



CENTRAL BANKING AND FINANCIAL SUPERVISION ROADMAP:

**Transitioning to a Net Zero
and Nature Positive economy**

ACKNOWLEDGEMENTS

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WWF is one of the world's most respected and experienced conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which people live in harmony with nature. WWF has worked with the finance sector for more than a decade via innovative collaborations that seek to integrate ESG risks and opportunities into mainstream finance so as to redirect financial flows to support the global sustainable development agenda. Through its Greening Financial Regulation Initiative (GFRI), WWF engages specifically with this Initiative, WWF engages with central banks, financial supervisors and regulators on the need to fully integrate climate and environmental risks into mandates and operations. The GFRI tracks regularly how central banks and supervisors are making progress via its [SUSREG](#) tool. It also undertakes research, capitalizing on in-house expertise and external partners, and offers targeted assistance, trainings and workshops to individual financial supervisors, central banks and policy makers using scientifically based data, tools and methodologies.

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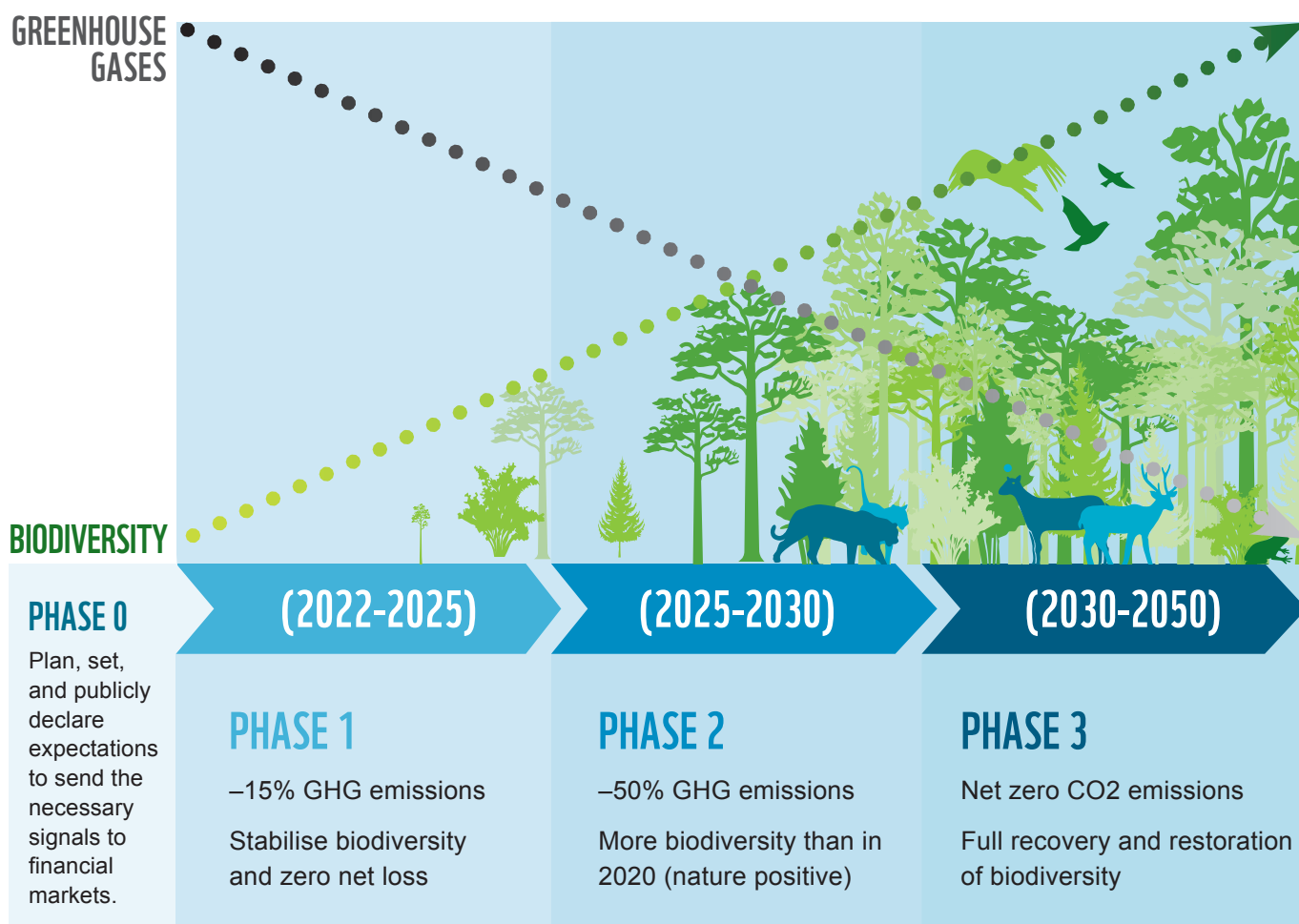
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KEY TAKE AWAYS FOR CENTRAL BANKS AND FINANCIAL SUPERVISORS

- 1 Treat biodiversity loss and climate change as a single twin crisis and recognise the massive destabilizing effects on financial and price stability;
- 2 Therefore, using a precautionary approach, work proactively and decisively to prevent future risks, as this is within their remits of the mandate of central banks and financial supervisors, focusing on the most environmentally harmful businesses and sectors;
- 3 So act now and use every available regulatory/ supervisory tool to effectively reduce greenhouse gas emissions and recover/restore biodiversity – and stop distinguishing between risks and impacts, as today's impacts are tomorrow's risks.

A PATHWAY TO A CLIMATE SAFE AND NATURE POSITIVE GLOBAL ECONOMY



* The GHG and Biodiversity related curves are linear for illustration purposes. These need to align with science based scenarios such as 1.5C aligned with no/low overshoot by 2050.

** The time intervals depicted here are focused on near term priorities. Nevertheless it is essential for financial actors to do regular continuous target setting in 5-yearly (ideally shorter) time intervals, and annual progress reporting against these targets.

PRINCIPLES THAT CENTRAL BANKS AND FINANCIAL SUPERVISORS SHOULD ADOPT TO ADDRESS THE TWIN ENVIRONMENTAL CRISES:

- **Acknowledge the reality and the scientific basis of climate change and biodiversity loss** and the imminent risk of tipping points, and the threat they pose to human life on Earth.
- **Stop distinguishing between climate- and biodiversity-related financial risks and impacts.** Today's environmental impacts are tomorrow's financial risks and are thus within the existing mandates of central banks and financial supervisors.
- **Act now with the available data and solutions, rather than waiting for 'sufficient knowledge' and certainty.** Inaction or insufficient action are policy choices which result in high risks for financial and price instability.
- **Communicate the urgency of the twin crises and set short-, medium- and long-term goals** to reduce GHG emissions and recover and restore biodiversity.
- **Act now to utilize all available monetary policy, financial regulation, and supervisory instruments and tools,** with particular attention to the economic activities, companies, and sectors that are driving climate change and biodiversity loss, as these pose the greatest financial risks.

THERE IS NO ALTERNATIVE (TINA) AGENDA:

- **Treat it like a crisis,** with central banks setting environmental goals, taking a precautionary approach, publishing their own transition plans, and requiring regulated financial institutions to do so as well.
- **Focus on contributing to a rapid reduction of GHG emissions and a halt to biodiversity destruction,** by integrating explicitly the financial risks of environmentally harmful sectors, companies, and economic activities, thereby rendering them less financially attractive.
- **Extend the time horizon for managing environment-related risks to 10 to 30 years,** to not only take into account financial risks to the banks themselves, but also the adverse impacts they cause.
- **Do good housekeeping.** Start integrating climate change and biodiversity loss within the analyses which provide the foundation for monetary policy, financial regulation, and supervisory activities.
- **Cooperate,** work with the G20, the International Organization of Securities Commissions (IOSCO), the Basel Committee, and the International Monetary Fund (IMF) to elevate climate change and biodiversity loss as a top priority.
- **Be forceful stewards,** lobbying governments, rating agencies, and companies in which they invest to take action on climate and biodiversity.
- **Start supporting the green transition,** using their promotional role to encourage and support the transition to a low-carbon, nature-positive economy.

EXECUTIVE SUMMARY

This Roadmap from WWF’s Greening Financial Regulation Initiative (GFRI) argues that central banks and financial supervisors should immediately take urgent action on climate and biodiversity as it is squarely within their current mandates. Furthermore, it is feasible. Lessons learnt from the management of recent financial crises should be applied by these stewards of financial and price stability to proactively and effectively help reduce greenhouse gas (GHG) emissions and restore biodiversity.

We therefore call on these actors to adopt a precautionary approach and define a three-phase pathway that would allow them to support and encourage an economy-wide transition to net-zero emissions and a nature-positive world.

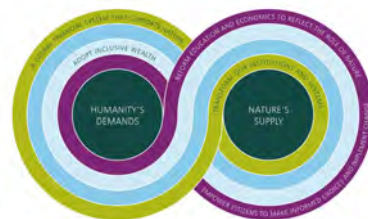
This Roadmap presents a ‘There Is No Alternative’ agenda which summarizes a set of measures that central banks and financial supervisors need to implement this year or, at the latest, in 2023. It is accompanied by a Technical Background Report, which provides in-depth analysis of the subject matter, the theoretical groundwork for this Roadmap, and an extensive list of further measures.

The global economy is dependent on nature. A report from the World Economic Forum indicates that half of global GDP (or US\$44 trillion/year) comes from economic sectors that directly depend on the flow of goods and services generated by nature (such as food, raw materials, pollination, water filtration, and climate regulation).¹ More fundamentally, the UK government’s Dasgupta Review noted that human society is “embedded in Nature”.²

The degradation of nature, otherwise understood as biodiversity loss, and climate change will have serious economic impacts on individuals, households, firms, and industry sectors. These impacts inevitably flow through to individual financial institutions. They also threaten to aggregate to cause systemic risk to the overall global financial system.

Over recent decades, environmental degradation has steadily increased. We have overshot five of nine planetary boundaries that define the safe limits within which humanity can thrive on planet Earth. The coming seven to 10 years will be crucial for reversing these trends. The faster we start reducing GHG emissions and recovering and restoring biodiversity, the higher the probability we will be able to safeguard nature on Earth within the safe space for humans. If the twin crises of climate and biodiversity are not addressed now, we will likely tip our planet’s ecosystems towards a new stable equilibrium, which will provide only degraded living conditions. This would be a bad outcome for humanity, as well as for the economy as we know it today.

Central banks and financial supervisors are mandated to safeguard the stability of the financial system and of price levels. They are embedded in a wider regulatory framework defined by sovereign states, which set their mandates. They have numerous tools and instruments at their disposal, including financial regulation, supervision, and monetary policy, which they can use independently, based on the responsibilities provided by their mandates.



**THE DASGUPTA REVIEW
POINTS OUT THAT ALL
ECONOMIC ACTIVITIES
DEPEND ON NATURE.**

Central banks and financial supervisors have acknowledged since 2019 the threat climate change poses to financial stability and overall price levels, and therefore their need to address it within their mandates. Protecting biodiversity is key to tackling climate change and also falls within their mandates, as was recognized in March 2022 by the Network for Greening the Financial System (NGFS), a grouping of central banks and financial supervisors.³

Central bankers and financial supervisors often argue that their mandates incorporate climate- and biodiversity-related financial risks, but not the negative environmental impacts generated by the banks, insurance companies, etc. that they regulate. This falls short of what is required; today's negative impacts on climate and biodiversity by banks, insurance companies, etc. are tomorrow's financial risks and thus fall within the current mandates of those ensuring the stability of the financial system and of prices. To distinguish between one and the other is an act of "organized irresponsibility".⁴

Both environmental crises are caused by unsustainable economic activities which, in turn, is facilitated by the financial system, overseen, and regulated by central banks and financial supervisors. Given the speed and scale of the degradation we are facing, the risks and uncertainties involved, and the nature of climate change and biodiversity loss threatening irreversible changes for human living conditions on Earth, central banks and financial supervisors need to embrace a precautionary approach. This approach allows for action before the full materialization of a particular risk, based on the acknowledgment that non-action regarding climate change and biodiversity loss would be fatal, catastrophic, and irreversible.

WWF stipulates that adopting a precautionary approach requires

that central banks and financial supervisors integrate financial risks and impacts related to climate change and biodiversity loss into their daily decision-making processes, regarding all the financial regulation and monetary policy instruments they have at hand, and in a manner which is globally coordinated with their peers. They must therefore focus on taking pre-emptive, proactive measures which effectively contribute to reducing global GHG emissions, and recovering and restoring biodiversity as fast as required. Their efforts must be focused firstly on the highest emitting and most impactful sectors, companies and economic activities which are associated with the highest financial risks and secondly, they must utilize the array of tools at their disposal to encourage the transition to a low-carbon economy.

Inaction regarding climate change and biodiversity loss is not neutral but contributes to a worsening situation. Acting today, pre-emptively and with full force, will assure that the stewards of financial and price stability safeguard their ability to deliver their primary mandates – of ensuring price and financial stability – over time and, if the situation demands it, that they can also advocate for the framework conditions that enable them to do so.

In recent years, central banks and financial supervisors have begun integrating climate and, in a limited manner, biodiversity aspects into their daily decision-making processes. This needs to be rapidly upscaled and widened, embracing the precautionary approach, by doing whatever it takes to mitigate future financial risks related to climate change and the destruction of nature.

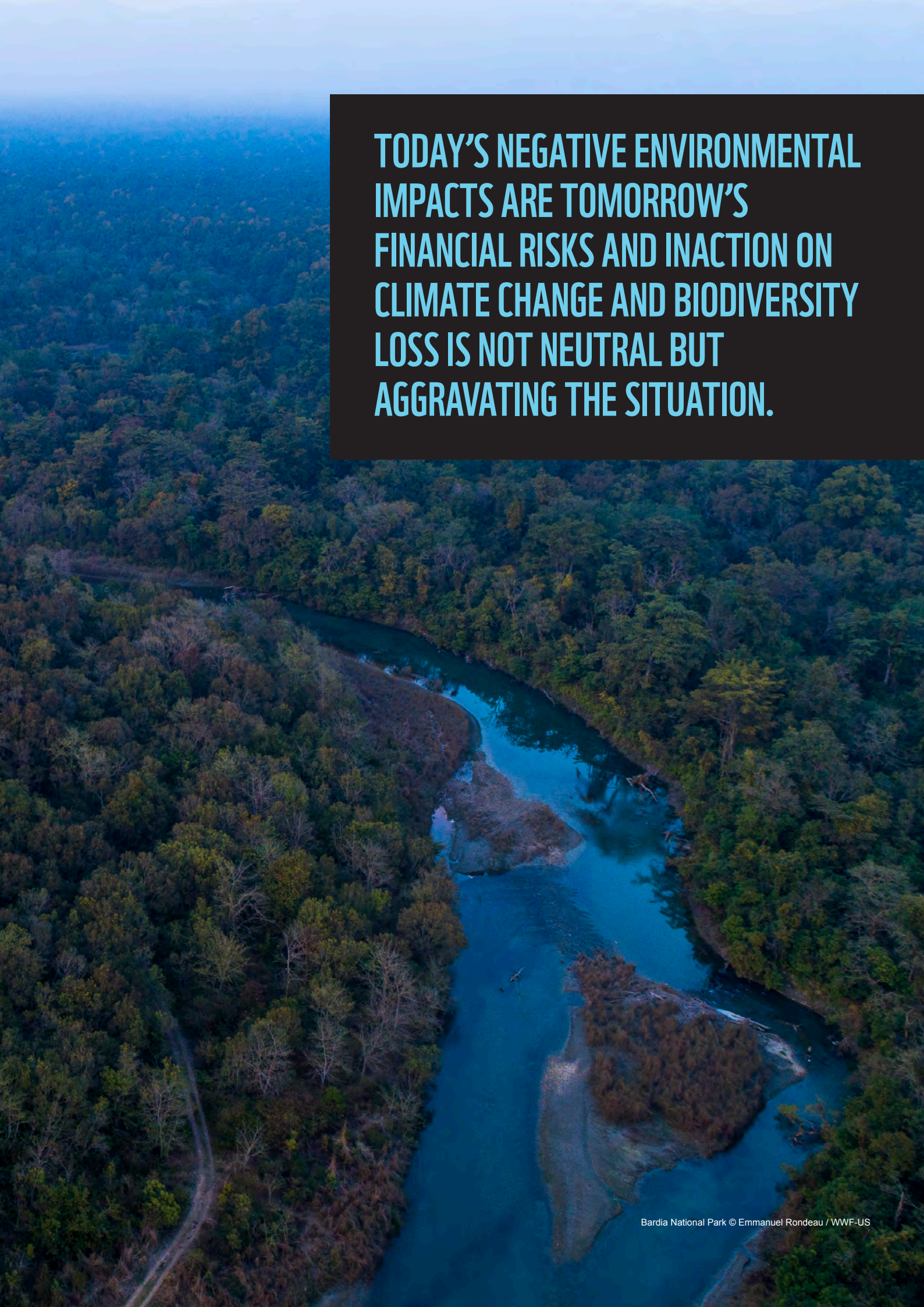
But they cannot tackle the twin crises of climate and biodiversity on their own. Governments and fiscal policy have a paramount role in setting targets for managing these twin crises. It is their



PROTECTING BIODIVERSITY IS KEY TO TACKLING CLIMATE CHANGE AND FALLS IN THE MANDATE OF CENTRAL BANKS AND FINANCIAL SUPERVISORS, AS RECOGNIZED BY THE NGFS

responsibility to set clear framework conditions and support central banks and financial supervisors in effectively implementing their mandates. Without a clear vision and conducive framework conditions set by elected governments, the stewards of financial and price stability will not be able to deliver on their mandates.

Collaboration with NGOs, environmental think tanks and scientific institutions is also key. It is the role of the WWF GFRI, a global WWF initiative, to support the integration of environmental considerations within the mandates of central banks and financial supervisors, to disseminate scientific knowledge, support main financial actors such as central banks, financial regulators, and financial supervisors, and advocate for better framework conditions regarding fiscal and overall economic policies at the national level.

An aerial photograph of a river winding through a vast, dense forest. The river is a deep blue-green color, contrasting with the surrounding green and brown foliage. The forest appears thick and continuous, with some areas showing signs of deforestation or land clearing along the riverbanks. The lighting suggests a late afternoon or early morning scene, with soft shadows and a warm glow.

**TODAY'S NEGATIVE ENVIRONMENTAL
IMPACTS ARE TOMORROW'S
FINANCIAL RISKS AND INACTION ON
CLIMATE CHANGE AND BIODIVERSITY
LOSS IS NOT NEUTRAL BUT
AGGRAVATING THE SITUATION.**



FOREWORD GFRI ROADMAP

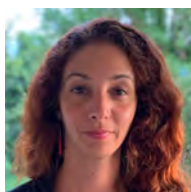
The Network for Greening the Financial System (NGFS) was established in 2017 to strengthen global central banking action to support delivery of the goals of the Paris Climate Agreement. Fast-forward to 2022, and the NGFS has acknowledged that its mandate also extends to biodiversity loss. From a scientific point view, climate and ecosystem breakdown are interrelated. We cannot solve one crisis without tackling the other.



MARGARET KUHLLOW
Finance Practice
Lead

Our broken relationship with nature, manifest in deforestation, land conversion, and depletion of natural capital, not only increase our exposure to zoonotic diseases but it also accelerates climate change, nature loss, and water shortages. Taken together, these crises reinforce each other. As we lose natural diversity and degrade ecosystem services, we radically restrict our opportunity to harness nature-based solutions to tackle climate change. In turn, climate breakdown further drives species extinction and lessens the resilience of natural systems.

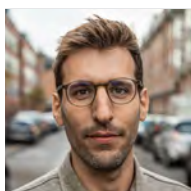
Despite being environmental crises, ultimately the impacts will be humanitarian. Heat waves, floods, and extreme weather events will make today's barely habitable places uninhabitable tomorrow. And the ravages of nature loss and impacts of climate change fall disproportionately on the world's poorest.



MAUD ABDELLI
Lead WWF Greening
Financial Regulation
Initiative (GFRI)

What is certain is that compound environmental crises are becoming more frequent and more severe. What remains uncertain is when and how they will materialize. And today's threats to financial and price stability will only increase.

The good news is that central banks have the mandate to ensure financial and price stability. Therefore, it is their duty to systematically factor climate and biodiversity into their decision-making, policies, and regulation. The bad news is that there is no time to wait for the perfect disclosure and regulatory framework to fight the climate and nature crises. Central banks must act immediately – not just because the cost of inaction is high, but because inaction risks fatally weakening the natural systems upon which the global economy relies.



IVO MUGGLIN
Lead Author,
Senior Sustainable
Finance Advisor

With the upcoming meetings of the G20 and the climate and biodiversity conventions, there is a unique opportunity to focus on financing an economic transition. Central banks must make plain to policymakers both the severity of the threat that climate breakdown and nature loss pose to financial stability, and the urgent need for coordinated international action. It's time to switch gears and apply the same level of active crisis management that financial and price stability stewards applied during the 2007/2008 financial crisis and the COVID-19 pandemic.

Recognizing that there is no alternative to a precautionary approach, this roadmap, outlines a pathway and concrete measures necessary to address the crises we face. Central banks and supervisors need to utilize their full complement of tools to reduce greenhouse gas emissions and restore biodiversity. Central banks and financial supervisors must exploit every avenue for action available to them, going beyond classical risk management to impact management in order to avert worst-case scenario outcomes. Given their mandate, it's their duty. Today's impacts on nature are tomorrow's risks to the financial system.



FOREWORD

From UNDP's Biodiversity Finance Initiative -BIOFIN

Addressing the world's crisis of nature loss and climate change needs urgent coordinated action from all stakeholders. Understanding the financial sector's exposure to biodiversity loss risks and accelerating the development of solutions to analyze, disclose and address its effects and impacts needs to be addressed during the next decade. BIOFIN is a UNDP initiative working globally to provide financial solutions; from generating sound information, indicators, and methodologies, to creating financial plans to mobilize capital for actions with neutral and net-positive impacts on biodiversity. BIOFIN is also working on creating enabling conditions for financial entities and authorities such as Ministries of Finance, Central Banks, and Financial Supervisors to effectively act towards reducing these risks and increasing their positive impact on nature.

We thus welcome the WWF 's Call to Action to Ensure Transition to a Net Zero and Nature Positive World, this is timely and comes at a particularly important time when countries are finalising negotiations for the new Global Biodiversity Framework , which recognizes the urgent need to increase and diversify the sources of finance, highlighting the role of financial entities. BIOFIN is committed to supporting this transformation and will continue to work with countries, governments, and stakeholders to ensure progress is made.



ONNO VAN DEN HEUVEL

Global Manager
The Biodiversity Finance Initiative

**THE DESTRUCTION OF NATURAL
SYSTEMS RELEASES VAST QUANTITIES
OF CARBON INTO THE ATMOSPHERE,
WHILE RISING GLOBAL TEMPERATURES
AND MORE EXTREME WEATHER ACT AS
STRESSORS ON NATURAL SYSTEMS**



1. HUMANITY UNDER THREAT

The environmental science is clear: global warming exceeding 1.5°C above pre-industrial levels may result in catastrophic impacts on the natural world and human society. In addition, the unprecedented destruction of natural habitats and biodiversity is triggering a mass extinction event unparalleled in human history and with highly uncertain, yet certainly profound, effects.

We have already witnessed warming of about 1.1°C above pre-industrial levels and, during the last decade, greenhouse gas (GHG) emissions were at their highest levels in human history. Many risks related to climate change are greater than previously thought, with some occurring at lower levels of warming than anticipated. Current efforts to adapt are insufficient, and some responses to climate change are doing more harm than good. Overall, we are not prepared for more global warming and even 1.5°C of warming, defined as a critical threshold for many ecosystems, will impact human life considerably. As the Intergovernmental Panel on Climate Change (IPCC) states, “without immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C is beyond reach.”⁵

To avoid warming above 1.5°C, rapid decreases in GHG emissions are necessary. To stay below the 1.5°C threshold, GHG emissions need to fall by about half by 2030, and reach net zero by 2050. This means that, starting from now, GHG emissions need to fall by around 7% each year, greater than the roughly 5% drop caused by the COVID pandemic. Such a rapid decline contrasts with the nationally determined contributions (NDC)

submitted by most countries as part of the Paris Agreement on Climate Change, which collectively would put the world on course for global warming of at least 2.4°C.¹⁰

Meanwhile, we also face a crisis of biodiversity. Biodiversity is defined by the Convention on Biological Diversity (CBD) as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”.¹² It can be understood as encompassing all life on earth, and thereby underpinning all nine planetary boundaries, the critical Earth System processes that enable human activities.¹³ The Intergovernmental Science-Policy Panel on Biodiversity and Ecosystem Services (IPBES) identifies the five main direct drivers of biodiversity loss to be land-use change, climate change, pollution, natural resource use and exploitation, and invasive species.¹⁴

Biodiversity loss is a key driver of climate change and vice versa. This has been recognized by the latest IPCC report, highlighting that the recovery and restoration of nature will be necessary if we are to remain within the 1.5°C threshold.¹⁵

\$2.7 TRILLION

CURRENT RATES OF NATURE LOSS COULD COST THE GLOBAL ECONOMY \$2.7 TRILLION ANNUALLY BY 2030⁶¹.

43%

TO STAY BELOW THE 1.5°C THRESHOLD, GLOBAL EMISSIONS NEED TO FALL BY ABOUT 43% BY 2030 AND REACHING NET ZERO BY 2050.

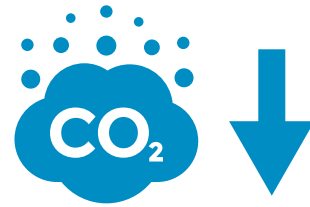
The destruction of natural systems releases vast quantities of carbon into the atmosphere, contributing to rising global temperatures and more extreme weather, which act as stressors on natural systems. Conversely, recovering and restoring biodiversity helps us mitigate climate change and adapt to its effects, while reducing climate impacts also reduces pressures on biodiversity.

Ecosystems such as forests, soils, and oceans provide essential carbon storage, absorbing 60% of all anthropogenic carbon emissions.¹⁶ Furthermore, addressing the climate and biodiversity crises will be foundational to meeting the Sustainable Development Goals and remaining within (or crossing back over) the planetary boundaries.

Unlike the global average temperature thresholds that underpin the Paris Agreement, there is currently no commonly agreed single quantitative target for biodiversity protection. However, many financial actors use Means Species Abundance (MSA) or Potentially Disappeared Fraction of species (PDF/m2) as indicators of biodiversity health. An MSA of 72% is often considered an appropriate lower boundary.¹⁷ Currently, we are at around 62% MSA globally, with no bending of the curve in sight. Other targets under discussion in the lead-up to the 15th Conference of the Parties (COP) to the Convention on Biological Diversity in Kunming, China, due to be held in fall 2022, include: 1) No net-loss of nature by 2025; and 2) A nature-positive world by 2030, such that there is

more nature in the world in 2030 than there was in 2020.¹⁸ The open-ended Working Group on the post-2020 Global Biodiversity Framework stipulates three goals: “Zero [net] loss of nature from 2020, [net] positive by 2030, and full recovery by 2050 – for the benefit of all people and life on Earth.”¹⁹ Generally, biodiversity loss is highly location specific, which thus adds a challenge to financial actors, as they need to rely on asset-level data in order to understand the real risks to which they are exposed.

The economic system is the main cause of continued biodiversity decline and climate change. Climate change is primarily caused by the burning of fossil fuels, whereas for biodiversity, deforestation, and conversion of natural habitats (primarily by the agricultural system) are the core drivers of its destruction.²⁰ Much economic activity is enabled by the financial system as the provider of capital in its various forms. The rules of the financial system are determined by central banks, financial regulators, and financial supervisors and, ultimately, by the political and policy framework conditions in which they operate. As Figure 1 indicates, the actors responsible for financial and price stability have many levers at their disposal (e.g. monetary policy and financial regulation) to encourage or require banks and insurance companies to channel money either to business-as-usual activities, or alternatively towards a more climate- and biodiversity-friendly circular economy. As just one example, the Asset Purchase Programme of the European Central Bank during the

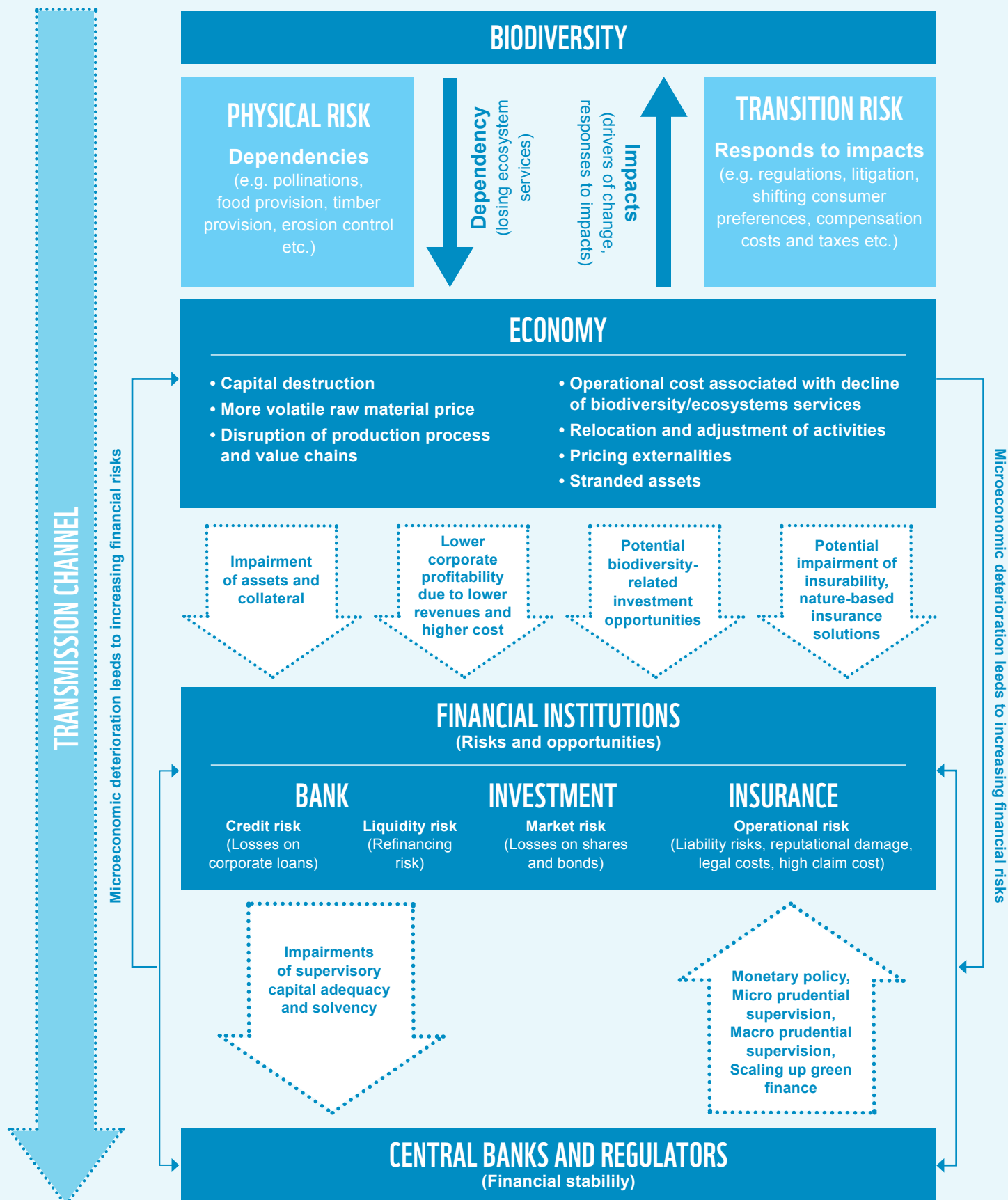


THE LATEST IPCC REPORT (2022) IS CLEAR: “THE TIME FOR ACTION IS NOW. WE CAN HALVE EMISSIONS BY 2030”¹⁵

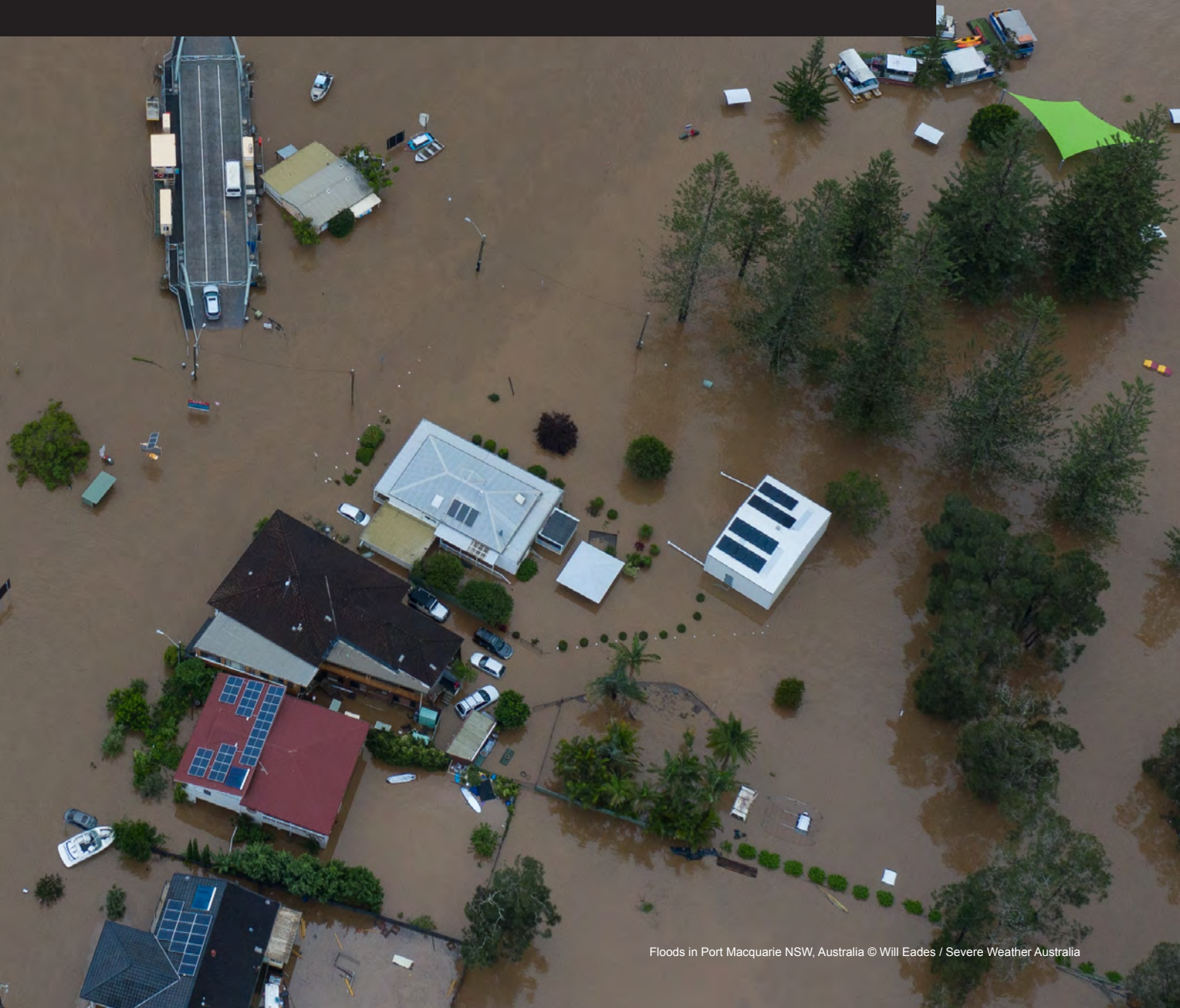
COVID pandemic had a significant positive influence on the financing conditions for issuers of eligible green assets.²¹

Time is running out. We do not have any alternatives to reducing GHG emissions and restoring biodiversity. The IPCC is clear: “The time for action is now. We can halve emissions by 2030.”²² It is possible and necessary. Given that both climate change and biodiversity loss threaten tipping points beyond which impacts become irreversible – and, in extremis, potentially existential for human society as we know it – failure to tackle these twin crises would be inexcusable and inaction could lead to even greater risks. Such failure would pose a massive risk to financial and price stability. Conversely, efforts to address these crises would have enormous economic benefits. The recent IPCC report stresses that the “global economic benefit from climate action is likely to exceed the cost of mitigation.”²³

FIGURE 1: OUR GLOBAL ECONOMY IS DEPENDENT ON NATURE



MOMENTUM IS BUILDING AMONG FINANCIAL AND PRICE STABILITY STEWARDS. THEY OFFICIALLY RECOGNISE THAT CLIMATE CHANGE AND NATURE DEGRADATION ARE DRIVERS OF FINANCIAL RISKS AND SHOULD THEREFORE BE CONSIDERED IN ALL THEIR ACTIVITIES¹⁷



2. FINANCIAL AND PRICE STABILITY IN THE FACE OF THE TWIN CRISES

Central banks and financial supervisors in different countries have a variety of mandates, which can be traced to their origins and the motivation behind their establishment, whether fiscal need, a response to a financial crisis, political-economic crisis, or monetary demands. Over time, most such bodies came to share several primary objectives, such as assuring price stability, financial stability and the safety and soundness of financial institutions. Secondary mandates can include contributing to economic growth, sustainable development, full employment, the protection of consumers of financial products, and protecting the reputation of a financial center. Central banks and financial supervisors also have leverage for changing the status quo: the Sustainable Finance Lab at Utrecht University concluded that just four central bank policies supporting the ecological transformation could lead to a global reduction of GHG emissions of 5-12%.²⁴

5-12%

THE SUSTAINABLE FINANCE LAB OF THE UTRECHT UNIVERSITY CONCLUDED THAT ALONE, FOUR CENTRAL BANKS POLICIES SUPPORTING THE ECOLOGICAL TRANSFORMATION COULD INDUCE A GLOBAL REDUCTION OF GHG EMISSIONS OF 5-12%.

Momentum is building among central banks and financial supervisors to play a role in addressing climate change and biodiversity loss. They officially recognize that climate change and the degradation of nature are drivers of financial risks and should therefore be considered in all their activities.²⁵ However, as the WWF SUSREG Tracker indicates, central banks and financial supervisors currently focus on a limited set of activities and measures, and very few integrate biodiversity into their activities.²⁷ Progress has been limited, and slow. Most attention has been on their supervisory

role, ensuring and encouraging transparency of climate-related financial risks by banks, insurers, and asset managers, rather than taking responsibility for their market-shaping role, which would mean that other instruments, such as collateral frameworks or capital requirements, would also need to be adapted.

Despite the increasing interest they are showing, central banks and financial supervisors are not doing enough. They are focused on financial risks stemming from climate change and biodiversity loss that can be already measured. Rather than this 'outside in' materiality, a holistic



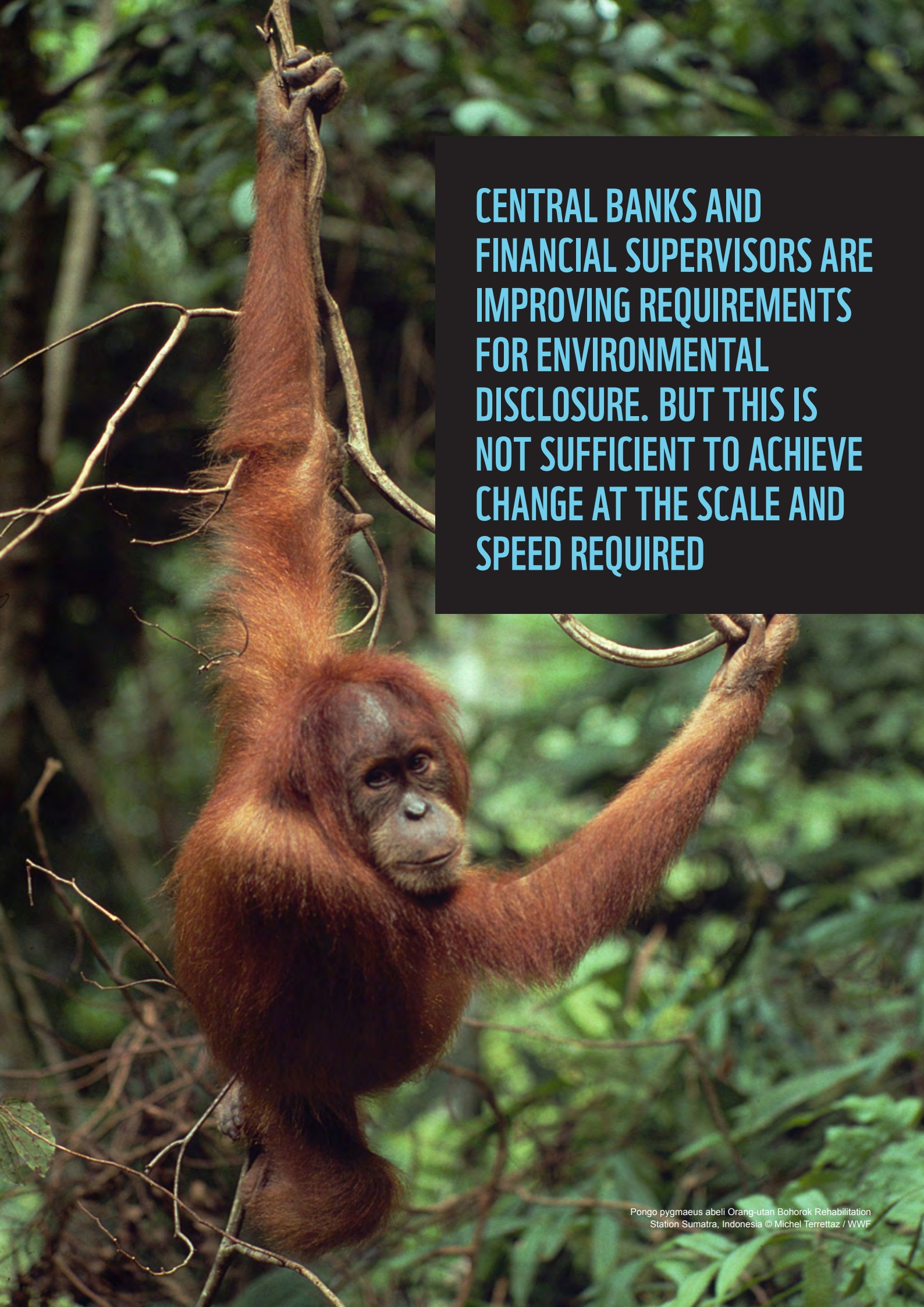
UNTIL GLOBAL GHG EMISSIONS BEGIN TO FALL AND BIODIVERSITY DESTRUCTION IS HALTED AND REVERSED, IT CAN BE ASSUMED THAT THE FINANCIAL SECTOR IS NOT ALIGNING ITS FINANCIAL FLOWS WITH THE ENVIRONMENTAL OBJECTIVES, AND FINANCIAL RISKS ARE INCREASING.

approach would call for central banks and financial supervisors to also progressively integrate an ‘inside out’ materiality to mitigating and managing environmental risks. They should stop distinguishing between ‘risks’ and ‘impacts’, and acknowledge the ‘double materiality’ of environmental exposures – meaning that negative environmental impacts today are tomorrow’s financial risks, and thereby fit within their existing mandates.

At the center of the debate about how central banks and financial supervisors integrate climate change and biodiversity loss are notions of ‘uncertainty’ and ‘knowledge’. They raise questions about how to translate uncertain environmental impacts (about which we have a high degree of confidence), into the internal risk management processes of central banks and financial supervisors defining and implementing financial regulation, supervision, and monetary policies. As former Bank of England Governor Mark Carney observed, climate change poses significant financial risk, but it is often not recognized in conventional risk models. Most of these are backward-looking and presuppose that the future will resemble the past. In addition, we would argue that risk models tend to underestimate the risks caused by the interconnectedness of climate and biodiversity, and the danger of tipping

points amplifying risks in ways that are hard to anticipate. Part of the problem is that new risk models are needed, as acknowledged by the Bank for International Settlements (BIS).²⁸

Moreover, the issues of biodiversity loss and climate change are subject to ‘radical uncertainty’, due to non-linearities of climate change and biodiversity loss and endogeneity. Future outcomes are subject to such uncertainty that makes the current decision-making tools used by central banks and financial supervisors poorly suited. Modifications to current approaches to analyzing and managing financial risks are therefore necessary, but not sufficient, as a state of ‘sufficient certainty’ is either not achievable or would likely come too late to prevent catastrophic climate change and biodiversity loss. These necessary modifications need to be based on the adoption of a precautionary approach by central banks and financial supervisors towards climate and biodiversity-related risks. In short, this means that central banks and financial supervisors acknowledge that they are co-responsible for contributing to the effective reduction of GHG emissions and the recovery and restoration of biodiversity, as this will have positive implications for their mandates of safeguarding financial and price stability.

A photograph of an orangutan hanging from a thin branch in a dense, green forest. The orangutan has reddish-brown fur and is looking towards the camera. The background is filled with out-of-focus green leaves and branches.

**CENTRAL BANKS AND
FINANCIAL SUPERVISORS ARE
IMPROVING REQUIREMENTS
FOR ENVIRONMENTAL
DISCLOSURE. BUT THIS IS
NOT SUFFICIENT TO ACHIEVE
CHANGE AT THE SCALE AND
SPEED REQUIRED**

3. DEMANDING THE NECESSARY: PUTTING PRECAUTION FIRST

Given the speed and scale of the degradation we are facing, the risks and uncertainties involved, and the particular nature of climate change and biodiversity loss resulting in irreversible changes for human living conditions on Earth, central banks, and financial supervisors need to embrace a precautionary approach.

Such an approach requires that they integrate financial risks and impacts related to climate change and biodiversity loss into their daily decision-making processes, regarding all the financial regulation and monetary policy instruments they have at hand, and in a manner which is globally coordinated with their peers. They must therefore focus on taking pre-emptive, proactive measures which effectively contribute to reducing global GHG emissions, and recovering and restoring biodiversity as fast as required. Their efforts must be focused firstly on the highest emitting sectors, companies, and economic activities which are associated with the highest financial risks and, secondly, they must utilize the array of tools at their disposal to encourage the transition to a low-carbon economy.

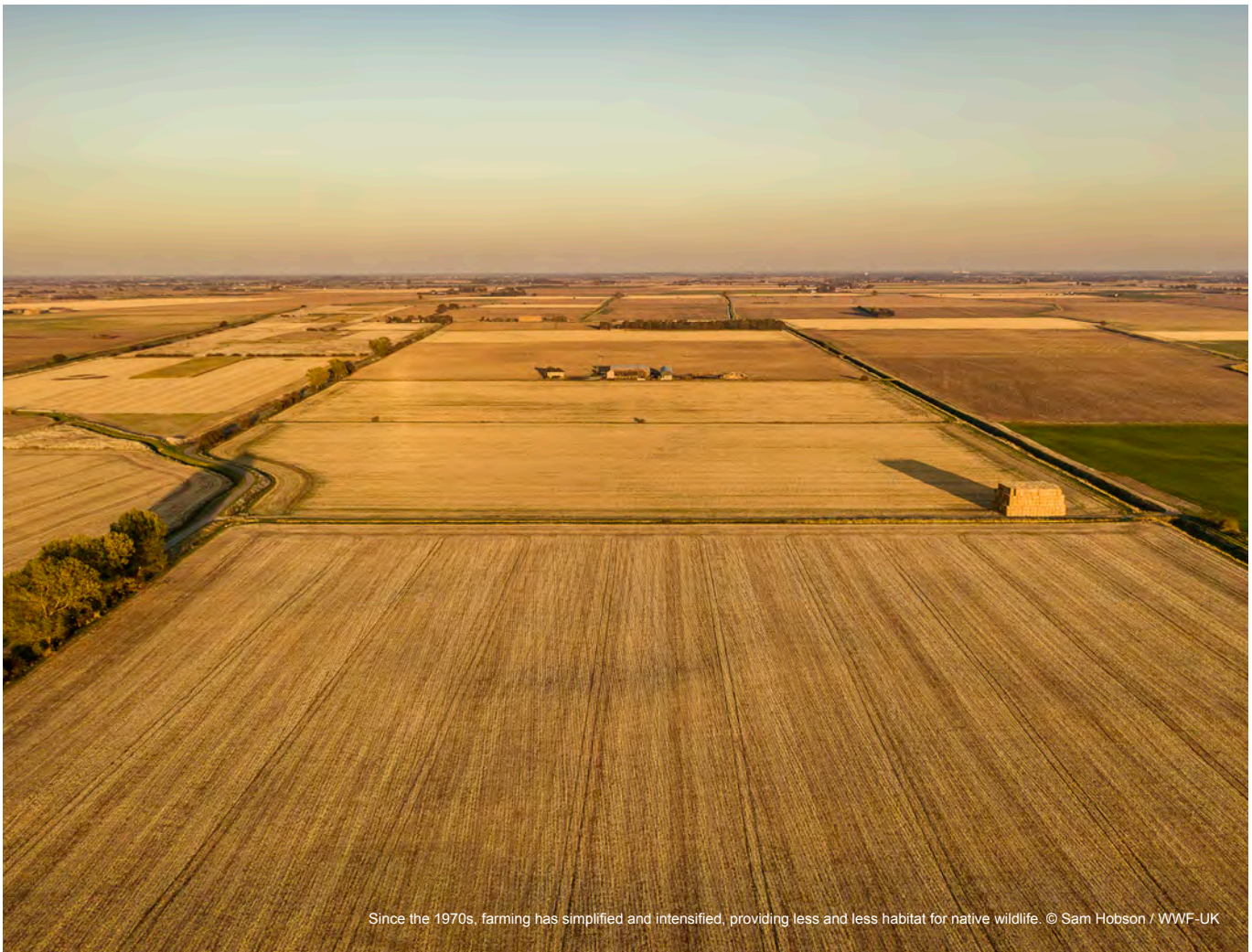
An accompanying [WWF Technical Background Report](#) provides a more in-depth discussion around such a precautionary approach and references the academic literature.³¹ The literature frames it as a theoretical approach that

legitimizes action under conditions of ‘radical uncertainty’, where the risks are systemic and catastrophic and irreversible. Climate change and biodiversity loss are already in full swing. Therefore, a central banker or financial supervisor that intended to act as a precautionary agent would have had to have been taking decisive action some years ago, before the twin environmental crises began unfolding. We therefore believe that the precautionary approach should focus mostly on a recognition that the ‘twin crises’ fall within the existing mandates of central banks and financial supervisors, and all monetary policy and financial stability instruments should thus contribute to the reduction of GHG emissions and recovering and restoring biodiversity.

In our view, the precautionary approach builds on a number of elements.

First, a planet Earth which is largely uninhabitable due to climate change and biodiversity loss will not be able to support an advanced economy, making irrelevant concerns

about financial and price stability. Combatting climate change and biodiversity loss is thus a sound way of approaching central bank and financial supervisory mandates and all their decisions should reflect this. These mandates require central banks and financial supervisors to minimize tail risks such as those posed by the twin environmental crises. Thus, central banks and financial supervisors should recognize that their decisions have an influence on the overall structure of the economy and that they shape markets. Central banks and financial supervisors are not exogenous to the financial system, but are rather active market participants, whose decisions influence the financial sector and subsequently the real economy. Pre-emptive and proactive measures to effectively contribute to a reduction of GHG emissions and the restoration and recovery of biodiversity need to be based on the consequences of inaction, the recognition that climate change and biodiversity loss unaddressed will lead to irreversible changes, which require all necessary actions to avoid worst-case scenarios,



Since the 1970s, farming has simplified and intensified, providing less and less habitat for native wildlife. © Sam Hobson / WWF-UK

and thereby their actions cannot be solely based on current risk models and assessments used by central banks and financial supervisors.

Second, as Maynard Keynes is believed to have said, “it is better to be roughly right than precisely wrong.” Applied to climate change and biodiversity loss, this means that rather than waiting for certainty and complete information about the impacts of environmental destruction, those responsible for financial and price stability need to act pre-emptively in a context of uncertainty. Or, as the deputy general manager of the BIS Luiz Awazu Pereira da Silva

said, the environmental risks we face call less for improvements in risk modelling and more for “decisive and immediate action and coordination”.³²

Third, international environmental law has long enshrined the necessity of the precautionary principle. The Rio Declaration of 1992 states that, “where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental damage.”³³ This reflects the 1987 UN Brundtland Commission’s definition of sustainability as “meeting the needs of the present without compromising

the ability of future generations to meet their own needs”. Alongside their primary mandate of assuring price and financial stability, many central bankers and financial supervisors also have additional mandates. The European Central Bank (ECB), for example, is required to support the general economic policies of the EU “with a view to contributing to the achievement of the Union’s objectives as laid down in Article 3 of the Treaty on European Union”.³⁵

Fourth, central bankers and financial supervisors have repeatedly acted under situations characterized by high uncertainty, such as the



financial crises in 1929 and 2007-08.³⁶ Scholars and journalists have acknowledged how individual actors, such as Ben Bernanke, Mervin King, Jean-Claude Trichet, Timothy Geithner, etc. moved swiftly, with incomplete information, using all available tools and instruments, and advocated for large interventions, rather than for small ones.³⁷ They recognized that inaction or modest responses would lead to disaster. They acknowledged that central bankers and financial supervisors had to be proactive, innovative, and use novel monetary policy or instruments of financial regulation. Central banks took center stage when it came to saving our financial system and economy. Given the magnitude of the climate and biodiversity risks that we face, it makes sense to apply a similar precautionary approach. Central bankers and financial supervisors need to understand that we are already in the midst of a twin environmental crisis which requires swift, large-scale, and coordinated action. Conversely, failing to pursue active intervention in the face of environmental crisis is itself a policy choice that carries risks.³⁸

A first necessary step towards the implementation of this precautionary approach is the establishment of a common language which provides a shared understanding and vocabulary, and which can help orientate actions and measures. The principles listed below should provide such a common framework for concerted actions by financial and price stability stewards. At WWF, we are calling on central bankers and financial supervisors to adopt these principles when applying and modulating their monetary policy and financial regulation instruments.



ON CLIMATE CHANGE AND BIODIVERSITY:

Climate change and biodiversity loss are happening, and they are directly linked to patterns of economic activity. These findings are not new; the scientific community, business leaders and policymakers have been aware of these threats since the 1970s.⁴⁰

Climate change and biodiversity loss are the result of more than a century of unsustainable energy and land use, lifestyles and patterns of production and consumption.⁴¹ Climate change is currently driven by GHG emissions produced by fossil fuels, agriculture, and land-use change (historical emissions before 1950 were dominated by land-use change). Biodiversity loss is mainly driven today by land-use change caused by agriculture and resource extraction.

Even with a significant reduction of GHG emissions, it will be difficult to hold warming below the 1.5°C ceiling, given inertia in the climate system and with continuing ecosystem loss significantly reducing uptake of carbon by natural sinks such as forests. Nonetheless, reducing GHG emissions dramatically and halting biodiversity loss over the coming seven years are essential if we are to limit global warming to 1.5-2°C.

Global warming exceeding 2°C will lead to catastrophic impacts on natural and human systems, with unknown consequences for the global economy and financial system. It will lead to irreversible environmental changes.

Climate change and loss of nature are twin problems that feed each other in a vicious circle. Given their inter-relationships, stewards of financial and price stability need to focus on climate change and biodiversity simultaneously. Restoring and recovering biodiversity will also help to mitigate climate change. For example, food systems are both the biggest single contributor to nature loss and also contribute to around 30% of global GHG emissions.⁴² It should be noted, however, that some climate change solutions risk negative impacts on biodiversity (such as large-scale bioenergy projects or monoculture afforestation of non-forest biomes).

Preparation should be made for worst-case scenarios where runaway climate change could make Earth uninhabitable for humans (e.g. insurance company AXA characterizes a world with 4.4°C warming “uninsurable”⁴⁴). Recent scientific research concludes that the urgency of environmental decline is even stronger and more acute than previously assumed, particularly as tipping points materialize sooner.



ON THE FINANCIAL SECTOR AND CLIMATE CHANGE AND BIODIVERSITY LOSS:

Regarding climate change, reducing the exposure of the financial sector to the oil, gas, and coal sectors and activities related to deforestation is of the highest priority, as those sectors are the core drivers of GHG emissions and therefore represent the greatest financial risks from efforts to reduce emissions.

As for biodiversity loss, the highest financial risks stem from the exposure of the financial sector to the conventional/industrial agriculture sector and the extractive sector, which are large drivers of land-use change and deforestation.

Until global GHG emissions begin to fall materially, and biodiversity destruction is halted and reversed, it can be assumed that the financial sector is not aligning its financial flows with the objectives of the Paris Agreement and the Convention on Biological Diversity, as enshrined in the former and as is proposed for the latter’s forthcoming Global Biodiversity Framework.⁴⁵



ON THE INSTRUMENTS AND TOOLS OF CENTRAL BANKS, FINANCIAL REGULATORS AND FINANCIAL SUPERVISORS:

Central banks and financial supervisors should assume that all environmental damage potentially impacts price and financial stability. When making decisions, economists, central bankers, and financial supervisors should first be required to prove that any resulting environmental degradation has no effect on financial and price stability, instead assuming that environmental degradation is per se financially risky. Clearly, environmental degradation can have enormous implications for financial and price stability, and inaction in the face of this evidence is itself a policy decision. There is a simple rule of thumb: the greater the GHG emissions produced or the higher biodiversity loss from a specific investment, project, or company, the greater the financial risk, and the greater the negative impact on our future resources, implying ever greater risks for our economy.

Central banks and financial supervisors should assume that environmental damage or risk has not been effectively internalized and accounted for by the market and that financial risks stemming from environmental degradation are by nature endogenous. The ECB indicated in 2022 that it was not able to assess the risk of climate change based on reporting by European banks, referring to their disclosures as being “white noise”.⁴⁷

Given the high uncertainty related to the current and future consequences of climate change and biodiversity loss, central banks and financial supervisors should, given their existing mandates, adopt a precautionary approach requiring them to act, based on the understanding of the environmental crises and the consequences of insufficient action or in-action. As Nobel Laureate Robert Lucas observed, “in cases of uncertainty, economic reasoning would be of no value.”⁵⁰

Biodiversity loss and climate change are inherently linked to the core mandates of central bank and financial supervisors, namely to assure financial and price stability and protect consumers. By orienting their monetary policy and financial regulation tools and instruments such that they contribute to the reduction of GHG emissions and help biodiversity to recover, central banks and financial supervisors will therefore be able to continue to execute

their mandates over the decades to come.

Central banks and financial supervisors should communicate their goals clearly, consistently, and do so continually. As the COVID crisis demonstrated, poor communication resulted in lower levels of trust among the population in its decision-makers, leading to more cases and higher hospitalizations and mortality.⁵¹ Communication in a clear, continuous manner, referencing the overall goal, builds trust, support for future measures and facilitates the smooth management of the crisis.⁵²

Central banks and financial supervisors should seek to simplify the challenges involved. Climate change and biodiversity loss are undeniably complex, wicked problems. But there are a number of elements that are simple, such as acknowledging that they exist, that they are interlinked, and that addressing them falls within the mandates of those responsible for financial and price stability.

With regards to the ‘radical uncertainty’ related to climate change and biodiversity loss, it is better to act now with imperfect solutions and data rather than wait for greater certainty. Delay is itself a choice. As Janet Yellen argued regarding climate change, “the thinking goes that, because we know so little about climate risk, let’s be tentative in our actions — or even do nothing at all. This is completely wrong, in my view. This is a major problem and it needs to be tackled now.”⁵³

Stewards of financial and price stability should utilize all instruments at hand to contribute to the reduction of GHG emissions and the restoration of biodiversity, using ex ante measures.

The current structure and decision-making of central banks and financial supervisors indirectly supports and subsidizes the destruction of biodiversity and climate change. The world’s largest publicly listed companies in 2008 generated more than US\$2 trillion of costs via environmental damages.⁵⁴ This needs to be acknowledged and stopped, to assure a level playing field for all companies.

Central banks and financial supervisors should focus on reducing the attractiveness of highly CO₂-intensive and biodiversity-destructive economic sectors and sub-sectors. The current economic system is highly environmentally damaging. There is a clear understanding of what is definitively not green and can be classified as always harmful for the climate and biodiversity and, therefore, as always contributing to financial risk. Once commonly agreed standards are available on what can be considered climate- and biodiversity-friendly economic activities, companies, and sectors, then central banks and financial supervisors can start reflecting on how to encourage these sectors, through, for example, their monetary policy operations.

Central banks and financial supervisors must be forceful stewards. They should:

- Request that governments and regulated financial actors take swift, pre-emptive measures, in an orderly fashion, to reduce the risk of a climate- and nature-related financial crisis.
- Acknowledge that environment-related risks from biodiversity loss and climate change are the single most important issue that society faces and, therefore, addressing this risk will be their primary priority over the coming seven years.
- Contribute to the discussions within the Convention on Biological Diversity and the Paris Agreement on Climate Change to raise awareness about the role of financial policymakers and to provide knowledge and expertise to the discussions.



4. INITIATING THE TRANSFORMATION. A PATHWAY IN THREE PHASES

Embedding these principles into the practices of central banking, financial supervision, and financial regulation will require a transformation, emerging from the current ‘Great Moderation’. This central banking orthodoxy, which began in 1979 when Paul Volcker took over at the Federal Reserve, holds that managing inflation is the primary responsibility (some argue the only goal) of central banks, and that financial markets and institutions should be subject to as little regulation as possible. This orthodoxy was destroyed by the 2007-08 Global Financial Crisis.

Now, the last vestiges of this outdated mindset must be abandoned in favor of a new era where the stewards of financial and price stability recognize that the economy is deeply embedded within the Earth’s planetary boundaries, and where they acknowledge their co-responsibility (with elected politicians, government agencies, civil society, etc.) to proactively and effectively encourage net-zero GHG emissions and the full restoration of biodiversity by 2050.

To meet these ambitious goals, a three-phase pathway would provide a sequence and mid-term goals. These phases are a general orientation for individual central banks and financial supervisors. Based on the scientific insights from the IPCC and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and the goals set by the Paris

Agreement and the Kunming Declaration, they should apply all the monetary policy, financial regulation, and supervisory tools at their disposal. Individual central banks and financial supervisors can be more ambitious regarding their quantitative targets. Being less ambitious, however, would conflict with their mandates to act as precautionary agents. It is important to keep in mind that successfully addressing the twin crises depends on action over the rest of this decade; phases 0 and 1 are arguably the most important ones, as they set the foundation for the others. Phases 0, 1 and 2 are mainly driven by the central banks and financial supervisors’ prudential mandate. Phase 3 focuses on the ‘promotional’ mandate that certain central banks have and can utilize to support the green transition.

PHASE 0 (2022):

Plan, set, and publicly declare expectations to send the necessary signals to financial markets.

PHASE 1 (2022-25):

By 1 January 2025, central banks and financial supervisors should be proactively and effectively contributing to and encouraging the abatement of at least 15% GHG emissions (against a 2019 baseline) and the stabilization of the biodiversity crisis by achieving zero (net) loss of nature, implementing a precautionary approach and using all necessary monetary policy and prudential supervisory tools at the micro and macro levels.

PHASE 2 (2025-30):

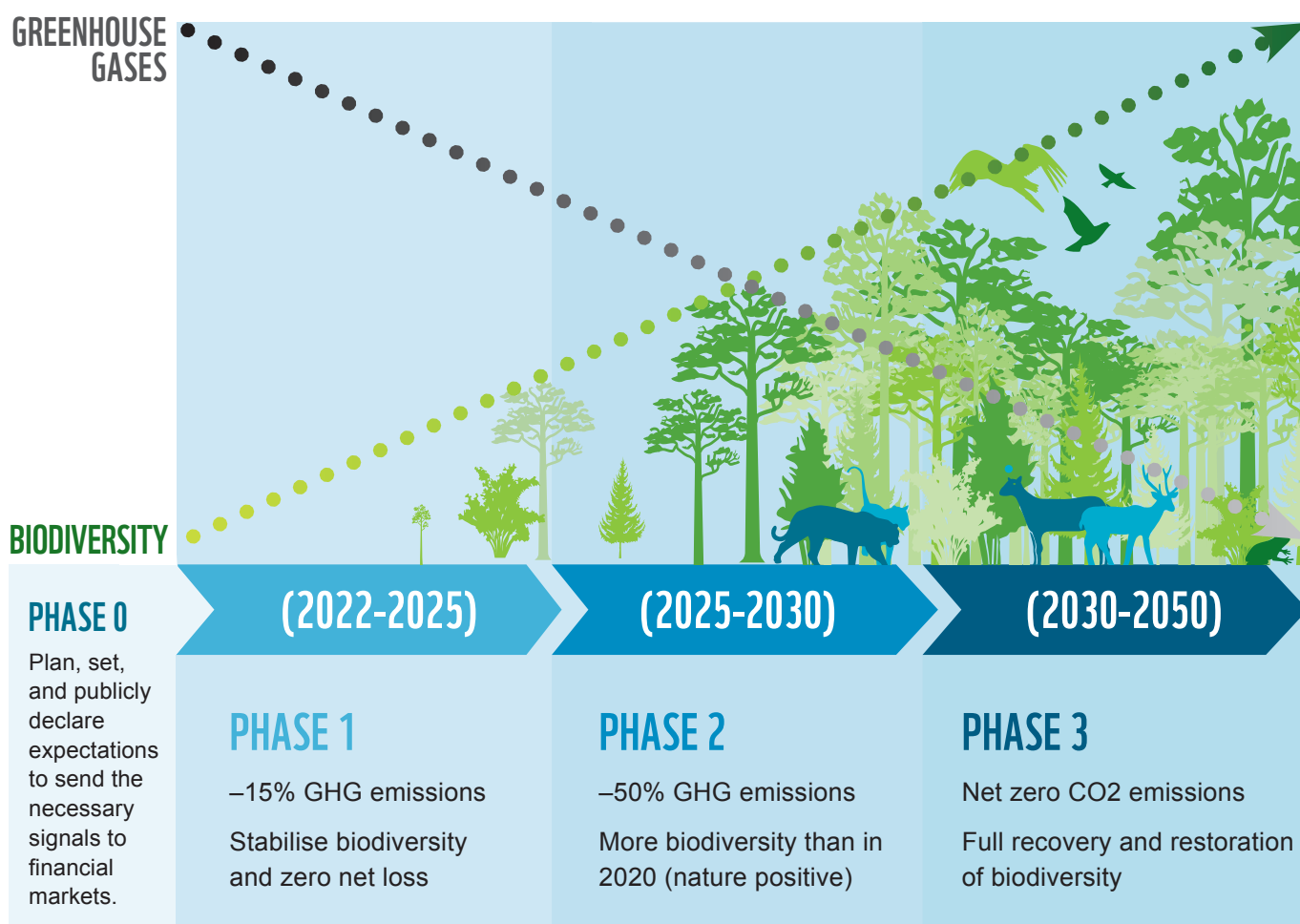
By 1 January 2030, central banks and financial supervisors should be proactively and effectively

contributing to and encouraging the abatement of at least 50% GHG emissions (against a 2019 baseline), and the reversal of biodiversity loss by recovering and restoring it, so that there is more nature from 2030 onwards than in 2020, implementing a precautionary approach and using all necessary monetary policy and prudential supervisory tools at the micro and macro levels.

PHASE 3 (2030-50):

By 1 January 2050, central banks and financial supervisors should be proactively and effectively contributing to and encouraging net-zero CO₂ emissions, and be on track to the full recovery and restoration of biodiversity by that date, implementing a precautionary approach and using all necessary monetary policy and prudential supervisory tools at the micro and macro levels.

A PATHWAY TO A CLIMATE SAFE AND NATURE POSITIVE GLOBAL ECONOMY



* The GHG and Biodiversity related curves are linear for illustration purposes. These need to align with science based scenarios such as 1,5C aligned with no/low overshoot by 2050.

** The time intervals depicted here are focused on near term priorities. Nevertheless it is essential for financial actors to do regular continuous target setting in 5-yearly (ideally shorter) time intervals, and annual progress reporting against these targets.

5. THE ‘THERE IS NO ALTERNATIVE’ (TINA) AGENDA

In contrast to the financial deregulation previously advocated, we believe that there is now no alternative to a global economic and financial system that is aligned with net zero emissions and a nature positive world, and that central banks and financial supervisors have a vital role to play.

To begin along the pathway on page 23, and to ensure a precautionary approach, we suggest that the stewards of financial and price stability follow a ‘TINA’ agenda. These measures are, in our view, the necessary steps to initiate in 2022, or at the latest by 2023, if we are to have a chance of attaining the objectives of phases 0 and 1. A more detailed set of measures are discussed in the WWF Technical Background Report. Overall, it is necessary to utilize all available avenues, inspired by the crisis management of the financial crisis of 2007 and 2008, the Eurozone crisis and the COVID crisis, focusing mostly on prudential mandates and secondly on the promotional tools that central banks and financial supervisors have at their disposal. We urge central banks and financial supervisors to:

TREAT THE TWIN CRISES LIKE A CRISIS.

Central banks and financial supervisors must add **two new nominal anchors** alongside existing inflation targets, namely: the 1.5°C global warming ceiling which requires that GHG emissions are reduced to net zero by 2050, and a qualitative target of fully recovering and restoring biodiversity by 2050.

They should publicly **adopt a precautionary approach** regarding climate change and biodiversity loss, and express their intention to take preventive and pre-emptive measures.

Central banks and financial supervisors need to lead by example and provide necessary clarity and forward guidance to financial market actors by **publishing their own**

clear and detailed transition plans (with quantifiable climate and biodiversity goals for 2025, 2030, 2040, and 2050), covering all central banking, financial regulation, and supervision activities.

All regulated financial institutions must be required to publish credible transition plans with clear quantifiable climate and biodiversity goals for 2025, 2030, 2040, and 2050, covering all their business lines (investment, lending, and underwriting).⁵⁵

FOCUS ON CONTRIBUTING TO A RAPID REDUCTION OF GHG EMISSIONS AND A HALT TO BIODIVERSITY DESTRUCTION.

As precautionary agents, central banks and financial supervisors need to focus all their efforts on avoiding the worst financial and price stability risks that stem from climate change and biodiversity loss. Companies which have the greatest environmental impacts also have the highest financial risks, and therefore require the greatest attention. A filter list of ‘always environmentally harmful’ sectors, companies, and economic activities (see Table 1) provides a first proposal for a list of indicators which can be used now by central banks and financial supervisors to modulate the core instruments at their disposal, to allow for a smooth transition and avoid rapid price hikes or financial instability. This list will need to be further enhanced and specified over time, particularly taking into account the highly location-specific nature of biodiversity loss, or urgent issues such as deforestation or water security. The distinction between economic activities,



**‘RADICAL UNCERTAINTY’
REGARDING ENVIRONMENTAL
DESTRUCTION DEMANDS
IMMEDIATE ACTION WITH
IMPERFECT SOLUTIONS AND
DATA, RATHER THAN WAIT
FOR GREATER CERTAINTY.
DELAY IS ITSELF A CHOICE.**

companies and economic sectors allows central banks and financial supervisors to choose the indicator which best suits their internal decision-making tools.

Central banks and financial supervisors need to require that banks lending to companies included in the ‘always environmentally harmful’ filter list set aside regulatory capital for the full amount of that lending.

They should consider all companies that are part of the list to be **no longer as liquid** and therefore to be excluded in calculations of regulated institutions’ net stable funding factors and liquidity coverage ratios.

Central banks and financial supervisors need to demand from all financial institutions that remain exposed to companies on the list to **reduce their exposure** within one year, or face capital add-ons for concentration risk.

Those banks subject to existing systemic risk buffers need to face increased rates according to their exposure to actors on the list, or to assets in particularly vulnerable regions.

Central banks must no longer invest in those companies included in the list, and exclude them from asset purchase programs, foreign exchange portfolios, etc.

Central banks must reduce their own exposure to risks from climate change and biodiversity loss by using the list to, among other things, modulate collateral frameworks (through the collateral they accept – both in their eligibility criteria as well as in the haircuts applied).

Central banks and financial supervisors must convene and cooperate with the leading climate and biodiversity scientists as well as environmental organizations to regularly update and extend the filter list.

ALWAYS ENVIRONMENTALLY HARMFUL REFERENCE POINTS

This chart sets out the reference points for economic activities, businesses, and sectors that central banks and financial supervisors should consider as 'Always Environmentally Harmful', which can serve as a 'dirty taxonomy' for adapting monetary policy and financial regulation instruments. Central banks and financial supervisors need to choose their reference point (economic activity-, company-, or sub-sector-level) for adapting all their financial regulation and monetary policy instruments.

ALWAYS ENVIRONMENTALLY HARMFUL ECONOMIC ACTIVITIES



Always significantly harmful economic activities based on the 'extended taxonomy' of the EU Platform on Sustainable Finance, and activities related to logging of primary or old growth forests, deep-sea bottom trawling, and exploiting and trading of endangered IUCN RED List species.

Harmful economic activities that could be retrofitted to exit the harmful category, based on the 'extended taxonomy' of the EU Platform (e.g. truck, airplane and car manufacturers, steel and cement production, and building construction).

Damaging activities that take place in certain geographical areas of high environmental importance. For example No-Go-Areas such as natural World Heritage Sites, Protected Areas as indicated in the Convention on Biological Diversity or Key Biodiversity Areas).

ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES (BROAD)



Companies that are expanding coal production.

*See for example Urgewald's Global Coal Exit List.

Companies that are expanding the oil and gas production.

*See for example Urgewald's Global Oil and Gas Exit List.

Constituent companies of the Carbon Underground 200 that identifies the top 100 coal and top 100 oil and gas publicly traded reserve holders globally.

ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES (SPECIFIC)



Companies that are expanding their environmentally harmful activities should systematically be considered as high environmental risk, independent of their exposure to harmful activities and their environmental targets and transitions plans.

Thresholds for considering a company harmful, to identify those companies that are most exposed hence face the highest related financial risks (e.g. 30% of revenues from harmful activities until 2025, thermal coal max. 15% of revenue by 2025, or deforestation related activities need to be phased out by 2030).

Exception: Harmful companies that can be exempted, based on their actions to reduce their exposure to harmful activities. The companies have set and published measurable, specific, time-bound, science-based target(s) for the environmental issues, publish five-year transition plans, and report annual progress.

HARMFUL ECONOMIC SUB SECTORS



- Oil & Gas Drilling (GICS Code: 10101010)
- Integrated Oil & Gas (GICS Code: 10102010)
- Oil & Gas Exploration & Production (GICS Code: 10102020)
- Oil & Gas Refining & Marketing (GICS Code: 10102030)
- Oil & Gas Storage & Transportation (GICS Code: 10102040)
- Coal & Consumable Fuels (GICS Code: 10102050)
- Fertilizers & Agricultural Chemicals (GICS Code: 15101030)

- Gas Utilities (GICS Code: 55102010)
- Electric Utilities (GICS Code: 55101010)
- Multi-Utilities (GICS Code: 55103010) in so far as it relates to electric and/or gas utilities (not water utilities)
- Independent Power Producers & Energy Traders (GICS Code: 55105010)
- Steel (GICS 15104050) in so far as it relates to metallurgical (coking) coal mining used for steel production (not steel production itself)

ADAPT AN APPROPRIATE TIME HORIZON IN FINANCIAL REGULATION AND PRUDENTIAL SUPERVISION TO OVERCOME THE ‘TRAGEDY OF THE HORIZON’.

Monetary policy is orientated towards the business cycle, which typically lasts between two and three years. The time-horizon for financial regulation is the credit and financial cycle, which lasts between 10 and 16 years. As the then-Governor of the Bank of England Mark Carney argued, the risks posed by climate change may not materialize within these time horizons and are therefore typically considered out of scope for central banks and financial supervisors, despite the longer-term systemic financial risk they pose.⁵⁶ This needs to change.

The **time horizon** for management of environment-related risks **need to be extended to 10 to 30 years**, to not only take into account financial risks to the financial institutions themselves, i.e. the consequences of their financed activities, but also the adverse impacts they cause.

DO GOOD HOUSEKEEPING.

Central banks and financial supervisors need to do their homework and start integrating climate change and biodiversity loss within the analyses which provide the foundation for their monetary policy, financial regulation, or supervisory activities. They should:

Collect and publicly provide data and analytics as a public good to enable climate and biodiversity risk assessments by financial institutions. They must **define reporting templates** based on the Task Force for Climate-related Financial Disclosures (TCFD) and the Taskforce for Nature-related Financial Disclosures (TNFD).

Request financial institutions disclose asset-level data to improve the risk analytics regarding climate and biodiversity risk. The TNFD has shown that location matters greatly for the identification, assessment, mitigation, and management of nature-related risks. The TNFD Beta Framework⁵⁷ therefore stresses the necessity of asset-level data as a key design consideration.

Run annual scenario analysis, using worst-case scenarios, for climate change and biodiversity loss for the banking and insurance sectors, and develop scenarios that combine climate change and biodiversity loss.⁵⁸

Amend supervisory expectations so that, from 2023 onwards, all financial actors not disclosing according to the TCFD framework, and from 2025 onwards according to the TNFD, are considered to be part of the ‘always environmentally harmful’ filter list.

CREATE NECESSARY COOPERATIVE STRUCTURES TO HANDLE THE TWIN CRISES.

The G20 Sustainable Finance Working Group should integrate biodiversity alongside climate to ensure the coherence of policies at the international level and to promote convergence in practices. The G20 must integrate climate change and biodiversity loss as key priorities within its existing working groups.

The International Organization of Securities Commissions, the Basel Committee on Banking Supervision and the International Association of Insurance Supervisors should **establish a joint climate and biodiversity working group** (under the auspices of the Financial Stability Board) to adapt international financial standards and ensure the coherence of action across different financial sectors, heavily investing in better data and comparable disclosure regimes.

The IMF must integrate climate and biodiversity targets and international standards into its Financial Sector Assessment Program monitoring, and regularly assess and publicly report on compliance with international financial standards.

Similarly to the Jackson Hole meetings, where academics are invited to present their findings to central banks and financial regulators, they should **invite climate change and biodiversity experts**, such as those involved with the IPCC and the IPBES, to the appropriate forums to help them better understand the challenges at hand.

BE FORCEFUL STEWARDS.

Central banks and financial supervisors are co-responsible for addressing the biodiversity and climate crises. They can exert important leverage for change, but they cannot tackle this enormous challenge alone. They therefore need to make sure that their voice is clearly heard. Central banks and financial supervisors must:

Echo the “Act Now” paper from the Glasgow Finance Alliance for Net Zero, **requesting governments to take more decisive action**.⁵⁹

Cooperate with policymakers and the CBD to draw up a scientifically sound quantitative biodiversity target which could help guide the instruments and tools at their disposal.

Initiate discussions with external credit rating agencies, requesting the clear and transparent integration of climate change and biodiversity loss data points into agencies' risk models.

Draft proxy engagement and voting guidelines regarding central bank investments. If, within two years, no significant progress regarding the alignment with climate and biodiversity goals by an issuer is perceived by the central bank, it needs to divest all that issuer's assets held in asset purchase programs, foreign exchange portfolios, pension plans, etc.

START SUPPORTING THE GREEN TRANSITION.

In their promotional roles, central banks should use monetary policy operations to encourage and support the transition to a low-carbon economy. Doing so would influence the funding conditions faced by companies.

This would be necessary for phase 3 of the suggested pathway. Central banks and financial supervisors should:

Incentivize green small and medium-sized enterprises (SMEs). Based on the existing SME supporting factor that many central banks and financial supervisors have implemented, these refinancing operations could be modulated that those SMEs that conform to a green taxonomy (e.g. EU, Colombia, etc.) can benefit from preferential interest rates or earmarked lending volumes.

Green asset purchases: the massive asset purchases after the 2007-08 financial crisis and during the COVID crisis were instrumental in successfully combatting those crises. These ongoing asset purchase programs and any subsequent ones should only be able to invest in companies that have set science-based climate and biodiversity targets, or are eligible within a green taxonomy (e.g. EU, Colombia). A further option could be that, from 2023, bonds that do not provide information on the taxonomy alignment of the use of their proceeds would no longer be eligible for asset purchase programs (in jurisdictions with an existing green taxonomy).

WWF's Greening Financial Regulation Initiative brings together a broad network of environmental scientists and finance practitioners to support the transition outlined above. It has an overview of existing tools, methodologies and metrics that can enable financial supervisors and central bankers to integrate climate and environmental considerations in all their activities. However, central banks and financial supervisors are not the only relevant actors. They must act within policy frameworks created by governments. But their existing mandates to protect financial stability require them to proactively and urgently act to shift financial and economic systems towards protecting nature and cutting emissions. Anything less would be a dereliction of their duty and would put the future wellbeing and prosperity of humanity at risk.

EXISTING MANDATES TO PROTECT FINANCIAL STABILITY REQUIRE TO PROACTIVELY AND URGENTLY ACT TO SHIFT FINANCIAL AND ECONOMIC SYSTEMS TOWARDS ZERO NET EMISSIONS. ANYTHING LESS WOULD BE A DERELICTION OF THEIR DUTY AND WOULD PUT THE FUTURE WELLBEING AND PROSPERITY OF HUMANITY AT RISK.

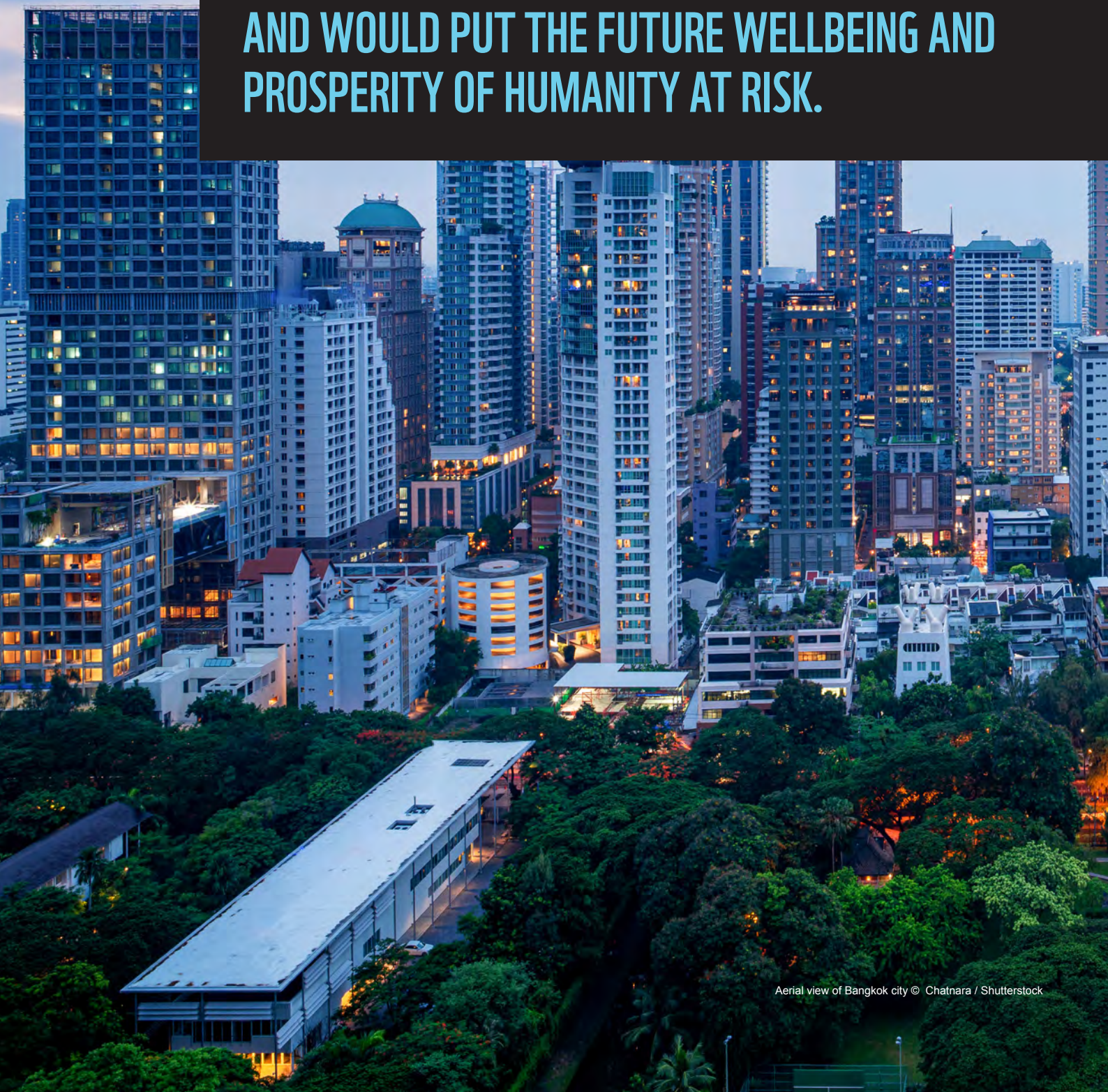


TABLE 1: ALWAYS ENVIRONMENTALLY HARMFUL ECONOMIC ACTIVITIES

ALWAYS ENVIRONMENTALLY HARMFUL ECONOMIC ACTIVITIES			
DESCRIPTION	Always significantly harmful economic activities	Harmful economic activities that could be retrofitted to exit the harmful category	Geographical location of economic activity
	The EU Platform on Sustainable Finance, the European Commission’s expert group, has just published a report proposing an ‘extended EU taxonomy’ including a category of environmentally harmful activities. Such activities include those that are always significantly harmful and which need to be decommissioned. Coal activities are explicitly included in the law; the European Commission is in the process to assess how and when to develop this list. WWF is developing a project to issue criteria recommendations for this list by early 2023.	The EU Platform on Sustainable Finance, the European Commission’s expert group, has just published a report proposing to set an ‘extended EU taxonomy’ including a category of environmentally harmful activities. Such activities include those that are currently harmful but can be retrofitted to exit the harmful category.	Biodiversity loss, and its recovery and restoration are highly location-specific. Certain economic activities such as mining are necessary for the ecological transformation of the energy system. However, mining in biodiversity hotspots is highly environmentally damaging and risks the overall stability of Earth’s biodiversity. It is therefore important that companies do not undertake certain economic activities within specific regions of the Earth ("no go areas"). Companies therefore need to disclose asset-level data on specific production areas to enable an assessment and decision-making process. For example, a financial actor investing in or insuring a company that mines for cobalt in a biodiversity-rich area increases its reputational, litigation, and transition risks.
INDICATORS	Report from the EU Platform on sustainable finance	Report from the EU Platform on sustainable finance. Significantly harmful activities that can be retrofitted: all activities in the EU taxonomy that do not meet the Do No Significant Harm criteria. List of activities with DNSH criteria	Natural World Heritage Sites
	By definition, all activities within Harmful Economic Sub Sectors (see page 40) are harmful.	Truck manufacturers	Protected Areas based on the Convention on Biological Diversity
	Additional to EU list: Logging of primary or old-growth forests	Airplane manufacturers	Key Biodiversity Areas
	Additional to EU list: Deep-sea bottom trawling (fishing)	Car manufacturers	ENCORE : interactive map to explore geographical-specific risks of depleting natural capital stocks (avoid high depletion areas areas)
	Additional to EU list: Hunting of species on the IUCN Red List of Threatened Species	Steel manufacturing	ESG transparency assessments of commodity producers and traders
		Cement manufacturing	Using World Benchmark Alliance on retrofittable economic activities to guide engagement/discussions
		Buildings	

TABLE 2: ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES

	ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES (BROAD)			ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES (SPECIFIC)		
	Companies that are expanding coal production	Companies that are expanding oil and gas production	Constituent companies of the Carbon Underground 200	Companies that are expanding their environmentally harmful activities	Thresholds for considering a company harmful	Exception: Harmful companies that can be exempted
DESCRIPTION	<p>The Coal Exit List from Urgewald is a public database that identifies the largest companies that are expanding the oil and gas production and highlights the largest CO2-emitting companies, based on their yearly real production and the associated emissions. The list consists of over 1,000 parent companies and around 1,800 subsidiaries operating along the thermal coal value chain (upstream, midstream, and downstream), representing 90% of the world’s thermal coal production and the world’s coal-fired capacity. Thereby it thus covers captures the physical climate risk part and is a proxy for future lock-in situations and thereby high transition risks.</p>	<p>The Global Oil and Gas Exit List is a public database that identifies the largest companies that are expanding the oil and gas production and highlighting the largest CO2-emitting companies by focusing on their yearly real production and the associated emissions. The list consists of 887 companies operating in the upstream and/or midstream sectors of the oil and gas sector, capturing physical climate risk. The list also tracks the exploration and new oil and gas infrastructure capex, providing a proxy for future lock-in situations and high transition risks.</p>	<p>The Carbon Underground 200 identifies the top 100 coal and top 100 oil and gas publicly traded reserve holders globally. The companies are ranked by the potential carbon emissions content within their reported reserves. The transition of the economy, those reserves will become stranded assets. In contrast to the Global Oil and Gas Exit List from Urgewald, this list does not account for effective annual emissions per year.</p>	<p>Some companies have legacy harmful activities but are not developing new ones (i.e. they have revenues from but no capex for harmful activities), and their exposure to harmful activities is decreasing over time. Others have capex for new harmful activities and their exposure to harmful activities could increase over time. This is a fundamental difference that should be taken into account: new harmful activities that need to repay their investment or could be stranded are far riskier financially than existing ones that may be near or at the end of their productive lifetime and can potentially be decommissioned soon.</p>	<p>The EU Taxonomy focuses on economic activities: it is possible for companies to use the taxonomy Do No Harm criteria to assess their total corporate exposure to environmentally harmful activities, by aggregating each activity not meeting the Do No Harm criteria they have in their operations (or portfolio, for financial institutions). It is then necessary, in addition, to set ‘high risk’ thresholds for corporate exposure to harmful activities, to identify those companies that are most exposed and hence face the highest related financial risks. The thresholds have two critical features. First, they must be dynamic (i.e. decrease over time), to reflect the growing financial risks related to corporate exposure to harmful activities. Secondly, they should be sector-specific (i.e tailored) in the sectors where climate and environmental science finds that pathways towards full sustainability (e.g. net-zero emissions) must be faster than average (e.g. the power sector needs to be decarbonized quicker than the rest of the economy).</p>	<p>A growing number of companies are taking action to reduce their exposure to harmful activities. As a result, their related financial risks will decrease over time. It is proposed to remove companies from the list of high environmental risk companies if they comply with the three following complementary requirement listed below.</p>

TABLE 2: ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES (CONT>)

				ALWAYS ENVIRONMENTALLY HARMFUL COMPANIES (SPECIFIC)		
				Companies that are expanding their environmentally harmful activities	Thresholds for considering a company harmful	Exception: Harmful companies that can be exempted
INDICATORS				Companies expanding harmful activities (i.e. with capex planned for harmful activities) should systematically be considered as high environmental risk, whatever their exposure to harmful activities and their environmental targets and transition plans.	30% of revenues from harmful activities until 2025, decreasing by 6 percentage points every five years to reach zero by 2050.	The companies have set and published measurable, specific, time-bound, science-based target(s) for the environmental issues that create material risks to their operations (e.g. using the six environmental issues defined in the EU taxonomy). For that purpose, the Science Based Targets Initiative could be taken into account for climate mitigation.
					Based on the IEA’s 1.5°C scenario, thermal coal needs to be phased out in the EU/OECD by 2030. For these activities, the threshold should be at 15% of revenue until 2025, decreasing to zero by 2030.	Companies have set and published five-year detailed implementing transition plan(s) describing how they will achieve their target(s), including their capex plans.
					Based on the IEA’s 1.5°C scenario, deforestation-related activities need to be phased out globally by 2030. The threshold should be at 15% of the revenue until 2025, decreasing to zero% by 2030.	Companies report annually on the progress towards the achievement of the target(s) and include corrective measures in case of delay.

TABLE 3: ALWAYS ENVIRONMENTALLY HARMFUL ECONOMIC SUB-SECTORS

ALWAYS ENVIRONMENTALLY HARMFUL ECONOMIC SUB SECTORS	
DESCRIPTION	Historically, fossil fuels are the driving force for climate change on biodiversity loss. A number of economic sub-sectors have the historic responsibility for past emissions and still contribute a large part to today's emissions. High negative environmental impacts come with high physical, transition, and litigation risks for financial institutions. As the current economic system is still in large part dependent on fossil fuels, these economic sub-sectors thus represent a systemic risk for the financial industry.
INDICATORS	Historically, fossil fuels (oil, gas, and coal) are the driving force for climate change and, have also a significant influence on biodiversity loss. A number of economic sub-sectors have the historic responsibility for past emissions and still contribute a large part to today's emissions. High negative environmental impacts come with high physical, transition, and litigation risks for financial institutions. As the current economic system is still in large part dependent on fossil fuels, these economic sub-sectors thus represent a systemic risk for the financial industry.
	Oil & Gas Drilling (GICS Code: 10101010)
	Integrated Oil & Gas (GICS Code: 10102010)
	Oil & Gas Exploration & Production (GICS Code: 10102020)
	Oil & Gas Refining & Marketing (GICS Code: 10102030)
	Oil & Gas Storage & Transportation (GICS Code: 10102040)
	Coal & Consumable Fuels (GICS Code: 10102050)
	Fertilizers & Agricultural Chemicals (GICS Code: 15101030)
	Gas Utilities (GICS Code: 55102010)
	Electric Utilities (GICS Code: 55101010)
	Multi-Utilities (GICS Code: 55103010) in so far as it relates to electric and/or gas utilities (not water utilities)
	Independent Power Producers & Energy Traders (GICS Code: 55105010)
	Steel (GICS 15104050) in so far as it relates to metallurgical (coking) coal mining used for steel production (not steel production itself)

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