



Report

Mobilising private climate finance in lower-income countries

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Cover photo: Bikes parked in an alleyway in Hue, Vietnam.

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Executive summary

Although there is increasing information on flows of public climate finance, studies of private climate finance are challenging given the paucity of data at the international level on current flows. Beyond large renewable energy projects, there is very little information available on private investment by climate-relevant sector and sub-sector, and country-level data are very limited beyond those for the Organisation for Economic Co-operation and Development (OECD) countries and the BRICS (Brazil, Russia, India, China, and South Africa).

In addition to acknowledged data gaps, there is widespread acceptance of the following:

- Significant shifts in existing private investment and mobilisation of new resources are needed to help countries undertake climate-compatible development (CCD).¹
- The creation of a stable and attractive regulatory environment through ‘transparency, longevity and certainty’ (TLC) (or long, loud and legal signals) is essential to enable this shift in private investment.
- There is an important role for public finance (domestic and international) to enable greater investment in CCD by the private sector.

With the aim of supporting governments in their efforts to shift or direct additional private resources to CCD, we have developed a methodology to: i) fill key information gaps about incentives and investment at country level in climate-relevant sectors, and ii) enhance understanding of the links between public incentives and private investment in CCD. Thus far, we have applied this methodology in the

energy sector in Uganda, the agriculture sectors in Zambia and Ghana, and the transport sector and water and sanitation sector in Viet Nam.

This report highlights five key recommendations for those actors seeking to mobilise private climate finance in lower-income countries:

Recommendation 1: Ensure consistency between climate objectives and national budget priorities.

Recommendation 2: Address existing disincentives for investment in climate-compatible development.

Recommendation 3: Mobilise the full diversity of private investment (including local and smaller-scale investors).

Recommendation 4: Gather information about climate impacts and investment opportunities (not just private finance).

Recommendation 5: Shift existing private investment, while mobilising new flows.

We believe this work demonstrates that there are numerous opportunities to increase the scale of private climate finance, and that this can be done without access to comprehensive investment data and without crowding out existing private investors. This research also reinforces the findings of early studies on private investment in renewable energy, which highlight a key role for policies and incentives, and the need to start with eliminating disincentives.

In addition to these cross-cutting findings, the experience of applying this methodology across a number of sectors and lower-income countries: i) highlights how a similar approach might be used to identify opportunities to mobilise public and private finance to support longer-term national climate commitments, and ii) identifies key opportunities to support longer-term tracking of private climate finance.

¹ Climate-compatible development (CCD) safeguards development from climate impacts (climate-resilient development) and reduces emissions or keeps them low without compromising development goals (low-emissions development) (CDKN, 2013).

Introduction

The issue of how to mobilise private investment to help developing countries respond to climate change has long been the focus of international climate policy. This question came into focus when in 2009, under the Copenhagen Accord, parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to mobilise \$100 billion from public and private

sources by 2020 for climate action in developing countries. The UNFCCC Paris Agreement, adopted at the end of 2015, furthered this commitment by urging ‘developed countries parties to scale up their level of financial support, with a concrete roadmap to achieve the goal of jointly providing \$100 billion annually by 2020’.

Box 1: Key findings on global private climate finance

There is a growing body of evidence at the global level on the volume of public and private investment that must be mobilised from new sources and shifted from existing sources to support low-carbon development and green growth.

Depending on the assumptions and methodologies used, current global estimates are between \$0.7 and \$4 trillion in additional costs, and \$1 trillion in savings² between 2015 and 2050 (GGBP, 2014; Global Commission on the Economy and Climate, 2014). The highest end of these estimates is 40 times higher than donor countries’ internationally agreed commitment to developing countries under the UNFCCC, and 10 times higher than global climate-finance flows in 2014³ of \$391 billion, of which 62% is estimated to have come from the private sector (Buchner et al., 2015).

Beyond large renewable energy projects there is very limited information available on private investment by climate-relevant sectors and sub-sectors, and very little country-level data beyond those for the Organisation for Economic Co-operation and Development (OECD) countries and the BRICS (Brazil, Russia, India, China, South Africa) (IFC, 2013, and OECD, 2014).⁴

In addition to new investment requirements, and current data gaps, findings from researchers tracking current climate finance flows demonstrate the following:⁵

- Of total global climate finance, only \$34 billion was identified as flowing from developed to developing countries in 2013 (10% of total global climate finance identified).
- Almost 74% of all climate finance is domestic investment, with private actors having an especially strong domestic investment focus: 92% of their investments remain in the country of origin. A minority (26%) of climate finance is spent abroad.
- Domestic policies have a greater role in mobilising private finance than international public finance deployed at the project level (based on reviews of renewable energy incentives and investment).
- Early findings are that the ‘leverage’ effect of international public finance is relatively low. A review of the Bloomberg New Energy Finance (BNEF) database of renewable energy investments found that multilateral public finance leveraged private finance at a ratio of 1:1, and bilateral public finance leveraged private finance at a ratio of 1:0.7. Forecast leverage ratios for dedicated multilateral climate funds are similar, with \$1 of public funds aiming to mobilise \$0.8 of private investment. Parallel analysis has not identified the leverage objectives and impact of domestic public finance.

2 Including operating expenses would make a low-carbon transition even more favourable leading to potential savings of \$1 trillion.

3 This includes investment in both developed and developing countries.

4 In the case of developing countries, even data on renewable energy investment is lacking; for example, in the Bloomberg New Energy Finance (BNEF) database, 60% of asset finance transactions do not have an associated transaction value (Jachnik and Raynaud, 2015). Early work by the Overseas Development Institute (ODI) suggests issues of commercial confidentiality and regulatory restrictions may make the tracking of private finance even more challenging than tracking public flows (Whitley, 2013).

5 See Buchner et al. (2014), Buchner et al. (2015), Buntaine and Pizer (2014), and Haščič et al. (2015), Jachnik and Raynaud (2015), and Whitley et al. (2014a).

These commitments have prompted policy interest in understanding both how much private investment is already flowing to support climate change activities in developing countries, and how best to scale up these flows. These are vexing issues, however, given the paucity of data and reporting on private investment in relevant sectors, particularly in lower-income countries.

The inadequacy of data on private climate finance is well documented (see for example UNFCCC 2014, Buchner et al., 2014). Box 1 summarises best available knowledge at the global level about current levels of public and private investment in climate action, along with key drivers of that investment. Better understanding of what drives the investment decisions of private actors, as well as how much finance they are presently investing in climate relevant sectors, is important for forging a more effective global response to climate change.

A better understanding of precisely what it takes to mobilise public and private investment in solutions to climate change is now even more relevant as countries seek to implement the actions anticipated in the Nationally Determined Contributions (NDCs) under the UNFCCC Paris Agreement. Although there is widespread agreement that significant shifts in private investment are needed to help countries undertake climate-compatible development (CCD),⁶ the

extent to which countries have considered the financing requirements of delivering on their NDCs varies (Hedger and Nakhooda, 2015). Nonetheless, it is clear that going forward, better information on current levels of investment and opportunities to increase finance will be necessary to enable countries to deliver and exceed their intended goals.

Since 2011, the Overseas Development Institute (ODI) has been working to understand levels of and drivers of private climate finance in a number of sectors and countries. We have completed initial studies using a common methodology to: i) fill key information gaps about incentives and investment at country level in climate-relevant sectors, and ii) enhance understanding of the links between public incentives and private investment in CCD. This work aims to fill a crucial gap in our understanding of the nature of private investment in CCD in lower-income countries.

This paper presents a set of cross-cutting recommendations arising from a four-year body of work mapping incentives and investment in climate-relevant sectors in lower-income countries. It starts with a brief overview of the findings from the country and sector studies. Drawing on concrete examples from these four countries, Sections 2-6 highlight five key recommendations for those seeking to mobilise private climate finance. Section 7 summarises and concludes.

⁶ Climate-compatible development (CCD) safeguards development from climate impacts (climate-resilient development) and reduces or keeps emissions low without compromising development goals (low-emissions development) (CDKN, 2013).

Key findings from country and sector studies

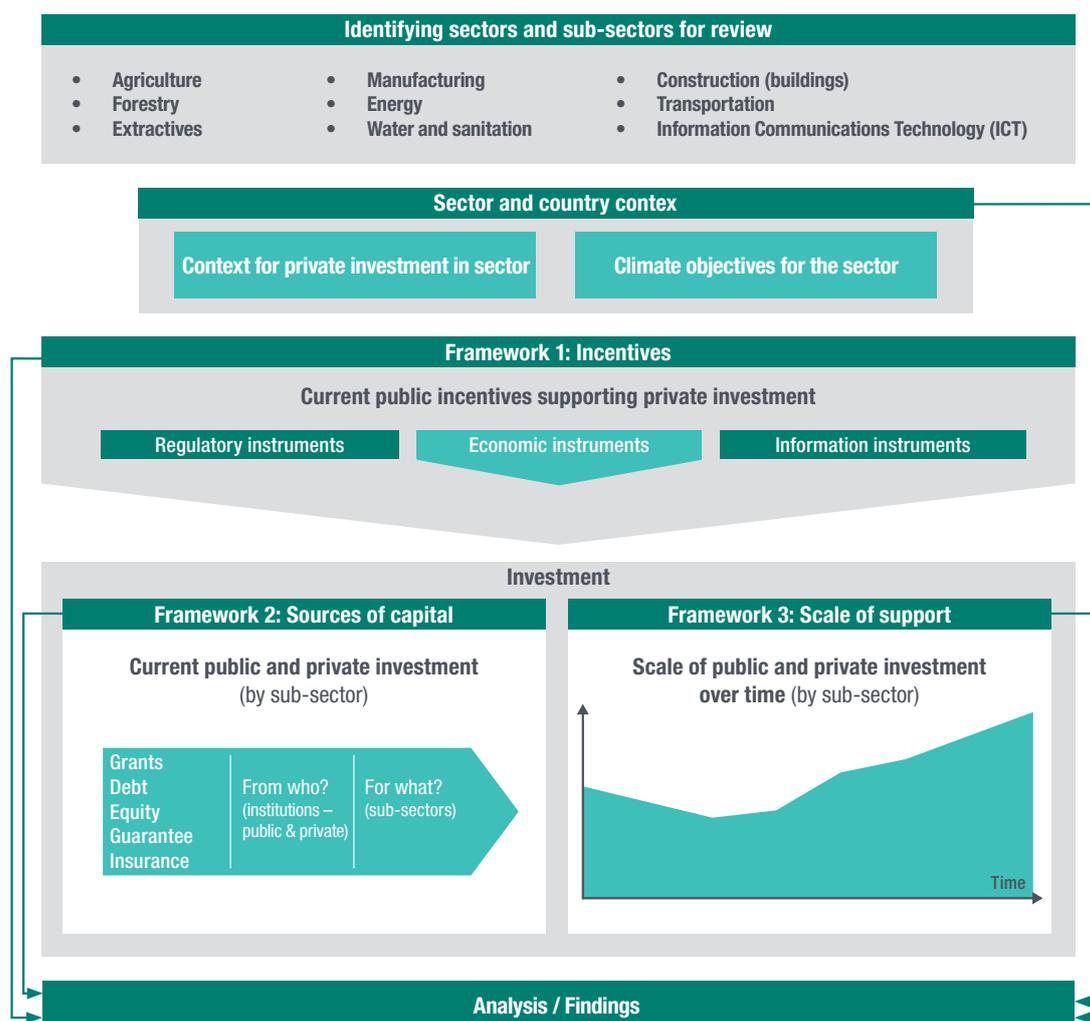
We have developed a diagnostic tool to support governments in their efforts to shift or direct additional private resources to CCD by: i) filling key information gaps about incentives and investment at country level in climate-relevant sectors, and ii) enhancing understanding of the links between public incentives and private investment in CCD. We seek to overcome the challenge of determining which activities are climate compatible by reviewing available information on all public and private finance flows in a given sector (and sub-sectors) and then analysing these findings in the context of the country's stated climate

and green growth objectives (including those for mobilising climate and green finance).

Applying this diagnostic tool involves four steps (see Figure 1):

1. Identifying sectors and sub-sectors for review.
2. Completing basic research on the context for private investment, and the country's climate and green growth plans, as they both apply to the selected sector.
3. Completing three frameworks for the selected country and sector (and sub-sectors) based on the review of relevant international and domestic data sources and

Figure 1: Diagnostic tool – mapping incentives and investment at sector and country level



information as well as interviews with key stakeholders in government, private sector and civil society.

- Framework 1: Incentives (for private investment in the selected sector for review)
 - Framework 2: Sources of capital – public and private (current in selected sector and sub-sectors)
 - Framework 3: Scale of investment – public and private (historic in selected sector and sub-sectors)
4. Where sufficient information is available to complete all or part of the three frameworks, preliminary analysis is completed on the potential links between public incentives; public and private sources of capital and the resulting investment trends; and the implications

for mobilising additional private climate finance in that country and sector.

Thus far, this approach has been applied in the energy sector in Uganda, the agriculture sectors in Zambia and Ghana, and the transport sector and the water and sanitation sector in Viet Nam. The full results from these studies can be found in Whitley and Tumushabe (2014), Whitley et al. (2014b), Darko et al. (2015), Canales Trujillo et al. (2015) and Norman et al. (2016). The aim is to refine this methodology and these frameworks by applying the approach across additional countries and sectors. The following tables (see tables 2-6) summarise high-level findings from each of these studies.

Table 1: Findings – mobilising private climate finance in Ghana's agriculture sector

Sub-sectors reviewed	Examples of private actors investing in Ghana's agriculture sector	Opportunities to mobilise private climate finance in Ghana's agriculture sector
<p>Crops primarily produced by smallholder farmers (e.g. cashew, maize, cassava, shea, garden vegetables, yam, cocoyam, groundnuts, sweet potatoes)</p> <p>Crops primarily produced by smallholder farmers with significant public sector support (i.e. cocoa)</p> <p>Crops and other products from mixed farm scales, including smallholder farmers and commercial agri-business (e.g. rubber, rice, oil palm, fruits, livestock)</p> <p>Crops produced primarily by commercial agribusiness (e.g. cotton, tobacco, coffee, sugar cane, plantain)</p>	<p>Smallholders and small businesses Majority of investment – challenging to identify specific actors</p> <p>Medium and large companies (domestic) Kuapa Kokoo (cocoa) West Africa Fair Fruits (cocoa) Twifo oil palm plantation Ltd (oil palm) Ghana Rubber Estate Ltd (rubber) Mim (cashew) Ghalia Ghana Ltd (coffee) Upcountry coffee (coffee)</p> <p>Medium and large companies (international) Kraft (cocoa) Cadbury (cocoa) Mondeléz (cocoa) Mars (cocoa) UsiBras (cashew) Diageo (cassava) SAB Miller (cassava) Dutch agricultural development and trading company (cassava) Olam (cashew, cocoa, cotton, oil palm) Barry Callebaut (cocoa) British American Tobacco (tobacco) Viram Plantation Ltd (coffee, rubber) Gold Coast foliage Ltd (coffee) Sifca Group (oil palm) Blue skies (fruit) Compagnie Fruitiere (fruit)</p> <p>NGOs, foundations and charities Gates Foundation (maize and yams, crops on mixed farm scales) Peace Corps (maize and yams)</p> <p>Financial intermediaries Root Capital (shea) Acumen Fund (crops on mixed farm scales)</p>	<p>An established area for private finance within Ghana's agriculture sector is in cocoa, which receives private investment at all scales (from smallholders to large multinational companies). A key opportunity is increasing resilience of cocoa production through promotion of private investment in mixed agroforestry systems where fruit trees with economic value – such as oil palm, avocado and citrus – are grown next to cocoa trees.</p> <p>Both private investment and government subsidies in the agriculture sector in Ghana are highly concentrated on cocoa. Diversifying fertiliser subsidies – so they focus less on cocoa and instead support specific and appropriate crop varieties that are heat and drought tolerant – could provide incentives for private investment in a wider number of resilient crops.</p> <p>Opportunities for mobilising private investment in resilient agriculture include providing support for: meteorological information; improved inputs (fertilisers and irrigation); new crops and varieties; appropriate management of soil fertility to improve water harvesting and nutrient supply; and strengthening of research and advisory services to develop, demonstrate and implement new technologies and management systems.</p> <p>Although increased urbanisation may shift their importance, smallholder farmers are currently the main group of private actors investing in Ghana's agriculture sector. There are three key opportunities to support smallholders: 1) increasing understanding of climate impacts and implications for agricultural products and production, particularly how climate change is likely to affect their crop and livestock production; 2) supporting smallholders with management practices that can support adapting and building resilience to these likely climate impacts; and 3) providing access to finance, to support smallholders in responding to those climate impacts.</p>

Table 2: Findings – mobilising private climate finance in Zambia’s agriculture sector

Sub-sectors reviewed	Examples of private actors investing in Zambia’s agriculture sector	Opportunities to mobilise private climate finance in Zambia’s agriculture sector
<p>Crops primarily produced by smallholder farmers (e.g. maize, cassava, groundnuts / peanuts)</p> <p>Crops primarily produced by commercial agribusiness (e.g. coffee, wheat, soybeans)</p> <p>Crops produced by commercial agribusiness using smallholder out-grower schemes (e.g. tobacco, horticulture /floriculture, cotton)</p> <p>Crops and other products from mixed farm scales, including smallholder farmer and commercial agri-business (i.e. livestock)</p>	<p>Smallholders and small businesses Majority of investment – challenging to identify specific actors</p> <p>Large companies (domestic) Arica Leaf (tobacco) York Farm Ltd (horticulture/floriculture) Zambeef (maize, livestock)</p> <p>Large companies (international) Alliance One (tobacco) Dunavant (cotton) Cargill (cotton)</p> <p>NGOs, foundations and charities Concern Worldwide (livestock, horticulture/floriculture) Red Cross (livestock, horticulture/floriculture) Oxfam (livestock, horticulture/floriculture) WorldFish (livestock, horticulture/floriculture)</p> <p>Financial intermediaries Zambia National Commercial Bank (maize, livestock, sugar cane, soybeans) Community Markets for Conservation (groundnuts/peanuts, soybeans) Madison Insurance (maize, tobacco, sugar cane, cotton, wheat, soybeans)</p>	<p>Zambia has indicated its intention to liberalise and diversify the agriculture sector and to create an enabling environment for further private investment. However, there is a disproportionate allocation of fiscal resources towards price support programmes, and the rate of regulatory reform is slow. This is currently limiting the expansion of private sector investment.</p> <p>Zambian fiscal incentives in the agriculture sector are dominated by price support programmes with the goal of improving food security through maize production. Although food security for the poorest is an important component of climate adaptation and resilience, there is evidence that price support resources do not actually reach the poorest smallholders but pool with better-off farmers who have greater access to capital and local political power, and are economically regressive.</p> <p>There is further need to support the expansion of the financial sector for smallholder farmers. Current finance to these farmers is mainly through programmes within out-grower schemes of large commercial agribusinesses (input credit). Whereas this can be a model for promoting private finance, it may require regulatory oversight to ensure benefits to the poorer contracting party.</p>

Table 3: Findings – mobilising private climate finance in Viet Nam’s transport sector

Sub-sectors reviewed	Types of private actors investing in Viet Nam’s transport sector (indicative non-comprehensive list)	Opportunities to mobilise private climate finance in Viet Nam’s transport sector
<p>Transport infrastructure Land (roads, pipelines, railways and stations) Water (ports and waterway infrastructure) Air (airports) Storage facilities</p> <p>Transport operations Land (cars, coaches, buses and motorbikes, trucks and road freight, rail and metro) Air (airport services, airlines and satellites) Water (passenger ferries and commercial boats, port and waterway operation) Storage operations</p>	<p>Smallholders and small businesses Vietnamese taxi companies including the Mai Linh Taxi Group (cars, coaches, buses and motorbikes) Vina Express (passenger ferries and commercial boats) Greenlines (passenger ferries and commercial boats)</p> <p>Large companies (domestic) Hai Au Aviation (seaplanes) Hai Phong Fishery Shipbuilding JSC and the Viet Nam Petroleum Transport JSC (joint stock passenger ferries and commercial boats) Vinapco (airport services)</p> <p>Large companies (international) Sovico Holdings (airline operations) Jetstar Pacific Airlines Joint Stock Aviation Company (airline operations) Qantas (airline operations) Molenbergnatie Viet Nam Limited Company (storage operations) Samsung (storage operations) APL Logistics (trucks and road freight) Tan Cang–Cai Mep International Terminal Co. Ltd (port and waterway operations) GS E&C (road infrastructure) Molnykit Company (water transport infrastructure) Kawasaki Kisen Kaisha, Ltd, Cool Japan Fund Inc. and Japan Logistic Systems Corp (storage infrastructure)</p> <p>Financial intermediaries SoftBank Corp investing in GrabTaxi Holdings Pte Ltd (cars, coaches and motorbikes)</p>	<p>Viet Nam has made it a priority to increase private investment in transport, from both domestic and international sources. This has been promoted through part privatisation of state-owned enterprise (SOEs) and through pilot public–private partnerships (PPPs). Nonetheless, many parts of the transport sector (including those important for climate mitigation – including water and rail transport) remain dominated by state-owned companies or exclusively publicly owned, limiting scope in some areas for private investment.</p> <p>Given the significant role of the public sector in investment in Viet Nam, for some sub-sectors (including those important for climate mitigation including water and rail transport) it will be important to continue to focus on public finance. However, this does not limit the room for support to improve efficiencies through climate finance.</p> <p>Although there is emerging private investment in a number of sub-sectors of the transport sector in Viet Nam, a key next step will be promoting shifts to public transport and low-carbon modes of transport (i.e. from private road vehicle use to bus, rail and water). This can be undertaken by supporting the government’s development of incentives for both public and private investment in affordable and high-quality service provision in these areas. This could include incentives for improved and more extensive bus, train and ferry services, and increased provision of freight services over rail and water.</p>

Table 4: Findings – mobilising private climate finance in Viet Nam’s water and sanitation sector

Sub-sectors reviewed	Types of private actors investing in Viet Nam’s water and sanitation sector (indicative non-comprehensive list)	Opportunities to mobilise private climate finance in Viet Nam’s water and sanitation sector
Urban water supply (large)	Households	One of the main strategies for attracting domestic private investors in Viet Nam is through the partial privatisation of State Owned Enterprises into Joint Stock Companies. However, according to national policies, companies in the sector must remain majority state-owned; and therefore the main source of investment in this sector, in the short to medium term, will be domestic rather than foreign private actors, including small and medium enterprises.
Urban water supply (small)	Households (small urban water supply; rural water supply and sanitation)	
Solid waste collection and treatment	Small businesses (domestic)	There are opportunities to reform the current tariffs and fees for water and sanitation services in Viet Nam as an incentive to promote private sector re-investment or expansion of current services and infrastructure. Current tariffs and fees are kept low so people can afford them, and they do not support further investment. However, some studies show that people would be willing to pay more for better service.
Wastewater collection and treatment	Septic tank cleaning services (solid waste and wastewater collection and treatment)	
Rural water supply and sanitation	Private truck companies for the provision of water in peri-urban areas (small urban water supply)	Private investors are already financing water supply in large urban areas. There are opportunities for further private investment in urban areas, particularly in waste management. This investment would also support national climate mitigation targets, if the focus were on reuse, recycling, and waste-to-energy projects; as well as investment in waste disposal and wastewater collection and treatment.
Irrigation and flood control (water for agriculture)	Responsible for operation of publicly owned solid waste facilities (solid waste treatment only)	
	Large companies (international)	The urbanisation process in Viet Nam will involve a transition from rural to urban areas, on the margins of the country’s largest cities. There is an important role for small and medium enterprises in the provision of water and sanitation services to peri-urban areas, for which incentives are yet to be developed.
	Binh An Water Company (large urban water supply)	
	Manila Water Company (large urban water supply)	
	Large companies (domestic)	
	Vietstar Environmental JSC (large urban solid waste collection and treatment)	
	Thanh Vu JSC (industrial wastewater collection and treatment)	
	Joint Stock Companies (large urban water supply; small urban water supply; solid waste collection and treatment; wastewater collection and treatment)	
	NGOs, foundations and charities	In rural areas, households are the main private investors in water and sanitation. This investment has been highly supported by national government programmes. There is an opportunity to use similar public incentives and business models to support growing peri-urban areas.
	Bill & Melinda Gates Foundation (small urban water supply; rural water supply and sanitation)	
	Financial intermediaries	
	MayBank (large urban water supply)	
	Malaysian Export Import Bank (large urban water supply)	
	Vietnam Infrastructure Limited	

Table 5: Findings – mobilising private climate finance in Uganda’s energy sector

Sub-sectors reviewed	Types of private actors investing in Uganda’s energy sector (indicative non comprehensive list)	Opportunities to mobilise private climate finance in Uganda’s energy sector
Hydro power (large and small)	Households and small companies	Uganda has focused government support in the energy sector on the development of large hydro projects, and on thermal power. This support has included unbundling the electricity sector, establishing a transparent and effective regulatory authority, feed-in tariffs and power-purchase and investment agreements. This support has been able to attract large-scale private investment in these sub-sectors.
Thermal power	Individuals and small businesses – largely informal (fuel wood and charcoal) Eco-Fuel Africa Ltd (charcoal)	
Biomass	Medium and large companies (domestic)	Smaller-scale projects, such as those addressing the lack of sustainable resources for cooking (mainly charcoal), or the need for mini-grid or off-grid sources of energy, have not been prioritised. Focusing on these projects will support areas where the private sector is less inclined to invest because of the common barriers of high transactions costs in proportion to overall deal size.
Solar	SunFunder (solar) Barefoot Power (solar) Solar Sister (solar)	
Charcoal	Hydromax (Ugandan – Dott Services Limited) (small hydro) Kakira Sugar Works (biomass)	The majority of current support instruments can only be accessed by foreign entities (e.g. small-solar and small-hydro). To make such instruments more accessible to local start-ups, it is necessary to recognise that different private actors and sources of capital are important for different sub-sectors and scales of investment, and that government and donor support must take into account the structure of the local capital markets.
Biogas	Kampala Jellitone Suppliers (charcoal) Electro-Maxx (thermal – heavy fuel oil)	
Geothermal	Small and medium companies (international)	There is a critical role for local financial institutions in the development of smaller-scale energy projects and programmes. This approach has been undertaken using climate finance at scale in a number of middle-income countries, and could begin to be replicated in certain sub-sectors in Uganda. This approach would also support access to local and diaspora resources resulting from increased savings across Africa, and to local currency financing.
	Green Resources (charcoal) SolarNow (solar) South Asia Energy Management Systems (SEAMS) (small hydro)	
	Large companies (international)	
	Lafarge’s Hima Cement (biomass thermal) Exxon Mobil (solar)	
	TronderEnergi (small hydro) Aggreko (thermal – heavy fuel oil)	
	Simba Group (thermal – heavy fuel oil) Jacobsen Elektro (thermal – heavy fuel oil)	
	NGOs, foundations and charities	
	Garfield Weston Foundation (charcoal) Vitol Foundation (charcoal)	
	Draper Richards Kaplan Foundation (solar) Global Social Benefits Incubator (solar)	
	Ashoka (solar)	
	Financial intermediaries	
	Stanbic Bank (thermal – heavy fuel oil) Crane Bank (thermal – heavy fuel oil)	
	Nordea Bank (thermal – heavy fuel oil) Barclays Bank (charcoal)	

Recommendation 1: Ensure consistency between climate objectives and national budget priorities

The sectors for review in each country study were selected based on where the greatest volumes of international public climate finance were directed across the economy (i.e. climate finance was directed primarily to the energy sector in Uganda and the agriculture sector in Zambia). These trends were identified by reviewing data in the Climate Funds Update dataset and confirmed by also reviewing climate-relevant Official Development Assistance (ODA) in OECD databases.

As part of each country study we used national and international datasets to identify the different sources of capital for each sector (and sub-sectors where available), with the aim of mapping trends in levels of support from different sources over time. Although data was inadequate to track support over time (with the exception of ODA flows), we were able to identify where national budgets, ODA, Other Official Flows (OOF)⁷ and Foreign Direct Investment (FDI)⁸ aligned or not with levels of international public climate finance.

Although there is increasing evidence of the role of domestic policies and support in mobilising private investment (see Introduction), when we use proportion of national budget as a proxy for domestic support, we find that public climate finance does not appear to be aligned with domestic priorities. Instead it appears that international public climate finance is either aligned with other international flows including OOF (in the case of Viet Nam’s transport sector and Ghana’s agriculture sector) and FDI (in the case of Uganda’s energy sector); or it is not obviously aligned in scale with any parallel or domestic or international support (in the case of Viet Nam’s water and sanitation sector and Zambia’s agriculture sector) (see Table 7).

Given that national budgets are currently being used to support high-carbon activities and practices that may increase vulnerability (see Section 3), and that there is an absence of parallel fiscal instruments to support CCD, it is a question of whether private climate finance can be

Table 6: Sector-level support from international and domestic sources of finance (as a proportion of total flows)

Country	Sector	% total national budget sector	% total ODA for sector	% total for OOF	% total FDI for sector	% total climate finance for sector
Viet Nam	Transport	10%	25%	90%	1%	56%
Viet Nam	Water and sanitation	4%	8%	<1%	<1%	21%
Uganda	Energy	2%	5%	18%	31%	38%
Zambia	Agriculture	6%	4%	0%	1%	46%
Ghana	Agriculture	3%	5%	17%	3%	18%

⁷ Other official flows, include refinancing loans, that are considered to be for development purposes, but which have too low a grant element to qualify as ODA (OECD, 2016).

⁸ Foreign direct investment is defined as investment from one country into another (normally by companies rather than governments) that involves establishing operations or acquiring tangible assets, including stakes in other businesses (Financial Times, 2016).

mobilised in the absence of wider domestic public financial commitment for these sectors.

In addition to gaps in budget support at the sector level, our research found qualitative evidence of lack of implementation of existing policies and priorities – both those that aim to increase private investment and those that support wider climate objectives.

For example, the government of Viet Nam has made it a priority to increase private investment in transport, from both domestic and international sources. This has been promoted through part privatisation of state-owned enterprises and through pilot public–private partnerships (PPPs). However, many parts of the transport sector (including those that are important for climate mitigation – such as water and rail transport) remain dominated by state-owned enterprises or exclusively publicly owned, limiting scope in some areas for private investment. As a result, the only PPPs thus far developed in Viet Nam have been in road construction.

There are similar patterns in Ghana, which has attempted to improve its general business climate and attract FDI, with an emphasis on commodity export. However, regulations and policies have been changed significantly over recent years and the private sector needs more consistency. In parallel, the Government of Ghana has sought to mainstream climate adaptation and mitigation into public agriculture sector regulation

and investment through the Food and Agriculture Sector Development Policy (FASDEP II, 2007) and the Medium Term Agriculture Sector Investment Plan (METASIP) (2011-2015) as well as the Ghana Shared Growth and Development Agenda (GSGDA 2010-2013). However, as these have yet to be formalised through regulatory or economic instruments, they currently only provide an informational signal to investors in the agriculture sector about possible future policy orientation (see Box 2).

Finally, the Government of Zambia also has a number of policy activities aiming to promote adaptation and resilience in the agriculture sector. These include the National Climate Change Response Strategy (NCCRS) and the National Climate Change Policy (NCCP), each of which has yet to be implemented. The success of these plans in mobilising private capital investment towards adaptation will depend on whether they are able to shape the major public incentives for agricultural investment when placed in the context of other sector policies that affect investment choices.

In the absence of national budget support and fiscal policy that supports efforts to attract private investment to climate-related activities, there is a risk that even if climate is ‘mainstreamed’ into plans and strategies, existing strong incentives will continue to drive private finance towards high-carbon and vulnerable investments.

Box 2: Ghana’s climate change commitments and financial needs

Consistent with other countries in sub-Saharan Africa, the most significant sources of agriculture finance in Ghana are FDI (averaging \$124 million annually) and international public finance mainly through ODA (averaging around \$117 million annually). While ODA has historically provided high levels of investment in agriculture in Ghana, the annual contributions have fallen in recent years, almost halving since a peak of \$220 million in 2011.

As a result, Ghana has an objective to both ramp up the national budget for agriculture and – as part of its INDC – seek to increase climate-compatible investment in Ghana. The government of Ghana has committed to allocate and spend at least 10% of the national budget on agriculture. The government has also outlined that Ghana will need to mobilise \$23 billion in international and domestic support for the mitigation and adaptation pledges included in the country’s INDC under the UNFCCC between 2020 and 2030.

At least \$3.2 billion or an average of \$320 million annually is expected to be spent on climate resilient agriculture, with forestry financial needs estimated at \$6.3 billion by 2030 or \$630 million per year between 2020 and 2030 as part of the INDC commitment. While the proportion expected to be financed by the private sector is not specified, 14.2 % of finance overall is expected to come from the domestic private sector and 16.8% from international private capital investment.

If Ghana is to meet the financial investment requirements of its NDC, the country can either seek to mobilise at least \$950 million annually in new climate-compatible investment from public and private sources or also look to green or mainstream climate within the existing finance flowing to agriculture that have been identified in this study (through FDI, ODA, national budget and Climate Finance which already averages \$405 million annually).

Recommendation 2: Address existing disincentives for investment in CCD

The first framework applied in each country study (see Figure 1) identifies and analyses the incentives most commonly used to mobilise private investment in the sector under review. We use this analysis to identify whether/how these policy tools could be used to shift existing or mobilise new private climate finance. This information on the incentives available to support private investment shows both how they are provided across different sub-sectors and whether this investment might favour climate-compatible or -incompatible outcomes.

It is essential to understand ‘climate-incompatible’ incentives before designing interventions to mobilise private climate finance, and there is significant potential for climate finance and other forms of public support to be directed towards subsidy reform and phaseout. However, beyond fossil fuel subsidies (Whitley, 2013), there has been relatively limited acknowledgment of how current incentives⁹ across a wide range of sectors undermine CCD.

Creating the enabling environment for private investment in CCD requires increased policy coherence within climate-relevant sectors, and unfortunately incentives were identified in many sub-sectors that may be promoting private investment in high-carbon and maladaptive activities. These incentives can also lead to overcapitalisation in one sub-sector and a lack of funding in others, which can lead to a parallel lack of diversity in investment and investment opportunities, and increased vulnerability. A small number of established sub-sectors often monopolise scarce resources that could be used more broadly for mobilising private climate finance (see Section 4).

Examples from our country studies (see References) of where such incentives persist include:

1. Uganda (energy sector) – International public finance and capacity payments are focused on supporting private investment in thermal (heavy fuel oil) power production.

In 2006, the Ugandan government needed to procure emergency generation, because of increasing demand and shortfalls in production from hydro power plants. To address this demand, Uganda commissioned thermal power from heavy fuel oil (HFO). These projects were financed through combinations of public international grants and debt (from the World Bank and Norway) along with domestic and international balance sheet finance (equity). Local private banks were also involved in the provision of debt, which is rare in the context of the country’s energy sector (particularly for alternatives including small-scale hydro) but not surprising given the long history of banks financing fossil-fuel power globally. Although the Government of Uganda did not provide capital to the projects, it has made payments to providers of standby capacity to ensure supply.

2. Zambia (agriculture sector) – Government price support to maize leaves limited public resources to support resilience in agricultural development.

Zambian fiscal incentives in the agriculture sector are dominated by price support programmes¹⁰ with the goal of improving food security through maize production. This use of public budgets to support maize production remains a dominant force shaping private capital investment choices across the agriculture sector. Unfortunately, this focus may steer private climate finance towards activities that increase vulnerability to climate impacts by i) causing over-investment by

⁹ According to the Agreement on Subsidies and Countervailing Measures of the World Trade Organization, a subsidy is any financial contribution by a government or agent of a government that is recipient-specific and confers a benefit on its recipient in comparison to other market participants. Subsidies include all financial contributions or direct support from a government; transfer of risk through provision of debt, equity and guarantees; foregone revenue through tax breaks; and provision of infrastructure, goods and services below market value; as well as royalty breaks and investment into infrastructure (WTO, 1994).

¹⁰ A price support may be either a subsidy or a price control, both with the intended effect of keeping the market price of a good higher than the competitive equilibrium level.

smallholders in a climate-vulnerable sub-sector (maize) (Thurlow et al., 2009) and ii) leading to underfunding of other support instruments that would steer private finance to a wider variety of crops (Kaczan et al., 2013; Watson et al., 2013). Although food security for the poorest is an important component of climate adaptation and resilience, there is evidence that price support resources do not actually reach the poorest smallholders but pool with better-off farmers who have greater access to capital and local political power (IAPRI, 2013), and are economically regressive (Mason and Myers, 2011).

3. Ghana (agriculture sector) – Fertiliser subsidies have been focused on the cocoa sub-sector and thus far have not increased uptake.

Between 2008 and 2011, the government of Ghana spent 79% of the annual government agriculture budget on fertiliser subsidies, which aimed to increase the rate of fertiliser application among farmers (one of the lowest in the world) (WTO, 2014). Cocoa is also the sub-sector that receives the highest levels of public and private investment in Ghana. Although such programmes have the potential to increase productivity, and thereby increase returns and attractiveness for private investment, subsidies on fertiliser have not been successful thus far in increasing fertiliser use. Even after implementation of the input subsidy programme, fertiliser consumption has remained low (FAO, 2015). Most fertiliser subsidies to date have suffered from poor targeting, leakages and smuggling, and delayed deliveries that do not match the growing season. In parallel, no public budget or domestic fiscal policy mechanism was identified that expressly sought to incentivise private investment in more climate-compatible agricultural practices in Ghana. Although it is possible that these incentives may support climate change adaptation efforts (e.g. through improving soil fertility), thus far these support instruments have been ineffective, and as they are concentrated on cocoa, may come at the expense of other programmes to support specific and appropriate crop varieties that are heat and drought tolerant.

4. Viet Nam (transport sector) – Public budget and international public finance is focused on road construction in contrast to the country's climate and green growth objectives.

There are two major components to Viet Nam's climate change and green growth strategies' focus on transport: i) cleaner technology and fuels, and ii) increased use of public transport. The public transport strategies focus on shifting from private vehicles (cars and motorcycles) to buses and metro rail (in Hanoi and Ho Chi Minh City), and improving water and intercity rail. However, we find that a dominant proportion of both national government budget for transport (over 80%) and international public finance for transport are directed towards roads, rather than supporting these climate-

compatible objectives. Roads remain the dominant modality for both passenger and freight transport, and road traffic also accounts for a major portion of Viet Nam's gasoline and diesel consumption.

5. Viet Nam (water and sanitation sector) – Subsidised tariffs across water and sanitation sector lead to underinvestment which could undermine water security, a key climate objective.

One of the most significant barriers to private investment in water and sanitation in Viet Nam is the low level of tariffs or absence of fees for use, which lead to high levels of government subsidy. This is a barrier to private investment as companies and investors cannot achieve full cost recovery, let alone profits that will allow for reinvestment. It is also a barrier to increasing government budgets at the national, provincial and municipal levels to allow for greater enforcement of standards and regulations in the sector and improvement and expansion of services. This is particularly important, as guaranteeing water security is one of the main considerations under Viet Nam's climate policy. Reform is required in all sub-sectors, but in particular in wastewater collection and treatment. In doing this, Viet Nam will need to strike a balance between ensuring affordable water and sanitation services and increasing private investment. Initial studies on willingness to pay for improved services suggest this balance could be achieved.

A number of countries around the world are providing incentives to high-carbon activities while implementing carbon taxes and green taxes. Pricing is sending diverse signals and creating competing incentives, which simultaneously promote and undermine the viability of private climate finance. This is likely to make these individual instruments less effective, and creates undue complexity for investors. This is exemplified in the case of Viet Nam's transport sector, where in addition to fossil fuel subsidies that reduce the cost of fuels for transport, Viet Nam has introduced an Environment Protection Tax (EPT), making the country a leader in environmental tax reform in South-East Asia. Consumer unit taxes are levied on refined fuels and coal as well as on environmentally harmful substances (hydrochlorofluorocarbons, certain pesticides, plastic bags). Taxes on coal and refined fuels are expected to account for 99.5% of the estimated EPT revenue. It was estimated that the EPT had the potential to reduce Viet Nam's annual CO₂ emissions by up to 75% and contribute up to €1.5 billion in additional tax revenue to support both state and provincial budgets (Green Fiscal Policy Network, 2016).

In addition, often the incentives outlined above remain in place in sectors where there are no specific incentives to promote private climate finance. This is exemplified in the cases of Zambia's and Ghana's agriculture sectors, where no fiscal policy tools are presently being expressly used to encourage private investment in CCD.

These examples create a strong justification for combining any efforts to mobilise private climate finance through co-financing – with parallel efforts focused on changing policies and regulations (and incentives). Additional research has found examples of this approach in existing climate funds – where Global Environment Facility (GEF) programmes are playing an important role in addressing regulatory and institutional barriers to private investment (using grants), which complements the role of the Clean Technology Fund (CTF) in intervening to de-risk investments at the project level (using concessional debt) (Whitley et al., 2014a).

These findings are linked to wider observations and early research on the importance of combining project and market interventions at country level (including through support to policy development), and linked to opportunities for collaboration through the international organisations that are involved in the majority of support to private climate finance. In addition, efforts to track and rationalise subsidies and mobilise private climate finance can be mutually reinforcing. Based on a reform of subsidies, a level playing field can be created for private investment in climate-compatible development (see Section 3).

Recommendation 3: Mobilise the full diversity of private investment (including local and smaller-scale investors)

In addition to understanding incentives at the country level (see Section 2), designing interventions to mobilise private investment in CCD requires a clear picture of the currently available sources of capital (public and private). To that end, the second framework in our methodology (see Figure 1) is completed to identify the different sources of public and private finance available for the sector under review to show where there may be gaps for both private and public investors to fill.

In addition to the persistent focus on tracking investment flows, efforts to mobilise private climate finance have often focused (at least rhetorically) on instruments and approaches that resonate with international and institutional investors (i.e. big banks, insurance companies, and pension funds), as opposed to local investors (UN, 2015). The argument is often made that instruments such as green bonds and insurance products facilitated by international financial institutions are key to unlocking these large pools of capital, and therefore offer the greatest opportunities for private investment in CCD and green growth (World Economic Forum, 2013).

Yet the smaller and more local private investors often constitute a large portion of the formal and informal economic activity in many sectors, particularly in lower-income countries. These actors investing at a smaller scale and a more local level are likely to be just as important for mobilising private climate finance as larger actors within the finance sector.

Understanding capital investment decisions across all of an economy, and at different scales, is necessary in order

to design public investment and incentives to mobilise private climate finance. Focusing on large international and institutional investors in the context of lower-income countries may overemphasise the role of both international actors and the financial sector in private climate finance, and underestimate the importance of investment decisions made within businesses (on-balance-sheet finance) and households.

The full diversity of private investment needs to be mobilised. To that end, our research has resulted in the development of a typology of private investors (see Box 3 and Whitley et al., 2016). We find that when this typology is applied to each sector and sub-sector,¹¹ it further reveals the importance of all scales of investment, and all types of actors, and the specific roles for international investors in a given sector and country. As outlined in Table 8, domestic

Box 3: Typology of private investors

- Households
- Smallholders and small businesses
- Large companies (domestic and international)
- NGOs, foundations and charities
- Companies producing or selling carbon or ecosystem credits
- Local financial institutions (microfinance and retail finance)
- Financial intermediaries
- Funds and institutional investor

11 In the methodology (Whitley et al., 2016) this analysis has been completed in the context of mapping current sources of capital – under Framework 2.

and international investors operating at different scales often provide finance in different sub-sectors of the agriculture, energy, transportation, and water and sanitation sectors. This reinforces the need for different types of interventions, to support the full breadth of private actors that are, or could be, providers of private climate finance.

This analysis has also highlighted a number of established areas of private finance in the lower-income countries reviewed (see Figure 1), of which a portion may be considered climate compatible (depending on the definition used and safeguards applied). With further information, and using a definition of climate finance

agreed at country or sub-national level, private climate finance could be identified, and might include investment in small hydro and biomass in Uganda, and urban water supply in Viet Nam. Given significant levels of private investment within the agriculture sectors of Ghana and Zambia (particularly by households and smallholders), it is likely that private climate finance in these sectors could be identified based on additional information (see Box 4). supply in Viet Nam. Given significant levels of private investment within the agriculture sectors of Ghana and Zambia (particularly by households and smallholders), it is likely that private climate finance in these sectors could be identified based on additional information (see Box 4).

Table 7: Private investors by country, sector and sub-sector¹²

Private investor/country/ sector and sub-sector	Uganda (energy sector)	Viet Nam (transport sector)	Viet Nam (water and sanitation sector)	Ghana (agriculture sector) **Private investment at all scales (see Box 4)	Zambia (agriculture sector) **Private investment at all scales (see Box 4)	
International	Large international banks and companies	Large hydro**	Roads**	Urban water supply	Cocoa	
		Thermal (fuel oil) power plants**	Ports (infrastructure and operations)	(large scale)**	Cashews	Cotton
					Coffee	Wheat
				Rubber	Soybeans	
				Oil Palm	Livestock	
	International NGOs and foundations	Charcoal (green)	Not identified (could require further research)	Urban water supply (small scale)	Maize	
		Solar		Rural water supply and sanitation	Yams	
					Livestock	
					Horticulture	
	Small international companies, banks and funds	Small hydro** ¹³	Storage	Solid waste collection and treatment	Not identified (could require further research)	
Domestic	Large local companies	Biomass power**	Pipelines	Solid waste collection and treatment	Coffee	
			Airline operations**		Cotton	Livestock
		Passenger ferries and commercial boats	Wastewater collection and treatment	Flowers		
				Tobacco		
	Small local banks	Small hydro**	Not identified (could require further research)	Not identified (could require further research)	All commodities (particularly cotton, flowers, tobacco and coffee)	All commodities (except cassava, wheat and coffee)
Small local companies	Biogas	Land transport operations: cars, coaches, motorbikes (private and taxis)**	Not identified (could require further research)	Coffee	Not identified (could require further research)	
		Passenger ferries and commercial boats				
		Trucks and road freight				
Households (including smallholders - agriculture)	Not identified	Land transport operations: cars, coaches, motorbikes (private and taxis)**	Rural water supply and sanitation	Cocoa	Maize	
				Cashews	Cassava	
				Maize	Groundnuts	
				Cassava	(see country study for full list)	
				Groundnuts		
				(see country study for full list)		

12 ** Indicates sub-sectors where private investment is already established. For more detailed information about where private investment is emerging or limited, see each country study.

13 ODI research on Private Climate Finance Support has found that a number of private equity funds focusing on renewable energy in lower-income countries are capitalised significantly with public resources. See Whitley (2012).

Box 4: A special case: mapping private investment in the agriculture sector

When the second framework – on sources of capital – was applied to the energy, water and sanitation, and transport sectors, each sub-sector was categorised according to whether private finance was ‘established’, ‘emerging’ or ‘limited’ in that sector, based on a qualitative judgment of the scale and depth of the private investment identified.

Unfortunately, these categories could not easily be applied to the agriculture sector in the countries under review (Ghana and Zambia), given widespread private investment across the sector. In contrast to other sectors – such as energy, transport or water and sanitation, where there are significant levels of public investment – private investment is likely to be the most important source of support to agriculture. Although private investment is well established in the agriculture sector, there is a further challenge of tracking this finance in lower-income countries as the majority of private investment takes place through informal channels or at a small scale, and is infrequently tracked by governments or other actors compiling sector-level investment statistics.

To account for the fact that private investment is ‘*everywhere and nowhere*’ in the agriculture sector in many lower-income countries, the analysis for the agriculture sector was instead reframed using a different set of categories to highlight the different producers (and thereby potential private investors) associated with each sub-sector:

- mainly smallholder farmers
- mainly commercial agribusiness
- mixed farm scales
- other (mainly directed to smallholders via some private corporations).

These are general classifications and not exhaustive. They merely provide a general grouping of the overall producers. The sources of capital are also categorised as ‘international’ or ‘domestic’, based on the headquarters of the majority shareholder or investor.

Recommendation 4: Gather data on climate impacts and investment opportunities – not just private investment

One of the main challenges highlighted in much of the research on private climate finance, and in applying the third framework in our methodology (see Figure 1), is an absence of publicly available data on historic levels of private investment. Significant gaps have been identified in international datasets both in terms of tracking international and domestic private investment, and in identifying the portion of investment that is climate relevant (or climate positive). Although these data gaps can create longer-term challenges for monitoring the mobilisation impact of wider climate finance, this does not create insurmountable barriers now to designing interventions at the country and sector level.

When the three frameworks are applied together (see Figure 1), two key areas of information emerge as more critical in the near term for private investors: i) information on investment opportunities, and ii) information on climate impacts.

4.1 Investment opportunities

In spite of weak data on levels of historic investment, across all of the countries and sectors reviewed, we have found that it is always possible to glean enough information about incentives, current investment and investment trends (by both the public and private sectors) to inform donors and governments adequately about where there are opportunities to mobilise private climate finance.

Transparent data and information at the country and sector level is critically important for the private sector decision-makers. In the countries and sectors studied, general information on investment opportunities is very weak, and gaps were found to be even greater in the case of new sub-sectors and activities that must be undertaken to ensure CCD.

One would expect government investment advice centres, and groups such as industry associations, to provide support in these areas – however, these capacities are lacking across the board. This highlights a need

for greater public support to market-level information collection and dissemination, both through investment advice centres (in the case of national and regional governments) and potentially through support to new industry associations (in the case of development partners). These channels can also support data collection and information sharing on the country's resources (i.e. geothermal or hydro resources in the case of renewable energy) and key climate risks.

This lack of data and potential to work jointly in new areas and technologies has been highlighted in the case of Uganda's energy sector. This could be addressed through the country's early activities in exploration and development of bundled hydro and geothermal sites (prior to opening them up for private investment), and through establishing local industry associations for clean energy (including biogas and biomass businesses) (Whitley and Tumushabe, 2014). This was also highlighted in the case of Viet Nam's transport sector, where information and awareness campaigns were seen as key to ensuring support for supporting price and tariff reforms that could in turn be more favourable to private investment (Darko et al., 2015).

If governments and development partners take on or support information collection and sharing at the country and sector level, this allows the public sector to take on what might be seen as 'early risks' or 'up-front costs' by individuals or single businesses.

4.2 climate impacts

Information on climate-compatible investment opportunities is much harder to identify in some sectors than in others. Although economies of scale can be achieved in data collection in cases where investments can take place at the project level and involve large-scale infrastructure (i.e. for large energy, transport and water and sanitation projects), this is not often the case in other sectors (such as agriculture

and probably construction), where adaptation provides the greatest private investment opportunities, or in the case of smaller and more distributed interventions.

These smaller investments, and investments in resilience, require far more specialised knowledge and information, which can be costly for individual businesses and investors. Overall, this means that climate impact data is likely underestimated in terms of its potential role in mobilising private climate finance. The provision of climate impact data by governments and development partners can therefore be key to mobilising private climate finance across a number of sectors. Of the countries reviewed, this information seems to be most highly developed in the water and sanitation sector in Viet Nam.

4.3 Investment data

Although information on local risks and opportunities is far more important to private investors in the near term, investment data tracking becomes more critical over the longer term. It is particularly important for governments and development partners to study the causal link between support provided and any shifts in climate-compatible activities and investment. Therefore, even though it is not a prerequisite or a near-term requirement, supporting the collection of investment data should be included in new donor interventions in order to track their effectiveness in mobilising private climate finance.

Recommendation 5: Shift existing private investment, while mobilising new flows

Linking the findings across the three frameworks (see Figure 1) highlights two different opportunities for mobilising private climate finance that complement existing private sources of capital and seek to fill existing gaps. These two opportunities are: i) ‘greening’ sub-sectors where there is existing private finance (see Table 8), and ii) incentivising private investment in new low-carbon and resilient sub-sectors. Both of these transitions require a clear understanding of what activities can be defined as climate compatible. This process can be supported through reviewing existing national and local commitments on climate and green growth (see Whitley et al., 2016).

A key objective should be to avoid areas where there is already significant private climate finance, while ensuring that there is an exit strategy for any public support that directly subsidises private investors (Whitley and Ellis, 2012). Mobilising private finance often involves the use of subsidies or wider incentives by both governments and development partners. This creates the risk of either completely crowding out private investment, or providing ‘super-normal’¹⁴ profits to existing private investors (Carter, 2015).

Examples of recommendations to this end from our country studies (see References), which allow for ‘greening’ existing finance or ‘mobilising’ new finance, while avoiding crowding out established private investment:

1. ‘Greening’ sub-sectors that are already receiving private investment
 - a. Uganda (energy) – The energy sector in Uganda already receives significant private investment including in thermal power and large hydro. A key opportunity for shifting away from thermal (fuel oil) power plants will be through supporting

public sector identification and development of bundled small-hydro sites, to reduce risk for private investors.

- b. Ghana (agriculture) – An established area for private finance within Ghana’s agriculture sector is in cocoa, which receives private investment at all scales (from smallholders to large multinational companies). A key opportunity is increasing resilience of cocoa production through promotion of private investment in mixed agroforestry systems where fruit trees with economic value – such as oil palm, avocado and citrus – are grown next to cocoa trees.
 - c. Viet Nam (transport) – Although there is emerging private investment in a number of sub-sectors of the transport sector in Viet Nam, a key next step will be promoting shifts to public transport and low-carbon modes of transport (i.e. from private road vehicle use to bus, rail and water). This can be undertaken by supporting the government’s development of incentives for both public and private investment in affordable and high-quality service provision in these areas. This could include incentives for improved and more extensive bus, train and ferry services, and increased provision of freight services over rail and water.
2. Incentivising private investment in new sub-sectors
 - a. Uganda (energy) – Although there are many local small companies and investors in Uganda seeking to finance renewable energy projects, they often do not operate in a coordinated manner to influence

14. If a firm makes more than normal profit it is called super-normal profit. Super-normal profit is also called economic profit, and abnormal profit, and is earned when total revenue is greater than the total costs. Total costs include a reward to all the factors, including normal profit. This means that when total revenue equals total cost, the firm is earning normal profit, which is the minimum reward that keeps the firm providing its skill, and taking risks. The level of super-normal profits available to a firm is largely determined by the level of competition in a market – the more competition the less chance there is to earn super-normal profits.

policies that would facilitate investment. One opportunity could be supporting the development of one or more clean energy industry associations to bring together emerging businesses, including those looking to invest in new sub-sectors such as small-scale biomass and biogas.

- b. Ghana (agriculture) – Both private investment and government subsidies in the agriculture sector in Ghana are highly concentrated on cocoa. Diversifying fertiliser subsidies – so they focus less on cocoa and instead support specific and appropriate crop varieties that are heat and drought tolerant – could provide incentives for private investment in a wider number of resilient crops.
- c. Zambia (agriculture) – As with cocoa in Ghana, government support in Zambia’s agriculture sector is highly focused on maize. Widening support to promote private investment in extension services, irrigation, storage and transportation infrastructure, and smallholder access to mechanisation, could allow for diversification and increased resilience of the sector.
- d. Viet Nam (transport) – Given the significant role of the public sector in investment in Viet Nam, for some sub-sectors (including those important for climate mitigation including water and rail transport) it will be important to continue to focus on public finance. A number of these areas remain dominated by state-owned companies or are exclusively publicly owned, which limits the scope in some areas for private investment. However, this does not limit the room for support to improve efficiencies through climate finance.
- e. Viet Nam (water and sanitation) – There is limited private investment in Viet Nam’s water and sanitation sector beyond urban areas. Reforming tariffs in the waste management sub-sector to

ensure full-cost recovery could support private investment in reuse, recycling and waste-to-energy projects. Concessional loans to support small and medium enterprises (SMEs) could also support their investment in rural water supply and sanitation.

In particular, there remains a significant gap in support to the diffusion of decentralised and smaller-scale technologies (hard and soft), which are particularly relevant for lower-income countries. It appears there is also always potential for a greater focus on smaller-scale interventions, and for working to support local financial institutions and to target people in more rural parts of the countries reviewed. These are both areas where there will be limited risk of crowding out the private sector.

For example, in Uganda’s energy sector, local companies are often starts-ups without significant cash flows, and the majority of current support instruments can only be accessed by foreign private investors (as shown in the small-solar and small-hydro sub-sectors). Our research highlights the importance of partnership with local financial institutions for the development of smaller-scale energy projects and programmes. This is an approach that has been undertaken through the use of climate finance at scale in a number of middle-income countries (MICs), and – if support were provided to local financial markets – could begin to be replicated in certain sub-sectors in Uganda (mini-grid and distributed solar, wind and small-hydro systems, formalising the biomass-for-cooking sub-sector, and scaling up biogas installations) (EUEI PDF, 2014; Whitley, 2013). Measures aimed at supporting local financial institutions could also support access to local and diaspora resources resulting from increased savings across Africa, and access to local currency financing.

This gap in private investment at smaller scales and in rural areas is also found in Viet Nam’s water and sanitation sector, where investment is needed for peripheral urban areas and rural areas, which the more centralised urban water supply, sanitation and irrigation infrastructure has not reached and where a more decentralised model of investment is required.

Conclusion

The issue of how to mobilise private investment to help developing countries respond to climate change has long been the focus of international climate policy. This question came into focus when in 2009, under the Copenhagen Accord, parties to the UNFCCC agreed to mobilise \$100 billion from public and private sources by 2020 for climate action in developing countries. The UNFCCC Paris Agreement, adopted at the end of 2015, furthered this commitment by urging ‘developed countries parties to scale up their level of financial support, with a concrete roadmap to achieve the goal of jointly providing \$100 billion annually by 2020’.

We have developed a methodology with the aim of supporting governments in their efforts to shift or direct additional private resources to CCD in lower-income countries. This report is a synthesis of the findings and recommendations that resulted from applying this methodology in Uganda’s energy sector, Zambia’s and Ghana’s agriculture sectors and Viet Nam’s transport sector and water and sanitation sector.

The previous sections of this report have outlined the key findings from the country- and sector-level studies to map incentives and investment, and highlighted five recommendations for those actors seeking to mobilise private climate finance in lower-income countries:

Recommendation 1: Ensure consistency between climate objectives and national budget priorities.

Recommendation 2: Address existing disincentives for investment in climate-compatible development.

Recommendation 3: Mobilise the full diversity of private investment (including local and smaller-scale investors).

Recommendation 4: Gather information about climate impacts and investment opportunities (not just private finance).

Recommendation 5: Shift existing private investment, while mobilising new flows.

We believe this work demonstrates that there are numerous opportunities to increase the scale of private climate finance, and that this can be done without access to comprehensive investment data and without crowding out existing private investors. This research also reinforces the findings of early studies of private investment in

renewable energy, which highlight a key role for policies and incentives, and the need to start with eliminating disincentives.

In addition to these cross-cutting findings, the experience of applying this methodology across a number of sectors and lower-income countries: i) highlights how a similar approach might be used to identify opportunities to mobilise public and private finance to support longer-term national climate commitments, and ii) identifies key opportunities to support longer-term tracking of private climate finance.

Mobilising public and private climate finance for NDCs

A better understanding of precisely what it takes to mobilise public and private investment in solutions to climate change is now even more relevant as countries seek to implement the actions anticipated in the Nationally Determined Contributions (NDCs) under the UNFCCC Paris Agreement. Although there is widespread agreement that significant shifts in private investment are needed to help countries undertake climate-compatible development, the extent to which countries have considered the financing requirements of delivering on their NDCs varies (Hedger and Nakhoda, 2015). It is clear that more information and data are needed for countries to be able to finalise, implement and finance their proposed climate mitigation and adaptation actions so as to meet overall emission reduction commitments by 2030.

There is a range of data that can be tracked at country and sector level on public and private climate finance flows (using frameworks 2 and 3 from our methodology – see Figure 1) and which can support those seeking to mobilise climate finance for NDCs. This information includes the following:

1. The average annual level of climate finance flowing to a given country for a specific sector and already supporting key climate actions set out in the country’s NDC.
2. The average annual level of other finance flowing to the sector which is not necessarily supporting climate-compatible goals (including domestic public government spend, FDI, wider international ODA) and which could be shifted towards supporting climate-compatible development in the sector. There are opportunities to conduct further research and consider the best ways to ‘mainstream’ climate within these existing flows and so

reduce the scale of new finance needed between 2020 and 2030 to fund the country's NDC.

3. The current average annual finance gap between finance already flowing and the costs of delivering climate mitigation and adaptation actions in the sector by 2030. This can be completed where a rigorous assessment of investment needs has been set out in a country's NDC or other national plans (Hedger and Nakhooda, 2015).

There is also a range of potential actions that can be identified to shift and mobilise public and private climate finance (using frameworks 1 and 2 from our methodology – see Figure 1). These include the following:

1. Options to address the current barriers (regulatory and fiscal) in order to deliver the proposed climate mitigation and adaptation actions.
2. Opportunities to redirect existing budget sources, fiscal policy tools, and financial instruments to support a country's NDC planned actions and outcomes.

Tracking private climate finance

Over the medium term, the absence of publicly available information on historic levels of investment has significant implications for tracking climate finance effectiveness, and not only as it pertains to mobilising further private capital. If it is not possible to track support and investment at sub-sector level, it is not possible to make a causal link between the support provided and any shifts or increases in climate-compatible activities and investment. It would be useful to look into the following questions on data availability for private climate finance assessments.

To what extent is investment data for climate-relevant sectors transparent, comparable and publicly available?

What is the cost (time and financial) of accessing data?

Who are the data-holders in a given country/sector – and what are the drivers behind and barriers to making information open and transparent?

This work could build on existing open data and data transparency initiatives. One possibility could be to look at countries that have already accepted and adopted open data protocols, including the US (data.gov), the UK (data.gov.uk and openei.org), and Kenya (opendata.go.ke). In addition, there could be an opportunity to influence the next version of the UN's International Standard Industrial Classification of All Economic Activities (ISIC), which is widely used both nationally and internationally for compiling economic and social statistics, including the investment data necessary for this diagnostic.

Each UN ISIC Section is subdivided into divisions, groups and classes. In many cases, the divisions, groups and classes provided under UN ISIC (and country-level investment tracking systems) are not granular enough for us to use in tracking and informing climate finance. For example, the most granular ISIC category for electricity includes 'thermal, nuclear, hydroelectric, gas turbine, diesel and renewable'. This would need to be split into multiple classes to allow for tracking of public and private support shifting from high-carbon to low-carbon sources of energy.

Future work could include seeking out opportunities for international institutions and country governments to provide more granular data that better reflect the finance data that are necessary at both the national and the international level for tracking progress towards objectives on climate change, green growth and wider development goals.

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