

County Energy Planning Data Flows in Kenya: Practitioner Perspectives

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Executive Summary

This working paper investigates data needs and flows involved in county-level energy planning in Kenya. It draws from workshops and semi-structured stakeholder interviews conducted with a total of 28 professionals representing 19 different organizations supporting the production of county energy plans (CEPs) in Kenya, as well as relevant law and policy. The aim is to identify where rigorous processes must be established to facilitate data flow. The key insights can be broken down into the categories of data needs, data collection, data flows, and data sharing.

Data needs: Key data needs for county energy planning identified across stakeholders include grid infrastructure (e.g., substations, transmission lines, transformers), connectivity data, demand data by usage categories, baseline socioeconomic data, and development needs across sectors.

Data collection: All stakeholders reported that primary data collection is necessary to fill data gaps for county energy planning. This is typically undertaken by in-county civil society organisations. A key gap is high-resolution spatial data. Kenya Bureau of National Statistics (KNBS) data is released at sub-county level but planners desire ward-level. KNBS indicated that they are willing to share ward-level data if it does not render individual people identifiable – this should be requested by the Council of Governors. A huge volume of data must be collected to fulfil the requirements of the Integrated National Energy Planning (INEP) framework, and stakeholders worry that some of it may not be used, leading to cynicism. They were also unclear as to how the three-year data collection cycle of county energy plans should align with the five-year timeline of County Integrated Development Plans or the ten-year census timeline. *Key recommendations:* Synchronize CEP data collection across counties. Ensure timeline aligns with existing planning efforts. Create clear standards for data quality and communicate these to civil society organisations. Council of Governors to contact KNBS indicating the data gaps required to be filled for county energy planning.

Data flows: Three types of data flow are required for county energy planning: top-down (national to county), horizontal (between county departments), and bottom-up (county to national).

- **Top-down:** Counties experience difficulties and delays getting data from national-level organizations. Getting data from Kenya Power can be very slow, and certain data types can be impossible to access. Kenya Power explained that this is due to their data structure: currently, it is split in eight regions which do not align with counties, and by consumer type (e.g., domestic, small commercial, commercial) rather than economic sector. While INEP specifies that national agencies must make data available to counties, INEP is not yet legally binding. As such, agencies like Kenya Power want direct instruction from a higher level (i.e., Ministry of Energy) to share data, particularly as there can also be legal concerns of data falling into the wrong hands. Key recommendations: Create a standard protocol for bilateral data sharing. Appoint a designated coordinator at national agencies as a contact point for CEP data requests. Where possible, speak to in-county representatives of national agencies to accelerate data exchange.
- **Horizontal:** Interviewees reported that going back and forth between county ministries to get sectoral data (e.g., health, agriculture) for energy planning can be challenging. Specifically, it was noted that requests from one County Executive Committee (CEC) member to another can be underprioritized as they are at the same hierarchical level. Routing requests through a higher-level (e.g., county governor) was suggested as a solution to this. It was also recommended to engage a data point-person to coordinate these requests, as CECs are overburdened with multiple portfolios. Key recommendations: Establish a point person in county government to facilitate data access. Route requests through the county governor or director of planning so that they are prioritized. Collect and store data in easily reusable formats.
- **Bottom-up:** Bottom-up flows should ensure that plans produced at county level feed up to influence national level planning - currently, this pathway does not exist. Indeed, the Ministry of Energy indicated that the national level is not yet ready to receive and consolidate CEPs – while counties were mandated in The Energy Act 2019 to undertake this planning, the Ministry does not consider it launched until a circular is released from the cabinet secretary. CEPs which do exist have been produced as lengthy PDF documents, which would be difficult to parse to extract relevant data for aggregation into national plans. A more standard analysis-ready digital format for submission of key data points may solve this issue. Key recommendations: Determine a set of minimum viable data for counties to feed up to national level planners. Create a template digital form for this purpose. Modify or extend the INEP framework to facilitate this.

Data sharing: There is a strong desire for easier data sharing. Stakeholders want to synthesize their independent data repositories; however, there is a tension about who should own and maintain the final repository. Many believe that it should be initiated by the Ministry of Energy, and potentially hosted by Kenya Power. Implementing a repository with controlled access requires infrastructure management, and heavy attention to data protection law; it is unclear whether there is adequate resource and expertise available to maintain that amongst stakeholders at present. Key recommendations: Implement a standard access point (e.g., repository) for commonly requested data, managed by one national agency and with access delegated to other national agencies and county representatives.

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Acronyms and Abbreviations

CEC	County Executive Committee
CEP	County Energy Plan
CIDP	County Integrated Development Plan
CSO	Civil Society Organisation
EDM	Energy Delivery Model
INEP	Integrated National Energy Plan
KNBS	Kenya National Bureau of Statistics
KPLC	Kenya Power
MoE	Ministry of Energy
REREC	Rural Electrification and Renewable Energy Corporation
SETA	Sustainable Energy Technical Assistance programme

1. Introduction

This working paper investigates data needs and flows involved in county-level energy planning in Kenya. Counties in Kenya are mandated to independently produce energy plans every three years. These plans are intended to inform national energy planning and policy. A complex web of funders, organizations, and governmental bodies collaborate to produce these plans, using different approaches and operating on different timescales. For this devolved planning process to function, data and communication flows are required from the national to county level, horizontally across county departments, and upward from county to national level. This working paper aims to investigate these data flows across actors at different levels which enable county-level energy planning to facilitate improved energy planning which accounts for county needs.

1.1 Policy Background

Energy sector decentralization in Kenya began with the Constitution of Kenya (2010), which devolved political and administrative authority to 47 newly established counties¹. Planning and development of energy, electricity, and gas is devolved to counties in Schedule Four of the Constitution. This was compounded by the Energy Act (2019)², which required counties to independently develop County Energy Plans (CEPs) every three years. The purpose of these plans is to feed into national-level energy planning via the Ministry of Energy (MoE). They are supposed to follow the outline provided in the draft Integrated National Energy Plan (INEP) framework.

County-level energy planning efforts in Kenya have accelerated in recent years. Several organizations and programmes have partnered with county governance to build energy planning capacity and develop their inaugural CEPs. Notably, the European Union-funded Sustainable Energy Technical Assistance programme (SETA)³ has provided baseline energy planning training across the country and is now conducting advanced training leading to CEP development with 12 counties using the Energy Delivery Model (EDM) framework⁴.

Despite these accelerated efforts, few counties have succeeded in drafting CEPs. This can be attributed to limited capacity, lack of clarity on the process and expectations, difficulties with data access, and fledgling county-level institutional structures. Furthermore, unifying CEPs into a coordinated national energy strategy is daunting, given the way these reports and the data therein vary in form, scope, timeframe, and method. To ensure that county energy planning develops sustainably, processes must be established to address these challenges.

1.2 Contribution

This working paper investigates data-related challenges in county energy planning processes. It aims to answer the following question: *What are the critical data needs, flows, and gaps for county energy planning in Kenya?* Through engagements with organizations supporting county-level energy planning, including workshops and key stakeholder interviews, data needs and sources were identified, and critical data flows and challenges were mapped. The aim of this work is to identify where rigorous processes must be established to facilitate data flow and ensure that county energy planning becomes a sustainable practice in Kenya.

2. Method

This report draws on information from workshops and stakeholder interviews. An **online workshop** was undertaken in July 2022 with eight stakeholders representing eight organizations/programmes supporting county energy planning in Kenya. Data-related workshop prompts included:

- What data is used in participant's county level planning approach?
- How is it managed? Is the data open? Why or why not?
- What data are missing to facilitate the different approaches?

Subsequently, individual **semi-structured interviews** were arranged with 23 stakeholders representing 15 different organizations/programmes supporting county energy planning in Kenya identified through snowball sampling. Three of the interviewees had previously attended the workshop. Data-related interview prompts included:

- When undertaking county energy planning, what are your main data needs?
- Do you find that these data are available and easy to access?
- Are there any particularly big or difficult data gaps?
- Are there any challenges in working with available data? (e.g., formats, granularity)
- Have you undertaken any primary data collection?
- Is the data you collect shared with other organizations or made open source?

The workshop and interviews were recorded, transcribed, and anonymized. In total, 28 professionals representing 19 organizations/programmes supporting county energy planning were represented. Quotes used below to illustrate key findings have all identifying information removed and are labelled with an interviewee code number, appended with “-I” to indicate that the quote was from an interview or “-W” to indicate that the quote was from the workshop.

Please refer to the parallel working paper “[*Mapping the County Energy Planning Ecosystem in Kenya*](#)” for full details on the data collection methodology, and the full lists of interview questions, which are provided therein as appendices⁵.

3. Results and Discussion

The challenges related to data in county energy planning can be broken down into **data needs, data collection, data flows, and data sharing**. Each of these aspects is discussed below.

3.1 Data Needs

Common data needs highlighted across stakeholders, which are critical to facilitate county energy planning, include: grid infrastructure (e.g., substations, transmission lines, transformers); connectivity data; demand data, ideally disaggregated into categories; baseline surveys including local socioeconomics and demographics; and key development needs across sectors. It was reported that some of these data can be retrieved from organizations at county or national levels in Kenya, whilst others must be collected, as elaborated in Table 1.

Table 1: Core data needs to feed into county energy planning, identified through interviews. Note that KNBS is the Kenya National Bureau of Statistics.

Data need	Source
Grid infrastructure	Kenya Power – Typically willing to provide this data after bilateral approach/negotiation and instruction from MoE.
Grid connectivity	Kenya Power – Less willing/unable to provide this data. Sourced at present via one-off surveys instead.
Electricity access rates	KNBS – Reported to be responsive but does not provide this data at ward level (e.g., as needed in EDM).
Demand data by categories	Kenya Power – Less willing/unable to provide this data. Sourced at present via interviews, focus groups, etc.
Local demographic baseline	KNBS – Reported to be responsive but does not provide this data at ward level (e.g., as needed in EDM).
Cross-sector development needs	National ministries and county executive committees, depending on the sector considered.

“We are working at least to get that all technical item for electricity, so it's clear from, I would say, big substation, transmission line, transmission lines ... possibly what would be good if you could have the distribution transformer ... And we need also to have data regarding, I would say, the magnitude of consumption by categories. And that will be a bit more complex, because at that level, the new regulation on the data protection, so we have to find a good way to, to ask or to request question in type of categories that cannot be linked with the person in the county” [12-I]

“They needed transformer data right? And that was very difficult to come by, transformer data and also the low voltage distribution network. So it was very difficult, difficult, it took a very long time, and then they eventually got it” [13-I]

3.2 Data Collection

All interviewees reported that they conduct some form of primary data collection to fill data gaps and support their county-level energy planning processes. Two of these gaps (i.e., in data granularity and specific to bioenergy) are discussed by 6-W and 5-W below. The primary data collection for county energy planning typically involves some combination of baseline demographic surveys, key informant interviews, workshops, and spatial mapping.

“There are quite a lot of data gaps, particularly at this sort of sub-county level and going down to the ward level” [6-W]

“Especially [in] the bioenergy sector, data out there is either very scarce or fragmented, or it's not there altogether. ... For example, when it comes to estimation of potential energy that would accrue from crop residue, it is or it was only possible to get, for example, the average amount of those residue at the household level, only through the household. That also goes with the estimation of the animal waste, like cow dung or the dungs from the sheep and the goat. So yeah, it, we got from those kind of survey.” [5-W]

A key gap which had to be filled by data collection was high-resolution spatial data. While the Kenya National Bureau of Statistics (KNBS) release data at sub-county level, ward-level resolution or higher was desired by numerous interviewees to facilitate county energy planning. The emphasis on ward-level data by these stakeholders is likely based on the EDM approach, which specified ward-level data collection in its implementation in Kitui, which is now being replicated across 12 counties. Interviewees highlighted that some of this data collection could be avoided if KNBS released census data at higher resolution. Re-collecting data already collected by KNBS simply to increase the level of spatial resolution is an inefficient use of resources. This gap was discussed by various actors, as can be seen in the box below. This point was then brought to KNBS for feedback.

“If you look at the census, it ends at the sub-county level and planning, the planning we need to do is from the ward” [17-I]

“Interestingly, you know, KNBS does have that at ward level but that's not publicly available, so you can get to sub-county level but that's it” [6-I]

“The census report of 2019, where you'll expect that you'll get the most recent detailed data, you find that it stop at sub-county level, whereas you're looking at a ward-level data.” [3-W]

“Mostly the data gaps that we are missing ... is the granularity of the data. The data which is available at the county and the ones which were able to find from the Kenya Bureau of Statistics were up to this sub-county, but it was very important, especially when it comes to the modelling, the least cost electrification and also the bioenergy part, to have granular data. So we had to do a comprehensive ... primary data collection. And we sent enumerators to every ward.” [7-W]

“You're really looking for sort of GIS GPS data and it's not there, it's, it's address-based information or it's kind of buried ... the sort of data that you want is buried in specific individual reports.” [2-W]

KNBS indicated that they are happy to share data of higher resolution (e.g., at ward level) where available, so long as the data cannot be used to identify individuals. To request data from KNBS, counties should write to the KNBS managing director where they can expect feedback within three working days. In addition, KNBS has officials across the 47 counties therefore counties can enquire about data availability from these officials.

KNBS also indicated that despite a lot of talk on data gaps, nobody has officially informed them what these gaps are. They suggested that the council of governors should write to them indicating the data that would be required for county energy planning then they can go ahead to collect the data where it is not available. Going forward, KNBS will be doing quarterly household surveys, which include collecting energy related data. This offers an opportunity to collect data that is required for county energy planning.

“I go to many meetings and there is this thing that there are data gaps. But I ask people who have you told about those gaps? Because if we [KNBS] don't know what that gap is, how are we supposed to help you? So, what we advise is that you tell us your data gaps and what you want ... If the 47 counties write to KNBS indicating the datasets they want, the management will decide on how these datasets will be made available because of the demonstrated demand. However, if no request is placed to KNBS, then no action is taken.” [25-I]

At present, data collection is often undertaken by in-county civil society organizations (CSOs) which partner with the county energy planning project. This is particularly common amongst organizations undertaking the EDM approach to produce their CEPs. Many interviewees had positive experiences with CSO engagement, as illustrated in the following quotes.

“For us, [CSO name] have been quite useful because if you understand how [CSO name] is structured, it's that it's grassroot-based, so that they bring out rich knowledge on community mobilization and understanding the dynamics ... the same reasoning has been applied to the SETA project in that, in the 11 mirroring counties, they have actually co-opted civil society organizations that are based in those counties who have been working closely with the communities so they understand the community structure, the way they are organized.” [3-W]

“So working with CSO – basically, the majority of them, they're quite capable and they have been engaged at grassroot level, so they understand the ground level.” [17-I]

“We did engage an organisation – it's called [name] – they are kind of spread across the whole county and they know the sub-counties and the wards and they have network so that even when it came to, like, getting information regarding the energy needs from the women, from the cooperatives, from the farmers, from [inaudible], they were able to guide, to direct us. They actually were very critical during the data assembly stage. ... We really wanted to get to understand how different actors on the ground - whether they are fish farmers, cottage Industries - how they would fare with the use of these productive energies. So [name], that CSO it really helped us a lot.” [5-W]

While experiences with CSOs have been often positive, it was reported that the capacity of CSOs to undertake quality data collection can vary. It is important that these organisations are well-equipped to undertake data collection, or data quality can be affected. This requires either selecting a capable CSO, or ensuring capacity is built prior to data collection. Given the lack of standard data collection practice across CEP production approaches, however, providing clear instruction on best practices for data collection in this space may be difficult. The lack of clarity on data quality expectations is illustrated by 2-W.

“There's kind of a question, when you start doing the primary data gathering, which is of course more time consuming, what point do you say, well, this, this is good enough? And I think it's a bit of an art rather than a science, and but it's, it's good in this type of forum to kind of discuss, cause obviously it's good to have some commonality in sort of standards.” [2-W]

Generally, counties do not seem to have capacity at present to collect the amount and detail of data required by the draft INEP framework. As the EDM process seeks to meet INEP requirements to the letter, it entails a high level of detailed data collection. This is likely to be infeasible across many counties given the three-year CEP timeline, particularly it is to be sustained without external funding and support.

“I don't think they're going to get that data from the counties either, unless they massively invest, basically.” [6-I]

There is also an issue with the synchronicity of data collection at county and national levels given the timeline of CEP production specified in INEP. The draft INEP specifies that CEPs are to be updated every three years, and CEPs should ideally feed into County Integrated Development Plans (CIDPs) and national-level energy plans. To ensure that these documents are coordinated, their data collection efforts and publication needs to be properly timed, as discussed by 13-I.

“So, the energy act says the Cabinet secretary has to update the INEP every three years. So there needs to be like synchronization on how the bottom-up data is collected” [13-I]

There are worries amongst practitioners that much of the data collected is not being used. As previously discussed, EDM requires extensive data collection to align with INEP – but it is not clear how the collected data influences energy sector decision making. Collecting data which then is not used could lead to disenchantment from communities with the county energy planning process. This is discussed further in the bottom-up data flow sub-section, and illustrated by 13-I.

“It requires a lot of effort, but that's not the problem. The problem is, what do you do with all that detail, right? Because already even some counties ... they are asking themselves, like, what do we get by engaging in the CEP? Yeah, so we've done the first CEP, we're doing a second one - what are we getting? Like, yes we did the first document. How did that change our lives, right?” [13-I]

3.3 Data Flows

Much of the rigor and benefit of county energy plans hinges on data availability. Many data inputs are sourced from national level organizations or from county departments. Once CEPs are produced, data contained therein also need to feed up into national-level energy planning. There are three layers of data flow to be considered in county energy planning:

- **Top-down:** Availability of data from national organizations to support CEP development.
- **Horizontal:** Availability of data across county departments.
- **Bottom-up:** Availability of the data contained in CEPs to national organizations.

Each of these levels is discussed below in further detail.

3.3.1 Top-down flows

Top-down data flow is critical to ensure that counties have the data they need to create their CEPs. This includes national level data from KPLC or KNBS, for instance, which need to be disaggregated at county level for use in modelling (e.g., least-cost electrification in OnSSET) or to understand grid coverage. There is, however, a lack of clarity about how this data should flow, as well as how far counties are meant to proceed with analysis of this data, as discussed by 6-I.

“How is this data going to flow down from the National level to the counties? And it's not just about accessibility of data, it's like using the data, right? What's the capacity for data analysis. Is that supposed to just still sit at the national level?” [6-I]

Counties experience difficulties and delays getting data from certain national-level organizations. Generally, good experiences were reported getting data from KNBS; however, as previously discussed, their data has only been available at sub-county level, and ward-level data is needed for many planning approaches. Some organizations and approaches use and require even more highly resolved data (e.g., household level geotagged data) as discussed by 6-I.

“Interestingly, you know, KNBS does have that at a ward level but that's not publicly available, so you can get to subcounty level but that's it.” [6-I]

Getting data from Kenya Power can reportedly be very slow. Interviewees highlighted that there was a lot of back and forth required and letters which had to be written to obtain access. It appears that bilateral agreements are arranged between Kenya Power and each county seeking data. No standard practice or data access point seems to be established; one-off agreements between county energy planning organizations and national agencies seem to be the norm.

“So basically, the [county] government minister wrote to Ministry of Energy saying ‘can you release this data?’ Because they knew the data existed on, sort of, where is the grid in [county], you know, I mean, that's - future plans, you know, plans for extending the greatest, very political so, as you know, those and connectivity and all the rest of it. So, so basically, they, we had to go to massive long process of getting that data released to the county government.” [6-I]

“Sometimes also getting the data from some of these, um, electricity providers does prove to be a challenge.” [8-W]

“The duration it takes you to access the data from these institutions has been quite long.” [3-W]

“It's not been easy, you know, it's not been very easy - you have to write letters, you have to follow up, and all these things.” [13-I]

It was highlighted that distribution grid, transformer, connectivity, and demand data by categories can be difficult to get from Kenya Power. Interviewees highlighted data protection as a cause of this, as shown by 12-I below. However, from discussion with Kenya Power, it was subsequently learned that there are also data structuring issues at play.

“And we need also to have data regarding, I would say, the magnitude of consumption by categories. And that will be a bit more complex, because at that level, the new regulation on the data protection, so we have to find a good way to, to ask or to request question in type of categories that cannot be linked with the person in the county” [12-I]

Kenya Power explained that their data is organised in eight regions which do not align with counties. Specifically, the regions are Central Rift, North Rift, Mount Kenya, North Eastern, Coast,

South Nyanza, Nairobi and Western. This means that they do not have readily available data at the county level. In addition, Kenya Power consumption data is not organised in sectors of the economy; rather it is organised in consumer levels (i.e., domestic, small commercial and commercial). However, they are currently georeferencing energy metres across the country which should enable them to map their demand data in counties and according to economic sectors. The MoE has also committed to instruct all national energy agencies to aggregate their data in terms of counties and sectors of the economy.

"At the county level, this is the time we are trying to segregate the data into the counties. This is a challenge because transmission lines crisscross counties. Our network is mapped on GIS. What requires more mapping is identifying which counties the customers are in. There is a program being run by [organisation] of georeferencing all energy meters in the country." [22-I]

"We are going to tell our agencies to disaggregate their data at the county level. We will ask them to present this data in GIS format ... Data of Kenya Power is not aggregated in sector of the economy. We are working closely with them to do aggregation of data in this way." [26-I]

While INEP specifies that national agencies must make data available to counties, they often want direct instruction from a higher level to do so. Organization such as Kenya Power have been reported by other stakeholders to want instruction from a higher national level (e.g., MoE) to make data available to the county, and are unwilling to share their data unless directed to do so by the MoE, as illustrated by 13-I below.

This aligns with what Kenya Power has told us themselves. As there is no standardised procedure or guideline on sharing data with the counties (outside of the INEP framework, which is not legally binding – see quote from 6-I below), they see that all data requests should go through the managing director. The turnaround time of the requests depends on the availability of the request data in the desired resolution. They also expressed hesitation to share data with counties due to the legal risk of data falling into the wrong hands. They suggested that the MoE should officially send them a list of data required for county energy planning, so they provide this to the ministry rather than to the counties, aligning with ideas from 13-I and 12-I below.

"The leadership has to come from ministry, the mandate has to come from the ministry, so that the counties are not always asking" [13-I]

"INEP say OK, the service provider has to provide data to the process, and the service provider say, oh, it is our data, and we request to have an instruction from the Ministry to provide data, and what kind of data? And there is also now, the EULA of data protection that we have to take - so some data cannot be disclosed, some data can be disclosed" [12-I]

"INEP is very, very recent framework. It hasn't even been properly, kind of promulgated yet. It's not kind of written into law." [6-I]

Where top-down data access difficulties are found, it was reported that it can be effective to talk to representatives of national organizations present in-county, where these connections exist (e.g., regional representatives for Kenya Power or the Rural Electrification and Renewable Energy Corporation, REREC).

It is worth noting that several top-down data access wish lists are being developed. These are intended to document what data counties want from national organizations and make a plan for how to achieve this. The idea is to detail the minimum data county planners need from the national agencies to facilitate county energy planning.

3.3.2 Horizontal flows

Horizontal data flows between county departments and from county departments to supporting organizations are critical to CEP development. Particularly important in this vein is cross-sectoral data access. Energy planning needs to be informed by data in other sectors, such as health and agriculture, as each sector has its own energy uses and aspirations. These data must be sourced from county departments, and particular from the County Executive Committee members (referred to as CECs) responsible for each sectoral portfolio, as illustrated in the quotes below.

“You go to the CEC energy because you’re doing energy stuff, right, but the energy stuff cannot be done without talking to people in agriculture, people in water, the people in education.” [13-I]

“We’re kind of moving beyond just, uh, demand for, for kilowatts right? It’s, it’s kind of for the solutions that will use energy.” [2-W]

“Whoever is in charge, they would give us like a contact person or focal person that would help us engage with the other CECs, particularly CECs in health, in education, in agriculture, economic development, so those would be very key.” [13-I]

“When you ask the county officials, what are your energy needs? They may not be able to articulate and say, in the next five years we need, I don’t know, an additional capacity of 100 Megawatts ... But if you ask it another way and say, what are your plans in agriculture, what are your plans in education, what are your plans in health? And then they’ll tell you.” [13-I]

Interviewees reported that going back and forth between county ministries in different sectors to get this sectoral data can be a challenging, lengthy process. It is reported to be a matter of chasing down the right person, finding the right report, transcribing data from PDF files, and so on, as discussed by 2-W. This is not helped by the fact that these ministries are often working in quite siloed ways, as highlighted by 12-I.

“The sort of data that you want is buried in specific individual reports. So it’s just kind of then accessing those reports and then - which can be way more time consuming than you think - and then sort of standardizing, standardizing the formats.” [2-W]

“People are, are still working very much in silo, and we have to break this silo.” [12-I]

There is also a problem of horizontal data requests being underprioritized. CECs in different departments are working at the same level in terms of institutional structure. As such, it was reported that requests from one CEC to another may not be prioritized as highly a top-down request from a higher level. In such cases, requests from the county governor are likely to bear more weight and be more highly prioritized, as discussed by 13-I.

“Why should I listen to the Department of Energy? They’re my peers, right? But if it comes from the office of the governor there, there’s, there’s better coordination, there’s better response” [13-I]

Equally, it was indicated that requests or coordination from the director for planning in charge of the County Integrated Development Plan (CIDP) may be a more effective approach than contacting CECs directly.

“I think this should be taken one notch higher, so even when we go to the county and say, look, we want to work with you on your county energy plan, we should not be directed to the CEC, we should be directed to the officers in charge of the CIDP ... so that there is kind of one-stop coordination on planning, all planning aspects needs to be coordinated. And then from there then it can cascade downwards to the CEC.” [13-I]

To help overcome data access challenges, interviewees reported engaging a focal point person in county governance to help ensure smooth data flow. Given the current overburdening of CECs, with multiple portfolios and limited budgets, having such a point person can make horizontal requests easier to manage, as discussed by 13-I and 6-I.

“We had conversations with the CECs, of course led by the CEC energy, and most of the county don’t have a dedicated CEC for energy, it’s always energy, environment, water or energy public works and something - so whoever is in charge, they would give us like a contact person or focal person that would help us engage with the other CECs, particularly CECs in health, in education, in agriculture, economic development, so those would be very key ... They had one person dedicated, so anything that we needed, any meeting, any kind of data, this person would help us get the data. So we have those kind of focal points.” [13-I]

“So they that's an independent person, that is kind of employed for a certain number of months to accompany the process to make sure things happen because you know as you probably know you need to hold people's feet to the fire. ... That's the point about working with the different ministries and having that point person in the ministry, is that you can go, is to go to them and see what data they actually hold” [6-I]

3.3.3 Bottom-up flows

Bottom-up flows ensure that plans produced at county level feed up to influence national level planning. For CEPs to be useful, the data and results produced need to influence the decisions of national-level planners somehow. A main entry point for this is likely to be through more spatially explicit demand estimates which can then feed into national models, as discussed by 6-W and 11-I.

“The kind of ambition I guess, is to come up with a more accurate county demand forecasts that can then feed into and help inform national level planning.” [6-W]

“The intention is that the, the different county energy plans would ultimately be consolidated into the integrated national energy plan.” [11-I]

Currently, this pathway for data up-flow does not exist. It has been reported that county-level officials preparing CEPs are not sure which data points are critical to feed up to national level to facilitate planning. They are unclear on how national level organizations use any of the data provided in CEPs.

“A lot of the data that is going into individual county energy plans needs to find its way up into the national energy planning process, into the INEP at national level. And so that process of consolidation and aggregating data at the national level then is, is important and it should be part of the, the data governance mechanism that we are currently grappling with.” [11-I]

“What is the idea that you just take all these different plans and sort of aggregate them in some way into some like master plan? - I mean, it's yeah because you know, you've also got the service provider so, you know, you have KPLC where they're gonna be doing their own plans. So, how is all this actually going to be brought together into some integrated plan?” [6-I]

Given the lack of clarity on what data is essential to feed up, as previously discussed, stakeholders working at county level worry that they may be collecting useless data. They fear they may be wasting resources to do this data collection and getting peoples' hopes up, which could lead to cynicism (e.g., doing aspiration surveys and no change resulting) as flagged by 13-I.

“So we've collected a lot of data, gone through a lot of very detailed process, but what do you do with that data? This is a question.” [13-I]

The CEPs are intended to follow the INEP framework, which provides two main things. First, it offers high-level steps for developing and reviewing county energy plans. Second, it provides a high-level overview of the chapters/topics that should be covered in the CEP. Additionally, the INEP framework has added a chapter on coordination and the proposed committees for driving forward the INEP objectives. However, INEP was reported to not adequately specify tools to achieve the planning objectives, which might result in the different counties using different methodologies and hence producing reports that are not comparable.

“When you look at the INEP framework, it's very general, really. I mean, they have this for the CEP, they have this kind of very general process, and then they have basically, you know, the chapters of the CEP, what the content supposed to be and to be able to, in terms of data, some of it is a bit nonsensical. It's a bit like well, what do they actually need this data for? How is this really going to help with planning?” [6-I]

“A standard approach for development of the CEPs should be adopted.” [23-I]

The data produced in CEPs are also not captured in easily accessible formats. CEPs are delivered as PDF reports. There is no database entry portal for key quantitative results. CEPs are therefore difficult to parse and aggregate at national level. It would be a lot of work at national level to consolidate critical data from 47 different written reports with variable structures, particularly if no resource is allocated to do this.

“What we have, we have suggested to the ministry is actually developing an online template, an online platform that aggregates the information, because if we are going to have 47 counties developing county energy plans that are 150 pages at different times using different methodologies using different assumptions, it's very hard to put this document together to come up with a national plan. So what we've suggested repeatedly is first, the template itself should not just be how do you write the county energy plan. There should be also instructions on how do you it, in terms of what methodology, or what's a basic minimum methodology.” [13-I]

The MoE indicated that the national level is not yet ready to receive and consolidate CEPs. They indicated that, according to them, the process of county energy planning has not officially been launched. They see that this should be preceded by a circular from the cabinet secretary, which has not yet been issued. The ministry acknowledged that that the INEP framework is 3 years late, as it was expected to be ready a year after the enactment of Energy Act 2019. They attributed this slowdown to the lack of a centralised energy database, a lack of coordination framework between national and county governments, and a shortage of technical capacity at the county level.

“There is currently no mechanism of consolidation of CEPs as the ministry is not ready ... I know there is a lot of county energy planning going on, but this has to be preceded by a circular from the CS which hasn’t been sent out ... INEP should have come 1 year after the enactment of energy act 2019, so we are late by 3 years ... One major challenge that affected achievement was INEP was unavailability of a centralised database for the entire energy sector. We have a lot of information/data but it sits in different agencies.” [26-I]

The ministry was concerned that development partners are not adequately engaging at national level, instead focusing prematurely at county level and CEP production only. They see that partners which are paying attention to counties are not doing the same at the national level to ensure that processes are in place for the ministry to receive and aggregate the CEPs. They agreed that it will be important to make the CEPs similar for ease of integration. In terms of their plans for aggregating the CEPs, the ministry said this will be a back-and-forth process between the county level and the national level.

“Capacity building needs to be enhanced both at county and national level ... Let us talk about national level because it is up to the national level to guide the counties. We don’t want to have good information at the counties that feeds nowhere ... We have to make sure that the CEPs are similar for ease of integration.” [26-I]

“CEP and INEP will be completed at the same time. When a CEP draft comes to the ministry, there will be consultations to process it. It will be a back and forth process. We can even have sessions with individual counties to discuss their plans ... I want to look at it [data mapping] as bottom up.” [26-I]

3.4 Data sharing

There is a strong desire for easier data sharing expressed across all organizations. As there is a lack of coordination forum for this at present, this desire has manifested as each organization undertaking its own version of a data repository effort. There was also a sense of competition expressed from some stakeholders, which may make them reluctant to share data which places them at a competitive advantage in the “marketplace” of support for county energy planning.

“The sharing of the information. I think there is, but in my context to – as far as I’m aware, speaking personally - to a limited level, because a forum, like the one which we are part of at the moment, which brings us together to know better what each is doing, more or less has been lacking.” [7-W]

“On the sort of sharing of data, I mean, I think, you know, it’s a bit of a market to be honest with you.” [6-W]

“We have to join forces to make the transition between what we have done, what we want to do and look at working together to have more impact on both the ministry, both the SAGAs or these service providers that is more or less looking to keep the territory for themselves.” [12-I]

There is a desire to synthesize data repositories, but a tension about who should be responsible for this and who should host it. In short, those who have existing data repositories want theirs to be adopted by others. Additionally, those who have collected data sometimes express that this can give them a competitive advantage and may be unwilling to share it.

“On that data repository side, I think that's going to be an interesting one because I think there are different players that want to kind of recognize - I mean, and not necessary just for kind of market reasons - but have recognized that, you know, there's a need to have more systemic collection and analysis of data, right? And, but you know where that sits, who owns it, is it a big thing, right?” [6-I]

A commonly expressed sentiment was that any such repository would need to be initiated by the MoE, and potentially hosted by Kenya Power, though this is debated. MoE is on board with the idea of a repository and will be happy to host it. A data management chapter has been added to the latest version of the INEP framework draft highlighting commitments for a centralised data repository, capacity building at the county and national level on data management, and data management policy development. The ministry wishes for this repository to have data on ongoing/complete projects, including their budget, location, the agency implementing them, the technology being used and the key milestones for the project. They envision the database to allow the counties to input their projects and that different stakeholders will be given different access rates to the database.

“The ministry would need to possibly have control of this tool, but, but the tool can be located in Kenya Power, for instance, or one of the research institutes from Kenya Power will be a good place to locate this kind of tool” [12-I]

“Let the national institutions provide the data, so that's the, the people developing the county energy plans don't have to have unilateral contacts with them. Everybody is asking for, 47 – when you get there, 47 people contact KPLC. Let KPLC just provide the data somewhere and then people go and check.” [13-I]

“We want the database to be a kind of reporting with automatic updates. The reporting is already being done, but through email exchange. We want it in such a way that we can easily access different energy related information at different administrative levels. This will give us the flexibility to do the modelling” [26-I]

“From the database we will give different access rights to different people ... It has to be hosted by the ministry and it has to be real time. If hosted by one the energy agencies, it might bring some politics ... [MoE] need to manage the database such that we don’t create suspicion around information sharing.” [26-I]

Implementing a data repository with controlled access requires infrastructure management. There is a certain amount of uncertainty whether there is adequate capacity or resources to manage this at any organization who could host it. Additionally, there would need to be protocols for how data should be entered in this repository, maintained, and updated so that it remains clean and easy to use. This was highlighted by 14-I.

“We had talked about creating a platform where we can be able to collect data. And while that's a good idea, I think one of the things that should go along with that is ensuring that it's constantly updated, because then you have the problem of these, at least so you can get the information. But then it's perhaps five years not being updated.” [14-I]

There are also data protection concerns surrounding the repository concept, including the need for anonymization and aggregation. This is difficult, especially given the vocal push for more disaggregated and highly resolved data (e.g., magnitude of consumption by economic sector, ward-level census data) from interviewees working at county level. This highlights the importance of KNBS concerns about ensuring any data resolution which is shared is not identifiable.

“Some of that data is sort of proprietary or confidential, et cetera, so I think there's a discussion amongst different actors at the moment and the ministry and other, other agencies about creating a kind of data repository ... I think that that will have to be housed within one of those agencies given, given the nature of that basically.” [6-W]

An alternative suggestion to a repository has been to implement dedicated county liaison officer at Kenya Power and REREC. This person would have the county-level datasets needed for county energy planning ready, would be equipped with templates for bilateral data sharing agreements, and would simply fast-track the bilateral agreement process. This idea is outlined by 13-I.

“So I think that's also what the ministry should do, just tell KPLC, you need to dedicate an officer or an office that intersects with the county governments, and they’re going to ask for these kinds of document.” [13-I]

Another option currently being pursued is a data wish list to be shared with national agencies, so that they know precisely which data are needed in county energy planning and can have these prepared and available as needed. This aligns with what Kenya Power had suggested as a viable

alternative above. If this data wish list came from MoE, it therefore represents a potentially feasible pathway to improve data access.

“The protocol is a long-term solution to issues of data access, but in the short term where we need to deliver the county energy plans, uh, there is a data wish list that is currently being developed to be shared by the ministry to get approval for the different agencies - that is KPLC, KETRACO, the Rural Electrification - to at least share the data that is required to develop the least-cost electrification solution for the county energy plans” [3-W]

4. Recommendations

Based on the outcomes of this research, the following steps are recommended to improve data flows in county energy planning in Kenya.

Data collection:

- Synchronize data collection across counties for symmetry across CEPs. Align the timeline with CIDP production and national level planning exercises to minimize duplicated effort.
- Create clear standards for data quality and communicate these to CSOs or enumerators undertaking baseline data collection in advance to ensure that capacity is adequate.
- The Council of Governors to write to KNBS indicating the data required for county energy planning so KNBS can provide this data if available or begin the process of collecting it.

Top-down data flows:

- Encourage KNBS to release census data at ward-level resolution instead of subcounty-level resolution to county-level energy planners.
- Create a standard protocol or legal framework data sharing agreements to accelerate the bilateral negotiation process.
- Appoint a designated coordinator at relevant national agencies (e.g., Kenya Power, KNBS) to serve as a contact point and disseminator for data requests related to county energy planning.
- Where possible, speak to representatives of national organizations present in-county to accelerate data exchange (e.g., regional representatives for Kenya Power or REREC).

Horizontal data flows:

- Route data requests through the County Governor or the Director of Planning to facilitate prioritization of data transfer across departments.
- Establish a focal point person in county government, who is engaged and responsive and will facilitate data access, if you are an external organization.
- Collect and store data in easily reusable formats (e.g., spreadsheets instead of PDFs).

Bottom-up data flows:

- Determine a set of minimum viable data to be fed-up to national level which can assist in national planning processes and is viable for most counties to achieve.
- Create a template digital form for this purpose, so that even if a whole CEP report is not produced, key data can be provided by counties and used in national planning exercises.

Data sharing:

- Implement a shared data repository where national agencies can add data which county level energy planners will need, and where county level officials can upload key data points for aggregation by national planners.

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