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Is Europe Adapting to a Changing Climate?
Part II. What Hinders Adaptation?




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Abstract

In our previous note, we argue that geophysical processes under way exhibit inertia, and therefore a warmer climate and rising extreme climate events are likely. Given that significantly higher climate damages are probable, it would be prudent to frontload climate adaptation. Despite overwhelming evidence that adaptation is beneficial, current adaptation financing is dreadfully inadequate. We argue that climate adaptation in Europe is hindered by three limitations. First, a lack of a unified understanding of what it encompasses. Should it be incremental or transformational? What are its costs, benefits, and residual risks? Second, a duty to implement adaptation is increasingly compelled by international and national obligations, climate litigation and tort law. Yet, "legal adaptation" is still loosely defined and insufficiently prescriptive. Third, a growing financing gap stems also from a lack of clear guidance for financial markets. For example, there is no unified "adaptation taxonomy." On the positive side, we can now better forecast climate risks, awareness that adaptation choices must be dynamic exists, and the pool of case studies is growing, all of which can be harnessed to facilitate climate adaptation.

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A lack of a unified understanding of adaptation needs

Climate adaptation is a moving target. Are we adapting for 2C or 5C temperature increase? While the general concept of adaptation is intuitive, its actual implementation to face rising and uncertain climate risks is complex. A prerequisite is the availability of granular data on climate hazards and exposures. Adaptation then presents society and decisionmakers with a need to choose between how much to invest in it versus how much residual risk they are prepared to accept. Thus, there are trade-offs among adaptation costs, its benefits, and the residual damages and losses after adaptation strategies and actions have been implemented. What renders such choices complex is that the costs of adaptation are neither set nor universal.

The degree of ambition matters: incremental or transformational? *Incremental adaptation* maintains the integrity of a social-economic system or process at a given scale. Some examples include: "*no-regret actions*" such as early warning systems to alert the population of looming climate hazards; "*climate-smart designs*" which foster climate resilient infrastructures and might prove cost-effective over longer periods; and "*low-cost preparatory and early actions*" which provide option value for more transformational adaptation over time. Instead, *transformational adaptation envisages changes in the fundamental attributes of a system in anticipation of further climate change and more severe impacts from extreme weather events (World Bank (2024)).*[1]

Planning adaptation measures cost-effectively under uncertainty. Planning at a national level versus a project level, considering climate inertia, execution time lags and uncertainty must bring together several perspectives, expertise, and tools. Analyses of regional climate patterns by the European Environment Agency (EEA) and Joint Research Centre (JRC) are indispensable starting points the result in a national adaptation plan/high level plan and usually, the national adaptation plans rely on climate risk assessment (hence projections).[2] It's important to proceed on various parallel tracks, learn from and compare experiences across countries and then tailor to local needs. The spirit of dynamic adaptation lies in a decision-making under uncertainty (DMUU) and identifying adaptation tipping points at which actions are no longer adequate, and thus requiring transformational adaptation (World Bank (2024)).

The computational burden to plan cost-effective adaptation is significant. The World Bank also flags the need for adaptive management bringing together climate model projections, for example until 2050, and project or policy-based adaptation assessments. Such a hybrid adaptation would be based on expected future climate risks, adaptation roadmaps, and pathway frameworks.[3] Adaptation strategies change as more information on adaptation options for different sectors become available. There are several choices that decisionmakers might face when setting an adaptation objective. For example, approaches for adaptation investment for protection from coastal or river flooding include:

- **Business as usual with maintenance of existing infrastructures** costs are low, but residual damage can increase over time with unabated climate change.
- **Stepping up flooding protection to a constant risk level** involves setting a standard for risk to protect against such as a 1-in100-year event. Over time, the level of protection needed increases.
- **Maintenance of a constant absolute risk level** entails maintaining a constant level of residual damage, which includes greater protection and higher adaptation costs;
- **Protection to a risk-intolerant level** involves reducing average annual losses to very low levels, involving very high adaptation costs; and
- **Protection to an economically optimal level of adaptation** means investing in adaptation until marginal costs equal marginal benefits. Such a strategy, requiring perfect information, might lead to lower levels of overall adaptation or even maladaptation.

[1] WMO (2024) "State of the Global Climate 2023", World Meteorological Organization report, see: https://wmo.int/publication-series/state-of-global-climate-2023

[2] EEA (2024) "European Climate Risk Assessment 2024", Report 1.2024, see: https://www.eea.europa.eu/publications/European-climate-risk-assessment

[3] The PESETA IV study follows a "science-first" approach (also referred to as top-down approach). It raises awareness about the costs of climate policy inaction and supports high-level planning.

Overall, cost differences in various adaptation strategies can be significant. The costs for river flood protection can vary by a factor of four between the economically optimal action versus that which results in the least residual damage (World Bank (2024)).

While adaptation might be costly, not all adaptive measures are necessarily expensive. Some require raising awareness, education, information, collecting, analysing, and sharing more granular data concerning climate hazards and vulnerabilities, as well as a requalification of existing budget items. Public awareness and support are pivotal. Thus, a key question is: *how might awareness and support for climate adaptation be enhanced?*

Summing up, *while the general concept of adaptation is intuitive, deciding where to adapt, how, to what extent given residual risks, and at what speed is complex. Greater standardization and a need for quantifiable targets and steps, a shared classification system and approaches to climate adaptation must embrace trade-offs, learn by doing and share best practices. Adaptation also requires substantial data and computational power, building synergies and adjusting to changing risks and scenarios.*

It's a duty! Yet "legal adaptation" is loosely defined and insufficiently prescriptive

An international and European Union legal frameworks on climate adaptation exists but receives far less attention than climate mitigation. Due to unabated climate change and rising damages and losses, climate adaptation also has become a legal requirement, borne out of the international and EU legal frameworks and case law. The international legal framework makes provision for climate adaptation whilst the EU legal framework prescribes more concrete obligations regarding climate adaptation. Additionally, climate adaptation has become a focal point in a growing number of climate litigation cases. A common complaint is that regulations meant to foster adaptation are "soft" as they lack clear targets and objectives.

International obligations on climate adaptation

The Paris Agreement also has introduced a global adaptation goal, but it is a *"soft obbligation.'* Article 7 of the Paris Agreement sets out the goal of "enhancing adaptive capacity, strengthening resilience and reducing vulnerabilities to climate change", referred to as the 'global adaptation goal'. Both the EU and its Member States are Parties to the Paris Agreement. The global adaptation goal under the Paris Agreement specifies and strengthens the non-binding Adaptation Principle introduced in the 1992 United Nations Framework Convention on Climate Change (UNFCCC).[4] However, the Paris Agreement commitments on adaptation are formulated in a less stringent and verifiable manner than the commitments on mitigation thus, are less enforceable (Brus et al. (2023)).[5] In addition, the Paris Agreement does not reflect any agreed definition of climate adaptation among Parties, nor does it prescribe specific targets to be reached. As such, the provision is framed as a process-based obligation, mandating Parties to follow some specific procedural steps with the caveat 'as appropriate', while leaving wide discretion as regards the outcome. Accordingly, the literature characterizes the adaptation provisions of the Paris Agreement as "soft obligations" (Rajamani (2016)).[6]

International or regional human rights treaties may create obligations for states to ensure adaptation measures are adopted, when the failure to do so undermines the ability to enjoy a variety of human rights. The European Convention of Human Rights (ECHR (2019)),[7] the International Covenant on Civil and Political Rights (ICCPR),[8] and the International Covenant on Economic, Social and Cultural Rights (ICESCR)[9] might create obligations

[4] Article 3 UNFCCC. UNFCCC (2022) "Promoting Synergies Between Climate Change Adaptation and Biodiversity: Through the National Adaptation Plan and National Biodiversity Strategy and Action Plan Processes", see: https://unfccc.int/documents/619807
[5] Brus, M. et al (2023) "The Normative Status of Climate Change Obligations under International Law", EP study.
[6] Rajamani L. (2016) "The 2015 Paris Agreement: Interplay between Hard, Soft and Non-Obligations" 28 J Envtl L 337.
[7] Verein Klimaseniorinnen Schweiz & ors v Switzerland [2024] ECtHR App no53600/20.
[8] HRC (2019), General comment No. 36 on Article 6 of the International Covenant on Civil and Political Rights, on the right to life and CESCR (2022), General comment No. 26 on land and economic, social, and cultural rights. Daniel Billy et al. v. Australia; "Torres Strait Islanders case."
[9] CESCR (2022), General comment No. 26 on land and economic, social and cultural rights.

on States to ensure that adaptation measures are put in place. The lack of climate adaptation planning and action can undermine the ability of citizens to enjoy a variety of human rights - such as the right to life, food, housing, health, a healthy environment, and social rights of workers. Climate litigation may play an important role in specifying States' human rights obligations in relation to climate adaptation. For instance, following the 2024 ruling of the European Court of Human Rights (EctHR) in the *Verein Klimaseniorinnen Schweiz v. Switzerland* case, litigants argue that Articles 2 and 8 ECHR, which protect the right to life and the right to private and family life, imply obligations for states to adopt climate adaptation measures.[10]

Nature-based solutions (NBS) are growing in importance but still need to be more broadly implemented. The 2022 Kunming-Montreal Global Biodiversity Framework (GBF)[11], which recommends Parties to minimise the impact of climate change on biodiversity and increase its resilience, inter alia through adaptation and disaster risk reduction actions. Unlike the global adaptation goal enshrined under the Paris Agreement, the GBF includes specific targets and metrics to measure Parties' progress but follows the weaker form of a COP decision and lacks an implementation mechanism.[12] The adaptation targets prescribed under the GBF therefore do not legally bind the contracting parties.

The EU legal framework on climate adaptation

The EU legal framework requires continuous progress towards adaptation. The 2021 European Climate Law,[13] which incorporates the Paris Agreement into the EU legal framework, imposes a duty on relevant Union institutions and the Member States to a ensure 'continuous progress' towards adaptation in accordance with the Paris Agreement's global adaptation goal. The EU adaptation goal includes: (i) enhancing adaptive capacity, (ii) strengthening resilience and (iii) reducing vulnerability to climate change The European Climate Law also obliges the Commission to adopt an EU-wide strategy on adaptation, and regularly review it. Relevant Union institutions and Member States are obliged to support the integration of adaptation measures in all policy areas, while Member States are required to adopt and implement national adaptation strategies and plans. In 2023, the European Commission adopted a revised set of non-legally binding Guidelines to assist Member States in updating and implementing national adaptation strategies, plans and policies. Most notably, the Guidelines call for Member States to adopt legal frameworks on climate adaptation rather than the implementation of soft policies.

Like the Paris Agreement, the European Climate Law does not contain quantitative elements or annual targets. Instead, it contains procedural-based obligations for the Commission to assess the collective progress of the Union and the Member States towards the EU adaptation objective. Pursuant to the European Climate Law, the Commission published its 2021 EU Adaptation Strategy, which identifies four high-level objectives to strengthen EU adaptive capacity: smarter, systemic, faster, and international adaptation in several key policy areas. The Commission emphasized the need to streamline adaptation actions and investments at the local, regional, and national levels in the coming years.

In line with the GBF, the EU Nature Restoration Law also recognizes the importance of adaptation policies for nature protection objectives.[14] The Nature Restoration Law is a key element of the EU Biodiversity strategy, aimed at restoring at least 20% of the EU's land and sea areas by 2030 and all ecosystems in need of restoration by 2050. The Law specifies that restoring ecosystems also contributes to the Union's climate change mitigation and adaptation objectives. In the preparation of national restoration plans, Member States are required to identify synergies with climate mitigation and adaptation, land degradation neutrality and disaster prevention and prioritise restoration measures accordingly. A dedicated section of such plans is expected to set out "the potential of restoration measures

[10] Verein Klimaseniorinnen Schweiz & ors v Switzerland [2024] ECtHR App no53600/20, para. 552.
[11] See Target 8 of UNEP Decision 15/4 on the Kunming-Montreal Global Biodiversity Framework under the Convention on Biological Diversity (19 December 2022).
[12] For further discussion on this topic, see Ekdart, F. (2023) Legally binding and ambitious biodiversity protection under the CBD, the global biodiversity framework and human rights law and Streck C, (2023) Synergies between the Kunming-Montreal Global Biodiversity Framework and the Paris Agreement: the role of policy milestones, monitoring frameworks and safeguards.
[13] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), (9.7.2021) OJ L 243.
[14] Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 ('Nature Restoration Law'), OJ L, 2024/1991, 29.7.2024.

to minimise climate change impacts on nature, to prevent or mitigate the effects of natural disasters and to support adaptation", as well as synergies with national adaptation strategies or plans and national disaster risk assessment reports.

New avenues to spur adaptation: climate litigation

Climate adaptation also has been the focus of an emerging number of cases of climate litigation (other than human rights). Such cases may heighten awareness of climate adaptation needs within civil society and among policymakers, potentially influencing the development of new legislation and regulations in the EU, as well as their implementation and enforcement. Some of these cases allege that a government or company has a responsibility to adopt adaptation measures or has failed to implement necessary measures, leading to reasonably foreseeable harm for which the plaintiff seeks compensation, i.e., *'failure to adapt'* cases (see Setzer et al. (2024)).[15] Such cases have coined the term *strategic cases.* A limited number of cases seek monetary damages from companies based on their alleged contribution to harm caused by greenhouse gas emissions, aiming to fund the cost of adaptation, i.e., '*polluter pays'* cases (see UNEP (2023)).[16]

Summing up, *climate laws are beginning to address climate adaptation. However, they still lack clear shared targets and objectives. This may be due to a lack of clarity surrounding the steps to adaptation. Meanwhile, climate litigants are beginning to pressure governments and businesses to take adaptation measures to safeguard fundamental rights. What role can climate litigations play in the future? Will this affect how laws and regulations are transposed in European governance? Clarity and enforceability in the applicable legal framework are critical for encouraging further adaptation and related investments.*

The need for clear guidance in adaptation for financial markets

In recent years the EU has developed a Sustainable Finance Framework (SFF) with several legislative measures to enhance private sector funding of climate adaptation. The aim is to support the objectives enshrined in the 2019 European Green Deal as well as the EU's international climate commitments.[17] As described by the European Commission's action plan on financing sustainable growth,[18] the EU's Sustainable Finance Framework is composed of three pillars: (i) reorienting capital flows towards a more sustainable economy; (ii) mainstreaming sustainability into risk management; and (iii) fostering transparency and long-termism. At present, only five components of the SFF incentivize private funding towards climate adaptation:

- **Taxonomy Framework,** the Taxonomy Regulation[19] and Commission delegated act[20] put forward a classification system for sustainable activities in the EU. The Taxonomy framework establishes 'climate change adaptation' as one of the six environmental objectives to which an economic activity should substantially contribute for it to be considered 'environmentally sustainable' under the regulation.

[15] Setzer J. and C Higham (2024) "Global Trends in Climate Change Litigation: 2024 Snapshot – Policy Report", Grantham Research Institution on Climate Change and the Environment, pp. 29-30.
[16] UNEP (2023) "Global Climate Litigation Report: 2023 Status Review."
[17] Sustainable finance is about financing both what is already environmentally friendly today (Green Finance), and what is transitioning to become environmentally friendly over time (Transition Finance). See European Commission, Overview of Sustainable Finance, website page.
[18] European Commission, Renewed sustainable finance strategy and implementation of the action plan on financing sustainable growth, updated on 5 August 2020.
[19] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 [202] OJ L 198, 22.6.2020, ('The Taxonomy Regulation').
[20] Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, OJ L 442, 9.12.2021.

- **EU's Green Bond Standard Regulation,**[21] lays down uniform requirements for issuers of bonds who wish to use the designation ''European Green Bond'' (''EuGB''). Through its link with the Taxonomy framework, EuGB encourages companies to undertake climate adaptation measures. To be able to use the designation EuGB, issuers must invest the proceeds from these bonds in full, before the bond reaches maturity, in sustainable economic activities deemed 'environmentally sustainable' in accordance with the Taxonomy Regulation, which include climate adaptation ('gradual approach'). Issuers can alternatively allocate the proceeds to a portfolio of fixed assets or financial assets in accordance with the Taxonomy Regulation's criteria ('portfolio approach');
- **Corporate Sustainability Reporting Directive (CSRD**)[22]The CSRD imposes disclosure requirements on companies, including their policies and targets with respect to climate change adaptation. Such information must be reported in accordance with European Sustainability Reporting Standards (ESRS).[23] ESRS 1 includes disclosure requirements regarding climate-related hazards that can lead to physical climate risks for the undertaking and its adaptation solutions to reduce these risks. CSRD implementation will start in 2025 with so-called wave 1 companies (with more than 1,000 employees) and for other companies a stop-the-clock directive will lead to a 2-year delay in the implementation. In addition, the Commission has tasked the European Financial Reporting Advisory Group (EFRAG) to revise and simplify the existing ESRS standards. From a risk perspective it is pertinent to preserve disclosure requirements which relate to physical risk and climate adaptation.
- **Sustainable Finance Disclosures Regulation (SFDR):**[24] The SFDR adopted in 2019, specifies asset managers' and institutional investors' duties regarding sustainability. While not requiring disclosure of climate adaptation measures *per se*, it provides indirect incentives for climate adaptation by increasing transparency about sustainability risks and adverse sustainability impacts; and
- **Environmental, Social and Governance (ESG) Ratings Regulation:** The proposed Regulation introduces a common regulatory approach to enhance the integrity, transparency, comparability, good governance, and independence of ESG rating activities.[25] ESG rating providers are required to publish methodologies, models and key rating assumptions used in ESG rating activities on their website. It underpins adaptation measures, by increasing investor understanding of the methodologies underpinning (ESG) ratings, and thus whether adaptation measures in place.
- **Other legal obligations and developments**. Other areas of EU policy require the consideration of climate adaptation and resilience aspects during planning or licensing application processes and when performing impact assessments. Key examples include the Environmental Impact Assessment Directive,[26] the Energy Performance of Buildings Directive[27] and the Critical Infrastructure Directive.[28]

Summing up, *to enhance private sector funding of sustainable economic activities, the EU has developed a multifaceted approach to integrate climate adaptation systematically also into financial practices. At present, only five components of the SFF are aimed at incentivizing private investment in climate adaptation: the taxonomy, the EuGB, the CSRD, the SFDR and the ESG ratings. Moreover, their design lacks certain incentives. Various aspects are being revisited under the Omnibus.*

[21] Regulation (EU) 2023/2631 of the European Parliament and of the Council of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability linked bonds (30.11.2023) OJ l 2631 (''The Green Bond Standard Regulation'').
[22] Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC, and Directive 2013/34/EU, as regards corporate sustainability reporting, OJ L 322, 16.12.2022, (The Corporate Sustainability Reporting Directive).
[23] Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards, OJ L, 2023/2772, 22.12.2023.
[24] Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector, OJ L 317, 9.12.2019, p. 1. (''Sustainable Finance Disclosure Regulation'').
[25] The European Commission published its proposal in June 2023 and the European Council and Parliament reached a provisional agreement on the 5 February 2024 which resulted in the final compromise text and awaits approval of the Permanent Representatives Committee with a view to reach an agreement of at first reading with the European Parliament. Environmental, social and governance (ESG) ratings: Council and Parliament reach agreement - Consilium (europa.eu).
[26] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (28.1.2012) OJ L 26/1.
[27] Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (8.5.2024) OJ L 2024/1275.
[28] Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC (27.12.2022) OJ L 333/164.

Some final remarks

Climate adaptation in Europe is currently hindered by diverse limitations: how can we transform them in opportunities? As a start, unifying the understanding of what it encompasses, where, when, how and with which trade-off is essential. This might in turn help making "legal adaptation" more prescriptive. Addressing climate change also requires a wholistic transformation of economic governance as well as the sustainable finance framework. There are opportunity costs as adaptation financing competes with mitigation financing as well as other policy goals within a given budget.

Adaptation investments also support development goals. "*However, we still see widespread underinvestment in adaptation due to electoral cycles, definitional ambiguity surrounding what adaptation entails; complexity associated with quantifying the negative economic consequences of climate change and the positive economic returns to investment in adaptation." (Allen et al. (2019).*[29]

We now have better granular climate data to study the frequency and impacts of climate hazards and thus forecast climate risk. Growing awareness that adaptation choices must be dynamic and reactive, as well as an increasing pool of case studies from which to learn exists. Moreover, there is evidence that efficient adaptation investments can yield "dividends" helping to close the financing gap (PESETA IV).

Solving the adaptation puzzle and mosaic will require substantial data and computational power, building synergies and adjusting to changing risks and scenarios as they unfold. The potential of combining digitalization, artificial intelligence, and sustainable energy to support efficient and effective adaptation should be explored. Next, Part III of this series addresses financing needs, gaps and insurance to support climate adaptation.

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[29] Allan et al. (2019) "The Role of Domestic Budgets in Financing Climate Change Adaptation", Rotterdam and Washington, DC. Available at: https://gca.org.

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