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## Creating U.S.-South Korea Cooperation on Climate Change, Clean Energy, and Technology Innovation Geopolitics

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At the May 2021 summit between U.S. and South Korean presidents Biden and Moon the two leaders issued a [joint statement](#) making clear that they were ushering in a “New Chapter” in the alliance relationship. They agreed that “contemporary threats and challenges require us to deepen our partnership in new areas,” including climate change, clean energy, technology, and innovation.

These critical issues are increasingly important in the current complex and challenging international environment, and they are at the core of modern civilization and economic prosperity. They also are interrelated, and effectively managing them will be an incredibly complex challenge that requires both nations to work together.

### **Climate and Clean Energy**

U.S.-South Korean collaboration on climate change is vital. Both countries have committed to achieving net-zero emissions by 2050 in order to meet the objectives of the Paris Climate Agreement. However, it will be a very significant challenge for both to meet these carbon reduction commitments.

In 2019, [almost 90%](#) of South Korea’s energy consumption came from fossil fuels. Its [9th Basic Plan](#) for Long-Term Electricity Supply and Demand 2020-2034 calls for a substantial expansion of clean energy, primarily renewable solar and wind power, by 2030. Offshore wind power accounts for a significant portion of that overall increase.

The scale of the transition is massive. South Korea’s plan to build an 8.2 gigawatt (GW) offshore wind project would make it the global leader by a large margin. The U.K.’s [Hornsea 1](#) wind farm is currently the world’s largest at 1.2 GW. This green energy ambition also faces a variety of complex [challenges](#), including generating political support, managing costs, and ensuring supply chains.

The U.S. faces a similar test in decarbonizing its energy sector, and it has raised its climate change ambitions under the Biden administration.

The Biden proposal calls for a 50-52% reduction from the 2005 greenhouse gas pollution level by 2030. At its core is the completion of a massive [30 GW](#) wind project by 2030. While renewable energy continues to grow quickly in the U.S., there is still a significant reliance on fossil fuels, particularly natural gas.

The scale of this clean energy transition is substantial and has many radiating impacts that are not yet well-understood for both countries. Significant variables include the effects on overall economic growth, changes in the price of energy to consumers, the reliability of electricity production, the impacts of the growth of intermittent energy sources on electrical

grid stability, and the implications for energy security.

In addition, there are geopolitical considerations. China is the global leader in the production of solar panels, manufacturing about 60% of the world's total, and it produces about 30% of the world's wind turbines.

China also supplies approximately 80% of the globe's rare earth minerals, which are used in renewable energy, battery storage, and electric vehicles—all key elements of a carbon reduction strategy.

Therefore, at least early in the clean energy transition process, both the U.S. and South Korea will significantly depend on China for their renewable energy components. These needs are emerging both at a time of increasing tension between the U.S. and China across a variety of areas and a time when China has proven that it will [use trade as a weapon](#) against other nations creating potential uncertainty for U.S. and ROK economies.

The clean energy cooperation agenda between the U.S. and South Korea will need to span from technology to diplomacy, for example, exchanging information on the deployment of large-scale wind power and coordinating on policy positions in the field of clean energy diplomacy. In between there are numerous other joint concerns that the nations should be tackling in tandem.

### **Nuclear Energy and Exports**

One area where the two nations need better coordination is on the contribution of nuclear power to clean energy.

For both nations, nuclear energy currently provides over 50% of zero-carbon energy while representing a much smaller percentage of their total electricity production (19% for the U.S. and 17% for South Korea). It is unclear how either country can reach zero-carbon goals by 2050 without the continued contribution of their nuclear plants, but there are conflicting views on the role of domestic nuclear power.

South Korea currently has a [nuclear phase out policy](#) while the U.S. is committed to maintaining the role of nuclear power as a clean energy source for the future. For the U.S., this means taking steps to keep existing reactors open and providing funds and test beds for the next generation of smaller nuclear technologies. These smaller new reactors would complement renewables, addressing issues associated with renewable energy intermittency and storage.

An area for nuclear cooperation is in nuclear exports, but the pathway to that success is not well charted.

At the May [summit](#) the two nations agreed to, “develop cooperation in overseas nuclear markets, including joint participation in nuclear power plant projects,” and coordination of the supply chain. It also [commits](#) South Korea to “a common policy” with the U.S. to require the IAEA safeguards Additional Protocol as a condition of supply for nuclear power plants, a significant and controversial shift for Seoul.

The reality is that the U.S. and ROK nuclear industries already are reliant upon one another. This has been demonstrated in the South Korean APR-1400 nuclear plant construction in the United Arab Emirates, which included significant U.S. technology.

The collaboration now extends to the next generation of nuclear energy with South Korea's Doosan Heavy Industries and Construction Co. leading a [commitment to invest](#) over \$100 million in NuScale Power, the U.S. small modular reactor company.

There are international nuclear market collaboration opportunities for the two countries in the Middle East, Eastern Europe, and potentially in the U.K.

At the moment, China has a prominent role in Britain's plans to build new nuclear reactors as part of its power and clean energy strategy, but recent aggressive actions by China are [causing a rift](#) in that nuclear cooperation relationship. If the U.K. severs its ties with China on its nuclear projects, an opportunity is opened for other nations, including the U.S. and South Korea, to play a more prominent role.

However, the framework for the division of labor, financial obligations, and rewards that would underpin a joint nuclear project in a third country is not well developed. There are clear strengths and weaknesses in the nuclear industries of both nations. However, they also have been competitors for reactor sales, thus finding common ground will be necessary.

There is some urgency to identifying this joint arrangement, as the current nuclear market [dominated by Russia](#) and China is expanding into international nuclear markets. It is a clear global security risk to allow two authoritarian nations to control the nuclear market of the 21<sup>st</sup> century at a time when zero-carbon energy is a pressing need. Together, the U.S. and South Korea could anchor a coalition of democratic nuclear suppliers that can provide an alternative to Russian and Chinese nuclear exports.

### **Technology Innovation**

The critical foundation of global economic competitiveness and growth in this century will be emerging and high technologies. Communications technologies like 5G, computing technologies like artificial intelligence, health technologies like biotechnology, and clean energy technologies are critical areas of international competition. These are also priority technology areas and economic growth sectors for the U.S. and South Korea.

The challenges for the U.S. and South Korea in this complex political, technological, and geopolitical environment are significant because at the center of this competition is China. Both nations have deep and wide trade relationships with China, and a disruption of these trade ties would impose substantial economic impacts on both nations.

The U.S. has made clear that it intends to aggressively contest China's growing power, influence, and desire to dominate high technology. South Korea, however, maintains a position of "strategic ambiguity," preferring not to confront China.

As techno-democracy allies, however, U.S.-South Korea cooperation is necessary to manage the security implications and governance of these advanced technologies. One example is China's infiltration of international technology standards-setting organizations. This has raised alarms about the potential for these standards to be skewed in favor of Chinese products.

Effectively navigating these policy challenges will be a delicate process that will require a sustained bilateral dialogue to arrive at a cooperative and effective approach to this competition that serves the needs of both nations.

### **Summary**

The U.S. and South Korea have deeply shared democratic values that underpin their alliance, societies, and economic strength. However, democracy is being seriously challenged by autocratic governments and the assertion that a centralized approach is a more efficient form of governmental decision-making. Faced with this challenge, it is essential for these two allies to expand their cooperation to jointly address new global challenges. The most urgent are responding to climate change with effective low and zero-carbon energy strategies, protecting global security and clean energy markets by collaborating on the role of nuclear power and exports, and maintaining a preeminent role in the development and trade of critical technologies of the future.

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