

The Influence of US-China Climate Policies on India's Renewable Energy

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Abstract

This article looks at how the climate policies of the United States and China affect India's efforts to grow its renewable energy sector. India is one of the world's biggest energy users and polluters, and it's trying hard to switch from coal and oil to cleaner sources like solar and wind power. But India doesn't make these changes alone—what the US and China do on climate issues has a big impact on India's progress. Both the US and China are major players in global climate talks and technology, and their decisions influence trade, investments, and partnerships in India's energy market. Sometimes their policies clash, sometimes they work together, but either way, India has to figure out how to balance its own energy goals while dealing with the effects of these two big powers. This article explores how the US and China's climate strategies shape India's renewable energy plans. It looks at how India navigates this tricky situation, balancing its own needs with outside pressures and opportunities. It also uses ideas from international relations and environmental studies to understand why the US and China act the way they do on climate issues, and what that means for India. By asking important questions about these influences, this study shows what the effects are on India's economy and environment, and how the world's response to climate change is shaping India's future. It also discusses what all this means for creating a cleaner, greener planet—not just for India, but globally. In the end, this article hopes to give a clear and balanced picture of how global climate politics affect India's path to sustainable energy. It aims to help anyone interested in climate policy, international relations, and the future of clean energy understand what's happening and why it matters.

Keywords: climate policies, international relations, clean energy, global climate, China

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Introduction

Climate change is one of the biggest challenges we face today. Around the world, countries are working hard to reduce their reliance on fossil fuels like coal and oil and switch to cleaner energy sources such as solar, wind, and hydropower. This change isn't just about protecting the environment — it's also about how countries shape their economies and work together globally. Two of the biggest players in this fight are the United States and China. They are the world's largest economies and also the biggest producers of greenhouse gases. Because of this, the choices they make about climate and energy have a huge impact—not just on themselves, but on the whole world. Their policies influence everything from how renewable energy technology is developed and shared, to how investments flow across countries, to how nations cooperate (or compete) on climate goals (Singh, 2021).

India is a key part of this story. It's a fast-growing country with a huge population and rapidly rising energy needs. India wants to grow its economy while also tackling pollution and climate change, so it has set big goals for using more renewable energy (IRENA, 2023). But India's energy plans don't happen in a vacuum. The US and China both have a lot of influence on India's renewable energy sector in different ways. The US provides technology, funding, and diplomatic support for clean energy, while China is a major manufacturer of solar panels and wind turbines, and also invests heavily in energy projects around the world (Raghavan & Koo, 2022).

This article looks at how the climate policies of the US and China affect India's efforts to expand renewable energy. It explores the opportunities this creates for India, as well as the challenges of balancing outside influences with India's own priorities. Understanding this is important because what happens in India matters for the whole world's fight against climate change (Dubash & Rajamani, 2019).

We'll also see how India manages its relationships with both countries—sometimes working with them, sometimes trying to keep its independence. The choices India makes will influence not only its own future but also the future of clean energy globally.

Theoretical Framework

- ❖ **How US and China's Climate Policies Influence India: A Simple Explanation Using Four Key Ideas**

To really understand how the United States and China affect India's renewable energy choices, it helps to look at some ideas from international relations and environmental policy. These ideas help explain why countries act the way they do and how different influences shape India's energy path. I'll explain four important perspectives that give us a clearer picture: Realism, Liberalism, Constructivism, and Energy Security.

❖ **Realism: Power and Competition Between Countries**

Realism is one of the oldest ways to think about international politics. It says that countries are mainly interested in protecting their own power and security because there's no global police to keep order. Countries act in their own best interest, often competing or even fighting to become stronger.

From this point of view, the climate policies of the US and China aren't just about protecting the planet. They are also about showing who's the most powerful and getting economic advantages. Both countries want to be seen as leaders in clean energy, because that can give them more influence in the world.

- The United States tries to stay ahead by pushing new clean energy technologies and encouraging other countries (like India) to follow its example. It uses climate agreements and investments to build partnerships that support its leadership.
- China has become the biggest producer of solar panels and wind turbines and uses its huge manufacturing power to help other countries build clean energy. Through projects like the Belt and Road Initiative, China invests in energy infrastructure in many countries, including some close to India, to increase its influence.

For India, this means dealing with two powerful countries that both want to shape its energy future—but in different ways. India has to carefully balance its relationships because it doesn't want to be too dependent on either side. It's a bit like walking a tightrope between two giants competing for control.

❖ **Liberalism: Cooperation and Working Together**

Liberalism offers a more hopeful way to think about global politics. It says that even though countries have their own interests, they can work together through agreements and organizations to solve big problems like climate change.

One example is the Paris Agreement, where almost every country, including the US, China, and India, promised to cut greenhouse gas emissions. This kind of international cooperation shows how countries can come together for a common cause.

- The US and China both played important roles in making the Paris Agreement happen, even though they sometimes compete.
- For India, international agreements open doors to financial help, technology sharing, and support from global organizations. This helps India grow its renewable energy faster.

However, cooperation isn't always smooth. The US pulled out of the Paris Agreement for a few years and returned later, which made the process uncertain. Also, tensions between the US and China sometimes make it harder for countries like India to work with both.

Still, liberalism helps explain why India participates in global talks and follows some international rules even while trying to protect its own interests.

❖ **Constructivism: How Ideas and Identity Shape Behavior**

Constructivism is about how countries act based on who they believe they are and what they think is “right.” Instead of just focusing on power or rules, it looks at the role of ideas, culture, and beliefs.

India sees itself as a responsible country that wants to develop but also protect the environment. This identity shapes how it makes climate policies. India also pushes for fairness—arguing that richer countries like the US and China should do more because they've caused most of the pollution in the past (UNFCCC, 2015).

- India often talks about “common but differentiated responsibilities,” meaning everyone should fight climate change, but richer countries should help more.
- India also wants to keep control over its own decisions and not be forced to follow rules that hurt its growth or make it too dependent on others.

The US and China also have their own “climate identities.” The US pushes for market-based solutions and innovation, encouraging India to adopt similar approaches. China promotes a development model focused on building infrastructure and transferring technology quickly.

India has to navigate between these different ideas and values while deciding how to develop its renewable energy sector.

❖ **Energy Security: Making Sure Energy is Reliable and Affordable**

Energy security means having steady access to the energy a country needs at a price it can afford. For India, this is very important because it needs more energy as its economy and population grow.

Right now, India depends a lot on coal and imports oil and gas, which can be expensive and unstable. India wants to use more renewable energy to reduce this risk, but switching to renewables requires new technologies, money, and equipment—much of which comes from other countries.

- The US helps India by sharing technology, offering funding, and working together on clean energy projects.
- China is a major supplier of affordable solar panels and batteries, making it easier for India to build renewable energy systems. But because of political tensions, India is sometimes wary about relying too much on Chinese technology.

India's goal is to balance its energy needs by diversifying where it gets energy and technology from. It wants to avoid being dependent on just one country or one energy source to keep its energy secure.

Putting It All Together: A Complex Picture

When we combine these four ideas, we see a complicated but clear picture of how the US and China influence India's renewable energy sector:

- Realism helps us understand the competition and power struggles between the US and China, and how India tries to manage those pressures.
- Liberalism shows the importance of international cooperation and agreements that support India's renewable energy growth.
- Constructivism reveals how India's identity and ideas about fairness shape its climate policies and how it interacts with the US and China.
- Energy Security explains India's practical concerns about having reliable and affordable energy, which affect how it accepts or resists foreign technology and investments.

India is trying to grow its renewable energy while managing relationships with two global powers that sometimes push different ideas and interests. It's about finding a balance—working with others without losing control over its own future.

Why This Matters

India's renewable energy transition is important not just for India but for the whole world. India's success will affect global efforts to fight climate change. By understanding the influences of the US and China through these different perspectives, we get a better idea of the challenges and opportunities India faces.

This understanding helps governments, businesses, and researchers create better strategies that support India's goals for a clean, affordable, and secure energy future—while recognizing the complex politics behind those efforts.

The Impact of US and Chinese Climate Policies on India's Renewable Energy Investments

This explores the direct impact of the US and China's climate strategies on India's choices when it comes to clean energy. Both countries have very different approaches to fighting climate change and promoting renewable energy (IEA, 2023). The US often focuses on innovation, advanced technology, and partnerships that emphasize transparency and market-driven solutions. China, on the other hand, leads the world in manufacturing affordable solar panels and wind turbines, and supports infrastructure projects across many countries, including India's neighbors.

We want to understand how these different policies shape India's investments in solar, wind, and other renewables. For example, does India prefer buying technology from China because it's cheaper? Or does it work more closely with the US for knowledge-sharing and funding? This question looks at how India makes these choices and how US and Chinese climate policies pull India in different directions.

The Role of International Agreements and Diplomacy in Shaping India's Energy Transition

Global agreements like the Paris Agreement bring countries together to fight climate change as a team (UNFCCC, 2015). But they also create a framework where

countries influence each other's policies through cooperation, funding, and shared goals. This question digs into how such agreements, along with one-on-one relationships India has with countries like the US and China, help shape India's renewable energy journey.

For instance, how do these agreements encourage India to set ambitious renewable energy targets? How do bilateral deals—like partnerships on clean energy research or investments— help India build its renewable sector? This question also considers how India balances its international commitments with its own national development priorities.

Navigating Superpower Rivalry: India's Balancing Act Between the US and China

This is a key matter, because India is caught between two major powers with different priorities and approaches (Singh, 2021). The US and China are both offering support and opportunities in renewable energy, but they also have strategic and economic interests that don't always align.

Here, we want to explore how India navigates this tricky situation. Does it lean more toward one country in certain areas, like technology or financing? Does it try to keep a middle ground? How does India protect its own interests and sovereignty while benefiting from partnerships with these global giants? This question looks at India's strategy for balancing these influences without losing control of its own energy future.

Renewable Energy and India's Foreign Policy: Positioning in the US-China Rivalry

India's move toward renewable energy isn't just about the environment—it's also a key part of its bigger foreign policy strategy. India wants to show the world it's a responsible player tackling climate change, which helps it build stronger relationships with countries like the US and other Western nations.

At the same time, India has a complicated relationship with China. It trades and cooperates with China on many levels but also sees China as a strategic rival. So, India's decisions on renewable energy try to take advantage of Chinese technology

without becoming too dependent on China (Raghavan & Koo, 2022), while also deepening ties with the US through clean energy partnerships.

India also uses its leadership in renewable energy to boost its influence in South Asia by working on regional projects and climate cooperation, which helps strengthen its position in the neighborhood (Sarma & Dubey, 2023). So, India's energy plans are part of a bigger picture—helping it balance between the US and China, build alliances, and play a stronger role on the world stage.

Impact on India's Renewable Energy Sector

❖ Opportunities

Technology Transfer: One of the biggest advantages India gets from working with both the US and China is access to some of the latest and most advanced renewable energy technologies. The US is known for pushing the boundaries with innovation—think cutting-edge solar panels, smarter wind turbines, and energy storage solutions that make clean energy more reliable (IRENA, 2023; Dubash & Rajamani, 2019). When American companies and research institutions partner with India, it's not just about selling equipment—they often share knowledge, provide training, and help build India's own technical expertise. This kind of support can be invaluable as India tries to build a strong, homegrown renewable energy industry (Singh, 2021).

China, meanwhile, has become the world's factory for affordable solar panels, wind turbines, and batteries. Chinese companies produce this equipment on a massive scale and at prices that are hard to beat. That means India can roll out renewable projects more quickly and cost effectively by tapping into Chinese technology (IEA, 2023). So, India benefits from both the US's innovative edge and China's production power—a rare and powerful combination that can really boost its clean energy ambitions.

Financing and Aid: Another big opportunity is the financial support that comes along with climate commitments from both countries. The US provides funding through a variety of climate aid programs, green bonds, and partnerships with development banks. This financial backing is crucial because starting renewable energy projects often requires a lot of upfront money, which can be a major hurdle (World Bank, 2024).

China also plays a big role here, investing heavily in energy infrastructure through initiatives like the Belt and Road. Sometimes, China offers loans and subsidies that make it easier for India to get these projects off the ground (Raghavan & Koo, 2022). This mix of US and Chinese financial support doesn't just provide money—it also reduces risks for private investors, encouraging more people to put their money into India's renewable energy future. With more funds flowing in, India can plan bigger and more ambitious projects, speeding up its journey toward clean energy.

Market Development and Competition: The competition between US and Chinese companies in India's renewable energy market creates a healthy push for progress. When businesses from both countries compete for contracts, it drives them to innovate, improve their products, and lower prices. This kind of rivalry benefits India because it leads to better technology and more affordable options for building solar farms, wind power plants, and other renewable energy infrastructure (Sarma & Dubey, 2023).

It also pushes Indian companies to up their game, adopting new technologies and becoming more efficient. Over time, this helps build a stronger domestic industry that's well-prepared to meet India's growing energy needs in a clean and sustainable way. So, this competition isn't just good for India's energy sector today—it helps lay the groundwork for a brighter, greener future.

❖ Challenges

Geopolitical Tensions and Strategic Dilemmas: One of the toughest challenges India faces is navigating the bigger political rivalry between the US and China. These two superpowers are competing for global influence, and India finds itself caught in the middle. On one hand, India wants to maintain good relations with both, but on the other, it doesn't want to get dragged into their conflicts (Sarma & Dubey, 2023).

This puts India in a tricky spot when making energy decisions. For example, it might have to decide whether to adopt US or Chinese technological standards—choices that affect costs, compatibility, and even security. Plus, both countries sometimes try to push India toward using their products or following their policies, which can complicate things. India has to carefully balance these pressures so it doesn't lose control over its own energy future. This balancing act is complicated and sometimes slows down progress or raises costs (Singh, 2021).

Supply Chain Vulnerabilities: India relies heavily on Chinese factories for key parts like solar panels and batteries, which makes it vulnerable to supply disruptions. Political tensions, tariffs, or trade bans can suddenly block or delay shipments, slowing down projects and driving up costs (Singh, 2021).

For instance, if there's a border dispute or new sanctions, India might find it hard to get the affordable equipment it needs to build renewable energy plants. This dependence means India has to think about diversifying where it gets these materials or building more of its own factories at home. While Chinese products are often cheaper, relying too much on them can put India's energy security at risk and make it harder to meet its clean energy goals on time (IEA, 2023).

Policy Pressure and Reduced Autonomy: Sometimes, when the US or China offers help, they also come with certain expectations. Both countries might encourage India to adopt policies that serve their own strategic or economic interests, which might not always line up perfectly with what India needs domestically (Raghavan & Koo, 2022).

For example, India could face pressure to open its energy markets in ways that expose local companies to too much competition, or to use specific technologies that benefit foreign firms. These kinds of demands can limit India's ability to craft policies that truly reflect its social, economic, and environmental priorities. So, while partnerships are helpful, India has to work hard to keep its policy independence and make sure its energy strategies serve the country first.

❖ International Response

Global institutions and international frameworks play a really important role in recognizing just how crucial India is when it comes to fighting climate change on a global scale. Groups like the United Nations Framework Convention on Climate Change (UNFCCC), the World Bank, and the International Renewable Energy Agency (IRENA) don't just offer a platform for countries to talk; they also provide funding, technical support, and guidance that help countries like India take big steps toward their clean energy goals. Through these organizations, India can tap into resources and knowledge that are tailored to its own unique situation—balancing rapid growth with the urgent need to reduce emissions (World Bank, 2024).

Take the UNFCCC, for example. It's the place where countries come together to hammer out agreements, share ideas, and support each other in reaching climate targets. For India, this means having a voice in global climate negotiations and access to tools that help it meet its nationally determined contributions (NDCs)—basically, its climate promises (UNFCCC, 2015). The World Bank backs India with loans, grants, and investment programs designed to boost clean energy projects and make the country's energy systems more efficient and resilient to climate impacts. Meanwhile, IRENA focuses entirely on renewable energy, offering India the latest research, data, and international partnerships that speed up its transition to cleaner power sources (IRENA, 2023).

Beyond these big international players, both the US and China have been very active in their own ways when it comes to climate diplomacy with India. The US, for instance, has rolled out a number of initiatives to build stronger clean energy ties with India. This includes helping develop technical skills, sharing innovative technologies, supporting joint research efforts, and encouraging investments that push India's renewable energy sector forward. American organizations and companies often work hand in hand with Indian partners to bring new ideas, improve policy frameworks, and build more reliable energy infrastructure. These efforts not only help India hit its climate goals but also deepen the partnership between the two countries (Dubash & Rajamani, 2019).

China, on the other hand, plays a somewhat different but equally important role. It's one of the biggest suppliers of renewable energy technology worldwide, and India benefits from the availability of affordable solar panels, wind turbines, and batteries made in China. But China's influence doesn't stop there. Its Belt and Road Initiative (BRI) has poured investment into energy projects and infrastructure across neighboring countries, which affects India's regional energy landscape too. While India has been cautious about certain aspects of the BRI, it can't ignore how these projects influence energy security and regional cooperation in ways that indirectly impact its own renewable energy ambitions (Raghavan & Koo, 2022). This means China is both a competitor on the geopolitical stage and a critical partner when it comes to the technology and infrastructure India needs.

All of this together paints a picture of a complex web of cooperation and competition. India has to skillfully navigate this space, making the most of funding, technology, and partnerships offered by global institutions and major powers, while

also managing the geopolitical tensions and strategic challenges that come with it. Understanding this dynamic is key to seeing how India's renewable energy sector is evolving and what it means for the world's fight against climate change.

Conclusion

India's renewable energy goals are closely linked to the climate policies and actions of two global giants: **The United States and China**. Both of these countries bring a lot to the table— whether it's access to advanced technology, financial resources, or opportunities for collaboration. These partnerships can really help India speed up its transition to clean energy and meet its ambitious climate targets. But at the same time, there's a bigger picture to consider: the strategic rivalry between the US and China. This competition creates a tricky situation for India, where it has to carefully balance the benefits it gains from each side while avoiding getting caught up in their larger geopolitical conflicts.

For India to build a sustainable and secure energy future, it can't just rely on outside help. It needs to find a middle path—one that makes the most of international support without losing control over its own energy policies. This means crafting domestic policies that reflect India's unique needs and priorities, while also being flexible enough to work with global partners. At the same time, India will need to strengthen multilateral cooperation—working not just bilaterally with the US and China but also engaging with global institutions and regional players to create a supportive environment for renewable energy growth.

On the home front, policy reforms will be just as important as international partnerships. India must focus on improving regulations, encouraging innovation, building infrastructure, and making sure financing reaches projects that can truly transform its energy landscape. Only by combining strong internal policies with smart engagement on the global stage can India overcome the external pressures that come from the US-China rivalry and other geopolitical challenges.

At the heart of India's clean energy future lies a careful balancing act. On one side, there are huge opportunities coming from global powers like the US and China, as well as from international organizations that provide technology, funding, and support. These resources can give India a powerful boost to expand renewable energy, improve infrastructure, and create jobs. But on the other side, India must

hold firm to its own goals, values, and independence. It can't simply follow what others want—it needs to protect its sovereignty and make sure its energy policies truly serve the country's long-term interests.

This balancing isn't easy. It requires smart diplomacy, strong domestic policies, and the ability to adapt quickly to shifting global politics. India has to carefully weigh every partnership, investment, and agreement to make sure it helps build a sustainable, secure, and affordable energy system for its people. At the same time, India must avoid becoming overly dependent on any one country or external actor, which could limit its freedom to make decisions in the future.

If India can navigate these challenges successfully, the payoff will be huge—not just in meeting its climate targets and powering its growing economy with clean energy, but also in setting an example for other developing countries. Many emerging economies face the same tricky mix of external pressure and internal priorities, and India's experience can offer valuable lessons on how to manage these complexities.

Ultimately, India has the potential to become a global leader in the energy transition, showing the world how a large, diverse, and fast-growing country can move toward a greener future while standing strong on its own terms. This journey will shape not only India's destiny but also the broader global effort to tackle climate change and build a more sustainable planet for everyone.

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