Environmental Defense Fund

BOOSTING CHINA'S GREEN TRANSITION

ENVIRONMENTAL DEFENSE FUND CHINA

2023 REVIEW

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Greetings from Beijing,

The COP 28 UN Climate Change Conference concluded with a historic agreement among nearly 200 nations to transition away from fossil fuels and avert the worst impacts of climate change. This fresh commitment marks the start of a new era of accelerated worldwide climate action. As the world's biggest contributor to climate pollution and the largest manufacturer of wind turbines, solar panels, and electric vehicles, China can – and must – play a critical role in stabilizing global climate change.

As the well-known Chinese adage goes, "a journey of one thousand miles can never be made without accumulating every single step." For twenty-five years, thanks to our committed donors and partners, EDF has worked tirelessly to build China's momentum to stem climate change. And in 2023, the country took a series of monumental steps that promise to accelerate China's role in leading climate action on the global stage. In a major shift, the government officially pivoted from its long-time focus on reducing energy consumption to reducing carbon emissions — a move that will more directly address the largest long-term driver of climate change. It laid the foundation for the country to set a mass-based cap for its top climate goals in 2035 and beyond. Meanwhile, the central government's Beautiful China plan created an official policy framework that guides industry and societal measures that will protect and restore China's vital ecosystems, clean the air, and improve people's quality of life. EDF is proud to have played a role in bringing about these milestones through rigorous scientific research, sustained policy advocacy, and effective partnerships across every industrial sector. China's steps in 2023 dramatically expand EDF's opportunities to help the country achieve climate goals that will make a global impact.

Now, EDF's greatest task in China lies in strengthening national climate commitments and transforming them into swift action with tangible results. Our goal is to help China peak its emissions as quickly as possible using tools and strategies that resonate with decision makers and policymakers. We aim to support China in **significantly reducing carbon emissions by 2035** by identifying and promoting robust **decarbonization pathways**, expanding **market-based solutions** like the national Emissions Trading System (ETS), and promoting **technological solutions** to reverse the tide of climate pollution. We also leverage **EDF's global reach** to support regionally-tailored strategies to reduce planet-warming pollution.

Please join the EDF China team in celebrating the achievements of the past year, made possible with the steadfast support of our partners and supporters. Together, we moved mountains in 2023, and we look forward to achieving new heights in 2024 in our pursuit of a greener, more sustainable future.

QIN Hu

VP, Chief Representative China
Environmental Defense Fund

SIGNIFICANTLY REDUCING CHINA'S CARBON EMISSIONS BY 2035

China has committed to peak carbon emissions before 2030 and reach carbon neutrality before 2060 while the government's Beautiful China initiative provides the framework to move the country towards a greener economy and bolster ecological protections by 2035. However, in many cases, the concrete actions needed to dramatically reduce China's emissions from peak levels have yet to be developed or announced.

Based on our extensive research and engagement, EDF sees clear opportunities for China to achieve carbon peaking and neutrality at a faster pace than would be required to simply meet its goals. By pursuing critical carbon reduction opportunities, policy instruments, and technologies, EDF is working to set China on a path to exceed its climate commitments and dramatically reduce its carbon emissions from peak levels by 2035.

PATHWAYS FOR A BEAUTIFUL CHINA

To assist China in quickly peaking and substantially reducing climate pollution by 2035, EDF works with partners to identify and deliver actionable, feasible pathways to drive down carbon emissions that can inform national decision-making. EDF's rigorous climate models point to policy and technical solutions that government and industry can prioritize to rapidly and effectively reduce climate pollution and stem global temperature rise. EDF's trusted reputation in China allows us to engage with influential organizations, industry decision-makers, and policymakers to help build confidence around our climate solutions and raise China's ambitions for stronger climate actions. We also work to drive progress towards the energy transition at the local and regional levels, delivering research, policy, and industry engagements in the Yellow River Basin – home to 80% of China's coal production. Progress toward a green energy transition in this region can be a powerful test case to accelerate decarbonization nationwide.

2023 Achievements

Identified accelerated pathways to dramatically reduce carbon emissions from China's energy sector by 2035. The China Energy Modelling Forum, co-founded and led by EDF China, published a report showing that China can feasibly peak emissions before 2025 and achieve a 35%-40% reduction in emissions from peak levels by 2035. These findings enabled EDF to advance discussions with influential members of China's government, fostering their confidence in policies that align with national climate targets and prevent the most severe consequences of climate change.

Supported the development of a new power system and engaged with decision-makers and policymakers to advance power sector decarbonization. Power generation in China accounts for nearly half of the country's carbon emissions, largely because the sector relies heavily on coal. EDF's research shows that cutting emissions in the power sector could contribute more than 40% of the reductions needed to achieve China's climate goals by 2035. Therefore, EDF and the China Electricity Council established a special working group to shape the standards and guidelines that govern a new, low-carbon power system.

Proposed a sustainable pathway for a low-carbon transition in the Yellow River Basin with an eye towards protecting the local environment. Aside from being China's main coal production base, the region holds abundant potential for renewable energy sources, and its ecosystem and water resources are highly vulnerable to climate change. EDF research laid out a comprehensive formula that policymakers could adopt to reduce coal production; support the basin's water, energy, food, and ecology systems; ensure energy security; and create prosperous livelihoods for citizens and the country, alike. EDF used these findings to mobilize local government action to foster the region's ambitions to move from a coal-dependent economy to a low-carbon economy. We developed materials and met with local business and community leaders to show how a framework that seeks to optimize the region's unique intersection of water, energy, agriculture, and natural resources can help improve the way that the river basin is managed to benefit communities, the environment, and the climate.

MARKET-BASED SOLUTIONS

Carbon markets are an essential policy instrument for reducing climate pollution today and in the long term. By making companies pay for their carbon emissions, markets create economic incentives that make it more attractive for firms to cut greenhouse gas emissions than to continue climate-polluting practices.

China launched its national ETS in 2021 after years of EDF's support conducting research, providing training, and building trust and buy-in from high level stakeholders. Today, China's carbon market is the largest in the world; however, it currently oversees only the country's power sector — responsible for about 40% of national and 12% of global CO_2 emissions. The government plans to expand the ETS to include more high-emitting industries and eventually cover about 70% of China's carbon emissions. Additionally, China launched a new voluntary carbon market in January 2024, which will channel financing to initiatives that benefit the climate, ecosystems, sustainable development, and people's livelihoods. The mandatory carbon market (ETS) and voluntary carbon market will form China's comprehensive carbon market system, working in tandem to offer financial incentives for enterprises across China's economy to emit less climate pollution.

With strategic academic and policy partners, EDF provides research and regulatory guidance to ensure that China's carbon market maximizes its potential to reduce climate pollution while benefitting participating industries.

2023 Achievements

Advocated for and contributed to the first ever climate-related regulation from China's State Council. Since 2017, EDF has worked steadily to advocate for strong regulations to govern the ETS. This work came to fruition in January 2024, when the State Council released an official ETS management decree that includes many of EDF's recommendations to make the ETS a more effective tool to reduce carbon emissions. The decree elevates the governance of China's ETS from the ministry level to the State Council level and imposes harsh penalties with data quality control measures to ensure enterprises' compliance.

Prepared new industries to join China's carbon market. The sectors that will ultimately be covered by the ETS – such as steel, aluminum, petrochemical, and aviation – will face widely varying challenges and opportunities as they integrate into the market. EDF convened industrial working groups for each sector, which provided opportunities for industry leaders in each sector to inform the government's expansion planning process. These working groups secured critical buy-in from industries that will facilitate a faster, smoother, and more effective expansion process. We also set up a new Emissions Trading Expert Committee to work closely with government agencies to steer the national ETS's future development.

Helped launch China's voluntary carbon market as a key element of China's integrated carbon market system. As part of a comprehensive program of support for the voluntary carbon market, EDF worked with China's Ministry of Ecology and Environment (MEE) and the National Center for Climate Change Strategy and International Cooperation to help develop policies that equip the voluntary market to maximize emission reductions through high-quality carbon credits. With support from EDF, the MEE finalized and published the voluntary market regulations with a series of rules and methodologies in late 2023, and President Xi Jinping has affirmed that the voluntary carbon market is expected to create huge green market opportunities. Some estimates project that the voluntary market could potentially reach ¥20 billion ($2.8 billion) by 2025.

PROMOTING LOW-CARBON TECHNOLOGIES

Scaling green and low-carbon technologies is an essential element of achieving China's carbon peaking and neutrality goals. While China is a global leader in the climate tech industry, there is a great need and opportunity to develop cost-effective ways to expand applications of existing technologies. At the same time, we must continue research to create new solutions that can help significantly reduce greenhouse gas emissions by 2035.

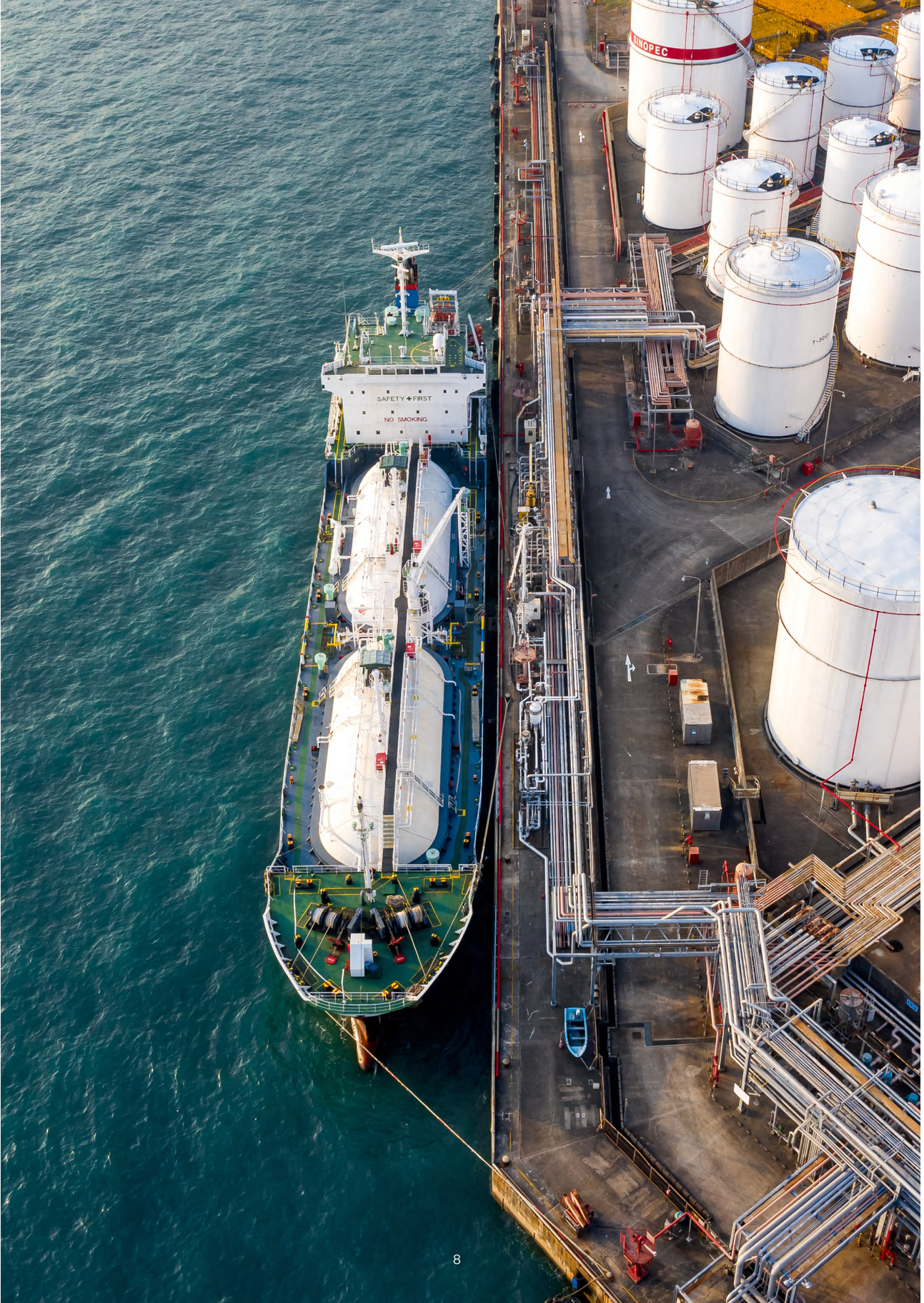
EDF delivers demonstration projects that show how existing technologies can be deployed to drive decarbonization while also advancing research on new, scalable technologies that can further accelerate carbon neutrality. Our work with strategic partners aims to draw policymakers' attention to technologies that can spur green development in both urban and rural areas, and in carbon-intensive industries.

2023 Achievements

Encouraged the adoption of green technologies in urban communities nationwide through our pilot in Beijing. In previous years, EDF supported the development of Haotian Carbon Neutral Park, which showcases low-carbon technologies and provides residents with green space while offering a model as China seeks to create and restore almost 250,000 acres of parks and urban green spaces by the end of 2025. The Haotian park has been promoted in the media and at COP 28 as an excellent case study for urban communities fighting climate change. To build upon the park's success, we prepared guidelines for cities to develop similar carbon neutral parks. Our guidance has been adopted as the official standard to be replicated across the country.

Developed a plan to help governments expand low-carbon rural revitalization projects. Together with partners, we developed an action plan for Wuyi County in Zhejiang Province as local authorities plan to construct low-carbon pilot projects in Liucheng Town and Shanghuang Village. This work has already informed an official rural renewal plan that will help scale our recommendations countywide and the Wuyi County government has endorsed our action plan.

Organized convenings with our partners to support emerging climate technologies, including hydrogen, sustainable fuels, long-term energy storage, and long-distance freight transportation. These events brought together policymakers, entrepreneurs, and experts to discuss the opportunities that climate technologies present and challenges facing efforts to scale them. The discussion and findings have been submitted to the MEE as a reference to inform policies guiding the development and deployment of green technologies in China. For example, through our efforts, China's provincial and national governments are paying more attention than ever to developing green hydrogen and have launched several regional policies throughout 2023. Whereas in most of the country hydrogen is only permitted to be produced in chemical industrial parks, provinces like Hebei and Guangdong and cities like Dalian and Lu'an have begun to permit green hydrogen production outside such parks.



HARNESSING EDF'S GLOBAL REACH TO ACHIEVE CHINA'S GOALS

As an authentically global organization, EDF leads programs in more than 30 countries worldwide to help stabilize the climate, strengthen the ability of people and nature to thrive, and support people's health. In addition to the China-specific work detailed above, EDF applies our deep expertise from these global initiatives to advance China's climate impact. This work includes:

Supporting Methane Mitigation

As the world's leading emitter of methane, China accounts for nearly 16% of global methane emissions. EDF partnered with national and provincial officials to help develop the country's first national methane action plan. The plan sets an explicit framework for how methane is used and monitored, focusing on high-emitting sectors like coal, oil and gas, agriculture, and waste. Many of EDF's recommendations are reflected in the plan, including those on key topics like satellite monitoring technology, market-based policies, and global cooperation. At the local level, technologies tested by EDF in Shanxi Province to measure and reduce methane emissions from coal mines have been incorporated into a provincial coal mine action plan. This marks a major step in scaling up the use of these technologies to reduce coal mine methane, which is responsible for about 40% of China's methane emissions.

Getting Hydrogen Right

In 2022, China produced nearly 30% of the world's hydrogen. While hydrogen holds tremendous potential to drive decarbonization across the economy, it is also a tiny, leak-prone molecule that can indirectly warm the climate. EDF commissioned the China Hydrogen Alliance to conduct a study on hydrogen emissions across the value chain in China and worked with the MEE to organize a workshop with experts and hydrogen energy companies to better understand the climate impact of hydrogen. During COP28, EDF launched an initiative to promote international cooperation for safe, climate-beneficial, sustainable hydrogen development that controls hydrogen leakage in partnership with the Foreign Exchange and Cooperation Center, an affiliate of China's MEE, and other organizations and companies that are involved in China's hydrogen industry.

Ten Years of Climate Corps China

Last September, EDF commemorated the 10th anniversary of Climate Corps China, our global program that equips young professionals with the connections and skills necessary to drive climate progress. In the past decade, the program has recruited over 200 postgraduate students who have been embedded in more than 40 companies across China. Climate Corps China fellows have identified over $100 million in cost-saving opportunities, equivalent to about half a million metric tons of greenhouse gas emissions to be avoided in China.

The program's 2023 cohort supported companies like GE Aviation, LONGi Green Energy Technology Company, Foxconn Industrial Internet Company, KAS Shanghai Co., and Shanghai Roche Pharmaceutical. Fellows worked on projects that strengthened corporate sustainability and identified emissions reductions, for example:

- Xuecong Pu, who is studying at Zhejiang University, supported Walmart China by working to introduce innovative solutions to reduce food waste and carbon emissions. His project converted various forms of food waste into animal feed across 45 distribution centers in China, offsetting 767.6 metric tons of CO_2e emissions over six months, offering substantial benefits while reshaping industry practices.

- Guoying Zhu, a student at Peking University, was placed at Covestro Polymers, where he worked to streamline the company's energy usage efficiency in manufacturing facilities. His recommendations are projected to yield annual electricity savings exceeding 3 million kWh, equating to a reduction of 255 $MtCO_2e$ emissions annually.

Equipping Local Governments to Provide Clean Air

We can only tackle air pollution once we know where it comes from. In Jinan, a city in East China's Shandong province, EDF China partnered with Tsinghua University to launch a system that monitors air quality at the "hyperlocal" level and precisely determines pollution sources. We use EDF's online Air Tracker tool and incorporate local meteorological data, air quality measurements, and emissions inventory to pinpoint sources of pollution and their impacts. With this data, we work with local government officials to help develop targeted control measures to reduce both air pollution and carbon emissions. Ultimately, we plan to expand the system in Jinan to cover the entire city of 9 million people.

Advancing Climate-resilient Food Systems

EDF and partners promoted a pilot that would set catch limits in the Bohai Sea to encourage sustainable fishing practices. We worked with Shanghai Ocean University, Stony Brook University, Qingdao Marine Conservation Society, and other research organizations to evaluate the performance of similar pilots that have been undertaken at the provincial level, and provided science-backed policy recommendations to officials. We are advocating for an ecosystem-wide multispecies program in the Bohai Sea that can restore declining fish populations and nurture a climate-resilient marine ecosystem.

We also launched a project to enhance degraded land in the largest grazing pastures in southern China, the Nanshan State Farm. Overgrazing and continuous use of these pastures has compromised 83% of the land, with severely degraded areas seeing 67% lower yields. To reverse these impacts, we are working with farmers, scientists, and officials to help move towards sustainable practices like rotational grazing methods. These practices promise to improve milk yield, animal health, and farmer livelihoods while reducing methane and carbon intensity.

To advance low carbon transformation of agrifood system and promote domestic and international cooperation, we also initiated the International Forum of Low-Emission Agrifood Systems together with China Agricultural University and CGIAR Mitigate+.

2024 OUTLOOK

If the world is to avoid climate catastrophe, China must be an integral part of stabilizing the climate. This is not only because China is the world's largest emitter of greenhouse gases, but also because it is a global leader in providing solutions that will be critical in a low-carbon future—for example, the country is the largest producer of renewable energy technologies and electric vehicles.

China has committed to updating its Nationally Determined Contributions in 2025 and announcing climate goals for 2035. This opens a window of opportunity for EDF to share our research results with decision-makers, businesses, and other researchers to build consensus around strong goals that can lead to fundamental changes. To capitalize upon this, over the next year, we plan to:

- **Continue our efforts towards a Beautiful China by 2035.** Beyond advancing our work that supports China's carbon market expansion and a low-carbon transition in the Yellow River Basin, we will also focus on helping China accelerate industrial decarbonization, develop a low-carbon power grid, adopt widespread renewable energy sources, and ensure a just transition for coal-producing areas of the country.

- **Helping to curb short-lived greenhouse gases.** We will work with partners to build upon the momentum from China's methane control action plan to help improve the government's capacity to regulate and reduce methane. We will also support decision-makers seeking to develop China's hydrogen industry in a manner that is more beneficial to the climate, ensuring that hydrogen leakage is accounted for and minimized throughout this process.

- **Seizing upon opportunities for international climate collaboration.** We will explore opportunities for China to further support developing countries' decarbonization efforts, for example–by advancing renewable energy adoption and supporting carbon pricing cooperation—and also facilitate dialogue with the United States and European Union on faster renewable deployment.

EDF'S GLOBAL PRESENCE

Environmental Defense Fund is sharply focused on addressing the climate crisis and achieving our vision of a vital Earth for everyone.

We work with a wide array of partners and allies worldwide to spark innovative solutions to stabilize the climate, strengthen the ability of people and nature to thrive, and support people's health. Our staff are located in 30 countries, with a strategic focus on four geographies that contribute the greatest share of the world's climate pollution— Europe, India, China, and the United States.

EDF has been a trusted presence in China for nearly three decades, widely recognized for bringing deep economic, scientific, corporate partnership and policy advocacy expertise to China's pressing environmental work. We were the first NGO registered with the Ministry of Ecology and Environment under China's 2017 foreign NGO law, and we serve as an advisor on China's highest international advisory body on the environment. Considering the myriad national and global challenges facing China's emissions reduction efforts, we are well positioned to engage with key government, private sector, and research stakeholders to maintain momentum for climate action to ensure a vital Earth for all.

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