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The Role of Economic Policy Instruments in Promoting the Green Building Transition: Evidence from Sydney

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Abstract. In the context of global climate change, transitioning the building industry toward green and low-carbon development has become an inevitable trend. This paper takes Sydney, Australia, as a case study to explore the role of economic policy instruments in facilitating the green building transition.It examines a multidimensional policy framework, inclusive of incentives for green buildings, mechanisms on carbon pricing, green finance and their interactions. The results show that while tools such as BASIX1 can only provide baseline environmental thresholds, regulatory in nature, they remain highly limited in addressing high upfront costs and institutional barriers. By analysing the Green Building Grant in Sydney and Australia's carbon pricing experience, the study demonstrates that economic incentives can effectively internalize positive environmental externalities. Moreover, green finance is anchored in performance-based schemes such as NABERS ratings, offering long-term momentum by linking sustainability to market value. Ultimately, this study argues that the success of green building transitions lies not in isolated policies but in the synergistic integration of regulatory, financial, and economic instruments. The findings offer practical insights for urban policymakers seeking to optimize policy design toward achieving Sydney's 2035 net-zero building emissions target.

Keywords: Green building incentives, Green finance, Carbon pricing, Net zero emission, Sustainable building transition

1. Introduction

As global urbanization accelerates, the building sector has become a critical battleground in the fight against climate change. In Sydney, Australia, the ambitious target of achieving net-zero emissions by 2035 places unprecedented pressure on the construction industry to transition toward sustainability.

However, relying solely on mandatory regulations has proven insufficient. While the Building Sustainability Index (BASIX) establishes a necessary environmental baseline, its focus on minimum compliance and exclusion of embodied carbon limits its ability to drive deep decarbonization. Furthermore, the repeal of Australia's carbon pricing mechanism in 2014 created a significant "policy vacuum," removing the direct cost penalties for carbon-intensive practices and stalling the internalization of environmental externalities.

Consequently, the driver for transition must shift towards alternative economic instruments. This paper examines how fiscal incentives (e.g., Green Building Grants) and market-based financial

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instruments (e.g., Green Bonds) can synergize to fill this void. By analysing empirical evidence from Sydney, this study demonstrates that in a post-carbon-pricing era, aligning financial capital with environmental performance is the most effective pathway to bridge the gap between minimum compliance and net-zero aspirations.

2. Barriers to Sydney's green building transformation: a multidimensional analysis

2.1. Policy rationale and mechanisms of green building incentives

Green building incentives can be categorised into external and internal incentives. Governments mainly provide external incentives, including both financial and non-financial measures [1]. Beneficiaries must meet specific conditions to access these incentives, which function as conditional, government-driven financial incentives that promote green building adoption. Ye et al. [2] emphasise that the core function of such economic incentive mechanisms is to internalise positive externalities by converting social benefits into private gains. These mechanisms comprise tax reductions, direct fiscal rewards, and low-interest loans, thereby reducing the effective cost of developing a green building. This leads to an increase in the developer's desire to supply green buildings and, subsequently, to higher consumer demand, enabling the broader diffusion of green buildings in the market.

2.2. Economic and institutional barriers to the green building transition

A major economic barrier green buildings are associated with is the high up-front construction costs and long payback periods. In a city like Sydney where land prices and labor costs are already high, development costs have increased. This puts additional financial pressure on developers to invest in renewable energy systems and high-efficiency mechanical and electrical systems needed to satisfy the requirements of green buildings. Moreover, the energy-saving benefits of green buildings are primarily captured by occupants and are realised gradually over the building's lifecycle, while developers tend to prioritise short-term financial returns.

In New South Wales, Australia, the Building Sustainability Index (BASIX) is regarded as one of the strongest sustainable planning measures [3]. However, Thorpe and Graham [4] mention that BASIX is centred on minimum compliance and is characterised by relatively low target commitments. Given that energy use, water consumption, and emissions in NSW have continued to increase, it is reasonable to assume that BASIX has not achieved significant sustainability gains. Meanwhile, BASIX excludes embodied energy associated with material extraction, transportation, and installation, which further limits its effectiveness as a comprehensive sustainability instrument. This suggests that tools like BASIX are not free from institutional barriers in their design and implementation.

3. Policy instruments and incentive practices for green building transformation

3.1. Policy instruments for the green building transition

Policy instruments for green building transformation can be divided into regulatory, economic, and financial instruments. Regulatory instruments, such as building codes and minimum performance standards, establish mandatory baseline requirements. Economic instruments translate environmental benefits into quantifiable monetary values and provide direct incentives to developers. Financial instruments aim at easing the constraints of finance in facilitating long-term

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investment in sustainable building technologies. Both types of instruments play parallel roles in helping a transition take place toward green buildings.

3.2. Green building incentives: pathways to overcoming transition barriers

In response to the economic and institutional barriers discussed in Section 1.2, incentives are indispensable economic tools for the green building transition. He and Chen [5] construct a two-stage game model involving the government, developers, and consumers and find that simultaneously subsidising both developers and consumers yields the highest developer profits and the most significant level of social welfare. This indicates that incentives targeting both supply and demand are more effective in promoting the development of green building markets.

Given that green buildings generate social benefits such as energy savings and emissions reductions, they exhibit positive externalities. A core rationale of incentive policies, therefore, lies in internalising these social benefits into private gains, thereby enhancing developers' willingness to supply green buildings. Meanwhile, to avoid the split-incentive problem and to close the market loop, dual-sided incentives can increase developers' incentives to construct green buildings and consumers' willingness to pay a premium for green attributes.

Moreover, incentive schemes should be tailored to local market conditions by accounting for consumers' willingness to pay for green buildings, local energy prices, and labour costs, and by aligning with local planning policies to improve approval efficiency [1]. By being carefully designed to respond to local economic and environmental conditions, incentives can more effectively drive the transition towards green buildings.

3.3. Practical models and impact analysis of Sydney's green building incentive program

Many green building incentive programs are currently being implemented in Sydney. For example, the City of Sydney Council's Green Building Grant offers up to AUD $50,000 per project per year for building owners and owners' corporations located within the City of Sydney local government area. This grant helps reduce the high upfront costs associated with obtaining green building assessments and certifications such as NABERS and Green Star, while supporting buildings in their transition toward net zero emissions by 2035 [6]. Unlike minimum compliance frameworks such as BASIX, this programme uses financial incentives to encourage buildings to pursue higher levels of sustainability performance proactively.

In the energy sector, targeted incentive schemes are also available. The NSW Energy Savings Scheme provides incentives of approximately AUD $405–$675 for residential households that replace conventional electric water heaters with heat pump water heaters. It offers businesses a Heat Pump Feasibility Grant of up to AUD $30,000 (NSW Government, n.d.) [7]. These incentive policies not only improve building energy efficiency but also contribute to the development of green building and clean energy markets.

4. Carbon taxes and carbon pricing: internalising carbon costs in the building sector

4.1. Theoretical basis and transmission mechanisms of carbon pricing

The economic rationale underlying carbon pricing originates from A. C. Pigou's theory of externalities, which argues that polluters do not bear the full social costs of the environmental damage they cause. Carbon pricing, including carbon taxes and emissions trading schemes,

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functions as a mechanism for internalising the negative externalities associated with carbon emissions [8,9].

Based on earlier OECD research on energy taxation and effective carbon rates, a well-cited academic paper finds that an increase in the effective carbon rate (ECR) of EUR 10 per tonne of CO_2 leads to an average long-term reduction in emissions of 7.3% [10]. Since the building sector is a major source of carbon emissions, carbon pricing not only raises the prices of energy sources such as electricity and gas but also increases the costs of carbon-intensive construction materials such as steel and cement. As a result, carbon pricing effectively steers both production and consumption decisions towards low- and zero-carbon alternatives.

4.2. Impacts of Australia's carbon pricing experience on the Australian building market

The Clean Energy Act 2011 is one of the most significant pieces of climate legislation passed by the Australian Parliament to address climate change. It came into effect on 1 July 2012, marking the first time Australia introduced a nationwide carbon pricing mechanism (Clean Energy Act 2011 [11]. This mechanism initially adopted a fixed-price approach for the first three years, with plans to transition to a more flexible, market-based emissions trading scheme. During its implementation, the carbon pricing scheme prompted many businesses to accelerate their adoption of cleaner technologies, while carbon-intensive activities were constrained by rising costs [12]. However, the scheme also contributed to higher prices for electricity, gas, and other energy sources, increasing costs for businesses and households, which, in turn, triggered significant public dissatisfaction.

In the building sector, the existence of a carbon price provided stronger incentives for developers to invest in green technologies, such as improved material choices and energy-efficient systems. However, after the carbon pricing mechanism was repealed in 2014, the cost gap between green and conventional buildings widened again, leading many developers to favour traditional construction methods with lower upfront costs.

5. Green finance: amplifying the long-term effects of policy instruments

5.1. How financial instruments facilitate green policy goals and drive transformation in the building market

In addition to the economic instrument of carbon pricing mentioned above, financial instruments are also a crucial component of green policy frameworks. These tools help lower the financing costs of green projects by facilitating capital flows and optimizing financial structures, thereby providing sustained funding support for sustainable investments.

Green finance refers to capital from banks, insurance companies, investment institutions, and both the public and private sectors that is preferentially directed towards green and sustainable development. In the building market, such financial mechanisms include green bonds and green loans.

Projects with higher green ratings often gain easier access to green financing. By directing capital towards high-performance buildings, financial instruments not only help translate policy objectives into market behaviour but also enhance the appeal and investment potential of the green building market, further driving the sustainable transformation of the construction industry.

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5.2. Interactions between green buildings and financial markets in Sydney

NABERS (National Australian Built Environment Rating System) is Australia's official environmental rating system for buildings, assessing performance in areas such as energy, water, and indoor environmental quality. NABERS launched its Sustainable Finance Criteria on June 1, 2022, aiming to support green investment and direct capital toward sustainable real estate projects.

There are currently 324 buildings in Sydney with a NABERS rating of 5 stars or higher. Among them are iconic buildings such as the three International Towers at Barangaroo, all rated at 6 stars, and Coca-Cola Place building North Sydney rated at 5.5 stars [13]. As reported in the NAB Annual Green Bond Report for 2024, the average NABERS Energy Rating for commercial buildings financed with green bonds stands at 5.4 stars, which is significantly higher than the average star rating of 4.9 stars for commercial buildings [14]. This suggests a clear link between strong environmental performance and access to sustainable finance.

Furthermore, the Lendlease Green Bond Impact Report FY2025 confirms that 100% of the green bond proceeds were allocated to assets meeting high environmental standards, such as those rated 5 stars or above under the Green Star certification system [15]. These cases highlight the positive feedback loop between green building certification and green financial instruments, reinforcing Australia's sustainable building transition.

6. Integrated case study of Sydney: policy synergies rather than isolated measures

6.1. Sydney's urban climate goals and building policy context

In response to global climate change, the City of Sydney has established a series of important climate targets. According to the City of Sydney's Environmental Strategy [16], the city aims to reach net zero emissions by 2035, with embodied carbon significantly reduced. To support these goals, the City of Sydney has introduced a range of supporting policies.

These include mandatory regulatory requirements, such as the Building Sustainability Index (BASIX), which sets minimum energy-efficiency standards for residential developments, as well as economic incentives, such as the Green Building Grant, which helps developers manage the high upfront costs associated with green building assessments and certifications, such as NABERS. In addition, market-based instruments, including energy use taxes and emissions trading schemes, influence supply- and demand-side decisions through market price signals. Financial instruments, such as green bonds, also play a role by directing investment towards green building projects.

6.2. Synergistic mechanisms of the policy instruments

Policy instruments in Sydney's building sector generate synergistic effects. Regulatory policies first establish a baseline level of environmental performance by setting minimum energy-efficiency and emissions standards, thereby preventing the continued development of carbon-intensive, energy-inefficient buildings. Based on that, economic incentive policies play a complementary role. Through subsidies and financial support, these incentives internalise social benefits such as energy savings and emissions reductions into private gains for developers and building users, encouraging market actors to exceed minimum compliance requirements voluntarily.

Meanwhile, market-based instruments reinforce low-carbon choices over a longer time horizon through price signals. Through the combined operation of policy instruments, Sydney promotes the

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transition of the building sector towards low- and zero-carbon outcomes across multiple decision-making levels.

7. Conclusion

This study has critically examined the role of economic policy instruments in Sydney's green building transition. The analysis reveals that while regulatory frameworks like BASIX provide an essential "compliance floor," they are insufficient to overcome the high capital barriers of high-performance buildings. Our empirical review highlights that economic incentives and green finance have effectively stepped in to fill the void left by the repeal of carbon pricing. Specifically, integrating NABERS ratings into green bond issuance has created a robust market screening mechanism, as evidenced by green bond-financed buildings achieving an average rating of 5.4 stars, significantly outperforming the market average of 4.9 stars.

The core contribution of this research lies in identifying the synergistic efficacy of these instruments. A single policy does not drive the transition. However, by a tiered structure, regulations prevent the worst practices, fiscal grants offset the "green premium," and financial instruments signal long-term value to investors. This "carrot-and-finance" approach effectively internalizes positive externalities even in the absence of a penalizing carbon tax. To meet 2035 net-zero goals, policymakers should enhance BASIX by including embodied carbon and linking financial incentives to sustainability ratings. Sydney demonstrates that strategic incentives and green finance can drive sustainable building practices when carbon taxation is limited.

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