Debt-for-Climate Swaps

IGSD Background Note

Institute for Governance & Sustainable Development

Discussion Document: 12 August 2020

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About the Institute for Governance & Sustainable Development (IGSD)

IGSD's mission is to promote just and sustainable societies and to protect the environment by advancing the understanding, development, and implementation of effective and accountable systems of governance for sustainable development.

As part of its work, IGSD is pursuing "fast-action" climate mitigation strategies that will result in significant reductions of climate emissions to limit temperature increase and other climate impacts in the near term. The focus is on strategies to reduce non-CO_2 climate pollutants, protect sinks, and enhance urban albedo with smart surfaces, as a complement to cuts in CO_2. It is essential to reduce both non-CO_2 pollutants and CO_2, as neither alone is sufficient to to provide a safe climate.

IGSD's fast-action strategies include reducing emissions of the short-lived non-CO_2 climate pollutants—black carbon, methane, tropospheric ozone, and hydrofluorocarbons (HFCs). Reducing HFCs under the Kigali Amendment to the Montreal Protocol has the potential to avoid up to 0.5°C of warming by end of century. Parallel efforts to enhance energy efficiency of air conditioners and other cooling appliances during the phase down of HFCs can double the climate benefits at 2050, and by 2060 avoid the equivalent of up to 460 billion tones of CO_2.

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Table of Contents

I. Developing a Framework for Debt-for-Climate Swaps

Much of the world is awash in unsustainable public and private debt, made significantly worse by the COVID-19 crisis. Efforts to relieve the debt crisis provide opportunities to advance climate protection, health, and economic goals together, specifically through debt-for-climate swaps, building on the success of debt-for-nature swaps.

Nearly 30 countries have utilized debt-for-nature swaps since the 1980s to provide more than USD $1 billion to protect the environment.[1] Extending debt-for-nature swaps to the broader concept of debt-for-climate swaps would provide funding for climate mitigation and adaptation in developing countries, at a discount to creditor countries.

In a debt-for-climate swap, instead of continuing to make external payments on outstanding loans in hard currency, an indebted country makes payments in local currency to finance fast climate mitigation and adaptation project on terms agreed upon between debtors and creditors.

Swapping some of the unsustainable public and private debt for climate protection can provide relief for debt-distressed borrowers, create local green jobs, stimulate investment in clean technologies, and drive a more resilient economic recovery. Swapping even a small percentage of global debt could direct billions toward climate protection to tackle the climate emergency while creating and maintaining millions of jobs essential for the economic recovery. In addition, creditor governments could use the relief to make good on their so-far unfulfilled promise to provide $100 billion per year in climate finance to countries vulnerable to the effects of climate change.[2]

Climate swaps should be guided by strong climate science, including the IPCC Special Report on Global Warming of 1.5ºC, as well as by the need to strengthen poverty alleviation efforts and the economic recovery. Key targets for fast climate mitigation include strategies to cut short-lived climate pollutants (SLCPs)—methane, black carbon, tropospheric ozone, and fluorinated gases—which would provide the fastest temperature abatement to slow feedbacks and tipping points, protection of sinks and other nature-based solutions, and increases in energy efficiency. According to a recent study, clean energy infrastructure and increases in energy efficiency generate more than 2.5 times the number of jobs than fossil fuels per $1m spent.[3] These efforts could be paired with strategies to reduce air pollution, which would save millions of lives and reduce crop losses, while reducing black carbon and tropospheric ozone. There is emerging evidence that reducing air pollution also would reduce the death rate from COVID-19.[4]

As countries begin negotiations to restructure sovereign debt to address the COVID-19 pandemic and wider debt crisis, climate protection should be included, as way to ensure debt sustainability, deliver more resilient societies, and inoculate the economies of the world by diminishing economic risk of a climate crisis.

After a series of consultations with stakeholders and decisionmakers, IGSD has identified the following strategies for developing a framework for debt-for-climate swaps as a way to implement, at scale, climate mitigation strategies consistent with a 1.5°C pathway.

The strategies are:

- to create a High Level Task Force to raise awareness and political visibility,
- to engage high level champions from States (creditors and debtors), as well as international financial institutions,
- to identify climate protection options for debt swaps,
- to facilitate at least one debt-for-climate swap to gain implementation experience,
- to strengthen and expand debt frameworks for debt swaps, including the U.S. Tropical Forest and Coral Reef Conservation Act and the G20 Debt Service Suspension Initiative,
- to encourage China and India to undertake debt climate swaps, and
- to engage with sovereign debt rating agencies such as Moody's to explore how debt swaps can be structured to work in favor of sovereign credit ratings.

II. Overlapping Disasters: How Addressing the Debt Crisis Can Help Avert Climate Crises and Stabilize Global Economies

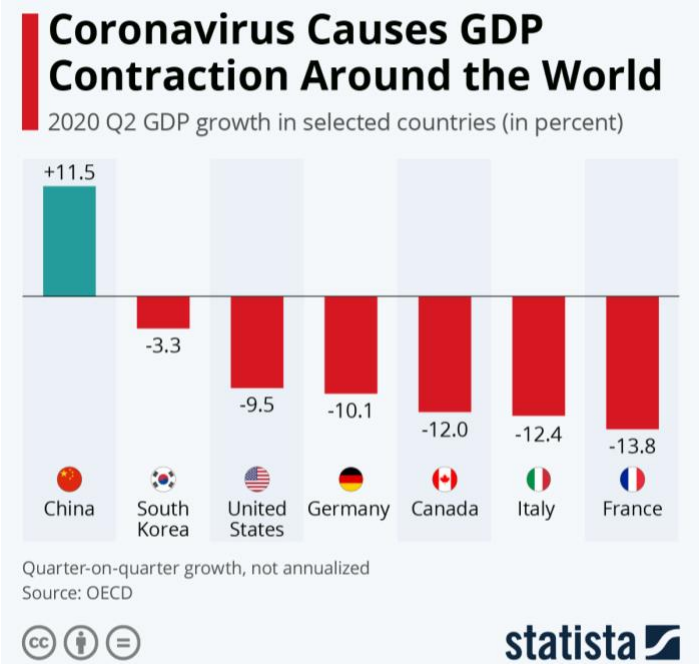
A. *Debt Crisis*

Before the pandemic struck, total debt reached a record $253 trillion last year – equivalent to 322 percent of global GDP. The IMF and the World Bank issued warnings over the unsustainable accumulation of debt, with more than 40 percent of developing countries at high risk of debt distress, including more than half of all Sub-Saharan African borrowers. In 2019, more than 60 countries spent more on debt servicing than on public health.[5]

Corporate debt is also precarious. In 2019, the IMF warned that nearly 40 percent of the $19 trillion in corporate debt could become unserviceable in the event of an economic downturn, which has now arrived.

With the coronavirus continuing to spread around the world, the IMF projects global public deficits to climb by 10 percentage points this year to reach 14 percent of national income – exceeding levels seen in 2008-9. The Maldives, Zambia, Ecuador, and Rwanda have announced that they are struggling to repay their debts. Several prominent African dignitaries have called for "immediate debt relief for African countries in order to create the fiscal space governments need to respond to the pandemic." Pope Francis called on creditors to reduce or forgive the debt held by the world's poorest nations, where resources are most needed. (IGSD is currently working on a memo on debt-for-climate swaps for the Vatican (in Spanish).)

The global economy is expected to contract by 4.9 percent in 2020, with debtor nations likely to feel more financial stress in the months and years ahead, even if growth returns in 2021. A July 2020 World Bank report warns that the pandemic could undo decades of global poverty reduction, and could further exacerbate global inequalities. *See* the following graph.



In response, the IMF doubled its emergency rapid-disbursing capacity to meet a projected demand of about $100 billion from a reported 103 countries. In early April, the United States approved a doubling of the IMF's borrowing arrangements, and the IMF executive board agreed on a new round of bilateral borrowing to secure $1tn in lending capacity.[6] The IMF also approved a reform of the Catastrophe Containment and Relief Trust (CCRT), which allows the IMF's poorest member countries to invest in crisis response rather than repay IMF loans. The IMF also is seeking to triple concessional funding from its Poverty Reduction and Growth Trust for the most vulnerable countries.

In mid-April, the IMF and the World Bank received backing from G20 governments for a moratorium on debt repayments for the rest of the year by the world's poorest nations – *i.e.*, Afghanistan, Ethiopia, and many sub-Saharan African countries, called the Debt Service Suspension Initiative (DSSI). The debt suspensions would run from May 1st through the end of 2020. By late July, 42 of the 73 countries offered the postponement had applied for the temporary suspension, these countries had already deferred USD $5.3 billion, and they are expected to defer around $12 billion by the end of 2020. Despite the relief, the 73 countries offered postponement were estimated to still be required to pay up to $33.7 billion in debt repayments through the end of the year, or $2.8 billion per month. In contrast, G20 governments promised USD $50 billion in aid to low-income countries in 2009 in response to the financial crisis, and delivered much of that aid through the IMF and bilateral aid.

A further meeting of G20 Finance Ministers and Central Bank Governors took place on 18 July 2020. The Communiqué welcomes the progress of the DSSI, promises to coordinate with the IMF and World Bank on fiscal monitoring, encourages multilateral development banks to go further in their efforts, and strongly encourages private creditors to participate in the DSSI on comparable terms.[7] The Communiqué calls on the IMF to "explore additional tools that could serve its members' needs as the crisis evolves, drawing on relevant experiences from previous crises." Debt-for-climate swaps should be one of the additional tools utilized.

IMF Chief Economist Gita Gopinath emphasized that private sector participation will be key to the success of the debt relief initiative, and that it will likely need to be extended into 2021. Some emerging economies are choosing to finance their COVID 19-driven deficits through issuing new bonds in the international bond market, rather than restructuring existing borrowing.

In June 2020, the World Bank began to publicly disclose outstanding debt payments and debt suspension benefits for 68 countries, potentially putting pressure on major creditors to forgive more debt or allow these countries to default.

Many middle income countries, led by Argentina, also are struggling to service debt amidst soaring borrowing levels and a contracting economy. As yet, these countries have no ready means of relief, despite some initial discussions among international financial institutions (IFIs) and within G20 governments. For months creditors rejected Argentina's initial restructuring offers, fueling a foreign bond default in May. In August, Argentina reached an agreement with three groups of creditors to restructure its debt, along with significant debt relief. The saga of Argentina's default foreshadows risk in other similarly-situated middle income countries.

B. *Need for Green Recovery to Address the Health, Economic, and Climate Crises*

Indebted countries will have many demands on any debt relief they negotiate, including stabilizing their economies, alleviating poverty and hunger, creating and maintaining jobs, and strengthening their health care systems. At the same time, the post-pandemic recovery provides an opportunity to "build back better" to protect human health and create more equitable and sustainable societies and a more resilient future. In this context, it is essential to ensure that a portion of any debt relief be allocated to reduce the risk of the fast-advancing climate crisis.

Doing so can contribute to the long-term recovery of indebted countries, and to critical global climate objectives. We have about 10 years before we crash through the 1.5°C guardrail, based on conservative projections that don't fully include the effect of feedbacks, even though the current warming of 1°C is already accelerating some feedbacks, which in turn are accelerating warming.

The climate crisis brings risk not just to the natural world, but also to financial sustainability and debt loads. Countries together will need to invest USD $2.4 trillion per year through 2035 in the energy system alone to hold warming below 1.5°C. Economic impacts from climate change are expected to most severely harm countries in the tropics and Southern Hemisphere,[8] further exacerbating inequalities. Studies associate climate change with a substantial slowing of economic growth rates.[9]

While the pandemic has slowed climate emissions over the past several months, these reductions will be sustained only if green investment choices are made during the recovery phase. As noted in the May 2020 Oxford University study by Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis, "The emergency rescue packages that are currently being implemented represent life and death decisions made by government officials about people alive today. The imminent recovery packages, soon to be designed and implemented, will reshape the economy for the longer-term, representing life and death decisions about future generations, including through their impact on the climate."[10]

Similarly, IMF Managing Director Kristalina Georgieva has emphasized the need to address both the economic and climate crisis at the same time by promoting a green recovery. She recommends the use of public finances to mandate commitments to reduce carbon emissions, green bonds and other forms of sustainable finance, and the need to put a price on carbon to minimize the risks of misallocating investments. She also has offered the IMF as a global platform for joint action on a green recovery.[11]

A green recovery produces better results for the economy and the environment, and sustainable development than business-as-usual investments. Representatives of the Least Developed Countries have recognized that clean energy is vital in the coronavirus recovery efforts of the world's poorest countries, and that shifting from dirty to clean, low-carbon energy is a critical step towards integrating health, energy, climate, and other priorities. The Oxford study by Hepburn, *et al.* notes that spending on renewables infrastructure and energy efficiency both generate more than 2.5X the number of jobs than fossil fuels per $1m spent.[12]

The Oxford study also stresses the need for speed:

> "Speed of implementation is critical for the rescue packages but also valuable for the longer-term recovery packages." Fast-acting climate-friendly policies include residential and commercial energy efficiency retrofits, as well as natural capital spending (afforestation, expanding parkland, enhancing rural ecosystems) (Bowen et al., 2009; Houser et al., 2009). When implemented through existing programs (Houser et al., 2009), energy efficiency retrofits can be the "most obvious option for a shovel-ready, local green investment" (Kamal-Chaoui and Robert, 2009). Natural capital spending is fast-acting because worker training requirements are low, many projects have minimal planning and procurement requirements, and most facets of the work meet social distancing norms. Through their Nationally Determined Contributions (NDCs), many countries have already prepared "shovel-ready" projects, and in most lower- and middle-income countries (LMICs) these NDCs are heavily oriented towards infrastructure."[13]

Speed is equally important for climate mitigation,[14] in light of the accelerating impacts and the risk that climate feedbacks[15] will push the planet into uncontrollable warming and onto a "Hothouse Earth" pathway.[16] Failure to slow Arctic warming presents a potentially catastrophic risk; losing the remaining reflective sea ice—which could happen within 15 years or less[17]—will add the equivalent of a trillion tons of CO_2, on top of the 2.4 trillion added since pre-Industrial times, assuming cloud cover remains constant.[18]

Similarly, the IPCC Special Report Global Warming of 1.5ºC notes that if warming continues at the present pace global average temperature could add 50 percent more warming and reach 1.5ºC as soon as 2030.[19] The 1.5ºC barrier could be breached even sooner—as early as 2025—from continued rising emissions of greenhouse gases, removal of cooling aerosols with air pollution controls, and internal variability within the climate system.[20]

The fastest way to slow the impacts and the feedbacks is to cut the short-lived climate pollutants, black carbon, methane, tropospheric ozone, and hydrofluorocarbons, also known as "super pollutants."[21] Cutting the super pollutants can cut the rate of global warming in half and Arctic

warming by two-thirds by 2050.[22] This is up to six times more avoided warming than aggressive cuts to carbon dioxide can provide at mid-century.[23] Cutting SLCPs is an essential strategy for limiting climate threats within the 10-year window for effective climate action.[24]

III. Expanding the Proven Model of Debt-for-Nature Swaps

Debt-for-climate swaps can build on the proven model of debt-for-nature swaps. The first debt swaps to benefit the environment were pioneered by Tom Lovejoy in the mid-1980s for conservation, often brokered by large environmental NGOs such as Conservation International, which orchestrated the first debt-for-nature swap with Bolivia in 1987. Most early debt swaps involved sovereign debt owed to commercial banks purchased by NGOs; these three-party transactions evolved into bilateral deals between creditor and debtor governments, often at significantly greater scale.[25] The early swaps were limited in scope due to the limited resources of environmental NGOs, but served to strengthen environmental groups in the developing countries by enlisting them to implement the agreements.[26]

In the early 1990s, under the Enterprise for the Americas Initiative (EAI), the United States agreed to reduce more than USD $1 billion of debt owed by Latin American countries from a total debt of over USD $1.9 billion, and nearly USD $180 million was generated for a range of conservation and social measures.[27] The Tropical Forest and Coral Reef Conservation Act (TFCA) built on this model and since 1998 has used $233.4 million of federally appropriated funds to restructure loan agreements in 14 countries, generating $339.4 million for tropical forest conservation.[28] The Nature Conservancy reports that TFCA agreements have saved more than 67 million acres of tropical forest in countries such as Botswana, Brazil, Philippines, and Indonesia.[29]

In an early multilateral debt-for-nature swap, Sweden, Norway, the United States, France, Italy, and Switzerland agreed to convert some of the debt Poland owed them into a fund for environmental initiatives.[30] In April 1992, the countries created the "EcoFund" – located in Warsaw, Poland – as a non-profit foundation. Through 2003, Poland had received more than USD $580 million in debt-for-nature swaps from the Finland, France, Italy, Norway, Sweden, Switzerland, and the United States, much of it managed through the EcoFund.[31] EcoFund finances are allocated to environmental goals, including the reduction of greenhouse gas emissions, the protection of biodiversity, waste management, and prevention of soil contamination.[32]

Based on the Poland case, Argentina successfully conducted a debt for environment swap with the U.S. Under the agreement, the U.S. allowed certain debts owed by the Republic of Argentina to be reinvested through non-reimbursable credits granted to non-profit NGOs that developed projects in the following areas of interest: i. soils and their agronomic potential; ii. energy resources and development of alternative energies; iii. air pollution; iv. biological diversity and v. water resources. The face value of debt addressed was USD $38,100,000 and the environmental swap was USD $3,100,000. The successful experience served to spur negotiations for a wider environmental swap with the Paris Club.

Caribbean nations also have been using debt-for-climate swaps. The UN's Economic Commission for Latin America and the Caribbean (ECLAC) proposed debt for climate adaptation swaps in 2017 in part to help countries respond in a climate resilient way to hurricane damage. A UN conference on the issue that year helped secure over $1 billion in pledges for loans and debt relief

for climate resilience in Caribbean countries. In 2012, Antigua and Barbuda negotiated an $18 million debt for climate adaptation swap with Brazil, and in 2017, the Seychelles agreed to a $30 million debt swap with Paris Club and South African creditors, with the Nature Conservancy and others collaborating in the transaction.[33]

Although early debt-for-nature swaps proved the model could be successful, the scale of the debt that must be addressed in the coming economic crisis is of a vastly different scale—many billions, perhaps trillions of debt will need to be restructured, relieved, and forgiven. The scale of debt-for-climate swaps will similarly need to expand to meet the crisis.

IV. Getting Started with Debt-for-Climate Swaps

Among the strategies identified above for a robust debt-for-climate swap program, the following building blocks should be priorities.

A. *Identify Climate Protection Options for Debt-for-Climate Swaps*

While the original debt-for-nature swaps have been used for protecting and expanding sinks and building resilience, there are other ways to use debt swaps to tackle the climate emergency, alleviate poverty, and build economic resilience, including strategies to cut the short-lived super climate pollutants, which can provide the fastest avoided warming through 2050 while also creating and maintaining jobs:

- Strategies to cut short-lived climate pollutants (SLCPs or super pollutants)—methane, black carbon, tropospheric ozone, and fluorinated gases—would provide the fastest temperature abatement to slow feedbacks and tipping points and associated climate impacts. Such efforts could include strategies to reduce air pollution, which would reduce two of the super pollutants—black carbon soot and the tropospheric ozone—and save millions of lives every year, while also reducing crop losses.

- Fast-acting climate mitigation strategies include residential and commercial energy efficiency retrofits, along with spending on natural capital, including afforestation. Energy efficiency retrofits can be the "most obvious option for a shovel-ready, local green investment."[34]

- Reductions in methane emissions from oil and gas production by preventing flaring and reducing fugitive emissions. This could be used to help clean up overseas oil and gas production, where developing countries are attempting to regulate methane emissions.

- If oil prices remain low, it may be possible to persuade some oil-producing debtor nations to forsake future exploration and production activities and establish clean energy investment targets in exchange for debt relief.*

* For each approach, early analysis could focus on the proportion of global emissions that are accounted for by the most highly indebted countries, as this will determine where the largest climate benefits lie from a debt-for-climate approach. They could also be evaluated for co-benefits in terms of health, jobs, social protection, and development.

The traditional debt-for-nature swaps, a subset of the broader debt-for-climate swaps, would include protecting and restoring forests, wetlands, mangroves, grasslands, and peat bogs that function as critical sinks to remove and store carbon dioxide. A 2009 study estimated that 4-5 million new jobs could be created globally from afforestation, reforestation, and desertification control.[35] In response to the 2008/2009 economic recession, the UNDP published a call for public works programs to create green jobs, advance environmental goals, and lift the poor out of poverty.[36] More recently, the May 2020 study from Oxford University calculates the superior job creation potential from various climate mitigation strategies.[37]

Actions to strengthen sinks could be modeled after the Great Depression-era Civilian Conservation Corps in the United States that created 3 million jobs and planted 3.5 billion trees. A widespread effort to plant trees will also reduce air pollution and local health harms.[38] Governor Jay Inslee advocated for the concept during his run for president, and Democratic nominee Joe Biden is promoting the creation of a "civilian climate corps" as a key campaign platform.

B. *Facilitate One or More Early Debt Swaps as Prototypes to Gain Experience*

It would be useful to facilitate one or more debt-for-climate swaps as prototypes to gain experience and develop a methodology for other swaps. The French development bank could, for example, promote a debt swap with one or more African countries, or perhaps with Argentina. Moody's and other credit rating agencies should be engaged to make sure debt swaps do not reduce the creditworthiness the participating countries.

C. *Expand the U.S. Tropical Forest and Coral Reef Conservation Act*

The Tropical Forest and Coral Reef Conservation Act should be expanded to include fast climate mitigation, including reductions of short-lived super pollutants. The Act was reauthorized in January 2019 and expanded to protection of coral reefs as well as tropical forests,[39] after a decline in debt-for-nature transactions under the TFCA in recent years. The Act has used $233.4 million of federally appropriated funds since 1998 to restructure loan agreements in 14 countries, generating $339.4 million for tropical forest conservation,[40] protecting more than 67 million acres of tropical forest.[41]

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Endnotes

1 OECD (2007), Environmental Finance, Lessons Learnt from Experience with Debt-for-Environment Swaps in Economies in Transition ("By 2000, according to the World Bank (2003), an estimated USD 4.2 billion of official debt had been swapped for local currency. Of this amount, USD 2.2 billion was in the form of debt-for-equity swaps, USD 1.6 billion was for debt-for-environment swaps, including debt-for-development, while other swap arrangements accounted for the remaining USD 0.4 billion . . . It is estimated that since 1985 about 30 countries have benefited from DFES, which have generated over USD 1 billion in funding for the environment.").

Further, each approach should be measured using clear metrics, such as carbon intensity and/or methane intensity (the amount of carbon or methane admitted (or absorbed) per additional dollar of GDP generated.

[2] Fenton, A. et al. (2014), Debt relief and financing climate change action, *Nature Climate Change Commentary* ("Debt owed by developing countries could provide an alternative source for achieving the annual US$100 billion climate finance target. Its potential is substantial — over the period 2010–2012 the combined total external debt servicing of developing countries stood at more than US$1.7 trillion17, far surpassing discussed levels of climate finance.").

[3] Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02, at 9 ("Clean energy infrastructure is also helpfully very labour intensive in the early stages – one model suggests that every $1m in spending generates 7.49 full-time jobs in renewables infrastructure, 7.72 in energy efficiency, but only 2.65 in fossil fuels (Garrett-Peltier, 2017)." The study also notes that "any recovery package, including climate-friendly recovery, is unlikely to be implemented unless it also addresses existing societal and political concerns – such as poverty alleviation, inequality, and social inclusion – which vary from country to country."). *See also* page 8: ("Renewable energy generates more jobs in the short run (higher jobs multiplier), when jobs are scarce in the middle of a recession, which boosts spending and increases short-run GDP multipliers (which are derived from expanding demand)." *and* page 9, "Harnessing more of these opportunities could result in 'kick starting the green innovation machine' (Acemoglu et al., 2012) and driving an efficient, innovative, and productive economy, with higher spill overs that benefit the wider economy (Aghion et al., 2014)."

[4] Wu X., *et al.*(April 2020) *Exposure to air pollution and COVID-19 mortality in the United States*, Harvard T. H. Chan School of Public Health ("We found that an increase of only 1 μg/m3 in $PM_{2.5}$ is associated with an 8% increase in the COVID-19 death rate (95% confidence interval [CI]: 2%, 15%). The results were statistically significant and robust to secondary and sensitivity analyses."); Conticini E., *et al.* (April 2020) *Can atmospheric pollution be considered a co-factor in extremely high level of SARS-CoV-2 lethality in Northern Italy?*, ENVTL. POLLUTION, In Press, 1 ("We conclude that the high level of pollution in Northern Italy should be considered an additional co-factor of the high level of lethality recorded in that area."); Ogen Y. (April 2020) *Assessing nitrogen dioxide (NO_2) levels as a contributing factor to coronavirus (COVID-19) fatality*, SCIENCE OF THE TOTAL ENV'T., Short Communication, 1–5, 1 ("The objective of this study is to examine the relationship between long-term exposure to NO_2 and coronavirus fatality. … These results indicate that the long-term exposure to this pollutant may be one of the most important contributors to fatality caused by the COVID-19 virus in these regions and maybe across the whole world."); and Cui Y., *et al.* (2003) *Air pollution and case fatality of SARS in the People's Republic of China: an ecologic study*, ENVTL. HEALTH 2(15):1–15, 1 ("SARS patients from regions with high APIs [air pollution index] were twice as likely to die from SARS compared to those from regions with low APIs…."). *See also*, Scientific Advisory Panel of the CCAC (April 2020) Special SLCP Research digest - Covid-19 (discussing these and related Covid-19 studies.)

[5] *See also*, Munevar, D, *Covid-19 and debt in the global south: Protecting the most vulnerable in times of crisis I*, European Network on Debt and Development (Eurodad), 12 March 2020 ("[Low-income economies] spent on average 28.5% of their public revenues on debt service and 2.5% of GSDP on health care services…. For the top 25% of countries with the highest debt service to revenue ratios, debt service increases to 68.9 per cent of public revenues while health care expenditures decrease to 1.8 per cent of GDP" (figure omitted)).

[6] In April 2020 former UK Prime Minister Gordon Brown and former US Treasury Secretary Lawrence Summers jointly called for the IMF to expand its use of Special Drawing Rights (SDRs, the IMF's global reserve asset) to well over $1 trillion, from a current $280 billion, giving developing countries more financial flexibility. The Financial Times Editorial Board argued in July 2020 that the IMF should put this proposal back on their agenda.

[7] G20 Finance Ministers and Central Bank Governors (18 July 2020), Communiqué:

> "We welcome the progress achieved under the Debt Service Suspension Initiative (DSSI). As of 18 July 2020, 42 countries have requested to benefit from the DSSI, amounting to an estimated USD 5.3 billion of 2020 debt service to be deferred. The International Monetary Fund (IMF) and the World Bank Group (WBG) have proposed a fiscal monitoring framework and a process to strengthen the quality and consistency of debt data and improve debt disclosure. To provide maximum support to DSSI-eligible countries, we will continue to closely coordinate in its implementation. All official bilateral creditors should implement this initiative fully and in a transparent manner. While protecting their current ratings and low cost of funding, Multilateral

Development Banks (MDBs) are encouraged to go further on their collective efforts in supporting the DSSI, including through providing DSSI-eligible countries with net positive financial flows over the suspension period of the DSSI, and further details on the new money provided to each eligible country. We take note of the Institute of International Finance (IIF) Terms of Reference for Voluntary Private Sector Participation. We note the need for further progress and strongly encourage private creditors to participate in the DSSI on comparable terms when requested by eligible countries. We will consider a possible extension of the DSSI in the second half of 2020, taking into account the development of the COVID-19 pandemic situation and the findings of a report from the IMF and WBG on the liquidity needs of eligible countries, which will be submitted to the G20 in advance of our meeting in October 2020. We also look forward to an update on the implementation of IIF's Voluntary Principles for Debt Transparency, including on work to identify a data repository."

8 Pörtner, H.-O. et al. (eds.) (2019) *Summary for Policymakers*, *in* IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, A.3.1–A.3.2 ("B.5.5 Risks to global aggregated economic growth due to climate change impacts are projected to be lower at 1.5°C than at 2°C by the end of this century10 (medium confidence). This excludes the costs of mitigation, adaptation investments and the benefits of adaptation. Countries in the tropics and Southern Hemisphere subtropics are projected to experience the largest impacts on economic growth due to climate change should global warming increase from 1.5°C to 2°C (medium confidence). {3.5.2, 3.5.3}").

9 *See*, *e.g.*, Moore, F. & Diaz, D. (2015) *Temperature impacts on economic growth warrant stringent mitigation policy*, Nature Clim Change 5, 127–131.

10 Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02, at 7.

11 Consistent with this approach, four current and former central bank leaders in Europe published an Op-Ed arguing that in the face of the pandemic and economic crises, "We have a choice: rebuild the old economy, locking in temperature increases of 4C with extreme climate disruption; or build back better, preserving our planet for generations to come." Another Op-Ed was published 4 August 2020 by leading economists with the headline: "To rebuild our world, we must end the carbon economy." *The Guardian* (4 August 2020), Letter from economists: to rebuild our world, we must end the carbon economy, by *Jeffrey Sachs, Joseph Stiglitz, Mariana Mazzucato, Clair Brown, Indivar Dutta-Gupta, Robert Reich, Gabriel Zucman and others*. Joseph E. Stiglitz & Hamid Rashid (31 July 2020) How to Prevent the Looming Sovereign-Debt Crisis, Project Syndicate (suggesting "voluntary sovereign-debt buybacks. Debt buybacks are widespread in the corporate world, and have proved effective both in Latin America in the 1990s and, more recently, in the Greek context. And they have the advantage of avoiding the harsh terms that typically come with debt swaps.")

12 Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02, at 9 ("Clean energy infrastructure is also helpfully very labour intensive in the early stages – one model suggests that every $1m in spending generates 7.49 full-time jobs in renewables infrastructure, 7.72 in energy efficiency, but only 2.65 in fossil fuels (Garrett-Peltier, 2017)." The study also notes that "any recovery package, including climate-friendly recovery, is unlikely to be implemented unless it also addresses existing societal and political concerns – such as poverty alleviation, inequality, and social inclusion – which vary from country to country."). *See also* page 8: ("Renewable energy generates more jobs in the short run (higher jobs multiplier), when jobs are scarce in the middle of a recession, which boosts spending and increases short-run GDP multipliers (which are derived from expanding demand)." *and* page 9, "Harnessing more of these opportunities could result in 'kick starting the green innovation machine' (Acemoglu et al., 2012) and driving an efficient, innovative, and productive economy, with higher spill overs that benefit the wider economy (Aghion et al., 2014)."

13 Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02, at 9.

[14] Molina M., Zaelke D., Sarma K.M., Andersen S.O., Ramanathan V., & Kaniaru D. (2009) *Reducing abrupt climate change risk using the Montreal Protocol and other regulatory actions to complement cuts in CO_2 emissions*, PROC. NAT'L. ACAD. SCI. 106(49):20616–20621, 20616 ("Current emissions of anthropogenic greenhouse gases (GHGs) have already committed the planet to an increase in average surface temperature by the end of the century that may be above the critical threshold for tipping elements of the climate system into abrupt change with potentially irreversible and unmanageable consequences. This would mean that the climate system is close to entering if not already within the zone of "dangerous anthropogenic interference" (DAI). Scientific and policy literature refers to the need for "early," "urgent," "rapid," and "fast-action" mitigation to help avoid DAI and abrupt climate changes. We define "fast-action" to include regulatory measures that can begin within 2–3 years, be substantially implemented in 5–10 years, and produce a climate response within decades. We discuss strategies for short-lived non-CO_2 GHGs and particles, where existing agreements can be used to accomplish mitigation objectives. Policy makers can amend the Montreal Protocol to phase down the production and consumption of hydrofluorocarbons (HFCs) with high global warming potential. Other fast-action strategies can reduce emissions of black carbon particles and precursor gases that lead to ozone formation in the lower atmosphere, and increase biosequestration, including through biochar. These and other fast-action strategies may reduce the risk of abrupt climate change in the next few decades by complementing cuts in CO_2 emissions."); *see also* Shindell D., *et al.* (2012) *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, SCIENCE 335:183–189; *and* Shoemaker J. K., *et al.* (2013) *What Role for Short-Lived Climate Pollutants in Mitigation Policy?*, SCIENCE 342:1323–1324, 1323 ("Direct comparisons of the climate influence of SLCPs and CO_2 require making a judgment about the relative importance of short and long time scales. SLCPs have a powerful impact on climate, but they persist in the atmosphere for only a short time— days to weeks for BC, a decade for CH_4, and about 15 years for some HFCs. Thus, immediate reductions in SLCPs will result in relatively immediate climate benefits, as the effects on climate depend largely on the emission rate, or flow, of SLCPs to the atmosphere. In contrast, CO_2 has a very long atmospheric lifetime; more than 20% will remain for thousands to tens of thousands of years (*6*). Thus, climate effects from CO_2 depend on the cumulative emissions, or stock, of CO_2 in the atmosphere (*7*).").

[15] Xu Y. & Ramanathan V. (2017) *Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes*, PROC. NAT'L. ACAD. SCI. 114(39):10315–10323, 10321 ("The SP lever targets SLCPs. Reducing SLCP emissions thins the SP blanket within few decades, given the shorter lifetimes of SLCPs (weeks for BC to about 15 years for HFCs). The mitigation potential of the SP lever with a maximum deployment of current technologies (32) is about 0.6 °C by 2050 and 1.2 °C by 2100 (SI Appendix, Fig. S5B and Table S1)."). *See also* Molina M., Ramanathan V., & Zaelke D., *Best path to net zero: Cut short-lived super-pollutants*, BULLETIN OF THE ATOMIC SCIENTISTS (2 April 2020); Lenton T. M., *et al.* (2019) *Climate tipping points—too risky to bet against*, NATURE, Comment, 575:592–595, 592 ("In our view, the consideration of tipping points helps to define that we are in a climate emergency and strengthens this year's chorus of calls for urgent climate action — from schoolchildren to scientists, cities and countries."); Molina M., Ramanathan V., & Zaelke D., *Climate report understates threat*, BULLETIN OF THE ATOMIC SCIENTISTS (9 October 2018); *and* Molina, et al. (2009) *Reducing abrupt climate change risk using the Montreal Protocol and other regulatory actions to complement cuts in CO_2 emissions*, PROC. NAT'L. ACAD. SCI. 106(49):20616–20621, 20616.

[16] Steffen W., *et al.* (2018) *Trajectories of the Earth System in the Anthropocene*, PROC. NAT'L. ACAD. SCI. 115(33):8252–8259, 8254 & 8256 ("This risk is represented in **Figs. 1** and **2** by a planetary threshold (horizontal broken line in **Fig. 1** on the Hothouse Earth pathway around 2 °C above preindustrial temperature). Beyond this threshold, intrinsic biogeophysical feedbacks in the Earth System (***Biogeophysical Feedbacks***) could become the dominant processes controlling the system's trajectory. Precisely where a potential planetary threshold might be is uncertain (**15**, **16**). We suggest 2 °C because of the risk that a 2 °C warming could activate important tipping elements (**12**, **17**), raising the temperature further to activate other tipping elements in a domino-like cascade that could take the Earth System to even higher temperatures (***Tipping Cascades***). Such cascades comprise, in essence, the dynamical process that leads to thresholds in complex systems (section 4.2 in ref. **18**). This analysis implies that, even if the Paris Accord target of a 1.5 °C to 2.0 °C rise in temperature is met, we cannot exclude the risk that a cascade of feedbacks could push the Earth System irreversibly onto a "Hothouse Earth" pathway. … Hothouse Earth is likely to be uncontrollable and dangerous to many, particularly if we transition into it in only a century or two, and it poses severe risks for health, economies, political stability (**12**, **39**, **49**, **50**) (especially for the most climate vulnerable), and ultimately, the habitability of the planet for humans.").

[17] *See* Guarino, M., Sime, L.C., Schröeder, D. *et al.* Sea-ice-free Arctic during the Last Interglacial supports fast future loss, *Nature Climate Change* (10 August 2020) ("The ability of the HadGEM3 model to realistically simulate the very

warm LIG Arctic climate provides independent support for predictions of ice-free conditions by summer 2035. This should be of huge concern to Arctic communities and climate scientists."). *See also* Overland J. E. & Wang M. (2013) *When will the summer Arctic be nearly sea ice free?*, Geophysical Research Letters 40:2097–2101, 2097 ("Observations and citations support the conclusion that most global climate model results in the CMIP5 archive are too conservative in their sea ice projections. Recent data and expert opinion should be considered in addition to model results to advance the very likely timing for future sea ice loss to the first half of the 21st century, with a possibility of major loss within a decade or two.") From January to June 2020, the Siberian Arctic experience anomalously hot weather that would not have been possible without human-influenced climate change. This formerly rare event is now 600 times more likely to occur than a century ago, and in 2050, the region could be 0.5–5.0 ºC warmer than today. During this extended period of warmer weather, the town of Verkhoyansk north of the Arctic Circle had a record temperature of 38 ºC on June 20th. World Weather Attribution (2020) *Prolonged Siberian heat of 2020*.

18 *See* Pistone K., *et al.* (2019) *Radiative Heating of an Ice-Free Arctic Ocean*, Geophysical Research Letters 46(13):7474–7480. The remaining Arctic ice could be gone within 10 years to 15 years. Guarino, M., Sime, L.C., Schröeder, D. *et al.* Sea-ice-free Arctic during the Last Interglacial supports fast future loss, *Nature Climate Change* (10 August 2020); and Overland J. E. & Wang M. (2013) *When will the summer Arctic be nearly sea ice free?*, Geophysical Research Letters 40:2097–2101, 2097.

19 Allen M., *et al.* (2018) SUMMARY FOR POLICYMAKERS, *in* IPCC (2018) GLOBAL WARMING OF 1.5 ºC, 6 ("Human activities are estimated to have caused approximately 1.0 ºC of global warming above pre-industrial levels, with a *likely* range of 0.8 ºC to 1.2 ºC. Global warming is *likely* to reach 1.5 ºC between 2030 and 2052 if it continues to increase at the current rate. (*high confidence*)").

20 Xu Y., *et al.* (2018) *Global warming will happen faster than we think*, NATURE, Comment 564:30–32, 31 ("First, greenhouse-gas emissions are still rising. … Second, governments are cleaning up air pollution faster than the IPCC and most climate modellers have assumed. … Third, there are signs that the planet might be entering a natural warm phase that could last for a couple of decades. These three forces reinforce each other. We estimate that rising greenhouse-gas emissions, along with declines in air pollution, bring forward the estimated date of 1.5 °C of warming to around 2030, with the 2 °C boundary reached by 2045. These could happen sooner with quicker shedding of air pollutants. Adding in natural decadal fluctuations raises the odds of blasting through 1.5 °C by 2025 to at least 10% (ref. 9). By comparison, the IPCC assigned probabilities of 17% and 83% for crossing the 1.5 °C mark by 2030 and 2052, respectively.").

21 Molina M., *et al.* (2009) *Reducing abrupt climate change risk using the Montreal Protocol and other regulatory actions to complement cuts in CO_2 emissions*, PROC. NAT'L. ACAD. SCI. 106(49):20616–20621, 20616; Shindell D., *et al.* (2012) *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, SCIENCE 335:183–189; *and* Shoemaker J. K., *et al.* (2013) *What Role for Short-Lived Climate Pollutants in Mitigation Policy?*, SCIENCE 342:1323–1324, 1323 ("Direct comparisons of the climate influence of SLCPs and CO_2 require making a judgment about the relative importance of short and long time scales. SLCPs have a powerful impact on climate, but they persist in the atmosphere for only a short time— days to weeks for BC, a decade for CH_4, and about 15 years for some HFCs. Thus, immediate reductions in SLCPs will result in relatively immediate climate benefits, as the effects on climate depend largely on the emission rate, or flow, of SLCPs to the atmosphere. In contrast, CO_2 has a very long atmospheric lifetime; more than 20% will remain for thousands to tens of thousands of years (*6*). Thus, climate effects from CO_2 depend on the cumulative emissions, or stock, of CO_2 in the atmosphere (*7*).").

22 Shindell D., *et al.* (2012) *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, SCIENCE 335(6065):183–189, 183–185 ("The screening revealed that the top 14 measures realized nearly 90% of the maximum reduction in net GWP…. Seven measures target CH_4 emissions, covering coal mining, oil and gas production, long-distance gas transmission, municipal waste and landfills, wastewater, livestock manure, and rice paddies. The others target emissions from incomplete combustion and include technical measures…, covering diesel vehicles, clean-burning biomass stoves, brick kilns, and coke ovens, as well as primarily regulatory measures…, including banning agricultural waste burning, eliminating high-emitting vehicles, and providing modern cooking and heating. We refer to these seven as "BC measures," although in practice, we consider all co-emitted species. …The global mean response to the CH_4 plus BC measures was –0.54 ± 0.05ºC in the climate model. …Roughly half the forcing is relatively evenly distributed (from the CH_4 measures). The other half is highly inhomogeneous, especially the strong BC forcing, which is greatest over bright desert and snow or ice surfaces. Those areas often exhibit the

largest warming mitigation, making the regional temperature response to aerosols and ozone quite distinct from the more homogeneous response to well-mixed greenhouse gases…. BC albedo and direct forcings are large in the Himalayas, where there is an especially pronounced response in the Karakoram, and in the Arctic, where the measures reduce projected warming over the next three decades by approximately two thirds and where regional temperature response patterns correspond fairly closely to albedo forcing (for example, they are larger over the Canadian archipelago than the interior and larger over Russia than Scandinavia or the North Atlantic).”); *see also* United Nations Environment Programme (UNEP) & World Meteorological Organization (WMO) (2011) INTEGRATED ASSESSMENT OF BLACK CARBON AND TROPOSPHERIC OZONE, 262 (“Large impacts of the measures examined here were also seen for the Arctic despite the minimal amount of emissions currently taking place there. This occurs due to the high sensitivity of the Arctic both to pollutants that are transported there from remote sources and to radiative forcing that takes place in areas of the northern hemisphere outside the Arctic. The 16 measures examined here, including the measures on pellet stoves and coal briquettes, reduce warming in the Arctic by 0.7 ºC (range 0.2 to 1.3 ºC) at 2040. This is a large portion of the 1.1 ºC (range 0.7 to 1.7 ºC) warming projected under the reference scenario for the Arctic, and hence implementation of the measures would be virtually certain to substantially slow, but not halt, the pace of Arctic climate change.”).

23 Xu Y. & Ramanathan V. (2017) *Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes*, PROC. NAT’L. ACAD. SCI. 114(39):10315–10323, 10321 (“The SP lever targets SLCPs. Reducing SLCP emissions thins the SP blanket within few decades, given the shorter lifetimes of SLCPs (weeks for BC to about 15 years for HFCs). The mitigation potential of the SP lever with a maximum deployment of current technologies (32) is about 0.6 °C by 2050 and 1.2 °C by 2100 (SI Appendix, Fig. S5B and Table S1).”).

24 Molina, M., Ramanathan, V. and Zaelke, D. (2020) Best path to net zero: Cut short-lived super-pollutants, *BULLETIN OF THE ATOMIC SCIENCES* (“The need for speed. Time is of the essence for slowing these feedbacks: The planet is currently on course to add 50 percent more warming and exceed the 1.5 degrees Celsius threshold for dangerous warming as early as 2030, with a one-in-10 chance of doing so a full five years earlier, or 2025. As warming continues to accelerate, weather extremes are expected to worsen, imposing more serious impacts on ecosystems and public health. Already, in the 20 years prior to 2015, weather-related disasters have killed 30,000 people a year on average—more than 600,000 in total—while leaving more than four billion people injured, homeless, or in need of emergency assistance. The window for limiting these threats has shrunk to perhaps 10 years, according to a recent Comment piece in *Nature* aptly titled “Global warming will happen faster than we think.” Whatever pathway we select to reach the goal of net zero must harvest all the low-hanging fruit of mitigation opportunities over the next decade; that way, we stand a chance of slowing climate change enough in the near-term to stay in the game and possibly win by 2050. The harvesting should start with immediate cuts to the emissions of short-lived super-pollutants—black carbon, methane, tropospheric ozone, and HFCs. As a net-zero carbon dioxide strategy, fast cuts to super-pollutants would halve global warming by 2050, cut the rate of warming in the Arctic by up to two-thirds, and at least halve the amount of warming over elevated regions of the Himalayas and Tibet. This would avoid up to 0.6 degrees Celsius of global warming by 2050, and provide life-saving collateral benefits along the way.).

25 After Conservation International’s arrangement of the first swap with Bolivia, the World Wildlife Fund negotiated agreements for debt-for-nature swaps with Costa Rica, Ecuador, and the Philippines. Hamlin, T. B. (1989), *Debt-for-Nature Swaps: A New Strategy for Protecting Environmental Interests in Developing Nations*, 16 Ecology L.Q. 1065.

26 Hamlin, T. B. (1989), *Debt-for-Nature Swaps: A New Strategy for Protecting Environmental Interests in Developing Nations*, 16 Ecology L.Q. 1065 (Given the limited resources of the environmental organizations, there was not any expectation that the debt-for-nature swaps would significantly impact the aggregate debt burden of any of the swapping nations. The agreement between Bolivia and CI involves a total of $650,000, but Bolivia's total foreign debt has been estimated to be $3.7 billion. Similarly, Ecuador's agreement with WWF involves at most $10 million of an overall foreign debt of $8.3 billion. WWF's agreement with Costa Rica relieves only $3 million of an estimated total debt of $4.5 billion. The Philippine-WWF agreement trades only $2 million out of that country's estimated $28.4 billion foreign debt. Thus, relative to the aggregate debt burden, the amounts involved in nature swaps are minuscule. . . . The CI and WWF agreements strengthen environmental groups in the swapping countries by including them in the implementation of the agreements and by channeling funds through them. The Bolivia-Cl agreement directs CI to "name a national institution as executing entity of its programs and/or projects" in Bolivia.”).

[27] Sheikh, P. A. (2018), *Debt-for-Nature Initiatives and the Tropical Forest Conservation Act (TFCA): Status and Implementation*, U.S. Congressional Research Service Report, RL31286 ("Debt swaps, buybacks, and restructuring are three mechanisms authorized to conduct debt-for-nature transactions under the EAI. Seven of the eight countries that have participated in debt-for-nature transactions under the EAI used the debt-restructuring mechanism to generate environmental funds (see Table 3); only Peru took advantage of the debt buyback option. In a debt-restructuring agreement, the original debt agreement is cancelled (e.g., a percentage of the face value of the debt could be reduced) and a new debt agreement is created with a provision for an annual amount of money (in local currency) to be deposited into an environmental fund. . . . For all eight debtor countries, more than $1 billion (face value) of debt was reduced from a total debt of $1.9 billion, and almost $180 million of conservation funds were generated under the guidelines of the EAI.").

[28] No federal funds have been appropriated for TFCA agreements since 2014. Congress reauthorized the TFCA in January 2019, with the reauthorizing legislation attracting significant bipartisan support. Just prior to the pandemic, efforts were underway to appropriate approximately $20 million in federal funds in FY2021 to restart work under TFCA. This could be expanded as part of any recovery legislation Congress considers later this year and potentially include climate-related projects.

[29] Note that not all debt swaps have been beneficial for the environment. Contracts signed between Ecuador and China stipulated that the creditor be repaid in oil, not dollars, incentivizing Ecuador to drill deeper into the Amazon to repay its debts. *See* Nicholas Casey and Clifford Krauss (24 Dec 2018), It Doesn't Matter if Ecuador Can Afford This Dam. China Still Gets Paid, *The New York Times*; *see also* David Whitehouse (16 June 2020, updated 17 June 2020), Seeking debt relief, Angola opens door of oilfield holdings to China, *The Africa Report.*

[30] OECD (1998), Swapping Debt For The Environment: The Polish Ecofund ("The Polish "EcoFund" was established in 1992, following Poland's debt relief agreement with the "Paris Club" of western creditor nations. Due to a timely initiative by the Polish Government, this agreement included an option for creditor countries to make bilateral agreements with Poland for the conversion of up to an additional 10% of debt for environmental protection purposes. Although other "debt-for-environment" swaps had been concluded elsewhere, EcoFund was the first fully-fledged institution established in Central and Eastern Europe for the purposes of managing debt-for-environment swap proceeds.").

[31] OECD (2007), Lessons Learnt from Experience with Debt-for-Environment Swaps in Economies in Transition, Annex I, p. 59.

[32] OECD (1998), Swapping Debt For The Environment: The Polish Ecofund ("As described in the EcoFund's Statute, the objective of the Fund is to use the financial resources made available to it through the debt-for-environment swap agreements or other mechanisms to provide financial assistance, in the form of grants, to projects aimed at: • preventing transboundary air pollution of sulphur and nitrogen oxides; • reducing flows of polluting and eutrophying substances into the Baltic Sea; • reducing the emission of gases causing global climate change; • protecting biological diversity, and; • promoting waste management and contaminated soil reclamation.").

[33] Debt swaps outside the debt-for-nature may also be instructive. For example, at the G8 summit in Gleneagles, Scotland in 2005, the G8 called for the full cancellation of debt owed by low income countries to the IMF, the World Bank, and the Africa Development Bank in order to drive poverty reduction spending. Some of the countries that received debt relief demonstrated significant success in combatting poverty: both Ghana and Rwanda increased spending on poverty reduction tenfold. However, these programs did not provide for a permanent solution to debt problems: 26 of the countries that went through the Gleneagles process are now at risk of debt distress.

[34] Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02 at 8-9 ("Green construction projects, such as insulation retrofits or clean energy infrastructure, can similarly deliver higher multipliers. These large construction projects are less susceptible to offshoring to imports (Jacobs, 2012). Clean energy infrastructure is also helpfully very labour intensive in the early stages – one model suggests that every $1m in spending generates 7.49 full-time jobs in renewables infrastructure, 7.72 in energy efficiency, but only 2.65 in fossil fuels (Garrett-Peltier, 2017). … Fast-acting climate-friendly policies include residential and commercial energy efficiency retrofits, as well as natural capital spending

(afforestation, expanding parkland, enhancing rural ecosystems) (Bowen et al., 2009; Houser et al., 2009). When implemented through existing programs (Houser et al., 2009), energy efficiency retrofits can be the "most obvious option for a shovel-ready, local green investment" (Kamal-Chaoui and Robert, 2009). Natural capital spending is fast-acting because worker training requirements are low, many projects have minimal planning and procurement requirements, and most facets of the work meet social distancing norms. Through their Nationally Determined Contributions (NDCs), many countries have already prepared "shovel-ready" projects, and in most lower- and middle-income countries (LMICs) these NDCs are heavily oriented towards infrastructure." *See also* Brian Motherway & Michael Oppermann, IEA Commentary (8 April 2020), Energy efficiency can boost economies quickly, with long-lasting benefits ("Energy efficiency offers many win-win opportunities – labour-intensive projects that start quickly and are rooted in local supply chains such as construction and manufacturing. Putting such projects in stimulus programmes can support existing workforces and create new jobs. Energy efficiency brings other major benefits: it improves the economic competitiveness of countries and businesses, makes energy more affordable for consumers – and, of course, reduces greenhouse gas emissions. The buildings and construction sector – covering everything from houses and apartments to offices, hospitals and factories – represents a key opportunity to rapidly create new jobs and reinvigorate local businesses. This can take the form of incentives for new construction projects or upgrades of existing buildings. When homes are upgraded to higher efficiency standards, more than half of the total investment typically goes directly to labour.")

35 Nair, C.T.S. & Rutt R. (2009), *Creating forestry jobs to boost the economy and build a green future*, 19th Session of the FAO Committee on Forestry ("Afforestation and reforestation, including reclamation of degraded or desertified lands, offer the greatest scope for job creation, particularly where rural unemployment or underemployment is high and vast tracts of degraded land are available.") (See table under "Potential new jobs in sustainable management of forests and level of investment required (annual targets for an initial five-year period).").

36 Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02. ("Renewable energy generates more jobs in the short run (higher jobs multiplier), when jobs are scarce in the middle of a recession, which boosts spending and increases short-run GDP multipliers (which are derived from expanding demand)."); ("In LMICs [lower- and middle- income countries], new renewable energy can be used to increase rural electrification and provide support to citizens working to escape the poverty trap (Aklin et al., 2018).").

37 Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis (2020) *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Oxford Smith School of Enterprise and the Environment, Working Paper No. 20-02, at 9. *See also* page 8: "Renewable energy generates more jobs in the short run (higher jobs multiplier), when jobs are scarce in the middle of a recession, which boosts spending and increases short-run GDP multipliers (which are derived from expanding demand)." *and* page 9, "Harnessing more of these opportunities could result in 'kick starting the green innovation machine' (Acemoglu et al., 2012) and driving an efficient, innovative, and productive economy, with higher spill overs that benefit the wider economy (Aghion et al., 2014)."

38 Trees reduce nearby particulate matter by an average of 7 to 24% and more than 60 million people benefit from at least a 1 µg/m reduction in $PM_{2.5}$ pollution due to the cleaning effect of trees.38 *See* McDonald, R. et al..(2016), *Planting Healthy Air: A global analysis of the role of urban trees in addressing particulate matter pollution and extreme heat*, The Nature Conservancy. A recent study at Harvard University, found that an increase of 1 µg/m in $PM_{2.5}$ is associated with an 8% increase in COVID-19 death rate.38 *See* Wu, X., *et al.*(April 2020), *Exposure to air pollution and COVID-19 mortality in the United States*, Harvard T. H. Chan School of Public Health (5 April 2020).

39 Sheikh, P. A. (2018), *Debt-for-Nature Initiatives and the Tropical Forest Conservation Act (TFCA): Status and Implementation*, U.S. Congressional Research Service Report, RL31286 (Initially, "Eligible conservation projects include (1) the establishment, maintenance, and restoration of parks, protected reserves, and natural areas, and the plant and animal life within them; (2) training programs to increase the capacity of personnel to manage parks; (3) development and support for communities residing near or within tropical forests; (4) development of sustainable ecosystem and land management systems; and (5) research to identify the medicinal uses of tropical forest plants and their products.").

[40] No federal funds have been appropriated for TFCA agreements since 2014. Congress reauthorized the TFCA in January 2019, with the reauthorizing legislation attracting significant bipartisan support. Just prior to the pandemic, efforts were underway to appropriate approximately $20 million in federal funds in FY2021 to restart work under TFCA. This could be expanded as part of any recovery legislation Congress considers later this year and potentially include climate-related projects.

[41] Note that not all debt swaps have been beneficial for the environment. Contracts signed between Ecuador and China stipulated that the creditor be repaid in oil, not dollars, incentivizing Ecuador to drill deeper into the Amazon to repay its debts. *See* Nicholas Casey and Clifford Krauss (24 Dec 2018), It Doesn't Matter if Ecuador Can Afford This Dam. China Still Gets Paid, *The New York Times*; *see also* David Whitehouse (16 June 2020, updated 17 June 2020), Seeking debt relief, Angola opens door of oilfield holdings to China, *The Africa Report.*