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# The Landscape of Climate Finance in Germany

Climate Policy Initiative

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Executive Summary

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### Background

A leader in the European transition to a decarbonized society, Germany has set ambitious targets for its contribution to the global fight against climate change. Through the 2010 Energy Concept (*Energiekonzept*) and 2011 decision about the Energy Transition (*Energiewende*), Germany has set goals to reduce greenhouse gas (GHG) emissions 80 to 95% below 1990 levels by 2050, and phase out nuclear energy by 2022 (BMWi 2010).

Achieving these objectives requires significant investments in renewable energy, energy efficiency, and other means of GHG emissions reductions. Public funds cannot finance this transition alone. Hence, it is crucial to understand 1) the current level of investment; 2) potential investment gaps; and 3) how public policies and finance can help create an environment conducive to private investment.

As a first step toward answering these questions, this study assesses how much money is being invested in Germany to reduce GHG emissions. By compiling data from a wide range of sources, we map finance flows along their life cycle, from their sources, to the intermediaries and financial instruments that are applied, to the sectors where the money is used. The result is a first comprehensive snapshot of climate finance in Germany in 2010.<sup>1</sup>

## Who invested how much into what?

1. **Our research suggests that at least EUR 37 billion,<sup>2</sup> or 1.5% of GDP, was invested in 2010 to support the German transition to a low-carbon economy.** This number includes full capital costs for renewable energy and incremental costs for all other investments. Figure ES-1, the German climate finance diagram (also known as the 'German spaghetti diagram') illustrates the current landscape of climate-specific finance flows along their life cycle.
2. **The private sector provided more than 95% of climate finance in Germany, almost half of which was supported by concessionary loans from public banks. Thus, the public sector played an important role in supporting private investment.** The bulk of private money came from corporate investors (EUR 22 billion), led by corporations in the energy sector. Private households invested a significant EUR 14 billion.
3. **Renewable energy generation accounted for the bulk of climate investment in 2010 with EUR 26.6 billion of total capital investment.** Households invested the largest share (37%), utilities, banks, and other financial investors in the energy sector invested 25%, farmers invested 20%, industry and commerce invested 16%, with the public sector contributing the remaining 2%. Small-scale<sup>3</sup> renewable projects, such as residential solar photovoltaic installations, dominated overall renewable energy investment, representing 75% of all investment in renewable energy, while large-scale projects accounted for the remaining 25%.
4. **Energy efficiency amounted to EUR 7.2 billion of incremental investment.** Investments in efficient buildings and appliances accounted for the largest share of energy efficiency investment with EUR 5.8 billion.

1 We generally used data for the year 2010, which is the most recent year for which most of the relevant data is available. We used 2009 data for the industry sector, and for electrical appliances sales and price data from 2007 to 2012.

2 This number only reflects EUR 0.8 billion of national public climate-specific finance. The German government however disbursed a total of EUR 1.2 billion in 2010. The numbers were derived differently. See Box 1 in the main report for a discussion of why we chose to use EUR 1.2 billion in the diagram and EUR 0.8 billion for our total climate-specific investment estimate.

3 For the purposes of this study, small-scale is defined as under 1 MW installed capacity. In 2010, 81% of solar PV capacity was under 1 MW, and 85% were roof-top installations.

## Which key factors supported these investments?

1. **The high share of private investment coincides with significant public incentives such as concessionary loans and the feed-in tariff.** During 2010, when the private sector channeled more than 70% of their climate-specific investments into renewable energy generation, corporations, households, and farmers had access to EUR 11.3 billion of concessionary loans to support their renewable energy investments.<sup>4</sup> In 2010, the Feed-in Tariff (FiT) paid to household and corporate renewable energy generators amounted to approximately 13.1 billion.<sup>5</sup> While this latter amount reflects payments for all renewable electricity fed into the grid in 2010 (and not just capacity built or financed in 2010), the magnitude of the FiT-related finance flow underlines the importance of this instrument for private renewable energy investments. The FiT is funded by the private sector via the FiT premium on electricity bills. Industry is largely exempt from this, leaving the bulk of the cost to households and small and medium enterprises.
2. **Public banks played a key role by providing the concessionary loans described above.** These concessionary loans represented a 43% share of total investment in renewable energy, and 72% of investment in energy efficiency. The main beneficiaries were private households (KfW) and farmers (Rentenbank).

## Was information about climate finance in Germany readily available?

1. **Climate finance is not systematically and comprehensively tracked** in public budgets or by the private sector. There is no established definition of climate-specific finance and — with some exceptions such as programs managed by the Environment Ministry (BMU) and KfW — there is no established process and no common framework for monitoring, reporting, and verification of climate-related expenditures.
2. **There is no systematic and comprehensive assessment of the effectiveness of public (EU and German) climate finance** in achieving GHG emissions reductions, energy efficiency improvements, or renewable energy deployment. Only the effects of single programs (such as the National Climate Initiative or KfW programs) are being evaluated.
3. **Difficulties in accounting for the incremental cost of renewable energy investments hamper comparability of different types of finance flows in Germany.** Due to these difficulties, our report takes both incremental costs (for energy efficiency and other non-energy related means of emission reduction) and investment capital (for renewable energy) into account. Additional efforts will be required to arrive at a comprehensive picture of German climate finance in terms of incremental costs and net flows.

This lack of information is a barrier to optimizing and further developing the most effective policy framework for mobilizing climate finance.

In order to enhance the understanding of the effectiveness of climate finance efforts, Germany as well as EU Funds need a more comprehensive system of monitoring, reporting, and verification (MRV), which will require improved definitions, more coordinated finance tracking efforts, and more and better access to information.

4 The estimate is conservative in that it does not include concessionary loans from public state level banks.

5 The FiT affects cost-benefit ratios of renewable energy projects in Germany eligible for this tariff. Payments in relation to the FiT are considered separate from actual renewable energy investments in 2010.

## Open questions and policy implications

Our report about the German climate finance landscape raises important questions with clear policy implications:

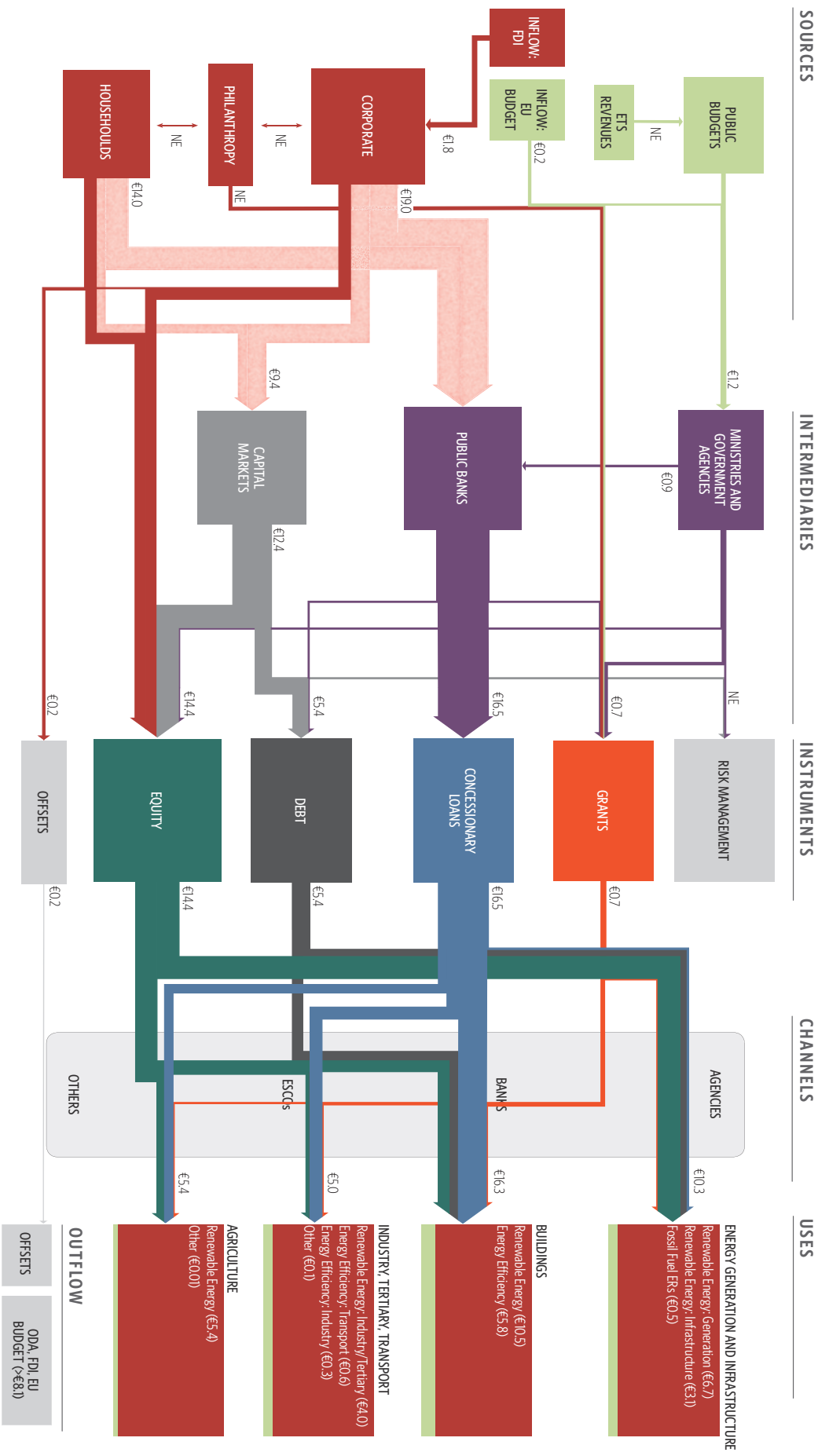
- **Is there a good balance between small- and large-scale renewable investments?** Large-scale renewable energy generation investments currently trail small-scale renewable energy investments. Further analysis is needed to understand whether a continuation of the current ratio represents a cost-effective approach to achieve the ambitious long-term renewable energy targets.
- **What is the optimal allocation between investments in renewable energy generation, and investments in electricity transmission and distribution networks?** Germany's ambitious energy and climate targets require both types of investments. Our estimates of energy sector investment suggest a potential imbalance, raising the question as to whether electricity networks and their rate of expansion will be able to accommodate the expected growth of renewable energy at the available capacity. More analysis on this question is necessary.
- **Are financial flows being used effectively, and do they address the challenges posed by climate change?** The question of policy effectiveness (including the effectiveness of EU finance to Germany) is the biggest gap in Germany's climate finance landscape. To ensure that public money is spent wisely, and to mobilize additional private finance, we need a better understanding of the effectiveness of policy and financial instruments at EU, national, and sub-national levels.

## Outlook

As the first comprehensive picture of climate finance flows in Germany, this study lays the groundwork for the academic, economic, and political discourse around German climate finance. It also takes the first step toward identifying key issues and solutions for climate finance tracking in Germany. A better understanding of the effectiveness of policy and financial instruments, including the role of different instrument mixes and how these instruments are viewed by different investors, will be fundamental for building an adequate and effective financing framework for the German *Energiewende*. In addition, rigorous monitoring, reporting, and verification, and systematic effectiveness analysis can assist learning, planning, and budgeting at the country level and drive effectiveness improvements in climate policy and finance.

CPI will continue to engage with partners and stakeholders to enhance the understanding and transparency of Germany's climate finance landscape.

# THE GERMAN CLIMATE FINANCE DIAGRAM: CLIMATE-SPECIFIC INVESTMENTS IN 2010 (EUR BILLIONS)



**KEY**

- PUBLIC MONEY
- PRIVATE MONEY
- PUBLIC INTERMEDIARIES
- PRIVATE INTERMEDIARIES
- DEBT OWED

Notes: Figures for Renewable Energy (RE) represent total capital investment, and figures for Energy Efficiency (EE) and Other represent incremental cost. Budget includes federal budget disbursement for the year 2010 for tangible climate-specific investment but does not include public procurement, or administrative costs. Data about state- and municipal-level investments are not covered except when reported at the national level. In 2010, the government also supported private actors that made investments prior to 2010. This is the main reason why disbursements from the government "at the source side" (above shown, EUR 12 billion) differ from public spending "at the use side" (EUR 0.8 billion). Debt owed does not represent the actual finance flows (e.g. debt repayment), but is shown to highlight the original investors or asset owners who make use of Public Banks or Capital Markets as financial intermediaries. Buildings only include investment in residential buildings. Tertiary includes investment in renewable energy generation only. Shading on Use boxes represent the split of private (red) to public (green), but are not to scale.

