



# ASPEN GLOBAL CHANGE INSTITUTE ENERGY PROJECT

## June 2020 Quarterly Research Review

### COVID-19 RECOVERY, CLIMATE IMPACTS, AND CO-BENEFITS: STIMULUS POLICIES THAT CAN MULTI-SOLVE

By Emily Jack-Scott, Aspen Global Change Institute

The COVID-19 pandemic spurred a global cessation of travel, manufacturing, and countless economic activities. Because our economies are still coupled with the burning of fossil fuels, this markedly reduced greenhouse gas (GHG) emissions. In April, [daily emissions fell by as much as 17 percent](#), and total 2020 emissions may be 7-11 percent lower than 2019 (as projected by the [Energy Policy Simulator](#), and a new Opinion piece in *Nature* by Hanna et al., Figure 1).

But as many countries' economic activities have resumed, emissions have quickly begun resurging. And yet, opportunities exist through climate-friendly recovery packages to not only stimulate economies, but also reduce emissions while promoting social and environmental co-benefits. While economic *rescue* packages were targeted at triaging markets and personal financial

#### SHOCK AND RECOVERY

Emissions\* from fossil fuels dip during recessions as the world economy slows. The rate of growth during recovery depends on whether green or dirty technologies supplant old infrastructure.

- International Energy Agency's 2020 forecast
- Current trajectory, no pandemic†
- Dirty recovery
- Green recovery

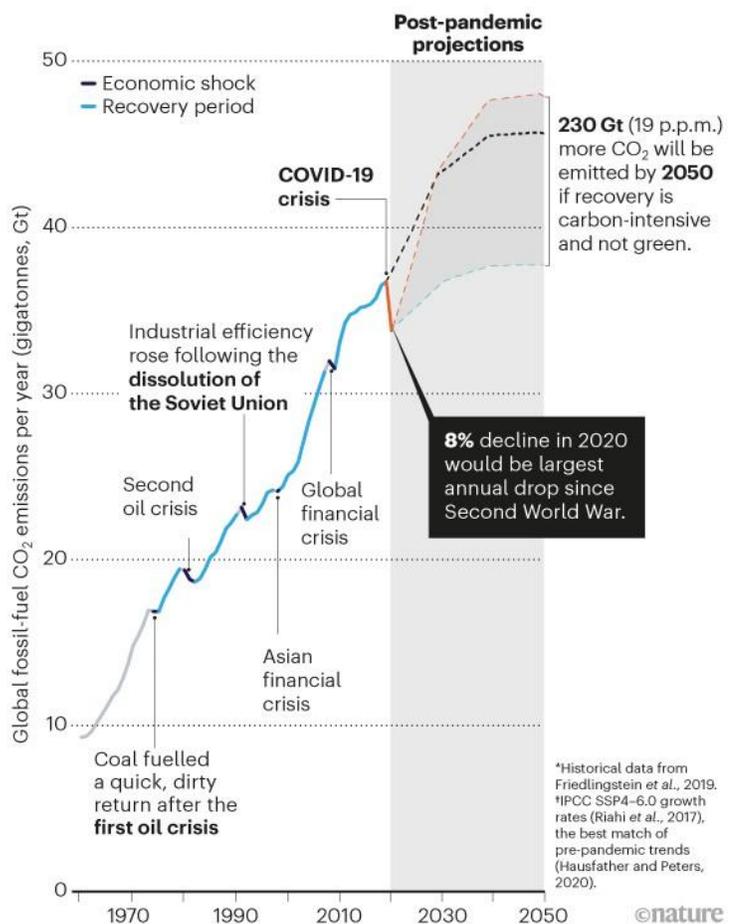


Figure 1. Hanna et al. 2020.

impacts on immediate time scales, subsequent *recovery* packages will hold the key to whether the global response to this pandemic will curb or accelerate climate change in the long-term.

In a May 2020 paper in the *Oxford Review of Economic Policy*, a team of economists led by Cameron Hepburn led a survey to assess the most climate-friendly recovery policies. They asked 230 experts (senior finance ministry officials, senior central and development bank officials, academic economists, and think tank commentators) from across 53 countries (including all G20 nations), to evaluate stimulus policy frameworks (dubbed “policy archetypes”) for their potential to deliver positive economic and climate results.

The survey evaluated 700 economic recovery policies from 2008-2020 (categorized into 25 archetypes) and their ability to be implemented reasonably quickly, reduce GHG emissions, and provide large economic multipliers (as authors define it the long-term return for every dollar of expenditure). Climate-friendly policy archetypes (see upper right panel of Figure 2) included investments in connectivity infrastructure (S), general R&D spending (X), education (L), clean energy infrastructure (T), and clean energy R&D spending (Y).

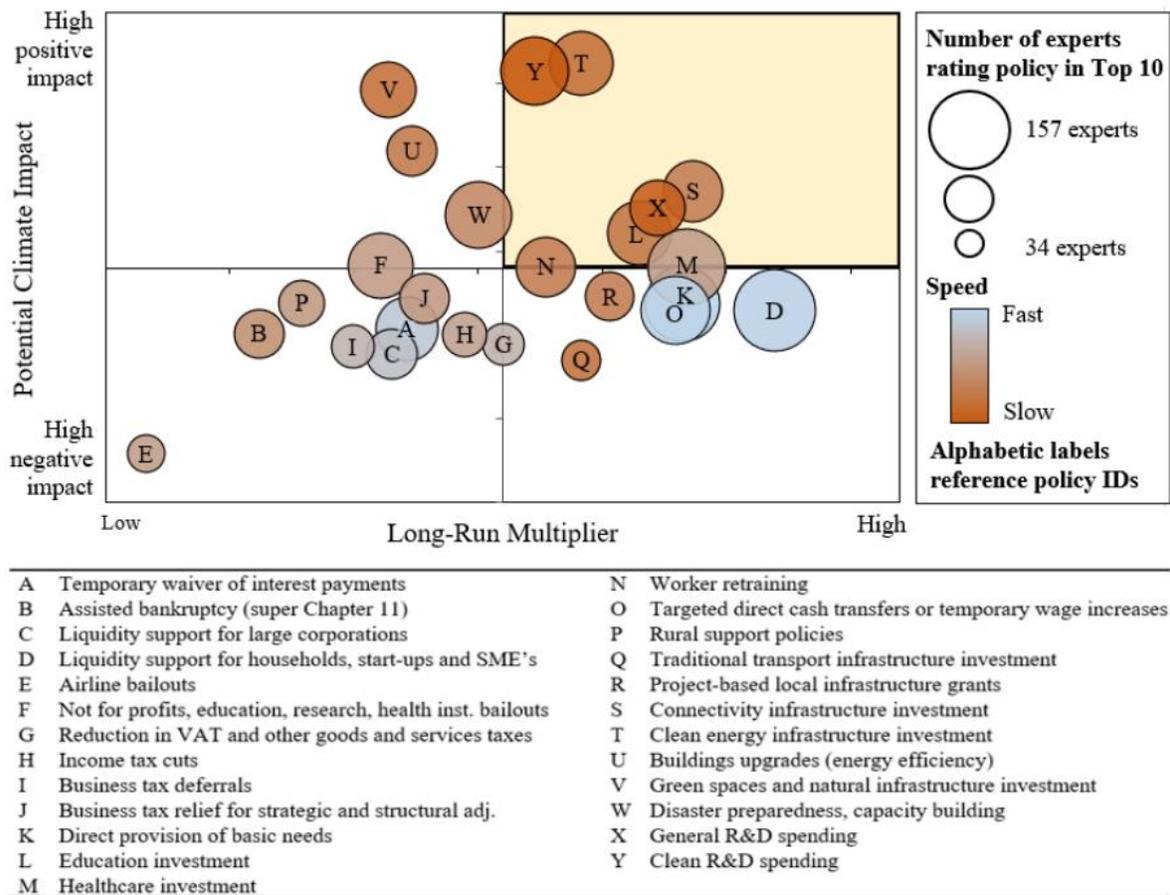


Figure 2 Mean survey results of recovery policy archetypes (2008-2020) aggregated using relativity-adjusted scores. From Hepburn et al. 2020.

Other desirable policy archetypes capable of delivering large economic multipliers without exacerbating emissions included healthcare investment (M) and worker retraining (N). Two others with the potential to reduce emissions, but which were not ranked highly for high multiplier or speed of implementation, were investments in green spaces and natural infrastructure (V) and energy efficient buildings upgrades including retrofits (U). Airline bailouts (E) were ranked particularly poorly both in terms of multiplier and climate potentials.

Notable variation exists among survey results depending on if respondents were from a high income country or a low or middle income country (LMIC). LMIC respondents ranked rural support policies (P) more highly than their colleagues in high income countries. The authors assert this difference may be due to rural support policies leading to direct creation of jobs in LMICs, as opposed to increased agricultural subsidies in high income countries. Clean R&D investment ranked more highly in high income countries.

Hepburn et al. drew out specific lessons learned through “green” stimulus policies from the Global Financial Crisis. Renewable energy and energy efficiency investments created much-needed short-term jobs, while driving down long-term costs of the clean energy transition. Every \$1 million invested in renewable energy or energy efficiency created nearly three times as many jobs compared to the same investment in fossil fuels.

The authors combined the survey results with a literature review to make specific COVID-19 recovery policy recommendations that invest in:

- Renewable energy infrastructure (assets, storage, grid modernization) and carbon removal technologies
- Building efficiency improvements (through renovations, retrofits, insulation, heating, and energy storage)
- Education for unemployed workers to prepare them for structural shifts underway in the wake of COVID-19 and forthcoming energy decarbonization
- Habitat restoration and regenerative agriculture, especially in carbon-rich habitats
- Clean R&D in high income countries and rural support spending in low income countries (towards regenerative agriculture, ecosystem restoration, and clean energy installations where appropriate)

Policy design is critical, as always, and must stay flexible in the continually dynamic COVID-19 context. Well-designed policy can also help reinforce climate-friendly behavioral shifts that have escalated during the pandemic (like teleworking), through improvements in high-speed Internet and energy efficiency.

International coordination on such policies is also highly recommended, especially those that affect industries and sectors across geopolitical boundaries. Recovery policy affordability varies

dramatically from country to county, so international collaboration can ease the burden for those without the resources for expansive stimulus packages. This may make the most of a period when international cooperation on climate policies is at a standstill, with COP26 postponed to 2021. Hepburn et al. note that while this may on one level be a setback, if the U.S. administration changes in 2021, long-term climate progress may ultimately be better off with the delay.

While the survey and literature review by Hepburn et al. highlight a full suite of opportunities for climate-friendly COVID-19 recovery packages, a June Opinion piece in *Nature* by Ryan Hanna, Yangyang Xu, and David Victor takes a more somber and pragmatic tone. They point out that already some countries like Mexico, South Africa, and the U.S. are heading down a pathway that could exacerbate emissions by rolling back environmental and pollution regulations.

The authors highlight the stark shift in politics the COVID-19 pandemic has wrought on governments around the world. When economies were growing steadily, policymakers were more open to exploratory clean initiatives, whereas now the political focus is on immediate economic gains and job creation. As such, Hanna et al. strongly emphasize that recommendations for climate-friendly recovery policy be filtered to those that maximize job retention and growth like R&D investments, keeping nuclear power plants open, and wind and solar power plant expansion.

They also call for targeting certain high-reward industries like design and deployment of zero-emissions steel and cement production (which could be a big job creator), and modernization of power lines to support renewable power. They rebuff any push for policies that add taxes or premiums on prices, even if they will be repaid in the long-run, as well as for unproven technologies that can't be scaled up quickly (such as carbon capture and storage or hydrogen infrastructure). They point to the EU's \$1 trillion, 10-year Green New Deal as an example of a climate-friendly, politically right-sized recovery package.

COVID-19 recovery packages could dramatically shape climate policy, which will not only affect the trajectory of climate change, but also the many co-benefits of climate-friendly policy. A recent comprehensive literature review authored by Mikael Karlsson, Eva Alfredsson, and Nils Westling in *Climate Policy* serves as a valuable reminder of the imperative to consider and assert co-benefits in the development and implementation of climate-friendly policies.

Extensive research has been done on the co-benefits of climate policy, including:

- Improved human health (with reduced air pollution and meat consumption lessening disease burdens and increasing physical activity)

- Improved soil and water quality (with better farming practices increasing soil conservation, soil sequestration, and productivity of certain crops, while reducing fertilizer application, water runoff, and eutrophication)
- Biodiversity conservation (with afforestation, reforestation, and better forest management *if* target forests are indeed biodiverse)
- Economic performance (with double dividends from redistributed carbon taxes boosting both GDP and social welfare, while reducing GHG emissions; and energy efficiency investment payback times as little as two-five years for individuals, and 11-14 years for commercial projects)
- Energy security (with import-reliant countries no longer heavily or completely reliant upon fossil fuel producing nations)

These climate policy co-benefits interact with one another in a network of direct and indirect impacts, all of which serve to improve the well-being of humans and other species (Figure 3).

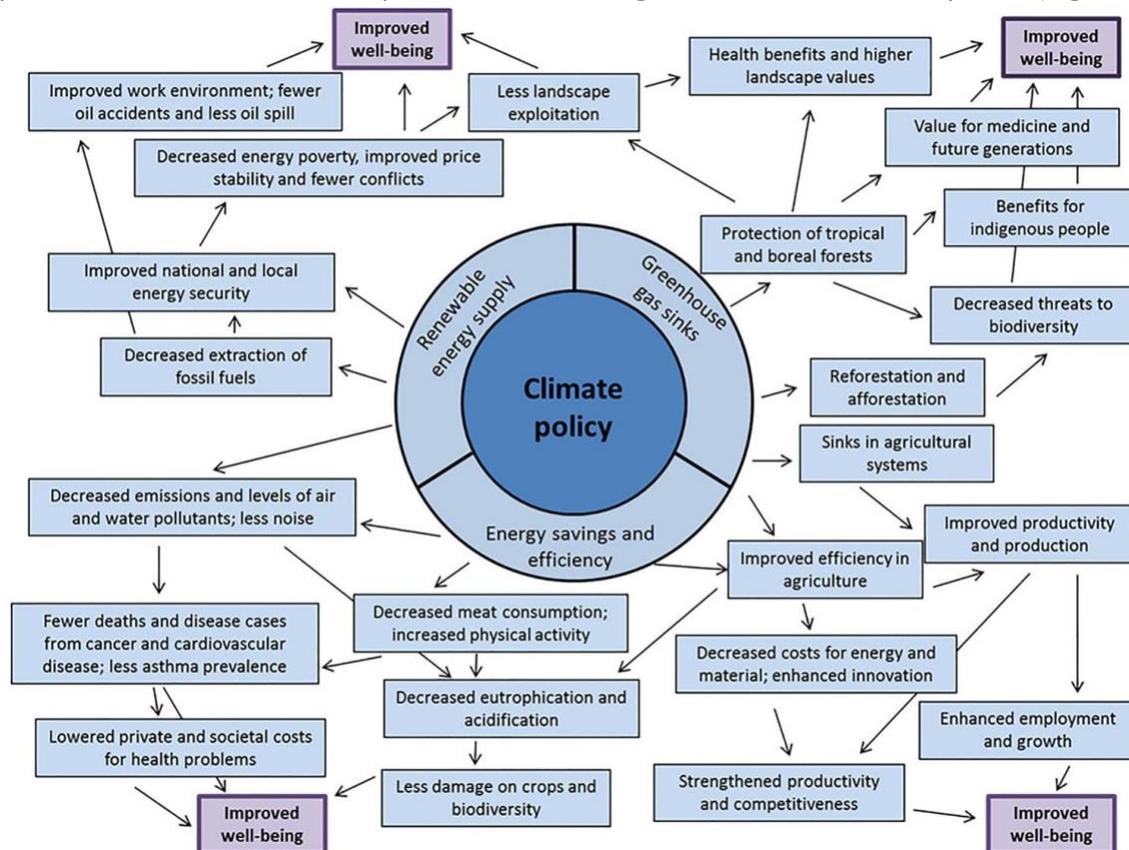


Figure 3 Co-benefit categories in climate policy. The three main components of climate policy in the circle may result in chains of potential positive effects, which – as examples – eventually may improve well-being. Source: Alfredsson and Karlsson 2016.

The cost effectiveness of mitigation strategies compared to co-benefits is contested in the literature. The global cost of air quality co-benefits has been estimated at 75 percent of mitigation costs, with regional benefits sometimes outweighing mitigation (namely in India and parts of China). While another recent study led by Jon Sampredo in *Environment International*

found that health co-benefits exceeded mitigation costs across decarbonization scenarios (various combinations of combined heat and power, renewables, nuclear, bioenergy with carbon capture and storage, biomass, and fossil fuels with carbon capture and storage and without), *and* across most regions (with the exceptions of Australia, Canada, and the U.S., where population density is lower).

Yet if political traction for climate policy (and thus the co-benefits they engender) is limited in the face of the COVID-19 pandemic, economic gains must be immediate and without an additional upfront premium or tax. Many co-benefits and climate policies don't see financial gains for decades, even when long-term multipliers are high. It therefore remains to be seen whether international recovery packages will fall more in step with the recommended climate-friendly policies presented by Hepburn et al. (which would advance the whole list of co-benefits), or if they will be more limited.

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