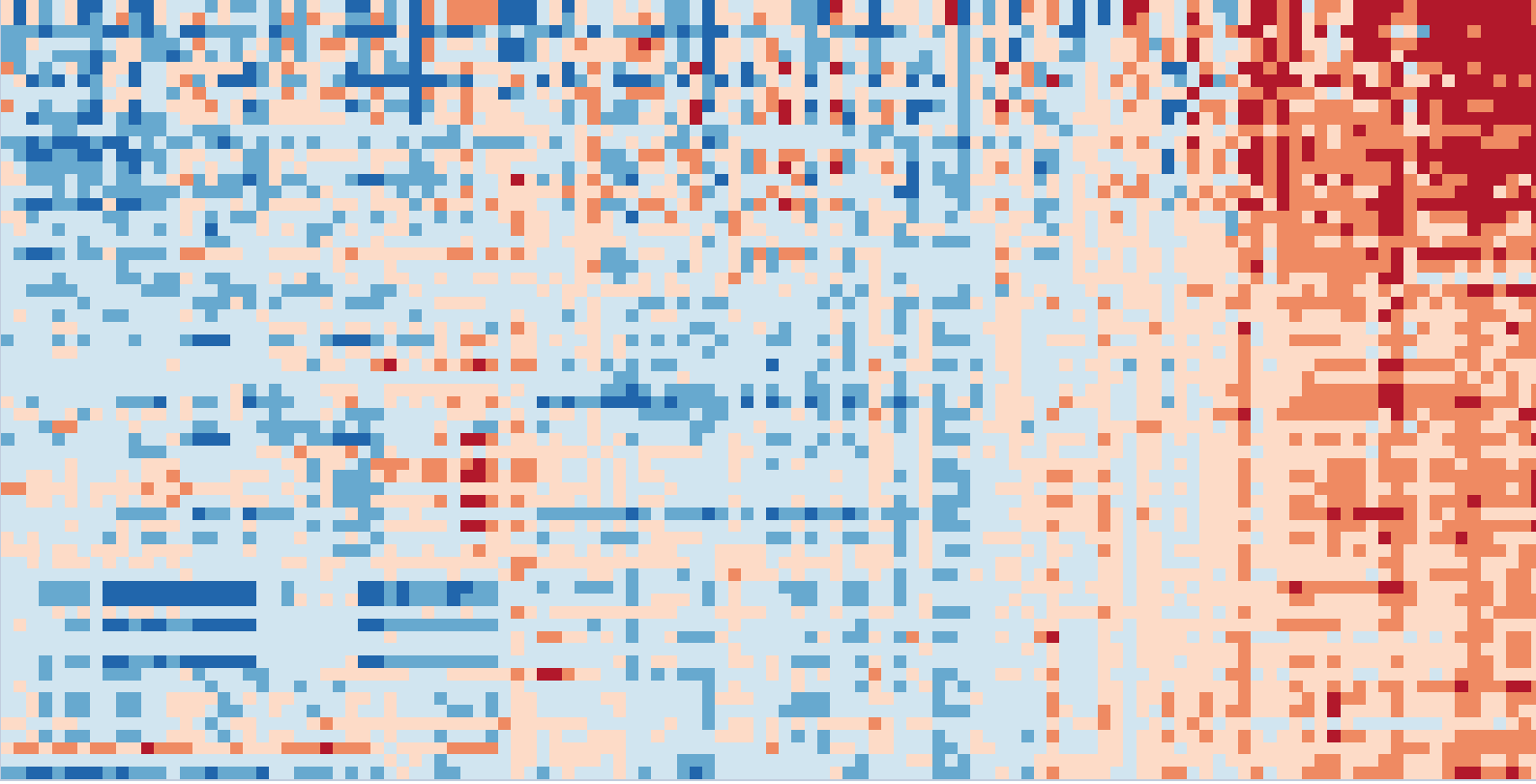

CLIMATE CHANGE MITIGATION THROUGH DEVELOPMENT COOPERATION

Contribution of German development cooperation to mitigating greenhouse gas emissions in developing countries

2024

DEval
GERMAN INSTITUTE FOR DEVELOPMENT EVALUATION

This evaluation presents evidence on climate policy interventions by the BMZ, Germany and the OECD donor community.

According to reporting, Germany provides a fair share of climate-relevant development finance and fulfils international agreements and self-imposed targets. However, the overall investment needs are significantly higher, while there are increasing indications that too many interventions are being declared to be climate-relevant. Private capital mobilisation is also only average.

When distributing mitigation-relevant development cooperation, the BMZ is guided by socio-economic need and the political-institutional framework conditions. The objectives of the partner governments are often supported. In contrast, the potential for mitigation is less relevant. The analysis shows that development cooperation reduces emissions best when climate change mitigation is pursued as the principal objective or the energy sector is addressed.

The BMZ is recommended to continue to strive for a fair contribution to mitigating greenhouse gas emissions, to act in a partner-orientated manner and to substantially promote the effective and impactful portfolio. In order to be able to make statements on the emission-mitigating effect of (groups of) development interventions, the GIZ and KfW should in future record mitigation effects at module level in a valid and more precise manner.

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IMPRINT

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The German Institute for Development Evaluation (DEval) is mandated by the German Federal Ministry for Economic Cooperation and Development (BMZ) to independently analyse and assess German development interventions.

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EXECUTIVE SUMMARY

Background

The international community has set itself ambitious targets for climate change mitigation in the Sustainable Development Goals (SDGs), the 2030 Agenda and the Paris Agreement (UNFCCC, 2015). The most important goal is to limit the global temperature increase to well below 2 °C and, if possible, below 1.5 °C compared to pre-industrial times. In order for the objectives to be achieved, a transformational change towards climate-neutral, inclusive, equitable, resilient and sustainable development pathways needs to take place quickly and in the near future (Climate Investment Funds, 2021; IPCC, 2022a: 298; UNFCCC, 2023a).

The ambitions and implementation of Nationally Determined Contributions (NDCs) are currently insufficient to achieve the climate targets (UNFCCC, 2023b). Average annual global greenhouse gas (GHG) emissions in the period from 2010 to 2019 were higher than ever before in human history (54.6 ± 5.55 GtCO2e), and they continue to rise. In 2022, they were 37 percent higher than in 2000 (UNEP, 2023).

Development cooperation (DC) can contribute to the mitigation of GHG emissions in developing countries. For the Federal Ministry for Economic Cooperation and Development (BMZ), the topic of "climate and energy" is one of six core areas. The BMZ aims to strengthen capacities and institutions for the creation and implementation of climate-relevant policies, support a fundamental system change towards climate neutrality with a transformational climate portfolio, meet the increasing energy demand with a climate-neutral energy supply and make cities sustainable and climate-neutral (BMZ, 2021).

In addition, the DC places further demands on the mitigation-relevant DC. As a signatory to the 2030 Agenda, the Federal Government is committed to leaving no country or population group behind (leave no one behind) (BMZ, 2021; UN, 2015a). The BMZ therefore also supports the just transition approach, which aims to shape the transition to a climate-friendly economy and way of life and pursue the goal of compensating as far as possible for social disadvantages that are caused or exacerbated by the change in the economic structure, for example in the energy sector (BMZ, 2022a). Supporting this approach is a prerequisite for effective transformational change (IPCC, 2022a: 412).

Objectives, purpose and object of the evaluation

The aim of the evaluation is to assess the relevance, effectiveness and overarching development impact of mitigation-relevant DC under the political responsibility of the BMZ. Beyond the DC for which the BMZ is responsible, the evaluation also makes statements about the impacts of German and international DC relevant to mitigation. The data currently available is not sufficient for a comprehensive assessment of efficiency. However, proposals are being developed that could make this possible in the future.

The purpose of the evaluation is to further develop German mitigation-relevant DC, in particular through the evidence-based implementation of the BMZ core area strategy "Responsibility for our Planet – Climate and Energy". This will supplement the DEval evaluations on interventions for climate change adaptation (Leppert et al., 2021; Noltze et al., 2023a, 2023b; Noltze and Rauschenbach, 2019), access to (green) energy in rural Africa (Rauschenbach et al., 2024) and the circular economy (Guffler et al., in publication) as well as the synthesis study on the German contribution to the REDD+ forest and climate protection programme (Reinecke et al., 2020).

The evaluation examines climate policy interventions by the BMZ, Germany and the members of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD) to mitigate GHG emissions. This includes the scope of Germany's climate- and mitigation-relevant development finance as well as the scope and distribution of BMZ funds. It also analyses the causal pathways and the climate-relevant effects and impacts of development finance by OECD-DAC member states and specifically Germany.

Evaluation questions (EQs)

Firstly, the evaluation assesses the extent to which German DC fulfils international agreements, meets the goals it has set itself and takes partner priorities into account. The subject of international agreements as well as national objectives is first of all a balance between the funding of interventions to mitigate climate change and those to adapt to its consequences. Two funding objectives are also relevant:

1. The German Federal Government aims to increase climate finance for developing countries from budget funds to at least EUR 6 billion per year by 2025 at the latest.
2. The Federal Government has made an international commitment to make a fair contribution to the industrialised nations' goal of increasing international climate finance to USD 100 billion per year from 2020.

Whether these targets are considered to have been achieved depends largely on whether funds are reported as being relevant to mitigation. On the one hand, this evaluation highlights the challenges of transparency and accountability by analysing the extent to which it is plausible to identify mitigation-relevant interventions using the Rio markers. On the other hand, it shows how difficult it is to precisely determine the level of public commitment in the climate sector in a universally recognised way. Four forms of reporting are compared: the official (international) climate reporting to the European Environment Agency of the European Union (EU) and the United Nations Framework Convention on Climate Change (UNFCCC), the reporting on DC to the OECD as part of the Creditor Reporting System and the BMZ data in the Modular Extensible Management Financial Information System (MeMFIS).

As public funds are not sufficient to achieve the climate targets, this evaluation also includes private capital mobilisation through the BMZ's fund and direct holdings. This is complemented by an analysis of the extent to which funds from bilateral German mitigation-relevant climate finance match the needs expressed in the NDCs of partner governments.

Evaluation question 1 (Relevance): To what extent is the mitigation-relevant portfolio aligned with international agreements and the priorities of the development partners and the German Federal Government?

The second evaluation question revolves around the criteria according to which the BMZ distributes mitigation-relevant development finance. In particular, the evaluation considers possible connections between allocation decisions on the one hand and the mitigation potential, need and political-institutional framework conditions in developing countries on the other hand.

Evaluation question 2 (Relevance): To what extent is the BMZ's distribution of mitigation-relevant development finance aligned with the mitigation potential, taking account of the need of development partners?

Thirdly, the evaluation investigates the extent to which mitigation-relevant development finance contributes to the reduction or avoidance of GHG emissions. It not only examines the achievement of objectives (effectiveness), but also analyses the contribution to GHG emission mitigation (impact). The focus of this analysis is on the BMZ "Energy" funding area (which covers energy generation, distribution and efficiency). This addresses a "key sector for climate change mitigation" (BMZ, 2021: 23), and it is where developing countries articulate the majority of their needs for mitigation interventions. It also accounts for almost half of bilateral BMZ development finance relevant to mitigation.

Evaluation question 3 (Effectiveness): To what extent are the intended objectives (outcomes) of the BMZ's German mitigation-relevant development finance in the "Energy" funding area achieved?

Evaluation question 4 (Impact): To what extent is the overarching development impact of GHG emission mitigation achieved through German mitigation-relevant development finance in the "Energy" funding area?

Fourthly, the evaluation identifies prerequisites for evaluating the efficiency of mitigation interventions. For this purpose, it examines the current reporting on the standard indicator for the quantity of reduced or avoided GHG emissions by the two largest implementing organisations – the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and KfW Development Bank (KfW). Due to a lack of suitable data, it does not assess efficiency.

Evaluation question 5 (Efficiency): What are the requirements for evaluating the efficiency of development interventions to reduce and avoid GHG emissions and how can these be met by improving reporting?

Methods

This is a macro-quantitative evaluation. Many cases or observations are compared using predominantly statistical methods, based largely on existing data.[1] The identification of average associations and the derived evidence on causal relationships at an aggregated level can yield useful information for strategic decisions and in particular for portfolio management. Macro-quantitative analyses can also uncover abstract causal relationships and thus reduce complexity. Specifically, eight analyses were carried out (see Box 1).

Box 1 Analyses

- Descriptive portfolio analysis of the amount and distribution of public funds in the climate sector
- Machine classification (natural language processing) of mitigation-relevant interventions based on their brief descriptions in combination with a qualitative analysis of a sample to test the Rio markers
- Statistical comparison of all fund and direct holdings managed by the KfW on a fiduciary basis since 2017, regardless of whether or not they relate to mitigation, for the analysis of private capital mobilisation
- Statistical comparison of the sectoral distribution of mitigation-relevant development finance with the conditional targets set out in NDCs to determine partner orientation
- Inferential statistical analysis of which countries receive bilateral, mitigation-relevant official development assistance (ODA), with what probability and to what extent, in order to assess the distribution of mitigation-relevant development finance
- Synthesis of scientific findings on DC interventions in order to better understand causal relations and create valid models for them
- Descriptive and inferential statistical analysis of the extent to which mitigation-relevant development finance disbursements are linked to changes in the energy system and GHG emissions
- Qualitative analysis of KfW and GIZ reporting on the standard indicator "quantity of reduced or avoided GHG emissions" with regard to the requirements for evaluating allocation efficiency

[1] Many DEval evaluations that have already been published use macro-quantitative methods (Noltze and Rauschenbach, 2019; Wencker, 2022; Wencker and Verspohl, 2019).

Findings, conclusions and recommendations

Mitigation funding

Germany is one of the largest donors of public climate-relevant development finance. According to its own data, Germany – and the BMZ in particular – contributed a total of EUR 9.96 billion in 2022 from budget funds including grant equivalents, market funds mobilised the by the KfW and DEG, and mobilised private climate finance to achieve the goal of industrialised countries to provide developing countries with USD 100 billion annually for climate change mitigation and adaptation as of 2020 (BMZ, 2024a). The share from budget funds including grant equivalents totalled EUR 6.39 billion.

In view of Germany's contribution to global warming to date and its current capabilities, Germany's share appears fair, that is, in line with the principle of common but differentiated responsibilities set out in Article 3(1) of the UNFCCC. Scientific studies estimate Germany's share of the USD 100 billion target to be just over 8 percent on average. Germany is also one of the most important donors in terms of climate-relevant development finance, which is provided with the main aim of promoting economic and social development. However, the figure of USD 100 billion is well below the investment needs identified in the global stocktake of the Paris Agreement. Future commitments are likely to depend on the negotiations of the UNFCCC on the New Collective Quantified Goal on Climate Finance (NCQG) in the context of the Conference of the Parties (COP29).

Apart from the financial targets, the decisive factor is ultimately the mitigation achieved. There is no doubt that climate finance is an essential tool for climate change mitigation, as this evaluation also shows. The current debate is focussing on funding objectives, the time frame, possible sources and the distribution of the funding burden. The mitigation achieved takes up comparatively little space.

The BMZ is succeeding in its efforts to achieve an almost equal distribution of mitigation- and adaptation-relevant development finance through bilateral commitments from budget funds from 2011 to 2021 (see also Noltze et al., 2023b). The ministry is therefore achieving its goals in this respect. However, this only slightly affects the enormous imbalance of all public and private financial flows aimed at low-carbon and climate-resilient development in favour of mitigating GHG emissions. If the activities of companies, households, financial institutions and banks are also included, only 5 percent of these are relevant to adaptation, according to Buchner et al. (2023).

However, these overall positive results for mitigation funding are relativised by doubts about the reporting. In line with many other studies, analyses performed as part of this evaluation indicate that the Rio markers for climate change mitigation (KLM) are assigned too frequently and sometimes too high. In addition, the way in which grants and loans are counted must always be taken into account when assessing the achievement of objectives. This primarily concerns the question of whether loans subject to repayment should be recognised as funding in their entirety or whether this should only apply to the financial advantage resulting from the interest rate reduction compared to market conditions.

In addition to public funding, the joint commitment of public and private sector stakeholders is a key factor in achieving the climate targets. However, this evaluation shows that – despite the interest in impact-oriented investments in the area of "climate change mitigation and clean energy" – private capital mobilisation in this area is no more successful than in comparable cases in other focus areas. The renewable energy sector continues to be characterised by an imbalance between demand and investment, particularly in developing countries (IEA, 2024). Considering the financial challenges and in view of private investment, market opportunities, innovation potential and the future security, a greater priority needs to be assigned to clean technologies.

Irrespective of the mobilisation of private capital, an appropriate partner orientation should contribute to a more effective and efficient use of limited financial resources.

There is a double finding here. On the one hand, the majority of German mitigation-relevant development finance is provided in line with the partner governments' NDCs. On the other hand, there are no indications in the statistical country comparison of this evaluation that allocation decisions by the donor community are actively orientated towards this, as agreed in the Paris Agreement.

The findings with regard to the amount, balance, leverage effect and partner-orientation of mitigation-relevant DC give rise to the following recommendation:

Recommendation 1: The BMZ should uphold its commitments to make a fair contribution to mitigating GHG emissions, in line with the principle of common but differentiated responsibilities and capacities, and continue to align its commitments with the NDCs in order to achieve the goals of the Paris Agreement.

When implementing the recommendation, the BMZ could (1) focus more on verifiable mitigation impacts in addition to climate finance objectives; (2) further improve the transparency and validity of reporting; (3) continue to work towards a stronger partner orientation of the donor community in line with the NDCs, hereby maintaining and strengthening the principle of self-determination of the NDCs; (4) systematically ensure that the distribution of mitigation-relevant DC is oriented towards partner priorities and that the achievement of the NDCs is supported; (5) strive to make better use of the comparative advantages in the area of mitigating GHG emissions in private capital mobilisation and carry out an analysis of the risk-specific mobilisation effect. Existing structures such as the Just Energy Transition Partnerships and the private capital mobilisation staff can be utilised.

Distribution patterns of mitigation-relevant development finance

When distributing mitigation-relevant development finance, the BMZ focuses more on countries' socio-economic need than on their mitigation potential. This means that poorer countries receive more frequent and higher commitments. In addition, the ministry works more frequently with technological pioneers, including countries that patent low-carbon energy technologies. However, there is hardly any evidence to suggest, for example, a focus on a lack of efficiency in energy supply or high per capita emissions.

With regard to the political-institutional framework conditions, it can be seen that democracies receive more frequent and higher commitments, and are therefore systematically favoured over autocracies. In contrast, there is at best weak evidence for an orientation towards governance, conflict intensity or the number of women in parliament.

Due to the long-term negative consequences of climate change and the effects and impacts of mitigation-relevant development cooperation identified in this evaluation, a reduced commitment to mitigation-relevant DC in favour of other development goals does not appear to be expedient. However, the distribution of mitigation-relevant DC requires careful consideration of several interlinked and potentially conflicting objectives, in particular national economic development and global climate change mitigation. The urgency, risks and uncertainties of climate change and climate change mitigation must be taken into account. It is therefore hardly possible to make generally valid recommendations.

When weighing up strategic allocation decisions, the nexus between socio-economic development and the promotion of global public goods must be taken into account. For example, climate change mitigation is particularly efficient where the costs of avoiding emissions are low, but this would imply neglecting poorer countries with mostly low GHG emissions. As a result, opportunities for growth may be missed, as climate change mitigation can promote socio-economic development through greater resource efficiency, the scaling effects of new technologies, increasing productivity and innovations. A purely efficiency-orientated approach that exempts mitigation-relevant interventions from the development proviso could, in extreme cases, also violate

the do-no-harm principle due to negative externalities. In the light of a multidimensional understanding of development, which pursues coherent and integrated policies to achieve the SDGs as important norms, such an approach does not appear feasible.

The aim of international and German DC is a holistic approach to sustainable development that encompasses both climate change mitigation and socio-economic development. This gives rise to the challenge of distributing scarce DC funds in such a way that climate change mitigation and development goals are achieved in a balanced manner. One possible way of utilising synergies here is to align mitigation-relevant development cooperation with a fundamental change in climate-relevant systems that makes extensive positive contributions towards inclusive, climate-neutral, equitable, resilient and sustainable development pathways. German DC has also set itself the objective of enacting transformational climate policy.

In addition to these synergy effects, there are also potential conflicts of objectives relating to inequality that are relevant for strategic allocation decisions. Climate change mitigation can increase consumption and production costs in the short term, which disproportionately penalises poorer population groups. The just transition approach can be used to take this into account in the allocation. It aims to offset the negative social consequences of climate change mitigation and thus reduce potential conflicts of objectives.

Based on the analysis of the distribution of mitigation-relevant development finance, this evaluation reaches the conclusion that the requirement to focus on mitigation potential, need and suitable political-institutional framework conditions is partially fulfilled. The evaluation gives rise to the following recommendation:

Recommendation 2: When distributing mitigation-relevant DC, the BMZ should more specifically consider the synergies and conflicts of objectives between promoting socio-economic development and mitigating GHG emissions in order to minimise potential conflicts of objectives and maximise possible synergies.

In implementing the recommendation, the BMZ could (1) recognise the conflicts of objectives and the synergies between key development results even more strongly by using up-to-date, well-founded, complexity-reduced descriptions of these areas; (2) deal more systematically with the conflicts of objectives and the synergies and, if conflicts of objectives exist, focus mitigation-relevant development finance more strongly on mitigation potential, in the process mitigating possible short-term negative impacts of mitigation interventions through accompanying interventions based on the just transition approach and, at best, creating new socio-economic synergy effects or strengthening existing ones; (3) further promote transformational approaches to utilise synergies, including comprehensive risk management, climate and development partnerships, partnership-based and donor-coordinated approaches such as the NDC Partnership, and a cross-ministry environmental policy.

Effectiveness and impact of mitigation interventions

In order to understand the effects and impacts of mitigation-relevant DC, it is first of all important that there is sound scientific documentation of the effectiveness and impact of several groups of interventions that development cooperation aims to promote. The evidence synthesis of this evaluation sums this up for seven groups of interventions:

- **Technological and infrastructural interventions** promote direct investment and infrastructure programmes as well as the introduction of new technologies, processes or practices, thereby increasing renewable energy generation capacity, energy efficiency and the effective use of low- and zero-carbon energy sources.
- **Economic interventions** such as carbon taxes and emissions trading systems are particularly effective.
- **Institutional interventions** such as the establishment of institutions and governance structures strengthen state capacities and thus create the framework conditions for the implementation of mitigation interventions.
- **Regulatory interventions** effectively contribute to the avoidance of GHG emissions through the introduction of performance and technology standards.

- **Climate change mitigation strategies and laws** are used to set emissions targets, promote cross-sectoral approaches and improve the political framework conditions for climate change mitigation in the long term.
- **Voluntary interventions** contribute to mitigating GHG emissions through voluntary commitments and agreements. One example is the global "C40 Cities" network, in which cities enter into voluntary agreements.
- **Information-based and behaviour-changing interventions** improve access to information and influence the behaviour of target groups to mitigate GHG emissions.

As the results of this evaluation show, the extent to which mitigation-relevant DC succeeds in promoting these interventions varies. There is particular evidence of a favourable effect for technological and infrastructural interventions. Specifically, it can be seen that disbursements of mitigation-relevant DC are linked to a growing share of renewable energies in electricity generation in partner countries. The benchmark of decarbonising the energy supply through mitigation-relevant development finance in the "Energy" funding area is therefore partially fulfilled.

Irrespective of specific impact pathways, the results of this evaluation show that both DC with the principal objective of mitigating GHG emissions and mitigation-relevant DC in the energy sector go hand in hand with emission mitigation by development partners. This emission mitigation relates to greenhouse gases that are produced when converting existing energy into electricity or heat as well as when storing, transporting and distributing energy. However, there are no comparable effects for the total mitigation-relevant DC. This is primarily due to the fact that the funding of interventions that aim to mitigate GHG emissions as a significant objective does not go hand in hand with emission mitigation. This could be because the distribution of these funds is based more on need. In addition, significant objective interventions could be less climate-relevant than reported. The results of the Rio marker assignment support this interpretation, demonstrating that the climate relevance of significant objective interventions is not always clear. One explanation as to why interventions in the "Energy" funding area are effective can be found in the results of the analysis of effectiveness, as this funding area more frequently implements direct interventions (technological and infrastructural), which the analysis of effectiveness shows to be effective.

The evidence synthesis of this evaluation indicates that democracies and well-governed countries are comparatively better at mitigating emissions. Democracy is crucial for climate change mitigation, and democracies adopt more ambitious climate policies compared to autocracies. This could be because democracies are accountable to large majorities or the electorate as a whole and prioritise public goods over private goods. Good governance and political stability also often correlate negatively with emissions. However, further current research seems advisable here. After all, although democracy should facilitate decarbonisation, authoritarian regimes are still able to implement large-scale environmental policy interventions.

In summary, the objective of mitigating GHG emissions is therefore met both for interventions with mitigation as principal objective and for mitigation-relevant DC in the "Energy" funding area, but is not met for mitigation interventions with "climate change mitigation" as a significant objective. The evaluation thus gives rise to the following recommendation:

> **Recommendation 3: The BMZ should continue to substantially promote the effective and impactful interventions in the portfolio of mitigation-relevant development finance with the principal objective of "mitigation", especially in the "Energy" funding area, in comparison to the rest of the mitigation-relevant portfolio.**

During implementation, the BMZ could also critically examine the actual effects and impacts of interventions in the cross-sectoral portfolio of mitigation-relevant development finance. When managing the portfolio of DC mitigation interventions with a more indirect effect, in particular, the ministry should take greater account of how the political-institutional framework conditions can strengthen or weaken mitigation effects and, where appropriate, specifically promote framework conditions by promoting democracy and state capacity.

Efficiency measurement

Finally, this evaluation develops five prerequisites for a future evaluation of the efficiency of development interventions to reduce and avoid GHG emissions. Valid statements on the emission-mitigating impact of individual development interventions can therefore only be made if effects and impacts are reported in a complete, differentiated, comprehensive, standardised and simultaneous manner.

The analysis of reporting on the standard indicator "quantity of reduced or avoided GHG emissions [in tonnes of CO_2 equivalent/year]" by the GIZ and KfW shows a mixed picture. Firstly, although the current reporting does not provide a complete record of all mitigation-relevant impacts, it appears to be sufficiently complete to evaluate efficiency. Secondly, uncertainties could be communicated more clearly, especially when measuring indirect effects and impacts. Thirdly, definitions at the GIZ and KfW should be standardised. Fourthly, direct and indirect emissions should always be reported separately. Fifthly, a standardised ex-ante and ex-post assessment is recommended, insofar as this is possible with sufficient certainty. The comparison of technical and financial cooperation interventions remains a particular challenge due to their typically different results chains.

In principle, it would therefore appear possible to evaluate the efficiency of direct effects and impacts of mitigation-relevant interventions in particular. In the case of indirect effects and impacts, however, the downstream and delayed mitigation effect means that an efficiency analysis is associated with great uncertainties and, if at all, is only possible using an ex-ante assessment.

The objective of performing complete, differentiated, comprehensive, standardised and simultaneous reporting on emissions and mitigation effects in order to evaluate the allocation efficiency of development interventions for reducing and avoiding GHG emissions is therefore barely fulfilled up to now. This gives rise to the following recommendation:

Recommendation 4: In the future, the GIZ and KfW should document mitigation effects at module level in such a way that valid statements can be made on the emission-mitigating effect of (groups of) development interventions.

During implementation, the GIZ and KfW could coordinate further development interventions to ensure complete, differentiated, comprehensive, standardised and simultaneous reporting on the standard indicator "mitigation of greenhouse gas emissions". More specifically, the GIZ and KfW could (1) estimate information on the mitigation relevance of interventions below the significance threshold on the basis of a sample; (2) standardise definitions of different types of emissions; (3) always report direct and indirect emissions separately; (4) communicate uncertainties more clearly, especially when estimating indirect effects and impacts; (5) carry out a uniform ex-ante and ex-post assessment of the mitigation effect where this is possible.

In order to limit the resulting additional effort, mitigation effects could in future only be recorded for a representative sample. This could be done with greater care in each case. Better data quality reduces the measurement uncertainty in individual cases and, in combination with the recommended standardisation of definitions and procedures, makes it less likely for systematic errors to arise. These advantages could be weighed up against the expected sampling error. In summary, a sampling-based approach could thus reduce the systematic and random errors that occur when recording GHG emissions and at the same time be more cost-efficient.

The findings on the reporting of the Rio markers are also important in this context. The allocation of markers should continue to be subject to ongoing quality assurance. For example, the proportionate crediting of mitigation interventions could be more finely scaled and reported on an intervention-specific basis in order to contribute to the transparency and credibility of the reported German climate finance.

Overall results

Looking at the overall findings of the evaluation with regard to mitigation-relevant DC gives rise to the following consequences for relevant, effective, impactful and economical DC.

In view of the extreme risks of climate change with negative implications for a wide range of SDGs, the BMZ should continue to ambitiously pursue the goal of mitigating GHG emissions. The climate relevance of all interventions reported as climate-relevant could be made even clearer in the reporting.

The distribution of the funds provided should be orientated towards partner priorities in order to increase effectiveness through ownership. As the funds made available will probably not be sufficient in the future either, further distribution criteria are necessary. Mitigation potential could play a greater role here. This applies especially to interventions with the primary objective of climate change mitigation, as such interventions effectively mitigate GHG emissions. More democratic and better governed development partners are particularly suitable. In non-democratic countries or where there are restrictions on good governance, promoting the state and civil society can also help to achieve climate targets, although short-term success is not so likely here. Where the mitigation of GHG emissions is only a significant objective, distribution can continue to be primarily based on need. In this case, the primary aim is to take account of negative externalities for climate change mitigation in order to counter the immense dangers of further global warming for development goals. Conversely, the social impacts of mitigation-relevant DC should always be included in considerations to ensure that climate change mitigation is organised in a socially just and inclusive way.

CONTENT

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Boxes

ABBREVIATIONS AND ACRONYMS

BMUV
Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection)

BMZ
Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (German Federal Ministry for Economic Cooperation and Development)

BR
Biennial Reports (reporting system for climate finance to the UNFCCC)

BTR
Biennial Transparency Reports (reporting system for climate finance to the UNFCCC)

CO_2
Carbon dioxide

CRS
Creditor Reporting System (reporting system for official development assistance to the OECD)

DAC
Development Assistance Committee

DC
Development cooperation

EI
Empirical implication

EQ
Evaluation question

EU
European Union

FC
Financial cooperation

GDP
Gross domestic product

GHG
Greenhouse gas

GIZ
Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

GNI
Gross national income

HDI
Human Development Index

IO
Implementing organisation

IPCC
Intergovernmental Panel on Climate Change

KfW
Kreditanstalt für Wiederaufbau (KfW Development Bank)

KLA marker
Rio marker for climate change adaptation

KLM marker
Rio marker for climate change mitigation

LDCs
Least developed countries

LMDCs
Like-minded developing countries

MDB
Multilateral development bank

MeMFIS
Modular Extensible Management Financial Information System (reporting system for official development assistance in the BMZ)

MMR
Monitoring Mechanism Regulation (reporting system for climate finance to the EU)

NCQG
New Collective Quantified Goal on Climate Finance

NDCs
Nationally Determined Contributions

NLP
Natural Language Processing

ODA
Official development assistance

OECD
Organisation for Economic Co-operation and Development

SDGs
Sustainable Development Goals

UN
United Nations

UNEP
United Nations Environment Programme

UNFCCC
United Nations Framework Convention on Climate Change

USD
United States Dollar

GLOSSARY

Bilateral development cooperation
Direct development cooperation agreed between states by contract.

Climate finance
Climate finance generally refers to the provision of financial resources to mitigate GHG emissions or to adapt to climate change. In this report, it refers more narrowly to reporting to the EU and UNFCCC under the Paris Agreement.

Climate-relevant development finance
ODA-relevant shares of climate finance with Rio markers for climate change mitigation (KLM) and climate change adaptation (KLA).

"Energy" funding area
BMZ "Energy" funding area, which covers energy generation, distribution and efficiency (purpose code starting with 23).

Energy system
Energy generation, conversion, storage, transport and distribution as well as final consumption.

Grant equivalent
The grant equivalent is the grant portion of sufficiently subsidised loans. Since 2018, only this amount has been counted as official development assistance in reporting to the OECD DAC. Prior to 2018, loans were recognised at nominal value and repayments were subtracted.

Mitigation
Mitigation here refers to the reduction in greenhouse gas emissions compared to a (hypothetical) baseline scenario without mitigation interventions. The term mitigation can therefore include both emission reduction and emission avoidance, which is differentiated where necessary.

Mitigation-relevant development finance
ODA-relevant shares of climate finance with Rio markers for climate change mitigation as a principal objective (KLM 2) or significant objective (KLM 1).

Mitigation-relevant portfolio
Mitigation-relevant development finance on the basis of German reporting to the EU, UNFCCC and OECD as well as internal BMZ data.

Multibilateral development cooperation
Earmarked contributions from a donor country to a multilateral organisation for development cooperation. In this publication, multibilateral development cooperation is subsumed under bilateral development cooperation, in line with the OECD.

Multilateral development cooperation
Contributions from several donor countries to a multilateral recipient organisation for development cooperation that are transferred to the budget and used independently.

Official development assistance
Official development assistance (ODA) is assistance provided by public bodies in the form of grants, goods or services with the primary objective of promoting the economic and social development of developing countries and which is provided to developing countries, in exceptional cases to nationals of developing countries or to international organisations for the benefit of developing countries. The grant portion of sufficiently subsidised (including "concessionary") loans, referred to as grant equivalents, can also be counted as ODA. The list of developing countries and territories is determined by the OECD DAC.

1.

INTRODUCTION

1.1 Background

The international community has set itself ambitious targets for climate change mitigation. The Sustainable Development Goals (SDGs) laid out by the 2030 Agenda and the Paris Agreement (UNFCCC, 2015) are the most important international agreements. The main goal is to limit the global temperature rise to well below 2 °C and, if possible, below 1.5 °C compared to pre-industrial temperatures (BMZ, 2021).

For the Federal Ministry for Economic Cooperation and Development (BMZ), climate and energy is one of six core areas. The associated strategy "Responsibility for our Planet – Climate and Energy" (BMZ, 2021) emphasises the BMZ's contribution to meeting the 1.5 °C limit and the SDGs. In particular, the Ministry aims to strengthen capacities and institutions for the creation and implementation of climate-relevant policies, support a fundamental system change towards climate neutrality with a transformational climate portfolio, meet the increasing energy demand with a climate-neutral energy supply and make cities sustainable and climate-neutral (BMZ, 2021). The BMZ also supports the just transition approach, which aims to shape the transition to a climate-friendly economy and way of life and pursue the goal of compensating as far as possible for social disadvantages that are caused or exacerbated by the change in the economic structure, for example in the energy sector (BMZ, 2022a).

However, it is uncertain whether these objectives will be achieved, as a more extensive and faster energy transition would be required. Although the climate crisis is one of the greatest global challenges for the conservation and development of natural and human systems (IPCC, 2021, 2022a) and jeopardises the achievement of sustainable development goals as well as the development successes of recent decades (UN, 2015a; UNFCCC, 2015), the latest global stocktake emphasises that current policies are inadequate (UNFCCC, 2023b). Average annual global greenhouse gas (GHG) emissions in the period from 2010 to 2019 were higher than ever before in human history, and they continue to rise. In 2022, they were 37 percent higher than in 2000 (UNEP, 2023). Even assuming that all declarations of intent to mitigate GHG emissions are honoured, it is very unlikely that we will succeed in limiting global warming to at least below 2°C compared to pre-industrial levels by the end of the century (UNEP, 2023). There is therefore a discrepancy both in the ambition and in implementation.

Without a far-reaching mitigation[2] of GHG emissions in all sectors, the limit on global warming agreed in the Paris Agreement cannot be achieved (IPCC, 2022a). This includes the need for increasingly rapid and timely transformational change towards climate-neutral, inclusive, resilient and sustainable development pathways (Climate Investment Funds, 2021; IPCC, 2022a: 298; UNFCCC, 2023a) (see Box 2). It can therefore be established that there is a large discrepancy between the targets that have been agreed internationally to tackle the climate crisis and the predicted development.

2 In this report, the term mitigation includes both emission reduction (in accordance with the IPCC's physical definition of mitigation [IPCC, 2022a]) and emission avoidance (in accordance with the whole-of-society approach to development pathways [OECD, 2016]). Where necessary, the term is described in terms of emission reduction and emission avoidance.

Box 2 Transformational change

The 2030 Agenda (UN, 2015) and the Paris Agreement (UNFCCC, 2015) have declared the transformation of human systems as a guiding principle for sustainable development. Transformational change is defined as a fundamental change in climate-relevant systems with extensive positive contributions towards inclusive, climate-neutral, equitable (see Box 6), resilient and sustainable development pathways (Climate Investment Funds, 2024). The Intergovernmental Panel on Climate Change (IPCC) also states in its 6th Assessment Report (IPCC, 2022a: 298) that fundamental change is required in order to achieve the climate targets. Complete decarbonisation concerns all sectors and contexts (UNFCCC, 2023a).

Transformational change is characterised by five dimensions (Climate Investment Funds, 2021):

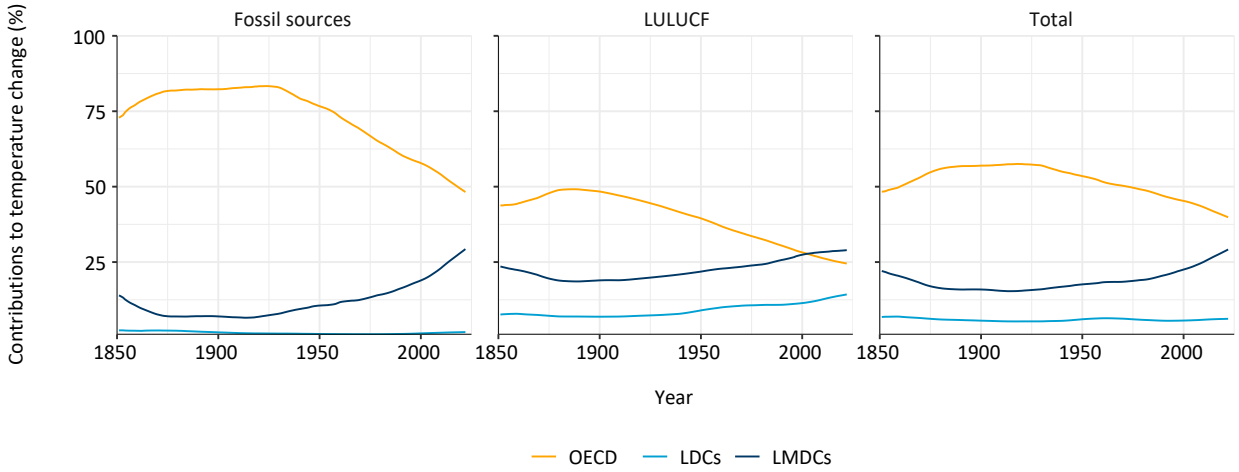
- **Relevance:** Accordance with the transformation objectives of the global, bilateral and national agendas and contexts
- **Systemic change:** Fundamental change to social, economic and ecological systems, institutions and policies
- **Speed:** Fast and flexible implementation of mitigation interventions
- **Scaling:** Temporal, geographic and/or sectoral scaling of mitigation interventions
- **Sustainability:** Permanent change to the structures and framework conditions of the new system

Likewise, German DC has set itself the objective of enacting transformational climate policy (BMZ, 2021). It can promote corresponding change through various interventions, including comprehensive risk management, climate and development partnerships, partnership-based and donor-coordinated approaches such as the NDC Partnership and a cross-ministry environmental policy (Noltze et al., 2023a). Such approaches can utilise synergies between socio-economic development and climate change mitigation (IPCC, 2022a; UN, 2015a) (see Box 5).

Box 3 Man-made global warming

The average temperatures on Earth are rising continuously. This is happening because the Earth absorbs more solar energy than it reflects or radiates. It is due to a change in the atmospheric composition of the climate caused almost entirely by human activities. Greenhouse gases, released in particular by burning fossil fuels, absorb and emit infrared radiation, with the result that the Earth radiates less heat. Growing agricultural and urban areas absorb more solar energy. Due to the decreasing amount of fine particles in the atmosphere as a result of air pollution control interventions, less sunlight is reflected. Moreover, the process of global warming reinforces itself, for example because less sunlight is reflected due to the melting of Arctic ice.

Figure 1 **Contributions to the change in the global average surface temperature from 1850 to 2022**



Source: DEval, own visualisation based on Jones et al. (2023)
Note: The figure shows the contributions of OECD countries, the least developed countries (LDCs) and what are known as like-minded developing countries (LMDCs) to the increase in the global average surface temperature. The abbreviation LULUCF stands for "land use, land use change and forestry".

Historically, the countries of the Organisation for Economic Co-operation and Development (OECD) have contributed the most to the rise in global average temperatures. This is shown in Figure 1. In contrast, the least developed countries (LDCs) are only responsible for a very small proportion of global warming. Historically, the contribution of the group of like-minded developing countries (LMDCs) is also low, but has increased significantly in the recent past. This also includes China and India, which are experiencing a particularly sharp rise in emissions due to their rapid industrial growth. The share of OECD countries, on the other hand, has steadily decreased.

Box 4 **The Kaya identity for describing CO_2 emissions**

$$CO_2 = Pop * {}^{GDP}/_{Pop} * {}^{kWh}/_{GDP} * {}^{CO_{2e}}/_{kWh}$$

To gain a better understanding of future scenarios for the development of global emissions, it is worth taking a look at the main influencing factors. These are population size, per capita gross domestic product (GDP), energy intensity (energy consumption relative to GDP) and emissions intensity (CO_2 e emissions[3] relative to energy consumption) (Kaya, 1997) (see Box 4).[4] At a global level, economic output (measured by GDP and per capita GDP) was the strongest factor influencing GHG emissions between 2010 and 2019 (IPCC, 2022b). In developing countries, consumption and production are the biggest drivers, especially in East Asia. Economic output as the main influencing factor is primarily evident in China and India.

Per capita GHG emissions vary greatly between and within countries. In 2020, for example, they were almost 14 times higher per capita in Germany than in Rwanda. Countries with strong population growth in particular emit comparatively low levels of GHGs (Nice et al., 2022). The energy footprint of the poorer half of the world's population is smaller than that of the richest 5 percent (Oswald et al., 2020).

3 CO_2 equivalent (CO_2e) emissions include all other greenhouse gases in addition to CO_2 and standardise their unit of measurement to make it easier to compare their contribution to the greenhouse effect.

4 There are extended and more disaggregated versions of the Kaya identity that, for example, disaggregate the factors by sector or include the effect of land use. In the form used here, the Kaya identity is particularly suitable for sectors in which energy requirements are directly relevant. These include, for example, energy supply and end consumer sectors such as "transport and infrastructure", "buildings" or "industry" and "retail".

The strong population growth forecast above all for developing countries, and especially for Africa (UN DESA, 2022), is expected to lead to higher emission levels. However, this development must always be viewed in the context of the historical and current causes of climate change.

Per capita global economic output will most likely also increase, despite possible losses due to climate change (Newell et al., 2021). It is mainly in developing countries that the economy is likely to grow (IMF, 2024). Poverty reduction is increasing the demand for energy-intensive technologies, at least for the time being.

The link between prosperity, energy demand and GHG emissions, which has been close up to now, is also a starting point for less emissions-intensive socio-economic development pathways (Riahi et al., 2017). However, decoupling economic growth and GHG emissions, that is, reducing energy intensity, has so far only been partially successful, mostly by economically developed countries (Hubacek et al., 2021). Progress can be seen in the expansion of renewable energies and in the increasing efficiency of fossil fuel utilisation. This reduces emissions intensity, meaning the GHG emissions per unit of electricity and heat generated (IEA, 2022a).

These advances in renewable energies and the increasing efficiency of fossil fuels are based on two developments. On the one hand, the share of renewable energies is growing. According to forecasts by the International Energy Agency (IEA) (IEA, 2022b), they will increase by almost 2,400 gigawatts between 2022 and 2027, which corresponds to an increase of 75 percent compared to the last five years. Renewable energies are expected to account for 38 percent of the electricity mix by 2027, making them the largest source of global electricity generation. The upward trend is mainly attributable to China, the European Union, the United States and India. On the other hand, emissions from the oil and gas industry are currently stagnating (IEA, 2023a). Key mechanisms here are avoiding methane emissions, eliminating unnecessary flaring, electrifying upstream plants with low-emission electricity, equipping oil and gas processes with technologies to capture, utilise and store carbon, and expanding the use of hydrogen from low-emission electrolysis in refineries (IEA, 2023a). In turn, these developments are closely linked to technological innovations, economic structures or the political framework conditions (see the results of the evidence synthesis in Section 3.3.2).

The majority of emissions are caused by the supply of electricity and heat. The energy supply sector, especially the generation of electricity and heat, caused around one third of global GHG emissions in 2019 (IPCC, 2022a)**.**[5] The combustion of carbon-intensive energy sources such as coal, natural gas and oil in power plants, for example, leads to the emission of greenhouse gases, especially carbon dioxide (CO_2). Other sectors caused less GHG emissions, including industry (24 percent of global GHG emissions), agriculture, forestry and other land use (22 percent), transport (15 percent) and buildings (6 percent) (IPCC, 2022a). In the 39 bilateral partner countries of German development cooperation (DC), the production of energy and heat accounted for 11 percent of GHG emissions in 2020. Only agriculture (30 percent) as well as land use change and forestry (together 17 percent) were responsible for greater emissions (World Resources Institute, 2022).[6]

Mitigating GHG emissions in the energy supply sector requires a significant reduction and avoidance of fossil fuel consumption, comprehensive electrification characterised by renewable energies and improved energy efficiency. This can be supported by funding and implementing a variety of mitigation interventions, including technological, infrastructural, economic, institutional, regulatory, voluntary, information-based and behaviour-changing interventions, and climate change mitigation strategies and laws.

However, the necessary mitigation to meet climate targets is difficult to finance, especially for developing countries. Even if governments prioritise policies to mitigate GHG emissions, the scope for national budgets to make sufficient investments, which is already limited, continues to decrease due to rising debt burdens (UNCTAD, 2022). A more restrictive

5 The "energy supply" sector includes all processes of energy generation, conversion, storage, transmission and distribution for the provision of energy in end-use sectors (transport, infrastructure, industry, agriculture and forestry) (IPCC, 2022a). The "Energy generation, distribution and efficiency" funding area comprises all funding areas that have a purpose code beginning with 23.

6 The sector classification of the emissions data (World Resources Institute, 2022) is based on that of the IPCC. The calculations are based on emissions from the "Electricity/Heat" sub-sector of the "Energy" sector.

monetary policy and a strong US dollar reduce the scope even further (IRENA and CPI, 2023). In addition, developing countries levy fewer taxes than industrialised countries (OECD, 2023a, 2023b; OECD et al., 2023).[7] This is particularly problematic, as delayed action significantly increases the costs of climate change (Köberle et al., 2021).

Developing countries account for two-thirds of the world's population but, with the exception of China, are responsible for only one-fifth of investments in clean energy and have just one-tenth of the global financial assets at their disposal (IEA, 2021). This discrepancy is due to high perceived investment risks, the tendency to invest primarily in domestic markets (Ardalan, 2019) and the pro-cyclical volatility of capital flows, which may worsen with climate vulnerability and unsustainable debt burdens (UNEP, 2022). At the same time, investments in companies in the fossil fuel industry in developing countries increased significantly between 2016 and 2022 (IMF, 2022). In developing countries (excluding China), investments in renewable energies recently amounted to only a quarter of investments in fossil fuels (IMF, 2023). In developing countries, factors such as large informal sectors with small companies, dependence on natural resources, low competition in access to political power and weak state institutions make it difficult to increase tax rates (Besley and Persson, 2014).

In addition, these countries often lack the technical capacities to implement the necessary mitigation interventions independently. The introduction of low-emission technologies is lagging behind industrialised countries due to weaker framework conditions, including limited institutional and technical capacities for the implementation of mitigation interventions (IPCC, 2022a: 11).

Problematic incentive structures are also particularly important. The climate is a global public good from which every country benefits.[8] The costs associated with mitigating emissions, on the other hand, are largely borne by the countries themselves. This is the free-rider problem (Luqman et al., 2022). In addition, those who cause the highest GHG emissions are also the least affected by the consequences (Nielsen et al., 2021).

International cooperation can help to mitigate funding problems, implement interventions and create incentives to mitigate GHG emissions. Financial cooperation (FC) can make mitigation-relevant investments. It can also create incentives for public investment in mitigating GHG emissions and thus alleviate the free-rider problem. Technical cooperation (TC) provides technologies, knowledge and training. It supports the introduction of economic and regulatory instruments and strengthens institutions and capacities.

1.2 Objective and purpose

The aim of the evaluation is to assess the relevance, effectiveness and impact of mitigation-relevant DC under the political responsibility of the BMZ. One focus area is the BMZ "Energy" funding area. The evaluation of relevance contributes to accountability and transparency. A retrospective review of the effectiveness and contributions to overarching development impacts is intended to contribute to improving the effectiveness and impact of German DC in the area of "climate change mitigation and clean energy". The assessment of efficiency that was originally planned was not possible due to a lack of data. Specific proposals are being developed that could allow it to be performed in the future.

The criteria of "coherence" and "sustainability" are not assessed. In this evaluation, references to coherence are established by analysing the partner orientation of the donor community for climate- and mitigation-relevant development finance and discussing the interactions between mitigation policies and economic development. A more extensive analysis of this criterion would ultimately have meant analysing all interactions due to the full population study of all mitigation-relevant interventions considered here and the lack of a geographical focus. References to sustainability

7 The average tax rate is 34 percent in OECD countries, 16 percent in African countries, 20 percent in countries in the "Asia-Pacific" region and 22 percent in countries in the "Latin America and Caribbean" region.

8 An important exception to this is the improvement of air quality through mitigation interventions.

are established by analysing the effects and impacts over time. No genuine analysis of sustainability is performed, partly due to long results chains.

The evaluation also supports the further development of the German mitigation-relevant portfolio. In this way, independent and science-based evidence is to be provided in order to report on the reflection process of the BMZ core area strategy "Responsibility for our Planet – Climate and Energy" (BMZ, 2021b). This report thus complements the DEval evaluations on interventions for climate change adaptation (Leppert et al., 2021; Noltze et al., 2023a, 2023b; Noltze and Rauschenbach, 2019), access to (green) energy in rural Africa (Rauschenbach et al., 2024) and the circular economy (Guffler et al., in publication). In the area of "climate change mitigation", DEval has already conducted a synthesis study on the German contribution to the REDD+ forest and climate protection programme (Reinecke et al., 2020).

1.3 Object

The object of the evaluation is the BMZ's DC to mitigate GHG emissions, with a particular focus on the "Energy" funding area.[9] The investigation periods are between 2002 and 2023, but differ depending on the analysis (see Table 1 in Chapter 2). The portfolio and allocation analyses begin by examining Germany's climate- and mitigation-relevant development finance, and then focus specifically on BMZ funds.[10] In terms of effectiveness and impact, they analyse climate-relevant effects of the development finance of the member states of the OECD Development Assistance Committee (DAC) and specifically Germany, making a distinction between the effect and impact of total development finance, the mitigation-relevant share and the mitigation-relevant share in the "Energy" funding area.

One theoretical and analytical focus is on interventions in the energy supply sector, this means interventions that are assigned to the BMZ "Energy" funding area. This includes purpose codes that start with 23 (BMZ, 2022b).[11] The energy system comprises energy generation[12] conversion, storage, transport and distribution as well as final consumption (see Figure 2). Primary energy sources include fossil fuels (oil, natural gas, coal and lignite), nuclear energy and renewable energies (solar and wind power, hydropower, geothermal energy and biomass) (IPCC, 2022a). These energy sources are converted and/or stored for further consumption and finally passed on to the end consumer (transport, buildings, industry, trade and agriculture). This evaluation focuses on the energy supply sector; namely all the elements of the energy system mentioned here with the exception of final consumption. This largely corresponds to the interventions in the "Energy" funding area.[13] Energy efficiency is analysed insofar as it relates to energy supply.

9 Table 2 specifies the operationalisation of mitigation-relevant DC.

10 The interventions must therefore meet the requirements of labelling with the Rio markers KLM 1 (significant objective "mitigation") or KLM 2 (principal objective "mitigation") or the method for calculating the imputed multilateral climate shares) (OECD, 2016). The validity of the Rio markers is verified as part of the evaluation. In this respect, the analysis is not based exclusively on the reported Rio markers. The imputed multilateral climate shares are used in parts of multilateral cooperation.

11 Funding areas refer to the sectors in which development cooperation takes place. The energy supply sector is largely categorised in the "Energy generation, distribution and efficiency" funding area. In addition, two purpose codes from funding area 32 ("Industry") are allocated to the energy supply sector: purpose code 32167 ("Processing of energy raw materials [fossil fuels]") and purpose code 32173 ("Production of modern biofuels"). Focussing on the strategically important funding area of "Energy" also means that interventions in end-use sectors (transport, infrastructure, industry, agriculture and forestry) are not evaluated separately. Furthermore, interventions that would be classified as belonging to the energy supply sector but do not fulfil the requirements of the KLM marker are not taken into account (26.3 percent of energy interventions with USD 527 million over the period from 2017 to 2021 do not have a KLM marker). Finally, the following also does not fall under the "Energy" funding area, although it should be attributed to the energy supply sector: The extraction of raw materials for power generation is classified under mining, while the processing of energy raw materials is classified under industry. Interventions to capture and store carbon dioxide that are not related to power plants are recorded under protection of the biosphere.

12 Strictly speaking, no energy is generated, but rather existing energy is converted (usually into electrical energy or heat). However, as the corresponding funding area is officially titled "energy generation, distribution and efficiency", the term is used in several places in this report.

13 There is no standardised definition of the energy system. This evaluation uses the definition from the 6th Assessment Report (IPCC, 2022a: 619).

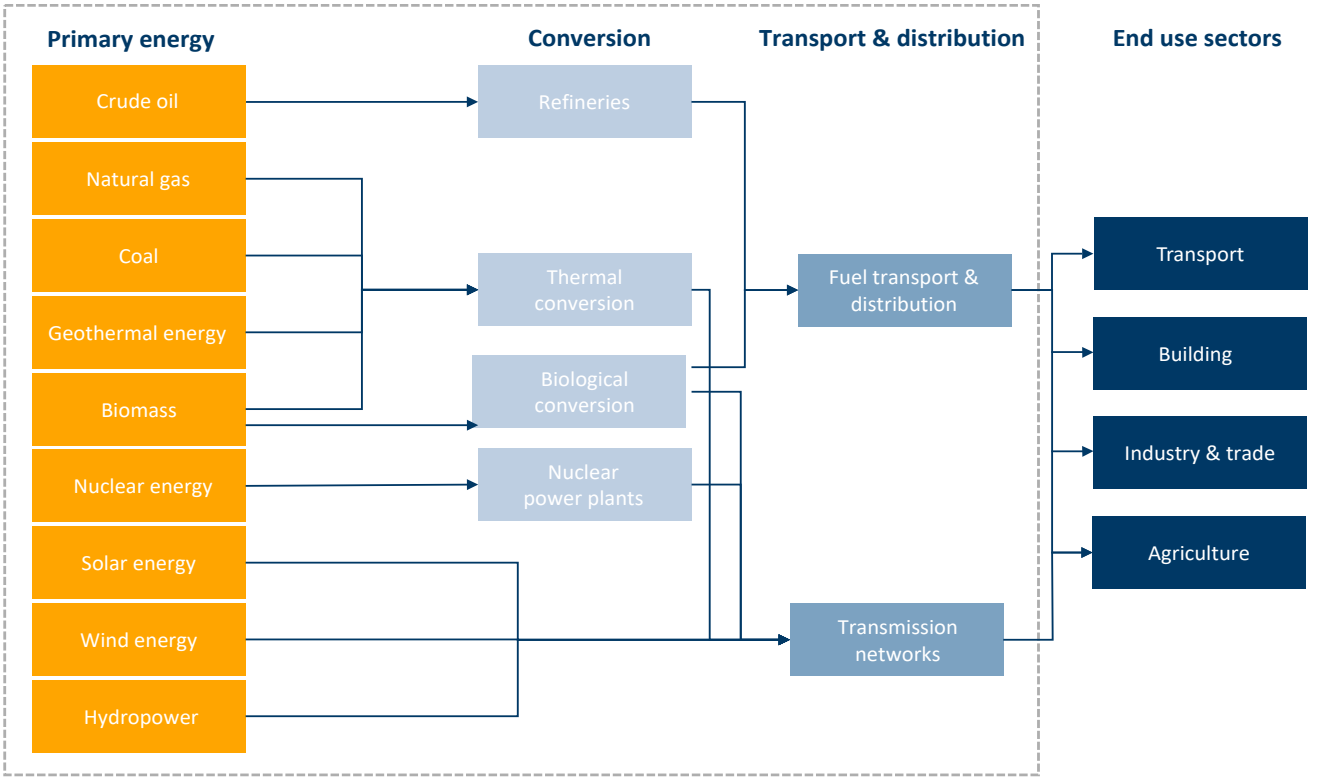
This prioritisation is based on strategic relevance, portfolio coverage, significance for climate change and partner priorities.[14] Firstly, the BMZ core area strategy identifies the energy sector as a "key sector for climate change mitigation" (BMZ, 2021: 23). It refers to the obligation to mitigate GHG emissions (SDG 13) and makes a commitment to contribute to climate change mitigation, for instance by expanding renewable energies (SDG 7.2).[15] This focus on energy generation, distribution and efficiency is also evident in the BMZ report on climate policy engagement (BMZ, 2022c). Secondly, this strategic focus is also reflected in the portfolio. The "Energy" funding area receives almost half of the BMZ's bilateral mitigation-relevant development finance, and almost a third of all mitigation-relevant funding in developing countries by multilateral development banks (MDBs) is provided in the energy sector (European Investment Bank, 2023). Thirdly, it was responsible for 34 percent of anthropogenic GHG emissions in 2019 (IPCC, 2022a). Models show that energy supply and demand could make the largest contribution of all sectors to reducing global GHG emissions (74 percent of the global reduction in GHG emissions) (IPCC, 2022b). In absolute terms, the Climate Policy Initiative (Buchner et al., 2023) identifies the highest investment needs and the second highest investment gap (after the transport sector) in the energy sector. Fourthly, renewable energies and energy efficiency are a particular strategic priority for developing countries.[16] This is where they articulate the majority of their needs for mitigation interventions, as is shown by the fact that all 166 available Nationally Determined Contributions (NDCs) of the 193 signatories to the Paris Climate Agreement refer to GHG emission mitigation interventions in the energy sector. The generation of energy from renewable sources is mentioned most frequently (in 88 percent of NDCs) (UNFCCC, 2022).

14 Focussing on the "Energy" funding area means that the causal pathways and the effects and impacts with regard to the mitigation of GHG emissions in this funding area are considered in particular. No other funding areas are specifically analysed. However, some analyses consider mitigation-relevant development finance in general. The scope of the conclusions and recommendations is indicated in the evaluation in each case.

15 The positive effects and impacts of a needs-based energy supply on economic and social development are also mentioned, in addition to access to energy services (SDG 7.1) and the improvement of energy efficiency (SDG 7.3). However, these priorities primarily concern the end-use sectors or are only relevant to mitigation to a limited extent

16 In UNFCCC (2022), the targets for renewable energies and energy efficiency are subsumed under the "Energy" sector. The other sectors are "Waste & Sanitation", "Land Use & Forestry", "Transport" and "Agriculture".

Figure 2 The energy system



Source: DEval, own visualisation based on IPCC (2022a) and Subramanian et al. (2018)
Note: The illustration shows a simplified model of the energy system. The energy supply is outlined in grey. Some elements of the energy system are rarely or never directly addressed by German DC (e.g. fossil fuels or nuclear energy) and are of little relevance in the evaluation.

1.4 Evaluation questions

No strategic evaluation of German mitigation-relevant DC has yet been performed. For this reason, this report analyses the relevance and effectiveness as well as the overarching development impact and efficiency of mitigation-relevant DC. It answers five evaluation questions (EQs).

Relevance

The report begins by looking at the extent to which Germany fulfils international agreements and commitments on climate finance and the share for which the BMZ is responsible. Although there are independent studies on this, they either do not reflect the latest developments (Kowalzig, 2021) or do not specifically analyse the German contribution (OECD, 2023c). There has also been no independent investigation to date into the extent to which the BMZ succeeds in mobilising private capital for mitigation-relevant interventions. Finally, there is still a gap in the research on potential distortions caused by an imprecise declaration of interventions as relevant to mitigation.

Similarly, there is little evidence to date regarding the alignment of mitigation-relevant development finance with needs and capacities for Germany (Halimanjaya, 2016).[17] Above all, it is unclear to what extent the needs and priorities of partners influence the distribution (Mulugetta et al., 2022). International discussion and scientific research tend to focus on investment needs (Alayza and Caldwell, 2021; Reda and Wong, 2021).

One particular challenge of "sustainable development" (BMZ, 2021b: 23) arises from the potential conflict of objectives between promoting socio-economic development and achieving climate targets. In the case of global public goods, it is not need but rather efficient emissions avoidance that is important for maximising benefits (Bagchi et al., 2016). Viewed in isolation, emissions avoidance should take place where it is most cost-effective. However, this may be at the expense of development needs in poorer regions and may jeopardise the development goal of ensuring universal access to affordable, reliable and modern energy services by 2030 while increasing the share of renewable energy in the global energy mix (SDG 7; UN, 2015).

Box 5 The nexus between socio-economic development and climate change mitigation

The connection between socio-economic development, GHG emissions and climate change mitigation is of central importance for international DC (IPCC, 2022a: 141, 176; Lankes et al., 2024). There has been a strong relationship between socio-economic development and environmental pollution or GHG emissions since the Industrial Revolution (IPCC, 2022a: 153). Historically, socio-economic development has increased the energy demand covered by fossil energy sources and thus caused GHG emissions (Lankes et al., 2024). The environmental Kuznets curve describes this relationship as an inverse U-shaped curve (IPCC, 2007). The hypothesis is that socio-economic development increases the demand for and supply of energy and thus initially increases GHG emissions. As of a certain level of development, however, GHG emissions should fall due to the transition to low-carbon sectors, decreasing prices for low-carbon energy sources, increased environmental awareness and rising yields from emission avoidance (Copeland and Taylor, 2004; IPCC, 2022c; Lankes et al., 2024).

The evidence for the Kuznets curve is mixed (IPCC, 2007). It has been confirmed for some industrialised countries, including the USA and the United Kingdom, which have been able to reduce their GHG emissions despite increasing economic growth (IPCC, 2022c: 2717). However, the curve is not a universally valid model for describing the relationship between economic growth and environmental quality. Specific national and regional conditions must be taken into account in order to gain an accurate understanding and develop effective policies. However, the development of suitable, effective and impactful climate change mitigation interventions requires a better understanding of the causes of emissions and the influence of specific policies and external factors. The Kuznets curve therefore only provides limited information on suitable policies or interventions for climate change mitigation (IPCC, 2007).

17 The evidence on the distribution of climate-relevant resources is more extensive (Weiler et al., 2018; Samuwai and Hills, 2018; Qian et al., 2023; Mori et al., 2019; Garschagen and Doshi, 2022; Doku et al., 2021; Bayramoglu et al., 2023).

Another criticism concerns the assumption that socio-economic development is synonymous with GDP. After all, economic growth may also reinforce inequalities, which in turn has a negative impact on poverty reduction (Fosu, 2017). It should also be noted that socio-economic development pathways and economic systems cannot grow indefinitely and are therefore not sustainable (Washington and Twomey, 2016).

The literature discusses interactions between socio-economic development and climate change mitigation in detail. On the one hand, there could be a conflict of objectives between socio-economic development and climate change mitigation. Climate change mitigation, including through the implementation of NDCs, may increase consumption and production costs for poorer population groups, thus reducing their prosperity, income and consumption (Akimoto et al., 2012; Campagnolo and Davide, 2019; Fujimori et al., 2019; Hasegawa et al., 2018; Hussein et al., 2013). However, such analyses might not adequately take into account the consequences of climate change, growth and market failure (Lankes et al., 2024).

On the other hand, there are synergies between socio-economic development and climate change mitigation. Ambitious climate change mitigation is a prerequisite for achieving several SDGs (IPCC, 2022a). Climate change mitigation can drive economic growth, for example through improved resource efficiency, scaling effects of new technologies, productivity, innovation and investment (Stern and Stiglitz, 2023). The resulting effects and impacts include increased well-being among poorer population groups thanks to higher income and the creation of new jobs, particularly in the energy sector, greater resilience and improved health (Lankes et al., 2024).

A lack of climate change mitigation would have serious long-term consequences, especially for poorer population groups (IPCC, 2022a), including current and future economic and non-economic damage and losses that jeopardise health, livelihoods and society (IPCC, 2022a). In addition, GHG emissions lead to inequalities both within and between generations (Lankes et al., 2024). For climate change mitigation to be compatible with socio-economic development and poverty reduction, it must be designed in a fair and inclusive manner and reduce inequalities, for example through just transition approaches (IPCC, 2022a: 153; Stern and Stiglitz, 2023; Wollburg et al., 2023) (see Box 6). Just structural change is a prerequisite for effective transformational change (IPCC, 2022a: 412) (see Box 2).

The scientific literature on sustainable development and climate argues that international DC can avoid the potential conflicts of objectives between socio-economic development and climate change mitigation and utilise synergies, for example through cross-sectoral policies and interventions that integrate climate change mitigation with other SDGs (IPCC, 2022a; UN, 2015a). In contrast, the literature on the allocation of DC argues that allocation decisions are often associated with conflicts of objectives (Dissanayake, 2023; Guillaumont Jeanneney and Severino, 2023; Kenny, 2020).

Even if climate change mitigation as a global public good and socio-economic development complement each other, DC interventions depend on context, location and time and are therefore always associated with opportunity costs (Dissanayake, 2023). It is unlikely that the allocation will be distributed in such a way that both climate change mitigation and development goals are achieved in a balanced manner. From a pure cost-benefit perspective, climate change mitigation would be most efficient where emissions avoidance is cheapest (Bagchi et al., 2016). However, this would imply neglecting the needs of poorer countries, which account for only a small proportion of global emissions (Kenny, 2020).

Even if climate change mitigation and socio-economic development cannot be considered equally at intervention level, a holistic approach to sustainable development that encompasses both aspects is of central importance for international and German DC (AFD, 2017; BMZ, 2021; Chan et al., 2021; Lankes et al., 2024; USAID, 2022; World Bank, 2023a). In addition, both support just transition approaches that aim to offset the negative social and economic impacts of climate change mitigation and thus mitigate potential conflicts of objectives (BMZ, 2022a; Center for Strategic and International Studies, 2021) (see Box 6).

Box 6 Just transition

The preamble to the Paris Agreement stipulates that the signatory states should shape the structural change in economy, society and state that is required to achieve the 1.5 °C target in a fair way, working to establish sustainable systems (UNFCCC, 2015). However, there is no generally recognised definition of a just transition (Lee and Baumgartner, 2022; United Nations Department of Economic and Social Affairs, 2024; Wang and Lo, 2021). It is a generic term covering a large number of different and context-specific interventions aimed at organising the systemic transformation process in the economy at macro, meso and micro level in such a way that the consequences are distributed fairly among people, places, sectors, countries and regions. Just structural change is therefore not a concept limited to DC, but part of a holistic policy for the climate and environment (Wissenschaftlicher Dienst des Deutschen Bundestages, 2021).

The starting point is the realisation that both climate change and the structural change it causes have a significant impact on various stakeholders (Hizliok and Scheer, 2024; Lee and Baumgartner, 2022; United Nations Department of Economic and Social Affairs, 2024). According to the IPCC, the transformation of the economy has distributional effects (IPCC, 2022a: 412). In order to achieve a just transition, the Intergovernmental Panel on Climate Change (IPCC, 2023a: 129) states that it is necessary to maximise the benefits for those most affected by structural and climate change and minimise the negative economic, social and environmental consequences. This is because the unfair distribution of the consequences harbours the risk of creating new inequalities and exclusions or reinforcing existing ones, which could diminish support for climate change mitigation and adaptation interventions and slow down the transformation process itself (Lee and Baumgartner, 2022).

The UN Committee for Development Policy and a group of heads of state and government demand that a just transition follows the principle of “leave no one behind” (European Council, 2023; United Nations Department of Economic and Social Affairs, 2024). This principle of the 2030 Agenda calls for all people and countries, especially the poorest and most disadvantaged, to be included in global development and for inequalities to be reduced (UNSDG, n.d.). Accordingly, just transition approaches focus on the interests of the stakeholders who are most affected by the transformation and climate change (IPCC, 2023: 129). They address questions of distributive justice (questions of socially equitable resource distribution) and procedural justice (questions of fair participation in political processes that distribute resources and resolve conflicts) (IPCC, 2023: 1748).
At international level, climate finance is a decisive factor for just and low-carbon structural change (IPCC, 2023c: 1559). It should be allocated specifically to developing and vulnerable countries (IPCC, 2023c: 1559). At national, regional and local level, just transition interventions concentrate on the interests of particularly vulnerable groups, including the poor, women, ethnic minorities and people with disabilities (Lee and Baumgartner, 2022). According to the IPCC, they should be involved in consultation and decision-making processes together with other stakeholders to ensure that their concerns and needs are taken into account in the political process (IPCC, 2023d: 75).

The Intergovernmental Panel on Climate Change also states that just structural change in the economy requires targeted and proactive (political) interventions to eradicate poverty (SDG 1), provide affordable and clean energy (SDG 7), create decent jobs (SDG 8) and reduce inequalities (SDG 10) (IPCC, 2023d: 75). The IPCC thus establishes a link between just transition and the 2030 Agenda and addresses issues of socially equitable resource distribution. Moreover, the call for participatory consultation and decision-making processes refers to SDG 16 (Peace, justice and strong institutions). According to the UN Development Programme, SDG 16 is a precursor to achieving all other SDGs (Balasubramanian et al., 2022).

A just structural change is often called for in the transformation of energy systems from fossil fuels to renewable energy sources (BMZ, 2023a; IEA, 2023b; IRENA, 2023a), as it leads to job losses in the fossil fuel sector and the creation of new jobs in the renewable energy sector (IEA, 2023b). According to the IEA (2023b), although more jobs will be created than lost overall, just transition interventions such as training programmes for workers are necessary to avoid potential negative distribution effects (IRENA, 2023a).

German DC also follows the just transition principle of "leave no one behind" (BMZ, 2021, 2023a). The BMZ promotes a just energy transition through multilateral just energy transition partnerships, for example in South Africa, Vietnam and Indonesia (BMZ, 2024b). In all three countries, the aim is to drive forward the fossil fuel phase-out and the expansion of renewable energy sources, while providing training programmes for workers and participatory consultation processes to ensure fair structural change (European Commission, 2022; Just Energy Transition Partnership Indonesia, 2023; Presidential Climate Commission, 2022).

Just transition projects are generally characterised in that they have an impact on climate, are geared towards the principle of "leave no one behind", include inclusive and transparent decision-making processes, offer partner-orientated and context-specific solutions, are inclusive, place an emphasis on particularly affected regions and provide flexible, long-term support services (Limburg, 2023).

The following EQs are derived from this:

Evaluation question 1: To what extent is the mitigation-relevant portfolio aligned with international agreements and the priorities of the development partners and the German Federal Government?

Evaluation question 2: To what extent is the BMZ's distribution of mitigation-relevant development finance aligned with the mitigation potential, taking account of the need of development partners?

Effectiveness and impact

There is no consensus in research on the extent to which international DC has a significant mitigation effect. A significant effect is established in several studies (Boly, 2018; Farooq, 2022; Kablan and Chouard, 2022; Wu et al., 2021), but not in others (Bhattacharyya et al., 2018; Ikegami and Wang, 2021; Kretschmer et al., 2013; Li et al., 2021). These unclear findings are surprising, as the studies are based on similar data.

This evaluation helps to clarify the issue. It does so by applying a statistical analysis method that maps dynamic effects and through careful model specification. In particular, the analysis method takes account of possible feedback loops.

It is plausible that, in addition to DC influencing emissions, emissions may also influence the distribution and amount of development finance. Moreover, the appropriate theoretical basis for analysing the mitigation effect is controversial.

Alongside achieving overarching development impacts, an understanding of the effectiveness of different development interventions is of great strategic importance. This raises the question as to the outcomes with which interventions contribute to mitigating emissions. A response to this question provides valuable strategic insights for the mitigation-relevant portfolio.

The following EQs are derived from this:

Evaluation question 3: To what extent are the intended objectives (outcomes) of the BMZ's German mitigation-relevant development finance in the "Energy" funding area achieved?

Evaluation question 4: To what extent is the overarching development impact of GHG emission mitigation achieved through German mitigation-relevant development finance in the "Energy" funding area?

Efficiency

The extent to which resources are used efficiently to mitigate GHG emissions is of particular importance if international funding objectives are not achieved and there is increased competition for the distribution of budget funds. In general, it is also very important to evaluate efficiency, as the BMZ and the implementing organisations are required to use limited public funds in accordance with the principles of economic efficiency. In accordance with the Federal Budget Code, financially effective interventions must be subject to an economic feasibility study.[18] This is what originally gave rise to the development question regarding the extent to which the overarching development impact of GHG emission mitigation could have been achieved more cost-effectively by distributing the mitigation-relevant development finance differently and to what extent – compared to an alternatively designed intervention in the "Energy" funding area – the positive effects and impacts could have been increased with the available resources.

However, the data basis available proved to be inadequate in the course of the study. The Federal Court of Auditors (Bundesrechnungshof, 2022), too, calls for better recording of GHG emission mitigation data in its assessment report on Departmental Budget 23. Accordingly, the BMZ has pledged to document mitigation effects using standard indicators starting in 2022 and to develop a measurement system for recording GHG emission mitigation in the future. In order to allow efficiency to be evaluated in the subject area in the future, the evaluation assesses the comparability and validity of the methods used by the two largest implementing organisations – Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) and KfW Development Bank (KfW) – to calculate emission reductions.

The following EQ is derived from this:

Evaluation question 5: What are the requirements for evaluating the efficiency of development interventions to reduce and avoid GHG emissions and how can these be met by improving reporting?

1.5 Structure of the report

Chapter 2 presents the data basis and the methodological approach used for the eight analyses that have been performed. Chapter 3 contains a presentation of the results structured based on the evaluation criteria and the EQs. Finally, Chapter 4 draws conclusions from the results by evaluating the benchmarks and deriving recommendations.

[18] Economic efficiency includes, on the one hand, the extent to which the implementation of an intervention used resources economically (implementation efficiency) and, on the other hand, how efficiently an intervention achieved its objectives (intervention efficiency) (administrative regulation under Section 7 of the Federal Budget Code). The implementation efficiency results from a comparison between the expenditure and income that was initially planned and that which was ultimately realised. The intervention efficiency establishes the positive and negative effects of an intervention in relation to the costs.

2.

METHODS

This chapter describes the procedure for answering the Evaluation questions (EQs). To this end, we begin by providing an overview of the respective objects and investigation periods of the individual analyses (see Table 1). We then present the individual analyses for evaluating relevance: a portfolio analysis (see Section 2.1), a validation of the Rio markers for climate change mitigation (KLM) (see Section 2.2), a comparative analysis of private capital mobilisation (see Section 2.3), an investigation of partner priorities (see Section 2.4) and an allocation analysis (see Section 2.5). This is followed by a description of the analyses for evaluating effectiveness and impact: an evidence synthesis (see Section 2.6) and an effect and impact analysis (see Section 2.7). Finally, Section 2.8 analyses the prerequisites for evaluating efficiency and Section 2.9 discusses the limitations of the overall evaluation approach.

The portfolio, allocation and efficiency analyses consider mitigation-relevant DC in general, while the evidence synthesis and the effectiveness and impact analyses focus on the "Energy" funding area (see also Section 1.3).

Table 1 Objects of investigation

Analysis	Object	Sector focus	Data basis	Time period
Portfolio	German and BMZ-organised climate- and mitigation-relevant development finance	No focus	OECD DAC CRS, BMZ MeMFIS, EU MMR, UNFCCC BR	2011–2021
Validation of KLM marker	German and BMZ-organised mitigation-relevant development finance	No focus	OECD DAC CRS	2011–2021
Private capital mobilisation	BMZ fund and direct holdings managed on a fiduciary basis with KLM marker	No focus	OECD DAC CRS, KfW data	2017–2023
Partner priorities	German and international mitigation-relevant development finance	No focus	OECD DAC CRS, NDCs	2015–2022
Allocation analysis	BMZ-organised mitigation-relevant development finance	Consideration of indicators for the energy sector	OECD DAC CRS	2011–2021
Evidence synthesis	Evidence from IPCC on DC in the "Energy" funding area	"Energy" funding area	IPCC	2022
Effect and impact analysis	OECD-DAC donors' mitigation-relevant development finance, separate analysis of the "Energy" funding area	Comprehensive analysis and focus on the energy sector	OECD DAC CRS	2002–2021
Efficiency assessment	Reporting on the standard indicator "mitigation of greenhouse gas emissions" applies to GIZ and KfW modules	No focus	Documents on the reporting method	2023

Source: DEval, own visualisation
Abbreviations: OECD DAC CRS (OECD DAC Creditor Reporting System), MeMFIS (Modular Extensible Management Financial Information System), EU MMR (EU Monitoring Mechanism Regulation), UNFCCC BR (reporting system for climate finance to UNFCCC), NDCs (Nationally Determined Contributions)

2.1 Portfolio analysis

The portfolio analysis investigates the extent to which the mitigation-relevant portfolio of German DC is aligned with national and international agreements (EQ1). This is based on reporting to the European Environment Agency of the European Union (EU), the United Nations Framework Convention on Climate Change (UNFCCC), the OECD and the BMZ data in the Modular Extensible Management Financial Information System (MeMFIS) from 2011 to 2021. All four datasets were prepared in the same way; the analysis considered data relating to (a) official development assistance (ODA) and (b) commitments (bilateral DC) or disbursements (multilateral DC) either (c) from Germany or (d) from the BMZ (depending on the information provided).

Four different datasets were analysed to contribute to the transparency of climate reporting. The following sections highlight the unique selling points and common features of each dataset (see also Table 11 in the Annex). It should be noted that the datasets cannot be compared due to their different requirements; however, a comparison contributes to the transparency of climate reporting and facilitates an understanding of the figures. The respective datasets are also suitable for investigating different evaluation benchmarks.

Official (international) climate reporting is based on the datasets that the Federal Government regularly sends to the UN Climate Change Secretariat in the context of its reporting obligations under the Paris Agreement and the UNFCCC. The data up to 2020 can be viewed in the UNFCCC's Biennial Reports (BR). It corresponds to the data that the Federal Government also regularly submits to the EU in the context of its reporting obligations under the Monitoring Mechanism Regulation (MMR). From the end of 2024, the reporting years 2021 and 2022 will be reported in the Biennial Transparency Reports (BTR). One limitation of the two datasets for German reporting is that they only allow differentiation by ministry from 2017 onwards. The data therefore cannot be used to analyse long-term trends for the BMZ.

Reporting on DC is based on the annual ODA data submitted to the OECD and the BMZ's internal MeMFIS dataset. Both make it possible to describe the BMZ-specific portfolio for mitigation-relevant development finance.[19] This allows the portfolio to be analysed for the German Federal Government and the BMZ. However, there are differences between the two datasets. In contrast to the MeMFIS data, the reporting rules of the Creditor Reporting System (CRS) – including the determination of the time of a commitment – correspond to those of other donors, thus making it easier to compare donors. In addition, grant equivalents have been reported since 2017 and have been used since then for this evaluation. Loans before that are recognised at nominal value. The MeMFIS dataset has three unique features: It records commitments already at the time of government negotiation or official notification; the plausibility of the Rio markers is checked again with respect to the notification to the OECD, which means that the climate identifier in the MeMFIS data is more up to date; and differentiation by budget item and by budget/market funds is possible. Comparative disadvantages are that MeMFIS does not allow donor or ministry comparisons, lacks information on grant equivalents and contains no information on either core contributions to multilateral organisations or mobilised private capital.

The CRS dataset appears particularly suitable for a longitudinal and differentiated analysis of mitigation-relevant development finance under the political responsibility of the BMZ. For the more recent past, the datasets within the scope of the reporting obligations to the EU and the UNFCCC are also useful. In both cases, the data is not transmitted based on the ODA report, but also follows the Rio marker method with regard to identifying and discounting interventions. MeMFIS enables a more detailed instrumental differentiation and a more valid recording of the timing of the commitments. However, as this is of secondary importance for answering the EQs, the information from MeMFIS is only reported for the sake of completeness.

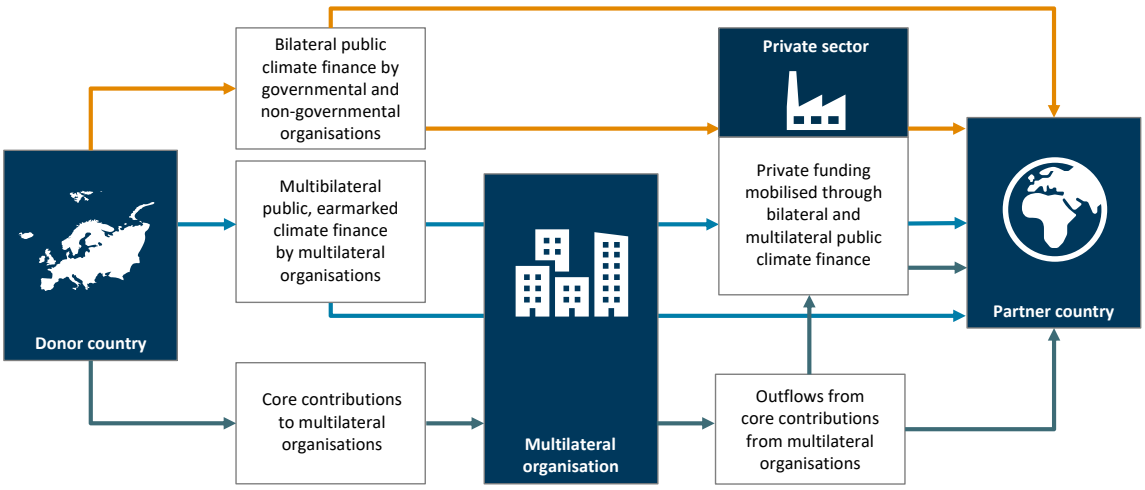
19 The KfW not only appears in the dataset as an implementing organisation (channel of delivery), but also reports its own funds on an equal footing with the BMZ as the government agency responsible for the budget (extending agency). For example, the KfW's own funds for development loans are not reported with the ministry as the government agency responsible for the budget, although they are committed under its political responsibility.

In the datasets on official development assistance (CRS and MeMFIS), mitigation-relevant development finance from ODA funds is identified by means of labelling with Rio markers. In all datasets, interventions with climate change mitigation as the principal objective (KLM 2) are counted in full, while those with climate change mitigation as a significant objective (KLM 1) or cross-cutting issue are counted 50 percent.[20] Values are stated in constant prices with 2015 (MeMFIS) or 2020 (CRS) as the base year. Grant equivalents of loans are recognised as of 2017.

The investigation period is 2011 to 2021. Prior to 2011, more than 90 percent of the KLM markers are missing in the CRS and MeMFIS. One possible reason could be that, although reporting has been mandatory as of 2006, no labelling has taken place. In addition, a Rio marker for climate change adaptation (KLA) was introduced in 2010, allowing interventions focussing on mitigation and adaptation to be differentiated from 2011 onwards. It is impossible to determine with certainty whether missing markers correspond to KLM 0 and should therefore be considered "not relevant to mitigation". This data is therefore treated as missing.

There are four possible stakeholder-specific ways in which official development assistance supports partner countries in interventions to reduce GHG emissions. As shown in Figure 3 (a) these are (a) bilateral official development cooperation with partner countries, which is implemented by government agencies in partner countries; (b) civil society, municipal and economic engagement, in which development interventions of non-governmental agencies are supported with public funds;[21] (c) earmarked contributions to international organisations for specific programmes or interventions (referred to as "multibilateral" DC) and core contributions to multilateral organisations such as development banks and multilateral funds (multilateral DC); (d) private funds mobilised through public funds. As in Germany's official reporting to the EU and UNFCCC, bilateral DC funds are calculated from commitments and multilateral DC funds from disbursements for the evaluation.

Figure 3 Simplified presentation of the stakeholder-specific approaches of German official development assistance to climate finance



Source: DEval, own visualisation based on OECD (2022a)
Note: The presentation does not include any publicly funded climate-related export credits.

20 This corresponds to Germany's reporting. Other donors take a different approach in some cases (Xu and Gualberti, 2023).

21 Civil society, municipal and economic engagement is often referred to as "non-governmental DC" (such as in Departmental Budget 23). However, this involves *governmental* funding for development interventions of (1) churches and political foundations, (2) civic and municipal engagement and (3) development partnerships with companies. In the case of non-governmental DC, the grants and subsidies are thus financed from budget funds, but are used by the recipients on their own responsibility (Wencker, 2022: 12).

Multilateral DC includes core contributions paid by donor countries to multilateral organisations, multilateral climate funds and MDBs. Mitigation-relevant core contributions can be taken from the EU data and calculated approximately from the CRS data on the basis of "imputed multilateral climate shares". For this purpose, the share of a multilateral organisation's disbursements for mitigation-relevant DC in all disbursements is multiplied by the amount that Germany has paid to this organisation as a core contribution in a given period. This calculation is an approximation of the share that Germany finances via core contributions to multilateral organisations for climate change mitigation.

The bilateral mitigation-relevant development finance from ODA funds is calculated using a formula that is basically identical for each dataset, but is based on different variable names. The formula is as follows:

$$M = \sum_{\{i=1\}}^{N} B_i \times D(R_i) \times I(D_i)$$

The funds under consideration M (such as M = bilateral [BMZ] commitments for mitigation-relevant development finance) are the sum of the monetary amounts B in line i of the dataset. Discounting (D) is carried out according to OECD Rio markers at project level. Interventions with a Rio marker of KLM 0 or a missing Rio marker are disregarded (that is $D_i = 0$, if $R_i = 0$ or the value R_i is missing, $D_i = 0.5$ if $R_i = 1$, and $D_i = 1$, if $R_i = 2$). In addition, lines are only considered if certain conditions are met. This shows the indicator function $I(D_i)$ (which means $I = 1$, if condition C_i is met). For example, only interventions with a specific donor code are recognised in the CRS. The calculations differ only in terms of the amounts taken into account B_i and the conditions $I(D_i)$. Discounting according to Rio markers is always performed in the same way. Table 2 indicates the columns used to calculate the total amounts and for the conditions.

Table 2 Calculation of the ODA funds under consideration

Dataset	Amounts B_i	Conditions C_i
Bilateral German commitments and multilateral German disbursements for mitigation-relevant development finance		
EU	Commitments ("CommittedAmount"/ "Climate specific amount", EUR) and disbursements ("ProvidedClimateSpecific")	Funding source = ODA Funding type = commitments ("committed") and disbursements ("provided") Financial instrument = "Grants", "Concessional loans from budgetary sources" and "Grant equivalent of concessional loans") (loans and grants)
UNFCCC	Commitments ("Totalamount")	Funding source = ODA Funding type = commitments ("committed") Financial instrument = "Grants", "Other (concessional loans from budgetary sources)" and "Other (grant equivalent of concessional loans)" (loans and grants)
CRS	Commitments ("usd_commitment_defl") and disbursements ("Amount")	Donor code = 5 (Germany) Flow code = 11 and 13 (loans and grants) Funding type = 1 ("committed") Aidtoorthru = Contributions to multilat. organisations ("Core contributions to") Flow type = "Disbursements"

Dataset	Amounts B_i	Conditions C_i
Bilateral BMZ commitments for climate-relevant development finance		
MeMFIS	Commitments and approvals ("ZusagebetraginklReprogrammie" & "Bewilligungsbetrag")	Budget item number t1 = [2301–2305, 2310–2312] Funding type = 1 ("committed")
CRS	Commitments ("usd_commitment_defl")	Donor code = 5 (Germany) Flow code = 11 and 13 (loans and grants) Funding type = 1 ("committed") Agency code = 1 (BMZ)
UNFCCC	Commitments ("Totalamount")	Funding source = ODA Funding type = commitments ("committed") Financial instrument = "Grants", "Other (concessional loans from budgetary sources)" and "Other (grant equivalent of concessional loans)" (loans and grants) Donor = BMZ ("AdditionalInformation")
EU	Commitments ("CommittedAmount"/ "Climate specific amount", EUR)	Funding source = ODA Funding type = commitments ("committed") Financial instrument = "Grants", "Concessional loans from budgetary sources" and "Grant equivalent of concessional loans") (loans and grants) Donor = BMZ ("AdditionalInformation")

Source: DEval, own visualisation

2.2 Analysis of KLM markers with automated language processing

The analysis of the KLM markers is part of the assessment basis for EQ1. Machine learning was used to validate the KLM markers of the interventions in the CRS dataset based on the brief descriptions. This makes it possible to analyse large datasets with few resources.

The machine learning involves training an artificial neural network to recognise the connection between project descriptions and the Rio markers assigned during manual recoding on the basis of a sample. The classifier created in this way then codes all interventions reported to the OECD DAC, likewise making it possible to identify interventions with missing Rio markers. By integrating the findings from machine learning, it is possible to re-estimate the extent of mitigation-relevant climate finance and contribute to the validity of the findings (see Borst et al., 2022).

The CRS project descriptions used for the classification usually have a length of just a few sentences and contain less information than the project and programme documents that the OECD recommends as the basis for classification. However, this evaluation assumes that the CRS project descriptions for interventions with significant mitigation relevance also contain the relevant information.[22]

As a basis for validating the CRS data, two researchers, independently of one other, manually coded a sample of 1,500 German interventions between 2006 and 2020. In addition, they discussed a randomly selected CRS training dataset of around 500 interventions in order to eliminate differences and uncertainties in the understanding of the KLM classification according to BMZ and OECD guidelines. As the CRS data prior to 2005 does not contain any long project descriptions, these could not be taken into account. They did not use any longer project descriptions (for example in the data of the International Aid Transparency Initiative [IATI] or the project databases of the implementing organisations) either, as the lack of standardised identification numbers prevented a connection to the CRS data.

22 The importance of this reference is explicitly emphasised in the Rio Marker Handbook: "To facilitate transparency, it is important that in the description of activities reported to the CRS, the relationship between the activity and the objective (including climate change mitigation/adaptation) is clearly communicated and made explicit. This is particularly important for activities with a principal objective score and for very large activities (recognising the administrative constraint this implies when numerous small activities are concerned)" (OECD, 2016: 5).

Box 7 Rio markers

The Rio marker for recording interventions to mitigate GHG emissions was introduced in 1998 for reporting bilateral ODA funds and other official flows apart from export credits. Multilateral contributions are not coded by the OECD countries themselves, but by the international organisations using Rio markers. The international development banks use the Common Principles for Climate Mitigation Finance Tracking for this purpose (IDFC, 2023).

The BMZ has been using the Rio markers to calculate the amount of bilateral funds in the climate sector since 2011 (BMZ, 2023b). If the principal objective of an intervention is to mitigate GHG emissions, the Rio marker is set to 2 and 100 percent of the funds are counted as relevant to mitigation. If mitigation is a significant objective, the Rio marker assumes the value 1 and the financial volume is discounted 50 percent, that is, only half is taken into account.

To promote transparency, the Rio Marker Handbook stipulates that CRS project descriptions, especially for principal objective interventions and large interventions, should make any associations to GHG emission mitigation clear (OECD, 2016). These project descriptions form the basis for the review in this evaluation.

Even though the Rio markers are described in the handbook as a descriptive and not strictly quantitative measure of the climate relevance of interventions, they are used in German (and in some cases international) reporting as a basis for calculating climate finance.

In order to address the problem that climate-relevant intervention objectives may have remained undetected due to the short project descriptions, the results of the classification were compared with the independent results of a methodologically complex review of the Rio markers by Oxfam (in preparation). This check is based on a qualitative analysis of project descriptions available online. A total of 395 climate change mitigation interventions from 2018 and 2020 were analysed on the basis of their project objectives and interventions.

The agreement between the researchers was analysed using Cohen's kappa, a statistical measure for assessing the agreement between two observations[23]. It yielded a value of 76 percent, which is described as moderate with a kappa between 0.51 and 0.58 (Landis and Koch, 1977). Large differences were found for KLM-1 interventions in particular. It was rarely clear from the project description whether a KLM marker should be assigned to an intervention and, if so, which one.

2.3 Comparative analysis of private capital mobilisation

The comparative analysis of private capital mobilisation serves to answer the question as to the extent to which the BMZ succeeds in mobilising private capital for mitigation-relevant interventions (EQ1). Private capital mobilisation here refers to the funding of development services by private stakeholders through official development assistance within the framework of joint funding instruments. It does not take account of the area of private sector mobilisation. The scope of mobilised private capital is examined on the basis of fund documents. Forms of recording mobilised private capital are first compared and then calculated on the basis of a sample of fund documents.

The population of the analysis comprises the BMZ fund and direct holdings managed by KfW on a fiduciary basis with a KLM marker of 1 or 2 in the period from January 2017 to June 2023, totalling 14 interventions. Two key figures were used to analyse private capital mobilisation.

23 Cohen's kappa (K) compares the agreement between the answers of two observers. K is calculated as $K = (p_o - p_e)/(1 - p_e)$, where p_o is the observed probability with which both observers arrived at the same result, and p_e is the random expected probability. All of the observers' answers are then added together and inserted into the formula under p_e.

The first was the amount of capital mobilised through BMZ funds that are implemented through financial cooperation (FC). This also takes account of the relative risk assumption and the BMZ's holding level (OECD, 2018b). The second key figure was the leverage, which evaluates the private capital in relation to the public funds invested.[24] This generally does not take account of the degree of risk assumption.

In order to assess the mobilisation potential of mitigation-relevant interventions, the key figures in the mitigation-relevant area were compared with non-mitigation-relevant BMZ fund and direct holdings. For this purpose, a control group was formed that is as similar as possible to the mitigation-relevant interventions, except for their relevance to mitigation.

Of the 14 mitigation-relevant holdings, two are direct holdings, nine of the fund holdings are debt funds, a further two are equity funds and one is a guarantee fund. In the case of structured holdings, the BMZ has always invested in the most risky tranche of the mitigation-relevant holdings. Three of the fund investments are structured in such a way that all investors have the same risk and the same expected return (flat funds). The 60 non-mitigation-relevant fund and direct holdings comprise 18 direct holdings, 20 structured funds and 22 flat funds (see Table 3).

Table 3 Number of holdings by KLM marker and type of holding

	KLM 0	KLM 1	KLM 2	Total
Direct holdings	18	1	1	**20**
Structured funds	20	4	5	**29**
Flat funds	22	1	2	**25**
Total	**60**	**6**	**8**	**74**

Source: DEval, own visualisation

2.4 Comparison of partner priorities with allocation patterns

The secondary data analysis serves to answer the question as to the extent to which the needs and priorities of the partners influence the distribution of mitigation-relevant DC. The alignment of German DC with the priorities of development partners is assessed on the basis of a quantitative measure, namely the share of mitigation-relevant development finance committed in sectors in which partner countries have formulated corresponding conditional targets in their NDCs. This means that the analysis only considers objectives where the partner countries state that their achievement depends on the receipt of international financial, technological and capacity-building support. In particular, this reflects the priorities with regard to international cooperation. The dataset contains a total of 63 developing countries with such goals, all of which receive mitigation-relevant DC from the donor community and 45 of which receive mitigation-relevant DC from Germany.

To begin with, the analysis used the data from Climate Watch (Climate Watch, 2021; Pauw et al., 2016) to determine the year in which a conditional sectoral target was formulated in an NDC for the first time for each ODA-eligible country. From this year onwards, partner-oriented commitments can be identified in accordance with the operationalisation chosen here. Conditional targets were then coded for the eight sectors contained in the NDC content dataset for the period selected (see Table 4). For this purpose, a binary variable was defined for recipient-sector-years, which assumes the value 1 if at least one conditional sectoral target was published

24 Private capital mobilisation involves attracting private investors to interventions by mitigating risks, for example through guarantees, subordinated loans or holdings in funds or companies.

in an NDC in the respective sector in the year concerned or preceding years.[25] As an NDC should be updated every five years, it is assumed that targets will remain valid from the year of publication (2015 or later) until the last year of the analysis (2022). New targets were thus added (through updated NDCs), but none were removed. In order to measure the overlaps with commitments of mitigation-relevant development finance, the sectors of the targets were linked to sectors of the CRS dataset. Commitments with climate change mitigation as a significant objective were discounted as in all analyses in this report. Finally, the commitments of mitigation-relevant development finance that correspond to partner priorities were totalled and divided by the total amount of mitigation-relevant development finance.

Table 4 Linking the sectors of the NDC Content Dataset with the purpose codes of the OECD-DAC-CRS dataset

NDC Content Dataset	OECD DAC CRS
Agriculture	Agriculture
Buildings	Construction
Economy-wide	Trade policy and regulations/trade-related adjustment
Energy	Energy generation, distribution and efficiency
Transport	Transport and storage
LULUCF	Forestry
Industries	Industry
Waste	Waste management and disposal

Source: DEval, own visualisation
Note: The abbreviation LULUCF stands for "Land Use, Land-Use Change and Forestry".

2.5 Allocation analysis

An allocation analysis investigates the factors according to which German mitigation-relevant development finance is distributed under the political responsibility of the BMZ. This involves analysing the probability of countries receiving development contributions and to what extent. Particular attention is paid to the extent to which the BMZ bases its allocation of funds on potential for mitigating GHG emissions and on the needs of potential cooperation countries.

The allocation analysis is carried out as an inferential statistical analysis based on a multivariate regression model. To this end, potential conditional factors are first made measurable by means of quantifiable indicators (see Table 5 and, for details, Table 13 in the Annex).[26] Statistical associations between indicators and allocation decisions are then used to identify factors that influence allocation decisions.

The analysis is based on CRS data from 2011 to 2021. For the analysis, the data is summarised for one-year, two-year and four-year periods with the aim of ensuring robust results. A distinction can also be made between short-term, medium-term and long-term influences.

The allocation analysis investigates commitments of bilateral mitigation-relevant DC under the political responsibility of the BMZ. Commitments are considered because they are closer in time to the decision-making processes at the BMZ than disbursements and better reflect political priorities (Wencker, 2022). Disbursements represent actual transfers, but can be influenced by conditions in cooperation countries.

25 It is therefore not the number of targets in a particular sector that is used as a measure of its importance. Otherwise, it would be assumed that all conditional targets are equally ambitious. As the sectoral targets can vary greatly in ambition, a binary measure is used.

26 The potential conditional factors are identified on the basis of the objectives set out in BMZ strategies and a review of the academic literature on the distribution of international DC.

Table 5 List of selected independent variables

Conditional factors	Indicators
Needs of cooperating countries	Income group, per capita GDP (PPP), infant mortality, HDI, climate risk[27]
Political-institutional framework conditions of cooperation countries	Electoral democracy, governance, effectiveness of government action, level of corruption, women in parliament, violent conflicts
Economic and political interests of donors	Voting behaviour at the United Nations (UN), exports from Germany, imports to Germany, oil production, geographical distance to Germany
Mitigation potential of the energy supply	Power supply from RE, GHG emissions, per capita GHG emissions, energy intensity[28], emissions intensity, installed capacity of renewable energies in energy supply, share of renewable energies in primary energy sources
(Mitigation-specific) pioneering role	Patents in the area of "renewable energies and supporting technologies"

Source: DEval, own visualisation
Note: RE = renewable energies, HDI = Human Development Index, PPP = purchasing power parity

The allocation process is modelled using a two-stage model. The first step, in the selection stage, is to analyse which countries receive bilateral BMZ commitments for mitigation-relevant development finance and which conditional factors they are based on. The allocation stage then involves analysing the relationship between conditional factors and the amount of bilateral BMZ commitments to mitigation-relevant development finance for all countries that have received commitments. The statistical model of this analysis builds on other DEval evaluations, for example those by Noltze and Rauschenbach (2019) on adaptation to climate change and by Wencker (2022) on the allocation of bilateral official DC.

The bilateral commitments of the BMZ's mitigation-relevant development finance were taken from the previous period, meaning delayed, in order to avoid a possible reverse causality between the amount of BMZ commitments (dependent variable) and the conditional factors (independent variables). This is intended to prevent false conclusions. Then again, this means that the relationship between the distribution of commitments in a specific period and potential conditional factors in the respective previous period was analysed. Missing data was imputed.

2.6 Evidence synthesis

The evidence synthesis forms the theoretical basis for the effectiveness and impact analyses. It presents scientific findings on the interdependencies between interventions in a simplified way. To this end, international DC interventions to mitigate climate change are first analysed and grouped on the basis of the IPCC's 6th Assessment Report (IPCC, 2022a).[29] For each group, causal relationships are summarised as a narrative and visualised in illustrations (see Section 6.3 in the Annex). The summaries are the derivation of the hypotheses of the effect and impact analysis.

2.7 Effect and impact analysis

The effect and impact analysis evaluates the effectiveness and achievement of overarching development impacts of greenhouse gas emission mitigation from mitigation-relevant development finance. In particular, it analyses the extent to which mitigation-relevant development finance is linked to changes in the energy system and GHG emissions. The explanatory variable is disbursements of bilateral official development assistance. In contrast to the allocation analysis,

27 Germanwatch's climate risk index measures the extent to which countries are affected by extreme weather events. The index takes into account the number of fatalities caused by extreme weather events and economic losses (Eckstein et al., 2019).

28 The energy intensity is defined here as energy consumption per unit of GDP (in US dollars).

29 The 6th Assessment Report, published in 2021 to 2023, is the most comprehensive report, containing the current international state of knowledge and consensus on climate change mitigation. It therefore forms the basis of the impact pathways presented in the evidence synthesis. This should ensure that the effect and impact analysis is based on the most reliable evidence possible.

disbursements are used here, as these are closer in time to the effects and impacts. The variable to be explained at the level of overarching development impacts is the quantity of GHG emissions in a country aggregated over five years. In accordance with the Kyoto Protocol (Gütschow et al., 2016), GHG emissions include methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6) in addition to carbon dioxide (CO_2). To evaluate effectiveness, the expected effects and impacts of different groups of interventions are operationalised using the variables to be explained. For example, the share of renewable energies in electricity generation operationalises the effect and impact of technological and infrastructural interventions. An overview of the variables used can be found in Table 13 in the Annex.

The assessment of the effect and impact of mitigation-relevant development finance is based on theory-driven analyses of descriptive and inferential statistics as well as the current state of research. More specifically, it uses descriptive and inferential statistical methods. The descriptive analysis is easy to interpret, but may lead to erroneous conclusions due to the distorting influence of confounders. In the models of inferential statistics, the association of interest (in this case between ODA disbursements and GHG emissions) is statistically shielded from the influence of potentially distorting confounders. The aim is to uncover theory-based evidence for causal effects between variables by excluding random correlations or correlations caused by confounders with sufficient certainty. For this purpose, observable, potentially distorting influencing factors are derived from the evidence synthesis and the scientific literature. In addition, the available panel data makes it possible to statistically control certain potentially distorting variables, even if they are not explicitly named or known. However, the statistical methods used for this (two-way fixed effects models) are based on certain assumptions. One aspect that is particularly problematic in this case is the assumption that there is no causal "feedback loop" in which the development of GHG emissions influences the amount of mitigation-relevant development finance. As this seems unrealistic, an inferential statistics method that takes account of potential feedback loops is used where possible (a dynamic panel model calculated on the basis of a maximum likelihood estimate in the form of a structural equation model). However, the prerequisites for this model are not met for all analyses. The quality of the evidence obtained using the different methods varies accordingly, which is taken into account in the conclusions.

2.8 Evaluability of efficiency

The data basis did not allow an evaluation of efficiency; instead, conditions were developed with a view to evaluating the allocation efficiency of development interventions for the mitigation of GHG emissions in the future. The prerequisite for this is comparable, valid and intervention-specific data on GHG emission mitigation through DC. While data on financial resources is precisely recorded and publicly reported in all interventions, this only applies to a limited extent to the standard indicator for GHG emission mitigation.[30]

The aim in investigating efficiency is to assess methods for collecting and recording reduced or avoided GHG emissions in the context of DC interventions. To this end, the conditions needed in order to record emission reductions reliably are established. The evaluation then analyses the extent to which the methods used to date to assess the efficiency of the GIZ and KfW fulfil these conditions. Finally, recommendations are made on how to improve the recording of GHG emission mitigation so that an allocation efficiency can actually be evaluated in the future.

The limitations in recording the standard indicator are also pinpointed. Where standardised reporting does not appear possible, the necessary differentiations are established. This concerns, for example, recording direct and indirect effects and impacts. The recording methods differ so greatly here that this is highly likely to have an impact on the quality and precision of measurement. Inasmuch, values should not be aggregated across these groups of interventions.

30 Standard indicators are intended to make development results measurable and, through standardised reporting, enable development results to be aggregated across topics and countries in order to present them to the public (Janus and Esser, 2022: 1).

2.9 Limitations

This evaluation is a macro-quantitative evaluation. This means that the results are based on a comparative analysis of many cases using mainly statistical methods based on secondary data. Neither quantitative nor qualitative data collection took place. The aim of the analysis is to gain knowledge at an aggregated level. The findings therefore apply on average across a range of cases and cannot necessarily be transferred to individual cases. Although case studies or comparisons with a smaller number of cases can examine individual cases in more detail, they are not necessarily more informative due to a lack of generalisability. Macro-quantitative analyses can be more informative by reducing complexity (for example, by looking at more abstract causal relationships instead of differentiating numerous functionally equivalent causal mechanisms) and uncovering cross-case relationships. The approach appears to be particularly well suited to the object of evaluation, as the aim is to gain knowledge regarding mitigation-relevant DC in general and not in individual cases. This increases the usability of the evaluation for strategic decisions.

The analyses use only observational data. In contrast to experimental designs, the value of the potentially explanatory variable is not assigned (for example, using randomised procedures such as drawing lots) (Krämer et al., 2021), but is observed. For this reason, observational data only allows conclusions to be drawn about causal relationships under certain conditions. For example, confounders can create a connection (even a significant one) between two variables that are not actually causally related and thus lead to false conclusions. However, such confounding variables cannot be identified based on the available observational data; this identification requires additional theoretical knowledge or well-founded theoretical assumptions regarding the subject area. In other words, if causal conclusions are to be drawn from analyses of observational data, this can only be done on the basis of assumptions about relationships between variables that are not empirically verifiable (Pearl, 2009). Theoretical assumptions were systematically derived from the scientific literature in order to avoid any possible erroneous conclusions. In particular, the aim is to identify those variables that, as common causes of the explanatory variable being analysed and the variable to be explained, make it difficult to identify causal relationships. By closing such "back doors", it is possible to extract findings on causal relationships from observational data on the basis of transparent assumptions.

The quantitative analyses are based on indicators that allow the objects of investigation to be observed and quantified and thus allow theories to be tested. These indicators are not equally valid, as it is not only the highest possible validity that is relevant, but also the quality and availability of the data. This is particularly important for the comparative analysis of different groups of interventions (see Section 2.6 and Section 2.7). As the quality of the indicators is not equivalent, the findings are not analysed for specific groups of interventions.

3.

FINDINGS

This chapter begins by examining the extent to which Germany fulfils international agreements, meets the goals it has set itself and takes partner priorities into account (see Section 3.1). The criteria according to which the mitigation-relevant development finance is distributed are then evaluated, paying particular attention to the role played by the mitigation potential and the needs of the partner countries (see Section 3.2). Sections 3.3 and 3.4 describe the extent to which mitigation-relevant development finance achieves its objectives (effectiveness) and contributes to GHG emission mitigation (impact). Section 3.5 discusses the prerequisites for evaluating the efficiency of mitigation interventions.

3.1 Relevance: Alignment with international agreements

3.1.1 Benchmarks

EQ1 is verified based on two benchmarks. The first benchmark relates to the scope of mitigation-relevant development finance and the balance of support for adaptation and mitigation interventions. The second is dedicated to the goals of developing countries, analysing the extent to which German development finance is aligned with these goals.

Evaluation question 1: To what extent is the mitigation-relevant portfolio aligned with international agreements and the priorities of the development partners and the German Federal Government?

Benchmark 1.1: The contributions of German DC to mitigation-relevant development finance are in a balanced relationship with adaptation-relevant development finance and correspond to the principle of common but differentiated responsibilities.

Benchmark 1.2: The priorities of German mitigation-relevant development finance are geared towards the partner countries' nationallly determined contributions.

3.1.2 Derivation

Level and responsibilities of international climate finance

At the World Climate Conference in Egypt in November 2022, the German Federal Government confirmed that Germany intends to increase its climate finance for developing countries to at least EUR 6 billion from budget funds by 2025 at the latest (BMZ, 2023b).[31] This commitment is mentioned in BMZ documents (BMZ, 2022c) and is part of the goal of industrialised countries to increase international climate finance to USD 100 billion annually as of 2020 (OECD, 2022b; UNFCCC, 2015). Above all, the poorest countries with the fewest financial reserves and lowest capacities are to be supported (BMZ, 2022c: 3).

The target of USD 100 billion was not achieved in 2020 and 2021. The value reached up to USD 89.6 billion in 2021, which corresponds to an increase of 7.6 percent compared to 2020 (OECD, 2023c). Although official bilateral and, in particular, multilateral climate finance grew strongly between 2013 and 2021, it did not grow strongly enough. In addition, the amount of mobilised private capital is stagnating at a low level (OECD, 2023c) and climate finance, depending on the type of calculation, is significantly lower (Colenbrander et al., 2022; Zagema et al., 2023). This is partly due to the fact that donor countries recognise interventions more extensively in international climate reporting than in official development assistance reporting. For example, they recognise loans at full face value and not on the basis of grant equivalents (Zagema et al., 2023).

31 There are different formulations of the EUR 6 billion target, which also refer to different amounts (highlighted in italics in the following quotations). At COP27, Federal Chancellor Olaf Scholz stated: "By 2025, we will increase our contribution from *public funds* for international climate finance to EUR 6 billion per year" (Federal Government, 2022). The Federal Statistical Office's 2022 Indicator Report (2023: 118) states that the Federal Government's aim is to raise its contribution to international climate finance to EUR 6 billion from *budget funds* by 2025. Different amounts are also referred to with regard to the achievement of objectives. On its climate finance website, the BMZ writes: "With those sums included, the total amount of *budget funds* committed by the German government for climate change mitigation and adaptation measures stood at some EUR 6.39 billion in 2022" (BMZ, 2024a). According to the OECD definition, official development assistance includes grants from federal budget funds and grant equivalents of sufficiently concessionary loans. Grant equivalents – particularly relevant when recognising sufficiently concessionary loans – represent concessions on loans compared to market conditions. However, this is not only due to the addition of budget funds, but also to all mechanisms that make the interest rates of concessionary FC loans more favourable than market conditions.

In climate finance, a distinction must be made between the goals of the donor community and the German goals. Accordingly, this evaluation looks both at the German share of the common target of USD 100 billion and at the national target of EUR 6 billion. In the case of the former, the German contribution is not precisely defined, which is why it is assessed according to the principle of common but differentiated responsibilities. Several approaches are used to determine a fair share. The latter is an objective of the German Federal Government and the evaluation examines it for German climate finance.

The reporting also differs. In order to avoid differences in the figures due to different reporting rules, the evaluation considers grant equivalents where possible. It therefore does not recognise loans at nominal value. In addition, it analyses only ODA funds. Consequently, the evaluation does not take account of German contributions via the mobilisation of capital market funds (see the separate analysis in this chapter with regard to this) and private climate finance. The allocation of Rio markers is validated by machine learning.

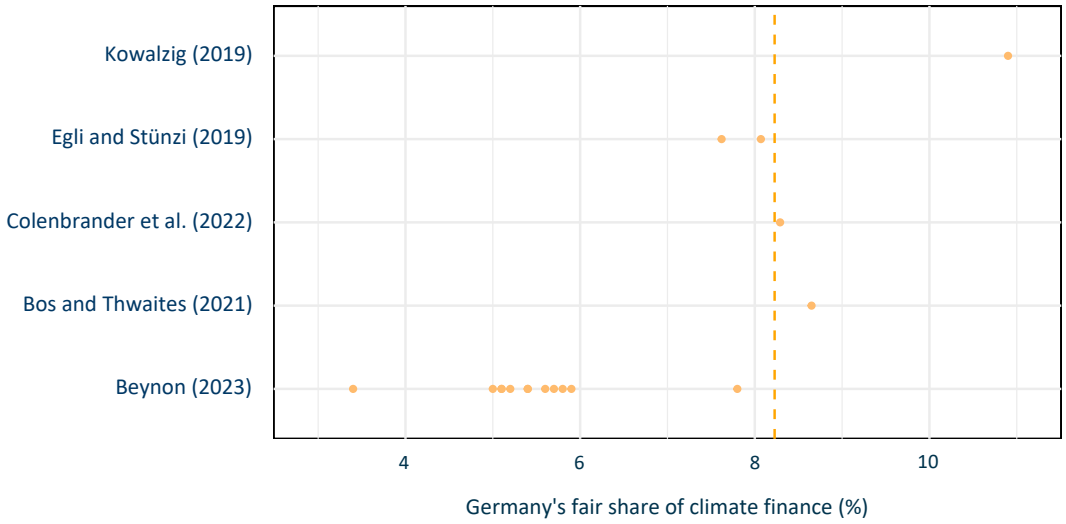
The Paris Agreement does not specify how high the share of the USD 100 billion target should be for individual industrialised countries. However, it emphasises that climate change should be tackled "on the basis of equity" (UNFCCC, 2015 Article 4[1]). The principle of common but differentiated responsibilities, taking into account the respective capabilities, is fundamental here (Article 4[3]).[32] The principle applies to the entire Paris Agreement and thus also to support for developing countries (Articles 9[1], 9[3], 10[5] and 10[6]). However, there is no concrete operationalisation of the principle (Dooley et al., 2021). According to the IPCC, international climate finance is central to a global just transition to climate-friendly economic structures (IPCC, 2023c: 1559). As Pachauri et al. (2022) establish, financial flows from North America and Europe to other regions must increase significantly in order to comply with the principle and achieve the goals of the Paris Agreement.

On average, Germany's fair share of the USD 100 billion target is estimated at just over 8 percent. Typical indicators for calculation are (a) the historical contribution to climate change, (b) the (financial) capacity of a country to contribute to coping with climate change and its consequences, (c) the principle of equality and (d) the ability to fulfil basic needs (Holz, 2023). According to this approach, responsibility is compared with development and adaptation needs; emissions from consumption at low income levels, for example, are excluded from responsibility. In order to measure Germany's fair share, a total of five publications were analysed.[33] The results are shown in Figure 4.

32 Article 4[3] of the Paris Agreement states: "Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances" (UNFCCC, 2015).

33 Colenbrander et al. (2022) calculate a fair contribution share of 8.3 percent or USD 9.9 billion for Germany in 2020, taking into account cumulative GHG emissions as of 1990, gross national income (GNI) and population size. They also reach the conclusion that Germany is overfulfilling its fair share of donor community monetary targets. It should be noted here that, as the authors themselves admit, the results are based on a crediting logic that is now outdated in the statistics on official development assistance. Kowalzig (2019) calculates Germany's fair contribution to international climate finance at 10.9 percent. This takes account of Germany's share of the total nominal GDP of the Annex II countries (2018), cumulative CO_2 emissions (1990 – 2016) and ODA (2014 – 2017). Bos and Thwaites (2021) base measurement on a country's share of GNI averaged over the years 2011 to 2016, the share of cumulative GHG emissions (data averaged from 1850 to 2016) and a scaling factor for per capita GHG emissions. The level of the factor depends on whether the GHG emissions in the country are above or below the average for Annex II countries. The factor increases the fair share for countries whose per capita CO_2 emissions are above the average and vice versa (Bos and Thwaites, 2021). Beynon (2023) creates twelve scenarios, each with differently calculated indicators. For example, there are differences regarding the period over which the emissions are recorded (1979 – 2021, 1990 – 2021, 1900 – 2021) or the type of emissions (GHG or CO_2 emissions). Egli and Stünzi (2019) use GDP in 2017 and GHG emissions (1990 – 2014) in one approach, while in another they use the GDP projected until 2030 minus expected climate damage and the expected cumulative GHG emissions between 1990 and 2030 minus the expected GHG emission reductions according to the NDCs.

Figure 4 Germany's fair share of climate finance



Source: DEval, own visualisation
Note: The figure shows estimates of Germany's fair share of international climate finance. The underlying method is explained in more detail in Footnote 33.

The amount of USD 100 billion is not necessarily needs-based and, as a purely monetary target, is not a valid indicator of mitigation effects.[34] For example, the technical report on the global stocktake establishes the need to "unlock and redeploy trillions of dollars to meet global investment needs" (UNFCCC, 2023c: 9). Compared to these requirements, the sum of USD 100 billion is small. Beyond the discussion about amounts, it is essential to what extent financial resources effectively mitigate GHG emissions through good regional and instrumental distribution and the promotion of adequate interventions.

Balancing international climate finance

A balanced ratio of funds for GHG emission mitigation on the one hand and those for adaptation to climate change on the other is also the subject of international agreements and national objectives. The Paris Agreement (Article 9[4])[35] and the BMZ core area strategy state that funds for adaptation and mitigation should be balanced. The BMZ aims to ensure a balanced ratio of mitigation and adaptation funding from budget funds (BMZ, 2021b: 15).

Internationally, the balance between official mitigation and adaptation funding has not been achieved. In fact, if we consider private financial flows too, it is a long way off. According to the global stocktake (UNFCCC, 2023), the imbalance is decreasing, but remains considerable with a share of adaptation funding of only 28 percent in 2019 and 2020. In this respect, it is important to differentiate between the achievement of self-imposed targets and the achievement of multilaterally agreed targets by the donor community. Differences in operationalisation must be taken into account too, as the German target relates to budget funds, while the global stocktake relates to international climate finance. Buchner et al. (2023) additionally look at all public and private forms of climate finance. Consequently, the imbalance is even more pronounced with a share of only 5 percent for adaptation funding (see also Waskow et al., 2023).[36]

34 The improved measurability of a monetary target could be cited as an advantage. But there are also doubts about this (Roberts et al., 2021).

35 Article 9(4) of the Paris Agreement states: "The provision of scaled-up financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change and have significant capacity constraints, such as the least developed countries and small island developing States, considering the need for public and grant-based resources for adaptation" (UNFCCC, 2015: 13).

36 However, the Climate Policy Initiative report (2023b) also recognises loans on the basis of their nominal value and not the grant equivalent.

Partner orientation

Alignment with partner priorities can contribute to policy coherence and thus to sustainable development. Partner orientation is intended to strengthen the ownership of development partners and contribute to a more effective and efficient use of limited financial resources (Paris Declaration on Aid Effectiveness [OECD, 2005], Accra Agenda for Action [OECD, 2008], Busan Partnership for Effective Development Cooperation [OECD, 2011]; see also Iacobuţã et al., 2022).

Only a few studies analyse the partner orientation of DC. Exceptions are the studies by Noltze and Rauschenbach (2019) and Iacobuţã et al. (2022) for German adaptation-relevant climate finance and international climate-relevant development finance. The former compare allocation patterns of the German adaptation portfolio with the partners' sectoral priorities formulated in NDCs and find that only slightly more than 50 percent of the funds are committed to the sectors that are prioritised by the partners according to the NDCs. The latter analyse the extent to which international climate-related official development assistance is in line with the priorities of development partners, linking statements in NDCs with the SDGs and in turn linking these with commitments to climate-relevant development finance. It transpires that they are very much in line with partner priorities, but no improvement is to be seen since the conclusion of the Paris Agreement.

3.1.3 Findings

Principle of common but differentiated responsibilities

Firstly, the assessment of the extent to which Germany fulfils the principle of common but differentiated responsibilities with regard to supporting developing countries depends on the commitments made by the Federal Government. Germany has committed itself to the joint goal of providing developing countries with USD 100 billion annually for climate change mitigation and adaptation as of 2020 (OECD, 2022b). Scientific approaches to operationalising the principle come to the conclusion that Germany's contribution to this is just over 8 percent (see Figure 4). Germany is also aiming to contribute at least EUR 6 billion in climate-relevant budget funds, including the grant equivalents of loans, by 2025 at the latest (BMZ, 2022c, 2023c).[37]

Secondly, the assessment of the achievement of objectives depends on the respective reporting of international climate finance and mitigation-relevant development finance. There are some considerable differences here. These differences can only partly be explained by the survey methods or definitions of the object, as the dataset comparison in Table 6 shows. The columns on the right show bilateral BMZ commitments for mitigation-relevant development finance. Accordingly, the BMZ has committed funds totalling EUR 4.3 billion (EU), EUR 4.8 billion (UNFCCC), EUR 3.8 billion (CRS) or EUR 5.2 billion (MeMFIS) from 2017 to 2020.

In turn, the figures calculated here differ from other publications. For example, a publication by Oxfam (2023) states that Germany pledged an average of USD 7.2 billion in bilateral climate finance each year in 2019 and 2020.[38] These figures are taken from the fifth biennial report to the UNFCCC and include grants and loans recognised at face value. This broader definition of climate finance, which takes account of nominal values rather than grant equivalents and thus complies with UNFCCC standards, leads to higher figures. In other reports, Oxfam examines only climate-relevant budget funds and grant equivalents. Loans are therefore not recognised at nominal value and funds mobilised on the capital market are excluded. However, multilateral payments are taken into account. Based on this definition, Oxfam reports a total of EUR 4.34 billion in 2019 and EUR 5.09 billion in 2020 (Kowalzig, 2023).

37 The requirement that the aforementioned amount is to be provided from budget funds should be emphasised. While it is now mandatory for ODA reporting to the OECD to include only the grant portion of sufficiently subsidised loans, it is possible to do so in full when reporting climate finance for loans. However, Germany only reports grant equivalents in its climate reporting.

38 Oxfam presents the average of the funds for 2019 and 2020 and not individual years.

Table 6 Results of the dataset comparison: relative share and absolute totals of bilateral BMZ commitments for mitigation-relevant development finance (ODA funds) aggregated from 2017 to 2020

	Percentage share of KLM in KL				Absolute totals for KLM in EUR billion (constant)			
	EU	CRS	MeMFIS	UNFCCC	EU	CRS	MeMFIS	UNFCCC
Climate interventions								
KLM 2	23	11	9	22	3.2	1.9	3.3	3.7
KLM 1	21	32	23	21	1.1	1.9	1.9	1.1
Total KLM	44	43	32	43	4.3	3.8	5.2	4.8
Number of interventions	3,052	3,605	4,881	3,002	1,337	1,641*	1,557	1,297

Source: DEval, own calculations
*Note: KLM 1 is discounted 50 percent; * excluding the KfW as agency code; from 2017, the grant equivalents are included in the CRS data. The difference in the number of interventions is due to more differentiated reporting in the EU dataset compared to the UNFCCC dataset. In the latter, country allocations are sometimes missing and regional interventions are summarised. Even a comparatively large intervention (EUR 400 million) cannot be clearly allocated, which may account for the difference in the KLM totals.*

Thirdly, the assessment is influenced by the validity of the allocation of the Rio markers. As will be explained in more detail below, the evaluation of the KLM markers using machine learning indicates that BMZ interventions are overreported in the CRS dataset – something that also has consequences for the EU and UNFCCC datasets, which are not based on CRS but on the Rio marker system for bilateral climate finance.[39] This means that the number of interventions reported as climate-relevant is higher than the actual figure.

German climate-relevant official development assistance

Germany's climate-relevant development finance analysed below therefore includes all ODA funds reported by Germany as a whole. In contrast to the BMZ-specific analyses below, however, the core contributions to multilateral DC, which are paid by donor countries to multilateral organisations, multilateral climate funds and MDBs, are also examined here. As these funds cannot be allocated to a ministry in either the EU data or the CRS data, only an aggregated view is possible.

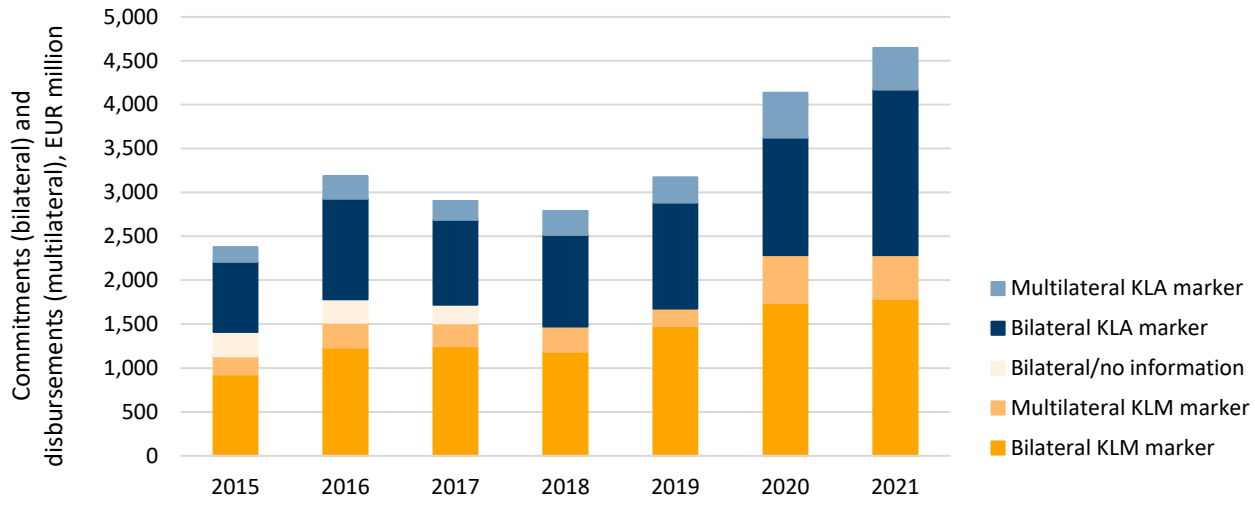
Germany is one of the most important donors of adaptation- and mitigation-relevant development finance. With EUR 49 billion, Germany is the largest bilateral OECD donor of climate-relevant development finance (CRS data, 2011 to 2021). In terms of mitigation-relevant development finance – and on the basis of standardised calculation methods – Germany ranks second after Japan with EUR 31 billion.

In 2021, Germany's climate-relevant development finance was higher than ever before. According to CRS data, Germany contributed a total of EUR 6.1 billion (EUR 5.1 billion in bilateral commitments and EUR 1 billion in multilateral disbursements) to climate-relevant development finance that year.[40] According to EU data, Germany recorded a lower contribution totalling EUR 4.6 billion (EUR 3.7 billion in bilateral commitments and EUR 970 million in multilateral disbursements) (see Figure 5).

39 However, as the EU and UNFCCC datasets from Germany do not contain any project descriptions that are necessary for a machine analysis, no separate validations could be carried out for these.

40 The MeMFIS data only contains the BMZ shares and therefore cannot be analysed for the German Federal Government; the UNFCCC dataset, as of July 2024, does not yet provide any figures for 2021, which is why a comparison is not possible.

Figure 5 **Bilateral commitments and multilateral disbursements by Germany for climate-relevant development finance from 2015 to 2021 in EUR, reporting to the EU**

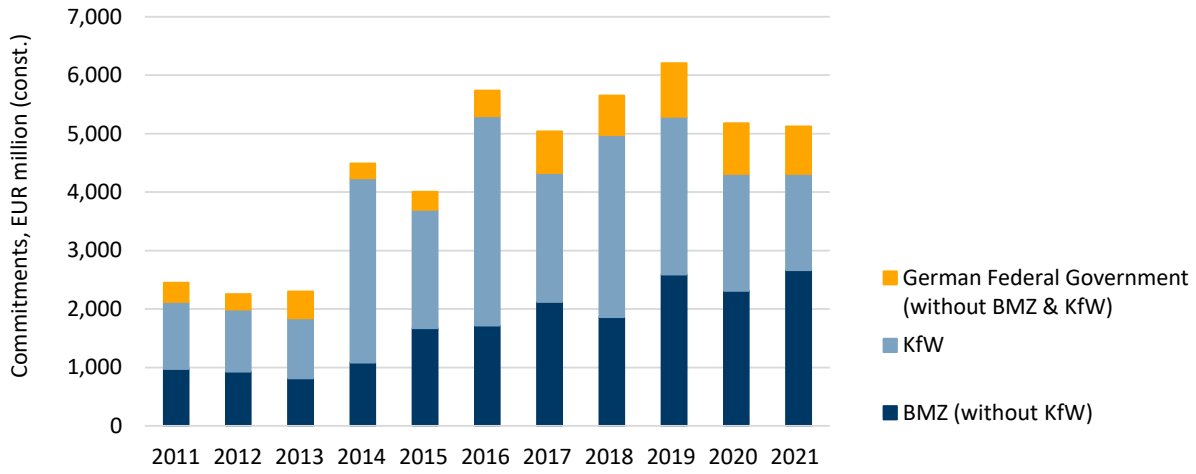


Source: DEval, own calculations based on EU data
Note: KLM 1 and KLA 1 are discounted 50 percent; "no data" refers to interventions that do not have a KL marker but are part of the bilateral commitments for climate-relevant development finance, as the EU dataset only reports on climate finance.

BMZ

Among the German federal ministries, the BMZ is responsible for the majority of bilateral commitments to climate-relevant development finance and thus also for the German contribution to achieving the USD 100 billion target (84 percent of bilateral climate-relevant development finance, EU data). This share can also be seen in the CRS data if KfW funds are added (without them it is only 52 percent). Between 2011 and 2021, the BMZ reported 19 out of a total of EUR 49 billion in bilateral climate-relevant development finance to the OECD (11,346 climate interventions), while the KfW reported an additional EUR 24 billion (see also Section 2.1 and Footnote 19). However, most of these KfW funds should be regarded as BMZ funds, as commitments from market funds are secured by a guarantee from the Federal Government (guarantee framework) and therefore require the approval of a ministry. This is usually the BMZ, but there are also market funds that are allocated under the responsibility of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), for example.

Figure 6 **Bilateral commitments by the BMZ and the German Federal Government for climate-relevant development finance from 2011 to 2021 in EUR, reporting to the OECD**



Source: DEval, own visualisation based on CRS data
Note: BMZ figures do not include KfW funds (see Section 3.1 and illustrations in the Annex); KLM 1 and KLA 1 are discounted 50 percent; the deflation rate was taken into account with 2020 as the base year; grant equivalents are shown from 2017 onwards.

The amount of bilateral climate-relevant development finance commitments made by the BMZ in 2021 fluctuated between EUR 3.1 billion (EU data), EUR 2.7 billion (CRS data without the KfW) and EUR 4.3 billion (CRS data with the KfW), depending on the dataset. This is shown in Table 7. On its website, the BMZ reports climate-relevant development finance totalling EUR 5.2 billion for 2021. This sum takes account of budget funds (EUR 3.2 billion) and market funds (EUR 2 billion). In the case of the latter, the grant equivalents are also stated (EUR 600 million) and only these are included in the calculation. On top of this, EUR 1 billion come from multilateral disbursements. The BMZ therefore reports a total of EUR 4.8 billion from bilateral and multilateral budget funds, taking grant equivalents into account (BMZ, 2024a).

Table 7 **Comparison of bilateral commitments for climate-relevant development finance according to climate reporting[a] for 2021 in EUR billion**

	EU data	CRS data	MeMFIS data
Germany	3.7*	5.1	Not available
BMZ	3.1	2.7	3.7
BMZ commitments to mitigation (KLM)	1.4	1.1	1.9
BMZ commitments on adaptation (KLA)	1.7	1.5	1.9
KfW (as "agency" in the CRS)	Cannot be calculated	1.6	Cannot be calculated

Source: DEval, own visualisation
Note: KLM 1 and KLA 1 are discounted 50 percent. Figures are rounded and therefore occasionally deviate from the total.
*[a] No data is available from the UNFCCC for 2021, so this cannot be included in the comparison. A comparison of all four datasets aggregated over several years can be found in Table 6. * Excluding the multilateral disbursements of EUR 970 million in 2021.*

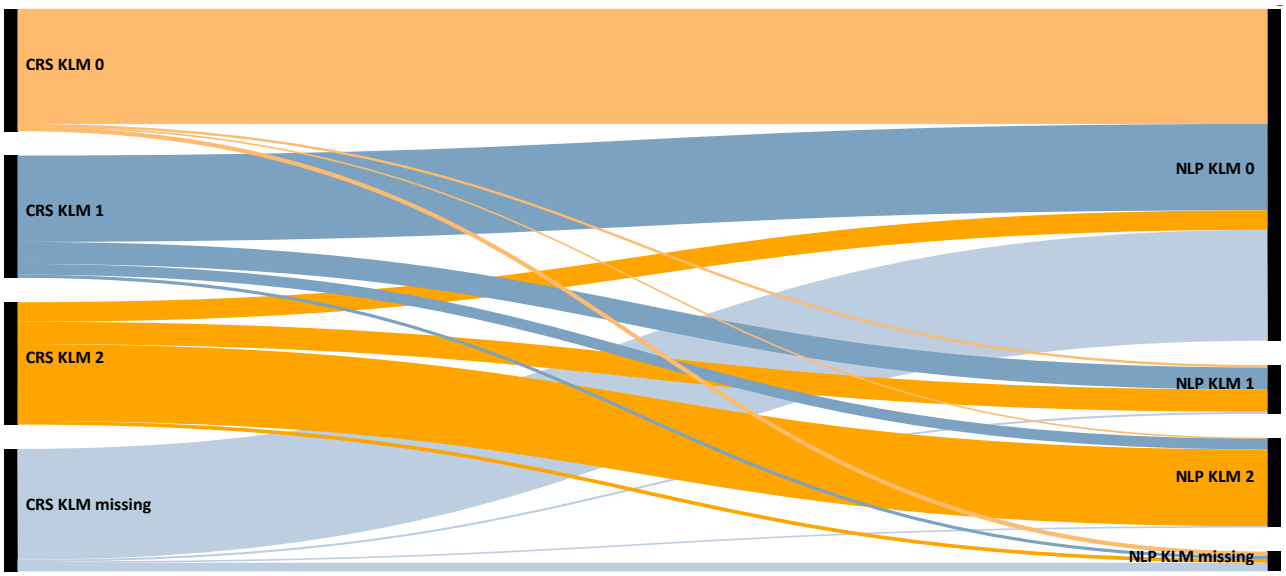
Validity of the KLM-Rio markers with machine learning

The information provided so far is based on the assumption that the Rio markers have been assigned correctly. However, existing independent studies on the validity of the KLA and KLM markers agree that the two markers are prone to being assigned too frequently and thus do not accurately represent climate-relevant development finance (Borst et al, 2023; Michaelowa and Michaelowa, 2011; Toetzke et al, 2022; Weikmans and Roberts, 2019). An additional study was therefore conducted using machine learning to determine the extent to which the Rio markers in the OECD-DAC-CRS data were assigned in a comprehensible manner and all climate-relevant interventions were coded appropriately.

Since the brief descriptions in the CRS dataset could have left climate-relevant intervention objectives undetected, the results were finally validated using qualitative data. One limitation of the approach pursued here is that the underlying project descriptions (long descriptions in the CRS dataset) are relatively short and therefore any actual relevance to the climate may not be reflected in the descriptions in some cases. In turn, this can lead to incorrect classifications. In an earlier study by Borst et al. (2023), which used very similar methods, machine recoding was compared with a complex review of the Rio markers by CARE International (Hattle et al., 2021). The study found that the proportion of downgraded interventions has fallen by just over half. This evaluation follows a similar approach.

The KLM markers classified by machine learning match the markers actually assigned 81 percent of the time. At 18 percent for KLM-1 interventions, the level of agreement is low. As Figure 7 shows, the majority of these interventions (71 percent) are classified as KLM 0. The interventions concerned are primarily from the main funding area "General Environment Protection", in particular the funding area "Biodiversity". In the case of KLM 2 interventions, the agreement is significantly higher, amounting to 63 percent (18 percent are classified as KLM 1 and 16 percent as KLM 0). In total, only 7 percent instead of 13 percent are classified as mitigation-relevant. Only a few KLM-0 interventions are "upgraded" as relevant to mitigation. For interventions in the funding area "Other Multisector" especially, the machine classification resulted in a decrease in KLM-1 markers and an increase in KLM-2 markers.

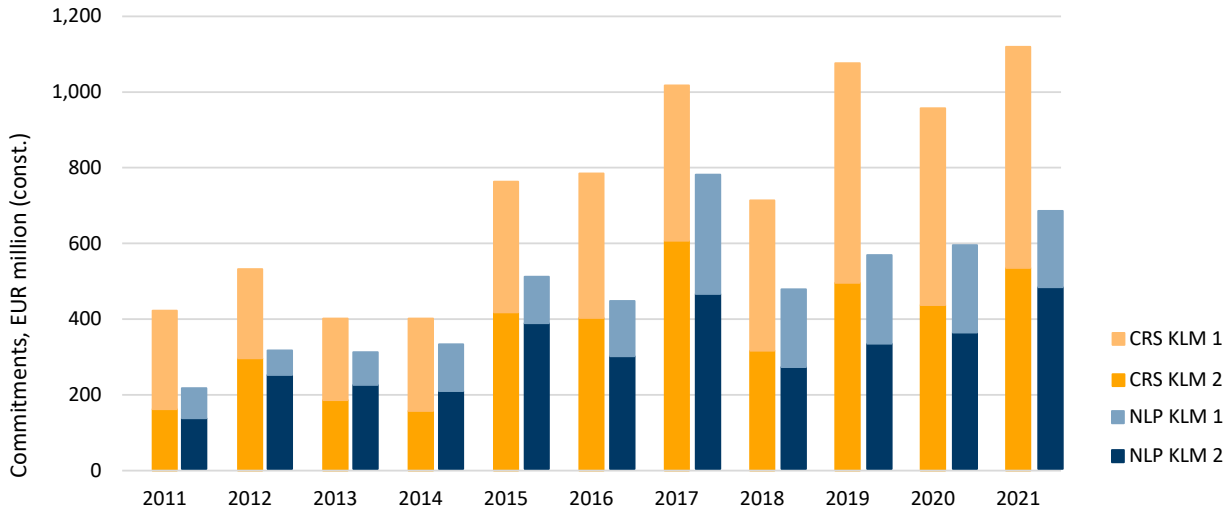
Figure 7 **Result of the machine classification of KLM markers depending on the marker reported to the OECD in the bilateral DC of the BMZ from 2011 to 2021**



Source: DEval, own visualisation based on CRS data and machine classification (Natural Language Processing, NLP) (excluding the KfW)

The results indicate that BMZ interventions are overreported in the CRS dataset. If we follow the machine coding of the short descriptions in the CRS dataset, the mitigation-relevant development finance is lower than reported. The sum of EUR 8.2 billion committed by the BMZ from 2011 to 2021 as bilateral ODA funds for mitigation-relevant development finance according to the CRS is thus reduced by EUR 2.1 billion. The downgrading of many KLM-1 interventions is particularly significant. While only EUR 51 million are deducted for KLM-2 interventions, the figure for KLM-1 interventions is over EUR 2 billion. Although these figures relate specifically to BMZ interventions, there is no reason to assume that the findings would be different for other countries or ministries.

Figure 8 **Comparison of BMZ bilateral commitments for mitigation-relevant development finance from 2011 to 2021 in EUR between the CRS (original coding) and the machine classification**



Source: DEval, own visualisation
Note: KLM 1 is discounted 50 percent; the deflation rate is taken into account with 2020 as the base year; grant equivalents are taken into account as of 2017.

The results of a more detailed examination of the Rio markers in individual cases by Oxfam (in preparation) essentially confirm the findings of the machine classification. In line with the results of the machine classification, the qualitative analysis also shows that overreporting is an issue, particularly in the case of KLM-1 interventions.[41] Accordingly, around half of the KLM-1 interventions in both 2018 and 2020 are not relevant to mitigation (2018: 45 percent; 2020: 50 percent). Also in line with the results of the machine classification, the extent of overreporting in the KLM-2 interventions is lower, amounting to 16 percent overall.[42] The results of the qualitative analysis thus confirm those of the machine classification. However, the extent of overreporting is estimated to be somewhat lower compared to machine classification. For example, 70 percent of the KLM 1 interventions in 2018 that are identified as too high in the machine classification are also assessed as too high in the qualitative analysis.[43] In view of how short the CRS descriptions are, this was to be expected.

In summary, it can be established that mitigation-relevant development finance under the responsibility of the BMZ would be lower if the Rio marker assignment for climate change mitigation (KLM 2 and 1) were validated. Although the extent of the downgrading cannot be determined exactly, the results show that Rio markers are awarded too frequently. They also indicate that the Rio markers allocated are sometimes too high.

It is therefore plausible that the reported figures are too high. Since it cannot be assumed that this pattern is significantly different for other OECD-DAC donors (Borst et al., 2023), the results of the machine coding do not cast any doubt on the perception that Germany is one of the largest donors, or that the BMZ is responsible for a large proportion of climate- and mitigation-relevant development finance. However, they suggest that doubts about the absolute amount are justified.

41 This comparison does not take account of different investigation periods for the qualitative analysis and the machine classification.

42 Accordingly, 15 percent of KLM 2 interventions for 2018 were to receive a KLM 1 marker and 2 percent a KLM 0 marker. In 2020, the figures are 14 and 1 percent respectively.

43 This correction factor for the results of the machine classification is 0.70 (2020) and 0.63 (2018) for downgrading KLM 1 interventions, 0.79 (2020) and 0.82 (2018) for the downgrading from KLM 2 to KLM 1, and 0.07 (2020) and 0.14 (2018) for the downgrading from KLM 2 to KLM 0. In particular, the correction factors for downgrading from KLM 1 to KLM 0 and from KLM 2 to KLM 1 indicate, due to their proximity to factor 1, that the problem of undetected relevance in the "mitigation" area is less severe.

A further question is to what extent the values of the discounting are appropriate. The discount factors vary greatly between countries (see Table 1 in Zagema et al., 2023). It is not plausible that these different calculation methods are based solely on actual differences in climate relevance.

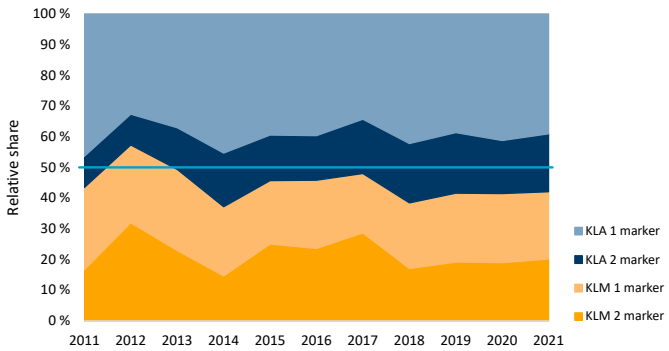
Relationship between mitigation- and adaptation-relevant development finance

After analysing climate-relevant development finance, this section examines the internal relationship between mitigation and adaptation funding. The analysis shows that the BMZ is succeeding in its efforts to ensure a balanced ratio of mitigation and adaptation funding from budget funds (BMZ, 2021b: 15). However, due to different calculation rules, German climate finance does not fulfil multilaterally agreed requirements.

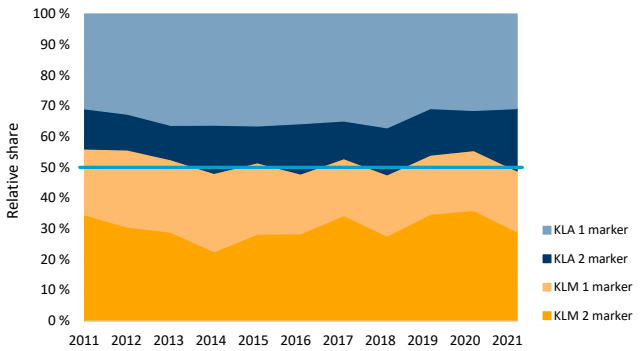
The statement on equal distribution varies depending on the dataset used. For example, the share of mitigation-relevant development finance for bilateral BMZ commitments in 2021 is 42 percent according to the CRS data and 49 percent according to the MeMFIS data. In absolute figures, this corresponds to EUR 1.1 billion (CRS) or EUR 1.9 billion (MeMFIS) for mitigation-relevant development finance and EUR 1.5 billion (CRS) or EUR 1.9 billion (MeMFIS) for adaptation-relevant development finance from the BMZ as bilateral commitments (no data is available for UNFCCC for 2021). The distribution of commitments for both areas fluctuates around the 50 percent mark. According to the CRS data, the BMZ's bilateral commitments for climate change mitigation are slightly lower than for adaptation (see Figure 9). According to the EU data on official climate reporting, out of the BMZ's total bilateral commitments in 2021 of EUR 3.1 billion, around EUR 1.4 billion was mitigation-relevant development finance while around EUR 1.7 billion was adaptation-relevant development finance.[44] This means that 45 percent of the bilateral climate-relevant development finance under the political responsibility of the BMZ is mitigation-relevant. In the previous years (2017 to 2020), this share was between 51 and 52 percent.[45]

With regard to the number of interventions, a growing proportion of KLA-2 interventions can be observed. Despite this relative increase in importance, KLM-2 interventions are still more frequent. In contrast, significant objective interventions occur with similar frequency. If the results of recoding using machine learning are taken into account, the increase in KLA interventions is even more pronounced.

Figure 9 Relative share of BMZ bilateral commitments and approvals (EUR) for mitigation- and adaptation-relevant development finance, broken down by CRS and MeMFIS datasets from 2011 to 2021



Source: DEval, own visualisation based on CRS data (excluding the KfW)



Source: own visualisation based on MeMFIS data

44 The total of EUR 3.1 billion for 2021 relates only to the BMZ's bilateral commitments and excludes multilateral disbursements, as these are not stated separately for the BMZ, but only for the German Federal Government.

45 According to the EU data, the German Federal Government has achieved parity in bilateral commitments with EUR 1.8 billion for mitigation-relevant development finance and EUR 1.9 billion for adaptation-relevant development finance and also in multilateral disbursements with EUR 500 million for mitigation-relevant development finance and EUR 470 million for adaptation-relevant development finance in 2021 (see Figure 5).

Private capital mobilisation

Reporting on mitigation-relevant development finance has only recently begun to consider the mobilisation of private capital. The OECD has been collecting this data with some methodological difficulties since 2017 (OECD, 2023d).

When it comes to achieving the goals of the Paris Agreement (UNFCCC, 2015)**, the mobilisation of private capital and the joint commitment of state and private stakeholders** (BMZ, 2021b: 21) **play an increasingly important role.** Public funds alone are not enough (BMZ, 2021b: 8). One important instrument for mobilising private capital is structured funds.[46] Moreover, the BMZ contributes, or has contributed, indirectly to private capital mobilisation through contributions to multilateral funds (such as the Green Climate Fund [GCF] or the Global Environment Facility [GEF]) and MDBs.[47]

In the mobilisation of private capital, there is tension between the financial sustainability of private investment and the orientation of DC towards the needs of partner countries. For example, funds often invest in high-risk countries, but rarely in the least developed countries (Orth et al., 2020). However, it is plausible that this tension is less problematic in the area of creating global public goods.

The results of this evaluation on the financial effectiveness of private capital mobilisation through BMZ fund and direct holdings show that the ministry mobilised a total of EUR 137 million in private capital for climate change mitigation between 2017 and 2023. The effectiveness of the various funding instruments is revealed by analysing the leverage, which puts the various types of capital in relation to each other. For this purpose, private capital is set in relation to public capital (state capital and development financial institution capital [DFI capital]).[48] Accordingly, the largest share of private capital is attributable to the two mitigation-relevant direct holdings. The share of public capital (state plus [D]FI capital) is around 70 percent in the mitigation-relevant area.

However, these absolute amounts and the analysis of the leverage only have a limited informative value. Instruments for mobilising private capital should be used where private investors would not invest without state subsidies. Accordingly, a very large mobilisation effect could also indicate that the use of public funds would not have been necessary. Especially in higher-risk projects, it may take time and public capital to introduce private investors to these markets. These differences in investment risks in countries with different levels of economic development are not systematically taken into account in the analysis presented here. For these reasons, a comparative perspective is adopted below.

The analysis of this evaluation shows that slightly less private capital is mobilised in the area of "climate change mitigation and clean energy" compared to other areas; however, the difference is not decisive or significant. This result is initially surprising as, despite the interest in impact-oriented investment in this area, the mobilisation of private capital is no more successful than for other areas. One reason for this finding may be that many energy systems are, at least partly, state-managed and therefore the sector is being opened up more slowly than other sectors. The assumption that greater risk-taking makes mobilisation more effective is not confirmed either. In terms of the effectiveness and efficiency of private capital mobilisation, structured funds are comparable to unstructured funds. Particularly in view of the fact that the BMZ invests in structured funds primarily in the mitigation-relevant area, the question arises as to whether this is an effective and efficient strategy for mobilising private capital.

The evaluation of structured funds identifies a variety of reasons why mobilisation potential is not always fully exploited (Orth et al., 2020). For example, there may be a lack of acquisition strategies in some cases or the proportion of private

46 Other examples of funding instruments for private capital mobilisation, which do not necessarily play a significant role in German DC, include guarantees to assume the default risk, loans from a consortium of public and private lenders (syndicated loans), direct investments in companies in developing countries, credit lines and other collective forms of investment (OECD, 2018a).

47 In its core area strategy, the BMZ also emphases the promotion of private commitment to more climate change mitigation with the initiative topic "Development and Climate Alliance" in that the alliance promotes CO_2 compensation projects. The BMZ's aim here is to improve political framework conditions, develop sustainable business models, enter into new collaborations and reduce corruption risks in order to strengthen the trust of private stakeholders (BMZ, 2021b: 16).

48 For holdings where climate change mitigation is stated as a significant objective, the specification of the capital employed is discounted by 50 percent.

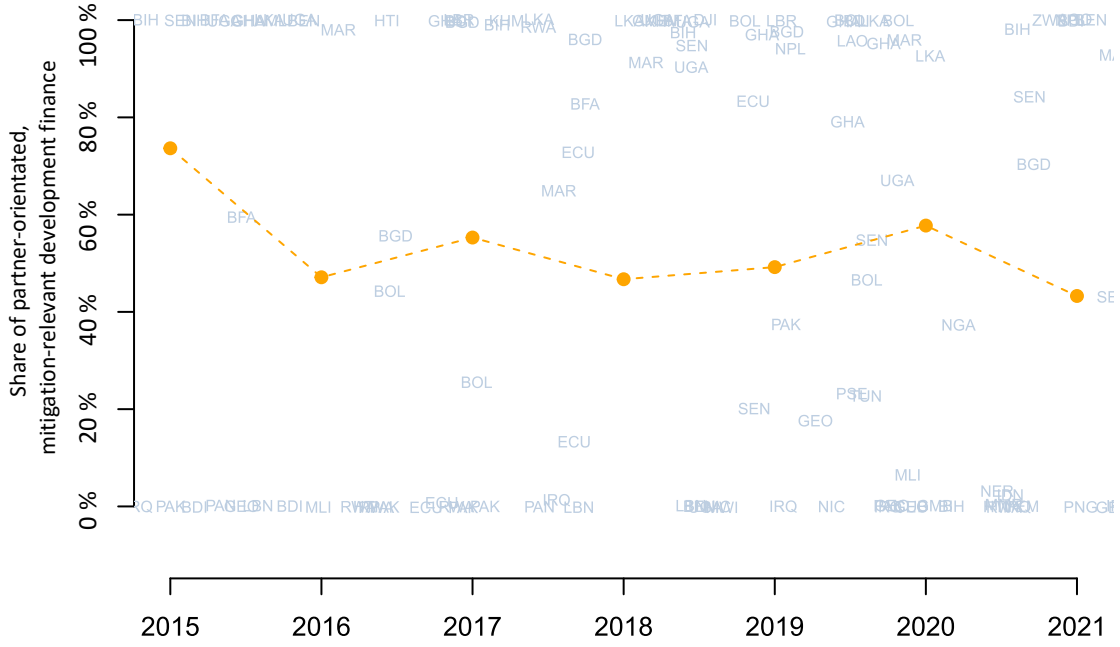
funds is not allowed to increase any further due to planned risk buffers (without a further increase in public capital). Another reason is that sufficient funds have already been provided by public donors. Moreover, the evaluation of structured funds did not include a comparison with direct holdings and most of the funds considered were microfinance funds, so the analyses focus on different sectors.

Partner orientation

The analysis of the extent to which funds from bilateral German mitigation-relevant climate finance correspond to the needs expressed in the NDCs of the development partners gives rise to ambivalent findings. On the one hand, more than two thirds (71 percent) of all commitments for German mitigation-relevant development finance are target-oriented. On the other hand, the analysis reveals that mentioning the need for support in a sector does not lead to comparatively higher commitments. These two perspectives on partner orientation – the extent of partner orientation and the effect of naming conditional targets – are explained in more detail below.

In total, more than two thirds (71 percent) of all German mitigation-relevant development finance commitments are made in sectors in which partner countries indicate a need for international support by formulating conditional targets in their NDCs. The proportion of target-related commitments per development partner is between 43 and 74 percent on average (see Figure 10). However, the mean value only has a limited informative value, as this proportion varies greatly between countries. The individual observations are shown in grey as ISO country codes and show that most countries receive either a very large or a very small proportion of the commitments in their preferred sectors.

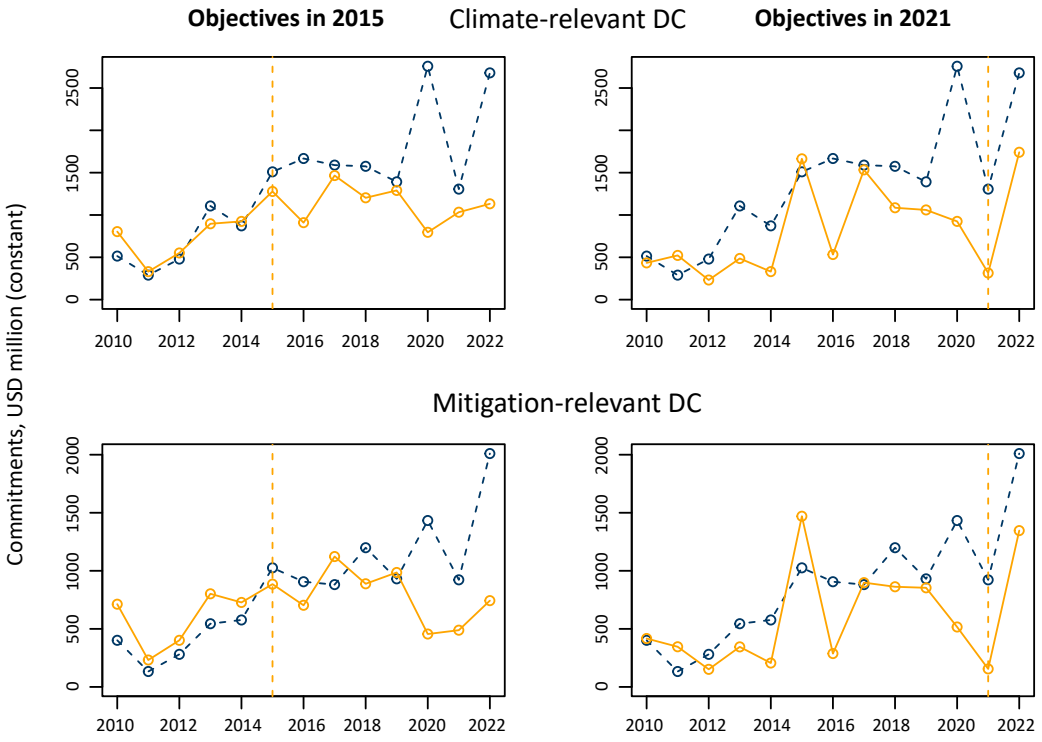
Figure 10 Development of partner orientation from 2015 to 2021



Source: DEval, own visualisation based on Climate Watch data (Climate Watch NDC Content, 2021) and CRS data (OECD, 2023e)

Nevertheless, stating a conditional target does not appear to increase commitments in the associated sector in subsequent years. In fact, a decrease can actually be seen.[49] It would have been reasonable to expect distribution patterns to change as a result of reports of support needs. However Figure 11 shows that this does not appear to be the case. The diagram shows climate-relevant (top line) and mitigation-relevant (bottom line) development finance for sectors with conditional targets (solid line) and sectors without conditional targets (dashed line).[50] A distinction is made between targets for 2015 (left-hand column) and 2021 (right-hand column). A comparatively large number of conditional targets were published in these two years. None of the four comparisons indicate that naming a conditional target influences the level of commitments in the corresponding sector. These results apply to all OECD DAC donors and are not directly transferable to German allocation practice.

Figure 11 **Development of commitments for sectors with and without conditional targets before and after publication of the target**



Source: DEval, own visualisation
Note: The illustration shows bilateral official mitigation-relevant development finance (millions, constantly US dollars in 2021) for sectors where a conditional target was mentioned in an NDC (solid orange line) and for sectors without a corresponding target (dashed blue line) between 2010 and 2022. The vertical line indicates the time at which the respective target was formulated.

49 These results are based on the mitigation-relevant DC of all OECD-DAC donors. This makes sense, as partner orientation should be coherent across all donors. In other words, if other donors are already making high commitments in line with the objectives of the development partners, complementary interventions in other sectors may make more sense.

50 For years prior to the publication of the NDCs (vertical line), the differentiation that only becomes potentially effective with their publication is also shown. This makes it possible to assess the extent to which sectors with and without differentiation differ even before publication. Parallel trends are particularly evident where comparatively large amounts of funds are considered (for climate-relevant DC for conditional targets in 2015). Deviations from the parallel trend can possibly be explained by higher fluctuations, which even out the more funds are considered.

3.2 Relevance: Distribution according to need and mitigation potential

3.2.1 Benchmarks

EQ2 on the distribution of German mitigation-relevant development finance is assessed on the basis of two benchmarks. The first benchmark is dedicated to the nexus between the promotion of socio-economic development and the achievement of climate targets. The second then considers alignment with the political-institutional framework conditions of potential development partners as a significant moderator of mitigation-relevant development impacts.

Evaluation question 2: To what extent is the BMZ's distribution of mitigation-relevant development finance aligned with the mitigation potential, taking account of the need of development partners?

Benchmark 2.1: Developing countries with a high mitigation potential are more likely to have funds committed to them from German mitigation-relevant development finance and have a larger amount committed than developing countries with a low mitigation potential, while at the same time taking into account their need.

Benchmark 2.2: When allocating mitigation-relevant development finance, the BMZ is guided by the political-institutional framework conditions of potential development partners.

3.2.2 Derivation

Need and mitigation potential

It is to be expected that the nexus between the promotion of socio-economic development and the achievement of climate targets (see Section 1.4) **will be reflected in the distribution pattern.** Specifically, the mitigation potential, that is, the amount of net GHG emission reductions that can be achieved by a given mitigation option relative to specific emission baselines (IPCC, 2022a: 1808), should play an important role.[51]

The BMZ sees great potential for the energy transition in countries that currently have a high proportion of fossil fuels in their energy mix, rising energy demand, a high regional profile and an important role in key climate negotiation processes (BMZ, 2021: 25).

At the same time, the BMZ is endeavouring to cooperate with countries in particular need. As a signatory to the 2030 Agenda, the German Federal Government aims to leave no country and no population group behind (BMZ, 2021; UN, 2015a). Countries with high vulnerability and low capacities to act against climate change should not be neglected. Usually, this includes the least developed countries and small island states (Article 9[4], UNFCCC [2015]). Under the objective of poverty reduction as set out in SDG 1 (No poverty), DC sets itself the goal of primarily reaching countries in need and thus the poorest of the poor. Poorer developing countries have fewer financial resources of their own than richer countries to finance development (BMZ, 2021).

The BMZ core area strategy also formulates precise benchmarks for the energy supply sector. It aims to achieve a sustainable, needs-based and inclusive energy supply that is 100 percent renewable and at the same time "leave no one behind" (BMZ, 2021: 23). This also corresponds to SDG 7 (Affordable and clean energy), one aim of which is to increase the proportion of the population with access to electricity. The BMZ defines the "Energy" funding area as a key sector for climate change mitigation, stating that the climate targets can only be realised through a fair energy supply with renewable energies – and that only in this way can socio-economic development be simultaneously driven forward (BMZ, 2021: 23). The BMZ endeavours to reduce energy poverty in the cooperation countries and to supply the various population groups with affordable, reliable and sustainable energy (BMZ, 2021: 23).

Political-institutional framework conditions

The core area strategy takes account of the influence of political-institutional factors. For example, the BMZ values transparent and participatory governance in cooperation countries, as it believes this to be the only way to achieve

51 IPCC (2023a: 126) defines mitigation potential as follows: "The quantity of net greenhouse gas emission reductions that can be achieved by a given mitigation option relative to specified emission baselines".

effects/impacts and acceptance for climate change mitigation (BMZ, 2021: 18). It also pursues anti-corruption and integrity promotion approaches (BMZ, 2021: 18) and advises partner countries on policy and sector reforms in order to promote the necessary framework conditions for effective and impactful DC to mitigate GHG emissions (BMZ, 2021: 20). This fits in with the importance of governance for DC in general. Accordingly, the final report of the "BMZ 2030" reform concept defines good governance as essential for successful development policy.

Academic research provides equally good arguments in favour of the important role of the type of regime, governance or the representation of women in political positions. Due to their accountability towards large majorities or the electorate as a whole, democracies should assign the provision and maintenance of public goods priority over private goods. If climate change mitigation is seen as a global public good that is also increasingly relevant at national level, democracies are therefore likely to show increased efforts to implement mitigation interventions such as the expansion of renewable energies (Deacon, 2009; Obydenkova and Salahodjaev, 2017; Tjernström and Tietenberg, 2008). There is also evidence in comparative studies of the connection between regime type and climate-friendly policies (Böhmelt et al., 2016; Dolphin et al., 2019; Lachapelle and Paterson, 2013; Lamb and Minx, 2020). However, it should always be borne in mind that the regime type is only one of several important factors. Although a democratic form of government should facilitate decarbonisation, authoritarian regimes are also capable of implementing large-scale environmental policy interventions. This emphasises China's leading position in renewable energies.[52] The representation of women in political positions also appears to influence climate policies. Salamon (2023) shows that, in democracies, a higher proportion of women in parliament is associated with a higher consumption of renewable energy. In particular, men appear to perceive the costs of decarbonisation to be higher than women as economic development increases (Bush and Clayton, 2023). The literature on how state capacity and governance effect economic and human development (Savoia and Sen, 2015) indicates that fundamental adjustments to the energy system to achieve decarbonisation are particularly successful in states with high capacity and good governance.

3.2.3 Findings

The results of the allocation analysis are structured according to conditional factors. For each conditional factor, we first present the theoretical argument and state of research, then describe the results of our own analyses. These can be found in the Annex in Table 12 and Figure 18. The assessment of benchmark 2.1 ensues from the results on mitigation potential, pioneering role and need. The assessment of benchmark 2.2 is based on the results regarding the political-institutional framework conditions.

Mitigation potential and pioneering role

Argument and state of research

There is only little evidence on the role of mitigation potential in the distribution of mitigation-relevant DC. Although research shows that donor countries with higher emissions commit to more mitigation-relevant development finance (Halimanjaya, 2016; Weiler and Sanubi, 2019), these results do not very specifically relate to the mitigation potential and the pioneering role of possible development partners.

With regard to the indicators for measuring mitigation potential and the pioneering role in the energy supply sector, the evaluation builds on references from the BMZ core area strategy and scientific findings (Doku et al., 2021; Halimanjaya, 2015, 2016; Weiler et al., 2018). This report primarily understands the mitigation potential in technological terms, as is also the case in the BMZ core area strategy (BMZ, 2021). It considers the potential to be high in countries with a low share of renewable energies in the electricity supply, high per capita emissions (across all sectors) and low energy supply efficiency. With regard to the pioneering role, it is assumed that patents for renewable energies are a good indicator of innovation and technological progress and can therefore provide information on the extent to which developing countries are taking on a pioneering role in the expansion of these energies. Patents reflect both current capacities and future potential and illustrate a country's commitment to renewable energies. They indicate which countries could become important regional and international actors for these technologies.

52 However, over 80 percent of China's energy supply in 2021 came from coal, oil and gas.

Analysis results

The analyses do not indicate that countries with higher mitigation potential are selected more frequently or receive higher bilateral commitments. Neither a lack of efficiency in the energy supply (in the form of high emissions or energy intensity) nor the quantity of per capita emissions appear to be systematically linked to selection or allocation. Contrary to expectations, the analysis shows that countries with a high share of renewable energies in their electricity supply are more likely to receive commitments for mitigation-relevant DC.[53] This can also be interpreted as an orientation towards pioneers.

There are indications that a country's pioneering role is linked to the allocation decision. Across all periods, it is apparent that countries in which low-carbon energy technologies were patented in the period from 2011 to 2021 are more likely to be selected as cooperation countries. However, this is less relevant for the level of allocation.

Need

Argument and state of research

The findings of empirical research on the relationship between a country's need and the distribution of development finance are ambiguous. While some studies report that poorer countries not only receive more development finance, but also receive more frequent and higher commitments for mitigation-relevant development finance (including Berthélemy, 2006; Halimanjaya 2015; Weiler and Sanubi 2019), not all confirm this finding (Bagchi et al., 2016; Mori et al., 2019). Halimanjaya (2016) establishes that an emphasis is placed on medium-need countries in the selection of German mitigation-relevant development finance, whereas no correlation with income group or a country's child mortality rate can be identified for the allocation. For the adaptation portfolio, Noltze and Rauschenbach (2019) even state higher commitments to wealthier countries. However, this does not appear to be the case for bilateral BMZ involvement from budget funds in general. For example, a DEval evaluation (Wencker, 2022) identifies that need has a significant influence on the selection and allocation level of bilateral commitments from budget funds.

A DEval evaluation of climate change adaptation interventions in German DC established a positive correlation between the climate risk index and the German Federal Government's adaptation-relevant development finance. Accordingly, although countries with a higher climate risk are more likely to have received bilateral commitments for adaptation from budget funds, they do not receive higher commitments (Noltze and Rauschenbach, 2019). The climate risk, defined by an index for the number of fatalities and economic losses caused by extreme weather events (Eckstein et al., 2019), represents the extent to which a country is affected by extreme weather events and thus its need for preventive interventions.

Analysis results

The results of this evaluation support the finding that the BMZ's distribution of mitigation-relevant development finance is orientated towards need as measured by per capita GDP. There are indications that poorer countries are more likely to receive commitments and receive higher commitments (see Figure 12).[54] Countries particularly affected by extreme weather events have a higher probability of receiving commitments, although this connection is more likely for adaptation funding.

Political-institutional framework conditions

Argument and state of research

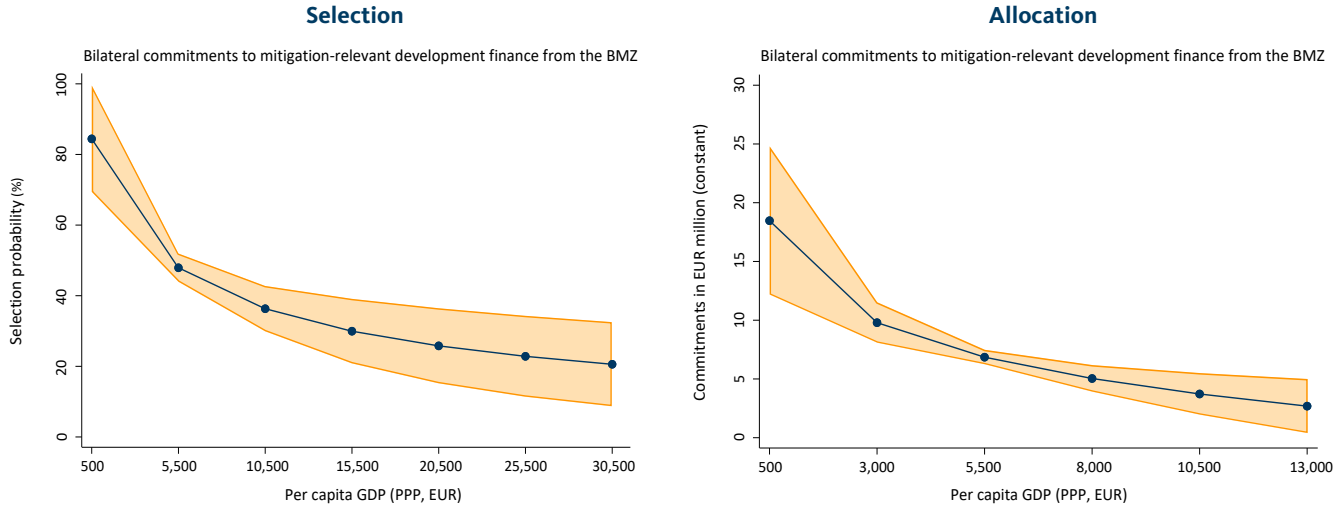
Empirical research shows that countries with weak governance, weak institutions and more violent conflicts receive less mitigation-relevant development finance (Bagchi et al., 2016; Weiler and Sanubi, 2019). The findings also indicate a connection – albeit not a linear one – for mitigation-relevant German DC. Apparently, countries with both good and bad governance are selected. One possible explanation for this is that DC endeavours to strengthen good governance (Halimanjaya, 2016). For development finance from budget funds in general, Wencker (2022) finds that there is no connection between selection and allocation on the one hand and good governance on the other hand. For the adaptation portfolio, Noltze and Rauschenbach (2019) find indications that countries with good governance receive higher commitments.

53 At first glance, it seems conceivable that the relationship is based on reverse causality, meaning a higher share of renewable energies in the electricity supply is a consequence of higher commitments. However, as the values of the previous period are included in the model for explanatory variables, this is unlikely (see Section 2.5).

54 The correlation between per capita GDP and selection/allocation is negative in all models, but not statistically significant everywhere.

Above all, the state's capacity to react to possible negative consequences of climate change is proving to be important for allocation decisions. Weiler and Sanubi (2019) find a similar discrepancy between development finance in general and climate-relevant development finance in particular, namely that governance takes a back seat in cooperation with African countries, but good governance is crucial for mitigation-relevant development finance.

Figure 12 Results of the selection and allocation to the needs of the cooperation countries (per capita GDP in EUR)



Source: DEval, own visualisation
Note: The illustrations show the estimated probability of receiving commitments (selection) based on the statistical model and the estimated level of the commitment (allocation) depending on the respective specified variable. In each case, point estimates connected by the line are predicted, alongside the 95 percent confidence interval, represented as an area, for 100 values distributed equally over the entire value range of the variable under consideration.

With regard to the representation of women in political decision-making processes, scientific findings point to a connection between the number of women in parliament and climate-friendly policies. A higher number of women in parliament therefore leads to more climate-friendly policies and indirectly to GHG emission mitigation (Mavisakalyan and Tarverdi, 2019). Salamon (2023) identifies a similar connection for the use of renewable energies, but only in richer countries.

Analysis results

Aiming to allow clear delimitation, the analysis in this evaluation distinguishes between the influences relating to the form of government and to governance. The former is defined by the concept of electoral democracy (free participation and public competition on the basis of elections), the latter as the ability to set and enforce rules that apply to society as a whole and to provide public goods and services (see also Wencker, 2022).

The analysis shows that more democratic countries are more likely to receive commitments for mitigation-relevant development finance and receive higher commitments. This finding is robust and statistically significant across all annual periods and is consistent with the findings on development finance in general (Wencker, 2022).

In contrast, no clear connections can be established for governance. There are actually signs that better governed countries receive less funding and receive funding less frequently, but the results are subject to uncertainty. The same applies to the intensity of conflict in a country and the number of women in parliament.

Economic and political interests

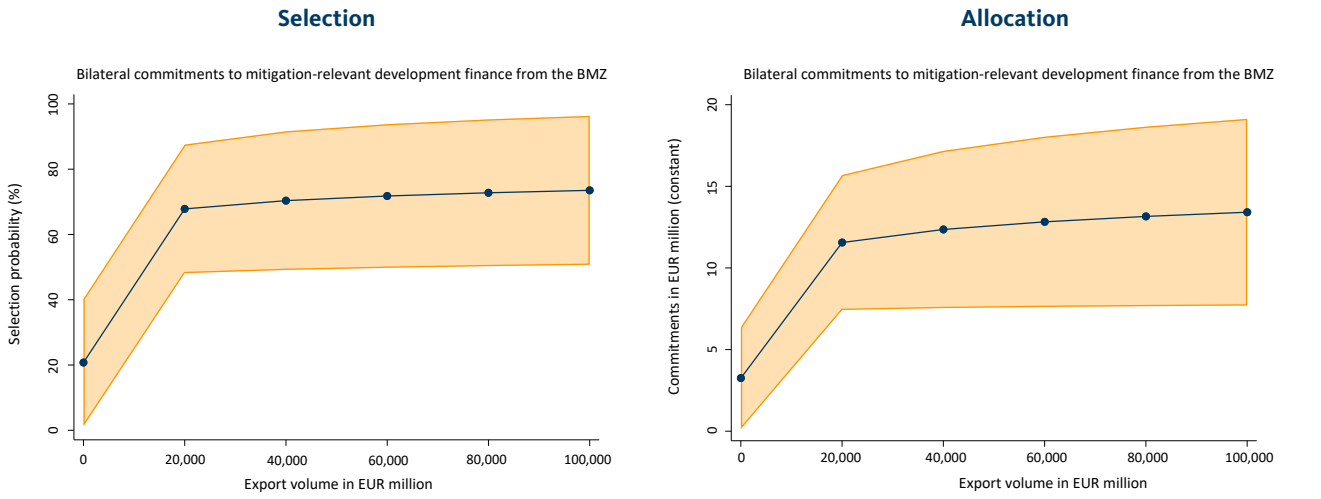
Argument and state of research

Research indicates that selection and allocation decisions for climate-relevant development finance are linked to the economic and political interests of donor countries. In the case of both adaptation-relevant and mitigation-relevant development finance, countries that exchange goods with donors or have the same UN voting behaviour receive higher commitments (Halimanjaya, 2016; Weiler et al., 2018; Weiler and Sanubi, 2019). For the BMZ's bilateral DC, the DEval allocation study (Wencker, 2022) finds a positive correlation between export volume and geographical distance on the one hand and allocation on the other hand.

Analysis results

In the analysis, there are indications that the selection and allocation of mitigation-relevant DC is geared towards foreign trade interests. All models show a consistently positive, albeit not always significant, correlation between the export volume and the probability and level of commitments (see Figure 13). In contrast, the results on geographical distance and voting behaviour do not indicate any systematic correlations.

Figure 13 Results of the selection and allocation to the economic and political interests of the donor countries (export volume in EUR million)



Source: DEval, own visualisation

Note: The illustrations show the estimated probability of receiving commitments (selection) based on the statistical model and the estimated level of the commitment (allocation) depending on the respective specified variable. In each case, point estimates connected by the line are predicted, alongside the 95 percent confidence interval, represented as an area, for 100 values distributed equally over the entire value range of the variable under consideration.

3.3 Effectiveness: Achievement of objectives of mitigation-relevant DC in the "Energy" funding area

3.3.1 Benchmarks

EQ3 on the effectiveness of German mitigation-relevant development finance in the "Energy" funding area is assessed on the basis of a benchmark.

Evaluation question 3: To what extent are the intended objectives (outcomes) of the BMZ's German mitigation-relevant development finance in the "Energy" funding area achieved?

Benchmark 3: An increase in mitigation-relevant development finance in the "Energy" funding area goes hand in hand with a decarbonisation of a development partner's energy supply, all other things being equal.

3.3.2 Derivation

The benchmark is assessed by examining the results chains of seven groups of international DC interventions derived from the international evidence of the IPCC's 6th Assessment Report (see Table 8). The causal pathways of the groups of interventions are summarised as briefly as possible below. An empirical implication (EI), such as an expected connection between mitigation-relevant development finance and the characteristics of the energy system, is then formulated in each case. This EI indicates the achievement of the intended objectives.[55]

Table 8 Groups of interventions in the evidence synthesis

Group	Intervention	Definition
Technological and infrastructural interventions[56]	Funding and investment	Funding and investment interventions for energy generation, conversion, storage, transmission and distribution
	Support in the implementation of new technologies, processes or practices	Introduction of new technologies, processes or practices; technical assistance or capacity building interventions
	Infrastructure programmes	Providing (or granting a state licence for) infrastructure
Economic interventions	Taxes and duties	Tax levied on each unit of a specific activity
	Subsidies and incentives	Direct payments, tax concessions, subsidies or their equivalent by a government to an organisation
	Emissions trading systems	Setting limits for total emissions from certain sources and submission of permits, certificates or other units
Institutional interventions	Strengthening institutions	Strengthening the institutional framework for the introduction and implementation of laws and regulations
Regulatory interventions	Regulations and standards	Regulations or standards that specify certain emission mitigation technologies or other activities
Climate change mitigation strategies and laws	Climate change mitigation laws, NDCs	Technical support in the development of national strategies and laws
Voluntary interventions	Voluntary agreements and interventions	Agreements, obligations or interventions that are entered into voluntarily

55 Only EIs for which data was available for review are shown here. Further EIs are specified in the background paper.

56 This refers to the funding and implementation of technological and infrastructural interventions that contribute directly to GHG emission mitigation. For the other groups of interventions, this is only indirectly the case.

Information-based and behaviour-changing interventions	Information tools	Public disclosure of information to change behaviour through awareness-raising
	Research, development and implementation of interventions to promote research and development	Political interventions to promote research and development

Source: DEval, own table based on Aitmambet et al. (2020), GIZ (2011), GHGP Policy Standard (Rich et al., 2014), IPCC (2014, 2022a), KfW Development Bank (2019, 2022)

Technological and infrastructural interventions

International evidence shows that the funding and implementation of technological and infrastructural interventions contribute to GHG emission mitigation (IPCC, 2022a). Funding (FC) and implementation (TC) (inputs) therefore promote direct investment and infrastructure programmes as well as the introduction of new technologies, processes or practices (outputs). As a result, mitigation interventions are implemented in the areas of "energy generation", "energy conversion", "energy storage", "energy transmission" and "energy distribution" (outcomes). They increase the generation capacities of renewable energies, energy efficiency and the effective use of low-carbon and carbon-free energy sources (effects), which ultimately mitigates GHG emissions (impact).

Indications of the effect and impact of the promotion of technological and infrastructural interventions by international DC can also be derived from studies analysing the supply of electricity from renewable energies. For example, Carfora and Scandurra (2019) recognise a positive effect of ODA on the substitution of fossil fuels with renewable energy sources. In an early, but broad-based study, Kretschmer et al. (2013) identify a technical modernisation brought about by international DC. In a more recent and equally extensive research paper, Ikegami and Wang (2021) also find positive effects with a shift away from fossil fuels and towards sustainable technologies. This report updates this state of research, particularly with regard to the period analysed and the statistical methodology, and expands on it by explicitly examining German ODA funds.

This gives rise to the following empirical implication:

> **Empirical implication 1:** By funding and implementing technological and infrastructural interventions, mitigation-relevant development finance in the "Energy" funding area increases the share of renewable energies in the electricity supply.

Economic interventions

International evidence confirms that the implementation of economic interventions creates financial incentives for mitigation activities to reduce GHG emissions (IPCC, 2022a). Policy advice (input) is used to support the design of economic instruments, for example in the form of taxes, levies or subsidies (output). The introduction of these economic instruments (outcome) creates financial incentives, for example in the form of carbon taxes, emissions trading systems or subsidies[57], which in turn lead to an expansion of mitigation activities (effects). This reduces GHG emissions (impact).

Specifically, research shows that the economic mitigation approaches of a carbon tax and an emissions trading system are effective in mitigating GHG emissions (IPCC, 2022a). They not only act independently, but are also complementary to regulatory approaches at national and sub-national levels.

57 Subsidies are not analysed because, according to IRENA, it is currently not possible to record subsidies accurately. A lack of standardised definitions and complex funding mechanisms prevent usable quantification (Taylor, 2020).

The following empirical implications are derived from this:

Empirical implication 2: By implementing economic interventions, mitigation-relevant development finance in the "Energy" funding area leads to the introduction of a carbon tax.

Empirical implication 3: By implementing economic interventions, mitigation-relevant development finance in the "Energy" funding area leads to the introduction of an emissions trading system.

Institutional interventions

There is an international consensus that institutional TC interventions strengthen state capacities and thus support the effective implementation of regulatory and economic interventions to reduce GHG emissions (IPCC, 2022a). Specifically, DC promotes the design (output) and introduction of needs analyses and action plans (outcomes) through capacity building (TC) at institutions (input). This strengthens the capacities of national institutions, in turn improving the coordination and integration of activities between the sectors and stakeholders in the partner country, the mediation of interests and consensus-building, as well as the political framework conditions in the long term (effects). Institutional capacities are also strengthened subnationally, which gives rise to developing local action plans, addressing weaknesses and gaps in the functioning of national institutions, establishing local administrative structures and coordinating local stakeholders (effects). In this way, regulatory and economic interventions are implemented that indirectly mitigate GHG emissions (impact).

This gives rise to the following empirical implication:

Empirical implication 4: By implementing institutional interventions, mitigation-relevant development finance in the "Energy" funding area increases the number of climate policies adopted to promote climate policy interventions.

Regulatory interventions

International evidence shows that regulatory interventions supported by TC, such as performance and technology standards, promote the use of low-emission technologies, processes and products (IPCC, 2022a). Here, DC supports the design (output) and introduction of regulations (outcomes) in the form of performance or technology standards (effect) via policy advice (TC) (input). A performance standard prescribes a target for private-sector stakeholders that is met by introducing new technologies/methods or by acquiring credits from other stakeholders (effect). A technology standard defines specific technologies, processes and products (effect). This leads to a mitigation of GHG emissions (impact).

The following empirical implication is derived from this:

Empirical implication 5: By implementing regulatory interventions, mitigation-relevant development finance in the "Energy" funding area increases the number of climate policies adopted in the form of regulatory instruments.

National climate change mitigation strategies and laws

International evidence shows how TC supports the formulation and implementation of national climate policies for the mitigation of GHG emissions (IPCC, 2022a). In this context, DC promotes the design (output) and introduction of climate change mitigation strategies and laws (outcomes) through policy advice (TC) (input). That includes transformational and sectoral strategies, NDCs and long-term net zero strategies. As a result, long-term emissions targets are set, coordinated cross-sectoral approaches are developed and national strategies and laws are regularly updated (effects). Such changes in the political framework conditions stimulate more ambitious regulatory, economic, technological and infrastructural interventions as well as voluntary interventions (effects), thus leading to a mitigation of GHG emissions (impact).

This results in the following empirical implication on the effect and impact of national climate change mitigation strategies and laws:

Empirical implication 6: By implementing national climate change mitigation strategies and laws, mitigation-relevant development finance in the "Energy" funding area leads to the formulation of nationally determined contributions (NDCs).

Voluntary interventions

International evidence shows that TC promotes voluntary engagement among governmental and non-governmental stakeholders to reduce GHG emissions. In this context, DC promotes development (output) and the implementation of voluntary interventions (outcome) through technical support (input). This includes the establishment of multi-stakeholder partnerships, city partnerships, climate governance networks and international cooperation initiatives between governmental and non-governmental stakeholders (effects). The result is policy development, implementation of mitigation interventions and information dissemination that contributes to GHG emission mitigation (impact).

The following empirical implication on the causal pathways of voluntary interventions is derived from this:

Empirical implication 7: By implementing voluntary interventions, mitigation-relevant development finance in the "Energy" funding area leads to the formulation of climate targets that are not linked to any conditions in the nationally determined contributions (NDCs).

Information-based and behaviour-changing interventions

The international evidence makes it clear that access to information and ultimately the attitudes and behaviour of target groups towards policy interventions that have an impact on mitigation are increased by DC in the form of TC knowledge, information and training. In this context, DC assists the development of knowledge and information products as well as training for research and development capacities (outputs) through technical support, advice and capacity building (TC) (inputs). Thus, target groups are sensitised and research results are published, enabling institutions to identify and develop energy solutions in a national context (outcomes). This increases the capacities, awareness and ultimately the acceptance of the target groups of low-carbon and carbon-free energy supply and implements climate change mitigation strategies and laws as well as regulatory, economic, technological and infrastructural interventions (effects), thus leading to a mitigation of GHG emissions (impact).

Mitigation literature without a reference to DC shows that education and information campaigns can be effective and efficient (Allcott, 2011; Allcott und Rogers, 2014; Bidwell, 2016; Clot et al., 2022; Halleck-Vega et al., 2018; Nolan et al., 2008). However, most of these studies were conducted in the Global North, so transferability to the Global South is not assured (Andor and Fels, 2018). In this context, research also shows that implementing organisations must have a great deal of contextual knowledge about local conditions for implementation in order to avoid unintended effects (Hahn and Metcalfe, 2016; Kühltau, 2023).

This gives rise to the following empirical implications on the effect and impact of information-based and behaviour-changing interventions:

Empirical implication 8: By implementing information-based and behaviour-changing interventions, mitigation-relevant development finance in the "Energy" funding area increases the number of climate policies adopted in the area of "Information and education".

Empirical implication 9: By implementing information-based and behaviour-changing interventions, mitigation-relevant development finance in the "Energy" funding area increases the share of renewable energies in energy consumption.

Empirical implication 10: By implementing information-based and behaviour-changing interventions, mitigation-relevant development finance in the "Energy" funding area increases the number of climate policies adopted in the area of "Research, development and deployment".

Empirical implication 11: By implementing information-based and behaviour-changing interventions, mitigation-relevant development finance in the "Energy" funding area increases the number of patents for renewable energies and supporting technologies.

For these impact hypotheses, it must be taken into account that a large number of moderators influence the strength and direction of the causal relationships within the interventions. The most frequently mentioned and most important moderators in the IPCC's 6th Assessment Report include economic, political and social context factors (IPCC, 2022a). These comprise available natural resources, economic conditions, the political system, institutional capacities, the level of civic engagement and activism, public acceptance and political support. Some moderators already influence interdependencies at output level, for example the political system and available natural resources, others at outcome and impact level, for example the engagement of political and private stakeholders, the technological scaling potential and the carbon intensity of energy generation.

3.3.3 Findings

The results of the statistical analyses of this evaluation for each EI are presented below. The assessment of benchmark 3 is based on an overall view of the results. As the indicators do not cover the entire range of intended effects and impacts and differ in terms of their scale level and validity, they are not interpreted on an intervention-specific basis. Illustrations of all results can be found in the Annex and in the Online Appendix.

Technological and infrastructural interventions

The statistical analysis shows that the international mitigation interventions targeting the energy supply have a significant and positive correlation with the share of renewable energies in the electricity supply in the partner countries (see empirical implication 1). A 10 percent increase in ODA funds is correlated to an increase in the share of renewable energies in the electricity supply of around 12.75 percentage points. This is an indication that investments in technological and infrastructural interventions are effective.

The specific analysis of German contributions to these mitigation interventions also shows a significant and positive correlation with the supply of electricity from renewable energies. A 10 percent increase in German ODA funds with a mitigation objective in the partner countries' energy supply is correlated to a 12.46 percentage point increase in the share of renewables. Accordingly, the estimated relationship between German investment in technological and infrastructural interventions is similarly strong to that for average total investment.

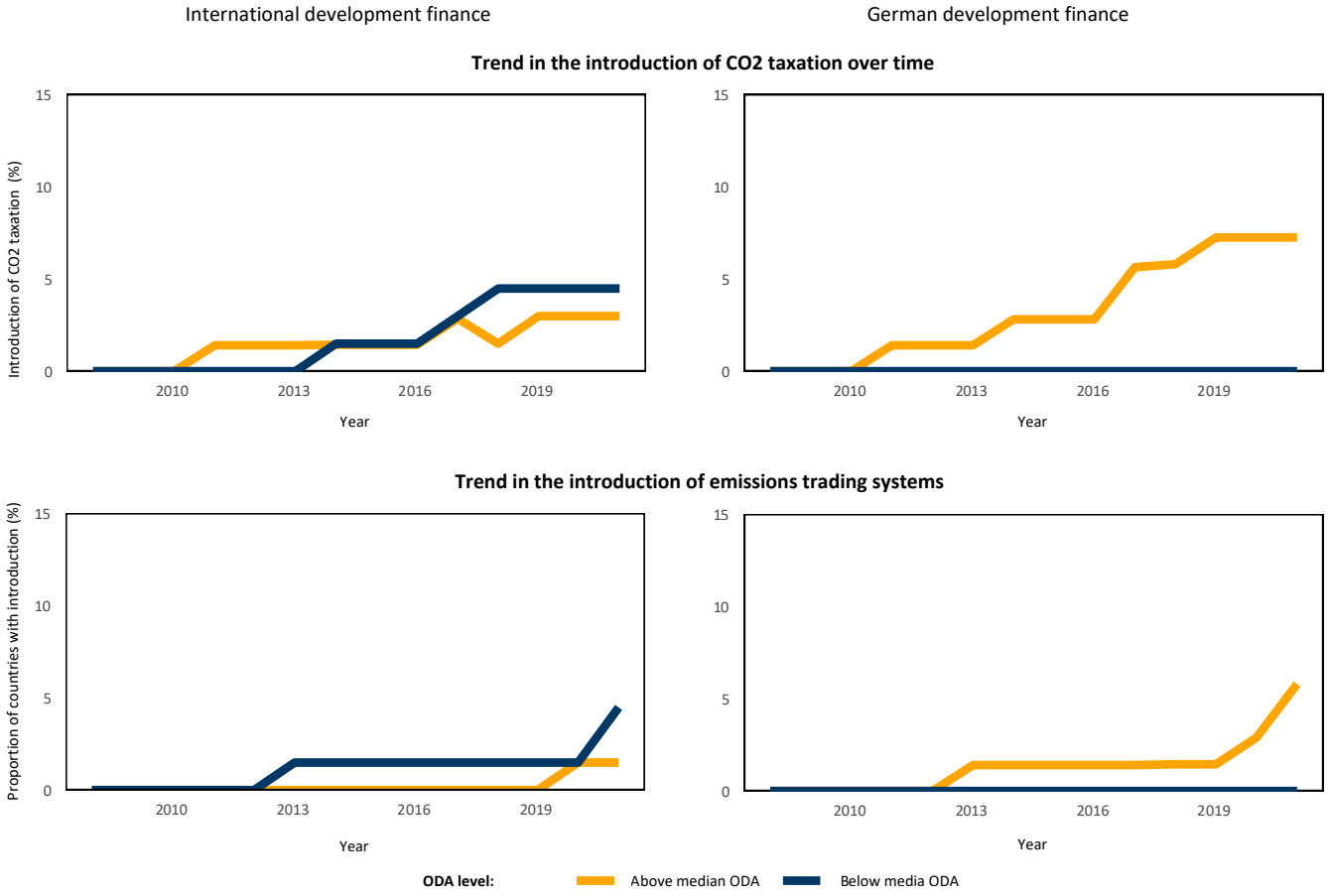
Economic interventions

On a global scale, the introduction of a carbon tax remains an exception, although more and more countries are pursuing such an economic mitigation approach (see empirical implication 2). The descriptive comparison reveals that countries with lower grants are more likely to introduce corresponding taxes (see Figure 14). The two-way fixed effects model shows no significant correlation between mitigation-relevant development finance and the introduction of a carbon tax.

The results for emissions trading systems are similar (see empirical implication 3). Here, too, the introduction rate (see Figure 14) is generally low and the increase is greater among countries that receive comparatively less grants. The two-way fixed effects analysis does not show any significant correlation either.

The results for German DC are more positive and indicate that economic interventions have an effect and impact in comparison to the international ODA funds overall. However, as no significant correlations were found in the two-way fixed effects models, the sequence of effects and impacts remains unclear (see Figure 14).

Figure 14 Time series of indicators for economic interventions



Source: DEval, own visualisation based on data on CO2 taxation and emissions trading systems from Dolphin and Xiahou (2022) and CRS data (OECD, 2023e)
Note: The two time series on the left refer to total international development finance, while the two on the right are limited to German shares. The classification of the partner countries can be found in Figure 23 while the choice of purpose codes corresponds to the variable "Energy supply mitigation ODA" in Table 14.

Institutional interventions

The extent to which international mitigation-relevant development finance in the energy sector is linked to an increase in the number of climate policies adopted cannot be determined with sufficient certainty (see empirical implication 4). The estimated correlation is not statistically significant.

In contrast, there is a significant and negative correlation for German mitigation-relevant development finance in the energy sector. The calculations show that a 10 percent increase in German funding is correlated to a reduction in the number of climate policies adopted to promote climate policy interventions by 3.81 units in the period under review from 2001 to 2021. These results therefore provide no evidence in favour of EI4.

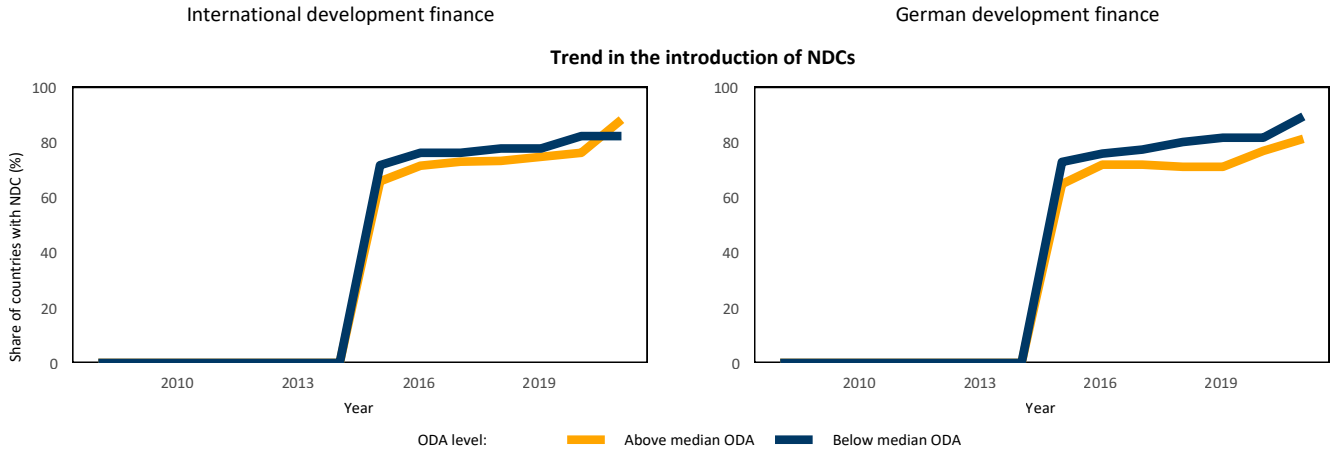
Regulatory interventions

There are no indications in the period under review from 2001 to 2021 (EI5) for a positive correlation between the number of regulatory climate policies and the international or German funding. The partial correlation in the statistical calculations is not significant.

National climate change mitigation strategies and laws

The analysis of the NDCs initially reveals that, since the Paris Agreement, the majority of potential development partners have adopted formal voluntary commitments to climate-related interventions (see empirical implication 6). Initially, there are hardly any differences to be seen between countries that have received a lot or little mitigation-relevant development finance in the energy sector. The analyses with the two-way fixed effects model also show no significant correlation. For the more recent past (since 2020), however, there is cautious evidence in the sense of the empirical implication, as can be seen in Figure 15.

Figure 15 Time series for the NDC publication of the partner countries

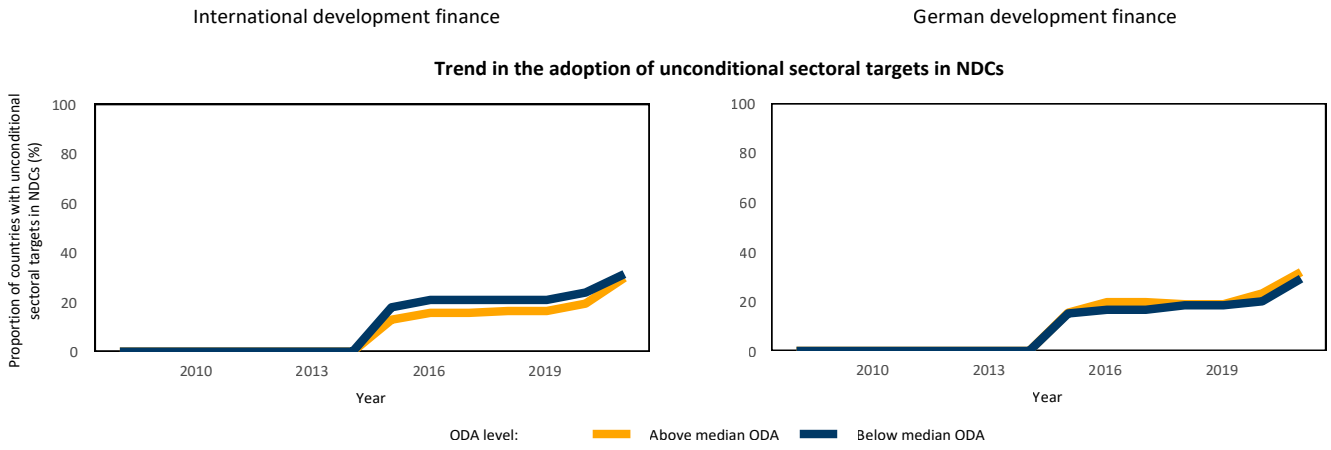


Source: DEval, own visualisation based on Climate Watch data (Climate Watch NDC Content, 2021) and CRS data (OECD, 2023e)
Note: The time series on the left refers to total international development finance, while the one on the right is limited to the German share. The classification of the partner countries can be found in Figure 23, while the choice of purpose codes corresponds to the variable "Energy supply mitigation ODA" in Table 14.

Voluntary interventions

The same applies to the climate targets, which are not linked to any conditions (see empirical implication 7). The trend is similar for countries with high and low levels of DC funds. As can be seen in Figure 16 this applies to both international (left) and German (right) ODA funds. None of the analyses with the two-way fixed effects model show any significant correlations between mitigation-relevant development finance and the number of voluntary climate targets.

Figure 16 Time series for the voluntary interventions formulated in the NDCs



Source: DEval, own visualisation based on Climate Watch data (Climate Watch NDC Content, 2021) and CRS data (OECD, 2023e)
Note: Again, the international funds are shown on the left and the German funds on the right. The classification of the partner countries can be found in Figure 23, while the choice of purpose codes corresponds to the variable "Energy supply mitigation ODA" in Table 14.

Information-based and behaviour-changing interventions

The analyses do not show any substantial positive correlation between the mitigation-relevant development finance in the "Energy" funding area and the impact indicators of information-based and behaviour-changing interventions. This applies to the number of climate policies adopted in the area of "Information and education" (see EI8), the share of renewable energies in energy consumption (see EI9), the number of climate policies adopted in the area of "Research, development and deployment" (see EI10) and the number of patents on renewable energies and supporting technologies (see EI11).

Table 9 Summary of the evidence on the effectiveness of the interventions

Intervention group	Empirical implication	Type of evidence	Evidence indicator	Findings
Technological and infrastructural interventions	EI1	Inferential	Share of renewable energies in electricity generation	Moderate evidence
Economic interventions	EI2	Descriptive & inferential	Existence of a CO_2 tax	No evidence
	EI3	Descriptive & inferential	Existence of an emissions trading system	No evidence
Institutional interventions	EI4	Inferential	Number of climate policies adopted to promote climate change mitigation interventions	Little evidence
Regulatory interventions	EI5	Inferential	Number of climate policies adopted in the form of regulatory instruments	No evidence
Climate change mitigation strategies and laws	EI6	Descriptive & inferential	Existence of a Nationally Determined Contribution (NDC)	No evidence

Intervention group	Empirical implication	Type of evidence	Evidence indicator	Findings
Voluntary interventions	EI7	Descriptive & inferential	Formulation of unconditional sectoral targets in the NDC	No evidence
Information-based and behaviour-changing interventions	EI8	Inferential	Number of climate policies adopted in the area of "Information and education"	No evidence
	EI9	Inferential	Share of renewable energies in energy consumption	Little evidence
	EI10	Inferential	Number of climate policies adopted in the area of "Research, development and deployment"	Little evidence
	EI11	Inferential	Number of patents for renewable energies and supporting technologies	No evidence

Source: DEval, own visualisation

3.4 Impact: Mitigation effects of German and international mitigation-relevant DC

3.4.1 Benchmarks

EQ4 on the impact of German and international mitigation-relevant development finance in the "Energy" funding area is assessed on the basis of a benchmark.

Evaluation question 4: To what extent is the overarching development impact of GHG emission mitigation achieved through German mitigation-relevant development finance in the "Energy" funding area?

Benchmark 4: An increase in mitigation-relevant development finance in the "Energy" funding area goes hand in hand with a decrease in a development partner's GHG emissions, all other things being equal.

3.4.2 Derivation

The extent to which mitigation-relevant DC actually reduces the GHG emissions of development partners is disputed in research. Such an effect is found in several studies (Boly, 2018; Farooq, 2022; Kablan and Chouard, 2022; Wu et al., 2021), but not in others (Bhattacharyya et al., 2018; Ikegami and Wang, 2021; Kretschmer et al., 2013; Li et al., 2021). Possible explanations for the differences in previous studies include differences in the statistical estimation procedure, in the assumptions of the model specification and in the control variables (Kühltau, 2023).

When distributing scarce resources, it is of paramount importance to understand the effect and impact of DC on GHG emissions. This can only be achieved by evaluating development impacts. At the same time, it is a challenge to identify such diffuse effects and impacts, which are difficult to attribute due to long results chains. Finally, allocation decisions in favour of the creation of global public goods should be based on the best possible evidence – especially when donor countries, which are historically mainly responsible for climate change, support the mitigation of climate change in developing countries.[58]

3.4.3 Results

The results of the statistical analyses are presented below. Figure 17 shows the relationship between the international DC of all OECD-DAC donors (upper part) and German DC (lower part) on the one hand and the development of GHG emissions on the other. To allow more detailed analysis, a distinction is made between the funds used and sector-specific emissions. The models are based on data from 2001 to 2021, divided into five periods.

58 In this context, it is important to distinguish between cases in which development interventions fail to prove their effectiveness despite careful evaluation and those in which the available evidence is not sufficient to make sound recommendations.

According to the benchmark, there is a significant and substantial negative correlation between mitigation-relevant DC in the "Energy" funding area and the GHG emissions in energy supply. For the international donor community, a 10 percent increase in disbursements results in a sector-specific GHG emission reduction of 0.64 percent. The estimated correlation for Germany is 1.06 percent, whereas it is somewhat weaker for total GHG emissions (0.17 percent for the international donor community, 0.57 percent for German funds). These results indicate that the mitigation-relevant DC in the "Energy" funding area is achieving its objectives.

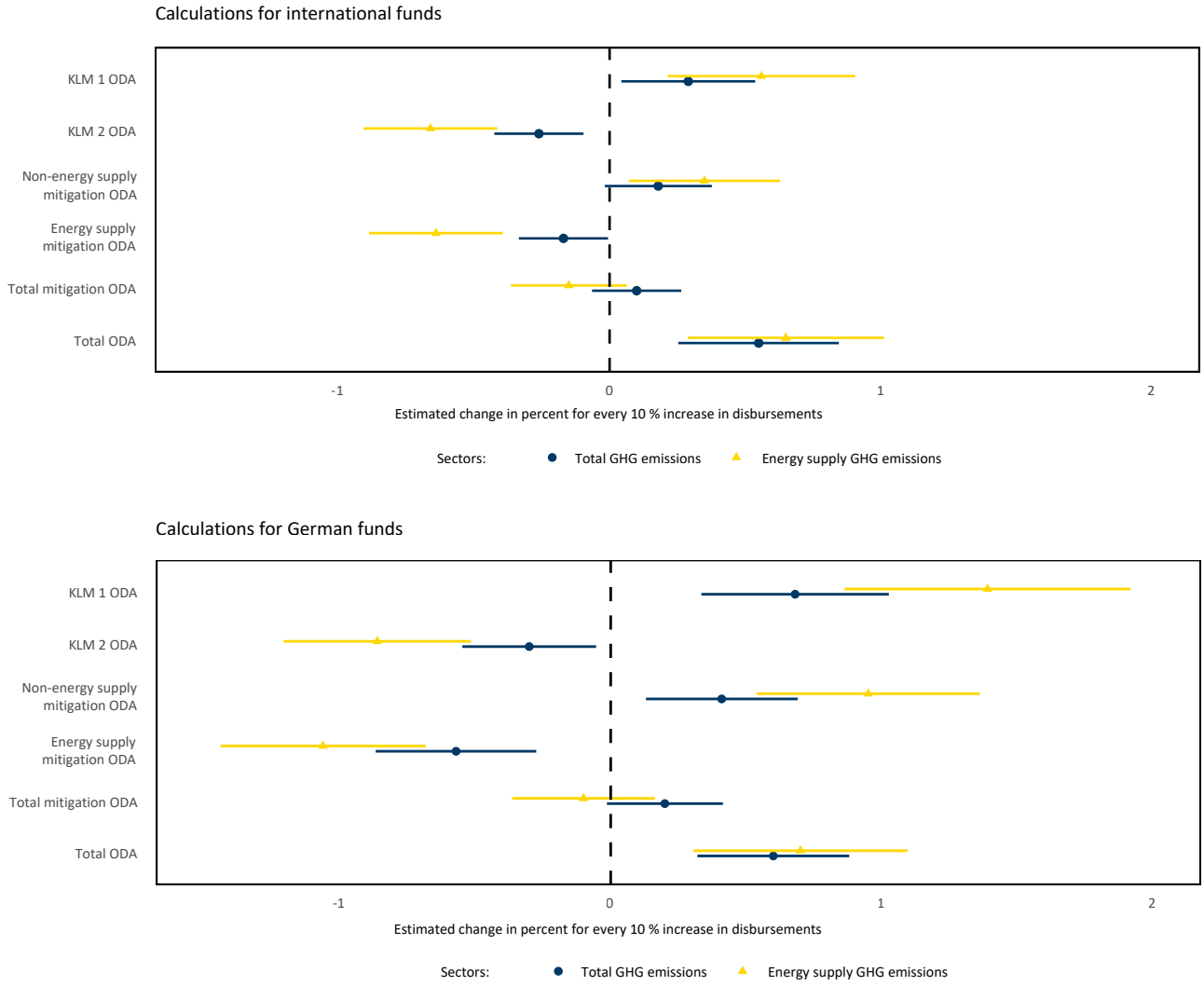
Analysing the mitigation-relevant development finance in all funding areas yields little evidence of a mitigation effect. This applies equally to international and German DC as well as to GHG emissions overall and energy supply GHG emissions.

One possible explanation for the lack of correlation lies in the significantly more positive results for mitigation-relevant DC with the principal objective of "climate change mitigation" compared to that with climate change mitigation as a significant objective. DC with the principal objective of "climate change mitigation" exhibits a consistently significant and substantial correlation with emissions reduction. The estimated reduction ranges from 0.26 to 0.86 percent, depending on which emissions are considered and whether international or only German DC is analysed. In contrast, DC with the significant objective of "climate change mitigation" is associated with higher GHG emissions (in the range of 0.29 to 1.39 percent). The results thus indicate that DC with "mitigation" as the principal objective achieves its objectives, whereas interventions in which the mitigation of greenhouse gases is a significant objective do not achieve any reduction in emissions. One possible reason for these observations could be the analysis results for the Rio markers (see Section 3.1.3), which indicate that significant objective interventions do not always have any clear climate relevance.

In a final step, a distinction was made between direct and indirect intervention types based on the funding areas. Details of the differentiation and the results can be found in the Annex in Table 14 or in Figure 21 and Figure 22. The analyses of GHG emissions from the energy supply sector show that direct interventions have a substantial correlation with GHG emission mitigation, while indirect interventions are associated with an increase in GHG emissions. A 10 percent increase in disbursements for direct interventions is correlated to a 0.86 percent reduction in emissions in the energy supply sector. For emissions that are not caused by the energy supply sector, there is a correlation with increasing GHG emissions for both direct and indirect interventions. If we consider only DC with the principal objective of "climate change mitigation", the results for direct interventions are confirmed as expected. One significant difference, however, is that the results now also suggest that indirect interventions can mitigate GHG emissions from the energy supply sector. For example, a 10 percent increase in disbursements for indirect interventions with the principal objective of "climate change mitigation" (KLM 2) is associated with a 1.12 percent reduction in emissions.

Overall, the correlations identified in the analysis indicate that international DC and German DC with some forms of mitigation-relevant DC achieve the goal of mitigating emissions. This applies in particular to mitigation interventions with the principal objective of "climate change mitigation" and mitigation-relevant DC in the "Energy" funding area. By contrast, interventions with the significant objective of "climate change mitigation" and outside the "Energy" funding area are associated with comparatively higher emissions.

Figure 17 Impact of international (top) and German (bottom) DC on GHG emissions



Source: DEval, own visualisation based on a structural equation model
Note: The dots show the estimated (average) effect of different forms of international and German development finance on GHG emissions. The composition of the respective types of ODA can be found in Table 14. Negative values correspond to the expectation that DC mitigates GHG emissions. The precision of the estimate is illustrated by the confidence interval (horizontal line). The 90 percent confidence interval is the value range that reflects the true effect in nine out of ten samples, provided the estimation function is unbiased.

3.5 Efficiency: Requirements for evaluating the efficiency of mitigation-relevant DC

3.5.1 Benchmarks

The comparability and validity of the methods used by the GIZ and KfW (development bank) to calculate emission reductions are assessed in order to allow evaluations of efficiency in subject area in the future. EQ 5 is verified on the basis of a benchmark.

Evaluation question 5 (Efficiency): What are the requirements for evaluating the efficiency of development interventions to reduce and avoid GHG emissions and how can these be met by improving reporting?

Benchmark 5: In order to evaluate the allocation efficiency of development interventions to reduce and avoid GHG emissions, reporting is required at module level that provides complete, differentiated, comprehensive and standardised information on emissions and mitigation effects at the same time.

3.5.2 Derivation

To assess the benchmark, the conditions of providing complete, differentiated, comprehensive and standardised information at the same time that are formulated there are assessed below for the two largest implementing organisations – GIZ and KfW. The assessment criteria for benchmark 5 are specified in Table 10.

Table 10 Assessment criterion for the reporting benchmark

Assessment criterion	Description
Completeness of reporting	If possible, all development interventions with a plausible mitigation effect (or a representative sample) should be required to record their emissions and emission mitigation effects.
Differentiation between direct and indirect impacts	Direct and indirect DC impacts and the resulting GHG emission mitigation should be differentiated as in the Indicator Definition Sheet for the standard indicator "mitigation of greenhouse gas emissions". Direct climate impacts are directly related to the service provided in the module (e.g. funding, investment grants) and are therefore the direct responsibility of the module. This means that the resulting emission mitigation can be directly allocated to DC funding or investment (including Scope 1, Scope 2 or, if relevant, Scope 3 emissions). Indirect climate impacts with only an indirect connection to the module or a causal relationship that is difficult to define (including advice on feasibility studies or a long-term expansion strategy for renewable energies) arise outside the direct area of responsibility of the module. Only indirect impacts that can be clearly assigned to the module and for which the resulting GHG emission mitigation can be quantified with reliable methodical evidence (including Scope 1, Scope 2 or, if relevant, Scope 3 emissions) should be recorded here. As direct and indirect impacts are determined on the basis of different premises, the values must be reported separately and must not be aggregated to form a total.
Comprehensiveness of reporting – operational limits	Emissions and emission mitigation should be documented as comprehensively as possible in accordance with the classification of the Greenhouse Gas Protocol for direct emissions (Scope 1) and indirect emissions from utilised electricity and heat (Scope 2). Where relevant, additional indirect emissions (Scope 3) should also be recorded. This includes, for example, embodied carbon in buildings or emissions generated along supply chains.

Assessment criterion	Description
Standardisation of definitions	In order to comprehensively document GHG emission mitigation and emissions from DC projects, all absolute emissions should be recorded in a standardised manner after project implementation. Absolute and relative emissions should be clearly differentiated after implementation. Absolute emissions (also known as the carbon footprint) are emissions caused by a project. Negative absolute emissions arise when GHGs (mostly CO_2) are removed from the atmosphere (also known as "sequestration"). Relative emissions are avoided or reduced emissions. They indicate the difference in absolute emissions between a "with" project scenario and an estimated "without" project scenario.
Timing of reporting and evaluation of interventions	Ideally, a standardised and transparent practice should be established among the implementing organisations and the BMZ's funding recipients and grantees, making information on ex-ante and ex-post GHG emissions easily accessible for all absolute and relative emissions from DC impacts on a project basis. Accordingly, an ex-ante assessment of the resulting emissions should first be performed, where possible supplemented by annual monitoring and reporting during implementation (ex-post) or corrected if necessary. If annual recording is not possible (for instance due to data availability), an ex-post evaluation should at least be carried out at the end of the project, ideally in combination with an updated estimate of the remaining (technical) term or lifetime.

Source: DEval, own visualisation

3.5.3 Findings

Completeness of reporting

The standard indicator "quantity of reduced or avoided GHG emissions (in tonnes of CO_2 equivalent/year)" applies to GIZ and KfW modules from the budget items of bilateral official development cooperation. This is an estimate of the GHG emissions reduced, avoided or sequestered by a development intervention (in tonnes of CO_2 equivalent). The aim is to estimate GHG emissions compared with the counterfactual situation in which the development intervention had not been implemented. The indicator is mandatory for all interventions with KLM-1 and KLM-2 identifiers and is therefore reported in both TC and FC.

The GIZ reports the standard indicator on a mandatory basis for interventions with a KLM identifier. Otherwise, reporting is optional.

The KfW records emissions and emission mitigation for interventions that are expected to exceed a significance threshold of more than 5,000 tonnes of CO_2 equivalent per year. As this is only possible by recording emissions and emission mitigation, emissions for interventions are initially estimated by sector. Emissions are then documented for interventions that are likely to be "GHG-significant". For interventions below the significance threshold, recording is simply recommended. This does not exist at the GIZ.

To summarise, the current reporting does not indicate that all mitigation-relevant effects and impacts have been fully recorded. However, the reporting to date is sufficiently complete for an evaluation of efficiency.

Differentiation between direct and indirect impacts

The GIZ differentiates between direct and indirect project impacts. Direct effects are calculated in relation to the "investment factor" (such as the funding share) (pro rata calculation). However, the majority of TC interventions are advisory interventions with only indirect climate impacts. The mitigation effect is outside the direct responsibility of the module. An "impact factor" is used to estimate the proportion of impacts that can be attributed to the GIZ intervention. As it is more difficult to record indirect impacts accurately and mitigation effects usually only occur with a time lag, this data is less reliable.

The KfW only records the direct climate impacts from FC project funding. The pro-rata calculation is based on the funding share of the project, similar to the GIZ's "investment factor". Indirect impacts are not recorded. This is to be distinguished from the inclusion of climate impacts from indirect funding, for example credit lines channelled through the financial sector that do not comprise an investment project directly financed by FC. In the future, however, such impacts are to be recorded in accordance with the GHG Protocol. The KfW is currently

developing a method to estimate emissions for indirect funding based on the Partnership for Carbon Accounting Financials and the Technical Working Group of the International Financial Institutions.

In summary, therefore, only the GIZ differentiates between direct and indirect impacts. Although KfW records the majority of impacts, it only records direct impacts from project financing.

Comprehensiveness of reporting – operational limits

The GIZ does not provide any specifications for positive impacts, but refers to the relevant methods, which generally cover Scope 1 and Scope 2, but rarely Scope 3. In the case of negative emissions, however, Scope 3 emissions that can be directly attributed to the project are included (including financed travel activities).

The KfW takes account of Scope 1 and Scope 2 emissions, and Scope 3 if relevant. Scope 3 emissions are usually not relevant for typical FC funding in the energy sector (renewable energies). In other sectors (especially transport and mobility, financial sector interventions), they can be taken into account where appropriate.

The GIZ and KfW thus record Scope 1 and Scope 2 emissions, whereas there is no standardised procedure for Scope 3. Up to now, there is no widely recognised definition of which Scope 3 emissions from DC interventions should be considered relevant.

Standardisation of definitions

For GHG-significant interventions, the KfW records absolute GHG emissions and relative emissions. Since the beginning of 2022, the KfW has been using the Greenhouse Gas Accounting Methodology for this (KfW Development Bank, 2022), based on the GHG Protocol and the calculation standards of multilateral and national development banks (IFI, 2021). In addition, sector-specific GHG calculation tools are used in FC (including for energy, mobility and water). The existing project-related KfW estimation method is well suited for direct impacts (including funding infrastructure), but only to a limited extent for recording indirect impacts (including policy-based lending).

The GIZ estimates and records only additional unintended emissions that have a direct impact as absolute emissions. Project emissions from interventions with a direct mitigation effect are not recorded as absolute emissions, but are offset in the calculation of emission reductions.

To sum up, it can therefore be stated that the KfW documents all absolute emissions, while the GIZ only documents some absolute emissions.

Timing of reporting and evaluation of interventions

The KfW and GIZ record the "annually reported value in tonnes of CO2eq/a" differently with regard to the point in time. The GIZ documents the contributions to mitigation or prevention "per year" in relation to the project term or the respective project year (= reporting year), recording the contributions ex post, including for the previous year. Depending on the intervention's advisory approach, GHG emission mitigation may be reported annually or only once, for example in the last project year because no relevant GHG mitigation effects could be recorded beforehand. The KfW records the average annual value of the mitigation over the term. As standard, the operating phase taken into account for the calculation is 20 years. An ex-ante estimate is therefore made for new commitments, for which the average annual mitigation value is reported once.

4.

CONCLUSIONS AND RECOMMENDATIONS

4.1 Portfolio of mitigation-relevant development finance

To answer EQ1, to what extent the mitigation-relevant portfolio is aligned with international agreements and the priorities of the development partners and the German Federal Government, this evaluation assesses four datasets on the reporting of mitigation-relevant development finance and also draws on further analyses. In the assessment as part of this evaluation, it is important to note that the results differ depending on which form of reporting is used for international climate finance or mitigation-relevant development finance. There are some considerable differences here. The focus is on ODA funds for which the German Federal Government and the BMZ are responsible via bilateral channels and, where the reporting allows, multilateral channels. Where possible, loans are not recognised in full, but only the grant equivalent (Heidebrecht, 2017). The mobilised private climate finance is not included in the calculations.

Germany is one of the most important donors internationally

Germany is one of the largest OECD donors of climate-relevant development finance. According to calculations by Colenbrander et al. (2022), Germany complies with the principle of common but differentiated responsibilities with regard to the goal of industrialised countries to provide developing countries with USD 100 billion annually for climate change mitigation and adaptation as of 2020. Scientific studies estimate Germany's fair share of this target at just over 8 percent on average. Germany is one of the most important donors for adaptation- and mitigation-relevant development finance – that part of climate finance that is provided with the main aim of promoting economic and social development in developing countries. In 2021, Germany's climate-relevant development finance was higher than ever before. Among the German federal ministries, the BMZ is responsible for the majority of Germany's contribution to achieving the USD 100 billion target.

According to German reporting, Germany has honoured its international obligations and has also already achieved its self-imposed goal of increasing the funds for climate finance for developing countries to at least EUR 6 billion from budget funds by 2025. According to the BMZ, the benchmark that Germany fulfils the principle of common but differentiated responsibilities with regard to contributions to mitigation-relevant development finance is therefore met. However, in light of the recent debate about cuts to the development budget, it is unclear to what extent funding can continue to be secured to the desired extent.

Future commitments regarding the level of German climate finance will depend to a large extent on the negotiations of the United Nations Framework Convention on Climate Change regarding the New Collective Quantified Goal on Climate Finance (NCQG) in the context of the UNFCCC Conference of the Parties (COP29). The level of the NCQG should take account of the financial requirements for climate interventions in developing countries, which are estimated at over USD 1 trillion per year (UNFCCC, 2024). Germany's share of the NCQG is also influenced by the contributions of other countries. So far, only Annex II countries have committed to paying, but there are discussions about expanding this group (Aleksandrova and Koch, 2024). If this were to happen, the share of Annex II countries in the total amount could fall, and thus also that of Germany (Beynon and Wickstead, 2024).

The BMZ finances mitigation and adaptation in a more balanced way than Germany as a whole

The same applies to the desired parity ratio of mitigation and adaptation. The evaluation of the climate reporting shows an almost balanced distribution between mitigation- and adaptation-relevant development finance via bilateral BMZ commitments from 2011 to 2021. Although there is some uncertainty, as the ratio varies depending on the dataset, we can say that the BMZ is succeeding in its efforts to ensure a balanced ratio of mitigation to adaptation funding from budget funds (BMZ, 2021: 15).

However, the finding of an almost equal distribution only applies to the limited consideration of budget funds plus the grant equivalents of concessionary loans, but not to the reporting of climate finance in the context of the USD 100 billion target. According to official climate reporting, the balance between public mitigation and adaptation funding has not been achieved. This is primarily because loans are

recognised here at face value (not just the grant equivalent) and not just ODA funds. If all public and private financial flows aimed at low-carbon and climate-resilient development are taken into account (also activities of companies, households, financial institutions and banks), the adaptation-relevant share is only 5 percent according to Buchner et al. (2023). Overall, the BMZ therefore achieves the goals it has set itself. However, public funding is only able to offset the imbalance between adaptation and mitigation funding to a limited extent.

There are well-founded doubts about the validity of the Rio markers

There are indications that not all of the reported ODA funds are actually climate-relevant to the same extent. The analyses of this evaluation show that the Rio markers for mitigation are awarded too frequently and too high. These results are in line with numerous other studies (Borst et al, 2023; Hattle et al, 2021; Michaelowa and Michaelowa, 2011; Oxfam, in preparation; Toetzke et al, 2022; Weikmans and Roberts, 2019). As only the validity of the Rio markers for Germany was analysed in the course of this evaluation, no statements can be made about the quality of reporting by other donors. However, there is no reason to assume that these findings would be different for other countries. For Germany, however, the actual bilateral climate-relevant development finance (from ODA funds) is lower than reported. Reporting for Germany therefore faces challenges in terms of transparency and accountability, although the results are also relevant for other donors.

Based on the reporting, the comparison of different databases and the review of the Rio markers, the following assessment can be formulated:

Assessment of benchmark 1.1

The benchmark that the contributions of German DC to mitigation-relevant development finance are in a balanced relationship to adaptation-relevant development finance and correspond to the principle of common but differentiated responsibilities is **mostly fulfilled.** However, this only applies if the form of reporting used for the respective targets serves as a basis and the validity of the reporting is assumed based on the Rio markers.

Transparency of reporting

This evaluation highlights the challenges involved in accurately determining the amount of mitigation-relevant development finance. There is a significant difference between the recognition of loans at nominal value or – in line with reporting in development finance – on a pro rata basis using grant equivalents. In addition, reporting on bilateral DC is based on financial commitments, while reporting on multilateral DC is based on actual disbursements. This, in turn, can take account of disbursements in the form of contributions to MDBs or the development contributions of the multilateral development banks themselves. When it comes to recording private capital mobilisation, different stakeholders in German and international DC use different approaches and key figures. The results already described for the allocation of the Rio markers also lead to uncertainty. The donor comparison also involves different practices for discounting significant objective interventions, which have no less massive effects on the estimated amounts (see Table 1 in Zagema et al., 2023).

The assessment of the achievement of objectives is made even more difficult by differently defined targets. The goal of distributing adaptation and mitigation funding equally refers to budget funds plus grant equivalents. The definitions of public climate finance according to the EU and UNFCCC guidelines, on the other hand, are much broader. In addition, the well-known USD 100 billion target is not clearly operationalised, which means that progress towards achieving it can be estimated (OECD, 2023c) but not clearly determined (Roberts et al., 2021). For donor-specific data, the fair share corresponding to the principle of common but differentiated responsibilities and capacities must also be estimated.

This leads to a range of different estimates of climate-relevant development finance. Depending on the dataset, Germany's climate-relevant development finance from ODA funds calculated as part of the evaluation, taking account of bilateral commitments and multilateral disbursements in 2021, amounts to between EUR 4.6 billion (EU data) and EUR 6.1 billion (CRS data).

However, the effects and impacts achieved have a greater strategic relevance than the amount of funding. Although financial commitments may have a signal effect and large amounts may increase the ambitions of national contributions, climate finance is nevertheless primarily a means to an end. It therefore seems advisable to attribute more strategic relevance to the mitigation objectives. Specifically, the BMZ could prioritise the goal of GHG emission mitigation. Insofar as there is transparent reporting in the future – complete, differentiated, comprehensive, standardised and simultaneous recording of the mitigation effect (see below) – this goal can be tracked.

The mobilisation of private capital fails to meet expectations

The use of private funds is becoming increasingly important for sustainable investments (Orth et al., 2020). The mobilisation of private funds and the joint engagement of state and private stakeholders are also key factors in achieving climate targets (BMZ, 2021). However, the high expectations of an increase in private investment to meet the needs of developing countries (UN, 2015b) have not yet been fulfilled (Houérou and Lankes, 2023; OECD, 2023c). To evaluate the BMZ's private capital mobilisation for the purpose of mitigating GHG emissions, 14 BMZ mitigation-relevant fund and direct holdings managed by the KfW on a fiduciary basis were examined for this evaluation. BMZ funds totalling EUR 762 million have been channelled into these holdings, running from January 2017 to June 2023.

The analysis shows that the BMZ mobilised a total of EUR 137 million in private capital from 2017 to 2023 through the use of public funds in the examined fund and direct holdings with mitigation relevance. However, these absolute amounts and the analysis of leverage are only meaningful to a limited extent, as investment risks must also be systematically taken into account. The comparative perspective is therefore more important. What is surprising here is that private capital mobilisation in the area of "climate change mitigation and clean energy" – despite great interest among private investors – is no more successful than in other focus areas. Greater risk-taking does not lead to better mobilisation either. In view of the fact that the BMZ invests in structured funds primarily in the mitigation-relevant area, the effectiveness and efficiency of this strategy should be critically reviewed.

In view of the financial challenges, there seems to be no alternative to mobilising more private funds for the global effort to mitigate GHG emissions. The aim here is to capitalise more on market opportunities, innovation potential and the future security of clean technologies. This can work towards consistently gearing all financial flows to sustainable emissions reduction.

A conclusive assessment of the extent to which certain private capital mobilisation strategies are more suitable than others is not possible on the basis of this analysis and is generally difficult for strategic decision-makers to gauge. It is not sufficient to consider absolute values or leverage, as they alone can hardly provide insights into the extent to which other instruments would have been more successful (counterfactually). For example, a high mobilisation effect may indicate that private investment would have taken place even without public support.

A differentiated view of the effectiveness of private capital mobilisation would be desirable. There is a lot of information available at fund level for this purpose, but it is not adequately prepared for strategic FC allocation. In particular, it would be important to prepare the characteristics of the funds (countries, sectors and projects) in a way that reduces complexity for strategic decision-making. The BMZ could thus align the allocation decision more closely with potential financial additionality (see also Orth et al., 2020). This does not call for a shift in the management (as opposed to strategic control) of fund and direct holdings to public donors. On the contrary, due to the necessary business and financial expertise, it makes sense for the management to remain with specialised fund managers. However, the flow of information that enables effective strategic management should be improved.

Mitigation-relevant DC is in line with partner interests, but the NDC steering effect is low

Although the majority of German mitigation-relevant development finance is provided in line with the NDCs of the development partners, these national climate change mitigation objectives do not appear to have a strong steering effect. The majority of German mitigation-relevant development finance commitments are made in sectors that are formulated as conditional targets by partner countries. However, there is no evidence that allocation decisions by the donor community are actively orientated towards the NDCs, as was agreed in the Paris Agreement.

The double finding that mitigation-relevant DC is aligned with the goals in NDCs, but at the same time the publication of conditional targets hardly influences donor community distribution patterns, has several possible explanations. To begin with, it is conceivable that the distribution patterns were already orientated towards the partners' objectives before the NDCs were published. In this case, NDCs would merely codify already known priorities, while the patterns of distribution would change only slightly. The generally strong path dependency of allocation patterns speaks in favour of this (Islam, 2022; Wencker, 2022). It is also conceivable that the formulated conditional targets are not specific enough to have a steering effect on the portfolio. One indication of this is that clear cost estimates are often lacking (Pauw et al., 2020). The costs associated with the individual targets are not yet determined in sufficient detail and according to a comparable method, which makes the distribution of mitigation-relevant DC more difficult. Another explanation could be that political priorities change due to a change of government, for example. However, this would manifest itself in updated NDCs, as was the case after Bolsonaro's election as president in Brazil, for example (Peterson et al., 2023). It could also be that the implementation of the NDCs takes place so late that changes in the distribution patterns of mitigation-relevant DCs do not occur in the period under review. This seems fairly unlikely in view of the long investigation period up to 2022 – at least for the NDCs published in 2015 – and the fact that the object of analysis is commitments rather than disbursements made later on. The results could also indicate that the NDCs were only drawn up with limited transparency and inclusivity, meaning that they only have a limited steering effect. NDCs are conceived as voluntary goals developed by countries on a sovereign basis and are thus an expression of self-determination. One indication of this is provided by Pruett and Hill (2024), who investigated NDC consultations in eleven developing countries and found that civil society is often only involved to a limited extent. More generally, a lack of capacity on the part of non-governmental and, to an equal extent, governmental stakeholders can also reduce the benefits of NDCs (Gerhard et al., 2022). DC can further strengthen the transparency and inclusivity of NDCs through capacity building and knowledge transfer, for example as part of the NDC Partnership.

This results in the following assessment of the benchmark:

Assessment of benchmark 1.2

The benchmark that German mitigation-relevant development finance is orientated towards the nationally determined contributions of the partner countries specified in the NDCs is **partially fulfilled.**

The findings with regard to the amount, balance, leverage effect and partner-orientation of mitigation-relevant DC give rise to the following recommendation:

Recommendation 1: The BMZ should uphold its commitments to contribute equitably to mitigating GHG emissions, in line with the principle of common but differentiated responsibilities and capacities, and continue to align its commitments with the NDCs in order to achieve the goals of the Paris Agreement.

Implementation guidance 1.1: In addition to climate finance objectives, the BMZ could focus more on verifiable mitigation effects.

Implementation guidance 1.2: The BMZ could further improve the transparency and validity of reporting.

Implementation guidance 1.3: The BMZ could continue to work towards a stronger partner orientation in the donor community in the spirit of the NDCs and in doing so maintain and strengthen the principle of self-determination of the NDCs.

Implementation guidance 1.4: The BMZ could systematically ensure that the distribution of mitigation-relevant DC is oriented towards partner priorities and that the achievement of NDCs is supported.

Implementation guidance 1.5: The BMZ could make better use of the comparative advantages in the area of GHG emission mitigation in private capital mobilisation and analyse the risk-specific mobilisation effect. Existing structures such as the Just Energy Transition Partnerships and the private capital mobilisation staff can be utilised.

Outlook

With the planned reflection of the core area strategy "Responsibility for our Planet – Climate and Energy", the question arises as to which strategy the BMZ will pursue in the coming years. Two developments are relevant with regard to monetary targets. The first is that the BMZ has, according its own calculations, already achieved the EUR 6 billion target. Secondly, the budget provides for a reduction of EUR 940 million in 2024 for Section 23, which amounted to EUR 11.22 billion the previous year, and a further reduction in 2025. This is also likely to have an impact on the amount of climate finance.

4.2 Distribution patterns of mitigation-relevant development finance

EQ2 is about the extent to which the distribution of mitigation-relevant development finance is aligned with the mitigation potential, taking into account the needs of the partner countries.

The BMZ bases the distribution of mitigation-relevant development finance on need rather than on mitigation potential. The results of the statistical analysis indicate that poorer countries receive more frequent and higher commitments. In contrast, there is little evidence of a systematic focus on mitigation potential. Neither a lack of efficiency in the energy supply sector nor high per capita emissions appear to have a significant influence on selection or allocation. However, the BMZ works more frequently with technological pioneers – such as countries that patent low-carbon energy technologies.

With regard to the political-institutional framework conditions, the form of rule is particularly relevant. Democracies were more likely to receive commitments and to a greater extent. In contrast, there is only weak evidence of systematic correlations with regard to governance, conflict intensity or the number of women in parliament.

In summary, this results in the following assessment:

Assessment of benchmarks 2.1 and 2.2

The benchmark (2.1) that, taking account of their needs, developing countries with a high mitigation potential are more likely to receive a greater volume of German mitigation-relevant development finance than developing countries with a low mitigation potential is **partially fulfilled.**

The benchmark (2.2) that the BMZ should base the allocation of mitigation-relevant development finance on the political-institutional framework conditions of developing countries is **partially fulfilled.**

A stronger focus on need rather than mitigation potential raises the question of the efficiency of the achievement of objectives. It is irrelevant for the achievement of climate targets where the mitigation effect is achieved. Multilateral stakeholders such as the World Bank are therefore already examining a systematic orientation towards the provision of global public goods or mitigation potential (World Bank, 2023b).However, focussing on global public goods

creates opportunity costs for national development.[59] At the same time, it should be borne in mind that countries with stronger economies have better access to the capital market and can secure mitigation-relevant funding on more favourable terms than poorer countries.

The distribution of mitigation-relevant DC is confronted with synergies and conflicts of objectives (Chan et al., 2021). In principle, the achievement of individual development goals can have a positive or negative impact on other development goals (International Council for Science, 2015). This applies equally to SDG 13 (Climate action) (IPCC, 2018), as the achievement of some SDGs influences GHG emissions and thus climate change mitigation (UNEP, 2016). As climate change has largely negative consequences for SDG achievement, climate change mitigation has a largely positive effect on other development goals, especially in the long term (IPCC, 2018).

Development solutions that aim solely at effective and efficient GHG emission mitigation are therefore inadequate. Instead, the distribution of mitigation-relevant DC requires careful consideration of interlinked and sometimes conflicting objectives. The urgency, risks and uncertainties of climate change and climate change mitigation must be taken into account (Stiglitz et al., 2024). One example is the "Vision 100" model with the core objectives of 100 percent needs-based energy access by 2030 and net decarbonisation of all energy-relevant sectors by 2050. The aim is to use DC interventions to mitigate (reduce and avoid) GHG emissions and at the same time promote socio-economic development through better energy access. This considers DC holistically, in line with the 2030 Agenda, but faces the challenge of balancing goals effectively.

Firstly, such an approach requires the (recognition and) identification of conflicting objectives and synergies between climate change mitigation and other development goals. Some bilateral and multilateral donors, including the BMZ, are already addressing the climate crisis with a holistic approach that maximises synergies and minimises conflicts of objectives (AFD, 2017; BMZ, 2021; Chan et al., 2021; Lankes et al. 2024; USAID, 2022; World Bank, 2023a). This also includes transformational change in climate-relevant systems with extensive positive contributions towards inclusive, climate-neutral, equitable, resilient and sustainable development pathways (Climate Investment Funds, 2024). Current, scientifically sound and complexity-reduced descriptions of synergies and conflicting objectives between key development outcomes are already available (Miola et al., 2019). The findings from the identification of conflicting objectives and synergies could be incorporated into the strategic orientation and into the operational module and programme proposals.

Secondly, dealing with conflicting objectives and synergies could be conducive to addressing the climate crisis. If conflicting objectives are identified in the strategic orientation and the operational module and programme design, the mitigation-relevant development finance could be geared more towards mitigation potential. Interventions with "mitigation" as their principal objective (KLM 2) are particularly effective in mitigating GHG emissions, while those with this significant objective (KLM 1) and without a mitigation objective (KLM 0) can achieve other development goals more efficiently (Dissanayake, 2023; Ghanem, 2023). Accompanying interventions along the just transition approach can then reduce the short-term negative consequences of mitigation interventions (BMZ, 2022a; Chan et al., 2021). Ideally, they should also maximise the opportunities of those most affected by climate change and structural change while minimising the economic, social and environmental impacts in order to make a positive contribution to the 2030 Agenda. In cases where only synergies in module and programme design are identified, no trade-off between socio-economic development and GHG emission mitigation is necessary (Dissanayake, 2023).

Thirdly, transformational approaches could utilise synergies between socio-economic development and climate change mitigation (IPCC, 2022a; UN, 2015a) (see Box 5). German and international DC have adopted the objective of establishing a transformational climate policy (BMZ, 2021). German DC could further promote transformational approaches,

59 A purely efficiency-orientated approach would focus on implementing the most efficient interventions in the respective areas. This would mean addressing the promotion of climate change mitigation independently of the priorities of poverty reduction and not necessarily promoting economic development with climate-neutral solutions. Such an approach would free development solutions from the "climate proviso" and mitigation-relevant interventions from the "development proviso". In extreme cases, however, such a less integrated DC could violate the do-no-harm principle due to negative externalities. However, in the light of a multidimensional understanding of development, which pursues coherent and integrated policies to achieve the SDGs as important norms, such an approach does not appear feasible (see also Box 2 zon transformational change, Box 5 on the nexus between socio-economic development and climate change mitigation and Box 6 on just transition).

including comprehensive risk management, climate and development partnerships, partnership-based and donor-coordinated approaches such as the NDC Partnership, climate-resilient infrastructure interventions and a cross-ministry environmental policy (Noltze et al., 2023a). In the process, it could examine those interventions that may potentially have particularly negative unintended effects on poverty with a view to minimising them. This concerns, for example, resource extraction (fossil fuels and transition minerals) and the fossil fuel phase-out, carbon pricing instruments (including fossil fuel subsidies), the creation and distribution of new green jobs, inclusiveness and local impacts of low-carbon technologies (Lankes et al., 2024). Country-specific context analyses and modelling can be used here.

Recommendation 2: When distributing mitigation-relevant DC, the BMZ should more specifically consider the synergies and conflicts of objectives between promoting socio-economic development and mitigating GHG emissions in order to minimise potential conflicts of objectives and maximise possible synergies.

Implementation guidance 2.1: The BMZ could do more to recognise the conflicting objectives and synergies between key development results by using up-to-date, scientifically sound, complexity-reduced descriptions of these areas.

Implementation guidance 2.2: The BMZ could deal with conflicting objectives and synergies more systematically. If there are conflicting objectives, it could focus mitigation-relevant development finance more on mitigation potential, reducing possible short-term negative impacts of mitigation interventions through accompanying interventions using the just transition approach and, at best, creating new socio-economic synergy effects or strengthen existing ones.

Implementation guidance 2.3: The BMZ could further promote transformational approaches in order to utilise synergies, including comprehensive risk management, climate and development partnerships, partnership-based and donor-coordinated approaches such as the NDC Partnership and cross-ministry environmental policy.

4.3 Effectiveness and impact of mitigation interventions

EQ3 deals with the intended objectives (outcomes) of German mitigation-relevant development finance in the "Energy" funding area. The conclusions are based on the comparative statistical effect and impact analysis and the evidence synthesis on the interdependencies between different mitigation interventions.

The results of the effect and impact analysis indicate that mitigation-relevant development finance in the "Energy" funding area for direct technological and infrastructural interventions has a significantly positive mitigation effect. Disbursements of mitigation-relevant DC are positively related to the share of renewable energies in electricity generation in the partner countries. This is plausible, as technological and infrastructural interventions contribute to GHG emissions comparatively directly, meaning that impact comes soon after the input.

For mitigation-relevant development finance in the "Energy" funding area, in contrast, a significantly positive mitigation effect can be demonstrated by the statistical analyses for indirect interventions (economic, institutional, regulatory, information-based and behaviour-changing as well as voluntary) and climate change mitigation strategies and laws. This does not necessarily imply that indirect interventions are ineffective. Very long impact pathways, minor effects and impacts or an incorrect specification of the analysis performed here may also lead to these results. Moreover, it is possible that heterogeneous effects and impacts cancel each other out and thus lead to null findings.

The international evidence makes it clear that indirect interventions funded by DC contribute to a mitigation effect (IPCC, 2022a). This evidence can provide guidance for German DC. Economic interventions such as carbon taxes and emissions trading systems are among the most widespread and are considered to be the most effective and impactful for mitigating GHG emissions (IPCC, 2022a: 269). Institutional interventions strengthen institutional capacities and improve

the framework conditions to make it possible to implement further mitigation interventions (IPCC, 2022a: 44). The creation of participatory decision-making and consultation processes following the just transition approach gives rise to a broad consensus that allows the transformational change needed to effectively mitigate GHG emissions (IPCC, 2023d: 74). Regulatory interventions effectively contribute to the avoidance of GHG emissions through the introduction of performance and technology standards (IPCC, 2022a: 46). Climate change mitigation strategies and laws such as the conditional and unconditional targets of the NDCs create improved political framework conditions in the long term and are effective in mitigating greenhouse gas emissions (IPCC, 2022a: 411). Information-based and behaviour-changing interventions improve access to information and influence the behaviour of target groups that can make an effective and impactful contribution to avoiding GHG emissions (IPCC, 2022a: 127). Finally, voluntary interventions can contribute to the avoidance of GHG emissions through voluntary commitments and agreements (IPCC, 2022a: 125).

In addition, international evidence shows that DC makes a positive and demonstrable contribution to this mitigation effect (IPCC, 2022a). The international cooperation mechanisms within and outside the UNFCCC climate regimes are crucial for achieving climate change mitigation objectives in the context of sustainable development (IPCC, 2022a: 1453). Both international TC and international FC increase the likelihood of developing countries achieving their mitigation objectives (IPCC, 2022a: 1517). International DC has helped to reduce or avoid greenhouse gas emissions in many of these countries (IPCC, 2022a: 1517). The conditional targets of the NDCs require DC in the areas of "funding", "technology" and "capacity building" (IPCC, 2022a: 1467). International DC provides important institutional capacities for mitigation interventions in developing countries IPCC, 2022a: 1487).

Despite this positive contribution, an expansion of international DC is necessary in order to achieve the Paris climate targets (IPCC, 2022a). The need for funding, technology and capacity building to achieve the conditional targets of the NDCs goes beyond what has been provided by DC to date (IPCC, 2022a: 1454). Sectoral and bilateral DC also provides crucial support to developing countries, but there is still room for improvement (IPCC, 2022a: 1454). Ultimately, it is unclear to what extent international DC will contribute to the transformational changes required to achieve the Paris climate goals (IPCC, 2022a: 1517).

This results in the following assessment of the benchmark:

Assessment of benchmark 3

The benchmark that an increase in mitigation-relevant development finance in the "Energy" funding area goes hand in hand with a decarbonisation of a development partner's energy supply, all other things being equal, is **partially fulfilled.**

EQ4 addresses the question of the extent to which the overarching development impact of GHG emission mitigation is achieved through German mitigation-relevant development finance in the "Energy" funding area. In addition to German DC, this also entails analysing international DC in order to check the external validity of the findings.

The results indicate that DC with GHG emission mitigation as the principal objective, such as mitigation-relevant DC in the "Energy" funding area, leads to emission mitigation for the development partner. It is also relevant here that a high proportion of the mitigation interventions with the principal objective of "climate change mitigation" (KLM 2) are implemented in the "Energy" funding area. These results indicate that development cooperation – both German and international – is achieving its goals in the "Energy" funding area and mitigating GHG emissions in the energy supply sector.

What is surprising is that no emission-mitigating effect can be identified for mitigation-relevant development finance in general, meaning for all funding areas. This finding applies equally to international and German DC as well as to GHG emissions overall and energy supply GHG emissions. As the analysis shows, this is due in particular to the fact that

the funding of interventions that aim to mitigate GHG emissions as a significant objective does not go hand in hand with emission mitigation. One possible explanation for this is that German DC is orientated towards need rather than mitigation potential, especially in the case of significant objective interventions.[60] Another possible explanation can be found in the results of the effectiveness analysis. Accordingly, direct interventions (technology and infrastructure) are implemented comparatively more frequently in the "Energy" funding area. In addition, significant objective interventions could be less climate-relevant than reported. The results of the Rio marker assignment support this interpretation, demonstrating that the climate relevance of significant objective interventions is not always clear.

The evidence synthesis of this evaluation indicates that democracies and well-governed countries are comparatively better at mitigating emissions. Democracy is crucial for achieving climate change mitigation, and democracies adopt more ambitious climate policies in the NDCs under the Paris Agreement compared to autocracies (V-Dem Institute, 2021). One possible explanation for this finding is that public goods are prioritised over private goods due to accountability to the electorate. Good governance and political stability also correlate negatively with emissions in many studies. Further current research seems advisable here. After all, although democracy should facilitate decarbonisation, authoritarian regimes are still able to implement large-scale environmental policy interventions. This emphasises China's leading position in renewable energies.

Based on this evidence, it seems advisable in the context of strategic management to take even greater account of how the political-institutional framework conditions can strengthen or weaken mitigation effects. To this end, the framework conditions could be promoted in a targeted manner by supporting democracy and state capacity.

This results in the following assessment:

Assessment of benchmark 4

The benchmark that an increase in mitigation-relevant development finance is accompanied by lower GHG emissions of a development partner under otherwise identical conditions is **fulfilled** in the "Energy" funding area and for mitigation interventions with the principal objective of "climate change mitigation", but is **not fulfilled** for mitigation interventions with the significant objective of "climate change mitigation".

This gives rise to the following recommendation:

Recommendation 3: The BMZ should continue to substantially promote the effective and impactful interventions in the portfolio of mitigation-relevant development finance with the principal objective of "mitigation", especially in the "Energy" funding area, in comparison to the rest of the mitigation-relevant portfolio.

Implementation guidance 3: The BMZ could critically examine the actual mitigation effects of the cross-sectoral portfolio of mitigation-relevant development finance.

4.4 Requirements for measuring efficiency

EQ5 analyses which requirements exist for evaluating the efficiency of development interventions to reduce and avoid GHG emissions and how these can be met by improving reporting. The aim of improved reporting is to be able to make valid statements on the emission-mitigating effect of development interventions. Only if effects and impacts are reported in a complete, differentiated, comprehensive, standardised and simultaneous manner can political decision-makers assess their efficiency on the basis of reliable information. To make it possible to compare the efficiency of different interventions, we recommend taking five measures.

60 However, in accordance with the reporting rules for climate finance, only half of the significant objective interventions are taken into account in the allocation analysis on which this finding is based, which means that the significant objective interventions have a lower weighting in the analysis.

Firstly, although the current reporting does not provide a complete record of all mitigation-relevant impacts, it appears to be sufficiently complete to evaluate efficiency. The KfW records interventions above a low significance threshold (compared to other FC organisations with 20,000 tonnes of CO_2 equivalent, such as the European Investment Bank [EIB, 2023]). If initial estimates (including during the feasibility study) indicate a value below this, reporting is recommended but there is no need for a more precise calculation. To ensure representative results, the KfW could estimate information on the mitigation relevance of interventions below the significance threshold on the basis of a random sample. According to the KfW, the threshold of 5,000 tonnes of CO_2 equivalent will no longer be applied in the medium term. Climate mainstreaming means that the possibility of significant emissions is already questioned today for all projects (not just those with KLM > 0). This would allow FC to be fully recognised in the future.

Secondly, uncertainties could be communicated more clearly or reported more generally, in particular when measuring indirect effects and impacts. The indirect mitigation-relevant effects of TC in particular are comparatively difficult to record precisely (Greenhouse Gas Protocol, 2014). One possible approach would be to make these estimation uncertainties more transparent in the reporting. They would then also have to be taken into account in further data processing, especially data aggregation, and in publication. Alternatively, a simplification could also be considered to facilitate the allocation of the proportionate mitigation via the impact factor by reporting the overall mitigation effect and referring to the general DC contribution in the communication, not the proportion. Although the total indirect effects and impacts occurring and the resulting emissions would thus be determined, the proportion caused by the impact factor would not be recorded. The International Climate Initiative is pursuing this approach. However, it harbours the risk of effects and impacts being reported too high and possibly more than once.

Thirdly, definitions at the GIZ and KfW should be standardised. This initially concerns the definition of which emissions should be documented under Scope 3. In addition, the GIZ should explicitly incorporate the recording of Scope 1 and Scope 2 emissions into its own guidelines and methods. It would also be desirable to harmonise the definitions with regard to the documentation of absolute emissions so that they are recorded and reported separately for all interventions. Project emissions, for example from projects that mitigate GHG emissions, are not recorded uniformly at the GIZ with an aggregated carbon footprint. International standards, such as the International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, can be used for this purpose. Definitions and procedures should be standardised as part of the further development of the reporting rules for the standard indicator "mitigation of greenhouse gas emissions".

Fourthly, direct and indirect emissions should always be reported separately. As FC and TC interventions are not entirely comparable due to their differences, separate reporting does them more justice. Emission mitigation and emissions from projects should not be offset either, but rather reported in a differentiated manner.

Fifthly, a standardised ex-ante and ex-post assessment is recommended. This would make it possible to validate the assessments made at the outset for the project term. Since the majority of indirect effects and impacts only occur after project implementation, the ex-ante assessment would also be forward-looking and would serve to estimate future mitigation-relevant effects. The GIZ would have to introduce a standardised assessment agreed with the KfW at the beginning and end of the intervention. For indirect interventions in particular, an ex-ante estimate is likely to be subject to a high degree of uncertainty. Here, ex-post assessments of comparable interventions could be used to estimate risks based on the range of effects and impacts identified in previous interventions. This evidence-based approach could be suitable for strategic management.

In principle, it would therefore appear possible to evaluate the efficiency of mitigation-relevant interventions. This applies in particular to direct effects and impacts. In the case of indirect effects and impacts, however, the downstream and delayed mitigation effect means that an efficiency analysis is associated with great uncertainties and, if at all, is only

possible using an ex-ante assessment. However, this does not currently take place under the standard indicator "mitigation of greenhouse gas emissions" and is probably not feasible for all TC interventions, which mainly have an indirect effect on emission mitigation.

This results in the following assessment:

Assessment of benchmark 5

The benchmark that reporting at module level should provide a complete, differentiated, comprehensive, standardised and simultaneous report on emissions and mitigation effects in order to evaluate the allocation efficiency of development interventions for reducing and avoiding GHG emissions is **barely fulfilled.**

Recommendation 4: In the future, the GIZ and KfW should document mitigation effects at module level in such a way that valid statements can be made on the emission-mitigating effect of (groups of) development interventions.

Implementation guidance 4.1: The GIZ and KfW could implement coordinated interventions to ensure complete, differentiated, comprehensive, standardised and simultaneous reporting on the standard indicator "mitigation of greenhouse gas emissions". More specifically, the GIZ and KfW could (1) estimate information on the mitigation relevance of interventions below the significance threshold on the basis of a sample; (2) standardise definitions of different types of emissions; (3) always report direct and indirect emissions separately; (4) communicate uncertainties more clearly, especially when estimating indirect effects and impacts; (5) carry out a uniform ex-ante and ex-post assessment of the mitigation effect where this is possible.

Implementation guidance 4.2: In order to limit the additional effort, mitigation effects could in future only be recorded for a representative sample and with greater accuracy in each case. Better data quality reduces the measurement uncertainty in individual cases and, in combination with the recommended standardisation of definitions and procedures, makes it less likely for systematic errors to arise. These advantages could be weighed up against the expected sampling error that arises when drawing conclusions about the population from a sample. In summary, a sampling-based approach could thus reduce the systematic and random errors that occur when recording GHG emissions and at the same time be more cost-efficient.

Implementation guidance 4.3: If funding is to continue to play a central strategic role, the Rio marker assignment should continue to be continuously quality-assured. At the same time, the proportional crediting of mitigation interventions should be more finely scaled (see Box 3) and reported on an intervention-specific basis. Reporting could also take place at the level of specific types of interventions. This could contribute to the transparency and credibility of the reported German climate finance.

4.5 Contributions to the 2030 Agenda for Sustainable Development

As the year 2030 approaches, a critical assessment of the development goals of the 2030 Agenda and the Paris Agreement is imminent. The Federal Government intends to support partner countries in implementing the 2030 Agenda (BMZ, 2021). Against this background, this evaluation report ends by looking at how the German DC portfolio analysed contributes to the implementation of the 2030 Agenda.

The reduction of GHG emissions in developing countries mainly contributes to the achievement of climate change mitigation interventions (SDG 13). The effect and impact

analysis shows that DC contributes to GHG emission mitigation, and the evidence synthesis also shows how interventions funded by DC contribute to climate change mitigation interventions (IPCC, 2022a). As climate change mitigation mitigates the negative consequences of climate change, climate adaptation gives rise to synergy effects (also SDG 13) (IPCC, 2022a).

In addition, climate change mitigation (SDG 13) contributes to the achievement of other SDGs and is therefore of crucial importance for sustainable development in the broader sense (IPCC, 2022a: 40). Climate change mitigation can have a positive impact on energy access (SDG 7) (IPCC, 2022a: 40). As shown in another recent DEval evaluation (Rauschenbach et al., 2024), the German DC portfolio contributes to climate change mitigation through appropriate interventions for access to (green) energy in rural Africa. In addition, climate change mitigation can drive economic growth (SDG 8) through higher income, the creation of new jobs and improved health (SDG 3). Climate change mitigation that is fair and inclusive can reduce inequalities (SDG 10) (IPCC, 2022a: 153).

At the same time, however, climate change mitigation can also lead to challenges in achieving other SDGs (UNEP, 2016). Climate change mitigation may increase consumption and production costs for poorer population groups, thus reducing their prosperity (SDG 1) as well as income and consumption (SDG 12) (Akimoto et al., 2012; Campagnolo and Davide, 2019; Fujimori et al., 2019; Hasegawa et al., 2018; Hussein et al., 2013). However, such analyses do not adequately take into account the effects of climate change, growth and market failure (Lankes et al., 2024).

The synergies and potential conflicts of objectives between climate change mitigation and the achievement of other SDGs depend on a number of contextual factors (IPCC, 2022a: 40). These factors include inequalities in terms of climate justice, intra- and inter-sectoral interactions, the order and timing of the implementation of mitigation interventions, support from international DC, governance and policy design.

A holistic approach to sustainable development, which encompasses both climate change mitigation and socio-economic development, is of central importance for international and German DC. It can maximise synergies and mitigate conflicts of objectives (see Box 5). The just transition approach supported by German and international DC aims to offset the negative social consequences of climate change mitigation and thereby mitigate potential conflicts of objectives (BMZ, 2022a). At best, the transformational change towards climate-neutral systems is steered by a targeted, proactive and holistic policy mix that maximises the opportunities for those most affected by structural and climate change on the one hand and minimises the negative economic, social and environmental consequences on the other hand. A transformation managed in this way leaves no country, no region and no population group behind in the global development process (leave no one behind), but actively contributes to the implementation of the 2030 Agenda by eradicating poverty (SDG 1), providing equitable energy access (SDG 7), creating decent jobs (SDG 8) and reducing inequalities (SDG 10).

5.

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6.

ANNEX

6.1 Assessment scale for DEval evaluations

Categories	Explanation
Exceeded	The intervention clearly exceeds the benchmark for the applied evaluation criterion. Findings demonstrate a result well above the benchmark.
Fulfilled	The intervention meets the benchmark for the applied evaluation criterion. Findings demonstrate that the benchmark is met.
Mostly fulfilled	The intervention largely meets the benchmark for the applied evaluation criterion. Findings which demonstrate that the benchmark is met predominate.
Partially fulfilled	The intervention partially meets the benchmark for the applied evaluation criterion. The numbers of findings demonstrating that the benchmark is met, and those demonstrating it is not, are (more or less) equal.
Barely fulfilled	The intervention barely meets the benchmark for the applied evaluation criterion. Findings which demonstrate that the benchmark is not met predominate.
Not fulfilled	The intervention does not meet the benchmark for the applied evaluation criterion. Findings demonstrate that the benchmark is not met.

6.2 Evaluation matrix

Only indicators that operationalise the variables of interest are named. A list of control variables and indicators can be found in Table 13. The evaluation matrix does not show control variables.

Evaluation question 1: To what extent is the mitigation-relevant portfolio aligned with international agreements and the priorities of the development partners and the German Federal Government?

	Benchmark	Indicators	Data basis	Analysis methods
1.1	The contributions of German DC to mitigation-relevant development finance are in a balanced relationship with adaptation-relevant development finance and correspond to the principle of common but differentiated responsibilities.	KLA and KLM markers (allocation probably as in the official reporting procedure, such as 50% discounting of KLM and KLA markers) Historical GHG emissions; financial capacity to contribute to climate change mitigation	UNFCCC, EU, CRS, MeMFIS (Beynon, 2023; Beynon and Wickstead, 2024; Bos and Thwaites, 2021; Colenbrander et al, 2022; Kowalzig, 2019; Pachauri et al, 2022)	Descriptive cross-sectional and longitudinal analysis of development achievements
1.2	The priorities of German mitigation-relevant development finance are geared towards the partner countries' nationally determined contributions.	German mitigation-relevant development finance; priorities of the (conditional) NDCs of the partner countries	UNFCCC, EU, CRS, MeMFIS; ClimateWatch NDC database	Descriptive longitudinal analysis of development performance; evaluation of the priorities in the NDCs of the partner countries and their connection to the performance of German mitigation-relevant development finance

Evaluation question 2: To what extent is the BMZ's distribution of mitigation-relevant development finance aligned with the mitigation potential, taking account of the need of development partners?

	Benchmark	Indicators	Data basis	Analysis methods
2.1	Developing countries with a high mitigation potential are more likely to have funds committed to them from German mitigation-relevant development finance and have a larger amount committed than developing countries with a low mitigation potential, while at the same time taking into account their need.	German mitigation-relevant development finance Income group, per capita GDP (PPP), infant mortality, HDI, climate risk[61] Power supply from renewable energies, GHG emissions, per capita GHG emissions, energy intensity[62], emissions intensity, installed capacity of renewable energies in energy supply, share of renewable energies in primary energy sources	CRS, MeMFIS, energy statistics (such as IEA), datasets from Quality of Government and the World Bank	Qualitative methods for theory development and model specification, multivariate two-stage dynamic panel model
2.2	When allocating mitigation-relevant development finance, the BMZ is guided by the political-institutional framework conditions of potential development partners.	German mitigation-relevant development finance Electoral democracy, governance, effectiveness of government action, level of corruption, women in parliament, violent conflicts	CRS, MeMFIS, energy statistics (such as IEA), datasets from Quality of Government and the World Bank	Qualitative methods for theory development and model specification, multivariate two-stage dynamic panel model

Evaluation question 3: To what extent are the intended objectives (outcomes) of the BMZ's German mitigation-relevant development finance in the "Energy" funding area achieved?

	Benchmark	Indicators	Data basis	Analysis methods
3	An increase in mitigation-relevant development finance in the "Energy" funding area goes hand in hand with a decarbonisation of a development partner's energy supply, all other things being equal.	German mitigation-relevant development finance, decarbonisation (see Figure 7)	CRS, MeMFIS, energy statistics (such as IEA)	Qualitative methods for theory development and model specification, multivariate dynamic panel model

61 Germanwatch's climate risk index measures the extent to which countries are affected by extreme weather events. The index takes into account the number of fatalities caused by extreme weather events and economic losses (Eckstein et al., 2019).

62 The energy intensity is defined here as energy consumption per unit of GDP (in US dollars).

Evaluation question 4: To what extent is the overarching development impact of GHG emission mitigation achieved through German mitigation-relevant development finance in the "Energy" funding area?

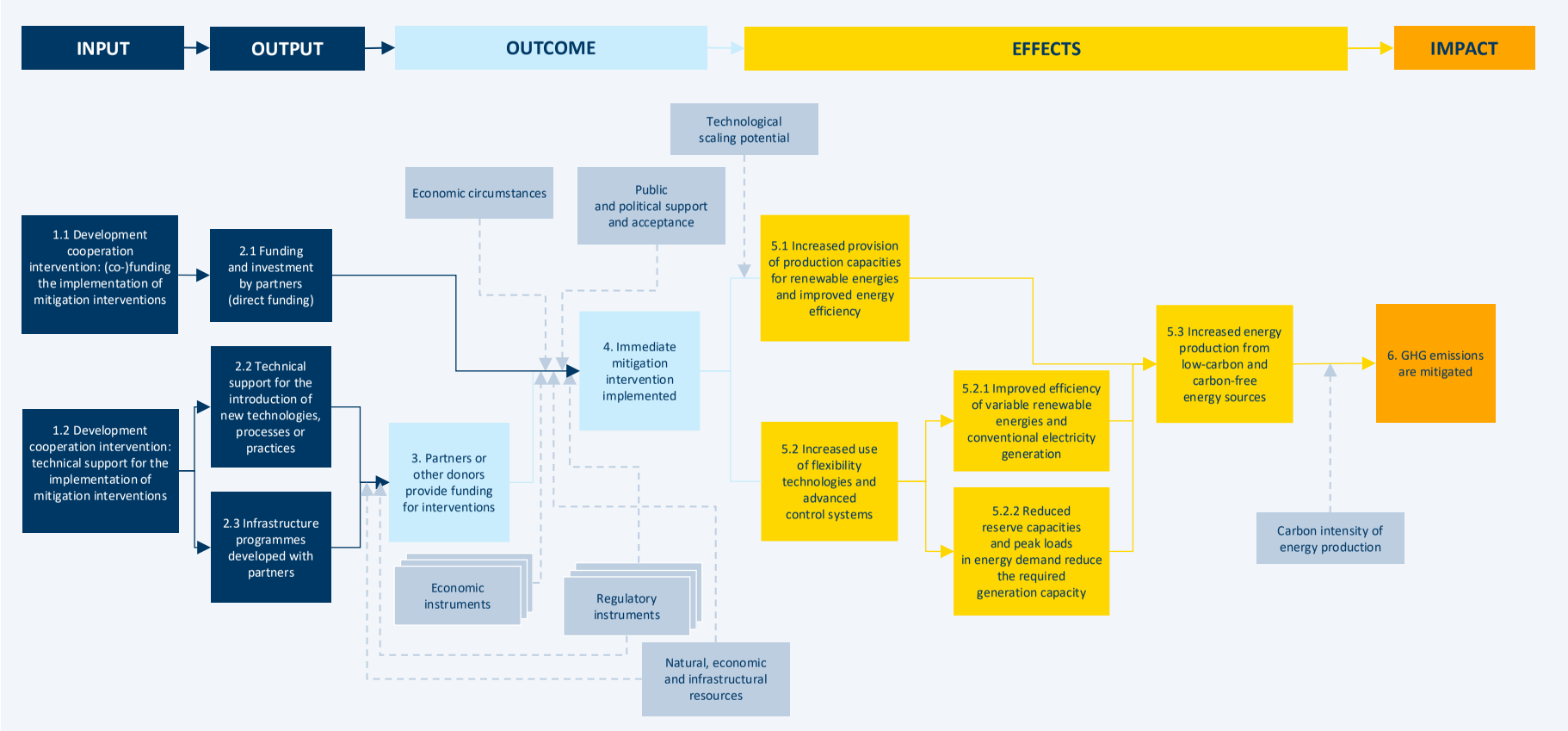
	Benchmark	Indicators	Data basis	Analysis methods
4	An increase in mitigation-relevant development finance in the "Energy" funding area goes hand in hand with a decrease in a development partner's GHG emissions, all other things being equal.	German mitigation-relevant development finance, (sector-specific) GHG emissions (per capita)	CRS, MeMFIS, energy statistics (such as IEA), PIK PRIMAP-hist	Qualitative methods for theory development and model specification; multivariate dynamic panel model

Evaluation question 5: What are the requirements for evaluating the efficiency of development interventions to reduce and avoid GHG emissions and how can these be met by improving reporting?

	Benchmark	Indicators	Data basis	Analysis methods
5	In order to evaluate the allocation efficiency of development interventions to reduce and avoid GHG emissions, reporting is required at module level that provides complete, differentiated, comprehensive and standardised information on emissions and mitigation effects at the same time.	Completeness of reporting, differentiation between direct and indirect effects and impacts, comprehensiveness of reporting, standardisation of definitions, timing of reporting	Data and documents as part of the reporting of the standard indicator "mitigation of greenhouse gas emissions"	Qualitative assessment of the methods

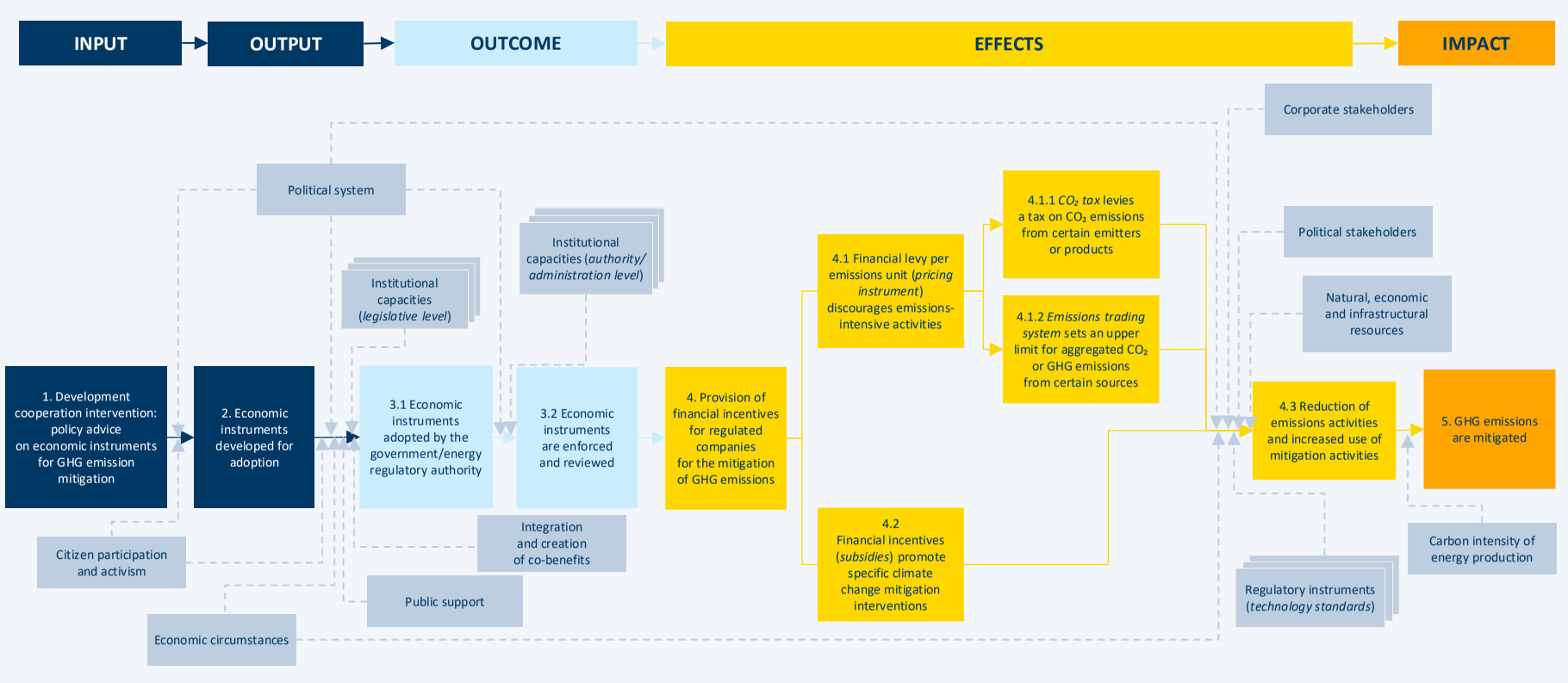
6.3 Causal diagrams

6.3.1 Technological and infrastructural interventions



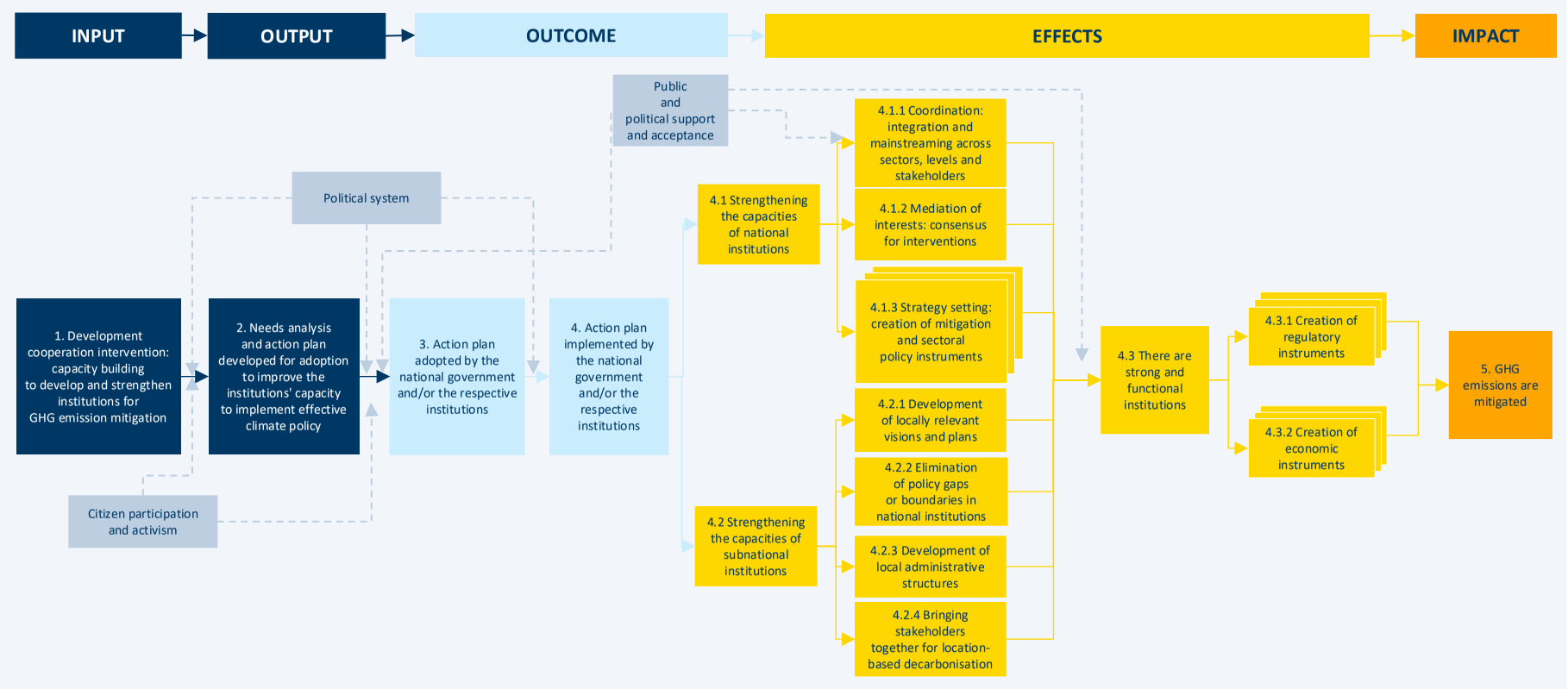
Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.3.2 Economic interventions



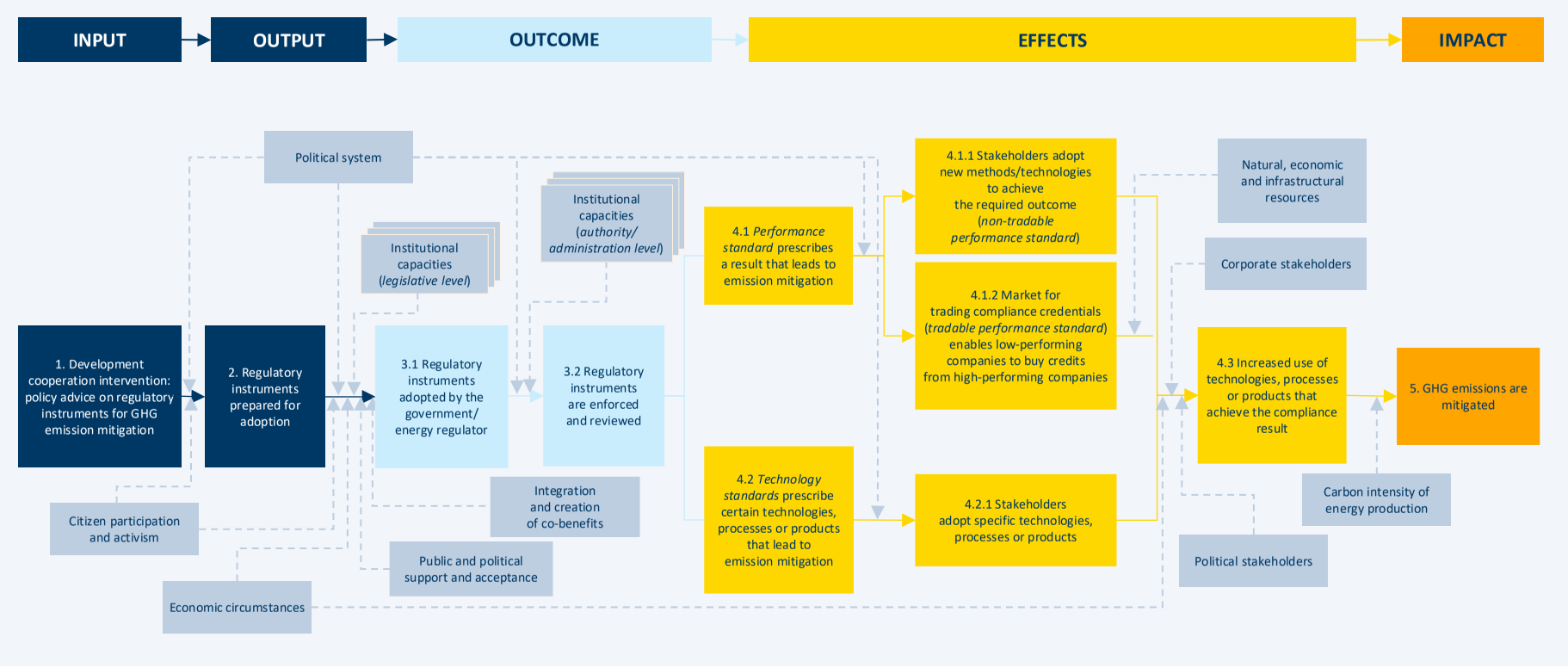
Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.3.3 Institutional interventions



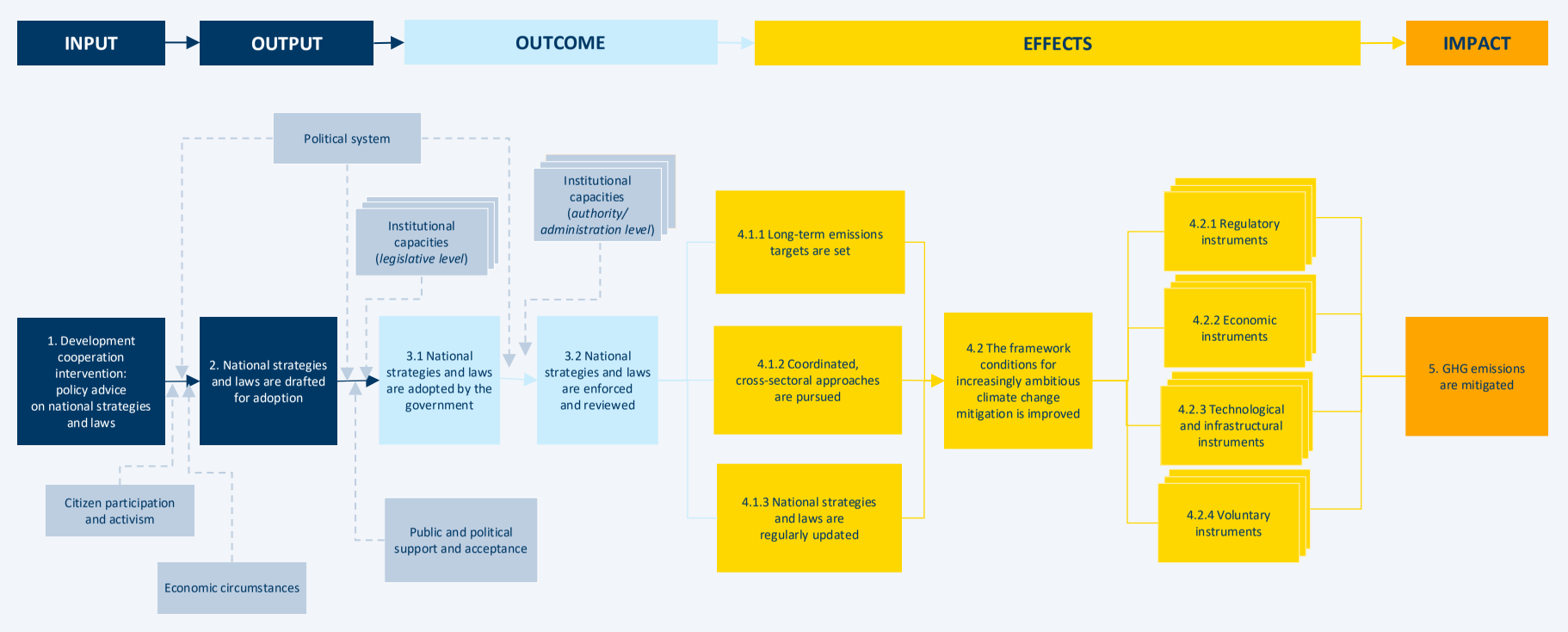
Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.3.4 Regulatory interventions



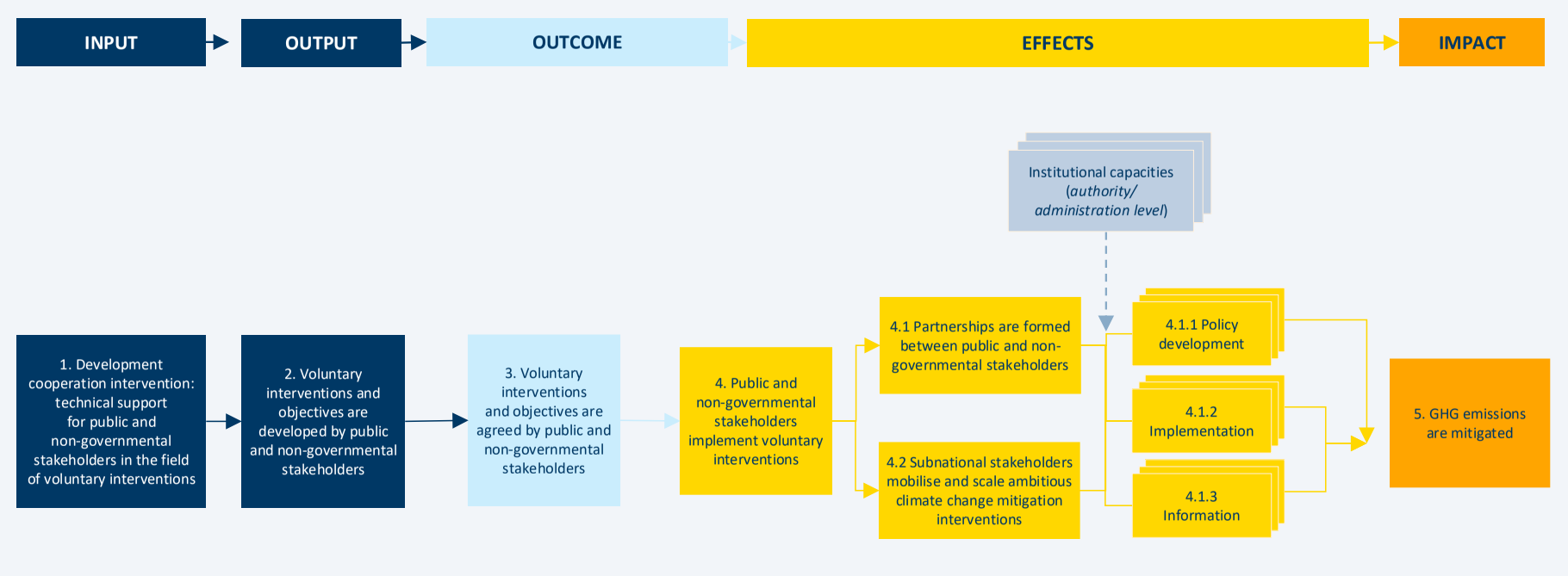
Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.3.5 Climate change mitigation strategies and laws



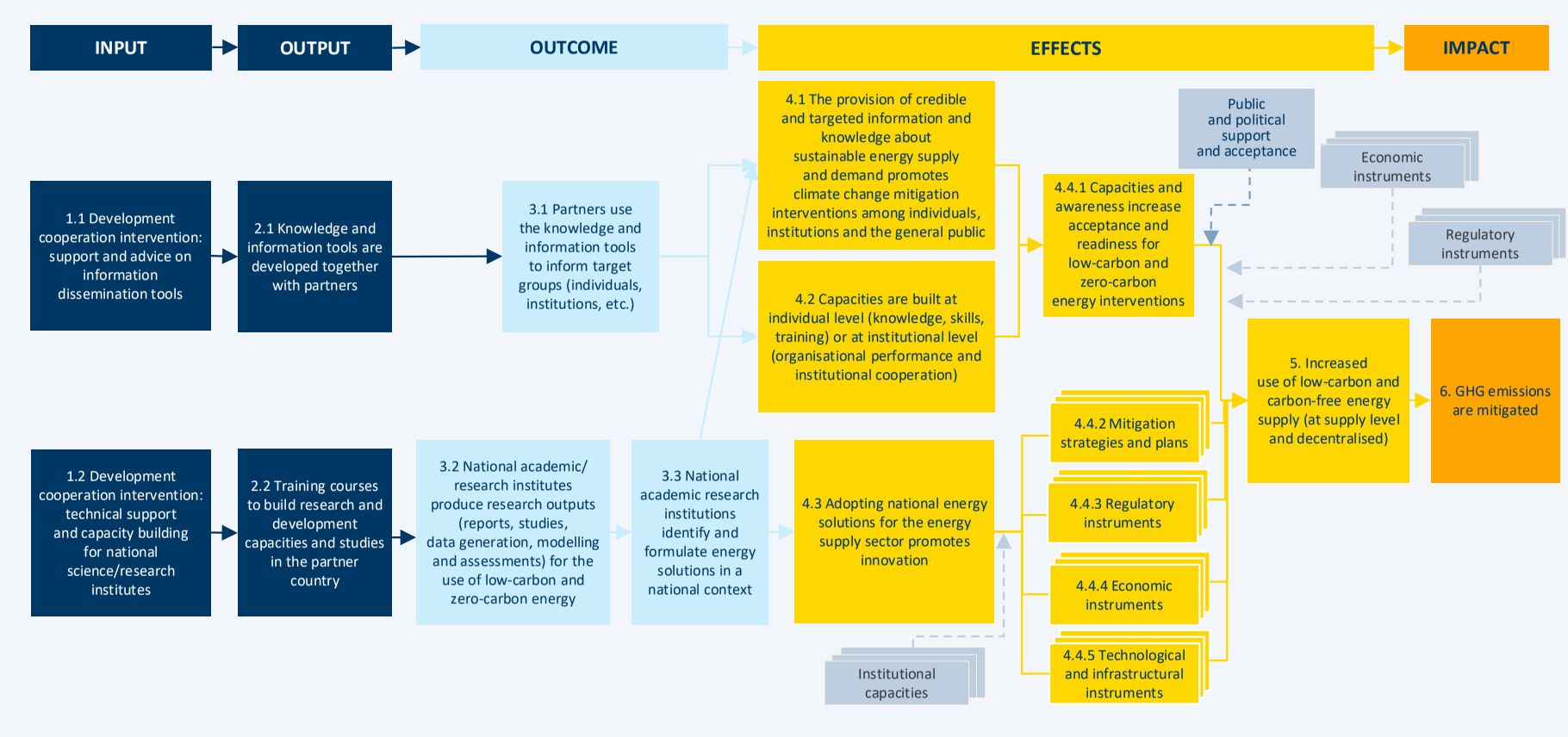
Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.3.6 Voluntary interventions



Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.3.7 Information-based and behaviour-changing interventions



Source: DEval, own illustration based on IPCC (2022a). See the online appendix for detailed description.

6.4 Tables and illustrations

Table 11 Comparison of databases for climate reporting

	EU Monitoring Mechanism Regulation (MMR)	UNFCCC Biennial Reports (BR)	OECD DAC Creditor Reporting System (CRS)	BMZ MeMFIS
Object of reporting	Climate-relevant official development assistance of EU member states (official reporting)	Climate-relevant official development assistance of UNFCCC members	Official development assistance of OECD-DAC members	Official development assistance under the political responsibility of the BMZ
Reporting parties	EU Member States, multilateral donors	UNFCCC members, multilateral donors	OECD-DAC members, multilateral donors	BMZ (data from other ministries incomplete)
Comparison between reporting parties	In different datasets	In different datasets	In one dataset	Not possible
Available period	2013–2021	2011–2020	1998–2021	2000–2022
Reporting date of the data	Commitments at the time of order placement and implementation agreements	Commitments at the time of order placement and implementation agreements	Commitments at the time of order placement and implementation agreements in TC and the conclusion of funding or loan agreements in FC	Bilateral commitments at the time of the commitment to a cooperation partner in government negotiations or by official notification
Curated	Within Germany	By the Implementation and Compliance Committee (UNFCCC, 2023d)	By Destatis and OECD	Within the BMZ
Recognised separately by the BMZ	Since 2017	Since 2017	For the entire period	For the entire period
Differentiation according to budget items	*May be possible by linking the BMZ number to the MeMFIS data*	*May be possible by linking the BMZ number to the MeMFIS data*	*May be possible by linking the BMZ number to the MeMFIS data*	Budget item specified at intervention level
Rio markers	KLA and KLM	KLA and KLM	KLA and KLM	KLA and KLM
Purpose codes	Five-digit purpose code since 2019, less specific before that	Five-digit purpose code since 2019, less specific before that	For the entire period	For the entire period
Executing organisations	Assignment possible	Assignment possible	Assignment possible	Assignment possible
Funding instruments	Grants and debt instruments (EUR)	Grants and debt instruments (EUR)	Grants and debt instruments (EUR)	Grants and debt instruments (EUR)
Cash flow	Commitments (bilateral; partly multilateral), disbursements (bilateral, multilateral)	Commitments (bilateral; partly multilateral), disbursements (multilateral)	Commitments (bilateral), disbursements (bilateral, multilateral)	Commitments and authorisations (bilateral)

	EU Monitoring Mechanism Regulation (MMR)	UNFCCC Biennial Reports (BR)	OECD DAC Creditor Reporting System (CRS)	BMZ MeMFIS
Grant equivalents	At regional level since 2017	At regional level since 2017	At intervention level since 2017	Not included; approximation possible by differentiating between market and budget funds
Differentiation between budget/ market funds	No differentiation	No differentiation	No differentiation	At intervention level for the entire period
Multilateral climate shares recognised *(Imputed multilateral climate shares)*	Already specified	Already specified	Calculable	No information on core contributions to multilateral organisations
Mobilised private capital	At intervention level since 2015	At intervention level since 2015	Separate	Not specified
Data sources	*https://cdr.eionet.europa.eu/de/eu/mmr/art16_finance* *https://reportnet.europa.eu/public/dataflow/577* *https://www.bmz.de/de/themen/klimawandel-und-entwicklung/klimafinanzierung*	*https://unfccc.int/BR5*	*https://stats.oecd.org/Index.aspx?DataSetCode=CRS1*	Within the BMZ

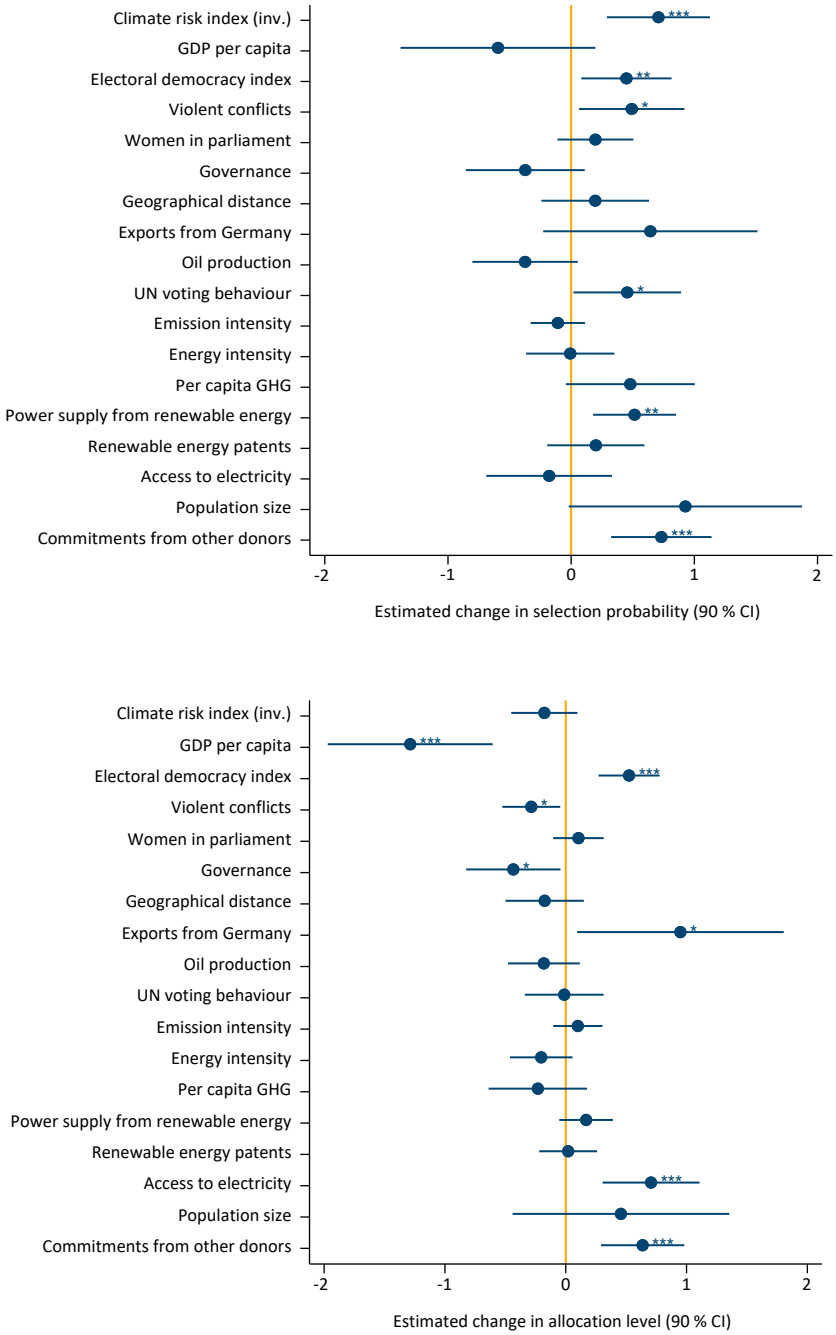
Source: DEval, own visualisation
Note: The colour defines the assessment with regard to the respective criterion: dark grey = good, light grey = with restrictions, white = incomplete.

Table 12 **Selection and allocation of bilateral BMZ commitments for mitigation-relevant development finance from 2011 to 2021**

	Selection (coefficients)			Allocation (coefficients)		
	1-year periods	2-year periods	4-year periods	1-year periods	2-year periods	4-year periods
Need						
Climate risk index (inv.)	0.01**	0.01***	0.03***	0.00	−0.004	−0.007
Per capita GDP (log.)	−0.74***	−0.60*	−0.66	−1.08****	−1.50****	−1.43***
Political-institutional framework conditions						
Index on electoral democracy	1.92****	2.56****	2.27**	2.04****	2.44****	2.65***
Violent conflicts (log.)	−0.10***	−0.07	0.20*	−0.03	−0.04	−0.11*
Women in parliament	0.02***	0.02	0.02	0.01	0.01*	0.01
Governance	−0.20	−0.50*	−0.63	0.06	−0.22	−0.73*
Donor interest						
Geographical distance (log.)	0,04	0,07	0,35	−0,54***	−0,37	−0,31
Exports from Germany (log.)	0.17**	0.16	0.24	0.29***	0.45***	0.36*
Oil production (log.)	−0.05	−0.11*	−0.14	−0.03	0.01	−0.07
UN voting behaviour	0.009	−0.00	0.05*	−0.002	0.00	−0.15
Mitigation potential						
Emission intensity	−0.04	−0.08	−0.04	0.13**	0.09	0.04
Energy intensity	0.05	0.08	−0.003	−0.01	−0.04	−0.07
Per capita GHG emissions	−0.10*	−0.03	0.14	−0.05	−0.04	−0.07
Power supply from renewable energies	0.01***	0.01***	0.02**	0.002	0.003	0.01
Pioneering role						
Patents in the area of “renewable energies and supporting technologies”	0.57**	0.83**	0.49	−0.39*	−0.33	0.05
Control variables						
Access to electricity	0.02****	0.01*	−0.01	0.02***	0.02***	0.02***
Population size (log.)	0.52****	0.47***	0.42	0.12	−0.02	0.21
Mitigation-relevant development finance from other donors (log.)	0.19****	0.24****	0.33***	0.16***	0.28****	0.29***
Observations	1.474	804	402	732	470	270
R-squared				0.20	0.30	0.38

Source: DEval, own visualisation
*Note: Time-fixed effects for the various annual periods; inv. = inverted, log. = logarithmised; * p-value < 0.1, ** p-value < 0.05, *** p-value < 0.01, **** p-value < 0.001*

Figure 18 **Selection and allocation of bilateral BMZ commitments for mitigation-relevant development finance for the 4-year periods from 2011 to 2021**

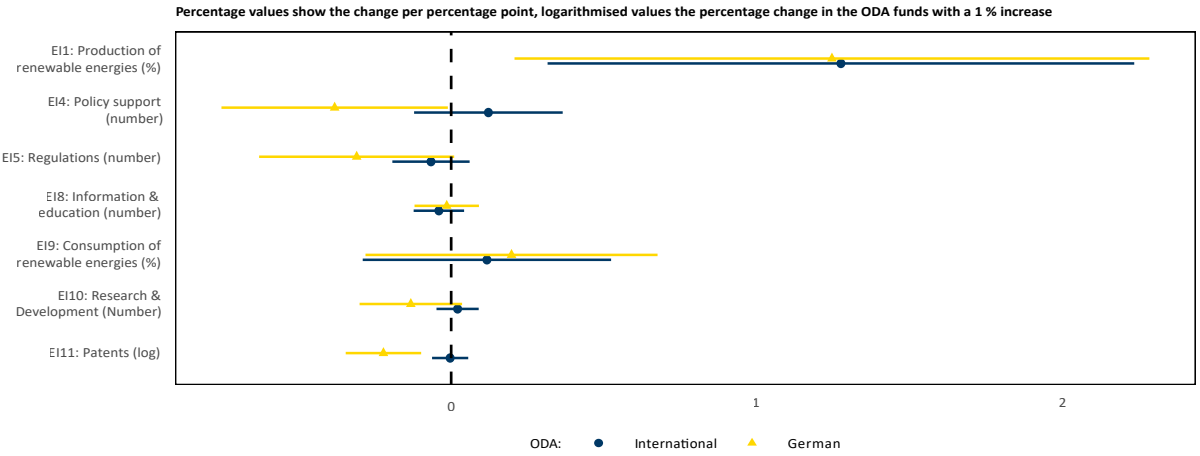


Source: DEval, own visualisation

Note: The illustrations show the results of the logistic regression of the selection stage (top) and the linear regression of the allocation stage (bottom). The coefficients of the selection stage are shown in the form of log odds. The explanatory variables are z-transformed in order to present them on a standardised scale and make them easier to compare in relation to the dependent variable. Divided by 4, the coefficients indicate an upper estimate of the predicted change in the probability of obtaining a mean in the event of an increase in the respective explanatory variable by one standard deviation. If the respective explanatory variable increases by one standard deviation, the selection probability (Fig. above) or the allocation level (Fig. below) changes positively (> 0) or negatively (< 0).

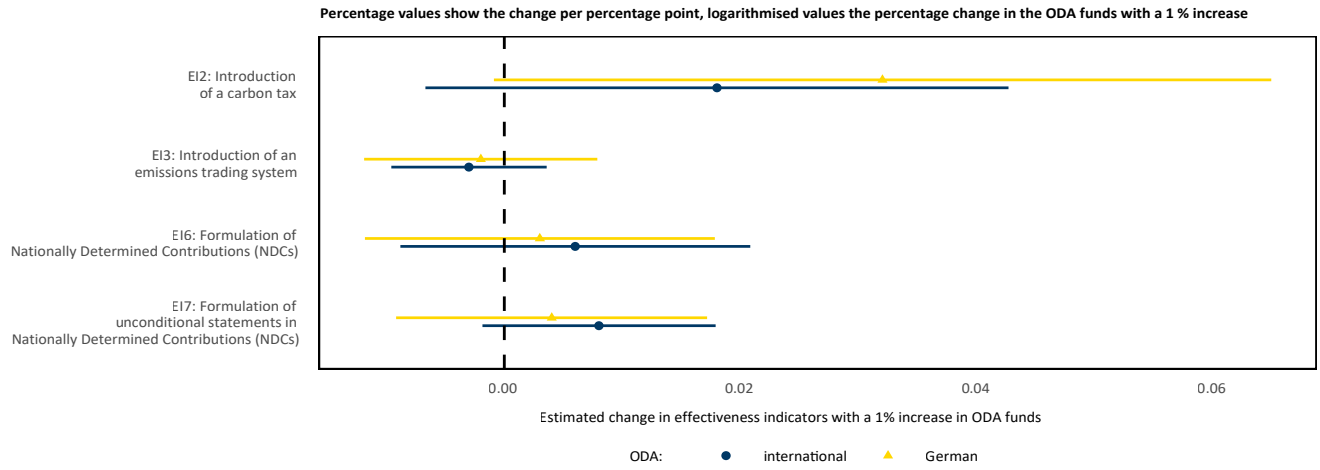
*CI = confidence interval, inv.= inverted; * p-value < 0.1, ** p-value < 0.05, *** p-value < 0.01, **** p-value < 0.001*

Figure 19 Effectiveness of international mitigation-relevant development finance



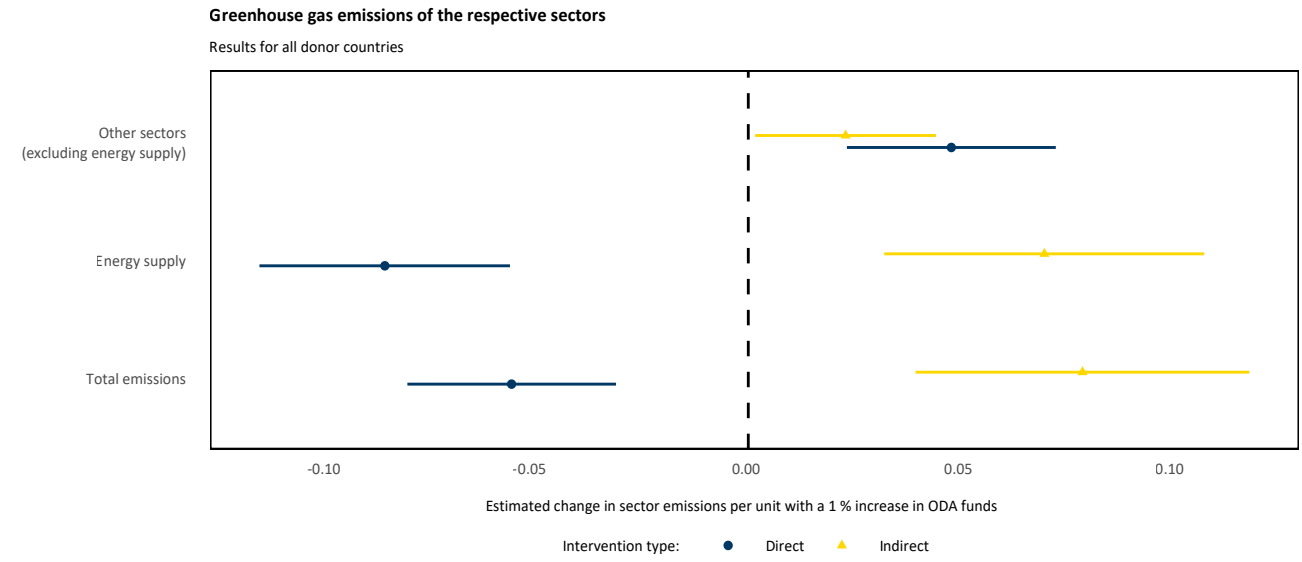
Source: DEval, own visualisation based on a structural equation model
Note: The dots show the estimated (average) effect of international (blue) and German (yellow) mitigation-relevant development finance in the "Energy" funding area on variables that convey the effect of DC on GHG emissions. The precision of the sample-based estimate is illustrated by the confidence interval (horizontal line). The 95 percent confidence interval is the value range that reflects the true effect in nine out of ten samples, provided the estimation function is unbiased. The choice of purpose codes for the two ODA variables corresponds to "Energy supply mitigation ODA" in Table 14.

Figure 20 Effectiveness of international mitigation-relevant development finance (binary variables)



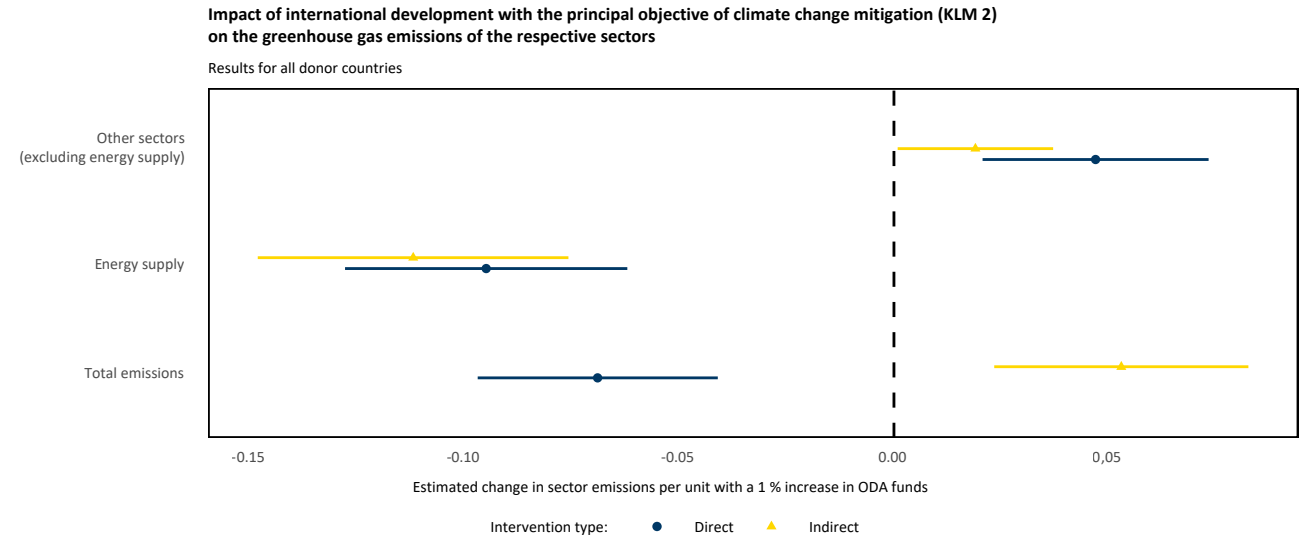
Source: DEval, own visualisation based on a two-way fixed effects model
Note: The same principle applies here as in Figure 19.

Figure 21 Effectiveness and impact of international mitigation-relevant development finance in the "Energy" funding area per intervention group



Source: DEval, own visualisation based on a structural equation model
Note: The principle of Figure 19 also applies here, with the difference that the purpose codes for the ODA variables were classified into direct (blue) and indirect (yellow) intervention types. The exact details are documented in Table 14 and correspond to "ODA intervention types" there.

Figure 22 Effectiveness and impact of international KLM-2 development finance in the "Energy" funding area per intervention group

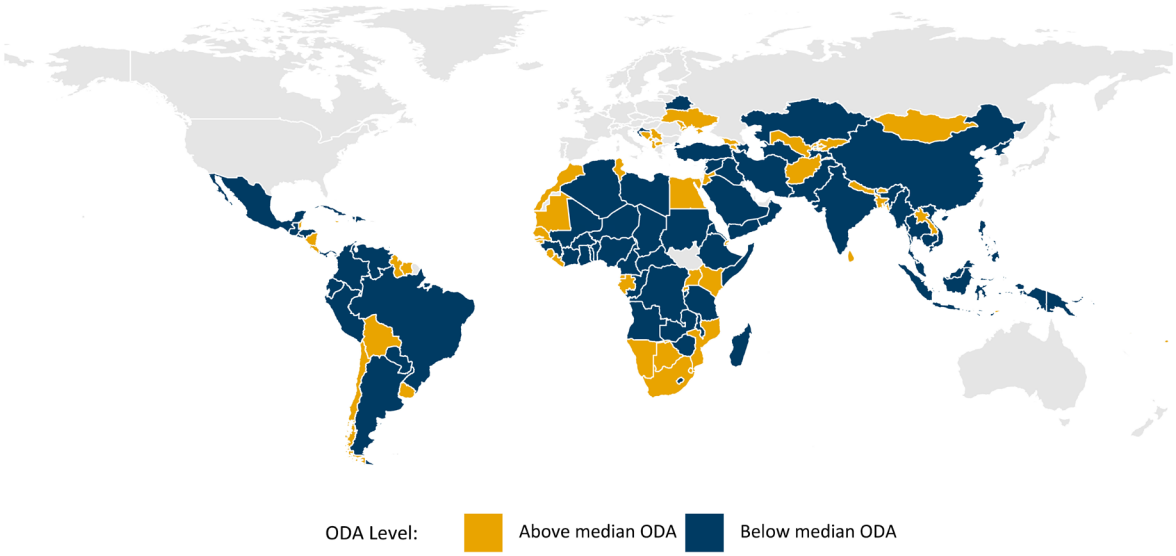


Source: DEval, own visualisation based on a structural equation model
Note: The same principle applies here as for Figure 20 and Figure 21, with the difference that only interventions that include climate change mitigation as a principal objective (Rio marker KLM 2) were taken into account when compiling the ODA variables. The exact details are documented in Table 14 and correspond to "KLM-2-ODA divided into intervention types" there.

Figure 23 World maps to classify countries based on ODA level

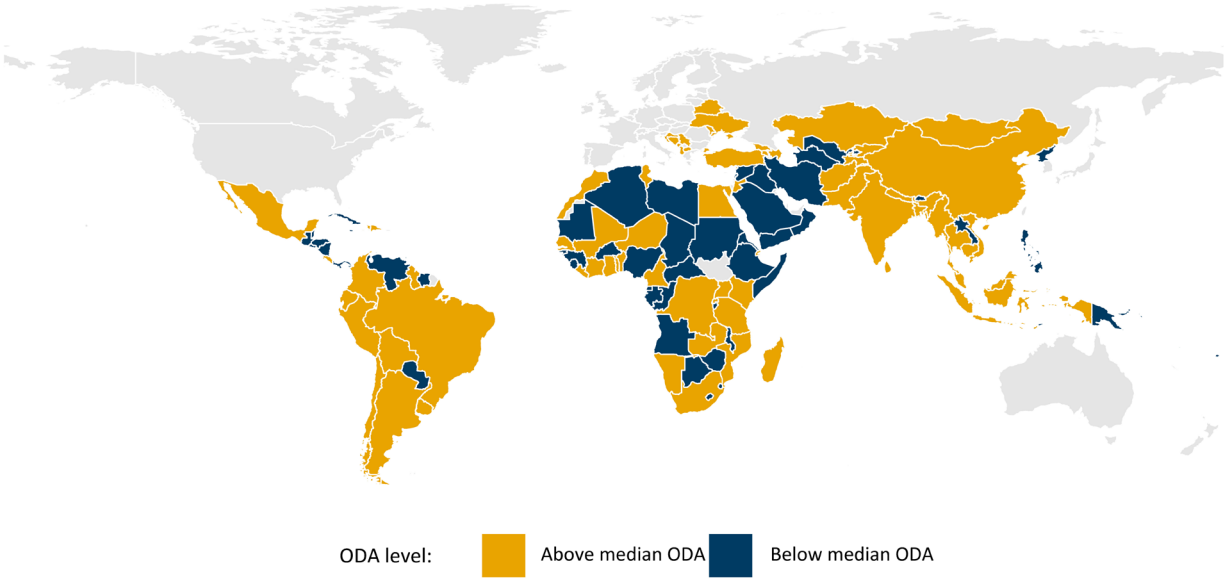
World map by country coloured by ODA level – classification based on international funds

Mitigation per capita ODA level, centred on energy supply for the period 2000-2021



World map by country coloured by ODA level – classification based on German funds

Mitigation per capita ODA level, centred on energy supply for the period 2000-2021



Source: DEval, own visualisation based on CRS data (OECD, 2023e)
Note: The top map illustrates the international funds, while the bottom map is limited to the German shares. ODA funds relevant to mitigation aimed at the energy supply sector were used here.

Table 13 Data selection for the statistical analyses

No.	Indicators	Unit	Source	Abbreviation
1.	Other natural resources rents	Percent of GDP (revenue from forest and minerals)	World Bank (2023b)	resource_rent
2.	Share of renewable energies in primary energy sources	Relative share of renewable energies in the primary energy supply	IRENA (2023b)	REshare_cap
3.	Number of people killed by natural disasters	Total	Povitkina et al. (2021)	emdat_ndeath
4.	Number of people affected by natural disasters	Total	Povitkina et al. (2021)	emdat_naffect
5.	Foreign direct investments	Relative share of net inflows in GDP	World Bank, (2023b)	fdi_rel
6.	Unconditional sectoral target in the NDC	Binary (1 = yes, 0 = no)	Climate Watch NDC Content (2021)	ucst_ndc
7.	Population size	Total	Teorell et al. (2023)	wdi_pop
8.	Per capita GDP growth	Annual percentage rate	World Bank (2023b)	gdppopgrowth
9.	CO_2 tax	Binary (1 = yes, 0 = no)	Dolphin and Xiahou (2022)	tax
10.	Covid-19 policy stringency index	Average stringency score per year	Hale et al. (2021)	covid_stringency
11.	Effectiveness of government action	From -2.5 (bad) to 2.5 (good)	Teorell et al. (2023)	wbgi_gee
12.	Income group	From 1 (low) to 4 (high)	World Bank (2023b)	income_group
13.	Emissions trading system	Binary (1 = yes, 0 = no)	Dolphin and Xiahou (2022)	ets
14.	Emission intensity	kg CO_2 per kg energy consumption in oil equivalent	Ritchie et al. (2023a), World Bank (2023b)	emInt
15.	Energy intensity	MJ energy per purchasing power parity in USD from 2017	IEA (2022d)	energInt
16.	Generation of renewable electricity	Percent	World Bank (2023b)	REout
17.	Exports from Germany	Export volume in EUR	UN (2022)	exports_to_germany
18.	Research & development and deployment	Number of laws passed	NewClimate Institute et al. (2023)	cpd_i1_rdd
19.	Women in parliament	Relative proportion of women with a seat in parliament	World Bank (2023b)	wparl
20.	Geographical distance	Distance from Germany in km	C-Shapes 2.0 (Schvitz et al., 2022)	distance_km
21.	Total energy exports	Terajoule (TJ)	IEA (2022c)	energy_exp
22.	Total energy imports	Terajoule (TJ)	IEA (2022c)	energy_imp
23.	Violent conflicts	Number of fatalities caused by armed forces	World Bank (2023b)	wdi_brdeath
24.	HDI	From 0 (low) to 1 (high development)	UN (2022)	undp_hdi
25.	Imports to Germany	Import volume in EUR	United Nations (2022)	imports_from_ germany

No.	Indicators	Unit	Source	Abbreviation
26.	Index on electoral democracy	From 0 (weak) to 1 (strong)	Teorell et al. (2023)	vdem_polyarchy
27.	Information and education	Number of laws passed	NewClimate Institute et al. (2023)	cpd_i1_info_ education
28.	Innovation	Number of patents in the field of "renewable energies and supporting technologies"	IRENA (2023)	patents
29.	Installed capacity of renewable energies in energy supply	MW capacity of renewable energies in the energy supply	IRENA (2023b)	REcap
30.	Installed electricity capacity	MW	IRENA (2023b)	ecap
31.	Capital formation in relation to the labour force	Ratio of capital to labour	World Bank (2023b)	CF_LF_ratio
32.	Purchasing power parity	Per capita GDP (EUR)	World Bank (2023b)	ppp
33.	Infant mortality	Mortality rate of children under the age of 5 (frequency per 1,000 live births per year)	World Bank (2023b)	childM
34.	Climate risk index	From 0 (high vulnerability) to > 100 (low vulnerability)	Eckstein et al. (2021)	cri_score
35.	Climate risk index (inv.)	From > 100 (high vulnerability) to 0 (low vulnerability)	Eckstein et al. (2021)	cri_score_inv
36.	Level of corruption	From 0 (weak) to 100 (strong)	Standaert (2015)	bci
37.	NDC	Binary (1 = yes, 0 = no)	Climate Watch NDC Content (2021)	ndc
38.	Countries eligible for ODA	Authorised = 1	OECD (2023c)	oda_elig
39.	Public investment in renewable technologies for energy generation	Million EUR (const.)	IRENA (2023b)	pub_invest_re
40.	Oil production	TWh	Ritchie et al. (2023b)	oil_prod_Twh
41.	Personal transfers, received	Current EUR	World Bank, (2023b)	remit
42.	Political support	Number of laws passed	NewClimate Institute et al. (2023)	cpd_i1_policy_ support
43.	Governance	From -2.5 (bad) to 2.5 (good)	World Bank (2023b)	gov
44.	Regulatory instruments	Number of laws passed	NewClimate Institute et al. (2023)	cpd_i1_regulatory
45.	Relative global share of emissions	Emissions of the country divided by global emissions	Own calculation based on Gütschow et al. (2016)	Rel_global_ghg
46.	Strength of the national fossil fuel industry	Profit from using fossil fuels (natural gas, coal, oil) in relation to total GDP Total for the respective fossil fuels	Own calculation based on WGI (World Bank, 2022)	FFrent
47.	Power supply from renewable energies	Relative share of renewable energies in the electricity supply	IRENA (2023b)	REshare_gen
48.	GHG emissions	t GHG emissions in CO_2 equivalent	Gütschow et al. (2016)	ghg

No.	Indicators	Unit	Source	Abbreviation
49.	Per capita GHG emissions	t GHG emissions in CO_2 equivalent per capita	Gütschow et al. (2016)	ghgpop
50.	UN voting behaviour	From 0 (none) to 1 (% agreement with Germany)	Voeten (2012)	UN_voting
51.	Consumption of renewable energies (% of total final energy consumption)	Percent	World Bank (2023b)	REcon
52.	Access to electricity	Relative share of population size	World Bank (2023b)	ae

Source: DEval, own visualisation

Table 14 Selection of ODA funds

ODA type	Description	Source	Abbreviation
Total ODA	Total international or German development finance	OECD DAC CRS	Int_TotODA or GER_ODA_Tot
Total mitigation ODA	Sum of KLM 2 and KLM 1 ODA	OECD DAC CRS	IntODA_mit or GER_ODA_Mit
Energy supply mitigation ODA	Mitigation ODA, with purpose code for energy supply **included purpose codes**: 23110, 23181, 23182, 23183, 23210, 23220, 23230, 23231, 23240, 23250, 23260, 23270, 23310, 23320, 23330, 23340, 23350, 23360, 23410, 23510, 23610, 23620, 23630, 23631, 23640, 23642, 32167, 32173	OECD DAC CRS	Eng_IntODA or GER_ODA_Ener
Non-energy supply mitigation ODA	Difference from mitigation ODA and energy supply mitigation ODA	OECD DAC CRS	Mitig_NonEnergy_IntODA or GER_Mitig_NonEngy_ODA
KLM-2-ODA	Interventions with the principal objective of "climate change mitigation"	OECD DAC CRS	Tot_KLM2_IntODA or GER_KLM2_ODA
KLM-1-ODA	Interventions with the significant objective of "climate change mitigation" (discounted 50%)	OECD DAC CRS	Tot_KLM1_IntODA or GER_KLM1_ODA
ODA intervention types	International mitigation-relevant development finance classified as direct or indirect intervention type **Purpose codes included for direct interventions:** 232, 233, 234, 235, 236, 32167, 32173 **Purpose codes included for indirect interventions:** 151, 231, 41010, 510	OECD DAC CRS	Direct Interv or Indirect Interv
KLM-2-ODA divided into intervention types	International development finance with the principal objective of "climate change mitigation" in the "Energy" funding area classified as direct or indirect intervention type (constant purpose codes)	OECD DAC CRS	Direct Interv KLM2 or Indirect Interv KLM2

Source: DEval, own visualisation
Note: For all ODA variables, disbursements rather than commitments were selected. The sums of money are adjusted for inflation and converted from US dollars to euros (OECD, 2024).

6.5 Evaluation schedule

Time frame	Tasks
01/2023 – 4/2023	Creation of inception report
05/2023	Reference group meeting to discuss inception report
06/2023 – 01/2024	Survey/analysis phase and reporting
02/2024	Reference group meeting to present the evaluation report
03/2024 – 07/2024	Revision of the evaluation report
07/2024	Dispatch of the final draft report
08/2024	Completion of the evaluation after layout and printing

6.6 Evaluation team and contributors

Core team	Role	CRediT statement[63]
Dr Thomas Wencker	Senior Evaluator and Team Leader	Supervision, project administration, conceptualization, methodology, data curation, formal analysis, investigation, visualization, writing – original draft, writing – review and editing
Georg Kühltau	Evaluator	Conceptualization, methodology, data curation, formal analysis, investigation, writing – original draft, visualization, writing - review and editing
Dr Isabel Mank	Evaluator	Conceptualization, methodology, data curation, formal analysis, investigation, writing – original draft, visualization, writing – review and editing
Kevin Moull	Evaluator	Conceptualization, methodology, data curation, formal analysis, investigation, writing – original draft, visualization, writing – review and editing
Sylvia Vogt	Project Administrator	Project administration

Responsible	Role
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Contributors	Role
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Prof Dr Gerhard Heyer	External consultant
Prof Daniel Henderson	External consultant
Dr Michel Köhler	External consultant
Dr Andreas Niekler	External consultant
Dr Hanne Roggemann	External consultant
Stefan Wehner	External consultant
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Dr Pieter Pauw	External peer reviewer
Dirk Hoffmann	Internal peer reviewer
Dr Martin Noltze	Internal peer reviewer
Dr Kathrin Wolf	Internal peer reviewer
Marie Podien	Student employee
Oluwatosin Olowookere	Student employee
Arber Jasiqi	Student employee
Yannick Gunia	Intern

63 The CRediT statement (Contributor Roles Taxonomy, *https://credit.niso.org/*) indicates the roles of the authors of this evaluation report in the evaluation. The CRediT taxonomy distinguishes between 14 different roles to show the specific contribution of the individual authors.

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