



Realizing the Green Jobs Promise

The Benefits of a Regenerative Approach



Executive Summary

The switch to a carbon-free economy is the biggest economic opportunity of our era.¹ The International Energy Agency (IEA) and other analysts have predicted that this wave of market-driven innovation will create two to six “green jobs” for each fossil fuel job lost. The promised jobs are already arriving; the 2022 Annual Review by the International Labour Organization (ILO) and the International Renewable Energy Agency (IRENA) reported that renewables alone had created more than 12 million jobs as of 2021.²

But as well-researched and credible as such studies are, unfulfilled promises of prosperity have left many people skeptical about clean energy job claims. As a result, narrowly framing job numbers as a direct trade-off between fossil fuel jobs lost versus clean energy jobs gained risks undermining political and popular support for the clean energy transition. A clean energy focus also misses the bigger picture of our rapidly changing global economy, obscuring the “hidden” costs and risks within our current economic system as well as the nascent opportunities embedded in a shift to a more sustainable economy.

We must reframe the notion of green jobs within this broader context of economic risk, opportunity, and transformation. A more holistic framing centered on the concept of regenerative capitalism, where achieving net-zero carbon emissions is but one step toward a long-term sustainable economy, can better position communities, companies, and workers globally to thrive as part of a more equitable and abundant future. This report looks beyond analytical findings of “more jobs” to begin charting the deeper work, analyses, and stories needed to inspire a leap from a job scarcity mentality toward one of purpose-inspired economic abundance. We propose calling this shift the Great Regeneration.

Green Jobs Have a Believability Problem

The shift to clean energy will require millions of new energy workers, but “more” is an insufficient metric. It is not credible to imply that green jobs can directly substitute for potential or existing fossil-based jobs. Scaling new industries and workforces is difficult, and most studies fail to consider how new energy jobs can become attainable or desirable opportunities — whether for those trying to escape poverty in emerging economies or those likely to lose current fossil fuel jobs amid global changes. The green jobs promise is failing to deliver against expectations in two key areas:

Failure 1: Job quality and location mismatches undermine the transition and can devastate local communities.

A mismatch in location and perceived job quality between fossil fuel and clean energy jobs risks alienating workers, potentially aggravating labor shortages and weakening political support for the energy transition. In addition, as workers take lower paying jobs or relocate for higher quality jobs, compounding negative impacts can devastate local communities.



Some green jobs are lower quality than those they would replace. Many studies underappreciate the importance of job quality (e.g., compensation, security, and safety). For example, construction roles that make up a large share of clean energy jobs are more transient than typical fossil fuel industry jobs. Such quality gaps are more pronounced in developing countries, where high rates of informal economy employment mean less regulatory protection for such concerns as safety, fair wages, and working hours.



Fossil fuel and clean energy projects are often developed in disparate places due to differing resource quality and policy supports. Such location mismatches mean that many transition opportunities may require workers to relocate, but there is little evidence that they want to move. In India, for example, interstate mobility remains low despite a growing shift from rural to urban areas, while the US mobility rate has been falling for decades.

Compounding effects can devastate local communities.

These mismatches create a threefold risk for communities of lower wages, outmigration for better jobs, and lost tax revenues from fossil fuel–related activities. The subsequent impacts can quickly compound within a community, affecting people who work in the supply chain, restaurant workers, arts institutions, government agencies, nonprofits, and social services such as schools, fire departments, and the police. These collective losses can undermine a community’s adaptive capacity and lead to a poverty trap, reducing its ability to attract new employers and invest in critical infrastructure and services (see Exhibit ES1).

Exhibit ES1

Mismatches undermine the transition and can devastate local communities



Source: RMI

Failure 2: Barriers often prevent investment from supporting a people-centered energy transition.

Financial investment is the foundation of green job growth, as massive spending on energy infrastructure, energy-efficient housing, and other industries is required to achieve climate targets. Yet structural barriers often prevent money and other resources from flowing to where they are most needed, and wealthy countries continue to fall short on investments in less affluent communities, regions, and countries.



Financial investment in developing nations continues to fall short. Clean energy investment in the Global South needs to increase by an estimated \$1.5 trillion annually by 2030 to align with the IEA’s net zero energy (NZE) scenario.³ Yet rich nations continue to underdeliver their 2009 Copenhagen climate summit promise to direct \$100 billion per year in climate finance to developing nations.⁴ This is despite G20 governments spending \$290 billion annually on fossil fuel subsidies during 2017–19.⁵ With high levels of existing debt (exacerbated by COVID-induced emergency borrowing), Global South governments are unable to finance the complementary infrastructure and institutions required to support new clean energy investments. Such challenges will likely worsen in the face of climate change impacts and subsequent economic shocks.



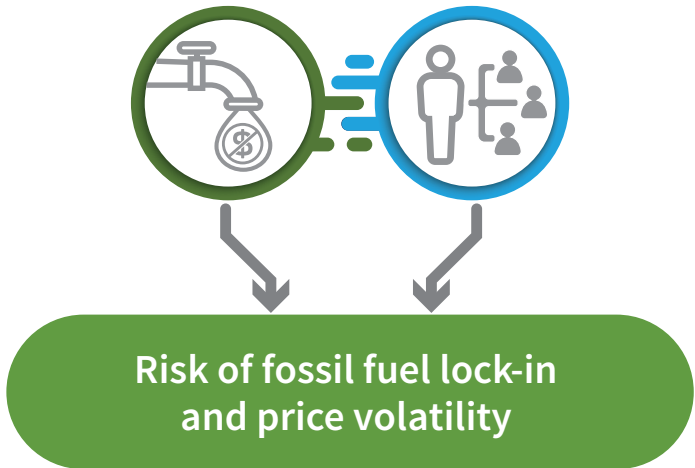
Developing communities need planning, institutional, and technical capacity to support these investments. Building a clean energy workforce requires not only foundational technical training but sharing of best practices and context-relevant insights. It also requires the rapid scaling and alignment of new industry ecosystems and peer networks, governance, leadership and planning capacity, and opportunities for hands-on project experience. Local, regional, and national policies must simultaneously support demand creation for the same clean energy industries in which workers are being trained, ideally in a way that acknowledges the volatility, existing subsidies, and environmental and health damages of fossil fuels.

A people-centered energy transition will avoid locking in risky fossil fuel investments.

Without sufficient investment, capacity building, and policy support, capital will continue flowing to conventional energy infrastructure that will likely increase inequality and vulnerability, particularly in the Global South (see Exhibit ES2).⁶ This is despite strong evidence suggesting that global fossil fuel consumption has already peaked, accelerated by recent price spikes and a renewed focus on energy security.⁷ Even where renewable energy is not yet more cost-effective, gas price volatility increases the risk that new natural gas investments will lead to sustained periods of high costs or stranded assets, especially when compared with renewable energy’s zero marginal fuel cost.

Exhibit ES2

A lack of adequate financial investment and institutional capacity to support clean energy will lock in long-term risk



Source: RMI

From the Green Transition to the Great Regeneration

The notion that clean energy jobs should necessarily replace those lost due to a declining fossil fuel industry is a false dilemma that unnecessarily limits stakeholders' understanding of the risks and opportunities facing their local communities. Any transition discussion must consider the risks not only of a changing climate, but also from other socioeconomic megatrends — technological innovation, urbanization, and international migration — that are disrupting the economic status quo. And although energy is the single largest source of greenhouse gas (GHG) emissions, the need to transition from fossil fuels to clean energy is only one step on the path to a more sustainable global economy.

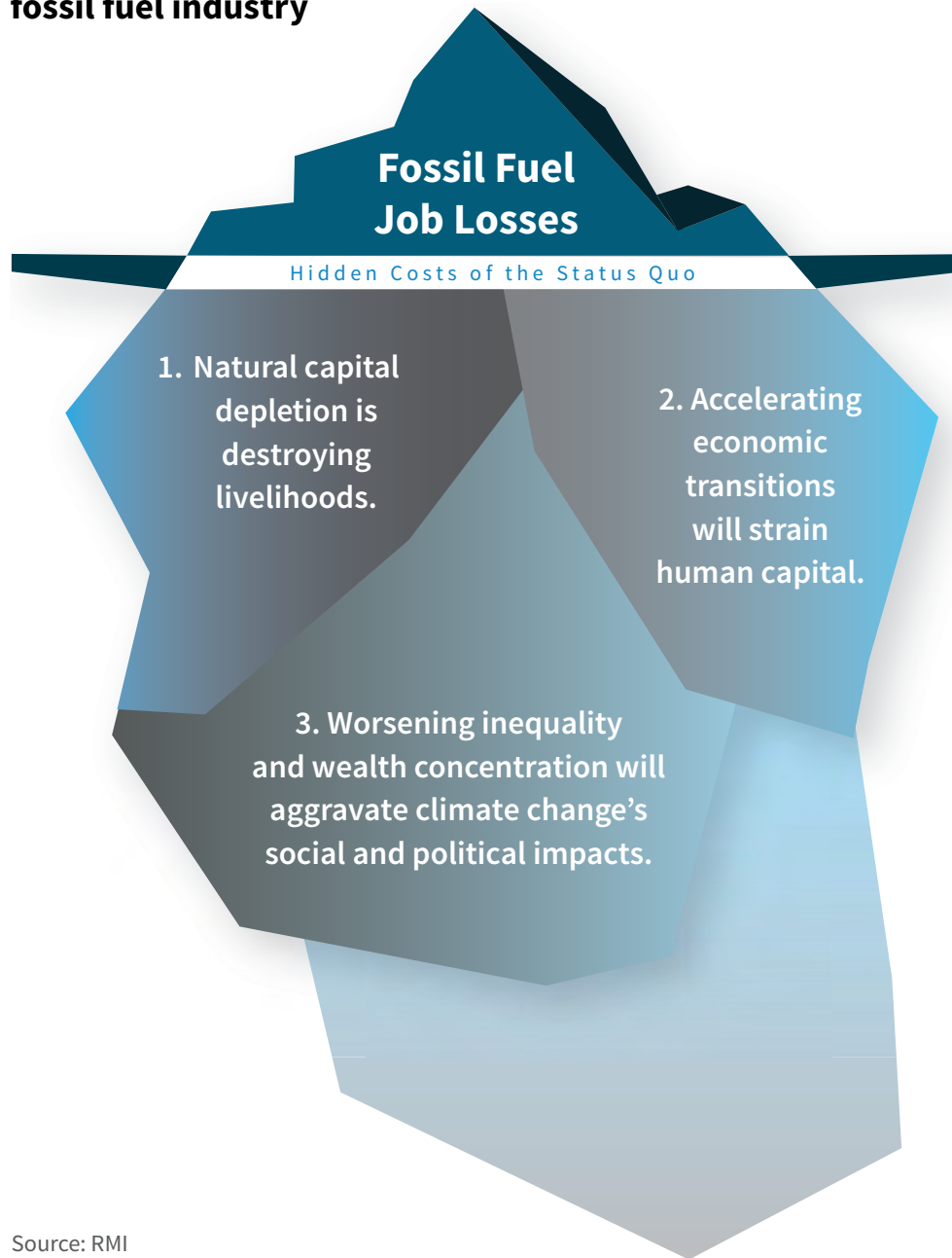
It is within this broader context that an increasing number of institutions and leading corporations are calling for a shift toward regenerative capitalism.⁸ This sustainable economy paradigm seeks to internalize firms' impacts on all types of capital — particularly human and natural capital that are often treated as externalities today — and actively works to support transformational changes for both people and the planet. Such a shift would provide a major boost for achieving the United Nations' Sustainable Development Goals (SDGs), within which the goal of limiting long-term global warming to 1.5°C is but one indicator of long-term global prosperity.⁹

Adopting a posture of adaptability that embraces this broader economic transformation — what we propose calling the Great Regeneration — can help individuals, companies, policymakers, and local communities find growing opportunity where they otherwise perceive loss and risk.

The green-for-fossil energy framing ignores three “hidden” costs of the status quo

Embedded in our business-as-usual economics approach, but missing from most green jobs analyses, are three systemic risks that will increasingly threaten communities and companies with tangible costs that outweigh the impact of lost fossil fuel jobs (see Exhibit ES3). All three must be factored into any community's evaluation of the long-term risks of failing to adapt their approach to economic development.

Hidden costs and risks of our status quo approach to economic development will outweigh the impacts of lost jobs in the fossil fuel industry



Source: RMI

Hidden Cost 1: Natural capital depletion is destroying livelihoods. An isolated focus on fossil fuel job losses neglects the far greater global impacts of failing to address environmental degradation and climate change. Mines pollute the air, ground, and water, while 2 billion tons of waste is dumped into landfills each year, causing local health issues ranging from diarrhea to respiratory infections.¹⁰ Globally, the loss of a livable climate threatens our collective well-being, including many of the underlying economic arrangements that have fueled great rises in human welfare. It will directly affect nearly 40% of workers globally (1.2 billion, disproportionately in the Global South) whose jobs depend on ecosystem services, while heat stress-related productivity losses will be equivalent to losing 80 million full-time jobs by 2030.¹¹

Such disruptions are already causing social and economic damage, including to supply chains that underpin the global economy.

Hidden Cost 2: Other economic transitions are increasingly straining human capital. Workers, labor groups, and industries must increasingly adapt to rapidly shifting technological and economic landscapes. The Fourth Industrial Revolution — an exponential expansion of digital technologies' roles in the physical world — is dramatically changing the way people live and work.¹² Although it has improved human connectivity, technological progress, and business innovation and efficiency, it is also accelerating the rate at which data and technology can displace human labor. The speed of this transformation is far outpacing that of prior industrial revolutions, and workers may no longer assume that a particular skill set will adequately prepare them for a several-decade career. Companies, industry and labor organizations, and educational institutions will have to improve and evolve to support professional development models that prepare workers for such ongoing shifts.

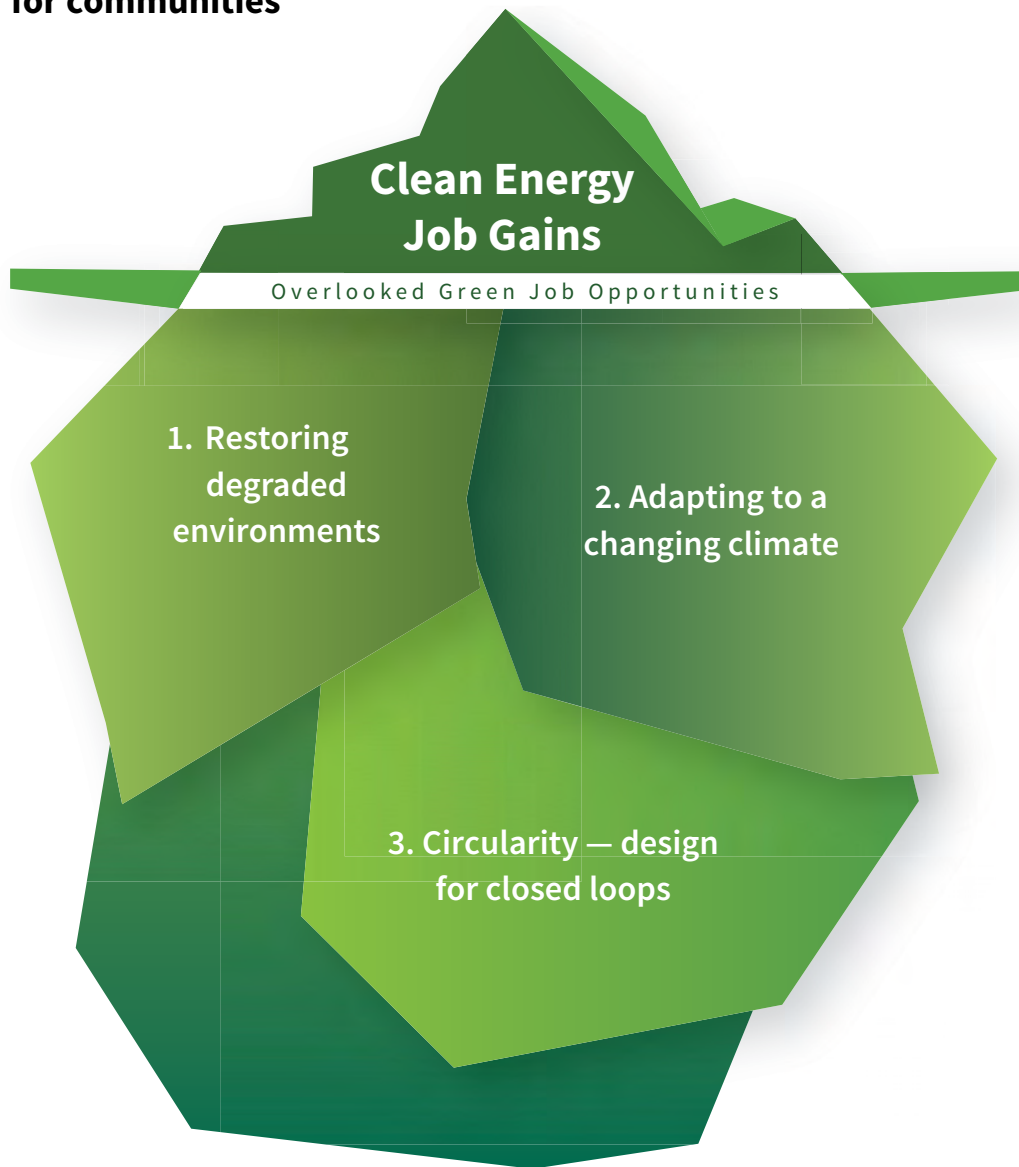
Hidden Cost 3: Worsening inequality and wealth concentration will aggravate the social and political impacts of a changing climate. The financial and social benefits of our extractive economic model are evident — global gross domestic product has increased approximately 28 times in the past 50 years, and billions of people have had the opportunity to lift themselves out of poverty.¹³ But inequitably distributed financial gains have led to extreme wealth concentration, made worse by COVID-19, as income and wealth growth among the highest 1% of global earners has consistently outpaced that of the remaining population.¹⁴ Worsening inequality, including along gender lines, directly affects individuals' health outcomes, access to food, and abilities to respond to the changing climate and global economy. Converging increases in economic disruption and climate change impacts only exacerbate the risks of social and political upheaval.

How the Great Regeneration expands transition opportunities

These trends underscore the increasing vulnerability of our interconnected global systems. The Great Regeneration aims to counteract these trends through a transition to a global economy that invests in and expands *all* types of capital, with a stronger focus on equitable and enduring outcomes. Although it is global in scope, the Great Regeneration focuses on regenerating productive capacity and capital at the community level, with an emphasis on improving locally unique natural and human sources of value and more equitably distributing those assets. Refocusing on regenerating communities rather than replacing jobs requires that we consider and measure jobs' broader attributes (e.g., livelihood, security, sense of purpose, opportunity, and identity), thereby reducing the risk that green jobs fail to provide those benefits.¹⁵

In this report, we've highlighted three example categories of regenerative work — all regularly excluded from green jobs research and messaging — that can expand economic opportunities for local communities while enhancing their natural and human capital (see Exhibit ES4). For those designing economic transition and development strategies for communities and regions, they offer a useful starting point for analysis, as they are likely to reveal the new capacities and institutions necessary to support community regeneration.

Including work associated with a shift to a regenerative economy significantly expands the economic development opportunities for communities



Source: RMI

Opportunity 1: Restoring degraded environments. Even as the world moves away from fossil fuels, the mines, wells, and power plants left behind will continue to pollute the air and surface and groundwater sources, with billions of dollars in health and environmental damage to surrounding areas.¹⁶ Stopping and reversing these impacts through remediation and reclamation can have immediate and lasting effects on GHG emissions, the productive value embedded in surrounding ecosystems, and the human capital whose health and welfare are directly affected. The economic development potential of these activities is significant and widespread, and can serve as a partial economic counterweight to declining fossil fuel demand. Many such jobs are also well suited for the skills, equipment, and infrastructure that local workers have spent their careers building.¹⁷

Opportunity 2: Adapting to a changing climate. Climate adaptation helps preserve the natural and human capital connected to a particular place, yet adaptation spending has generally fallen well behind emissions mitigation efforts. As climate change–related weather and natural disasters intensify, so must our collective investment in adapting our natural systems, built environment, and social institutions to withstand these impacts. The associated job-creating activities will require a wide range of both technical and skilled labor, including improving disaster preparedness; hardening infrastructure against extreme weather stresses; and helping agricultural, ecotourism, and other workers who depend on affected natural systems adapt.

Opportunity 3: Circularity — designing for closed loops. As GHG emissions are harmful by-products of most modern value chains, climate change mitigation efforts have become a driving force for developing new technologies, institutions, and practices to manage resources in a more efficient and, increasingly, circular way. Climate alignment will require a huge focus on designing for efficiency and reuse, as many of the technologies that will displace fossil fuels themselves require significant amounts of natural resources and mined materials. The economic benefits of circularity are well suited to improve community resilience and adaptability. The COVID-19 pandemic has shown us how unexpected drops and surges in demand for products can strain supply chains, create shortages, and lead to anxiety about turbulent prices.¹⁸ A circular economy, by contrast, is designed to promote local production with shorter supply chains that are less exposed to global disruptions and to retain capital and wealth within the local community.¹⁹

Critical Questions for Restoring the Green Jobs Promise

To really inspire change toward a vision of a healthy and regenerative economy, we need to shift from an incremental cost-benefit focus on job numbers to a broader framing of risks and opportunities in a fast-changing global economy. We must remember that a job is also a means, not an end goal, and that what people ultimately desire includes security, opportunity, and purpose. To this end, we offer three questions or problem framings that society must collectively answer to restore the green jobs promise, viewed through the lens of a regenerative approach to the future economy.



Question 1: How can we regenerate communities, not just jobs?

Economic plans that focus on jobs without taking time to understand the opportunities and constraints of a particular place frequently fail or compound existing problems.²⁰ The Great Regeneration is a vision for an economic future where opportunity and value are more accessible and resilient to long-term risks. Such plans must identify the common ground, shared values, and vision for a community to harness its greatest assets and sources of unique value: its people and place. At the same time, community regeneration also means mapping and mitigating a specific community’s vulnerabilities.²¹ Stakeholders can approach this inquiry with three tenets for resilient economic renewal:

1. Cultivate and invest in local assets
2. Reduce resource leak from communities
3. Build regional connectivity²²



Question 2: What new risk management structures do we need?

The turbulence in our interconnected global economy suggests that an opportunity-focused lens is insufficient. The risks of climate change, compounded by other global shocks and technological change, mean that we need a more proactive set of risk-management institutions and policies to help us overcome structural barriers and prepare for the challenges ahead. This is a call for institutions, policymakers, and businesses to think holistically, to collaborate, and to innovate to create new risk-management models that are better suited for a world of rapid disruption. Areas that are ripe for innovation include forward-looking risk minimization practices for finance and new approaches to risk pooling and inclusive finance.



Question 3: How can we support high-quality opportunities and individual development pathways?

In a world with vastly more learning and change, people need better information and support structures to help them improve their lot in life. Information improvements require more focus on *job quality* attributes, including how compensation, location, and skills relate to one another and are expected to evolve as industries grow and change. This information is critical to inform policymakers and professional, labor, and industry organizations' planning and must be integrated into support structures necessary for ongoing workforce development. A pathways approach to both research and policymaking can and should center on how known emerging and existing professions can evolve and provide continual growth toward a better future.

Endnotes

- 1** Faith Birol, “Global Leaders Recognize Clean Energy’s Huge Economic Potential. Now They Need to Act,” IEA, 2021, <https://www.iea.org/commentaries/global-leaders-recognise-clean-energy-s-huge-economic-potential-now-they-need-to-act>.
- 2** *Renewable Energy and Jobs — Annual Review 2021*, IRENA and ILO, 2021, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Oct/IRENA_RE_Jobs_2021.pdf.
- 3** *IEA World Energy Outlook 2022*, IEA, 2022, <https://www.iea.org/reports/world-energy-outlook-2022>.
- 4** Lauren Sommer, “Here’s What World Leaders Agreed To — And What They Didn’t — At the U.N. Climate Summit,” NPR, November 13, 2021, <https://www.npr.org/2021/11/13/1055542738/cop26-climate-summit-final-decision>.
- 5** Johannes Urpelainen and Elisha George, “Reforming Global Fossil Fuel Subsidies: How the United States Can Restart International Cooperation,” Brookings Institution, July 14, 2021, <https://www.brookings.edu/research/reforming-global-fossil-fuel-subsidies-how-the-united-states-can-restart-international-cooperation/>.
- 6** Justin Locke and Francis Elisha, “Opinion: Ukraine Invasion Shows Urgency of Renewables Shift for Global South,” Reuters, March 17, 2022, <https://news.trust.org/item/20220317101917-2m0k8/>.
- 7** Kingsmill Bond and Sam Butler-Sloss, “Peaking: A Theory of Rapid Transition: How Patterns of Peak, Plateau, and Decline Point to Fossil Fuels’ Accelerating End,” RMI, 2022, <https://rmi.org/insight/peaking-a-theory-of-rapid-transition/>.
- 8** Marc Buckley, “Is Regenerative Capitalism the Answer to the World’s Problems?” *Innovators Magazine*, March 30, 2022, <https://www.innovatorsmag.com/is-regenerative-capitalism-the-answer-to-the-worlds-problems/>.
- 9** “Natural Capitalism Solutions,” accessed November 5, 2022, <https://natcapsolutions.org/>; and *Reinventing Capitalism: A Transformation Agenda*, World Business Council for Sustainable Development, 2020, <https://www.wbcsd.org/contentwbc/download/10585/157859/1>.
- 10** “Trends in Solid Waste Management,” World Bank, accessed October 25, 2022, https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html.
- 11** *Working on a Warmer Planet: The Impact of Heat Stress on Labour Productivity and Decent Work*, ILO, 2019, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_711919.pdf.

- 12 Klaus Schwab, *The Fourth Industrial Revolution: What It Means, How to Respond*, World Economic Forum, 2016, <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>.
- 13 “GDP (current US\$),” World Bank DataBank, accessed October 25, 2022, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2020&start=1960>; and Homi Kharas and Kristofer Hamel, *A Global Tipping Point: Half the World Is Now Middle Class or Wealthier*, Brookings Institution, September 27, 2018, <https://www.brookings.edu/blog/future-development/2018/09/27/a-global-tipping-point-half-the-world-is-now-middle-class-or-wealthier/>.
- 14 *World Inequality Report*, World Inequality Lab, 2018, <https://wir2018.wid.world/>; and Nabil Ahmed et al., *Inequality Kills*, Oxfam International, 2022, <https://www.oxfam.org/en/research/inequality-kills>.
- 15 Kate Morgan, *Why We Define Ourselves by Our Jobs*, BBC, April 13, 2021, <https://www.bbc.com/worklife/article/20210409-why-we-define-ourselves-by-our-jobs>.
- 16 Eric Dixon, *Repairing the Damage: Cleaning Up the Land, Air, and Water Damaged by the Coal Industry before 1977*, Ohio River Valley Institute, April 14, 2021, <https://ohiorivervalleyinstitute.org/cleaning-up-aml-damage/>.
- 17 Dixon, *Repairing the Damage*.
- 18 Susan Helper and Evan Soltas, “Why the Pandemic Has Disrupted Supply Chains,” The White House, June 17, 2021, <https://www.whitehouse.gov/cea/blog/2021/06/17/why-the-pandemic-has-disrupted-supply-chains/>.
- 19 Irena Pichola, *Circular Economy and Producing Locally*, Deloitte, 2021, <https://www2.deloitte.com/global/en/pages/public-sector/articles/urban-future-with-a-purpose/circular-economy-and-producing-locally.html>.
- 20 Claire Wang, Sam Mardell, Jeremy Richardson, and Uday Varadarajan, *Ensuring an Inclusive Clean Energy Transition*, RMI, 2022, <https://rmi.org/insight/ensuring-an-inclusive-clean-energy-transition/>.
- 21 Michael Grubb et al., *The New Economics of Innovation and Transition: Evaluating Opportunities and Risks*, Economics of Energy Innovation Systems Transition (EEIST), October 2021, <https://eeist.co.uk/eeist-reports/>.
- 22 Michael J. Kinsley, *RMI’s Economic Renewal Program: An Introduction*, RMI, 1997, https://library.uniteddiversity.coop/REconomy_Resource_Pack/Community_Assets_and_Development/Economic_Renewal_Guide-Chapter_2.pdf.