POLICY BRIEF

The Net Zero Blind Spot:

When Climate Policy Overlooks the Informal Economy

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Background

A compelling global consensus has formed around achieving Net-Zero emissions as the indispensable framework for collective climate action. This framework, which aims to balance greenhouse gases emitted with those removed from the atmosphere, is grounded in the *Paris Agreement's objective of limiting global temperature rise to well below 2°C*. It provides a common language and a set of quantifiable targets that shape national policy, international finance, and corporate strategy. The urgency for this framework is clear: between 1990 and 2023, annual energy-related CO_2 emissions surged from *20.5 to 37.3 gigatonnes*, with the global per capita average standing at *4.67 tonnes* in 2023.

To achieve this balance, the net-zero framework relies on a quadripartite policy approach[1]. This includes

1. **emissions reduction** across key sectors like energy, transport, and industry by shifting to renewables, electrifying transport, and improving efficiency;

2. **active carbon removal** through both natural solutions like reforestation and technological methods like carbon capture and storage;

3. **regulated offsetting,** where any remaining, unavoidable emissions are compensated with high-integrity credits; and

4. **foundational policy components** such as setting clear near-and long-term targets, mobilising public and private investment, and fostering multi-stakeholder collaboration.

[1] For the purpose of this article, the term "net-zero policy" or "framework" covers these four policy strategies

Yet, parallel to this ambition is a second global reality of staggering scale: the informal economy. In Africa, this economy employs between 85% and 90% of the working population. Across Asia and Latin America, it constitutes the majority of the non-agricultural workforce, ranging from 45% to over 85%. In advanced economies, it employs about 15%. This trend is clear at the country level: the informal economy employs approximately 90% of the workforce in Nigeria and India, 85% in Ghana, and nearly 85% in Bolivia. This is the world of street vendors, domestic workers, home-based workers, waste pickers, smallholder farmers, small-scale artisanal miners, informal transport workers and unregistered service providers, a vast and dynamic sphere of economic activity that operates beyond the direct purview of state regulation and taxation (see table 1 for the classification of the informal economy).

Table 1: Summary of Informal Economic Activities

Classification	Activities
Vending	Food/vegetable sellers, garment/retail vendors, mobile stall operators, etc.
Waste Pickers/Recyclers	Landfill scavengers, solid waste, ragpickers, e-waste handlers/recyclers, etc.
Small-Scale Farmers	Subsistence farmers/fishers, Pastoralists, Peri-urban growers, etc.
Transport Workers	Rickshaw pullers, Motorcycle riders, taxis, Informal bus operators, pedicab and tricycle drivers, etc.
Pollution-Intensive Activities	Brick kiln workers, artisanal miners, leather tanners, repair shops, etc.
Home-Base and Domestic Work Activities	Craftsmen, tailors, shoemakers, carers, housekeepers, etc.

The failure of the mainstream net-zero policy strategies to recognise the existence and role of the informal economy creates a critical blind spot. This oversight fundamentally weakens policy effectiveness by misjudging the structure of economies in the Global South, undermines social equity by imposing disproportionate burdens on the most vulnerable, and ultimately hinders a genuinely just transition from taking place. As a result, policies formulated within formal institutional settings risk severe policy failure when applied to the complex, hybrid economies where most of the world's population lives and works.

This article addresses a critical blind spot by first examining the assumptions underlying the established climate policy framework, then exploring the unintended consequences of its application, and finally proposing a new set of principles for integrating the informal economy not as a problem, but as a vital asset in the pursuit of a sustainable future.

The Established Framework for a Low-Carbon Future: A World of Formal Assumptions

To understand the policy blind spot, one must first analyse the dominant climate mitigation instruments. These tools, particularly market-based mechanisms, are celebrated for their theoretical efficiency and have become supporting pillars of the Net Zero strategies (see Figure 1). However, they are not neutral instruments; they are built upon a distinct set of assumptions about how economies are structured, regulated, and monitored.

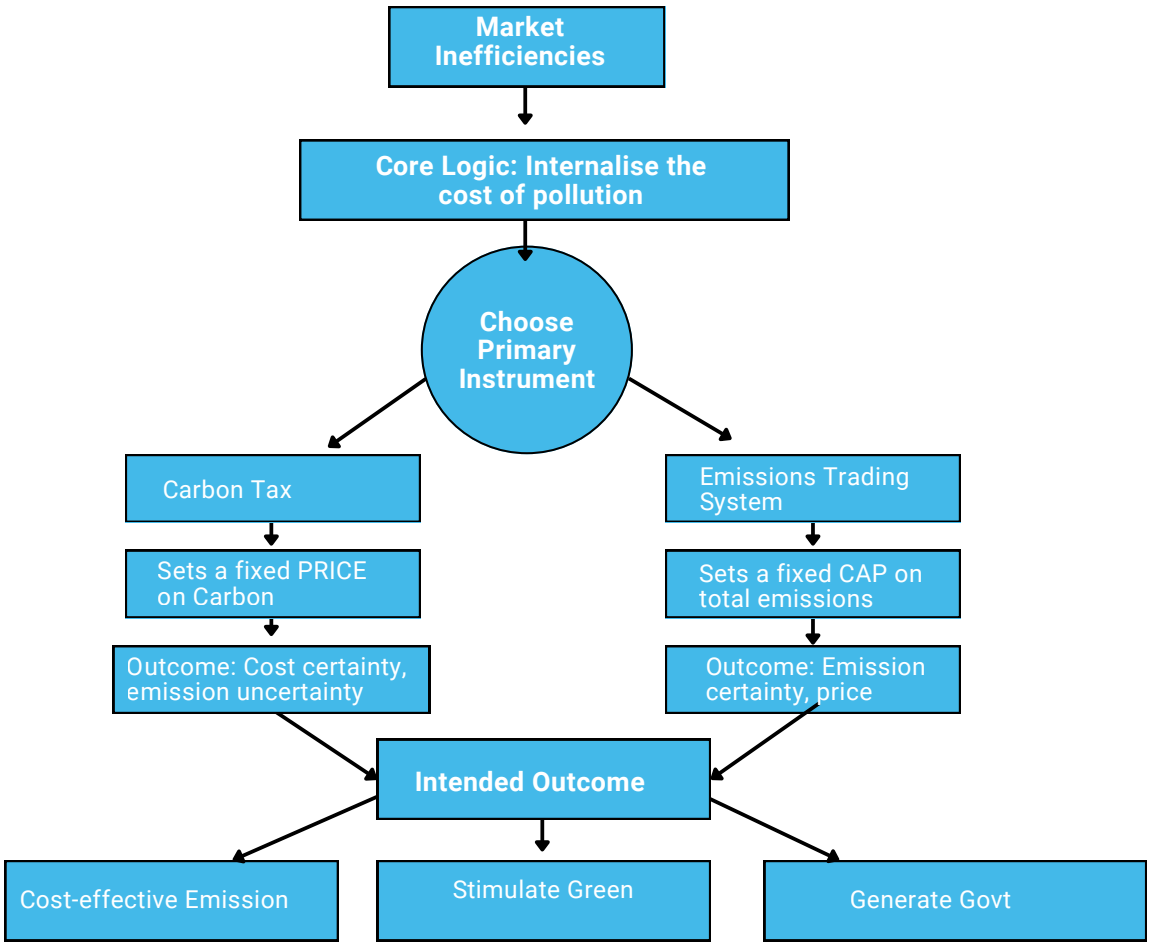
The two common market-based mechanisms for achieving Net Zero goals are:

Carbon Taxes: These are Pigouvian fees[2] designed to internalise the external costs of greenhouse gas emissions. A government imposes a direct price on carbon by defining a tax base, typically the carbon content of fossil fuels sold by registered distributors, thereby creating a clear financial incentive for firms and individuals to reduce their consumption of polluting energy sources.

[2] Pigouvian taxes (or fees) are charges on activities that create negative externalities, such as pollution or increased healthcare costs from harmful goods, to correct market failures and align private costs with social costs. Named after economist Arthur Pigou, these taxes aim to make the "polluter" pay for the external costs they impose on third parties, thereby encouraging more socially efficient production and consumption by internalising the externality.

Emissions Trading Systems (ETS): Commonly known as cap-and-trade, these systems establish a firm, legally binding limit or cap on the total amount of greenhouse gases that a predefined set of regulated entities, such as large industrial facilities, can emit. This cap is divided into allowances that firms can buy and sell, ensuring that emissions reductions occur where they are cheapest to achieve.

The basic assumption behind both instruments is that they operate within the formal economy. Their design presumes registered enterprises, official supply chains, legal employment contracts, and comprehensive tax and regulatory oversight. A carbon tax draws from the taxable base, and an ETS regulates entities that exist only as formal constructs.



Source: Author's conceptualisation from the definitions from Nippa et al., 2021; Green, 2021; Metcalf, 2025.

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The Policy Divide: Regulating the Visible, Ignoring the Invisible

The chasm between formal policy design and the reality of informal economic activity is not merely a theoretical concern; it is a primary driver of policy failure. By focusing exclusively on the visible, regulated parts of the economy, conventional climate instruments overlook a sphere of activity that is not only vital for the livelihoods of over 2 billion workers but is also, in many ways, central to a functioning circular economy. This illustrates the specific disconnects this divide creates and analyses the resulting governance challenges.

Formal Economy: Regulated & Targeted	Informal Economy: Unregulated & ignored
Activity: Large-scale, capital-intensive manufacturing and energy production.	Activity: Labour-intensive, small-scale waste collection and recycling.
Policy Interaction: Subject to carbon taxes, included in Emissions Trading Systems (ETS), and targeted by environmental regulations.	Policy Interaction: Operates outside the purview of state regulation, taxation, and environmental law, making it invisible to formal policy instruments.
Climate Contribution: A primary source of industrial emissions targeted for reduction.	Climate Contribution: Collects 50-100% of waste in Global South cities, acting as a critical agent of the circular economy and emission reduction.

This policy divide creates a fundamental governance challenge. The informal economy's shape is not defined by the basic characteristics of its activities but rather by the boundaries of state regulation. This failure of policy to account for economic heterogeneity and the existence of non-market actors leads to flawed general equilibrium assumptions in the climate-economy models that inform policy design. Policies that assume state monitoring and enforcement capacity will inevitably fail to engage with actors whose livelihoods are structured around the absence of such omission. This failure leads not just to a lack of positive engagement but to actively harmful and unintended consequences that can undermine both climate goals and social equity.

Unintended Consequences: Internal Pollution Havens and Worsened Inequity

The concept of carbon/pollution leakage is a well-established concern in climate policy, conventionally referring to the risk that emissions-intensive industries might relocate from countries with strict climate policies to those with weaker regulations. However, the formal-informal divide creates internal leakage, where polluting activities are displaced not to another country, but from the regulated formal economy to the unregulated informal economy within the same borders. This internal leakage can be called an internal pollution haven[3].

This phenomenon can be understood by adapting the logic of the Pollution Haven Hypothesis (PHH) to the domestic context. The PHH speculates that polluting industries will naturally lean toward jurisdictions with the lowest environmental standards to minimise costs. This logic finds a potent, domestic application in the informal economy, which is widely recognised in development and environmental economics literature as operating outside state regulation and enforcement (e.g., Chaudhuri & Mukhopadhyay, 2006; Baksi & Bose, 2016).

[3] Based on the traditional pollution haven hypothesis, the author introduces the term "internal pollution haven" to conceptualise the displacement of polluting activities to the unregulated informal economy within a country's own borders.

Within a single national economy, the informal economy serves as a haven for internal pollution, a jurisdiction with no environmental regulations, monitoring, or enforcement. This theoretical fusion explains the mechanism of internal leakage. Stringent formal economy regulations increase compliance costs, creating a competitive advantage for informal economic operators who externalise their environmental costs onto society.

The mechanism for this internal leakage is an exercise in basic economic incentives. When carbon pricing internalises the social cost of carbon for formal firms, it creates a cost-differential arbitrage opportunity for formal economic actors who can shift polluting activities to the informal economy, where the perceived private cost of emissions is zero. For example, processes like waste incineration, scrap metal processing, or vehicle repair can be moved off the books to avoid taxes, environmental compliance costs, and labour regulations. Research[4][5][6] confirms a direct link between informal economic activities and higher pollution levels, driven precisely by this absence of regulatory oversight.

The social consequences of creating these internal pollution havens are deeply inequitable. These polluting activities are often relocated to informal settlements or marginalised urban areas, concentrating environmental harm in communities that are already the most vulnerable. Informal economic workers, particularly in activities like waste management, are exposed to toxic substances, hazardous materials, and dangerous working conditions with no access to social or health protections. By unconsciously incentivising the shift of pollution to this sphere, poorly designed climate policies can deepen existing social inequalities, placing the environmental and health burden of the green transition squarely on the shoulders of the poor. This failure is illustrated in the practical application of what is often considered the most economically efficient climate policy, the carbon tax.

Case Study: The Regressive Impact of Carbon Taxes

The carbon tax is often acclaimed by environmental economists as a theoretically elegant, first-best policy for climate mitigation due to its market efficiency. By placing a uniform price on emissions, it allows the market to find the most cost-effective reduction pathways. However, this theoretical elegance can collapse into a regressive and socially disruptive failure when applied in a real-world context characterised by significant informal economic activities.
The primary and well-documented weakness of a carbon tax is its regressive nature. Low-income households spend a larger proportion of their income on energy-intensive

[4] Mazhar, U., & Elgin, C. (2013). Environmental regulation, pollution and the informal economy. SBP Research Bulletin, 9(1), 62-81. Link
[5] Ward, C. (2024, September). Getting to grips with heterogeneity in the informal economy. Link
[6] Ahmad, W., & Hussain, B. (2024). Shadow economy and environmental pollution nexus in developing countries: What is the role of corruption?. International Economic Journal, 38(2), 293-311. Link

necessities like transportation, heating, lighting, and basic goods whose prices rise with energy costs. Therefore, a carbon tax imposes a disproportionately heavy burden on the poor, potentially increasing poverty and inequality.

The standard policy solution for this regressivity is revenue recycling. Governments can use the revenues generated by the tax to provide targeted relief, making the overall policy reform progressive. The most common mechanisms include a climate dividend (an equal, per-capita cash grant) or targeted reductions in other distortionary taxes, such as labour taxes.

Here lies the critical flaw: the delivery mechanisms fail to reach their target population due to a lack of integration with non-formal payment and social systems. These revenue recycling mechanisms are designed for and delivered through the formal state structure. They rely on official tax returns, registered bank accounts, and formal household data to identify and compensate eligible citizens. In a country where a significant proportion, and often the majority, of the low-income population operates within the informal economy, these households can be invisible to the system. They will suffer the price increases passed down from the formal economy but will be ineligible for or unable to access the compensatory rebates. This transforms a policy that is regressive further into one that is potentially catastrophic, deepening poverty and fuelling social opposition to climate action.

This policy failure reveals a deeper truth: the informal economy cannot simply be ignored or treated as an outlier in our climate-economic models. It is not just a challenge to be managed but a potential asset to be leveraged in the climate transition.

[4] Mazhar, U., & Elgin, C. (2013). Environmental regulation, pollution and the informal economy. SBP Research Bulletin, 9(1), 62-81. Link
[5] Ward, C. (2024, September). Getting to grips with heterogeneity in the informal economy. Link
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Acknowledging the Dual Face of the Informal Economy

The Informal Economy as a Pollution Agent

The environmental impact of the informal economy is fundamentally dualistic. It provides crucial employment and circular economy services, yet it also harbours pollution-intensive activities, a contradiction that necessitates carefully calibrated policies focused on support and upgrading rather than purely on regulation.

Examples of environmental challenges within the informal economy:

Pollution-intensive informal activities: As indicated in Table 1, activities like artisanal and small-scale mining (ASM) are prominent in the informal economy. While a source of livelihood for millions, ASM is a major contributor to mercury and cyanide pollution in waterways, deforestation, and unsafe land degradation. Similarly, informal leather tanning, brick kilns, and metal recycling often involve highly polluting processes with severe consequences for local soil, air, and water quality, as well as worker health.

Unregulated Waste Streams: The informal recycling activities excel at recovering valuable materials, but the pursuit of these materials can also lead to problematic practices. The informal recycling of e-waste, for instance, is notorious for unsafe methods like open-air burning to extract metals, which releases toxic fumes containing dioxins and heavy metals.

Lack of Mitigation: The absence of regulatory oversight means there are no enforceable standards for waste disposal, emissions, or worker safety. For example, used motor oil from informal repair shops may be dumped into drains, and plastics deemed non-valuable by waste pickers can be burned or discarded, contributing to local pollution

The Informal Economy: An Environmental Asset

However, viewing the informal economy solely as a problem of unregulated pollution is a critical misdiagnosis. This perspective overlooks its contributions to sustainability. A more accurate and strategic approach is to reconceptualise the informal economy as a prevailing, decentralised, and highly adaptive agent of climate resilience and a circular economy that is already in operation.

Evidence of the informal economy's positive environmental contributions is compelling:

Masters of the Circular Economy: For instance, informal waste pickers are the backbone of recycling systems across the Global South. They collect between 50 and 100% of municipal waste, achieving recovery rates as high as 80%. Case studies from Brazil (90% of Municipal Solid Waste recycling) and Jakarta (25% of the city's waste recovered by 37,000 pickers) highlight their indispensable economic and environmental contribution.

This represents a vast, uncompensated positive externality, delivering critical ecosystem services and resource efficiency at zero fiscal cost to the state. Their work helps to reduce landfill methane emissions, conserves natural resources, and lowers the energy demand associated with new resource extraction.

Agents of Organic Waste Management: In many communities, informal enterprises manage organic waste through practices like vermitechnology. Using earthworms, they break down household garbage and industrial refuse into valuable vermicompost. This process diverts organic matter from landfills, where it would generate methane, and creates a natural fertiliser that improves soil health and agricultural productivity.

Low-Carbon Operations: The structural characteristics of the informal economy often led to lower environmental impacts compared to formal industry. Its reliance on low capital intensity, small-scale production, and labour-intensive methods means it is less prone to the large-scale industrial pollution and high energy consumption associated with formal heavy industry.

Taken together, these activities represent a pre-existing green economy that is decentralised, requires minimal capital investment, and is highly adaptable to local conditions. It is an engine of circularity and resource efficiency that conventional climate policy, with its focus on formal industrial actors, fails to see, let alone support. Recognising this reality requires moving beyond policies designed to regulate or eradicate informality and towards a framework that empowers it as a key partner in a just transition

The Path Forward: Principles for a Truly Just Transition

A Just Transition is a framework designed to ensure that the economic and social burdens of shifting to a sustainable economy are not borne by the most vulnerable workers and communities. Integrating the informal economy into this framework requires a shift in policymaking, moving from assumptions of formality to an engagement with reality. This shift can be built on four core principles.

Principle 1: Formal Recognition of Unaccounted Economic Value. The first and most critical step is to move beyond rigid and often pejorative views of the informal economy. Policymakers must formally acknowledge the legitimacy and significant unaccounted economic and environmental value generated by informal economic activities. This means actively supporting, rather than criminalising, their activities. For waste pickers, this could mean securing access to waste streams; for street vendors, it could mean designating safe and legal operating spaces. Recognition is the precondition for any meaningful and just engagement.

Principle 2: Instrument Design for Heterogeneous Economic Agents. Policymakers should replace or supplement one-size-fits-all policies like broad carbon taxes, which are designed for fully formal economic activities, with instruments tailored to the diverse economic agents in the informal economy. For example, a city-led programme could establish Solidarity Recycling Hubs, which provide informal waste pickers with secure storage, safety equipment, and direct market linkages. Such initiatives will help increase their income while improving recycling rates. Policy should focus on empowerment and capacity building instead of trying to impose formal regulations on actors who cannot comply . This includes providing financial and technical support for informal economic actors to improve their efficiency and safety, delivering targeted training programmes to upgrade skills, and invest in basic infrastructure that supports and improves informal livelihoods

Principle 3: Differentiate and Upgrade.
A just transition must honestly confront the dual environmental role of the informal economy. Policy cannot be blind to the significant pollution caused by activities like artisanal mining or informal waste processing. The third principle is to differentiate between informal economic activities based on their environmental impact and to design targeted pathways to upgrade polluting activities. For activities that are net positive for the environment, policy should focus on amplifying their impact. For polluting activities, the goal is to facilitate a transition by providing access to cleaner technologies, green microfinance, and incentives to adopt environmental standards. This approach acknowledges that justice involves not only recognising value but also responsibly addressing harm, guiding all informal economic actors toward a greener future.

Principle 4: Governance Structures that Internalise Local Knowledge. A just transition cannot be designed in a top-down manner and imposed on informal economic communities. Effective and equitable policy requires the direct participation of those it affects. This means establishing permanent platforms for social dialogue that explicitly include representatives from informal economic worker organisations. Policymakers must design governance structures that internalise the local knowledge, institutions, and priorities of informal economic communities to ensure that climate action isnot only socially just but also practically effective on the ground.

Navigating Implementation

Translating these four principles from theory to practice requires navigating implementation gaps integral to the informal economy's heterogeneous nature. The state must overcome the challenge of engagement by identifying and legitimising pre-existing informal economic associations, such as wastepicker cooperatives or vendor unions, rather than imposing new structures from the top down. A practical approach begins at the grassroots level with phased, sector-specific pilot programmes that prioritise tangible support, like providing safety equipment or a secure workspace, to build trust before introducing policies.

A good example of this approach in action is in Colombia's Decree 596, which formally recognises waste pickers as public service providers within the national solid waste management system. This policy directly embodies the principles outlined above:

Formal Recognition & Instrument Design: The law mandates that municipalities pay waste-picker organisations for the collection, transportation, and recovery of recyclable materials, transforming their environmental service from an unacknowledged externality into a formal, compensated activity.

Indian Case Study

India's SWaCH Pune model is another example that demonstrates the efficiency of the four principles within an Asian context. The model transformed the city's informal waste-picking community into a legitimised, member-owned cooperative. By providing tangible support like safety equipment and stable contracts, SWaCH directly empowers workers and integrates their service into the city's formal waste management system, exemplifying all four principles in practice.

South African Case Study

In the context of Africa, South Africa's Waste Picker Integration Guideline provides a comprehensive policy framework that compels municipalities to recognise, protect, and formally include waste pickers. The guideline operationalises the principles of legitimisation and empowerment by mandating integration into the recycling economy and ensuring fair compensation. Together, these examples demonstrate that a strategic, principle-led approach can effectively bridge the gap between informal work and formal recognition.

These cases demonstrate that success is possible through establishing platforms for dialogue and accepting incremental, locally adapted progress rather than seeking immediate, comprehensive formalisation. The Colombian, Indian, and South African model, while not without its implementation challenges, provides a replicable blueprint for other developing economies, showing how to bridge the formal-informal divide through recognition, fair compensation, and collaborative governance.

The Transformative Question

The core argument of this article is that the current framework of the Net Zero strategies, with its exclusive focus on the formal economy, is structurally limited in delivering an effective, equitable, and just global climate transition. This is not a minor flaw but a fundamental design failure. By ignoring the reality of how billions of people live and work, this approach not only misses a significant portion of economic activity but also actively risks creating internal pollution havens, worsening poverty, and undermining the very social fabric upon which a successful transition depends.

The path forward requires a complete model shift. We must move from viewing the informal economy as a problem to be controlled or eradicated to recognising it as a vital partner to be enabled and supported. It is already an engine of circularity and resilience. The challenge is not to force its diverse and adaptive activities into rigid, formal structures they were never designed for, but to design policies that recognise its value, respect its actors, and invest in its potential.

This leads us to a final, provocative question that should be at the heart of all future climate and development policy. It challenges us to fundamentally rethink the relationship between state regulation, climate models, and human reality. Instead of asking how we can formalise the informal economy to fit our climate models, we should ask how we can informalise our climate policies to fit the reality of how vulnerable workers already live, work, and survive. Such an approach does not mean lowering environmental standards, but rather designing policies that are modular, flexible, and delivered through channels that are accessible to non-formal actors.