



Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovations

AquaSPICE

WP8: Communication, Dissemination, Training and Social Awareness

AUDENCIA



The AquaSPICE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958396.



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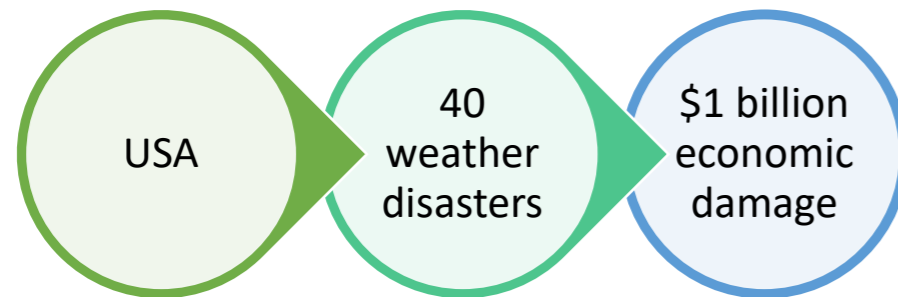
FINANCIAL RISKS

Transition risks



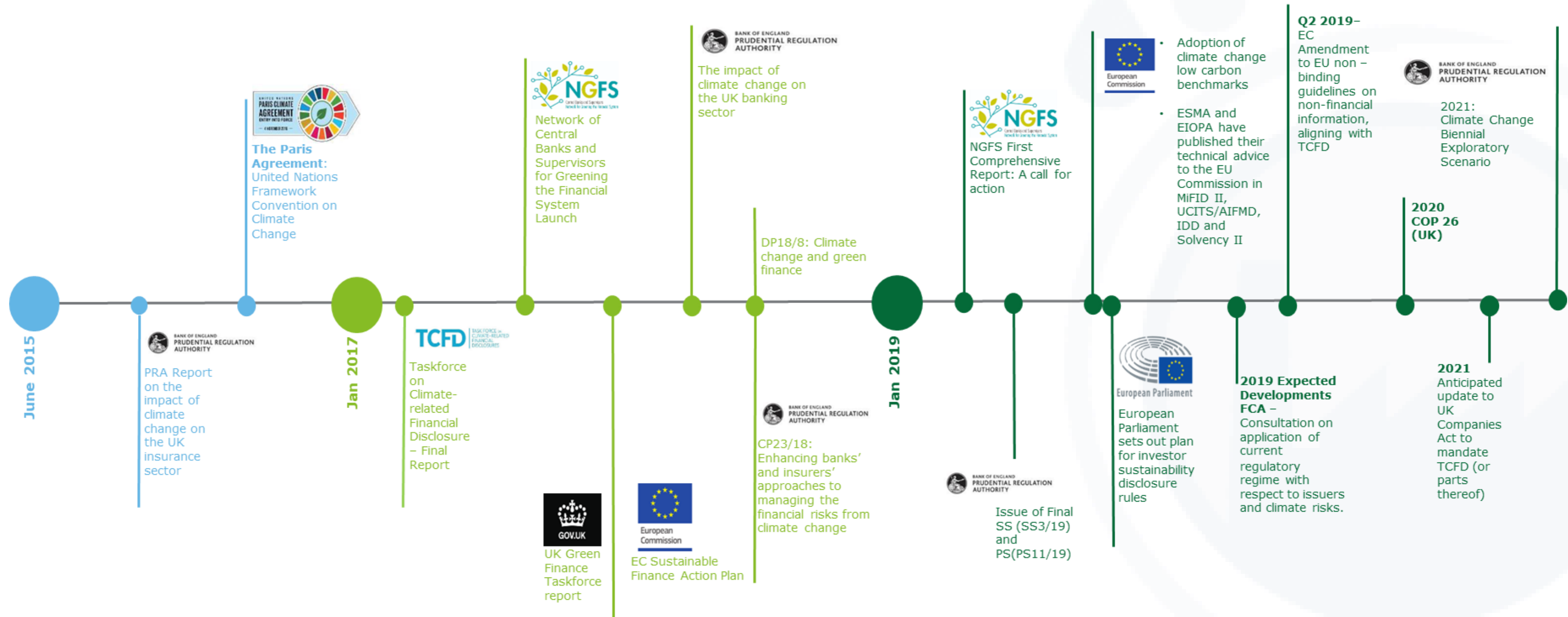
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- During the last years, climate change and its consequences to the global economy have become more transparent. Hence, financial regulators are trying to mitigate the negative impacts, by setting out a framework for a transition to a greener economy.



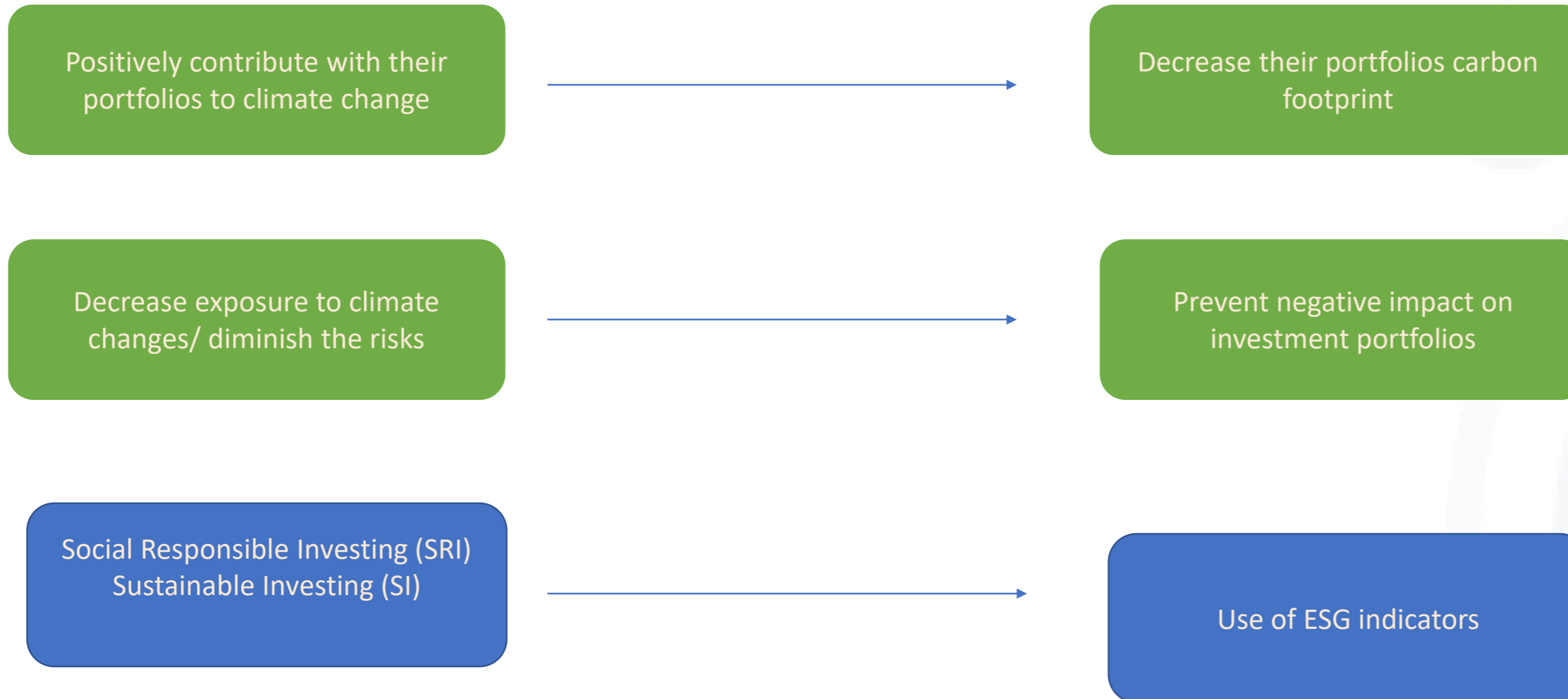
- Transition risks stemming from:
 - Technological changes
 - Innovation
 - Competition
 - Liabilities (financial compensations)
 - Changes in regulations and laws
- Physical risks: weather conditions
- What types of industries are impacted?

Governmental and regulatory framework



INVESTMENTS & RISK MANAGEMENT

MANAGING CLIMATE RISK IN INVESTMENT PORTFOLIOS



Environmental

- Energy consumption
- Carbon emissions
- Air and water pollution
- Waste management
- Water consumption
- Green energy initiatives
- Renewable energy usage

Social

- Diversity at workplace
- Customer satisfaction
- Human rights issues
- Gender equality
- Company equal treatment policies etc..

Governance

- Diversity of board members
- Executive pay
- Internal corruption
- Lobbying etc..



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CLIMATE RISKS PLANNING

Risk management



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How companies can respond to climate change?

REDUCE OR PREVENT EMISSION OF GHGS

- ✓ shifting power generation to non-emitting sources
- ✓ electrifying systems that rely on the burning of fossil fuels
- ✓ reducing emissions, through increased efficiency and decreased consumption of existing GHG-emitting activities



Mitigation



Adaptation

THE PROCESS OF ADJUSTMENT TO ACTUAL OR EXPECTED CLIMATE CHANGE

- ✓ Prepare actions to reduce their exposure to risks-
i.e. relocating vulnerable links in the supply chain

1) Develop a climate Strategy

- assessing emissions profile - tracking the quantities of GHG emissions;
- identify risks and opportunities posed or presented by emissions;
- evaluating action options for reducing emissions;
- setting GHG reduction goals and targets;

2) Focus inward

- developing the financial mechanisms to support GHG reductions;
- engaging the organisation/ personnel;

3) Focus outward

- start with formulating a policy strategy;
- identify policies and regulations;
- search an area of influence at local, regional, national level;

Source: Hoffman, A., (2014) Conference Board Director Notes, University of Michigan Ross School of Business



1. Governance:

- o Board-level engagement and accountability.
- o Integration with business strategy and risk appetite framework.
- o Evidence of how the firm monitors and manages financial risks arise from climate change (long-term view).
- o Ownership by the relevant Senior Management Function (SMF).
- o Inclusion of the sustainable finance metrics in the Group’s strategic plans.
- o Provision of adequate resources, skills and expertise, including of sustainability training to manage financial risks from climate change.

2. Risk Management:

- o Identification of material exposures to physical and transition risks.
- o Development of sustainability risk policies covering specific sectors/ customers.
- o Measurement of short-term and long-term risks.
- o Models enhanced to include climate-related risks in credit decision-making process.
- o Reporting & Management Information (MI) to drive board and senior management to discuss, challenge, and take decisions relating to the firm’s management of the financial risks from climate change.

3. Scenario Analysis:

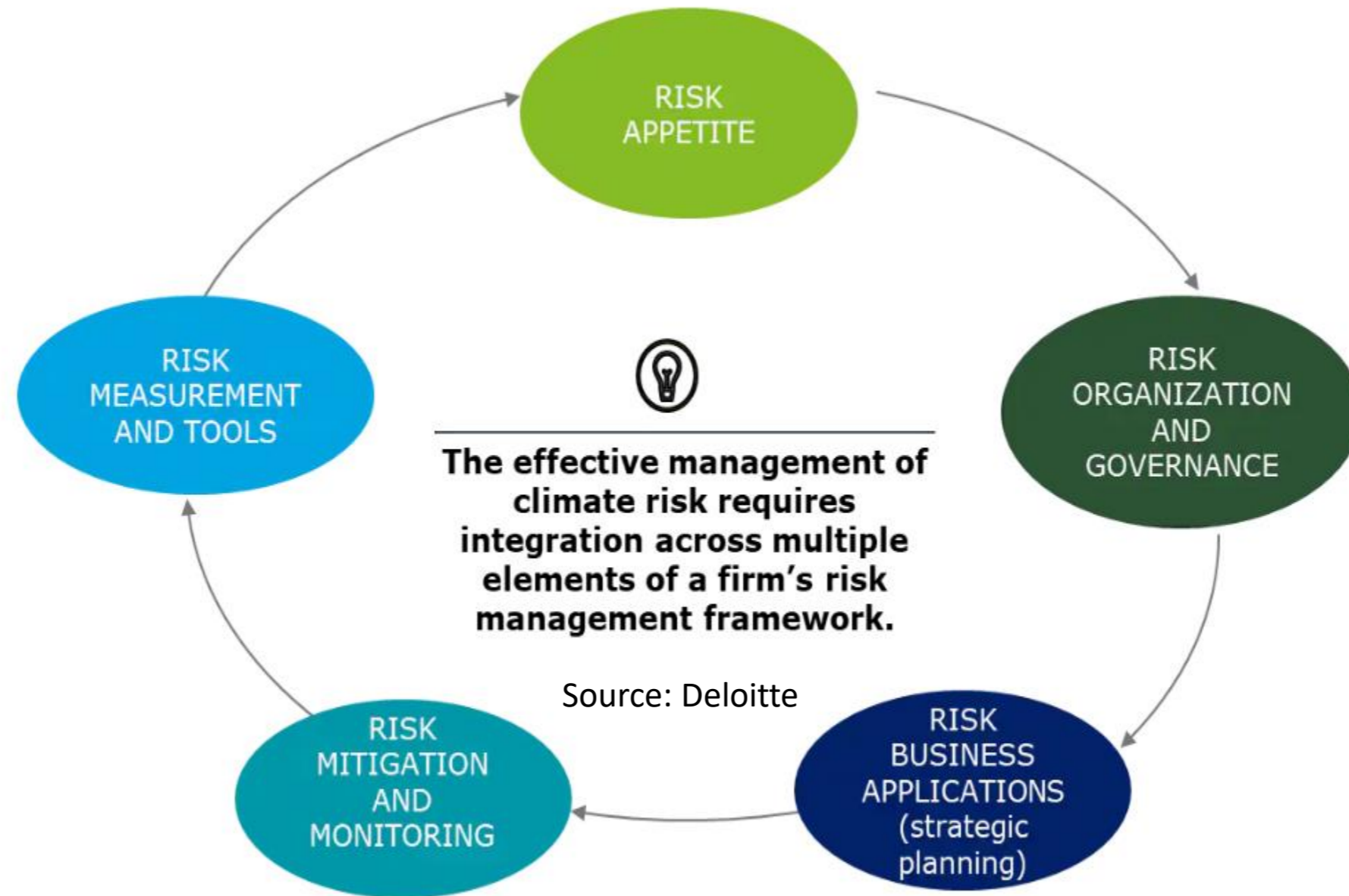
- o Inform strategic planning (short- and long-term) and determine the impact of the financial risks from climate change on their overall risk profile and business strategy.
- o Address a range of outcomes relating to different transition paths to a low-carbon economy.
- o Determine material exposures and the impact on the ICAAP.
- o Impact on the solvency and liquidity profile and realistic, credible management actions.

Source: Prudential Regulation Authority)

- **4. Disclosure:**
- Relevance within existing material and principal risks disclosures.
- Consider whether further disclosures are necessary to enhance transparency on their approach to managing the financial risks from climate change.
- Develop and maintain an appropriate approach to disclosure of the financial risks from climate change.
- Disclosure of integration into existing governance and risk management process.
- Consider engaging with the TCFD ('Taskforce on Climate-related Financial Disclosures' published recommendations in June 2017) framework and other initiatives in developing their approach to climate-related financial disclosures.

Management & identification of risks

Climate risk management is an approach which looks specifically at climate risks as part of a comprehensive risk management strategy; the risks range from extreme weather events such as storms and floods to slow-onset environmental changes such as increasing sea levels and desertification



- The Financial Stability Board (FSB) created the TCFD to develop recommendations on the types of information that companies should disclose to support investors, lenders, and insurance underwriters in appropriately assessing and pricing a specific set of risks—risks related to climate change. The Task Force consists of 31 members from across the G20, representing both preparers and users of financial disclosures. The TCFD is chaired by Michael R. Bloomberg, founder of Bloomberg L.P.



Source: www.fsb-tcfd.org

TCFD Recommendations and Supporting Recommended Disclosures

Governance

- Disclose the company's governance around climate-related risks and opportunities.

Strategy

- Disclose the actual and potential impacts of climate-related risks and opportunities on the company's businesses, strategy, and financial planning where such information is material.

Risk Management

- Disclose how the company identifies, assesses, and manages climate-related risks.

Metrics and Targets

- Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Source: [TCFD 2022 Status Report](#)

Examples of risks

Opportunities for climate change

Contribution areas related to climate change	Achievements in fiscal 2020		
Contributions to climate change mitigation	Approx. ¥960 billion	<ul style="list-style-type: none"> Sales of products contributing to decarbonization (with eco-label certifications): Sales of major business negotiations based on ESG performances: Sales in the products and parts recycling business: Sales in energy creation and energy saving business: Creating and developing new businesses; Sales of eco-friendly products such as Silicone-top linerless labels and Foamed PLA sheets: 	Approximately ¥900 billion Approximately ¥10 billion Approximately ¥30 billion Approximately ¥20 billion —
Contributions to climate change adaptation	Approx. ¥70 billion	<ul style="list-style-type: none"> Solution sales to support new ways of work (Scrum packages, Scrum assets*¹ and WTA*²): Creating and developing new business; Sales of dye-sensitized solar cells: 	Approximately ¥70 billion —

*1 Packaged solutions sold to small and medium-sized companies in Japan *2 Work Together, Anywhere: Packaged solutions in Europe

Risks from climate change and Ricoh's actions

Transition risks: Analysis based on 2°C and 1.5°C scenarios Physical risks: Analysis based on 4°C scenario

	Impact on Ricoh Group's business	Financial impact	Urgency	Ricoh's actions	
Transition risks	Carbon taxes and emissions trading systems applied to suppliers	<ul style="list-style-type: none"> Carbon pricing (carbon tax emissions trading) will be applied mainly to material suppliers with high GHG emissions. The price will be passed on to raw materials, and procurement costs will increase. 	Medium	Medium	<ul style="list-style-type: none"> Reducing virgin materials by sales of recycled machines and utilization of recycled materials Actively supporting suppliers' decarbonization activities and addressing the risk of procurement cost increase
	Response to accelerated transition to a decarbonized society by consumers and investors	<ul style="list-style-type: none"> Due to the advance demands for achieving the target of 1.5°C and achieving RE100, additional costs for implementing measures such as energy-saving/renewable energy facility investment and switching to renewable energy are incurred. 	Small	Medium	<ul style="list-style-type: none"> Active development of energy-savings and renewable energy measures that contributes to the SBT 1.5°C Financing by sustainability linked loans
Physical risks	Rapid increase of natural disasters	<ul style="list-style-type: none"> Due to climate change, extreme weather has become more severe, causing production stops and sales opportunity losses due to disruption of the supply chain, etc. 	Medium	High	<ul style="list-style-type: none"> Supply chain risk addressing Strengthen risks response at Japanese sites
	Regional epidemics of infectious diseases	<ul style="list-style-type: none"> Impact on production plan due to parts supply disruption Insufficient inventory due to lower operating rates at production sites Decrease in sales opportunities due to difficulty of face-to-face business 	Medium	Low	<ul style="list-style-type: none"> Strengthening business continuity plans against infectious diseases IT-based operation and negotiation, decentralization of production bases/automation of processes, additional stock of parts and products
	Declining forest resources	<ul style="list-style-type: none"> Global warming has led to an increase in forest damage caused by wildfires, insects, etc., which has worsened the stable supply of raw materials for paper. 	Small	Low	<ul style="list-style-type: none"> Reducing use of base paper with Environmentally Friendly Paperless Labels Promoting forest preservation activities

Source: Ricoh, Integrated Report 2021, p. 43 in TCFD 2022 Status Report, pp.23

Climate Risk Type	Climate Drivers	Main affected Time Horizon	
Transition Risk	Market & Customers	<ul style="list-style-type: none"> → Change in consumer behaviours including deliberate move to more sustainable products → Potential loss of competitive advantage with our green product proposition or pricing risks → Increased market volatility and cost, sourcing restrictions for carbon heavy raw materials 	Short - Medium Term
	Policy-Making	<ul style="list-style-type: none"> → More demanding policy environment affecting our customer's business operations → Increased green house gas (GHG) emissions pricing to foster movement to renewable sources 	Short - Medium - Long Term
	Technology & Data	<ul style="list-style-type: none"> → Investment in technology to reduce emissions or improve energy efficiency ratings → Lack of procedures and systems to obtain and store reliable data for risk assessments and disclosure 	Medium Term
	Regulatory Pressure	<ul style="list-style-type: none"> → New public disclosure products which increase the risk of misrepresentation, increased regulatory requirements which increases the potential of non-compliance, increased use of external analytics providers which increases the potential for data privacy breaches, all of which could result in fines, payment of damages and the voiding of contracts → Increasingly demanding banking regulation (disclosure, stress testing, taxonomies, etc) → Inefficiencies as consequence of different climate regulations, with special attention in those financial entities with international scope 	Short - Medium Term
	Reputational	<ul style="list-style-type: none"> → Risk of slow, lack or not sufficient reaction from financial entities impacting its reputation; extreme events that would cause damages to financial entities and employees own sites could challenge, if readiness response plans fail, the ability of the banks to prompt react to restoration of service and customers attention in vulnerable situations due to the damages → Increased scrutiny from different stakeholders (e.g. supervisors, regulators, media, NGO's, shareholders, investors, etc) → Perceived not to be meeting, sufficiently progressing, or providing transparency on climate-related commitments and transitioning → Liability implications as an intermediary in several value chain (e.g. data, products, financial services) → Reputational impact from potential misalignment of emissions reduction commitments with performance in specific portfolios 	Short - Medium - Long Term
	Acute	<ul style="list-style-type: none"> → More frequent and severe climate events such as flooding, drought, etc, that could affect financed assets and the value of the collaterals 	Short - Medium - Long Term
	Chronic	<ul style="list-style-type: none"> → Alterations in weather patterns and stability of local ecosystems affecting food production and living environment. → Rising temperatures affecting working conditions, living conditions and local infrastructure. → Rising sea levels affecting local ecosystems, increasing subsidence and flood risks 	Long Term
	Physical Risk		

Source: Banco Santander, Annual Report 2021, p. 500 in TCFD 2022 Status Report, pp21

Climate risk identification

Climate risk management framework

Cathay established the ESG Risk Management Policy and Guidelines in 2020, and integrated it with its Enterprise Risk Management Framework (ERMF) to enhance its ESG and climate-related risk management abilities.



Basis for climate risk management and measures

Cathay integrated climate-related risk management with its existing risk management framework, and adopted the Three Lines of Defense Model. Each line of defense performs its duties by identifying and assessing climate-related risks, analyzing the relevance of risks, evaluating the impact on the Company's operations and business, and formulating control measures and response strategies. Cathay continues to strengthen the management of climate-related risks associated with its investment, loan, and insurance products, and developed Business Continuity Management (BCM), obtaining ISO 22301 Business Continuity Management System Certification to strengthen emergency response abilities for major contingencies such as natural disasters. Please see [Chapter 2 Sustainable Finance](#) and [Chapter 6 Sustainable Operation Management](#) for details.



Cathay Financial Holdings, Sustainability Report 2021, p. 59 in TCFD 2022 Status Report, pp.25

Enterprise Risk Management Process

The ERM process identifies and assesses both enterprise risks and opportunities, including those relating to the emerging impacts of climate change.

The ERM process is centered on five key components as depicted in the graphic below:

- Ensure appropriate risk governance across all levels of our organization;
- Promote a risk-aware culture where all employees have a responsibility in identifying and communicating risks;
- Enable risk-informed decision-making and objective-setting;
- Manage execution risk through regular identification and assessment of risks, as well as risk response review and monitoring; and
- Report and communicate risks appropriately.

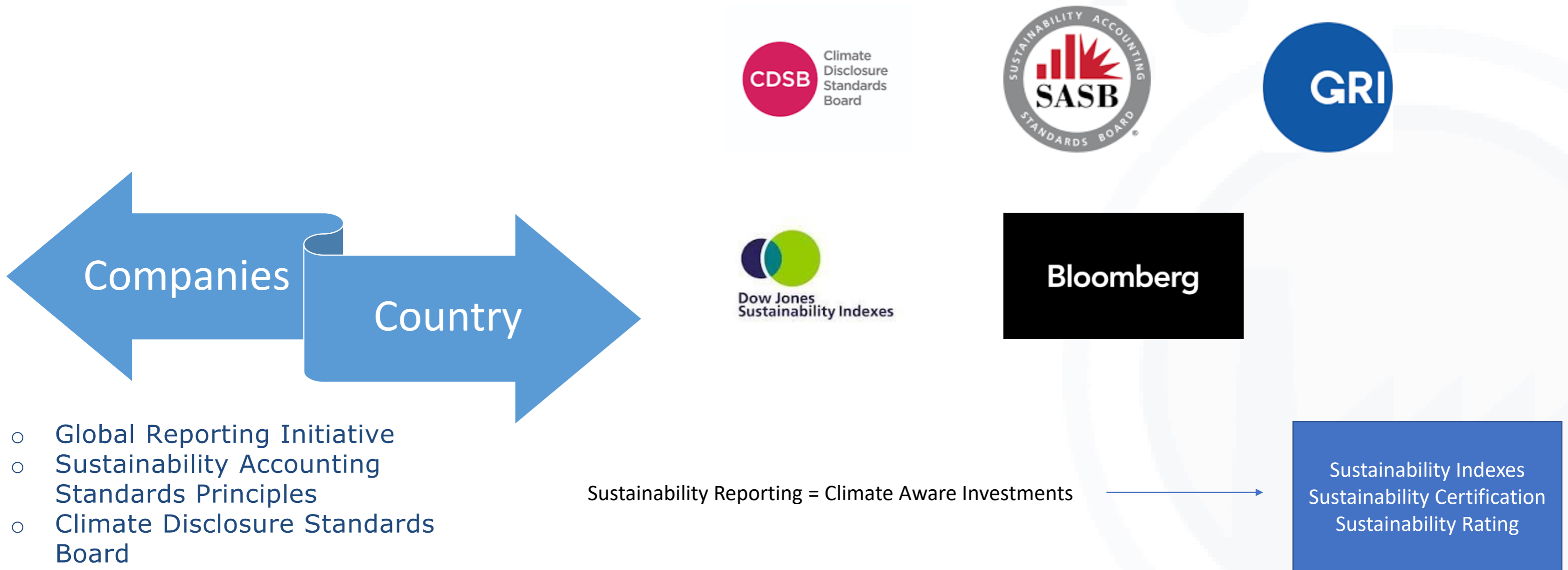
PSEG enterprise risk management process components and top risk categories



PSEG, Sustainability and Climate Report 2021, p. 33 in TCFD 2022 Status Report, pp.27

ESG indicators

Standards & indices



Environment Pillar

- Emissions & pollution
- Natural capital endowment and management
- Environment/climate risk & resilience
- Food Security

Social Pillar

- Education & skills
- Employment
- Demography
- Poverty & Inequality
- Health & Nutrition
- Access to Services

Governance Pillar

- Human Rights
- Government Effectiveness
- Stability & Rule of Law
- Economic Environment
- Gender
- Innovation

- **Databank:** <https://databank.worldbank.org/source/environment-social-and-governance?preview=on>
- **Country Dashboards:** <https://datatopics.worldbank.org/esg/dashboards.html>

1. Brings together in a single platform, all the necessary elements such as Risks & Opportunities, Performance Indicators, Mitigation Actions, Dashboards & Reporting:
2. Incorporates Prediction Models at Climate Change milestones (for years 2030, 2040, 2050 or longer depending on the available models)
3. It is the only Greek Risk Management and Control software that includes Climate Change issues
4. Includes Knowledge Database, with ready-to-use lists of Risks, Indicators and Actions
5. Facilitates the process of complying with the Directives and the Legal Framework on Climate Change
6. Supports risk mitigation and helps reduce the economic impacts of Climate Change
7. Boosts the achievement of Strategic Objectives on Climate Change
8. Enhances Corporate Sustainability and Resilience
9. Delivered with ongoing support from expert consultants and customization of the system to your needs
10. Offered at a highly competitive price and without the need for an initial investment (SaaS - Software as a Service)



- Climate Risk Management Plan:
https://www.adaptationscotland.org.uk/application/files/6014/6970/5493/Climate_risk_management_plan_template.pdf (example)

Resources:

- Inderst, G., & Stewart, F., (2018) Incorporating Environmental, Social and Governance (ESG) Factors into Fixed Income Investments, Available at: <https://documents1.worldbank.org/curated/en/913961524150628959/pdf/Incorporating-environmental-social-and-governance-factors-into-fixed-income-investment.pdf>