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## **Post COVID-19 Energy Investment**

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The U.S. must respond to the COVID-19 shock positively, and seize it as an opportunity to strengthen its economy by building energy efficient infrastructure, promoting advanced electrification, and moving towards secure and clean energy sources. The COVID-19 recovery plan in the U.S. should include international collaboration to leverage our resources and shape energy and climate geopolitics going forward.

The scale of the energy and climate challenge is huge—the International Energy Agency (IEA) estimates the world needs to invest \$3.5 trillion per year until 2050.<sup>[1]</sup> Similarly, Bloomberg New Energy estimates \$78 trillion to \$130 trillion of new investment is needed to implement their renewables and hydrogen scenario between now and 2050.<sup>[2]</sup> However, failure to decrease emissions from the energy sector, which contributes the majority of global CO2 emissions, would cost much more taking into account extreme weather impacts, higher insurance costs and other collateral effects of climate change.

There are ambitious pledges from numerous countries to move towards net-zero emissions. On October 26, Prime Minister Yoshihide Suga in his first speech to Parliament announced that Japan will adopt this target. President Moon two days after announced the Republic of Korea's adoption of this target in line with its \$35 billion Green New Deal announced in July. These announcements make the ROK and Japan the first two countries in Asia to adopt this target. For both countries, it means taking measures to dramatically decarbonize such as eliminating coal in the energy mix; utilizing hydrogen in industrial processes; increasing renewable energy use; increasing the energy efficiency of industry, buildings, and transportation; and maintaining a strong nuclear energy presence.

The European Union adopted a net-zero emissions target in 2019. China pledged in September 2020 to reach this target in 2060. U.S. President Joe Biden's climate plan also calls for ensuring that the United States reaches net-zero emissions no later than 2050. The Biden Plan includes investing \$400 billion over the next ten years in clean energy and innovation including research and technology for

areas such as energy efficiency, small modular nuclear reactors, decarbonizing heavy industry, electric vehicles, and carbon capture and storage.[3] The U.S. bipartisan stimulus bill passed on December 21, 2020 included about \$35.2 billion for alternative fuels and clean energy research, and extends tax credits for wind and solar projects as well as creating a new tax credit for offshore wind. It also phases down the production and use of hydrofluorocarbons, approves a carbon capture and storage program, and provides funds for modernizing nuclear power plants and for developing advanced reactors. The stimulus bill should create a blueprint for action by the 117<sup>th</sup> Congress in 2021.

Governments already have committed over \$12 trillion dollars to kickstart their economies after COVID-19.[4] Each country will prioritize its domestic policies and practices but at the same time should not neglect the international activities that can leverage domestic expenditures and impact the direction of the future global energy system. The U.S. should dedicate upfront a small portion of COVID-19 recovery funds to international collaboration on research and development, job training and education, project financing and deployment, setting codes and standards, and sharing of best practices. After all, climate is the ultimate global public good.

Who will drive the international transition that will surely result from the COVID-19 crisis? The transition needs to be transparent, safe, socially acceptable, and done responsibly. It will create decades-long relationships among collaborating countries, companies, universities, and individuals. The potential geopolitical implications of such long-term relationships add to the seriousness of the discussion on how the transition will happen. Thus, it is essential like-minded countries such as the United States, the Republic of Korea, Japan, the European Union, and Canada cooperate and take a leadership role in ensuring that the transition provides benefits for countries, industry, and labor; retains and creates good quality jobs by investing in more efficient clean infrastructure, provides the requisite education needed for the new economy, and invests in research and development to move the world forward.

Global CO<sub>2</sub> emissions in 2020 will be down 5 to 7 percent from 2019 due to loss of economic activity from COVID-19. The IEA's *World Energy Outlook 2020* (WEO 2020) states energy demand will likely drop by 5 percent, and energy-related CO<sub>2</sub> emissions by 7 percent. The IEA's *World Energy Investment 2020* reveals the COVID-19 pandemic set in motion an 18 percent drop in global energy investment, with spending plunging in every major energy sector. WEO 2020 also states global emissions must fall by 40 percent by 2030 on the path to 2050 carbon neutrality. As the world's economies recover, how renewed energy market investment is directed in the next ten years will be critical to achieving a low or zero emissions future.

In the next few years, new low-emission energy technologies will become available or will be close to fruition if sufficient new investments are directed to them. Collectively, the international community can create a future in which the upward trajectory of CO<sub>2</sub> emissions is not resumed as global recovery from COVID-19 begins. These technologies include affordable mass market electric-drive vehicles, advanced nuclear including small modular nuclear reactors, advanced energy storage, and hydrogen solutions. The increasing deployment of cost-effective solar and wind technologies, advances in digitalization, advanced power grid technologies, and the globalization of natural gas have already put the world on a lower-emissions path.

There are many energy and climate pathways into which investments should be directed, especially those that lead to greater energy efficiency and electrification. Two priorities on which international collaboration among like-minded advanced economies can make a major difference and should be prioritized are advanced nuclear energy solutions and the electrification of transportation.

The World Nuclear Organization sets a target to build an additional 1000 GWe of nuclear energy by 2050, which would provide 25 percent of electricity.<sup>[5]</sup> The development and deployment of advanced reactors, especially small modular reactors (SMRs), could be a gamechanger. SMRs are close to being a real alternative to conventional large-scale nuclear energy for some applications such as district heating, process steam for industrial uses, hydrogen production, and desalination, in addition to providing electricity. According to the IAEA, there are some 50 small, medium sized or modular reactor concepts designed to generate up to 300-450 MW at various stages of development around the world. SMRs can complement renewable energy by stabilizing high amounts of volatility in grids. Organizations, including the Global Business America Institute, are already working to promote international collaboration among the ROK, the United States, Japan, Canada, and others.

The electrification of transportation is another area where collaboration among like-minded countries such as the ROK, the United States, Japan and the European Union makes sense. The transition of the vehicle industry, which is still 92 percent petroleum powered in the United States, offers tremendous opportunities for CO<sub>2</sub> reductions. Like the nuclear industry, collective leadership in this transition will determine whether this transition is done transparently and responsibly. According to the IEA, the shift to electric-drive (EV) and autonomous (AV) cars could reduce CO<sub>2</sub> emissions in the global transportation sector by almost 90 percent from 8.1 Gt in 2019 to 1 Gt by 2070.<sup>[6]</sup> The IEA notes that 17 countries, mostly in Europe, have announced 100 percent zero-emission vehicle targets or the phase-out of internal combustion engine vehicles through 2050.<sup>[7]</sup> The supply chains for EVs and AVs, including batteries and 5G networks, are all strategic sectors in the move to a clean energy economy. The automotive industry also remains a major driver of the manufacturing sector overall.

The countries that take advantage of Post COVID-19 stimulus funds to invest in energy efficient infrastructure, promote electrification, and move towards secure and clean energy sources both domestically and through international collaboration will determine the path on which the world moves forward towards a zero-emission future. Spending a portion of COVID-19 recovery funds in cooperation with international partners on nuclear energy and electrification of the transportation sector will be critical.

[1] IEA, *Deep Energy Transformation Needed*, March 2017, <https://www.iea.org/news/deep-energy-transformation-needed-by-2050-to-limit-rise-in-global-temperature>.

[2] Bloomberg NEF, *2020 Energy Outlook*, October 27, 2020, <https://about.bnef.com/new-energy-outlook>.

[3] *The Biden Plan for a Clean Energy Revolution and Environmental Justice*, <http://https://joebiden.com/climate-plan/>.

[4] Marina Andrijevic and Joeri Rogelj, *How the global coronavirus stimulus could put Paris Agreement on track*, Carbon Brief, October 15, 2020, <https://www.carbonbrief.org/guest-post-how-the-global-coronavirus-stimulus-could-put-paris-agreement-on-track>.

[5] World Nuclear Organization, *The Harmony Programme*, March 12, 2019, <https://www.world-nuclear.org/our-association/what-we-do/the-harmony-programme.aspx>.

[6] IEA, *Energy Technology Perspectives 2020*, September 2020, <https://www.iea.org/reports/energy-technology-perspectives-2020>.

[7] Ibid.

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