a project's revenues are often in local currency, creating a risk that they will not be enough to pay back foreign debt if the local currency loses value. The long timeframes involved with renewable energy investments mean changes in the value of a currency of 50% or more are not uncommon.

While the provision of low-cost, long-term debt in a foreign currency can hugely improve a project's economics the cost of hedging currency risk can almost entirely erode the benefits (Konda et al., 2016).

Currency risk is a particular barrier in India. Foreign investors typically expect returns in their respective currencies (e.g., USD), whereas renewable projects earn revenues in the Indian currency (INR). This exposes foreign investors to devaluations in INR. However, market-based currency hedging solutions, which provide return certainty in foreign currencies, can be expensive due to market pricing of currency volatility, counterparty credit risk as well as liquidity risk.

The [FX Hedging Facility](#) selected by the India Innovation Lab for Green Finance is a customizable currency hedging product that allocates risks to suitable parties and eliminates the credit risk premium otherwise charged in a commercial currency swap. As a result, it can reduce the cost of currency hedging by 9% to 79% depending on the rate of depreciation and also has significant leverage potential. It could mobilize USD10 million of foreign debt investment for every dollar of subsidy with more than a 50% probability that the subsidy will be fully recovered (Farooque, et al., 2016). By managing the currency risk that foreign investors face, this instrument could help open up a significant channel of investment for renewable energy, particularly from foreign institutional investors.

5.5 Case Study from the Fire Awards: Affordable Green Homes

Lesson 14: Markets sometimes lag behind innovative business models even when they are commercially viable. Exposure to new potential investors through targeted marketing can open up new opportunities, helping to accelerate investment and make up lost ground.

Cities in emerging markets will add hundreds of millions of homes in the coming decades. There is a one-time opportunity to ensure the houses built are affordable and green. The main barriers to such investments are that households do not understand the benefits and overestimate the costs of green technologies. This translates into low demand, and therefore low supply.

Affordable Green Homes (AGH) believes large-scale demonstration projects can prove the benefits of energy efficiency measures to households and that this will create demand. International Housing Solutions (IHS) is a housing investment fund manager that has already built thousands of homes through its first fund, which was focused on South Africa. In its current fund, IHS is building additional affordable green homes in South Africa with investments from the IFC and KfW, the German development bank; and in Namibia with an additional investment from KfW. It seeks further capital to increase the number of affordable green homes and catalyse markets in South Africa, Namibia, and Botswana.

The intervention will replicate IHS's existing fund model, using capital from both catalytic and commercial investors to pay for the additional costs of green homes under construction. Through the use of a rigorous green homes standard (IFC EDGE), measurement of savings, and communication of benefits to consumers, the fund aims to deliver strong returns to investors while catalysing significant new demand to drive green homes market growth in these countries.

After the instrument was voted a 2016 Fire Award winner at the BNEF Future of Energy Summit, CPI as secretariat for the awards convened a working group of high-level energy and finance experts, and Bloomberg New Energy Finance (BNEF) and CPI analysts to support IHS in conducting outreach to raise capital. Support through the Fire process included identifying at least 43 potential investors, contacting 17 target investors, and facilitating investor meetings or introductions to help raise capital for the Fund.

6. Conclusion – Moving Forward

Closing the green investment gap and ensuring a pathway to limit temperature rise to below 2°C requires both public and private actors to manage risks, balance costs and revenues, achieve scale, and most importantly, deliver impact.

A growing body of experience and evidence drawn from around the world demonstrates that, where public resources and policies still favour business-as-usual, the private sector is unlikely to invest at scale in renewable energy, resilience and energy efficiency solutions, or sustainable supply chains.

A large variety of policies and financial instruments, actions, and public and private partnerships are unlocking finance for a low-carbon, climate-resilient future, by tailoring the allocation of risk and costs to overcome specific barriers. More can be done. CPI analysis contributes to this growing body of evidence. This report features examples of how governments and public finance institutions can reduce risks and costs, thus attracting green investment including by:

- Understanding what behaviours are encouraged by existing fiscal measures such as tax incentives, and adjusting these to promote more sustainable and socially inclusive business models. For example, rewarding agricultural companies that pursue growth through more productive technologies and methods, as well as making available more resources for local government actors contingent on specific sustainable uses, could support systemic transformations of business models supported by improved administrative governance.
- Taking actions that help private actors to reduce their exposure to risks and improve their access to financing, such as providing state backed guarantees. Reducing exposure to some core risks, such as early exploration risk, can overcome fundamental barriers faced by would-be investors. Providing continued underlying support to continuing developments, for example, by renegotiating terms to guarantee future purchases, can improve the bankability of projects, helping to unlock other sources of finance, including from international public and private actors. All along, the government is able to take comfort in the fact resources are being developed and managed efficiently and cost effectively.
- Increasing access to concessional finance and targeted extended tenor debt to help investors to reduce project costs and support the expansion of large projects, in line with high level government targets for lowering energy costs and/or improving access to energy.
- Supporting opportunities to demonstrate the effectiveness of new methods and approaches. For example, channelling public resources through private entities, while making access to such resources contingent on applying behaviours and metrics, supported by easily accessed technical training, can improve understanding about green investment opportunities, while improving resilience across supply chains. Successful demonstrations can and are being replicate and scaled up in new geographies and for new challenges.

The bottom line is that where investors can manage costs and risks, and access predictable future revenues, investment will certainly follow. The aim of this paper has been to share the myriad of lessons that can be drawn from CPI analysis, and early insights from existing interventions developed within the Global Innovation Lab for Climate Finance, to inform and underpin future attempts to unlock green investment.

The pressing urgency of the climate challenge means that key influencers and decision makers must move with speed, and multiply their efforts to test and prove innovations that utilize existing capital flows supported by well-designed policy instruments while re-imagining what is possible and bankable. CPI is committed to working with decision makers around the world to ensure a climate-resilient future for all of the world's people.

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