International Governance for Global Commons Stewardship

The role of international initiatives in driving system transformations

A discussion paper
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CENTER FOR GLOBAL COMMONS

Contents

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Foreword

In today's interconnected world, the global commons are under increasing threat due to human activities. These stable and resilient Earth systems—comprising several global commons domains, such as the climate system, the land biosphere and oceans—are the foundation for humanity's current prosperity and future wellbeing. Our global commons are shared by all nations and must be collectively safeguarded.

Traditional forms of governance, based on the authority of nation states, have proven inadequate on their own in addressing the urgent challenge of safeguarding the global commons. Increasingly, nonstate actors—such as civil society organizations, businesses and scientific institutions—are playing an important role in international collaboration. A range of international initiatives involving nonstate actors have emerged in recent years, which are beginning to complement traditional forms of international governance and collaboration across national governments. In particular, they may offer innovative solutions, greater flexibility and faster response times. But their role remains incompletely understood. We need to understand better what works and what does not work.

This discussion paper reviews the effectiveness of international initiatives across the three transformations identified in Introducing the Global Commons Stewardship Framework, which we published last year. We lay out a simple method for assessing international initiatives and then proceed to take stock of the impact that international initiatives have had, identify gaps in each transformation and consider lessons that might be applied from one transformation to the next. There are no silver bullets or copy-paste solutions to safeguarding the global commons; but our discussion paper identifies a number of actionable steps that can vastly improve the governance—broadly understood—of the global commons.

We hope readers will find the analysis and recommendations useful, and welcome comments and feedback. The Center for Global Commons would be very pleased to work with other organizations to sharpen our understanding of how we can safeguard the global commons through improved international collaboration and help drive action for their stewardship.

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Summary

This discussion paper proposes a framework for understanding the role of international initiatives in safeguarding the global commons. Global commons sub-systems such as the climate system, land biosphere and oceans provide the stable and resilient earth system on which humanity's current prosperity and future wellbeing depend. The discussion paper outlines the roles of international actors—including civil society organizations, businesses and governments—in driving the necessary transformations. International initiatives led by these actors can play a complementary role in driving innovation and change—especially in areas where intergovernmental governance processes may be slow or inadequate. The discussion paper provides a qualitative assessment of high-profile international initiatives under each transformation. It also highlights areas in which significant gaps remain and provides recommendations for action to fill these gaps and strengthen existing international initiatives. The discussion paper demonstrates the importance of such international initiatives in complementing formal international governance to drive the transformations that can safeguard the global commons.

1 International initiatives for global commons stewardship

Human activity is at risk of exceeding the scientifically estimated safe operating space for people and the planet, whereby the capacity of the planet to provide life-support systems for humans is endangered.[1,2] While the last 12,000 years constituted a unique geological period of stability that enabled the rise of human civilization, the recent explosion in human activity has pushed us into a new geological epoch characterized by human degradation of critical Earth systems: the Anthropocene.[3] The stability and resilience of interdependent Earth systems — our global commons — are the foundations of humanity's current prosperity and future wellbeing (see Box 1).

By breaching the planetary boundaries – nine processes that regulate the stability and resilience of the Earth system – we risk reaching tipping points beyond which the global commons will undergo massive changes that will threaten human civilization and survival.[4] This risk increases significantly within the 'Paris range' of 1.5-2°C of global warming and becomes even greater beyond 2°C.[5]

1 Rockström et al., 2009.
2 Wang-Erlandson et al., 2022.
3 Steffen et al., 2011.
4 Ishii et al., 2022.
5 Armstrong McKay et al., 2022.

Box 1 | Defining the global commons

The **global commons** refers to the **stable and resilient Earth system**, which provides **the foundation for humanity's prosperity and future wellbeing**.

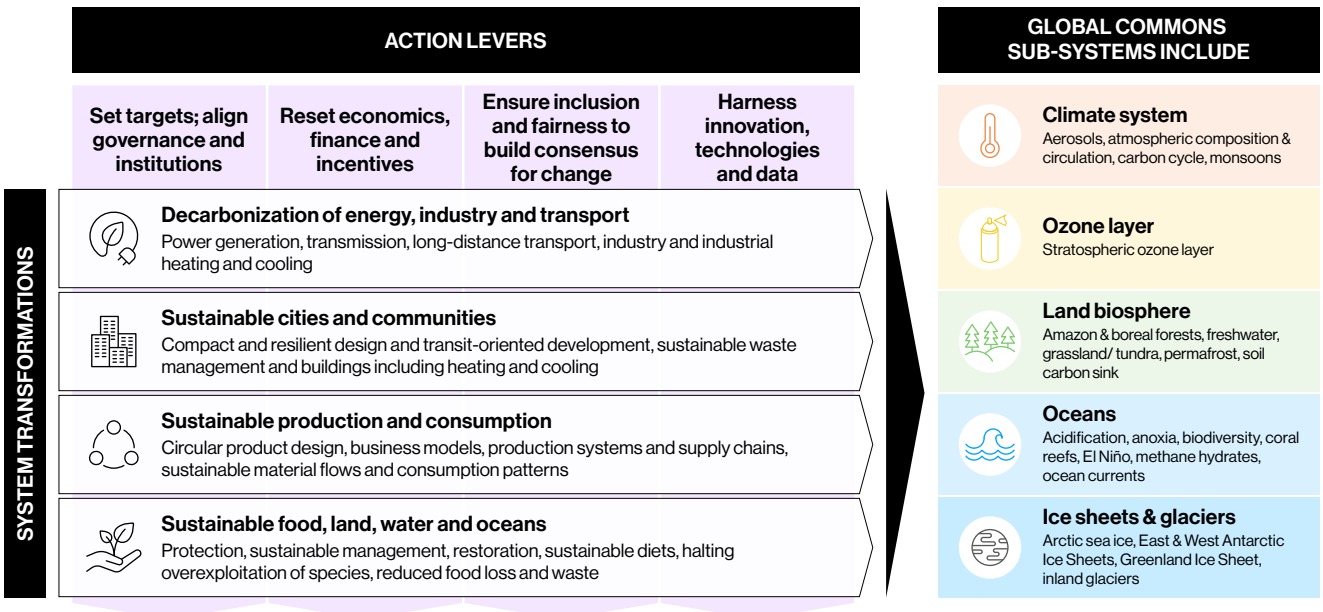
The global commons consists of interdependent and interconnected **sub-systems (e.g., the land biosphere sub-system is made up of forests, freshwater, biodiversity and other ecosystems)** and **functions**, and their interlinked **processes** (e.g., carbon, water, and nutrient cycles).

Safeguarding the 'global commons' is essential to ensuring the planet functions within 'safe and just' earth system boundaries – a necessary condition for justice, people and planet – and requires integrated, often location-specific, strategies at the local, national, and global level.

As described in Introducing the Global Commons Stewardship Framework, published in 2022 by the Center for Global Commons, countries must transform four economic and social systems to safeguard the global commons (Figure 1).

Each transformation describes a major change in the organization of societal, political and economic activities involving resource use, institutions, technologies and social relations to achieve the UN Sustainable Development Goals and meet the objectives of the Paris Agreement.

FIGURE 1
The Global Commons Stewardship Framework



1.1 The role of international initiatives

International initiatives can involve civil society organizations, businesses and governments. In contrast to intergovernmental bodies, such actors operate without a formal intergovernmental mandate, so all their work is nonbinding on governments. International initiatives can assist in activating the four action levers for global commons stewardship in the following ways:

1. **Shared goals and pathways:** Goals are critical to set the right level of ambition for countries, businesses and civil society. Pathways can make time-bound targets operational and bring together stakeholders—including competing businesses—to develop a joint vision of how shared goals can be achieved. International initiatives can propose targets that operationalize intergovernmental agreements and can develop pathways for reaching them. By providing international benchmarks, they help in raising the level of ambition, developing a consensus around the feasibility of achieving ambitious goals and assisting stakeholders in moving toward them (e.g., by reducing first-mover disadvantages). International initiatives can play an important role in translating pathways into voluntary standards for business targets.

Examples: The Mission Possible Partnership (MPP) mobilizes industry representatives and experts in hard-to-abate industrial sectors to develop a consensus on ambitious sector targets and to prepare shared sector transition strategies that show how these targets can be achieved. In doing so, the MPP helps operationalize the headline objectives of the Paris Agreement at sector levels and pulls actors into shared problem solving to achieve these targets. In a similar way, the 2050 Pathways Platform mobilizes governments and technical experts around national decarbonization pathways to inform mid-century low-emission development strategies under the Paris Agreement. The Science-Based Target Network/ Initiative (SBTN/SBTi) establishes global standards for net-zero and nature-positive business standards.

2. **Policy and regulation:** Well-designed international initiatives can support governments in improving policy and regulation by sharing lessons and best practices internationally, including through open-access databases. They can also score countries' policies, which helps pinpoint gaps and disseminates learning from one country to the next.
   Examples: The Climate Action Tracker (CAT) assesses and scores national energy policies for consistency with the Paris objectives to decarbonize economies by mid-century. The CAT has also developed a database of national climate policies that allows governments to benchmark their own policies, analyzing all the biggest emitters and a representative sample of smaller emitters covering about 85% of total global emissions.

3. **Finance, de-risking and investments:** The transformations for stewardship of the global commons require a fundamental reallocation of financial resources and face significant financing shortfalls.[6] To increase resource mobilization, international initiatives can help develop and advance new financing concepts and instruments, such as blended finance, Paris-aligned investments and high-integrity carbon markets.
   Examples: The Voluntary Carbon Market Initiative is helping to establish shared standards for high-quality carbon offsets; and the SBTi is proposing standards for high-quality demand for offsets that are consistent with the Paris Agreement. Meanwhile, the Glasgow Financial Alliance for Net Zero (GFANZ) and the Net-Zero Asset Owners Alliance are mobilizing asset owners and investment companies to align capital flows with net zero.

4. **Behavior change:** A challenging but no less important objective of international initiatives is to accelerate the behavior change required to safeguard the global commons, including changes in the volume and types of goods and services people consume (demand-side measures). These include changes toward healthier and more environmentally sustainable diets and energy-saving mobility choices. Such changes are notoriously hard to facilitate and comparatively few international initiatives have emerged in this space. It is also important to recognize that large-scale behavior change will be impossible without overhauling the underlying system, such as the available infrastructure (supply side) and economic incentives (policies).
   Examples: By accelerating alternative protein intake, the Good Food Institute aims to shift diets away from animal proteins and reduce global consumption of meat. Meanwhile, the FAIRR Initiative has been raising awareness of the environmental, social and governance implications of intensive livestock production.

5. **Innovation and new technologies:** Knowledge and technological innovation are non-rival goods, so new ideas and solutions create benefits for wider society, not just for their inventors (e.g., lower manufacturing costs, foundations for further research). The development and deployment of technologies also benefit from international collaboration

6 See Blended Finance Taskforce, 2020 and IEA, 2022.

and shared financing. Innovation is therefore a critical driver of global commons stewardship.
Examples: By identifying priority investment needs for clean energy technologies and fostering coordinated investments, the Clean Energy Ministerial demonstrates how international initiatives can drive targeted innovation and technology development for the transformations toward global commons stewardship. Similarly, Breakthrough Energy Ventures promotes investments in early-stage clean technologies.

6. **Data and monitoring, evaluation and accountability:** Many transformations are held back by a lack of data, shared accountability standards and rigorous evaluation of what works and what doesn't. International initiatives have been particularly active in driving standards for data and monitoring, evaluation and accountability.
Examples: The Greenhouse Gas Protocol sets de facto international standards for reporting greenhouse gas (GHG) emissions; while the International Sustainability Standards Board is driving voluntary standards for sustainability-related financial reporting. The Systems Change Lab is establishing global metrics for tracking the speed of system change transformations across sectors and countries.

1.2 Methodology

We propose a framework for understanding the roles of international initiatives and how they can complement each other. This section introduces the framework, which describes the roles that each type of multistakeholder coalition plays, and then applies it to three of the four system transformations outlined in the Global Commons Stewardship Framework.

The discussion paper starts with the energy and industry transition, which is arguably the most advanced—even though the latest United Nations Environment Programme Emissions Gap Report reminds us that the world remains off track to decarbonize energy systems to stay within the 1.5°C threshold adopted in the Paris Agreement.[7] It then goes on to explore the transformations of food, land and ocean use; as well as materials and circularity.

While transforming cities and communities and making them more sustainable are also key to achieving the climate goals of the Paris Agreement and the biodiversity goals of the Kunming-Montréal Global Biodiversity Framework (GBF), a detailed assessment of nongovernmental international initiatives in this area is beyond the scope of this discussion paper. This is partly because key elements of this transformation—such as the built environment and mobility—are captured by the other transformations of energy, nature and materials. Nonetheless, there are important initiatives dedicated to the transformation of cities (e.g., United Cities and Local Governments (UCLG), ICLEI, Cities Alliance, C40, Circular Buildings Coalition and Circular Cities Declaration). On the climate side, we focus on mitigation efforts and do not consider in detail how climate adaptation is driven by international initiatives. This is a major gap that should be filled soon, as there is a major shortfall in action on climate adaptation.

Most international initiatives rely on philanthropic and government funding—even if some, such as the Energy Transition Commission, have become largely financed by their members. Philanthropic and government funders may find the framework and analysis in this discussion paper useful in identifying gaps that can be filled through targeted investments. Our discussion paper suggests that it might be beneficial for funders to explore how lessons from one transformation can be transferred to another.

In recent years, the number of international initiatives has increased significantly and many have been launched at climate action summits (see Figure 2). The Future of Climate Cooperation Initiative has created a comprehensive and frequently updated stakeholder map that depicts actors and climate actions across the world.[8] We do not attempt to provide such an exhaustive list of initiatives here; rather, we focus on a range of high-profile initiatives that are illustrative of the vibrancy of each transformation. While the number of initiatives has increased across each transformation, the discussion paper highlights areas where significant gaps remain.

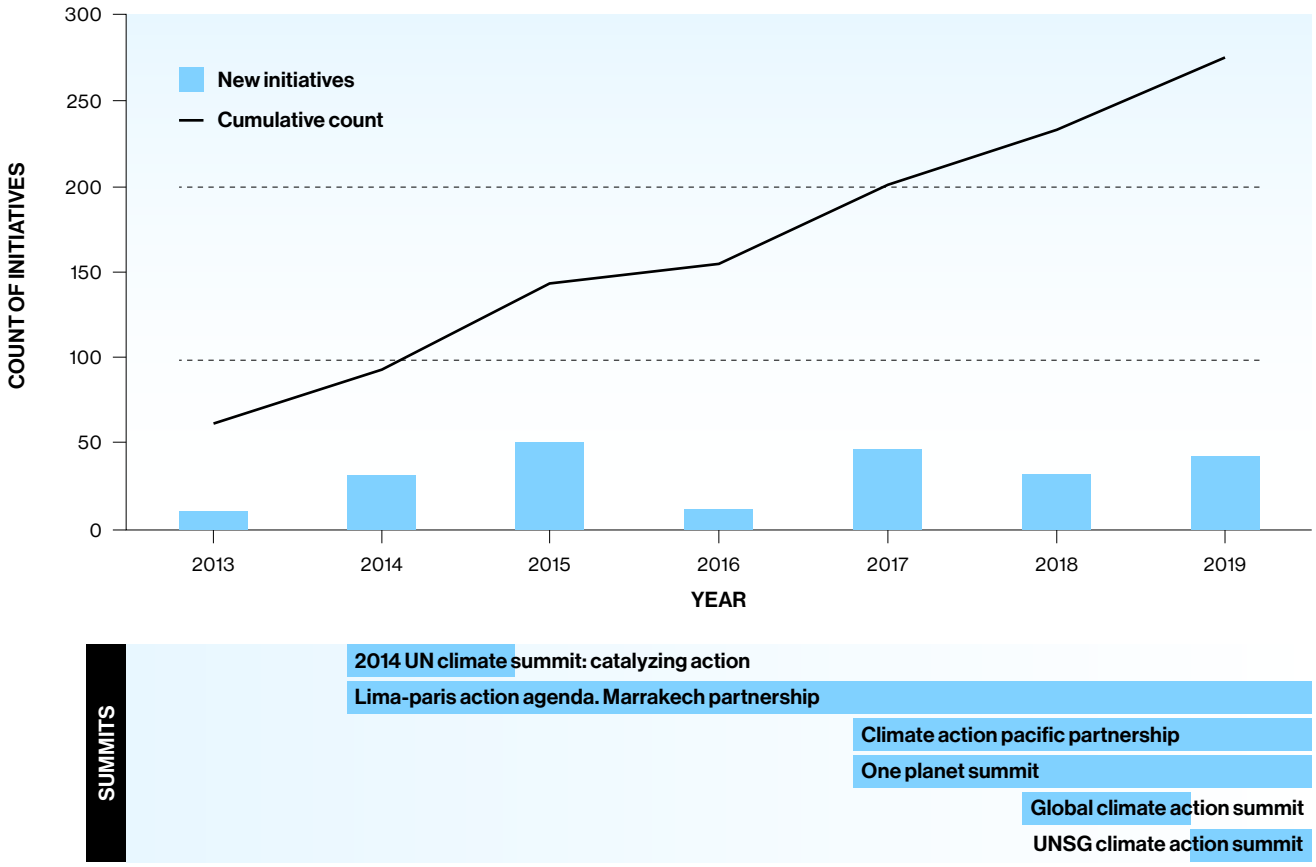
The discussion paper is based on a qualitative assessment that has been tested in discussions with practitioners (see acknowledgments). To enhance readability, we have focused on what we see as some of the most important initiatives, and obviously this selection has involved a degree of subjectivity. Our aim is not to provide an exhaustive review, but rather to give a flavor of the important roles played by international initiatives in driving global commons stewardship.

7 United Nations Environment Programme, 2022.

8 Future of Climate Cooperation, 2021.

FIGURE 2

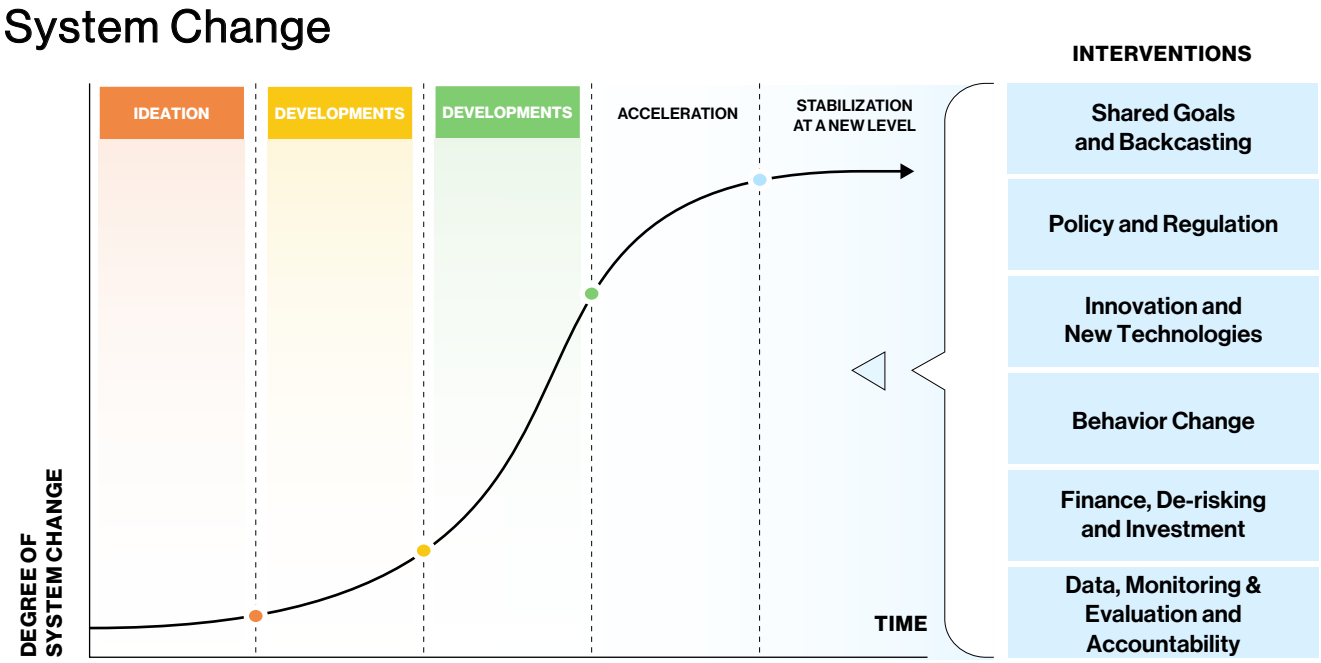
Number and growth of transnational climate initiatives with an approximate timeline of climate action summits and mobilization efforts (n = 276)



Source: Chan, S., Hale, T., Deneault, A. et al. Assessing the effectiveness of orchestrated climate action from five years of summits. Nat. Clim. Chang. 12, 628–633 (2022). Figure 2: Number and growth of transnational climate initiatives with an approximate timeline of climate action summits and mobilization efforts.

Many system transformations follow an S-shaped curve (Figure 3). Following ideation and early-stage development, technologies, policies, norms of behavior and business models can achieve a system shift when they start to undergo rapid change before reaching maturity. Such system shifts are particularly common for technologies or business models that can experience rapid market take-up after reaching technological maturity and cost competitiveness.

FIGURE 3
Driving system transformations



System transformations[9] can be accelerated through feedback loops that are driven by social contagion, technological reinforcements, ecological and socio-ecological conditions and other factors. They also depend on the right conditions, including economic competitiveness, high performance, accessibility, cultural and social norms and capability of actors.

9

For each transformation, we identify major international initiatives acting across the six interventions identified in Figure 3. We assess the extent to which each intervention is triggering a system shift, assigning color codes as follows:

- Red: Ideation phase
- Yellow: Development phase
- Green: Take-off phase

We start by examining the more mature energy-related transformations and consider how lessons from these might be applied to the other transformations. We do not list the individual initiatives in the main discussion paper but describe them separately in the annex to the discussion paper.

2 Driving system transformations

Below we review how implementation of the six levers has advanced across three transformations:

- decarbonization of energy, industry and transport;
- sustainable food, land, water and oceans;
- sustainable production and consumption of materials.

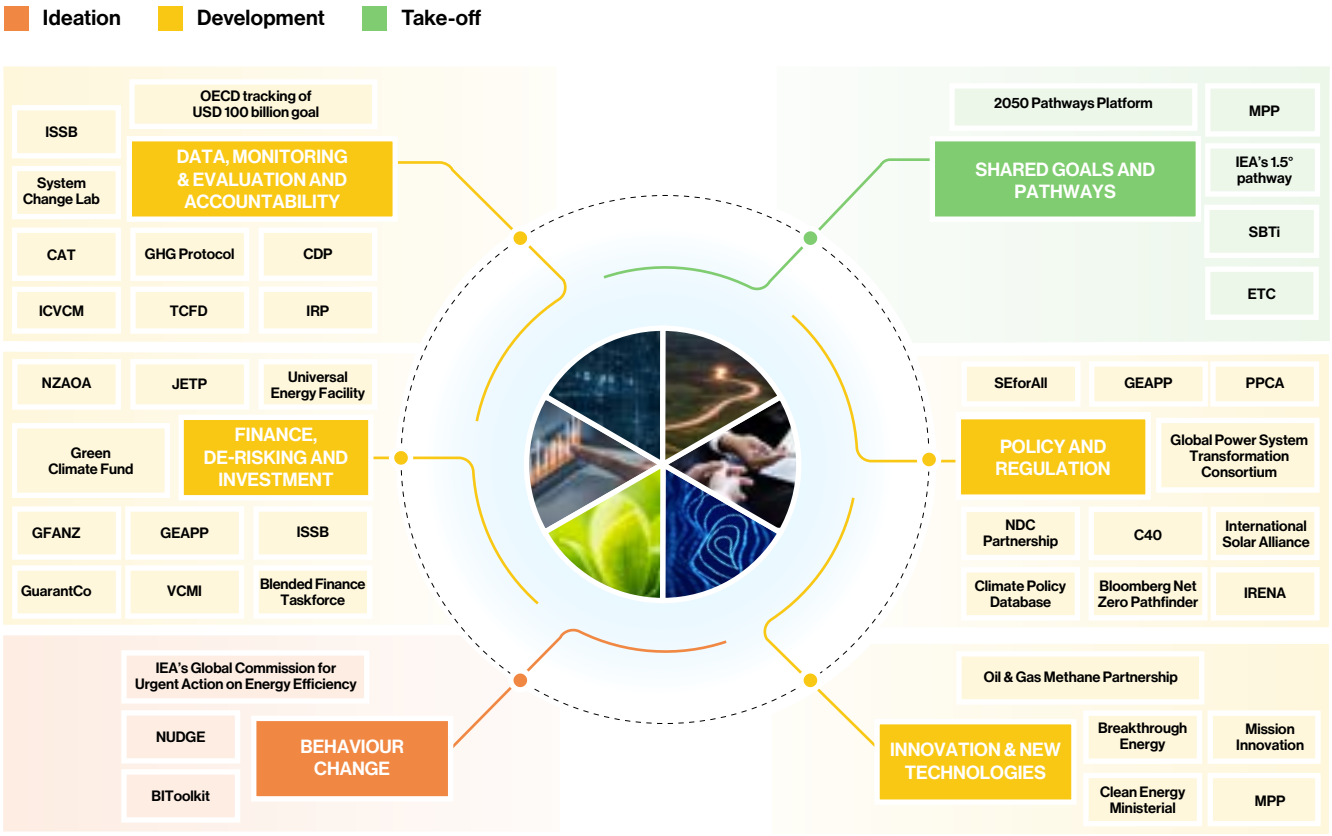
A selection of the most important international initiatives for each transformation is provided in the annex.

2.1 Decarbonization of energy, industry and transport

Since the Paris Agreement, progress on decarbonization has been more extensive than many realize.[10] Both formal international governance mechanisms and international initiatives are playing important roles in scaling zero-carbon industries. Numerous international initiatives are helping drive the decarbonization of energy, industry and transport; but major gaps remain in key areas, such as behavior change. Figure 4 lists the principal international initiatives that are supporting this transformation.

10 Jeremy Oppenheim et al., 2021.

FIGURE 4
International initiatives supporting the decarbonization of energy, industry, and transport



2.1.1

Shared goals and pathways

Many international initiatives promote shared goals and backcasting pathways for decarbonizing energy, industry and transport. Partly in response, some 140 countries have adopted or announced net-zero targets; 57 countries have put forward long-term pathways; and more than 2,200 companies—representing one-third of global gross domestic product—have adopted science-based targets under the SBTi. These targets and pathways are well understood by most governments, businesses and civil society organizations.

Take-off

Major gaps

Shared goals and pathways are now well understood, thanks in large part to international initiatives. Greater efforts are needed to support low-income countries in building the capacity to develop and apply their own national pathways. Moreover, Science-based Targets (SBTs) require greater take-up in emissions-intensive sectors; and methodologies have not been developed for all sectors, including oil and gas and the built environment.

2.1.2 Policy and regulation

Development

Improved policies and regulation are at the heart of decarbonizing energy, industry and transport. Numerous international initiatives promote best practices in policy and disseminate lessons from one country to the next. They have led to significant improvements in our understanding of which policies are needed to drive this transition; but adoption of these policies is falling short. It is important to consider the social impacts of decarbonization policies, because policymakers need political buy-in for decarbonization reforms and could fail because of opposition.

Major gaps

The uptake of decarbonization policies remains vastly insufficient. More work is needed through international initiatives to understand how to design and implement just transition policies, assess and tackle policy tradeoffs, and consider the macroeconomic implications of decarbonization policies. The food and nature transition places greater emphasis on the rights of indigenous groups, which policy initiatives in the energy space might replicate. It appears that the Russian invasion of Ukraine and the resulting spike in energy prices, as well as concerns about energy security, have accelerated the transition to renewable energy by five to 10 years.[11] International initiatives should support policymakers in setting the right regulations to balance energy security needs with the danger of long-term fossil fuel lock-in investments. Countries in the Global South will need to pursue decarbonization policies that bolster sustainable development, providing a foundation for industrialization and healthy job growth. There is potential for greater knowledge sharing on policy packages that deliver economic, social and environmental benefits.

11 The Economist, 2023.

2.1.3 Finance, de-risking and investment

Development

Rich countries have so far failed to mobilize the $100 billion in climate finance promised under the Paris Agreement. Indeed, trillions of dollars of financing are needed to decarbonize energy, industry and transport systems—which in turn calls for greater blended finance, shared standards and other measures. International initiatives are critical for developing new tools and standards, and for mobilizing governments, business and the financial sector to increase the flow of finance for decarbonization.

Major gaps

The world is not on track to mobilize the financing needed to meet the objectives of the Paris Agreement. Most blended finance mechanisms are not scaling at the required rate. Greater efforts are needed to make major transition efforts, such as the South Africa JETP, fully operational. Aside from mobilizing international and domestic finance, most countries struggle to structure and execute complex investments in decarbonizing energy, industry and transport.

International initiatives can provide valuable leadership by supporting countries in strengthening their enabling environments with good policies, supportive regulatory regimes and capacity for structuring and executing infrastructure investment, especially for domestic institutional investors. Financial sector initiatives, such as GFANZ, are limited in their ability to drive systemic change through voluntary action alone. Stronger government policies are needed to put the financial system on a firm net-zero trajectory.

Box 2 | Just Energy Transition Partnerships

Just energy transition partnerships (JETPs) are novel long-term partnerships to support decarbonization in developing countries. The first JETP for the coal transition in South Africa was announced at the Glasgow COP26. Its first phase will provide $8.5 billion of financing to prevent up to 1-1.5 gigatons of emissions over 20 years by supporting South Africa in moving away from coal and in accelerating its transition to a low-emission, climate-resilient economy.

Since COP26, several other JETPs have been launched. They are a promising mechanism to engage governments, domestic actors and international partners—including multistakeholder initiatives—around the practicalities of the transition out of coal. Particular emphasis has been placed on mobilizing the necessary finance and on ensuring that the transitions are just. Several other JETPs are in preparation, including for countries in Latin America.

Recently, discussions have started on what equivalent programs might look like for halting deforestation and switching to sustainable agriculture. A first set of these programs is expected to be launched under the Forest and Climate Leaders Partnership at COP28 in Abu Dhabi. The last important gap for such national transition programs concerns support for green industrialization efforts in developing countries that lack domestic saving pools and cannot access international capital markets at a reasonable cost of capital. Conceivably, such green industrialization programs could also support the transition of national oil companies in poorer countries away from fossil fuels.

2.1.4 Behavior change

Changing behavior is critical. Without demand reduction and efficiency measures, energy, industry and transport systems cannot be fully decarbonized. Similarly, behavior change can help make the transition just, as rich countries need to lower their per-capita emissions that are causing disproportionate harm in the Global South. Meanwhile, global primary energy consumption continues to increase and energy intensity is not improving quickly enough to offset the trend.[12] Beyond outlining the need for behavior change, international initiatives have struggled to transform behavior.

12 IEA, 2022.

Ideation

Major gaps

Major gaps: There is a lack of international initiatives to drive demand-side change—including energy efficiency measures—in energy, industry and transport systems. Most efforts to drive behavior change are led by national governments and civil society. Businesses also need to become active in promoting behavior change and building business models that enable a decoupling of wellbeing from GHG emissions. All too often, sustainable behavior change is perceived to require sacrifice through less or worse consumption. There is a lack of positive narratives about the benefits of innovations like a decarbonized and shared mobility system, with the power to convince and create societal feedback loops. Furthermore, there are good insights on how citizens and businesses can reduce and improve their energy consumption; but there are not enough effective interventions to make this happen.

2.1.5 Innovation and new technologies

There has been significant innovation in energy systems, but the rate of innovation is insufficient and must increase in many areas. [13] In particular, the hard-to-abate sectors have made limited progress so far. [14] International initiatives can play an important role in developing a shared understanding among governments, businesses and research institutions of the priorities for innovation and technology development; promoting international collaboration in innovation; and helping propagate new technologies, particularly in developing countries.

13 Jeremy Oppenheim et al., 2021.
14 Jeremy Oppenheim et al., 2021.

Development

Major gaps

We have seen tremendous innovation in key technology areas, but more is needed—particularly in industrial decarbonization and transport. International initiatives, such as industry coalitions, can play a critical role in mobilizing industrial players around the practicalities of driving decarbonization. We have seen significant acceleration of progress on tackling methane emissions from the oil and gas sector, carbon capture and storage and green hydrogen. These known interventions must now be taken up more widely by energy companies and be scaled. The costs of these technologies remain too high; and it remains to be seen if international initiatives can mobilize even more capital to drive the rate of innovation.

2.1.6 Data and monitoring, evaluation and accountability

Largely thanks to international initiatives such as the GHG Protocol, significant progress has been made in standardizing rigorous data for GHG emissions across energy, industry and transport. More recently, the Global Methane Partnership and others have started to tackle data for methane emissions. Other international initiatives track government and industry efforts to tackle decarbonization and map the pace of the needed transformations. More and more international initiatives are focused on making this data freely available.

Major gaps

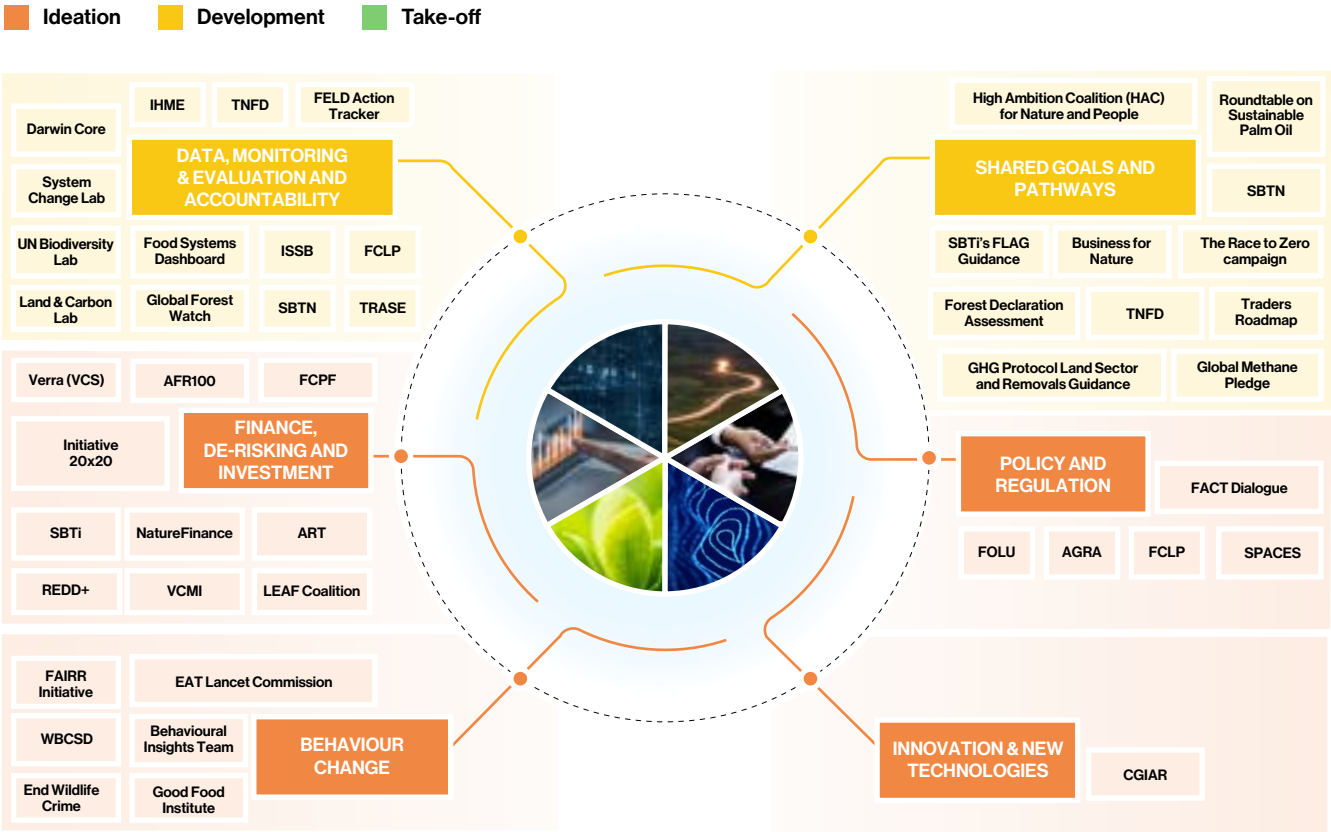
The quality and availability of data on GHG emissions have improved significantly, particularly thanks to international initiatives. Important gaps are being filled in relation to methane emissions. New data mining and artificial intelligence technologies make it possible to extract large volumes of company and asset-level information. Nonetheless, investors and companies alike struggle with monitoring Scope 3 emissions. Greater efforts are needed to publish interoperable company and asset-level data. Live tracking of emissions should be publicly available and not behind a paywall. Greater efforts are needed to expand the tracking of policies and other leading indicators for the decarbonization of energy, industry and transport.

2.2 Sustainable food, land, water and oceans

Food production has increased dramatically since the middle of the last century, which has promoted human development and massively reduced hunger and malnutrition. But today's food and land use systems are environmentally destructive and vulnerable; they generate poor health outcomes and reinforce major inequalities. The hidden costs of the food system exceed $12 trillion per year; indeed, they are higher than the total value of agricultural production. Transforming to a more sustainable food and land use system is critical to curb climate change, protect biodiversity and improve human health.

Numerous international initiatives are helping drive change toward sustainable food, land, water and oceans; but major gaps remain. Figure 5 lists the principal international initiatives that support this transformation.

FIGURE 5
International initiatives supporting sustainable food, land, water and oceans



2.2.1 Shared goals and pathways

In the run-up to and following the adoption of the GBF, some 100 countries have committed to 30x30 and other GBF targets. But these nature targets now need to be operationalized through national pathways and strategies. Far fewer countries have quantitative targets for transitioning food systems. Perhaps the COP28, under the leadership of the United Arab Emirates, will be an opportunity to promote and operationalize ambitious national targets that cover nature and food systems. These would need to include spatially explicit pathways toward 30x30 and other GBF targets.

Major gaps

The GBF sets ambitious global targets that must now be operationalized at the national level, including through national pathways. Countries have not achieved previous biodiversity targets, partially due to a lack of actionable pathways. Closing this gap will require better data (see Section 2.2.6), as well as spatial planning to effectively manage competing uses of land and ocean. Clearer and more ambitious targets are needed on food systems; and climate pathways should pay greater attention to land and the oceans. One critical challenge will be to ensure that nationally determined contributions and national biodiversity strategies and action plans are closely aligned, to maximize benefits and minimize tradeoffs. That means integrating thinking on nature and food with both emission mitigation and climate change adaptation.

2.2.2 Policy and regulation

The transformation toward sustainable food, land, water and oceans is highly dependent on better policies—particularly for agriculture, fisheries, conservation, and restoration, as well as research and development (R&D). Policy coordination is a major challenge, as countries need to pursue integrated land use planning and harmonize policies across food, nature, infrastructure and finance. As this is the transformation with arguably the greatest international spillover effects, trade policies and trade agreements will play a critical role in driving it. Several international initiatives exist to share knowledge and help drive better policies, but their scale remains insufficient to bring about the change the world needs.

Major gaps

While the Food and Land Use Coalition, the Food Action Network, SPACES and other initiatives are supporting a growing number of countries in operationalizing their food, land, water and ocean objectives, these efforts remain subscale. Countries lack integrated approaches to meet these objectives.

Underneath this broad conclusion, a number of thematic priority gaps emerge: support on integrated land use planning; land tenure and rights of indigenous and other communities; increased smallholder productivity; reduced methane from agriculture; work on food loss and waste; and dietary shifts.

2.2.3 Finance, de-risking and investment

International finance and mechanisms to de-risk investments are critical in driving this transformation. Carbon markets can play a crucial role in mobilizing finance for nature. Yet only $154 billion in annual financing is going toward nature-based solutions—just one-third of the investment needed by 2030 ($484 billion).[15] To deliver on this transformation, the world needs to scale up international carbon markets and mobilize blended finance models—perhaps along the lines of the South Africa JETP. Moreover, supply-chain finance should be directed toward nature-positive outcomes, which in turn requires clear standards for mitigation and nature-positive outcomes inside and outside value chains.

15 United Nations Environment Programme, 2021.

Major gaps

Financing for this transformation is less advanced than for the energy transition. Voluntary carbon markets have evolved and improved over time. While there remain important concerns over their environmental integrity and credibility, the markets offer promising mechanisms for scaling up investments. Standards for high-integrity supply and demand are being developed; the challenge now is to scale up effective demand, particularly from sovereign buyers. We are also seeing some encouraging signs that new models of public-private financing can support restoration activities (e.g., AFR100 and Partnership for Forests). Some fully commercial companies have also been formed to drive restoration efforts. These recent efforts illustrate how a combination of carbon credit finance, supply chain finance, timber revenues and—where needed—concessional financing might drive nature-based solutions at scale.

Many investments in nature-based solutions and other elements of this transformation cover mosaic landscapes that require a complex mix of investments in rural infrastructure, sustainable business models

and farming systems, conservation and restoration. These investments are arguably even more complex than investments in decarbonizing energy and industry. For this reason, it is highly welcome that several governments are now exploring how to structure and execute "JET-Ps for Nature" — such as the Country Packages for Nature proposed by the US and French governments, respectively — as mechanisms to get all types of capital providers and stakeholders around the table. Across the investments, it is vital to carefully consider the social impact of investments in nature-based solutions — especially carbon markets — and ensure that they are socially sustainable.[16]

16 CIEL, 2021.

2.2.4 Behavior change

One of the greatest levers for this transformation is the shift of diets toward healthier and more sustainable food. In many cases, this means shifting away from animal proteins toward plant-based proteins, fruits, legumes and tubers. The business opportunity of shifting toward healthier diets is valued at $2 trillion. Another critical behavior shift is away from consuming wildlife products such as ivory and shark fins. International initiatives can play a central role in driving such behavior change.

Major gaps

Changing behavior is notoriously hard and politically sensitive. In particular, changing diets goes to the heart of personal choice and deep-seated cultural preferences. Consequently, initiatives aimed at shifting diets, such as the EAT-Lancet Commission, have experienced a backlash. We are not on track to make the necessary dietary changes, so greater innovation is required. Evidence-based approaches (i.e., behavioral insights) could be used more widely to determine which communications and interventions are most effective in encouraging dietary shifts. On a positive note, the trade in illegal wildlife has fallen precipitously in recent years, thanks in large part to well-organized international initiatives.

2.2.5 Innovation and new technologies

As with the other transformations, the rate of innovation must increase in many areas, particularly in relation to agricultural productivity and resilience. The four big levers to make food consumption more sustainable are dietary shifts; reduced food waste; alternative proteins; and regenerative agriculture. There have been significant innovation advances in alternative proteins, so these could soon be cost-effective and attractive to consumers on a global scale. Alternative proteins are projected to reach ~10% of market share by 2035, but technological innovation and policy could push this to ~20%. [17] Furthermore, innovation on reducing food waste offers promising potential to reduce GHG emissions and loss of biodiversity driven by agricultural land use.

17 Systemiq et al., 2023.

Ideation

Major gaps

Compared with the energy transition, far fewer investments go into innovation and new technologies for transforming land, food, water and ocean use. We do not see initiatives like the Clean Energy Ministerial or Breakthrough Energy in this space. Also, corporates invest far less in R&D in this sector than in the energy transition. Particular gaps exist in relation to behavior change toward healthier diets and better farming practices. In order to change diets, initiatives should support the development of tasty and affordable alternative proteins. Regenerative agriculture is also a key enabler of sustainable land use, but scalable concepts are lacking. These areas are particularly ripe for increased investments and disruption.

2.2.6 Data and monitoring, evaluation and accountability

As with the other transformations, better data is critical to set baselines, track progress and serve as a management tool to adjust when transformations are off track. Major efforts are underway to make data on deforestation and land use change publicly available. Additional priority areas are measuring the other principal drivers of the transformation, including biodiversity (through in situ data); agricultural productivity; dietary shifts; and reduced food loss and waste. Addressing these challenges will require technological innovation in some areas. An increasing number of international initiatives are working to collect data on nature and ensure that global progress can be monitored and evaluated, but the data remains patchy and out of date. Without robust data on nature, businesses and policymakers cannot be held accountable for their actions. There is also a need to encourage

Development

businesses to tap into existing data and to incentivize further data collection by businesses. Another important area is the tracking of policies and leading indicators for the transformation.

Major gaps

Progress is being made in making remote sensing data publicly available and in tracking some dimensions of the transformation through the System Change Lab. However, major gaps remain, such as a policy tracker along the lines of the CAT; vastly improved data for key drivers of the transformation—particularly diets, food loss and waste; more in situ data for biodiversity that cannot be collected through satellites so that governments, businesses and investors can set nature-positive targets and track progress toward them; and a nature equivalent of the Partnership for Carbon Transparency to reduce the risk of data remaining in (technical) silos and ensure the availability of high-quality, comparable data.

2.3 Sustainable production and consumption of materials

Resource use (extraction of materials, land and water use) is a chief cause of environmental collapse.[18] The triple planetary crisis of climate change, biodiversity loss and air pollution is driven by unsustainable material production and consumption patterns. [19] The extraction and processing of materials (metals, minerals, fuels and biomass) account for about half of all GHG emissions and cause approximately 90% of global land-related biodiversity loss and water stress. So making production and consumption more sustainable by adopting circular economy approaches is critical for safeguarding the global commons, including meeting climate and nature objectives.[20]

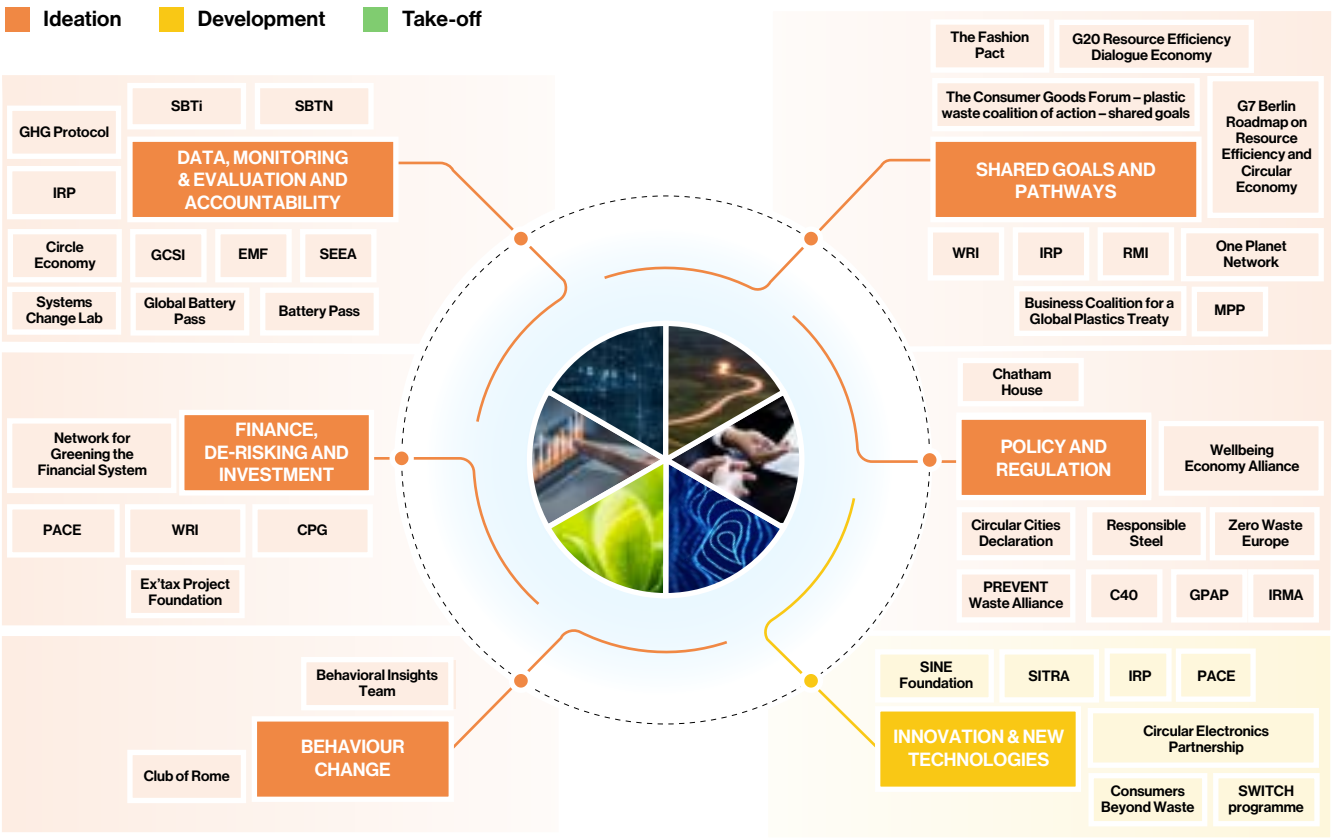
18 Oberle et al., 2018.
19 Oberle et al., 2018.
20 Oberle et al., 2018.

Several international initiatives aim to accelerate the change toward sustainable production and consumption, but meaningful progress has been limited and major gaps remain. As most governments have been slow to embrace policies to advance sustainable production and consumption, pressure and support from international initiatives can play a critical role. Progress on this transformation has arguably lagged behind the climate and biodiversity agendas because it is not a critical environmental issue in itself, but rather is a key driver of the others. As such, while the Rio Convention of 1992 established formal intergovernmental mechanisms to tackle biodiversity loss and climate change, to date there is no equivalent mechanism to drive material use efficiency.

Initiatives that work on energy-intensive materials have already been addressed in the analysis of the energy transformation. This section focuses on consumer goods industries such as fashion and electronics. A selection of critical initiatives is listed in the Annex. Figure 6 shows the principal international initiatives that support this transformation.

FIGURE 6

International initiatives supporting sustainable production and consumption of materials



2.3.1 Shared goals and pathways

There is no universally agreed goal for transforming material production and consumption. Target-setting is difficult because it cuts across many different sectors. It is also contentious because sustainable consumption and production raise the questions of resource efficiency and sufficiency. The latter in particular goes to the heart of economic models that are often built around growing resource use and consumption. Countries should aim to increase wellbeing and reduce material footprints by decoupling wellbeing from resource use. Such objectives can then be underpinned and operationalized through national pathways along the lines of what most countries have developed for the energy transition. As one example, the Dutch government has aimed to halve raw material consumption by 2030 and make the economy fully circular by 2050.

Major gaps

In the absence of agreed global targets for resource use, isolated national and sectoral goals and pathways are not linked to global targets and thus lack coherence and impact. Sustainable consumption and production of materials cut across virtually every industry and area of government activity, making them hard to implement through an integrated program. With the exception of plastics, where an international agreement to end plastic pollution is under negotiation, there is no cross-cutting intergovernmental process (equivalent to the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention on Biological Diversity) driving global and national target-setting on material use. There is also no scientific consensus on how targets could be set. However, it is impossible to achieve the objectives of the Paris Agreement, the GBF and other global environmental targets without reducing resource use; so resource-use targets are implicit in existing international agreements. International initiatives should encourage more countries to adopt targets reflecting both the production and consumption of materials. Globally, governments should accelerate target-setting so that national, sectoral and business goals and pathways are coherent and coordinated. Additionally, the SBTi allows private companies to set net-zero targets and pathways, and they will need to implement circularity levers when including Scope 3 emissions in their pathways. Overall, it is key to incorporate the externalities of material use in our economic system.

2.3.2 Policy and regulation

Improved policies are essential to drive the transformation toward sustainable production and consumption. While there is a diverse mix of international initiatives working toward circular economy policies across different sectors, the number, scale and scope of these initiatives are too limited. There is a need for policy toolkits that offer solutions across the supply chain. For an introduction to a spillover policy toolkit, see the upcoming discussion paper by the Center for Global Commons entitled Tackling International Spillovers through National Policies. Formal governance mechanisms have been relatively inactive in driving policy for sustainable materials compared to the other two transformations, which offers an opportunity for international initiatives to become policy entrepreneurs and test different policy concepts.

Major gaps

Resource efficiency and circular economy approaches should be positioned as central pillars of climate policies. The energy transition has significant potential to reduce resource intensity; materials can be retained at their highest possible value for as long as possible by "closing the loop." [21] Approaching these interlinked transformations in a coherent manner not only makes sense but may be the best strategy to drive the rapid adoption of policies for sustainable production and consumption of materials, given the lack of formal intergovernmental processes and momentum (see section 2.3.1).

The latest Intergovernmental Panel on Climate Change mitigation report revealed that the indicative potential of demand-side strategies to reduce direct and indirect GHG emissions in three end-use sectors (buildings, land transport and food) is 40% to 70% globally by 2050. [22] Nonetheless, decarbonization efforts tend to over-rely on supply-side measures at the expense of demand-side measures (e.g., revising building codes to encourage more material-efficient structures or avoid "over-specification") and circular approaches (e.g., designing buildings for disassembly and reuse). Correcting this imbalance is an important opportunity for international initiatives. Overall, there are fewer initiatives driving policy on sustainable consumption and production of materials than for the other transformations; and these initiatives work on a smaller scale and are less mature. In particular, there is a lack of initiatives aimed at helping low-income countries "leapfrog" to the most advanced technologies and bypass resource-intensive conventional pathways.[23] While business initiatives are important to reset production and consumption, many industry initiatives are not tied to policy and may create an illusion of progress.

21 Systemiq, 2022.
22 Shukla et al., 2022.
23 Oberle et al., 2018.

2.3.3 Finance, de-risking and investment

Financial incentives need to be reshaped to encourage the decoupling of wellbeing and socio-economic development from material consumption in order to drive the transformation toward sustainable production and consumption. Innovative financing models can be used to promote sustainable production and consumption. The financial sector should target societal outcomes that work toward long-term planetary health and human wellbeing.

Major gaps

There are no dedicated financing mechanisms for circularity, in the same way as there are for energy and nature. Financing for the energy transition is biased toward supply-side measures that are material intensive and overlooks high-impact demand-side measures that have a low material footprint. Improving the interconnections of the energy system and increasing demand responsiveness are necessary changes that do not receive enough financing. Decisions should be informed by high-quality data on how societal outcomes influence each other to avoid these unintended consequences.[24] Material pricing should be adjusted to accurately reflect the externalities and real costs of material usage. This could be achieved through material taxation. In addition, financing tools must be accessible to local actors. There needs to be a link between international initiatives and national governments to encourage green supply chains, innovation and resource efficiency at the local level. [25]

24 Potočnik, J & Teixeira, I., 2022.
25 Oberle et al., 2018.

2.3.4 Behavior change

Shifting human behavior can increase wellbeing, while achieving de-materialization through more resource-efficient consumption and production. Social norms can be an effective lever to change behavior related to natural resource use. [26] Small behavior changes can have significant impact, as they are adopted by more people and expand to other behaviors. While individual behaviors are important, governments have the responsibility to put in place the systemic conditions, infrastructure and incentives that will help make societally desirable, sustainable choices the norm.

26 Oberle et al., 2018.

Major gaps

Too few international initiatives focus on changing behaviors toward more resource-efficient production and consumption models. Several gaps should be addressed as priorities. First, there is insufficient knowledge on how to nudge people toward more sustainable resource use—although important lessons have been learned in some areas (e.g., water consumption). We need more experimentation and research into how to change behaviors. Second, greater efforts are required to apply available lessons at scale, including through enhanced use of social media. Third, we must weave efforts together under a broad, positive narrative for reduced resource use that may become a broad social movement.

2.3.5 Innovation and new technologies

A growing number of international initiatives aim to catalyze innovation and new technology to support sustainable production and consumption. Some of these relate to materials themselves, the manufacturing process, product design, business model design and after-use systems. However, with the exception of Breakthrough Energy, these initiatives have not yet moved the dial on overall resource use.

Major gaps

Although a significant number of international initiatives promote innovation and technology for resource use efficiency, they have so far had limited impact and are not easily scalable. In particular, innovation for new materials is underfunded, which is proving a barrier to scaling key solutions such as plastic substitutes. Today's market incentives do not include externalities, so artificially low material pricing discourages innovation on resource efficiency. International initiatives can help build a consensus around the areas in greatest need of innovation and targeted support. Governments and industry must then step in to close the initial funding gap for private companies and non-state international initiatives. Critically, we need more innovation toward sustainable consumption, as innovation efforts toward sustainable production receive comparatively more support.

2.3.6 Data and monitoring, evaluation and accountability

Data is critical to monitor and evaluate progress toward improving the sustainability of production and consumption of materials. Data on material use has typically been fragmented, inconsistent and hard to access.

Major gaps

The availability and accessibility of data on material footprints are significant challenges for many business actors and decision-makers. Although there are material flow databases that showcase consumption patterns through standardized methodologies, the data is often buried behind difficult interfaces, limiting its accessibility. Additionally, the data is primarily at the national level, rendering it inadequate for use by individual businesses. To make the data more effective, its granularity and overall accessibility must be improved. Harmonization between national and business-level material flow and impact data is also critical, as this will enhance transparency. This involves improving accessibility to data on material footprints, as well as digital passports. The development of digital passports is particularly promising for materials, but it could also be replicated across the other transformations—for example, for agricultural commodities.

2.4 Sustainable cities and communities

Transforming cities and communities and making them more sustainable is key to achieving the climate goals of the Paris Agreement and the biodiversity goals of the GBF. Inefficient land use threatens biodiversity hotspots and the built environment accounts for up to 40% of global GHG emissions, with the vast majority coming from construction and operation. Urbanization is continuing rapidly: by 2050, a projected 80% of the world's population will live in cities. Without decisive action, these trends risk putting global climate and biodiversity targets at risk.

Some major international initiatives are contributing toward sustainable cities and communities (e.g., UCLG; ICLEI, Cities Alliance, C40, Circular Buildings Coalition and Circular Cities Declaration). However, a detailed assessment of international initiatives in this area is beyond the scope of this discussion paper. This is partly because key elements of cities transformation—such as built environment and mobility—are captured by the other transformations of energy, nature and materials.

3 Conclusions

Many international nonstate initiatives established over the last two decades are making an increasingly important contribution to driving the transformations of energy systems, land and ocean use and resource use that are needed to safeguard the global commons. They can complement intergovernmental mechanisms, which at times have been slow to react on the transformations; but our analysis shows that they cannot drive the transformations on their own. Better policies and intergovernmental cooperation thus remain essential.

3.1 Findings

First, international initiatives have been particularly effective in setting shared goals and pathways, as well as driving innovation and improving data. However, there are major gaps on the demand side, including behavior change toward more sustainable consumption and production models.

Second, our six-step framework for driving transformations and its link to positive tipping points appears to work well in identifying gaps for each transformation. It reveals major differences across the transformations. International initiatives supporting the energy transformation are most advanced; while the transformation toward sustainable

consumption and production models is the least advanced, including in relation to the basic question of how to set shared goals and operationalize them through clear pathways. The transformation of food, land, water and oceans sits in the middle, but lags behind the energy transformation—particularly on the financing side.

This leads us to our third finding: that major lessons can be learned from one transformation to the next. However, such lessons are not systematically analyzed or applied—perhaps because most professionals, and indeed organizations, tend to dedicate themselves to a particular set of issues and lack an in-depth appreciation of how other sectors are approaching their transformations. We hope that our discussion paper and the analytical framework it presents (section 1) will spark greater interest in understanding and applying lessons on the role of international initiatives from one transformation to the next.

Finally, the emerging JETPs—particularly in South Africa and Indonesia—have become a vital mechanism for bringing government and non-government actors together around the practical challenges of decarbonizing power systems in middle-income countries. This emerging model is increasingly credited with driving action—especially on shared goals and pathways, improved policy and regulation, and of course financing. It can be an excellent way to integrate the best of intergovernmental cooperation, international initiatives and domestic policy, as well as business action.

3.2 Recommendations

We see four practical recommendations emanating from this discussion paper. First, we need to deepen our understanding of lessons on international initiatives that can be shared across the transformation. This is a challenge that the Center for Global Commons at Tokyo University will continue to address. In particular, we see a need to better understand how to mobilize business and the financial sector effectively, as is happening in the energy transformation. Similarly, we need to better understand how agile international initiatives can encourage and help drive more ambitious policymaking, as appears to be happening through the CAT's review of national energy policies.

Second, most international initiatives require dedicated funding, including from public and philanthropic sources. We urge such funders to focus their attention on filling gaps in the architecture of international initiatives. This is an area where international processes, such as the annual UNFCCC Conference of the Parties, can exert significant positive influence by providing a platform for some of the highest-impact international initiatives. The annex to this discussion paper lists some of the most important initiatives that might be worth strengthening further; and of course, there are many others. Indeed, in some areas there might be too many—sometimes competing—international initiatives, so funders should consider how such efforts could be consolidated.

Third, there is an urgent question of how business and civil society organizations from developing countries or the Global South can become more involved in international initiatives, which is critical for their credibility and long-term impact. We urge existing initiatives to reach out to organizations from the Global South and welcome efforts by the COP28 presidency to build a bigger tent to strengthen international cooperation on global challenges—particularly at a time when inter-governmental collaboration has become more difficult due to geopolitical tensions and mistrust among countries. We therefore cannot over-state the importance of international initiatives opening themselves up to more organizations from the Global South and reforming their governance to become more inclusive.

Fourth, we welcome efforts to extend JETPs to other countries with fossil fuel-intensive power grids and encourage the application of emerging lessons to the other transformations. Ongoing discussions around national-scale programs to accelerate the conservation and restoration of nature (particularly forests)—as initiated by the governments of the United States, France and the United Kingdom—are important and should lead to tangible announcements by COP28. It is of course critical that such efforts be coordinated under one broadly shared umbrella, to minimize transaction costs and maximize the benefits of supporting national policy action through international initiatives and government collaboration. Another area that is worthy of similar national-level efforts is green industrialization or industrial decarbonization, as this connects sustainable production with the energy transformation as two critical drivers of global commons stewardship.

The Center for Global Commons will continue its work on international initiatives and practical ways to strengthen international governance mechanisms in support of the global commons. We welcome collaboration with scientists and practitioners to advance this important agenda.

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