

ABSTRACT

We present a methodology to develop the integrated climate change transition and physical risk assessment of industrial plants. We analyse data from **70,000 companies** and their **170,000 plants**, which report to fragmented **Pollutant Release and Transfer Registers and Greenhouse Gas Reporting Programs**. We show that climate change transition and physical risks are not correlated, therefore **there are no corporate winners or losers of climate change** in general.

Keywords: sustainability, CSRD, SDGs.

MATERIALS & METHODS

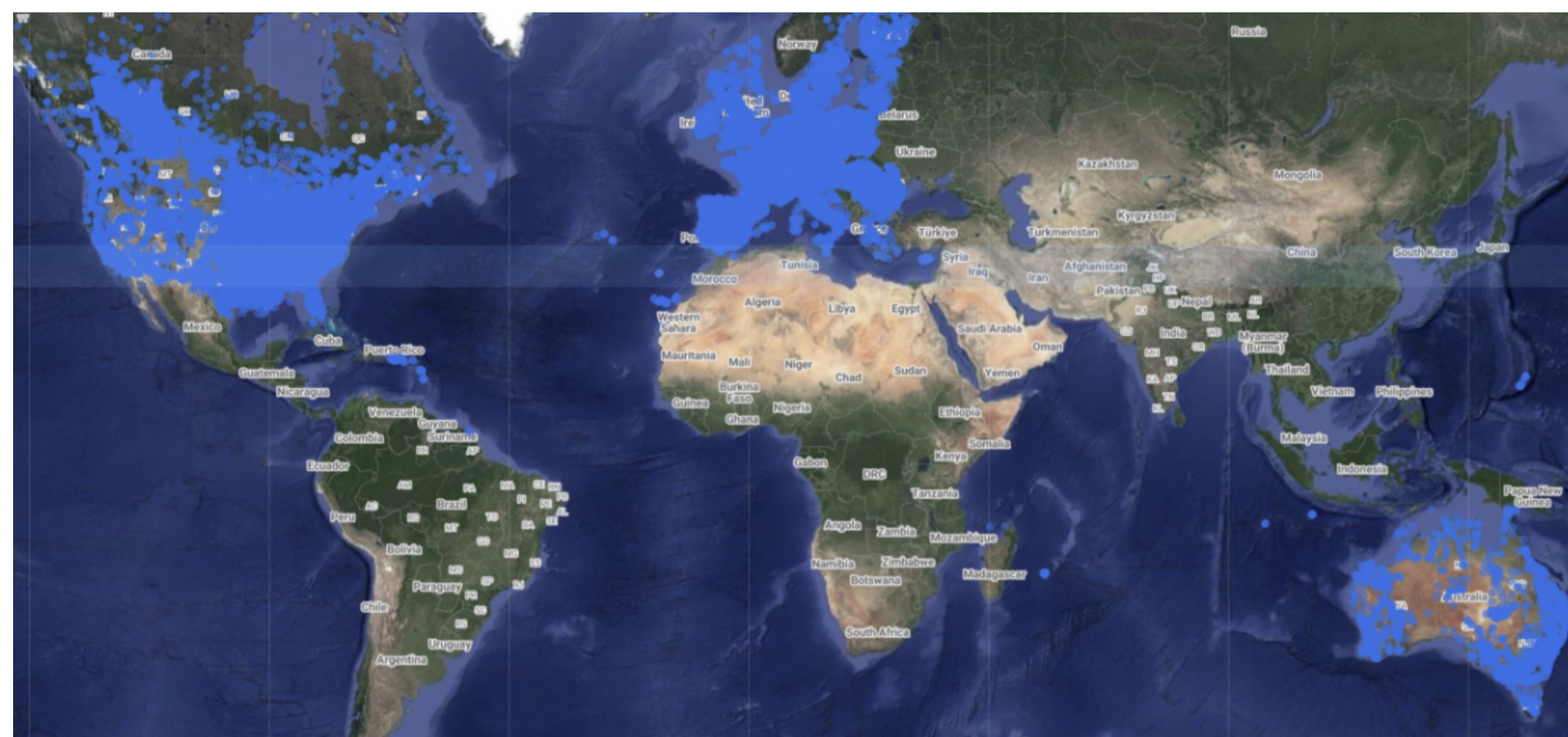


Figure 6: Company locations in the sample

Institution	Reporting program, database	Country
European Environment Agency	EU Pollutant Release and Transfer Register	European Union
Environmental Protection Agency	Toxic Release Inventory	United States
Environmental Protection Agency	Greenhouse Gas Reporting Program	United States
Australian Government	National Pollutant Inventory	Australia
Government of Canada	Greenhouse Gas Reporting Program	Canada, United States
Clean Energy Regulator	National Greenhouse and Energy Reporting	Australia
Australian Government	National Pollutant Release Inventory	Australia

Abbreviations of institutions, programs and databases
 European Environment Agency (EEA)
 Environmental Protection Agency (EPA)
 Toxic Release Inventory (TRI)
 Facility Level Information on Greenhouse Gases Tool (FLIGHT)
 National Pollutant Inventory (NPI)
 Clean Energy Regulator (CER)
 National Greenhouse and Energy Reporting (NGER)
 Greenhouse Gas Reporting Program (GHRP) - There are two separated programs with identical program names for Canada and the United States.
 National Pollutant Release Inventory (NPRI)

Figure 7: Data sources by institution, reporting program and country

REFERENCES

- [1] Szilárd Erhart, Sándor Szabó, and Kornél Erhart. Climate change risks of industrial companies in AU, CA, the EU and the US. *forthcoming, preprint*.
- [2] Szilárd Erhart and Kornél Erhart. Environmental ranking of european industrial facilities by toxicity and global warming potentials. *Nature Scientific Reports*, 2023.

INTRODUCTION

Albeit climate-related financial disclosure is becoming a universal norm, **firms' TCFD/climate risk disclosures are prone to become a 'ceremonial' practice with 'cheap talk', 'green wash' or 'cherry-picking'** and reporting of primarily **'non-material'** climate risk information. The methodology developed by the present study gives insight for policy makers and corporations on the potential strategies towards managing these risks.

RESULTS 2 - CORRELATIONS

Low correlations, except for the pair of heat risks and photovoltaic potential.

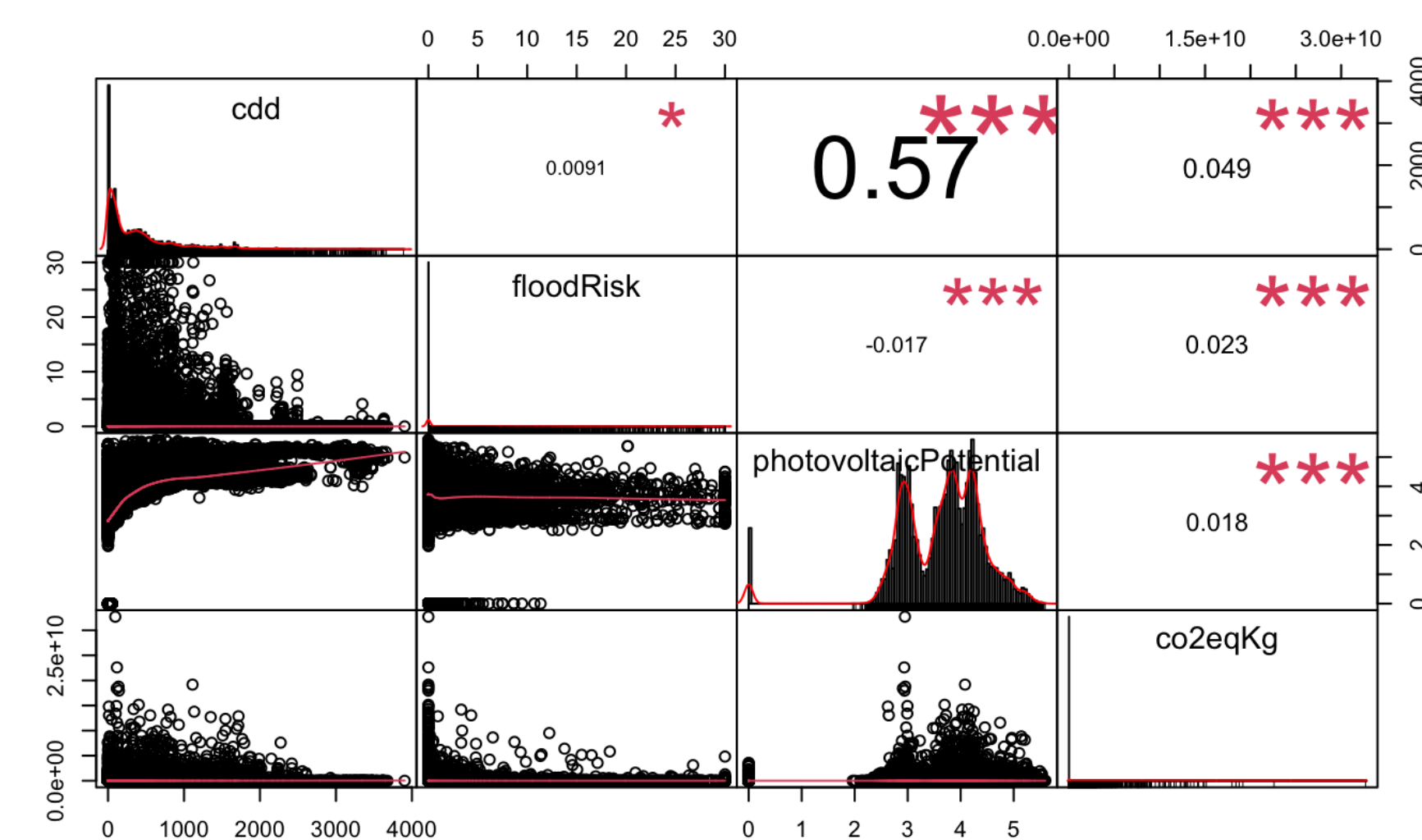


Figure 8: Histogram, pairwise Pearson correlation and significance and scatter plot of plant level climate change indicators

RESULTS BY CLIMATE THEMES

Different climate change risk indicators cannot be directly compared, as they are measured on different scales and in different units. Hence, we also converted original values into normalized scores. Heat risk is estimated to be higher for firms in the US, in the Mediterranean countries of Europe and in Australia, while lower for firms located in Canada and Northern European countries (UK, Sweden, Norway). On the continental level industrial firm locations in Central Europe have been most vulnerable to flood events in the past. More detailed visualisation on the plant level data reveals that there are several plants in Eastern States of the US which are exposed to higher level of flood risks.

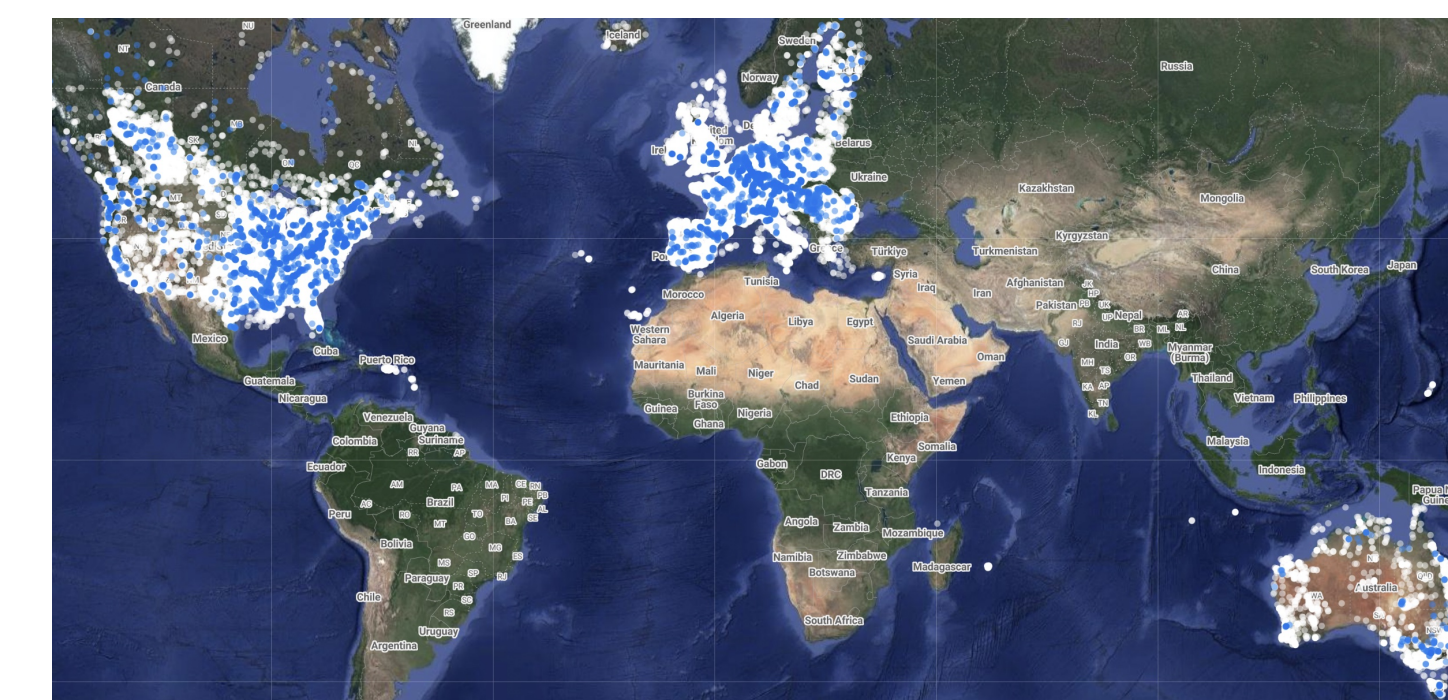


Figure 1: Flood exposure of industrial company sites in the sample in meter

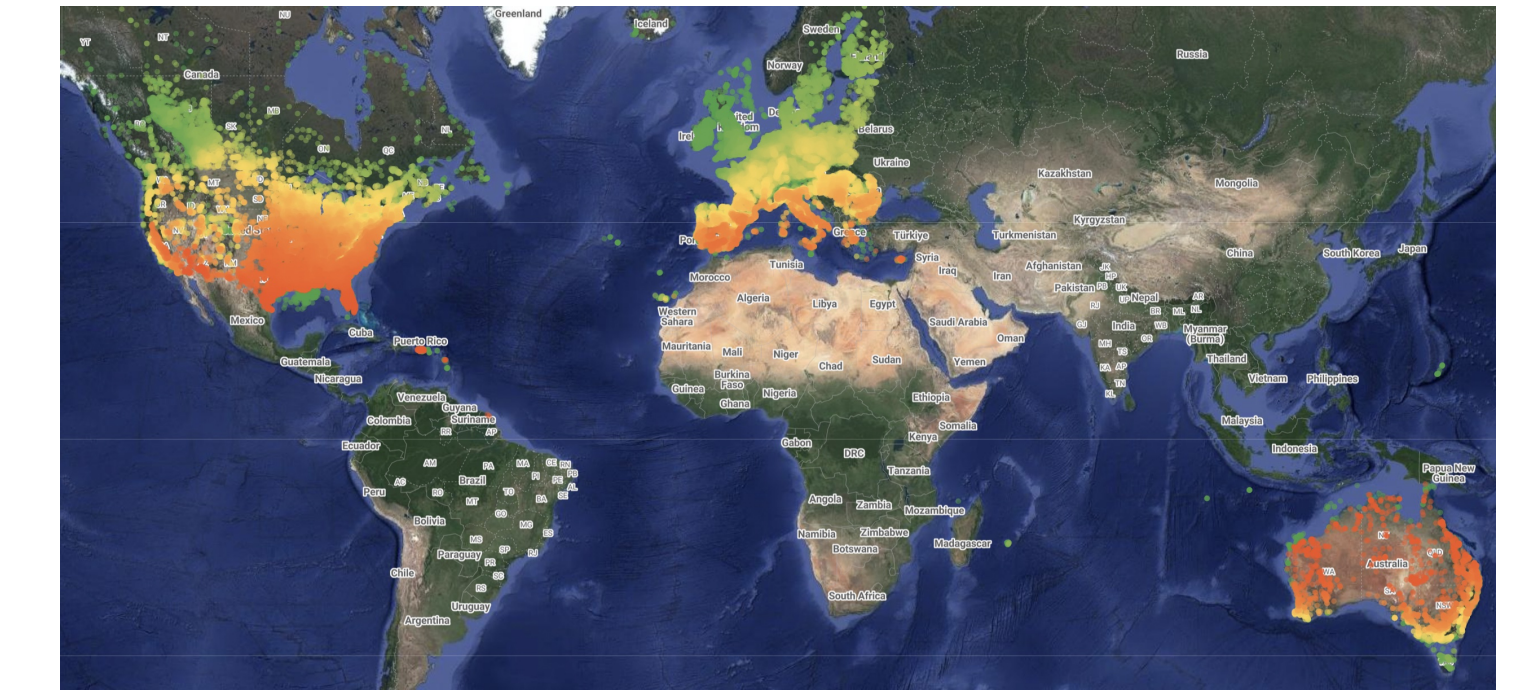


Figure 2: Heat risk of industrial company sites in the sample in Cooling Degree Days

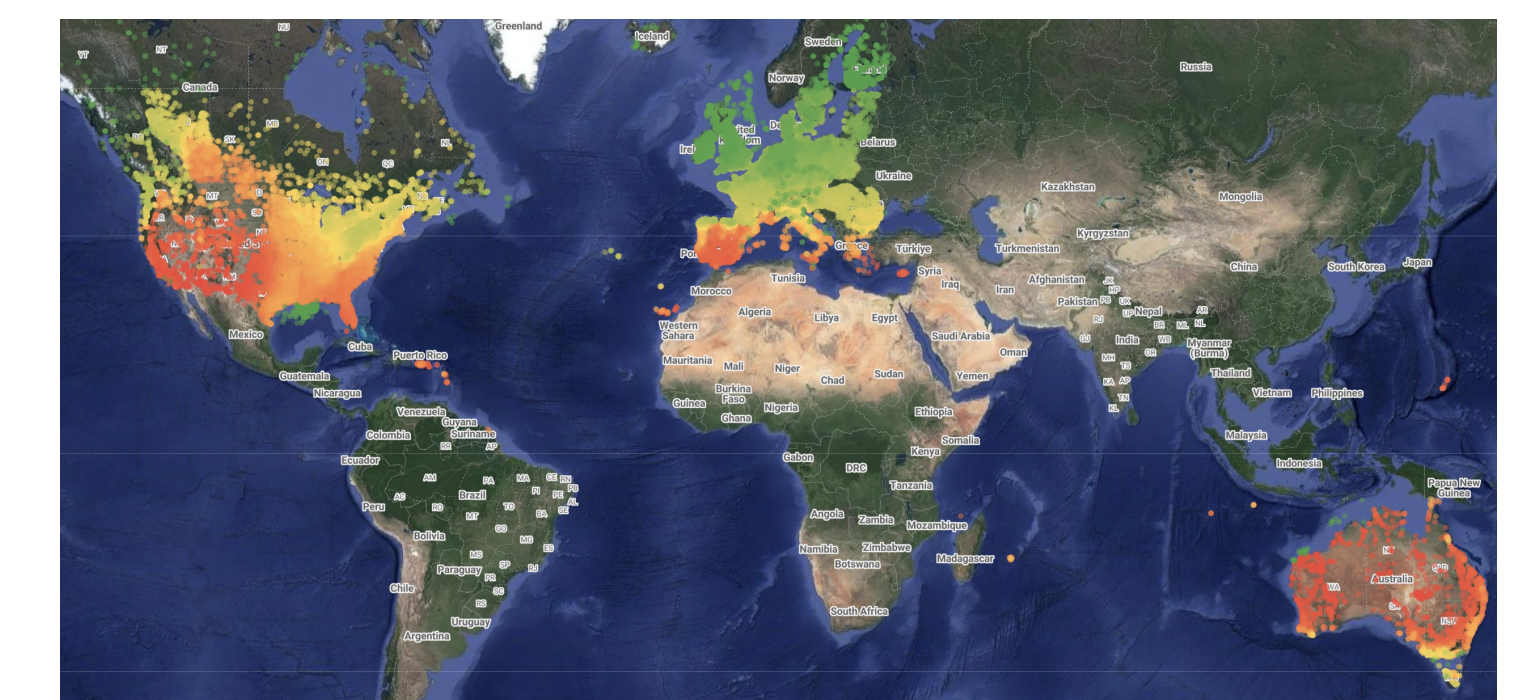


Figure 3: Photovoltaic potential of industrial company sites in the sample in KWh

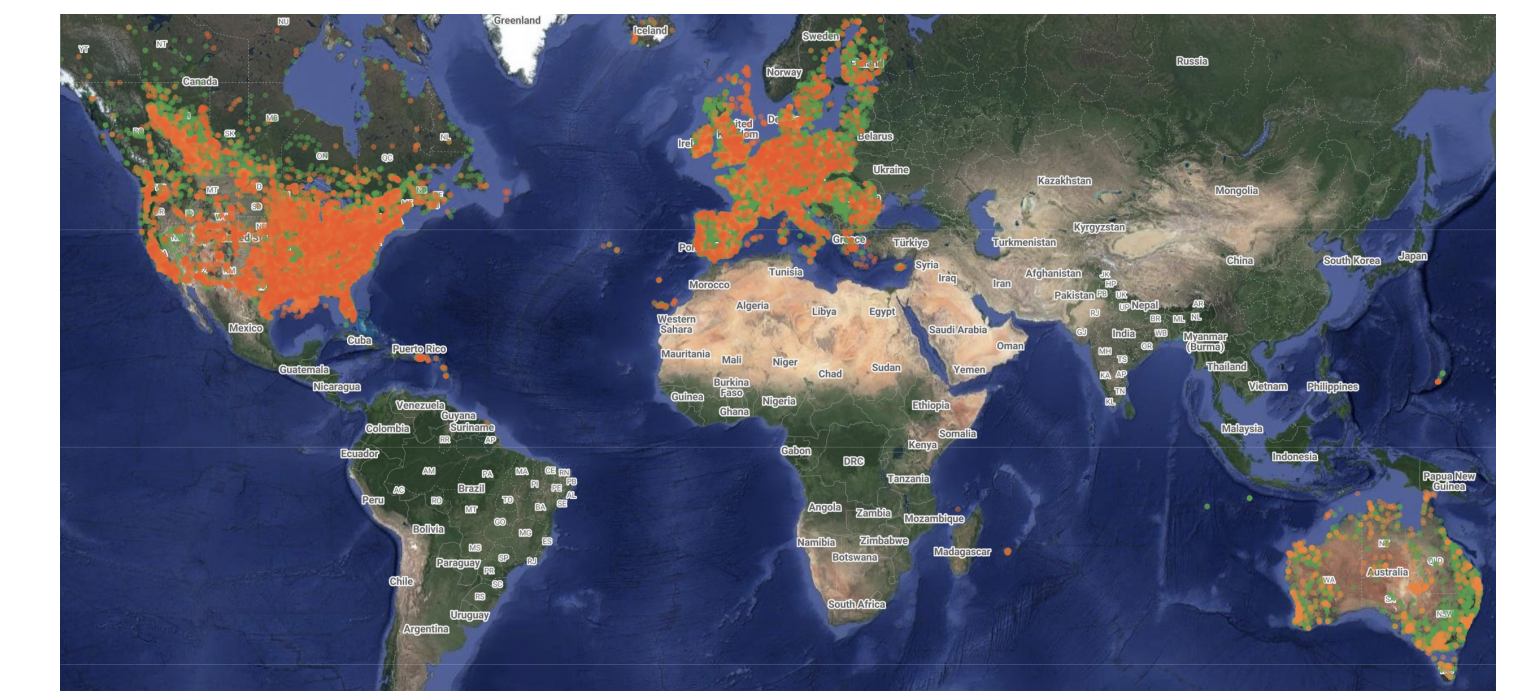


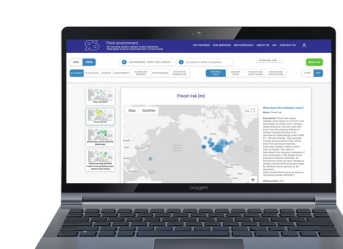
Figure 4: Greenhouse gas emission of industrial company sites in the sample in CO2 equivalents

CONCLUSION

The research uncovers a lack of strong correlation between climate change transition and physical risks, emphasizing the challenges in managing global climate change risks. As climate-related financial disclosure becomes a universal norm, this research contributes to the evolving landscape of climate risk management and underscores the importance of standardized methodologies in the face of impending regulatory changes

EIC ACCELERATOR - ESRS-CSRD PROJECT SITE

A platform with 70K companies in 30+ countries.



+FRAMEWORKS> CSRD,SDGs

+SEARCH> ISIN, company name, ticker or symbol
+GET INSIGHT> map, chart, headline value, year-on-year change, score

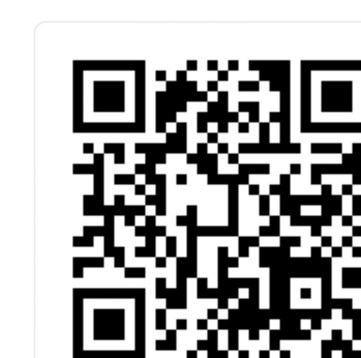


Figure 5: ESRS project site
<https://www.r6bros.eu>

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