ENERGY PROGRAM

FOSTERING INCLUSIVE DEVELOPMENT

TRACING THE INFLUENCE OF INTERNATIONAL ENERGY MODELLING COLLABORATIONS ON KENYA'S POLICY LANDSCAPE

Project Brief

Climate Compatible Growth

UCL

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Introduction

Over the past decade, Kenya has seen a proliferation of international collaborations related to energy modelling. These partnerships are typically framed as technical assistance packages (modelling, training, and workshops) but also carry strategic and political aims.
This brief outlines:

- How international collaborations influence energy planning in Kenya.
- Some dynamics around tool choice and scenario development.
- Issues around energy modelling capacity development.

Kenya offers a particularly instructive case for examining how international modelling collaborations evolve, given its long history of external engagement alongside the institutionalisation of domestic planning processes such as the Least Cost Power Development Plan (LCPDP). Based on these insights, we identify practical lessons to improve future collaborations and build sustainable modelling capacity.

Data Sources

The insights presented in this brief draw on three complementary sources:

- **Mapping of modelling collaborations over past decade**

Document analysis of major modelling episodes involving international partners, including LCPDP reports, collaboration outputs, and partnership agreements.

- **Literature review**

Review of academic and grey literature on energy system modelling, capacity building, and policy engagement in Sub-Saharan Africa.

- **Stakeholder interviews**

Semi-structured interviews with Kenyan planners and regulators, alongside researchers, development partners, and consultants engaged in energy modelling.

Typology of modelling episodes involving international partners

Not all energy models serve the same purpose
Energy modelling tools are designed to answer different planning questions. As a result, they vary in their time horizon, scope, influence, and institutional requirements, thus shaping how planning processes are organised and how capacity is built.

Three broad types of models

1. Short-term operational models
- Focus on dispatch, grid management, reliability
- Timeframe: Hours to months
- They require sustained technical expertise within utilities and regulators
- Influence operational decision-making

2. Long-term system and transition models
- Focus on capacity expansion, investment pathways, least-cost planning
- Timeframe: 10–40+ years
- They emphasise scenario development and cross-sector coordination
- Shape strategic and policy decisions under uncertainty

3. Targeted analytical tools
- Focus on specific questions (e.g. demand forecasting, flexibility, energy security)
- Often project-based and issue-specific
- Influence particular policy debates or planning components

Why This Matters
Models influence:
- Who participates in planning
- What uncertainties are considered
- Where capacity must be built
- How decisions are justified

The tool used affects the planning outcome.

International Collaboration Processes

The institutionalisation of the LCPDP process

The Least Cost Power Development Plan (LCPDP) was initiated in the 1980s as a collaboration between the World Bank and the Government of Kenya. For over three decades, each revision relied heavily on international consultants and external technical expertise.

1980s–2015: Externally supported planning
The LCPDP process was shaped by project-based technical assistance, with knowledge transfer occurring largely through international collaborations.

Post-2015: Institutionalisation and domestic ownership
The process became embedded within national institutions, and the adoption of the LIPS model marked a shift towards stronger in-country modelling capacity and ownership.

Today: Anchor of Kenya's power planning ecosystem
The LCPDP now sits at the centre of power system planning discourse. Its modelling team serves as the primary entry point for international collaborations and as the reference framework through which new modelling approaches are introduced.

Brokering Mechanisms

Kenya stands out for its willingness to engage multiple partners and experiment with new modelling tools. Over time, this has led to a diverse landscape of tools and international collaborations.

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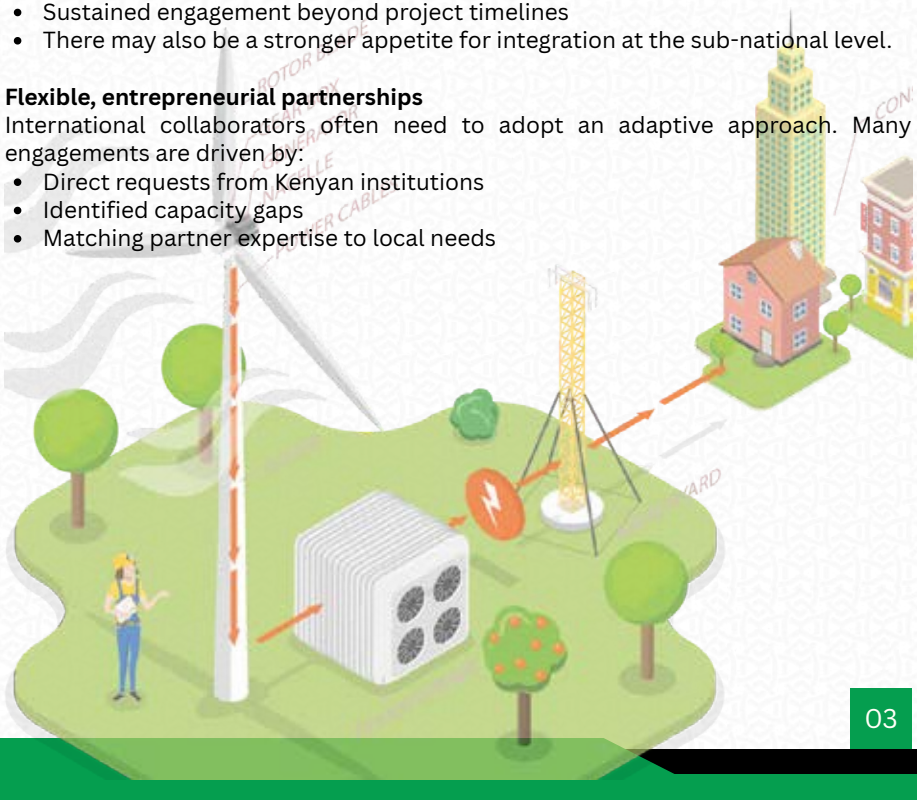
Openness to new approaches
International partners consistently note a readiness among Kenyan institutions to explore new models and build new skills.

But integration takes time
Being taken seriously within national planning processes requires more than tool introduction. It often depends on:

- Explicit handover of model files and metadata
- Ongoing technical support
- Sustained engagement beyond project timelines
- There may also be a stronger appetite for integration at the sub-national level.

Flexible, entrepreneurial partnerships
International collaborators often need to adopt an adaptive approach. Many engagements are driven by:

- Direct requests from Kenyan institutions
- Identified capacity gaps
- Matching partner expertise to local needs



What defines a successful partnership?

Success means independence.
A partnership is successful when Kenyan institutions no longer need to rely on external consultants for technical expertise, funding, or models.

Core marker of success include:

- Internal capacity to run and update models
- Ability to train new team members in-house
- Sustained institutional ownership

Beyond capacity: What partnerships actually unlock
Modelling collaborations do more than transfer technical skills; they reshape access and incentives within the planning ecosystem.

Access to tools
For many institutions, partnerships open doors to proprietary software licenses that would otherwise be financially out of reach. This can significantly expand the analytical possibilities available to planners.

Access to methods and networks
Engagement with international partners exposes teams to new modelling approaches and connects them to global professional communities. Workshops and training therefore function not only as skill-building exercises, but also as gateways into broader epistemic networks and future collaboration opportunities.

Modelling as policy language
For international collaborators, modelling may offer a means of engaging with Kenyan energy policy and planning decisions. One interviewee noted with regards to climate and energy spaces that "[modelling] is definitely very much used and as a way of communicating to the world that Kenya is in that space." in part because in Kenya, modelling is "very well used and it's very well appreciated and it very well offers a language that allows them to communicate with different kind of actors "

2. Tools, Models and Scenarios

What's in the toolbox? Comparing proliferation against consolidation

Kenya's energy planning landscape is characterised by an expanding range of modelling tools, but interviewees differ on whether this diversity is a strength or a risk.

A sector in transition

Two parallel trends are visible:

- Gradual shift toward open-source tools within processes such as the LCPDP
- Introduction of new proprietary software through externally financed initiatives (e.g., Master Plan renewal supported by AFD)

The result is a transitional moment:

Expertise is spread across multiple platforms, as teams balance legacy skills, emerging tools, and new partnership opportunities.

> The question remains whether having numerous tools enables different types of analyses and capacity across multiple areas, or whether too many tools lead to fragmented capacity with no real ownership.

When a tool gains institutional footing

The case of OSeMOSYS illustrates how consolidation can occur.

- OSeMOSYS was introduced through the CCG programme
- It was also used in the ETIP developed by SEforALL
- It was then selected by the Ministry of Energy and Petroleum for the Kenya Beyond Oil and Gas study

The rationale:

- There was alignment of the tool with existing planning processes
- There was growing familiarity among analysts
- In-country capacity was already established

Lesson: Once a model becomes embedded, accumulated familiarity and institutional memory make continued use more likely than switching platforms.

Scenarios as coordination tools

Scenarios are more than technical exercises; they help align ministries, balance competing goals, and create a shared language across domestic and international actors.

Some international partners view scenarios as underutilised in current modelling approaches and plan to place greater emphasis on them in future initiatives.

Implication: Strengthening scenario design can improve both analytical robustness and cross-sector coordination in energy planning.

> ***The Strategic Question***
> **Does a diverse toolbox enable complementary analyses and broaden capacity?**
> **Or does it fragment expertise across too many platforms, weaken institutional ownership or limit depth of mastery in any one tool?**

The politics of demand scenarios

Future demand is one of the greatest sources of uncertainty in energy planning, and one of the most politically sensitive.

- **Short-term forecasts (0–5 years)** are primarily technical, and are shaped by data quality and operational needs.
- **Long-term forecasts (20+ years)** are normally intertwined with expectations about economic growth, structural change, and national development ambitions.

Where modelling meets development strategy

Demand projections do not sit in isolation. They:

- Connect technical modelling to national visions (e.g. long-term development goals)
- Strongly influence model outputs and investment pathways
- Shape how Kenya communicates its ambitions to development partners.

Because demand assumptions affect financing signals, modelling teams may face pressure to align projections with ambitious growth narratives.

International collaborations can also influence priorities, for example, emphasising industrial electrification, growth, or efficiency in line with broader climate and development agendas.

Implication:
Demand scenarios are not purely technical inputs; they are strategic assumptions that shape planning outcomes, financing flows, and the direction of Kenya's energy transition.

> **Short-term forecasts (0–5 years) are primarily technical, and are shaped by data quality and operational needs.**

3. Capacity Development

Staff turnover and fragmentation

Staff turnover and fragmentation of current approaches are creating gaps in capacity, a challenge discussed widely across interviews. With modelling team members changing so frequently, particularly on the LCPDP team, brief training engagements become far less likely to produce durable capability or institutional memory.

Further, knowledge loss between cohorts is common. Differences in participants' background knowledge also make training harder, which increases the time and cost of training. A short workshop is often not enough without pre-training baseline assessment and modular curricula that can address different starting levels.

Coordination challenges

International partners also reported that they are not always aware of what other partners are doing in this area, leading to duplication of efforts, suggesting room for better coordination. Some further noted that frequent workshops and meetings with development partners can take LCPDP staff away from their core planning work.

Short term workshops and the Trainer-of-Trainers approach dominate

The dominant models of capacity building seem to be short-term workshops and the Trainer-of-Trainers (ToT) approach, with mixed results.

Potential strengths of ToT:

- Training others reinforces deeper technical understanding
- Can extend engagement beyond a single workshop
- Offers a pathway to retaining knowledge within teams

At the same time, one-off workshops often struggle to build sustained capability.
Recent initiatives suggest a shift toward more targeted, topic-specific training, reflecting recognition that generic workshops may not be sufficient.

Moving from broad, short-term workshops toward more focused and sustained learning models may strengthen long-term institutional capacity.

Where to build capacity

The current focus of capacity building by international partners is in government and the LCPDP team. While important, this concentration may be too narrow.

The capacity of the broader ecosystem matters

Strengthening expertise across academia, independent research organisations, and the private sector can support more diverse analytical approaches and reduce reliance on short-term external consultants.

Limited domestic private-sector capacity in energy modelling means external consultants are still frequently required, thus reinforcing familiar challenges linked to temporary support and knowledge loss.

The case for institutional anchoring

Several interviewees emphasised the value of establishing a permanent modelling base within the ministry, for example through a dedicated planning unit.

A designated unit could:

- Coordinate tool selection
- Provide strategic oversight
- Reduce fragmentation from multiple platforms and trainings
- Anchor institutional memory

Comparative examples suggest that when technical expertise is housed within a stable government agency, knowledge retention is stronger and less vulnerable to staff turnover.

Continuous training or core expert pool?

Given high turnover and short-term international engagement, a key question emerges:
Should the priority be **continuous broad-based capacity building**, or the development of **a stable core group of experts** who consistently play the Training of Trainers role?

> **Implication:**
> Where and how capacity is built will shape not only technical proficiency, but also long-term institutional ownership and resilience in Kenya's energy planning system.

RECOMMENDATIONS

01

Require model handover in TORs and contracts. Procurement documents must require the delivery of model files, data dictionaries, and a handover period with mentoring.

02

Standardise documentation, e.g. through a modelling disclosure annex for all consultant contracts (including e.g. an assumptions table, data sources, and key scripts).

03

Create a small, permanent energy modelling unit within the INEP framework with defined career paths and annual training.

04

Coordinate donor training calendars to reduce duplication and improve participant selection, so those trained are retained and able to apply skills.

05

Monitor training outcomes through brief follow-up reports at, e.g., 3 and 9 months, describing evidence of reuse (who ran the model and what decision it informed).