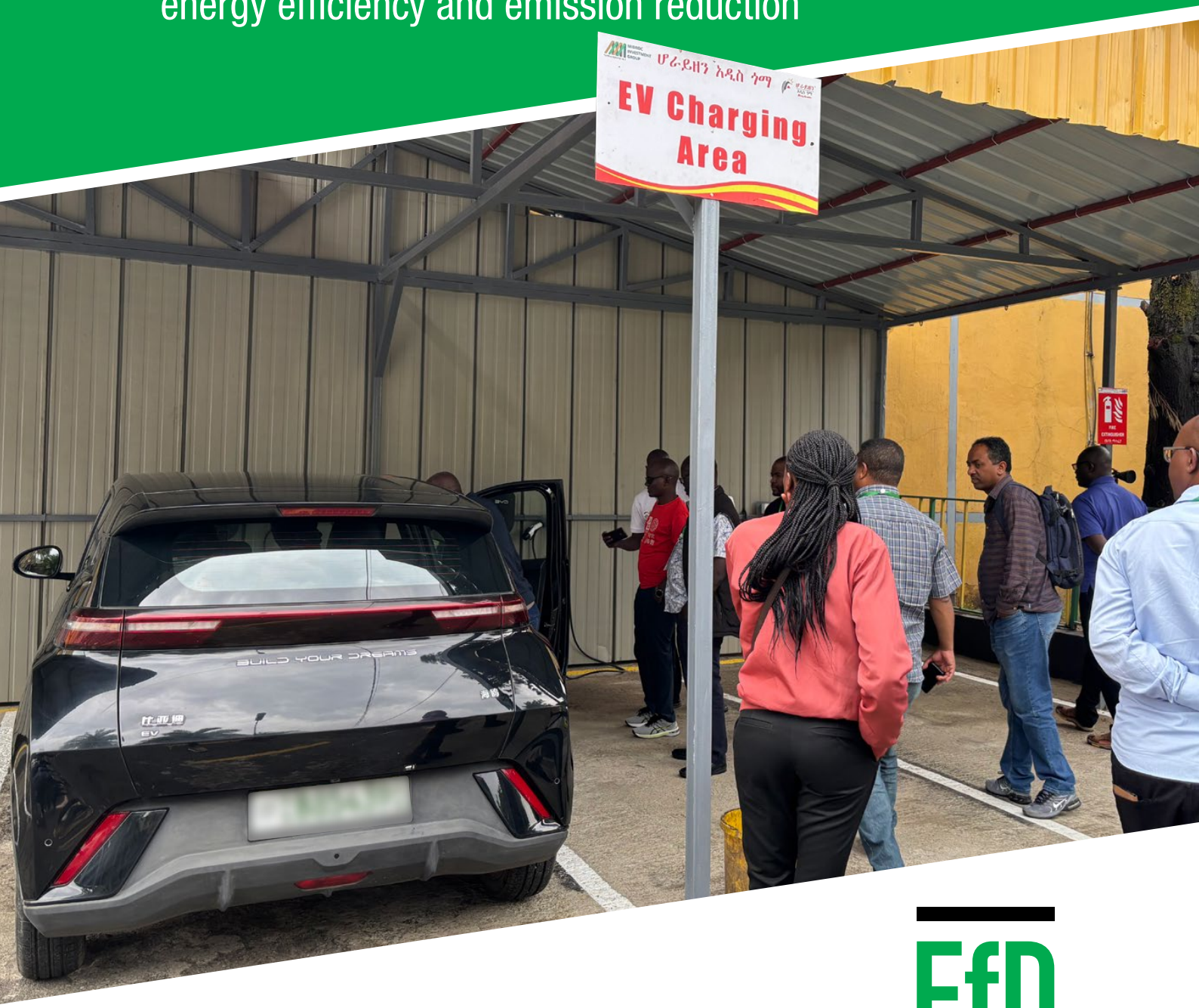
Inclusive Green Economy

Advancing Inclusive Green Economy in Eastern Africa

Transformation Initiative processes for energy efficiency and emission reduction



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Cover photo: Anders Ekbom

Inclusive Green Economy Program

This report presents the results of the Transformation Initiative (TI) processes implemented within the Inclusive Green Economy (IGE) in Practice program during 2024-2025. The IGE program (2023-2027) is a capacity development program for civil servants in Eastern Africa, specifically Ethiopia, Kenya, Rwanda, Tanzania, and Uganda. It focuses on increasing knowledge and the use of economic policy instruments to achieve just green transitions. It bridges the gap between research and policy to strengthen evidence-based policymaking and practices.

The program is funded by the Swedish International Development Cooperation Agency (Sida) and implemented by the Environment for Development Initiative (EfD) at the University of Gothenburg in close collaboration with EfD centers and partners in Ethiopia, Kenya, Rwanda, South Africa, Tanzania, and Uganda.

This report is written by the parts of the IGE program's consortium[1], based on each country TI team's reports. The first draft of this report was done with the assistance of an AI-based tool. All content has then been developed, reviewed and verified. The report does not necessarily represent the views of the participating researchers and civil servants' organizations.

Read more about the IGE program.

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Summary

This synthesis report outlines the results of the Transformation Initiative (TI) processes implemented within the Inclusive Green Economy (IGE) program during 2024–2025 across Ethiopia, Kenya, Rwanda, Tanzania, and Uganda.

The IGE program aims to strengthen the capacity of senior civil servants and policymakers to apply economic policy instruments to promote sustainable and inclusive economic development. The TI model, developed by the IGE team, serves as a practical, analytical, and collaborative approach for government officials, researchers, and other stakeholders to operationalize IGE by using applied research, stakeholder engagement, innovative thinking, and policy development. The thematic focus of this report is Sustainable Energy Transition, emphasizing the challenges to increase energy efficiency and reduce emissions. In each participating country, a TI team of researchers and civil servants has addressed these specific challenges.

Reducing biomass dependency

The TI-team in **Ethiopia** focused on reducing biomass dependency in the commercial sector, particularly in restaurants, hotels, and bakeries. Key barriers include high costs of clean energy alternatives, unreliable electricity supply, cultural preferences, and policy gaps. Recommendations include fiscal incentives, improved electricity reliability, and awareness campaigns.

Transitioning to energy-efficient domestic appliances

The TI-team in **Tanzania** focused on promoting energy-efficient domestic appliances to reduce energy consumption and emissions. Barriers include high costs, limited consumer awareness, and weak enforcement of energy standards. Recommendations include stronger enforcement of standards, fiscal incentives, and regional harmonization of policies.

Sustainable transport and promotion of e-vehicles

The TI-teams in Kenya, Rwanda, and Uganda, addressed sustainable transport and opportunities and barriers to promote e-vehicles. The TI-team in **Kenya** explored barriers to e-mobility adoption, with a national goal to achieve 5% e-vehicle registration by 2025. Challenges include limited charging infrastructure, high vehicle costs, and low public awareness of government incentives. Recommendations include expanding charging infrastructure, fiscal incentives, such as subsidies, and public awareness campaigns.

The TI-team in **Rwanda** investigated the role of e-motorcycles in reducing emissions and improving energy efficiency. Challenges include high upfront costs, limited charging infrastructure, and supply chain gaps. Recommendations include finalizing a National E-Mobility Strategy, promoting affordable financing solutions, and enhancing infrastructure.

The TI-team in **Uganda** examined energy efficiency and reduced emissions in the transport sector through e-mobility promotion. Challenges include limited infrastructure, high costs, and regulatory gaps. Recommendations include updating regulatory frameworks to include e-mobility products, expanding charging infrastructure, and promoting awareness and training.

Introduction to the Transformation Initiative process

The Transformation Initiative (TI) process is a key component of the IGE in practice program. Through the TI, civil servants (so called IGE Fellows) enrolled in the IGE program apply knowledge of inclusive green economy in practice together with their organizations and a support team of researchers in their country. This process includes identifying a locally relevant development challenge or issue related to inclusive green economy, investigating it, and, most importantly, taking concrete actions to address it.

The ultimate purpose of working on a TI process is to build individual and organizational capacity to apply environmental, economic policy instruments in real-world contexts. The TI is designed to evolve gradually during the IGE program through a structured **Action Learning** process, in which participants identify local/national challenges, design and test solutions, and build capacity to implement sustainable policies, plans and/or programs.

The TI method uses **backcasting** starting from a desirable future and working backward to define necessary actions. Guided by the **"cruise and expedition"** metaphor, organizations ("cruise ships") support exploratory teams ("expeditions") that test new ideas before integrating them in the organization (Holmberg and Holmén, 2024; Holmén, 2020).

The process unfolds in five steps:

1. Plan the process as far as possible, find the thematic question to be explored, and invite relevant participants.
2. Envision and describe the desirable future to get the direction and set a purpose.
3. Describe today's situation in relation to the desired future, e.g. digging into root caused to the defined challenge.
4. Find possible areas of intervention that can bring the fellows and their organization closer to the desired future.
5. Identify concrete ideas on how to take action.

Each TI is aligned with the IGE program's chosen thematic area, which varies from year to year. The thematic area of focus in this report is **Sustainable Energy Transition**, with a specific focus on energy efficiency and reduced emissions. Together with a support team of local researchers, the five IGE Fellows in each country form a *TI team*, which jointly addresses the challenge.

Through regular and structured monthly meetings, team members support each other by reflecting on actions taken,

IGE Fellows, Alumni, and EfD researchers discussing and sharing experiences at IGE workshops and EfD's Policy Day in Kenya 2024. Photos: Anders Ekbom and Kevin Wamz

IGE Fellow Esther Atek presenting at an IGE workshop. Photo: Anders Ekbom

sharing accomplishments and challenges, and identifying next steps. In this way, the TI evolves over time. By working in stages and adapting actions to emerging difficulties and opportunities, the TI tackles real and pressing issues. The Action Learning process ensures that new knowledge and insights from the IGE program are relevant and applicable to each Fellow's organization and context.

The TI team's reflections and exchange of experiences are central to learning and fostering both cross-agency collaboration and cross-country peer learning. Ultimately, the TI process seeks to improve existing practices, introduce new approaches, and create a vibrant network for transformative change.

The **TI process** supports the main objective of the program: to strengthen each country's capacity for transformation towards an Inclusive Green Economy, with a focus on enhanced use of environmental economic policy instruments - such as environmental taxes, pollution fees, subsidies, and other forms of fiscal incentives when appropriate - to foster economic, environmental and societal development in line with both **Agenda 2030 and Agenda 2063**, and the respective countries' main green economy strategies:

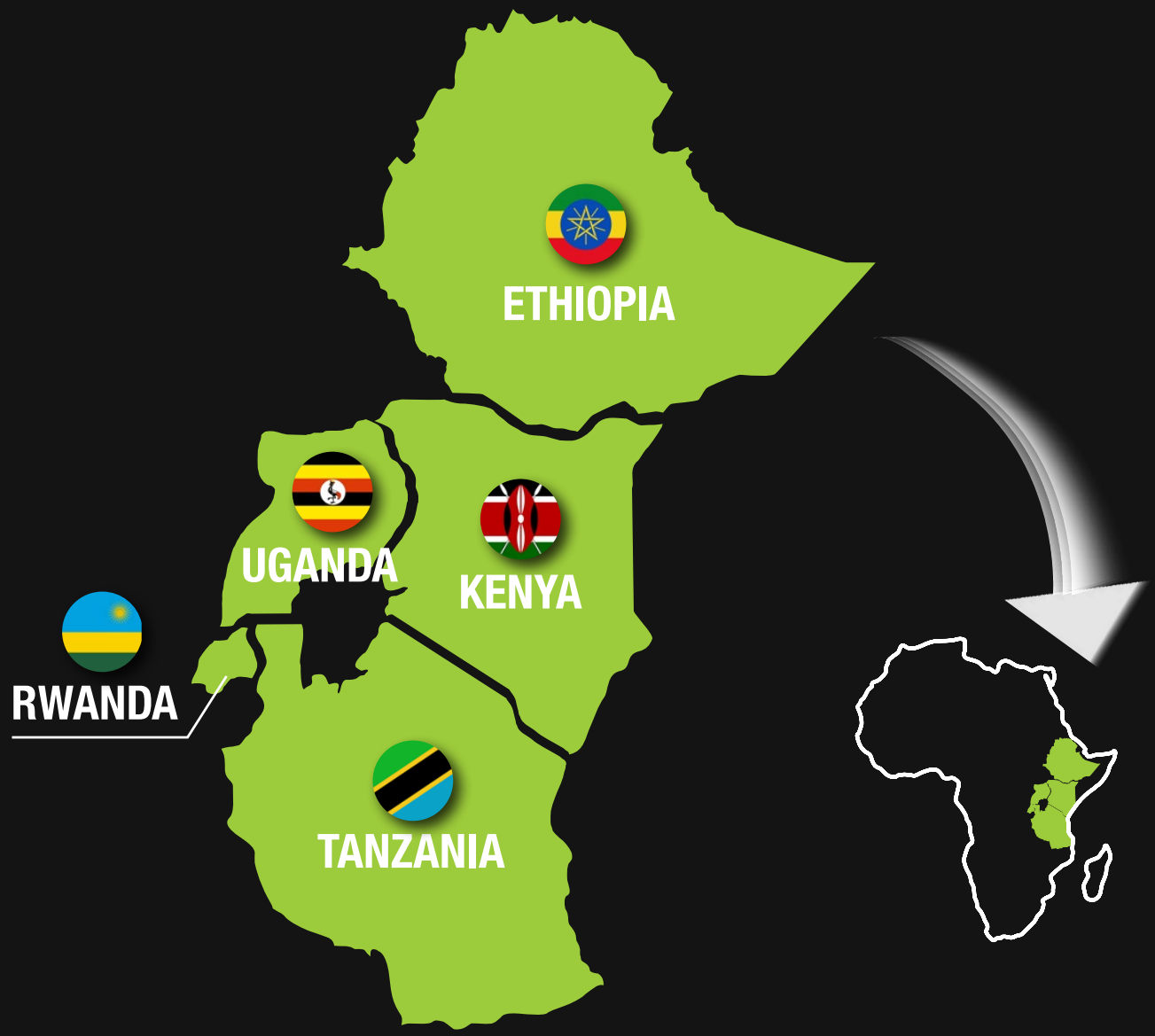
- In Ethiopia, the Climate Resilient Green Economy Strategy (2011-2030)
- In Kenya, the Green Economy, Strategy and Implementation Plan (2016 – 2030)
- In Rwanda, the Green Growth and Climate Resilience Strategy (2022-2050)
- In Tanzania, the Development Vision 2025 (1999 – 2025)[2]
- In Uganda, in the Green Growth Development Strategy (2017-2031).

This report aims to give an overview of the TI process in each of the participating countries. It highlights key achievements and results of the TI processes, along with policy recommendations developed to promote energy efficiency and emissions reductions in selected sectors. Finally, it presents the identified common key challenges encountered and concluding remarks.

2 In 2025, Tanzania Development Vision 2050 was launched.

Definition of Inclusive Green Economy

An inclusive green economy is one that improves human well-being and builds social equity while reducing environmental risks and scarcities. An inclusive green economy is an alternative to today's dominant economic model, which exacerbates inequalities, encourages waste, triggers resource scarcities, and generates widespread threats to the environment and human health.
Source: UNEP (2019)



Population density[1] and country size[2] – People/km² (2023) & km²

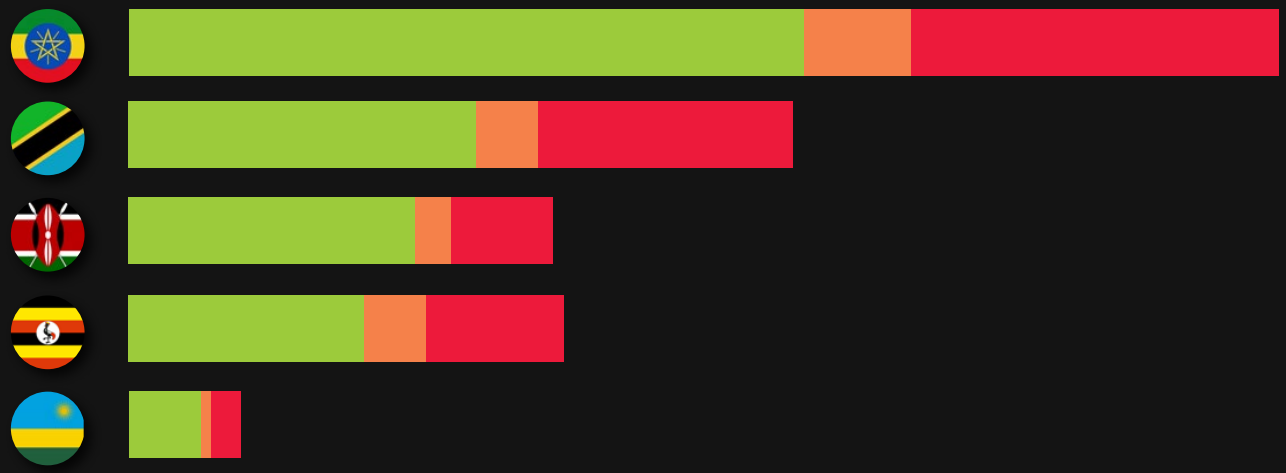
RWANDA	UGANDA	ETHIOPIA	KENYA	TANZANIA
566/km²	**243**/km²	**114**/km²	**95**/km²	**75**/km²
26 338km²	**241 038**km²	**1 104 300**km²	**580 367**km²	**947 300**km²

GDP/Capita[3] - USD/Capita (2024)

KENYA	ETHIOPIA	TANZANIA	UGANDA	RWANDA
2132 $	**1334 $**	**1187 $**	**1078 $**	**1000 $**

Population size (million people) in 2024[4] / 2030[5] / 2050[5]

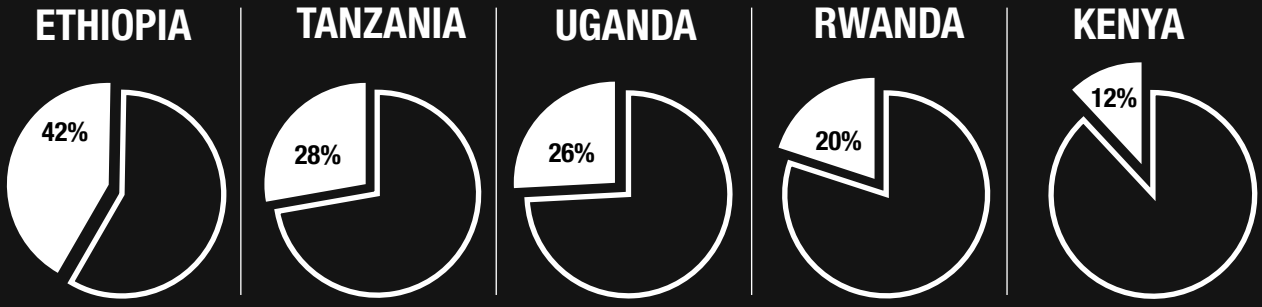
	ETHIOPIA	TANZANIA	KENYA	UGANDA	RWANDA
2024	132M	68M	56M	46M	14M
2030	153M	80M	63M	58M	16M
2050	225M	130M	83M	85M	22M



Access to electricity[6] (% of population 2023)

KENYA	RWANDA	ETHIOPIA	UGANDA	TANZANIA
76%	64%	55%	52%	48%

Population in severe multidimensional poverty[7] – according to the Global Multidimensional Poverty Index



1) World Bank (2026) World Development Indicators, Population density (people per sq. km of land area).
2) WorldAtlas (2026) Countries by area.
3) World Bank (2026) World Development Indicators, GDP per capita (current US$).
4) World Bank (2026) World Development Indicators, Population (total). For Uganda: Uganda Bureau of Statistics (2024). The National Population and Housing Census 2024 – Final Report - Volume 1 (Main).
5) UN, Department of Economic and Social Affairs, Population Division (2024) World Population Prospects 2024, Inline Edition.
6) World Bank (2026) World Development Indicators, Access to electricity (% of population).
7) UNDP (2023). 2023 Global Multidimensional Poverty Index (MPI): Unstacking global poverty: Data for high impact action. URL. Weighted index of: nutrition, child mortality, years of schooling, school attendance, use of cooking fuel, sanitation, drinking water, access to electricity, housing, assets.

Transformation challenge 2024: Energy efficiency and reduced emissions

The first step of the TI process is to match IGE organizations' policy needs with scientific evidence. This is accomplished in a co-creative process.

High-level civil servants and academics meet to identify transformation challenges and opportunities connected to an inclusive green economy. This collaboration between civil servants and academics aims to map existing knowledge gaps related to economic incentives and policy instruments related to the transformation challenge in focus.

The transformation challenge for 2024 was *Sustainable Energy Transition*[3]. This was chosen based on survey results on national academic capacity at the EfD centers where the Support Teams are allocated, a thematic concept note, and joint discussions within the program consortium. The prerequisite was that the challenge fulfills certain criteria, such as having concrete potential to work with economic policy instruments, being crucial from a poverty perspective, being of strong interest for the policy sector, and being relevant to the five countries involved in the program.

In a dialogue between senior management and experts at the relevant governmental organizations (IGE organizations) and the IGE Support Team, the aim is to identify the IGE policy needs in each country. This is followed by an alignment meeting with the Support Teams from the five program coun-

3 Previous year focused on sustainable energy transition and specifically clean cooking. Read more: Policy instruments to achieve cleaner cooking practices - experiences and cross-country learning from the East African region | EfD - Initiative

Field visit to Isuzu East Africa in Nairobi 2024, winner of the Kenya Association of Manufacturers Energy Management Award 2023. Photo: Anders Ekbom

tries. **Energy efficiency and reduced emissions** were selected as a regionally specific transformation challenge within *Sustainable Energy Transition,* as it addresses environmental sustainability, economic resilience, and social inclusion. Improving energy efficiency enables countries to optimize the use of resources, lower emissions, and minimize the economic burden of fossil fuel imports and inefficient biomass use.

The final step is for each TI team to discuss and select its national Transformation Initiative. In each country, the team consists of the IGE Support Team and five participating civil servants. The civil servants enrolled in the program are given the title IGE Fellows, and are recruited in dialogue with the IGE organizations.

"The civil servants enrolled in the program are given the title IGE Fellows, and are recruited in dialogue with the IGE organizations"

- **In Ethiopia** the TI focused on the biomass dependency in the commercial sector, specifically to enhance energy efficiency and look into why the commercial sector still depends on biomass fuels to a large extent. This dependency contributes to deforestation, greenhouse gas emissions, indoor air pollution, and negative health outcomes, disproportionately affecting women and children.

Charging station in Kampala, Uganda. Photo: EfD Mak-Center

Meal preparation on a gas stove at a hotel kitchen in Nairobi. Photo: Anders Ekbom

- **In Tanzania,** promoting the use of energy-efficient technology in domestic appliances was selected. Domestic appliances account for more than 60% of the country's total energy use, with lighting, cooking, and refrigeration being the major contributors (NBS, 2025). Most households, especially in urban areas, are increasingly using electricity, but traditional biomass (e.g., charcoal and firewood) dominates in rural areas. Studies such as Mwakapugi et al. (2019) highlight the shift toward electrical appliances like refrigerators, fans, TVs, and electric cookers, as an opportunity for energy savings through efficiency improvements. However, as rural electrification expands, a rise in domestic electricity consumption is expected. Currently, a range of structural and behavioral barriers hinder widespread adoption of energy-efficient technologies.

The Kenyan, Rwandan, and Ugandan teams chose to focus on the transport sector, due to its importance for the economy as well as high dependency on fossil fuels. The three countries have a growing population, indicating increasing demands on the transport system, which leads to higher fossil fuel consumption and emissions (Sudmant et al., 2020). For example, in Rwanda, vehicles are responsible for about 13% of total national greenhouse gas emissions and nearly 50% of urban air pollution (MoE, 2020). The countries are also dependent on economically risky fossil fuel imports.

- **In Kenya,** the TI focused on accelerating e-mobility to address the challenge of energy use and emissions. This is in line with the national target of 5% of EVs registered in 2025 from a baseline of 0% in 2019 (Republic of Kenya, 2020). Recent available data shows that the country did not meet this target. The TI explores the economic perspective, since the heavy reliance on fossil fuels also exposes public and private transport users to high transport costs during periods of high fuel prices. High transportation costs, also lead to job losses and expose the country to exchange rate fluctuations, given that Kenya is a net importer of fossil fuels.

- **In Rwanda,** the TI focused on the

Boda boda in Uganda.
Photo: Pixabay

> *"The continued expansion of petrol-powered motorcycles raises serious concerns for air quality, public health, and energy security"*

promotion of e-motorcycles since motorcycles constitute 53% of the transport sector (Ayetor et al., 2023). In Kigali, motorbike taxis are the primary mode of transport, offering an affordable and efficient alternative to public transportation. However, most of these motorcycles use internal combustion engines (ICE), contributing significantly to air pollution. As of 2023, Rwanda had approximately 180 000 motorcycles, of which 70,000 operated as taxis – about 30,000 in Kigali alone, with roughly 26,000 of them petrol-powered (NISR, 2024a). While 5,500 electric motorcycles have been introduced to the market (MIFOTRA, 2024), ICE-powered motorbikes still dominate. Given Kigali's annual population growth rate of 3.2% (NISR, 2024b), the continued expansion of petrol-powered motorcycles raises serious concerns for air quality, public health, and energy security. There is also a wide range of policy instruments implemented by the government to promote electric mobility.

- **In Uganda,** the TI also focused on e-mobility as a means to increase energy efficiency and reduce emissions in the transport sector. Apart from the reasons above, energy efficiency is a key ingredient in Uganda's Vision 2040 and highly emphasized in the fourth National Development Plan (NDPIV).

In the following chapters, a summary of each country's specific TI is presented.

Ethiopia: Enhancing energy efficiency in the commercial sector

The Ethiopian TI focused on understanding biomass dependence in the commercial sector, identify the underlying drivers and to propose practical policy instruments to support a transition toward efficient and low emission energy use.

Why do commercial sectors still depend on biomass fuels?

Despite significant investments in renewable electricity and despite the national policies to promote cleaner and more efficient energy use, Ethiopia's commercial and service sectors, particularly restaurants, hotels, bakeries, butcheries, and fast-food vendors, remain heavily dependent on traditional biomass fuels such as firewood and charcoal.

Even with the expansion of hydropower and other renewable sources, biomass still constitutes nearly 85% of the total national energy consumption, as less than 10% of the population has access to clean cooking technologies (MoWE, 2024). This reliance on biomass contributes to deforestation, greenhouse gas emissions, indoor air pollution, and negative health outcomes, disproportionately affecting women and children.

Improving energy efficiency in the commercial sector is therefore critical for achieving national climate and development objectives as articulated in various national strategy documents, with the aim of achieving middle-income status by 2030 and striving for net-zero emissions by 2050. A review of these national policies and strategies, such as *Climate Resilient Green Economy Strategy* (CRGE) (FDRE, 2011), the *National Sustainable Energy Development Strategy* (N-SEDS) (MoWE, 2024), the *Long-Term Low Emission Development Strategy* (LT-LEDS) (MoPD, 2020), *Updated Nationally Determined Contribution* (NDC) and other relevant energy and forestry regulations, was combined with primary data collection to provide insights on energy efficiency policies and strategies of the country.

Primary data were collected through surveys and interviews with twenty commercial establishments in Addis Ababa and selected nearby towns, covering restaurants, bakeries, butcheries, fast food outlets, and mixed business types.

In addition, interviews were conducted with institutional cookstove producers to understand supply side constraints. Stakeholder engagement was also undertaken through consultations with policymakers, private sector actors, clean cookstove manufacturers, and energy experts, including presentations at the national IGEP forum. Based on this, the findings were synthesized to develop policy relevant recommendations aligned with Ethiopia's green growth strategy.

Key achievements and results

The TI generated several important findings explaining the dominant use of biomass energy in the commercial sector. Commercial food and hospitality businesses were identified as major consumers of firewood and charcoal, with Addis Ababa and Oromia regions accounting for a significant share of the wood-based energy consumption.

- Economic factors play a central role. Many businesses perceive clean energy alternatives such as electricity, liquefied petroleum gas, and efficient institutional cookstoves as (too) costly due to high upfront investment requirements coupled with limited access to finance.
- Reliability concerns reinforce biomass use, as frequent electricity interruptions compel businesses to rely on biomass as a stable and predictable energy source.
- Traditional cooking practices and consumer preferences for taste and food quality continue to favor biomass use, particularly for the preparation of sauce ("wot") and coffee.
- There are policy and institutional gaps in existing energy and climate policies, particularly the limited attention given to commercial energy efficiency within CRGE and NDC implementation. Meanwhile, enforcement of existing regulations remains weak.

The TI process strengthened the dialogue among government institutions and private enterprises, such as clean cookstove producers, and raised awareness of the environmental and economic costs of inefficient biomass use.

Informed by both national analysis and regional experiences from countries such as Rwanda and Tanzania, where tax exemptions and financial incentives have supported clean cooking transitions (NEC, 2025), the TI team developed policy instruments. They include fiscal incentives such as tax exemptions, targeted subsidies, and low-interest loans to address the biomass dependency in the commercial sector. The IGE Fellows have actively participated in the preparation of both the N-SEDS and *Clean Cooking Roadmap*, emphasizing the engagement of the private sector and providing incentives as a means for enhanced engagement.

Finally, the TI contributed to capacity building among IGE Fellows by strengthening skills in applied policy analysis, stakeholder engagement, and inclusive green economy design, thereby supporting more evidence-based policymaking within public institutions. The significant interaction between the IGE

Fellows and the researchers in the TI team also created a platform for collaboration also beyond the specific TI process, laying the ground for long-term cooperation.

Policy recommendations

The findings indicate that improving energy efficiency in Ethiopia's commercial sector requires coordinated technological, financial, behavioral, and institutional interventions. Addressing these constraints presents a significant opportunity to advance Ethiopia's Inclusive Green Economy objectives. Key policy recommendations include:

- Integrate targets for the commercial sector's energy efficiency into the implementation of national strategy frameworks, including the CRGE, N-SEDS, and LT-LEDS.

- Provide structured incentives such as tax exemptions, targeted subsidies (particularly for micro and small enterprises), and low-interest loan facilities to support both clean cookstove producers and commercial users in transitioning away from traditional biomass fuels.

- Strengthen local production of institutional cookstoves and household level cooking stoves through improved access to finance, technology transfer, and facilitation of imported inputs and machinery.

- Enhance the reliability of electricity supply and promote complementary clean energy options, including efficient biomass technologies, which could help to reduce business reliance on traditional fuels, and raise awareness on liquid petroleum gas (LPG).

- Strengthen the implementation and enforcement of minimum energy performance standards and labelling requirements for institutional cooking appliances in line with existing energy regulations.

- Conduct sustained awareness and capacity-building campaigns targeting business owners and consumers to address cultural preferences and information gaps related to clean energy adoption and health impacts of biomass use.

Ethiopia's TI Team

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Tanzania: Promoting the use of energy-efficient technologies

The Tanzanian TI focused on identifying opportunities and barriers to promoting energy-efficient domestic appliances to reduce the national energy consumption, and the local and global emissions.

The case of domestic appliances

The TI process was guided by Tanzania's national energy policy frameworks, including for example the *National Energy Policy* (2015), *National Energy Efficiency Action Plan* 2018–2023, *National Clean Cooking Strategy* (2024-2034), *National Energy Efficiency Strategy* (2024-2034) and *Nationally Determined Contributions* (URT, 2015, 2018, 2024a, 2024b, 2021). Through desk reviews, policy analysis, and stakeholder engagement, the TI team examined the structural, financial, and behavioral barriers that limit the uptake of energy-efficient appliances at household levels in Tanzania.

Key achievements and results

The TI contributed to a more nuanced understanding of the challenges and opportunities associated with promoting energy-efficient domestic appliances in Tanzania. While the initiative did not aim to generate new large-scale empirical datasets, it synthesized existing evidence and knowledge to support informed policy dialogues on necessary reforms to achieve the country's energy efficiency objectives.

The analysis and dialogues highlighted that - despite steady progress in rural electrification and appliance ownership - the penetration of energy- efficient technologies remains limited. Studies indicate that only a small share of households currently use energy- efficient or smart appliances, such as LED lighting, refrigerators, and clean cookstoves (NBS, 2025; URT 2024b). Reasons for this include affordability and high upfront costs, and limited awareness among consumers. Although energy-efficient appliances offer substantial long-term savings through reduced electricity consumption, their purchase price is significantly higher than that of conventional models, which hampers adoption. Other constraints are limited access to consumer finance, low awareness of energy labels, and weak enforcement of Minimum Energy Performance Standards (MEPS) (UNDP, 2022). These are particularly pronounced in rural and peri-urban areas, where market availability of certified appliances and after-sales services is low and electricity supply is unreliable.

A central achievement of the TI was the strengthened collaboration among institutions responsible for electricity production and distribution, energy policy, regulation, and standards. This includes engagement with the Tanzania Electricity Supply Company (TANESCO),

Tanzania Bureau of Standards (TBS), and the Energy and Water Utilities Regulatory Authority (EWURA), Centre for Agricultural Mechanization and Rural Technology (CAMARTEC), and the National Construction Council. This collaboration contributed to the national efforts to improve the enforcement of MEPS and energy labeling systems.

The TI also reinforced the research-policy interface by translating technical assessments and international lessons into nationally policy-relevant insights. Fellows contributed to ongoing policy processes, including inputs to the National Building Code and discussions on expanding MEPS to also cover clean cooking, including e.g. electric cooking appliances, in line with emerging national strategies. Through these engagements, the initiative supported institutional learning and helped position energy efficiency as a cross-cutting issue within Tanzania's broader energy and development agenda.

Policy recommendations

Promoting energy-efficient domestic appliances offers significant potential to advance Tanzania's Inclusive Green Economy transition by reducing pressure on the national power grid, lowering household energy expenditures, and mitigating climate impact (IEA, 2021). Improved energy efficiency can also support energy security and social welfare, particularly as electricity access continues to expand nationwide.

Building on the TI findings, sustained progress will require stronger enforcement of MEPS, expanded consumer financing mechanisms, and coordinated awareness campaigns that emphasize long-term cost savings and environmental benefits. Targeted fiscal incentives — such as tax exemptions for efficient appliances and support for local manufacturing — can help improve affordability and market availability. Regional harmonization of standards within the East African Community may further reduce compliance costs and stimulate private-sector participation.

The TI findings suggest that stronger coordination among ministries, regulators, and academia is essential to reach evidence-based approaches to policy development and lead to measurable outcomes. By maintaining the partnerships and dialogue platforms established through the initiative, Tanzania can continue strengthening the research–policy interface and institutional capacity required to achieve a more energy-efficient and inclusive green economy.

Tanzania's TI team

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Ruth Chuwa, *IGE Fellow: Ministry of Transport*

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Kenya: Accelerating e-mobility for a sustainable future

The Kenyan TI examined how the country can accelerate the adoption of e-mobility to enhance energy efficiency and reduce local and regional emissions, which cause environmental and health problems.

Drive green

Building on Kenya's national policy commitments, including the *National Energy Efficiency and Conservation Strategy* (Republic of Kenya, 2020) and the *National Climate Change Action Plan* 2023–2027 (Republic of Kenya, 2023), the TI sought to identify barriers, opportunities, and incentives for e-mobility uptake. The process involved conducting literature reviews, a public perception survey in Nairobi[4], and stakeholder consultations that brought together public transport operators, regulators, and representatives from the private sector.

By employing the Action Learning approach, the team linked data analysis with policy reflection, focusing on technical, economic, and social dimensions of e-mobility. This interactive process fostered networking and stronger collaboration between government agencies and academic partners, facilitating mutual learning on how empirical findings can inform regulatory and fiscal interventions within the transport and energy sectors.

Key achievements and results

The TI process contributed to a deeper understanding of Kenya's evolving transport landscape and the challenges of shifting from fossil-fuel dependency to cleaner alternatives. While Kenya seeks to have 5% of EVs registered in 2025 from a baseline of 0% in 2019 (Republic of Kenya, 2020), available data shows that the country remains behind schedule in meeting the target. For instance, by the end of 2024, EVs represented only 3.2 % (app. 5300 EVs) of total registered vehicles (Kenya Power, 2025). This pace casts doubt on reaching the country's target of 5% new registered EVs by 2025.

The findings show that while the awareness of e-mobility is relatively high among urban transport operators and users, the practical adoption remains limited. This is mainly due to structural, economic, and infrastructural constraints. Survey results indicated that most respondents, particularly public transport operators, were famil-

4 A total of 160 participants were interviewed. The target participants were largely public transport operators, public transport users, and private vehicle operators.

iar with the concept of e-mobility and its environmental benefits. However, widespread adoption has been hindered by poor charging infrastructure, high vehicle purchase costs, limited access to finance, and uncertainty about vehicle performance and maintenance. Limited charging infrastructure was stated as the main barrier to the adoption of EVs. Existing infrastructure is mainly available in urban areas, particularly Nairobi, hampering the use of EVs in rural areas. Even in urban areas, this infrastructure is limited. The high purchase cost of EVs was cited as the second most limiting barrier. EVs are currently more expensive compared to ICEs, making them unaffordable to many purchasers. Despite these challenges, the growing visibility of electric motorcycles and buses in Nairobi reflects increasing public interest and emerging market potential.

The study also revealed a gap between policy intent and public awareness of existing government incentives. While the Kenyan government has introduced several fiscal measures, such as reductions in excise duty for electric vehicles, VAT exemptions for e-mobility equipment, and preferential tariffs for charging stations, many stakeholders were unaware of these incentives. This lack of awareness limits the effectiveness of current policies and highlights the need for more coordinated communication and stakeholder engagement.

A significant achievement of the TI process was the dialogue between key policy institutions and non-state actors. Through stakeholder dialogues and the presentation of research evidence, the initiative helped align different perspectives across ministries, researchers, and private sector actors, enhancing the evidence base for policy reforms. The fellows' involvement strengthened research–policy linkages by integrating field data into policy discussions on energy efficiency and sustainable transport.

Furthermore, the TI reinforced the capacity of participating institutions to engage in applied policy research and cross-sectoral collaboration. It demonstrated the value of combining research knowledge and technical analysis with participatory engagement, ensuring that policy recommendations are grounded in scientific evidence, local realities, and informed by stakeholder experience. The process illustrates one of the IGE program's central objectives: fostering a culture of evidence-based policymaking that connects academic analysis and scientific knowledge, with implementation practice.

Policy recommendations

Kenya's e-mobility transition holds considerable potential to contribute to the country's Inclusive Green Economy goals. These include the updated National Determined Contribution (NDC) target, where Kenya aims to reduce 35% of its greenhouse gas emissions by 2035 (Republic of Kenya, 2025a), and growth in real GDP, where the GDP in a green economy is expected to be 12% higher than under the business-as usual-scenario (Republic of Kenya, 2016). This growth is expected to create 240,000 green economy jobs by 2030 (FSD Africa, 2024). With more than 90% of its electricity already generated

from renewable sources, scaling up e-mobility could substantially reduce emissions from the transport sector, which currently accounts for over 85% of national fuel consumption, and decrease dependence on imported petroleum products (IRENA, 2025; Republic of Kenya, 2025b). The shift also promises wider social and economic benefits, including job creation in local vehicle assembly, maintenance services, and battery production.

To realize this potential, continued policy innovation and institutional coordination will be crucial. Based on the findings and lessons learned from the TI-process the following recommendations are proposed:

- prioritize the development of a comprehensive charging infrastructure through public-private partnerships,
- expand fiscal incentives and concessional financing for e-mobility investments,
- integrate gender and social inclusion considerations into transport planning,
- intensify the use of targeted public awareness campaigns to key stakeholders, and
- create clearer regulatory framworks.

Overall, the TI has helped lay the groundwork for a more evidence-informed and collaborative approach to Kenya's green transport transition. By bridging research, policy, and practice, it has strengthened professional networks and the national capacity to design and implement energy-efficient and low-emission solutions that align with the country's climate and development commitments.

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Rwanda: The contribution of e-mobility in emission reduction

The Rwandan TI explored the potential of e-motorcycles to reduce emissions and improve energy efficiency within the transport sector.

A case study of e-motorcycle promotion

The TI-process began with the identification of key challenges related to Rwanda's transition from fossil fuel-based transport to e-mobility, as stated in Rwanda's national development and climate frameworks, including *Vision 2050* and the *Nationally Determined Contributions* (MoE, 2020). Through a series of stakeholder dialogues, the national TI team refined its understanding of the effectiveness of e-motorcycle adoption, included socio-economic aspects of the transition, and analyzed the barriers hindering widespread uptake.

Regular meetings and workshops brought together policymakers, researchers, private-sector representatives, and development partners. These interactions encouraged mutual learning and knowledge sharing, while connecting national transport policy discussions with local implementation realities. The TI-process also highlighted the importance of creating an enabling environment that supports technological innovation, evidence-based policymaking, and private investment in sustainable mobility solutions.

Key achievements and results

The TI contributed to an improved understanding of Rwanda's e-mobility transition and strengthened the collaboration between government agencies, researchers, and private-sector actors. The evidence base was drawn largely from secondary data and stakeholder consultations; the process generated policy-relevant insights into how electric motorcycles can contribute to emission reductions, energy efficiency, and economic resilience.

The analysis indicated that the transport sector remains a significant contributor to greenhouse gas emissions and urban air pollution, with motorcycles accounting for a large share, particularly in Kigali where they represent 53% of the total vehicle fleet (Ayetor et al., 2023; MoE, 2020; NISR, 2024a). Stakeholder discussions highlighted that e-motorcycles reduce emissions and the reliance on imported petroleum products compared to internal combustion engine motorcycles and save on operational costs. (MININFRA, 2021). It was estimated that 100 RWF (0.069 USD) would provide fuel for a journey of approximately 5 kilometers on a conventional

ICE motorbike, and 11 kilometers for an e-motorbike (Sudmant, et al., 2020). Over the lifetime, an e-motorbike would save approximately 1.9 million RWF in fuel expenditure.

The TI-process also revealed several practical challenges that limit adoption. These include high upfront costs of the required technologies (e-motorbikes, batteries, charging stations etc.), limited access to financing, uneven distribution of charging infrastructure (concentrated in Kigali), battery swapping infrastructure, behavioral preference toward ICE motorcycles due to familiarity and perceived reliability, and the absence of fully harmonized technical standards (European Sting, 2022; IFC, 2024). While government incentives - such as tax exemptions and preferential electricity tariffs - have supported early uptake and a rise in electric motorbike operators, infrastructure gaps remain a major obstacle. Moreover, the awareness of these measures among operators is uneven.

A key achievement of the TI was to strengthen the research-policy interface. Collaboration with academic institutions, including the University of Rwanda and the African Centre of Excellence in Energy for Sustainable Development (ACE-ESD), enabled the integration of scientific evidence into the policy dialogue. The TI also facilitated exchanges between policymakers and e-mobility operators (such as Ampersand, Spiro, and REM), which improved a mutual understanding of regulatory, technical, and social dimensions of the transition. These interactions supported institutional learning and contributed to more informed discussions on the design and sequencing of policy instruments.

Policy recommendations

Rwanda's strategy for e-mobility of 2021, seeks to accelerate the transition to EVs in line with the sustainable transportation hierarchy to reduce greenhouse gas emissions from vehicle transportation in Rwanda. The national green growth and climate resilience strategy of 2023 (RoR, 2023), promotes the key developments in green technology and digitalization of electric mobility service systems in line with national

Examples of Rwandan policy incentives to promote electric mobility

- Economic policy instruments, e.g. tax exemptions on electric vehicles (EVs), hybrid vehicles, and related infrastructure; reduced corporate income tax rates for EV manufacturers; carbon tax to promote use of low-emission vehicles.
- Regulatory policy instruments, e.g. preferential green license plates; rent-free land for charging stations; registration of ICE motorcycles for taxi purposes will be prohibited in Kigali, meaning that all new motorcyclists entering the sector from 2025 onward must use electric motorcycles. Additionally, from June 2025, all existing ICE motorcycles must obtain a control certificate verifying their status, including compliance with emission standards.

Source: MININFRA (2021); IFC (2024)

Vision 2050 (RoR, 2020). These measures are to be implemented with a strong emphasis on efficiency and the provisioning of affordable services across Rwanda's urban areas.

The findings from the TI process suggest that scaling-up e-motorcycles can yield long-term benefits in emission reductions, health, and energy security. To achieve these gains, the collaboration between policymakers, private sector investors and researchers needs to continue, to strengthen the interoperability of charging systems, improve access to affordable financing for drivers, and promote awareness campaigns to ccelerate adoption.

From a policy perspective, recommendations from the TI-process include:

- Finalize a comprehensive *National E-Mobility Strategy* that harmonizes fiscal incentives, e.g. complement the carbon market with a clear fee structure as an incentive to investors, technical standards, and environmental safeguards.
- Increase investment in renewable-powered charging networks.
- Enhance research capacity in local institutions.
- Ensuring mechanisms for inclusion, particularly of low-income and female operators.

The TI reinforced the importance of linking policy innovation with empirical learning. By nurturing partnerships between government, academia, and the private sector, it contributed to building a stronger foundation for an inclusive and low-carbon transport system that aligns with Rwanda's long-term green growth ambitions.

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Uganda: Promoting e-mobility

The Uganda TI focused on energy efficiency and reduced emissions in the transport sector through promoting e-mobility.

Energy efficiency and reduced emissions in the transport sector

The TI followed the action-learning approach and was closely aligned with Uganda's long-term development frameworks, including *Vision 2040* and the *Fourth National Development Plan* (NDP IV) (NPA, 2015; GoU, 2025). Also, *Uganda's national E-mobility strategy*, from 2023, has the vision of a full transition to e-mobility in public transport and motorcycles by 2030 and passenger vehicle sales by 2040 (STI, 2025). Through desk reviews, focus group discussions, key informant interviews, and stakeholder workshops, the initiative explored the drivers and barriers for e-mobility in Uganda. The regular engagements among policymakers, researchers, and transport operators strengthened the research-policy interface and supported an evidence-informed dialogue.

Key achievements and results

The TI contributed to a deeper understanding of Uganda's transport transition and strengthened the collaboration across governmental institutions responsible for energy, transport, and climate policy.

The dialogues indicated that the transport sector remains a significant source of emissions, particularly in urban areas such as Kampala, where congestion and the rapid increase of ICE motorcycles have worsened air quality. Discussions highlighted that electric buses and motorcycles offer potential benefits in terms of lower operating costs, reduced emissions, and improved urban air quality, especially when combined with Uganda's increasing electricity generation capacity from renewable sources.

At the same time, the TI identified several barriers to wider adoption, including limited charging infrastructure, high upfront vehicle costs, concerns about battery quality and maintenance, and gaps in the regulatory framework for e-mobility. Awareness of e-mobility benefits among transport operators and users was found to be uneven, underscoring the need for more systematic information and capacity-building efforts (Afema and UNEP, 2024).

A key achievement of the TI was the strengthened collaboration between government institutions, research organizations, and emerging domestic innovators such as Kiira Motors Corporation. Site visits, stakeholder workshops, and media

engagements facilitated knowledge exchange and helped align research findings with policy priorities. The TI also highlighted the importance of gender inclusion in the e-mobility transition, drawing attention to both progress and remaining barriers to women's full participation in the sector. Through these interactions, the initiative contributed to institutional learning and more coherent discussions on energy efficiency and reduced emissions in the context of developing and implementing adequate transport policies.

Policy recommendations

Uganda's transport sector presents significant opportunities to advance Inclusive Green Economy objectives by integrating e-mobility into national energy and urban development strategies. Expanded use of electric cars, buses, and motorcycles can reduce emissions, improve air quality, and stimulate local manufacturing and innovation, supporting both environmental, social, and economic goals (NPA, 2015; GoU, 2025).

Building on the TI findings, the key policy recommendations include:

- Updating and harmonizing the regulatory framework to better accommodate e-mobility.
- Expanding charging infrastructure through public-private partnerships.
- Improving access to affordable financing for operators and innovators.

Continued investment in awareness-raising and technical training will be essential to build confidence among users and address concerns related to battery performance and maintenance.

The TI demonstrated the value of collaborative and evidence-based policy-making. By sustaining the partnerships between government, academia, and the private sector, Uganda is well positioned to strengthen its research–policy interface and advance a more energy-efficient, inclusive, and low-carbon transport system in line with its IGE ambitions.

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Concluding remarks

Across the five countries, the TI processes – focused on sustainable transport by promoting e-vehicles, reducing biomass dependence in the commercial sector, and transition to energy-efficient domestic appliances – have strengthened the capacity to design and implement economic policy instruments for energy efficiency and emissions reduction.

These gains extend beyond participating fellows to their respective institutions and broader stakeholder networks. Key achievements include enhanced collaboration between government, academia, and the private sector, improved research–policy linkages, and more evidence-based policy recommendations.

Common key challenges to sustainable energy transitions

- High upfront costs and limited access to financing for cleaner energy technologies.
- Inadequate infrastructure, including lack of charging stations and unreliable electricity supply.
- Weak enforcement of energy standards and limited awareness of government incentives.
- Cultural and behavioral barriers to adopting cleaner energy solutions.

Overarching policy recommendations

1. **Fiscal incentives**: Review, design and introduce adequate tax exemptions, subsidies, beneficial financing and other adequate fiscal incentives to make cleaner energy technologies more affordable and adopted.
2. **Infrastructure development**: Expand charging networks and improve electricity reliability to support e-mobility, energy-efficient appliances, and other technologies that can promote a sustainable energy transition, reduce emissions, and increase energy efficiency. Enhance promotion of electricity transitions to lower the dependency on fossil fuel imports, which is subject to volatile global markets
3. **Awareness campaigns**: Conduct targeted campaigns to address cultural preferences and increase awareness of benefits of cleaner energy and available policies, including financial incentives.
4. **Private sector engagement:** Include relevant private sector actors in the policy processes to ensure their perspectives are considered, create awareness and understanding, as well as enabling private investments.
5. **Policy integration**: Align energy efficiency targets with national strategies and ensure robust enforcement of energy standards.
6. **Regional collaboration**: Share experiences and harmonize policies across Eastern Africa to accelerate progress.

TI-teams, facilitators and EfD researchers at training in Nairobi, Kenya. Photo: Anders Ekbom

Way forward

The TI processes have laid out the groundwork in the participating countries for evidence-based policymaking and cross-sectoral collaboration. They have also promoted inclusion by raising its importance and successfully engaged relevant stakeholders in each TI-process. By addressing institutional, financial, and behavioral barriers, the participating countries can advance their work towards a more Inclusive Green Economy, reduce emissions, and improve energy efficiency to achieve sustainable development aligned with national commitments in this field of work. By the establishment of the IGEP secretariats nationally and regionally, the researchers and IGE fellows have created platforms for knowledge sharing, networking, and practical engagements to sustain long-term cooperations on these thematic areas, beyond the duration of their participation in the IGE program.

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