Reclaiming Clean Cooking: From Orphanhood to Institutional Mandate in Ethiopia

A Knowledge Product of the P4G-Supported Partnership for Clean Cooking Reform in Ethiopia

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July 2025

1. Executive Summary

Clean cooking in Ethiopia is not a peripheral household issue—it is a national development crisis with global consequences. According to the World Bank, the country loses an estimated $72 billion annually due to lack of access to clean cooking. These losses span premature deaths from household air pollution, time poverty for women and girls, deforestation, health care costs, and diminished labor productivity. At the same time, Ethiopia ranks third globally—after India and China—in its potential to reduce global surface temperature by transitioning to clean cooking, due to its heavy reliance on biomass and high exposure to household smoke.

Yet despite more than a decade of strategies, pilots, and donor funding, nearly 90% of Ethiopian households still rely on polluting fuels. The problem is not technological—it is institutional. Clean cooking in Ethiopia is structurally orphaned: visible in national plans, but absent in budgets, mandates, and enforcement. Ministries cite it, but rarely own it. Donors invest heavily but operate in silos, reinforcing fragmentation instead of resolving it.

A review of 35 national policy documents reveals that clean cooking appears in over two-thirds of strategies, yet almost none assign implementation authority, allocate domestic funding, or track results. Even the 2024 Clean Cooking Roadmap by the Ministry of Water and Energy (MoWIE) repeats these institutional failures—vesting leadership in a single ministry, excluding health and environment counterparts, externalizing financing expectations, and offering no enforcement tools. Donor-funded programs mirror this logic: over 80% bypass government systems, prioritize optics over operations, and devote disproportionate funding to consultancy and workshops instead of durable systems or products.

Meanwhile, the one actor capable of turning strategy into scalable delivery—the domestic manufacturing sector—remains systematically excluded. Manufacturers face steep tariffs on components, lack access to affordable finance, and are required to pay value-added tax (VAT) on production—costs that are rarely borne by donors or importers. These structural penalties exacerbate the affordability barrier of clean cooking, inflating prices for end-users and starving producers of capital. Yet these same manufacturers have developed technologies that deliver up to 65% fuel savings and over 90% reductions in indoor air pollution. *No clean cooking reform can succeed unless Ethiopia's local manufacturers are placed at the center of its policy, financial, and institutional architecture.* Manufacturing is not an implementation detail—it is the mechanism through which every other reform gains traction.

To reverse institutional orphanhood and enable delivery at scale, this report proposes a four-part reform agenda:

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- **Institutional Reform**: Establish a cross-sectoral delivery unit under the Prime Minister with budget authority and mandate to convene health, energy, and environment actors. Create a Clean Cooking Trust Fund that pools and allocates funding based on performance. These structures must be grounded in domestic manufacturing capacity—without a steady pipeline of locally made, appropriate technologies, institutional coordination remains hollow.
- **Financial Architecture Reform**: Legislate clean cooking as core infrastructure to unlock long-term investment. Create carbon-backed guarantees to de-risk stove lending and scale pay-as-you-save (PAYS) models through SACCOs. Public procurement must prioritize verified domestic products, and punitive tariffs and VAT obligations on local manufacturers must be eliminated to level the playing field.
- **Accountability Mechanisms**: Tie public and donor financing to verified stove usage and measurable outcomes like DALYs averted, emissions reduced, and fuel savings. Reform stove testing protocols to reflect real-world conditions and eliminate systemic bias against local innovation. Build feedback loops that trigger design correction, procurement shifts, or project suspension when performance thresholds are missed.
- **Donor Alignment and Conditionality Reform**: Donors must be required to reinforce—not bypass—national systems. This includes channeling funds through domestic institutions, aligning with national procurement and certification standards, and conditioning disbursement on verified stove usage and local manufacturing inclusion. Donor funding should be pooled into the national trust fund and linked to long-cycle systems, not short-cycle visibility metrics. Ending extractive consultancy models and redirecting funds to scalable local solutions is essential.

Clean cooking in Ethiopia is not under-discussed—it is under-governed. It is not starved of ideas—it is starved of operational traction. And above all, it is not viable without a domestic manufacturing base that can deliver appropriate, affordable technologies at scale. Each pillar of this reform agenda—institutional, financial, accountability, and donor—must reinforce that core.

The time to govern clean cooking seriously is now. Ethiopia has the technologies, the institutional templates, and the financial tools to build a system that delivers. What remains is the decision to treat clean cooking not as a development footnote, but as foundational infrastructure—and to build that foundation from the ground up.

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2. The Hidden Costs of the Status Quo

Ethiopia's household energy practices come at an immense, under-acknowledged cost. While policy efforts have focused on expanding electricity supply and reforestation, the daily reality in homes, schools, and informal businesses tells a different story: energy is being misused, forests are disappearing, health is deteriorating, and the burden falls heaviest on women and the poor. This section synthesizes the scale of this invisible crisis by examining the three dominant household energy sources—electricity, charcoal, and firewood—and quantifies their cumulative toll on the country's economy, health system, climate resilience, and social equity.

2.1 Electricity: Misuse, Grid Stress, and Missed Opportunity

Ethiopia has made historic investments in energy infrastructure—hydropower dams, transmission lines, and electrification programs. Yet these supply-side achievements are undermined by how electricity is actually used. In Addis Ababa alone, an estimated 218 GWh of electricity is wasted annually due to inefficient household cooking—enough to power over 650,000 homes.

The primary source of this waste is inefficient injera baking. A typical electric mitad consumes 3.5 kW, and even small delays during batter spreading result in 85 GWh/year lost. Combined with widespread use of outdated, soot-covered hot plates, this pushes total waste to over 52 GWh/year in urban kitchens. These inefficiencies impose not just technical burdens, but social ones: they raise electricity costs disproportionately for low-income households, who already struggle with unreliable access and high tariffs.

Because women perform the vast majority of domestic cooking, they are doubly penalized—bearing the brunt of heat, cost, and time loss. While government strategies continue to emphasize generation, the truth is stark: end-use inefficiency is now one of the main barriers to equitable electrification in Ethiopia.

2.2 Charcoal: Urban Poverty Trap and Forest Collapse

Charcoal remains the primary fuel in Ethiopia's urban and peri-urban kitchens. In 2025, demand is projected to exceed 6.26 million tons—which translates to over 500,000 hectares of forest cleared annually, effectively nullifying Ethiopia's Green Legacy reforestation efforts. Even if replanting matches deforestation acre-for-acre, young trees cannot replace the biodiversity and carbon storage lost from mature forests.

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Charcoal's climate impact is staggering. By 2030, emissions from its production and use are expected to reach 55 million metric tons of CO_2e, equivalent to the annual output of 12 million gasoline-powered cars—24 times the number of cars currently registered in the country.

Health-wise, charcoal is no safer. Indoor air pollution from charcoal stoves exposes families to $PM_{2.5}$ concentrations exceeding 300 µg/m³, more than 12 times the WHO guideline. The result: respiratory disease, cardiovascular illness, and an estimated $500 million per year in health-related economic losses.

Socially, charcoal entrenches inequality. Though it costs more per unit of energy than electricity, it is more accessible to the urban poor because it is sold in small increments. This pay-as-you-go logic traps families in a cycle of high cost and low quality, while women remain the primary users and laborers—managing procurement, storage, and cooking, yet excluded from energy policy decision-making.

2.3 Firewood and Biomass: A Chronic Emergency in Disguise

While charcoal dominates cities, firewood and biomass remain Ethiopia's primary fuels overall—especially in rural areas. In 2023, Ethiopians burned an estimated 115 million tons of biomass, primarily in the form of firewood, dung, and crop residues. That equates to the felling of over 1.3 billion trees per year, or the clearing of 540,000–620,000 hectares of forest annually, making household cooking the single largest driver of deforestation in the country.

The environmental cost doesn't stop with trees. Deforestation linked to biomass use has reduced carbon storage by 35% in some regions and caused average temperature increases in Addis Ababa that are 1.2°C above global norms. Biodiversity, watershed stability, and even coffee yields have declined in firewood-reliant zones.

Health impacts are catastrophic. Indoor kitchens regularly register $PM_{2.5}$ levels of 400–1,000 µg/m³, exposing women and children to the equivalent of smoking 400 cigarettes per hour. Household air pollution causes more than 60,000 deaths per year in Ethiopia—more than malaria, unsafe water, or undernutrition.

Labor burdens are equally profound. Women and girls spend over 1.2 billion hours annually collecting fuel, often walking 10–20 km per trip. This labor suppresses agricultural productivity

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by $320 million per year and keeps girls out of school. The value of lost time from firewood collection alone is estimated at $1.2 billion annually.

2.4 Total Economic Toll: $9.34 Billion Per Year

When combined, the direct and indirect costs of household energy use in Ethiopia amount to at least $9.34 billion annually—roughly 6% of GDP. These include:

Impact Area	Charcoal	Biomass	Combined
Environmental Loss	$1.75B	$2.37B	$4.12B
Health Costs	$0.50B	$1.50B	$2.00B
Social & Gender Burden	$0.30B	$0.90B	$1.20B
Economic Productivity Loss	$0.50B	$1.52B	$2.02B
Total Annual Cost	**$3.05B**	**$6.29B**	**$9.34B**

These figures represent avoidable losses—tied directly to outdated technologies, institutional neglect, and inefficient energy systems. They are not inevitable. They are the result of policy choices.

3. Diagnosing Institutional Orphanhood

Ethiopia's clean cooking crisis is not caused by lack of awareness, data, or technology. It is the product of a governance vacuum. Clean cooking is structurally orphaned—recognized in rhetoric but unclaimed in budget, mandate, or enforcement. This section defines the concept of orphanhood, presents a quantitative diagnosis using two institutional analysis tools, and illustrates how even flagship documents like the MoWIE Roadmap deepen the problem.

3.1 What Is Institutional Orphanhood?

We developed and applied a framework of 11 criteria to cross-map clean cooking visibility, ownership, and coordination across six ministries. The appendices provide detailed matrix data on policy mentions, budget allocations, coordination structures, project leadership, and implementation gaps. Accordingly, we define institutional orphanhood to the systemic condition where a policy area is visible in plans but invisible in action. In orphaned sectors:

- No single ministry is accountable for delivery (**C1**),

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- No budget is allocated to match stated goals (**D1**),
- Coordination mechanisms are missing or symbolic (**E2**)
- Framing Cross-cutting co-benefits (e.g., health, climate, gender) are unmeasured or ignored (**BI**), and
- No enforcement or follow-up exists for missed targets (**E1**).

3.2 Institutional Scorecard: Measuring Orphanhood

To highlight systemic deficiencies, we assessed five of Ethiopia's most influential policy documents across five core institutional dimensions of orphanhood discussed above. Each document received a score based on whether it fully, partially, or failed to meet these conditions. The result is summarized below (Figure 1) as an orphanhood scorecard. The latter assesses whether a specific policy document entrenches or disrupts clean cooking orphanhood, thereby rendering judgment for each dimension that enables comparative evaluation across documents.

Document	C 1	D1	E2	B1	E1	Orphan Index
Ministry of Environment, Forest and Climate Change – Nationally Determined Contribution (2023)	No	No	No	No	Not Available	8.3 / 10
Ministry of Health – Health Sector Development Plan V (2021)	No	No	No	No	Not Available	10.0 / 10
Ministry of Water and Energy – National Energy Policy	Partial	No	No	No	No	8.0 / 10
National Planning Commission – Ten-Year Development Plan	No	No	No	Partial	Not Available	8.8 / 10
Ministry of Finance – Budget Procedures	No	No	No	Not Available	Not Available	10.0 / 10

Figure 1. Institutional Orphanhood Scorecard

Key observations:

- No document scores below 8.0 out of 10 on the Orphan Index (where 10 = most orphaned).
- The MoH's Health Sector Plan and the Ministry of Finance's Budget Procedures score a perfect 10.0, indicating complete institutional disengagement.
- Even the MoWIE Energy Policy, which partially acknowledges accountability and framing, lacks coordination mechanisms, enforcement tools, and dedicated finance.

3.3 Policy Disintegration: The Matrix View

Unlike the scorecard, the Orphanhood Matrix (Figure 2) is a diagnostic map. It cross-references multiple institutional documents to identify where clean cooking is mentioned, omitted, or

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delegated. It exposes *patterns of neglect*, *performative inclusion*, and *institutional misalignment*, providing a bird's-eye view of systemic fragmentation. Figure 2 distills our cross-mapping analysis of the same five core binding policy documents that shape Ethiopia's clean cooking landscape using the same set of criteria as the scorecard.

What becomes immediately clear is that clean cooking, though often mentioned in abstract terms, is structurally orphaned within Ethiopia's policy architecture. No single document fulfills even half of the institutional criteria, and across all five, the pattern is consistent: commitments are made, but the machinery to act on them is missing or misaligned. The Nationally Determined Contribution (NDC) sets an ambitious goal—distributing one million efficient stoves by 2025—but fails to assign implementing authority, allocate budget, or align timelines with the broader climate cycle. The Ministry of Health's strategy ignores household air pollution altogether, despite its well-documented contribution to respiratory illness and premature death.

The National Energy Policy uses vague terminology without defining what counts as an "improved" stove, and offers no metrics, timelines, or links to health or gender outcomes. The Planning Commission's Ten-Year Plan reproduces this logic, offering stove access targets without baselines, responsible institutions, or budget lines. Meanwhile, the Ministry of Finance continues to allocate billions to fossil subsidies and stove imports, while providing zero funding for household air pollution prevention and imposing steep tariffs on local manufacturers.

The result is a set of policies that, while technically "active," operate in isolation from one another. Climate commitments are disconnected from health goals. Energy strategies are divorced from implementation capacity. Budget proclamations fund procurement but not sustained use. What emerges is not just fragmentation, but a kind of institutional evasion, in which no actor is structurally empowered—or held accountable—to integrate and deliver.

This is the essence of institutional orphanhood. Clean cooking is not absent from policy—it is everywhere and nowhere at once. The documents exist, the targets are declared, but the roles, resources, and relationships required to act on them are unassigned, unfunded, or uncoordinated. The matrix does not just catalogue deficiencies; it reveals the architecture of neglect.

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Figure 2. Clean Cooking Policy: Cross-Mapping Matrix

Document	A1 (Acknowledged in Intro)	B1 (Framed as Cross-Sectoral)	C1 (Lead Agency Assigned)	C3 (Joint Implementation Plan)	D1 (Budget Line)	D2 (Domestic Financing Mechanism)	E1 (Monitoring/Enforcement)	E2 (Coordination Mechanism)
MoEFCC – NDC (2023)	Yes	Yes	No	No	No	Not Applicable	No	No
MoH – HSDP V (2021)	No	No	Not Applicable	No	No	Not Applicable	No	No
MoWIE – National Energy Policy	No	No (Partial)	No	No	No	Yes	No	Not Applicable
Planning Commission – Ten-Year Plan	No	Partial	No	Not Applicable	No	Not Applicable	No	No
Ministry of Finance – Budgets	No	No	No	No	No	No	No	Not Applicable

Despite these patterns of symbolic policy and fragmented responsibility, there remained hope that the recently launched Clean Cooking Roadmap (2024) would mark a turning point. Its timing, framing, and political visibility seemed to suggest a new chapter. But does the roadmap break from the orphanhood that has defined past efforts—or does it merely formalize it?

3.4 Roadmap Autopsy: When Symbolism Replaces Structure

The Clean Cooking Roadmap released by the Ministry of Water and Energy (MoWIE) in 2024 was presented as a solution to Ethiopia's longstanding governance vacuum in the sector. Instead, it illustrates and codifies that vacuum. Evaluated using the five orphanhood dimensions—accountability, budgeting, coordination, framing, and enforcement—the roadmap performs poorly, exposing deep structural weaknesses masked by technocratic ambition.

On accountability, the roadmap vests sole ownership in MoWIE, sidelining ministries whose mandates are central to clean cooking outcomes, notably the Ministry of Health (MoH) and the Ministry of Environment, Forest, and Climate Change (MoEFCC). Their exclusion from co-signatory status signals a lack of binding, cross-sectoral commitment. In budgeting, the document calls for mobilizing $3.4 billion from external donors and private investors but fails to commit any domestic funding. No portion of Ethiopia's anticipated carbon revenues is earmarked for clean cooking, rendering the financing strategy a funding mirage that externalizes responsibility without institutional buy-in.

Coordination mechanisms are equally weak. The roadmap proposes an inter-ministerial taskforce chaired by MoWIE, but without any legal authority or mandate to compel cooperation. Critically, the MoH is not included in the taskforce's draft composition. This reinforces clean cooking's isolation within the energy sector and undermines systemic alignment. The roadmap's framing compounds this problem by defining success almost exclusively in terms of "access," without reference to measurable improvements in health, deforestation, or labor burden. By omitting indicators such as DALYs averted, time saved, or emissions reduced, the roadmap severs clean cooking from the broader development agenda.

Enforcement provisions are functionally nonexistent. While annual progress reviews are mentioned, they are internal to MoWIE, with no independent monitoring or consequences for inaction. Regulatory incentives are selectively applied—tariff waivers for finished stoves are highlighted, while punitive tariffs on components used by local manufacturers remain untouched. Meanwhile, budget allocations for "capacity building" appear inflated and misdirected. According to leaked drafts, the proposed $500 million envelope is dominated by workshops and studies, with little left for actual implementation.

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In short, the roadmap entrenches orphanhood rather than correcting it. It is a document of strategic ambition without institutional teeth. To serve as a vehicle for structural reform, it must be fundamentally redesigned: ownership must be shared with health, environment, and gender ministries; domestic finance must be institutionalized through carbon revenue allocations; coordination must be enforceable; and ghosting mechanisms must be explicitly addressed. Absent these changes, the roadmap risks becoming not a remedy for orphanhood—but its most official expression.

4 Donor Orphanhood: External Actors, Internal Erosion

A thorough analysis of donor behavior lies beyond the scope of this document and deserves dedicated attention. However, even a preliminary review reveals that the donor community has not merely operated within the landscape of institutional orphanhood—it has helped normalize and sustain it. Donors are not neutral supporters of clean cooking; they are active participants in its institutional erosion.

This pattern becomes visible when examining how donor-funded clean cooking projects have been designed and executed over the past decade. Between 2015 and 2025, the vast majority of these initiatives in Ethiopia operated outside formal government channels. Rather than strengthening national planning, regulatory, or procurement systems, these projects were designed for short-cycle visibility: workshops, branded campaigns, and high-profile exposure visits often took precedence over sustained investment in local capacity or infrastructure.

In many cases, a disproportionate share of resources was allocated to international consultancies, advisory services, and administrative overhead. Technology development, manufacturing support, or systems integration received marginal attention. These donor programs rarely interfaced with Ethiopia's national certification frameworks or procurement protocols, leaving local manufacturers unable to scale or benefit from alignment with state priorities. Even when the language of institutional capacity was invoked, the actual implementation remained externally driven and structurally detached.

Carbon finance, once hailed as a breakthrough in aligning climate and development goals, has similarly failed to deliver tangible benefits to Ethiopian producers or users. Between 2016 and 2020, clean cooking-linked carbon credits generated $3.46 million in revenue. Yet less than 15% of that amount reached the ground. The lion's share was absorbed by intermediaries—traders,

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verifiers, auditors—and by the transaction costs of navigating opaque global certification systems. For local manufacturers, access to carbon finance has become more bureaucratic than enabling, more extractive than catalytic.

This donor logic mirrors that of the state: acknowledge clean cooking rhetorically, but fail to build the institutions required to govern it.

5. Systemic Policy and Market Failures

The institutional orphaning of clean cooking in Ethiopia has not remained a bureaucratic abstraction. It has produced concrete and compounding failures across the policy and market ecosystem. The fragmentation of mandates, absence of shared accountability, and symbolic donor engagement have all contributed to a dysfunctional system—one where plans are made but not acted upon, technologies are deployed without quality control, and financing models systematically exclude those who build and use clean cooking solutions. The consequences are visible in four interrelated domains:

5.1 Plan–Use Disconnect

The planner–user disconnect is a defining feature of clean cooking orphanhood in Ethiopia. Institutions produce strategies, set numeric targets, and launch pilots—but fail to embed the operational systems necessary for sustained adoption. What results is a cycle of ambition without accountability: stoves are distributed, projects are celebrated, but usage fades quickly and lessons go unlearned.

This disconnect is not abstract. In Oromia, for example, 83% of distributed stoves were abandoned, despite the Ministry of Water and Energy celebrating "110% target achievement." Households cited design mismatch, lack of maintenance support, and fuel incompatibility as key reasons for rejection. In other cases, donor-led interventions have collapsed almost immediately after project closure. Biogas programs in Hadiya and Halaba failed due to water scarcity and livestock shortages—structural conditions that were known in advance—yet the same model was replicated nationally without modification.

Yet when technology aligns with user needs and context, long-term adoption is possible. A multi-year study of Ethiopia's widely promoted Mirt stove found that 63% of households retained their stoves near end-of-life, with many using them regularly or even more frequently over time. Among those who discontinued use, over 80% cited breakage—not preference—suggesting that the design

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was culturally compatible and practically useful. This contrast reveals that sustained adoption depends less on awareness campaigns than on infrastructure, durability, and support systems.

Unfortunately, most donor-funded initiatives fail to meet those criteria. Research in northwest Ethiopia found that only 12% of households adopted improved stoves distributed through a government-NGO program. Households reverted quickly to traditional methods, citing high upfront costs, stove incompatibility with daily cooking needs, fuel access challenges, and the complete absence of follow-up or user training.

This pattern reflects a planning culture that prioritizes distribution over durability, and visibility over verification. Adoption metrics are rarely tracked, and feedback loops are absent. Institutions count stoves delivered, not stoves used, and success is measured in launch events, not long-term outcomes. The government's roadmap, as previously discussed, sets high-level access goals but remains silent on delivery architecture or usage verification. Donor projects mirror this logic: the EU's HTCC program, for instance, allocated 60% of its €1.85 million budget to workshops and exposure visits—activities that generate immediate visibility but do little to ensure that stoves are adopted, maintained, or integrated into daily cooking routines. Long-term fuel supply and after-sales systems were left unaddressed, reinforcing a model where symbolic delivery substitutes for structural support.

The root problem is epistemological. Planning treats clean cooking as a one-time technical fix rather than a socio-institutional transition requiring embedded support, iterative learning, and local adaptability. Orphanhood ensures no institution owns the outcome—only the announcement. In such a system, stove abandonment is not failure; it is expected.

5.2 Appliance Standards and Quality Gaps

A direct consequence of institutional orphanhood is the failure to establish and enforce credible appliance standards. Ethiopia's current regulatory framework is both outdated and misaligned with international norms, leading to systemic underestimation of stove performance, market confusion, and barriers to scaling clean cooking technologies.

The thermal efficiency protocol currently in use—ES 6053:2018, overseen by the Petroleum Energy Authority—mandates stove testing without pot lids, even though pot lids are routinely used in Ethiopian households. This requirement not only violates ISO 19867-1:2018, which stipulates that testing should reflect local cooking behavior, but also leads to uncontrolled convective heat

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losses. These losses are not corrected in the energy output calculation, resulting in an efficiency underestimation of up to 4%. Such discrepancies can be the difference between a stove qualifying for a higher performance tier—and with it, access to carbon finance—or being disqualified entirely.

The justification given for removing the lid is the need to insert a thermometer, yet multiple ISO-compliant alternatives exist: sealed lid ports, side-entry thermocouples, and external guide collars, all of which allow for repeatable temperature measurement without compromising real-world cooking conditions. This is not a technical necessity—it is a procedural shortcut with significant implications.

Further compounding the issue is the misapplication of boiling point thresholds in high-altitude locations such as Addis Ababa. Despite water boiling visibly at approximately 91.8 °C, testers often delay test conclusion until 92.2 °C is reached. This directly contradicts Section 7.1.2 of the national protocol itself, which calls for determining the actual local boiling point based on empirical observation. The result is a consistent downward bias in thermal efficiency scores—a margin of ~0.5% per test—which can shift a stove's classification and affect its eligibility for carbon markets, donor programs, or inclusion in national planning.

The implications of these distortions are not confined to technical misclassification. They cascade through Ethiopia's energy and climate governance architecture. Stove developers are penalized for engineering innovations that, in real kitchens, perform exceptionally well. Consumers are misled by certification labels that do not correspond to actual performance. The country underreports its emissions reductions, weakening its position in climate negotiations and reducing access to international financing tied to Nationally Determined Contributions (NDCs).

But these outcomes are not incidental—they are institutional. This is not a matter of minor technical oversight, but a case of *planner logic weaponized*. Standards bodies like the Petroleum Energy Authority prioritize procedural control over empirical accuracy. The insistence on lidless testing—justified by the need to insert a thermometer—is a case in point: rather than adapting the protocol to reflect real cooking behavior, institutions constrain testing to fit the apparatus. Multiple alternatives for probe placement exist and are in use globally, but these are dismissed without engagement. Manufacturer feedback is ignored. There is no cross-sectoral accountability to ensure that standards align with public health, climate, or industrial policy goals.

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This is the institutional pathology of orphanhood in action. The stove testing regime operates in isolation, without checks from ministries of health, environment, or industry, and without mechanisms to update protocols based on empirical feedback. The result is not just inaction—it is active institutional harm. Manufacturers are denied access to carbon finance due to flawed efficiency scores. Carbon revenues are diverted upstream to auditors and brokers, while local innovators are left starved of investment. Your letter to the PEA makes this vivid: orphanhood is not passive neglect—it is encoded into the very procedures meant to certify progress.

Unless appliance standards are reformed to reflect real-world usage, inter-ministerial coordination, and international best practice, stove testing will remain a gatekeeper—not for quality, but for exclusion. And clean cooking will remain not a field of energy transition, but of bureaucratic entrenchment.

5.3 Financial Exclusion and Weak Incentives

The financial marginalization of clean cooking in Ethiopia is not simply a matter of underinvestment—it is the economic face of orphanhood. In the absence of institutional guardianship, clean cooking is left to navigate a hostile financial landscape shaped by donor misalignment, regressive fiscal policy, and discriminatory banking norms. What emerges is a system where capital flows around local producers and users rather than to them, reinforcing the very exclusion orphanhood describes.

Donor financing illustrates this most starkly. Without state coordination or sectoral integration, external actors operate autonomously—prioritizing visibility over viability. The European Union's *High Technology Clean Cooking* (HTCC) project allocated €1.85 million to Ethiopia, but nearly 70% (€1.3 million) went to "pipeline development," workshops, and consultant deliverables. Only €550,000 supported the actual production of clean stoves. This is not an isolated case. In the orphaned space of clean cooking, donors substitute procedural activity for structural investment—repeating the state's pattern of rhetorical commitment without financial accountability.

Carbon finance, once considered a tool for remedying that gap, now deepens it. Between 2016 and 2024, Ethiopia earned $3.46 million from clean cooking-linked carbon credits, yet 85% of that revenue flowed to intermediaries. Local manufacturers received less than $5 per stove—far below what is needed to reduce prices for consumers or reinvest in production. Carbon markets,

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uncoupled from national policy or enforcement, have become another extractive mechanism operating in an institutional vacuum.

Domestic fiscal policy reinforces the pattern. While imported LPG stoves enjoy tax exemptions, locally produced biomass stoves face tariffs to import components, inflating production costs by up to 40%, and are required to pay Value Added Tax (VAT). These distortions are not being corrected because no ministry has claimed clean cooking as a strategic industrial sector deserving protective policy. The policy silence reflects institutional orphanhood—and the result is an uneven playing field that punishes local manufacturers and skews the market toward incompatible technologies.

Formal finance mirrors the same logic of exclusion. With no public guarantee mechanisms, no sector-specific credit windows, and no directive from central government, banks treat clean cooking as a high-risk, low-priority sector. Loan applicants face 150% collateral requirements—twice the rate for agribusiness—and only 3% of clean cooking enterprises accessed formal financing in 2023. This "credit apartheid" is the financial expression of clean cooking's statelessness.

The consequence is a locked system. Donors circle above, carbon revenue flows out, and domestic policy remains inert. No institution takes responsibility for correcting the distortions, and no coordinating body aligns incentives across manufacturing, adoption, and long-term use. Financial exclusion is not a parallel problem—it is what orphanhood looks like when expressed in capital terms.

5.4 Neglect of Informality, Gender, and Local Manufacturing

The orphaning of clean cooking is most visible in what policy fails to see. The three domains that structure Ethiopia's actual cooking economy—informal markets, women's labor, and local manufacturing—are routinely ignored, excluded, or marginalized in planning documents, budget allocations, and technical standards. This is not a failure of information. It is a failure of recognition, and it is foundational to how orphanhood operates: the most essential actors are systematically rendered peripheral.

Informality governs the energy lives of most Ethiopians. Over 90% of rural households depend on informal energy flows—wood collected from nearby forests, charcoal purchased from unregistered producers, and stoves assembled by local artisans. Yet these informal systems are invisible in

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government strategy documents, donor project designs, and national subsidy schemes. There are no formal mechanisms to engage charcoal sellers in emissions reduction programs, no incentives for artisanal stove makers to upgrade quality, and no inclusion of informal fuel vendors in national procurement plans. The result is a parallel economy where policy is made in one domain and energy is consumed in another.

Gender exclusion follows the same logic. Women account for the vast majority of cooking labor in Ethiopia, and collectively spend an estimated 13.2 billion hours per year collecting fuel—equivalent to a loss of roughly 15% of household income in opportunity cost. Yet major policy frameworks, such as MoWIE's Clean Cooking Roadmap, fail to incorporate *time-poverty metrics* or model gendered labor impacts. Health burdens are likewise overlooked. Average maternal exposure to carbon monoxide in traditional kitchens reaches 562 μg/m³, over 37 times the WHO limit, yet the Ministry of Health allocates $0 for household air pollution screening, diagnosis, or treatment. The silence is not due to lack of evidence—it is due to a governance model that treats clean cooking as a technical problem rather than a gendered, health-linked, labor-intensive reality.

Local manufacturers are similarly dismissed. Ethiopia's stove economy is homegrown: thousands of artisans and small firms build and distribute clean and semi-clean stoves using locally sourced materials. But institutional pathways to support these actors remain blocked. Funds from initiatives like the National Innovation and Climate Smart Program (NICSP) are out of reach for informal producers, and subsidies disproportionately favor bulk imports of finished products over investment in domestic supply chains. Meanwhile, knowledge production is dominated by external voices: over 63% of clean cooking research in Ethiopia is authored by non-Ethiopians, and much of it promotes designs ill-suited to injera baking or rural cooking routines. The epistemic gap mirrors the policy gap—both erase local needs and capabilities.

These exclusions are not peripheral—they are structural. Clean cooking is institutionally orphaned precisely because the state has failed to recognize or build relationships with the actual agents of the energy system: women, informal workers, and small-scale manufacturers. The outcome is a policymaking process that designs from above, implements through donors, and ignores the very actors who carry the burden of cooking every day. Orphanhood is not just the absence of coordination—it is the absence of representation.

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6. From Planners to Searchers: Rethinking Policy Logic

Ethiopia's clean cooking roadmap does not fail because its goals are unworthy or its authors unqualified. It fails because it operates under the wrong institutional logic. To understand this failure—and how to correct it—we must move beyond the surface of policy content and examine the deeper logic that governs how policy is made, revised, and enforced. The contrast between the Ministry of Water and Energy's roadmap and Ethiopian Airlines' Vision 2035 illuminates two fundamentally different paradigms: planner logic and searcher logic. The former, as articulated by William Easterly and echoed by James Scott and Esther Duflo, emphasizes centralized blueprints and top-down control. The latter prioritizes learning, iteration, and alignment with the complexity of real-world behavior.

Planner logic begins with the assumption that solutions can be designed in advance. It treats planning as an engineering exercise: define the goal, assign targets, deploy interventions, and scale. This is the dominant logic embedded in MoWIE's roadmap, which forecasts 76 percent clean cooking access by 2035 but lacks delivery mechanisms for learning, adjustment, or mid-course correction. Its structure is linear, and its worldview is static. Like the high-modernist states described in Scott's *Seeing Like a State*, it seeks to make society legible from above, collapsing informal energy economies, gendered labor dynamics, and cultural diversity into spreadsheet-ready targets. Friction is treated not as a source of insight but as a disruption to be smoothed out. When stoves are abandoned, the roadmap points to community reluctance or market immaturity—never to upstream design failure or institutional blindness.

By contrast, searcher logic starts from uncertainty. It assumes that policy operates in conditions of incomplete knowledge and treats outcomes as emergent rather than engineered. Ethiopian Airlines, governed by this logic, does not assume its 2035 targets—expanded fleets, new destinations, growing cargo volumes—will unfold as planned. It scaffolds each goal with systems that learn: pilot routes are launched and adjusted based on feedback; maintenance decisions respond to real-time data; logistical pivots, like converting passenger planes into freight carriers, are designed around constraint rather than ideal conditions. Vision 2035 is not a static map but a platform for disciplined experimentation. Failure is not hidden—it is functional. Organizational performance is reviewed weekly; shortfalls trigger redesign; accountability is tied to impact, not paperwork. What makes EAL effective is not sectoral advantage or special exemptions—it is institutional architecture that rewards responsiveness and iteration.

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This contrast carries direct implications for the clean cooking sector. MoWIE's roadmap, shaped by planner logic, delivers stoves but not sustained use. It measures success in distribution counts, not behavioral change. It assumes adoption is automatic, that technology alone can shift decades of cooking norms, and that scale is merely a matter of procurement and publicity. But the lived reality is different: households cook in mixed-use patterns, fuel decisions vary by season and gender, and stoves are abandoned when they break or mismatch cooking needs. These failures are not unpredictable—they are precisely the frictions that a searcher logic would seek to understand and design for. Yet under the current system, there is no formal mechanism for post-deployment feedback, no budget line for structured experimentation, and no performance metric linked to actual usage over time.

What clean cooking needs is not more centralized planning, but a shift in policy logic. It needs institutions that treat technology rollouts as testable hypotheses rather than definitive solutions. It needs budgets that allocate space for trial and error, not just implementation. It needs promotion systems that recognize adaptive success, not just delivery milestones. Most critically, it needs to reframe failure—not as an embarrassment to be buried in endline reports, but as a prompt for redesign. The resale of stoves in Afar or the collapse of biogas in Halaba are not signs of community resistance. They are institutional signals that current designs are misaligned with real conditions.

Ethiopian Airlines shows that adaptive public institutions are not a fantasy. They are already operating within the same political, legal, and economic constraints that define Ethiopia's broader bureaucracy. Their success is not a function of ideology or luck—it is the product of governance systems built to learn. Until clean cooking institutions adopt that same logic—one grounded in feedback, friction, and revision—they will continue mistaking motion for progress. Visions like "universal access by 2030" will remain just that: visions, not outcomes. Searcher logic is not a rhetorical flourish. It is the precondition for making policy that lives—and lasts—at the scale of people's lives.

7. Institutional Reform Pathways

Clean cooking has no shortage of pilots, plans, or policy papers. What it lacks is an institutional home capable of converting vision into durable systems. The failure of MoWIE's roadmap—and the broader stagnation of clean cooking access—cannot be resolved through another strategy

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document. It requires the redesign of the governance environment itself. Reforming the sector means replacing planner logic with institutional architecture that rewards iteration, accountability, and responsiveness. Ethiopia has already demonstrated that such design is possible in other sectors. The challenge now is to replicate those conditions—deliberately, not accidentally—within the clean cooking ecosystem.

The first and most critical reform is to re-anchor clean cooking within a cross-sectoral mandate, housed outside the current siloed ministries. Institutions like Telebirr and the GERD Office succeeded not because they had better ideas, but because they had political prioritization at the center of government. Clean cooking requires a similar elevation. A Prime Minister–chaired delivery unit, modeled on the Delivery Unit architecture used in health reforms in countries like Rwanda and Malaysia, would signal national ownership and enable decisions that transcend ministerial vetoes. Such a unit should have the authority to track outcomes across health, energy, and environment ministries—and to trigger corrective action when progress stalls.

Second, the financing architecture must shift from fragmented, project-based spending toward pooled, adaptive mechanisms. A Clean Cooking Trust Fund, supported by domestic carbon revenues and donor matching, should be established with multi-sectoral governance. Budget allocations from health, environment, and women's affairs ministries should be pooled under performance-based disbursement rules. This fund should operate with operational autonomy, using a dedicated project office with hiring and procurement exemptions similar to those granted to INSA or IFTMS. Autonomy is not a luxury—it is the only way to break the bottlenecks that cripple stove R&D, restrict manufacturer access to finance, and delay field corrections when failure is evident.

Third, monitoring systems must be restructured to integrate health, gender, and climate metrics, not just stove counts. Current systems reward input delivery—number of stoves distributed, workshops held—but ignore impact. Programs should report on indicators like time savings for women, DALYs averted, and fuel expenditures reduced. These metrics must be linked to incentives: donor disbursements, staff promotion, and program continuation should depend on verified field outcomes. This is the lesson of eGP and IFTMS: when feedback is embedded and consequential, systems learn. When it is optional, it is ignored.

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Fourth, the public procurement and enforcement system must be retooled to support domestic manufacturing and real accountability. Procurement rules should be amended to enable flexible, performance-based contracting—allowing stove producers to be paid based on verified usage, not just delivery. Enforcement must shift from static inspections to trigger-based reviews: when abandonment exceeds thresholds, designs must be re-evaluated. Regulatory oversight, now housed in technically weak or underfunded units, should be merged with the standards body and backed by enforcement powers tied to carbon finance eligibility. No stove should receive public support without passing real-world trials.

These reforms are not sequential—they are systemic. Elevation without autonomy invites paralysis. Metrics without budget authority create noise, not change. Procurement reform without pooled financing replicates today's fragmentation. The lesson from Ethiopia's high-performing outliers is clear: adaptive institutions are built when reformers secure political cover, operational space, clear mandates, feedback systems, and disciplined finance. All five are needed to shift clean cooking from symbolic priority to executable policy.

Absent these reforms, Ethiopia's clean cooking sector will remain trapped: institutionally voiceless, financially starved, and procedurally performative. But the failures of the past also clarify the path forward. Reform is not about perfect planning. It is about constructing the conditions where learning can happen—and matter.

8. Financial Architecture Reform

Institutional orphanhood in Ethiopia's clean cooking sector extends as surely to its financing mechanisms as it does to its governance structures. Without a redesigned financial architecture, efforts to scale technology, reach marginalized users, and sustain adoption will continue to founder. The reforms below outline how finance can shift from extracting value to enabling institutional custodianship.

First, clean cooking must be legislated as public infrastructure—not just another energy project. This designation would grant clean cooking access to infrastructure-grade financing tools, such as access to capital market instruments, long-term financing terms, and eligibility under public investment frameworks. It would also mandate integration with broader infrastructure planning—ensuring alignment with electrification, agricultural development, public health, and climate resilience.

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Second, a carbon-backed guarantee facility should be established to de-risk stove lending for manufacturers and financial intermediaries. As The Reporter details, consumer-facing clean cooking loans are bypassed due to high servicing costs and small ticket sizes, despite potential returns of 15–25%. Guarantee support that ties repayment to verified carbon credits could allow financial service cooperatives (SACCOs) to issue pay-as-you-save (PAYS) loans with confidence. This model both expands access and anchors carbon finance into domestic lending ecosystems.

Third, SACCO-based PAYS systems can mobilize local capital, reduce default risk, and foster regular usage. Small, localized savings groups are better suited than commercial banks to manage low-value loans and incremental repayment schedules. When paired with usage tracking devices or community reporting systems, SACCOs could directly benefit from verified stove use while ensuring stewardship remains within the community. This approach builds local financial inclusion and embeds clean cooking accountability at the grassroots level.

Fourth, tapping domestic financial markets through green bonds should target local manufacturing investment—not just hardware imports. Ethiopia needs finance to support quality assurance, factory upgrades, and R&D for stoves compatible with traditional cooking systems like injera. Green bond instruments backed by carbon revenue streams and structured with graded performance clauses could provide long-dated capital for manufacturers—thus closing the gap left by donor grants and short-cycle funding.

These reforms address more than financing gaps—they strike at the institutional logic of orphanhood. Designating clean cooking as infrastructure embeds it within planning systems; carbon guarantees link climate finance to domestic value creation; SACCO-sourced credit aligns adoption with accountability; and green bonds create durable fixtures in the economy rather than one-off deliverables. Together, they shift the sector away from external dependency and toward self-sustaining structures grounded in usage, performance, and domestic ownership.

Without a fundamental transformation in the financial architecture, clean cooking will remain orphaned—announced in lofty plans, funded in brief bursts, and dependent on external vessels. But with these reforms, finance can become the mechanism that cements responsibility, embeds feedback, and underwrites scalability.

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9. Reforming the Donor Ecosystem: From Bypass to System Building

Donors have been among the most visible actors in Ethiopia's clean cooking space. From bilateral aid agencies to multilateral institutions and philanthropic foundations, external actors have financed pilots, run awareness campaigns, supported studies, and initiated carbon-linked programs. Yet despite this investment, clean cooking adoption has stagnated. The issue is not simply funding levels—it is donor modality. Current donor practices often reinforce the very institutional orphanhood they seek to address.

9.1 The Problem: Funding Bypasses, System Fragmentation, & Procedural Optics

Between 2015 and 2025, more than 80% of clean cooking projects in Ethiopia operated outside formal government systems. Rather than building national delivery capacity, donors created parallel structures—outsourcing project management, bypassing local procurement systems, and channeling funds through international NGOs and consultants. As a result, national ownership was weakened, accountability diluted, and sustainability undermined.

This bypass logic favors short-cycle visibility: workshops, high-profile launch events, branded pilots, and exposure visits. Meanwhile, investment in domestic manufacturing, long-term systems, or verification infrastructure is minimal. In one typical case, over 60% of a €1.85 million EU grant was spent on pipeline development and foreign consultancy, with less than €600,000 reaching stove producers. Technology handoffs are shallow. Institutional learning is absent. The dominant approach prioritizes process over permanence.

Donor-driven carbon finance has similarly failed to empower local systems. Of the $3.46 million in clean cooking carbon revenue generated between 2016 and 2024, less than 15% reached stove users or manufacturers. The majority was absorbed by intermediaries—verifiers, traders, and certification agencies. Projects rarely linked carbon revenue to usage verification or domestic policy targets. In effect, global carbon markets extracted value from Ethiopian households and manufacturers while contributing little to their capacity.

9.2 The Consequences: Institutional Erosion and Market Distortion

Donor bypass practices produce more than inefficiencies—they cause **active harm** to clean cooking governance in Ethiopia. Their effects include:

- **Fragmented coordination**: Projects often operate without reference to national strategies, undermining MoWIE, MoH, and MoEFCC efforts to coordinate.

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- **Procurement distortion**: Donor procurement tends to favor prequalified foreign vendors, marginalizing domestic manufacturers and skewing incentives away from local innovation.
- **Misaligned metrics**: Donor evaluations often focus on units distributed or beneficiaries trained, not verified usage, emissions reductions, or labor savings.
- **Knowledge extraction**: Reports authored by international consultants dominate the evidence base. Local research institutions and manufacturers are often relegated to peripheral roles or token partnerships.
- **Policy noise**: Donor-generated roadmaps, toolkits, and recommendations—while well-intentioned—often duplicate or conflict with national efforts, leading to contradictory priorities and reform fatigue among civil servants.

The net result is a system that performs well in donor reporting cycles but poorly in sustained household adoption. Symbolic visibility masks structural fragility. The donor community has not simply operated in a fragmented ecosystem—it has helped produce and normalize it.

9.3 The Reform Imperative: Donor Realignment as a Structural Pillar

For clean cooking reform to succeed, donors must be integrated into the national system—not positioned around it. This requires a shift from funding visibility to building durable infrastructure, domestic capability, and verifiable outcomes. The core elements of this reform include:

- **Channeling donor funds through a Clean Cooking Trust Fund** governed by national institutions. Donor financing should be pooled alongside domestic budgets and carbon revenue, with allocations tied to joint performance metrics (e.g., DALYs averted, verified stove usage, CO_2 reductions).
- **Aligning procurement standards** with national testing protocols and certification systems. Donor-financed technologies must meet the same field-verification and usability requirements as those funded by government. Local manufacturers should receive preference in procurement, especially when they meet or exceed technical benchmarks.
- **Conditioning disbursement on real-world outcomes**, not procedural outputs. Funding should be linked to verified usage, fuel savings, and sustained adoption—not just stoves distributed or workshops held.
- **Redirecting financing away from extractive consultancy models**. A hard cap should be placed on funds allocated to foreign technical assistance. The majority of donor support

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should go toward domestic production capacity, testing infrastructure, after-sales systems, and monitoring tools.

- **Mandating usage verification** and impact reporting as core elements of all donor-funded projects. Donor-supported stoves should be tracked using the same systems that support national carbon registration, allowing alignment with Ethiopia's NDCs and enabling scale.
- **Co-financing carbon-backed guarantee facilities** and adoption-linked subsidies. Donors should underwrite risk-sharing mechanisms that enable SACCOs and MFIs to finance clean stoves at scale. These guarantees must be linked to usage—not just loan disbursal.
- **Providing matching funds** tied to government commitments. Donor funds should not substitute for domestic budgets, but **amplify them**. Match funding requirements (e.g., 1:1 with national carbon revenues or pooled ministry contributions) can promote accountability and leverage.

9.4 The Precedent: Other Sectors Show It Can Be Done

Donor reform is not a radical ask—it is a proven modality. In health and education, Ethiopia has successfully hosted pooled donor funds (e.g., GEQIP for education, the One Plan in health) governed by national institutions and tied to multi-sectoral performance metrics. These models created stronger incentives for coordination, improved financial transparency, and shifted donor behavior toward system strengthening. The same can be done for clean cooking—if donors accept that alignment is not inefficiency, and ownership is not obstruction**.**

The stakes are clear: donors remain the largest source of funding for clean cooking in Ethiopia. If they continue to operate outside national systems, they will reinforce the very fragmentation and exclusion that structural reform seeks to overcome. But if donor modalities are redesigned to support domestic manufacturing, enforce outcome-linked disbursement, and operate through pooled, nationally governed mechanisms, they can become the decisive enabler of the clean cooking transition.

Reforming donor practice is not peripheral—it is foundational. It is the fourth pillar of structural reform.

10. Technology and Local Innovation

Clean cooking in Ethiopia cannot rely on a one-size-fits-all stove model—or on imported appliances that fail to address local cooking practices or production systems. For reform to

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succeed, technology must be domestically designed, rigorously tested, and institutionally supported. This implies a need for a diversified stove portfolio, digital usage monitoring, and a robust domestic manufacturing ecosystem.

Recent reporting by *The Reporter Ethiopia* (written by the author of this report) highlights several locally developed innovations that combine energy efficiency with cultural alignment. One example is a pellet stove tailored to Ethiopian cooking patterns, which reportedly reduces cooking time by over 40% using local biomass feedstocks—with direct economic and health benefits for communities. These technologies are being produced by Ethiopian firms using local materials, ensuring that fuel cycles and maintenance practices remain grounded in local ecosystems.

Peer-reviewed research reinforces the need for context-sensitive design. A controlled field study of biomass gasifier/injera baking stoves found thermal efficiencies of 21–25%, with fuel savings of up to 86% compared to traditional stoves, and significant reductions in particulate and CO emissions. Crucially, these stoves were designed to match injera baking demands and cultural kitchen layouts. While performance varied across stove types (EZY, Tikikil, Lakech), the clear takeaway was that efficiency and compatibility matter as much as laboratory certification.

For clean cooking to scale, stove portfolios must include not only Mirt and Lakech models but also gasifier stoves and newer pellet-based options suited to different cooking styles and fuels. However, diversified hardware requires diversified oversight: without performance labs authorized to conduct standardized testing and enforce quality assurance, even homegrown stoves risk misclassification or quality slippage.

Digital monitoring adds another layer of rigor to innovation systems. Usage-tracking sensors or mobile reporting tools can verify stove adoption, enable real-time feedback, and support carbon credit eligibility—tying stove performance to both finance and quality. Embedding monitoring into product rollouts creates feedback loops between users, manufacturers, and policy institutions—and protects against orphanhood by demanding real-world results.

Ultimately, domestic manufacturing must be the backbone of innovation. That means supporting local SMEs and artisans with access to performance labs, innovation grants, and market channels. Areas where local engineering firms are advancing designs—such as gasifier stoves with integrated exhaust systems or clean pellet stoves—should receive special institutional support, including lab certification and carbon registry facilitation.

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In short, institutional reform demands more than new delivery units or pooled funds. It demands that technology itself become a policy instrument—aligned with cultural realities, verified in the field, and supported by domestic infrastructure. Indigenous innovation is already underway. The missing piece is policy architecture that validates, regulates, finances, and scales it across the nation.

11. Recommendations by Stakeholder Group

Solving institutional orphanhood in Ethiopia's clean cooking sector will require differentiated responsibility across stakeholder groups. While coordination is essential, clarity of role is equally so. Reform will not come from consensus documents, but from targeted action by institutions empowered to act and held accountable for outcomes. The following recommendations outline what is needed—by whom—to convert vision into system change.

11.1 For Government

The first step is institutional ownership. Clean cooking must be anchored in a formal lead agency with a cross-sectoral mandate and the authority to convene and compel action across ministries. This agency—ideally a delivery unit under the Prime Minister's Office—must have clearly defined budget lines embedded within the national planning framework. Without budgeted authority, coordination becomes rhetoric. It must also be empowered to enforce accountability by setting usage benchmarks, triggering audits, and initiating policy reviews when rollout failures are detected.

Equally important is regulatory reform. Standards for stove performance must be harmonized with international protocols and adapted to reflect real-world cooking practices. National certification bodies must be equipped to validate stove efficiency under conditions that reflect Ethiopian kitchens—not foreign labs. Carbon finance must also be integrated directly into stove rollout programs. This includes earmarking domestic carbon revenue for stove adoption, establishing eligibility triggers linked to real usage, and ensuring carbon market participation benefits local manufacturers and users—not just intermediaries.

Critically, the government must also restructure its fiscal and industrial policies to support local clean cooking manufacturers. This includes prioritizing the allocation of space for manufacturing, eliminating punitive tariffs and VAT on components and intermediate goods, prioritizing local producers in public procurement frameworks, and extending access to performance-based

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subsidies and credit guarantees. Manufacturing is the operational backbone of clean cooking reform—without it, no level of coordination, carbon finance, or donor alignment will translate into durable adoption. Supporting local industry is not a protectionist gesture; it is a governance imperative.

11.2 For Donors

Donors must shift from bypass strategies to system strengthening. This begins by channeling clean cooking funds through national institutions—enabling them to build operational capacity and align efforts with national priorities. External financing should not displace public systems but reinforce them. Donor timelines and evaluation frameworks must also shift from visibility to viability. Funding should reward verifiable adoption, not high-profile pilots or media campaigns. Short-term exposure visits and consultancy-driven workshops must give way to sustained support for local manufacturing scale-up, design refinement, and end-user engagement.

Extractive consultancy models—where the majority of funds are absorbed by international advisors rather than reaching stove producers or users—must end. Donor contracts should prioritize outcomes tied to production, field performance, and cost reduction. All donor-supported projects should require stove usage verification, and those data streams must feed directly into national monitoring platforms. Donor alignment with national strategies must be more than procedural; it must structure funding flows, timelines, and accountability.

11.3 For Financial Institutions

For the financial sector, the challenge is to see clean cooking not as a social cause but as a bankable investment class. Central banks and development finance institutions must formally classify clean cooking as a priority sector—on par with agriculture or housing. This classification can unlock concessional windows, allow for favorable collateral treatment, and enable public guarantees. Retail banks and microfinance institutions should develop stove-linked credit products, particularly those structured around carbon revenue buffers that reduce default risk. These products can be offered through SACCOs and cooperatives, where repayment can be tied to usage metrics and community-based verification.

Institutional investors, including pension funds and commercial banks with ESG mandates, must integrate clean cooking into their portfolios. It meets core sustainability criteria—gender impact, climate relevance, and health outcomes—and yet remains absent from financial inclusion

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strategies. Instruments such as clean cooking green bonds, risk-sharing facilities, and blended finance platforms must be activated not as experiments but as part of core lending practice. Finance cannot remain the lagging edge of clean cooking reform. It must be reimagined as the catalyst.

12. Conclusion

Clean cooking in Ethiopia has been treated as a humanitarian concern, a development footnote, or a carbon monetization opportunity—but rarely as core national infrastructure. That neglect is not simply a matter of low budgets or weak awareness. It is structural. It reflects a system in which responsibility is dispersed, feedback is ignored, and ambition substitutes for delivery. At every level—planning, financing, regulation, and enforcement—clean cooking remains orphaned: present in vision documents, absent in execution.

We have shown that this orphanhood is not accidental. It is the result of planner logic embedded in Ethiopia's institutional design. Ministries write blueprints instead of building systems. Donors fund optics instead of outcomes. Financial institutions misclassify clean cooking as a fringe issue rather than a transformative investment. The result is a self-reinforcing cycle: stove distribution without sustained use, standards without accountability, carbon finance without local benefit, and policy without consequence.

Yet Ethiopia has proven that a different kind of governance is possible. Institutions like Ethiopian Airlines, eGP, INSA, and IFTMS operate under a different logic—one that prizes feedback, operational autonomy, narrow mandates, and performance-driven adaptation. These are not miracles. They are design choices. Their success illustrates what can happen when institutions are allowed—and required—to search, not just plan.

The reforms outlined here are not peripheral fixes. They are the conditions under which institutional orphanhood can be reversed. Clean cooking must be governed as infrastructure: embedded in national delivery systems, backed by adaptive finance, aligned with domestic innovation, and accountable for outcomes. Until the public sector is restructured to see real-world use—not policy output—as the metric of success, new targets will only produce new failures.

The stakes are not symbolic. More than 60,000 deaths per year from household air pollution, environmental and climate degradation, billions of labor hours lost to fuel collection, and thousands of stalled manufacturing jobs are the cost of inaction. Symbolic policy will not solve this. Structural reform might.

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The time to govern clean cooking seriously is not in the next strategy cycle. It is now. The country has the technical capability, financial tools, and institutional examples to build a clean cooking system that learns, adapts, and delivers. What remains is the political decision to do so.

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