

# Climate and energy investment map in Germany

Status report 2016 - executive summary

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## Executive summary

Addressing climate change will require the redistribution of investment towards climate-friendly solutions as well as an overall increase in such investment. As one important element in addressing this challenge in the European Union (EU), the Regulation on the Energy Union Governance requires the EU Member States to create national energy and climate plans (NECPs). These must include details on current investment flows to the decarbonisation of Member State economies.

**The present report aims to contribute to the discussion of current climate and energy investment in Germany** by evaluating recent data for 2016 and comparing it to a similar assessment conducted for 2010 (Juergens et al. 2010). The report is also intended to assess whether the methodological and data challenges encountered in such assessments have changed since 2010.

**The principal output of this report is a climate and energy investment map (CEIM) for Germany for the year 2016 presented below.** This map provides a snapshot of climate and energy investment flows, from the sources of capital, through the relevant intermediaries and financial instruments, to the recipient sectors.

The map was created using a **bottom-up approach**, tracking **actual 2016 disbursements** at a technology level and aggregating them at sector and then country level. We considered only climate-specific **tangible investment** (i.e. energy-efficient equipment, infrastructure, buildings, and renewable energy technologies targeting or resulting in greenhouse gas (GHG) emissions reductions and/or increases in carbon sinks). Soft measures (i.e. research and development, information campaigns, and policy development) play a key role in driving the energy transition and climate-change mitigation; however, these were excluded from our analysis.

**The map reflects both total capital investment and incremental investment.** The incremental investment represents the additional expenditure necessary to invest in a low-carbon technology rather than a business-as-usual practice. Total capital investment reflects the full cost of a technology or practice.

Based on the climate-specific investment flows traced here, **we observe a 16% increase in the volume in 2016 (EUR 42.7 billion) relative to 2010 levels (EUR 36.7 billion).** These volumes reflect the share of incremental investment in energy efficiency (EUR 8.5 billion), the total investment cost of renewable energy deployment (EUR 25.0 billion), and the total investment cost of non-energy-related mitigation and cross-cutting measures (EUR 9.3 billion). Relative to 2010 investment, the **volume of flows to renewable energies** decreased by 6%, while **the volume of flows to energy efficiency** increased by 18%.

We calculated total investment<sup>1</sup> in energy efficiency (EUR 29.0 billion) for 2016, as well as the incremental share of investment cost reflected in the comparison above (EUR 8.5 billion). Total investment across all technologies (including energy efficiency, renewable energy, and non-energy-related mitigation and cross-cutting measures) was EUR 63.2 billion in 2016. The report text provides an analysis of the total investment volume, except where stated otherwise.

**The private sector accounted for 83% of total investment** (EUR 52.3 billion); the remaining 17% originated in the public sector (EUR 10.9 billion). Corporate actors remained by far the largest private investors (EUR 35.2 billion), followed by households (EUR 17.2). In the public sector, the German government budget played the largest role (EUR 4.2 billion), followed by the EU budget (EUR 2.7 billion).

Germany is characterised by strong public promotional banks at federal level (e.g. KfW, Rentenbank, sixteen state-level promotional banks, and a large number of commercial banks). Our study indicates that public banks played a large role in providing means to finance climate-change mitigation measures and the energy transition. Altogether, they disbursed EUR 32.3 billion to support climate-specific investment. We were unable to evaluate the role of commercial banks due to the limited availability of relevant data.

In 2016, both **low-cost debt** (EUR 32.0 billion) and **grants** (EUR 4.7 billion) **offered by public actors played an important role in driving climate investment**. Due to the lack of data, there is significant uncertainty around the EUR 26.6 billion delivered through other financial instruments, such as balance-sheet financing, project-level equity, and market-rate debt.

The sectors that attracted **the largest share of investment were the buildings sector** (total: EUR 35.1 billion, incremental: EUR 14.6 billion) **and the energy generation and transmission sector** (total: EUR 17.1 billion). These sectors are also those with the highest sector-specific targets for GHG emission reductions by 2030 (BMU 2016a), namely 66–67% for buildings and 61–62% for energy. However, total investment volumes do not measure effectiveness in actual GHG reductions, and care should be taken in assessing such volumes in relation to GHG emissions-reduction targets. Other sectors that attracted less climate and energy investment include the agriculture (total: EUR 5.8 billion), transport (total: EUR 1.1 billion), and industry (total: EUR 945 million) sectors, as well as cross-cutting measures (total: EUR 3.2 billion).

Challenges associated with data availability and format make a comprehensive and unbiased overview of climate finance in Germany impossible. Future climate and energy investment **assessment exer-**

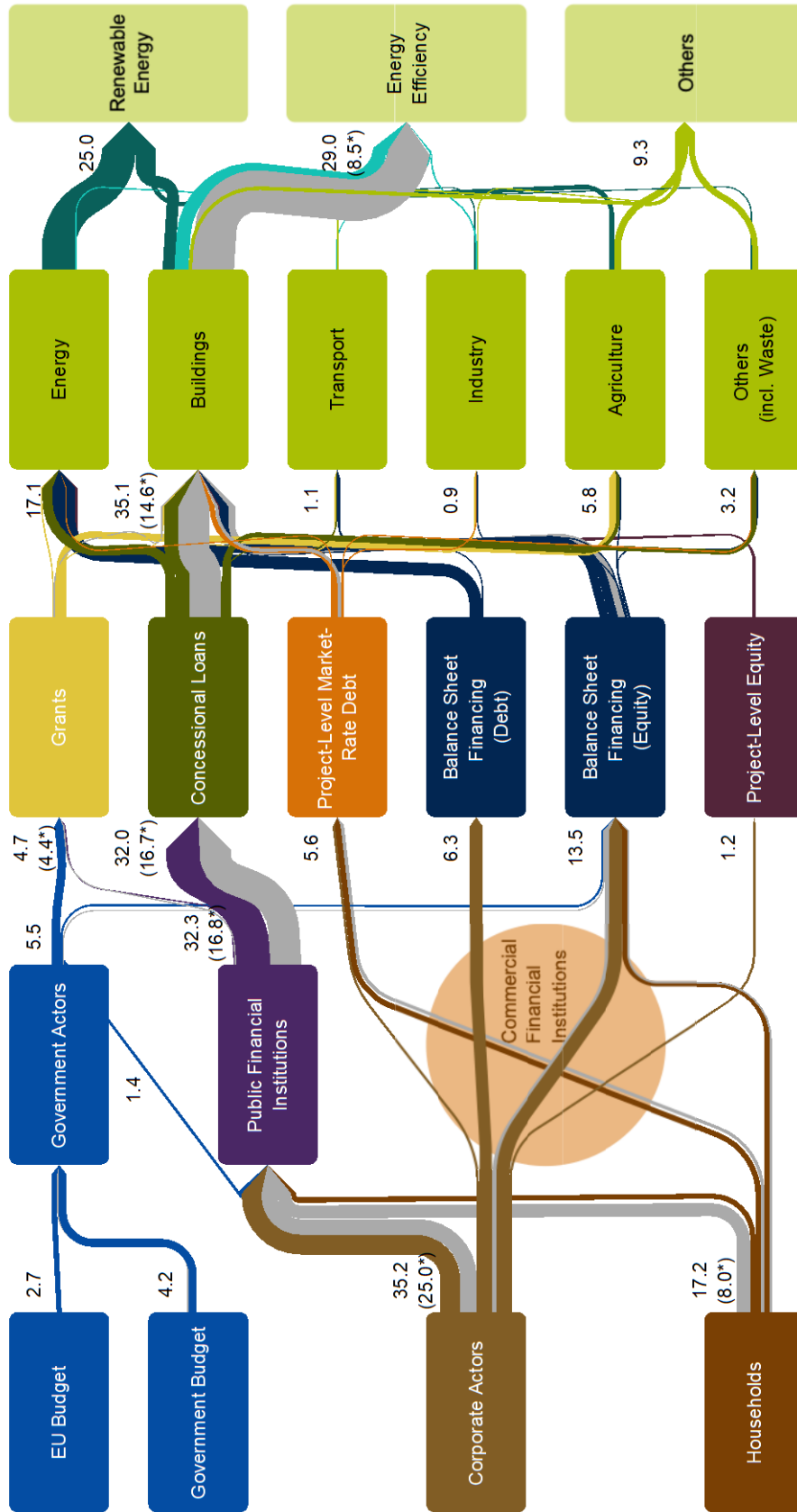
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<sup>1</sup> Except for household electrical appliances in the buildings sector, blast furnaces, or newly built power plants used in manufacturing, for which the incremental cost was included in the total investment figure.

**cises would benefit from the introduction of systematic tracking procedures for domestic public climate finance that covers federal, regional, and local government budgets and climate programmes implemented by public banks and agencies.** Possible approaches to such procedures include the introduction of climate tagging in public budgets and/or the establishment of annual evaluation procedures. In addition, **investment assessments could be improved by evaluating and streamlining existing private-sector surveys and reporting efforts with the government's climate-investment tracking approaches.**

There is also a need for further debate on **what constitutes climate finance at the domestic level.** The discussion should address **how and to what extent climate-related measures such as infrastructure projects should be accounted for.** Similarly, **practicable approaches to calculating incremental costs of climate investment,** especially in the building sector, should be developed further to prevent over- or underestimating related investment. In establishing a comprehensive and consistent tracking approach for Germany, it will be useful to review the lessons learned from relevant legislation implemented elsewhere, such as in France, and from the application of climate markers by the EU Commission.

# The 2016 Climate and Energy Investment Map for Germany (EUR billions)



**Notes:**

a) All financial flows except for the grey ones represent total tangible investment including public support into the reduction of GHG emissions and increase of carbon sinks with two exceptions, namely electrical appliances in the building sector, as well as blast furnaces and new power plants in manufacturing. The grey flows represent incremental investment into energy efficiency of buildings. Financing of intangible measures was excluded.

b) The government budget includes federal budget disbursements and co-financing of EU funds to support the investment in 2016, but it excludes public procurement and administrative costs. Regional and municipal investments are not covered, except when reported in the EU/federal budget, KfW and BAFA programmes.

c) Debt owed does not represent the actual finance flows (e.g. debt repayment), but it is shown to highlight the original investors or asset owners who make use of public and commercial financial institutions as financial intermediaries. The map includes only primary investment flows, e.g. the resources available to investors at the time they had to cover for their capital expenses. It does not cover therefore such financial instruments as guarantees, green bonds, the cost of capital or debt repayment by investors, the compensation payments from the public budget to energy generators supplying renewable electricity under the feed-in tariff, and others.

d) The following differences between 2010 and 2016 reports affect the finance volumes:  
 a) In this report, we account for total and incremental cost of energy efficiency investment into the building sector. This allows to add up investment across sectors and to compare 2010 and 2016 figures.  
 b) In 2016, investments in non-residential buildings are reflected under "Buildings" instead of consolidating it under "Industry, Transport" as in Jürgens et al. 2012.  
 c) We acknowledge the application of the climate markers to track climate expenditure of the EU funds targeting the energy, transport and agricultural sectors in 2016, while Jürgens et al. 2012 applied the same definition of climate finance to all sources of finance and sectors. This change leads to an increase of estimated grant volume by EUR 2.3 billion in 2016.  
 d) The instrument "Equity" used in 2010 is now split up into "Balance Sheet Financing (Debt)", "Balance Sheet Financing (Equity)", and "Project-level Equity".  
 e) We now account for investments into technologies and measures related to the waste sector, which adds another EUR 1.0 billion EUR to the total volume reflected in the 2016 CEIM for Germany.

