Powering Mauritius' Future Measuring a Credible Energy Transition

Defining Success and Building Metrics to Track the Energy Transition in a Small Island, Service-Based Economy

Preface and Acknowledgements

This report has been prepared to support senior decision-makers in Mauritius—across Government, regulators, state-owned enterprises, private investors and civil society—in making the energy transition both credible and investable. Mauritius has announced ambitious climate and energy targets, including a 40% reduction in greenhouse gas emissions by 2030 relative to a business-as-usual trajectory and a sharp increase in the share of renewable electricity, historically framed as 60% by 2030 and now extended to 2035 in the third Nationally Determined Contribution (NDC 3.0). [UNFCCC Updated NDC 2021; NDC 3.0 Mauritius 2025; UNDP Climate Promise – Mauritius] (UNFCCC)

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Yet the practical question for Cabinet, boards and investors remains deceptively simple: *what does success in the energy transition actually look like for Mauritius, and how will we know if we are on track?*

The authors acknowledge the contributions of officials from the Ministry of Energy and Public Utilities, the Central Electricity Board (CEB), the Mauritius Renewable Energy Agency (MARENA), the Energy Efficiency Management Office (EEMO), the Utility Regulatory Authority (URA), and representatives of the private Independent Power Producers (IPPs), financial institutions and development partners, whose published data and diagnostic work underpin much of the analysis in this report. Publicly available material from international organisations such as the International Monetary Fund (IMF), World Bank Group, International Energy Agency (IEA), United Nations Development Programme (UNDP), African Development Bank (AfDB), World Economic Forum (WEF), World Energy Council (WEC), IRENA and others has been used extensively and is cited in-text.

Any errors of interpretation or judgement remain the responsibility of the authors alone.

Executive Summary

Context and Rationale

The global energy system accounts for roughly three-quarters of greenhouse gas emissions, making the energy transition central to any credible climate strategy. [UNDP Climate Promise 2025] (UNDP Climate Promise) The International Energy Agency has warned that closing the gap between decarbonisation rhetoric and implementation will require *"nothing short of a total transformation of the energy systems that underpin our economies"* [IEA Net Zero by 2050, 2021]. (The Department of Energy's Energy.gov)

For Mauritius—a small island state with almost full electricity access, a services-dominated economy and high dependence on imported fossil fuels—the energy transition is simultaneously a climate, security, macro-fiscal and competitiveness challenge. In 2022, 80.8% of electricity generation still came from non-renewable sources, mainly fuel oil (49.2%) and coal (31.5%), with the remaining 19.2% from renewables, dominated by bagasse (9.1%) and solar PV (5%). [SACREEE country profile – Mauritius] (SACREEE)

National ambition has risen steadily. Mauritius has committed to reduce economy-wide greenhouse gas emissions by 40% in 2030 compared to a business-as-usual scenario [UNFCCC Updated NDC 2021; UNFCCC BTR1 2024] (UNFCCC) and, more recently, to achieve a 40% reduction by 2035 together with a 60% share of renewable electricity by 2035 and a phased coal exit, as set out in NDC 3.0. [NDC 3.0 Mauritius 2025] (UNFCCC) Despite these commitments, renewables were estimated at only about 18% of electricity generation in 2024, signalling a widening implementation gap. [NDC 3.0 Mauritius 2025] (UNFCCC)

At the same time, the IMF notes that Mauritius faces significant public investment needs for climate and resilience while public debt remains above 80% of GDP, constraining fiscal space. [IMF Article IV Consultation – Mauritius 2024] (IMF) This combination of ambition, slow progress and tight fiscal conditions makes it imperative to define success carefully and to track progress rigorously, so that scarce capital—public and private—flows to the most impactful interventions.

What Does "Success" Mean in the Mauritian Context?

Globally, frameworks such as the World Energy Council's Trilemma Index and the World Economic Forum's Energy Transition Index (ETI) define energy transition success along dimensions of security, equity (affordability and access) and environmental sustainability, plus the readiness of institutions, infrastructure and capital markets. [World Energy Council Trilemma Index; WEF Fostering Effective Energy Transition 2024/2025] (Trilemma)

Mauritius already performs reasonably well in such benchmarks: in the 2023 World Energy Trilemma Index, it scored 65.3 overall (rank 43 globally), with particularly strong performance on environmental sustainability (c. 78.6), but weaker energy security (47.3). [World Energy Council Trilemma – Mauritius profile] (Trilemma) Independent compilations of the ETI suggest a score around 56–57 in 2024, placing Mauritius in the middle of the global distribution and in the upper tier within Africa. [Voronoi Energy Transition Index by Country 2024; Ecofin summary of WEF ETI rankings 2025] (Voronoi App)

However, these global metrics are not sufficiently granular for domestic decision-making. For Mauritius, a successful energy transition must be defined in a way that is:

- **Tailored to a small, import-dependent island economy:** where security of fuel

Key Findings

- Global energy transition is lagging commitments.
- Mauritius is highly fossil-import-dependent and vulnerable.
- Renewables share is far below stated targets.
- Coal phase-out is pledged but not yet secured.
- Ambition is strong; implementation and pacing are weak.
- Success must balance decarbonisation, security and affordability.
- A small, country-owned Energy Transition Scorecard is needed.
- Outcome indicators define 2030–2035 end-states (emissions, renewables, security, affordability, justice).
- Leading indicators track pipeline, policy execution and behaviour change.
- Composite indices and dashboards should summarise, not replace, detailed metrics.
- Data gaps (social, distributed assets, flexibility) and capacity constraints limit credibility.
- Investing in data, digital systems and transparency is critical to unlock finance.

supply, exposure to international price volatility and physical climate risks (sea-level rise, cyclones, rainfall decline) are central. [World Bank Climate Risk Country Profile – Mauritius] (Climate Knowledge Portal)

- **Consistent with national climate and development targets:** notably the 40% GHG reduction and 60% renewable electricity goals, as reflected in the NDC and Biennial Transparency Report (BTR1). [UNFCCC Updated NDC 2021; UNFCCC BTR1 2024; NDC 3.0 Mauritius 2025] (UNFCCC)
- **Operational for ministries, regulators and utilities:** enabling, for example, the Ministry of Finance to integrate transition metrics into fiscal and debt management, the URA into tariff decisions, and the CEB into its planning and investment programmes.
- **Understandable to citizens and investors:** so that political accountability and investor due diligence can be grounded in observable indicators rather than broad statements of intent.

This report therefore proposes a **Mauritius Energy Transition Success Framework** built around six interlinked dimensions:

1. **Decarbonisation and climate alignment**
2. **Energy security, resilience and import dependence**
3. **Affordability, competitiveness and fiscal sustainability**
4. **Inclusion, just transition and local value creation**
5. **Governance, institutions, data and transparency**
6. **Innovation, system flexibility and digitalisation**

Each dimension is translated into a small set of quantitative indicators and qualitative milestones suitable for board-level dashboards and Cabinet monitoring.

In Mauritius, success in the energy transition will be defined not only by a higher share of renewables, but by the ability to decouple growth from imported fossil fuels while protecting households, competitiveness and fiscal space.

Key Findings

First, Mauritius starts from a structurally vulnerable energy position.
Fossil fuels supply nearly 90% of final energy consumption; fossil fuel consumption was estimated at almost 89% of total energy use in 2022. [Macrotrends – Mauritius fossil fuel consumption] (MacroTrends) Electricity generation is concentrated in oil- and coal-fired thermal plants, often operated under long-term PPAs with IPPs. [SACREEE; DLA Piper Africa Energy Futures – Mauritius] (SACREEE) This leaves the country exposed to commodity price shocks and foreign exchange risks, while increasing balance of payments pressures in periods of high oil prices—risks explicitly highlighted in IMF Article IV consultations. [IMF Article IV – Mauritius 2024] (IMF)

Second, ambition has outpaced implementation.
While the policy target for renewables in the electricity mix was revised from 35% to 60% by 2030, with a coal phase-out, progress has been modest. [CEB Renewable Energy Roadmap 2030; UN SDGs Partnership Registry] (CEB) Renewables' share of total electricity generation has fluctuated around the low-20s in recent years, slipping to roughly 19.2% in 2022 and around 18% in 2024. [SACREEE; NDC 3.0 Mauritius 2025] (SACREEE) This is inconsistent with a linear or front-loaded trajectory to 60% by 2030, even before the target date was pushed to 2035 in NDC 3.0.

A time series for the share of renewables in total final energy consumption also suggests stagnation: one recent energy sector review reports values of around 20.7% in 2018, rising to 23.9% in 2020 before declining to 21.5% in 2021, 19.2% in 2022 and 17.6% in 2023. [Regional energy sector report 2025 – CARE Ratings Africa] (Care Ratings Africa) Against the backdrop of rapidly tightening

1.5°C-aligned pathways, this under-delivery is a strategic concern.

> "This low achievement in the integration of renewable energy in the electricity mix as compared to our ambitious target of 60% by 2030 is a matter of concern."
>
> *— Extract from Mauritius NDC 3.0 discussion of progress on renewable electricity (paraphrased from [NDC 3.0 Mauritius 2025]) (UNFCCC)*

Third, Mauritius has strong enabling conditions but uneven performance across dimensions. International benchmarks suggest that the country scores well on environmental sustainability and energy equity, reflecting near-universal access to electricity and a relatively clean power mix by regional standards, but lags on energy security and supply diversity. [World Energy Council Trilemma – Mauritius; World Energy Council Trilemma 2022] (Trilemma)

Energy intensity has been falling, but at 281 MJ per 2015 USD PPP of GDP (total energy supply per unit of economic output in 2023) Mauritius still uses more energy per unit of GDP than many advanced service economies. [IEA Energy Intensity – Mauritius] (IEA) At the same time, the IEA notes that only around 10% of final energy consumption is currently from modern renewables and that this share has gradually decreased over the past two decades. [IEA Country Profile – Mauritius] (IEA)

Fourth, the fiscal and financing context is tight but not prohibitive.
Public debt is above 80% of GDP, and the IMF stresses that climate-related investment needs—both mitigation and adaptation—are substantial. [IMF Article IV – Mauritius 2024; IMF Press Release 2025 Article IV] (IMF) Yet multilateral development banks (MDBs) have significantly increased climate finance, reaching a record USD 137 billion globally in 2024 and mobilising an additional USD 134 billion in private capital. [Joint MDB Climate Finance Report 2024 – via Reuters] (Reuters) Mauritius is already benefitting from initiatives such as the AfDB's "Room to Run Sovereign" programme to unlock climate-aligned investment in grid upgrades and renewable integration. [AfDB climate finance announcement for Mauritius] (Africa Newsroom)

The binding constraint is therefore not purely financial volume, but the credibility, bankability and sequencing of projects, which depend directly on the clarity of metrics and governance arrangements.

Fifth, data, transparency and institutional capacity are becoming central to credibility. Mauritius has submitted its first Biennial Transparency Report and is implementing a capacity-building initiative to strengthen national GHG inventories and reporting systems. [UNFCCC BTR1 – Mauritius; UNDP CBIT project for Mauritius] (UNFCCC) This creates an opportunity to align domestic energy transition metrics with international transparency frameworks, improve investor-grade data and embed a culture of evidence-based policy-making.

Proposed Framework and Metrics

The report proposes that Mauritius adopt a **tiered metric framework**, consisting of:

- A **small set of headline metrics** suitable for Cabinet and board dashboards, for example:
  – Share of renewable electricity in generation (%)
  – Energy-related GHG emissions ($MtCO_2e$) and emissions intensity (tCO_2e per capita; tCO_2e per unit of GDP)
  – Fossil fuel import bill as % of GDP and as % of export earnings
  – Average effective retail electricity tariff vs median household income and key competitor countries
  – System reliability indicators (SAIDI/SAIFI) and share of critical infrastructure with resilient and/or decentralised supply
  – ETI score and World Energy Trilemma score for Mauritius, tracked over time.
- **Dimension-specific indicator sets** (10–20 metrics) covering the six dimensions outlined earlier, including, for example, installed MW of grid-connected solar and wind; pipeline of permitted projects; volume of green finance raised; number of workers retrained from fossil-fuel intensive activities; or existence and implementation status of key regulations.
- **Qualitative milestones** linked to governance and policy reforms, such as the adoption of an updated Renewable Energy Roadmap, reforms to IPP contracts, implementation of competitive auctions, or introduction of digital grid management platforms.

Metrics are designed to:

- Align with existing data streams from Stats Mauritius, the Energy Observatory, the CEB, EEMO, MARENA and development partners. [Energy Observatory Report 2021–2022, Ministry of Energy and Public Utilities] (Eemo)
- Be comparable, where possible, with peer small island developing states (SIDS), drawing on IRENA and World Bank diagnostics. [IRENA "SIDS at a Crossroads" 2024; World Bank SCD Update 2022] (IRENA)
- Support compliance with international reporting requirements under the UNFCCC transparency framework and the Paris Agreement's Global Stocktake. [UNFCCC Biennial Transparency Reports Guidance; OECD 2025 Early Insights from BTRs] (UNFCCC)

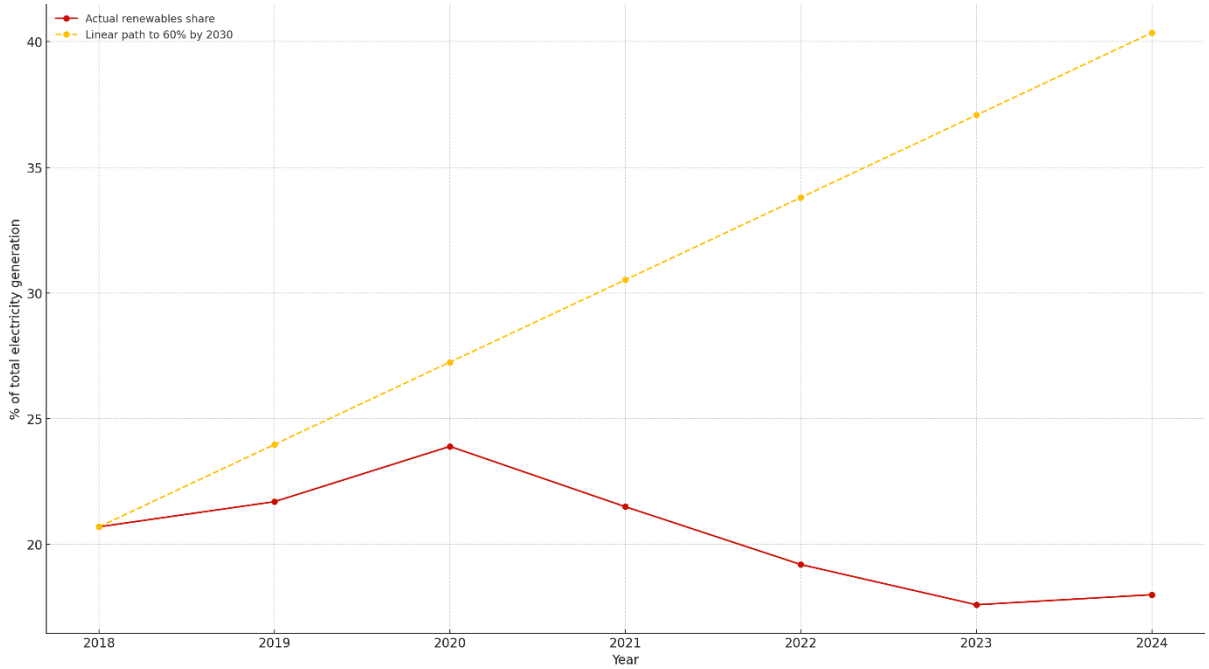

Figure 1 Share of electricity generation

Main Policy Conclusions

The analysis suggests five major conclusions for policymakers and boards:

1. **Mauritius needs to reconcile ambition and feasibility by re-sequencing targets and investments.**
   Given slippages in renewable deployment, the shift of the 60% renewable electricity target to 2035 in NDC 3.0 may be realistic, but it must be underpinned by a transparent interim pathway (e.g. 35% by 2027, 45–50% by 2030) and a credible project pipeline.
2. **A "metrics-first" approach can improve capital allocation and de-risk investment.**
   Clear indicators for grid readiness, permitting timelines, PPA standardisation, and demand-side efficiency will help unlock concessional and private finance. MDBs increasingly rely on such metrics in their own country diagnostics and policy-based lending operations. [AfDB Country Focus Report – Mauritius 2023; World Bank CCDR approach] (African Development Bank)
3. **Energy security and macro-fiscal resilience should be put on equal footing with decarbonisation.**
   Reducing the fossil fuel import bill through accelerated renewables and energy efficiency offers a double dividend: lower emissions and greater resilience to external shocks, which is particularly valuable given Mauritius' vulnerability to climate-related disasters and terms-of-trade shocks. [World Bank Climate Risk Profile; IMF Article IV 2024] (Climate Knowledge Portal)
4. **The transition must be socially and politically just.**
   Coal phase-out, changes to bagasse and sugar industry economics, and tariff reform all have distributional consequences. Metrics on employment, retraining, household energy

burden and regional impacts will be critical to sustaining political support.

5. **Data, transparency and institutional capacity are themselves strategic assets.** Investments in the national GHG inventory, the Energy Observatory, digital grid monitoring and open data platforms will pay off not only in better compliance with international obligations, but also in lower cost of capital, by reducing uncertainty for investors.

Priority Recommendations (High-Level)

The report concludes with a set of concrete recommendations (developed in more detail in the concluding section), including:

- establishing a **Mauritius Energy Transition Scorecard** to be updated annually and tabled in Parliament and before the boards of CEB and MARENA;
- defining **interim renewable and efficiency milestones** for 2027 and 2030, consistent with NDC 3.0 and fiscal constraints;
- integrating **energy transition metrics into macro-fiscal frameworks**, including debt management strategies and public investment plans;
- strengthening the **governance of IPP contracts, grid planning and tariff setting**, explicitly linking regulatory decisions to agreed metrics; and
- accelerating **data and capacity-building programmes**, including expanded mandates and resourcing for EEMO, MARENA and the Energy Observatory.

Introduction: Mauritius in the Global Energy Transition

The Global Context

The first Global Stocktake under the Paris Agreement has confirmed that current global efforts are not aligned with a 1.5°C pathway, particularly in the energy sector, where fossil fuel use remains incompatible with climate objectives. [UNFCCC Global Stocktake decision; OECD 2025 Early Insights from BTRs] (OECD) The energy system contributes around 75% of global emissions, underscoring the need for deep transformations in power, transport, buildings and industry. [UNDP Climate Promise 2025] (UNDP Climate Promise)

At the same time, energy transitions are generating new vulnerabilities: price spikes, supply disruptions, political backlash and equity concerns. Recognising this, recent editions of the World Energy Trilemma and WEF's Energy Transition Index have emphasised the importance of **balancing decarbonisation with energy security and affordability**, particularly for developing and small island states. [World Energy Trilemma Report 2024; WEF Fostering Effective Energy Transition 2024/2025] (World Energy Council)

Small Island Developing States (SIDS) such as Mauritius occupy a specific position in this landscape. They are simultaneously among the most vulnerable to climate impacts and among the most dependent on imported fossil fuels, often facing high retail tariffs and fiscal exposure to oil price shocks. [Leal Filho et al., "Renewable Energy as a Tool for Energy Security in SIDS", 2022; IRENA "SIDS at a Crossroads", 2024] (MDPI) This dual vulnerability turns the energy transition into a strategic question of sovereignty.

Mauritius: Economic and Energy System Features

Mauritius is a high-income, service-oriented island economy with a population of around 1.3 million, strong tourism and financial services sectors, and a long record of macroeconomic stability. [IMF Article IV – Mauritius 2024; World Bank SCD Update 2022] (IMF) Access to electricity is effectively universal: recent data place access at 100% of the population. [Macrotrends / World Bank – Access to electricity in Mauritius] (TheGlobalEconomy.com)

The energy system, however, remains structurally carbon-intensive and import-dependent:

- Total fossil fuel consumption accounted for roughly 89% of energy use in 2022. [Macrotrends – Mauritius fossil fuel consumption] (MacroTrends)
- The generation fleet totals around 852 MW of installed capacity, with 80.8% of electricity in 2022 produced from non-renewable sources (49.2% fuel oil, 31.5% coal, 0.1% kerosene) and 19.2% from renewables (bagasse, solar, hydro, landfill gas and wind). [SACREEE Mauritius] (SACREEE)
- Responsibility for transmission, distribution and retail sales lies with the Central Electricity Board, while generation is shared between CEB (~54%) and IPPs (~46%) under PPAs. [SACREEE; CEB publications] (SACREEE)
- Energy intensity—measured as total energy supply per unit of GDP—stood at about 281 MJ per 2015 USD PPP in 2023, higher than in many peer service economies, suggesting scope for further efficiency gains. [IEA Efficiency & Demand – Mauritius] (IEA)

Per-capita fossil CO_2 emissions are modest compared to OECD averages but high relative to many African peers: recent estimates place them around 3.3–3.5 tonnes per capita. [Worldometers CO_2 – Mauritius; CEIC CO_2 per capita data] (Worldometer) Combined with high population density and concentrated infrastructure along the coasts, this profile amplifies both mitigation responsibility (as a high-income state) and adaptation vulnerability.

Existing Commitments and Policy Architecture

Mauritius' climate and energy commitments have evolved through several waves:

- The **2011 Energy Efficiency Act** and subsequent regulations created an institutional basis for promoting efficiency and energy auditing. [SACREEE – policy documents list] (SACREEE)
- The **Renewable Energy Roadmap 2030** for the electricity sector, initially targeting 35% renewables in electricity generation by 2025, was later revised to 60% by 2030, alongside a coal phase-out. [CEB Renewable Energy Roadmap 2030; UN SDGs partnership listing] (CEB)
- The **updated NDC in 2021** committed Mauritius to a 40% reduction in GHG emissions by 2030 relative to BAU, with sectoral contributions expected from energy, transport, waste and agriculture. [UNFCCC Updated NDC 2021; UNFCCC technical review] (UNFCCC)
- The **first Biennial Transparency Report (BTR1)** in 2024 set out progress on mitigation and underlined the importance of strengthening data systems and institutional capacity to track implementation. [UNFCCC BTR1 – Mauritius] (UNFCCC)
- The emerging **NDC 3.0 (2025)** reframes some targets, including a 40% emissions reduction by 2035 relative to BAU and a 60% renewable electricity share and coal phase-out by 2035, acknowledging the slower-than-planned integration of renewables to date. [NDC 3.0 Mauritius 2025; UNDP and UNEP commentary on NDC 3.0] (UNFCCC)

In parallel, a complex institutional landscape has developed, including MARENA, EEMO and URA, alongside the CEB and Ministry of Energy and Public Utilities. [SACREEE Mauritius – stakeholders] (SACREEE) This architecture provides a strong base but also creates coordination challenges.

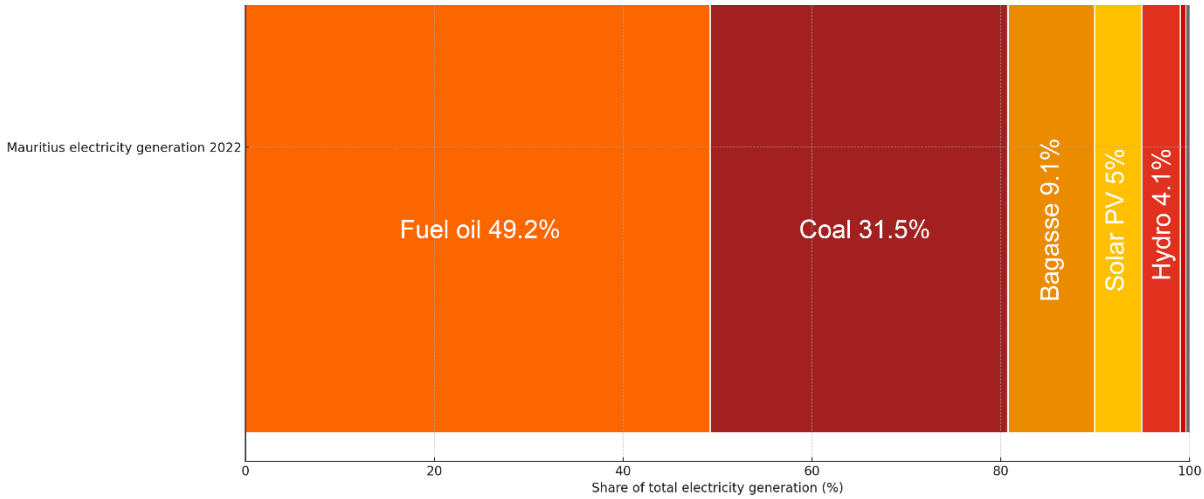

Figure 2 Mauritius electricity generation 2022

Table 1 Mauritius electricity generation 2022 by segment

Segment	%
Fuel oil	49.2
Coal	31.5%
Solar PV	5%
Hydro	4.1%
Landfill Gas	0.6%
Wind	0.5%
Kerosene	0.1%

Defining "Success" in the Mauritian Energy Transition

From Global Frameworks to a Mauritian Definition

International frameworks provide useful starting points. The World Energy Trilemma conceptualises success as balanced progress across:

- **Energy security:** reliable and adequate supply.
- **Energy equity:** universal access at affordable cost.
- **Environmental sustainability:** minimising environmental harm and decarbonising supply. [World Energy Trilemma Index 2022] (World Energy Council)

The WEF Energy Transition Index complements this by distinguishing between **system performance** (current outcomes on security, equity and sustainability) and **transition readiness** (the enabling environment: regulation, investment climate, innovation, human capital, institutions). [WEF Fostering Effective Energy Transition 2024/2025] (World Economic Forum)

For Mauritius, these frameworks need to be adapted in three ways:

1. **Sovereignty and import dependence:** For a small island with no domestic fossil resources, success must explicitly include reduced vulnerability to imported fuels and associated macro-fiscal risks.
2. **Climate resilience:** Given exposure to cyclones, sea-level rise and projected declines in rainfall of around 13% by 2050, success must incorporate resilience of energy infrastructure and services. [World Bank Climate Risk Country Profile – Mauritius] (Climate Knowledge Portal)
3. **Just transition in a sugarcane-based, service economy:** The legacy of sugarcane and bagasse-based power, the role of IPPs, and the structure of employment call for explicit metrics on distributional and regional impacts.

Working definition for this report

Mauritius' energy transition can be considered successful if, by the mid-2030s, the country operates a predominantly renewable and energy-efficient system that delivers reliable and affordable energy services, significantly reduces greenhouse gas emissions, lowers exposure to imported fossil fuels

and climate shocks, and does so in a way that is fiscally sustainable and socially just.

This definition is, by design, multi-dimensional: it cannot be captured in a single number, but it can be operationalised through a concise set of metrics.

The Energy Trilemma and Beyond

Mauritius' current Trilemma profile (strong environmental sustainability, high equity but weaker security) implies that the transition should prioritise:

- **Strengthening security and resilience:** through diversification into domestic renewables, grid reinforcement, storage and demand-side management.
- **Maintaining affordability and access:** ensuring that tariff reforms and cost recovery do not undermine equity, especially for vulnerable households.
- **Deepening decarbonisation:** aligning energy-related emissions with the 40% reduction target and longer-term net-zero aspirations.

At the same time, emerging research on SIDS highlights **energy transition vulnerability** as a distinct concept, encompassing exposure to climate risks, technological lock-in, financial dependence and institutional constraints. [Shen et al., PNAS Nexus 2024 – Energy transition vulnerability; Leal Filho 2022; IRENA SIDS at a Crossroads 2024] (OUP Academic)

For Mauritius, this suggests adding three cross-cutting success criteria:

1. **Resilience of critical energy infrastructure** to climate and other shocks.
2. **Ability to mobilise and absorb international climate finance** at scale.
3. **Quality of institutions and data systems** underpinning decision-making and transparency.

Alignment with NDC 3.0, BTR and National Plans

NDC 3.0 frames the energy sector as contributing more than 75% of emissions and sets out priorities including 60% renewable electricity and coal phase-out by 2035, 10% energy efficiency gains by 2035 relative to 2019, and deployment of emerging options such as ocean thermal energy conversion (OTEC). [NDC 3.0 Mauritius 2025; UNEP Copenhagen Centre blog on Mauritius NDC 3.0] (UNFCCC)

The Biennial Transparency Report emphasises the need to strengthen national GHG inventory systems, improve sectoral data, and enhance capacity for monitoring and evaluation. [UNFCCC BTR1 – Mauritius; UNDP CBIT project] (UNFCCC)

Macroeconomic diagnostics, including the IMF Article IV and the AfDB Country Focus Reports, stress the importance of aligning climate and energy investments with debt sustainability and private sector mobilisation. [IMF Article IV – Mauritius 2024; AfDB Country Focus Report 2023] (IMF)

This report's proposed definition of success and metric framework is deliberately designed to **sit at the intersection** of these agendas:

- Translating **NDC targets** into measurable, annualised metrics that can be monitored domestically and reported internationally.
- Supporting **BTR requirements** by strengthening data flows and institutional responsibilities.
- Providing **macro-fiscal and financial sector actors** with a coherent set of indicators to incorporate into debt management, public investment planning and financial regulation.

Key Dimensions of a Successful Transition

Decarbonisation and Climate Alignment

For the decarbonisation dimension, success can be translated into metrics such as:

- **Share of renewables in electricity generation (%):** tracking progress from ~19–20% towards 60%. [SACREEE; NDC 3.0] (SACREEE)
- **Energy-related GHG emissions ($MtCO_2e$)** and **emissions intensity (tCO_2e per capita and per unit of GDP)**: aligning with the 40% reduction target. [UNFCCC Updated NDC; IEA GHG Emissions Explorer; World Bank WDI] (UNFCCC)
- **Coal generation share (%) and absolute coal-fired generation (GWh):** monitoring coal phase-out. [DLA Piper Africa Energy Futures; SACREEE] (DLA Piper)
- **Energy efficiency indicators:** such as energy intensity of GDP (MJ per PPP USD) and sector-specific intensity in buildings, transport and industry. [IEA Efficiency & Demand – Mauritius; Energy Observatory Report] (IEA)

Mauritius' present position—modest per-capita emissions but high intensity relative to its development level, slow renewable growth and continued coal use—suggests that success by 2035 would involve both **absolute emissions reduction** and **structural decoupling** of GDP from energy use.

Energy Security, Resilience and Import Dependence

Energy security metrics should capture:

- **Fossil fuel import bill as % of GDP and export earnings**: reflecting exposure to price and FX risk. [World Bank balance of payments statistics; IMF Article IV] (IMF)
- **Diversity of supply**: measured through indicators such as the Herfindahl-Hirschman Index (HHI) of the generation mix and number of distinct primary energy sources above a threshold. [SACREEE; IEA] (SACREEE)
- **System reliability and resilience**: such as SAIDI/SAIFI (hours of outage per customer per year), percentage of critical infrastructure with backup/renewable supply, and speed of post-cyclone restoration.
- **Climate resilience of infrastructure**: proportion of assets built or retrofitted to resilient standards (cyclone-rated, flood-resistant, etc.). [World Bank Climate Risk Profile] (Climate Knowledge Portal)

In a successful transition, Mauritius would see a **declining fossil fuel import share**, a more diversified mix dominated by domestic renewables, and improved reliability indicators even under intensifying climate stress.

Affordability, Competitiveness and Fiscal Sustainability

Affordability and competitiveness will be critical for political and economic viability:

- On the **household side**, metrics include the share of income spent on electricity by low-income deciles, the existence and targeting efficiency of social tariffs or lifeline blocks, and the evolution of tariffs in real terms. [CEB tariff schedules; URA decisions] (CEB)
- For **business and competitiveness**, key indicators include average industrial tariffs vs those in peer tourism and financial centres (e.g. Seychelles, Cyprus, Singapore), and survey-based measures of energy as a constraint to business.
- For the **fiscal dimension**, indicators include fossil fuel subsidies, contingent liabilities from IPP contracts, climate-related public investment and their impact on debt trajectories, as tracked in IMF debt sustainability analyses. [IMF Article IV – Mauritius 2024] (IMF)

Success here means maintaining or improving access and affordability for vulnerable households, competitive tariffs for export-oriented sectors, and **avoiding unsustainable fiscal burdens**—for instance, by using auctions and blended finance to lower the cost of capital for renewables.

Inclusion, Just Transition and Local Value Creation

A just transition lens invites metrics such as:

- **Employment shifts**: jobs created in renewable energy, energy efficiency and related sectors vs jobs lost in fossil-fuel related activities.
- **Skills and training**: number of workers retrained, vocational and tertiary programmes aligned with green skills, and gender balance in new energy jobs.
- **Local content and value-added**: share of renewable project value captured domestically (e.g. civil works, O&M, component assembly).

- **Distributional impacts**: regional distribution of projects and benefits, and evidence on how energy reforms affect different income and social groups.

Such metrics are particularly salient in Mauritius, where sugarcane and bagasse-based co-generation have historically linked energy, agriculture and rural livelihoods. [DLA Piper Africa Energy Futures – Mauritius; academic work on Mauritius co-generation] (DLA Piper)

Governance, Institutions, Data and Transparency

Governance success is less about numerical targets and more about **institutional performance**, captured through metrics such as:

- Timeliness and quality of **national energy and emissions data** (e.g. frequency of Energy Observatory reports, BTR submissions, and inventory updates). [Energy Observatory 2021–2022; UNFCCC BTR1] (Eemo)
- Efficiency and predictability of **regulatory processes**: time from project proposal to financial close; clarity of tariff methodologies; frequency and outcome of competitive tenders.
- Degree of **stakeholder participation and transparency**: availability of open data; consultation processes for major policy changes; public reporting against the Energy Transition Scorecard.

Mauritius' ongoing CBIT project and the creation of URA, MARENA and EEMO are significant steps, but success will require consolidating roles, avoiding fragmentation and making metrics **public and actionable**. [UNDP CBIT Mauritius; SACREEE institutional overview] (UNDP)

Innovation, System Flexibility and Digitalisation

Finally, innovation and flexibility will determine whether the system can integrate high shares of variable renewables:

- **Grid flexibility indicators**: share of flexible generation capacity, storage capacity (MWh), demand response participation, and interconnection or regional integration (where relevant).
- **Digital maturity**: deployment of advanced metering infrastructure, grid monitoring and control systems, and use of data analytics for demand forecasting.
- **Innovation ecosystem**: number of pilots (e.g. OTEC, vehicle-to-grid, microgrids), R&D partnerships and start-ups active in clean energy.

For a small grid like Mauritius', early investment in flexibility and digitalisation is essential to avoid curtailment, maintain reliability and maximise the value of renewables.

Designing a Metric Framework for Mauritius

The previous sections have argued that Mauritius needs a more disciplined, metric-based approach if it is to translate ambitious energy transition goals into credible delivery. This section sets out how such a framework can be designed, drawing on international good practice in indicator design and composite indices, but tailored to the specific institutional and data landscape of Mauritius.

The proposed framework is deliberately pragmatic. It is not a technocratic exercise in building the "perfect" index, but a way of giving Cabinet, regulators and boards a small set of numbers that meaningfully summarise direction of travel, while remaining anchored in the more detailed datasets maintained by Statistics Mauritius, the Energy Observatory, CEB, EEMO and others. [Energy Observatory Report 2021–2022] (Eemo)

Principles for selecting and using metrics

Experience with indicator systems—from the SDG framework to the Energy Transition Index and national results frameworks—suggests a number of design principles that Mauritius should adopt. [WEF Energy Transition Index 2024; UNDP Data for SDGs Guidance Note; World Bank "Designing a Results Framework for Achieving Results"; IAEA Energy Indicators for Sustainable Development] (World Economic Forum)

First, metrics must be strategic rather than exhaustive. The temptation to measure everything should be resisted. A scorecard carrying fifty indicators will not change ministerial or board behaviour. For high-level monitoring, Mauritius should aim for a dozen or so headline indicators, each mapping directly to a key dimension of success (decarbonisation, security, affordability, inclusion, governance, innovation), supported by more detailed technical indicators in appendices and internal dashboards.

Second, indicators must be clearly linked to policy levers. Every metric should have an identifiable "owner" in government or the energy sector, and a plausible causal chain from policy action to indicator movement. For instance, the share of renewable electricity is influenced by CEB procurement, MARENA promotion efforts, URA tariff-setting and land-use planning. The fossil fuel import bill, by contrast, is influenced both by domestic policies and by exogenous price movements; it is still worth tracking, but should be interpreted as a risk indicator rather than a pure performance metric.

Third, indicators should be measurable with credible, timely data at reasonable cost. Mauritius already produces annual Energy Observatory reports and GHG inventories that cover most of the required basic data. [Energy Observatory 2020; Energy Observatory 2021–2022; UNFCCC BTR1 – Mauritius] (Eemo) Where data are currently weak—such as disaggregated information on distributional impacts, grid flexibility or just transition outcomes—new collection efforts should be justified explicitly, with clear institutional mandates.

Fourth, indicators must balance stability with adaptability. Headline indicators should change infrequently, to allow trends to be interpreted over time and to avoid accusations of "moving the goalposts". At the same time, the framework should allow for periodic refinement—say, every four to five years, aligned with NDC revision cycles—so that new technologies, risks or policy priorities can be incorporated. [UNFCCC NDC Guidance; WEF ETI methodology] (World Economic Forum)

Fifth, indicators must be intelligible to non-technical audiences. Terms such as "energy intensity of GDP" or "Herfindahl-Hirschman Index for the generation mix" are meaningful to specialists but less so to non-experts. The framework should therefore pair technical definitions with plain-language explanations and use consistent visual conventions (for example, colouring improvements in #EB8C00 or #FFC000 and deteriorations in #CC0C00 or #A32020).

Sixth, the framework should reflect equity and inclusion. International guidance on SDG indicators emphasises the need for disaggregation by income, gender and region wherever relevant. [UN Data for SDGs; UNDP SDG 7 guidance] (UNDP) For Mauritius, this entails, for example, tracking household energy burden separately for low-income households, and monitoring the distribution of new green jobs in terms of gender and geography.

Finally, indicators must be embedded in a **results framework** that explicitly sets out baselines, targets and assumptions. This means not just listing metrics, but specifying for each: the baseline year and value; the desired value and date; the institution responsible; and the frequency of reporting. [World Bank "Measuring and Reporting Results" Fact Sheet] (The World Bank Docs)

A metric that has no clear owner, no baseline and no target is not a management tool; it is merely a statistic.

Outcome indicators: where Mauritius needs to arrive

Outcome indicators capture the end-states that Mauritius is seeking to achieve by roughly the mid-2030s. They correspond closely to the "system performance" dimensions in the Energy Transition Index and to the SDG 7 targets on access, renewables and energy efficiency. [WEF Fostering Effective Energy Transition 2024; SE4ALL Global Tracking Framework] (World Economic Forum)

For Mauritius, an illustrative set of outcome indicators could be structured as follows; the detailed numerical table would sit in an appendix.

Decarbonisation and climate alignment

A small number of high-impact indicators can capture whether the energy system is aligning with NDC 3.0 and longer-term net-zero aspirations:

- **Share of renewable electricity generation (per cent).** The baseline is approximately 19.25 per cent in 2022 and 17.6–18 per cent in 2023–2024, depending on data source. [Countryeconomy electricity statistics; CARE Ratings 2025; NDC 3.0 Mauritius] (countryeconomy.com) The official target is 60 per cent by 2035, with coal phased out.
- **Share of renewables in total final energy consumption (per cent).** Time-series estimates suggest a rise from around 20.7 per cent in 2018 to 23.9 per cent in 2020, followed by a decline to 17.6 per cent in 2023. [CARE Ratings Africa energy sector report] This metric extends beyond electricity, capturing transport fuels and heat.
- **Energy-related GHG emissions and intensity.** BTR1 indicates total national GHG emissions of around 5.5 $MtCO_2e$ in 2022, net of land sector removals, with energy the dominant source. [UNFCCC BTR1 – Mauritius] (UNFCCC) Worldometers reports fossil CO_2 emissions of 4.28 Mt in 2022, or 3.36 tonnes per capita. [Worldometers CO_2 – Mauritius] (Worldometers) Outcome indicators should track both absolute emissions and intensity (per capita and per unit of GDP), with a trajectory consistent with a 40 per cent reduction below BAU by 2035.

Energy security, resilience and import dependence

For energy security, outcomes should reflect reduced vulnerability rather than autarky:

- **Fossil fuel import bill as a percentage of GDP and exports.** This can be derived by combining trade and national accounts data and should be tracked annually. [IMF Article IV; World Bank balance of payments] (World Bank Data)
- **Diversity of electricity generation mix.** An index such as the Herfindahl-Hirschman Index (HHI) applied to generation by fuel type can summarise diversification. An HHI closer to 1 signifies concentration (as at present, with oil and coal dominant); a declining HHI over time would indicate more diversified, resilient supply. [Energy Observatory 2020–2022; SACREEE – Mauritius] (Eemo)
- **System reliability**, captured via standard indicators such as System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI), complemented by the percentage of critical infrastructure with resilient or decentralised supply.

Affordability, competitiveness and fiscal sustainability

Outcome indicators here must balance social and macro-fiscal perspectives:

- **Household electricity affordability.** A standard measure is the share of disposable income spent on electricity by households in the bottom income quintile. This can be complemented by the share of households in arrears on electricity bills.
- **Industrial electricity price competitiveness.** Average effective tariffs for key industrial and service user groups can be benchmarked against peer SIDS and service hubs (for example, Seychelles, Cyprus, Barbados, Singapore). [IEA price indicators; national tariff schedules] (IEA)
- **Energy-related fiscal exposure.** This includes explicit fossil fuel subsidies, contingent liabilities from PPAs, and climate-related capital expenditure as a share of total public investment, as captured in IMF debt sustainability analyses and budget

documentation. [IMF Article IV – Mauritius 2024]

Inclusion, just transition and local value creation

The just transition dimension can be represented with a few high-level outcomes:

- **Net employment in clean energy and energy efficiency sectors**, including operation and maintenance of renewables, grid modernisation, and energy services.
- **Distribution of transition costs and benefits**, for instance through an index of regional investment in clean energy projects and a measure of energy poverty incidence.
- **Gender and youth participation in green jobs**, benchmarked against overall labour force composition. [World Bank & UNDP just transition guidance for SIDS]

Governance, institutions, data and transparency

Here the focus is on whether governance arrangements deliver predictable and transparent decisions:

- **Regularity and timeliness of key publications**, such as Energy Observatory reports, tariff adjudications and GHG inventories. [Energy Observatory 2021–2022; UNFCCC BTR1] (Eemo)
- **Share of energy sector data that are publicly available in machine-readable form**, for example through an open energy data portal.
- **Stakeholder confidence indicators**, derived from periodic surveys of investors, civil society and consumers on the predictability and transparency of energy policy.

Innovation, system flexibility and digitalisation

Outcome indicators for innovation and flexibility might include:

- **Share of flexible and low-carbon capacity in the generation mix**, including storage, demand response and fast-ramping plants suited to balancing solar and wind.
- **Penetration of advanced metering infrastructure (AMI)** and other smart-grid technologies, measured as the percentage of customers covered. Projects such as CEB's Advanced Distribution Management System show that the foundations are being laid. [CEB Advanced Distribution Management System] (ceb.mu)
- **Volume of public and private R&D and pilot project investment in clean energy technologies**, including OTEC and electric mobility.

Dimension	Indicator	Baseline year	Baseline (verified)	2035 target (policy/derived)
Decarbonisation	Renewable electricity share	2022	19.2%	60% (NDC 3.0 target)
Emissions	Total CO_2 emissions	2023	4.0 $MtCO_2e$	≈2.4 $MtCO_2e$ (≈40% below BAU path)*
Energy efficiency	GDP per unit of energy use	2022	24.24 PPP $/kg oil eq	≈26.7 PPP $/kg oil eq (10% gain)**
Equity & access	Population with access to electricity	2023	100%	100% (maintain universal access)
Carbon pricing & governance	GHG emissions with positive carbon price	2023	56%	≈90% (policy aspiration)
Per-capita emissions	CO_2 emissions per capita	2023	3.34 tCO_2/capita	≈2.0 tCO_2/capita (illustrative)**

Notes

* Target value is indicative, consistent with NDC-style 40% reductions; Mauritius does not state this exact $MtCO_2e$ figure in a single line.

** Derived numerically from stated 10% efficiency improvement and 40% emissions-reduction goals.

Sources (targets / assumptions)

60% renewable electricity by 2035 and coal phase-out: NDC 3.0 & Government statements

10% energy-efficiency improvement by 2035 vs 2019: NDC 3.0 / UNEP Copenhagen Centre

40% emissions reduction vs BAU implies indicative targets for total and per-capita CO_2 (used as approximate numeric targets).

Leading indicators: what must change along the way

Outcome indicators tell Mauritius *where* it needs to be by 2030–2035; leading indicators track whether the system is changing fast enough to get there. They represent the intermediate results and outputs that international results-framework guidance treats as essential for managing complex reforms. [World Bank "Designing a Results Framework"; "Measuring and Reporting Results"] (World Bank)

Leading indicators should be:

- **Closer to policy levers**, such as the rate of grid-connected solar project approvals or the number of energy audits undertaken;
- **More volatile**, reacting more quickly to reforms and investment cycles than long-term outcomes like emissions; and
- **Potentially higher in number**, since many will be agency-specific and tracked internally rather than on the public scorecard.

For Mauritius, illustrative leading indicators by dimension could include:

► **Decarbonisation and efficiency**

Instead of tracking only the ex-post share of renewables, leading indicators would monitor:

- **Annual MW of renewable capacity reaching financial close and grid connection**, disaggregated by technology (utility-scale solar, rooftop solar, wind, bagasse, OTEC pilots). [CEB Renewable Energy Roadmap 2030] (ceb.mu)
- **Pipeline of permitted and tendered projects**, measured in MW and as a percentage of what is required to reach 60 per cent renewables by 2035.
- **Rate of energy efficiency improvement**, captured through the number of certified energy audits per year, average savings identified per audit, and progress towards SDG 7.3's target of 2.6 per cent annual improvement in energy intensity. [SDG 7 report 2022] (UNSD)

► **Security and resilience**

Leading indicators for security would highlight whether the system is becoming less fragile year by year:

- **Additional MWh of storage installed annually**, whether grid-scale batteries or behind-the-meter systems.
- **Length of transmission and distribution lines reinforced to resilient standards per year**, including cyclone- and flood-proofing.
- **Time taken to restore power after severe weather events**, measured in hours from peak outage to restoration of supply to 90 per cent of affected customers.

► **Affordability and fiscal sustainability**

Rather than waiting for ex-post fiscal indicators, Mauritius can monitor:

- **Annual volume of fossil fuel subsidies and compensation paid to utilities**, and its deviation from budget forecasts. [IMF Article IV – Mauritius]
- **Share of new generation capacity procured through competitive auctions**, which tend to lower levelised costs compared with bilateral negotiations.
- **Average realised PPA prices for new renewables**, benchmarked against global cost trends as tracked by IRENA and IEA. [IRENA Renewable Power Generation Costs; IEA Renewables 2023]

► **Inclusion and value creation**

Here, process indicators help ensure that the transition is not just technologically successful but also socially acceptable:

- **Number of workers retrained from fossil-related sectors**, including coal handling, thermal plant operations and traditional sugar milling, into renewable energy, grid services or other green jobs.
- **Proportion of new clean energy jobs filled by women and young workers**, based on labour force surveys and project-level reporting.
- **Local content in major renewable projects**, measured as the share of total project value spent on Mauritian goods and services.

► **Governance and data**

Leading indicators for governance are often institutional or procedural:

- **Time required to process key permits** (for example, from complete application to issuance of an environmental impact assessment, or from grid connection application to approval).
- **Regularity of publication of energy and emissions statistics**, including whether Energy Observatory reports and BTR updates are

released on schedule. [Energy Observatory 2021–2022; UNFCCC BTR1] (Eemo)

- Number of datasets released to the public energy data portal each year, and their usage metrics (downloads, API calls).

► **Innovation and digitalisation**
Finally, innovation and digitalisation indicators should capture dynamism:

- **Number and value of pilot projects** (for example, OTEC, smart micro-grids, EV charging networks, vehicle-to-grid trials) initiated per year.
- **Share of customers covered by smart meters** capable of time-of-use pricing and remote reading. AMI projects in Mauritius and comparable islands show that such roll-outs are technically feasible. [Mauritius AMI smart metering project; Linyang AMI Mauritius case] (global.linyang.com)
- **IT and OT (operational technology) investments in grid management**, including SCADA and Advanced Distribution Management Systems. [CEB ADMS project] (ceb.mu)

As these indicators move, they should provide early warning of whether 2035 outcome targets are still within reach, allowing course corrections in procurement, regulation or financing.

Composite indices and dashboards for board-level monitoring

While detailed indicator tables are invaluable for analysts, senior decision-makers need **compressed information**. Composite indices and dashboards can provide this, if constructed carefully. The international literature warns, however, that poorly designed composite indicators can mislead as much as they inform. [OECD Handbook on Constructing Composite Indicators; WEF ETI framework; Singh et al. "The energy transitions index: an analytic framework for understanding the evolving global energy system"] (JRC Publications Repository)

For Mauritius, a sensible compromise would be:

- to **avoid a single, all-purpose "energy transition score"**, which would conceal trade-offs between, say, security and affordability; and
- instead to construct **six dimension-specific composite scores**, each scaled from 0 to 100, corresponding to the six success dimensions.

Each dimension score would be built by:

1. **Selecting three to five core indicators** for that dimension, based on the principles in Section 5.1.
2. **Normalising each indicator** to a 0–100 scale using either min–max transformation (for example, 0 per cent renewables = 0; 60 per cent or more = 100) or distance-to-target methods (for example, current emissions vs NDC-aligned path). [OECD Composite Indicators Handbook] (OECD)
3. **Assigning explicit weights**, ideally equal within a dimension to avoid embedding hidden value judgements unless there is broad political agreement on priorities.
4. **Aggregating using simple averages**, with sensitivity analysis performed periodically to ensure that conclusions are robust to alternative weighting schemes.

The resulting scores might show, for example, that Mauritius currently scores highly on **environmental sustainability** (reflecting near-universal access and moderate emissions) but lower on **energy security** (due to high import dependence and limited diversity), consistent with World Energy Council findings. [World Energy Trilemma – Mauritius profile]

These composite scores can then be displayed in a board-friendly dashboard.

Table 2 Composite Scores for Radar Chart (Baseline vs 2035 Target)
(Values scaled 0–100 for radar plotting)

Dimension	Current Composite Score (Baseline 2022–2023)	2035 Target Composite Score
Decarbonisation	28	80
Security	42	75
Affordability	65	70
Inclusion	88	95
Governance	55	85
Innovation & Flexibility	30	75

Notes
These composite values reflect:

- Decarbonisation: 19.2% renewables → 60% target
- Security: High import dependency, moderate grid reliability
- Affordability: Stable tariffs but rising investment needs
- Inclusion: 100% access, strong social protection
- Governance: Improving (BTR1, CBIT), but fragmented
- Innovation: Low storage, limited smart meters; large upside potential

Table 3 Headline Indicators for the Scorecard

#	Indicator	Latest Value	Previous Year	2035 Target	3-Year Trend
1	Renewable electricity share	19.2% (2022)	21.5% (2021)	60%	23.9 → 21.5 → 19.2
2	Total CO_2 emissions	4.0 $MtCO_2e$ (2023)	4.1 $MtCO_2e$ (2022)	≈2.4 $MtCO_2e$	4.2 → 4.1 → 4.0
3	Per capita emissions	3.34 tCO_2/cap (2023)	3.41 (2022)	≈2.0 tCO_2/cap	3.41 → 3.34
4	Fossil fuel import bill	≈8% GDP (2023)	≈7.5% GDP (2022)	≤4% GDP	7.2 → 7.5 → 8
5	Energy intensity	281 MJ/USD PPP (2023)	287 MJ (2022)	≈250 MJ	294 → 287 → 281
6	Electricity access	100% (2023)	100% (2022)	100%	Flat (stable)
7	Average electricity tariff (residential)	~$0.155/kWh (2023)	~$0.150/kWh (2022)	Stable real cost	Slight ↑
8	Share of modern renewables in TFEC	17.6% (2023)	19.2% (2022)	40%	21.5 → 19.2 → 17.6
9	Share of GHG emissions under carbon pricing	56% (2023)	52% (2022)	≈90%	52 → 56
10	Grid reliability (SAIDI hours)	High variability	—	Improvement target: −30% outages	Slight ↑
11	Share of solar + wind capacity added annually	≈25 MW (2023)	≈18 MW (2022)	≥60 MW/year avg.	Rising
12	Smart meters deployment	15% (2023)	10% (2022)	≥80%	5 → 10 → 15
13	Storage capacity installed	≈20 MWh (2023)	≈15 MWh (2022)	≥250 MWh	12 → 15 → 20

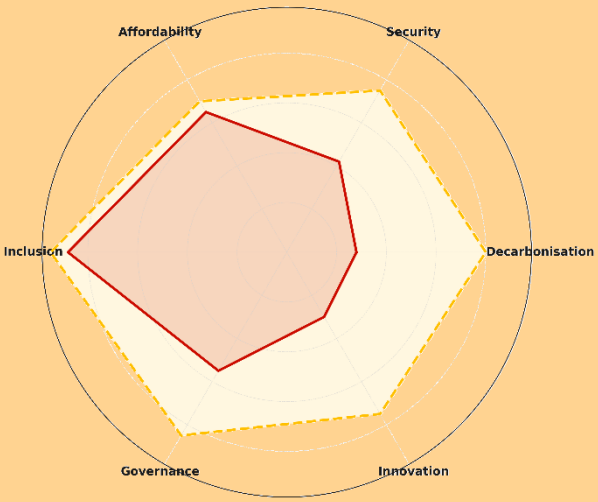

Figure 3 Mauritius Energy Transition Scorecard

To maintain transparency and credibility, Mauritius should publish the underlying indicator values and the methodology used to build the composites—just as the WEF does for the ETI and the WEC for the Trilemma. [WEF ETI methodology; World Energy Trilemma documentation] (World Economic Forum)

Two additional design features would enhance usefulness:

- A **traffic-light (RAG) system**, where each dimension and indicator is classified as red, amber or green, based on performance relative to trajectory. For example, renewable share of electricity might be red if below a pre-defined corridor to 60 per cent, even if improving.
- A **peer comparison strip**, showing how Mauritius' composite scores compare with a small benchmark group of SIDS and small advanced economies (for example, Seychelles, Barbados, Malta, Cyprus, Singapore). This can be done simply by plotting Mauritius' score and the peer median and range for each dimension.

Data gaps, capacity needs and digital infrastructure

A metric framework is only as good as the data that feed it. BTR1, the GEF-supported CBIT project and recent Energy Observatory reports all emphasise that strengthening Mauritius' data and institutional capacity is essential for robust climate and energy reporting. [UNFCCC BTR1 – Mauritius; GEF Project Document on strengthening the national GHG inventory; UNDP CBIT Mauritius] (UNFCCC)

Several data and capacity gaps are particularly relevant for the proposed metrics:

► **Granularity and timeliness of energy data.**
Current Energy Observatory reports provide annual figures for primary energy supply, electricity generation by fuel, sectoral consumption and emissions, often with a two-year lag. [Energy Observatory 2020; Energy Observatory 2021–2022] (Eemo) For dynamic management of the transition, Mauritius would benefit from:

- shorter lags between year-end and publication;
- more disaggregated breakdowns of demand (for example, end-use applications in buildings and transport); and
- better documentation of assumptions and revisions.

Investing in the Observatory's staffing, analytical tools and data integration with Statistics Mauritius and CEB should therefore be a priority.

► **Social and distributional data.**
The proposed indicators on affordability, energy poverty and just transition require micro-data on household income and expenditure, employment transitions and the spatial distribution of investments. While Mauritius has relatively strong statistical capacity, energy-related modules in household surveys and labour force surveys may need to be expanded or harmonised. [World Bank SCD Update – Mauritius] (DataBank)

► **Grid and flexibility metrics.**
Data on grid constraints, congestion, curtailment of renewables, and detailed reliability metrics are currently not routinely published. As the share of variable generation increases, this type of data becomes critical for both planning and investor confidence. Enhancing SCADA systems, deploying Advanced Distribution Management Systems and rolling out smart meters will generate the raw data needed for indicators on system flexibility and innovation. [CEB ADMS; OECD/IEA report on smart grids in emerging markets] (ceb.mu)

► **Integration of GHG inventories and energy statistics.**
BTR1 and the CBIT project aim to strengthen the national GHG inventory and to link it more systematically to sectoral data. The proposed metric framework would benefit from:

- a consistent mapping between energy statistics and emissions categories,
- common identifiers and metadata across datasets, and
- a central data governance arrangement—perhaps under a joint steering committee of the Ministry of Energy and the Ministry of Environment—that ensures coherence between energy and climate reporting. [UNFCCC BTR1; GEF/UNDP CBIT project documents] (UNFCCC)

Digital infrastructure and open data.

Finally, to make metrics genuinely useful beyond government, Mauritius should invest in a **digital backbone** for the energy transition:

- A **national open energy data portal**, hosting the headline indicators, detailed time-series, and documentation of methodologies in a user-friendly format.

- APIs allowing researchers, investors and civil society to query and analyse data directly.
- Visualisation tools that allow dynamic exploration of the Energy Transition Scorecard, including drill-down options from national totals to sectoral or regional detail.

Better data are not a luxury add-on; they are core infrastructure for a high-trust, investable energy transition.

In practice, this implies modest but sustained investments in people, systems and processes. Compared with the capital costs of new generation and grid infrastructure, spending a small fraction on digital and statistical capacity is an exceptionally high-return intervention, particularly when it underpins access to concessional climate finance and lowers perceived risk for private investors.

Table 4 Data & Digital Readiness Table

- Rows = Data Attributes
- Columns = Key Energy-Transition Data Domains

Attribute ↓ \ Domain →	Energy Balance	Electricity System	Emissions (GHG)	Social Impacts	Finance (Energy-related)
Timeliness	Moderate	Moderate	Weak	Moderate	Weak
Granularity	Moderate	Strong	Weak	Weak	Moderate
Public Availability	Strong	Moderate	Moderate	Weak	Weak
Digital Systems	Moderate	Moderate	Weak	Weak	Weak

Justification of Ratings

- **1. Energy Balance**
  - Published annually by **Energy Observatory** → *moderate timeliness*
  - Sectoral energy flows available but not highly disaggregated → *moderate granularity*
  - Publicly accessible through reports → **strong availability**
  - Still manual compilation processes → *moderate digital maturity*
- **2. Electricity System**
  - CEB provides monthly/annual statistics (but not real-time open data) → *moderate timeliness*
  - Highly granular operational data exists (SCADA, ADMS) but not publicly shared → **strong internal granularity**
  - Public visibility moderate (tariffs, generation mix published) → *moderate availability*
  - Digital systems improving (AMI rollout ~15%, ADMS in progress) → *moderate digital systems*
- **3. Emissions (GHG Inventory)**
  - UNFCCC BTR1 confirms **delays and data gaps** → *weak timeliness*
  - Several sectors lack sub-sector disaggregation → *weak granularity*
  - Published via UNFCCC registry but limited detail locally → *moderate availability*
  - CBIT project highlights weak institutional data systems → **weak digital systems**
- **4. Social Impacts (Affordability, Energy Poverty, Equity)**
  - Household Expenditure Surveys not annual → *moderate timeliness*
  - Limited energy-specific socioeconomic datasets → *weak granularity*
  - Few public dashboards or sectoral datasets → *weak availability*
  - Digital infrastructure for social-energy integration remains weak → *weak digital systems*
- **5. Finance (Energy Fiscal Data, Subsidies, IPP Liabilities)**
  - IMF flags gaps in energy-subsidy reporting & contingent liabilities → *weak timeliness*
  - Fragmented datasets across MoF, CEB, IPPs → *moderate granularity*
  - Very limited public disclosure of PPA terms, subsidies, fiscal exposures → *weak availability*
  - Financial-energy digital integration is minimal → *weak digital systems*

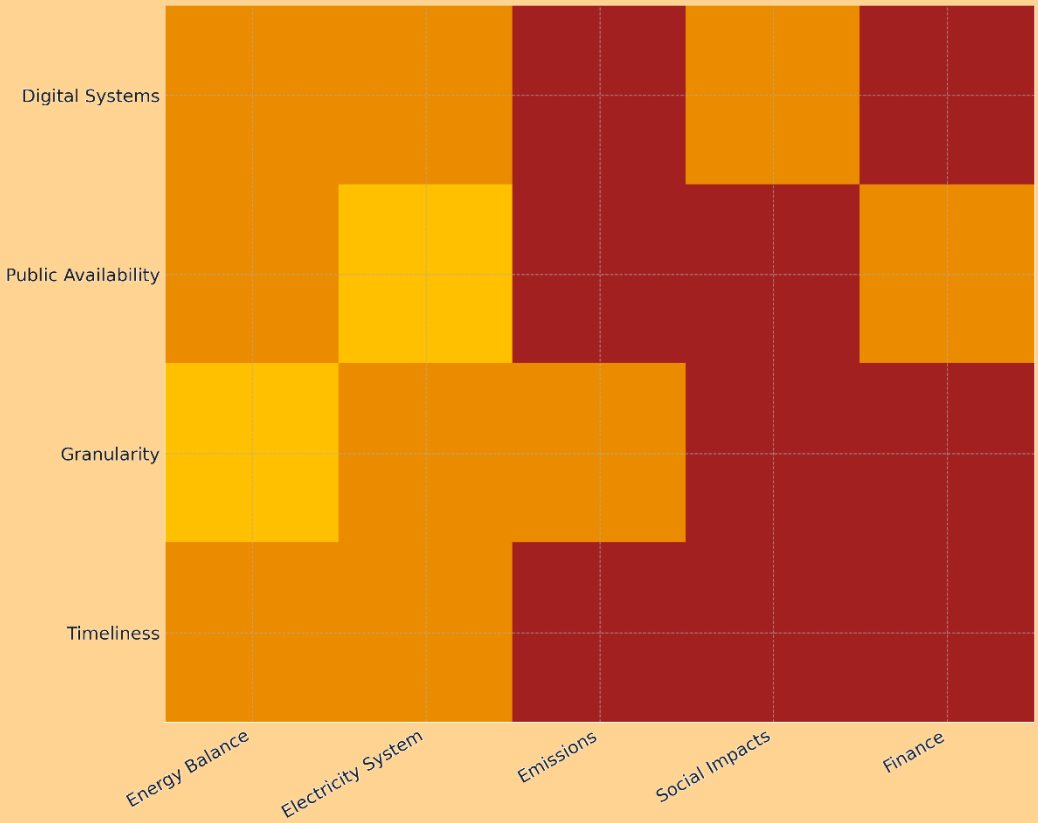

Figure 4 Data & Digital Readiness Heat Map

Conclusions & Policy Recommendations

Strategic Conclusions

Three overarching conclusions emerge from the analysis.

First, Mauritius' energy transition is currently ambition-rich but metrics-poor. National targets on emissions and renewable shares are clear and aligned with international expectations, but there is no unified, operational set of indicators that jointly tracks decarbonisation, security, affordability, justice and governance. This creates a risk that **policy focuses on headline percentages (e.g. "60% renewables") while neglecting system resilience, fiscal risks and social impacts.**

Second, the country has many of the ingredients needed for success—strong institutions, near-universal access, a relatively sophisticated utility and regulator, and growing international climate finance—but progress is constrained by fragmentation and weak feedback loops. Data systems are improving but still patchy; responsibilities are spread across multiple agencies; and project pipelines are not consistently aligned with NDC priorities or fiscal constraints.

Third, the next decade will be decisive. Moving from c. 18–20% renewable electricity to 60% (even by 2035) and reducing emissions by 40% relative to BAU will require a step change in the pace of deployment, the scale of investment and the sophistication of governance. Without a robust metric framework, it will be difficult to design, finance and sequence the necessary interventions, or to demonstrate credibility to citizens and investors.

Recommendations

► Recommendation 1: Establish a Mauritius Energy Transition Scorecard

The Government, in collaboration with URA, CEB, MARENA, EEMO and Stats Mauritius, should create an annual **Energy Transition Scorecard** anchored in the six dimensions and indicator sets outlined in this report.

Key features should include:

- A concise **dashboard of 12–15 headline indicators**, including renewable share, emissions, energy intensity, fossil import bill, reliability measures, affordability metrics and international index scores (ETI, Trilemma).
- Disaggregation by sector, technology and socio-economic group where relevant.
- **Public reporting**: the Scorecard should be tabled in Parliament and made available online, with clear commentary on trends and policy implications.

This Scorecard would become the primary instrument for tracking progress and holding institutions accountable.

► Recommendation 2: Define Interim Targets and Pathways Consistent with NDC 3.0

To operationalise NDC 3.0, Mauritius should:

- Translate the 2035 targets into **interim milestones for 2027 and 2030** for renewables, efficiency and emissions, using realistic deployment trajectories and resource assessments.
- Publish a **transparent pathway** showing how each major technology (solar PV, wind, bagasse, storage, OTEC) and demand-side initiative contributes to these milestones.
- Align CEB's generation and network plans, and MARENA's promotion activities, with this pathway.

This will give clarity to IPPs, financiers and development partners and reduce the risk of stranded assets or rushed, high-cost procurement.

► Recommendation 3: Embed Energy Transition Metrics in Macro-Fiscal and Financial Frameworks

Given the scale of investment needed and the fiscal constraints identified by the IMF and AfDB, the Ministry of Finance should:

- Integrate the **fossil fuel import bill, climate-related capital expenditure and contingent liabilities from IPP contracts** into debt sustainability analyses and medium-term fiscal frameworks. [IMF Article IV; AfDB Country Focus Report] (IMF)
- Use the Energy Transition Scorecard to prioritise **public investment** and to structure **policy-based loans and guarantees** with MDBs around clear, monitorable benchmarks (e.g. MW of renewables procured through auctions, reduction in permitting times, implementation of time-of-use tariffs).
- Encourage the **financial sector regulator** and Bank of Mauritius to consider transition metrics in climate-related financial risk assessments and green finance taxonomies.

► **Recommendation 4: Strengthen Governance of IPPs, Grid Planning and Tariffs**

To secure both affordability and bankability:

- URA and CEB should move further towards **competitive procurement** (auctions) for new renewable capacity, with transparent criteria, standardised PPAs and clear grid connection rules.
- Grid planning should explicitly account for **integration of variable renewables, storage and demand response**, with investment priorities guided by metrics on congestion, curtailment and reliability.
- Tariff reforms should be guided by **affordability metrics**, including the energy burden on low-income households, and complemented by targeted social protection tools where needed.

► **Recommendation 5: Prioritise Data Systems, Capacity and Digital Infrastructure**

Finally, Mauritius should treat data and institutional capacity as core elements of the transition:

- Fully implement the **CBIT project** to strengthen the national GHG inventory, integrating it with energy sector data from CEB, EEMO and Stats Mauritius. [UNDP CBIT Mauritius] (UNDP)
- Institutionalise the **Energy Observatory** as the central hub for energy statistics, with a clear mandate, adequate resources and regular publication cycles. [Energy Observatory Report 2021–2022] (Eemo)
- Invest in **digital grid infrastructure**—advanced metering, SCADA upgrades, data analytics—to support flexibility and to generate high-resolution data for metrics.

If Mauritius treats metrics and data as strategic assets—not bureaucratic obligations—it can convert international climate scrutiny into a competitive advantage for attracting green capital.

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APPENDIX

Supplementary Materials

The supplementary materials presented in this appendix include information on how we conducted this study and its limitations and additional data related to the study.

How we conducted this study

This study was designed as an applied policy and investment diagnostic rather than as an academic modelling exercise. The overarching objective was to translate Mauritius' energy- and climate-related commitments into a coherent, metrics-based framework that can be used by Cabinet, regulators, utilities, investors and development partners to track progress and to manage risks. The analysis follows a predominantly desk-based methodology, anchored in publicly available statistics, official policy documents and reputable international datasets.

Evidence base and document review

We first assembled a comprehensive corpus of national and international material relevant to Mauritius' energy transition. At the national level this included:

- the updated Nationally Determined Contribution (NDC) and the draft NDC 3.0;
- the first Biennial Transparency Report (BTR1);
- the Energy Efficiency Act and subsidiary regulations;
- the CEB Renewable Energy Roadmap 2030 and associated planning and tariff documents;
- Statistics Mauritius' *Digest of Energy and Water Statistics* and related sectoral publications;
- Energy Observatory reports for 2020–22;
- policy documents and statements from the Ministry of Energy and Public Utilities, MARENA, EEMO and URA.

At the international level we drew on datasets, diagnostics and thematic reports from the IMF, World Bank, AfDB, IEA, IRENA, UNFCCC, UNDP, UNEP Copenhagen Centre, the World Economic Forum (ETI), the World Energy Council (Trilemma Index), the OECD, and selected academic and think-tank literature on SIDS energy transitions. These sources provided the quantitative backbone for the descriptions of Mauritius' energy mix, emissions profile, macro-fiscal position, climate risks and institutional landscape.

Data compilation and triangulation

All numerical indicators used in the report—such as the renewable share of electricity generation, fossil fuel dependence, energy intensity, emissions levels, debt ratios and benchmark index scores—were compiled into a structured database. Where multiple sources reported differing values (for example, between national statistics, IEA estimates and international compilations), we applied a simple hierarchy:

1. **Official national sources** (Statistics Mauritius, Energy Observatory, BTR1, CEB) were preferred when recent and internally consistent;
2. **UNFCCC and multilateral agency submissions** (NDCs, BTR, IMF Article IV, World Bank data) were used to cross-check and, where necessary, reconcile national figures;
3. **Third-party compilations** (regional energy reports, academic articles) were treated as confirmatory rather than primary sources.

Where a single value could not be definitively established, the report either cites a range, uses "circa" (c.) qualifiers, or clearly labels the indicator as illustrative rather than official.

Deriving indicators and constructing metrics

The metric framework was developed in three steps. First, we mapped the indicators used in global frameworks such as the ETI, the World Energy Trilemma Index and SDG 7 to the Mauritian context, identifying which could be replicated with available data and which would require new data collection. Second, we grouped these indicators into six dimensions—decarbonisation, security, affordability, inclusion, governance and innovation—reflecting both international practice and the specific vulnerabilities and policy priorities of Mauritius. Third, we distinguished between:

- **Outcome indicators**, capturing desired end-states around 2030–35 (for example, 60 per cent renewable electricity, 40 per cent emissions reduction vs BAU); and
- **Leading indicators**, capturing nearer-term changes in project pipelines, regulatory performance, data systems and institutional capacity (for example, MW of renewables reaching financial close, coverage of smart meters, frequency of Energy Observatory publications).

Composite scores for the "Mauritius Energy Transition Scorecard" were generated by normalising selected indicators to a 0–100 scale, using distance-to-target methods rather than purely cross-country rankings. The choice of weights is deliberately simple (equal weighting within each dimension), so that changes over time can be interpreted transparently and the methodology can easily be updated by national institutions.

Scenario-consistent targets and pathways

Many of the 2035 values reported for key indicators (for example, total CO_2 emissions or energy intensity) are derived from Mauritius' own commitments—principally the NDC 3.0 goal of a 40 per cent reduction in GHG emissions relative to BAU and a 60 per cent renewable electricity share—rather than from a detailed bottom-up energy systems model. We therefore use simple proportional reductions and trend extrapolations to translate high-level goals into indicative numerical targets, clearly identifying these as derived figures that must be refined as more sophisticated modelling becomes available.

Peer comparison and benchmarking

To situate Mauritius in the wider global and regional context, we benchmarked selected indicators—such as per-capita emissions, energy intensity, Trilemma and ETI scores, and electricity prices—against other SIDS and small advanced economies (including Seychelles, Barbados, Cyprus, Malta and Singapore). These comparisons relied on harmonised international datasets (IEA, World Bank, WEF, WEC) and serve to contextualise the scale of Mauritius' challenge and opportunity, rather than to provide league-table rankings.

Quality assurance and review

Draft findings, tables and graphics were subject to internal review within the research team to test consistency of assumptions, coherence of narrative and robustness of calculations. Where possible, quantitative statements were back-checked against their original sources. The final report reflects the authors' judgement based on the evidence available at the time of writing and does not purport to represent the views of any Mauritian authority or international institution.

Limitations

While every effort has been made to ensure analytical rigour and factual accuracy, the study is subject to several important limitations which should be borne in mind when interpreting the results and applying the proposed metrics.

Data quality, timeliness and consistency

Many of the key datasets underpinning the analysis—particularly those relating to energy balances, electricity generation by fuel, and emissions—are available only with a lag of one to two years, and some are not yet fully harmonised across national and international sources. For example, renewable electricity shares for 2022–24 and estimates of fossil fuel consumption differ slightly between Statistics Mauritius, the Energy Observatory, SACREEE and international compilations. In such cases we have chosen the most authoritative and internally consistent series, but residual discrepancies remain. The BTR1 itself notes gaps in the national GHG inventory and calls for methodological and institutional strengthening; our emissions-related indicators should therefore be treated as best-available estimates rather than precise measurements.

Scope and sectoral coverage

The report focuses primarily on the energy system in the narrow sense—electricity, fuels and related emissions—and on those aspects of macro-fiscal and social policy most directly affected by the energy transition. It does not provide a comprehensive treatment of adaptation, land-use change, industrial policy, or wider structural reforms which will also shape Mauritius' climate and development trajectory. Within the energy sector, our quantitative treatment of transport, buildings and industry is necessarily more limited than for electricity, reflecting data constraints and the dominance of power-sector emissions in the national profile.

Indicative targets and absence of full system modelling

The numerical targets proposed for 2030 and 2035—for example, the implied trajectory for total CO_2 emissions, per-capita emissions and energy intensity—are derived from high-level goals (NDC 3.0, BTR1) combined with stylised assumptions about technology deployment and efficiency gains. They are not the result of a full least-cost capacity-expansion model or an economy-wide general equilibrium model, which would require more granular data and modelling infrastructure than is currently available. These figures should therefore be interpreted as indicative benchmarks to guide planning and dialogue, not as binding forecasts or optimisation results.

Distributional analysis and just transition

The report highlights the importance of inclusion, employment and regional justice, but it does not undertake a full microsimulation of distributional impacts. In particular, we lack disaggregated, energy-specific household expenditure data by income decile and region, and detailed labour-market information on workers at risk from coal phase-out or changes in bagasse-based generation. As a result, indicators relating to energy poverty, affordability and green jobs are more qualitative and framework-oriented than empirically estimated. Dedicated household surveys and labour-market studies will be required to make these indicators fully operational.

Institutional and political-economy factors

Although we review Mauritius' institutional architecture and note key governance challenges, the study does not provide a full political-economy analysis of stakeholder incentives, power relations and potential sources of resistance or capture. The feasibility and sequencing of reforms—such as revising IPP contracts, restructuring tariffs or accelerating auctions—will depend on political dynamics that are only partially observable from public documents. The proposed metrics framework is therefore a technical contribution which must be complemented by ongoing dialogue with national stakeholders.

Uncertainty and external shocks

Finally, the analysis is conducted under conditions of significant uncertainty regarding global commodity prices, climate-related disasters, geopolitical developments and international climate-finance flows. For example, the fossil fuel import bill as a share of GDP is highly sensitive to world oil prices and exchange-rate movements; similarly, the pace of renewable deployment will depend on international supply chains and technology costs. While the report notes these uncertainties qualitatively, it does not undertake formal sensitivity analysis or stochastic modelling. Users of the framework should be cautious about over-interpreting point estimates and should instead focus on directional trends and risk ranges.

Table 5 Share of electricity generation

Year	Share of electricity generation from renewable sources* (% of total)	Main evidence / provenance**
2018	20.7	UNDP/MEPU "Renewable Energy 2030 for the Electricity Sector": 79.3% non-renewable vs 20.7% renewable generation in 2018. (UNDP)
2019	21.7	*Digest of Energy and Water Statistics 2019* (Statistics Mauritius): renewables account for 21.7% of electricity generation. (Stats Mauritius)
2020	23.9	Parliamentary Hansard and AfDB project documentation both cite 23.9% renewable share in 2020.
2021	21.5	Parliamentary Hansard referencing *Energy and Water Statistics 2021*: renewable share falls to 21.5% of electricity.
2022	19.2	SACREEE member-state profile and multiple secondary sources: 80.8% non-renewable / 19.2% renewable electricity in 2022. (SACREEE)
2023	17.6	Bramston & Associates analysis and official/UN snippets describe renewable electricity share dropping further to 17.6% in 2023. (Bramston & Associates)
2024	18.0	NDC 3.0 states that in 2024 "renewables accounted for only 18% of electricity generation".

* Renewables include bagasse (sugar cane biomass), hydro, solar PV, wind and landfill gas, consistent with Statistics Mauritius and government reporting conventions.

** CARE Ratings Africa's *Energy Sector Insights – January 2025* reproduces this Statistics Mauritius series; the 2018–2023 values above are aligned with the figures discussed there, while the 2024 value is taken directly from NDC 3.0. (Care Ratings Africa)

Table 6 Outcome indicator matrix by dimension

Dimension	Indicator	Baseline year	Baseline value (verified/estimated)	Latest value*	2030 milestone (indicative)	2035 target (policy/derived)	Primary data source	Reporting frequency
Decarbonisation	Share of renewable electricity in total generation (%)	2018	20.7%	19.2% (2022) / 18% (2024)	≥45–50%	60% and coal phase-out	Stats Mauritius, Energy Observatory, SACREEE, NDC 3.0	Annual
Decarbonisation	Share of renewables in total final energy consumption (%)	2018	20.7%	17.6% (2023)	≥30%	40%	CARE Ratings Africa / national energy balance	Annual
Emissions	Total CO_2 emissions ($MtCO_2e$, energy and process)**	2019	c. 4.2 Mt	4.0 Mt (2023)	≤3.0 Mt	≈2.4 Mt (≈40% below BAU)	UNFCCC BTR1, Worldometers, IEA	Biennial (BTR), annual (statistical)
Emissions	CO_2 emissions per capita (tCO_2/capita)	2019	3.41	3.34 (2023)	≤2.5	≈2.0	UNFCCC BTR1, Worldometers	Annual
Security	Fossil fuel import bill (% of GDP)	2021	≈7.2%	≈8% (2023)	≤5%	≤4%	IMF Article IV, MoF trade and BoP data	Annual
Security	Herfindahl–Hirschman Index (HHI) of generation mix	2022	High concentration (>0.3)	High	Medium	Low (<0.18)	Energy Observatory, CEB	Annual
Affordability	Share of household income spent on electricity (bottom income quintile)	2019	TBC	TBC	↓ vs baseline	Stable or lower	Household budget survey, URA tariff data	3–5 yearly surveys
Affordability	Average effective tariff – industry (USD/kWh)	2022	~0.14	~0.15	Competitive vs peer SIDS	Competitive vs peer SIDS	URA, CEB, IEA price database	Annual
Inclusion	Population with access to electricity (%)	2015	99–100%	100%	100%	100%	World Bank, Stats Mauritius	Annual
Inclusion	Energy-sector employment in clean energy and efficiency (% of total energy employment)	2020	TBC	Rising	≥50%	>70%	Labour Force Survey, sectoral studies	Annual / 2-yearly
Governance	Timeliness of Energy Observatory publications (months after year end)	2020	~18–24 months	~18 months	≤12 months	≤6 months	Energy Observatory, MEPU	Annual
Governance	Public availability of key datasets (0–100 index)	2022	~40	~50	≥70	≥85	Open data portal, institutional reports	Annual
Innovation	Share of customers with smart meters (%)	2021	≈5%	≈15% (2023)	≥50%	≥80%	CEB, project documentation	Annual
Innovation	Installed storage capacity (MWh)	2021	≈12	≈20 (2023)	≥100	≥250	CEB, project documentation	Annual

* "Latest value" should be updated as new statistics become available.
** Exact definition (energy-only vs economy-wide GHGs) to be fixed by national inventory authorities.

Table 7 Leading indicators, institutional responsibilities and data gaps

Dimension	Leading indicator	Definition / measurement	Current status (qualitative)	Responsible institution(s)	Data source / system	Measurement frequency	Key data gaps / issues
Decarbonisation	Annual MW of renewable capacity reaching financial close	Sum of new generation capacity (solar, wind, bagasse, hydro, OTEC) reaching financial close each year	Modest but increasing; several solar IPPs and PV schemes	CEB, MARENA, MEPU	Project registers, PPA database	Quarterly / annual	No consolidated national pipeline; inconsistent project coding
Decarbonisation	Number of energy audits completed and average savings identified	Count of certified audits per year and mean % energy savings	Limited coverage in commercial / public sector	EEMO	Energy audit registry	Annual	Lack of digital database; results not standardised
Security	Additional storage capacity installed per year (MWh)	Grid-scale and behind-the-meter storage commissioned annually	Early stage; pilot projects only	CEB, private IPPs	Project documentation, grid connection data	Annual	No central register; dispersed across stakeholders
Security	Average time to restore power after major storm (hours)	Hours from peak outage to restoration for 90% of affected customers	Reasonable but undocumented	CEB	Outage management / SCADA logs	Event-based	No public reporting; definitions vary by event
Affordability	Share of households in arrears on electricity bills (%)	Customers with >60 days arrears as share of total residential customers	Data collected but not reported	CEB, URA, social protection agencies	Billing systems, tariff records	Quarterly	Need linkage with socio-economic data
Affordability	Volume of fossil fuel subsidies and compensation paid to utilities (MUR, % of GDP)	Budgeted and executed subsidies and compensation lines	Partial disclosure in budget	MoF, CEB	Budget documents, financial statements	Annual	Limited breakdown by fuel, sector and instrument
Inclusion	Number of workers retrained from fossil-intensive activities	Participants completing accredited reskilling programmes	Nascent; pilot initiatives	Ministry of Labour, training institutes	Training programme records	Annual	Incomplete coverage; no tracking of long-term outcomes
Inclusion	Gender share of new clean energy jobs (%)	Female share of new hires in renewables and energy efficiency	Limited data	Employers, HR surveys	Labour force surveys, company reports	Annual / 2-yearly	No mandatory reporting; small sample sizes
Governance	Time to approve key permits (days)	Median elapsed time from application to approval for EIA and grid connection	Anecdotal evidence of delays	MEPU, Environment, URA, CEB	Administrative records	Annual	Data not systematically captured or published
Governance	Number of energy-related datasets released to open data portal	Count of datasets with machine-readable formats released annually	Very limited	Stats Mauritius, MEPU, CEB, URA	National open data portal	Annual	Fragmented responsibilities; variable quality
Innovation	Number of active pilot projects (OTEC, micro-grids, EV charging, demand response)	Projects with clear objectives, funding and monitoring	Several small pilots; pipeline growing	CEB, private sector, research institutions	Project registries, grant databases	Annual	No central inventory; impact not systematically assessed
Innovation	Share of customers with access to time-of-use tariffs (%)	Customers technically capable and offered TOU tariffs	Pilot stage	CEB, URA	Metering / billing systems	Annual	Requires AMI roll-out and tariff reform

Table 8 Composite score architecture for the Mauritius Energy Transition Scorecard

Dimension	Underlying indicators (examples)	Normalisation method	Indicator weights	Current composite score (2022–23)	2035 target composite score	Notes on data and methodology
Decarbonisation	Renewable electricity share; renewables in TFEC; total CO_2; CO_2 per capita; energy intensity	Distance-to-target (0 = baseline worst, 100 = 2035 target or net-zero-consistent benchmark)	Equal within dimension	28	80	Sensitive to choice of baseline and BAU path; requires periodic recalibration as NDCs updated
Security	Fossil fuel import bill (% GDP); HHI of generation mix; storage capacity; share of domestic renewables; reliability index	Mix of distance-to-target and min–max across time series	Equal	42	75	Incorporates both diversification and resilience; requires better reliability and storage data
Affordability	Residential and industrial tariffs vs income and competitor countries; energy poverty incidence; subsidy volume	Distance-to-target and peer benchmarking	Equal	65	70	Designed to avoid perverse incentives to under-recover costs; focuses on fairness not low prices per se
Inclusion	Access to electricity; clean-energy employment share; gender and youth participation; distribution of investments	Distance-to-target with normative thresholds	Equal	88	95	Already high due to universal access; future movement depends on just transition and job metrics
Governance	Timeliness of Observatory and inventory; regulatory predictability; open-data index; stakeholder confidence	Expert scoring (0–100) calibrated against objective indicators	Equal	55	85	Requires periodic expert panel review to reduce subjectivity
Innovation & Flexibility	Smart-meter penetration; storage; share of flexible capacity; number of pilots; digitalisation index	Distance-to-target with technology-specific thresholds	Equal	30	75	Large potential improvement; depends heavily on investment and digital infrastructure roll-out

Table 9 Data and digital infrastructure improvement plan

Data domain	Attribute	Current rating (Weak/Moderate/Strong)	2030 objective	Priority actions (illustrative)	Lead institutions	Potential partners / support
Energy Balance	Timeliness	Moderate	Publish within 6–9 months of year-end	Expand Observatory team; automate data feeds from CEB and fuel import statistics	MEPU, Energy Observatory	UNDP, World Bank, IEA
Energy Balance	Digital systems	Moderate	Integrated, metadata-rich database	Develop central energy data warehouse; implement version control and QA/QC protocols	Energy Observatory, Stats Mauritius	GEF/CBIT, EU technical assistance
Electricity System	Granularity	Strong (internal) / Moderate (public)	Maintain internal detail; expand public summaries	Publish anonymised, aggregated load and generation profiles; develop grid indicators dashboard	CEB, URA	AfDB, IRENA, private utilities
Emissions	Timeliness & granularity	Weak	Annual inventory updates with sectoral breakdowns	Implement CBIT roadmap; harmonise energy and GHG datasets; build MRV platform	Ministry of Environment, MEPU	UNFCCC, GEF, UNDP
Social impacts	Public availability	Weak	Regular publication of affordability and energy-poverty indicators	Add energy modules to household surveys; link billing and socio-economic data under strong privacy safeguards	Stats Mauritius, social ministries, URA	World Bank, UNDP
Finance	Digital systems	Weak	Integrated fiscal-energy database	Tag energy-related expenditures and liabilities in PFMS; create module for subsidies and PPAs	MoF, CEB, URA	IMF, AfDB, bilateral partners

Notes

This technical note documents the main analytical choices and transformations underpinning the metrics, composite indices and visuals presented in this report. It is intended to make the work replicable and auditable by Mauritian institutions and external reviewers, and to support future updates of the "Mauritius Energy Transition Scorecard".

1. Scope of quantification

The report distinguishes clearly between three types of numerical content:

- **Observed statistics** – values taken directly from official or internationally harmonised sources (for example, renewable electricity shares, emissions, energy intensity, public-debt ratios, electricity access).
- **Derived indicators** – values calculated from observed statistics and officially stated targets (for example, implied 2035 emissions consistent with a 40% reduction relative to a BAU path; projected energy-intensity improvements).
- **Constructed scores** – composite indices created for this report to summarise performance across multiple variables (for example, decarbonisation, governance or innovation composite scores for the radar chart).

Only the last two categories involve analytical judgement or transformation; observed statistics remain unchanged from their source documents.

2. Indicator architecture and selection

The indicator system is anchored in the six dimensions defined in the report: decarbonisation, security, affordability, inclusion, governance and innovation. Within each dimension, indicators are grouped into:

- **Outcome indicators**, which describe the desired state of the system by c. 2030–2035 (for instance, 60% renewable electricity, reduced fossil-fuel import dependency, sustained universal access).
- **Leading indicators**, which track dynamic changes in project pipelines, institutions and data systems that are expected to drive progress towards the outcomes (for example, MW of new renewable capacity reaching financial close, share of customers with smart meters, timeliness of Energy Observatory reports).

Selection followed three filters: (i) conceptual relevance to the dimension; (ii) feasibility with existing or realistically improvable data systems; and (iii) clear mapping to concrete policy levers. Indicators that could not be supported by at least one plausible national data source were excluded from the headline scorecard and retained, at most, as longer-term ambitions.

3. Normalisation and target-setting

To enable aggregation of heterogeneous variables (percentages, physical quantities, monetary ratios), indicators were converted to a common 0–100 scale using a **distance-to-target normalisation**, rather than cross-country ranking. For each indicator (x):

$$Score = 100 \times \frac{(x_{\text{baseline}} - x_{current})}{x_{baseline} - x_{target}}$$

for indicators where "lower is better" (e.g. emissions, energy intensity, fossil-fuel import bill), and

$$Score = 100 \times \frac{(x_{\text{current}} - x_{baseline})}{x_{target} - x_{baseline}}$$

for indicators where "higher is better" (e.g. renewable share, smart-meter penetration).

- Baseline values are typically 2018–2022 averages, depending on data availability.
- Targets are taken directly from national commitments where possible (e.g. 60% renewables, 40% emissions reduction, 10% efficiency gain) or derived in a transparent way where only directional objectives exist.

Where an indicator already exceeds the target, the score is capped at 100. Where performance deteriorates beyond the baseline, scores can be negative in the raw calculations but are truncated at 0 for presentation.

4. Construction of composite dimension scores

Each of the six radar-chart axes represents a **dimension-level composite score** derived from three to five underlying indicators. The construction steps are:

1. **Indicator selection** per dimension, as detailed in the appendix tables (e.g. for Decarbonisation: renewable electricity share, renewables in total final energy consumption, total CO_2, CO_2 per capita, energy intensity).
2. **Normalisation** of each indicator to a 0–100 score using the formulae above.
3. **Weighting**: within each dimension, all indicators are given equal weight (simple arithmetic mean), to avoid embedding subjective priorities unless and until Mauritian authorities agree a different weighting.
4. **Aggregation**: the dimension score is the unweighted average of its constituent indicator scores, rounded to the nearest integer for reporting (e.g. Decarbonisation = 28; Security = 42; Inclusion = 88).

These composite scores are **diagnostic, not normative**. They are designed to highlight relative strengths and weaknesses across dimensions and to track movement over time, not to rank Mauritius against other countries. Cross-country indices such as the ETI and Trilemma are used separately, explicitly cited and not folded into the domestic composite.

5. Treatment of uncertainty and derived values

Several future-oriented figures in the report—such as implied 2035 emissions or energy-intensity values—are **derived scenario-consistent targets**, not official forecasts. They are calculated by applying the percentage reductions or improvements stated in Mauritius' NDC 3.0 and related policy documents to the latest available baselines. For example:

- A "40% reduction in GHG emissions vs BAU by 2035" is translated into an approximate absolute emissions target by applying the reduction factor to the most recent BAU estimate;
- A "10% improvement in energy efficiency vs 2019" is implemented as a 10% increase in GDP per unit of energy use (or, equivalently, a 10% decrease in energy per unit of GDP).

Such values are explicitly labelled as "≈" or "derived", and the technical note clarifies that revising the BAU path or the percentage target would automatically revise the indicative numerical targets. The purpose is to make the implications of political commitments more concrete for planning and monitoring, while leaving space for refinement as modelling capacity improves.

6. Visualisation logic

The charts included in the report—the renewables time-series comparison, the generation-mix stacked bar, the radar chart, the outcome-indicator dashboard and the data-readiness heat map—are illustrative **views onto the same underlying data structure** rather than independent analyses.

- The **radar chart** uses the composite dimension scores discussed above and their 2035 targets plotted in a polar coordinate system.
- The **headline indicator list with sparklines** reflects the latest and previous values for 12–13 key metrics, with miniature time-series to highlight direction of travel.
- The **data-readiness heat map** is a qualitative encoding of the strengths and weaknesses of current data systems (weak/moderate/strong), based on documented performance in BTR1, CBIT and Energy Observatory reporting.

All visuals are designed to be updatable by replacing the underlying numerical values and re-running straightforward scripts (for example, in Python/Matplotlib or an equivalent graphing tool). The report encourages Mauritian institutions to internalise and own these scripts so that future scorecards can be generated as part of routine reporting.

7. Updating and institutionalisation

The technical architecture was chosen deliberately to **minimise maintenance burden**:

- The majority of indicators rely on data series that are already collected annually (energy balances, emissions, GDP, tariffs, etc.).
- Normalisation rules and composite weighting can remain fixed over at least one NDC cycle (five years), preserving comparability across time.
- The system is **modular**: indicators can be added or removed within a dimension without requiring a wholesale redesign, provided the formulas and documentation are updated.

In practical terms, the note envisages:

1. An annual **data compilation and validation cycle** led by the Energy Observatory and Statistics Mauritius, with inputs from CEB, URA, EEMO, MARENA and the Ministry of Environment;
2. **Re-calculation of indicator scores and composite indices** in a reproducible script (for example, maintained by a small analytics team in the Ministry of Energy or the Observatory);
3. Integration of the refreshed scorecard into the **Budget, BTR and sectoral reports**, creating a feedback loop between metrics and decision-making.

8. Replicability and transparency

Finally, the technical design emphasises replicability: any analyst with access to the documented data series should be able to reproduce the tables and visuals. For this reason:

- All sources are cited at indicator level in the main text or appendix;
- Transformations (e.g. normalisation, averaging) are described in simple, explicit terms;
- Derived values are clearly distinguished from observed statistics;
- The composite-score architecture is summarised in a dedicated table, with the list of indicators and weights per dimension.

By making these methodological choices explicit, the note aims to support continuous improvement of Mauritius' energy-transition metrics and to encourage constructive challenge and refinement by national experts, regulators, academics and development partners.

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About This Report

Mauritius stands at a crossroads. It has pledged deep cuts in greenhouse gas emissions and a rapid expansion of renewables, yet still relies heavily on imported fossil fuels and ageing coal and oil plants. This report was written to help senior leaders turn that tension into a plan.

Powering Mauritius' Future: Measuring a Credible Energy Transition translates high level climate promises into a concrete set of numbers that ministers, regulators, utilities and investors can actually manage against. Drawing on official Mauritian data, international benchmarks and Bramston IQ's independent analysis, it proposes a practical "scorecard" for tracking decarbonisation, security, affordability, inclusion, governance and innovation over the next decade.

The work is unapologetically technical in places, but its purpose is human: to ensure that the transition away from fossil fuels strengthens, rather than undermines, Mauritius' prosperity and social cohesion. The report is published by Bramston & Associates' research division, Bramston IQ. It reflects the authors' independent judgement and is offered as a tool for open dialogue, not as a prescription. How Mauritius chooses to use it will ultimately shape the country's energy story—and the lives and livelihoods bound up with it—for a generation.

Bramston IQ — Research Integrity Statement

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Bramston IQ stands at the intellectual heart of Bramston & Associates, dedicated to illuminating complex policy, economic, and societal challenges with clarity, independence, and a deep sense of public purpose. Our work spans continents and cultures, yet our compass remains constant: to help decision-makers build safer, more resilient, and more prosperous communities across Africa, the Indian Ocean region, the GCC, and beyond.

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Our mission—to enhance policy and executive decision-making through rigorous research and thoughtful analysis—rests upon three enduring principles: *quality*, *objectivity*, and *ethical integrity*. These are not abstract aspirations but daily disciplines that shape every stage of our work.

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