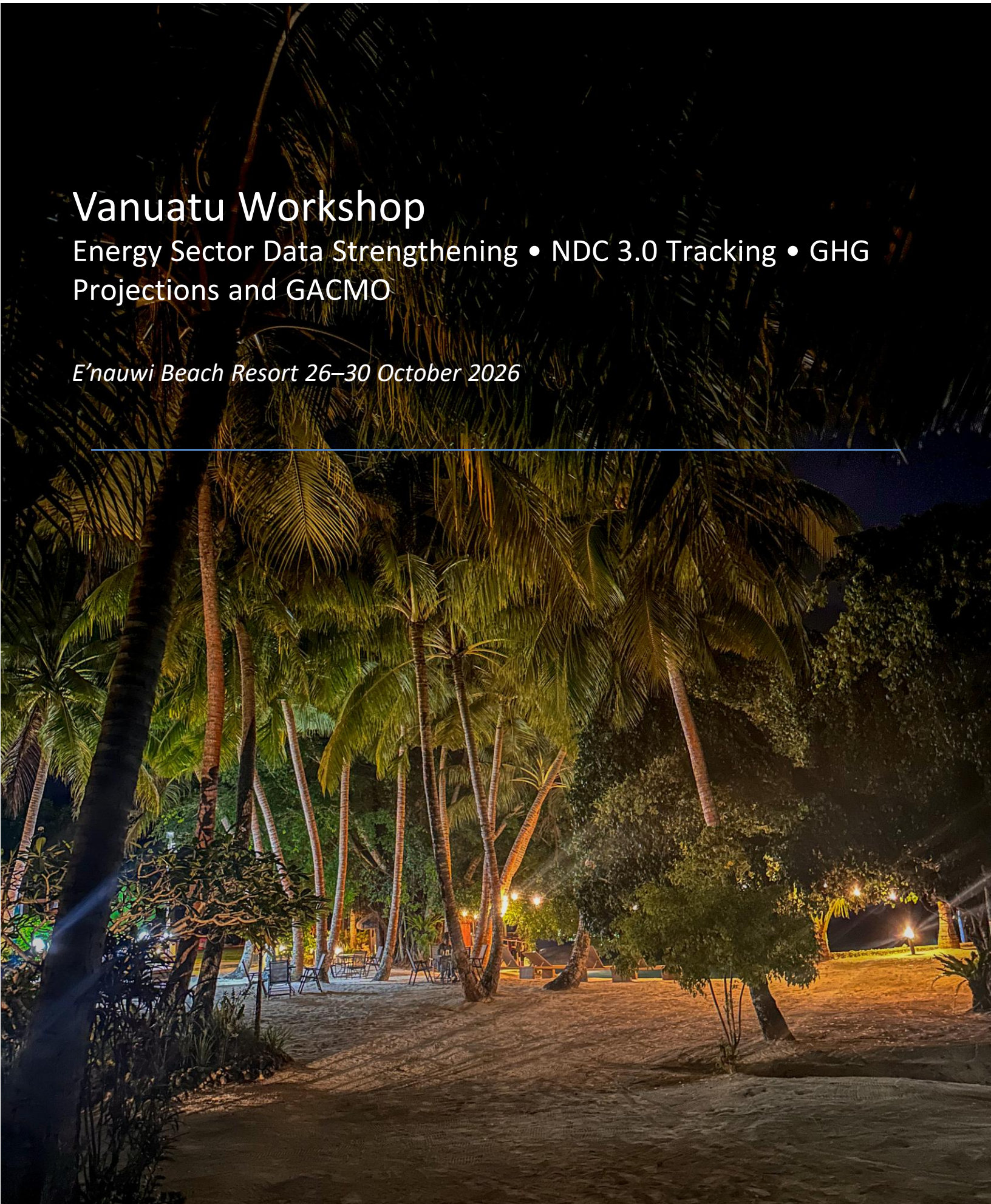
Vanuatu Workshop

Energy Sector Data Strengthening • NDC 3.0 Tracking • GHG Projections and GACMO

E'nauwi Beach Resort 26–30 October 2026



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Energy AD Workshop Report

Initiative for Climate Action Transparency (ICAT)

Output I

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1. Executive Summary

The five-day workshop on Energy Sector Data Strengthening, NDC 3.0 Tracking, GHG Projections and GACMO brought together relevant stakeholders to strengthen understanding and practical application of processes for tracking Vanuatu's climate commitments and improving greenhouse gas (GHG) data and projections for the energy and agriculture sectors.

Day 1 focused on energy-sector GHG emissions estimation methodologies, including the sectoral approach and reference approach, supported by practical exercises using Vanuatu's activity and fuel data. Day 2 examined the National Energy Balance, the status of energy data, institutional data-provider roles and gaps in the existing data collection system. Participants also reviewed and tested a standardized Activity Data Collection Template using 2023 energy data.

Day 3 focused on Vanuatu's NDC 3.0 targets and measures for agriculture and energy, selection of tracking indicators and activity data, practical indicator calculations, and development of an action plan to institutionalize NDC tracking. Days 4 and 5 introduced GHG projections and the GACMO tool, focusing respectively on energy and agriculture. Participants considered data flow mapping and institutional arrangements, identified required data types and information gaps, and developed and presented data flow maps for both sectors with input from key stakeholders.

Across the five days, discussions highlighted the importance of reliable activity data, clear institutional responsibilities, improved coordination among data providers, consistent reporting procedures and practical tools to support GHG inventory preparation, projections and NDC 3.0 tracking.

2. Workshop Background and Objectives

The workshop was convened to support national capacity and institutional arrangements for strengthening energy and agriculture data, tracking NDC 3.0 implementation, and improving GHG projections using relevant methodologies and tools, including GACMO. Sessions combined technical presentations, group discussions and practical exercises using national data and stakeholder input.

- Strengthen understanding of energy-sector GHG emissions estimation methodologies and their application to Vanuatu.
- Review the National Energy Balance and assess the availability, quality and management of energy activity data.
- Identify indicators and activity data for tracking NDC 3.0 targets and measures in the energy and agriculture sectors.
- Build understanding of GHG projections, including data requirements, emission sources, calculation methods, assumptions and reporting standards under the MPGs.
- Introduce and apply GACMO to identify data requirements for energy- and agriculture-sector projections.
- Identify information gaps and develop data flow maps and institutional arrangements to strengthen sectoral data collection and reporting.

3. Workshop Proceedings

Day 1: Energy-Sector Emissions Estimation Methodologies

The day commenced with an introduction and welcome address by the Project Coordinator, followed by opening remarks from Olia Glade and Nelson Kalo, Manager of the Department of Climate Change. In their remarks, they emphasized the importance of the workshop and highlighted the valuable contributions of each stakeholder in ensuring the successful implementation of the planned activities.

The participants later discussed the importance of reporting under the Paris Agreement and collecting reliable and consistent data to track Vanuatu's climate commitments. The project activities for the energy sector were then presented, including the objectives, key tasks, and expected outcomes for strengthening the national energy-sector GHG inventory and emissions projections.

The energy-sector overview covered different fuel types, energy content, GHG emissions and key parameters used in emissions estimation. Participants examined the sectoral approach (Tier 1), which estimates emissions by fuel type and economic sector using activity data, emission factors, and relevant fuel parameters. A practical exercise applied this approach using Vanuatu's activity data to calculate energy-sector emissions.

The reference approach was subsequently introduced. It uses national fuel production, imports, exports, international bunkers, and stock changes to estimate CO_2 emissions and verify the results of the sectoral approach. Participants completed a further exercise using Vanuatu's fuel data and compared the results with those obtained through the sectoral approach.

Overall, Day 1 provided participants with an overview of two complementary approaches to estimating energy-sector emissions and an opportunity to apply both methods using national data.

Day 2: National Energy Balance and Energy Data

Day 2 focused on the National Energy Balance (NEB) and its role in tracking energy supply, transformation, and consumption in Vanuatu. Participants discussed how the NEB provides an overview of fuels flow in and out of the country and they are used across different sectors, as well as how the NEB data links to IPCC inventory categories and supports GHG emissions calculations. Particular attention was given to distinguishing domestic consumption from international bunkers.

Participants reviewed available fuel data and identified gaps in historical records, sector allocation, stock changes, and renewable energy information. The group also examined challenges in the existing energy data collection system, including data sharing, quality control, verification, and storage, and discussed the actions that would address the identified challenges.

Key identified energy activity-data providers included the Department of Energy (DoE), Vanuatu Bureau of Statistics (VBoS), Customs (VCIR), Pacific Petroleum (PPC), Utilities Regulatory Authority (URA), and Origin Energy Vanuatu (OEV). Recommendations included establishing formal data-sharing agreements (MOUs/MOAs), assigning agency focal points, standardizing reporting templates, and introducing regular data submission schedules.

Participants were introduced to a standardized Excel Activity Data Collection Template designed by national experts of Vanuatu within this project to improve collection, recording, and management of energy activity data in line with IPCC and IEA methodologies. Workbook sheets reviewed included Energy Supply, Sectoral 1A, Fugitive 1B, Parameters, RA vs SA Check, and QA-QC Log. Group exercises validated recommended improvement actions and tested the template using 2023 energy data.

Overall, Day 2 emphasized the need for stronger inter-agency coordination, standardized reporting procedures, and improved data quality to support a more complete and consistent energy balance and GHG inventory.

Day 3: NDC 3.0 Tracking for Energy and Agriculture

Day 3 focused on reviewing Vanuatu's NDC 3.0 targets and relevant measures for the agriculture and energy sectors. Participants identified appropriate indicators and corresponding activity data required to track progress in each sector. Practical exercises were conducted to calculate the selected indicators and consider their potential impacts.

Participants also worked in two groups and engaged key stakeholders in developing an action plan to institutionalize the NDC 3.0 tracking framework. The group discussions provided an opportunity to consider the arrangements and steps needed to support ongoing tracking of NDC implementation across the two sectors.

Day 4: GHG Projections and GACMO – Energy Sector

Day 4 introduced GHG projections, covering key data requirements, emission sources, calculation methods, underlying assumptions, and reporting standards under the Modalities, Procedures and Guidelines (MPGs). Participants were then introduced to the GACMO tool, with particular emphasis on its application to the energy sector.

The session also covered data flow mapping and institutional arrangements for energy-sector GHG projections. A practical exercise using GACMO was conducted to identify the key data types required to support the preparation of energy-sector GHG projections.

Day 5: GHG Projections and GACMO – Agriculture Sector

Day 5 continued the introduction to GHG projections, covering data requirements, emission sources, calculation methods, assumptions, and reporting standards under the MPGs, with a focus on agriculture. Participants were introduced to GACMO and its application to the agriculture sector, followed by a practical exercise to identify the required data types.

Participants then divided into two discussion groups. The task for each group was to identify information gaps relevant to GHG projections. With support and input from key stakeholders, the groups developed two data flow maps addressing information gaps in the energy and agriculture sectors. Both groups presented their maps and proposed data flow arrangements at the Plenary discussion.

The discussion highlighted the importance of clarifying data requirements, identifying the institutions involved in providing and managing information, and strengthening coordination to support GHG projections in both sectors.

4. Key Outcomes and Outputs Reported

- Participants applied the sectoral and reference approaches to estimate energy-sector emissions using Vanuatu activity and fuel data.
- The role of the National Energy Balance in organizing energy supply, transformation and consumption data and supporting the GHG inventory was reviewed.
- Gaps in historical records, sector allocation, stock-change information, renewable energy data, data sharing, QA/QC, verification and storage were identified.
- Key energy data-provider agencies and organizations were identified, and measures to improve data coordination and submission processes were discussed.
- A standardized Excel Activity Data Collection Template was reviewed and tested using 2023 energy data.
- NDC 3.0 indicators and corresponding activity data for the energy and agriculture sectors were selected and used in practical indicator-calculation exercises.
- Two groups engaged key stakeholders in developing an action plan to institutionalize NDC 3.0 tracking.

- Participants were introduced to GHG projections and GACMO for the energy and agriculture sectors, and identified data types required for projections.

- Two data flow maps were developed to address identified information gaps in the energy and agriculture sectors and presented to the wider team.

5. Key Issues and Areas for Continued Attention

- Address gaps in historical energy records, sectoral fuel allocation, stock changes, and renewable energy information.
- Strengthen coordination and information exchange among agencies and organizations responsible for energy and agriculture activity data.
- Clarify institutional responsibilities and designate focal points for regular data collection and submission.
- Establish or strengthen formal data-sharing arrangements, including MOUs/MOAs where appropriate.
- Apply standardized templates and consistent procedures for data recording, verification, QA/QC, and storage.
- Continue improving the availability of activity data required for NDC 3.0 indicator tracking and GHG projections in both sectors.
- Use the developed data flow maps to guide follow-up discussions on information gaps, data providers and institutional arrangements.

6. Recommended Follow-up Actions

Recommended action	Potential contributors	Status/notes
Confirm agency focal points and institutional responsibilities for energy and agriculture data.	Relevant data-provider agencies and sector teams	Follow-up required
Progress formal data-sharing arrangements and regular submission schedules.	Relevant agencies and coordinating institutions	MOUs/MOAs discussed
Continue using and refining the Energy Activity Data Collection Template, including QA/QC procedures.	Energy data providers and inventory team	Template tested with 2023 data
Review and address identified gaps in energy data and document data limitations.	Department of Energy and relevant providers	Gaps discussed on Day 2
Confirm NDC 3.0 indicators, activity data and institutional tracking arrangements for both sectors.	Energy and agriculture stakeholders	Indicator exercises and action planning completed
Review the two sectoral data flow maps and agree on steps to address information gaps.	Energy and agriculture stakeholders	Maps developed and presented
Confirm data availability and responsibilities for GACMO energy and agriculture projection inputs.	Relevant sector agencies and technical teams	Required data types identified during exercises

7. Conclusion

The five-day workshop provided a platform for strengthening technical understanding and stakeholder collaboration on energy and agriculture data, NDC 3.0 tracking and GHG projections in Vanuatu. Participants worked through energy-sector emissions estimation approaches, reviewed the National Energy Balance and existing data systems, selected NDC tracking indicators, and explored the use of GACMO for projections in both sectors. The development and presentation of data flow maps for energy and agriculture, together with discussions on institutional arrangements and information gaps, provided a basis for further work to improve data collection and reporting.

Sustained engagement among the relevant agencies and stakeholders will be important to implement the proposed improvements, maintain regular data flows and strengthen the information base needed for Vanuatu's climate reporting and tracking of NDC 3.0 implementation.

8. Annex



Group photo of Participants at E'nauwii Beach Resort



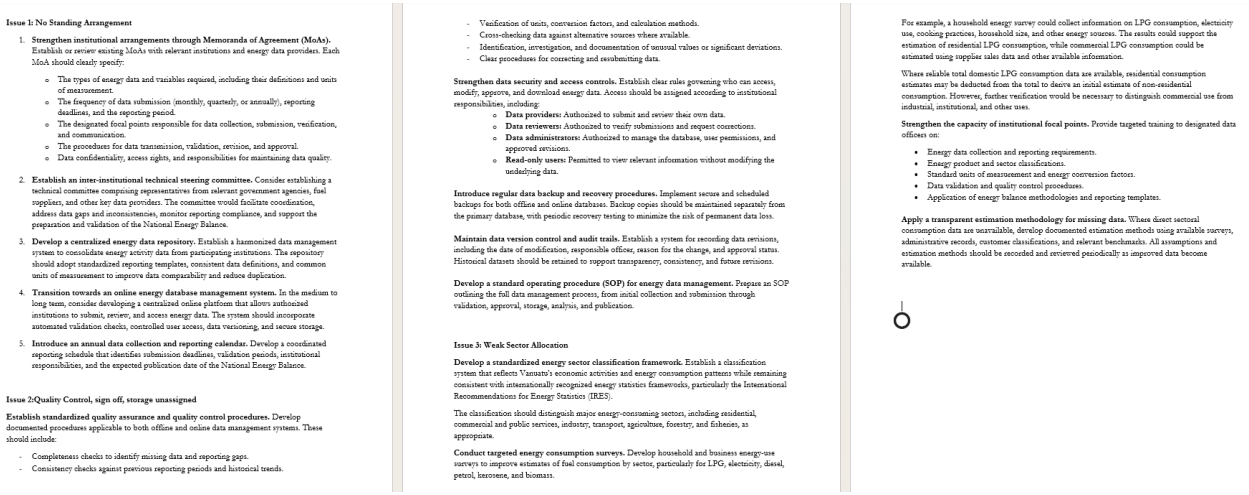
Group Discussions



Group 1 Presentations



Group 2 presentations



Issue 1: No Standing Arrangement

1. **Strengthen institutional arrangements through Memoranda of Agreement (MoAs).** Establish or review existing MoAs with relevant institutions and energy data providers. Each MoA should clearly specify:
    - The types of energy data and variables required, including their definitions and units of measurement.
    - The frequency of data submission (monthly, quarterly, or annually), reporting deadlines, and the reporting period.
    - The designated focal points responsible for data collection, submission, verification, and communication.
    - The procedures for data transmission, validation, revision, and approval.
    - Data confidentiality, access rights, and responsibilities for maintaining data quality.
2. **Establish an inter-institutional technical steering committee.** Consider establishing a technical committee comprising representatives from relevant government agencies, fuel suppliers, and other key data providers. The committee would facilitate coordination, address data gaps and inconsistencies, monitor reporting compliance, and support the preparation and validation of the National Energy Balance.
3. **Develop a centralized energy data repository.** Establish a harmonized data management system to consolidate energy activity data from participating institutions. This repository should adopt standardized reporting templates, consistent data definitions, and common units of measurement to improve data comparability and reduce duplication.
4. **Transition towards an online energy database management system.** In the medium to long term, consider developing a centralized online platform that allows authorized institutions to submit, review, and access energy data. The system should incorporate automated validation checks, controlled user access, data versioning, and secure storage.
5. **Introduce an annual data collection and reporting calendar.** Develop a coordinated reporting schedule that identifies submission deadlines, validation periods, institutional responsibilities, and the expected publication date of the National Energy Balance.

Issue 2:Quality Control, sign off, storage unassigned

Establish standardized quality assurance and quality control procedures. Develop documented procedures applicable to both offline and online data management systems. These should include:

- Completeness checks to identify missing data and reporting gaps.
- Consistency checks against previous reporting periods and historical trends.
- Verification of units, conversion factors, and calculation methods.
- Cross-checking data against alternative sources where available.
- Identification, investigation, and documentation of unusual values or significant deviations.
- Clear procedures for correcting and resubmitting data.

Strengthen data security and access controls. Establish clear rules governing who can access, modify, approve, and download energy data. Access should be assigned according to institutional responsibilities, including:

- **Data providers:** Authorized to submit and review their own data.
- **Data reviewers:** Authorized to verify submissions and request corrections.
- **Data administrators:** Authorized to manage the database, user permissions, and approved revisions.
- **Read-only users:** Permitted to view relevant information without modifying the underlying data.

Introduce regular data backup and recovery procedures. Implement secure and scheduled backups for both offline and online databases. Backup copies should be maintained separately from the primary database, with periodic recovery testing to minimize the risk of permanent data loss.

Maintain data version control and audit trails. Establish a system for recording data revisions, including the date of modification, responsible officer, reason for the change, and approval status. Historical datasets should be retained to support transparency, consistency, and future revisions.

Develop a standard operating procedure (SOP) for energy data management. Prepare an SOP outlining the full data management process, from initial collection and submission through validation, approval, storage, analysis, and publication.

Issue 3: Weak Sector Allocation

Develop a standardized energy sector classification framework. Establish a classification system that reflects Vanuatu's economic activities and energy consumption patterns while remaining consistent with internationally recognized energy statistics frameworks, particularly the International Recommendations for Energy Statistics (IRES).

The classification should distinguish major energy-consuming sectors, including residential, commercial and public services, industry, transport, agriculture, forestry, and fisheries, as appropriate.

Conduct targeted energy consumption surveys. Develop household and business energy-use surveys to improve estimates of fuel consumption by sector, particularly for LPG, electricity, diesel, petrol, kerosene, and biomass.

For example, a household energy survey could collect information on LPG consumption, electricity use, cooking practices, household size, and other energy sources. The results could support the estimation of residential LPG consumption, while commercial LPG consumption could be estimated using supplier sales data and other available information.

Where reliable total domestic LPG consumption data are available, residential consumption estimates may be deducted from the total to derive an initial estimate of non-residential consumption. However, further verification would be necessary to distinguish commercial use from industrial, institutional, and other uses.

Strengthen the capacity of institutional focal points. Provide targeted training to designated data officers on:

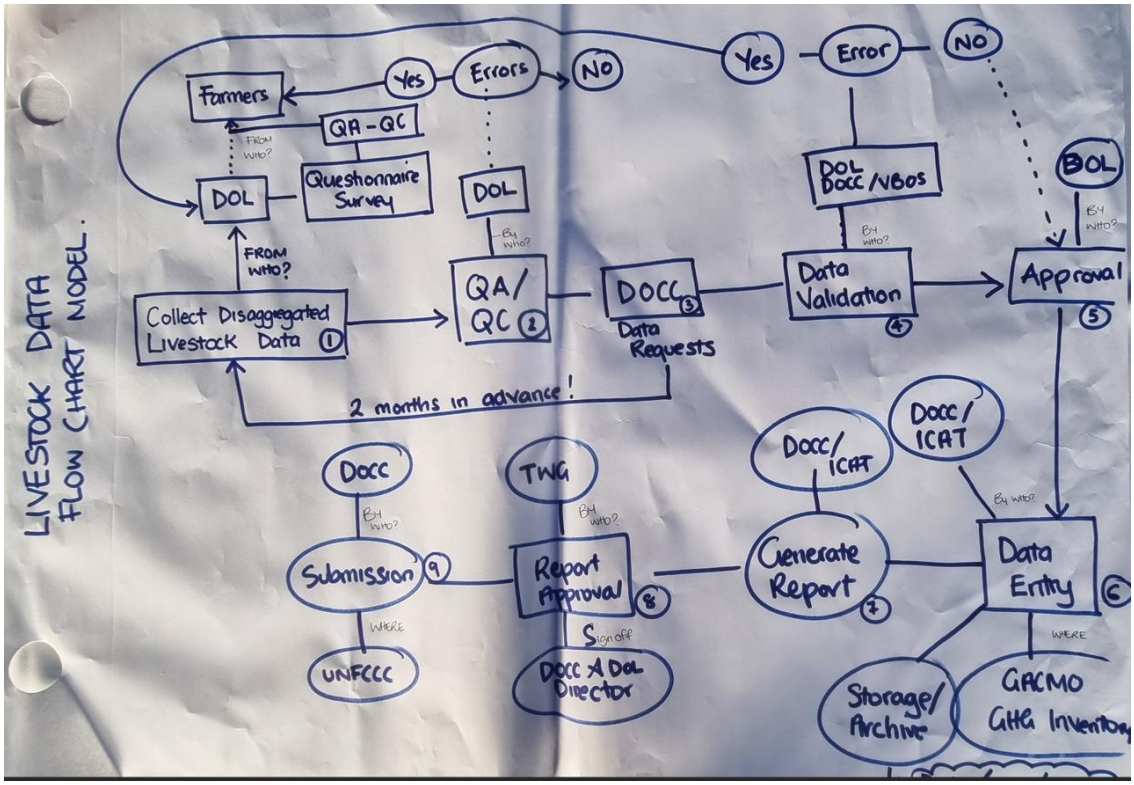
- Energy data collection and reporting requirements.
- Energy product and sector classifications.
- Standard units of measurement and energy conversion factors.
- Data validation and quality control procedures.
- Application of energy balance methodologies and reporting templates.

Apply a transparent estimation methodology for missing data. Where direct sectoral consumption data are unavailable, develop documented estimation methods using available surveys, administrative records, customer classifications, and relevant benchmarks. All assumptions and estimation methods should be recorded and reviewed periodically as improved data become available.

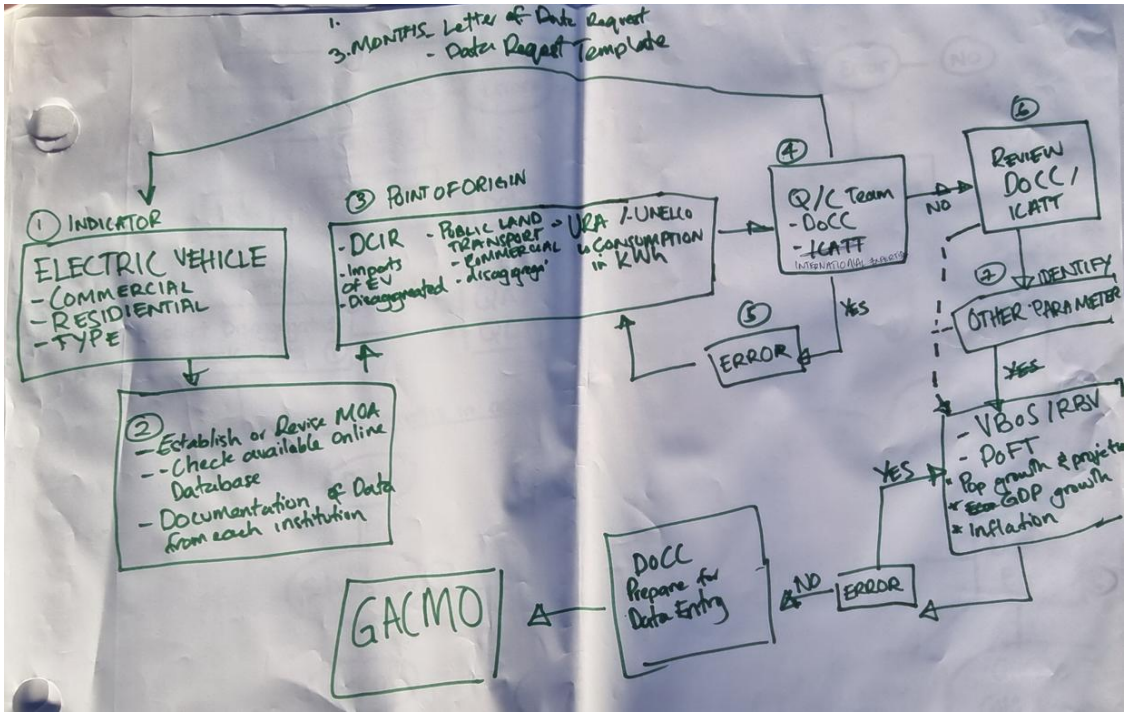
Action Plan to address information Gaps

Action Plan to address Data Gaps		
	Issue	**Recommendation**
4. Historical Series (1990-2006)	Natural Disaster (earthquakes, cyclone etc..)	Back up server (daily backups)
	Relocation of offices	Data portal hosted and maintained by VBoS(to include archiving of historical data)
	No central data portal	Use of open source tools/systems
	System update maintenance	
5. No Standard template	Different data format/types and reporting obligations from different agencies	Develop and agree on a simple structured template to transfer agency data into
	Different structure type	Develop documentation of each data required(metadata)/ SOPs/user manual for sustainability
6. Bunker and non-energy use	No access due to misunderstanding from data provider	Request data provider for release of data required
		Specify needs between agencies

Action Plans to Address Information Gaps



Livestock Data Flow Map



Energy Data Flow Map