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Bringing in Ethics: A Multi-stakeholder Approach to Manage the Transition to Low-Carbon Construction

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Policy Highlights To achieve the recommendation stated in the title, we propose the following:

- Policymakers should organise fair and balanced stakeholder engagement processes to address the key ethical trade-offs of the transition to low-carbon construction.
- The public sector should take a proactive role in leading the low-carbon transition and build strong cross-sectoral partnerships.

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- Public sector leadership demands transparency and accountability which are crucial for navigating ethical trade-offs with the various stakeholders in the construction sector.
- Policymakers should build a culture of sustainability and cultivate a shared understanding of ethics and values among all stakeholders.
- To find creative solutions to the complex challenges associated with the transition to low-carbon construction, SSH and STEM collaboration should be supported.

Keywords Low-carbon construction · Ethics · Stakeholder Participation · Transparency · Public sector leadership

INTRODUCTION

This chapter examines the ethical challenges of transitioning to low-carbon construction and offers policy recommendations at the EU level to address them. Currently, the construction sector globally contributes to 37% of emissions and employs approximately 7% of the workforce (World Green Building Council 2023). Transforming this sector is critical for achieving the UN Sustainable Development Goals (e.g., SDGs 1–2, SDGs 11–12, and SDG17), as it has great potential to reduce resource and energy consumption, increase the use of renewable energy, minimise environmental degradation and waste, and enhance occupant health and comfort (González-Díaz & García-Navarro, 2011, p. 295).

We argue that the transition to low-carbon construction is not solely a technological issue but involves complex decision-making processes, including weighing short- and long-term costs and benefits across society and stakeholders. This process is inherently ethical. Ethical concerns in the

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construction sector include conflicts of interest, financial integrity, corruption, consumer and employee privacy, and ethical advertising (Sohail & Cavill, 2008). Furthermore, research suggests that the professional ethics of the civil engineering sector may conflict with sustainability goals while also acknowledging the above-mentioned ethical issues within the construction sector (Mares-Nasarre et al., 2023).

The ethical complexity of transitioning to low-carbon construction requires an interdisciplinary approach. In this chapter, we, therefore, integrate insights from Public Policy, Sociology, Ethics, Materials Engineering, and Architecture to address how to manage ethical transitions. To achieve this, we utilised a mixed-method approach combining a systematic literature review and a workshop.

The first step was a systematic literature review aimed at understanding the current state of knowledge on the ethical challenges of the low-carbon transition process. The literature review, conducted in September 2023 using the Web of Science database, identified 234 records using keywords such as “low carbon construction + ethics” and “sustainable construction + ethics”. The review affirms that the ethical complexity inherent in the transition to low-carbon construction spans various scientific sub-disciplines, resulting in significant knowledge fragmentation. The majority of articles were classified under environmental sciences (33 articles), environmental studies (33 articles), ethics (27 articles), green & sustainable science & technology (26 articles), business (18 articles), and management (18 articles), among others. After an abstract review, 35 articles were selected for in-depth examination. The systematic literature review also informed the development of a scenario to be used at the collaborative workshop, which formed the second step of our mixed-method approach.

The workshop facilitated collaboration among researchers from various fields and aimed to provide a space for the participants to collaborate on new technologies, services, products, or systems (Duchková, 2023). Participant recruitment involved purposive sampling to ensure the representation of various stakeholders. Nine respondents were selected, including an applied ethicist, materials engineer, construction company owner, bridge designer, ministry employee, sustainability researcher, university transfer representatives, and a former senior public sector employment manager. Given the diverse backgrounds of the workshop participants (education and experience), we provided explanations and definitions of basic concepts, such as ethics in low-carbon construction.

At the workshop, conducted online in December 2023, participants received the above-mentioned scenario outlining key points, definitions, and questions derived from the systematic literature review. Participants were then asked to collaboratively define key concepts, unify knowledge levels, and discuss creative solutions to the ethical challenges of the transition to low-carbon construction. Moderated by one of the study authors, the workshop lasted approximately two hours and was recorded and transcribed. The data were coded using deductive and inductive approaches to explore new phenomena and mechanisms not previously described within the research framework. To minimise bias, the analysis was conducted by a team member different from the moderator (Jelínková et al., 2023). Participants were provided with a draft of the results for independent comments after the workshop.

RESULTS

Ethical Dimensions and Stakeholders in Transitioning to Low-Carbon Construction

Our examination has revealed that the ethical aspects of transitioning to low-carbon construction are fundamentally grounded in the human awareness of belonging to a larger interconnected system and the responsibility for life on this planet (Grunwald, 2001). However, effectively addressing this complexity requires breaking down these holistic insights into the interests of multiple stakeholders, which can often conflict (Rostamnezhad & Thaheem, 2022).

During the literature review, we identified various stakeholders of relevance for the low-carbon transition in the construction sector, including government entities, developers, architects, engineers, and others. Participants in the workshop emphasised the importance of also including independent certification and compliance authorities, universities, and information brokers in the overview of relevant stakeholders.

Participants were also asked to identify the stakeholders they considered “at-risk” due to negative effects of transition processes, such as increased costs, financial loss, or disruptions in the supply chain. Surprisingly, construction firms were not perceived as “at-risk stakeholders” during the transition; instead, materials producers were considered the most vulnerable. Discussions also touched upon the risk of unemployment. However, the participants noted even greater challenges regarding

demographic issues and problems of securing the available workforce due to an ageing population.

Our workshop revealed numerous potential ethical trade-offs faced by the diverse range of stakeholders (see Table 10.1).

These diverse stakeholders and the various trade-offs they face highlight the intricate web of ethical considerations inherent in the transition to low-carbon construction, underscoring the need for comprehensive and inclusive approaches to address them.

Resolving Trade-Offs Through Fair Stakeholder Interaction

Addressing these trade-offs effectively ultimately requires fair and balanced stakeholder interaction processes (Valentinov, 2023). Our systematic literature review highlights the significance of cross-sectoral partnerships in stakeholder interaction (Andrews & Entwistle, 2010). These partnerships involve collaboration between the public sector, business, and the non-profit sector, aiming to address society's main challenges.

Building on these findings, our workshop results emphasise the crucial role of clear leadership. Participants in the living lab expressed their belief in the efficiency of markets during a low-carbon transition but stressed the vital role of the public sector in providing leadership, directing the transition, and aligning diverse stakeholder interests. However, they also acknowledged the need for the public sector to enhance its ability to lead change and collaborate with different stakeholder groups. “*Creating a culture of sustainability, defined by values, beliefs, and behaviour favouring sustainability*” (Yip Robin & Poon, 2009, p. 3617), was deemed essential.

Another workshop outcome highlighted the importance of ethical precautions in designing financial support instruments such as grants, loans, and procurement. Public procurement, given its significant GDP allocation, was considered a key instrument. Participants stressed the necessity for transparent, value-for-money resource allocation to maintain legitimacy and credibility. Intelligent investment, which considers life-cycle costs and societal effects beyond merely pursuing the lowest price, was also emphasised. These tools should be institutionalised as long-term policy instruments.

The workshop participants also emphasised information and transparency as integral components of accountability. They highlighted the

Table 10.1 Overview of key stakeholders and ethical trade-offs

<i>Stakeholder type</i>	<i>Actors</i>	<i>Trade-Offs</i>	<i>Considerations</i>
Government	<ul style="list-style-type: none">• Central government• Regional government• Local government	<ul style="list-style-type: none">• Leadership• Capacity allocation• Environmental stewardship• Cross-sectoral collaboration	<ul style="list-style-type: none">• Acting as a leader or allowing others to behave according to their rationality• Allocating capacity to the low-carbon transition versus other government tasks• Balancing compliance-oriented behaviour with accountability pressures, and potential weakening of discipline for specific stakeholder involvement
Companies	<ul style="list-style-type: none">• Main contractors• Subcontractors• Suppliers• Managers• Employers• Developers	<ul style="list-style-type: none">• Profit vs. environmental and societal goals	<ul style="list-style-type: none">• Balancing long-term and short-term effects• Managing interests within the supply chain• Navigating between conservative biases and fostering innovation

(continued)

Table 10.1 (continued)

<i>Stakeholder type</i>	<i>Actors</i>	<i>Trade-Offs</i>	<i>Considerations</i>
Professional communities	<ul style="list-style-type: none"> • Architects • Structural engineers • Electrical and mechanical engineers • Surveyors 	<ul style="list-style-type: none"> • Professional ethics vs. personal interests 	<ul style="list-style-type: none"> • Balancing transparency and openness of communication versus public comprehensibility • Balancing precaution versus speed of innovation
Environmental lobby groups	<ul style="list-style-type: none"> • NGOs • Lobbyists • Think tanks 	<ul style="list-style-type: none"> • Accountability vs. members' interests 	<ul style="list-style-type: none"> • Balancing socio-environmental impact and lobby group interests
Media organisations	<ul style="list-style-type: none"> • Newspapers • TVs & radios • New media • Journalists • Professional associations • Owners • Shareholders 	<ul style="list-style-type: none"> • Shareholder interests vs. the interests of readers 	<ul style="list-style-type: none"> • Balancing revenue from advertisements versus firms' environmental impacts • Reducing the complexity of information and making it clear to the reader • Balancing the verification of the veracity of the information with the speed of publication
Environmental management accreditation bodies and independent certification organisations	<ul style="list-style-type: none"> • Public sector organisations • Private sector organisations • Consultancies 	<ul style="list-style-type: none"> • Ethical values and integrity vs. the interests of clients 	<ul style="list-style-type: none"> • Focusing on accountability, transparency, and fulfilling professional standards

(continued)

Table 10.1 (continued)

<i>Stakeholder type</i>	<i>Actors</i>	<i>Trade-Offs</i>	<i>Considerations</i>
Higher education institutions, research institutions, and training providers	<ul style="list-style-type: none">• Public and private universities• Public and private research institutions• Education companies	<ul style="list-style-type: none">• Quality and integrity, speed of publication, independence of research vs interests of funders	<ul style="list-style-type: none">• Scientific results should be freely available to all, and the underlying data should be accessible and meet the requirements of transparency and replicability• Communicate scientific results inclusive for all social groups• Mechanisms should be put in place to protect researchers with critical views on certain topics from institutional pressure
Funding institutions	<ul style="list-style-type: none">• Public institutions• Private institutions	<ul style="list-style-type: none">• Pressure to deliver results versus uncertainty in scientific knowledge	<ul style="list-style-type: none">• Openness in funding and the originality and disruptiveness of projects should be evaluated, not previous results, seniority, and perceived prestige• Accept the risk of failure as a normal part of scientific work
General public		<ul style="list-style-type: none">• Personal bias vs innovation, rationality vs emotions	<ul style="list-style-type: none">• Balance environmental engagement with privacy considerations

Source: Authors

importance of Environmental, Social, and Governance (ESG) reporting to encourage actors to prioritise sustainability. Information asymmetry was identified as a key issue, with suggestions that universities and certification authorities play a crucial role in presenting scientific study results efficiently to reduce transaction costs while maintaining credibility. The discussion also touched upon codes of ethics and corporate social responsibility documents, with participants noting a need for specific commitments rather than generalities.

In navigating ethical challenges successfully, the workshop participants emphasised the importance of ensuring that all levels of government possess sufficient capacity, including administration and resources, for policy implementation. Local governments, in particular, faced potential challenges due to complicated legislation and insufficient support for local politicians. Emphasising value for money was deemed vital for demonstrating the meaningful use of taxpayer money and legitimising implementation.

Implementing ethical solutions was viewed as a long-term commitment that required focus on the entire supply chain. Each part of the supply chain might encounter specific challenges of varying intensities. Therefore, a comprehensive approach addressing these challenges at each level is essential for successful and ethical policy implementation.

CONCLUSIONS AND RECOMMENDATIONS

This chapter aims to identify the main ethical challenges of transitioning to low-carbon construction and to present recommendations for EU-level policymakers. These recommendations, collectively addressing the multifaceted nature of the transition, aim to guide policymakers in developing effective strategies that consider the technical, social, political, and economic aspects of the low-carbon construction shift. The advantage of these recommendations is that they can be scaled up to lower levels of government, such as national and local governments.

On the basis of our analysis, four key ethical principles can be deduced for EU policymakers in the transition to low-carbon construction:

1. Fair and Balanced Stakeholder Engagement

Recognise numerous stakeholders: Policymakers should acknowledge and engage the diverse range of relevant stakeholders, including actors such as developers and architects, universities, certification bodies, and the public.

Address trade-offs: In these stakeholder engagement processes the identified trade-offs must be addressed and policymakers should strive to create solutions that fairly balance the competing interests of each stakeholder group.

2. Leadership and Collaboration

Proactive public sector: Governments at all levels should play a proactive role in leading the low-carbon transition, facilitating collaboration between various stakeholders. This leadership should be ethical, transparent, and focused on the common good. This entails establishing ambitious goals, developing clear roadmaps, and providing incentives for low-carbon practices.

Cross-sectoral partnerships: Building strong partnerships among the public sector, private businesses, and non-profit organisations is crucial for addressing complex challenges like the low-carbon transition. Partnerships involve creating platforms for diverse stakeholders—construction companies, architects, universities, etc.—to collaborate effectively, share knowledge, and devise solutions.

3. Transparency and Accountability

Ethical Policy Design: Policies and regulations concerning low-carbon construction should prioritise environmental benefits, ensure fair competition, and mitigate potential harm to vulnerable stakeholders like construction workers.

Transparency and Accountability: Public sector leadership demands open communication about goals, progress, and challenges. Transparency in decision-making processes and accountability for policy outcomes foster trust with stakeholders and promote responsible implementation.

Clear and accessible information: Policymakers should ensure transparent communication of information about the transition, its goals, and potential challenges. Complex scientific data should be presented clearly

and accessibly, potentially with the help of universities and certification bodies.

ESG reporting: Policymakers should encourage actors across the construction industry to adopt Environmental, Social, and Governance (ESG) reporting practices to foster accountability and transparency.

Ethical financial instruments: Policymakers should design financial support instruments, such as grants and loans, with ethical considerations in mind, including factors like life-cycle cost analysis and responsible resource allocation.

4. Building a Culture of Sustainability

Shared values: A shared understanding of sustainability values must be cultivated and ethical behaviour encouraged across all stakeholders through education, awareness campaigns, and promoting a culture of responsibility.

Long-term commitment: Policymakers should create sustainable policy frameworks that consider the entire supply chain and address the diverse challenges faced by different stakeholders throughout the process.

Adhering to these four key ethical principles will enable EU policymakers to foster a more inclusive, equitable, and sustainable approach to the low-carbon construction transition, benefiting all stakeholders and the planet. These principles must be integrated into everyday public leadership practices, serving as fundamental tools for successful transition.

Research on the implementation of sustainability policies shows that one of the key success factors is the institutionalisation of policies not only at the system level but also at the level of individual organisations. The following tools are recommended for successful institutionalisation:

- **Long-term policy frameworks:** Develop comprehensive policies and regulations that transcend short-term political cycles. These frameworks should establish clear industry expectations, provide long-term stability, and encourage investment in low-carbon solutions.
- **Capacity building:** Invest in enhancing the government's internal capacity to manage the transition effectively. This includes training

staff on sustainability principles, life-cycle costing, and stakeholder engagement.

- **Financial instruments with ethics:** Design financial tools such as grants, loans, and tax breaks to incentivise ethical low-carbon practices. Consider factors like life-cycle costs, local sourcing of materials, and fair labour practices.
- **Public procurement:** Use government purchasing power to promote low-carbon construction. Establish clear sustainability criteria for public construction projects and prioritise companies with strong Environmental, Social, and Governance (ESG) practise.
- **Knowledge sharing and collaboration:** Facilitate knowledge sharing among research institutions, universities, and the construction industry. Foster collaboration in developing and implementing innovative low-carbon construction technologies.
- **Independent oversight and enforcement:** Establish independent oversight bodies to monitor and enforce regulations, ensuring ethical practices throughout the construction supply chain.

By incorporating these ethical principles and utilising appropriate tools, EU policymakers can successfully contribute to the transition to low-carbon construction, fostering a sustainable future for all.

The main defining feature of the transition to low-carbon construction is complexity. This problem cannot be reduced to a technical or ethical dimension alone; collaboration between STEM and SSH can be a tool to address these challenges. We can expect that in the future, the boundaries between STEM and SSH will increasingly merge.

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