



# DEVELOPING 2°C-COMPATIBLE INVESTMENT CRITERIA

30 NOVEMBER 2015

AUTHORS:

NIKLAS HÖHNE, FRAUKE RÖSER, MARKUS HAGEMANN, LUTZ WEISCHER, ALEXANDER EL ALAOU, CHRISTOPH BALS, DAVID ECKSTEIN, SÖNKE KREFT, JAKOB THOMÄ, MORTEN ROSSÉ

WITH CONTRIBUTIONS FROM:

IAN COCHRAN, MARIANA DEHEZA (I4CE – INSTITUTE FOR CLIMATE ECONOMICS)  
MICHEL KÖHLER, BJÖRN DRANSFELD, ELENA STEFFENS (THE GREENWERK)



# DEVELOPING 2°C-COMPATIBLE INVESTMENT CRITERIA

EXECUTIVE SUMMARY



Photo: lovleah / www.istockphoto.com

# EXECUTIVE SUMMARY

**This report studies the development of criteria for assessing the compatibility of financial investments with the international goal to limit global temperature increase to below 2°C above pre-industrial levels.** The findings are intended as a starting point and a key input for a longer term process to develop consensus-based 2°C investing criteria. The focus here is placed on investments in projects and physical assets, in particular of development and climate finance organisations.

**In order to limit global temperature increase to 2°C, global greenhouse gas (GHG) emissions will have to be reduced significantly, eventually to zero, during the course of this century.** This requires shifting capital from high to low carbon investments as well as significant capital mobilisation for investments in 2°C-compatible infrastructure. Given the long lifetime of physical assets, and the urgency of decarbonisation over the coming decades, this needs to begin today.

**Public financial institutions can play a prominent role in contributing to aligning investment flows with the 2°C limit,** as well as in closing the current infrastructure investment gap, responding to their explicit or implicit climate mandates and leadership role in the finance sector.

**The majority of international financial institutions integrate climate considerations into their finance decisions to some degree, and are familiar with different types of criteria, including positive and negative lists, qualitative and quantitative benchmarks, and the use of shadow carbon pricing. However, current approaches do not link to the 2°C limit.** 2°C investment criteria are therefore needed to guide investors in this regard. Such criteria may also support other purposes, including an understanding of climate risks and improved reporting and accountability.

## Developing 2°C investing criteria

**In general, it is possible to develop 2°C investment criteria for individual projects on the basis of 2°C scenarios.** Despite certain limitations, scenarios are a good starting point for developing criteria. In many areas, the different 2°C scenarios are sufficiently aligned to allow the identification of projects and technologies that are unambiguously 2°C-compatible, and those that are clearly misaligned. For many technologies, however, 2°C-compatibility depends on what happens at the sector-wide level, and a straightforward statement is not possible (Table 1).

**In some cases, project-based criteria need to be combined with a broader systemic perspective.** It is also important to consider country-specific contexts, including aspects of market maturity, development priorities and specific system characteristics of the technology in question.

**The development of concrete and incontestable project-specific 2°C investment criteria is easier in some sectors than in others.** The research showed that the transport sector – due to its systemic complexities and limited availability of sector-wide decarbonisation strategies in any part of the world – is furthest away from implementation-ready, clear 2°C guidance, compared to, for example, the electricity supply sector, where political consensus on sector decarbonisation already exists, and where systemic considerations are easier to break down to the individual project level.

**An immediate move to full 2°C-compatibility is, in many cases, not possible.** Hence a transition approach will be needed that allows for investments in transition technologies, with the aim to achieve 2°C compatibility over time. 2°C criteria and benchmarks will also need to be adjusted as new technologies and knowledge become available.

2°C-COMPATIBLE POSITIVE LIST	CONDITIONAL	AMBIGUOUS	MISALIGNED NEGATIVE LIST
Fully aligned with 2°C consistently across all scenarios	2°C aligned only under certain conditions in all scenarios	2°C aligned in some scenarios, but not in others	Consistently misaligned with 2°C in all scenarios
	<ul style="list-style-type: none"> <li>• Due to the fact that multiple pathways can lead to 2°C (e.g. more renewables and less efficiency or the other way around)</li> <li>• Due to different assumptions on technological development</li> <li>• Due to considerations of other sustainability factors</li> </ul>		
<ul style="list-style-type: none"> <li>• Renewable energy</li> <li>• Energy storage</li> <li>• Low carbon transport fuel infrastructure</li> <li>• Low carbon vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Gas fired power plants</b></li> <li>• <b>Energy transmission and distribution infrastructure</b></li> <li>• <b>Energy efficiency in heating and cooling of buildings</b></li> <li>• <b>Efficiency in industry</b></li> <li>• <b>Transport infrastructure</b></li> <li>• <b>Transport efficiency</b></li> <li>• <b>Agriculture and forestry</b></li> <li>• Building appliances</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Biofuels</b></li> <li>• <b>Fossil Fuel production</b></li> <li>• Large hydropower</li> <li>• Bio energy carbon capture and storage</li> <li>• Nuclear</li> </ul>	<ul style="list-style-type: none"> <li>• <b>New coal fired power plants with unabated emissions over their lifetime</b></li> </ul>

**Table 1:** Summary of categorisation of investment areas and technologies (critical sectors in bold, sectors for further consideration in this analysis in red)

### Applicability of 2°C investing criteria

**Different types of 2°C investment criteria can be integrated at various steps along IFI decision making processes. Their application is not necessarily associated with significant additional costs for those financial institutions that already employ reasonably sophisticated climate criteria.** Good practice approaches suggest that climate-related criteria are best dealt with at different stages of project appraisal, including the general or strategic level, where overarching guidelines are implemented, and the project level where detailed sector – or technology-specific rules and procedures apply. In this context, a challenge is to balance the need for sufficiently robust guidance and criteria with pragmatic, implementable approaches.

**Financial institutions may choose to respond in different ways to the fact that – for some individual projects – there is a higher certainty they are 2°C-compatible than for others.** Certainty of 2°C compatibility can only be achieved by limiting investments to those on the positive list and excluding those on the negative list. Investments in technologies in the conditional or ambiguous category, can use benchmarks and criteria that allow for the assessment of relative 2°C compatibility – but uncertainties remain.

**A challenge development banks frequently highlight is the lack of fundable 2°C-compatible projects as well as a potential competitive advantage for those financial institutions which do not apply strict 2°C investing criteria.** Clearly more support is needed to proactively

develop attractive 2°C-compatible projects requiring action from both the donor and the recipient countries. However, there is already a strong indication of investment needs and interest in low carbon technologies by developing countries as expressed, for example, in the many emerging low carbon development strategies as well as climate commitments under the UNFCCC. The scale of the challenge and current investment gap suggest that sufficient investment opportunities are likely to become available and in many cases, ought to be available today.

**Interventions at a policy level are also needed to steer investment decisions to achieve the transition to a 2°C pathway.** Such policies must address the multiple barriers to low carbon development and create an enabling environment for investments in low carbon technologies. Continued effort is needed to create detailed, sector-based 2°C pathways for specific countries, coupled with politically endorsed investment plans.

**Proposed 2°C investing criteria for the power sector**

Positive and negative lists work well with energy sources that can be clearly classified as compatible with the

STEP IN THE APPROVAL PROCESS	QUESTIONS ALREADY ASSESSED BY DEVELOPMENT BANKS	ADDITIONAL QUESTIONS WHEN APPLYING 2°C CRITERIA
<b>Initial Screening</b>	<ul style="list-style-type: none"> <li>• Project type not on bank's exclusion list?</li> <li>• Safeguards likely to be impacted?</li> <li>• Does project fall in certain risk categories?</li> <li>• Project within bank's priority sectors?</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Project type not on 2°C negative list?</li> <li>• Project type on 2°C positive list?</li> <li>• Project type that triggers need to apply certain conditions?</li> </ul>
<b>Economic Evaluation</b>	<ul style="list-style-type: none"> <li>• Project financially viable?</li> <li>• Project with positive cost-benefit ratio?</li> <li>• Project not crowding out private finance?</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Project viable with shadow carbon price?</li> </ul>
<b>Development Evaluation</b>	<ul style="list-style-type: none"> <li>• Development benefits?</li> <li>• Aligned with bank's mandate and strategy?</li> <li>• Aligned with country's strategies and priorities?</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Consistent with country's climate strategy (INDC or other)?</li> </ul>
<b>ESG Evaluation</b>	<ul style="list-style-type: none"> <li>• Environmental and social impacts?</li> <li>• Respect for environmental, social and governance safeguards?</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Project meeting qualitative or quantitative conditions for 2°C?</li> </ul>

**Table 2:** Integrating 2°C criteria in development banks' project approval processes

2°C limit (wind and PV) or misaligned, e.g. new coal-fired power plants with unabated emissions over their lifetime. For other fuels, in particular natural gas, more sophisticated approaches are necessary either during the economic or environmental, social and governance (ESG) appraisal process.

Efficiency-floor values and carbon-ceiling values per technology can incentivise the use of best available technology (BAT), however, these approaches are not enough to ensure 2°C compatibility. Adopting a shadow economic price of carbon proves effective if the price is set at a high level that is compatible with 2°C scenarios. The most appropriate approach involves a systemic perspective based on linking the investment to a (national) decarbonisation path toward zero carbon in 2050.

### Proposed 2°C investing criteria for the building sector

Positive lists are the only way to ensure full 2°C compatibility at the project level in the building sector. These include near zero energy houses, a concept that has been proven, but may be difficult to implement at large scale in many country contexts. Shadow carbon prices will likely provide only a limited incentive in the building sector.

The benchmark indicators kWh/m<sup>2</sup> and gCO<sub>2</sub>/m<sup>2</sup> are broadly accepted indicators, so make a useful tool for the building sector. As a simple approach, at the individual building level a benchmark range between 10 kWh/m<sup>2</sup> and 150 kWh/m<sup>2</sup> can be used to determine relative 2°C compatibility of individual investments. The project-based benchmark approach could be combined with an approach to allow for gradual tightening of the benchmark based on existing BAT in the specific country context to

2°C-COMPATIBLE POSITIVE LIST	CONDITIONAL		MISALIGNED NEGATIVE LIST
Energy source: Wind PV Small hydro	<b>QUANTITATIVE CONDITIONS</b> Energy source: e.g. natural gas Criteria: Shadow economic price of carbon	<b>QUALITATIVE CONDITIONS</b> Energy source: e.g. natural gas Decarbonisation based approach. Simple: Prove that project fits into a path towards 0 gCO <sub>2</sub> /kWh in 2050 Advanced: Prove that the project fits into a national sector-based decarbonisation strategy including lifetime, operation mode and capacity requirements	Energy source: New coal fired power plants with unabated emissions (no CCS) over their lifetime

**Table 3:** Overview of proposed 2°C investing criteria for the energy sector

2°C-COMPATIBLE POSITIVE LIST	CONDITIONAL QUANTITATIVE / QUALITATIVE CONDITIONS	MISALIGNED NEGATIVE LIST
(Near) zero emission buildings (new and renovation) below 10 kWh/m <sup>2</sup>	<p><b>Quantitative benchmark (simple)</b></p> <ul style="list-style-type: none"> <li>• Specific energy use between 10 and 150 kWh/m<sup>2</sup></li> <li>• Gradual phase in and increased stringency based on BAT or country average</li> </ul> <p><b>Sector based decarbonisation (advanced)</b></p> <p>Buildings with their lifetime emissions have to fit into a decarbonisation of the building stock during the course of the century</p> <p>Benchmark of energy use per floor space (x kWh/m<sup>2</sup>) determined at a country level, considering</p> <ul style="list-style-type: none"> <li>• Market maturity for low energy buildings and capacity for low energy buildings</li> <li>• Current energy use of buildings and local BAT levels</li> <li>• Annual growth and lifetime of buildings, renovation rates and levels, demolition rates</li> <li>• Climatic zones</li> </ul>	Specific building energy use above 150kWh/m <sup>2</sup> (with exceptions for few, specific building uses)

**Table 4:** Overview of proposed 2°C investing criteria for the building sector

reflect the market maturity and the country’s development status.

A more advanced approach which provides greater certainty of 2°C compatibility is to apply a national decarbonisation pathway for the building sector. This can be used to benchmark individual buildings against the national decarbonisation requirement, where buildings with their lifetime emissions have to fit into the decarbonisation pathway. A simple tool could be developed that allows the setting of country-specific benchmarks (pathways) for the building sector. Alternatively, standards could be developed that allow for a flexible, country-specific approach towards decarbonisation.

### Proposed 2°C investing criteria for transport

The transport sector requires a systemic approach due to the interdependence of technologies and solutions within this and other sectors, in particular energy, land use and buildings. A low carbon transformation is unlikely to be achieved through technology change alone.

“Avoid and shift” strategies are needed: they require policy change and must address behavioural aspects.

An approach based on sector-wide decarbonisation targets is most effective and necessary in the long term to drive transformation. However, in practice, given the universal lack of transport decarbonisation strategies and lack of political consensus on transport decarbonisation, it is considered premature.

It is recommended to apply positive and negative lists in combination with a requirement to demonstrate how the planned infrastructure investment fits into a low carbon transport strategy. Setting infrastructure investment targets at the strategic level is also recommended in order to address the pronounced investment gap in the sector.

SUB-SECTOR	2°C-COMPATIBLE POSITIVE LIST	CONDITIONAL		MISALIGNED NEGATIVE LIST
		QUALITATIVE CONDITIONS (EXAMPLE)	QUANTITATIVE CONDITIONS	
<b>Air, Water, Rail</b>	Inland waterways Rail network and assets (passenger and freight) Mass rapid transit/ Light Rail Transit (LRT)	Airports with transport inter-connectivity plan/ bio-fuelling stations	<i>Quantitative criteria for transport infrastructure are difficult to set given the indirect link of infrastructure to GHG emissions. Quantitative criteria may be set for vehicles (e.g. fuel efficiency, penetration of electric/hybrid vehicles) and linked as sub condition to infrastructure investments.</i>	Rail networks dedicated to fossil fuel transportation New airports in developed regions
<b>Road</b>	Non-motorised infrastructure High quality Bus Rapid Transit (BRT)	Road renewal to include strategic plan Electric vehicle charging infrastructure linked to RE plan		New road network in developed regions*

**Table 5:** Overview of proposed 2°C investing criteria for the transport sector (examples)

### Way forward

**Additional research is needed to further develop 2°C investment criteria in the key sectors identified in this report.** Comprehensive 2°C investing criteria for all sectors and technologies that build on the initial results of this project can, in principle, be developed in the future. Given the lack of available guidance and tools to inform investment decisions on 2°C compatibility, as noted in this report, extending the research to additional key sectors is essential to enable the long term alignment of investment flows with international climate goals. Such work will require a larger process. The development of consensus-based criteria should involve a variety of stakeholders already active in the field to lift available expertise and ensure that criteria are grounded in the reality of different types of investors.

**The formation of a coalition of “early adopters” could bring together interested bilateral development banks and governments.** Such a coalition could support and accelerate the development of criteria and road test the proposed criteria for key sectors through a bottom up approach.

**Beyond the scope of this project, more work is necessary on processes and criteria applicable to private banks and private investors as well as to financial assets and portfolios.** Additional research will also be necessary to identify criteria that could be used to determine whether investments make a positive contribution to a community’s or a country’s resilience to climate change impacts. Such criteria should become an integral part of banks’ social impact assessments for any project.



To download the full report please visit

[www.newclimate.org](http://www.newclimate.org)

[www.germanwatch.org](http://www.germanwatch.org)

[www.2degrees-investing.org](http://www.2degrees-investing.org)

### Acknowledgements

This report was written for the German Federal Environment Agency (UBA) as part of the project titled “Klimagerechte Ausrichtung zukünftiger Investitionen – Entwicklung Zwei-Grad kompatibler Investitionskriterien” (project no. 48568). Funding for the design and printing of this report was kindly made available by the Gesellschaft für Internationale Zusammenarbeit (GIZ).

The contents of this publication do not necessarily reflect the official opinions of the German Federal Government and/or the German Federal Environment Agency (Umweltbundesamt).

The authors are very grateful for the many inputs, comments and suggestions received during the course of the project. The following institutions have been consulted at workshops or individually as part of the expert consultation process and peer review:

African Development Bank (AfDB) // Agence de l’environnement et de la maîtrise de l’énergie // Agence Française de Développement // Allianz Climate Solutions // Asian Development Bank (ADB) // Centre for Clean Air Policy (CCAP) // Climate Analytics // Climate Policy Initiative // Development Bank of Southern Africa // Deutsche Entwicklungs Gesellschaft (DEG) // European Bank for Reconstruction and Development // European Climate Foundation // European Investment Bank (EIB) // Fraunhofer ISI // Global Climate Forum // Green Climate Fund // Green Investment Bank // Investeringsfonden For Udviklingslande (IFU) // Institute for Climate Economics (I4CE) // Institutional Investors Group on Climate Change (IIGCC) // ING // Inter-American Development Bank // JICA // Kreditanstalt für Wiederaufbau (KfW) Development Bank // MCC Berlin // MSCI // Munich Re // Nordea // Overseas Development Institute // Overseas Private Investment Corporation (OPIC) // PIK Potsdam // responsAbility // South Pole Carbon // The CO-Firm // UNEP Inquiry // World Bank // World Resources Institute // World Wildlife Fund

**For further information please contact:**

NewClimate – Institute for Climate Policy and Global Sustainability gGmbH

[www.newclimate.org](http://www.newclimate.org)

Frauke Roeser

[f.roeser@newclimate.org](mailto:f.roeser@newclimate.org)

Germanwatch e.V.

[www.germanwatch.org](http://www.germanwatch.org)

Lutz Weischer [weischer@germanwatch.org](mailto:weischer@germanwatch.org)

2°Investing Initiative

[www.2degrees-investing.org](http://www.2degrees-investing.org)

Jakob Thomae [jakob@2degrees-investing.org](mailto:jakob@2degrees-investing.org)