

# Operationalizing Sustainable Development:

## Positive Case Studies for Improving the Science-Policy-Society Interfaces

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### Abstract

This article highlights some of the positive case studies in the National Academies report on operationalizing sustainable development in three themes to stimulate action of stakeholders across the science-policy-society interface. Decarbonization of energy systems is central to global decarbonization efforts and achievement of all SDGs. Partnerships across sectors, stakeholders, and disciplines, including STI cooperation, offer innovative approaches to advance the SDGs. Financing in blended public-private partnerships is important to achieve the SDGs. Accelerating progress on operationalizing sustainable development involving all levels of government and all sectors of society can be a major steppingstone to realize the optimistic future envisioned by the 17 SDGs.

The COVID-19 pandemic and overlapping global crises, including geopolitical conflict and climate change, have made achievement of the United Nations Sustainable Development Goals (SDGs) more challenging. The scientific community increasingly recognizes the need to accelerate the adoption of evidence-based, scientifically-sound policies and actions to operationalize sustainable development; however, stakeholders lack a shared understanding of how the 17 SDGs can be operationalized. Positive case studies can help to provide a shared understanding among stakeholders.

In November 2022, the U.S. National Academies of Sciences, Engineering, and Medicine released a short consensus report, *Operationalizing Sustainable Development to Benefit People and the Planet* that identifies key research priorities and possible actionable steps to operationalize sustainable development (NASEM, 2022). Common areas across the eight themes discussed in the report include: (1) the need for additional data and reporting; (2) the need for multi-stakeholder, multi-sectoral collaboration and the importance of participatory processes in decision-making; and (3) the need for targeted financing at multiple levels from the international to the community scale. Relating to the key focus areas of the High-Level Political Forum 2023, this article highlights forward-looking assessments from some of the positive case studies in the report, including certification, roadmaps, and benchmarking as tools to improve the science-policy-society interfaces and manage the complexity of sustainable development challenges in the themes of decarbonization; science, technology, and innovation (STI); and financing to achieve the SDGs (Table 1). As we approach the midpoint to implement the SDGs, broad engagement and commitment from governments, the

private sector, funders, and civil society is essential to achieve the SDGs.

**TABLE 1** Three Themes and Their Key Relevant SDGs

Themes	Key Relevant SDGs
Decarbonization	Goals 3 (good health and well-being), 7 (affordable and clean energy), 13 (climate action), 15 (life on land), and 17 (partnerships for the goals)
Science, Technology, and Innovation for the SDGs	Goals 9 (industry, innovation, and infrastructure), 12 (responsible consumption and production), and 17 (partnerships for the goals)
Financing to Achieve the SDGs	Goals 5 (gender equality), 9 (industry, innovation, and infrastructure), 10 (reduced inequalities), and 17 (partnerships for the goals)

### Case Study 1: Decarbonization: Framework for Carbon Sequestration Certification

Decarbonization of energy systems is central to global decarbonization efforts and achievement of all SDGs. The Intergovernmental Panel on Climate Change's Sixth Assessment (AR6) has identified the need to permanently sequester about 10 percent of current carbon emissions by 2050 to stay within the Paris temperature limits (IPCC, 2022). Carbon dioxide removal (CDR) technologies capture carbon either directly from the air or at a fossil-fuel source, then reuse or sequester it depending on the method. Both engineered and nature-based methods are at different stages of research, development, and deployment: direct air capture; mineralization; soils; forests; hybrid, such as bioenergy with carbon capture; and ocean

sequestration (Burns, 2022). However, CDR technologies are in the early stages of development, their unintended consequences are not known, and they require massive scale-up and financial investment to meet the AR6 goal.

Certification of carbon removal and sequestration can help ensure safety, performance, and trust through the improvement of science-policy-society interfaces. The role of certification is to provide direct (buyers) and indirect (public) assurance that a product, service, or person meets certain claims (Arcusa, 2022). Arizona State University (ASU), Thunderbird School of Global Management, and Conservation International have been involved in a multistakeholder collaborative project to develop a framework for carbon sequestration certification. There are more than 30 standards organizations and over 125 standards for 23 types of activities to sequester carbon; however, current certification and standards are inconsistent and incomplete (Arcusa and Sprenkle-Hyppolite, 2022). While carbon sequestration moves odorless, colorless gas that may have no discernible impact for years or decades, certification must be conducted within a recognized and trusted framework. Coherence across standards is essential to ensure the credibility of the carbon removal industry.

Although CDR is emerging as an important climate agenda item, other decarbonization options will play a substantial role in reducing 90 percent of net emissions, including zero-carbon energy sources such as renewables and nuclear energy. Transformation toward full decarbonization of energy systems and end use is not only about technology and economics, but also about people, societies, and values and behaviours (Nakicenovic and Lund, 2021; Nakicenovic, 2022).

### Case Study 2: Science, Technology, and Innovation for the SDGs: UN STI4SDG Roadmaps

Science, technology, and innovation (STI) are major pillars for accelerating progress toward the SDGs. Partnerships are emerging between city networks and the STI community to serve as intermediary knowledge brokers and catalytic technical advisors to support innovation from the local to global scale. Examples includes the climate action network of megacities known as C40, and other networks in which local governments work collectively to implement shared initiatives. STI is a way to engage youth in development issues and could provide an opportunity to enhance

training and capabilities of a technology-savvy workforce in both formal and informal settings.

One promising approach to accelerating the process to meet the SDGs is national development of roadmaps. For example, STI4SDG Roadmaps help a country to build ownership and coherence across its development plans, SDG programs, and STI initiatives. The UN Interagency Task Team on Science, Technology, and Innovation for the SDGs (IATT) began this pilot project with Ethiopia, Ghana, India, Kenya, and Serbia and continued to scale with the addition of Ukraine. According to a guidebook, the roadmaps have six steps: define objectives and scope; assess the current situation; develop vision, goals, and targets; assess alternative pathways; develop detailed STI for SDGs roadmap; and execute, monitor, evaluate, and update the plan (UN, 2021a). Key inputs include stakeholder consultations, technical and managerial expertise, and data and the evidence base. Lessons from the Roadmap Process include ensuring active participation across government, scientists and engineers, industry, NGO and local community stakeholder groups to develop a coherent vision, goals, and targets (UN, 2021b). Wars and local conflicts may be the greatest threat to achieving the SDGs, as Ethiopia and Ukraine, two of the pilot countries for STI4SDGs Roadmaps, are involved in conflicts that have disrupted their plans for the SDGs.

### Case Study 3: Financing to achieve the SDGs: Corporate Benchmarks

More than \$12 trillion in private investment is needed globally to address the SDGs by 2030 (BSDC, 2017). Accelerating global progress on the SDGs requires access to this capital and will necessitate new models and partners to finance projects and transitions, as well as greater openness to new customers and a willingness to redefine risk. Opportunities exist to realize tangible and intangible benefits from SDG-related investing. Place-based initiatives can be attractive investments for private capital, whether alone or through public-private-philanthropic (P3) partnerships. Cross-sector collaboration is essential to unlock the combined capacity of the private sector, public sector, and community. All relevant stakeholders including local communities must be at the table to collaboratively set goals, commit to action, and agree on metrics to assess results. Blended finance offers an opportunity to increase overall resources while offsetting some risk (OECD, 2021).

As one aspect of operationalizing the SDGs, benchmarks equip investors, governments, civil society, individuals, and companies with the information they need to engage and step up to achieve transformational change (Muusse, 2022). The World Benchmarking Alliance (WBA) was launched in 2018 based on the belief that the private sector can contribute to and benefit from the global ambition of the SDGs, and that corporate performance benchmarks are powerful levers for change. WBA has identified seven systems that offer a strategic framework for achieving the SDGs: food and agriculture, decarbonization and energy, urban, digital, and nature and biodiversity, with social at the core and the financial system essential to unlock change. WBA assesses, measures, and ranks 2,000 of the world's most influential companies on their contributions to the SDGs and other internationally accepted norms using free, publicly available data (WBA, 2023). The WBA benchmark has three broad measurement areas: governance and strategy, respecting planetary boundaries, and adhering to societal conventions, with a total of 32 issues and indicators. Twenty-seven “investor allies” are working with WBA, which provides a space for allies to develop coordinated action across sectors, mobilizes action through collaboration, and identifies key issues from the benchmarking data that are catalytic to drive systemic transformation. Recent issues that have been the focus of these coalitions include ethical artificial intelligence in the digital space and a just energy transition.

## Policy recommendations / conclusions

To strengthen science-policy-society interfaces and address issues relating to decarbonization, STI for the SDGs, and financing to achieve the SDGs, governments, the private sector, and nongovernmental organizations could:

- Work together to explore acceptable levels of uncertainty in certification in both technical and social dimensions of carbon removal and sequestration including intergenerational justice.
- Promote decarbonization in agriculture, industry, and energy production, including by building carbon-neutral cities, strengthening climate education and engagement, and encouraging low-carbon lifestyles for mobility, housing, and consumption.
- Become involved in the efforts at the UN to assist volunteer countries in developing their STI for SDGs roadmaps and to facilitate knowledge exchange and transfer at the local level.

- Create more blended finance options given the growing demand for positive ESG (environmental, social, and governance) investments where social benefits are significant and measurable. Impact investing, development aid, and concessionary capital could jumpstart a project or a partnership that provides access to previously underserved markets.

Accelerating progress on operationalizing sustainable development involving all levels of government and all sectors of society can be a major steppingstone to realize the optimistic future envisioned by the 17 SDGs.

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World Benchmarking Alliance website, <https://www.worldbenchmarkingalliance.org>.