



Green RWA and the CERM

November 2022



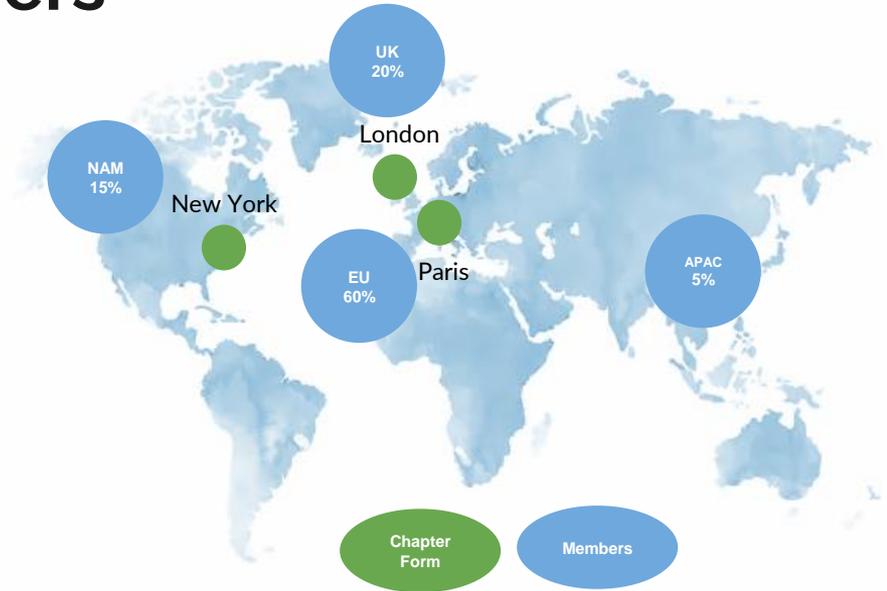
Agenda - 40 mns

- Introductions
- GREEN RWA overview
- CERM Presentation
- Sandbox and practical approach discussion



GREEN RWA in Numbers

- **85** Members
- **10** Corporate members
- **70+** Engagement with financial actors
- **2,200** LinkedIn followers
- **15** Events held



Corporate Members



FORRS

FORRS Partners is an expert consulting firm in the financial, energy and commodities industries. Founded in 2015, FORRS focuses on mission-critical projects along the complete trading value chain to service clients who are actively participating in all kinds of markets.



Square

Founded in 2008, Square is a strategy and business consulting group that brings together 7 medium-sized firms in France, Belgium and Luxembourg. Circle, Tallis, Viatys, Vertuo, Adway, Initio Belgique, Initio Luxembourg et Flow&Co are consulting firms specialized in trade, activity sector or level of intervention. The firms complementarity allows Square to address, with more than 700 consultants, the most complex projects of its clients. The partnership with Green RWA stems from a Research program dedicated to 'Modelling the impact of physical and transition risk on banks and insurances solvency', paired with the responses to the challenges of Climate Responsibility that Square is developing for and with its clients.



Ginini Antipode

Ginini Antipode is a French consultancy supporting finance departments in their daily operations (finance role replacement) and helping them to execute structural projects (changing systems, finance process re-engineering, fast close, mergers/acquisitions, business model overhauls, finance transformations, etc.).



ActiveViam

ActiveViam has provided cutting-edge data analytics technology to leading companies since 2005. ActiveViam is the creator of ActivePivot, atoti and Atoti+.

Our mission at ActiveViam is to bring powerful data analytics to every person, every team, every business who needs it. Our software tools give everyone the opportunity to directly and considerably impact their business. To this end, we support our clients in fulfilling their specific goals with a range of business solutions designed to help them make better data-driven decisions, faster, and continuously improve their operational efficiency. We also provide technological support so clients can build their own, powerful data analytics apps and deploy those apps at scale.



Synechron
Digital Business Consulting Technology

Synechron is a leading Digital Transformation consulting firm focused on the financial services industry and is working to Accelerate Digital Initiatives for banks, asset managers, and insurance companies around the world. Synechron uniquely delivers these firms end-to-end Digital, Consulting and Technology capabilities with expertise in wholesale banking, wealth management and insurance as well as emerging technologies like Blockchain, AI, and Data Science. Based in New York, the company has 22 offices around the globe, with over 10,000 employees producing over \$650M+ in annual revenue. For more information on the company, please visit our [website](#) or our [LinkedIn](#) community.



Lunalogic

Created in 2000 by Fadila Palmer, Lunalogic is an expert firm in finance with a 360° approach covering business lines, processes and technologies. Very active in the banking sector, Lunalogic also addresses asset management companies, insurances, energy companies through its two poles of competence: Businesses and Technologies. Research and Development and continuous training federate the expertise of Lunalogic, historical partner of the Finance Innovation Cluster of Paris EUROPLACE. For this, Lunalogic has developed a privileged relationship with the Grandes Ecoles of Engineering and the major universities in the field of finance, in order to surround itself with the best talents and to develop the skills of its employees.



DOMOS fs

DOMOS is the Software-as-a-Service solution dedicated to Alternative Investment Funds: Private Equity, Real Estate, Debt and Infrastructure. It offers first class digitalised investor and investment experience and allows to cut costs (saving time), gain control, and comply with regulations.



amalthea
TECH FOR GREEN FINANCE

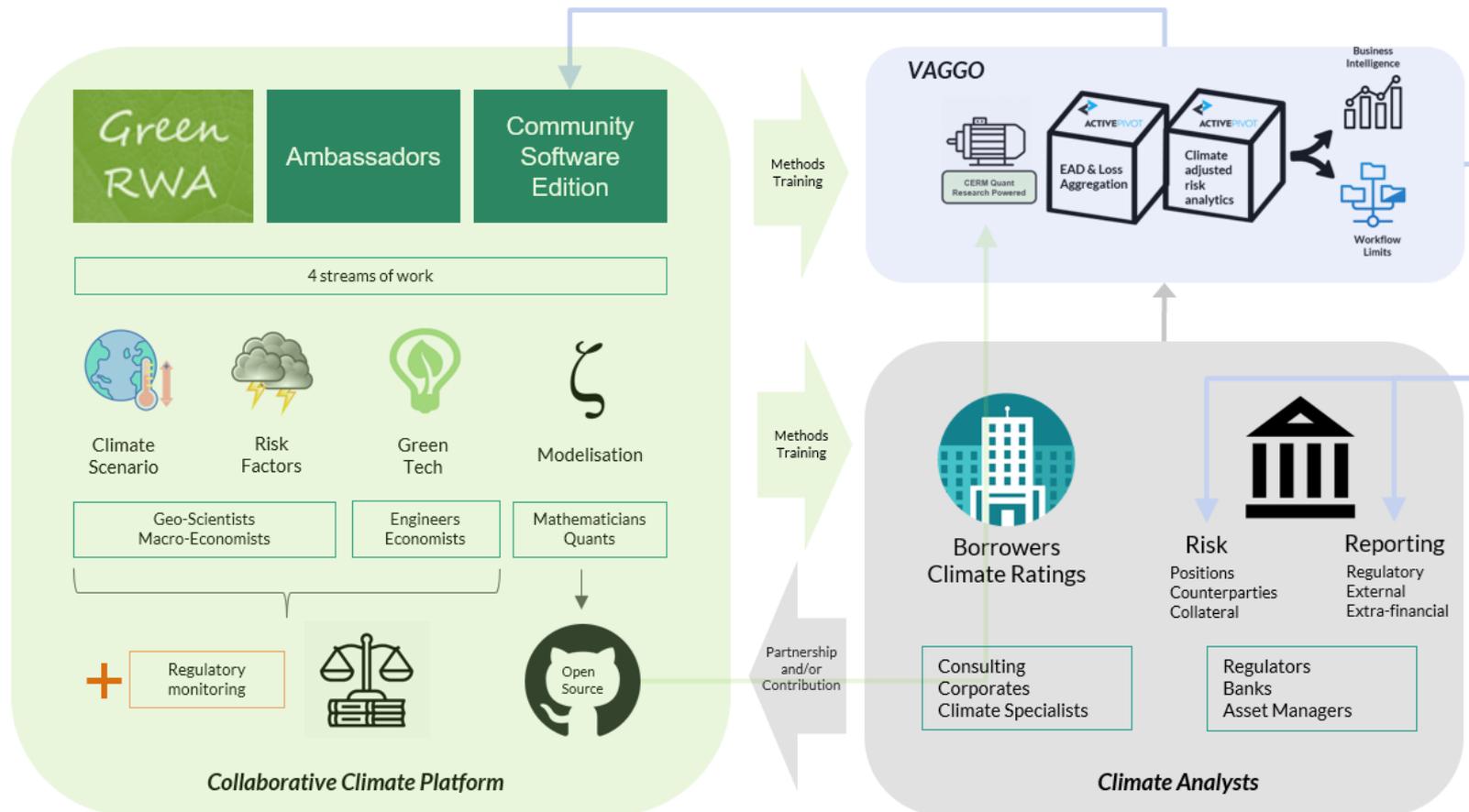
Founded in 2021, [Amalthea fs](#) is a fintech that believes that technology will be key for Financial Institutions to transition to Net Zero targets and that open and cloud-based frameworks will accelerate and optimise the journey.



International Institutions main contacts

IFC	Peter Cashion - June 2022
CSLN	James Vaccaro - April 2022
IMF	Charlotte Gardes - January 2022
ECB	Irene Heemskerk - Climate Hub - December 2021
FED	Kevin Stiroh - Climate Supervision Committee - November 2021
UNEP FI	David Carlin team - Q2 2021
GARP	Jo Paisley - 2020
PRMIA	Elmarie van Breda - Q1 2021

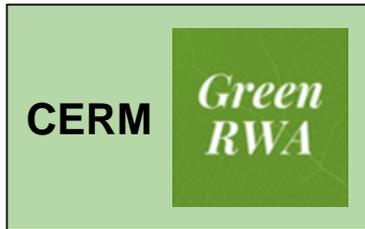
Collaborative Platform





CERM Presentation

Why extending credit risk models to climate risk ?



Extension of the regulatory credit risk model to increasing climate risk factors.

Compute **climate-extended metrics** for climate reporting/disclosure

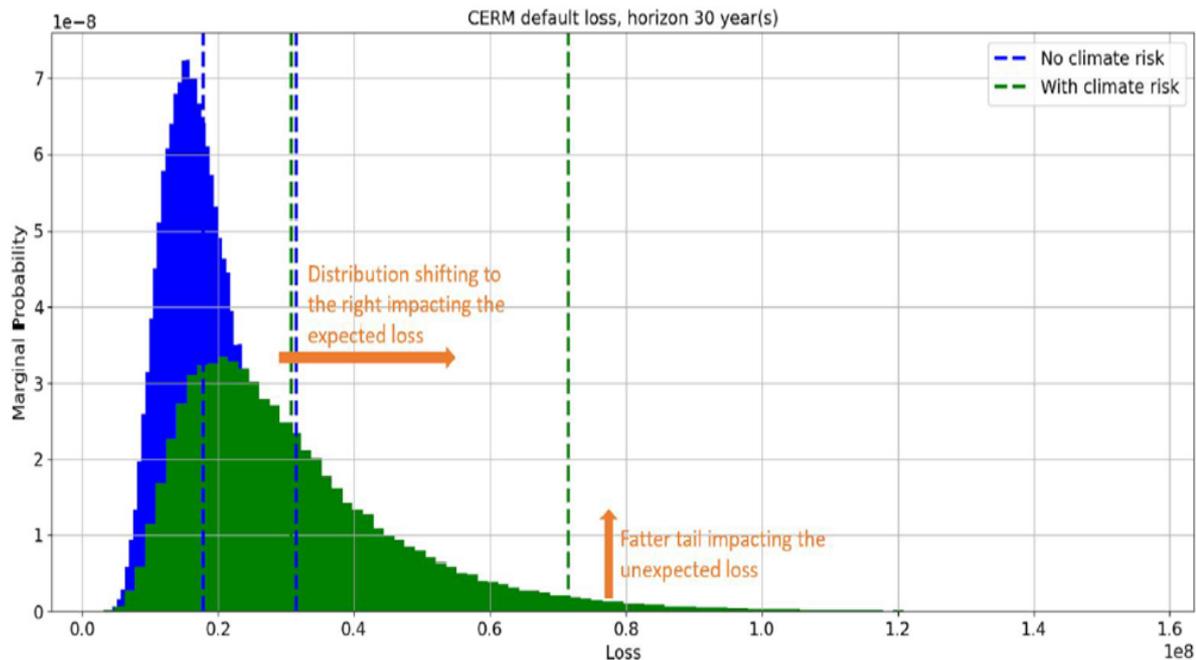
Assess **sustainability** of **net-zero transition scenarios** of lending portfolios under non stationary climate risk factors

Provide steering tools to capture **profitable financing opportunities** of **transition projects**

Context for CERM: what for?: illustrative graph

Due to their **systematic** nature, accounting for climate risks increase both the **expected loss** and the **unexpected loss** of a bank lending portfolio.

In the absence of net-zero transition of the lending portfolio, the losses **increase in time** with climate risk factors.



Loss distributions for an input portfolio for a given climate scenario, without climate risk (blue) and with climate risk (green)

The CERM



Borrower climate exposure:

- Carbon emission
- Taxonomy alignment
- Asset localization
- ...

Climate sensitivity *

Stochastic Climate Model

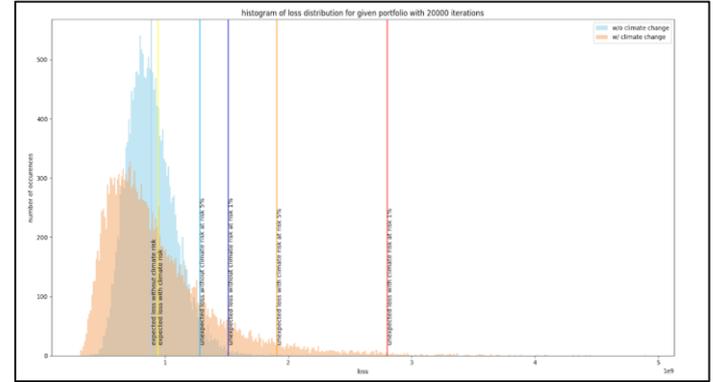
Climate Scenario **

CERM[®] by **Green RWA**

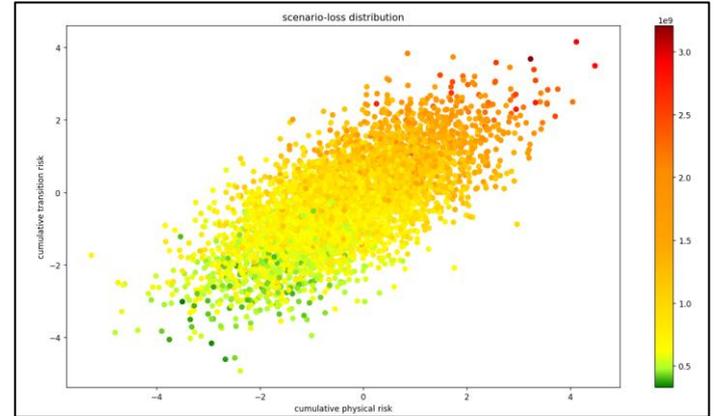
Ratings table Loan portfolio

Bank

Lending portfolio loss distribution with and without climate risks



Lending portfolio loss

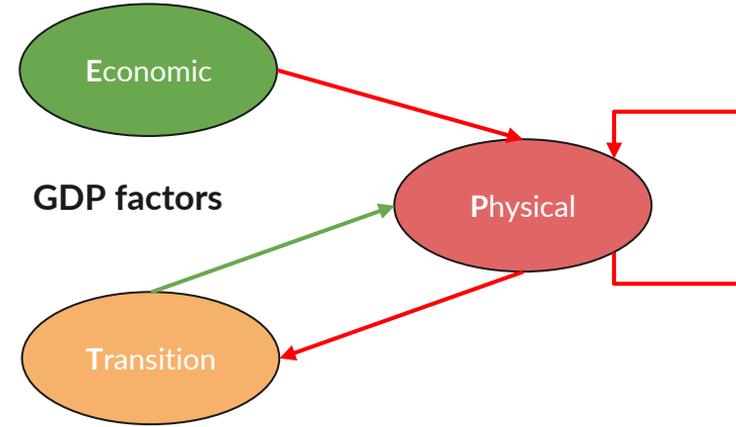


*: micro-correlations
 **: macro-correlations

Stochastic Climate Model

Objective: probabilize the physical and transition forward looking scenarios in order to calculate the default loss distribution of a bank loan portfolio.

1. Climate risks are additive to historical economic risks.
2. Physical risk add up with a growing incertitude over time as the climate reacts to the accumulation in the atmosphere of excessive carbon emission.
3. Accumulated transition efforts reduce climate change damage by adapting the economy and mitigating the new carbon emission.
4. Transition efforts partially stem from the political pressure and ecological awareness generated by climate change.



Climate risks are interdependent and we model the relationships between three GDP factors

$$GDP^t = GDP^{t-1} \exp [R^t + Y_E^t - Y_P^t - Y_T^t]$$

$$\begin{cases} Y_E^t = e\epsilon^t \\ Y_P^t = (1 - \gamma)Y_P^{t-1} + \gamma Y_E^t - (\alpha + \gamma)Y_T^t + p\epsilon^t \\ Y_T^t = \beta Y_P^{t-1} + \theta\epsilon^t \end{cases}$$



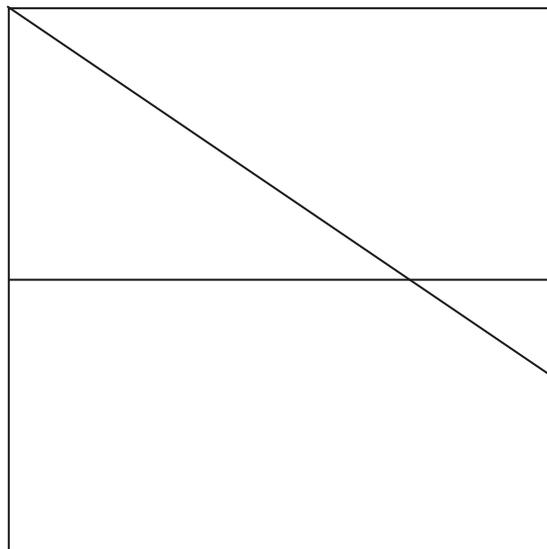
Sandbox demo



**Thank you.
Any questions?**



Average
credit
rating



Average
climate
exposure