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PUTTING NATURE AT THE HEART OF THE EUROPEAN GREEN DEAL

Building blocks for the next European
Commission

Sitra memorandum

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Building blocks for the next European Commission

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Foreword

The European Green Deal, launched in late 2019, was an ambitious response to tackle the climate crisis with a strategic approach. While the programme has encountered some headwinds as a result of Russia's attack on Ukraine and rising commodity prices, it is clear that we need to continue on the set course.

The European Union has long harnessed the market economy to fight climate change. Now it is time to take the next steps to exploit the market economy to halt and reverse biodiversity loss too. To boost resilience, mainstreaming circularity and leveraging the data economy within the single market are crucial.

In this memorandum, we suggest some building blocks for an updated Green Deal, which we call "European Green Deal 2.0". We believe that the European Commission should adopt an ambitious agenda to make Europe a pioneer of sustainable well-being.

Humans are currently pushing living and non-living nature beyond its carrying capacity, threatening the future of our economies and well-being. Solving the ecological sustainability crisis as a whole is essential but it can also bring about major opportunities.

We are in the middle of an industrial transformation, where hundreds of billions of euros are being invested in the green transition. The EU can significantly benefit from these new market opportunities, but only through consistency and leadership.

We encourage all stakeholders in Brussels and in member states to share their suggestions on the future European Green Deal. We can all shape the future of Europe – and it is our responsibility to do so.

Jyrki Katainen

President

Finnish Innovation Fund Sitra

Summary

Since its launch in 2019, the European Green Deal has been a true flagship strategy of the von der Leyen Commission. It can already be said that such a strategy was necessary to accelerate Europe's green transition amid a worsening ecological crisis. It was also vital for breaking away from the supply of Russian fossil energy to Europe following Russia's attack on Ukraine.

A new European Commission will take office in late 2024. Now is the right time to begin a debate on how the European Green Deal should be continued. It is of paramount importance that it continues, as the loss of biodiversity and the climate crisis continue with far-reaching consequences becoming more visible and tangible every year. At the same time, it has to evolve to take an even more integrated approach to solving the ecological crisis, while maintaining Europe's competitiveness and strengthening its resilience.

Human activity is exceeding the carrying capacity of nature and thereby threatening the very foundation of our economy and well-being. Nature, both biological and abiotic, is a whole. Therefore, we urgently need integrated responses to different facets of the ecological crisis. This can be done by putting nature at the heart of the decision-making of EU institutions, governments, local authorities, business and consumers. Our economies and well-being depend on nature, yet we have let our natural capital degrade and depreciate, because we have ignored it in our decisions. The value of nature and the ecosystem services it provides need to be made visible, internalised in economic decision-making and mainstreamed into core EU policies. This will ensure both sustainability and resilience of our economies and result in a new wave of investments and job creation.

This memorandum has two goals. First, it offers some "building blocks" upon which to design the next version of the European Green Deal, which we call "European Green Deal 2.0". These building blocks mainly address the very established core areas of the EU, namely the single market and the common agricultural policy, from the point of view of reducing the pressures on nature while creating new market opportunities and innovation. We discuss ecosystem accounting and biodiversity offsets as enablers and tools for making nature's value a visible part of decision-making, mainstreaming circularity into the single market, viewing nature as a business opportunity, using data and digital product passports as enablers of a green transition, tackling Europe's global biodiversity footprint and reforming the common agricultural policy. We also present a number of policy recommendations. The list is far from complete, and we encourage all stakeholders to share their suggestions.

Our second goal is thus to trigger an early debate on how a European Green Deal 2.0 should look. Nobody has all the answers, but it is important that various ideas are subjected to a public discussion. This paper also includes some questions that need further analysis with a view to formulating the European Green Deal 2.0.

Key policy recommendations

- The EU and its member states should make sure that the value of nature and ecosystem services is taken into account in economic decision-making and that damage to nature has a price.
- The EU should increase its ambitions for ecosystem accounting through the inclusion of monetary accounts in the European ecosystem accounting.
- The EU, its member states and their local authorities should ensure there is no net loss of ecosystems or ecosystem services through biodiversity offsets.
- The EU should establish a genuinely circular single market by introducing circular design principles in product policy and recycled content requirements for a broad range of products.
- Minimum mandatory targets for Green Public Procurement (GPP) should be introduced to create and stimulate demand for circular materials, products and services. Principles governing the green coding of software should also be introduced into green public procurement criteria.
- The EU and its member states should assess a broad range of policy measures to reduce European consumption of those key commodities which cause the greatest biodiversity impact.
- The next reform of the EU's common agricultural policy (CAP) should set a direction for gradually moving away from area-based and animal-based support payments towards results-based payments, which reward the strengthening and maintenance of ecosystem services.

Tiivistelmä

Vuonna 2019 julkaistu Euroopan vihreän kehityksen ohjelma (European Green Deal) on ollut Ursula von der Leyenin komission keskeisiä politiikka-ohjelmia. Jo nyt voidaan sanoa, että ohjelma tuli tarpeeseen ja onnistui vauhdittamaan vihreää siirtymää syvenevän ekologisen kestävyyskriisin keskellä. Ohjelma myös auttoi Euroopan unionia irtautumaan venäläisestä fossiilien energiasta Venäjän aloittaman hyökkäyssodan jälkeen.

Seuraavat europarlamenttivaalit järjestetään kesäkuussa 2024. Uuden komission odotetaan aloittavan työnsä syksyn 2024 aikana. Nyt onkin oikea aika aloittaa keskustelu seuraavan komission työohjelmasta ja Euroopan vihreän kehityksen ohjelman jatkosta. Ohjelmaa täytyy ehdottomasti jatkaa, sillä ilmastokriisi etenee ja luontokato kiihtyy. Luonnon kantokyvyn murenemisen seuraukset näkyvät selvemmin ja konkreettisemmin vuosi vuodelta. Euroopan vihreän kasvun ohjelmaa täytyy siis kehittää: ohjelmassa tulee etsiä ratkaisua ilmastokriisiin ja luontokatoon kokonaisuutena. Jos luontokadon pysäyttämiseksi epäonnistutaan, ilmastokriisiä ei voi saada kuriin – ja päinvastoin. Samalla ohjelman tulee huomioida Euroopan kilpailukyky ja vahvistaa maanosan kriisinkestävyyttä.

Ihmisen toiminta kuormittaa elollista ja elotonta luontoa yli kantokyvyn rajojen ja vaarantaa siten koko taloutemme ja hyvinvointimme pohjan. Ekologiseen kestävyyskriisiin ratkaisemissa on kiire – erityisesti tarvitaan ratkaisuja, jotka taklaavat kriisin samanaikaisesti eri ulottuvuuksia. EU:ssa tämä onnistuu asettamalla luonto päätöksenteon ytimeen EU-instituutioissa, jäsenvaltioissa, paikallistasolla ja yrityksissä.

Taloutemme ja hyvinvointimme ovat täysin riippuvaisia luonnosta, mutta olemme antaneet luontopääomamme huveta ja näivettyä. Luonnon ja sen tarjoamien palvelujen arvo onkin tehtävä näkyväksi ja tuotava osaksi taloudellista päätöksentekoa ja EU:n politiikkaohjelmia. Näin voidaan varmistaa kestävä hyvinvointi, talouden kriisinkestävyys sekä vauhdittaa uusia investointeja ja työpaikkojen syntymistä.

Tällä muistiolla on kaksi tavoitetta. Ensinnäkin tarjoamme ehdotuksia Euroopan vihreän kehityksen ohjelman seuraavan version pohjaksi. Ehdotukset koskevat Euroopan unionin keskeisiä osa-alueita: sisämarkkinoita ja yhteistä maatalouspolitiikkaa (CAP). Ehdotusten avulla voidaan vähentää luontoon kohdistuvia paineita ja samalla luoda uusia liiketoimintamahdollisuuksia ja innovaatioita. Muistoissa käsitellään ekosysteemitilinpitoa ja ekologista kompensatiota keinoina tuoda luonnon arvo näkyväksi osaksi päätöksentekoa. Ehdotamme myös sisämarkkinoiden uudistamista kiertotalouden periaatteiden mukaisiksi, luonnon näkemistä liiketoimintamahdollisuutena, datan ja digitaalisten tuotepassien hyödyntämisestä vihreän siirtymän mahdollistajana, Euroopan globaalin luontojalanjäljen pienentämistä sekä yhteisen maatalouspolitiikan uudistamista.

Muistossa esitämme joukon politiikkasuosituksia seuraavalle komissiolle. Lista ei ole kaikkia politiikkasektoreita kattava eikä varmasti täydellinen. Kutsummekin kaikki sidosryhmät jakamaan omia ehdotuksiaan. Muistion toinen tavoite on herättää keskustelua siitä, miltä seuraava Euroopan vihreän kehityksen ohjelma voisi näyttää. Kellään ei ole kaikkia vastauksia, mutta ideoita voidaan kehittää julkisessa keskustelussa. Muistiossa listaamme myös kysymyksiä, joiden osalta tarvitaan lisää tietoa seuraavan Euroopan vihreän kehityksen ohjelman muodostamiseksi.

Keskeiset politiikkasuositukset:

- Varmistetaan Euroopan unionissa ja sen jäsenvaltioissa, että luonnon ja sen tarjoamien ekosysteemipalvelujen arvo otetaan huomioon taloudellisessa päätöksenteossa ja että luontohaitoista syntyy kustannus niiden aiheuttajille.
- Nostetaan EU:n ekosysteemitilinpidon kunnianhimon tasoa sisällyttämällä rahalliset tilit eurooppalaiseen ekosysteemitilinpitoon.
- Varmistetaan EU:ssa, jäsenvaltioissa sekä paikallisten viranomaisten tasolla ekologisilla kompensatioilla, että ekosysteemejä tai ekosysteemipalveluja ei kokonaisuutena katsoen menetetä.
- Luodaan EU:ssa aidot kiertotalouden mukaiset sisämarkkinat ottamalla käyttöön kiertotalouden mukainen tuotepolitiikka, kuten laajaan tuoter ryhmään ulotettu kiertotaloutta tukeva tuotesuunnittelu ja laajalle ulotetut kierrätettyjen raaka-aineiden sekoite- ja käyttövelvoitteet.
- Asetetaan vihreille julkisille hankinnoille (Green Public Procurement) pakolliset vähimmäistavoitteet kiertotalousmateriaalien, -tuotteiden ja -palveluiden markkinan vauhdittamiseksi. Vihreän ohjelmoinnin periaatteet tulisi sisällyttää vihreisiin julkisiin hankintoihin.
- Arvioidaan unionissa ja jäsenvaltioissa, millä politiikkatoimilla voidaan vähentää eniten luontokatoa aiheuttavien hyödykkeiden kulutusta.
- Suunnataan EU:n yhteisen maatalouspolitiikan seuraavassa uudistuksessa tukipolitiikan painopistettä poispäin viljelyalaa ja eläinlukuun perustuvista tuista kohti tulosperusteisia tukia, jotka palkitsevat viljelijöitä ekosysteemipalvelujen ylläpitämisestä ja vahvistamisesta.

Sammandrag

Den europeiska gröna given (European Green Deal) som publicerades 2019 har utgjort en hörnsten i Ursula von der Leyens kommission. Ett sådant program kan redan nu sägas ha varit nödvändigt för att påskynda den gröna omställningen mitt under en allt djupare ekologisk hållbarhetskris. Programmet hjälpte också Europeiska unionen att frigöra sig från den ryska fossilen-ergin efter anfallskriget mot Ukraina som Ryssland inledde.

Nästa Europaparlamentsval hålls i juni 2024. Den nya kommissionen förväntas inleda sitt arbete under hösten 2024. Nu är det lägligt att inleda en diskussion om fortsättningen på den gröna given för nästa kommission. Det är av stor vikt att programmet fortsätter eftersom både klimatkrisen och förlusten av biologisk mångfald alltjämt fortsätter att förvärras. Följderna av att naturens bärkraft försvagas syns tydligare för varje år. Den europeiska gröna given måste samtidigt utvecklas för att i högre grad angripa den ekologiska hållbarhetskrisen som helhet och samtidigt stärka Europas konkurrenskraft och kriställighet.

Människan belastar idag naturen över gränserna för dess bärkraft och äventyrar därigenom grunden för hela vår ekonomi och välfärd. Det är bråttom att lösa den ekologiska hållbarhetskrisen – i synnerhet behövs det integrerade lösningar som samtidigt tacklar krisens olika dimensioner. Inom EU uppnås detta genom att placera naturen i centrum av beslutsfattandet i EU-institutionerna, medlemsländerna, på lokal nivå, bland medborgare och i företag.

Vår ekonomi och välfärd är helt beroende av naturen, men vi har låtit vårt naturkapital minska och förtvina. Värdet av naturen och de tjänster den erbjuder måste synliggöras och integreras i det ekonomiska beslutsfattandet och i EU:s politiska program. På så sätt kan man säkerställa en hållbar välfärd, ekonomins kriställighet samt påskynda en ny våg av investeringar och arbetstillfällen.

Denna promemoria har två syften. För det första presenteras förslag till grund för nästa version av den europeiska gröna given – vi kallar dessa förslag byggklossar. Förslagen gäller EU:s centrala delområden: den inre marknaden och den gemensamma jordbrukspolitiken (CAP). Med hjälp av förslagen kan man minska trycket på naturen och samtidigt skapa nya affärsmöjligheter och innovationer för lösningar som stärker naturen. I promemorian behandlar vi ekosystemräkenskaper och ekologisk kompensation som sätt att synliggöra naturens värde i beslutsfattandet. Vi föreslår också att den inre marknaden förnyas i enlighet med principerna för cirkulär ekonomi, att naturen ses som en affärsmöjlighet, att data och digitala produktpass utnyttjas för att möjliggöra en grön omställning, att Europas globala påverkan på den biologiska mångfalden minskas, samt att den gemensamma jordbrukspolitiken förnyas.

I promemorian presenterar vi även en rad rekommendationer till nästa kommission. Samtliga policyområden omfattas inte och listan bör inte betraktas som uttömmande. Därför bjuder vi in alla intressenter att dela med sig av sina egna förslag. Promemorians andra syfte är med andra ord att väcka diskussion om hur nästa europeiska gröna giv skulle kunna se ut. Ingen har alla svar, men i en offentlig diskussion är det möjligt att genom olika inspel utveckla idéerna. I promemorian räknar vi också upp frågor där det behövs mer data för att skapa nästa europeiska gröna given.

Centrala politiska rekommendationer:

- EU och dess medlemsländer bör säkerställa att naturens värde och de ekosystemtjänster den tillhandahåller beaktas i det ekonomiska beslutsfattandet, samt att skador på naturen medför kostnader för dem som orsakar dem.
- Ambitionsnivån i EU:s ekosystemräkenskaper bör höjas genom att inkludera monetära räkenskaper i de europeiska ekosystemräkenskaperna.
- Inom EU, i medlemsländerna och på lokal myndighetsnivå bör det genom ekologisk kompensation säkerställas att ekosystemen eller ekosystemtjänsterna som helhet beaktas och inte går förlorade.
- Inom EU bör det skapas en genuin inre marknad baserad på den cirkulära ekonomin, genom att ta i bruk cirkulära designprinciper och krav på innehåll av återvunna råvaror för ett flertal produktgrupper.
- För grön offentlig upphandling (Green Public Procurement) bör det fastställas obligatoriska minimimål för att påskynda marknaden för material, produkter och tjänster inom cirkulär ekonomi. Principerna för grön programplanering bör inkluderas i gröna offentliga upphandlingar.
- Inom unionen och i medlemsstaterna krävs en rad politiska styrmedel för att minska förbrukningen av de produkter som orsakar den största förlusten av biologisk mångfald.
- I nästa reform av EU:s gemensamma jordbrukspolitik riktas tyngdpunkten i stödpolitiken bort från stöd som grundar sig på odlingsareal och djurantal mot resultatbaserade stöd som belönar jordbrukare för att upprätthålla och stärka ekosystemtjänster

1 Introduction – the European Green Deal must continue

The European Green Deal (EGD), introduced by the European Commission in December 2019, was a true sea change in the European Union’s climate and environment policy in terms of its strategic approach, level of ambition, scope and method. While a lot of EGD legislation is still in the making and the majority of it is awaiting implementation in the member states, it can already be comfortably argued that the EGD was an absolute necessity to accelerate the green transition.

It was necessary because the climate crisis continues to deteriorate with far-reaching consequences ([IPCC 2023](#)) and biodiversity loss is accelerating ([Secretariat of the Convention on Biological Diversity 2020](#)). It has also proven to be necessary in order to increase Europe’s resilience and to reduce its dependency on imported fossil energy following Russia’s attack on Ukraine. And, importantly, it has accelerated an industrial transformation across Europe, triggering investment worth hundreds of billions of euros in renewable energy, green hydrogen, electric vehicles and energy-efficient solutions ([BloombergNEF 2023](#)).

The EU must continue with the EGD to tackle the ecological crisis. It also needs to continue to enhance Europe’s resilience and competitiveness and ultimately to improve the well-being of Europeans. Yet it needs to evolve, by increasingly focusing on halting and reversing the loss of biodiversity following the agreement on the Kunming-Montreal framework in December 2022, while also embracing a holistic approach to tackling the climate crisis and over-consumption of nature’s resources. As the final joint workshop report of the IPBES and IPCC ([Pörtner et al. 2021](#)) underlined, the mutual reinforcing of climate change and biodiversity loss means that satisfactorily resolving either issue requires consideration of the other.

This requires continued political will and leadership. As the mandate of the von der Leyen Commission will come to an end in December 2024, the new incoming European Commission (EC) will soon after need to design the continuation of the EGD agenda.

This memorandum has two goals, as follows.

- 1) To offer some building blocks**, that is, policy areas that need to be developed and upon which the next version of the EGD can be built, and associated recommendations and further questions. We would like to call it the “European Green Deal 2.0” (EGD 2.0) to denote the magnitude of challenges the EU is facing in this critical decade to achieve both the Kunming-Montreal framework and the Paris Agreement goals and the need to tackle the ecological crisis in a holistic manner. The name

also underscores the positive role that the use of ICT and data can play in achieving sustainability goals and increasing Europe's competitiveness – in other words, the “twin transition”.

This paper does not intend to cover all aspects of the current EGD. Nor does it have all the answers. Instead, the memorandum proposes a number of building blocks that we believe are essential for designing the EGD 2.0. Importantly, we consider climate to be part of nature and that halting biodiversity loss, combating the climate crisis and reducing the use of natural resources need to be integrated into the heart of EU policies, such as the single market and common agricultural policy. The EU climate policy understood more narrowly as a sectoral policy – which includes the EU's climate goals enshrined in the EU Climate Law (European Parliament and the Council 2022b), a goal for 2040, the emissions trading scheme, effort-sharing regulation, the LULUCF regulation, numerous other elements of the Fit for 55 package (European Commission 2021a) and technologies for negative emissions – is not within the scope of this paper. This choice was made by the authors – we expect many other stakeholders to provide elaborate views on how to take EU's climate policy forward and it is not because we consider the EU climate policy to be “ready”.

- 2) To trigger an early debate** among stakeholders on what the EGD 2.0 should look like. This paper, which is based on a large number of stakeholder conversations and the Finnish Innovation Fund Sitra's expert work, is one contribution to that debate. Sitra is keen to foster further stakeholder conversations and join forces with other organisations to further develop ideas presented in this paper by specific analyses and studies. This memorandum also proposes a number of policy recommendations and formulates a number of questions that warrant specific and deeper analysis in each chapter.

Structure of this memorandum

This paper is structured as follows. Chapter 2 briefly sets out the scene in terms of where the world and Europe are in terms of the ecological crisis and, at high level, sketches out some fundamental premises and concepts at the heart of the change that the EU has to drive – for Europe's competitiveness, resilience, well-being and the future of our planet.

The subsequent chapters present the proposed building blocks: they mainly address the long-established core areas of the EU, namely the single market and the common agricultural policy from the point of view of decreasing the pressures on nature while creating new market opportunities and innovation. This paper also provides some examples of innovative solutions – mainly from Finland – which we believe may have potential for scaling up or replication in Europe.

2 Putting nature at the heart of the European Green Deal – adjusting our economies to nature’s boundaries

Where are we?

It is evident that we need to adjust our economies and lifestyles to fit within nature’s boundaries. Biodiversity is declining at an unprecedented rate and the pressures driving this decline are intensifying ([Secretariat of the Convention on Biological Diversity 2020](#)). Some eight years after the Paris Agreement, the trend of global heating continues and, according to the Intergovernmental Panel on Climate Change (IPCC), we are likely to exceed the Paris target of 1.5 degrees of warming within the next decade. This has potentially very far-reaching consequences unless immediate action is taken to significantly reduce global greenhouse gas emissions ([IPCC 2023](#)). Europe is already witnessing the effects: according to World Weather Attribution initiative, the likelihood of droughts in Europe – such as those experienced in 2022 – are already much higher because of human-induced climate change ([World Weather Attribution 2022](#)). Also, the global use of natural resources has more than tripled since 1970 and keeps growing ([International Resources Panel 2019](#)).

From an economic point of view, the Dasgupta Review of 2021 ([Dasgupta 2021](#)) made a compelling case for looking at nature as one category of capital, **natural capital**. Unfortunately, we, human beings, have not managed our natural capital sustainably as diligent “asset managers” should. We have let our natural capital depreciate for decades without taking it into account in the way we manage or monitor our economies, even though we are completely dependent on nature. Moreover, we should assign value to **ecosystem services**, those essential services such as carbon sequestration, pollination and water management that the biological and abiotic nature provides us with every day. Preserving and restoring ecosystem services should be

We have let our natural capital depreciate for decades without taking it into account in the way we manage or monitor our economies, even though we are completely dependent on nature.

sources of revenue generation and causing harm to nature should have an appropriate price. Otherwise, we are bound to continue to deplete our natural capital by over-consuming resources and destroying biodiversity.

Where do we need to go?

The Kunming-Montreal global biodiversity framework of December 2022 gave new impetus and direction for global action, with a vision for 2050 to live in harmony with nature and a mission for 2030 to halt and reverse the loss of nature and put it on the path towards recovery.

The key challenge for the new EC, due to take office in late 2024, is to formulate a policy agenda that sets Europe on a journey towards the Kunming-Montreal vision, effectively oversees the implementation of the all-important Fit for 55 package and builds on it to achieve the Paris Agreement goals while keeping European economies competitive and resilient in both the short and long term. At the same time, the transition has to be socially fair. Supporting re-skilling through education and training is key, because, over time, jobs dependent on fossil energy will disappear and new jobs will emerge driven by the transition to renewable energy, a circular economy and the restoration and regeneration of nature.

To achieve these goals, EGD 2.0 needs to put nature at the heart of the decision-making of governments, consumers and businesses. By “nature” we refer to both biological and abiotic (air, water, earth) nature, climate being a key abiotic factor. The EC’s biodiversity strategy for 2020 ([European Commission 2020d](#)) raised biodiversity higher on the policy agenda and set ambitious nature protection and restoration goals; but in future nature needs to be mainstreamed into core EU policies and nature’s value needs to inform and guide economic decisions. What is needed is a smart mix of policy instruments that use the power of innovation and market mechanisms where appropriate and that fully maximise ICT and data to allow the impacts upon nature of decisions made by governments, businesses and consumers – whether positive or negative – to be fully transparent.

Nature needs to be mainstreamed into core EU policies and nature’s value needs to inform and guide economic decisions.

How to get there

Elements of the ecological crisis, namely loss of biodiversity, the climate crisis and over-exploitation of natural resources, are intertwined, complex problems. The good news is that in many instances they can be addressed together. They need to be looked at as a whole and tackling them needs to be integrated into core EU policies. In the following chapters, we discuss the building blocks we have identified as being particularly important for resolving the ecological crisis holistically. These building blocks are as follows.

- 1 Ecosystem accounting and biodiversity offsets that act as enablers for making nature's value visible and taking it into account in economic decision-making.**
- 2 A circular single market: mainstreaming circular economy principles into the European single market through relevant legislation, including ensuring European supply and circularity of strategic and critical raw materials and sustainable use of biomass.**
- 3 Business and nature – tapping into new businesses opportunities and reducing adverse impacts on nature.**
- 4 The data economy as an enabler of the green transition: using data and ICT as tools to enable circular solutions and informed, sustainable consumer decisions, including through Digital Product Passports.**
- 5 Tackling the EU's global nature footprint by reducing the over-consumption of key deforestation-linked commodities.**
- 6 Reforming the common agricultural policy (CAP) such that it preserves and restores biodiversity while building resilience and food security and contributing to achieving the EU's climate goals.**

3 Ecosystem accounting and biodiversity offsets: the EU should take action

Ecosystem accounting

In order to manage our natural capital sustainably, we need to understand our economies' dependencies on nature and their impacts on nature. The EU's environmental accounts have been produced for more than a decade. They measure the contribution of the environment to the economy regarding the use of resources and the impact of the economy on the environment. This is done in a compatible way with (macroeconomic) national accounts. Europe needs to also look beyond its borders and understand its nature impacts outside of the EU (please see Chapter 7 of this memorandum) and find means to reduce the consumption of commodities whose production causes the biggest threat to biodiversity.

However, an important fundamental enabler of understanding dependencies and impacts is missing, namely **ecosystem accounting**. The statistical framework for ecosystem accounting is built on five core accounts that record the extent and condition of ecosystems, ecosystem services in both physical and monetary flows, and monetary ecosystem assets. To provide – at least partially – for the missing enabler, in 2022 the EC proposed ([European Commission 2022c](#)) to include ecosystem accounting into the EU's environmental accounts starting with 2023 data. However, as of May 2023, it seems that the scope of the regulation will remain somewhat limited, its implementation will take more time and it does not yet include any monetary accounts.

The EU clearly needs to increase its ambition on ecosystem accounting, and the member states need to allocate sufficient resources to gathering and managing the necessary ecosystem information. And, crucially, the EU, its member states and regional and local authorities need to start using information from environmental and ecosystem accounting in public policy decisions in order to halt the degradation of our natural capital, the devaluation of ecosystem services and the loss of biodiversity.

Biodiversity offsets and market mechanisms

In some cases, avoiding damage to non-protected nature is unavoidable. This damage should always be minimised. For the damage that occurs after minimisation, **biodiversity offsets** should be used. The Business for Biodiversity Offsets Programme (BBOP) defines biodiversity offsets as “measurable con-

servations outcomes of actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken” (Forest Trends).

Simply put, biodiversity offsets are a way to compensate for damage to nature in one location by conserving nature in another location with at least a similar biodiversity value. Using biodiversity offsets serves to internalise the value of nature in economic decision-making by making, say, a construction project developer bear the cost of conservation of nature elsewhere. Thus, offsets can help to steer land use away from areas with high nature value.

Biodiversity offsets have been used in several countries either on a compulsory or voluntary basis. Germany was the first EU member state to enact a federal-level law, as long as 40 years ago. However, at the EU level, action on biodiversity offsets has been pending for a long time. As early as 2011, in its biodiversity strategy for 2020, the EC stated that “The Commission will carry out further work with a view to proposing by 2015 an initiative to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes)” (European Commission 2011). In the most recent EU biodiversity strategy (European Commission 2020d), biodiversity offsets are not mentioned at all. Now would be the time for the new EC to move forward with biodiversity offsets.

One interesting question is whether the EU should play a role in creating a system where a market mechanism would be used to facilitate the up-take of biodiversity offsets. The European emissions trading system (ETS) has played a fundamental role in significantly reducing carbon dioxide emissions by putting a price on emissions through a regulation-driven market for emission allowances. While the problem is somewhat different with biodiversity offsets, the parallel is intriguing. A “market place” for nature available for offsets with clear and stringent sustainability criteria could help those entities causing unavoidable damage to non-protected nature to find areas to conserve – and help farmers or forest owners to generate alternative revenue.

However, an important fundamental enabler of understanding dependencies and impacts is missing, namely **ecosystem accounting**.

Key recommendations

- 1** The EU should increase its ambition on ecosystem accounting through inclusion of monetary accounts in European ecosystem accounting, and the member states should allocate sufficient resources to gathering and managing the necessary ecosystem information.
- 2** The EC should move forward with an initiative to ensure there is no net loss of ecosystems and ecosystem services through biodiversity offsets when unavoidable damage is done to non-protected nature.

Questions for further analysis

- What are, and what should be, the respective competences of the EU and the member states in terms of biodiversity offsets?
- What kinds of market mechanisms could be created at European level to facilitate biodiversity offsets or other instruments to internalise value of nature to decision-making ?

4 Circular single market: mainstreaming circularity as a means of resource efficiency and resource independence

The EU single market has delivered many benefits for European citizens and member states' economies for 30 years already. To ensure that the EU single market continues to benefit European citizens and businesses, the EC should not compromise competition on a level playing field by loosening state aid rules. The EU's response to concerns over the potential repercussions of the US Inflation Reduction Act (IRA) on international investments related to clean-tech production and technologies, namely the Green Deal Industrial Plan ([European Commission 2023a](#)), should focus on research, development and innovation related to the green transition, including developing mineral and other materials recovery and reuse processes within the single market.

In principle, a circular economy has been part of the development of the EU's single market since the publication of the EU's first Circular Economy Action Plan (CEAP) in 2015 ([European Commission 2015](#)), which aimed at harnessing the potential of the single market to improve environmental outcomes through the circularity of products and materials. At first, circular policies highlighted downstream waste management and recycling, but it is now widely recognised and acknowledged that product and service design plays a central role in a successful transition to circularity. Since the latest Circular Economy Action Plan ([European Commission 2020c](#)), the EU's circular economy policies have placed product design at the centre of product policy to both generate and retain as much value as possible across value chains, with an incentive structure for reaching a lower environmental footprint of production and consumption. A lot of progress has been made and legislative initiatives proposed by the EC – now it is crucial to finalise them and then focus on implementation.

Circular solutions are a powerful tool to reduce CO₂ emissions in heavy industry by material recirculation and other measures (see, for example, [Material Economics 2018](#)). They generate new revenues and address inefficiencies in production (see, for example, [Sitra and Deloitte 2022](#)) as well as contribute to halting biodiversity loss by tackling the root causes of unsustainable production and consumption patterns (see, for example, [Forslund et al. 2022](#)). The circular economy has also increasingly been recognised as a means to reduce the EU's dependency on imported raw materials and thereby increase the resilience of its economy. The circular economy has an enormous potential to help us get more value from the resources that we already have and to slow, close and narrow the resource flow through our

economy (Bocken et al. 2016) and, in doing so, reduce the risks related to disruptions in supply chains.

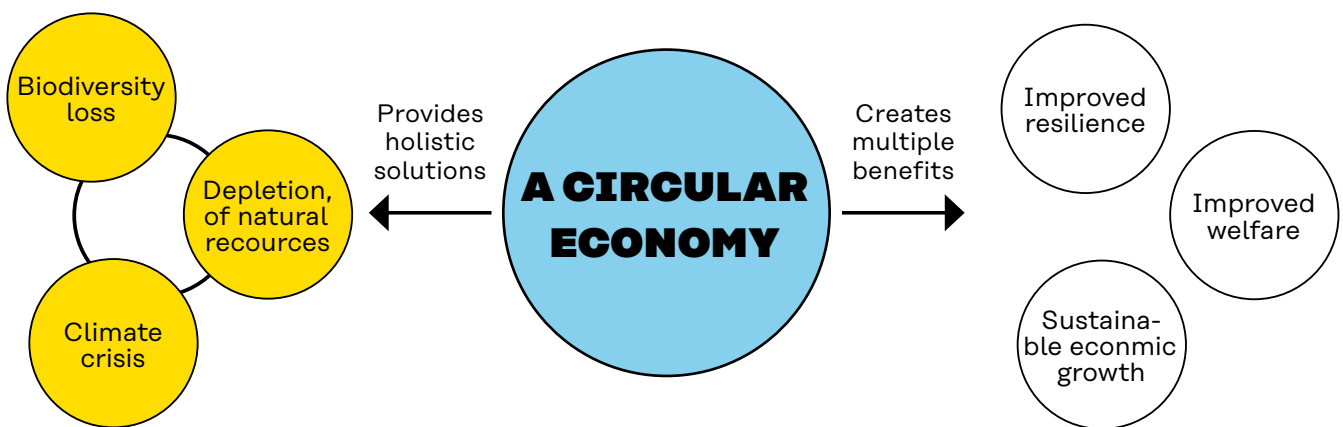
The EGD strategically combined the EU’s targets of becoming the first climate-neutral continent, halting biodiversity loss and decoupling economic growth from resource use. The latter target has fallen short of attention, although initiatives on sustainable product policy under the CEAP have proposed important elements for reducing the material and consumption footprint in the EU and paved the way for decoupling economic growth from increasing use of natural resources (European Commission 2020c). The objective should be that, over time, we have a circular single market, in which economic growth is no longer dependent on the unsustainable use of natural resources.

One key area in which sustainability needs to be carefully considered is biomass use. While we need biomass as a fossil-free alternative in climate action, the well-being of our nature sets a cap on its use. This is not yet widely recognised, however, and different climate scenarios envision 40 to 70% more biomass use in the EU than is likely to be available (Material Economics 2021). Therefore, it is vital to steer biomass towards uses with the highest value.

The circular economy should also be seen as an instrument for attracting investments for the industrial transformation and, as a result, increasing the EU’s competitiveness. This could also lead to a net increase in jobs in Europe (Trinomics 2021) although the most significant likely consequence for work will be related to new competence needs, which should be anticipated (Jalava et al. 2021; Degerman et al. 2023).

Now is the right time to take advantage of the single market to accelerate the transition to a carbon-neutral circular economy that reduces pressure on nature.

Image 1. Benefits of establishing a circular single market



Key objectives in establishing a circular single market

1. Markets for circular materials, products and services through regulation

Market regulation within the EU single market could be used more efficiently to drive the demand for materials, products and services based on circular principles. Setting minimum recycled content requirements for different products would help to facilitate and stimulate the market for secondary raw materials. The approach is already included in the EU's new Battery Regulation to promote the market for secondary raw materials for battery minerals and in the Commission's proposal for a revision of EU legislation on packaging and packaging waste to facilitate and stimulate the markets for recycled plastics ([European Commission 2020e](#); [European Commission 2022f](#)). These requirements for recycled content are highly important for creating a circular market for critical and other materials in order to secure supplies of critical raw materials for use in the green transition and to lower the environmental impact of production and consumption. As an example, plastics recycling can save 90 per cent of CO₂ emissions emerging from the production of new plastics ([Material Economics 2018](#)).

2. Circularity criteria for products to create a level playing field

The Ecodesign for Sustainable Products Regulation (ESPR) ([European Commission 2022d](#)), which sets circularity criteria for different product groups, is central to creating a level playing field for circular business models. The approach contained in the ESPR is critical for further reducing demand and, as a result, lowering environmental footprints and ensuring the recycling and recovery of raw materials used in production. Product design requirements would also help to lower the demand for critical raw materials by extending product lifetimes and requiring repairability and recyclability of products. According to the EC, sustainable product policy has proved its effectiveness to deliver significant reductions in the EU's energy consumption and economic savings to consumers through the Ecodesign directive ([European Commission, Directorate-General for Energy 2021](#)). In addition, the revision of the EU's Construction Products Regulation ([European Commission 2022e](#)) has the potential to mitigate pressures on biodiversity by enhancing the circularity of products containing materials with high biodiversity footprints, such as wood.

3. Standards for recycled materials and recovery processes

Standards for the circularity of products, materials and services play a key role and can influence global product norms and standards through European leadership. It has been shown that by creating and implementing regulations and standards that promote sustainability, the EU can influence the behaviour of companies operating within its borders and beyond ([Bradford 2020](#)). This approach can be further developed to promote circularity. In particular for critical raw materials, standards for circular product design are essential to enable product lifetime extensions and good quality of recycled materials to ensure sustainability in various applications. This would help to build confidence in the EU single market and encourage the use of recycled materials in manufacturing processes. The EC's new standardisation strategy ([European Commission 2022a](#)) is a commendable means for leveraging the single market to enable the twin transition. The European Standards Organisations (ESO) should be encouraged to drive the development of standards in this field and to promote them at the global level.

4. Unlocking the potential of Green Public Procurement (GPP)

The market for public procurement accounts for around 14 per cent of the EU's GDP and many expectations have been set for a better use of it to enhance the green transition. GPP has a lot of untapped potential due to its voluntary status and lack of mandatory targets. The good news is that the EC has proposed mandatory GPP criteria and targets, which will be set and specified in sectoral legislation ([European Commission 2020c](#)). In addition, for setting minimum mandatory targets for GPP in order to increase demand for circular materials, products and services, the scale and scope of GPP should be as wide as possible. In particular, more emphasis needs to be directed towards using existing product stocks and meeting needs through new business models. Sectors with high environmental impacts, such as the food system, should be prioritised in the minimum mandatory targets set by GPP.

5. Recycling capacity for critical raw materials

The development potential of recycling technologies for critical raw materials is substantial, since the recycling rates of many minerals, such as rare earths and others needed in renewable energy technologies, are at the moment close to zero ([European Commission 2023c](#)). The proposals of the Net-Zero Industry Act and the EU Critical Raw Materials Act ([European Commission 2023b](#)) are important for improving the EU's net-zero technology production and for increasing recycling capacity. Recycling of critical raw materials can help to cover some of the EU's demand for critical raw materials, but more action is needed and the EU's industrial and investment strategies should be aligned more closely to support the circular economy objectives.

6. An agenda for high-value biomass use

It is important that the limited supply of biomass is used in the manner creating most value. Therefore, while ensuring that the total demand for biomass remains within sustainable limits, the EU should steer the use of biomass towards high-value applications. This can be achieved by improving incentives for high-value use and by removing incentives from low-value use i.e., bulk energy use. In addition, improving the competitiveness of non-combustion energy solutions can reduce the use of biomass for energy, which can be achieved by setting a clear direction for biomass use and by improving coherence between policy areas. Currently, energy policy drives the increasing use of biomass while biodiversity policy sets limits for its supply. It is also critical to make a distinction between the different sources of biomass; they all have highly different biodiversity impacts, but are still widely considered under a single category – biomass. As long as the EU's biomass policy fails to have a coherent, commonly agreed long-term vision and targets, companies will face great uncertainty over the extent to which biomass use is considered sustainable in the future.

7. Removing barriers for secondary raw materials

Further harmonisation is needed to achieve a well-functioning EU market for secondary raw materials, as outlined in the EU's new CEAP ([European Commission 2020c](#)). National end-of-waste and by-products criteria, for example for industrial by-products resulting from production processes, including waste logistics, needs further harmonisation in order to create an EU-wide end-of-waste criteria.

Key recommendations

- **The EU should prioritise and accelerate the implementation of the Ecodesign for Sustainable Products Regulation (ESPR).**
- **The EC should set standardisation requests for European standardisation organisations focusing on circular product design and on the recycling of critical raw materials.**
- **Green Public Procurement (GPP) should be used more to create and stimulate demand for circular materials, products and services by setting minimum mandatory targets for GPP.**
- **The EU's industrial and investment strategies should be aligned to support the development of recycling technologies for critical raw materials.**
- **The EC should formulate an agenda for high-value biomass use to enhance the circular bioeconomy through a coherent set of policies.**
- **Further harmonisation of member states' end-of-waste and by-products criteria should be continued.**

Questions for further analysis

- Achieving public acceptance of new mining projects is crucial, since circularity on its own will not be enough to meet the demand for critical raw materials needed in the energy transition. In addition to a proposed declaration of the environmental footprints of critical raw materials in the EU's Critical Raw Materials Act, should sustainability criteria be set for European mining projects to improve acceptance by the public and provide predictability for companies?
- Should bio-based resources, which have the potential to replace critical raw materials, such as graphite in batteries, be defined as critical to achieve the green transition?

5 Business and nature – tapping into new opportunities and avoiding adverse impacts

For European companies, being good managers of natural capital is both a business opportunity and sound risk management. Any fundamental transformation of economies creates business opportunities, and halting and reversing the loss of natural capital and biodiversity must be seen as a fundamental transformation of how our economies function. The World Economic Forum has estimated that nature-positive transitions could generate globally up to US\$10.1 trillion in annual business value and create 395 million jobs by 2030 ([World Economic Forum 2020](#)). Managing natural capital sustainably is also sound risk management because all businesses depend directly or indirectly on natural resources and ecosystem services. It also makes a lot of business sense to understand, take control and act upon companies' nature footprints, as it is clear after the Kunming-Montreal global biodiversity framework that regulators, financiers and customers will increasingly require it.

Nature offers a vast range of business opportunities

As nearly all businesses have an impact on nature, there is nearly an infinite number of opportunities to reduce that impact by innovation in products, services, business models and processes, or in nature-positive business that restores or regenerates nature. Circular economy principles have already been embraced by countless companies (see, for example, [Sitra](#)) as the benefits are very tangible for resource efficiency, value retention and business-model innovation. For example, [Aguilar-Hernandez et al. \(2021\)](#) compiled 300 circular economy scenarios and found that, on average, they could increase employment by 1.6% and GDP by 2.0% and decrease emissions by 24.6% by 2030 if implemented over the period 2020 to 2050. There is also increasing evidence that the circular economy can play a key role in halting

The World Economic Forum has estimated that nature-positive transitions could generate globally up to US\$10.1 trillion in annual business value and create 395 million jobs by 2030.

biodiversity loss (see, for example, Forslund et al. 2022; Sandström et al. 2017; Peterson et al. 2020).

Opportunities exist both for “adapters” – existing companies who reduce their footprint or transform their businesses to be net positive – and “natives”, new companies whose entire business is established around products or services that embrace circular economy principles or replace those that have a significant impact on nature or have a net-positive impact through regenerative products, services or nature-based solutions. In addition, halting the degradation of nature and setting nature on a path to recovery will require a lot of “enablers”, organisations that have the knowledge, products or services to support other companies. These enablers include researchers, innovative engineering and IT companies, consultants and business services professionals. These opportunities can be summarised schematically as follows.

Table 1: Nature as a business opportunity

	Companies	
Impacts	Adapters	Natives
Avoided and reduced impact	Existing companies avoiding and reducing nature impacts in their current operations or transforming their business through business-model innovation.	New companies avoiding or reducing nature impacts through new business models or innovations with a smaller nature impact.
Net-positive impact	After avoiding and reducing the nature impact, existing companies become net positive through restorative and regenerative solutions.	New companies with a net-positive impact on nature through regenerative businesses.
<p>Enablers: Researchers, innovators, engineering firms, ICT and data services and business services. They enable adapters and natives to avoid, reduce and have a net-positive impact with their innovations, products and services.</p>		

Nature-based solutions harness ecosystem services

Nature-based solutions rely on nature or are inspired by nature. They harness nature’s ecosystem services to resolve ecological, health-related or urban problems. They yield benefits to people, the environment and the economy at the same time. A green infrastructure of green roofs, restored wetlands and urban green areas can reduce flooding, purify air and water and reduce heat stress. For example, floods caused by extreme weather events can be less expensive to control by using nature’s own tools, such as wetlands or water-permeating surfaces, rather than with barriers or mechanical pumping.

According to the United Nations Environment Programme (UNEP), some 26 billion dollars of private investments went into nature-based solutions in 2022 ([UNEP 2021](#)), and this amount is expected to grow significantly in the future. Indeed, investments in nature-based solutions have to grow to meet biodiversity, climate mitigation and adaptation goals.

Risk management – understanding and disclosing nature dependencies and impacts

Managing natural capital sustainably requires understanding companies' dependencies and impacts on nature and that requires the ability to measure them. That way, companies can set actionable nature targets. Interestingly, multiple efforts are simultaneously underway to find ways to measure businesses' dependency and impact on nature, including the Global Biodiversity Score of the French [CDC Biodiversité](#); the Dutch Biodiversity Footprint Financial Institutions tool ([Government of the Netherlands 2021](#)); the School of Resource Wisdom at the [University of Jyväskylä](#), Finland, whose work includes calculating the entire global nature footprint of the biggest Finnish retail group; and the [IUCN's](#) STAR metric. The European Commission-funded “Aligning accounting approaches for nature” project, launched in 2021 and building on the work of the EU's Business and Biodiversity Platform, aims at supporting businesses, financial institutions and other stakeholders to develop standardised natural capital accounting practices, including a standardised approach to biodiversity measurement ([European Commission 2021b](#)).

Making companies' nature footprints transparent to shareholders, customers and financiers is increasingly required – either on a voluntary or regulatory basis. In the EU, the new Corporate Sustainability Reporting Directive entered into force in January 2023 ([European Parliament and the Council 2022a](#)). It will require all publicly listed companies to report more broadly on their sustainability as of the financial year 2024. It empowers the European Commission to issue sustainability reporting standards on environmental questions, including on biodiversity and ecosystems. At the global level, inspired by the “Make it Mandatory” campaign by the [Business for Nature](#) coalition, the Kunming-Montreal Global Biodiversity framework target 15 calls upon governments to require companies to monitor, assess and disclose their risks and dependencies on biodiversity. From the EU standpoint, such global action would serve to level the playing field between European and non-European companies.

Setting out on a journey now

Leaping ahead to the inevitable makes business sense. Pioneering companies are both innovating with circular economy products and business models and acting on controlling their nature impacts by starting to measure them and setting nature-related targets. There is no reason to wait for perfect measurements before embracing the opportunities.

Questions for further analysis

- What policy and regulatory instruments should the EU use to enable European businesses to seize the opportunity that halting and reversing loss of natural capital and biodiversity presents?
- What financial instruments (for example, R&D&I programmes, Regional Funds or the common agricultural policy) should the EU use to encourage business action?

6 The data economy as an enabler of the green transition

The European Commission's data strategy, published in February 2020, aims to accelerate the building of a data-driven society and to create a strong legal framework for data mobility in the European single market so that fundamental rights are respected and cybersecurity is guaranteed. The Commission aims to increase the use of and demand for data-driven solutions in the EU's single market, while promoting international solutions based on European values ([European Commission 2020a](#)).

The data strategy is also essential for boosting the green transition, productivity and well-being. However, digital and green transitions are not automatically linked, and we must ensure that the data economy is harnessed to promote a green transition. This “twin transition approach” recognises that there is a huge and largely untapped opportunity for technology and data to drive sustainability goals. Rather than treating digital and sustainability in isolation, a twin transition strategy combines these critical functions to unlock benefits in terms of efficiency and productivity. To achieve this, the EU should closely align its sustainability and digital strategies.

Digital product passports – reliable information throughout the value chain

Better use and sharing of data is a prerequisite for the circular economy, especially in improving productivity, resource efficiency and traceability to enable long life cycles of products through maintenance, repair and refurbishment and safe recovery and reuse of materials. A great example of improving traceability and transparency of consumer information is digital product passports (DPPs), which have been introduced in the EU's CEAP ([European Commission 2020c](#)), and initiatives related to it. DPPs are currently being piloted in several industries in response to the European Commission's desire to speed up the digital green transition of industry. DPPs can be used to gather information on product sustainability performance, raw materials and safety, promote more sustainable production methods, enable informed and more sustainable consumer choices and accelerate the transition to a circular economy.

Digital and green transitions are not automatically linked, and we must ensure that the data economy is harnessed to promote a green transition.

The digital product passport is a sophisticated yet complex concept requiring collaboration between many parties to harness its benefits. For this reason, its successful implementation requires experiments and piloting. Experiments should start at the beginning of the value chain and proceed step by step to cover all those in the chain. It is also beneficial to start with use cases that are not too broad and to prefer to do well initially in one or two data areas, such as information on raw materials, manufacturing history or logistics emissions data, and to then expand subsequently. Based on the pilot schemes, there should be a dialogue between legislators and companies so that the concept becomes future-proof.

Sitra is actively supporting experiments and piloting of concrete DPP use cases with businesses from associated sectors. One of these is a DPP pilot project on gathering and storing transport emissions data. With consumers increasingly demanding environmentally friendly options, companies that prioritise sustainable transportation methods will be better positioned to succeed in the market. One effective way to demonstrate such commitment is by using DPPs to track the transportation of goods and provide evidence of emissions from end-to-end logistics. Other DPP pilot schemes are being conducted in the textile and clothing and battery industries.

Green coding practices can lead to significant energy savings

Although digitisation has brought significant benefits, it continues to have a significant carbon footprint. According to estimates, the ICT industry's share is 7-10 per cent of global electricity consumption ([Andrae 2020](#); [Jones 2018](#)) and it is estimated to rise to 21 per cent by 2030 ([Andrae 2020](#)). Although running software consumes a significant amount of energy, energy consumption is rarely considered in software design and implementation. The design of digital services is currently driven by cost, speed and ease, but not by energy efficiency. One example of a solution to this problem is “green coding”, which refers to more resource-efficient software solutions that require less storage space, computing and data transfer. By optimising digital assets and infrastructure to reduce their own environmental impact, organisations can harness the power of digitisation to make a more positive impact on the environment. According to various estimates, the energy-saving potential of green coding is significant ([Technology Industries of Finland 2022](#)).

Green IT and coding are beginning to take place. In 2021, the Finnish Government published the first climate and environmental strategy for the ICT sector with a view to reducing the carbon and environmental footprint of the ICT sector. In the strategy, the potential of sustainable software engineering (green coding) was highlighted and this work has accelerated the development work on green IT and coding in Finland. The Finnish Information Society Development Centre TIEKE has also enhanced efforts in the field of green ICT and its ecosystems. In addition, information and tools for organisations to acquire energy-efficient ICT systems are provided in line with procurement guidance and software companies are promoting the use of green coding through an association, Code from Finland. They have established a carbon-neutrality label that enables members to demonstrate their efforts to make software development more sustainable.

Key recommendations

- **Build DPPs in a way that leverages application programming interfaces (APIs) and that companies can integrate via existing enterprise systems. However, to ensure wide adoption, a data input interface should be offered, as SMEs may not have the immediate funding or resources to integrate their own systems with the DPPs.**
- **Ensure that horizontal and sectoral legislation drive interoperability that enables cross-industrial data flows for sustainable solutions.**
- **Include green coding principles in green public procurement criteria.**

Questions for further analysis

- How should the EU institutions ensure that the EU's digital and green transitions move in the same direction by accelerating and harnessing the data economy to promote the green transition?

7 Tackling Europe's global biodiversity footprint

Biodiversity is simultaneously a local and global issue. Similar pressures on nature result in different impacts in different areas, which differ in terms of ecosystems and ecological resilience. Therefore, the local characteristics of biodiversity have to be accounted for. At the same time, however, much of today's biodiversity loss is a result of production and consumption happening far away from where biodiversity is lost. Thus, biodiversity loss is also a global challenge.

Sustainable production of commodities causing deforestation

There is evidence that most of today's biodiversity loss caused by Europeans is a result of biomass extraction taking place outside of Europe – in particular through trade in a limited number of products especially in the agri-food sector (see, for example, [Forsslund et al. 2022](#); [Sandström et al. 2017](#)). In recognition of the outsize impact of these products, a landmark EU Deforestation Regulation (EUDR) is set to enter into force in 2024, addressing seven commodities and derived products: palm oil, timber, beef, coffee, cocoa, rubber and soy ([European Commission 2022b](#)). These commodities have a disproportionately large negative impact on biodiversity through deforestation in what are often biodiversity hotspots. The goal of the EUDR is that only products not associated with deforestation can be placed on the EU market.

Steering consumption to reduce deforestation

Consumption-related considerations are not addressed in the EUDR. However, they are necessary to ensure that the overall commodity consumption as a result of growing global demand does not continue to increase beyond volumes that current areas of production can sustain without encroaching on areas with high biodiversity value. Four EU member states – Austria, Belgium, Finland and the Netherlands – have already set targets for absolute reductions in resource use. Such ambitious goals can help pave the way towards decoupling of our economies from increased resource use in general. This would also help to halt biodiversity loss.

At the same time, however, more than 80% of biodiversity loss is due to the extraction and processing of biomass ([International Resources Panel 2019](#)). Therefore, recognising that the amount of biomass available in the EU is limited is of great importance ([European Commission, Directorate-General for Research and Innovation 2022](#)), as are further steps to steer EU biomass use

with the biomass supply available in the EU ([Material Economics 2021](#)), otherwise negative biodiversity impacts outside of Europe will grow.

While extracting biomass in general plays a major role in driving biodiversity loss, the seven biomass commodities in the EUDR have a disproportionately high impact on biodiversity. Therefore, to complement the existing drive in the EU member states to introduce resource targets, a mix of policy measures specific to different EUDR commodities should be considered. These could include taxes, green public procurement, R&D&I support for the development of substitutes with significantly smaller biodiversity and climate impact, waste-cutting measures and recycling. For example, beef and animal feed can be substituted with alternative protein sources, while timber use can be reduced by packaging standards and business-model innovation, as well as reuse and recycling of timber products.

Besides policy and business-model innovation, the choices we make – for example, what and how much we buy – have a direct impact on biodiversity. [PSLifestyle](#) is an EU Horizon 2020-funded project, intended to provide an inspiring and easy-to-use tool that European citizens can use to build sustainable lifestyles and close the gap between environmental awareness and individual action, to equip them to adopt a positive, sustainable and healthier lifestyle by guiding their choices and behaviour through smart everyday actions. The tool is being co-developed and localised in eight European countries through Living Labs.

Besides cutting European consumption's global biodiversity impact, a co-benefit of the above-mentioned policy measures would be enhanced EU resilience through less exposure to sourcing insecurity, fragile supply chains and volatile commodity markets causing peaks in consumer prices. Reduced levels of consumption in Europe would also contribute to keeping global prices lower and therefore more accessible to people in lower-income countries.

Key recommendations

- **The EU and its member states should assess a broad range of policy measures to reduce European consumption of those key commodities which cause the greatest biodiversity impact. These commodities are covered by the EUDR.**

Questions for further analysis

- What policies would be most effective and socially fair in reducing European consumption of commodities with high biodiversity impact?
- What trade and development policy aspects should be considered?

8 Rethinking the EU's common agricultural policy – towards resilient and circular agriculture

According to the European Commission, the EU common agricultural policy (CAP) is “a partnership between society and agriculture that ensures a stable supply of food, safeguards farmers’ income, protects the environment and keeps rural areas vibrant” (European Commission n.d.). The EU’s Farm to Fork Strategy (European Commission 2020b), adopted in 2020, calls for a fair, healthy and environmentally friendly food system, which includes moving to a more plant-based diet, and by doing so reducing the environmental impact of the food system.

Indeed, agriculture does not only provide food for consumers and livelihood for farmers, but in its current intensive form also puts a lot of pressure on biodiversity, soil health and climate. Agriculture could play a key role in conserving and restoring biodiversity, as is recognised in the Kunming-Montreal framework’s target number 10. From the point of view of climate, agriculture is an important sector, as some 10 per cent of the EU’s net climate emissions emanate from agriculture. (Under current EU policies, the non-CO₂ climate emissions – methane and nitrous oxide – are accounted for under what is known as the effort-sharing sector, while CO₂ emissions – and sinks – of agriculture are accounted for under the LULUCF sector (EEA 2022)).

Reforming the CAP is critical for ensuring Europe’s resilience and the achievement of the EU’s biodiversity and climate goals. The next EC is likely to need to propose new CAP budgets and legislation within a year of taking office in late 2024. Funding allocated for the ongoing CAP period of 2021-2027 is around €380 billion, approximately one third of the EU’s multiannual budget.

Key objectives for the next CAP reform

First, the next CAP reform should set a direction to gradually move away from area-based and animal-based support payments towards results-based payments, which reward strengthening and maintenance of ecosystem services. Farmers need to have a profitable business and they deserve a fair share of the food price that consumers pay. However, the CAP support mechanisms should not drive ever-increasing economies of scale and intensification at the expense of the environment.

Results-based subsidies should incentivise improving the prerequisites for food production, such as soil health, biodiversity, the ecological status of watercourses and animal welfare. For example, these could be implemented by subsidising increases in soil carbon storage and maintenance, species richness, water quality and grazing based on measured and monitored results. Metrics, however, should be further improved to indicate the progress of ecosystem services at farm level. As an example, the [EUSO Soil Health Dashboard](#) provides evidence of the condition of soil health within the European Union based on key indicators.

Second, the reformed CAP should shift focus from national and regional to local, from linear to circular and, increasingly, from above-ground to below-ground. This shift is necessary in order to preserve and restore soil health and biodiversity and to secure energy, nutrient and water supply. From the point of view of resilience, after Russia's attack on Ukraine, Europe would be well advised to work systematically to decrease agriculture's dependency on fossil-based ammonia, extracted phosphate and fossil fuels.

New approaches to farming

To pursue the above-mentioned objectives, the CAP can be reformed by supporting four farming approaches that are already in use but not yet mainstreamed in Europe.

1) Agroecological symbiosis. At the **systemic level**, an agroecological symbiosis (AES, see for example [FAO](#); [Helenius et al. 2020](#)) offers a way towards local, circular and resource-efficient agriculture. With AES, energy is mainly renewable and it is generated from the biomasses produced within the AES in a biorefinery, such as a biogas plant, whose digestate provides further nutrients back to the soil. Biologically fixed nitrogen is promoted by rotations of leguminous crops. The production volume and the reach to the surrounding farmland within the AES are limited by the biophysical potential of the specific agroecosystems without compromising the other ecosystem services. The AES strengthens the local socio-economic connections and diversifies the regional food culture.

To diversify local production, co-operation should be further strengthened by CAP support, for example between crop and livestock farms, so that the stocking density can be dimensioned to arable land and soil health. The supply should follow consumers' dietary preferences for healthier and ecological food, supported by a forthcoming sustainable EU food system initiative, which is expected to lay down rules on the sustainability labelling of food products and to boost sustainable public procurement of food products. For an example of an agroecological symbiosis in Finland, please see [Global Network of Lighthouse Farms](#).

- 2) Regenerative agriculture.** At **farm level**, regenerative agriculture ([World Economic Forum 2022](#)) focuses on improving the soil health that has been degraded by heavy machinery and tillage and intensive use of fertilisers and pesticides. In addition to improving soil health and fertility, regenerative agriculture aims at the efficient and circular use of resources, climate change mitigation and carbon sequestration (carbon farming), rich biodiversity and healthy watersheds. Regenerative farming can be a win-win for farmers, nature and Europe's resilience. For an example of a successful multi-stakeholder regenerative farming initiative, please see [Baltic Sea Action Group](#).
- 3) Precision farming for resource-efficient agriculture.** At **parcel level**, precision farming (see, for example, [European Commission, EIP-AGRI](#)) focuses on the observation of the temporal and spatial dynamics of the performance of a given field. It can enhance nutrient use efficiency by fertilisation according to crop needs (for example, split application of nitrogen fertiliser) and by integrated plant protection. Principles of precision farming combined with overall system optimisation by digitalisation is called smart farming (see, for example, [Nordic Testbed Network](#)). The emergence of a European agricultural data space should open up a significant opportunity to use very large amounts of data – according to fair data use principles – for precision farming.
- 4) Sustainable water management.** At **root zone level**, oxygen, water and nutrient supply are essential to make the most of soils for food production. Soil aeration is a prerequisite for root breathing and active soil biota. Excess water under humid conditions needs to be drained for soil aeration by, for example, sub-surface drainage with adequate ditching around parcels to allow soil structural functions for water infiltration. Similarly, water supply is essential for photosynthesis and nutrient use and, if needed, must be ensured by irrigation during times of drought.

Finally, consumers should have the right to make informed choices for ecologically produced food, just as farmers should have the right and incentives to produce such food. To make this happen in the European single market, the use of DPPs for food, based on science-based metrics, could provide holistic sustainability information to consumers in a user-friendly way. The European Commission should undertake further work to develop the appropriate sustainability metrics.

Key recommendations

- **The next reform of the CAP should set a direction to gradually move away from area-based and animal-based support payments towards results-based payments, which reward environmental performance.**
- **The reformed CAP should embrace local circularity of energy, nutrient supply and water by promoting agroecological symbiosis, regenerative farming, sustainable water management and precision farming.**

Questions for further analysis

- How should the CAP be reformed to ensure that farmers can generate additional revenue streams from maintaining and improving ecosystem services?
- How should the CAP be reformed so that animal density does not exceed what local nature can sustain?
- What are the means to ensure protein self-sufficiency in Europe without compromising the biodiversity and climate targets?

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