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Enhancing NDCs and COVID-19 Recovery: Synergies in the Power Sector

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Background

Aligning COVID-19 recovery programs with the enhancement and implementation of nationally determined contributions (NDCs) offers a significant opportunity for countries to adopt ambitious climate actions while promoting sustained economic recovery.

In 2019, power generation accounted for 41 percent of energy-related carbon dioxide (CO_2) emissions, more than 70 percent of which were contributed by coal. This suggests that power sector emissions must drop by an average of 4 percent per year in order to meet 2030 targets (IEA 2020). Although the world experienced declines in emissions in 2020 due to COVID-19 lockdowns, the resumption of economic activities threatens a rebound of emissions.

Economic recovery plans now underway provide a unique opportunity to advance climate actions by investing in climate-resilient infrastructure and driving the transition to a low-carbon future through economic recovery stimulus packages. By placing ambitious power sector climate actions at the heart of those stimulus packages, countries may work toward reducing power sector greenhouse gas (GHG) emissions while recovering from the COVID-19 pandemic. For countries submitting revised NDCs, this is a chance to consider how green recovery investments could offer opportunities to develop and implement ambitious NDCs in the power sector.

This expert note is one piece of a three-part series and describes the current status of low-carbon power sector interventions in economic recovery and in NDCs. The note then provides guidance for potential climate action in the power sector that can be incorporated and aligned in recovery efforts and NDCs. Other expert notes in the series address how economic recovery packages and NDC actions can be integrated in the transport and forest and agriculture sectors.

The Case for Alignment of Economic Recovery and NDC Alignment

An inclusive economic recovery can be driven by uniting NDCs and low-carbon power sector interventions that would help achieve long-term climate and sustainability ambitions. Studies show that recovery packages that capitalize on synergies between economic and climate goals have greater potential to reduce climate risks and contribute to socio-economic development (Hepburn et al. 2020; Jaeger et al. 2020).

For the world to meet the long-term goal of the Paris Agreement, NDC updates must feature more robust climate objectives and an accelerated shift of financial flows toward a greener economy (Fransen et al. 2019). Government spending on renewable energy and energy efficiency industries could generate nearly three times as many full-time equivalent (FTE) jobs as the fossil fuel industry with the same level of investment[1] (Garrett-Peltier 2017). Recent analysis produced by World Resources Institute (WRI) of

12 studies on near-term job creation from green investments additionally finds that renewable power generation (including solar photovoltaic, wind, and geothermal) creates 4.4 times as many jobs as fossil fuels per US$1 million invested, and building and industrial energy efficiency creates 4.6 times as many jobs (Jaeger et al. 2021). Another study further estimates that transforming energy systems with renewables could boost global gross domestic product (GDP) by $98 trillion by 2050 and create 63 million jobs globally in renewables and energy efficiency (IRENA 2018).

A low-carbon pathway further promises to boost economic growth in the long run while meeting climate goals. In Indonesia, for instance, the government's Low Carbon Development Initiative includes simulations where less carbon-intensive energy systems deliver an average of 6 percent growth in GDP per year until 2045, while simultaneously reducing GHG emissions by 43 percent by 2030 and exceeding Indonesia's conditional NDC target[2] under the Paris Agreement (Garrido et al. 2019).

Low-carbon power sector actions will also help ensure the provision of electricity for services that save lives. For example, the expansion of off-grid renewable energy resources for health facilities could enable health service delivery and provide uninterrupted cold chains for temperature-controlled medicine and vaccines (UN 2020).

Placing low-carbon power sector-specific actions at the heart of the COVID-19 economic recovery requires close coordination between ministries holding the portfolios of power, renewable energy and other fuels, infrastructure, labor, and, most importantly, finance. Finance ministers are best positioned to understand not only the devastating economic impacts of the ongoing pandemic and climate change, but also the subsequent opportunities from bold climate actions that could unlock $26 trillion globally in investments and generate 65 million more jobs through 2030 (The New Climate Economy 2018; NDC Partnership 2020). The improved coordination between ministries holding the portfolios of finance and power sector would result in

- clearer understanding of the economic benefits of low-carbon development through cost analysis of climate actions in the context of COVID-19 and economic recovery mechanisms;
- fiscal instruments designed to stimulate green growth; and
- boosting economic recovery after COVID-19 through incorporating and investing in low-carbon and/or climate-resilient projects resulting from the NDCs.

Low-Carbon Power Sector Measures in Economic Recovery

As of February 2021, COVID-19 economic recovery stimulus packages committed a total of $4.6 trillion worldwide to sectors such as energy, transport, agriculture, industry, and waste. Less than $1.8 trillion of that total, however, has been green (Vivid Economics 2021).

The European Union's "NextGenerationEU" is the greenest of all economic recovery packages declared to date, with 37 percent of the total package directed toward green measures, including low-carbon power sector interventions. These interventions include renewable energy generation, smart energy systems such as smart grids and related storage, high efficiency co-generation with low lifecycle emissions, and end-use energy efficiency in sectors such as buildings and transport (Council of the EU 2020).

Several national stimulus packages have also included much-needed climate action support. For instance, Germany's stimulus package included several green measures in the power sector, with a focus on energy transition and compliance with climate targets. Germany also announced major renewable energy capacity additions and abolished its previous cap on subsidizing (via tariffs) large renewable energy generation once a 52 gigawatt (GW) threshold was reached (Germany 2020).[3] South Korea similarly introduced a "Green New Deal," with particular attention to low-carbon and decentralized

energy. This includes building a smart grid and promoting renewable energy and a fair just transition process. With investment of $35.8 trillion Korean Won by 2025, this would create 209,000 jobs (Republic of Korea 2020).

The United Kingdom has also announced green recovery stimulus packages with power sector interventions, such as boosting offshore wind targets from 30 GW to 40 GW. Additionally, floating offshore wind projects will deliver 1 GW of energy by 2030, and the United Kingdom plans to double the capacity of renewable energy in the next Contracts for Difference auction, providing clean power to up to 10 million homes (Government of the United Kingdom 2020). The Canadian government's infrastructure package, announced in 2020, will also include some green measures and credible investments in clean power and storage (Government of Canada 2020).

In December 2020, Denmark, the largest oil producer in the European Union, declared the end of all new oil and gas exploration (BBC 2020). The Danish government's determination to instead invest in green projects was reinforced during the COVID-19 pandemic, during which time it invested in offshore wind energy, carbon capture and storage (CCS), and improving the energy efficiency of Danish homes (Evans and Gabbatiss 2020).

Also in December 2020, the United States (U.S.) passed a $900 billion stimulus package, including a $35 billion commitment to clean interventions such as investment in renewable energy and clean technology innovations (U.S. Congress 2020; Vivid Economics 2021). Additional legislation currently under consideration in the U.S. could also boost spending on green recovery measures, including electric vehicle (EV) and clean energy infrastructure and research and development.

Japan announced $708 billion in additional stimulus with a focus on clean tech innovations, solar photovoltaic (PV) deployment, and digital innovation. Further details of the interventions and financial support have not yet been made public (Kihara and Kajimoto 2020).

At the same time, however, several stimulus packages risk reinforcing non-renewable trajectories. China's COVID-19 stimulus package, for instance, continues investments in carbon-intensive sectors, and although China aims to be carbon neutral by 2060, the continued spending on fossil fuel infrastructure seldom aligns with that commitment. Out of its package of $2.95 trillion, only $49 billion is directed toward renewables and $11 billion toward energy storage and other non-power sector industries, such as transport EVs (Myllyvirta and Li 2020; Vivid Economics 2021). India's stimulus package, totalling approximately $325 billion, is also carbon-intensive, though recent measures also include a $3 billion investment in solar PV and battery development. Countries like Argentina, Mexico, Russia, Saudi Arabia, South Africa, and Turkey continue to invest primarily in non-renewable sources of power generation, as is made evident in their COVID-19 recovery plans (Vivid Economics 2021).

Key Developments in NDCs

Over the course of 2020 and 2021, 144 countries—including 27 member states of the European Union (EU)—submitted new or updated NDCs, representing 54.8 percent of global GHG emissions. Of those 144 countries, 53 provided specific mitigation targets in the power sector. These 53 countries,[4] however, represent just 18.71 percent of global GHG emissions (Climate Watch 2021).

The targets range from complete transition to renewable energy in the electricity sector (including commitments from Fiji and Costa Rica), renewable energy and energy storage targets (as in Papua New Guinea and Tonga), and reduced energy intensity targets with contributions from renewables (Andorra). A few targets also indicate the extension of national plans and emission-related targets. For instance, Morocco plans to extend its National Solar Plan to 2000 megawatts (MW) by 2030, while the Marshall Islands committed to lowering its emissions by 66 percent through electricity production by 2030.

Outside of NDCs, some countries have also recently prepared national energy policies that support their GHG emission targets under the Paris Agreement. For example, the EU and its member states have prepared an integrated National Energy and Climate Plan for 2021–2030 that includes their national contributions to achieve combined energy and climate targets while encompassing related commitments under the Paris Agreement (EU 2020). The European Commission also recently proposed legislation dubbed "Fit for 55," a package aimed at implementing the EU's NDC—a net domestic reduction of emissions of least a 55 percent by 2030 compared to 1990 levels—and a new binding target of 40 percent of the EU's energy consumption to come from renewables by 2030, up from the 32 percent target previously communicated in the NDC (Council of the EU 2021; EC 2021).

Some countries have also announced policy targets that complement their NDCs. For instance, China announced new climate targets during the Climate Ambition Summit 2020 that include increasing the share of non-fossil fuels in primary energy consumption to around 25 percent by 2030 and increasing wind and solar capacities to 1200 GW by 2030 (WRI 2020). India also plans to increase installed renewable energy capacity to 450 GW by 2030 (India 2019).

Recommendations for Measures in the Power Sector

A decarbonized power sector is a prerequisite for limiting global warming to 1.5°C (IPCC 2018). The following recommendations draw from the foundational strategies proposed in the WRI power sector guidance on enhancing NDCs and are highlighted in Table 1, though the measures addressed there may also be applied more broadly to recovery and NDCs (Chakrabarty et al. 2019).

Boost support for renewable production, deployment, and use

The COVID-19 pandemic has strengthened the case for an accelerated transition to clean energy. As countries across the world reset their economies to "build back better," it is only fitting that renewable energy technologies are placed at the heart of recovery packages. Particularly in regions where grid electricity is unreliable or even non-existent, renewable energy technologies could ensure that health centers are able to work around the clock without power outages.

Enhance grid flexibility

Greater grid flexibility will be able to accommodate more variable renewable energy (primarily wind and solar) on a daily and seasonal basis. The factors for enhanced grid flexibility include advanced electricity networks, smart meters, and storage. Including expansion of an advanced electricity network in COVID-19 recovery stimulus packages would not only allow for more renewable energy penetration and reduced transmission and distribution losses, but would also boost the national economy in the short term, create jobs, and address structural barriers to energy transition (Ram et al. 2020). Including distribution of smart meters in recovery stimulus packages would help distribution companies generate more net revenue by addressing the aggregate technical and commercial losses (PSU Watch 2020). Local manufacturing of smart meters could enhance the local value chain and accelerate recovery as the cash flow supports the national economy, while importing smart meters would help the economic recovery of trade partners, thereby further accelerating regional recoveries. Countries could also capitalize on falling battery prices by including energy storage in stimulus packages, thereby boosting electricity access in remote areas while leveraging private capital (Concessao et al. 2020; McKerracher et al. 2020).

Address coal asset issues

Phasing out coal would essentially require retirement of old and inefficient power plants and committing to no new coal-fired power plants. This process would also call for a roadmap regarding the sequence of activities, appropriate policy requirements, and assurances that the transition is just, particularly for the affected workforce to avoid increasing unemployment. Although this may be a medium- to long-term

option, including the phasing out of inefficient coal assets in stimulus packages would signal the relevant industries to begin planning future alternatives for electricity supply. This is especially pertinent for emerging economies grappling with air pollution.

The allocation of stimulus spending as part of COVID-19 economic recovery presents a unique opportunity to accelerate the coal-to-clean transition. A recent study by Bodnar et al. (2020) recommends a three-part approach for governments and financial institutions to accelerate the retirement of inefficient and old plants while interest rates are low:

- Refinance to free up capital for the transition while lowering customer costs (for instance, through asset-backed securitization, ratepayer-backed bond securitization, and green bonds). Adopting this approach would require governments to have a robust communication plan to ensure that this refinancing scheme does not seem like additional support for fossil fuels.
- Use a portion of the new low-cost capital to reinvest in clean energy, allow owners to phase out coal plants, and further reduce customer costs, replacing return from coal plants with that of clean energy.
- Use another portion of the new capital raised through refinancing to provide transition financing for workers and communities, offering immediate resources to preserve livelihoods and ensure that host communities and workers can continue to prosper.

Devising a roadmap for reducing fossil fuel subsidies to coal and fuel oil power plants, then redirecting a share of those subsidies toward green investments, could save government resources while simultaneously reducing GHG emissions. According to one study, fossil fuel subsidy reforms in general could result in the reduction of 4.8 gigatons of CO_2 equivalent ($GtCO_2e$) by 2030 while saving $2.56 trillion across 26 countries. The reallocation of 20 percent of the savings from fossil fuel subsidies into energy efficiency improvements and 10 percent into renewable energy plants would further increase emission reduction to a total of 10.63 $GtCO_2e$ by 2030 (Global Subsidies Initiative 2019). What's more, the removal of fossil fuel subsidies and application of appropriate taxation could result in a 28 percent reduction of GHG emissions globally (Coady et al. 2019).

Align finance and domestic policies for sustained greener COVID-19 recovery

Investments made today in sustainable recovery from the COVID-19 crisis will also work toward achieving climate goals. To do that, however, resources must be carefully calibrated, possibly through the following practices:

- Governments could use development policy loans from multilateral development banks to support policy reforms that then support clean energy and infrastructure investments as a key component of economic recovery (Walters 2020).
- Governments could capitalize on financing from international platforms such as Climate Investment Funds and the Green Climate Fund to design clean power sector projects that are conventionally cost-intensive, under the umbrella of COVID-19 recovery measures. This could include, for example, ocean thermal energy conversion and tidal power projects or deploying renewable energy in end-use sectors like transport and industries.
- Governments could use carbon pricing as a policy tool in the recovery stimulus package to create a strong market signal in the power sector to shift generation base from fossil fuels to renewables. Carbon pricing is often seen as a tool that yields environmental benefits in the medium- to long-term time horizon. Given the pressure to create additional financial streams during the pandemic, this could complement efforts to stabilize and boost the economy while combating the climate crisis (Mintz-Woo et al. 2020).

Table 1. Power Sector Actions that Link Recovery Measures and NDC Targets

COVID-19 Recovery Measures	Potential Targets to support NDC Goals
Boost support for renewable energy production, deployment, and use.	▪ Increased installed capacity of renewable energy targets ▪ Increased renewable energy as share of energy mix targets ▪ Increased energy access targets through renewables ▪ Individual technology targets, such as a solar rooftop target
Buy down the phaseout of fossil fuel power plants and invest in major reskilling programs.	▪ Commitments to address existing fossil fuel targets, such as coal phaseout targets ▪ No new coal beyond project pipeline commitments ▪ Air quality targets
Build smart energy infrastructure, including massive investments in the development and deployment of large-scale storage technologies and grid modernization.	▪ Energy storage targets ▪ Targets for smart meter deployment ▪ Targets on reducing losses from transmission and distribution
Electrification of end-use sectors through renewable energy	▪ Percentage targets of charging infrastructure powered by renewable energy sources ▪ Percentage target of residential and commercial buildings electrified through renewable energy ▪ Investment in green hydrogen for hard-to-abate industrial sectors

Source: WRI authors.

Endnotes

1 Each $1 million spent on coal, oil, and gas supports an average of 2.65 FTE jobs economy-wide, whereas renewable energy supports 7.49 FTE jobs while energy efficiency supports 7.72 FTE jobs. Thus, a $1 million shift from fossil fuel industries to clean energy generates a net increase of five jobs.

2 "Conditional NDC targets" are those that lower income countries can achieve only with support from higher income countries in terms of finance, technology transfer, and building capacities.

3 This abolishment is part of the amendments made in the Renewable Energy Sources Act. This provision had stipulated that solar photovoltaic plants with an installed capacity of up to 750 kilowatts would no longer receive remuneration once a total installed capacity of 52 gigawatts was reached. This cap would likely have been reached in summer 2020, which is why its abolition was urgent and the cap had been removed.

4 As of October 2021, the 53 countries that have provided mitigation targets in the power sector include Andorra, Antigua and Barbuda, Armenia, Bangladesh, Barbados, Belize, Benin, Bhutan, Cuba, Costa Rica, Democratic Republic of Congo, Eswatini, Fiji, Gambia, Georgia, Guinea, Guinea-Bissau, Ghana, Israel, Japan, Jordan, Laos, Liberia, Malawi, Marshall Island, Mauritius, Morocco, Myanmar, Namibia, Nauru, Nepal, Nicaragua, Nigeria, Panama, Papua New Guinea, Palestine, Paraguay, Samoa, Saint Lucia, Sao Tome and Principe, Senegal, Seychelles, Singapore, South Sudan, Sri Lanka, Suriname, Togo, Tunisia, Uganda, United Arab Emirates, United States of America, Tonga, and Vanuatu (Climate Watch 2020).

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