Initiative for Climate Action Transparency

Development and Institutionalization of a Framework to Track NDC Action and Build Capacity in Relevant Areas

Report on Data Collection, Management and Data Gap Assessment for the Energy Sector

St. Kitts & Nevis

29th July, 2024

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The Government of St. Kitts and Nevis' Ministry of Sustainable Development, Environment, Climate Action and Constituency Empowerment

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Initiative for Climate Action Transparency – ICAT

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Acronyms

BTR	Biennial Transparency Report
BUR	Biennial Update Report
CCMRVH	Caribbean Cooperative Measurement, Reporting and Verification Hub
EV	Electric vehicle
GDP	Gross Domestic Product
GHG	Greenhouse gas
GHGMI	Greenhouse Gas Management Institute
ICAT	Initiative for Climate Action Transparency
LEAP	Low Emissions Analysis Platform
LPG	Liquefied petroleum gas
MRV	Measurement, reporting and verification
NC	National Communication
NDC	Nationally Determined Contributions
NEVLEC	Nevis Electricity Company Ltd.
SIDS	Small Island Developing State
SKELEC	St. Kitts Electricity Company
SKN	St. Kitts and Nevis
TraCAD	Transport Climate Action Data Tool
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

The Twin Island Federation, St. Kitts and Nevis (SKN) is a small island developing state (SIDS) in the Caribbean committed to combating climate change's negative impacts. Fossil fuel imports have consistently been on the rise within the nation, given the increase in population and economic growth, and there is a heavy dependence on these imports to meet the country's energy needs. In the latest greenhouse gas (GHG) inventory, 2018, the energy sector, particularly the electricity generation and transport subsectors, was identified as the largest contributor to the total national emissions, with as much as 81.7% of the total emissions. As a result of this, SKN has identified the following key areas as major interventions which contribute to their overall economy-wide emissions reduction strategies in their updated 2021 Nationally Determined Contribution (NDC):

- Transition to 100% renewable energy in power generation
- Improve efficiency in the transmission and distribution of electricity
- Electrification of 2% of the total vehicle fleet
- Development of electric vehicle (EV) infrastructure

It is, therefore, critically important for the country to build the capacity to manage and track the implementation of its NDC, especially in the electricity generation and transport subsectors. As a result, the Government of SKN has sought project-level support under the Initiative for Climate Action Transparency (ICAT) to enable the analysis and capacity building towards the accomplishment of its NDC goals.

ICAT supports projects that help countries better assess the impacts of their climate policies and actions and fulfil their transparency commitments. This is done by increasing the capacities of countries in transparency, including the ability to assess the contribution of climate policies and actions on countries' development objectives, and providing appropriate methodological information and tools to support evidence-based policymaking.

The Government of SKN has undertaken this ICAT project, which is designed to support the development of the NDC tracking framework and establishment of sustainable capacity to conduct projections of GHG emissions for the electricity generation and transport subsectors.

The main objectives of the project are as follows:

- To develop an MRV framework for the electricity generation and transport subsectors with GHG emissions estimation, compilation and reporting
- To develop an NDC tracking framework that will manage and track the implementation of the NDC in the electricity generation and transport subsectors.

Including data collection for emissions and assessment of policies in the identified subsectors

- To develop appropriate indicators for reporting on NDC progress achieved
- To strengthen the capacity of the St. Kitts and Nevis Government to maintain the two frameworks and improve modelling capabilities

As a result of these objectives, the following tasks thus far have been completed under this project:

1. Mitigation Analysis Project Scope Report including justification for the selected modelling tools
2. Training Workshops on the selected modelling tools; Transport Climate Action Data Tool (TraCAD) and Low Emissions Analysis Platform (LEAP).

To continue the analysis, for the project a review of data collection, data management and assessment of data for the energy sector was undertaken. This document presents the results of the analysis for data collection and management to achieve the objectives of the project as stated above.

2 Analysis of the Current Data Collection Methods

SKN as indicated is a SIDS, and similar to many SIDS, particularly Caribbean SIDS, suffers from lack of human resources and skilled workers to undertake specific work activities. As such data collection in St. Kitts and Nevis is still in its primitive stages and only completed on an "as needed" basis. There is currently no formalised system for data collection as it relates to the preparation of reports to United Nations Framework Convention on Climate Change (UNFCCC) which would include the National Communications (NCs), Biennial Update Reports (BUR), Biennial Transparency Reports (BTR), Nationally Determined Contributions (NDCs) or other regular reporting requirements of the UNFCCC.

Government ministries and Government-owned facilities, such as the power utilities should be the primary coordinators of energy data and data collection practices. There is currently a lack of coordinated and regular data collection practices, which creates several data gaps as data for one sector can be stored in various ministries or sometimes not collected or stored. Although some of the data are stored in the ministries, sometimes this data can be difficult to access, as compilation requires time and effort and the format requested is unavailable.

In particular, some energy data is not readily available or not collected and stored. The transport sector in SKN is governed by the Traffic Department and the Inland Revenue Department and sometimes this can pose some confusion on which agency is responsible for the compilation of the data required.

Some of the key data required to complete the UNFCCC reports and modelling requirements are:

1. **Electricity production and transmission and distribution** – This is information on the electricity generation and the losses involved in transmitting and distributing the electricity in SKN. There are two electricity companies, the St. Kitts Electricity Company (SKELEC) on the island of St. Kitts and the Nevis Electricity Company Ltd (NEVLEC) on the island of Nevis. Therefore, data need to be obtained from both utilities to give an accurate account of the electricity generation across the country. For SKELEC this would include generation from the solar farms (currently not operational), solar distributed generation and the diesel generators. For NEVLEC this includes generation from the wind farm, solar farms/solar distributed generation and diesel generators.
   Technical losses can occur during the transmission and distribution of electricity through various factors, including heating, conductor/overhead cable losses, transformers and substation equipment. Non-technical losses are losses due to unidentified or misallocated energy flows, usually electricity that is consumed but not accounted for in the billing system. In many countries, this data can also be obtained through the utility reports and the central statistics division or from energy balances produced from the Energy Divisions but in the case of SKN, data is still obtained directly from the utilities.

2. **Energy Consumption –** This is information on the energy consumption patterns. This can be across the different sectors such as residential, commercial and industrial. It also involves

electricity and non-electricity consumption such as liquified petroleum gas (LPG) used for cooking and water heating, and the consumption in the transport sector of diesel and gasoline. The electricity consumption data in SKN is obtained mainly from the utility companies through their electricity sales data. Electricity consumption parameters also include consumption/load curves, peak loads and other consumption patterns which are usually collected by the utilities.

Data related to LPG consumption and the transport sector are usually obtained from the energy balances[1]. The data related to energy consumption in the transport sector is not currently collected on a regular basis, this data can be obtained from the fuel providers on the island.

3. **Fuel Imports –** SKN is a non-producing oil nation and therefore all fuel is imported into the country. This fuel is used in the electricity sector for utility generators, generators owned by households, commercial entities and industries, and in the transport sector. This data is essential for greenhouse gas (GHG) emissions inventories and mitigation assessments. Data of this nature is normally obtained from the energy balances of a country. Normally in Caribbean countries, this data is mainly obtained from the Customs and Excise Departments. Unfortunately in SKN there exists NDAs between fuel importers and the Customs and Excise Departments which prevents the release of sensitive data to competitors and therefore inhibits the accessibility of this data by the Ministry responsible for Energy.

4. **Renewable Energy Potential –** This involves studies and assessments on the potential for renewable energy (wind, solar, geothermal) and any installed renewable energy systems in the country. In SKN this data is mainly available from the power utilities. Studies of this nature are normally available in the various Government ministries responsible for investment, finance, or the environment.

5. **Transport-related data –** This is information on the number of vehicles, type, age, mileage/distance travelled per year, fuel type and other data related that can be collected. This data is normally found in the transportation departments where the statistics related to transport are stored. In SKN, two agencies are responsible for transport-related data, the Inland revenue department accountable for receiving the registration fees and the Traffic Department for all other related data. There is a lack of coordination between the two departments related to the data stored with each agency, leading to possible misdirection when data is required to be collected. In addition, the level of disaggregated data necessary for modelling and projections is not necessarily available.

1. [1] This ICAT project it focuses mainly on the electricity and transport sectors, so therefore analysis of LPG consumption was not analysed.

6. **Demographic Data –** This is statistical information that reflects the country's population and their attributes including age distributions, place of residence, household size and others. This information is usually found in a central statistics database and is collected from surveys and census data. Census data is normally collected every ten (10) years and therefore there may be limitations in the quality of data for non census years if estimations and projections are not performed. St. Kitts and Nevis Department of Statistics coordinates this information, and most of the updated information is available on their website stats.gov.kn. This information is normally used as drivers for the projections in modelling the energy sector.

7. **Macroeconomic Data –** This statistical information demonstrates the country's economic performance through Gross Domestic Product (GDP) totals and other attributes through the sectoral GDP and others. St. Kitts and Nevis Department of Statistics coordinates this information, and most of the updated information is available on their website stats.gov.kn. This information, similar to the demographic data is used as drivers for projections in modelling the energy sector.

8. **Greenhouse Gas Emissions Data –** This is information related to the GHG emissions for the sector. This data is analysed annually based on activity in the country and reported on a biennial basis or every four years. St. Kitts and Nevis recently published their BUR in 2023, in which the inventory chapter reported emissions for the energy sector from 2008 to 2018. The ministry with responsibility for the Environment is usually responsible for reporting requirements to the UNFCCC and therefore responsible for emissions data.

3 Data Management and Institutional Arrangements

Data management and defining the institutions responsible for this data is key to effectively meeting reports requirements of SKN to the UNFCCC under the Enhanced Transparency Framework. SKN is gradually transitioning towards more integrated data systems with enhanced accessibility. While this transition is occurring, it is important that the following is taken into consideration:

Data accessibility and integration: It is essential that energy-related data and information are made available to policymakers and the general public through online platforms and annual reports. It is also important that efforts to integrate various data streams, such as fuel consumption across the transport and electricity sector be made. This will support the development of a comprehensive overview of the energy sector. St. Kitts and Nevis' NDCs are heavily focused on the energy sector and therefore information related to this sector needs to be accessible to as many as possible involved in the implementation of the NDCs.

Capacity Building: The development of human resources through trainings and workshops to enhance capacity in data collection, management and analysis at the various ministries, departments and institutions is essential. The enhancement of local capacity in these areas are critical to the implementation and tracking of St. Kitts and Nevis NDCs.

Table 1 below describes the suggested institutional arrangement for data management for the energy sector. This table will support the capacity-building efforts and also help efforts with data accessibility for the general public.

Table 1: Suggested Institutional Arrangements for Data Collection and Data Management for the Energy Sector

Data Areas	Lead Responsible Entity	Role	Other Responsible Entities	Role
Electricity production and transmission and distribution data	SKELEC and NEVLEC	These are two main utilities in St. Kitts and Nevis and their main responsibilities are to collect the necessary data and ensure they are analysed and reported	Ministry with responsibility for Energy	To collate the information reported by SKELEC and NEVLEC in the annual energy balances.
Energy Consumption	Ministry with responsibility for Energy	Ensure that data related to energy consumption are reported across the energy sector. Include this data in	SKELEC, NEVLEC, Fuel Retailers	Provide information to the ministry with responsibility for energy on energy consumption in the various

Data Areas	Lead Responsible Entity	Role	Other Responsible Entities	Role
		annual energy balance reports.		energy subsectors.
Fuel Imports	Ministry with responsibility for Energy	Ensure that data related to fuel imports are collected and reported, in particular in the annual energy balance reports	SKELEC, NEVLEC, Fuel Importers, Department of Statistics, Customs and Excise	Provide fuel import information to the ministry responsible for energy
Renewable Energy Potential	Ministry with responsibility for Energy	Provide studies, projects, and future plans and assessments as it relates to renewable energy	Ministry with responsibility for the environment, Public Sector Investment Programme (PSIP), Ministry with responsibility for Economic Affairs	Support the Ministry with responsibility for energy in the collation of the related projects, plans and assessments related to renewable energy
Transport-related data	Ministry with Responsibility for Transport	Collate and analyse the necessary data related to the transport sector	Ministry with responsibility for Energy, Traffic Department, Inland Revenue Department, Customs and Excise Department	Support the ministry with responsibility for transport in the collection of data. Ministry with responsibility for energy should ensure that energy consumption data for the transport sector is reflected in the energy balances.
Demographic Data	Department of Statistics	Collect the necessary data related to population including projected population data,	Ministry with responsibility for Energy	Collaborate with the Department of Statistics to ensure that related energy data is collected in the surveys.

Data Areas	Lead Responsible Entity	Role	Other Responsible Entities	Role
		through surveys and census data		
Macroeconomic Data	Department of Statistics	Collect the necessary data related to the economy	Department of Economic Affairs, Ministry of Finance	Support the data collection by the Department of Statistics
Greenhouse Gas Emissions Data	Ministry with responsibility for the Environment	Prepare national inventory reports with emissions for the energy sector	Ministry with responsibility for Energy	Support the development of national inventory reports with the preparations of energy balance reports

4 Data Gap Assessment

St. Kitts and Nevis have made much progress in the development of their data collection practices for the energy sector. Despite this there still exist some data gaps which may hinder comprehensive policymaking, planning and tracking of progress especially related to the NDCs. This section highlights some of the major gaps that still exists as it relates to data in the energy sector. More detailed information related to the availability of data in the energy sector can be found in the **Appendix.**

- **Lack of Granularity**
  - ***Transport-related data*** – Although there is access to some data related to the transport sector, the level of detail available is still very limited. In St. Kitts and Nevis, the vehicles are inspected annually and registered. The registration information of all vehicles is stored at the Traffic Department and the Inland Revenue Department. The registration documents contain the type of vehicle, the manufacture year and engine size among others. Although this data is stored there have been some difficulties in accessing this data, due to technical issues with storage. In addition, there is no mandate to collect mileage data, as it is not an indicator of road worthiness in SKN, therefore, data associated with distanced travelled or mileage is not consistently collected. As a result of these difficulties, the disaggregation vehicles by type and age with associated mileage is very difficult.
  - ***Demographic data –*** Data is available on the population size but there is lack of data on projections for the populations and household sizes.
  - ***Macroeconomic data –*** Data related to projected GDP, GDP per capita and sectoral GDP are unavailable. These data may not be absolutely necessary for mitigation assessments but do represent a lack of granularity in the available GDP data.
- **Incomplete Data**
  - ***Renewable Energy Data –*** Insufficient data on the potential and performance of renewable energy sources, which may hinder the development of modelling of the potential for use of these resources.
  - ***Historical Data –*** St. Kitts and Nevis does not have an adequate archiving system and therefore, historical data is difficult to access. In addition, due to the limited data management system, this data has not been collected over the years.
  - ***Cost Data –*** Some cost data supplied for the energy sectors, data relating to costing for operations and maintenance is still limited in the country.
  - ***Emissions Data –*** Emissions data for years after 2018 are currently unavailable.
  - ***Recycling data –*** Limited data on recycling available, in particular, no data on metal recovery from vehicles is available.
- **Energy Balances**
  - St. Kitts and Nevis have energy balances completed for the years 2010-2012 but since then, no new energy balances have been completed for the country.

5 Recommendations for Improvements

There is a concerted effort in St. Kitts and Nevis to improve data collection and management across all sectors including the energy sector.This report provides recommendations to address data gaps in the energy gaps, in particular, relevant to this project and improve data-driven decision-making in the energy sector.

1. **Enhanced Data Collection Activities:** The ministry with responsibility for energy in collaboration the ministry with responsibility for the environment should take the lead for enhanced data collection activities to improve the granularity of data collected and the frequency of data collection. It is recommended that the ministry invest in the production of annual energy balances which will contain most of the information necessary for the energy sector. In addition, energy balances contain the bulk of the information necessary for estimating emissions in the energy sector and are key component for modelling and projections for the sector.

2. **Strengthen/Develop Data Management Systems:** Data collection and data management must be done in conjunction with each other. Therefore, it is important that data management systems be initiated to ensure integration, accessibility and security of the data for the energy sector. It is recommended that this data management system be done in collaboration with the Department of Statistics, and the ministries with responsibility for energy, the environment and climate action.

3. **Capacity Development:** Capacity development should be considered as a continuous, ongoing effort with data collection and management. Data collection in its initial stage can begin very primitively but with continuous application more advanced systems can be used. Therefore, it is of critical importance that continuous training is applied and collaboration be done with regional and international partners to enhance capacity in data collection, data analysis and data management.

4. **Studies and Assessments:** It is recommended that studies and assessments be conducted to fill priority or critical gap areas. These include disaggregating data related to the transport sector, such as the type and age of vehicles and cost data for the energy sector. In addition, studies on renewable energy potential should be conducted on the island of St. Kitts and assessments of the solar farms be conducted and shared.

5. **Legislation:** It is recommended that legislation be placed to address data collection, particularly to support the data collection in areas where there are clear hindrances and also support data security and privacy. This would support data access and transparency for use by researchers, policymakers and data compilers. This would help support fuel import data acquisition which is essential for greenhouse gas inventory and mitigation assessment. In addition, clear guidelines and data requirements for data collection can be implemented for specific transport and energy data.

6 Conclusion

As a SIDS, St. Kitts and Nevis have made tremendous strides to improve data collection and management in the energy sector, however, although the data in the electricity generation subsector has improved, there are still gaps in the transport and other aspects of the energy sectos. Data collection and data management systems still need to be established in the country. These gaps can be addressed through the recommendations highlighted in the previous sections. Addressing these gaps is essential for sustainable development, tracking and implementation of NDCs and supporting an informed policymaking Government.

This report is one of the first initial assessments of the data gaps in St. Kitts and Nevis and overall provides a strong basis for understanding SKN's current status in data collection and management for the energy sector and the outlined recommendation offer a path towards a more robust and integrated data system. This document should serve as a foundational document for stakeholders involved in the energy sector, guiding efforts to more resilient measurement, reporting and verification (MRV) systems.

7 Appendix

General Data Requirements for Modelling Tools

Data Requirements for Transport and Energy Sector Modelling in St. Kitts and Nevis

This document outlines the data requirements for modelling of St. Kitts and Nevis' Energy and Transportation sectors in the LEAP & TraCAD modelling software.

Where possible, data should be obtained annually for consecutive years and locally sourced data would be ideal.

Data Received & Outstanding

Description/Category	Data Received	Outstanding Data Gaps	Source
Demographic data	Population (historical for years 2011 & 2021)	***Population (historical for years 2012 – 2020, projected for years 2022 – 2030)***	***Department of Statistics***
	Average household sizes (historical)	***Average household sizes (projected)***	***Department of Statistics***
Macroeconomic data	Gross Domestic Product (GDP) (*historical and projected to 2030*) GDP Growth rates (historical & projected to 2030) GDP per capita (historical & projected to 2030) Sectoral GDP / GDP by Economic Shares (historical & projected to 2030)	***N/A***	***Department of Statistics***

Description/Category	Data Received	Outstanding Data Gaps	Source
General Energy Sector Data *[Received data up to 2021 from previous project]*	Current and historical installed capacities of power plants including generator sizes (MW) [Maximum amount of electricity that each power plant can produce] Capacity of renewable energy sources (GJ/Year, MWh) Historical generation (GWh) for each major type of power plant/energy source Average energy efficiencies/heat rate for each power plant/energy source Seasonal load shape for electricity distribution (e.g. MW hourly peak load) Cost of electricity Capital, fixed and variable operating and maintenance costs ($/MW) of each major type of power plant	***N/A***	***SKELEC/NEVLEC*** ***SKELEC/NEVLEC***
Transportation Sector data	Raw vehicle stock data (2019 – 2023)	***N/A***	***Inland Revenue Department/ Traffic Department***

*****See tables below for additional data requirements*****

General Data Requirements for *both LEAP & TraCAD* (Additional to data already received):

Description/Data category	***Data Requirement***	***Outstanding Data Gaps***	***Source***
Demographic data	• Population (***historical for years 2012 – 2020, projected for years 2022 – 2030***)	N/A	Department of Statistics
General Energy Sector Data	• Transmission and Distribution Losses (**technical**) (*losses that occur within the distribution network due to cables, overhead lines, transformers, mainly technical equipment*)	N/A	SKELEC/NEVLEC
Transportation Sector Data *Should be obtained (where applicable) for all transportation fuel types and modes which are used in St. Kitts and Nevis)*	• Vehicle sales (*number of vehicles sold per type of vehicles*) (national totals) • Fuel types and specific fuel consumption per vehicle type • Vehicle annual mileage (average annual distance travelled per type of vehicle) (*can be a result of a survey or estimated numbers*) • Fuel economy for each type of vehicle [litres/km] (*for electric vehicles average electricity consumption per distance travelled*) • Costs of vehicles by type (cars, SUVs, truck etc) and fuel use (gasoline, diesel,	Data imports are easily accessible but sales data from car dealers are not collected Data not readily available Data not collected Data not collected Data not readily available	St. Kitts and Nevis Customs Department, Department of Statistics, Traffic Department and Inland Revenue Department

Description/Data category	Data Requirement	Outstanding Data Gaps	Source
	electric, hybrid) • % share of vehicles per category (commercial vehicles, government, personal) or vehicle stock per category	Data not readily available	
Policy/Scenario Assumptions	• Any policies related to the transport and energy sectors	N/A	

The Low Emissions Analysis Platform (LEAP) is a Windows-based GHG modelling software used for energy policy analysis and climate change mitigation assessment. It can be used for energy sector modelling as well as transport sector modelling. This includes modelling the deployment of electric vehicles in the transport sector and assessing the interdependency between the transport and energy sectors.

The table below describes the additional input data requirements for the LEAP model (energy and transport sectors):

Additional data requirements for LEAP:

Description/Data category	Data Requirement	Outstanding Data Gaps	Source
Demographic data	• Population growth rates ***(historical & projected)***	Projections from census data not completed	Department of Statistics
General Energy Sector Data	• National energy balances from **2018 - 2023** (*data on energy consumption and production by sector or sub-sector*)	No available data.	Ministry of Public Infrastructure, Energy and Utilities; Domestic Transport; Information, Communication and Technology; and Posts

Description/Data category	Data Requirement	Outstanding Data Gaps	Source
	• Documents describing national energy policies and plans and GHG mitigation assessments for the country from **2021**	None	All ministries
	• Fuel costs ($/GJ) of each major type of power plant	Data available within utility companies.	SKELEC, NEVLEC
	• Cost of Generators (*capital cost of the generators*)	None	SKELEC, NEVLEC
	• Fuels for power plants (*the different fuels used in the power plants*)	None	SKELEC, NEVLEC
	• Transmission and Distribution Losses (**non-technical**) (*Losses attributed to unidentified or misallocated energy flows. Electricity that is consumed but not billed*)	None	SKELEC, NEVLEC
	• Documents detailing capacity expansion plans which describe anticipated power plants to be built (any planned decommissioning of generators, planned expansion of generating systems)	Data not available after 2030 for SKELEC, Limited Data NEVELC	SKELEC, NEVLEC
Transportation Sector Data *Should be obtained (where applicable) for*	• Total fuel sales for vehicles (if available)	No data from car dealers	St. Kitts & Nevis' Customs Departments, Department of Statistics

Description/Data category	Data Requirement	Outstanding Data Gaps	Source
all transportation fuel types and modes which are used in St. Kitts and Nevis)	• Information on import of used vehicles (including type and age)	Not readily available	Traffic Department, St. Kitts & Nevis' Customs Departments
	• National statistical reports or other sources of data on passenger-kms and tonne-kms	No data available	Department of Statistics
	• Vehicle life cycle profile / Average age of vehicle stock in the country	Data not readily available	Traffic Department, Inland Revenue Department, Department of Statistics.
	• Fuel costs per type (gasoline, diesel, etc.)	Data not readily available	Ministry of Finance
	• Overall fuel consumption if energy balance is not available	Data not readily available	Department of Statistics, Ministry of Public Infrastructure, Energy and Utilities; Domestic Transport; Information, Communication and Technology; and Posts
	• Scrappage fraction of vehicles (*The percentage of vehicles can be scrapped or reprocessed for another use or recycled*) and the value if available	Data not readily available	Recyclers,
	• EV battery nominal capacity (kWh/vehicle)	Data not readily available	EV dealers
	• Charging infrastructure (number)	No data available	

Description/Data category	Data Requirement	Outstanding Data Gaps	Source
Policy/Scenario Assumptions	• Import taxes • Subsidies/taxes for all vehicles • Renewable energy targets • Any vehicle emissions standards	Data not readily accessible	St. Kitts & Nevis' Customs Departments, Ministry of Finance

ICAT TraCAD (Transport Climate Action Data) Tool was developed by the International Climate Initiative (IKI) and the ClimateWorks Foundation to assess the impacts of transport sector policies and measures on greenhouse gas emissions and other environmental and socio-economic factors.

The TraCAD tool requirements are typically based on the methodology used, which is chosen based on the climate actions to be modelled. The data requirements below are separated based on the different modules within the tool.

Additional data requirements for TraCAD:

Description	Data Requirement	Outstanding Data Gaps	Source

Climate Action Module
 	
Collects transport sector mitigation actions from various parties; Maps mitigation actions under the commitments of NDC.
	• Details related to specific climate actions
	  ○ Scope of climate action; Status of climate action
	  ○ Proposed date of commencement of action
	  ○ Duration
	  ○ Objective
	  ○ Outcomes and sustainable development
		• None	• All ministries

Description	Data Requirement	Outstanding Data Gaps	Source
	benefits ○ Implementing entity, executing entity, parties involved, beneficiaries ○ Financial background/details – donors, investors, funding organization, etc.		
GHG Impact Assessment Modules *Conducts the GHG impact assessments; This would be the most relevant module for visualizing EV Decarbonization targets ex-ante & ex-post*	• Net calorific value for different fuel types (diesel, gas) • CO_2 emission factors for different fuel types and vehicle types (tCO_2/TJ, tCO_2/kWh) [gas, diesel, electric] • Average occupancy rate of transport mode (persons per vehicle) • Share of passengers by transport mode (%) • Fuel densities (petrol, gas) ******Other requirements can be found in the general data requirements table. ******	Not available. Not available. Data not collected/readily available. Data not collected/readily available. Data not readily available.	Department of Statistics, Ministry of Finance

Description	Data Requirement	Outstanding Data Gaps	Source
MAC Module (Marginal Abatement Cost) *Assesses additional costs associated with climate actions; Ranks climate actions according to MAC value, emission reduction and total additional cost*	• Emissions reduction attributed to mitigation action (Output from previous analysis) • Cost-related data of the mitigation action ○ Any existing vehicle taxes (pre-climate action implementation) [per fuel type] ○ Vehicle taxes post-implementation (assumptions or current plans) [per fuel type] ○ Average vehicle retail price (inclusive & exclusive of taxes) per fuel type ○ New vehicle sale price ○ Total investment ($) ○ Annual O&M ($) ○ Annual fuel costs ○ Other annual costs	Data not readily available.	Ministries with responsibility for energy and transport, utility companies, Inland Revenue Department, Customs Departments, Ministry with responsibility for Climate Action and the Environment

8 Annex

1. Inception Meeting Report
2. Modelling Selection Tool Meeting Report