

Climate and Environmental Risk Data in Italy

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1. Foreward and Structure of the paper

2. The sustainable data gap in Italy

- Data required for economic and financial analysis of climate risks
- Data required by financial intermediaries to respond to requests from supervisors
- Available data
- Data available but not accessible

3. Conclusions



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Questioni di Economia e Finanza

(Occasional Papers)

Data and methods to assess climate-related
and environmental risks in Italy

by L. Lavecchia, J. Appodia, P. Cantatore, R. Cappariello, S. Di Virgilio,
A. Felettigh, A. Giustini, V. Guberti, D. Liberati, G. Meucci, S. Piermattei,
F. Schimperia and K. Specchia

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- **Research context and motivation: Rising Demand for Climate Data**

Mitigation and adaptation to climate change are top priorities. Lots of public-private resources needed. Global initiatives have increased demand for climate-related data in sustainable finance and risk management.

- **Regulatory Pressure in Europe: Data Requirements**

European regulations push firms for comprehensive climate disclosures, intensifying reporting expectations. Goal is to enhance risk management and ensure compliance with regulatory climate requirements set by supervisory authorities and regulatory frameworks.

- **Sustainable Data Gap Challenges**

Huge demand for high-quality microdata.

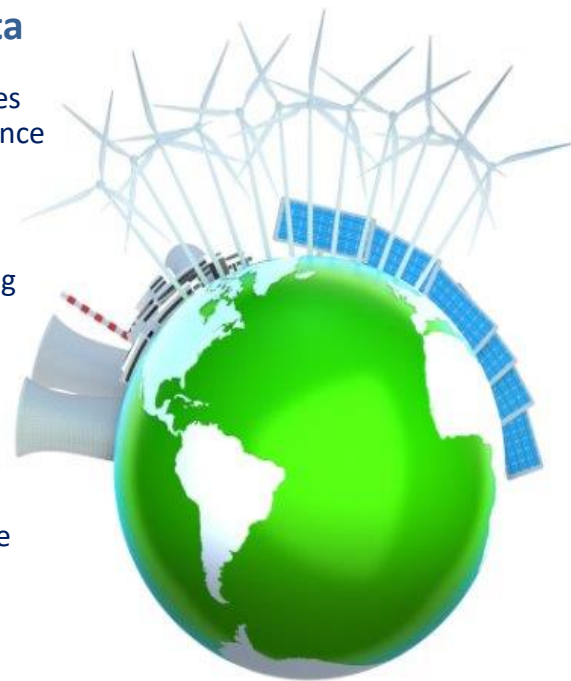
Missing/insufficient data concern: GHG emissions, energy use, physical/transition risk exposures; insurance protection gap and peril-specific economic losses; integration of climate scenarios into financial models; granular data for SMEs.

Private data providers offer partial solutions, but suffer from low transparency on the methodology involved and inconsistency (uncorrelation among scores/ratings).

The study maps available sources, assessing accessibility and quality for risk management.

- **Italy's Data Limitations and constraints**

Research focuses on identifying sustainable data gaps related to climate and environmental risks in Italy.



What about existing public data sources?

1. What data is required?
2. What data is already available?
3. Where is the *sustainable data gap* in Italy?

- **Physical Climate Risks:** physical risks result from extreme weather damaging infrastructure and disrupting operations.
 - **Transition Climate Risks:** transition risks arise from policy changes and market shifts affecting asset values
 - **Risk Evaluation and Mitigation:** comprehensive data is crucial to assess impacts and develop mitigation strategies. Accurate risk assessment depends on detailed data like geolocated risk maps and firm-level energy use.
- Pressure from stakeholders to commit to Net zero; align firms' performances to climate benchmarks
 - Define mitigation/adaptation plans
 - Measure and manage physical and transition risks
 - Decline climate scenarios
 - Country view: current exposure, vulnerability and available insurance coverage for climate risks

	Ante 2022	2022	2023	2024	2025	2026	...
NFD		Disclosure ESG as defined in the NFRD		Disclosure ESG as defined in the CSRD/EFRAG schemes			
Scope		Large listed undertakings, banks, insurances (relevant Public interest entities - PIEs)		Relevant PIEs	Relevant PIEs and large non-listed undertakings	(As 2025) + listed SMEs, small and non-complex credit institutions and captive insurance undertakings	
Taxonomy Reg.							
NFCs within the NFRD/CSRD's scope		• % of Capex, Opex, turnover from taxonomy <u>eligible</u> activities.		• % Capex, Opex, turnover from taxonomy <u>aligned</u> and taxonomy <u>eligible</u> activities.			
Banks within NFRD/CSRD's scope		• % Total assets from taxonomy- <u>eligible</u> activities.		• Green Asset Ratio (GAR) for lending and debt assets from firms covered by the NFRD/CSRD, computed according to the Capex and turnover from taxonomy <u>aligned</u> activities. % of guarantees from taxonomy <u>aligned</u> activities.		• % revenues from services different from lending from taxonomy <u>aligned</u> activities and GAR from trading activity	
Insurances within NFRD/CSRD's scope		• % Total assets from taxonomy- <u>eligible</u> activities. • % Total non-life insurance gross premiums written from taxonomy- <u>eligible</u> underwriting insurance activities		•% Total assets from taxonomy- <u>aligned</u> activities. •% Total non-life insurance gross premiums written from taxonomy- <u>aligned</u> underwriting insurance activities			
Pillar 3							
Large Institution		• Quantitative and qualitative disclosure of ESG risks		• Integration of quantitative disclosure with the Green Asset Ratio (GAR).			
All banks				• Integration of quantitative disclosure with the Banking Book Taxonomy Alignment Ratio (BTAR), scope 3 GHG emissions and alignment metrics.			
				• Extension of Pillar 3 to all banks			
Pillar 2/3		• identify any material exposure to climate change risks and, where relevant, assess the impact of climate change scenarios on their business (in the ORSA Report and public disclosure)					
Insurances							
Survey IVASS							
Insurances		• Investments broken by NACE code, data on taxonomy eligible activities, on carbon footprint and green bonds. Data on nat cat risk impact underwriting and on taxonomy <u>eligible</u> insurance activities		• Investments broken by NACE code, data on taxonomy eligible and taxonomy aligned activities, on carbon footprint and green bonds. Data on nat cat risk impact underwriting and on taxonomy <u>eligible</u> and taxonomy <u>aligned</u> insurance activities			



From
official
statistical
sources
and other
public
resources

- Eurostat environmental accounts (Air Emissions Accounts; Physical Energy Flow Account; Eurostat/Material flow accounts, Environmental taxes revenues, National expenditure on environmental protection by institutional sector)
- Climate Change Knowledge Portal, EIOPA Catastrophe data Hub
- Emissions data for EU ETS installations (EU transaction log; EUTL)
- European Pollutant Release and Transfer Register (E-PRTR)
- Dashboards: IMF - Climate change indicators, NGFS Dashboard on scaling up green finance, EIOPA Dashboard on insurance protection gap, FT Climate
- CO2 emissions data: Greenhouse Gas Emissions from Energy, Carbon Monitor and GRACED
- Real estate data: OpenStreetMap and OMI
- Data on severe weather events: European Storm Forecast Experiment (ESTOFEX) and European Severe Weather Database (ESWD)

National sources	<ul style="list-style-type: none">• ISPRA: national GHG inventory + data on water, air, sea and coasts, nature and biodiversity, climate, waste, environmental indicators, hydrogeological risk maps (IdroGEO portal);• MASE (formerly MITE): monthly data on fuel prices, oil, coal and natural gas consumption + fuel price monitoring (real-time prices) and Ecological Transition Plan;• ARERA: annual survey on regulated sectors;• DNF Observatory (University of Siena and Sustainability makers);• Istat: Household expenditure survey, household energy consumption surveys;
Risk indicators	<ul style="list-style-type: none">• JRC: DRMKC - RiskData Hub and Agri4Cast; WWF risk filter suite, Sigma Explorer, EIOPA Dashboard on Insurance Protection gap, Emergency Events Database (EM-DAT)

Green finance	<ul style="list-style-type: none">• UNEP Finance Initiative UNEP-FI• Sustainable Stock Exchange Initiative (SSEI)
Scenario data	<ul style="list-style-type: none">• NGFS: scenario data on the IIASA and Climate Analytics platform• RSE: Meteorological Reanalysis Italian Dataset (MERIDA)• CMCC: data and scenarios• OECD Climate Actions and Policies Measurement Framework (CAPMF)

1. The Sistema informativo integrato (SII) by Acquirente Unico
2. Sistema Informativo sugli Attestati di Prestazione Energetica (SIAPE) by ENEA



- The sustainable data gap is concentrated :
 - By theme: energy (use, prices, expenditure), for HHs and firms; GHG emissions; climate scenarios data; natural catastrophe risks coverages and economic losses
 - By regulations: Pillar 3, CSRD
 - By firm size: micro and SMEs

- **The financial system is increasingly committed to supporting the green transition**, yet data limitations remain a critical bottleneck, especially in assessing and managing natural catastrophe risks
- **Bridging the data gap is not just a technical challenge**—it's a strategic imperative for a resilient and sustainable financial system:
 - **High-quality, granular and forward-looking data** are essential for: internal risk analysis and transition plans, regulations, financial stability monitoring, insurance underwriting and pricing;
 - **Public data sources offer valuable insights**, but accessibility, interoperability and granularity are still insufficient
 - **The sustainable data gap persists**, notably in: Energy consumption and GHG emissions, SME-level disclosures, Insurance protection gap and peril-specific economic losses, Integration of EPCs and climate scenarios into financial risk models
- **Coordinated action is needed**: Among statistical agencies, regulators, financial institutions and data providers; To harmonize standards, improve data sharing, and support the development of robust climate risk analytics



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Thank you

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