



Mapping climate-relevant incentives and investment at country level

A diagnostic tool to mobilise private climate finance

Shelagh Whitley



Abstract

This paper describes a new methodology to support governments and development partners that wish to mobilise 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) through regulatory, economic, and information instruments, and through private investment in CCD.

An updated version of this methodology was published in April 2015 and is available at www.odi.org.

Acknowledgements

We are grateful for helpful comments provided by peer reviewers Aman Srivastava of WRI and Neil Bird of ODI.

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

Table of contents

Acknowledgements	ii
Abbreviations	ii
Executive summary	iii
1 Introduction	4
2 Rationale	6
2.1 Industrial policy tools (incentives)	6
2.2 Sources of capital	7
2.3 Scale of support	8
3 Proposed methodology	10
3.1 Approach	10
3.2 Research questions and sources of information	13
4 Additional methodological considerations	15
4.1 What is an applicable typology of climate relevant sectors?	15
4.2 What is an applicable typology of incentives?	16
4.3 What is an applicable typology of sources of capital?	16
4.4 What multi-year domestic and international data are available for completing the scale of investment framework?	17
4.5 Cross cutting questions on data availability (and next steps)	17
5 References	19
Appendix 1: Climate-relevant sectors	22
Appendix 2: Incentives framework (Uganda, Energy Sector)	23
Appendix 3: Sources of capital framework (Uganda, Energy Sector)	24
Appendix 4: Scale of support framework (Uganda, Energy Sector)	25

Abbreviations

Abbreviation	Description
AEEP	Africa EU Energy Partnership
AfDB	African Development Bank
BRICS	Brazil, Russia, India, China, South Africa
BRT	Bus rapid transit
CCD	Climate-compatible development
CDM	Clean Development Mechanism
Ci-Dev	Carbon Initiative for Development
CPI	Climate Policy Initiative
CSP	Concentrated solar power
CTI PFAN	Climate Technology Initiative's Private Financing Advisory Network
DGIS	Directorate General for International Cooperation of the Dutch Ministry of Foreign Affairs
EE	Energy efficiency
ERA	Electricity Regulatory Authority (Uganda)
FDI	Foreign direct investment
	Fossil fuels
FSF	Fast-start finance
GET FiT	Global Energy Transfer Feed-in Tariff
GVEP	Global Village Energy Partnership
IA	Investment agreement
ICT	Information and communication technology
IFC	International Finance Corporation
IFI	International financial institution
JICA	Japan International Cooperation Agency
MEMD	Ministry of Energy and Mineral Development (Uganda)
MW	Megawatt
NGO	Non-governmental organisation
ODA	Official development assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OOF	Other official flows
OTC	Over the counter (in relation to debt securities)
PPA	Power purchase agreement
PPP	Private public partnership
PVTMA	PV Targeted Market Approach
RE	Renewable energy
REA	Rural Electrification Agency (Uganda)
RE FiT	Renewable energy feed-in tariff
Solar PV	Solar photovoltaics
TLC	Transparency, Longevity and Certainty
UNCTAD	United Nations Conference on Trade and Development
UECCC	Uganda Energy Credit Capitalisation Company
UIA	Uganda Investment Authority
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

Executive summary

This paper describes a new methodology to support governments and development partners that wish to mobilise private finance for climate-compatible development (CCD).

There is consensus within the discourse on climate finance that there is a key role for the public sector (and donor funds more specifically) in mobilising private investment in CCD. However, there has been limited analysis about what specific role the public sector and public resources should play, particularly in light of recent findings on 1) the importance of domestic private investment, and 2) the current domination of public investment in international finance for CCD.

The first aim of this methodology is to fill these 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.

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

- Framework 1: relevant incentives
- Framework 2: sources of capital (current)
- Framework 3: investment trends (historic).

For each country study, three frameworks will be completed at sector (and sub-sector level). The frameworks will be 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 climate-relevant incentives, sources of capital and investment trends, and options to mobilise additional private finance.

Appendices contain findings from the first application of the methodology in the energy sector in Uganda. The full results from this pilot application can be found in Whitley and Tumushabe (2014). The aim is to refine this methodology and these frameworks through the application of the approach across multiple countries and sectors.

1 Introduction

Developed countries have committed to mobilise \$100 billion annually in long-term climate finance from public and private sources to address the needs of developing countries by 2020 under the United Nations Framework Convention on Climate Change (UNFCCC). While estimates of the scale of climate-financing needs vary substantially, depending upon the assumptions and methodologies used, current estimates of the costs of addressing climate change in developing countries alone range from \$0.6 to \$1.5 trillion per year (Nakhoda, 2012; Montes, 2012). These estimates are 5-10 times higher than the prospective annual flows under the UNFCCC and 3-5 times higher than global climate-finance flows in 2012¹, of which 62% is estimated to come from the private sector (Buchner, et al., 2013).

In addition to widespread acceptance that significant increases in financial resources are needed to help countries undertake climate-compatible development (CCD), there is growing consensus that:

- most of this funding needs to come in the form of private climate finance
- the creation of a stable and attractive regulatory environment through ‘Transparency, Longevity and Certainty’ (TLC) (or long, loud and legal signals) is essential for the private sector to make these investments, and
- there is a critical role for public finance (domestic and international) to enable greater investment in CCD by the private sector.

See High Level Advisory Group on Climate Change Financing (2010), Mabey (2012), UNFCCC (2012), and Kreibiehl and Miltner (2013).

There are also early research findings that:

- the majority (76%) of climate finance is domestic: sourced and/or originated in the country in which it is used
- the minority of international climate finance (North-South) originates primarily from public sources, and
- there is very limited information available on private investment by climate-relevant sector and sub-sector beyond that for renewable energy, and very little country level data beyond the OECD and BRICS.

See Buchner et al. (2013), Whitley (2013a), Whitley (2013b), Illman et al. (2014), OECD (2014) and IFC (2013).

The Overseas Development Institute (ODI) has developed a methodology to fill key information gaps about incentives and investment at the country level, with the first aim of supporting donor governments in their efforts to shift or direct additional private resources to CCD. This work should also benefit a wider group of stakeholders including those within government and the private sector. Where information is available, the parallel aim of this research project is to enhance understanding of the links over time between public support (both domestic and international) and private investment in CCD.

This paper outlines a proposed methodology in detail, including key sources of information, current data gaps, and areas where additional work might be undertaken to improve

¹ This includes investment in both developed and developing countries.

information on investment at the country and sub-sector level. It also references early findings from the application of this approach to the energy sector in Uganda, which is outlined in detail in a parallel report (see Whitley and Tumushabe, 2014).

2 Rationale

2.1 Industrial policy tools (incentives)

As outlined above, there is consensus within the discourse on climate finance on a key role for the public sector (and donor funds more specifically) in mobilising private investment in CCD. However, there has been limited analysis about what specific role the public sector and public resources should play, particularly in light of recent findings on 1) the importance of domestic private investment, and 2) the fact that international finance for CCD is currently dominated by public investment.

To date, those seeking to use public climate finance to support private investment have built their approaches on two widely held perceptions:

- that there are higher costs and risks to investment in CCD than in other parts of the economy or in business as usual (BAU) investments, and
- that approaches to address barriers to investment must be innovative (and have not been undertaken in the past), resulting in a rhetoric around ‘tools to mobilise the private sector’, ‘innovative instruments to leverage private capital’, and ‘de-risking tools to catalyse private capital’.

While there is an increasing awareness of the need for interventions at market level, historically there has been a focus on interventions to support private investment at the project level through the use of financial instruments such as grants, concessional lending, guarantees and equity investments. See Whitley (2013b) for a database of donor interventions, and the Green Climate Fund (2013) for a useful typology of these financial instruments.

There remains only limited recognition within the discourse on climate finance of the role that the public sector can (and does) play in shaping private investment. Support to private actors is often justified (by proponents of free markets) on the basis that there is room for government intervention to ensure socially efficient outcomes in the case of market failures, market distortions, or where markets are incomplete (Pack and Saggi, 2006). However, in the broader discourse on industrial policy² (Figure 1) there is a more general acceptance that the public sector has a key role to play in mobilising the private sector, and that a significant portion of the private sector globally depends in some way on support from the public sector³ (Mazzucato, 2013).

² Definitions of industrial policy:

- Government efforts to alter industrial structure to promote productivity-based growth (World Bank, 1993).

- 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).

³ Recent data from Bloomberg New Energy Finance shows that in 2012 total investment by state investment banks in renewable energy totalled \$80 billion, compared to a mere \$12.5 billion by the private sector (Mazzucato, 2014).

This growing recognition of the critical role for industrial policy in driving investment might call for a more nuanced approach to the allocation of climate finance – an approach that would complement current interventions at the project level, with a broader analysis of the incentives linked to investment in a given country or sector.

For the purpose of this research, we use the term ‘incentives’ to describe all industrial policies, subsidies, support, aid, assistance, fiscal policy and fiscal instruments.

The broader analysis of incentives and investment in key sectors for CCD has two important potential outcomes (Box 1) :

- lesson-learning from other sectors on the effectiveness of incentives in mobilising and shifting investment, and
- greater understanding of current incentives (or subsidies) that act as an impediment to private investment in CCD.

It is critical that national-level diagnostic tools, along the lines of that proposed in this methodology, be applied to review the different (and often competing) drivers of private investment, providing valuable lessons and allowing the replication of best practice across a wide range of sectors.

Box 1: Climate-relevant sectors (Whitley and Tumushabe, 2014)⁴ (see also Appendix 1)

- **Agriculture**
- **Forestry**
- **Extractives**
- **Manufacturing**
- **Energy**
- **Water and Waste**
- **Construction**
- **Transportation**
- **Information and communication technology (ICT)**

2.2 Sources of capital

In addition to understanding incentives and scale of investments at the country level, the design of interventions to mobilise private investment in CCD also requires a clear picture of the sources of capital that are available. This is highlighted in the approach taken by the International Finance Corporation (IFC) (Table 1), which seeks to sub-divide investment into the categories ‘public’ and ‘private’ along with distinctions between sources such as ‘dedicated climate funds’ and ‘institutional investors’.

⁴ Preliminary list based on Climate Bonds Taxonomy and the International Standard Industrial Classification of All Economic Activities, Rev.4 (Climate Bonds, 2014) and (United Nations, 2008).

Table 1: Summary of sector- specific climate finance (IFC, 2013)

(All the totals are in bold; the highlighted cells contain verifiable financial figures; NA = Not Available)													
Sources/Sectors	Total	Public Money					Private Money						
	Annual Invest. (US\$ billion)	Dedicated Climate Funds	Nat. Fin. Institutions	Gov. Budgets	Ind. Fin. Institutions	Total Pub. Sector	Corporate Actors	Institutional Investors	Project Developers	Households	Pvt. Fin Intermediaries	Total Pvt. Sector	
Total (2010/2011)¹	14	NA	5.2	2.7	6	13.9	NA	NA	NA	NA	NA	NA	
Adaptation													
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)	1.40	NA	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Disaster Risk Reduction (2011)	1.40	NA	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Total (2010/2011)	350	1.1–1.5	37.5	14.9–18.2	26.9	82.0	74.9	0.6	122.2	32.3	37.95	267.9	
Mitigation													
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	
Total (2010/2011)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Other													
Water (2010)	270 ^a	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	

Building on the work of the IFC and the Green Climate Fund (GCF) we have revised this framework to present a simplified typology of the range of instruments that have been used to drive private investment in the key sectors for CCD (see Box 1 and Appendix 1).

This has been developed in recognition of the fact that ‘climate finance’ is a nebulous term (including its relationship with 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 that the private sector uses when considering making investments that promote CCD. 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).

The application of this framework at the country level in the key relevant sectors for CCD should inform where public sector finance and incentives can best fill gaps, and support greater private investment (Nakhooda, 2013).

2.3 Scale of support

In addition to limited levels of analysis of broader incentives that may impact private investment in CCD, there is also limited publicly available data on current levels of investment in the key sectors for CCD (Whitley, 2013a, 2013c)..

Though recent research by the Climate Policy Initiative (CPI) and others has provided evidence that public policies and resources can attract private climate finance, only \$16-23 billion was identified as originating from the public sector in 2010/11 with the explicit goal of catalysing private climate finance (Buchner et al., 2012). 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 or country level, with the majority of data collection taking place at the international level (Figure 1) (IFC, 2013). Early work by ODI suggests that issues of commercial confidentiality

and regulatory restrictions may make the tracking of private finance even more challenging than tracking public flows (Whitley, 2013b).

This lack of information is one of the most significant barriers to understanding the effectiveness of existing initiatives by the public sector 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).

In addition, all efforts to fill these information gaps to date have been focused on reviewing climate ‘specific’ finance (or climate positive), as opposed to broader climate ‘relevant’ finance (see Appendix 4) (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). 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), while Oil Change International is the only organisation that is tracking these same actors’ broader climate-relevant investment, including investment in fossil-fuel projects (Louw, 2013; African Development Bank, 2012; World Bank (2012; Oil Change International, 2012).

The importance of tracking broader climate-relevant investment has been recognised in both the 2013 CPI *Global Landscape of Climate Finance* report:

‘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. More work is needed. This work should include consideration of the investment impacts of locking in high-emissions development pathways, as well as new risks associated with stranded assets’.

This links to the broader 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).

3 Proposed methodology

To address the information and methodological gaps outlined above, we propose to develop an approach to collecting information on climate-relevant investment and incentives – using a range of proposed frameworks and typologies (Figures 1-3).

In contrast to the majority of existing research in this space, which has been undertaken using global data sets, this work would be done at the country level, looking at investment and incentives in climate-relevant sectors.

3.1 Approach

This research has two goals. The first is to fill key information gaps about incentives and investment at country level, in climate-relevant sectors, 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 will be accomplished by seeking to complete three frameworks for a given country and sector (and sub-sectors), to summarise:

- Framework 1: relevant incentives (Figure 1)
- Framework 2: sources of capital (current) (Figure 2)
- Framework 3: investment trends (historic) (Figure 3).

Where information is available for all three frameworks preliminary analysis will be completed on the potential links between climate relevant incentives and on sources of both capital and investment trends.

This work builds on the review of public spending through ODI's national climate finance analysis process (Bird et al., 2013) and UNDP's 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. The aim is to apply this methodology at sector level for a given country. 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 see Whitley and Tumushabe (2014) on the pilot application for Uganda's energy sector).

This work builds on recent research completed by ODI the following areas.

- National climate finance analyses (Ethiopia, Tanzania and Uganda)
- Private climate-finance support (US, UK, Germany and Japan)
- International climate-finance effectiveness (Fast Start Finance (FSF) and Climate Funds)
- Subsidies and climate compatible investment

Figure 1: Template for Framework 1 - Incentives (industrial policy tools) (Whitley, 2013a)

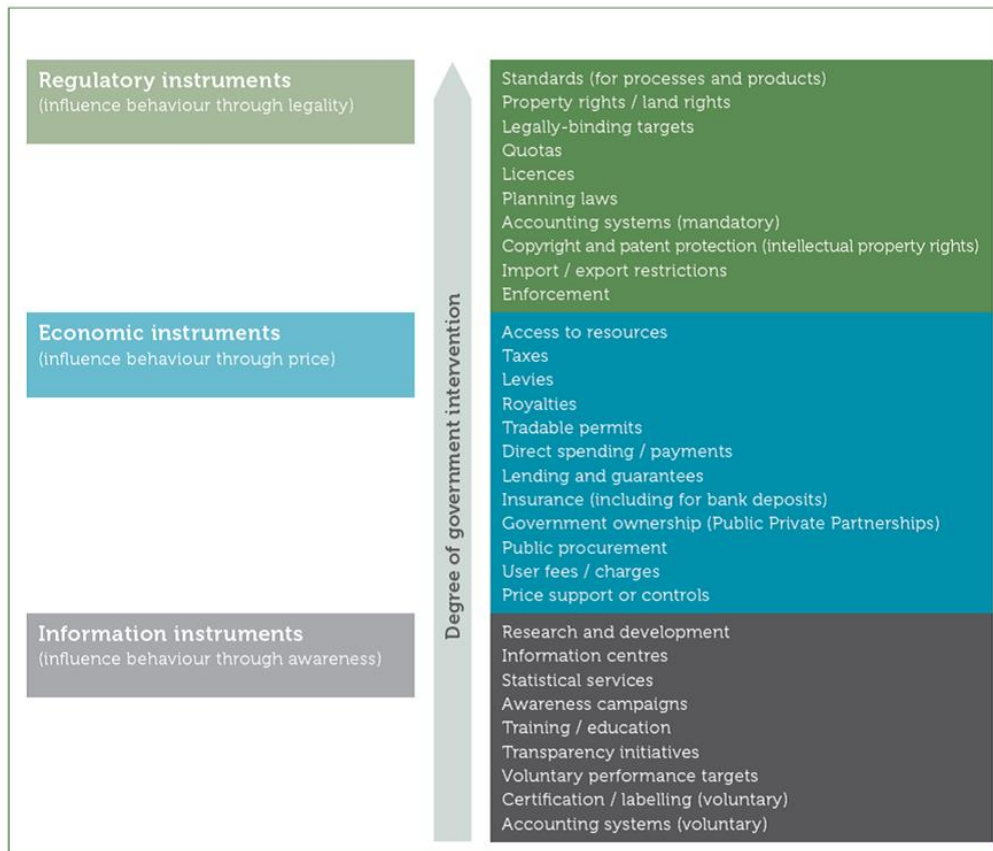


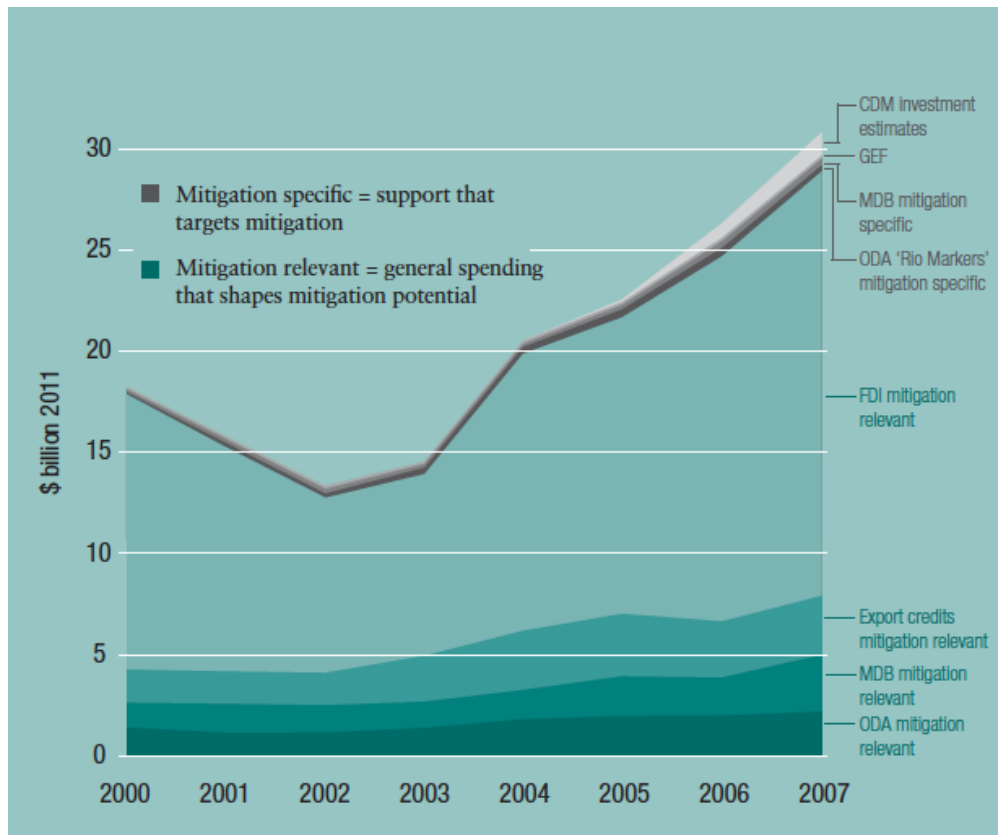
Figure 2: Template for Framework 2 - Sources of capital (Nakhoda, 2013)

Sector / Source of capital ¹	Debt (OTC and market traded etc.)		Equity (listed and unlisted – including balance sheet finance)		Guarantees / loan insurance		Insurance (including export credit insurance)		Grants (including philanthropy and corporate social responsibility)	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
Investors										
Mature renewable projects (onshore wind, solar PV)	Established	Established	Emerging	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Maturing renewable projects (geothermal and biomass power)	Established	Established	Emerging	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Developing renewable projects (offshore wind or CSP)	Emerging	Emerging	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Industrial efficiency / Efficient FF generation projects	Emerging	Emerging	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Sustainable buildings	Emerging	Emerging	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited
RE / EE equipment	Limited	Established	Limited	Limited	Limited	Limited	Established	Established	Limited	Limited
Sustainable transport solutions (BRT, Rail) ²	Limited	Limited	Limited	Limited	Established	Established	Limited	Limited	Limited	Limited
Waste and water management	Limited	Limited	Limited	Limited	Established	Established	Limited	Limited	Limited	Limited
Sustainable agriculture and forestry	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Established
Climate proofing (of infrastructure) ³	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited

Key: ■ Established⁴ ■ Emerging ■ Limited

- The table could be expanded by breaking out debt and equity in more detailed sub-categories, and include levels of concessionality
- Transport and waste/water management are often last to be privatized, public private partnerships may be elusive, and private sector participation is not always possible
- It may be useful to look at this in terms of specific infrastructure types (roads, buildings, power plants etc.)
- Specific levels of investment under each category and thresholds for ongoing monitoring need to be refined, and undoubtedly vary across countries.

Figure 3: Template for Framework 3 - Scale of support (Corfee-Morlot et. al., 2009)



3.2 Research questions and sources of information

3.2.1 What are the goals regarding private investment for the given country / sector?

This question is asked to provide context for findings related to incentives and investment, and to place them within the context of a government's expressed ambitions in terms of private investment. The information to answer this question is primarily available in:

- government documents including national and regional development plans, budget reports, ministerial reports and statements, and sector strategies
- international agency investment climate and economic reviews (OECD, WB, etc.)
- documentation of reform processes, and
- sector investment and investment-climate reviews (by government, research and academic institutions).

Although plans and strategies can send signals to investors, they may not drive investment in the absence of parallel use of regulatory and economic instruments (see Figure 2). If the data are available, these aspirations and statements can be compared with government incentives and historic use of government resources.

3.2.2 What are the primary incentives in place in the given country / sector? (Framework 1)

The information to answer this question is primarily available through:

- interviews with key stakeholders⁵ (public and private actors, international and domestic)
- 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.

3.2.3 What are the sources of capital (current) in the given country / sector and sub-sectors? (Framework 2)

The information to answer this question is primarily available in:

- local media (newspapers and websites)
- corporate documents (annual reports), 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 not publicly available through these sources.

⁵ These include representatives from the relevant ministries, departments, donor agencies, private companies, non-governmental organisations and civil-society organisations, researchers, academics and journalists.

3.2.4 What is the historic scale of support in the given country / sector and sub-sectors? (Framework 3)

This analysis is to be completed using comparable data across different years from domestic and international data sources. It can include the sources referenced in the template OECD graphic (Figure 3), such as UNCTAD for FDI data, and OECD data on official development assistance (ODA) and other official flows (OOF). 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
- World Development Indicators (World Bank),
- transparency initiatives, such as the Extractive Industries Transparency Initiative (EITI), the Transparency and Accountability (T/A) Initiative, Open Government Initiative and Publish What You Pay/Fund, and
- Climate-finance analysis (including *Landscapes of Climate Finance* reports by CPI, and Climate Funds Update and FSF reviews by ODI).

4 Additional methodological considerations

In addition to applying the methodology to a range of countries and sectors to inform climate finance, where possible, this methodology seeks to inform a broader group of actors who want to understand how private finance can be shifted and mobilised toward global public goods.

With this objective in mind, the only climate-change lens applied within the methodology is the focus on climate-relevant sector(s) within that country. It is hoped that this ‘climate agnostic’ approach allows for the information on incentives and investment that is collected for a given sector and sub-sectors to be used by a range of stakeholders beyond a climate-finance audience and to link to existing and emerging data-collection exercises on investment (including, but not limited to, climate finance).

To this end, there are a number of parallel questions that this approach seeks to answer and to refine throughout the process of applying the methodology across countries and sectors. Lessons from the first application of this methodology, to analyse the energy sector in Uganda (Whitley and Tumushabe, 2014) are also outlined below.

4.1 What is an applicable typology of climate-relevant sectors?

The typology of climate-relevant sectors in Box 1 was developed using the UN’s International Standard Industrial Classification (ISIC) of economic activities Rev. 4, filtered by using the categories within the Climate Bonds Taxonomy (CBT). The main contrast with the CBT is that we would propose to look at questions of private investment in adaptation and resilience across all sectors, as opposed to within a separate category or sector of ‘Adaptation’.

‘The International Standard Industrial Classification of All Economic Activities (ISIC) is the international reference classification of productive activities. Its main purpose is to provide a set of activity categories that can be utilized 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.’
(United Nations, 2008)

The main alternative typologies or classifications to ISIC that could have been referenced are those of investor groups including the Global Industry Classification Standard (GICS) developed by MSCI and Standard & Poor’s (S&P) and the Industry Classification Benchmark (ICB) by FTSE International.

Each ISIC Section (or sector for the purpose of this research) is sub-divided into divisions, groups and classes. In the case of the energy sector in Uganda, we developed our own sub-sector categories based on the country’s heat and electricity generation mix: hydro (large and small), thermal power, solar, charcoal, biomass and biogas. In the case of the energy sector,

the divisions, groups and classes were not granular enough for us to use in informing climate finance.

An opportunity for future research could be to understand if and how ISIC might consider breaking Class 3150 – *operation of generation facilities that produce electric energy, including thermal, nuclear, hydroelectric, gas turbine, diesel and renewable* – into multiple classes. Additional reviews of relevant Classes (sub-sectors) can be completed through further testing of the methodology.

4.2 What is an applicable typology of incentives?

For the purpose of this research we are using a typology developed in Whitley (2013a), which built on existing categories of subsidies and the industrial policy tools used to mobilise CCD or green growth. The list of examples within Figure 1 will be expanded and refined through the process of in-country application.

From the case study in Uganda, we could add in the following additional incentives.

- Regulatory: executive orders and court orders, enforceable power purchase and investment agreements (PPA and IA), independent regulatory authority
- Economic: capacity payments, parallel infrastructure (roads and transmission lines)
- Information: policies, plans and strategies, land and resource registries, independent investment authority, and industry associations.

It was a straightforward process to apply the industrial policy tools (incentives) framework (Framework 1) to the energy sector in Uganda (see Appendix 2).

4.3 What is an applicable typology of sources of capital?

For the sources of capital framework, we built on the typology of instruments developed in a report for the Green Climate Fund (GCF) (Green Climate Fund, 2013) which already included grants, concessional lending (debt), equity instruments and guarantees, by adding in insurance.

These instruments were then sub-divided in terms of the source of capital, be it public or private, and domestic or international. While these categories are not always clear-cut, for example where companies listed on stock exchanges are majority publicly owned or where finance flows through a range of intermediaries, we have made a conservative judgement for each source of capital included in Figure 2. Building on lessons from exercises in tracking private climate finance (Illman et al., 2014; Whitley, 2013b), references are included for each project and company included in the completed framework, so that the underlying information is transparent.

As outlined in the GCF report, each instrument can be applied through a number of modalities (such as credit lines, performance based payments, private public 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.

It was a straightforward process to apply the sources of capital framework (Framework 2) to the energy sector in Uganda (see Appendix 3).

4.4 What multi-year domestic and international data are available for completing the scale of investment framework?

It was anticipated that some of the information would be available at sector and sub-sector within the different international data sets referenced by the OECD in Figure 3, and that this could be used to complement national data.

Though we are unsure if this would be the case across other sectors and countries, it was not possible to complete Framework 3 in our first pilot study in Uganda. This was because of significant gaps in international and national data sets, in terms of both year and sub-sector coverage. It was also not possible to identify levels of private investment in the energy sector beyond FDI, as domestic investment was not covered by any of the national or international data sets.⁶ It was also impossible to find sub-sector information for FDI, with the lowest level of classification in Bank of Uganda statistics being ‘electricity and gas’, which links to the ISIC category limitations outlined above.

Despite these obstacles to data collection, and in order to highlight the trends observed in 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 energy sector as compared with investment to the country as a whole (for national budget, ODA, FDI, OOF and FSF), and investment by sub-sector (for all categories except FDI where this information was not available). Each data provider uses different sub-sector categories, and these have been shown in Appendix 4 to demonstrate the opportunities both for additional investment data collection and transparency, but also for harmonization across data sets.

It remains to be seen if future applications of this methodology will be able to complete information at country and sector level as per Figure 3, or if it is only possible to develop information as per Appendix 4.

4.5 Cross cutting questions of data availability (and 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.

Given the relatively significant levels of information and data sets for energy⁷ (and clean energy in particular) it is anticipated that finding private investment information will be even more challenging for other climate-relevant sectors and sub-sectors (see Figure 1) and also countries outside of the OECD and BRICS.

Our findings are echoed by the Status Report from the Africa EU Energy Partnership (AEEP, 2012), which states that:

- a massive amount of work is required to obtain accurate data on African access, energy efficiency and other indicators

⁶ With support from the UK Department for International Development (DFID), Bloomberg New Energy Finance (BNEF) will be publishing Climatescope data for Uganda, which will cover private investment in the country for some of the sub-sectors and sources of capital in this report. However, it will not be possible to see information on the sources of capital provided by sub-sector as in Appendices 3 and 6. In 2014, Climatescope will be expanded to cover countries in Africa and Southeast Asia. See BNEF (2013) for data and methodology for review of investment in countries in Latin America.

⁷ In addition to BNEF Climatescope data, there are a number of data sources on energy investment including International Energy Agency (IEA), REN 21 (Renewable Energy Policy Network for the 21st Century), International Renewable Energy Agency (IRENA), Ernst and Young RE Attractiveness Index, and the Vivid Low Carbon Economy Index. However, the majority of these sources do not have information at sub-sector level, or are not updated annually, or only cover BRICS and OECD countries.

-
- wide-ranging enquiries have confirmed that even groups of development finance institutions do not yet collate data on their financing flows and outcomes, and that there is no complete record of European commitments to the African energy sector
 - there is no central database from which African budget or other data on energy infrastructure spending can be tracked authoritatively, although the African Development Bank (AfDB) has begun to compile this for 20 countries), and
 - the AEEP Power Projects Database does not yet have the ability to produce accurate numbers, and much more work is needed to identify each of the financial instruments that feed into each of the several thousand projects recorded.

The AEEP Project Database would seem to be an important resource as it tracks 2,700 generation and transmission projects, is continually updated, and follows the Sustainable Energy for All Global Tracking Framework⁸. However, even though this was commissioned by an EU partnership, the information is not publicly available. The private firm that compiled the information now owns the underlying dataset.

As well as seeking to apply the methodology in a number of additional countries and sectors, as an additional next step we propose to look into the following questions on data availability for private climate finance assessments.

- To what extent is investment data for climate-relevant sector 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 and barriers for making information open and transparent?

This work will seek to build on existing open data and data transparency initiatives. One possibility may 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.

⁸ The Sustainable Energy for All (SE4 All) Global Tracking Framework is endeavouring to provide data for every country on the continent, as well as putting in place financial and technical support to produce better quality statistics in countries that have signed up to the SE4 All programme.

5 References

AEEP (2012) 'Energy Business Dialogue Uganda'. Kampala: Africa EU Energy Partnership.

African Development Bank (2012, December) *Joint MDB Report on Mitigation Finance 2011*. Tunis (temporary AfDB HQ): African Development Bank. Available at: <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Joint%20MDB%20Report%20on%20Mitigation%20Finance%202011.pdf>

Bird, N., Tilley, H., Canales Trujillo, N., Tumushabe, G., Welham, B., & Yanda, P. (2013) 'Measuring the effectiveness of public climate finance delivery at the national level'. London: Overseas Development Institute.

BNEF. (2013) 'Climatescope 2013: Assessing the Climate for Climate Investing in Latin America and the Caribbean'. Washington D.C.: Multilateral Investment Fund

Buchner, B., Herve-Mignucci, M., Trabacchi, C., and Falconer, A. (2012) *The Global Landscape of Climate Finance 2012*. Venice: Climate Policy Initiative.

Buchner, B., Herve-Mignucci, M., Trabacchi, C., Wilkinson, J., Stadelmann, M., Boyd, R., et al. (2013) *The Global Landscape of Climate Finance 2013*. Venice: Climate Policy Initiative.

Climate Bonds (2014) 'Climate Bonds Taxonomy'. Retrieved April 2, 2014 from <http://www.climatebonds.net/taxonomy-project/>

Corfee-Morlot, J., Guay, B., & Larsen, K. M. (2009) *Financing Climate Change Mitigation: Towards a Framework for Measurement, Reporting and Verification*. Paris: Organisation for Economic Co-operation and Development.

Forstater, M., and Rank, R. (2012) 'Towards Climate Finance Transparency'. London: Publish What You Fund and aidinfo.

Green Climate Fund. (2013) 'Business Models Framework: Financial Instruments'. Songdo: Green Climate Fund.

High Level Advisory Group on Climate Change Financing (2010) *Report of the Secretary General's High Level Advisory Group on Climate Change Financing*. New York: United Nations.

IFC (2013) *Mobilizing Public and Private Funds for Inclusive Green Growth Investments in Developing Countries: A stocktaking report prepared for the G20 development working group*. Washington, DC: International Finance Corporation.

Illman, J., Halonen, M., Whitley, S., and Canales Trujillo, N. (2014) *Practical Methods for Assessing Private Climate Finance Flows*. Helsinki: Nordic Council of Ministers.

Kreibiehl, S., and Miltner, S. (2013) 'GET FiT in Uganda: Observations & open issues from a financial perspective'. Frankfurt: Deutsche Bank.

Louw, A. (2013) *Development Banks - breaking the \$100 bn-a-year barrier*. London: Bloomberg New Energy Finance.

Mabey, N. (2012, 30 October) 'KfW Entwicklungsbank: Low-Carbon Sector Transformation in Developing Countries'. KfW Workshop: Driving Transformational Change (October 30, 2012). Retrieved 13 January, 2014 from: <https://www.kfw-entwicklungsbank.de/migration/Entwicklungsbank-Startseite/Entwicklungsfinanzierung/Umwelt-und-Klima/Konferenzen-und-Veranstaltungen/Low-Carbon-Sector-Transformation-2012/Mabey-Transformational-Change.pdf>

Mazzucato, M. (2014, 3 February) 'Startup myths and obsessions'. *The Economist*. Retrieved 2 April, 2014 from <http://www.economist.com/blogs/schumpeter/2014/02/invitation-mariana-mazzucato>

Mazzucato, M. (2013) *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. London: Anthem Press.

Montes, M. (2012, July 9) 'Understanding the Long Term Finance Needs of Developing Countries'. Bonn: United Nations Framework Convention on Climate Change. Retrieved 18 December, 2013 from: www.unfccc.int

Nakhoda, S. (2012, 1 August). *Climate conversations - how much money is needed to deal with climate change?* Retrieved 18 December, 2013 from AlertNet: www.trust.org

Nakhoda, S. (2013) 'The effectiveness of international climate finance'. ODI Working Paper 371. London: Overseas Development Institute.

Oil Change International (2012, 3 December) 'Fossil fuel subsidies five times greater than climate finance'. From *The Price of Oil*: <http://priceofoil.org/wp-content/uploads/2012/05/Fossil-Fuel-Subsidies-vs-Climate-Finance-2-pg.pdf>

Pack, H., and Saggi, K. (2006) *The case for industrial policy: a critical survey*. Washington DC: The World Bank.

UNCTAD (1998) *United Nations Conference on Trade and Development. Empirical Evidence of the Benefits from Applying Competition Law and Policy Principles to Economic Development in Order to Attain Greater Efficiency in International Trade and Development* (pp. 23-26). Geneva: UNCTAD.

UNFCCC (2009) 'Report of the conference of the parties on its fifteenth session, held in Copenhagen from 7 to 19 December'. Conference of the Parties to the Kyoto Protocol. Bonn: United Nations Framework Convention on Climate Change.

UNFCCC (2012) 'Report on the workshops of the work programme on long-term finance'. Conference of the Parties, Eighteenth session, Doha, 26 November to 7 December 2012 (p. 30). Bonn: United Nations Framework Convention on Climate Change.

United Nations (2008) 'International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4'. New York: United Nations.

Whitley, S. (2013a) 'At cross purposes: subsidies and climate compatible investment'. London: Overseas Development Institute. Available at:

<http://www.odi.org.uk/publications/7343-subsidies-climate-compatible-investment-fossil-fuel-private-finance>

Whitley, S. (2013b, 11 February). 'Five early lessons from donors' use of climate finance to mobilise the private sector'. ODI blog. London: Overseas Development Institute. Available at: <http://www.odi.org.uk/opinion/7268-climate-finance-private-sector-donor-lessons>

Whitley, S. (2013c) *Time to change the game: fossil fuel subsidies and climate*. London: Overseas Development Institute.

Whitley, S. and Tumushabe, G. (2014) 'Mapping current incentives and investment in Uganda's energy sector: lessons for private climate finance'. ODI Working Paper. London: Overseas Development Institute.

World Bank (2012, December) *Joint MDB Report on Adaptation Finance 2011*. Washington DC: World Bank. Available from: <http://www.worldbank.org/content/dam/Worldbank/document/Joint%20MDB%20Report%20on%20Adaptation%20Finance%202011.pdf>

World Bank (1993) *The East Asian Miracle*. Washington D.C.: The World Bank.

Appendix 1: Climate-relevant sectors⁹

- **Agriculture**
- **Forestry**
- **Extractives**
- **Manufacturing**
- **Energy**
- **Water and Waste**
- **Construction**
- **Transportation**
- **Information and communication technology (ICT)**

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

⁹ Preliminary list based on Climate Bonds Taxonomy and the International Standard Industrial Classification of All Economic Activities, Rev.4 (Climate Bonds, 2014) and (United Nations, 2008).

Appendix 2: Incentives (Uganda, Energy Sector)

(Whitley and Tumushabe, 2014)

Regulatory	<ul style="list-style-type: none"> • UECTL: Power Purchase Agreement (PPA) and Investment Agreement (IA) • Presidential decisions to fast track projects in terms of procurement processes and tendering (large hydro) • Electricity Act – established: <ul style="list-style-type: none"> - ERA with responsibility and guidelines for permitting and licensing (through fair open and competitive processes for transmission sale and distribution) and tariff setting - Rural Electrification Fund - Potential license exemptions for small scale (<2 MW) rural electrification - Cost reflective tariff guidelines • Land Act codified land tenure system • Uganda investment incentives codified in Tax Act (include investment capital allowances, duty and tax free import of plant and machinery, first arrival privileges and export promotion incentives and facilities) • VAT eliminated on imports of solar energy components
Economic	<ul style="list-style-type: none"> • Subsidies from Energy Fund and Rural Electrification Fund <ul style="list-style-type: none"> - Capacity payments for thermal power - Large hydro projects (Karuma dam) - Grid connection for small renewable projects (hydro and bagasse co-generation) - PV Targeted Market Approach (PVTMA) - Support for interconnectors • Renewable Energy Feed in Tariffs (RE FiT) • Global Energy Transfer Feed-in Tariff (GET FiT) • UECCC – loan guarantees • Guarantee of payment (Umeme) • See cost reflective tariffs (more detail ERA) (changed three years ago) • Domestic and International, Private and Public provision of Grants, Debt, Equity, Insurance and Guarantees • Policy Risk Guarantees – (WB support) • CDM and Voluntary Carbon (including via Ci-DEV – KfW and WB)
Information	<ul style="list-style-type: none"> • Uganda Energy Credit Capitalisation Company (UECCC) • Uganda Investment Authority (UIA) • Uganda Renewable Energy Association • REA <i>Department for Off-Grid</i> Renewable Energy • Digitalising land registry (World Bank support) • MEMD developing packaged sites for small hydro to tender (10 in pre-feasibility, and four at FS stage) • MEMD establishing a geothermal resources department (JICA support) • Government visions, policies and plans, and background to budget statements • Climate Technology Initiative’s Private Financing Advisory Network (CTI PFAN) • Support to skills and training (public universities): <ul style="list-style-type: none"> - Makerere University - Master of Science in Renewable Energy, Department of Civil and Environmental Engineering, and Renewable Energy Incubator - Kyambogo University – Faculty of Engineering

Appendix 3: Sources of capital (Uganda, Energy Sector) (Whitley and Tumushabe, 2014)

		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)	Domestic (MEMD and MWE)	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	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	Domestic	Domestic	International (Netherlands, Australia)	Domestic	Domestic (pilot stage)	International (Norway)
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

Appendix 4: Scale of support (Uganda, Energy Sector)

(Whitley and Tumushabe, 2014)

Uganda's sources of finance

(\$ Million - average annual)

National budget
2,302



Energy sector
2%

Energy subsectors

95%	Energy for Rural Transformation II
3%	Petroleum Exploration Promotion
<1%	Petroleum Exploration Production Department
<1%	Headquarters
<1%	Energy Resources Department
<1%	Petroleum Supply Department
<1%	Geological Survey and Mines Department
<1%	Energy Fund
<1%	Operations

ODA
1,679



Energy sector
5%

Energy subsectors

51%	Hydro-electric power plants	<1%	Solar energy
25%	Electrical transmission/distribution	<1%	Biomass
10%	Energy policy and admin. management	<1%	Energy education/training
7%	Headquarters	<1%	Energy research
4%	Power generation/renewable sources	<1%	Nuclear power plants
3%	Power generat./non-renewable sources	<1%	Wind power

FDI
623



Energy sector
31%

Energy subsectors

No information available

00F
89



Energy sector
18%

Energy subsectors

64%	Electrical transmission/distribution
36%	Power generation/renewable sources

FSF
35



Energy sector
38 %

Energy subsectors

93%	Electrical transmission/distribution
6%	Power generation/renewable sources
1%	Energy policy and admin. management
<1%	Biomass



ODI is the UK's leading independent think tank on international development and humanitarian issues.

Our mission is to inspire and inform policy and practice which lead to the reduction of poverty, the alleviation of suffering and the achievement of sustainable livelihoods.

We do this by locking together high-quality applied research, practical policy advice and policy-focused dissemination and debate.

We work with partners in the public and private sectors, in both developing and developed countries.

Readers are encouraged to reproduce material from ODI Working Papers for their own publications, as long as they are not being sold commercially. As copyright holder, ODI requests due acknowledgement and a copy of the publication. For online use, we ask readers to link to the original resource on the ODI website. The views presented in this paper are those of the author(s) and do not necessarily represent the views of ODI.

© Overseas Development Institute 2014. This work is licensed under a Creative Commons Attribution-NonCommercial Licence (CC BY-NC 3.0).

ISSN (online): 1759-2917

ISSN (print): 1759-2909

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0)20 7922 0300
Fax +44 (0)20 7922 0399



This material has been funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.