Initiative for Climate Action Transparency

Report presenting the overarching institutional arrangements and recommendation for national reporting for the Electricity Generation and Transport Sectors

St. Kitts & Nevis

21st January, 2025

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

Prepared by:
Caribbean Cooperative Measurement, Reporting & Verification Hub

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PREPARED UNDER

The Initiative for Climate Action Transparency (ICAT), supported by Austria, Canada, Germany, Italy, the Children's Investment Fund Foundation, and the ClimateWorks Foundation.

The ICAT Secretariat is managed and supported by the United Nations Office for Project Services (UNOPS)

Institutional Arrangements for the Electricity Generation and Transport Sectors
Initiative for Climate Action Transparency – ICAT

Deliverable L – Output 2.3.2

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21st January, 2025

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ACRONYMS

BUR	Biennial Update Report
BUR1	First Biennial Update Report
CCMRVH	Caribbean Cooperative Measurement, Reporting and Verification Hub
CO2	Carbon Dioxide
CSI	Climate Smart Initiative
DSA	Data Sharing Agreement
EV	Electric Vehicle
GCF	Green Climate Fund
GEF	Global Environment Facility
GWP	Global Warming Potential
ICAT	Initiative for Climate Action Transparency
LEAP	The Low Emissions Analysis Platform
MOU	Memorandum of Understanding
MRV	Measurement, Reporting and Verification
NC	National Communication
NDC	Nationally Determined Contribution
NEVLEC	Nevis Electricity Company
QA	Quality Assurance
QC	Quality Control
RE	Renewable Energy
SIDS	Small Island Developing State
SKELEC	St. Kitts Electricity Company
SKN	St. Kitts and Nevis
SNC	Second National Communication
SOW	Scope of Work
TOR	Terms of Reference
TraCAD	The Transport Climate Action Data Tool

1 Introduction

1.1 Project Background

The Twin Island Federation of St. Kitts and Nevis (SKN) is a sovereign Small Island Developing State (SIDS) in the Eastern Caribbean. The island is committed to implementing measures to combat the negative impacts of climate change through the implementation of its Nationally Determined Contributions (NDCs). SKN has identified the following key areas as major interventions that contribute to their overall economy-wide emissions reduction strategies in their updated 2021 NDCs:

- 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 EV infrastructure

To support the implementation of their NDCs, the country is participating in the Initiative for Climate Action Transparency (ICAT) project. The Initiative for Climate Action Transparency (ICAT) aims to help countries better assess the impacts of their climate policies and actions and fulfil their transparency commitments. This is executed by increasing the overall transparency capacities of countries, including the capacity 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. ICAT capacity development efforts are established to reinforce existing climate measurement, reporting and verification (MRV) systems and knowledge within countries and complement previous or ongoing activities by other initiatives.

The Government of SKN has undertaken this ICAT project to design an MRV and NDC Tracking Framework and to establish the sustainable capacity to conduct projections and mitigation of GHG emissions and removals and assessments of the impact of key policies and measures for the electricity generation and transport subsectors.

The project involved the following:

- The review of modelling tools available for the Energy Sector and the selection of appropriate modelling tools for the greenhouse gas (GHG) analysis of the Energy Sector. The process of this selection was highlighted in the SKN Modelling Tool Workshop Report and SKN Modelling Tool Justification Report also contained in **Annex 1** of this report.
- Training workshops virtual and in-person on the modelling tools selected for analysis: The Transport Climate Action Data Tool (TraCAD) developed by the Climate Smart Initiative (CSI) (virtual training) and the Low Emissions Analysis Platform (LEAP) developed by the Stockholm Environment Institute (SEI) (in-person training). This process is highlighted

in the TraCAD Training Report and the LEAP Training Report, also contained in **Annex 2** of this report.

- Data collection management and data gap assessment for the energy sector. This process is highlighted in the Data collection and management and data gap assessment report, also contained in **Annex 3** of this report.
- The development of fully elaborated models for the electricity generation and transport subsectors using the selected modelling tools TraCAD and LEAP with the datasets obtained and methodology for projections report.
- Validation workshop for the methodology for the projections where the data used for the projections and the methods were presented to stakeholders for validation and verification.
- Development of NDC Tracking training, including a report on NDC tracking tool and development of NDC Indicators, including data gaps. These reports can be found in Annex 4 of this report.

1.2 Purpose of the report

The purpose of this report is to provide a detailed overview of the institutional arrangements for SKN' MRV Framework including the NDC reporting requirements . Accurate GHG emissions and NDC indicator data tracking reporting is crucial for meeting international obligations, such as those under the Paris Agreement, which aims to limit the rise in global temperature. Through this initiative, SKN shows a continued commitment to ensuring that the data reported is both credible and actionable, aligning with global climate goals and ensuring institutional memory is maintained for future reporting cycles.

This report on the Institutional Arrangements for the electricity generation and transport subsector is presented in the following sections:
Section 2 – Background on Institutional Arrangement
Section 3 – Overview of Previous Institutional Arrangements
Section 4 – Overview of Recommended Institutional Arrangements
Section 5 – Implementation of Institutional Arrangements
Section 6 – Conclusion

1.3 Background on Institutional Arrangements

Institutional arrangements in the context of climate reporting refer to the formal structures, processes, and systems established to coordinate, manage, and implement the specific tasks and policies within an MRV System. It outlines how different entities—such as government ministries, agencies, private sector stakeholders, and experts—work together to collect, analyse, and report data on greenhouse gas (GHG) emissions and other NDC-related indicators

These arrangements define clear roles and responsibilities, ensuring that all parties involved contribute effectively to tasks such as data collection, validation, quality control, and reporting. They also help establish regular communication, coordination, and oversight, which ensures that the data produced is reliable, consistent, and aligned with both national priorities and international commitments, such as those under the Paris Agreement. Strong institutional arrangements are crucial for sustaining long-term reporting processes and improving the quality and transparency of climate action reporting. The transition to the ETF will require SKN to expand the scope and detail of its climate reporting, posing new challenges in terms of resources and coordination. A dedicated team of national experts must consistently engage in data collection, analysis, and reporting. This process also requires cooperation across a broad range of stakeholders to ensure that data informs national decision-making. Institutional arrangements provide many long-term benefits by equipping decision-makers with accurate, up-to-date information on climate progress and goals, aligning actions with national development strategies, and fulfilling international reporting requirements.

The institutional arrangements outlined in this document are tailored to SKN's circumstances and strengthen the NDC reporting requirements, ensuring coordination across sectors, capacity-building for national experts, and implementing rigorous quality assurance measures.

2 Overview of Previous Institutional Arrangements

Historically, SKN used a decentralized project-based MRV system to meet international climate change-related reporting obligations. This approach utilised regional and international consultants to plan and execute the associated reporting activities, which led to difficulties in retaining institutional memory of the methodologies, datasets and documentation on the expert judgement applied in the submitted reports. Due to these disadvantages, a centralised project-based MRV system was implemented for the preparation of the national inventory reports (NIR) for the BUR1 and TNC.

The institutional arrangements for the NIR of the TNC and BUR reports identified the Ministry of Environment and Cooperatives as the lead institution coordinating and managing the entire inventory process from the early stages of data collection to submission of the report. Private consultants were hired to identify key stakeholders in GHG data collection, compile the GHG inventory data, validate, conduct capacity-building activities and produce the NIR.

Error! Reference source not found. shows the institutional arrangements used for the energy sector f or the TNC and BUR reports and the relationship between the consultants and the domestic team.

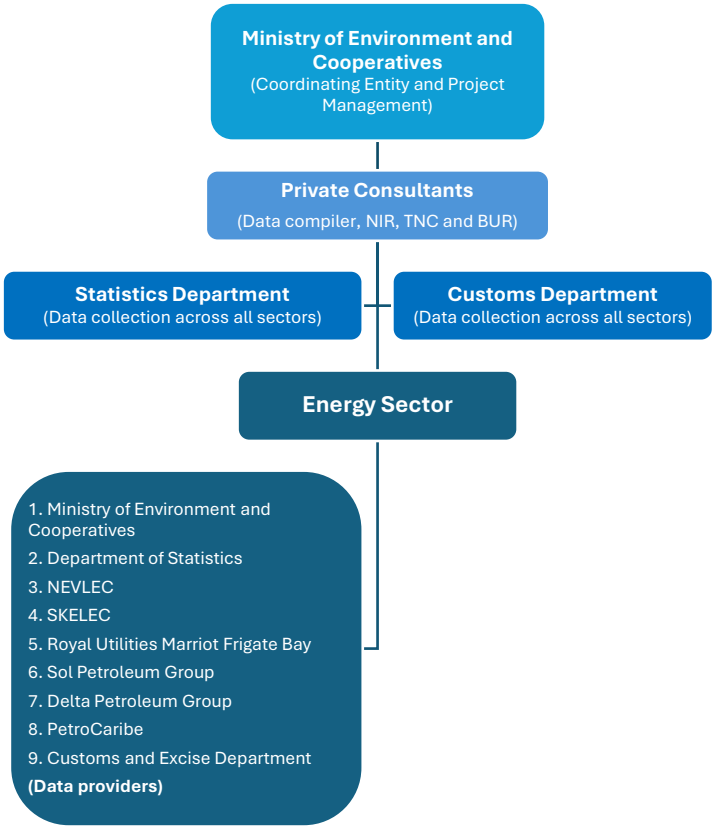

Figure 1 Institutional arrangements for the St. Kitts and Nevis Third National Communication and First Biennial Update Report

The Ministry of Environment and Cooperatives was subsequently renamed the Ministry of Environment, Climate Action and Constituency Empowerment.

At the time of writing this report, the ministry with responsibility for the environment and the UNFCCC Focal Point with responsibility for ensuring SKN fulfills its international climate change reporting obligations is the Ministry of Environment, Climate Action, and Constituency Empowerment. This ministry is led by Minister Honourable Senator Dr. Joyelle T. Clarke and structured into three departments: (i) the Department of Environment, (ii) the Climate Action Unit, and (iii) the Department of Constituency Empowerment. The Climate Action Unit, a newly formed unit in the Ministry, was tasked with the responsibility for coordinating the NCs, and BTRs, which include the coordination of the national GHG inventory report and the NDCs.

Data collection for the energy generation and transport subsectors occurs on a needs-based and ad-hoc basis across institutions without the formal identification of a central data collector and compiler for reporting purposes. **Figure 2** shows the current data flows between the key organizations. The Climate Action Unit recently formed within the Ministry of Environment and the Department of Public Transport are not depicted within these data flows as they are newly constructed units and departments that are just being established.

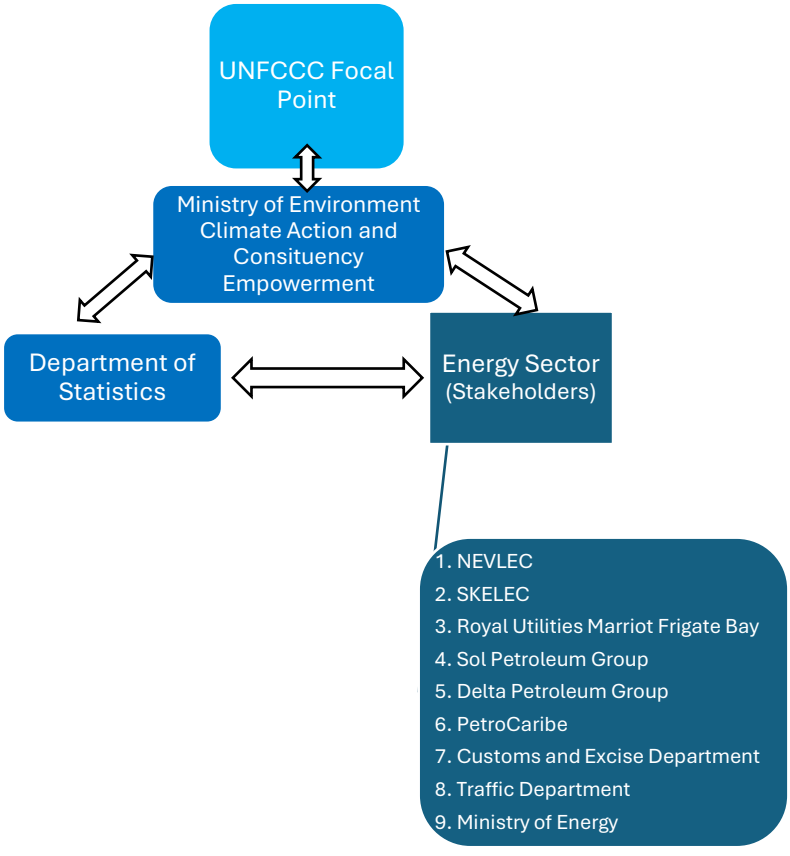

Figure 2 Current SKN GHG data flows

3 Overview of Recommended Institutional arrangements for the electricity generation and transport subsectors

The transition to the ETF presents an opportunity for SKN to benefit from improved institutional arrangements. These arrangements will strengthen the country's ability to meet more demanding climate change reporting requirements, which involve extensive data collection, analysis, and continuous updates.

Strong institutional arrangements establish clear roles and responsibilities for all stakeholders involved, support a steady and ongoing data flow, involve national expertise, promote coordination among institutions, and generate recurring, engaging, and progressively improving results. This helps the efficient management of national reporting teams and encourages accountability. This process will also support the generation and sharing of reliable and comprehensive data, crucial for both national decision-makers and the reporting obligations outlined in the Paris Agreement. For SKN, this will enable better climate action planning, alignment with sustainable development goals (SDGs), and aid the securement of investments by providing decision-makers and funders with ongoing, accurate data.

To fill the human resource and technical capacity gaps faced, it is recommended that a project-based or consultancy approach is taken to meet SKN's UNFCCC reporting requirements with an effort to transition to a more centralised approach through capacity-building of national expertise over time. In this approach, the Ministry of Environment, Climate Action and Constituency Empowerment is responsible for hiring the necessary consultants which provide technical support to and are managed by the Climate Action Unit. The Climate Action Unit is also given the overall responsibility of overseeing data integration from the data collectors and data compilers, and compliance with QA/QC procedures within the ministry. The data providers comprise the various agencies and government departments that collect, store or process data related to electricity generation and the transport sector. **Figure 3**Error! Reference source not found. illustrates the recommended institutional arrangements and data flows.

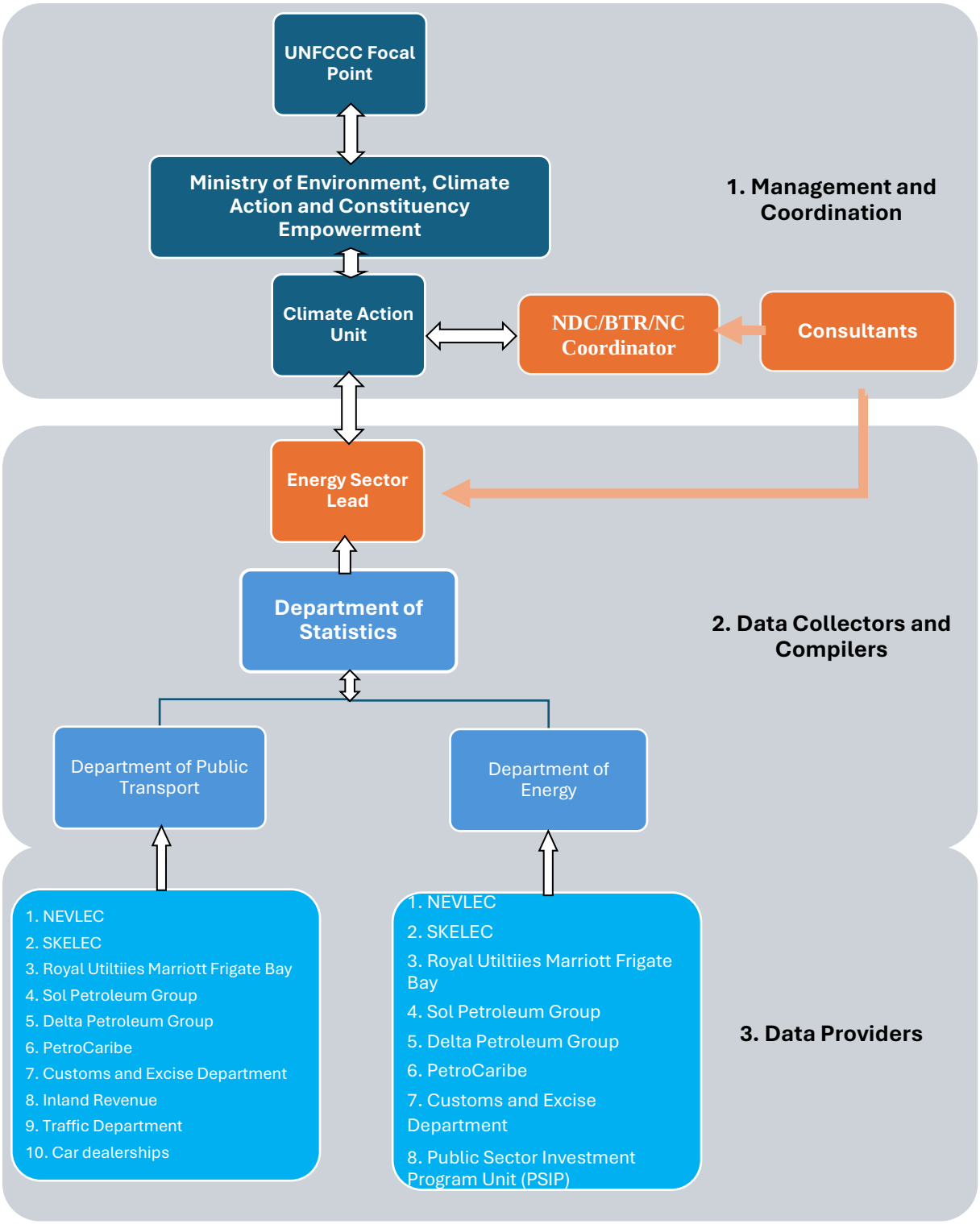

Figure 3 Institutional arrangements for the St. Kitts and Nevis Energy sector

3.1 Management and Coordination

The Ministry of Climate Action, Environment, and Constituency Empowerment serves as the overall manager of the MRV system as relates to NDC tracking and the NIR. This includes hiring consultants to fill technical capacity and human resource gaps and ensuring the allocation of funds for the development of the national reports. Within this ministry the Climate Action Unit is responsible for coordinating the aforementioned reports and submitting them to the UNFCCC Focal Point while UNFCCC Focal Point is responsible for submitting the final NDC, BTR and NC reports to the UNFCCC Secretariat. The Climate Action Unit is responsible for establishing the report preparation timelines, calculating the budget, and managing consultants hired for the roles of NDC/BTR/NC Coordinator and Energy Sector Lead. It is recommended that the **NDC/BTR/NC Coordinator** works within the Climate Action Unit to support the Energy Sector Lead in data compilation and stakeholder engagements, ensures quality assurance and quality control checks occur, and reviews the reports. The Climate Action Unit should hold the overall responsibility for data archiving and storage of all final data deliverables and reports.

It is also recommended that personnel involved in the Management and Coordination of the national reporting system for the electricity generation and transport subsector have an understanding of the UNFCCC reporting requirements to meet SKN's obligations as a signatory to the Paris Agreement.

Table 1 show the current roles and responsibilities of the Management and Coordination entities. The data compilers and collectors are the first point of data validation as outlined in the SKN MRV Framework.

Table 1 Management and Coordination of the SKN Energy Generation and Transport Subsector GHG Inventory - Roles and Responsibilities

[1]Management and Coordination	**Ministry of Climate Action, Environment, and Constituency Empowerment**		
	Minister: Honourable Senator Dr. Joyelle Clarke		
	Permanent Secretary and UNFCCC Focal Point		
	Colinicia Levine		
	Departments:		
	Climate Action Unit	**Department of Environment**	**Department of Constituency Empowerment**

	Responsibilities	Coordinating climate change matters, including NDC, BUR/BTR and NC reports.	Leads on preservation, conservation and protection of the natural ecosystems, which includes leading on biodiversity, forestry and land degradation matters	Community based and driven activities
	Director	Ms. Cheryl Jeffers	Mr. Derionne Edmeade	Ms. Kelvina Slaters
	Contact Person	Ouerika Lennon-Petty – Programme Management Officer – Contact Person	Kashief Hynes – Conservation Officer	
	Consultants	To be determined on a case-by-case basis		

3.2 Data Collectors and Compilers

The **Energy Sector Lead,** with support from the Climate Action Unit and NDC/BTR/NC Coordinator, is responsible for the energy generation and transport subsector's data compilation, GHG inventory and associated reports. It is recommended to establish the role of Energy Sector Lead and fill the position with a consultant or team of consultants who will compile the GHG and NDC related data and estimate the sector's GHG emissions inventory and NDC tracking data in conjunction with capacity-building activities to enhance national technical expertise. The Energy Sector Lead (private consultant) is encouraged to work closely with the Statistics Department. The Statistics Department is recommended to serve as the main national data collector and central hub for transport and electricity-generation data. It is recommend to establish formalised arrangements with stakeholders in the energy sector contributing to this data collection process as this will support the data collection in a timely manner.

The Department of Statistics, within the Ministry of Sustainable Development, which currently shares the same minister with the Ministry of Climate Action, Environment and Constituency Empowerment serves as the main data hub for the energy generation and transportation subsectors. It is essential that the Department of Statistics has established relationships with the Climate Action Unit to ensure that data collection and data verification for the subsectors are completed in accordance with the ETF and IPCC guidelines.

The Department of Energy within the Ministry of Public Infrastructure, Energy and Utilities and the Department of Public Transport within the Ministry of Domestic Transport currently share the same Minister and is recommended that these two departments provide support to the Department of Statistics in data collection and validation related to their sectors. It is recommended to establish a data sharing relationship with these departments and the Department of Statistics through an MOU and/or by including this data sharing activity as a specific role taken on by one or more personnel within the departments. **Table 2** shows the roles and responsibilities of these departments.

Table 2: Data Collectors and Compilers of the SKN Energy Generation and Transport Subsector GHG Inventory – Current Roles and Responsibilities

Data Collectors and Compilers	**Ministry of Sustainable Development**		**Ministry of Public Infrastructure, Energy and Utilities; Domestic Transport**	
	Minister: Hon. Senator Dr. Joyelle Clarke		Minister: Hon. Konris Maynard	
	Permanent Secretary			
	Sherilita Dore- Tyson		Daryll Lloyd	
	Departments:			
		Department of Statistics	**Energy Unit**	**Department of Public Transport**
	Responsibilities	Develop and manage an integrated, harmonised and coordinated National Statistical System which generates adequate, relevant, coherent, timely and quality statistics to meet national, regional and international data needs (Department of Statistics, Ministry of Sustainable Development. n.d.).	Collect and Compile data relevant to the energy sector, including the preparation of energy balances	Collect and compile data relevant to the transport subsector.
	Director	Carlton Phipps	Bertille Brown	Not Assigned

	Contact person	Sherise McKoy-Wilkin - Statistician	Denasio Frank – Energy officer	Michelle Buncome – Transport Officer

3.3 Data Providers

The data providers comprise various agencies and government departments and private sector. They collect, store or process data related to electricity generation or the transport subsector which is submitted and validated by the department of energy and transport and then submitted to the Department of Statistics and shared with the Energy Sector Lead, and the NDC/BTR/NC Coordinator. This data is critical for GHG inventories, emissions projections, and NDC tracking. The data providers include entities such as the utility companies, fuel providers, government departments, and private stakeholders like car dealerships and gas stations,. These entities contribute sector-specific data such as fuel consumption, vehicle numbers, and renewable energy projects, enabling data compilers to process and validate the information for accurate emissions reporting and analysis. Data compilers should ensure data consistency and engage in collaborative efforts to close existing gaps, improving overall data accuracy and reporting efficiency.

The agencies and departments providing data for the electricity generation and transport subsector and their current responsibilities are shown in **Table 3**.

Table 3: Data Providers - of the SKN Energy Generation and Transport Subsector GHG Inventory Current Roles and Responsibilities

	St. Kitts Administration		**Nevis Island Administration**
Data Providers	Ministry of Public Infrastructure, Energy and Utilities; Domestic Transport		Office of the Premier; Ministry of Public Utilities and Energy
	Minister: Hon. Konris Maynard		Minister: Hon Mark Graham Brantley
	Permanent Secretary		**Permanent Secretary**
	Daryll Lloyd		Wakely Daniel
	Departments:		
	St. Kitts Electricity Company (SKELEC)		**Nevis Electricity Company (NEVLEC)**
	Responsibilities	Collect data related to electricity generation (renewables and fossil fuel); data related to consumption by different subsectors (residential, commercial and industrial) disaggregated by fuel type; data related to consumption of electricity by the transport subsector; data related to system losses disaggregated by technical and non-technical losses	
	Director	Clement Williams	Albert Gordon

	Contact persons	Jonathon Kelly – Projects and Renewable Energy Manager in the Energy Transition Unit Haniff Woods – Operations Engineer	Nelson Stapleton – Transmission and Distribution Manager
Data Providers	Ministry of Finance		Ministry of Finance
	Minister: Dr. Terrance Drew		Minister: Hon Mark Graham Brantley
	Financial Secretary		**Permanent Secretary**
	Hilary Hazel		Colin Dore
	Departments:		
	Inland Revenue Department		**Nevis Inland Revenue**
	Responsibilities	Collect data related to the registration of vehicles, vehicle type, fuel use and age of vehicles.	
	Comptroller	Edward Gift	Deputy Comptroller – Eric Haynes
	Contact person	Not assigned	Keeshan Biscette – Senior Valuation Officer
	Departments		
	Customs and Excise Department		
	Responsibilities	Collect data related to imports of vehicles	
	Comptroller	Kennedy De Silva	Cynric Carey – Deputy Comptroller
	Contact person	Cephus Whittaker – Senior Customs Officer	Roger Fyfield- Assistant Comptroller Hurisa Martin – Customs Officer
Data Providers	Prime Minister Ministry		
	Minister: Dr. Terrance Drew		
	Permanent Secretary		
	Glenroy Blanchette		
	Department: National Security		
	Royal St. Christopher and Nevis Police Force – Traffic Department		
	Responsibilities	Responsible for vehicle licenses and collection of data related to annual licensed vehicles, fleet composition, fuel type, distance travelled per vehicle (annually)	
	Commissioner of Police	James Sutton	

	Contact persons	Ray Gordon - Sergeant
Data Providers	Ministry of Sustainable Development	
	Minister: Hon. Senator Dr. Joyelle Clarke	
	Permanent Secretary	
	Sherilita Dore- Tyson	
	Departments:	
	Economic Affairs and Public Sector Investment Planning Unit (PSIP)	
	Responsibilities	Maintenance and monitoring of the Public Sector Investment Programme
	Director	Manners Auren – Senior Project Analyst
	Contact persons	Yazim Leader/ Myrtilla Williams – Project Analyst
Data Providers	**Private Sector Companies**	
	Fuel Providers	
	Companies	
	Sol Petroleum Group Delta Petroleum Group PetroCaribe	
	Responsibilities	Provide data related to import, export and distribution of fuel and fuel products
	Other Generators of Electricity	
	Companies	
	Royal Utilities Marriott Frigate Bay	
	Responsibilities	Provide data fuel use, electricity generation (renewables and fossil fuel) and distribution losses
	Car Dealerships	
	Companies	
	Car Dealership Companies	
	Responsibilities	Provide data related to sales of vehicles by vehicle type

3.4 Implementation of the SKN Institutional Arrangements

To implement the institutional arrangements, it is recommended that robust and comprehensive engagements with stakeholders take place. This involves explaining the structure of the transparency system, consulting stakeholders on the organizational arrangements, roles, and responsibilities, explaining any legal arrangements, mandates or memorandums of understanding

(MOUs), and conducting training on the use of any templates, data collection procedures and QA/QC processes. Discussions should also focus on identifying data gaps and areas where capacity-building is needed. Based on these consultations, a comprehensive plan can be developed to fill gaps, address capacity-building needs and implement the institutional arrangements and accompanying MRV system.

This implementation plan will address several key components:

- Ensuring stakeholders understand their roles and responsibilities in the MRV framework
- Ensuring stakeholders understand the legal frameworks
- Ensuring local experts possess the technical skills to manage and sustain the system
- Ensuring stakeholders understand the data systems for ongoing collection, processing, and analysis
- Ensuring there are opportunities for revision and regular updates to the MRV framework and institutional arrangements as needed and in collaboration with stakeholders to ensure continuous improvement over time

During these discussions, it is essential to outline practical activities, such as data collection, analysis, and report production. Clearly defining the responsibilities of each stakeholder will help clarify their roles and the resources required to carry out the tasks efficiently.
To support the transparency system, a legal framework is recommended and developed through the creation of laws, MOUs, and data-sharing agreements (DSAs). These legal instruments encourage consistent data flows and long-term sustainability of the MRV system.

3.4.1 Consultants' Terms of Reference (ToR)

It is recommended to clearly define the roles, key responsibilities, expected deliverables and manager of the Consultants hired to fill the roles of NDC/BTR/NC Coordinator and Energy Sector Lead (Energy sector GHG inventory compiler).

The suggested responsibilities and qualifications[1] outlined in

[1] Toolkit for Building National GHG Inventory Systems, Institutional Arrangements, Sector Lead Roles and Responsibilities, U.S. EPA (May 2024) https://www.epa.gov/ghgemissions/toolkit-building-national-ghg-inventory-systems#how:~:text=Sector%20Lead%20Roles%20and%20Responsibilities%20%2D%20Energy%20(docx)

Annex 6 serve as a base that can be adapted and expanded to reflect the scope and specific needs of the consultancy and to create the ToR.

3.4.2 Memorandum of Understanding (MOU)

A MOU is a formal agreement between two or more parties that outlines their mutual responsibilities, roles, and expectations for collaboration. In the context of national GHG inventories, an MOU is often used to establish agreements between data providers and the organisation responsible for developing the inventory. This document sets out how the parties will cooperate to ensure reliable data sharing and effective inventory compilation.

A sample MOU[2] is provided in **ANNEX 7**, which can be adapted to outline the roles, responsibilities, and procedures for sharing data needed to compile the energy generation and transport subsector GHG inventory and encourage cooperation between the stakeholders identified in the SKN institutional arrangements and MRV framework.

The MOU includes details such as:

- The roles and responsibilities of each organisation
- Specific data to be provided and the format in which it will be delivered
- Timelines for data submission and updates
- Procedures for addressing any issues that arise during the collaboration

This agreement ensures transparency, accountability, and supports sustainable institutional arrangements and efficient coordination between the parties involved in the GHG inventory process.

3.4.3 Scope of Work

The Scope of Work (SOW) outlines the technical services required for the development and submission of a national GHG inventory in compliance with the UNFCCC. The selected contractor will manage the project, estimate GHG emissions across key sectors and prepare the final GHG Inventory Report for submission. Tasks include project management, data analysis, and reporting, with strict adherence to UNFCCC standards of transparency, accuracy, and completeness. The work plan includes key milestones and budget tracking. The sample SOW[3] provided in **Annex 8**

[2] Toolkit for Building National GHG Inventory Systems, Institutional Arrangements, Memorandum of Cooperation Template, U.S. EPA (May 2024) https://www.epa.gov/sites/default/files/2020-11/memorandum_of_cooperation_template.docx

[3] Toolkit for Building National GHG Inventory Systems, Sample Scope of Work (SOW) U.S. EPA (May 2024) https://www.epa.gov/sites/default/files/2020-11/sample_scope_of_work_sow.docx

can be used to develop a request for proposal or task order request for services related to compiling a GHG inventory

4 Conclusion

The recommended institutional arrangements for SKN's electricity generation and transport subsectors provide support for the MRV Framework and more robust and transparent reporting under the ETF. By establishing these clear roles, responsibilities, and data flows among key stakeholders, these arrangements will significantly improve the capacity of the country to meet its reporting obligations under the Paris Agreement. The involvement of the Ministry of Climate Action, Environment, and Constituency Empowerment, in coordination with sectoral institutions, is crucial in ensuring effective data collection, management, and reporting processes.

The institutional framework recommended enables better planning, decision-making, and resource allocation by providing accurate and timely greenhouse gas (GHG) emissions data. These arrangements support SKN in building and implementing a system that continuously improves climate reporting while promoting coordination and collaboration across government departments, consultants, and data providers. In turn, this helps align climate actions with national development goals, attract investments, and bolsters the country's commitment to global climate mitigation efforts. As the institutional structures evolve, ongoing collaboration, capacity building, and legal frameworks will be key to ensuring long-term success in climate transparency and reporting.

References

[1] Saint Kitts and Nevis. "Initial National Communication, 1994." United Nations Framework Convention on Climate Change, https://unfccc.int/sites/default/files/resource/InitialNationalCommunicationFinal.pdf.

[2] St. Christopher and Nevis. "The 2nd National Communication Under the United Nations Framework Convention on Climate Change (UNFCCC)." Oct. 2015, https://unfccc.int/sites/default/files/resource/Knanc2.pdf.

[3] Government of St. Kitts and Nevis. "Updated Nationally Determined Contribution Communicated to the UNFCCC." Oct. 2021, https://unfccc.int/sites/default/files/NDC/2022-06/St.%20Kitts%20and%20Nevis%20Revised%20NDC_Updated.pdf.

[4] U.S. Environmental Protection Agency. "Toolkit for Building National GHG Inventory Systems, Institutional Arrangements, Sector Lead Roles and Responsibilities." May 2024, https://www.epa.gov/ghgemissions/toolkit-building-national-ghg-inventory-systems#how:~:text=Sector%20Lead%20Roles%20and%20Responsibilities%20%2D%20Energy%20(docx).

[5] U.S. Environmental Protection Agency. "Toolkit for Building National GHG Inventory Systems, Institutional Arrangements, Memorandum of Cooperation Template." May 2024, https://www.epa.gov/sites/default/files/2020-11/memorandum_of_cooperation_template.docx.

[6] United Nations Framework Convention on Climate Change. "National Communications and/or Biennial Update Reports." http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php.

[7] United Nations Framework Convention on Climate Change. "Previous Non-Annex I National Communications." http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php.

[8] Intergovernmental Panel on Climate Change. "2016 IPCC Guidelines." http://www.ipcc-nggip.iges.or.jp/.

[9] United Nations Framework Convention on Climate Change Secretariat, Consultative Group of Experts, " Handbook on institutional arrangements to support MRV Transparency, United Nations 2020.

ANNEXES

Annex 1

Tool Selection Process

- SKN Modelling Tool Workshop Report
- SKN Modelling Tool Justification Report

Annex 2

Projections

- TraCAD Training Report
- LEAP Training Report
- Methodologies for Projections

Annex 3

Data Collection

- Data collection and management and data gap assessment report

Annex 4

NDC Tracking

- NDC Tracking Indicators Report
- Documentation on NDC Tracking Tool
- NDC Tracking Indicators and Data Gaps
- NDC Tracking Training

Annex 5

- MRV Framework

Annex 6

Recommended language to include in Terms of Reference

Responsibilities and Qualifications of Energy Sector Lead

Qualifications and Experience:

- Bachelor's degree in Energy, Environmental Science, Engineering, or a related field (Master's degree preferred).
- Minimum 5 years of experience in energy sector management, with specific experience in greenhouse gas (GHG) inventory processes and emissions analysis.
- Strong understanding of the IPCC Guidelines for GHG emissions estimation in the energy sector, including Tier 1 and Tier 2 methodologies.
- Experience with data management systems, QA/QC procedures, and reporting protocols for national GHG inventories.
- Familiarity with relevant UNFCCC reporting processes, such as National Communications (NC), Biennial Transparency Reports (BTR), and Nationally Determined Contributions (NDCs).
- Proven ability to coordinate across sectors and manage collaboration between data providers and relevant stakeholders.
- Strong organizational, communication, and project management skills.

Roles and Responsibilities:

Collaboration and Stakeholder Engagement:

- Coordinate with the NDC/BTR/NC Coordinator to provide input on report components relevant to the Energy Sector
- Engage with data collectors and compilers and if necessary, data providers (utility companies, fuel suppliers, etc.) to collect data, identify gaps, and develop improvement plans

Energy Sector GHG Estimation:

- Apply appropriate methodologies for estimating GHGs from energy sources, focusing on key categories such as fossil fuel combustion and renewable energy according to IPCC Guidelines
- Develop energy sector GHG estimates, ensuring that both sector and reference approaches are calculated and compared for fossil fuel combustion.
- Implement and document data collection procedures, methodologies, and assumptions used in developing GHG estimates.
- Oversee the preparation and finalization of all energy-related sections of the National GHG Inventory.

Data Management and QA/QC:

- With NDC/BTR/NC Coordinator, ensure QA/QC procedures are carried out
- Ensure that all data collection, assumptions, and methodologies are documented in accordance with EPA templates and national standards.
- Monitor, review, and improve uncertainty analysis for the energy sector estimates.

Reporting and Continuous Improvement:

- Ensure timely submission of deliverables, maintaining adherence to deadlines and inventory timelines.
- Identify and prioritize potential improvements for future GHG inventories, focusing on data accuracy, emission factors, and methodology enhancements.
- Archive relevant data and documentation for transparency and future reference, coordinating with national archiving protocols.
- Facilitate discussions with stakeholders to address comments from external QA reviews and make necessary updates to the energy sector GHG inventory.

The Energy Sector Lead will managed by and report to **[x]**.

Responsibilities and Qualifications of NDC/BTR/NC Coordinator

Qualifications and Experience:

- Bachelor's degree in Environmental Science, Climate Change, Engineering, or a related field (Master's or Ph.D. preferred).
- Minimum 5 years of experience in managing climate change projects, with a focus on national GHG inventories, emissions quantification, and UNFCCC reporting processes.
- Strong knowledge of the IPCC Guidelines for National GHG Inventories (Revised 1996, Good Practice Guidance, and 2006 Guidelines) and UNFCCC reporting requirements.
- Demonstrated experience in the preparation of National Communications (NC), Biennial Transparency Reports (BTR), and Nationally Determined Contributions (NDCs).

- Familiarity with GHG inventory management tools and software (IPCC, ALU, or country-specific software).
- Proven experience in managing teams, budgets, and schedules for the timely and efficient completion of GHG inventory reports.
- Ability to collaborate with government agencies, non-governmental organizations, research institutions, and international stakeholders.
- Strong analytical, communication, and organizational skills.

Roles and Responsibilities:

Stakeholder Engagement and Capacity Building:

- Engage with national agencies, institutions, and other stakeholders to enhance understanding of the relevant reporting process and their roles in data provision.
- Conduct capacity-building activities and provide technical training to team members and sector leads to ensure continuous improvement of UNFCCC reporting and inventory practices.

Inventory Development and Management:

- Oversee all aspects of National GHG Inventory development, ensuring compliance with UNFCCC requirements.
- Prepare and implement a detailed work plan for producing the National GHG Inventory, ensuring alignment with sector-specific work plans and deliverables.

Coordination with Sector Leads:

- Coordinate with national sector leads
- Facilitate collaboration between sector experts, data providers, and relevant institutions to ensure consistent and accurate data collection.
- Assist sector leads in implementing appropriate IPCC methodologies and emission factors, and ensuring quality control measures are applied.

Cross-cutting Responsibilities:

- Oversee cross-cutting activities, including Quality Assurance/Quality Control (QA/QC), key category analysis (KCA), uncertainty analysis, and archiving processes.
- Ensure that all QA/QC procedures, archiving, and inventory improvement plans are effectively implemented and consistent with national and international guidelines.
- Coordinate with national and international stakeholders to ensure compliance with UNFCCC reporting requirements.

Reporting and Continuous Improvement:

- Manage the compilation and submission of NC, BTR, and NDC reports, ensuring they meet UNFCCC reporting guidelines and national timelines.

- Organize review processes and respond to comments from external QA reviews, updating the inventory as needed.
- Maintain and implement a national improvement plan, fostering collaboration with related national projects and international programs.

The NDC/BTR/NC Coordinator will be managed by and report to **[x]**.

Annex 7

Sample Memorandum of Understanding

MEMORANDUM OF COOPERATION
between
_____[MINISTRY X]_____
and
_____ [MINISTRY Y]_____
on

The National Greenhouse Gas Inventory and Program B, C, etc…

I. OBJECTIVES

The objectives of this Memorandum of COOPERATION (MOC) between [Ministry X] and [Ministry Y] are:

1)

2)

Examples:

1) *To develop a system of data sharing between Ministry X and Ministry Y, to support the development of the National Greenhouse Gas Inventory (for UN reporting obligations (e.g. National Communication, BUR and/or national policy purposes)). Ministry X has been tasked under [degree, law, act, etc.] to coordinate development of the national GHG inventory.*

2) *To commit to work together to develop and jointly implement a program to slow the growth of greenhouse gas emissions.*

I. AUTHORITIES AND RELATED ACTIVITES

Nothing in this agreement alters, or is intended to alter, the legal and regulatory authorities of Ministry X and Ministry Y. This agreement is solely intended to facilitate the fulfillment of legal requirements and cooperative efforts.

A. The National Greenhouse Gas Inventory

1. The Program

Provide a description of the program in question and context for the program in this MOC.

Example from the USA: Section 1605 (a) of the Energy Policy Act (EPAct), requires that the Secretary of Energy, through the U.S. Energy Information Administration (EIA), develop an inventory of national aggregate greenhouse gas emissions. The inventory shall be established in consultation with EPA using existing and readily available data. Information in the inventory shall be analyzed and updated annually, also using available data.
The Clean Air Act Amendments of 1990 require that EPA: prepare national and international inventories of methane; monitor and report CO_2 emissions from certain stationary sources; pursue pollution prevention, including prevention of greenhouse gas emissions; and address substances which deplete stratospheric ozone (many of which, including their substitutes, are greenhouse gases). The CAA also authorizes EPA to compile and verify emission inventories of criteria air pollutants, most of which are implicated in climate change as indirect greenhouse gases. Section 103 (c) of the CAA requires that EPA conduct a program of research, testing, and development of methods of sampling, measurement, monitoring, analysis, and modeling of air pollutants, to ensure the comparability of air quality data collected in different States and obtained from different nations.
The Global Climate Protection Act of 1987 requires that the President, through EPA, develop a coordinated national policy on global climate change. As the necessary first step in meeting this requirement, EPA will continue to develop greenhouse gas inventories in cooperation with other agencies and various international organizations. EPA has developed the national inventories of U.S. emissions consistent with draft Intergovernmental Panel on Climate Change guidelines.

2. Authorities

Provide descriptions for the national authorities that are relevant to this MOC.
Example from the USA: EPAct Section 1605 (b) (4) allows reporting entities to use information reported through the voluntary reporting system to demonstrate achieved reductions of greenhouse gases.

B. Program B (If necessary)

1. The Program

Provide a description of the program in question and context for the program in this MOC.

2. Authorities

Provide descriptions for the national authorities that are relevant to this MOC.

. PROVISIONS

A. The National Greenhouse Gas Inventory

It is mutually agreed:

1) to…;

2) to…

Examples from the USA:

1) *to cooperate in the development of greenhouse gas inventories to meet the EPAct provisions and the E.S. commitments under the United Nations Framework Convention on Climate Change;*

2) *to share expertise, emission factors, methodologies, and data pertaining to the development of greenhouse gas inventories; and,*

3) *to establish appropriate points of contact for this section who will be available to regularly meet, review cooperative activities, and to raise issues as necessary.*

Ministry X agrees:

1) *to continue to consult with DOE on EPA's maintenance and preparation of the greenhouse gas inventories to meet the U.S. commitments under the UNFCCC;*

2) *to ensure that this inventory will undergo full interagency review, and that any outstanding issues will be raised to the Office on Environmental Policy or its Monitoring, Evaluation, and adjustment Task Force for final resolution; and,*

3) *to forward the inventory to the Department of State for submission by the U.S. Government under the UNFCCC.*

Ministry Y agrees:

1) *to make available supporting technical reports, models, and data that may form the basis of the guidelines; and,*

2) *to provide, in advance, a schedule for review of draft and final materials which includes, to the extent possible, adequate time for review and comment.*

B. Program B (If necessary)

It is mutually agreed:
Ministry X agrees:
Ministry Y agrees:

. MEETINGS AND CORRESPONDENCE *(optional)*

To accomplish the goals and activities set forth in this MOU, Ministry X and Ministry Y will to the fullest extent possible:

1) Regularly meet for the purposes of program planning and monitoring and evaluating outcomes;

2) Respond to correspondence by telephone or email in a manner and timeframe that promotes efficiency and the timely progress or completion of objectives and tasks consistent with the goals and activities described above; and,

3) Agree to specific meeting or call times and dates as far as possible in advance of the appointed occasion.

I. POINTS OF CONTACT

The points of contact for the MOC on The National Greenhouse Gas Inventory are:

Ministry X	**Ministry Y**
Position	**Position**

Points of contact may be re-designated by the signatories.

I. DURATION OF THE AGREEMENT

This MOC may be amended by written agreement between Ministry X and Ministry Y. The agreement becomes effective on the date of signature by both parties. It shall remain in effect for a ____ year term from the effective date. This MOC may be terminated by mutual written agreement of X and Y or by either party with ____ days notice to the other party.

This memorandum of cooperation is entered into
On the ____ day of ____ in the year ____.

Signatures:

_____	_____
Name	Name
Position	Position
Ministry X	Ministry Y
Date of Signature	Date of Signature

Annex 8

Sample Scope of Work

SCOPE OF WORK

The information in the table below will need to conform to procurement procedures set by your Inventory Agency or GEF implementation Agency issuing the solicitation for experts or firms to bid on providing these technical services, but helpful to collect here for reference.

Title: Greenhouse Gas Inventory Development and Technical Support

Contractor and Contract #: _____

Request for proposal #: _____

Estimated Budget: _____

Key Management Personnel (from Lead Inventory Agency, e.g. Office Directors, etc.): _____

Lead Inventory Agency Project Officer (PO): *[Insert name of inventory coordinator]*

Lead Inventory Agency Deputy Project Officer (DPO): _____

Subject Matter & Technical Experts (SMTE): _____

I. INTRODUCTION

All countries that are signatories to the United Nations Framework Convention on Climate Change (UNFCCC) are mandated to develop a national inventory of anthropogenic greenhouse gas (GHG) emissions and removals. In accordance with the commitment to the UNFCCC and the reporting requirements for Non–Annex I Parties under the Convention, [insert coordinating/lead agency issuing request for proposal/task order request (RFP/ToR)] calculates and submits estimates of emissions and removals [specify, e.g. as part of National Communications and/or Biennial Update Reports[4]] occurring in [insert country].

[4] National Communications and/or Biennial Update Reports, United Nations Framework Convention on Climate Change (UNFCCC) http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php

The emission and removal estimates produced in the greenhouse gas inventory by [coordinating/lead agency issuing RFP/ToR] represents a robust data analysis and conform to the UNFCCC standards of transparency, accuracy, consistency, comparability, and completeness.

II. BACKGROUND AND PURPOSE

In accordance with the commitment to the UNFCCC, and as part of the global effort to collect information about national emissions of greenhouse gases and other precursor gases, [insert country] is obligated to prepare a national GHG inventory. Under this contract, the Contractor will assist [insert country and coordinating/lead agency] in developing its greenhouse gas inventory submission to the UNFCCC as part of its [National Communication (NC) and/or Biennial Update Report (BUR)] and the related work necessary to improve and build the GHG Inventory program.

III. SCOPE OF WORK TASKS

The statement of work consists of the following components.

- Task 1: Project Management
- Task 2: Calculate Emission Estimates for Energy Sector Categories of Greenhouse Gases
- Task 3: Calculate Emission Estimates for Industrial Processes and Solvent and Other Product Use Sector Categories of Greenhouse Gases
- Task 4: Calculate Emission Estimates for Agriculture Sector Categories of Greenhouse Gases
- Task 5: Calculate Emission Estimates for Land–Use, Land–Use Change, and Forestry Sector Categories of Greenhouse Gases
- Task 6: Calculate Emission Estimates for Waste Sector Categories of Greenhouse Gases
- Task 7: Development of [insert country]'s GHG Inventory Report
- Task 8: GHG Inventory Analyses and Quick Turn–Around Response

Task 1: Project Management

This task includes project management for the contract including contract administration, attendance at inception and close out meetings, and development of a work plan and budget.

Subtask 1.1: Perform Contract Administration: The Contractor shall provide project management under this task, and shall submit a Monthly Progress Report to [coordinating/lead agency, such as Ministry of Environment] the Project Officer (PO). During the Period of Performance, the Contractor shall immediately inform the PO by telephone and/or email of

any issue(s) that may impede performance along with any corrective actions needed by [coordinating/lead agency] and [Contracting Agency such as UNDP if different from lead agency] to address the issue(s).

Subtask 1.2: Attend Inception Meeting: Under this task, the Contractor shall also attend a general or task specific inception meeting(s), either via conference call or in–person, whichever is most cost effective to the [Lead Inventory Agency administering the contract], to discuss the goals, strategy, and schedule for completing the products. The Contractor shall discuss the format of monthly contract reporting using a Monthly Progress Report, including more detailed budget tracking, and propose a progress report template to the [coordinating/lead agency] PO for approval. The Contractor, under this task, will also attend a wrap–up meeting at the end of the Period of Performance.

Subtask 1.3: Prepare Workplan: Using information from the inception meeting, including but not limited to a draft work plan that the National Inventory Coordinator provides, and in consultation with the inventory PO, the Contractor shall provide an updated draft work plan outlining the approach, resources, outputs or products, overall project timeline and key milestones, and estimated budget (costs and/or hours, if applicable) for the tasks included in the SOW. Estimates of costs and/or hours can be presented for each staff member by title and task/subtask, and/or product. The presentation of costs should be discussed with the Lead Inventory Agency Project Officer, and modified consistent with how the inventory budget is managed for your country. An example table is presented below that should be replicated for each Task and Subtask as it applies to your final estimates. This can be expanded to include staff names, titles, and products. This information shall be tracked and reported in the monthly progress reports. The timeline shall contain all products and shall be easily cross referenced against the projected hours and costs. An example work plan is included in the supplementary template for developing a National Inventory Inception Memorandum available online at: http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity–building.html. The [coordinating/lead agency issuing RFP/ToR] Project Officer (PO) and [insert name of any other required commenter] will review the draft work plan and will request revisions and/or changes as needed. The Contractor shall incorporate [coordinating/lead agency issuing RFP/ToR] comments into the final work plan.

Subtask 1.4: Prepare or Update Template Workbook: The Contractor shall work with the Inventory Coordinator and task-specific team coordinators to complete or update the existing QA/QC and Archiving National System Templates and complete an initial KCA upon consultation with the [coordinating/lead agency].

1. Using the QA/QC National System Template, with the [coordinating/lead agency] and the QA/QC Coordinator, the Contractor shall finalize the QA/QC procedures and schedule, including any sector specific checks for key emission and removal categories throughout the inventory development cycle. Contractors shall rely on existing drafts developed with the [coordinating/lead agency].

2. Using the Archiving National System Template, with the [coordinating/lead agency] and any Archives Coordinators, the Contractor shall finalize Archiving arrangements and procedures, define clear roles for core team members and update the archive schedule. Contractors shall rely on existing drafts developed with the [coordinating/lead agency].
3. Using the KCA National System Template and Excel KCA Tool, the Contractor shall prepare an initial IPCC Key Category Analysis or update the previous KCA to reflect the most recent Inventory results. The Contractors shall deliver the KCA spreadsheet and documentation to the [coordinating/lead agency].
4. Using the NIIP National System Template, the Contractor shall discuss priority improvements with the [coordinating/lead agency] and relevant technical partners. Contractors shall rely on existing drafts developed with the [coordinating/lead agency].

Sample budget template:

Task	**Budget**
Task 1 Total	**$**
Subtask 1.1	$
Subtask 1.2	$
Subtask 1.3	$
Task 2 Total	**$**
Subtask 2.1	$
[Add subtasks as necessary]	$
Task 3 Total	**$**
Subtask 3.1	$
[Add subtasks as necessary]	$
Task 4 Total	**$**
Subtask 4.1	$
[Add subtasks as necessary]	$
Task 5 Total	**$**
Subtask 5.1	$
[Add subtasks as necessary]	$
Task 6 Total	**$**
Subtask 6.1	$
[Add subtasks as necessary]	$
Task 7 Total	**$**
Subtask 7.1	$

[Add subtasks as necessary]	$
Task 8 Total	**$**
Subtask 8.1	$
[Add subtasks as necessary]	$
[**Add Tasks and subtasks as necessary**]	**$**
Total Budget for All Tasks	**$**

Products and schedule under Task 1:

Subtask 1.1 Products	**Due Date**
Prepare Monthly Progress Report/Budget Tracking Template	Draft due within 5 business days of inception meeting; Final due within 5 business days of PO comments
Monthly Progress Report	By 10th business day each month
Subtask 1.2 Products	**Due Date**
Attend inception meeting; Prepare revised staffing and budget plan	Within 2 weeks of award of contract
Attend wrap–up meeting	At least 2 weeks prior to the end of the contract, per PO direction
Subtask 1.3 Products	**Due Date**
Draft work plan	Within 7 days after receipt of this contract.
Final work plan	Within 5 days of receipt of comments from PO on draft work plan

Common Approach for Completing Tasks 2 through 6: Calculate Emission Estimates for Energy, Industrial Processes, Solvent and Other Product Use, Agriculture, Land–Use, Land–Use Change and Forestry, and Waste Sectors of Greenhouse Gases

[*The approach in the two subtasks below is a general approach that can be replicated or adapted for other subtasks in particular for any sector estimates the coordinating agency includes in the ToR. The following general guidance is divided into two subtasks and describes the approach and elements required for each sector of GHG emissions estimates outlined in Tasks 2 through 6. Modify these subtasks and tasks according to country circumstances*].

As noted above, the Contractor shall prepare inventory estimates, documentation, uncertainty, and QA/QC as described below in Subtasks 1 and 2 for the emission categories listed. The Contractor shall follow instructions distributed by the inventory coordinator in the [reference any inventory procedures, such as an inception memo which will summarize documentation, data management/archiving, QA/QC, national inventory improvement plans] that outlines

procedures and deadlines for the production of [insert country name]'s *Inventory of Greenhouse Gas Emissions and Removals* for [insert years included in inventory]. The Contractor shall use methods consistent with the conceptual framework developed by the Intergovernmental Panel on Climate Change (IPCC), and described in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, as well as being consistent with the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, and the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. The Contractor will also coordinate among sector leads to ensure there are no double counting issues among sectors and categories. An example of some of these unique cross–over issues are detailed in Appendix II.

Subtask 1 Inventory Improvements:

The Contractor shall review the key category analysis and existing improvement plans, and per those plans investigate new emission estimation methodologies and improvements to existing methodologies used in previous inventories[5], as well as integrating new activity data sources, especially for key emission categories. *{In particular, the Contractor should consider and discuss with the PO on the methodological advancements presented in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, as well as other work that may be undertaken under a separate work assignment or contract.}* Methodological improvements may not be necessary for all of the categories listed.

Following agreement between the Contractor and the PO on areas for improvement, the Contractor shall collect the necessary activity data and emission factors. If any methodological improvements are made, the Contractor shall provide preliminary results to the PO in memo form, along with comparisons with estimates for previous years.

Subtask 2 Finalize Estimates and Documentation for Sectors and Categories Included in the Contract:

- **Estimates:** The Contractor shall complete [carbon dioxide (CO_2), methane (CH_4) nitrous oxide (N_2O), HFC, PFC, and SF_6] emission estimates for [insert years, for example "2012 and 2014", or "2010–2017"] for the emission categories listed below. The Contractor, in consultation with the [insert key sectoral coordinating agency(s) and data supplying agencies], shall collect the necessary activity data and emission factors. The Contractor shall develop estimates that adhere to IPCC principles and are transparent, accurate, complete, consistent, and comparable.

  For improvements implemented, the Contractor shall prepare the necessary documentation consistent with IPCC Good Practice Guidance and/or 2006 IPCC Guidelines. For methodological improvements moving from Tier 1 to Tier 2 methods,

[5] Previous Non-Annex I National Communications http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php.

the Contractor shall prepare a memo comparing the Tier 1 and Tier 2 results. For integration of new data sources, the Contractor shall describe the treatment of data across the time series to ensure time series consistency, completeness, etc.

- **Inventory Report Discussion text***:* The Contractor shall also prepare discussion text of the results for each emission category within the subtask for inclusion in the *inventory*, following the procedures in the inception memo distributed by the inventory coordinator. [Coordinating/lead agency] will provide any existing discussion text from previous inventories to update (if available), but the discussion shall include the following information:
    - The nature of the source or emission category and pathway and relevance/detail on emission category for [insert country]
    - An analysis of historical trends over [insert time series]
    - Relevant avoided emissions from mitigation programs (e.g. voluntary programs)
    - A description of methods used to prepare estimates
    - Any methodological changes from previous reports or national communications
    - A summary discussion of uncertainty in the estimates (optional)
    - A summary discussion of recalculations if methodological changes were applied
    - A summary discussion of planned improvements, if applicable

- **Documentation***:* The Contractor shall provide a Technical Annex with the following documentation for the inventory archives:
    - A draft Methods and Data Documentation (MDD) template from the National System's Template (available at http://ledsgp.org/resource/greenhouse–gas–inventory–system/?loclang=en_gb#ghg–toolkit), completed for each sector included in this SOW. This template includes sections to document:
        - Calculation parameters, including activity data and emissions factors
        - The sources or references of all primary activity data and emissions factors, including assumptions and expert judgment
        - Methodologies selected for each calculation
    - Copies of clean, transparent (i.e., understandable to a third party), and well documented electronic worksheets used to complete estimates
    - Consult [Sector Lead/Coordinator] for documenting expert consultations, etc.

- **Inputs to UNFCCC Reporting tables and IPCC Background Tables**: For the emission categories listed within this task, the Contractor shall use the UNFCCC Reporting Software as directed by the [insert coordinating/lead agency]. [http://unfccc.int/national_reports/non–annex_i_national_communications/non–annex_i_inventory_software/items/7627.php]

- **Uncertainty (optional):** For each emission category estimated under Tasks 2 through 6, the Contractor shall perform an uncertainty analysis effort (e.g., Tier 1) consistent with latest IPCC guidelines per the direction of the [Sector coordinating agency] and, at minimum, prepare a detailed discussion of uncertainty along with a quantification of the uncertainty in the estimates updating any existing analyses. As discussed under "improvements" above, a revision to the current uncertainty estimates may also be undertaken.

- **Quality Control:** The Contractor shall complete the Tier 1 QC checks for each emission category based upon the QC forms [insert coordinating/lead agency] provides to the Contractor. Draft Tier 1 forms and a draft QA/QC National Systems template, including QA/QC checklists (available at http://ledsgp.org/resource/greenhouse–gas–inventory–system/?loclang=en_gb#ghg–toolkit), shall be completed during the inventory preparation process prior to any external reviews that are conducted according to the overall schedule provided by [coordinating/lead agency].

- **Quality Assurance/Review**: The Contractor may be directed to respond to any comments from analysis or reviews (internal, interagency, and/or international) of the draft and final inventory. For example, the Contractor will assist the [coordinating/lead agency] to respond to comments from the UNFCCC International Consultation and Analysis process per the projected schedule provided by [coordinating/lead agency] during the initial inception meeting. Personal communications should be documented in a suitable format.

- **Develop/Update GHG Inventory Improvement Plan:** The Contractor will consult with the [coordinating/lead agency] and apply available tools such as EPA's National Inventory Improvement Plan Template and [insert country]'s final KCA to prepare a prioritized list of improvements to discuss with the [coordinating/lead agency] and relevant technical partners.

Task 2: Calculate Emission Estimates for Energy Sector Categories of Greenhouse Gases

This task will include all elements of the common approach. Under Task 2 of this contract, the Contractor shall calculate specified categories in the Energy sector of the inventory, including:

Fuel Combustion Activities

- Energy Industries – carbon dioxide, methane, and nitrous oxide emissions
- Manufacturing industries and construction – carbon dioxide, methane, and nitrous oxide emissions
- Transport – carbon dioxide, methane, and nitrous oxide emissions
- Other sectors – carbon dioxide, methane, and nitrous oxide emissions

- Non–Specified – carbon dioxide, methane, and nitrous oxide emissions

Fugitive Emissions from Fuels

- Solid Fuels – carbon dioxide and methane emissions
- Oil and Natural Gas – carbon dioxide, methane and nitrous oxide emissions
- Other emissions from energy production – carbon dioxide, methane, and nitrous oxide emissions

Carbon Dioxide Transport and Storage

- Transport of CO_2 – carbon dioxide
- Injection and Storage – carbon dioxide
- Other – carbon dioxide

The Contractor shall use methods consistent with the conceptual framework developed by the Intergovernmental Panel on Climate Change (IPCC), and described in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, as well as being consistent with the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, and the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

The Contractor shall investigate new emission estimation methodologies and improvements to existing methodologies used in previous inventories, as well as integrating new activity data sources, if applicable. The Contractor shall adhere to the above mentioned subtask guidance on estimates, inventory report discussion text, documentation, UNFCCC reporting tables, uncertainty, QA/QC, and reviews. The products in the table below are consistent with this guidance.

Following agreement between the Contractor and the PO on areas for improvement, the Contractor shall collect the necessary activity data, including the data necessary for uncertainty modeling, and emission factors. If any methodological improvements are made, the Contractor shall provide preliminary results to the PO in memo form, along with comparisons with estimates for previous years.

Products and Schedule under Task 2:

Subtask 2.1 Products	**Due Date**
Memorandum (2–4 pages) including draft list of recommended improvements for [insert reporting years of inventory] inventory	Within **2 weeks** of contract initiation
Memorandum (2–4 pages) including final list of improvements for [insert reporting years of inventory] inventory	Within 1 week of receipt of comments from the PO
Subtask 2.2 Products	**Due Date**

Draft timeline and schedule for completion of Energy sector estimates, documentation (and completed MDD templates), uncertainty, QA/QC forms (and QA/QC template), and UNFCCC reporting table inputs for [insert years] inventory	Within **1 week** of submittal of memorandum of final list of improvements for the [insert time series] inventory (and to be determined on the basis of the inventory schedule provided in the inception memo)
Final timeline and schedule for completion of Energy sector estimates, documentation (and completed MDD templates), uncertainty, QA/QC forms (and QA/QC template), and UNFCCC reporting table inputs for [insert years] inventory	Within **1 week** of receipt of draft comments from the PO
Draft outline of inventory sectoral text conforming to the template established in Task 7	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Final outline of inventory sectoral text conforming to the template established in Task 7	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Draft estimates with discussion, documentation and draft UNFCCC reporting table inputs for [insert years] inventory	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Final estimates with discussion, documentation and draft UNFCCC reporting table inputs for [insert years] inventory	Within **2 weeks** of receipt of draft comments from the PO
QA/QC forms and inventory archive materials for all Task 2 sources for the [insert years] inventory	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Draft responses to comment from the review of the inventory, and any required revision to emission estimates, including discussion text and any supplemental documentation of revisions if required.	Due date to be determined on the basis of schedule for the inventory reviews in written technical direction from the PO
Final responses to comment from review of the inventory, and revision to emission estimates, including discussion text and any supplemental documentation of revisions if required.	Due date to be determined on the basis of schedule for the inventory reviews in written technical direction from the PO

Task 3: Calculate Emission Estimates for Industrial Processes and Solvent and Other Product Use Sector Categories of Greenhouse Gases

This task will include all elements of the common approach. Under Task 3 of this contract, the Contractor shall calculate emissions for the specified categories in the Industrial Processes and Solvent and Other Product Use sectors of the inventory, which could include, but are not limited to:

[Customize the categories for national circumstances, including product use]

Mineral Production

- Cement Production – carbon dioxide emissions
- Lime Production – carbon dioxide emissions
- Limestone and Dolomite Use – carbon dioxide emissions

Chemical Production

- Ammonia Manufacture – carbon dioxide emissions
- Urea consumption for Non–Agricultural Purposes – carbon dioxide emissions
- Nitric Acid Production – nitrous oxide emissions
- Adipic Acid Production – nitrous oxide emissions
- Petrochemical Production – carbon dioxide and methane emissions
    - Carbon Black
    - Ethylene
    - Ethylene Dichloride
    - Methanol
    - Styrene
- Soda Ash Manufacture and Consumption – carbon dioxide emissions
- Carbide Production and Consumption (Calcium and Silicon) – carbon dioxide and methane emissions
- Titanium Dioxide Production – carbon dioxide emissions

Metal Production

- Aluminum – carbon dioxide and sulfur hexafluoride emissions
- Iron and Steel Production – carbon dioxide and methane emissions
    - Metallurgical Coke Production
- Ferroalloy Production – carbon dioxide and methane emissions
- Magnesium Production – sulfur hexafluoride emissions
- Lead Production – carbon dioxide emissions
- Zinc Production – carbon dioxide emissions

Electronics Industry

- Semiconductor manufacture – Hydrofluorocarbon, Perfluorocarbon, Sulfur Hexafluoride, and Nitrogen Trifluoride emissions

- Flat Panel Display Production – Perfluorocarbon, Sulfur Hexafluoride and Nitrogen Trifluoride emissions
- Photovoltaics Production – Perfluorocarbon and Nitrogen Trifluoride emissions
- Heat Transfer Fluid Production – Hydrofluorocarbon and Perfluorocarbon emissions

Substitution of Ozone Depleting Substances

- ODS substitutes – Hydrofluorocarbon and Perfluorocarbon emissions

Solvent and Other Product Use

- Nitrous Oxide from Product Use – nitrous oxide emissions

The Contractor shall adhere to the above mentioned subtask guidance on estimates, inventory report discussion text, documentation, UNFCCC reporting tables, uncertainty, QA/QC, and reviews. The products in the table below are consistent with this guidance.

Products and Schedule under Task 3:

Subtask 3.1 Products	**Due Date**
Memorandum (2–4 pages) including draft list of recommended improvements for [insert time period of inventory] inventory	Within **2 weeks** of contract initiation
Memorandum (2–4 pages) including final list of improvements for the [insert reporting years of inventory] inventory	Within 1 week of receipt of comments from the PO
Subtask 3.2 Products	**Due Date**
Draft timeline and schedule for completion of Industrial Process and Product Use estimates, documentation (and MDD template), uncertainty, QA/QC forms (and QA/QC template), and UNFCCC reporting table inputs for [insert years] inventory	Within **1 week** of submittal of memorandum of final list of improvements for the 1990–2012 inventory (and to be determined on the basis of the inventory schedule provided in the inception memo)
Final timeline and schedule for completion of Industrial Process and Product Use estimates, documentation (and MDD template), uncertainty, QA/QC forms (and QA/QC template), and UNFCCC reporting table inputs for [insert years] inventory	Within **1 week** of receipt of draft comments from the PO
Draft outline of inventory sectoral text conforming to the template established in Task 7	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Final outline of inventory sectoral text conforming to the template established in Task 7	Due date to be determined on the basis of the final schedule in written technical direction from the PO

Draft estimates with discussion, documentation and draft UNFCCC reporting table inputs for [insert years] inventory	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Final estimates with discussion, documentation and draft UNFCCC reporting table inputs for [insert years] inventory	Within **2 weeks** of receipt of draft comments from the PO
QA/QC forms and inventory archive materials for all Task 3 sources for the [insert years] inventory	Due date to be determined on the basis of the final schedule in written technical direction from the PO
Draft responses to comment from the review of the inventory, and any required revision to emission estimates, including discussion text and any supplemental documentation of revisions if required.	Due date to be determined on the basis of schedule for the inventory reviews in written technical direction from the PO
Final responses to comment from review of the inventory, and revision to emission estimates, including discussion text and any supplemental documentation of revisions if required.	Due date to be determined on the basis of schedule for the inventory reviews in written technical direction from the PO

Task 4: Calculate Emission Estimates for Agriculture Sector Categories of Greenhouse Gases

This task will include all elements of the common approach. Under Task 4 of this contract, the Contractor shall calculate emissions for the specified categories in the Agriculture sector of the inventory, which could include, but are not limited to:

- [insert applicable categories here]

The Contractor shall adhere to the above mentioned subtask guidance on estimates, inventory report discussion text, documentation, UNFCCC reporting tables, uncertainty, QA/QC, and reviews. The products in the table below are consistent with this guidance.

[Insert any other relevant category text here]

Products and Schedule under Task 4:

Subtask 4.1 Products	**Due Date**
[insert products here]	[insert due dates here]

Task 5: Calculate Emission Estimates for Land–Use, Land–Use Change, and Forestry Sector Categories of Greenhouse Gases

This task will include all elements of the common approach. Under Task 5 of this contract, the Contractor shall calculate emissions for the specified source categories in the Land–Use, Land–Use Change, and Forestry sector of the inventory, which could include, but are not limited to:

- [insert relevant source and sink category text here]

The Contractor shall adhere to the above mentioned subtask guidance on estimates, inventory report discussion text, documentation, UNFCCC reporting tables, uncertainty, QA/QC, and reviews. The products in the table below are consistent with this guidance.

[Insert any other relevant category specific text here]

Products and Schedule under Task 5:

Subtask 5.1 Products	**Due Date**
[insert products here]	[insert due dates here]

Task 6: Calculate Emission Estimates for Waste Sector Categories of Greenhouse Gases

This task will include all elements of the common approach. Under Task 6 of this contract, the Contractor shall calculate emissions for the specified source categories in the Waste sector of the inventory, which could include, but are not limited to:

- [insert applicable category(s) here]

The Contractor shall adhere to the above mentioned subtask guidance on estimates, inventory report discussion text, documentation, UNFCCC reporting tables, uncertainty, QA/QC, and reviews. The products in the table below are consistent with this guidance.

[Insert any other relevant category text here]

Products and Schedule under Task 6:

Subtask 6.1 Products	**Due Date**
[insert products here]	[insert due dates here]

Task 7: Development of [insert country]'s GHG Inventory Report

This task will include all elements of the common approach. Under this task, the Contractor shall work to support the development of [insert country]'s GHG inventory report. The Contractor shall use methods consistent with the conceptual framework developed by the Intergovernmental Panel on Climate Change (IPCC), and described in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, as well as being consistent with the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance for Land Use, Land–Use Change and Forestry*, and the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.[6] The Contractor shall format the report according to the reporting guidelines agreed to at the UNFCCC [insert reference UNFCCC National Communication or Biennial Reporting Guidelines, both paragraphs 39–42 and annex III of decision 2/CP.17 and the Annex, paragraph 3 of 17/CP.8] and in consultation with the [insert country and lead/coordinating agency] on required and encouraged items.

The Contractor shall work with the PO on setting deadlines for the compilation of the inventory report. *The structure and schedule for the compilation of the inventory will be detailed in an "inception" memo. A template will be distributed by [coordinating/lead agency], and a sample is available online at* http://ledsgp.org/resource/greenhouse–gas–inventory–system/?loclang=en_gb#ghg–toolkit.

The Contractor shall collect and compile the necessary data and calculated emissions from category experts, and then provide complete emission estimates for all emission and removal categories to the coordinator at [coordinating/lead agency] for review. The Contractor will also perform a KCA once all emissions estimates for all emission and removal categories are complete and provide the complete analysis to the coordinator at [coordinating/lead agency] for review. The Contractor shall then prepare a first draft report, including any required annexes, for internal review. The Contractor shall also be responsible for summarizing the comments received during the internal review, identifying any major issues or conflicts, and incorporating changes in consultation with the coordinator. A summary of these comments and responses to these comments shall be provided to the coordinator. Following the internal review, the Contractor shall finalize all sections of the report, making changes to address comments received in consultation with the coordinator and relevant category experts. The revised, final inventory document will be supplied to the [coordinating/lead agency].

The Contractor shall also work with the coordinator at [coordinating/lead agency] to report estimates to the UNFCCC[7]). The reporting tables should be prepared for the required time series, paying particular attention to changes in data or methodologies. The Contractor shall work with the inventory coordinator at [coordinating/lead agency] to ensure that adequate review by relevant category experts is obtained. The Contractor shall deliver to the

[6] 2016 IPCC Guidelines http://www.ipcc-nggip.iges.or.jp/

[7] http://unfccc.int/national_reports/non–annex_i_national_communications/non–annex_i_inventory_software/items/7627.php

coordinator a set of reporting tables and the entire final document in an electronic format so that the coordinator can prepare the files for the UNFCCC submission.

The Contractor will conduct any other activities necessary to finalizing the document and related materials, including but not limited to: 1) developing an outline for the GHG Inventory Report and a template for sectors to follow, 2) completing the archive, a comprehensive collection of MDD, spreadsheets, documented QC, and all materials used and cited in the inventory, 3) developing the response document to the internal comments, and 4) putting together inventory binders for the coordinator, which include the inventory document and the annexes.

Products and schedule under Task 7:

Subtask 7.1 Products	**Due Date**
Discussion meetings and notes	As requested by the PO
Subtask 7.2 Products	**Due Date**
Draft outline of the GHG Inventory report, and templates for each sector	As requested by the PO
Final outline of the GHG Inventory report, and templates for each sector	As requested by the PO
Subtask 7.3 Products	**Due Date**
Internal review draft of inventory	As requested by the PO
Subtask 7.4 Products	**Due Date**
Summary of expert review comments and responses for each	As requested by the PO
Subtask 7.5 Products	**Due Date**
Final version of GHG inventory	As requested by the PO
Subtask 7.6 Products	**Due Date**
All data files for UNFCCC submission, including Excel reporting tables	As requested by the PO

Task 8: GHG Inventory Analyses and Quick Turn–Around Response

This task provides resources to enable the Contractor to provide expert support to the PO and to respond to requests for presentation materials, technical briefings, profiles or summaries of GHG emission characteristics, and inventory–related analyses, often needed on a quick turn–around basis. Additional work on disaggregating emissions to end use categories may also be conducted under this task. This task has been provided in recognition of the fact that inventory development work is a broader and more complex effort than data compilation and document production.

Products and Schedule under Task 8:

Subtask 8.1 Products	Due Date
Tables, spreadsheets, presentation graphics, and/or documentation	To be determined by PO

IV. PRODUCTS

Product due dates are specified by task above. Distribution of products should be handled by sending one electronic copy each to the [coordinating/lead agency, Contracting Officer] and the [coordinating/lead agency] Project Officer. Hard copy products will be made available.