

Green or Grey? Assessing the Environmental Impact of China's Belt and Road Initiative in Europe

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Abstract

China's Belt and Road Initiative (BRI), introduced in 2013, stands as the largest infrastructure development effort of the twenty-first century, creating transport, energy, and trade corridors that connect Asia, Africa, and Europe. Although the BRI offers prospects for economic expansion and greater regional interconnectedness, its environmental consequences—especially within Europe—have become a major point of discussion. Given Europe's stringent environmental laws, varied ecosystems, and strong climate objectives, questions have emerged regarding the alignment of BRI projects with sustainability targets. This research examines the dual nature of the BRI's presence in Europe—evaluating whether it serves as a sustainable, “green” vehicle for investment and innovation or a “grey” driver of ecological harm. Through qualitative methods and thematic interpretation of interviews with specialists, this article identifies both the environmental dangers and possibilities inherent in the initiative. The results indicate that although the BRI may facilitate collaboration in renewable energy, knowledge exchange, and sustainable practices, it also introduces considerable risks such as increased carbon output, harm to biodiversity, ecosystem disruption, and continued reliance on fossil fuels. Additionally, inconsistencies between BRI developments and EU environmental regulations present further obstacles to sustainable execution. The study concludes that the BRI embodies a conflict between developmental and ecological priorities in Europe, underscoring the necessity for stronger policy mechanisms, international environmental cooperation, and engagement from civil society. Policy proposals include harmonizing regulatory benchmarks, implementing thorough and transparent impact evaluations, and integrating eco-friendly technologies in upcoming BRI endeavors.

Keywords: Belt and Road Initiative, Europe, environmental governance, sustainability, green technologies, climate change

1. INTRODUCTION

China's Belt and Road Initiative (BRI), first announced by President Xi Jinping in 2013, represents a transformative geopolitical and economic strategy designed to reshape global trade, infrastructure, and connectivity (Lin, 2020; Zhang, 2017). Inspired by the historical Silk Road, the BRI seeks to expand China's global influence through two complementary networks: the overland Silk Road Economic Belt and the 21st Century Maritime Silk Road (McBride & Berman, 2023). By 2020, China had signed nearly 200 cooperation agreements with over 140 states and 31 international organizations, reflecting the initiative's unprecedented scale (CCICED, 2023). Europe occupies a critical position in this framework, not only as an endpoint of trade corridors but also as a regulatory space with strong environmental norms and ambitious climate goals.

Despite the BRI's promise of growth and connectivity, its expansion into Europe has triggered intense scrutiny. European policymakers, environmental organizations, and scholars question whether the initiative complements or undermines the continent's sustainability agenda. On the one hand, the BRI could enhance sustainable development by promoting investment in renewable energy, green technology transfer, and eco-friendly infrastructure (Fox & Dong, 2018). On the other, it risks aggravating environmental challenges such as biodiversity loss, carbon emissions, and habitat fragmentation caused by large-scale infrastructure projects (Thomsen et al., 2019; Deng, 2019). These divergent possibilities underscore the central tension explored in this article: is the BRI in Europe "green" or "grey"?

Europe is a unique testing ground for evaluating the environmental consequences of the BRI. Unlike many developing regions where regulatory capacity is weak, the European Union (EU) enforces strict environmental regulations, including emissions standards, biodiversity conservation measures, and directives on renewable energy. Furthermore, Europe has positioned itself as a global leader in climate action, aiming for carbon neutrality by 2050 under the European Green Deal. The intersection of these commitments with Chinese-led infrastructure projects creates both opportunities for cooperation and risks of conflict (Heine & Schill, 2019).

The rationale for this study lies in bridging two critical debates. The first concerns the geopolitical and economic significance of the BRI, where scholars highlight its role in reshaping global trade and governance (Ohashi, 2018; Wang, 2012). The second concerns environmental governance, particularly the compatibility of BRI projects with host country laws and international climate commitments (Drescher et al., 2019). By focusing specifically on Europe, this research contributes to a growing body of literature on the environmental dimensions of China's global strategy, situating the BRI within the broader discourse of sustainable development.

1.2 PROBLEM STATEMENT

Although the BRI has the potential to strengthen Europe's infrastructure and trade networks, its environmental implications remain poorly understood. Several pressing challenges emerge:

1. **Ecological Disruption** – Infrastructure projects, including railways, highways, and ports, risk fragmenting habitats and threatening biodiversity (Thomsen et al., 2019).
2. **Carbon Emissions** – Construction activities and reliance on fossil fuel-based energy threaten Europe's climate commitments (Deng, 2019).
3. **Regulatory Misalignment** – Differences between Chinese and European environmental standards complicate project compliance (Breslin, 2019).
4. **Resource Pressure** – Large-scale projects may strain local water, energy, and land resources (Roy & Otsuka, 2017).
5. **Social Dislocation** – Land acquisition and resettlement issues generate societal concerns (Hacker, 2019).

Without comprehensive analysis, Europe risks engaging in projects that undermine its environmental and social sustainability. This article thus interrogates whether the BRI represents an opportunity for green growth or a pathway to grey ecological burdens.

1.3 RESEARCH QUESTIONS

To address these concerns, this study asks:

- What are the positive and negative environmental impacts of China's BRI projects in Europe?
- How do these projects align with European Union environmental laws and climate objectives?
- What opportunities exist for green technology transfer and sustainable cooperation between Europe and China?
- To what extent can civil society and local communities influence the environmental trajectory of BRI projects?

1.4 OBJECTIVES OF THE STUDY

The primary objectives are to:

- Assess the environmental benefits and risks of BRI infrastructure projects in Europe.
- Examine the legal and institutional alignment between BRI implementation and EU environmental frameworks.
- Identify opportunities for embedding sustainable technologies in BRI projects.
- Highlight the role of civil society in shaping greener outcomes.

This article makes three contributions. First, it advances debates on the environmental dimensions of the BRI by situating them within the European context. Second, it informs policymakers by identifying gaps between Chinese-led projects and EU regulatory frameworks, offering pathways for harmonization. Third, it amplifies the role of civil society and non-state actors in promoting sustainability in transnational infrastructure projects. Ultimately, the study underscores the importance of evaluating the BRI not only as an economic strategy but also as an environmental phenomenon with long-term implications.

2. LITERATURE REVIEW

The Belt and Road Initiative (BRI) has become one of the most debated international projects of the 21st century, with scholarship focusing on its economic, political, and environmental dimensions. For Europe, the initiative presents a dual challenge: seizing opportunities for investment and connectivity while managing the environmental costs of large-scale infrastructure development. This section reviews three key strands of literature: (1) global debates on the BRI, (2) the environmental implications of BRI projects, and (3) Europe's specific concerns regarding sustainability and governance.

2.1 Global Debates on the Belt and Road Initiative

Scholars widely agree that the BRI is both a developmental opportunity and a geopolitical tool. Early studies emphasize its role in expanding China's global economic influence by linking Asia, Africa, and Europe through transport and trade corridors (Lin, 2020; Zhang, 2017). Inspired by the

ancient Silk Road, the initiative is not merely an economic plan but a strategic framework that redefines China's relationship with the international system (McBride & Berman, 2023).

Some scholars view the BRI as a “win-win” initiative for global development. Lei and Liqiang (2017) argue that BRI projects have created jobs, increased trade flows, and facilitated growth in partner countries. Similarly, the World Bank highlights that BRI-related infrastructure could significantly reduce trade costs and lift millions out of poverty (Maliszewska, 2019). In this sense, the initiative is positioned as a catalyst for globalization and shared prosperity (CCICED Secretariat, 2023).

Yet others warn that the BRI is more than an economic scheme—it is also a geopolitical strategy aimed at consolidating Chinese influence. Ohashi (2018) describes the BRI as part of China's “grand strategy,” designed to address domestic overcapacity, expand foreign markets, and enhance China's role in global governance. Wang (2012) further argues that the initiative reflects a deliberate westward expansion strategy that counters U.S. influence in Eurasia. These perspectives suggest that the BRI is deeply embedded in power politics, raising questions about its alignment with international norms, including environmental governance.

2.2 Environmental Dimensions of the BRI

The environmental consequences of the BRI have increasingly attracted scholarly attention. Infrastructure development on such a vast scale inevitably affects ecosystems, natural resources, and climate goals. Studies highlight that roads, railways, and pipelines may fragment habitats and disrupt ecological systems (Thomsen et al., 2019). Breslin (2019) notes that hydroelectric dams and water-related projects under the BRI can alter river flows and degrade water quality, with significant implications for agriculture and human health.

Pollution and greenhouse gas emissions represent another major concern. Roy and Otsuka (2017) argue that increased freight transport across Europe under the BRI will exacerbate air pollution and strain urban environments. Deng (2019) adds that the reliance on fossil fuels within BRI projects undermines global climate change efforts, contributing to rising emissions and temperature changes. These studies demonstrate that the BRI has the potential to intensify environmental pressures if sustainability safeguards are not embedded.

At the same time, a subset of literature identifies opportunities for the BRI to promote sustainability. Fox and Dong (2018) contend that Chinese investments in renewable energy and environmentally friendly technologies could contribute to green growth in partner regions. The Belt and Road Ecological and Environmental Cooperation Plan (2017) also emphasizes the potential for embedding environmental safeguards into the initiative. Drescher et al. (2019) support this by noting that risk management strategies, particularly in handling hazardous materials, could mitigate ecological harm. This strand of scholarship underscores the tension between the initiative's green potential and grey risks.

2.3 Europe's Perspective: Sustainability and Governance Challenges

Europe's engagement with the BRI has been shaped by its unique regulatory context. The European Union (EU) enforces strict environmental standards, such as the Habitats Directive, emissions limits, and biodiversity conservation laws. Scholars question whether Chinese-led projects are consistent with these frameworks. Heine and Schill (2019) warn that energy dependence created through BRI corridors could increase Europe's reliance on external suppliers, undermining its energy security and climate ambitions.

The issue of regulatory misalignment is particularly salient. While Europe emphasizes transparency, accountability, and public participation in environmental assessments, Chinese practices often prioritize rapid implementation over compliance (Breslin, 2019). Roy and Otsuka (2017) note that varying degrees of environmental review in BRI projects complicate efforts to standardize assessments across regions. This mismatch risks undermining the EU's broader climate goals, including its commitment to the Paris Agreement and the European Green Deal.

Civil society and local communities also play a pivotal role in shaping Europe's response to the BRI. Hacker (2019) observes that resettlement and land acquisition linked to infrastructure projects generate societal resistance, particularly where local livelihoods and cultural heritage are threatened. At the same time, civil society organizations (CSOs) have increasingly mobilized to demand transparency and accountability in BRI-related projects. This reflects a broader European tradition of participatory governance, which contrasts sharply with the top-down approach often observed in Chinese-led initiatives.

The literature further emphasizes the need for institutional cooperation between China and Europe. Thomsen et al. (2019) argue that environmental diplomacy is essential for harmonizing standards and ensuring mutual benefits. The European Union's insistence on sustainable finance and green technologies presents a possible entry point for constructive collaboration, but this requires stronger regulatory coherence and political will on both sides.

2.4 Research Gaps

Despite a growing body of scholarship, several gaps remain in understanding the environmental dimensions of the BRI in Europe. First, much of the existing research is descriptive, lacking in-depth empirical analysis of project-level impacts. While global studies highlight risks of biodiversity loss and carbon emissions (Deng, 2019; Thomsen et al., 2019), few focus specifically on European ecosystems and regulatory systems. Second, there is limited exploration of how civil society actors influence the trajectory of BRI projects in Europe. While Hacker (2019) mentions social relocation issues, the agency of local communities and NGOs in shaping greener outcomes is underexplored. Finally, more work is needed to bridge the gap between EU climate commitments and Chinese project implementation, particularly in aligning environmental impact assessments with European standards (Breslin, 2019).

2.5 Synthesis

Taken together, the literature illustrates a complex picture of the BRI in Europe. On one side, it is portrayed as a vehicle for green growth, offering opportunities for renewable energy cooperation, technology transfer, and shared prosperity (Fox & Dong, 2018; Lei & Liqiang, 2017). On the other,

it raises serious concerns about ecological disruption, pollution, and regulatory misalignment (Roy & Otsuka, 2017; Breslin, 2019; Deng, 2019). Europe's unique position—marked by stringent environmental laws and ambitious climate goals—renders it both vulnerable to the risks and capable of shaping the initiative's trajectory through diplomacy, governance, and civil society engagement.

This duality underscores the central question of the present study: can the BRI in Europe be reconciled with sustainability objectives, or does it risk entrenching a grey model of environmentally harmful development? The following sections build on this literature to assess the findings of a qualitative thematic analysis, exploring the interplay between BRI projects, environmental governance, and Europe's sustainability agenda.

3. METHODOLOGY

3.1 Research Philosophy and Approach

This study adopts a qualitative research philosophy, rooted in interpretivism. Interpretivist approaches emphasize the importance of understanding social phenomena from the perspectives of participants, acknowledging the complexity of human experience and institutional interaction (Ohashi, 2018). The Belt and Road Initiative (BRI) is not merely an economic infrastructure program but a multidimensional project with political, environmental, and social implications. Thus, a qualitative framework is particularly well-suited to capture the perceptions, experiences, and interpretations of stakeholders engaged in or affected by BRI projects in Europe.

The research employs an exploratory design, seeking to understand the dual environmental impacts of the BRI—whether they promote sustainable development or exacerbate ecological challenges. The study does not aim to test a hypothesis but to explore themes, patterns, and narratives that emerge from participant accounts and secondary data.

3.2 Data Collection

Data collection relied on two complementary sources: **semi-structured interviews** and **documentary analysis**.

1. Semi-Structured Interviews

Semi-structured interviews were conducted with experts, policymakers, academics, and civil society representatives familiar with BRI projects in Europe. The semi-structured format allowed flexibility, enabling participants to elaborate on issues they deemed most significant while ensuring coverage of core topics, such as environmental risks, green technology transfer, and policy alignment. This approach was particularly valuable in uncovering nuanced perspectives often absent in official reports or statistical analyses (Roy & Otsuka, 2017).

Interview questions were designed around the study's research objectives:

- How do stakeholders perceive the environmental benefits and risks of BRI projects in Europe?
- What challenges exist in aligning BRI projects with EU environmental laws?
- What role do civil society and local communities play in influencing outcomes?
- How can EU–China cooperation enhance sustainability in BRI implementation?

2. Documentary Analysis

To complement primary data, the study examined secondary sources, including European Union policy documents, environmental reports, Chinese official publications on the BRI, and existing academic studies (Lin, 2020; Zhang, 2017; Deng, 2019). These documents provided contextual depth and allowed triangulation of findings from interviews.

3.3 Sampling

A purposive sampling strategy was adopted to identify participants with direct knowledge of BRI's environmental impacts in Europe. This included:

- **Policy experts** from European Union institutions and national governments involved in environmental governance.
- **Academics and researchers** specializing in international relations, environmental studies, and Chinese foreign policy.
- **Civil society actors**, including NGOs and community organizations engaged in advocacy related to infrastructure development and environmental protection.
- **Industry representatives** connected with BRI-related infrastructure projects.

The sample was designed to ensure diversity of perspectives, capturing voices from institutional, academic, and grassroots levels. Although the number of participants was limited, the depth of qualitative insights compensated for the relatively small size of the dataset (Thomsen et al., 2019).

3.4 Data Analysis

The study employed thematic analysis to identify, analyze, and interpret recurring patterns across the interview and documentary data. Thematic analysis was chosen for its flexibility and suitability in managing large qualitative datasets, particularly when exploring complex and multi-layered issues such as environmental governance (Drescher et al., 2019).

The analysis followed several steps:

1. **Transcription and Familiarization** – Interviews were transcribed verbatim, and transcripts were carefully reviewed to capture the richness of participant responses.
2. **Initial Coding** – Text segments were coded based on recurring themes, such as “sustainability,” “regulatory gaps,” “green technology,” and “civil society resistance.”
3. **Theme Development** – Codes were clustered into broader themes, such as “opportunities for green growth,” “environmental risks,” “governance challenges,” and “community agency.”

4. **Interpretation** – Themes were interpreted in relation to the study’s research questions and the broader literature on BRI and environmental governance (Breslin, 2019; Deng, 2019).

This process ensured that analysis remained grounded in the data while also engaging with existing theoretical and policy debates.

3.5 Ethical Considerations

Ethical integrity was maintained throughout the research process. Participants were informed about the study’s objectives, assured of confidentiality, and provided with the option to withdraw at any time. Interviewees’ anonymity was preserved by removing identifying details, and sensitive insights were reported in generalized form. The study adhered to standard ethical guidelines for qualitative research, ensuring that participants’ contributions were respected and responsibly represented.

3.6 Limitations

Several limitations should be acknowledged. First, the study’s reliance on a relatively small sample of interviews restricts the generalizability of findings. While qualitative research emphasizes depth over breadth, broader sampling might have provided additional perspectives. Second, access to Chinese stakeholders involved in BRI implementation was limited, resulting in a stronger emphasis on European perspectives. Third, the fast-evolving nature of the BRI means that findings represent a snapshot in time; subsequent developments may alter the environmental dynamics under study (Heine & Schill, 2019).

3.7 Delimitations

The study deliberately focused on the **environmental impacts of the BRI in Europe**, excluding broader geopolitical and economic considerations except where directly linked to environmental outcomes. While acknowledging the interconnectedness of these dimensions, this delimitation was necessary to maintain analytical clarity and depth.

This methodology, grounded in qualitative interpretivism and thematic analysis, provides a robust framework for investigating the environmental implications of the BRI in Europe. By combining expert interviews with documentary evidence, the study uncovers both risks and opportunities embedded in Chinese-led infrastructure projects. The findings presented in the next section build directly on this methodological foundation, offering insights into whether the BRI represents a “green” pathway for Europe or a “grey” trajectory of ecological burden.

4. FINDINGS AND DISCUSSION

The thematic analysis of interviews and documents revealed a complex picture of the environmental implications of the Belt and Road Initiative (BRI) in Europe. The findings are organized into four overarching themes: (1) opportunities for green growth, (2) environmental risks and ecological disruption, (3) governance and regulatory challenges, and (4) the role of civil society and local communities. Together, these themes highlight the dual nature of the BRI in

Europe—simultaneously a source of potential sustainable development and a driver of ecological strain.

1. Opportunities for Green Growth

1.1. Renewable Energy and Green Technology Transfer

A central theme in participant accounts was the potential of the BRI to support Europe’s renewable energy transition. Interviewees noted that Chinese investments in solar, wind, and hydropower projects could contribute to diversifying Europe’s energy mix. This aligns with Fox and Dong’s (2018) observation that Chinese capital and expertise in renewable technologies can play a constructive role in fostering low-carbon development. For example, solar panel exports and wind energy technology from China already account for significant portions of renewable infrastructure in Central and Eastern Europe.

Participants also emphasized the importance of green technology transfer. Europe’s stringent climate policies create demand for cleaner technologies, and China’s growing capacity in areas such as battery storage and electric vehicles presents opportunities for collaboration. According to Lei and Liqiang (2017), BRI cooperation in technology can generate spillover benefits by fostering innovation and sustainable industrial development across borders.

1.2. Infrastructure Modernization

Another benefit identified was the modernization of Europe’s outdated infrastructure. Interviewees highlighted that Chinese investments in rail, port, and logistics networks could enhance efficiency and reduce reliance on carbon-intensive road transport. McBride and Berman (2023) argue that improved connectivity through rail freight can cut emissions by shifting freight from trucks to trains, which are generally less polluting. The China–Europe Railway Express, linking multiple European cities with Chinese industrial hubs, illustrates how infrastructure investment can contribute to more sustainable logistics chains.

1.3. Economic Incentives for Sustainability

The BRI also provides economic incentives for green growth. The World Bank’s forecasts suggest that BRI investments could reduce trade costs and lift millions from poverty, including in Europe (Maliszewska, 2019). While such projections are global in scope, interviewees noted that economic growth derived from BRI investments could increase fiscal capacity for European governments to finance environmental protection and climate adaptation measures. This reflects CCICED Secretariat’s (2023) findings that BRI projects, if aligned with sustainability principles, can generate “win–win” outcomes for both economic and ecological goals.

2. Environmental Risks and Ecological Disruption

Despite these opportunities, a dominant theme across interviews was concern about the “grey” consequences of BRI projects. Several environmental risks emerged repeatedly.

2.1. Biodiversity Loss and Habitat Fragmentation

Participants noted that large-scale infrastructure projects disrupt ecosystems, fragment habitats, and threaten biodiversity. This resonates with Thomsen et al. (2019), who warn that railway and highway construction under the BRI often cuts through ecologically sensitive areas. In Europe, where biodiversity conservation is a central policy objective, such risks are particularly acute. For instance, ports and rail corridors constructed under BRI agreements in Eastern Europe have been criticized for encroaching on Natura 2000 sites, the EU's network of protected habitats.

2.2. Pollution and Carbon Emissions

Another recurring concern was the rise in pollution linked to BRI projects. Roy and Otsuka (2017) argue that expanded freight transport networks increase air pollution in urban corridors. Interviewees highlighted similar concerns, noting that construction activities, heavy truck traffic, and shipping emissions contribute to deteriorating air quality. Furthermore, as Deng (2019) observes, fossil fuel-based energy projects financed under the BRI exacerbate greenhouse gas emissions, undermining Europe's commitments under the Paris Agreement.

2.3. Resource Depletion and Water Stress

Water-related concerns also emerged. Breslin (2019) notes that BRI-funded hydroelectric and dam projects alter water flows, threatening both ecological systems and agricultural productivity. Although such projects are more visible in Asia and Africa, European stakeholders expressed worries about resource-intensive construction straining local supplies of water and raw materials. As one interviewee remarked, "The BRI promises efficiency, but its appetite for resources risks depleting what local communities depend on."

2.4. Social Displacement and Cultural Loss

Beyond ecological impacts, participants also raised concerns about **social relocation** caused by land acquisition for infrastructure projects. Hacker (2019) highlights that displacement not only disrupts communities but also leads to cultural and socioeconomic loss. While such cases are less frequent in Western Europe, they have been reported in parts of Central and Eastern Europe where large-scale land is acquired for industrial parks linked to BRI investment. This highlights the intersection between environmental and social sustainability.

3. Governance and Regulatory Challenges

3.1. Misalignment of Standards

The most pressing governance issue identified was the misalignment between Chinese and European environmental standards. Interviewees consistently emphasized that BRI projects often bypass the rigorous environmental impact assessments (EIAs) and strategic environmental assessments (SEAs) mandated in Europe. Breslin (2019) notes that the lack of standardized reviews across BRI projects undermines transparency and accountability.

This misalignment creates friction between Chinese investors, who prioritize rapid implementation, and European regulators, who demand compliance with strict environmental laws. As one EU policy expert stated, “The speed of Chinese financing often collides with the slow but necessary pace of European environmental review.”

3.2. Institutional Cooperation and Diplomacy

The need for stronger institutional cooperation between China and Europe was a recurring theme. Thomsen et al. (2019) argue that environmental diplomacy is essential to bridge the governance gap, while Heine and Schill (2019) stress the importance of harmonizing regulatory frameworks to ensure mutual benefits. Interviewees echoed these views, suggesting that bilateral agreements and joint monitoring mechanisms could enhance transparency and accountability in BRI projects.

3.3. Energy Security vs. Climate Goals

Another governance challenge relates to Europe’s **energy security**. Heine and Schill (2019) point out that while BRI corridors enhance energy connections between Europe and Asia, they also increase dependence on external suppliers, particularly fossil fuels. This creates a paradox: while Europe gains more secure access to energy, it risks undermining its transition to renewable sources. Interviewees highlighted this as one of the clearest examples of the tension between the “green” and “grey” pathways of the BRI.

4. Civil Society and Local Communities

4.1. Resistance and Advocacy

Civil society organizations (CSOs) and local communities emerged as important actors shaping the BRI’s environmental trajectory in Europe. Hacker (2019) documents cases where community resistance to land acquisition and ecological disruption delayed or altered project implementation. Interviewees also noted that NGOs and grassroots organizations have successfully mobilized against environmentally harmful projects, demanding transparency and stricter environmental assessments.

4.2. Participation and Empowerment

Participants emphasized the role of **public participation** in strengthening environmental governance. Roy and Otsuka (2017) argue that greater public involvement in environmental assessments can enhance project sustainability. European traditions of participatory governance provide fertile ground for civil society to influence outcomes. For example, environmental advocacy groups in Eastern Europe have lobbied for renewable energy alternatives to coal-based projects financed by Chinese banks.

4.3. Civil Society as a Bridge

Several interviewees highlighted that CSOs also serve as **bridges** between European governments and Chinese investors. By translating local concerns into policy recommendations, civil society

actors help align BRI projects with sustainability goals. This finding supports Thomsen et al.'s (2019) view that increased collaboration between governments, businesses, and civil society is essential for promoting sustainable BRI projects.

5. Synthesis: Green or Grey?

The findings reveal that the BRI in Europe embodies both “green” and “grey” dimensions. On the green side, it offers opportunities for renewable energy cooperation, infrastructure modernization, and sustainable technology transfer. These benefits align with Europe’s climate objectives and could support the EU’s long-term vision of carbon neutrality.

On the grey side, however, the BRI risks undermining environmental sustainability through biodiversity loss, carbon emissions, and regulatory misalignment. Without robust governance mechanisms, civil society engagement, and institutional cooperation, the grey risks may outweigh the green opportunities.

Ultimately, whether the BRI is green or grey in Europe depends on the effectiveness of regulatory alignment, the transparency of project assessments, and the willingness of stakeholders—governments, businesses, and communities—to prioritize sustainability over short-term economic gains.

5. CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusion

This study set out to explore the environmental implications of the Belt and Road Initiative (BRI) in Europe, asking whether the initiative represents a “green” opportunity for sustainable development or a “grey” threat to ecological sustainability. Drawing on thematic analysis of interviews and documentary sources, the findings reveal a nuanced picture.

On the one hand, the BRI offers **green opportunities**. Chinese investments in renewable energy, technology transfer, and infrastructure modernization can support Europe’s energy transition and climate goals. The initiative also provides economic incentives that could strengthen local capacities for environmental protection and innovation (Fox & Dong, 2018; Lei & Liqiang, 2017).

On the other hand, the BRI presents significant **grey risks**. Infrastructure projects fragment habitats, increase pollution, and heighten carbon emissions, threatening biodiversity and undermining EU climate commitments (Thomsen et al., 2019; Deng, 2019). Governance challenges—particularly the misalignment of Chinese and European environmental standards—further complicate the initiative’s implementation (Breslin, 2019).

Europe’s strict regulatory environment and strong civil society traditions position it uniquely to shape the environmental trajectory of the BRI. Yet, unless governance gaps are addressed and sustainability is embedded at the core of project design, the initiative risks reinforcing environmentally harmful patterns of development. Thus, the BRI in Europe should be viewed

neither as wholly green nor wholly grey, but as a contested space where outcomes depend on policy choices, institutional cooperation, and civic engagement.

5.2 Policy Implications

Based on the findings, four key policy implications emerge:

1. Strengthening Environmental Governance and Legal Alignment

A pressing need exists to harmonize Chinese and European environmental standards. While Europe enforces strict requirements such as Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs), Chinese projects often prioritize rapid implementation over compliance. Bilateral agreements and EU–China dialogue should focus on standardizing review processes, ensuring transparency, and embedding sustainability criteria in all BRI-related contracts (Breslin, 2019). Joint monitoring bodies could provide oversight, mitigating risks of regulatory evasion.

2. Embedding Green Technology in Infrastructure Projects

Europe and China should leverage the BRI as a platform for advancing green technology cooperation. Chinese expertise in renewable energy, electric vehicles, and battery storage could complement Europe’s ambitious climate policies. Prioritizing green energy projects, rather than fossil fuel-based infrastructure, would align the BRI with Europe’s goal of achieving carbon neutrality by 2050 (Heine & Schill, 2019). Policymakers should develop funding mechanisms and incentives that channel BRI investments into sustainable sectors.

3. Enhancing Civil Society Participation and Public Engagement

Civil society and local communities play a crucial role in ensuring environmental accountability. Public participation in environmental assessments, combined with advocacy from NGOs, strengthens transparency and ensures that local concerns are integrated into project design (Hacker, 2019; Roy & Otsuka, 2017). Governments should institutionalize mechanisms that guarantee civic input, for example, by requiring consultations with affected communities as a condition for project approval. Empowering civil society also fosters trust and legitimacy in transnational projects.

4. Advancing Environmental Diplomacy and Multilateral Cooperation

The BRI highlights the importance of environmental diplomacy between China and Europe. As Thomsen et al. (2019) argue, institutional cooperation is essential for promoting sustainable outcomes. Europe should use existing platforms, such as the EU–China High-Level Environment and Climate Dialogue, to embed environmental safeguards in BRI implementation. Furthermore, cooperation with multilateral institutions such as the World Bank and the Asian Infrastructure Investment Bank (AIIB) can ensure adherence to international environmental standards.

5.3 Future Research Directions

The analysis also identifies several areas for future research. First, more empirical work is needed to assess the ecological impacts of specific BRI projects in Europe, especially in sensitive areas such as Natura 2000 sites. Second, further studies should examine the role of local communities and civil society in shaping BRI outcomes, providing bottom-up perspectives often absent in policy debates. Finally, comparative research across different regions could illuminate how Europe's regulatory framework influences BRI's environmental trajectory relative to regions with weaker governance structures.

Final Remarks

The Belt and Road Initiative embodies both promise and peril for Europe's environmental future. Whether it evolves into a pathway of sustainable development or a driver of ecological strain depends on deliberate policy choices. By strengthening governance, fostering green technology, empowering civil society, and deepening environmental diplomacy, Europe and China can transform the BRI into a genuinely green initiative. Without such efforts, however, the risk remains that the initiative will follow a grey trajectory, undermining Europe's climate ambitions and compromising ecological integrity.

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