



AN ASIA SOCIETY SPECIAL REPORT

COORDINATED STRATEGIES

How the U.S. & China Can Work Together to Tackle
Air Pollution & Climate Change

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FOREWORD

COORDINATED STRATEGIES: HOW THE U.S. AND CHINA CAN WORK TOGETHER TO TACKLE AIR POLLUTION AND CLIMATE CHANGE is the third report by Asia Society in a series about U.S.-China Collaboration on clean technology and the issue of climate change. China has the world's largest population, second largest economy, and is the world's leading exporter. Consequently, China, like the United States, is one of the world's largest emitters of greenhouse gases. Poor air quality is a public health issue across both nations. Not only do these shared conditions create a large market for the development of clean technologies, but they also encourage U.S.-China collaboration. The natural synergy between the U.S. and China and the shared responsibility to lead sustainable innovation will push this partnership further toward realization.

As the effects of pollution continue to negatively impact people and the environment, this report seeks to build upon previous undertakings by the Asia Society to promote an increase in U.S.-China cooperation in dealing with this matter. This report aims to locate areas in which the two countries can collaborate, specifically looking at the automobile market and the building heating market. US-China collaboration could solve issues of high relative heating and vehicle costs, inadequate charging infrastructure and electric grids, and overly rigid tariff designs, improving the overall accessibility to clean technologies. Making the application of low-emission technology more convenient would increase its consumption rate, and thereby promote clean technology as the new global norm in transportation and housing. Despite being at different stages of this energy transition, the U.S. and China face similar environmental challenges where, in some cases, the solutions may be the same. Shared policy, technology research, and development efforts, as well as open markets, could allow both countries to better confront the problems at hand.

In both China and the U.S., considerable efforts are being made to reduce environmental pollution and counter climate change. In China, the majority of research, development, and promotion of clean technologies that address air quality is headed by the central government, whereas in the U.S., many of these responsibilities have recently fallen to the states, of which California has been the most outspoken. Efforts to revamp the current energy system include finding new, cleaner ways to obtain, store and use energy.

Additionally, after the technology has been developed, there is still the task of getting the product to market. Even in the looming shadow of a trade war, it remains important for companies from both countries to continue to compete and work in each respective market. The presence of competition between companies from both countries and the accessibility of their products from both sides of the globe will help expedite progress toward a cleaner future. This report demonstrates ways in which U.S. companies have successfully entered the Chinese marketplace and vice versa. Drawing upon the lessons learned from the successes and failures of various companies, we believe that more companies can reach a similar level of international prominence.

Zero-emission technologies, which are sustainable and have the potential to be very inexpensive, are the inevitable future. We hope that this report will provide some new ideas and suggest new opportunities for greater cooperation between the U.S. and China in this field.

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EXECUTIVE SUMMARY

REDUCING THE RISKS OF CLIMATE CHANGE WILL REQUIRE TRANSFORMING how human societies obtain, store, and use energy. The U.S. and China have a critical role to play in leading this transformation, as the world's largest energy users and emitters of greenhouse gases (GHGs).¹

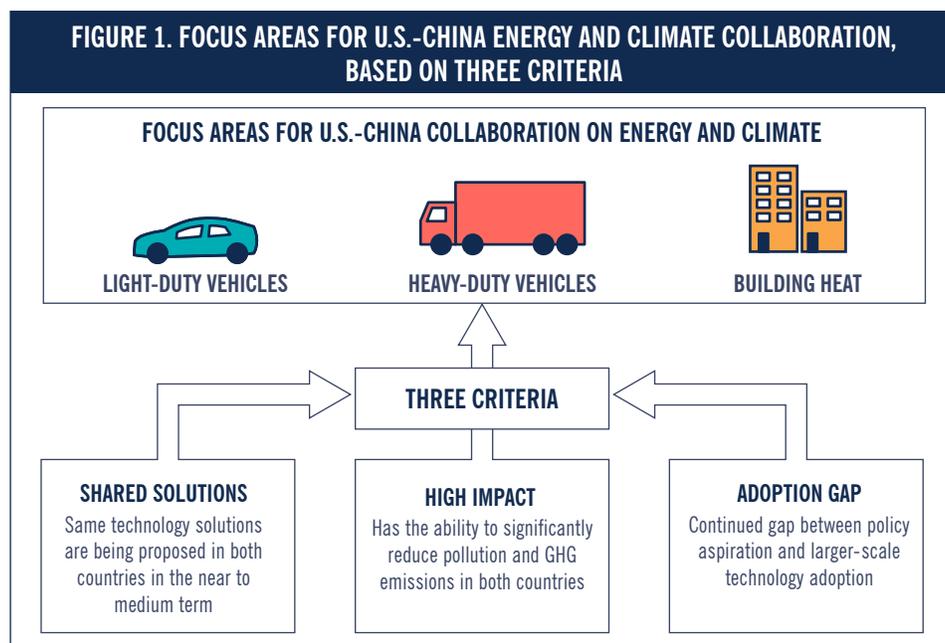
The transition to cleaner energy systems in the U.S. and China can be enhanced and accelerated through cooperation and coordination between the two countries. By coordinating policy direction and opening markets, the U.S. and China can lower the costs and advance the deployment of next-generation, zero-emission energy technologies faster than either country could on its own. Together, the U.S. and China account for nearly 40% of total global energy use, have nearly \$10 trillion of annual investment capital, and spend tens of billions of dollars on energy-related research and development.²

Zero-emission energy technologies will also enable significant reductions in air pollution and improvements in public health across both the U.S. and China, in cities like Beijing, Los Angeles, Houston, Pittsburgh, Tianjin, and Wuhan. In some regions, such as Northern China's Jing-Jin-Ji region and the Los Angeles Basin, meeting stringent air quality standards will likely not be feasible without large-scale adoption of zero-emission vehicles and buildings.

Effective cooperation and coordination require a common, focused vision. To contribute toward that vision, this report identifies three technology areas where near-term collaboration could have a transformative long-term impact: light-duty vehicles, heavy-duty vehicles, and space and water heating in buildings (Figure 1). Each area meets three criteria: (1) proposed solutions in the U.S. and China have focused on the same or similar technologies (shared solutions); (2) technological change in that area is pivotal to meeting climate goals and air quality standards in both the U.S. and China (high impact); and (3) there is a continued gap between policy vision and the pace of technology adoption (adoption gap).

¹ For energy use estimates, see IEA (2017a); for GHG emissions estimates, see the Climate Watch website, available at www.climatewatchdata.org/.

² For final energy consumption estimates, see IEA (2017a). Annual investment capital is based on annual investment in reported national income accounts, from the Bureau of Economic Analysis (U.S.) and National Bureau of Statistics (China). Energy-related R&D spending is a conservative estimate, based on IEA (2017b) and PwC (2018).



Although government policies have already begun to drive adoption of zero-emission vehicles and buildings, there is still a large gap between current levels of adoption and the levels needed to make meaningful reductions in GHG emissions and improvements in air quality over the next decade. For instance, together the U.S. and China now have more than 1 million electric cars on the road, but electric cars still account for less than 2% of car sales in both countries.³

Long-term plans and goals in both countries imply a significant scale-up of zero-emission vehicles and buildings by 2030 (Figure 2). However, scaling-up adoption to these levels will require addressing a chicken-and-egg problem: higher costs and lower convenience of new technologies limit demand for them, but higher costs and lower convenience are partly the result of small manufacturing scale, underdeveloped supply chains, and lack of supporting infrastructure, which in turn are limited by a lack of demand.

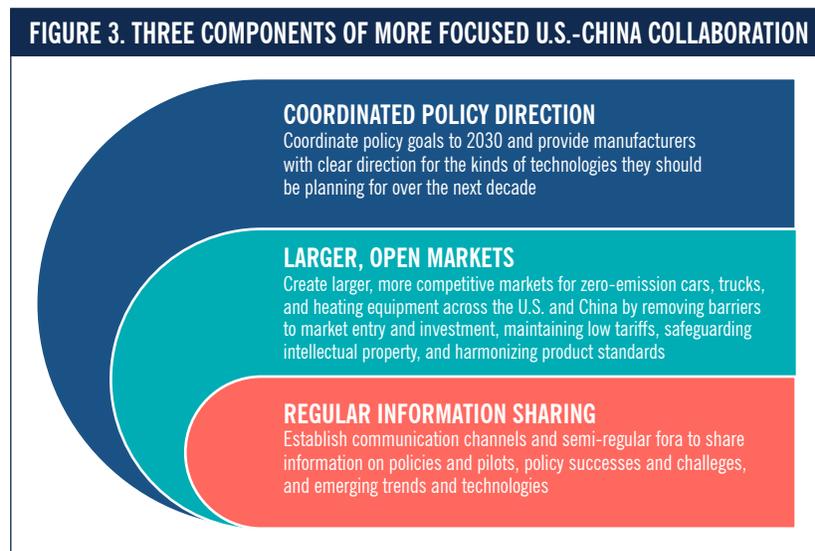
FIGURE 2. FOCUS AREAS FOR U.S.-CHINA ENERGY AND CLIMATE COLLABORATION, BASED ON THREE CRITERIA

	LIGHT-DUTY VEHICLES existing goals imply more than one hundred million zero-emission vehicles on the road in the U.S. and China by 2030
	HEAVY-DUTY VEHICLES long-term plans imply hundreds of thousands of fuel cell and electric trucks on the road in the U.S. and China by 2030
	BUILDING HEATING existing goals and long-term plans imply hundreds of thousands of new all-electric buildings in the U.S. and China by 2030

³ IEA (2017c).

National and local policy will be critical for bridging these adoption gaps. However, focused collaboration between the U.S. and China could also play a pivotal role in accelerating adoption of zero-emission vehicle and building technologies.

This collaboration would include three components: (1) *coordinated policy direction*, whereby governments in both countries jointly commit to medium- to long-term goals for zero-emission vehicle and building technologies, to provide clear signals to manufacturers and financial institutions; (2) *larger, open markets*, where the U.S. and China seek to create a large, common market for zero-emission vehicle and building technologies and their supply chains, through reciprocal efforts on trade tariffs, standards harmonization, protection of intellectual property rights, and regulations governing investment and market entry; (3) *regular information sharing*, whereby government agencies establish semi-regular fora for exchanging information on supporting policies and pilots, policy successes and challenges, and emerging trends and technologies (Figure 3).



This approach to collaboration would mark important shifts in U.S.-China cooperation on energy and climate. It would focus on a core set of technologies that have significant environmental leverage, rather than a more comprehensive strategy that results in significant breadth but little depth. It would shift cooperative activities from a focus on investments in joint research and innovation centers to negotiated, reciprocal activities around trade and commerce.

U.S.-China collaboration focused on vehicles and buildings could be globally transformative, enabling cleaner air and lower GHG emissions in both countries but also buying down the cost of zero-emissions technologies for lower-income countries. For industry, the scale of markets for zero-emission passenger cars, heavy-duty vehicles, and building heating technologies in the U.S. and China could be on the order of trillions of dollars by 2030.

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