International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN – 2347-7075 Impact Factor – 8.141
Peer Reviewed Bi-Monthly
Vol. 6 No. 19 March - April - 2025

The Price of Sustainability: Understanding the Green Premium Effect

Ms. Swarangi Sambhaji Yadav[1] & Dr. Harshad Laxman Jadhav[2]
[1]*PG Student, Karmaveer Bhaurao Patil College, Vashi, Navi Mumbai*
[2]*Head, Department of Economics, Karmaveer Bhaurao Patil College, Vashi*
Corresponding Author – Ms. Swarangi Sambhaji Yadav
DOI - 10.5281/zenodo.15100998

Abstract:

As India advances toward a sustainable future, balancing environmental responsibility with economic feasibility presents a significant challenge. The concept of the Green Premium, introduced by Bill Gates in How to Avoid a Climate Disaster (2021), refers to the additional cost associated with producing goods and services through environmentally sustainable methods. This premium often deters mass adoption, as sustainable alternatives, such as electric vehicles and green cement, remain more expensive than their traditional counterparts.

Heavy industries, particularly cement and steel, face substantial Green Premium costs due to high carbon capture expenses. The cement industry alone accounts for 6% of global Scope 1 and 2 emissions, with decarbonization efforts such as Carbon Capture, Utilization, and Storage (CCUS) increasing production costs by 75-140%. These additional costs translate into higher prices for consumers, influencing purchasing behavior and adoption rates.

Consumer willingness to pay (WTP) for sustainable products varies across demographics and industries. Global trends indicate a growing preference for eco-friendly goods, with searches for sustainable products rising by 71% in five years. However, behavioral heuristics such as loss aversion, status quo bias, and the framing effect influence consumer decisions. While surveys suggest that over half of consumers are willing to pay a Green Premium, skepticism regarding greenwashing and high upfront costs remain key barriers.

This paper explores the economic and behavioral dimensions of the Green Premium, assessing its impact on industrial sustainability and consumer purchasing decisions. Addressing these challenges through policy interventions and technological innovations is crucial for achieving widespread adoption of green solutions.

Keywords**: **Green Premium, Consumer Willingness to Pay, Sustainability Economics, Behavioral Economics, Net Zero Production, Sustainable Consumer Behavior

Understanding the Green Premium in Sustainability:

As India moves towards a more sustainable future along with the rapid economic progress and inevitable industrialization, the challenge of balancing environmental responsibility with financial feasibility has gained much prominence among the market players. While sustainability initiatives such as electric vehicles, organic food, and renewable energy hold great promise, their higher costs often deter mass adoption. To produce sustainable goods with clean technology and zero-carbon emissions is usually more expensive than high emission production options. This leads to higher cost of the goods and services and in turn shifts the burden of clean solutions on to the consumers and this increased price of the goods is termed as 'Green Premium' by the Microsoft co-founder Bill Gates in 2021 in his book named, 'How to Avoid a Climate Disaster'. In this book he gives a comprehensive plan for reducing global net CO2 emissions to prevent climate catastrophe and among the key concepts he discusses is the green premium concept,

which refers to the additional cost associated with producing goods or services in a pollution-free or environmentally friendly way. This premium represents the price tag for choosing a greener option.

The green premium effect refers to the additional cost consumers are willing to pay for sustainable products and services that contribute to environmental conservation. This phenomenon not only incentivizes businesses to adopt eco-friendly practices but also drives innovation in sustainable model development, allowing entrepreneurs to create value while addressing pressing environmental issues. By integrating sustainability into their business strategies, entrepreneurs can leverage the green premium effect to tap into a growing market of environmentally conscious consumers, ultimately fostering a new wave of entrepreneurship that prioritizes long-term ecological balance alongside economic growth (Rathod et al., 2024).

The concept of the green premium effect highlights the additional cost consumers and businesses often incur when choosing sustainable products or practices over conventional options, reflecting the economic challenge of transitioning to greener alternatives. This premium can act as a barrier to widespread adoption of sustainable technologies, but it also underscores the potential for innovation, as investments in renewable energy, energy efficiency, and sustainable materials can gradually decrease costs and enhance accessibility. By integrating the principles of the green premium effect into sustainable development strategies, stakeholders can effectively incentivize shifts toward environmentally friendly practices, ultimately leading to a more resilient economy that prioritizes both ecological stability and social equity (Wavare et al., 2024).

The green premium effect is a crucial concept in the context of sustainable development, highlighting the additional cost associated with environmentally-friendly products and practices compared to their conventional counterparts. In the pursuit of Viksit Bharat, or Developed India, the challenge lies in balancing economic growth with environmental sustainability. Achieving Viksit Bharat necessitates strategies that minimize the green premium effect, making green technologies and sustainable practices more accessible and affordable for all segments of society. By investing in innovation, infrastructure, and education, India can reduce the green premium, fostering a transition towards a sustainable economy while promoting inclusive development that aligns with the vision of a prosperous and ecologically responsible nation (Harale & Pawar, 2024).

Green Premium in Heavy Industries: The Case of Cement:

Green Premium is most noticeable in the electric vehicle and manufacturing industry where making steel and cement in the green and sustainable way is almost double the normal price making it undesirable for the companies and individuals who are price sensitive. Around 40% of manufacturing emissions are because of the steel and cement industry. Green cement has shown a lot of promise but is yet to take off because of its exorbitant high cost, both for the sellers and buyers. The reason why eco-friendly options are more expensive compared to traditional ways is due to the production methods. For instance, decades-long investment has gone to building infrastructure and developing technology to produce energy from gas, oil and other fossil fuels. Decarbonizing the energy industry requires making great strides in developing renewable energy to make business more efficient and profitable.

In 2022, the cement industry generated 2.6 GtCO2e (gigatonnes of carbon dioxide equivalent), accounting for 6% of the global Scope 1 and 2 emissions which refers to the direct and indirect emissions of greenhouse gas (GHG) respectively and are reported by several businesses around the world. The cement industry can use carbon capture, utilization and storage (CCUS), clean hydrogen, and clean power to achieve decarbonisation. According to the estimates

from the Global CCS Institute in 2017, the CCUS cost estimates range from $104 to $194 per ton for cement and these increased costs are applied to estimates of the current price and carbon intensity of global cement production.

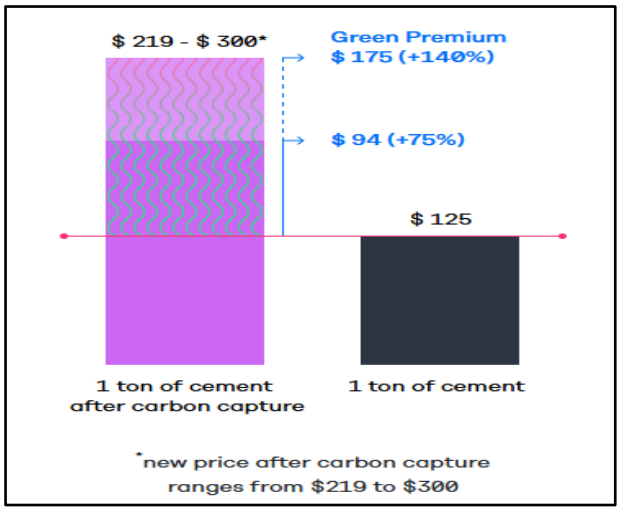

Figure 1.1: Cost of a normal ton of cement vs. new price after carbon capture
(Source: Breakthrough Energy)

The diagram illustrates the cost difference between producing one ton of cement under normal conditions versus after implementing carbon capture technology. Without carbon capture, the cost is $125 per ton, while with carbon capture, the cost increases to a range of $219 to $300 per ton. This additional cost, termed the 'Green Premium', represents the extra financial burden of making cement production environmentally sustainable. The Green Premium ranges from $94 (+75%) to $175 (+140%), highlighting the economic challenge of transitioning to greener industrial processes. This cost increase poses a barrier to widespread adoption, as manufacturers and consumers may be reluctant to pay significantly more for sustainable alternatives.

In the cement sector, using low-carbon cement can lead to a B2B green premium of 40-120% per ton of cement, driven by costs from carbon capture and alternative materials. For end consumers, this translates into a B2C green premium of a 1.5-3% increase in the cost of building houses due to the more expensive sustainable materials used. The overall impact on housing prices reflects the increased material costs as sustainable practices are integrated into building processes.

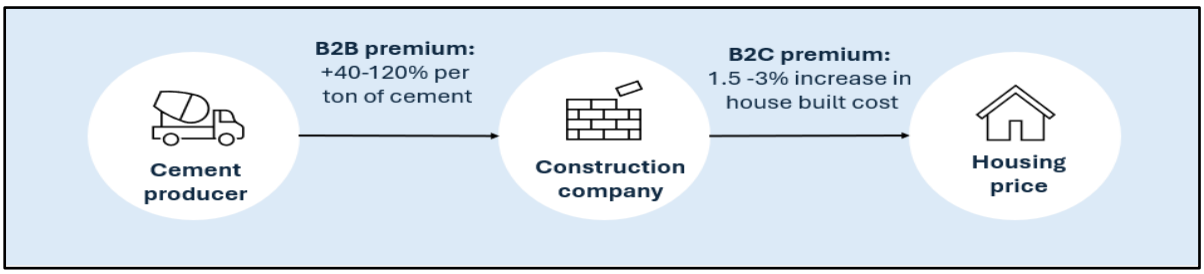

Figure 1.2: B2B and B2C green premium in the Cement Industry
(Source: Illuminem)

Consumer Behavior Towards Sustainable Products:

Rapid population increase and excessive consumption of goods and services are having a negative impact on Earth's ecosystem. Extreme resource depletion leads to imbalance, hence, consumers are paying more attention to green consumerism as a result of the oil crisis and rising environmental concerns. Consumers are willing to purchase green products and are increasingly

prioritizing sustainability when choosing products, particularly when it comes to packaging. Global online searches for sustainable goods have increased 71% in five years and products marketed as sustainable grew 2.7X faster than products not marketed as sustainable.

The major factors determining consumers' intention to purchase eco-certified products are– the level of awareness about the production conditions, perceived quality of the sustainable product, social influence, availability of information about sustainability claims, trust in the brand's sustainability practices, household income and the perceived effectiveness of their purchase in making a positive environmental impact.

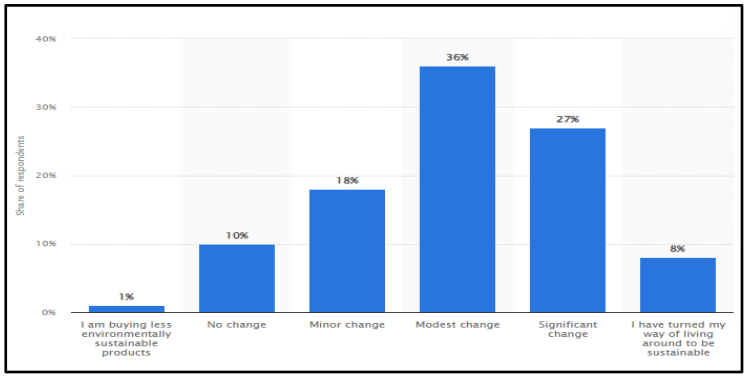

Figure 2.1: Degree to which consumers' purchasing behavior and choices shifted towards buying more sustainable products over the past five years worldwide in 2022
(Source: Statista)

In 2022, the vast majority of consumers across the globe saw their purchasing behavior become at least a little more environmentally friendly compared to five years earlier. The diagram illustrates the question asked in a panel survey, "To what degree have your purchasing behavior and choices shifted towards buying more environmentally sustainable products over the past 5 years?", conducted by Kasia Davies through Simon Kucher in 2022, where a total of 11,711 respondents participated from over 19 countries. Specifically, over a third of surveyed shoppers noticed a modest change, while nearly 30 percent said they bought sustainable products significantly more often. Nearly one in 10 respondents even claimed they had turned around their way of life in order to be environmentally sustainable.

Are Consumers Willing to Pay for Sustainability?

Willingness to pay (WTP) is the highest price a customer will pay for a product or service. This corresponds to the standard economic view of a consumer reservation price. It's a key metric in behavioral economics and is used to guide pricing and product development. WTP varies depending on the context, different demographics, the specific customer in question, and can fluctuate over time.

In a study by BGC focusing on the emissions generated during a product's production and throughout its entire value chain, up until the point of sale to consumers, they conducted a consumer survey in 2023 to evaluate their willingness to pay for net zero production where a total of 2,524 respondents participated from the US, the UK, Germany, France, Poland, Japan, and China. They introduced respondents to the concept of net zero production in detail and asked them explicitly about their willingness to pay for products manufactured via net zero production.

When asked, "How can we increase the likelihood that consumers who say they are willing to pay a green premium actually pay one at the time of purchase?" In our global survey, 57% of respondents said that they would "definitely" or "probably" consider net zero production when purchasing their next new passenger vehicle or home appliance, while 17% claimed no willingness to pay green premium. Among the countries surveyed, China ranked the highest to

vote definitely yes to net zero production whereas the UK was the highest to vote against the willingness to pay any green premium.

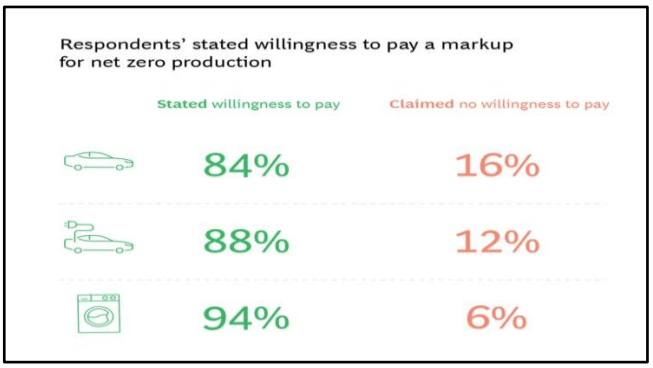

Figure 2.2: Global survey on consumer's willingness to pay green premium
(Source: BGC Analysis)

According to the BCG survey of auto consumers (passenger vehicle) and washing machine (home appliance) consumers, around 88% of the respondents stated they are willing to pay at least a 0.4% green premium for net zero production of passenger vehicles and about 94% of the respondents in the case of home appliances such as washing machines. The absence of strong brand preferences within segments, in contrast to the auto survey results, mostly results from the lesser visibility of washing machines for consumers compared with autos or even kitchen appliances. Indeed, OEMs (Original Equipment Manufacturer) often employ different marketing strategies for home appliances that are prominently visible versus those that are typically hidden in bathrooms or cellars. This leads to one of the common barriers that limit consumer willingness to pay for vehicles and home appliances– suspicions about false claims ("greenwashing") and concerns about performance. Other barriers being the additional charge is too expensive for their budget and the consumers often have doubts regarding the authenticity of net zero production.

To compare the data from India around the same time in 2022, according to a survey carried out by Insight Rakuten Global, when asked, "Have you adopted any sustainable practices when purchasing items in the last 12 months?" 56% of the total respondents replied yes whereas 27% respondents replied no and 17% of the respondents were unsure of their purchasing habits regarding sustainable goods and services. Here, adoption of sustainable practices refers to reduction of single-use plastic, buying more locally-made products, recycling or upcycling old items in the household and choosing items in sustainable packaging. When surveyed about the consumer's willingness to pay for sustainability in India, 74% opted that they are willing to pay while the other 26% chose not to pay for the green premium.

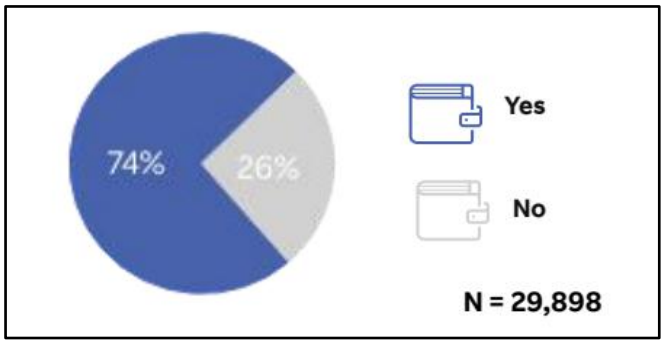

Figure 2.3: Willingness to Pay for sustainability in India
(Source: Insight Rakuten Global)

Behavioral Heuristics Used in Sustainability:

Behavioral Economics is a modern discipline that aims to understand how people make decisions. In 1972, the psychologists Kahneman and Tversky coined the term cognitive biases, these biases are what explain the gap between what people claim to do and how we really behave. The willingness of consumers to pay this premium is shaped by several behavioral heuristics—mental shortcuts and cognitive biases that influence decision-making. These heuristics can either encourage or discourage sustainable consumption. Key behavioral heuristics affecting the green premium:

1. Loss Aversion: The Fear of Losing Money:

People feel the pain of losing money more acutely than they feel the pleasure of gaining an equivalent amount. Marketing strategies can reframe the purchase to emphasize losses associated with not choosing the green option. For instance, utility companies often use messaging like "By not switching to solar energy, you are losing □ 10,000 annually on electricity bills." This shifts the focus from upfront cost to potential financial loss.

Example: If a consumer views the price difference between an organic and a non-organic product as a loss, they are less likely to choose the sustainable option. Even if organic food is healthier and better for the environment, the immediate financial "loss" of paying extra discourages them.

2. Framing Effect: How Choices Are Presented:

The way a decision is framed influences consumer choices, even if the information is the same. Governments and businesses can use positive framing to highlight savings and benefits. EV manufacturers often highlight “zero fuel costs” instead of emphasizing high upfront prices.

Example: If a sustainable product is marketed as "costing 20% more than the conventional option," it discourages purchases. But if the same product is framed as "saving you □ 10,000 annually in energy costs," people may perceive it as a financial benefit rather than an extra expense.

3. Status Quo Bias: The Comfort of Familiarity:

People tend to stick with familiar options rather than switching to new alternatives, even when change could be beneficial. Governments and automakers can address this bias by making green choices the default, such as offering trade-in incentives for old gasoline cars or expanding charging infrastructure to increase convenience.

Example: A consumer who has been using a gasoline car for years may hesitate to switch to an electric vehicle (EV), despite lower long-term costs and environmental benefits. They might believe that charging infrastructure is inadequate or that EVs are too different from what they are used to. This reluctance to change leads them to reject the Green Premium, opting for the more familiar option instead.

4. Social Proof and Herd Mentality: The Influence of Others:

People tend to mimic the choices of their peers, especially when they are unsure about a decision. Brands and policymakers can leverage influencers, testimonials, and real-world case studies to demonstrate widespread adoption of green products. For example, Tesla’s referral program, which rewards existing EV owners for bringing in new customers, capitalizes on social proof to encourage more people to switch.

Example: If most people in a neighborhood install solar panels or use eco-friendly packaging, others are more likely to follow. The social norm creates an implicit endorsement that makes the Green Premium seem more acceptable.

5. Anchoring Effect: The Influence of Initial Price Perceptions:

People rely too heavily on the first piece of information they see when making decisions. Retailers can strategically display mid-range and budget-friendly green options first to set a lower anchor. For instance, showcasing a □ 12-lakh Tata Nexon EV before displaying a □ 70-lakh BMW iX can make EVs seem more affordable.

Example: If a consumer first sees a luxury hybrid car priced at □ 80 lakhs, they may assume that all electric cars are expensive. As a result, they may dismiss more affordable EV options without further exploration.

Strategies to Minimize the Green Premium:

As much as green premium is essential for the businesses to survive, it is just as important to understand the customer's perspective and willingness to pay for these goods and services. Lowering the green premium will bring more customers interested which leads to smoother transition to zero emissions commodities.

- Companies and Investors: they can commit to buying cleaner alternatives as well as invest in research and development while supporting clean energy startups. They can also contribute by advocating for government policies that bring down the cost of getting to zero-carbon emissions.
- Governments: both central and state governments, can help by implementing public policies that make carbon-based technologies more expensive or make the clean counterparts cheaper for the companies and manufacturers. These policies can include rules about how much carbon a technology can emit, regulations that shape financial markets, and public investments in research and development.
- Individuals: every individual can play an important role too, by holding the elected officials accountable and by choosing cleaner products compared to cheaper alternatives. For example, even if buying an electric vehicle may cost more, in the long run the environmental benefits can be unmatched and this shows the demand for the cleaner technologies which encourages companies to invest more in them.
- Innovation: rapid innovation across the value chain– production, shipping and even end-of-life recycling are pivotal to reducing the green premium as it encourages finding ways to develop efficient profitable and emission-free methods for manufacturing products and delivering services.
- Financing: adequate funding drives innovation and transforms production to lower green premiums. Financial tools such as green bonds and other sustainable financial products can significantly support these initiatives. For example, the European Investment Bank (EIB) has been a global leader in climate financing, offering low-interest loans for renewable energy projects, leading the sustainable financing trend.
- Going Green vs. Greenwashing: Many consumers are increasingly wary of companies that greenwash their products. Greenwashing is when companies use images and words implying sustainability but don’t have any real green initiatives and might even hurt the environment with their practices. Some examples would be companies using images of trees on their products to make consumers subconsciously think of sustainability even though the product itself is harmful to the environment.

Conclusion and way ahead:

Sustainability is a growing concern for both the Indian government and the consumers. This trigger motivates Indian consumers to move towards and invest in more sustainable products

due to various health and environmental issues in the coming future. Technological breakthroughs combined with economies of scale has resulted in renewable energy becoming one of the first sectors where green premium is actually negative. As a matter of fact, solar energy today is cheaper than electricity derived from coal.

Currently we emit about 50 billion tons of greenhouse gas every year or about 6.5 tons per person per year through our activities. To bring this number down to zero by the year 2050, we have to shift to low-carbon emitting alternatives in every single thing we do on a daily basis. The simple rule of economics is that demand dictates supply. Consumers, companies, shareholders and governments, everyone has a paramount role to play. Investors are demanding companies to be stringent on turning net zero in manufacturing and supply chain activities. But challenges like lack of complete knowledge and awareness, high prices, availability issues and insufficiency of compelling products are currently plaguing the market.

The world is quickly decarbonizing and the critical window for material producers and purchasers is rapidly closing. In the coming years, the value from green premiums will be accrued by those who make quick and bold decisions. An understanding of what green premiums are and how it affects the decision making is crucial for the growth of sustainable goods and services.

References:

1. Wavare, A.K., Pawar, G.G., Babar, M.S., Harale, G.D. (2024). Role of Agricultural Science Centres in Attaining Sustainability in India: A Case Study. In: Kulkarni, S., Haghi, A.K. (eds) Global Sustainability. World Sustainability Series. Springer, Cham. https://doi.org/10.1007/978-3-031-57456-6_12
2. U. S. Rathod, S. A. Thomas, F. S. Maruti, P. Balasaheb Kadam, H. L. Jadhav and M. Jamal Bdair, "Reinforcement Learning for Sustainable Business Model Development in Social Entrepreneurship," 2024 Second International Conference Computational and Characterization Techniques in Engineering & Sciences (IC3TES), Lucknow, India, 2024, pp. 1-5, doi: 10.1109/IC3TES62412.2024.10877619.
3. Harale, G. D., & Pawar, G. G. (Eds.). (2024). Viksit Bharat @2047: Challenges and Opportunities (1st ed., Vol. 1) [Online]. Rayat Shikshan Sanstha's, Abasaheb Marathe Arts and New Commerce, Science College, Rajapur Dist. Ratnagiri. https://www.researchgate.net/publication/378610404_Viksit_Bharat_2047_Challenges_and_Opportunities.
4. DSouza, S. (2023). The concept of Green Premium and its importance for renewable energy. The Economics Times EnergyWorld.
5. Breakthrough Energy. (2024) Where to Innovate First- The Green Premium.
6. Kajrolkar, O. (2024). The green premium explained. Illuminem.
7. Roy, H. (2025). Role of Behavioral Economics in Developing Sustainable Behavior. James Lind Institute. https://youtu.be/VZq3ipT82w8?si=wqwp3epxbH7Ky-uO
8. Lakshmi, VV., HimaBindu, ES. (2023). Consumer Perception towards Green Purchasing. World J Forest Res, 2(1), 47-56.
9. Yaqub, M. (2024). 38 Eco-Friendly Consumers Statistics & Trends: A Must Know in 2024. BusinessDasher.
10. Zenkova, V. (2025). What Are the Top Challenges Facing Eco-Friendly Business Owners? Ecofreek.
11. VML The Cocktail. (2024). Sustainability under the gaze of Behavioral Economics.
12. Rincon, E. (2020). Behavioral Economics and Sustainability. Digitalbiz Magazine.
13. Voight, N., Meyer, M., Stein, J., Deutschlander, S., Wachtmeister, A., Lee, J. (2023). Green Awakening: Are Consumers Open to Paying More for Decarbonized Products? BCG.
14. Insight Rakuten. (2024). Sustainable Consumption in APAC.