

# Building Local Government Capacity to Account for GHG Emissions: The Case of Phitsanulok Municipality, Thailand

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**ABSTRACT:** This project had the primary objective of building the capacity of local government officers in a medium-sized Thai municipality, Phitsanulok Municipality (approximate population size of 100,000–120,000 persons) to develop and implement a ‘Measuring/Monitoring, Reporting and Verification’ (MRV) framework for quantifying city-level greenhouse gas (GHG) emissions. In the process, a pilot global standard for city-level GHG accounting was tested. The outputs provide a crucial foundation for future research work and practical projects relating to sustainable, green, low carbon city development in Phitsanulok City. In addition, the findings may be helpful to researchers, policy makers and other supporting stakeholders involved in capacity building activities for local governments on the topics of local-level GHG accounting and MRV.

**KEYWORDS:** *capacity building, low carbon city development, MRV, local governments, city-level GHG accounting and inventory*

## Introduction

It is widely asserted that a large share of global greenhouse gas (GHG) emissions may be attributed to activities in cities and urban areas. Hence, from a policy perspective, it is crucial to be able to measure/monitor, report and verify (MRV) GHG emissions in cities based on a globally consistent and comparable framework, which would cover methodologies for both GHG emissions inventory development as well as project-level mitigation action. While

methodologies need be harmonised to a global standard, they also have to be sufficiently flexible and practical for application in diverse country governance contexts.

Furthermore, as local governments are relatively new to MRV exercises, it is critical to build capacity of local governments and domestic actors in a sustainable manner towards enabling local mitigation policies and action to contribute meaningfully to national and global goals.

This project collaborated with Phitsanulok Municipality (as a representative for a mid-sized Thai municipality with high motivation but limited experience in MRV) to collect baseline data for establishing a municipal- and city-level GHG inventory. The process allowed an understanding of local governments’ responsibilities, institutional structures and governance factors.

## Methodology

This project collected two sets of inter-related data and referred to the following standards/frameworks for both municipal- and city-level GHG inventory development:

- For municipal-level inventory (i.e., covering GHG emissions arising only from the activities of the local government organisation), ‘ICLEI Local Government Operations Protocol for the Quantification and Reporting of GHG Inventories’ (Version 1.1; May 2010) and Guidelines on Municipal Carbon Footprint developed by the Thailand Greenhouse Gas Management Organization (TGO).
- For city-level inventory (i.e., covering GHG emissions arising from all activities within the geo-physical boundaries under the local government’s authority; a larger scope compared to a municipal-level inventory), the GPC Pilot Version 1.0 (<http://www.ghgprotocol.org/city-accounting>).

Primary and secondary data were collected by the Phitsanulok Municipality staff, which were reviewed by IGES as well as a third party expert. The data reported for municipal-level GHG inventory covered activities in calendar year 2013, while the data for city-level GHG inventory covered activities in calendar year 2012, due to data availability. Unless stated otherwise, all activity data reported are sourced from the staff of Phitsanulok Municipality.

## HIGHLIGHTS

- » This project demonstrated that it is possible for local governments to collect reasonably complete data for a municipal-level GHG inventory (which covers only activities within the organisational boundary of the local government) by giving careful consideration to: (i) role allocation; (ii) harmonisation of GHG data collection with existing institutional/organisational structure and processes; and (iii) appealing to the practical benefits of GHG data collection.
- » Collecting data for a city-level GHG inventory, however, is more complicated than a municipal-level GHG inventory, and requires additional effort to obtain the cooperation and assistance from external parties.
- » City-level GHG emissions inventory development could be pragmatically divided into two stages: Stage 1 on establishing a municipal-level inventory, which develops essential knowledge and skills on data collection. This provides a foundation to expand to Stage 2, which collects activity data within the municipality’s geo-political boundary to cover the residential and private sectors.
- » The level of guidance contained in existing global and national protocols (more details in ‘Methodology’) on local GHG inventory is insufficient to enable lower capacity and smaller-sized local governments to undertake MRV and GHG accounting independently.

## Results and Discussion

The project first established the baseline circumstances of Phitsanulok Municipality's in terms of (i) its organisational structure as well as existing data and collection processes relating to energy consumption (mainly electricity use in buildings/facilities and fuels for vehicles and machinery), solid waste, water supply, wastewater treatment and other sectors; and (ii) familiarity of municipal staff with MRV.

Among Phitsanulok Municipality's staff, basic knowledge and awareness about climate change among local government officers is quite high, but capacity for systematic data collection, as well as for basic project management, which are essential for sustaining the process of developing and maintaining a city-level GHG inventory and MRV of mitigation projects based in cities, is weak.

### *Data for a Municipal-Level GHG Inventory*

For example, initially, the municipality did not have a complete, unfragmented list of municipality-managed buildings/facilities, and the electricity meters associated with each building. Electricity bills are collected by each department and sent to the finance department every month, which only collates the financial (cost of electricity) but not activity (units of electricity consumed). Even when data is collected, the quality control is not assured. This is a general condition for other kinds of data, such as fuels purchased, vehicle fleet, refrigerants (air-conditioning in buildings and vehicles) and electric/electronic equipment inventory, etc.

Cross-department collaboration is a critical challenge in data collection. Existing data management systems and institutional structures within local governments do not support cross-departmental data collection, so a new working group, which is backed by a strong internal coordinator with high-level leadership was necessary.

### *Data for a City-Level GHG Inventory*

In contrast, most of the data required for city-level GHG inventory are not easily available – they need to be derived from higher-level, provincial-level data (top-down approach), or special requests need to be made to particular organisations for sampling (bottom-up approach) data.

In the case of Phitsanulok Municipality, special efforts need to be exerted by the municipality to request information about fuel sales from the private sector (petrol stations and cooking gas providers). For electricity use in households and commercial buildings, such data had to be requested from the Provincial Electricity Authority (PEA). PEA's database system could not easily and quickly isolate consumption data for all buildings within the city boundary.

As for fuel consumption in the transport sector, the municipality had to request sales data from petrol stations operating within the city boundary as an initial step. However, not all petrol stations were willing, nor were they legally obliged, to reveal such data. Even when data is revealed, the quality is uncertain. There was also no good quality baseline data of the transport sector, such as the number and type of vehicles travelling within the city boundary, as well as travel patterns (e.g. travel distance of vehicles).

### *Practicality of Present National and Global GHG Accounting Standards and Protocols*

Due to weak capacity (including English language capacity) and lack of incentives, Phitsanulok Municipality staff found it difficult to develop municipal or city-level GHG inventory merely by independently reading the guidelines issued by national and international agencies.

The data collection forms prescribed by both international agencies and national agencies request the summative data (total amount for the entire municipality operations, or the entire city). It leaves the question of how to collect scattered and fragmented subsidiary data to the municipality, which is actually the most challenging part of the process.

In particular, calculating citywide transport-related emissions may require the support of a third party expert, as the guidelines provided by the GPC is extremely complicated. Most municipalities in developing nations are unlikely to possess such capacity.

## Recommendations

Unless there is guidance and support from a third party and high motivation, it is unlikely that a municipality, especially one with limited capacity and experience on GHG accounting, will be able to establish a systematic and sustainable process to collect such data on a regular basis.

In reality, there are also no direct incentives or legal mandate for local governments to undertake MRV action or establish either a municipal- or a city-level GHG inventory. So, the framing of co-benefits of MRV action to the municipality itself, as well as to the local environment, economy and society is important. Benefits that could appeal to the municipality include:

- Creating a more robust and modernised routine data management system to facilitate better local development planning and policy-making for sustainable development.
- The reputational benefits for the local government to be involved in a global and emerging issue such as climate change can also be appealed to (being a 'progressive' city with international reputation and projects). This may attract further attention from various international organisations who may provide resources to help develop the city.
- Increase 'readiness' to comply with eventual directives from central government when national policy on climate change is fully enforced, especially legally, following the lead of developed countries. For example, it is most likely that central government will mandate all local governments to report energy and electricity consumption regularly and to formulate low-carbon city development.

Based on the above, a pragmatic approach might be to divide the inventory development into two stages, and the case of Phitsanulok Municipality suggests the two stages can be eventually implemented in parallel:

- Stage 1 for developing municipal-level GHG Inventory (smaller scope), which helps to nurture basic capacity on data collection towards Stage 2.
- Stage 2 for developing city-level GHG inventory (larger scope covering emissions which are emitted within the geopolitical administrative boundary of the local government).
- To aid in data collection for the above stages, awareness raising and capacity building activities on MRV organised by third parties should also be extended to relevant central and provincial agencies, such as Provincial Electricity Authority (PEA) and provincial authorities.
- The accuracy and quality of data needs to be improved over time and, for this, further measures other than setting up an ad-hoc project working group (which will not be active after project completion, since staff will be busy with their core duties) must be taken to formally institute GHG data collection work both as a routine and responsibility of relevant persons.
- Data management systems, both in the municipality and in external agencies collecting relevant data (such as PEA for electricity consumption), also need to be enhanced.
- The level of guidance contained in existing global and national protocols on local GHG inventory are insufficient to enable lower capacity and smaller-sized local governments to undertake MRV and GHG accounting independently. To encourage more local governments to undertake MRV-related work, supporting organisations may help by developing more detailed and local-language guidance on decentralised/micro-level data reporting forms to complement existing broad guidance provided by national/global GHG accounting protocols, especially for the transport sector at the city-level.

Category	Emission Sources	Total in FY2013	Unit	Remarks
Energy	Electricity - Stationary Sources (Buildings)	14,464, 110.89	kWh	
	Diesel	534,681.00	L	Off-road consumption needs to be differentiated from mobile consumption (vehicles).
	Benzene	3,873.00	L	
	Gasohol	31,376.00	L	
	CNG	77,151.00	Cu. Ft.	
Waste/ Wastewater	Solid waste landfilled	22,538.50	t	
	Biological Treatment/ Composting	9.00	t	Not including community-level composting
	Incineration	N/A		
	Wastewater Treatment & Discharge	180,291	m <sup>3</sup>	Needs to be reduced based on an assumption of how much of supplied water is eventually discharged into septic tanks.
Others	Fertiliser Use (16-16-16)	0.6	t	Estimated from 50kg x 12 packs per month.
	Fugitive Emissions (N-22)	TBC		As there are no consumption-based purchase records, estimation needs to be done based on the number of fire extinguishers, vehicle fleet and air-conditioning units.

**Table 1.** Data Collected for Municipal Level GHG Inventory as of 23 June 2014, Phitsanulok Municipality, Thailand.

## Conclusion

Due to a low baseline capacity and lack of practical incentives, it is challenging to build a local government's capacity on MRV actions, which starts with the development of local-level GHG inventory (both municipality- and city-level). Once an initial GHG inventory is developed, the long-term challenge is then to maintain a systematic/routine accounting mechanism to compile relevant data within a city government, so that a good quality annual GHG inventory report can be produced.

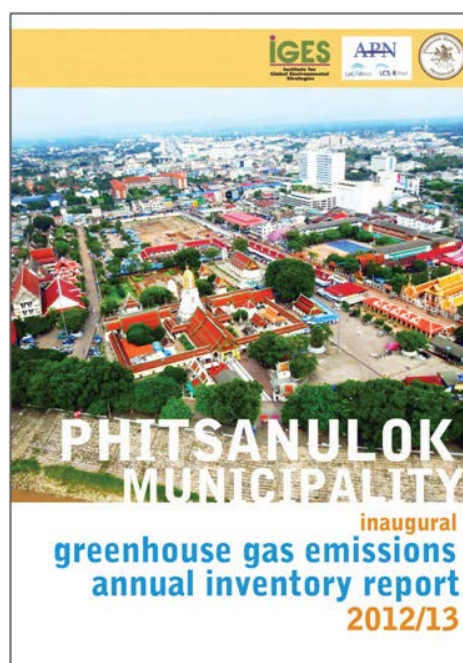
It is hoped that the case of Phitsanulok Municipality will provide some ideas and insights to supporting stakeholders on the required capacity building approaches and guidance that will enable more local governments in developing countries to account for city GHG emissions in the future.

## Project Publications

This project's findings will be published as part of an upcoming IGES policy report on Local-level MRV Action in 2015. The Municipality's 2012/13 Inaugural GHG Emissions Inventory will also be published separately as a public report in 2015 (Figure 1).

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**Figure 1.** Draft of the Phitsanulok Municipality's GHG emissions annual inventory report.

### PROJECT INFORMATION

Title:	Capacity Building for Implementing a 'Measurable, Verifiable and Reportable (MRV)' Model in a Mid-Sized Thai Municipality
Duration:	Single-year project
Total Funding:	US\$ 28,000
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