ORTEC FINANCE

CLIMATE
PREDICT

Quantify Future Extreme Weather
Event Impacts

Climate & ESG Solutions

Navigate a Changing Climate
With Ortec Finance's Climate & ESG Solutions

Climate PREDICT assesses your real assets' exposure to extreme weather events

Climate PREDICT models the increase in frequency and impact of climate attributable extreme weather events on physical assets and economic growth. Extreme weather frequencies are converted to losses year-by-year, across disaster types, for over 120 countries and 1,800 cities globally.
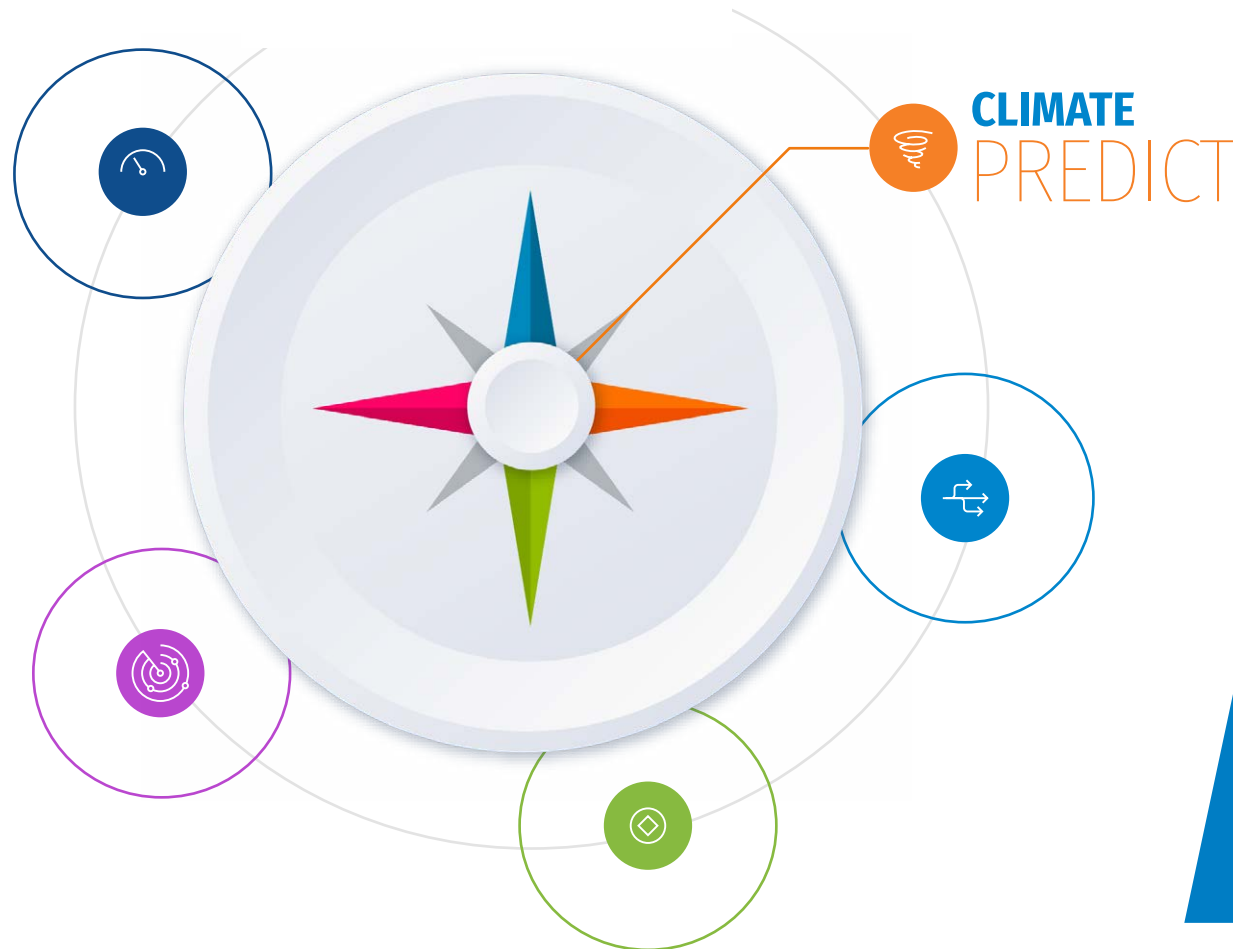
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*"Potential increases in the frequency or severity of extreme weather events driven by climate change could mean longer and stronger heat waves; the intensification of droughts; and a greater number of severe storms. While the attribution of increases in claims to specific factors is complex, **the direct costs of climate change are already affecting insurers' underwriting strategies and accounts.**"*

- Mark Carney

Key Strengths

Hands-on expert engagement coupled with robust analytics

Proprietary Extreme Weather Frequency & Loss Modeling:
Forward-looking extreme weather risk & impact model, which differentiates climate attributable and non-climate attributable damages.

Science-Based, Objective Methodology:
Dynamic model incorporating the most current literature.

Robust Data Sources:
Encompassing global temperature anomaly data, urbanization data, extreme weather type specific data, and hazard risk data.

Quantified Insight on Financial Risks:
Extreme weather frequency and loss are differentiated by type of hazard, when and where the event will occur, and to what extent the frequency and losses are attributable to climate change.

A Forward Looking Tool

Quantify the trends in extreme weather risk to come under various climate pathways

Climate PREDICT is designed for financial institutions with large property and real estate portfolios such as **banks, real estate managers, pension funds, and insurance companies.** Our tool can help these stakeholders understand the financial impacts of future extreme weather to make climate-informed decisions on:

Mortgage Risk

Real Estate Valuation

Property & Casualty Underwriting Risks

Capital Market Return Assumptions

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What can you use Climate PREDICT for?
Understanding the anticipated extreme weather losses due to climate change

Climate PREDICT provides investors with a granular picture of how extreme weather events will change in frequency and losses under climate change.

The climate change pathways we model include the Paris Transition and Failed Transition Pathways. The impact of climate change on extreme weather can be provided as frequency, economic losses, and GDP impacts. These total values can then be disaggregated into climate and non-climate attributable values.

These insights into individual physical climate risk drivers help improve investment decision-making such as:

Assessing risks to real assets, real estate and mortgage portfolios

Enhancing insurance companies' in-house P&C catastrophe models by

| Better quantifying the exposure to climate risk | Delta analysis of how exposure changes over time | Putting a cost on the impacts of climate change (USD per Metric ton of CO_2) |

Informing investors of the impacts of energy-related investments

How does PREDICT work?
Inputs, outputs, and how our engine brings it together

Figure 1 Climate PREDICT (climate change-related) Extreme Weather Risk & Impact Model

Key Model Inputs

Extreme Weather Event Data

Meteorological (storm, cyclone)

Hydrological (flood, extreme rainfall)

Climatological (drought, wildfire)

Urbanization Data

Hazard Risks

Temperature Anomaly Data

The Engine

Our urbanization algorithm links extreme weather events, hazard risk levels, and city growth for forward looking insights

Coupled with robust climate attribution literature to determine the proportion of extreme weather risk associated with our three extreme weather event data types

With a climate scenario mapping overlay to understand how these extreme weather risks differ under various climate pathways

Model Outputs

Quantified future extreme weather risk metrics across the range of hazard risk types into the following units:

· **Number of Events**
· **Direct Loss ($)**
· **GDP Impact**

By the following categories:

· **Type** ▸ Meteorological, Hydrological, Climatological
· **Location** ▸ World, Continent, 120 Countries, and 1,800 Cities
· **Year** ▸ Per year up to 2100

Climate attributable impacts disaggregated from non-climate attributable impacts, per hazard type, location, and year

The Climate PREDICT model identifies the growing extent by which climate change amplifies extreme weather losses under a range of climate scenarios. With increasing urbanization, cities have become epicenters of economic activity. More than half of the world's population now live in urban areas. In these increasingly dense cities, the amount of people and assets endangered by extreme weather events is large and growing.

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A Scenario-Based Approach
Our three climate pathways

Climate & ESG Solutions at Ortec Finance partners with Cambridge Econometrics to assess economic and financial impacts of three global warming pathways. Climate PREDICT uses the same climate scenarios as the other Ortec Finance solutions: Climate SIGNS, Climate ALIGN, Climate MAPS, and ESG RADAR.
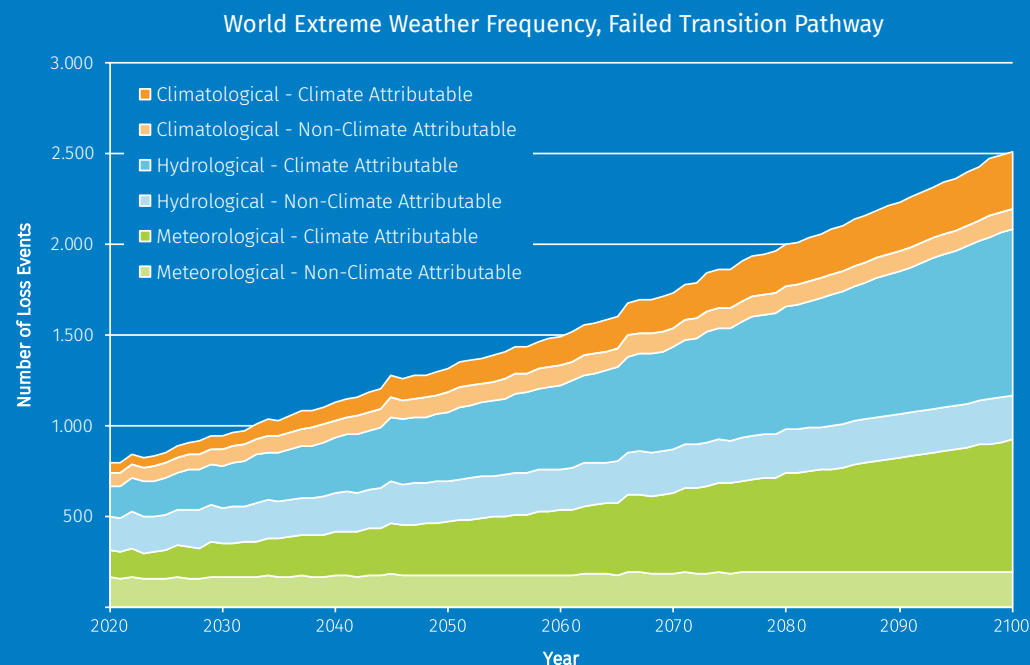
Global Warming Pathways Modeled

Paris Orderly Transition	Paris Disorderly Transition	Failed Transition
Transition efforts gradual and orderly Locked-in physical impacts	Rapid disorderly transition efforts Locked-in physical impacts	Business-As-Usual (only currently committed transition effects) Dramatic physical impacts

Our global warming pathways are aligned with the RCP scenarios put forth by UN Climate Change's (UNFCCC) appointed scientific body IPCC.

For each climate scenario, Climate PREDICT calculates the relative increase in expected event frequency or magnitude, associated losses, and a country's ability to absorb them.

The figure below illustrates how total extreme weather events globally can be split into expected trends (i.e. expected loss events per type of disaster) and proportion that is attributable to the specific climate scenario, in this case Failed Transition Pathway, the world would find itself in.
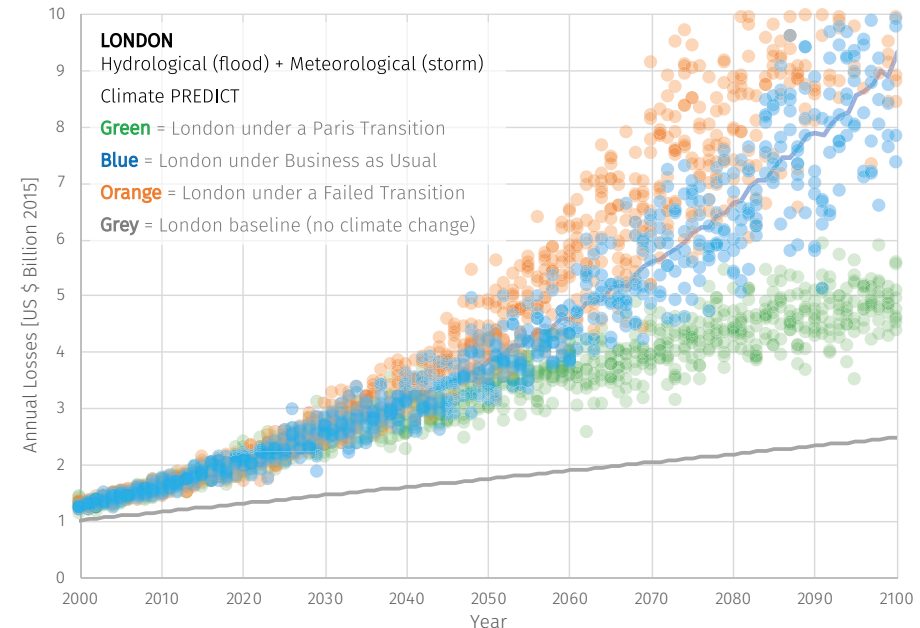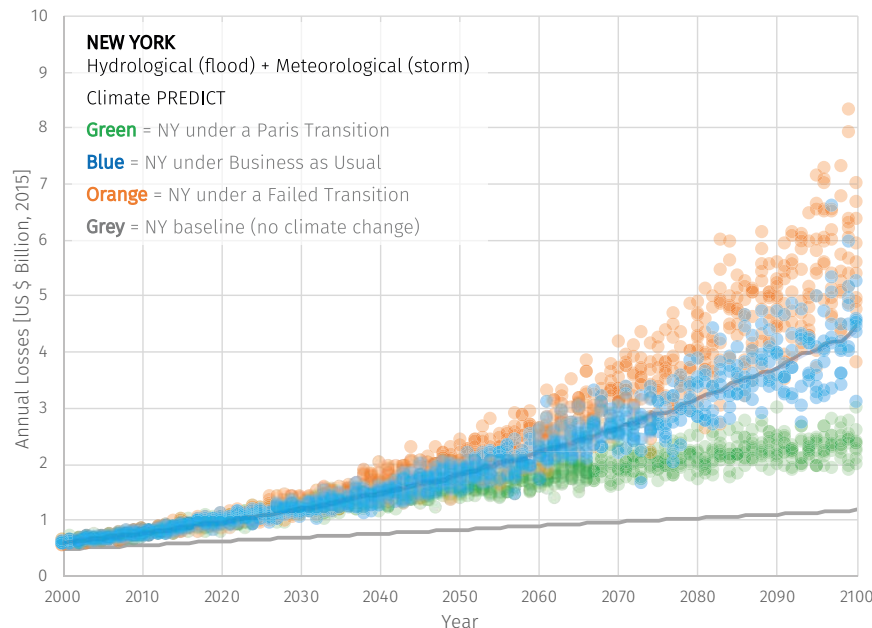
Figure 2 All perils picture under a Failed Transition Pathway from 2020 to 2100

World Extreme Weather Frequency, Failed Transition Pathway

Legend:
- Climatological - Climate Attributable
- Climatological - Non-Climate Attributable
- Hydrological - Climate Attributable
- Hydrological - Non-Climate Attributable
- Meteorological - Climate Attributable
- Meteorological - Non-Climate Attributable

Y-axis: Number of Loss Events
X-axis: Year

Understand Your Physical Risk Exposure
Comparing flood losses in London and New York City

*"The U.S. has sustained 279 weather and climate disasters since 1980 where overall damages/costs reached or exceeded $1 billion (including CPI adjustment to 2020). **The total cost of these 279 events exceeds $1.825 trillion.**" -NOAA 2020*

NEW YORK
Hydrological (flood) + Meteorological (storm)

Climate PREDICT

Green = NY under a Paris Transition
Blue = NY under Business as Usual
Orange = NY under a Failed Transition
Grey = NY baseline (no climate change)

LONDON
Hydrological (flood) + Meteorological (storm)

Climate PREDICT

Green = London under a Paris Transition
Blue = London under Business as Usual
Orange = London under a Failed Transition
**Grey** = London baseline (no climate change)

Under a Failed Transition (orange), New York's flood losses are expected to increase 4.5 times between 2000 and the end of the century, whereas in London the increase in flood losses are slightly less pronounced (4 times).

On the other hand, when comparing the two cities under a Paris Transition (in green), we observe that both will see their flood losses slightly more than double by end of century and thus curbing flood losses to around US$ 2-3billion and US$ 4-5billion respectively.

The findings presented in this case study first of all illustrate that investors should consider the geographical location and implied climate-related extreme weather exposure when determining the allocations to real estate, infrastructure, or any other physical assets. Secondly, investors should incorporate not only gradual physical risks but also extreme weather risks on the total economy and all asset class expected risks and return.

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Insights You'll Receive
Our three-module offering

The offerings will show estimates of the changes in extreme weather frequency, economic losses ($), and GDP impact over various climate pathways. Extreme weather impacts can be attributed to climate-induced and non-climate factors. These analyses are available in three different modules:

Dashboard Access

Dataset License

Consultancy & Bespoke Projects
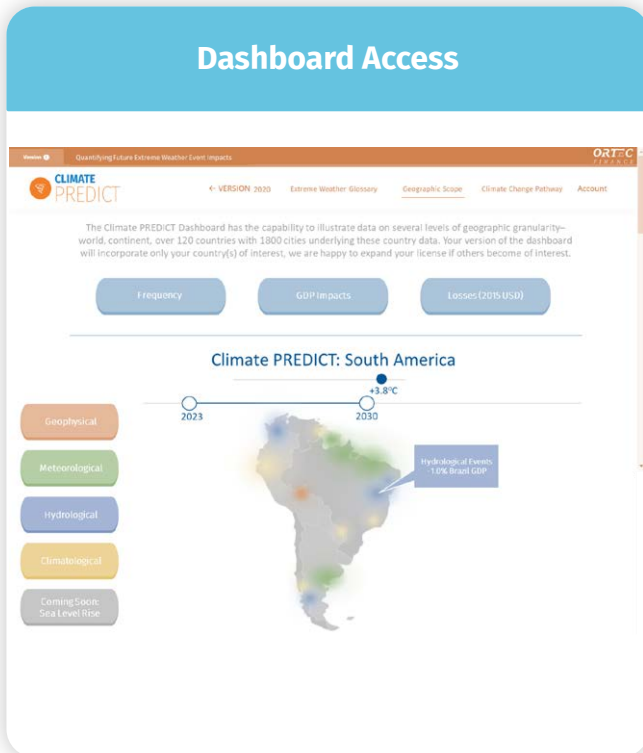
Access to our Climate PREDICT dashboard with interactive map visualizations and associated narrative texts
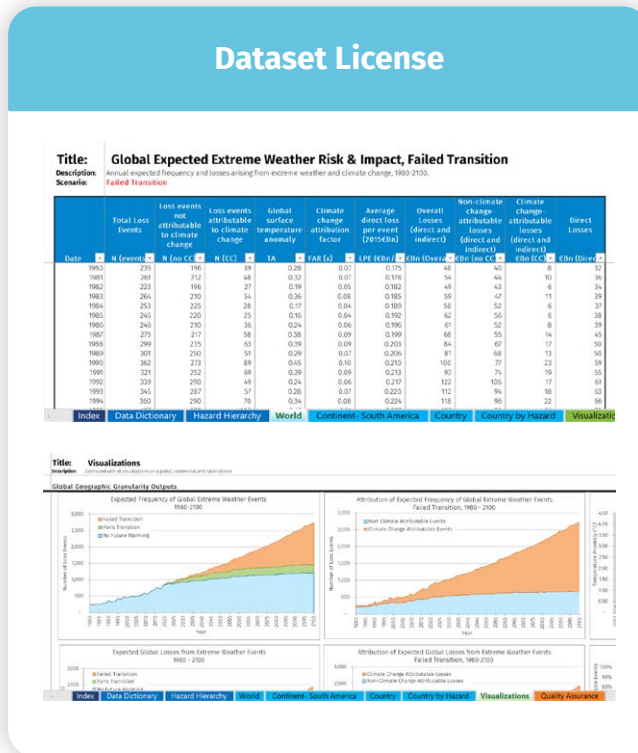
Dataset license for your country of interest. This is provided in conjunction with continent and world level data

Consulting support and bespoke projects such as a zoom-in on a specific country/region, overlays with own in-house data. For example, how will extreme weather event losses change in a post-COVID world?

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The Compass
Climate & ESG Solutions
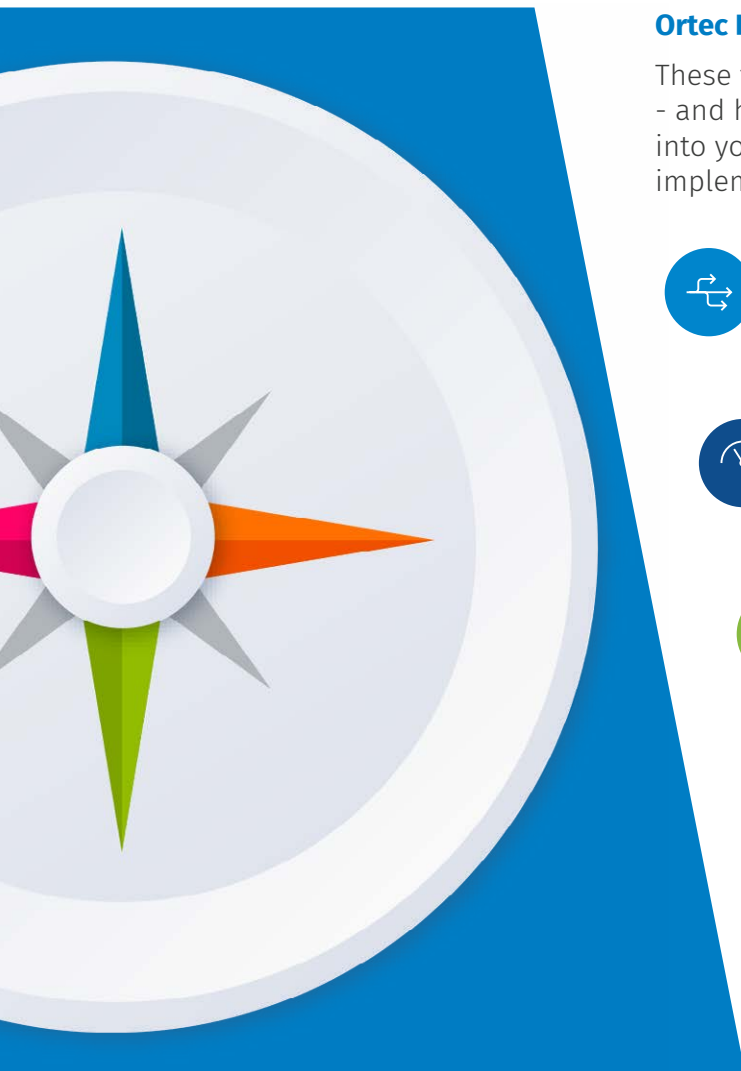
Ortec Finance has developed five tools to support you as an investor to navigate climate change.

These tools offer economic and financial insights into your investments' vulnerabilities and opportunities - and how to act on them. Insights are **quantified** and expressed in **financial metrics** for easy integration into your investment decision-making & reporting frameworks. Our tools can be integrated into **software**, implemented separately, or utilized in various combinations depending on your **specific needs**.

CLIMATE
MAPS

Maps out your portfolio's exposure to systemic, economic and financial climate risks.

In partnership with Cambridge Econometrics

CLIMATE
SIGNS

Signposts the world's actual climate trajectory.

CLIMATE
ALIGN

Monitors portfolio alignment with net-zero GHG emissions by 2050.

CLIMATE
PREDICT

Assesses your real assets' exposure to future extreme weather events.

ESG
RADAR

Alerts you to material ESG breaking news.

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Do you have other challenges?
Other solutions provided by Ortec Finance

	Insurance Companies	Pension Funds	Sovereign Wealth Funds	Wealth Management / Banks	Asset Manager
GLASS for Pensions and Insurance — Asset and liability scenario solution that improves financial decision making and risk management by simulating the short and long-term solvency position.	✓	✓	✓		✓
PEARL — The acclaimed performance measurement & attribution solution.	✓	✓	✓		✓
OPAL — Goal-based financial planning and monitoring solution.	✓	✓		✓	✓
Real world economic scenarios — Ortec Finance Scenarioset (OFS) generated by the Dynamic Scenario Generator (DSG). Ortec Finance also offers Risk Neutral scenarios	✓	✓	✓	✓	✓

Contact Us
Speak to one of our experts

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Ortec Finance is a leading provider of technology and solutions for risk and return management.

It is our purpose to enable people to manage the complexity of investment decisions. We do this through delivering leading technologies and solutions for investment decision making to financial institutions around the world. Our strength lies in an effective combination of advanced models, innovative technology and in-depth market knowledge. This combination of skills and expertise supports investment professionals in achieving a better risk-return tradeoff and thus better results.

Headquartered in Rotterdam, Ortec Finance has offices in:
Amsterdam, London, Toronto, Pfäffikon and Melbourne.

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20+ countries represented

500+ customers

96% retention rate

3 trillion euro total assets managed by our clients

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