Working paper 416

Mapping climate-relevant incentives and investment at country level

A diagnostic tool to mobilise private climate finance

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This paper provides an updated methodology to support governments and development partners seeking to understand the role of public support in mobilising private finance for climate-compatible development (CCD).

The first aim of this methodology is to fill key information gaps about incentives and investment at country level in climate-relevant sectors.

The second is to enhance understanding of the links between public support (both domestic and international) and private investment in CCD.

Thus far, this approach has been applied to look at the energy sector in Uganda, the agriculture sector in Zambia and the transport and water and sanitation sectors in Vietnam.

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We welcome inputs to this methodology from climate finance practitioners and beneficiaries.

Table of contents

Abbreviations

BRICS	Brazil, Russia, India, China, South Africa
CBT	Climate Bonds Taxonomy
CCD	Climate-Compatible Development
CDKN	Climate and Development Knowledge Network
CIF	Climate Investment Fund
CPEIR	Climate Public Expenditure and Institutional Review
CPI	Climate Policy Initiative
EBRD	European Bank for Reconstruction and Development
ERA	Electricity Regulatory Authority (Uganda)
FDI	Foreign Direct Investment
FSF	Fast Start Finance
GEEREF	Global Energy Efficiency and Renewable Energy Fund
GEF	Global Environment Facility
GET FiT	Global Energy Transfer Feed-in Tariff
GGBP	Green Growth Best Practice
GoU	Government of Uganda
ICT	Information and Communication Technology
IFC	International Finance Corporation
IFI	International Financial Institution
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification of All Economic Activities
ODA	Official Development Assistance
ODI	Overseas Development Institute

OECD	Organisation for Economic Co-operation and Development
PPCR	Pilot Program for Climate Resilience
PPP	Public–Private Partnership
REA	Rural Electrification Agency (Uganda)
RE FiT	Renewable Energy Feed-in Tariff
SREP	Scaling-up Renewable Energy Programme
TLC	Transparency, Longevity and Certainty
UK	United Kingdom
UN	United Nations
UNCTAD	UN Conference on Trade and Development
UNDP	UN Development Programme
UNFCCC	UN Framework Convention on Climate Change
US	United States
WTO	World Trade Organization

Executive summary

This paper provides an updated version of a methodology (Whitley, 2014) to support governments and development partners seeking to understand how public support can be used to mobilise private finance for climate-compatible development (CCD).

There is consensus within the discourse on climate finance under the UN Framework Convention on Climate Change (UNFCCC), and beyond, that there is a key role for the public sector in mobilising private investment in CCD. Although the evidence base is growing, there has been relatively limited analysis of what specific role the public sector and public resources should play, particularly in light of recent finding that i) domestic investment, including domestic private finance, plays the most significant role in financing CCD; and ii) domestic public policies have a stronger impact in relation to mobilising private investment in CCD than international public finance at the project level (based on initial analysis in the energy sector).

There is also consensus that the absence of transparent information is a significant barrier to analysis of investment (both public and private). A recent summary of the work of the Organisation for Economic Co-operation and Development (OECD) Research Collaborative on Tracking Private Climate Finance highlighted that *there is a current lack of comprehensive data on private climate finance beyond large renewable energy project finance transactions; some of the many data gaps for other low-carbon, climate resilient activities as well as smaller and other types of financial transactions are likely to remain* (OECD, 2014).

Current barriers to disclosure include commercial confidentiality, regulatory requirements and the fact that a number of interventions are in the early phases of implementation. The report of the UNFCCC Work Programme on Long-Term Climate Finance (2012) emphasises that additional information needs to be disclosed on private flows at the project and investment level, in order for governments to apply specific lessons learned to the design of future interventions.

The first aim of this methodology is to fill these key information gaps about incentives and investment at country level in climate-relevant sectors. The second is to enhance understanding of the links between public support (both domestic and international) through regulatory, economic and information instruments, and through private investment in CCD.

Applying this methodology involves completing three frameworks for any given country and sector (and sub-sectors).

- Framework 1: Public incentives;
- Framework 2: Sources of capital – public and private (current);
- Framework 3: Scale of investment – public and private (historic).

For each country study, three frameworks are to be completed at sector (and sub-sector) level based on the review of relevant international and domestic data sources and information and interviews with key stakeholders in government, private sector and civil society. Where information is available for all 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 finance.

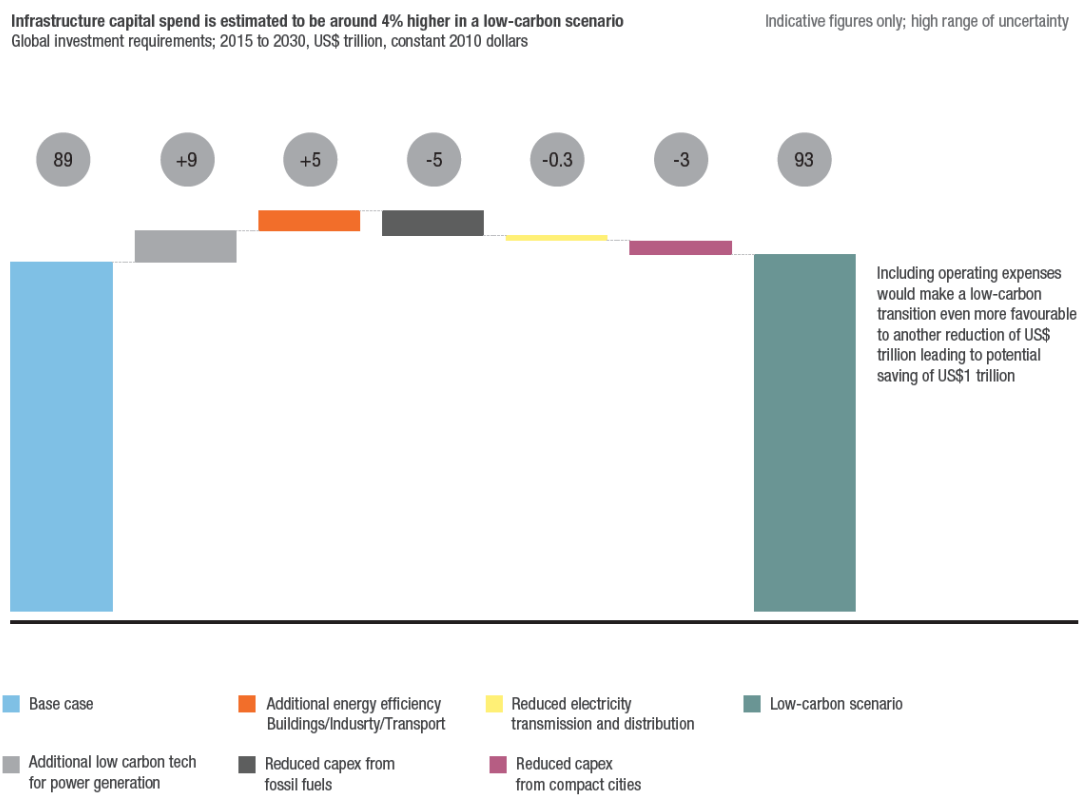
Thus far, this methodology has been applied in the energy sector in Uganda, the agriculture sector in Zambia and the transport and water and sanitation sectors in Vietnam. The full results from these studies can be found in Whitley and Tumushabe (2014), Whitley et al. (2014b), Darko et al. (2015 forthcoming) and Canales Trujillo et al. (2015 forthcoming). The aim is to refine this methodology and these frameworks through the application of the approach across additional countries and sectors.

1 Introduction

Under the UN Framework Convention on Climate Change (UNFCCC), developed countries have committed to mobilising $100 billion annually in climate finance from public and private sources to address the needs of developing countries from 2020.

While estimates of the scale of the specific climate financing needs of developing countries vary substantially, there is a growing body of evidence around the level of both public and private investment that must be shifted globally 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 savings between 2015 and 2050 (see Figures 1 and 2) (GGBP, 2014; Global Commission the Economy and Climate, 2014). The highest end of these estimates is 40 times higher than the prospective $100 billion annual flows to developing countries under the UNFCCC and 12 times higher than global climate-finance flows in 2013[1] of $331 million, of which 58% is estimated to come from the private sector (Buchner et al., 2014).

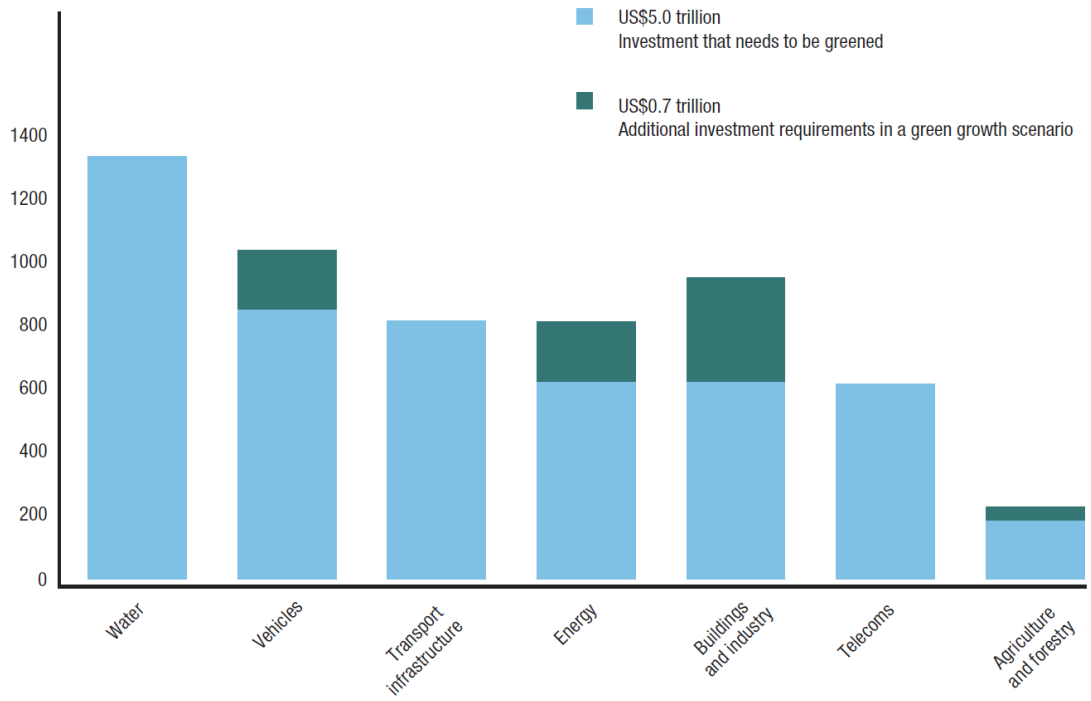
Figure 1: Global investment requirements in a low carbon scenario ($ trillion, 2010 dollars)



Source: Global Commission on the Economy and Climate (2014).

[1] This includes investment in both developed and developing countries.

Figure 2: Additional and total investment requirements in a green growth scenario ($ million, 2010 dollars)



Source: GGBP (2014).

In addition to new investment requirements, there is widespread acceptance that:[2]

- Significant shifts in private investment are needed to help countries undertake climate-compatible development (CCD).[3]
- 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.

Findings from researchers tracking current climate finance demonstrate that:[4]

- Almost 75% of climate finance is domestic investment, with private actors having an especially strong domestic investment focus: 90% of their investments remain in the country of origin.[5]
- The minority (10%) of international climate finance (North–South) originates almost exclusively (94%) from public as opposed to private sources,

[2] See Hamilton (2009), High-Level Advisory Group on Climate Change Financing (2010). Kreibiehl and Miltner (2013), Mabey (2012) and UNFCCC (2012).
[3] 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).
[4] See Buchner et al. (2014), Buntaine and Pizer (2014), Haščič et al. (2015), IFC (2013) and OECD (2014).
[5] This information from the Climate Policy Initiative (CPI) is based on a global data review, and it is unclear how this finding would change across different country contexts.

- Overall, there is very limited information available on private investment by climate-relevant sector[6] and sub-sector beyond that for large renewable energy projects, 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).
- Domestic policies are found to play 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).

We have developed a methodology to address i) this limited availability of information on private climate finance beyond renewable energy and outside the OECD countries and the BRICS and ii) the importance of domestic and public finance and incentives in shaping international and domestic private investment.

Our research aims to answer the following questions for a given country and sector:

- What are the public policy aspirations regarding private investment, both broadly at the country (economy) level and more narrowly at the sector level?
- What are the primary incentives (regulatory, economic and information) in place to support private investment?
- What are the i) current sources of financial capital and ii) historic investment trends, both public and private?
- How can the information on incentives and investment inform those seeking to use climate finance to mobilise private investment towards CCD?
- What are the remaining data gaps, and how could additional information and data inform domestic and international interventions?

This approach takes a holistic view of financial activity for each climate-relevant sector, given that incentives within a sector or sub-sector play a significant role in shaping the decision of private investors (Buntaine and Pizer, 2014; Haščič et al., 2015). The methodology is an attempt to fill key information gaps about both private and public finance, and the incentives that shape investment in CCD, and to create a framework to identify remaining gaps where data are simply uncollected. The primary aim of this work is to support governments in their efforts to shift or direct additional private resources to CCD.

This paper outlines the methodology in detail, including key sources of information. Thus far, this methodology has been applied in the energy sector in Uganda (see Box 1), the agriculture sector in Zambia and the transport and water and sanitation sectors in Vietnam. The full results from these studies can be found in Whitley and Tumushabe (2014), Whitley et al. (2014b), Darko et al. (2015 forthcoming) and Canales Trujillo et al. (2015 forthcoming).

[6] For the purpose of this research climate relevant sectors have been defined to include: agriculture, forestry, extractives, manufacturing, energy, water and sanitation, construction, transportation, and information and communication technology (ICT) (see Section 3.1)

Box 1: Key findings from application of the diagnostic in Uganda's energy sector

Current context – results from diagnostic

- The historic focus of the government of Uganda (GoU) and its development partners on grid extension, the development of large hydro projects and back-up thermal power has resulted in a lack of instruments oriented towards private financing of technologies for cooking, and off-grid or mini-grid solutions that would have an impact on the greatest (and poorest) proportion of the Ugandan population. Government resources, such as the Energy Fund and the Petroleum Fund, could be applied to energy sector investment more broadly.
- Focusing on smaller-scale projects will not only fill a gap left by GoU and development partners but also address the investment gap identified by a number of small-scale project developers that has resulted from the sharp decline in carbon prices in recent years. Such a focus would also 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.

Potential incentives – recommendations

- To address this gap, GoU and its development partners need to design financial instruments, in participation with local financial institutions, that suit the current environment, as most local companies are starts-ups without significant cash flows. The majority of current support instruments can be accessed only by foreign entities (as shown in the small solar and small hydro sub-sectors). To change this requires recognition 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.
- GoU has attracted private investment in electricity generation assets through unbundling and privatisation of elements of the electricity sector, establishment of a transparent and effective Electricity Regulatory Authority (ERA), Renewable Energy Feed-in Tariffs (RE FiTs) (topped up through the Global Energy Transfer Feed-in Tariff (GET FiT) programme) and template Power Purchase Agreements and Investment Agreements. There are opportunities to replicate these approaches in other countries (with similar objectives) with donor support through the innovative use of grants to top up RE FiTs.
- Information on energy sector investment can also be scaled up and harmonised through support to the current holders of these data, which include not only government ministries but also often the press and non-profit organisations. This would include support for the Rural Electrification Agency (REA) to track investment in off-grid projects and formalisation of the biomass cooking sector.

2 Rationale and context

2.1 Rationale

2.1.1 Improve understanding of the links between incentives and investment

As outlined above, there is consensus within the discourse on climate finance on a key role for public finance (and international funds more specifically) in mobilising private investment in CCD. These perceptions have led to a focus on financial interventions by international actors to support private investment at the project level through the use of financial instruments such as grants, concessional lending, guarantees and equity investments.[7]

However, there has been limited analysis of the broader role the domestic public sector and resources in developing countries play in mobilising private climate finance, particularly in light of parallel findings:[8]

- On the importance of domestic private climate finance;
- That North–South finance for CCD is currently dominated by public (not private) investment; and
- That, to enable the private sector to make investments in CCD, it is essential to create a stable and attractive regulatory environment through 'transparency, longevity and certainty' (TLC) (or long, loud and legal signals).

In the discourse on climate finance, there is relatively limited recognition of the role the domestic public sector can (and does) play in shaping private investment. Support to private actors is often justified only in the cases of market failures or market distortions, or where markets are incomplete (Pack and Saggi, 2006). However, in the broader discourse on industrial policy[9] or fiscal policy, there is a more general acceptance that the public sector has a key role to play in establishing and formalising domestic markets, and that a significant portion of the private investment globally depends in some way on support from the public sector[10] (Mazzucato, 2013).

This recognition of the critical role of the domestic public sector in driving investment calls for a more nuanced approach to understanding and allocating climate finance – an approach that would complement current interventions focused at the project level by reshaping incentives that drive investment at the sector or country level.

[7] See Whitley (2013b) and Whitley et al. (2014) for databases of specific donor and multilateral fund private climate finance interventions, and Green Climate Fund (2013) for a useful typology of these financial instruments.
[8] See Hamilton (2009) and Kreibiehl and Miltner (2013).
[9] Definitions of industrial policy (including activities in sectors beyond those typically associated with 'industry'): concerted, focused, conscious efforts on the part of government to encourage and promote a specific industry or sector with an array of policy tools (UNCTAD, 1998); any type of selective intervention or government policy that attempts to alter the structure of production toward sectors that are expected to offer better prospects for economic growth than would occur in the absence of such intervention (Pack and Saggi, 2006).
[10] Data from Bloomberg New Energy Finance show that, in 2012, total investment by state investment banks in renewable energy totalled $80 billion, compared with a mere $12.5 billion by the private sector (Mazzucato, 2013).

2.1.2 Improve tracking of investment in key climate-relevant sectors.

In addition to limited levels of analysis of broader incentives that may impact private investment in CCD, there is also a limited amount of publicly available data on current levels of investment in the key sectors for CCD (see Box 2 in Section 3).

Although recent research by the Climate Policy Initiative (CPI) and others has provided evidence that public policies and public investment can attract private climate finance, only $34 billion in climate finance in 2013 was identified as flowing from developed to developing countries (10% of total global climate finance identified) (Buchner et al., 2014). There may be other funds that are being used to mobilise private climate finance, but there are no consistent and comprehensive data on climate-relevant investment, and information is particularly weak at the regional and country level, with the majority of data collection taking place at the international level (Figure 3) (IFC, 2013). 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, 2013b).

Figure 3: Summary of sector-specific climate finance

		Total	Public money					Private money					
Sources / Sectors		Annual investment (US$ billion)	Dedicated climate funds	National finance Institutions	Government budgets	International finance institutions	Total public sector	Corporate actors	Institutional investors	Project developers	Households	Private finance intermediaries	Total private sector
Adaptation	Total (2010/211)*	14	NA	5.2	2.7	6	13.9	NA	NA	NA	NA	NA	NA
	Agriculture and Forestry (2011)	5.1	NA	3.78	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Water preservation, supply and sanitation (2011)	3.22	NA	3.22	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Capacity building and technical assistance (2011)	1.4	NA	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Disaster risk reduction (2011)	1.4	NA	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mitigation	Total (2010/2011)	350	1.1-1.5	37.5	14.9-18.2	26.9	82	74.9	0.6	122.2	32.3	37.95	267.9
	Energy efficiency (2011)	23.68	NA	NA	NA	23.68	NA	NA	NA	NA	NA	NA	NA
	Infrastructure (2011)	74.4	NA	NA	NA	NA	NA	NA	74.4	NA	NA	NA	74.4
	Renewable energy (2004–2011)	141.4	NA	NA	3.1	NA	NA	NA	NA	138.3	NA	NA	138.3
	Lcet (2009–2010)	23	NA	NA	23.54	NA	23	NA	NA	NA	NA	NA	NA
	Redd+ (2010–2012)	1.3	NA	NA	NA	1.3	NA	NA	NA	NA	NA	NA	NA
Other	Total (2010/20111)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Water (2010)	270**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Waste management (2011)	0.52	NA	0.52	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: IFC (2013).

This data gap is one of the most significant barriers to understanding the effectiveness of existing public sector interventions to mobilise private climate finance. Without information on where public sector funds come from and where they have been used to mobilise private climate finance in developing countries, it is virtually impossible to assess their effectiveness, learn lessons or replicate good practice (Whitley, 2013a).

This challenge links to the call from the UNFCCC Work Programme on Long-Term Finance for more accurate (and comparable) information on how countries channel their climate

finance, and for simple and manageable systems to monitor, report on and verify climate finance at the international and national levels (UNFCCC, 2012).
To date, all efforts to fill these information gaps have focused on reviewing climate-'specific' (or climate-positive) finance, as opposed to broader climate-'relevant' finance (Corfee-Morlot et al., 2009). Taking the energy sector as one example, the current gap in publicly available information can be seen in the imbalance between renewable energy investment at country level (which is relatively well detailed) and on fossil fuel investment by country (which is virtually absent from publicly available datasets). This information gap is also reflected in the separate tracking exercises on energy project support provided by international financial institutions (IFIs). Bloomberg and a group of IFIs are now tracking climate-specific public finance (in terms of mitigation and adaptation). Oil Change International is the only organisation that is tracking these same actors' broader climate-relevant investment, including investment in fossil fuel projects (EBRD, 2014; Louw, 2013; Oil Change International, 2015).

The importance of tracking broader climate-relevant investment is recognised (in the context of the energy sector) in both the 2013 and 2014 CPI Global Landscape of Climate Finance reports:

> *To date there has been insufficient analysis on the scale of, or interplay between, investment in conventional energy sources (i.e., 'brown investment flows') by both governments and private actors, and its implications for low-carbon growth in the medium to long-term* (2013).

> *To put climate finance estimates into perspective, we need comparable estimates of trends in traditional high-carbon 'brown', or business-as-usual, finance. This will enable us to track whether there is real progress towards a low-carbon, climate-resilient future and identify opportunities to shift financial resources towards more sustainable uses* (2014).

2.2 Context

The development of this diagnostic tool builds on the review of public spending through ODI's national climate finance analysis process (Bird et al., 2013) and the UN Development Programme (UNDP) Climate Public Expenditure and Institutional Review (CPEIR) studies – with two primary objectives: including private finance (international and domestic) and broadening the review to include climate-relevant finance. As the scope of review is to be extended to climate-relevant (as opposed to climate-specific) finance, and private finance, the boundaries are set at the level of a single sector and country.

In addition, this work builds on recent research ODI has completed in the following areas.

- National climate finance analyses (Ethiopia, Tanzania, Uganda);
- Private climate finance support (Germany, Japan, UK, US);
- Role of multilateral climate funds in mobilising private finance (Climate Investment Funds (CIFs), the Global Energy Efficiency and Renewable Energy Fund (GEEREF), the Global Environment Facility (GEF), the Pilot Program for Climate Resilience (PPCR) and the Scaling-up Renewable Energy Programme (SREP);
- Effectiveness of international climate finance, including Fast Start Finance (FSF);
- Subsidies and climate-compatible investment.

3 Diagnostic tool: methodology

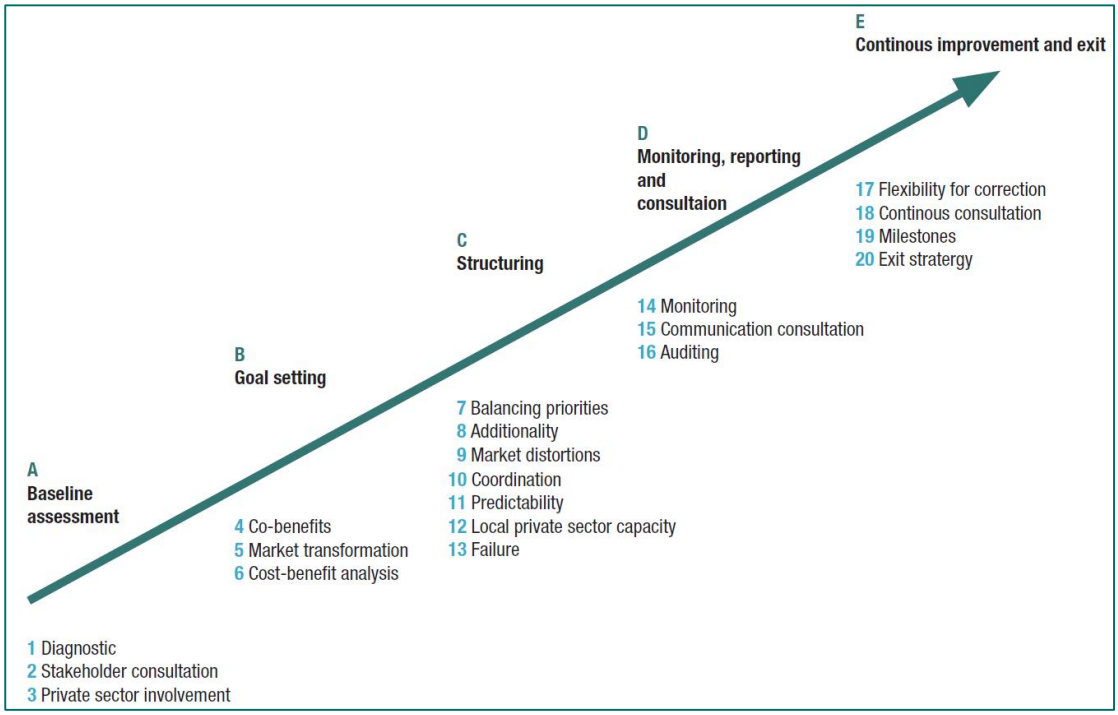
The development of this diagnostic tool has two goals. The first is to fill key information gaps about incentives and investment at country level, in climate-relevant sectors, in order to support governments in their efforts to shift or direct additional private resources to CCD. The second is to enhance understanding of the links between public support (both domestic and international) through regulatory, economic and information instruments, and through private investment in CCD.

This revised diagnostic is an updated version of a methodology published last year (Whitley, 2014) and has been amended to:

- Incorporate lessons from applying the approach in four sectors: energy, agriculture, transport and water and sanitation, including specific recommendations on sub-sector divisions and additional sources of information;
- Clarify the links between the three frameworks used in the diagnostic, and their application within a broader process of designing public interventions to mobilise private investment; and
- Update the literature review to include recent research on the role of public finance in mobilising private investment.

This diagnostic is meant to be applied as the first step in the wider process of designing public interventions to mobilise private climate finance, as part of a '20 Questions Toolkit' developed by ODI, which is meant to be applied in stages (A through E) and includes specific examples and resources where good practice exists for addressing a given question (see Figure 4).

Figure 4: 20 questions toolkit for mobilising private climate finance



Source: Whitley and Ellis (2012).

In contrast with the majority of existing research on private climate finance, which has been undertaken using global datasets, this diagnostic is designed to be undertaken at the country level, looking at both investment and incentives in climate-relevant sectors.

This diagnostic tool aims to answer the following questions for a given country and sector:

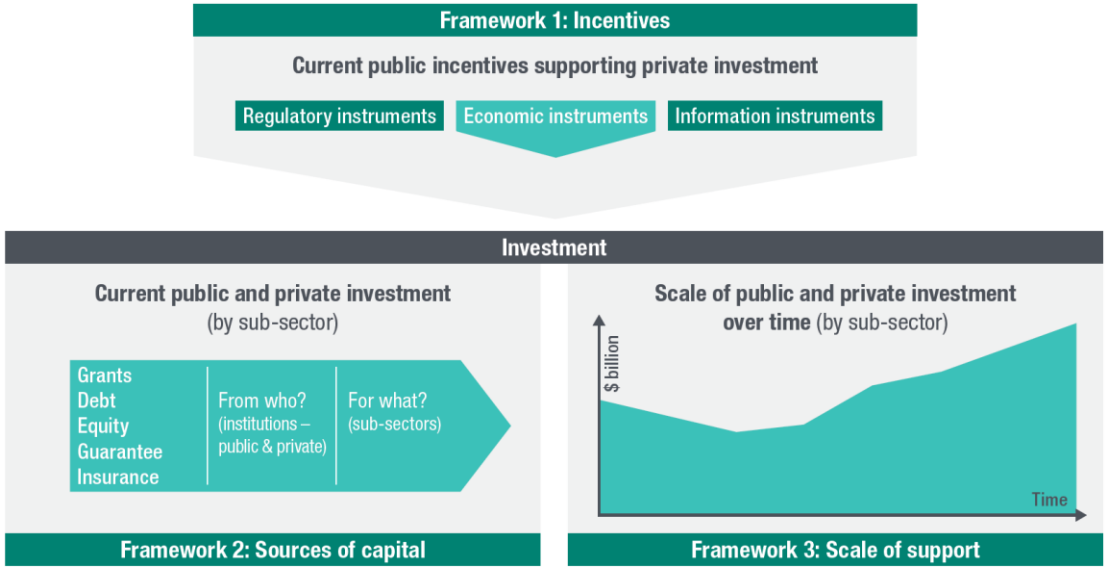
- What are a country's broad public policy goals with regard to private investment in the sector under review?
- What are the current incentives (regulatory, economic and information) in place to support private investment?
- What are the i) current sources of financial capital and ii) historic levels of investment, both public and private?
- How can the information collected on incentives and investment at sector level inform those seeking to use climate finance to mobilise private investment towards CCD?
- What are the remaining data gaps, and how could additional information and data inform domestic and international interventions?

To address the information and methodological gaps outlined above, we have developed three frameworks to be used in collecting information on incentives and investment in climate-relevant sectors.

- Framework 1: Relevant incentives (Figure 6);
- Framework 2: Sources of capital (current) (Figure 7);
- Framework 3: Scale of support (historic) (Figure 9).

Where information is available for all three frameworks, preliminary analysis can be completed on the potential links between climate-relevant incentives and both sources of capital and investment trends (see Section 3.4.4 on data access challenges).

Figure 5: Linking the three frameworks



3.1 Analysis at sector and sub-sector level

In order to understand the role of public policy and incentives for private climate finance, it is first necessary to understand how public policy and incentives shape investment decisions across entire sectors, and not only for those activities that might support mitigation of or adaptation to climate change. This research is to be undertaken using a sector and sub-sector lens, as this is the approach investors and government departments use most often in categorising their activities and investment and in tracking spend. This approach to data-gathering can be seen as partially 'climate-agnostic', as the information on investment and incentives is collected for the entire sector, including but not limiting the review to climate-positive activities (Whitley, 2013a).

The sector level analysis of incentives and investment (see Box 2) has two important potential outcomes:

- Lesson-learning from other sectors on the effectiveness of incentives in mobilising and shifting investment; and
- Greater understanding of current incentives (i.e. subsidies) that act as *either* an impediment to private investment in CCD (including subsidies to fossil fuels, to key commodities driving deforestation etc.) *or* an enabler.

Box 2: Climate-relevant sectors[11] (see also Appendix 1)

- Agriculture
- Forestry
- Extractives
- Manufacturing
- Energy
- Water and sanitation
- Construction (buildings)
- Transportation
- ICT

To assist this analysis, the typology of climate-relevant sectors in Box 2 was developed using the UN's International Standard Industrial Classification of All Economic Activities (ISIC)[12] Rev. 4, filtered using the categories within the Climate Bonds Taxonomy (CBT) (Climate Bonds Initiative, 2015; UN, 2008). The main contrast with the CBT is that we would propose looking at questions of private investment in adaptation and resilience across all sectors with climate relevance, as opposed to within a separate category or sector of 'adaptation'.

Each ISIC 'section' (or 'sector' for the purpose of this research) is sub-divided into divisions, groups and classes. In the case of each ISIC sector reviewed thus far (energy, agriculture, water and sanitation and transport), the divisions, groups and classes were not granular enough for us to use in informing the mobilisation of climate finance. As a result, we have established a set of sub-sector categories for use in this analysis (in particular in Framework 2) to ensure enough data were collected on incentives and investment to begin to distinguish between 'climate-compatible' and 'climate-incompatible' activities (see Appendix 2 for sub-sector breakdowns for the energy, agriculture, water and sanitation and transport sectors).

A climate change lens is therefore first applied early on in the analysis, in the selection of the sectors and sub-sectors, and then again at the end of the analysis, once all the interviews and data-gathering have been completed, in order to assess the implications of the findings for private climate finance. The middle stage of the research, which involves data-gathering and interviews for the three frameworks, does not involve an explicit discussion of climate change, as the aim is to collect comprehensive information on investment and incentives at the sector level.

3.2 Public incentives (Framework 1)

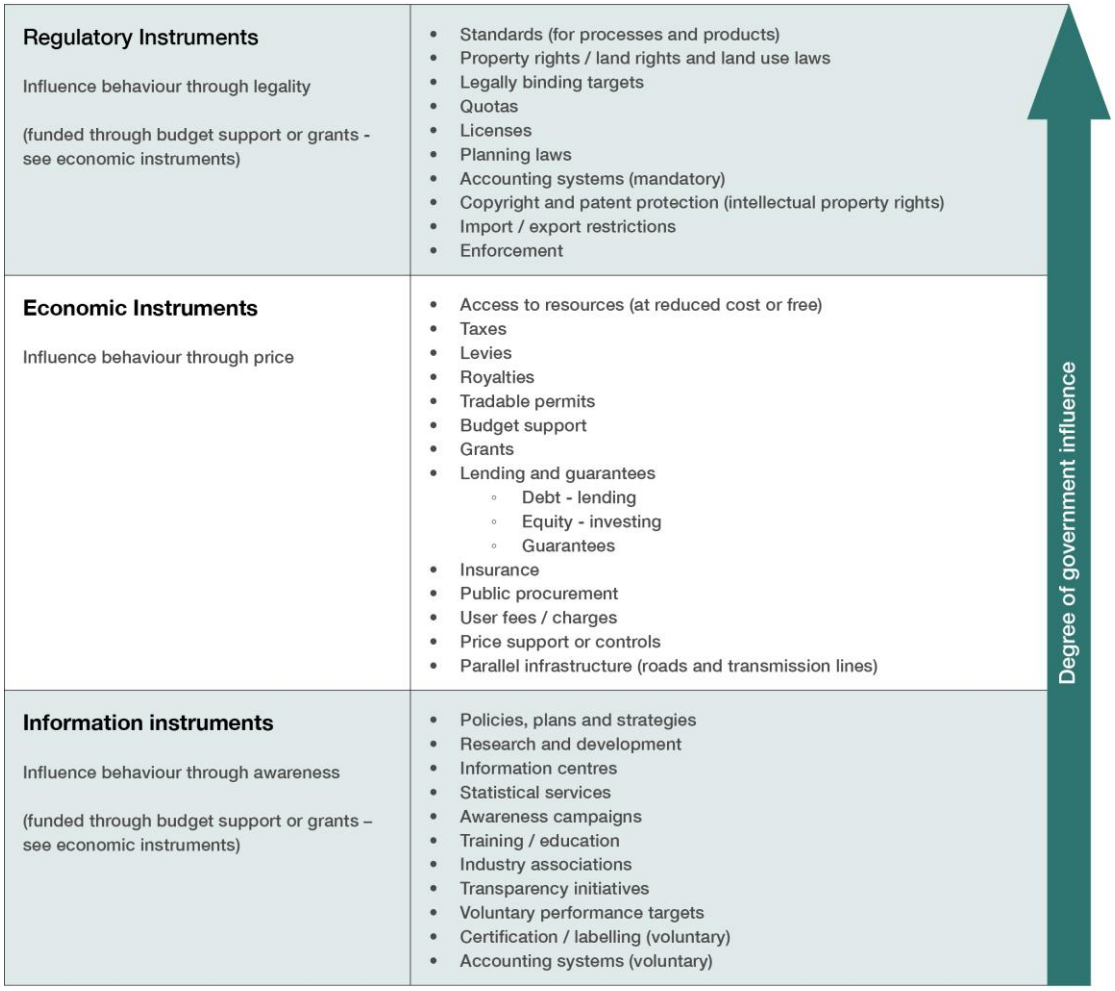
3.2.1 Approach

For the purposes of this research, we are using a typology developed in Whitley (2013a) for the incentives framework, building on existing categories of subsidies and the industrial policy tools most commonly used to mobilise private finance for CCD. The list of examples within Figure 6 serves as an example and should be expanded and refined through the process of in-country application. We use the term 'incentives' to describe all industrial policies, subsidies, support, aid, assistance, fiscal policy and fiscal instruments.

[11] Water and waste under the International Standard Industrial Classification of All Economic Activities (ISIC) (see next footnote) is called water and sanitation for the purpose of our analysis, and the construction sector excludes construction of infrastructure – which has been moved into the respective sector for the purpose of our analysis (i.e. construction of a power plant would be under energy as opposed to construction).

[12] ISIC is the international reference classification of productive activities. Its main purpose is to provide a set of activity categories that can be used for the collection and reporting of statistics according to such activities. Wide use has been made of ISIC, both nationally and internationally, in classifying data according to kind of economic activity in the fields of economic and social statistics, such as for statistics on national accounts, demography of enterprises, employment and others (UN, 2008).

Figure 6: Template for Framework 1 – Incentives (industrial policy tools)



3.2.2 Sources of information

The information to complete Framework 1 is available through:

- Interviews with key stakeholders (public and private actors, international and domestic). These include representatives from the ministry of finance, state bank(s), relevant sector ministry(ies), departments, donor agencies, private companies, non-governmental organisations and civil society organisations, as well as researchers, academics and journalists;
- Reviews of documents from government departments and ministries, and external agencies responsible for implementing the relevant incentive(s) identified through interviews, and (where available) internal or independent audits or reviews of incentives;
- Government documents, including national and regional development plans, budget reports, ministerial reports and statements and sector strategies;
- National-level investment climate and economic reviews completed by international agencies (OECD, World Bank, etc.);
- Documentation of incentive reform processes (e.g. International Monetary Fund (IMF) reviews of fossil fuel subsidy and energy sector reforms); and
- Sector-level investment and investment climate reviews (by government, research and academic institutions).

Although plans and strategies can send signals to investors (and therefore be seen as information instruments), they may not drive investment in the absence of parallel use of regulatory and economic instruments (see Figure 6). If the data are available, these aspirations and statements can be compared with government incentives and historic use of government resources to determine the likely impact of strategies and plans on private investment.

For examples of Framework 1 completed for the energy, agriculture, water and sanitation and transport sectors, see Whitley and Tumushabe (2014), Whitley et al. (2014b), Darko et al. (2015 forthcoming) and Canales Trujillo et al., 2015 forthcoming).

3.3 Sources of capital (public and private) (Framework 2)

3.3.1 Approach

In addition to understanding incentives and the scale of investments at the country level, the design of interventions to mobilise private investment in CCD requires a clear picture of the sources of capital available. This is highlighted in the approach taken by the International Finance Corporation (IFC) (Figure 3), which seeks to sub-divide investment into the categories 'public' and 'private' along with making distinctions between sources such as 'dedicated climate funds' and 'institutional investors'.

Building on the work of the IFC, we have developed a simplified typology of instruments that have been used to drive private investment in the key sectors for CCD (see Box 2 and Appendix 1). For Framework 2 (see Figure 7), we looked to a typology of instruments developed in Green Climate Fund (2013), which already included grants, concessional lending (debt), equity instruments and guarantees, and to which we added insurance.

As outlined in the Green Climate Fund report, each instrument can be applied through a number of modalities (such as credit lines, performance-based payments, public–private partnerships (PPPs) and advanced market commitments). As these are applied in a given country or sector, they are explained in greater detail in the text accompanying the framework. These instruments are then sub-divided in terms of the source of capital, be it public or private, and domestic or international.

Framework 2 has been developed in recognition of the facts that 'climate finance' is a nebulous term (including its relationship with official development assistance (ODA) and other forms of sustainable development support), that the boundaries between 'mitigation activities' and 'adaptation activities' are not clear-cut and that these are not distinctions the private sector uses when considering making investments. The line between private and public finance is also highly nuanced (e.g. private sector money being used to capitalise national development banks or to finance projects indirectly through public sector bond issuance). While these categories are not always clear, we have made a conservative judgement for each source of capital included in Figure 7, as can be seen in the framework as it has been applied to Uganda's energy sector (see Figure 8). Building on lessons from exercises in tracking private climate finance (Illman et al., 2014; Whitley, 2013b), references are included for each project and company in the completed framework, so the underlying information is transparent.

Figure 7: Template for Framework 2 – Sources of capital

Sector / source of capital		Established private finance Sub-sector A, B, C	Emerging private finance Sub-sector C, D, E	Limited private finance Sub-sector F, G, H
Grants (including philantropy and CSR)	Public			
	Private*			
Debt (OTC, market traded, microfinance, etc.)	Public			
	Private*			
Equity (listed and unlisted, including balance sheet finance)	Public			
	Private*			
Guarantee (including loan insurance)	Public			
Insurance (including export credit insurance)	Private*			

Figure 8: Framework 2 – Sources of capital – completed for Uganda's energy sector

		ESTABLISHED				EMERGING		LIMITED	
Sub-sector / sources of capital		**Hydro (large)**	**Hydro (small)**	**Thermal (heavy fuel oil)**	**Biomass (thermal)**	**Solar**	**Charcoal**	**Biogas**	**Geothermal**
Grants (including philanthropy and CSR)	**Public**		**International** (Norway, GET FiT)	**International** (Norway)	**International** (GET FiT)	**Domestic** (MEMD) **International** [I]	**Domestic** (MEMD and MWE) **International**[II]	**International** (DGIS and African Union, KfW, WB, Norway)	**International** (EU AITF, ICEAID, African Union Commission, BMU and KfW - GRMF)
	Private*		**International** (UK)			**International** (US)	**International** (US - Harvest Fuel Initiative)		
Debt (OTC, market traded, microfinance etc.)	**Public**	**International**[III]	**International** [IV]	**International** (WB)	**International** (WB)				
	Private*	**International** (UK and South Africa)	**International** (UK, South Africa, Sri Lanka)	**Domestic** **International** (Norway)	**Domestic**	**Domestic** **International** (US-microfinance)			
Equity (listed and unlisted, including balance sheet finance)	**Public**	**Domestic** (Energy Fund)	**Domestic** (REA) **International** (Norfund, IFC, KfW)						
	Private*	**International** (Kenya and US)	**Domestic** **International** (Norway, British Virgin Islands, India)	**Domestic** **International** (Norway and UK)	**Domestic**	**International** (Netherlands, Australia)	**Domestic** **International** (Norway)	**Domestic** (pilot stage)	
Guarantees (including loan insurance)	**Public**	**International** (WB)		**International** (Norway)		**International** (USAID)	**International** (USAID via GVEP)		
	Private*						**International** (foundations)		

* NGOs and charities included in 'Private'

** Wind power and Insurance not included as no information on this sub-sector and instrument were identified in the research on sources of capital.

[I] WB, EIB, EC, ADC and UNDP, GET FiT; [II] DANIDA, EU and DGIS, USADF, NDF, GEF, FAO, UNDP, UNCDF and BIO);

[III] IFC, AfDB, EIB, KfW, FMO and Chinese Ex Im Bank [IV] PTA Bank, AfDB, PIDG, FMO, DBSA, DEG, KfW, OeEB, IFC, and Finnfund

Source: Whitley and Tumushabe (2014).

3.3.2 Sources of information

The information to complete Framework 2 is primarily available in:

- Local media (newspapers and websites);
- Corporate documents (annual reports), company and websites and press releases;
- Industry, trade and professional publications; and
- Project and programme documentation, websites and press releases of international financial institutions, bilateral and donor agencies.

While such granular information, by both sub-sector and instrument (source of capital), may be collected at present by national governments and international agencies, it is often not publicly available through these sources.

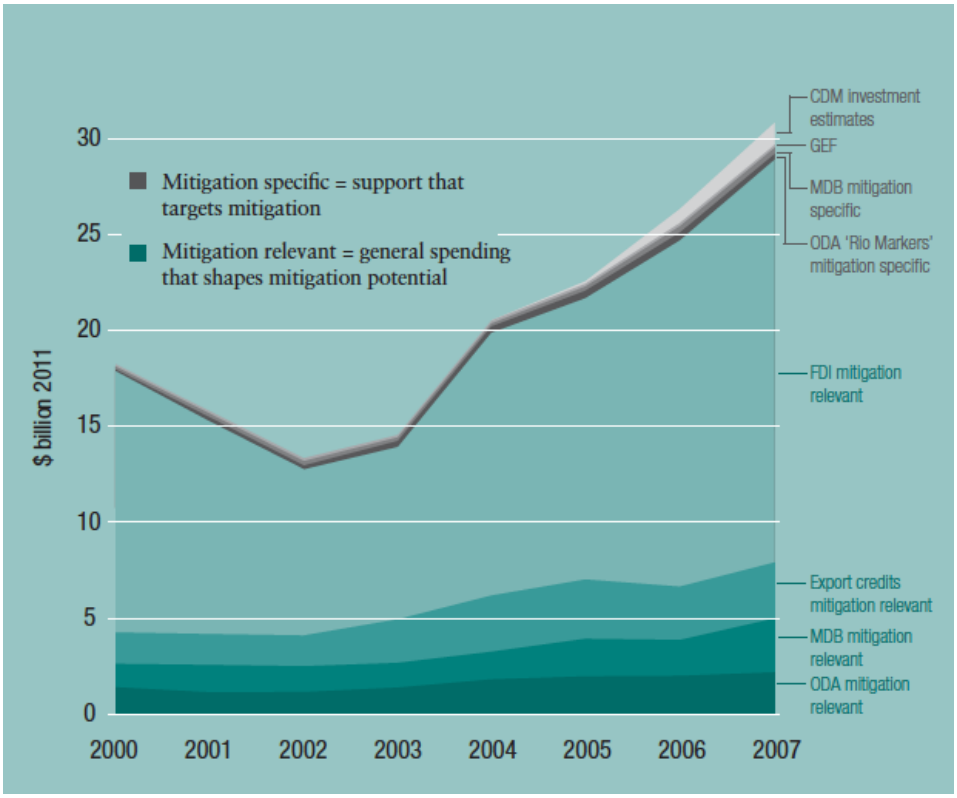
For examples of Framework 2 completed for the energy, agriculture, water and sanitation and transport sectors, see Whitley and Tumushabe (2014), Whitley et al. (2014b), Darko et al. (2015 forthcoming) and Canales Trujillo et al. (2015 forthcoming).

3.4 Scale of support (public and private) (Framework 3)

3.4.1 Approach

For Framework 3, we referenced analysis completed in 2009 by the OECD, which tracked climate-specific (climate-positive) and climate-relevant investment at the global level over time (see Figure 9). The aim in our analysis would be to track shifts in investment over time at the sub-sector level and, if possible, also by source (international, domestic, public and private). We anticipate some of the information required could be found within the different international datasets referenced by the OECD in Figure 9, and could be used to complement national-level data.

Figure 9: Template for Framework 3 – Scale of support



Source: Corfee-Morlot et al. (2009).

3.4.2 Sources of information

This analysis is to be completed at sector level using comparable data across different years (where possible) from domestic and international data sources. It can include the sources referenced in the template OECD graphic (Figure 9), such as the UN Conference on Trade and Development (UNCTAD) for foreign direct investment (FDI) data and OECD data on ODA and other official flows.

Other potential sources of information on investment at sector and sub-sector level may include:

- Domestic agencies for statistics, investment and the central bank;
- Domestic and international industry associations;
- Sector and sub-sector level investment data-sets (where these have been compiled for a particular country, sector or sub-sector);
- PPPs captured through the World Bank World Development Indicators;
- Transparency initiatives, such as the Extractive Industries Transparency Initiative, the Transparency and Accountability Initiative, the Open Government Initiative and Publish What You Pay/Fund; and
- Climate finance analysis (including Climate Funds Update and FSF reviews by ODI) and information from the UNFCCC Clean Development Mechanism database and registries of voluntary carbon standards including the Verified Carbon Standard and the Gold Standard.

3.4.3 Data access – challenges

For a number of countries and sectors (including energy in Uganda, agriculture in Zambia and transport in Vietnam), it has not been possible to complete Framework 3 as envisaged in Figure 9. This is because of significant gaps in international and national datasets, in terms of both year and sub-sector coverage. In many cases, it was not possible to identify levels of private investment in the sector beyond FDI, as none of the national or international datasets covered domestic investment. In many cases, it was also not possible to find sub-sector information for FDI.

Despite these obstacles to data collection, and in order to highlight the trends observed based on the available information, we calculated average annual investment (or support provided) where data were provided across multiple years. This enabled us to show investment to the sector as compared with investment to the country as a whole, and investment by sub-sector (where this information was available). Each data provider uses different sub-sector categories, and these have been shown in order to demonstrate the opportunities both for additional investment data collection and transparency, but also for harmonisation across datasets.

For examples of Framework 3 completed (either with annual data or data over time) for the energy, agriculture, water and sanitation and transport sectors, see Whitley and Tumushabe (2014), Whitley et al. (2014b), Darko et al. (2015 forthcoming) and Canales Trujillo et al., 2015).

3.4.4 Data access – next steps

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.

As well as seeking to apply this diagnostic in a number of additional countries and sectors, as an additional next step 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), Kenya (opendata.go.ke) and Ghana.

In addition, there could be an opportunity to influence the next version of the UN's ISIC, which was used to develop the list of climate-relevant sectors in this diagnostic (see Box 2) and is widely used both nationally and internationally for compiling economic and social statistics, including the investment data necessary for this diagnostic.

Each ISIC Section is sub-divided into divisions, groups and classes. In many cases, the divisions, groups and classes provided under ISIC are not granular enough for us to use in tracking and informing climate finance. By way of example, the most granular class within the group, 3150: 'Electric power generation, transmission and distribution', includes 'Operation of generation facilities that produce electric energy, including 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 the UN to break up ISIC classes to greater reflect the finance data that are necessary both at the national and at the international level for tracking progress towards objectives on climate change, green growth and wider development goals.

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Appendix 1: Climate-relevant sectors[13]

Included ISIC sectors:
A Agriculture forestry and fishing
B (Extractives) Mining and quarrying
C Manufacturing
D (Energy) Electricity, gas, steam and air conditioning supply
E (Water and Waste) Water supply; sewerage, waste management and remediation activities
F Construction
H (Transport) Transportation and storage
J Information and communication technology

Excluded ISIC sectors:
G Wholesale and retail trade; repair of motor vehicles and motorcycles
I Accommodation and food service activities
K Financial and insurance activities
L Real estate activities
M Professional, scientific and technical activities
N Administrative and support service activities
O Public administration and defence; compulsory social security
P Education
Q Human health and social work activities
R Arts, entertainment and recreation
S Other service activities
T Activities of households as employers
U Activities of extraterritorial organisations and bodies

[13] Preliminary list based on Climate Bonds Initiative (2015) and UN (2008).

Appendix 2: Climate-relevant sub-sectors

Each ISIC section (or 'sector' for the purpose of this research) is sub-divided into divisions, groups and classes (see Appendix 1). In the case of each ISIC sector reviewed thus far (energy, agriculture, water and sanitation and transport), the divisions, groups and classes were not granular enough for us to use in informing the mobilisation of climate finance. As a result, we have established a set of sub-sector categories for use in this analysis (in particular in Framework 2) to ensure enough data were collected on incentives and investment to begin to distinguish between 'climate-compatible' and 'climate-incompatible' activities.

An opportunity for future research could be to understand if and how ISIC guidance might become more granular to support climate finance tracking. For example, Energy Class (sub-sector) 3150, which currently includes *operation of generation facilities that produce electric energy, including thermal, nuclear, hydroelectric, gas turbine, diesel and renewable*, could be broken down into multiple classes.

Energy sector (developed in Uganda country study), divided by <u>energy source</u>

- Hydro power (large) - Hydro power (small) - Thermal power - Biomass - Solar - Charcoal - Biogas

Source: Whitley and Tumushabe (2014).

Agriculture sector (developed in Zambia desk study), divided by <u>agricultural commodity</u> and <u>scale</u>

Smallholder farmers (primarily) - Maize - Cassava - Groundnuts/peanuts
Mixed farm scales - Livestock
Commercial agribusiness using smallholder out-grower schemes - Tobacco - Horticulture/floriculture - Cotton
Commercial agribusiness - Coffee - Wheat - Soybeans

Source: Whitley et al. (2014b).

Water and sanitation sector (developed in Vietnam country study), divided (in part) between urban and rural supply

- Wastewater treatment (household and industrial) - Wastewater collection (drainage and flood control) - Urban water supply and sanitation (household and industrial) - Rural water supply and sanitation - Solid waste - Irrigation

Source: Canales Trujillo et al. (2015 forthcoming).

Transport sector (developed in Vietnam country study), divided into land, air, water and storage and infrastructure and operations

Land (infrastructure and operations) - Roads and bridges - Bus and taxi stations - Railways - Railway stations - Pipelines (gas, oil, water) - Cars, coaches, trucks, bikes and motorbikes - Trains and urban metro
Air (infrastructure and operations) - Airports - Airplanes, helicopters and seaplanes - Satellites
Water (infrastructure and operations) - Seaports - Inland ports and waterways - Passenger and commercial boats and ships
Storage (infrastructure and operations) - Warehouses - Silos - Cargo facilities

Source: Darko et al. (2015 forthcoming).

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