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# Towards Sustainable Materials

EPFL MSE-433

## Climate-financial Risks

Professor Karl Schmedders, PhD

12 May 2025

# Tragedy of the Horizon

## Breaking the tragedy of the horizon – climate change and financial stability – speech by Mark Carney

Speech given at Lloyd's of London.



**Mark Carney**

Former Governor, Bank of England from 2013 to 2020

<https://www.bankofengland.co.uk/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability>, accessed 6 May 2025

# WEF Global Risks Report 2025

## 2 years



## 10 years



HERITAGE EXPLAINS

# The ESG Pushback

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*Under the umbrella of Environmental, Social, and Governance (ESG) activism, corporations have become unimaginably woke.*

<https://www.heritage.org/environment/heritage-explains/the-esg-pushback>, accessed 6 May 2025

In the U.S. anti-woke turned into anti-climate turned into anti-ESG.

(IMD “Executive in Residence”)

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# Challenge

Question (Harsh & Cold-hearted?)

## What is the Business Case for Sustainability?

## One Avenue: Climate Risk Management

# Climate crisis on track to destroy capitalism, warns top insurer

The world is fast approaching temperature levels where insurers will no longer be able to offer cover for many climate risks, said Günther Thallinger, on the board of Allianz SE, one of the world's biggest insurance companies. He said that **without insurance**, which is already being pulled in some places, **many other financial services become unviable, from mortgages to investments.**

<https://www.theguardian.com/environment/2025/apr/03/climate-crisis-on-track-to-destroy-capitalism-warns-allianz-insurer>, accessed 6 May 2025

Action urgently needed to save the conditions under which markets - and civilisation itself - can operate, says senior Allianz figure



Some companies were ending home insurance in California due to wildfires, says Allianz SE board member. He says that without insurance, many other financial services become unviable, from mortgages to investments. Photograph: Mario Tama/Getty Images



## JPMorgan Touts Returns From Protecting Against Weather Shocks

The private sector isn't spending nearly enough on adaptation, leaving potentially huge returns on the table, according to JPMorgan Chase & Co.'s global head of climate advisory.

<https://www.bloomberg.com/news/articles/2025-05-01/jpmorgan-report-touts-huge-investment-returns-from-adaptation?embedded-checkout=true>, accessed 6 May 2025



Homes destroyed following wildfires in Altadena, California, US. *Photographer: Kyle Grillot/Bloomberg*

By Alastair Marsh

1 May 2025 at 14:00 CEST

# Physical Risk

Flood Damage, 23 July 2024

Porsche AG

+ Add to myFT

## Porsche warns on profits as flooding hits aluminium supplier

Production of models delayed after heavy rain in central Europe disrupts manufacturing chain

Novelis, a US aluminium producer owned by India's Hindalco Industries, told the Financial Times that its Sierre plant in Switzerland has been shut down since the end of June because of the floods.

“With our plant shut down due to the flooding, our ability to fully deliver to our automotive customers in Europe has been impacted,” it said in a statement.

<https://www.ft.com/content/8b988cfb-d2b0-47fd-841f-dcc0de437134>, accessed 6 May 2025



# BAE Systems Moves a Plant

The company moved its plant to the Huron Campus in nearby Endicott, NY — a complex of buildings that had at one time housed the IBM Corporation's main operations. All of BAE's employees were also moved to the new site within four days of the flood.

[https://www.us-tech.com/RelId/1099381/pagenum/9/ISvars/default/BAE\\_Plant\\_Ruined\\_by\\_Flood\\_Back\\_on\\_Line\\_with\\_Europlacer\\_s\\_Help.htm#](https://www.us-tech.com/RelId/1099381/pagenum/9/ISvars/default/BAE_Plant_Ruined_by_Flood_Back_on_Line_with_Europlacer_s_Help.htm#), accessed 6 May 2025

## BAE Plant Ruined by Flood, Back on Line with Europlacer's Help

By Chris Round, Global Marketing Manager, Europlacer

Severe storms can be devastating to business operations, with flooding causing damage to plants and machinery. As storms pushed over the Northeast portion of the United States on September 8, 2011, the Susquehanna River flooding, overcoming small towns including the Village of Johnson City, NY — a small city with over 15,000 residents. The flood waters devastated BAE Systems' facility there.



On September 8, 2011, BAE Systems was inundated by a flood-level Susquehanna River.

# BAE Systems 2024 Annual Report, page 50

Amazing!

We have analysed all our global sites (510) for climate-related physical risks, mapping against climate scenarios and temperature pathways across an 80-year outlook.

We are now working with the 66 sites we have identified as having a higher potential exposure to climate-related risk over that period. For each site, we are considering the potential impact on both the site and business continuity, and reviewing facilities management and business continuity plans to ensure appropriate mitigation is in place.

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# Bloomberg, June 2010

<https://www.bloomberg.com/news/articles/2010-06-24/peabody-energy-sees-global-coal-demand-at-the-beginning-of-a-super-cycle-?embedded-checkout=true>,  
accessed 6 May 2025



## Peabody Says Coal in Early Phase of 'Super Cycle'

By Mario Parker and Noah Buhayar

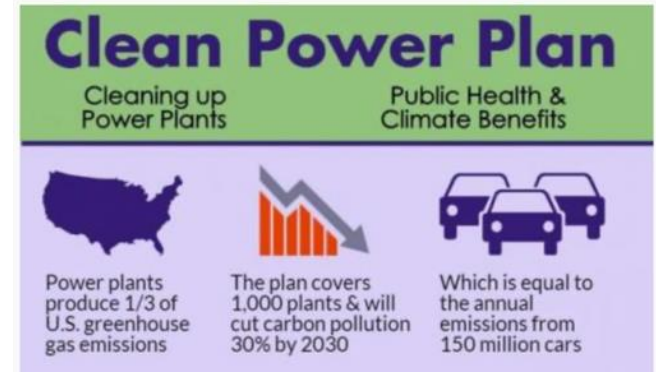
24 June 2010 at 16:46 CEST

“We’re in the early stages of a 30-year super cycle in global coal markets,” Chief Executive Officer Gregory Boyce said at the IHS McCloskey Group Coal USA Conference in New York.

# U.S. Clean Power Plan (CPP)

## A Policy that Never Was

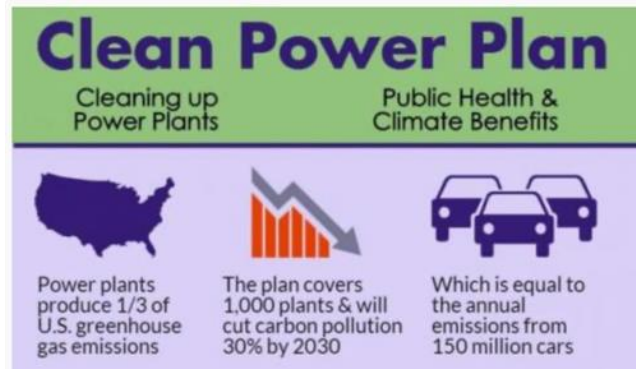
<https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-overview-clean-power-plan.html>, accessed 6 May 2025



- |           |   |
|-----------|---|
| June 2014 | President Barack Obama and the Environmental Protection Agency (EPA) announce the Clean Power Plan (CPP). |
| Oct 2015  | CPP is published in the Federal Register; intended effective date 60 days later.                          |
| Feb 2016  | U.S. Supreme Court issues a stay on the CPP, halting its implementation due to legal challenges.          |
| Mar 2017  | President Donald Trump signs an executive order directing the EPA to review the CPP.                      |

# Clean Power Plan

## A Policy that Never Was

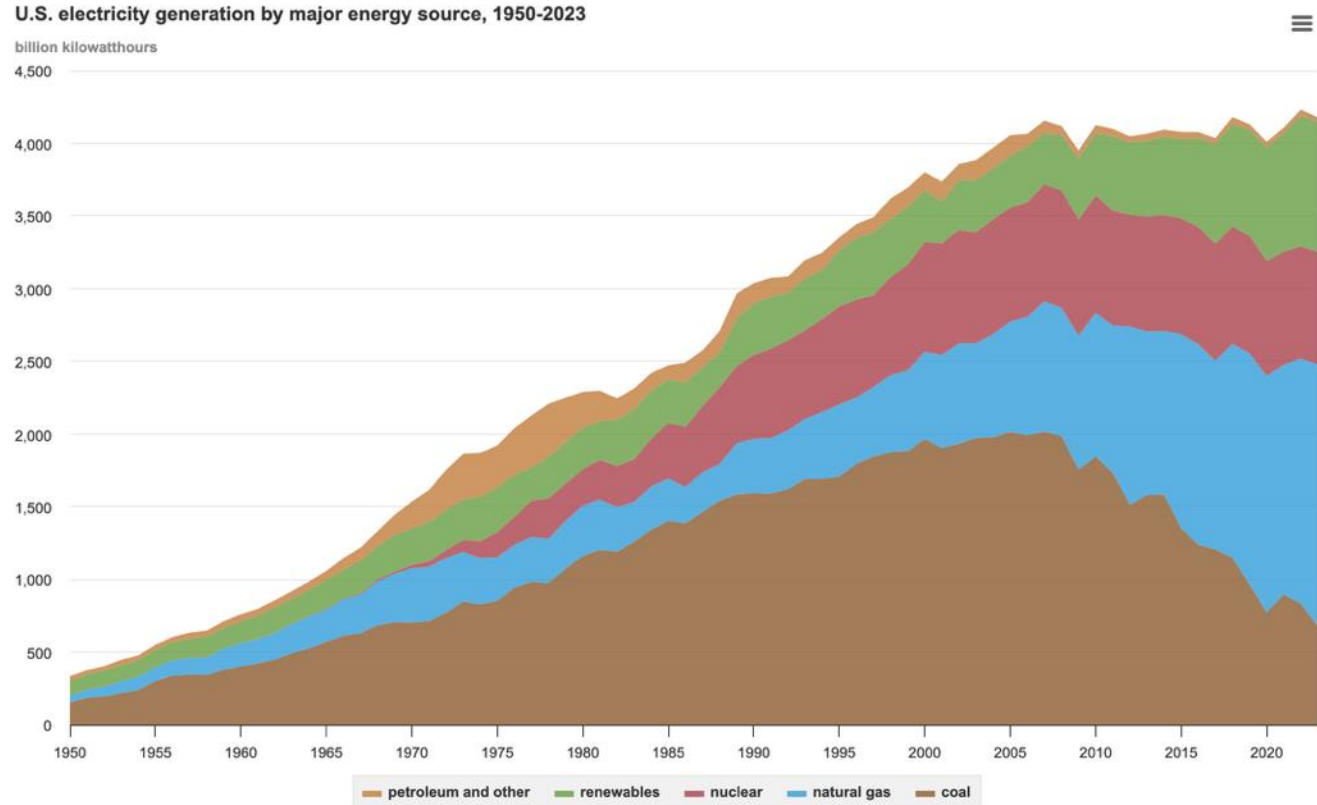


- |           |  |
|-----------|--|
| Oct 2017  | EPA Administrator Scott Pruitt announces the proposal to repeal the CPP.   |
| Aug 2018  | EPA proposes the Affordable Clean Energy (ACE) rule as a replacement for the CPP.  |
| June 2019 | The ACE rule is finalized, effectively replacing the CPP.  |
| Jan 2021  | U.S. Court of Appeals for the District of Columbia Circuit vacates the ACE rule, creating an opportunity for new regulations under the Biden administration. |
| June 2022 | U.S. Supreme Court strikes down CPP.   |



# U.S. Electricity Generation by Energy Source

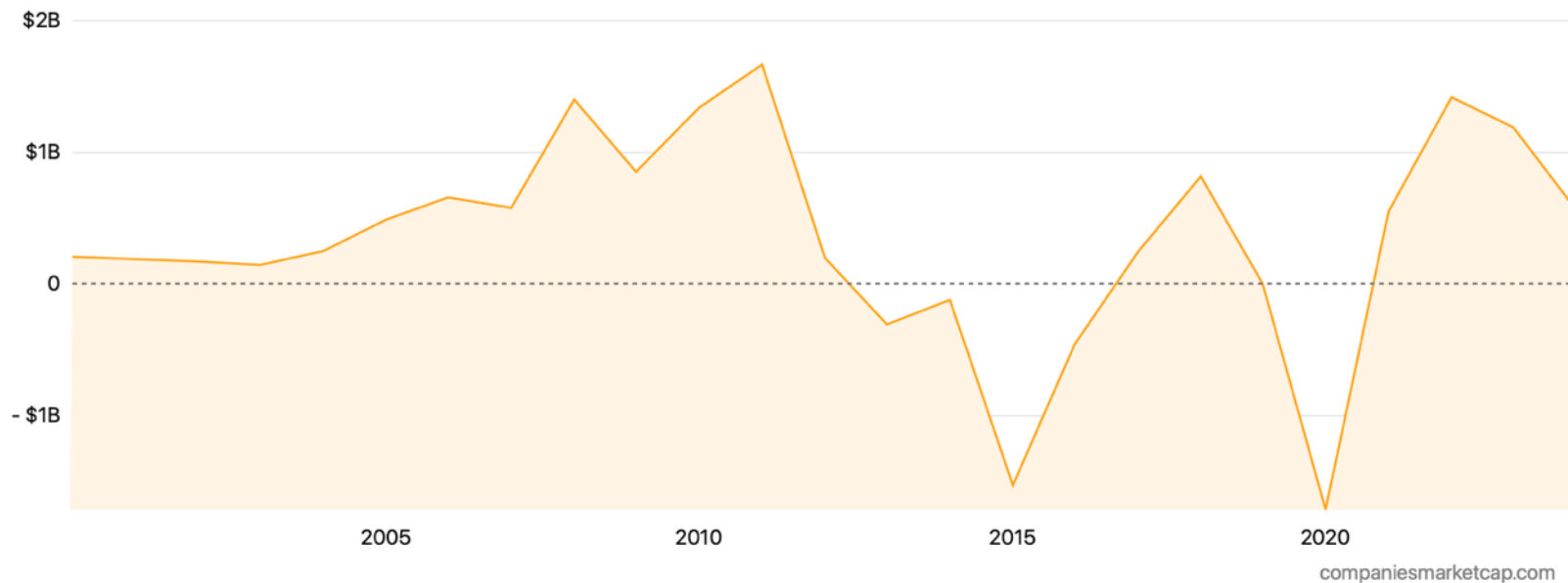
<https://www.eia.gov/energyexplained/electricity/electricity-in-the-us-generation-capacity-and-sales.php>,  
accessed 6 May 2025



# Annual Pretax Income



Earnings history for Peabody Energy from 2000 to 2024



<https://companiesmarketcap.com/peabody-energy/earnings/>, accessed 6 May 2025

# Washington Post, 13 April 2016

CLIMATE AND ENVIRONMENT

## How coal titan Peabody, the world's largest, fell into bankruptcy

By [Chris Mooney](#) and [Steven Mufson](#)

April 13, 2016 at 11:40 a.m. EDT

**The Washington Post**  
*Democracy Dies in Darkness*

In the starkest sign yet of declining fortunes in the coal industry, St. Louis-based Peabody Energy, the largest and most storied U.S. coal company, announced early Wednesday that it was filing for Chapter 11 bankruptcy.

<https://www.washingtonpost.com/news/energy-environment/wp/2016/04/13/coal-titan-peabody-energy-files-for-bankruptcy/#>, accessed 6 May 2025

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# Transition Risk

Transitioning to a lower-carbon economy may entail extensive **policy, legal, technology, and market changes** to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organizations.

<https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf>

In our view, one of the biggest risks that investors face is that financial markets are not pricing in the effects of policy responses to climate change fast enough.

(Five Sectors That Cannot Escape Climate Change, Morgan Stanley, Portfolio Allocation Trends & Highlights, Feb 2020)

# TCFD

## Task Force on Climate-related Financial Disclosures



### The Task Force on Climate-related Financial Disclosures

G20 Finance Ministers and Central Bank Governors asked the Financial Stability Board (FSB) to review how the financial sector can take account of climate-related issues.

The FSB established the Task Force on Climate-related Financial Disclosures (TCFD or Task Force) to develop recommendations for more effective climate-related disclosures that:

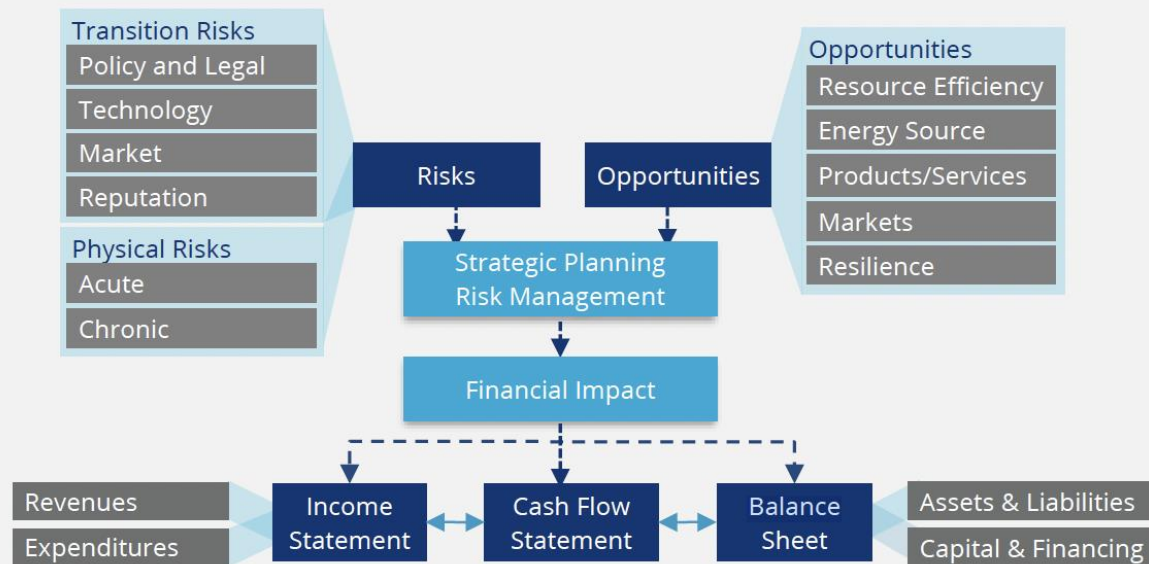
- could “promote more informed investment, credit, and insurance underwriting decisions” and
- in turn, “would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system’s exposures to climate-related risks.”

<https://assets.bbhub.io/company/sites/60/2022/12/tcfd-2022-overview-booklet.pdf>, accessed 7 May 2025



Figure 1

## Climate-Related Risks, Opportunities, and Financial Impact



Better disclosure of the financial impacts of climate-related risks and opportunities on an organization is a key goal of the Task Force's work.

- ❖ Active in more than 100 countries
- ❖ 32,000 (approximately) employees
- ❖ Sales: €15.2 billion
- ❖ EBITDA (adjusted): €2.1 billion

We may not manufacture tires, mattresses, medications, or animal feeds, but Evonik is part of all of those products –and many more. While we often contribute only small amounts of material, those contributions are precisely what make the difference. That's because Evonik products make tires fuel-efficient, mattresses more elastic, medications more effective, and animal feeds healthier. That's what specialty chemicals are all about. And when it comes to specialty chemicals, we're among the best in the world.

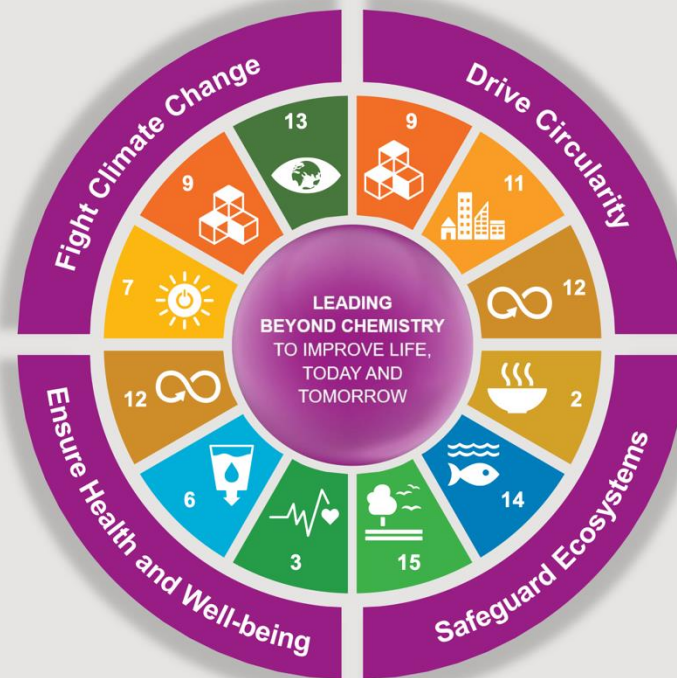
<https://www.evonik.com/en/company.html>, accessed 12 May 2025

# Evonik Sustainability 2024

Sustainability at  
Evonik.

2024

NEXTGEN 



<https://files.evonik.com/shared-files/sustainability-evonik-8329.pdf>, accessed 12 May 2024

# Exit & Innovation

Three major strategic levers...

... with sustainability fully integrated ...

... delivering on ambitious targets

## Next Generation Portfolio

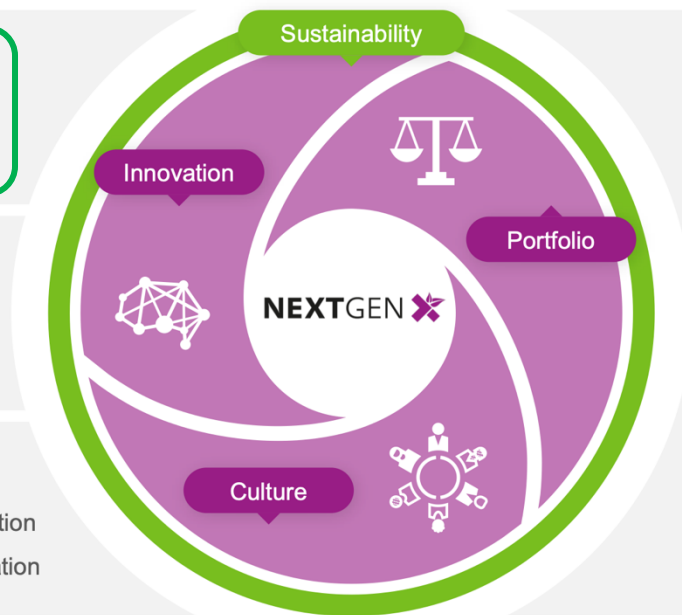
- + Exit Performance Materials
- + Full focus on three attractive growth divisions

## Next Generation Innovation

- + €1 bn new sales well on track
- + Growth areas beyond 2025 already launched

## Next Generation Culture

- + Diversity as key to successful strategy execution
- + ESG targets integrated into mgmt. compensation



## ESG Targets 2030

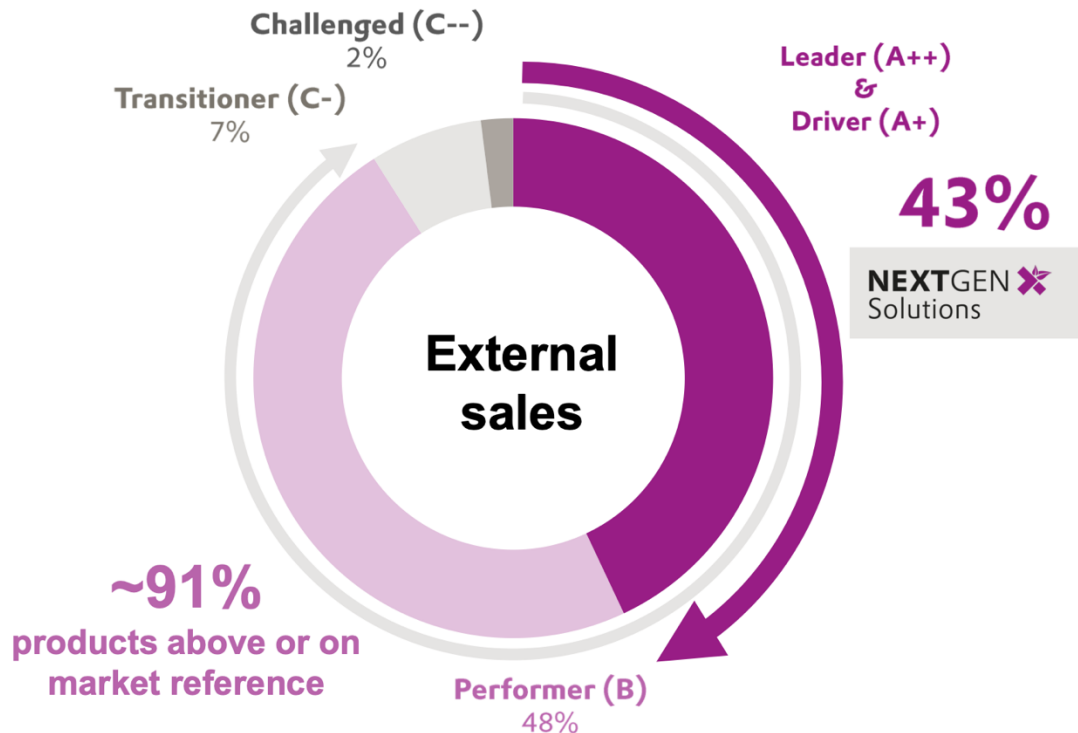
- + >50% sales share of **NEXTGEN Solutions** ✕
- + -25% CO<sub>2</sub> emission reduction<sup>1</sup>, e.g. via **NEXTGEN Technologies** ✕

## Financial Targets

- + Organic growth >4%
- + EBITDA margin 18-20%
- + ROCE ~11%
- + FCF Conversion >40%

A, B, C

## Result of PSA analysis



NGS: "Next Generation Solutions" include "Leader" (A++) and "Driver" (A+) products and solutions



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# Take Aways

## Business Case for Sustainability

### Climate-financial Risks & Opportunities

- Physical risks

- Transition risks

### Adaptation & Mitigation

- Product portfolio awareness

- Exit from high-emission products

- Develop products supporting the green transition

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Challenging what is and inspiring what  
could be.

We develop leaders who transform  
organizations and contribute to society.

*Thank you!*