



Measuring the financial impact of climate change: Risk and scenario analyses and to measuring climate-related financial impact

28 May 2020

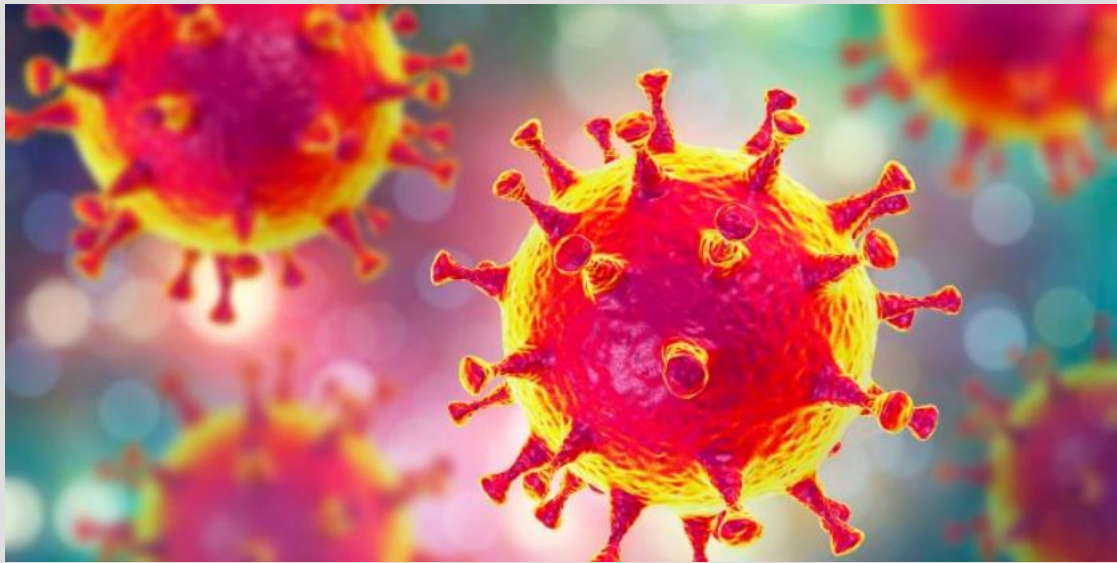
#WBEF | rics.org/wbef

Materiality of climate-related risks and opportunities



Is there any difference?

COVID-19



Climate change



Why to care about climate change?



License to operate – maintain regulatory and societal legitimacy and trust while doing business
e.g. usage restriction for commercial buildings in the Netherland

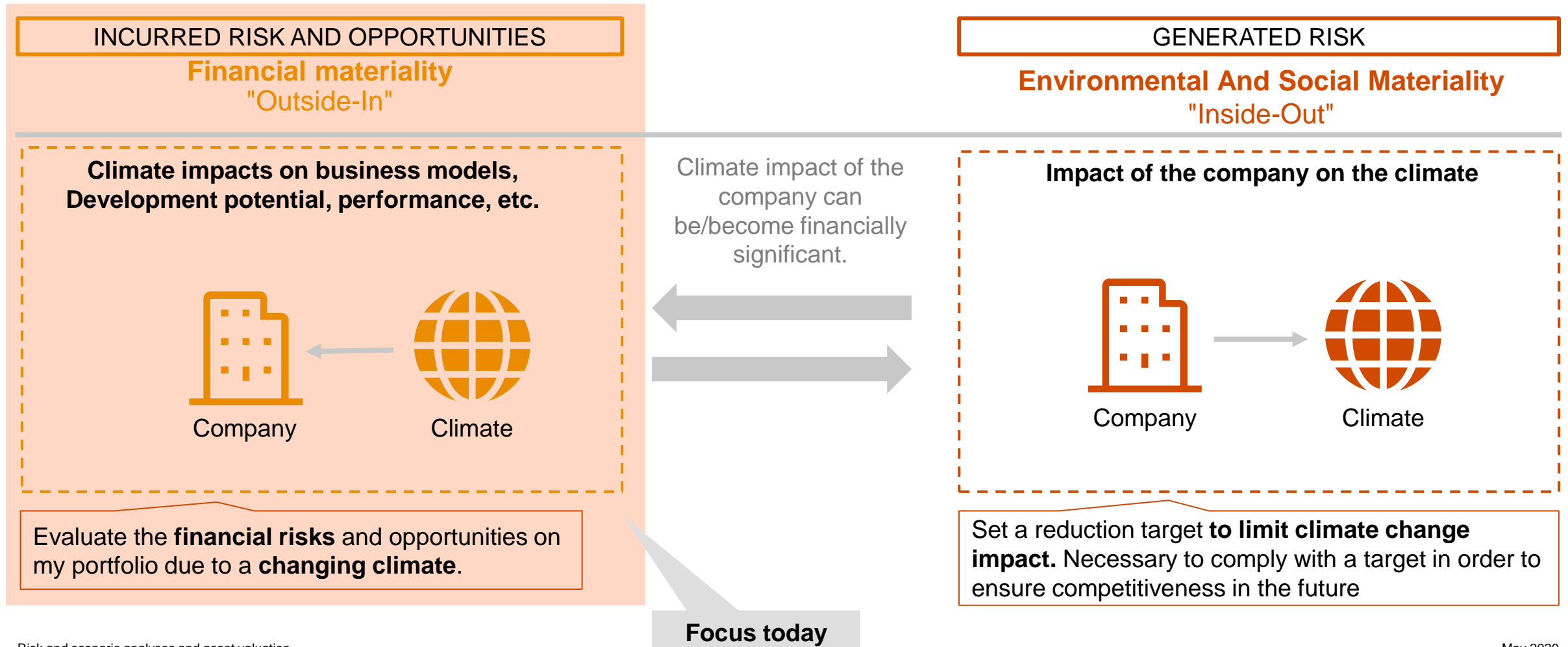


Risks – understand and estimate financial implications that may materialize e.g. physical damage or impairment



Opportunities – anticipating and realizing chances e.g. value increase or beneficial financing conditions

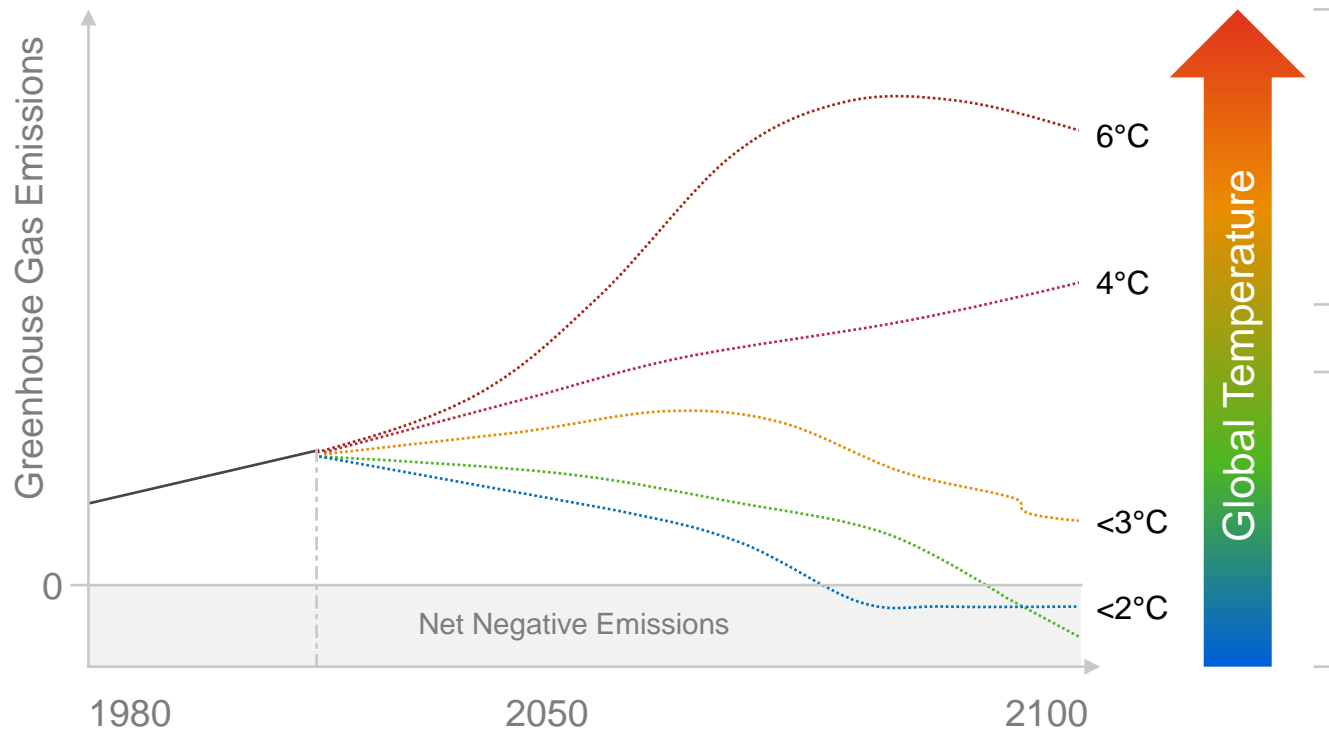
Climate risks and opportunities are driven by changing operating contexts as well as own climate activities



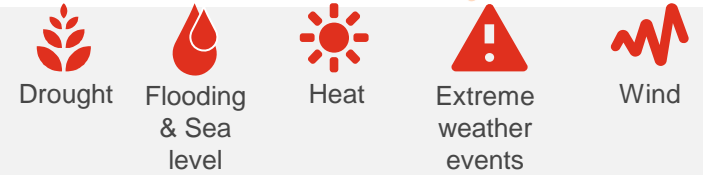
Much is uncertain, but it is certain that some form of climate-related risks will materialize



Illustrative Climate Scenarios

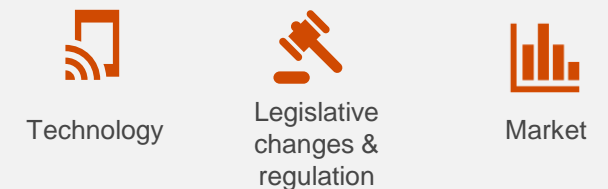


Source: PwC based on Global Carbon Project



01 More Physical Risks
If we do not contain climate change, physical risks will materialize.

02 More Transition Risks
If we embark on a transition path, transition risks will materialize. An orderly transition is preferred over an abrupt and disorderly transition.



Bank of England illustrates the vulnerability of real estate portfolios

The Bank of England derived the following future value changes in real estate assets caused by climate risks

Real Estate Assets	Value change from transition risks			Value change from physical risks		
	A	B	C	A	B	C
Scenario						
Global Average (incl. other regions)	-10%				-15%	-30%
North America	-10%				-15%	-30%
Europe	-5%				-8%	-15%
Asia Pacific	-20%				-30%	-60%

Focus today

Scenario Definitions:
 A - sudden transition to well below 2°C (Year 2022)
 B - orderly transition to well below 2°C (Year 2050)
 C - 4°C increase in global temperature (Year 2100)

Source: Bank of England / PRA Stress Test Guidance, 2019

Resilience to shocks and improved financial performance as well as financing conditions could be benefits

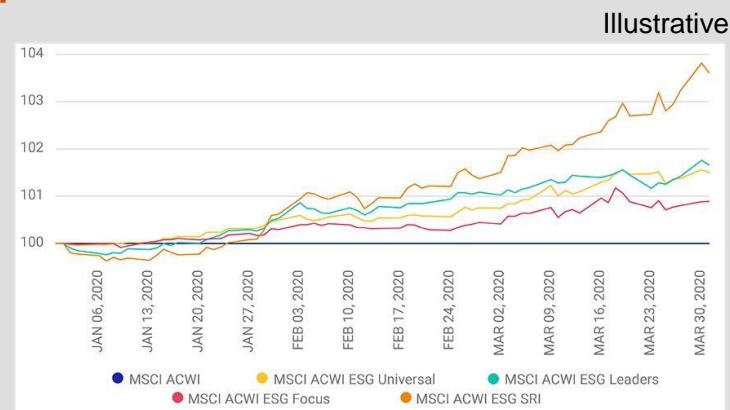
Financing the transformation will require to facilitate private sector finance

European Commission estimates an investment gap of **260 billion EUR per year** until 2030



Sources:
https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en

Sustainable investment show increased resilience during shocks, e.g. such as sub-prime crisis or COVID-19



Major Asset Manager, Rating agencies and Finance companies report the same

BlackRock

Amundi
ASSET MANAGEMENT

MSCI

MORNINGSTAR

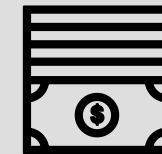
Sources:
[msci.com/www/blog-posts/msci-esg-indexes-during-the/01781235361](https://www.msci.com/blog-posts/msci-esg-indexes-during-the/01781235361) ;
[morningstar.com/insights/2020/04/06/how-did-esg-indexes-fare](https://www.morningstar.com/insights/2020/04/06/how-did-esg-indexes-fare) ;
[blackrock.com/corporate/about-us/sustainability-resilience-research](https://www.blackrock.com/corporate/about-us/sustainability-resilience-research) ;
[research-center.amundi.com/page/Article/2020/05/The-day-after-3-ESG-Resilience-During-the-Covid-Crisis-Is-Green-the-New-Gold](https://www.research-center.amundi.com/page/Article/2020/05/The-day-after-3-ESG-Resilience-During-the-Covid-Crisis-Is-Green-the-New-Gold)

Green residential buildings could achieve lower financing cost...

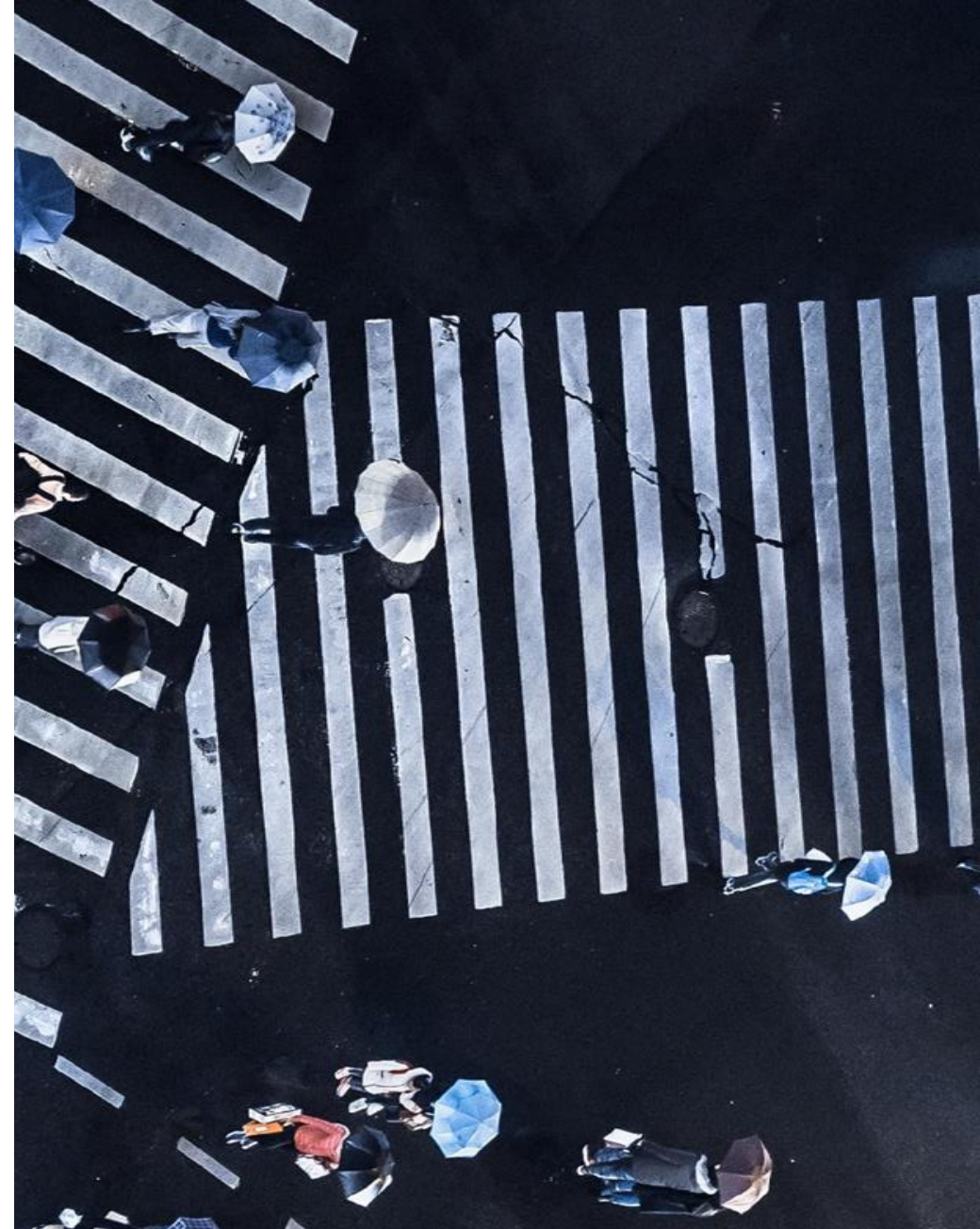
...according to European Commission sponsored Revalue Project....



...similar findings show US-American researchers for commercial buildings



Sources:
<http://revalue-project.eu/downloads/>
<http://www3.cec.org/islandora/en/item/2328-paper-2b-toward-sustainable-financing-and-strong-markets-green-building-en.pdf>



How to...
analyze and manage
climate risks/ opportunities



What are the key questions that you might be facing?



Is your building portfolio **vulnerable** to physical or transition climate risk?



How do I take the impact of climate change into consideration to steer **acquisition** and **life-cycle processes** for my buildings?



Where and how do I retrieve the relevant **data**?




How does materiality and financial impact differ under different **scenarios**?



How could you use such analysis to align your **risk management** and **strategy**?



How can I provide evidence that my buildings and my portfolio are green/sustainable, and how should I **report** about it?



How to...
assess vulnerability to
required climate
pathways

Understand the relative performance of buildings and financial investment requirements

Illustrative

“Stranding Tool” Project at a glance

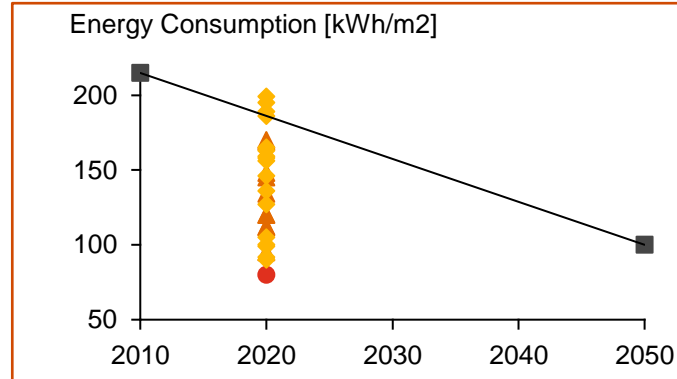
Public final products



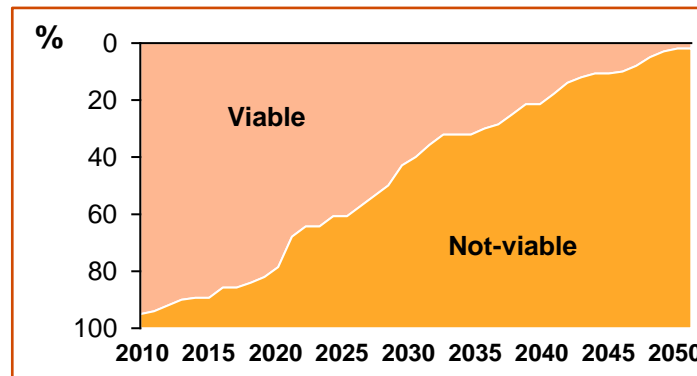
In collaboration with :

- Deka
 - Union Investment
 - Credit Suisse
 - DENEFF
 - Deutsche Bank RREEF
- Financed by:
- Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit

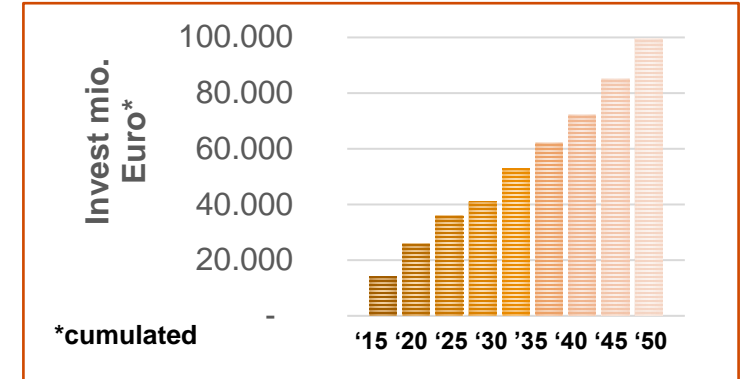
At which point in time do I need to renovate my building?



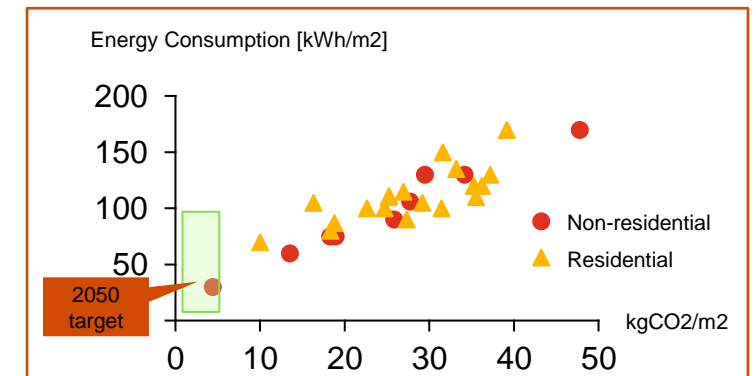
Over time, which share of my portfolio is viable?



How much investment will be required to upgrade my portfolio?

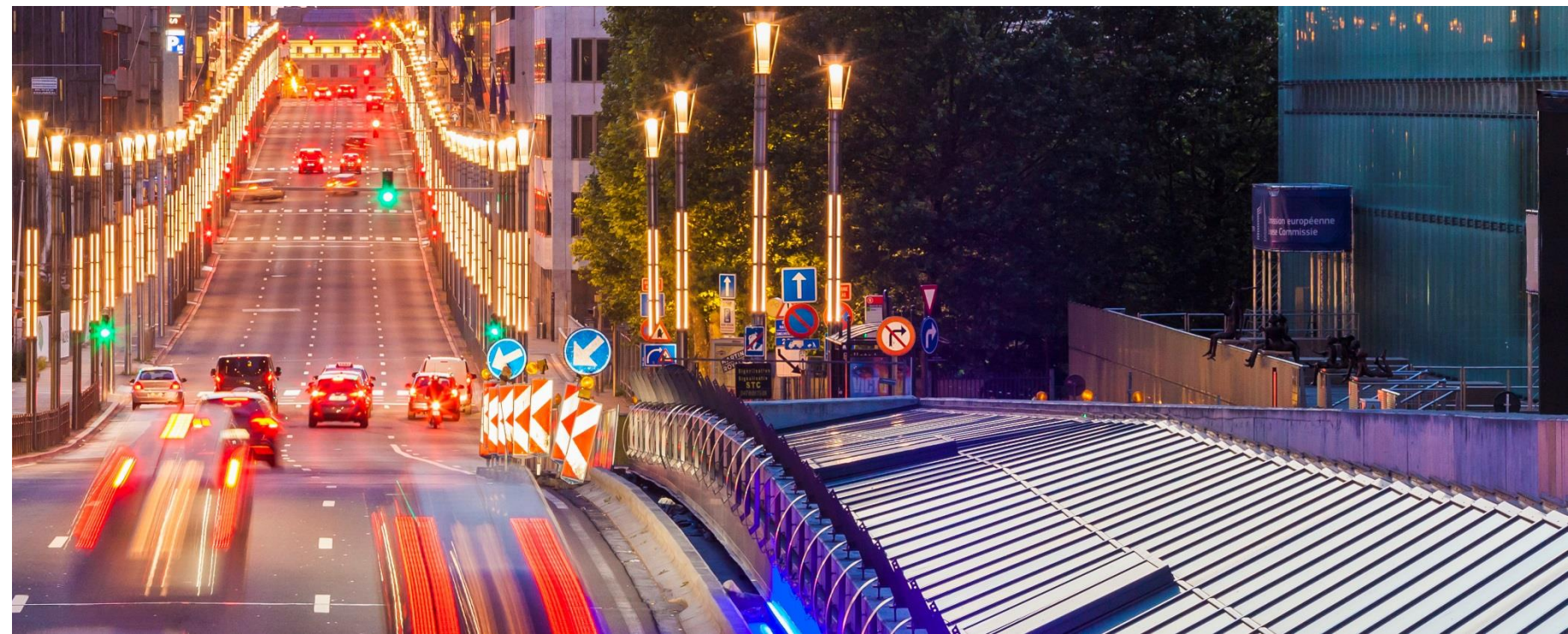


Which (types) of my buildings are at risk?





How to...
evaluate the financial impacts
of climate policies



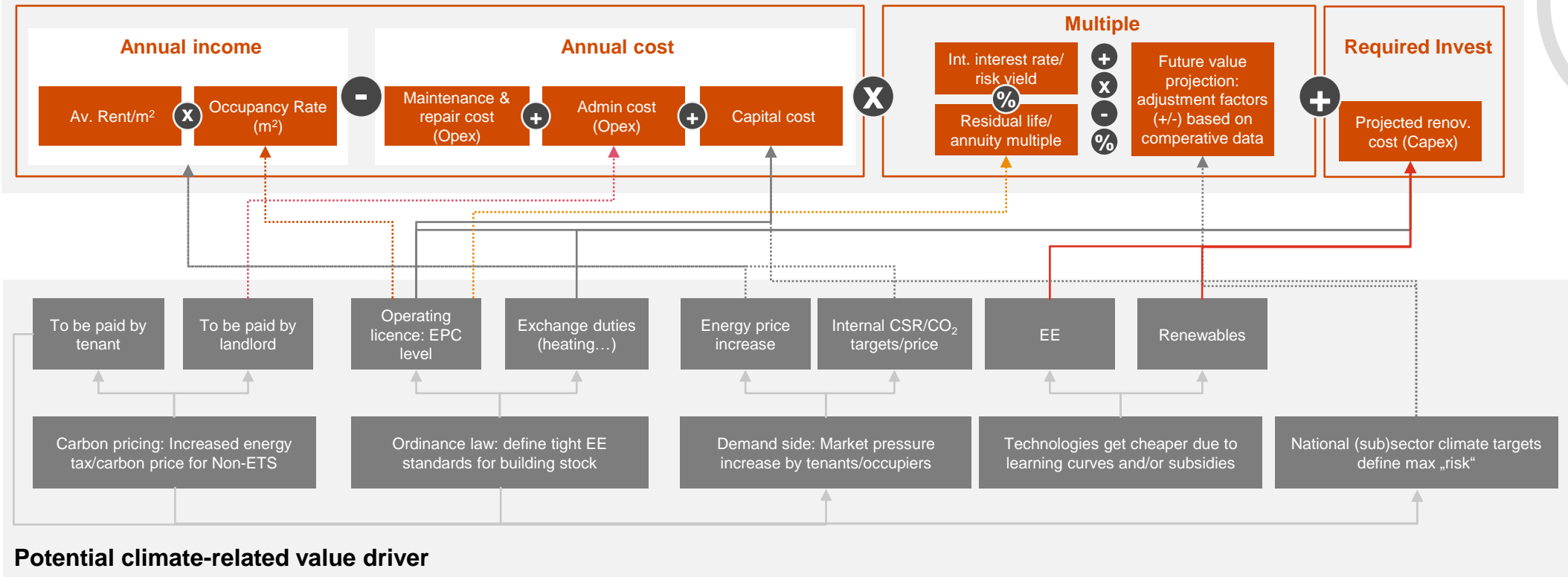
How would (potential) climate regulation impact building valuation?

Project partners:   

Financed by:  

Illustrative picture of value determination with the income approach

SCHEMATIC



A review of valuation impacts illustrates the materiality of energy efficiency-related regulations

Building Parameters



Office building

- Rent: €180/m² year
- Discount rate: 3.5%

Energy consumption classes in the office sector



Higher energy usage

- Energy consumption: 210 kWh/m² p.a.



Medium energy usage

- Energy consumption: 178 kWh/m² p.a.



Low energy usage

- Energy consumption: 99 kWh/m² p.a.

Regulatory Simulation

CO₂-Price

Introduction of a CO₂ price on the heating related emissions of the building.
The CO₂ price starts at 40 Euro/t CO₂ and increases to a max. price of 120 Euro/t CO₂.

Consumption Restrictions

In order to avoid a restriction of use, it will be renovated according to 2050 (100 kWh/m²) requirements. This regulation comes into force in 2025.

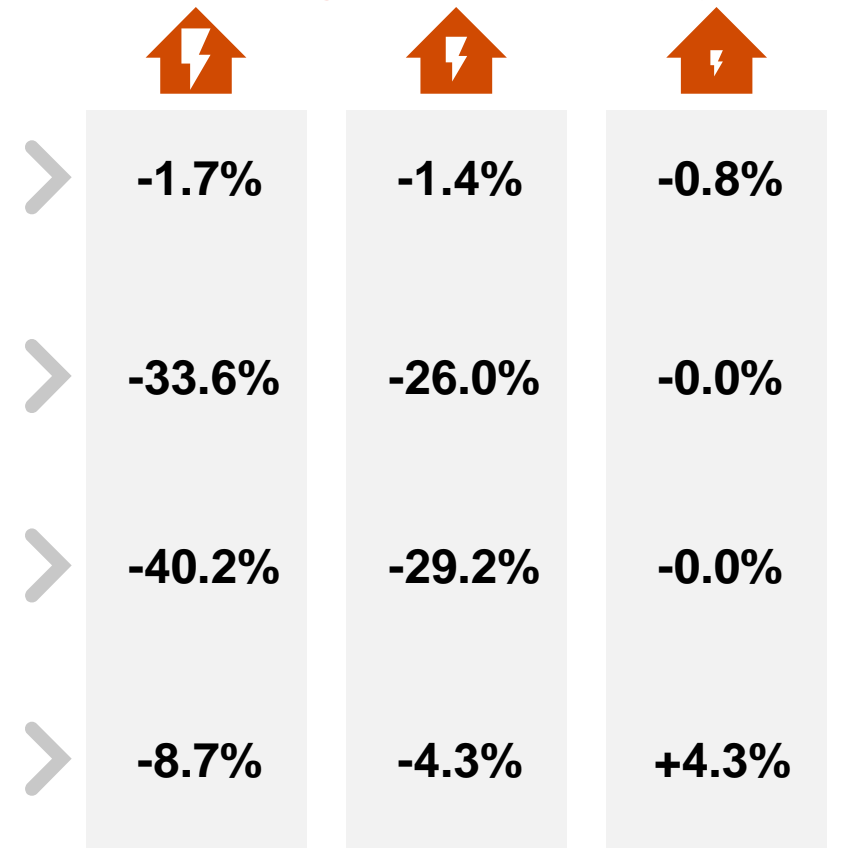
Climate Strategy Restriction

Simulation the point of time when the buildings has the intersection with the sectoral reduction pathway. The building is renovated in line with 2050 requirements (100kWh/m²) in that year.

Change in Demand

Efficient buildings are in greater demand, which is changing rental income (High energy usage: -10%; Medium energy usage: -5%; Low energy usage: +5%)

Result: Change in Value of Property (2050)





How to...
explore different climate
futures

Based on the scenario, a significant proportion of the building stock would have to undergo energy retrofitting

2°C scenario

The real estate sector in the scenario:



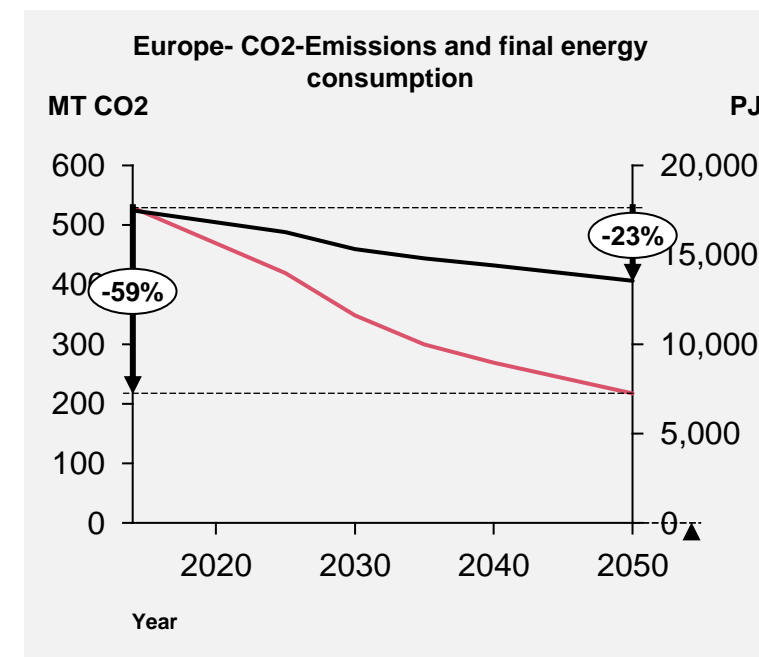
In the 2°C scenario the OECD countries have **to reduce the emissions** of buildings about 60% in 2050 (reference year 2014). **Energetic renovation** is a **key** component to achieve the sector targets. More than 80% of the buildings stock would need to be renovated.



GDP development and **population growth**, both roughly 0.9% p.a. till 2040, lead to a significant increase of floor area of residential and non-residential buildings with high regional and building-type differences.



The constantly improving performance of renewable energy the need to reduce the emissions, lead to a **technological shift** towards electric heating and ventilation systems (e.g. heat pumps and solar panels)



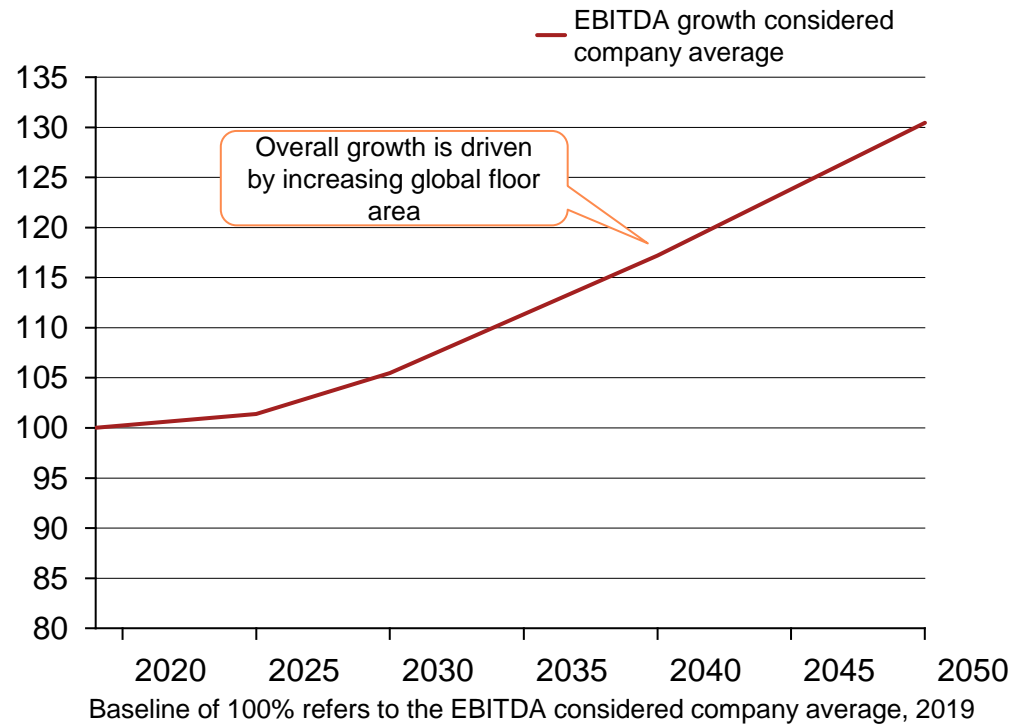
*Scenario basis is the IEA ETP 2017 2DS scenario

Real Estate might see substantial EBITDA growth in a 2°C scenario, with varying individual company performance

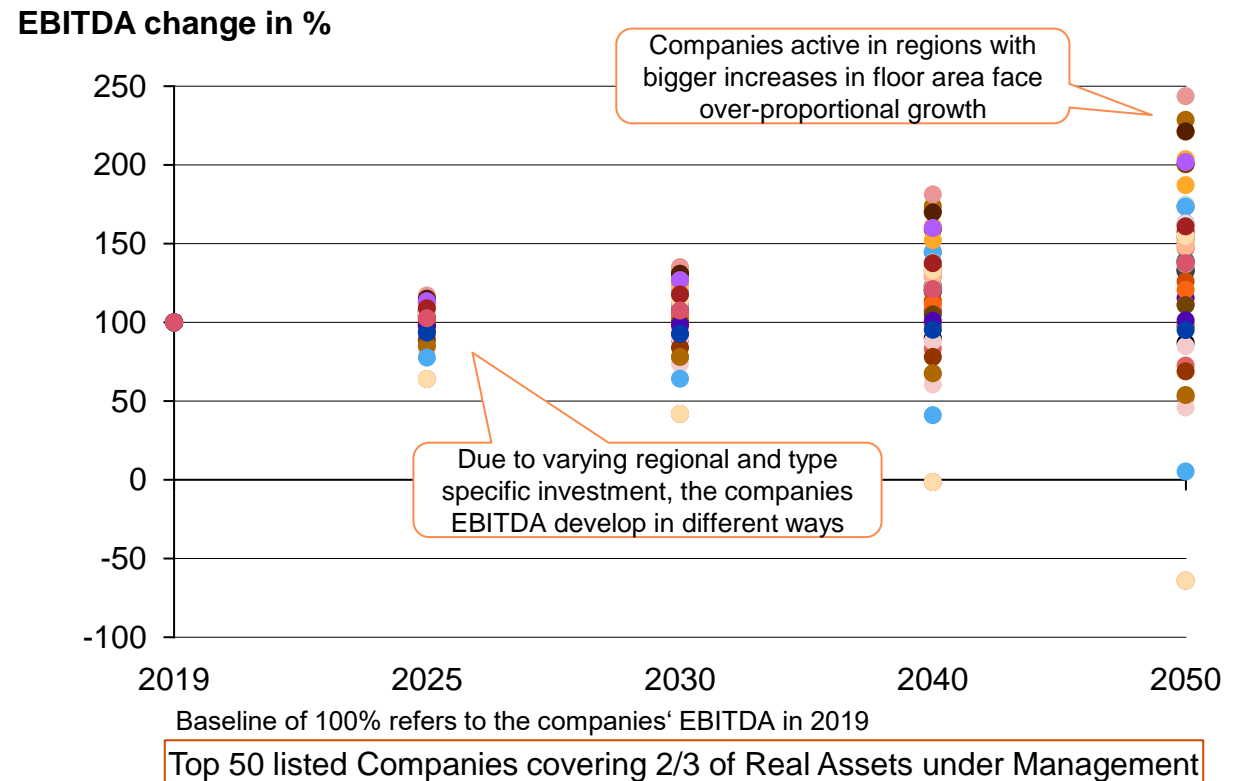
Climate Excellence Results for Real Estate

2°C scenario

Potential development of the real estate sector

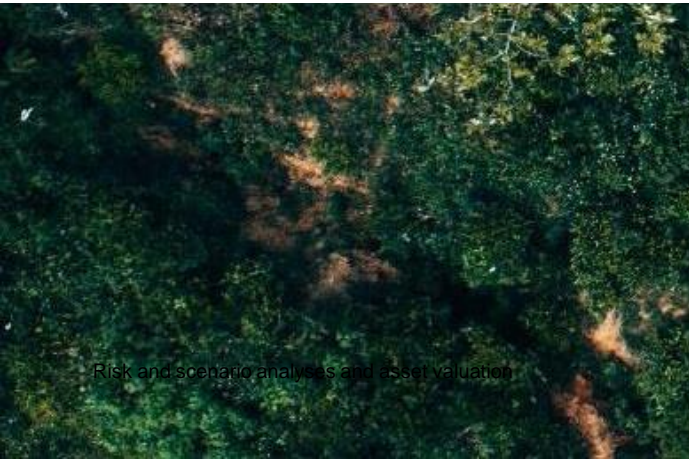


Individual companies' spread





Outlook & Wrap up



Key take aways from today



Climate change is and will remain a **priority topic**.



It is easy to get a first view on the climate exposure and materiality of the portfolio and individual buildings



A **integrated climate view**, acknowledging risks and opportunities from regulatory, technology and market changes, as well as physical impacts, can create the basis for **smart management and reporting**.

Your contacts:



Dr. Nicole Röttmer

Climate Lead Europe
PwC Germany

+49 151 40803712
nicole.roettmer@pwc.com



Fritz Fromageot

Real Estate Consultant
PwC Germany

+49 151 1729 6246
fritz.fromageot@de.pwc.com



Dr. Anne Michaels

Sustainable Finance Expert
PwC Germany

+49 151 67019175
anne.michaels@pwc.com

For general requests and questions please contact:
de_pmo_climate_excellence@pwc.com



rics.org/wbef