# PROMISE OF HANOI

## LOW EMISSION DEVELOPMENT STRATEGIES 2020-2030

AMBITIOUS CITY PROMISES

Engaging citizens. Driving climate action.

ICLEI Local Governments for Sustainability

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag

HÀ NỘI


SOUVENIR
HANOI GALLERY

# Acknowledgments

This document was produced by ICLEI – Local Government for Sustainability, in collaboration with and with contribution of the Hanoi People's Committee and Hanoi Department of Natural Resources and Environment, and with the financial support of the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) through its International Climate Initiative (IKI) program.

### Contributing Authors


| | |
|---|---|
| Ms. Mary Jane Alvarez | ICLEI Southeast Asia Secretariat, Regional Program Manager |
| Ms. Pamela Cabacungan | ICLEI Southeast Asia Secretariat, Senior Officer |
| Ms. Hoang Thi Huong Giang | ICLEI Southeast Asia Secretariat, Country Liaison Officer, Vietnam |
| Ms. Jiwon Lee | ICLEI World Secretariat, Senior Officer |
| Mr. Tim Lazaroff | ICLEI World Secretariat, Project Assistant |
| Ms. Nguyen Hoang Lan, Ph.D. | ACP Consultant |


### Document Date

30 June 2021

### Document Information

This report consists of the Promise of Hanoi, a document outlining the stakeholder-driven low emission development strategies that supplement the integrated climate action plan of the Hanoi People's Committee. This report reflects the inputs gathered from a series of consultations with the relevant city departments and agencies of the Hanoi People's Committee as well as with various stakeholder groups. The Promise of Hanoi incorporated the results of the 2015 city-level greenhouse gas (GHG) emissions inventory and GHG emissions reduction targets outlined in the Hanoi Green Growth Action Plan, among other relevant planning documents of the city. This report was prepared with supervision from ICLEI Southeast Asia Secretariat and World Secretariat under the project: **Ambitious City Promises**.

### Copyright information



Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

This project is funded by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU). The views expressed in this document are in no way considered to reflect the official opinion of BMU.

# TABLE OF CONTENTS


I. Message from the Hanoi People's Committee Council....4

II. Background....5

III. About Hanoi....6

A. Natural Conditions....6

B. Socio-economic Conditions....8

IV. Promise of Hanoi....10

V. GHG Emissions Profile of Hanoi....11

VI. GHG Reduction/Avoidance Target and the Contribution of the Promise of Hanoi..14

VII. Identification of Strategies and Actions in the Promise of Hanoi....16

VIII. Sector-specific Low Emission Development Solutions of the Promise of Hanoi....20

A. Energy....21

B. Transport....26

C. Waste and Water Management....33

D. Air Quality....42

E. Urban Agriculture and Ecology....46

F. Cross-cutting Actions....48

IX. Financing the Promise of Hanoi....48

X. Measurement, Reporting, and Verification (MRV) ....50

# I. Message from the Hanoi People's Committee Council

Many Southeast Asian countries are experiencing unprecedented economic growth and urbanization that threatens environmental sustainability. Half of Southeast Asia's population resides in urban areas, a share that has grown substantially in the last four decades and is expected to increase to 64% by 2050.[1] The region has seen rapid and often unplanned development and the emergence of megacities that face severe urban challenges and contribute significantly to greenhouse gas (GHG) emissions.

Hanoi, the capital of Vietnam, almost tripled its land area in 2008 when it expanded city boundaries to encompass neighboring provinces and districts. The city faces unique and complex urban challenges, and growth in carbon emissions is expected to accelerate without appropriate interventions. Efforts to reduce GHG emissions in Southeast Asian megacities like Hanoi will substantially contribute to national GHG emissions reduction goals and can help raise national and regional ambitions.

Hanoi hereby makes the following promises that embrace the intent of citizens, businesses, and the city government to build a low-carbon and energy-efficient city. This document signals Hanoi's intent to join global metropolitan efforts in achieving carbon neutrality.

Beginning in 2020, Hanoi will undertake appropriate measures to reduce GHG emissions from all economic sectors, encourage sustainable and efficient use of natural resources in all economic activities, and ensure environmental protection and ecological balance.

**Hanoi commits to reducing its GHG emissions by 12.14% (equivalent to 6.68 million $tCO_2e$) by 2025 and by 18.17% (equivalent to 13.76 million $tCO_2e$) by 2030 compared to the business-as-usual scenario.**

All citizens and businesses in Hanoi pledge to join hands with the Hanoi People's Committee Council to turn Hanoi into a peaceful and modernized, low carbon and resilient city with diverse culture, sustained economic growth, and preserved ecosystem.

**Hanoi promises to embrace the intent of citizens, businesses, and the city government to build a low-carbon and energy-efficient city.**

[1] *United Nations Department of Economic and Social Affairs Population Division, 2014. World Urbanization Prospects: The 2014 Revision, Highlights.*

# II. Background

The Promise of Hanoi is a result of the cooperation between ICLEI - Local Governments for Sustainability and the Environmental Protection Agency of the Hanoi Department of Natural Resources and Environment (DONRE) in the implementation of the Ambitious City Promises project. It expands Hanoi's latest 2015 GHG emissions inventory of the city with reference to existing and new plans and programs such as the Hanoi Green Growth Action Plan 2020-2025, Hanoi Climate Action Plan 2021-2030 (under final review), and Programme 05/CTr-TU 2021-2025 on strengthening the planning and management of natural resources, environmental protection, as well as natural disasters and climate change response (for approval).

The Promise of Hanoi reflects the expectations and aspirations of the city government and its citizens to a peaceful and modernized city where the economy grows and the culture thrives in harmony with the natural environment. It includes specific GHG emission reduction targets for 2025 and 2030 and consists of 11 strategies in the following areas: energy, transport, waste, air quality, urban agriculture, and ecology. For each strategy, a matrix of pledged actions and areas for city government, businesses, CSOs/NGOs, and citizens participation were outlined.

**This report consists of the following sections: (1) Description of the city in terms of natural, socio-economic and climate conditions, (2) Hanoi's city-level GHG emissions profile and scenario modeling, (3) GHG reduction/avoidance targets, (4) Identified mitigation strategies and actions, and (5) Proposed MRV mechanism for the Promise of Hanoi.**

Ambitious City Promises (ACP) is a four-year project implemented by ICLEI - Local Governments for Sustainability. Through this project, selected cities in Indonesia, Philippines, and Vietnam were supported to set their pledges to contribute to reducing GHG emissions thereby contributing to efforts by their national governments in delivering their Nationally Determined Contributions. These pledges referred to as "City Promises" embody climate actions with the following characteristics: ambitious GHG reduction targets, inclusive, integrated & cross-sectoral, actionable for all partners, and measurable & verifiable. The project was implemented in cooperation with the Seoul Metropolitan Government (SMG) and with funding support from the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMU) through the International Climate Initiative (IKI) Program. Learn more about ACP by visiting acp.iclei.org.

# III. About Hanoi

## A. Natural Conditions

***Geographical location:*** Located at the northwest of the Red River Delta, Hanoi has generally low terrain and an area of 332,492 hectares divided into 12 urban and 17 rural districts. Prior to August 1, 2008, Hanoi has an area of 100,000 hectares. In May 2008, Parliament of Vietnam has approved the merging of old Ha Tay province, Me Linh commune of Vinh Phuc province, 4 wards of Luong Son commune Hoa Binh province, into Hanoi city, resulting in today's area and administrative territory.


Figure 1. Map of Hanoi

***Climate:*** Hanoi has a tropical monsoon climate characterized by a hot season from May to September with an average temperature of 28.1°C, and a dry season from November to March with an average temperature of 18.6°C. However, an analysis of observed changes in climate from 1961-2019 showed that the city is experiencing an increase in average temperature and number of hot days.[2]

[2] *Institute of Meteorology, Hydrology and Climate Change, 2021.*

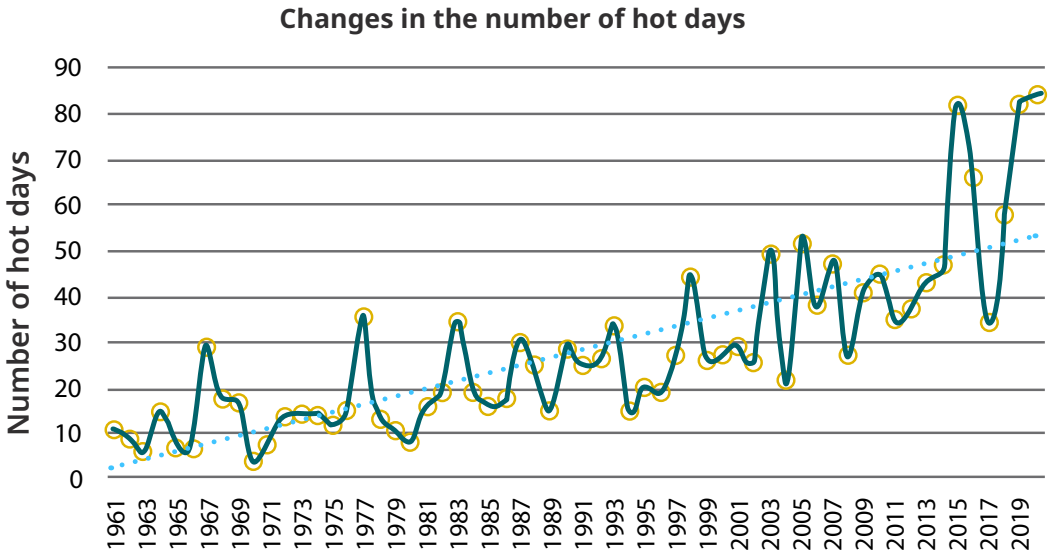



Figure 2. Changes in the number of hot days

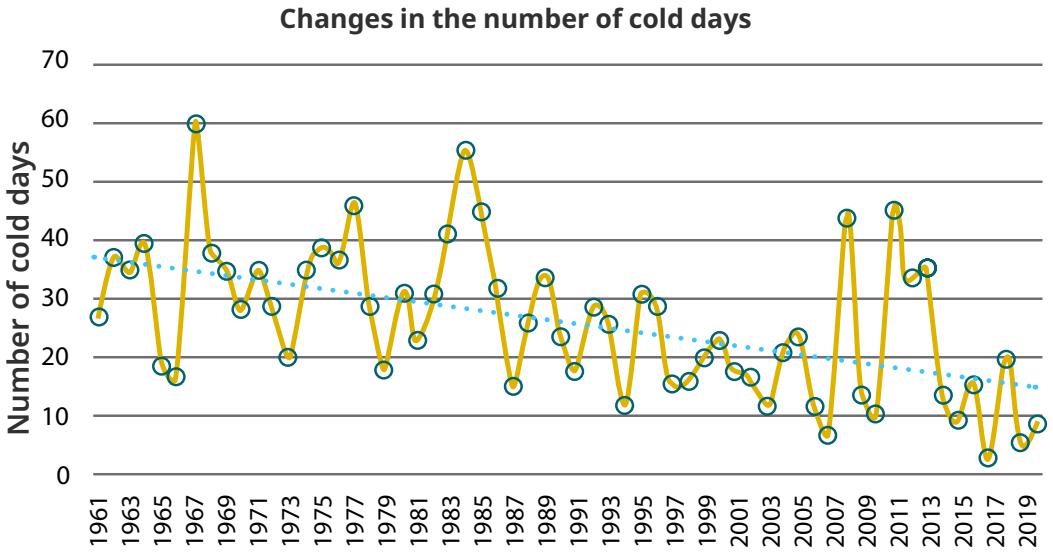



Figure 3. Changes in the number of cold days

***Water resources:*** Hanoi has a number of rivers and lakes covering a surface area of approximately 24,500 hectares (equivalent to 7% of the city's total surface area). These water bodies are tributaries of the Red and Thai Binh river systems. These rivers and lakes are increasingly becoming the main source of water supply in the city due to the poor quality of groundwater and aquifer depletion. However, this supply is also at risk because it is estimated that 78% of urban sewage is being discharged directly into the river systems.

***Land resources:*** Agricultural land accounts for more than half (58%) of Hanoi's total land area while non-agricultural land (that is used for residential, commercial, and industrial purposes) accounts for 40% of the total land area. Only 2% of the total land area remains unused.

Table 1. Land use of Hanoi, 2018[3]

| Land Type | Area in hectares | Share in % |
|---|---|---|
| **Agricultural land** | **195,872** | **58%** |
| Agricultural production | 154,218 | 46% |
| Forestry | 22,250 | 7% |
| Water surface for fishing | 14,207 | 4% |
| Others | 5,197 | 2% |
| **Non-agricultural land** | **134,186** | **40%** |
| Homestead | 40,873 | 12% |
| Special use | 64,170 | 19% |
| Religious land | 1,211 | 0% |
| Cemetery | 3,112 | 1% |
| Rivers and lakes | 24,542 | 7% |
| Others | 278 | 0% |
| **Unused land** | **5,801** | **2%** |

### B. Socio-economic Conditions

***Economy:*** Hanoi's economy is dominated by the service sector (62.79%) followed by the industrial and construction sector (23.67%), signaling the city's vision to transition from agriculture-based to services-based economy.[4] Currently, Hanoi is the second largest economic center of Vietnam and economic hub of the northern delta. Meanwhile, the total state budget revenue of Hanoi in 2020 is estimated at VND 280.5 trillion, reaching 100.6% of the budget planned by the Hanoi People's Committee Council, with an increase of 3.9% compared to the results in 2019.


[3]*Annual Statistics Yearbook 2018. Hanoi Office of Statistics.*
[4]*Annual Statistics Yearbook 2018. Hanoi Office of Statistics.*

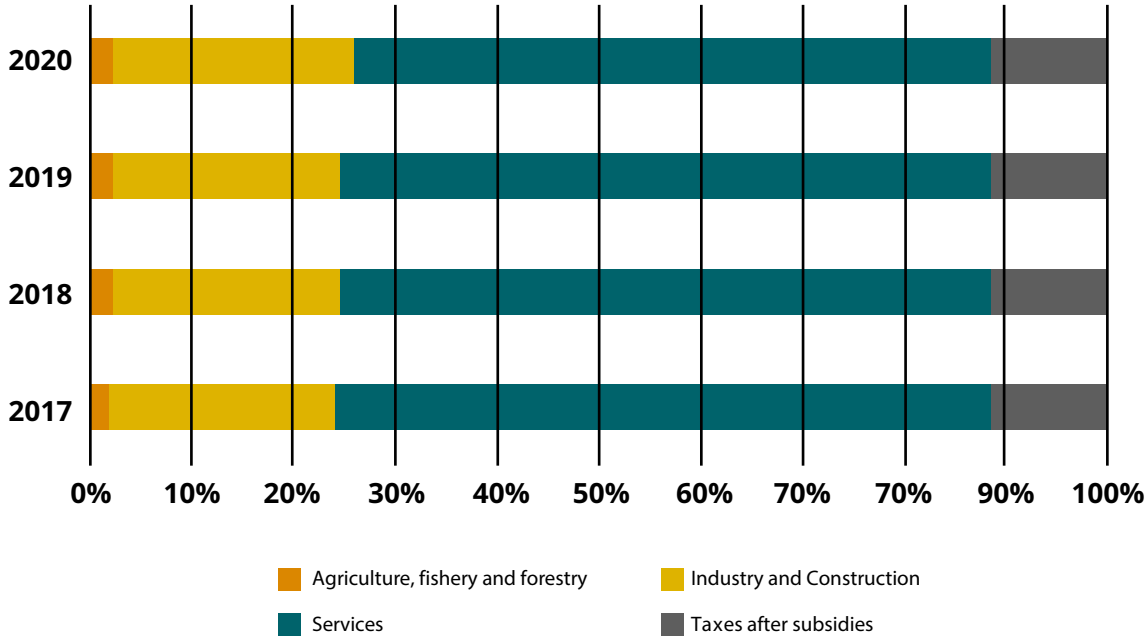
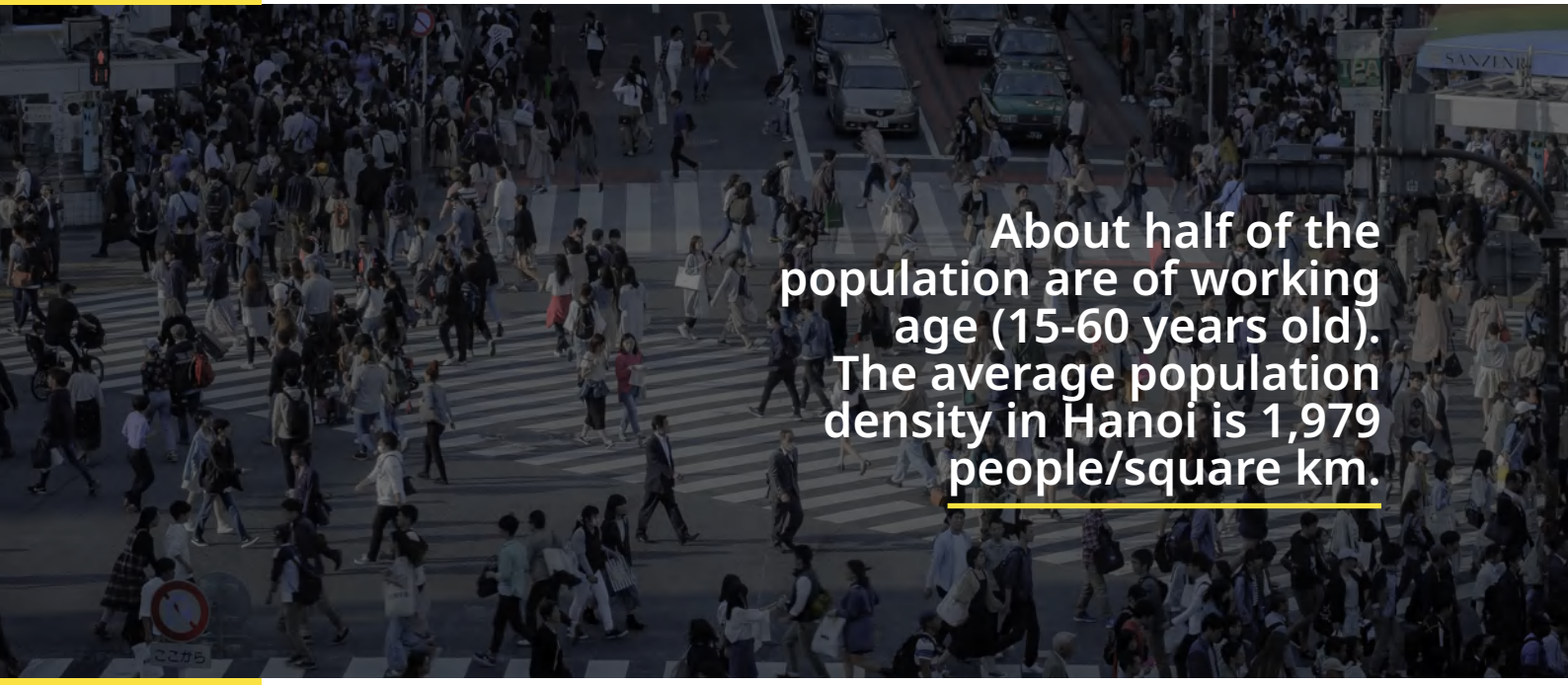



Figure 4. Share distribution per economic sector to Hanoi GRDP 2017-2020

***Population:*** Hanoi's population is estimated at 8.28 million (2020), one of the world's largest capital cities by population. About half of the population are of working age (15-60 years old). The average population density in Hanoi is 1,979 people/square km. However, the distribution is very uneven between rural and urban districts. For example, the downtown Hoan Kiem District has a population density of 35,341 people/square km, while peri-urban districts typically have a population density of less than 1,000 people/square km.



# IV. *Promise of Hanoi*

In the beginning of 2020, the city has pledged to take appropriate actions to reduce its GHG emissions in key economic sectors to encourage the efficient and sustainable use of resources in all economic activities. Concurrently, Hanoi will enforce pollution controls in maintaining ecological balance and biodiversity towards an environment-friendly and sustainable economy.

By 2050, Hanoi shall continue to strive towards greater improvement of the environment and maintaining ecological balance as well as towards ensuring efficient and sustainable utilization of resources to achieve environmental standards similar to its pioneering peers in the region.[5]


In conjunction with these targets and Vietnamese aspirations, the Promise of Hanoi serves as an instrument to simultaneously advance the city's climate priorities. The Promise of Hanoi—characterized to be ambitious, inclusive, integrated & cross-sectoral, actionable for all partners, and measurable & verifiable—is a compendium of climate actions pledged by the city government, representatives of the business sector, CSOs, NGOs, and everyday Hanoians, to support the implementation of Hanoi City's integrated climate action plan.

[5] *Climate Action Plan (CAP) of Hanoi City.*

# V. GHG Emissions Profile of Hanoi

According to Hanoi's 2015 GHG inventory, the city generated GHG emissions of 18,192.76 $tCO_2e$ coming from the sectors of energy, industrial processes and products use (IPPU), agriculture, land use, land use changes and forestry (LULUCF), and waste. The results are summarized in Table 2.

Table 2. Results of Hanoi's GHG emissions inventory, 2015

| Emission Sources | | Unit: Thousand $tCO_2eq$ |
|---|---|---|
| **1.** | **Energy** | **12,167.80** |
| | 1.A. Fuel combustion | 12,167.80 |
| | 1.A.2. Manufacturing and construction industry | 3,500.15 |
| | 1.A.3. Transportation | 265.38 |
| | 1.A.4.a. Trade/services | 1,606.63 |
| | 1.A.4.b. Residential | 6,795.62 |
| | 1.A.4.c. Agriculture, forestry, and fisheries | 0.01 |
| **2.** | **Industrial processes and products use** | **171.70** |
| | 2.A. Building materials and minerals exploitation | 171.70 |
| | 2.A.1. Cement production | 171.70 |
| **3.** | **Agriculture** | **3,273.00** |
| | 3.A. Food consumption | 235.00 |
| | 3.B. Agricultural waste management | 97.60 |
| | 3.C. Rice cultivation | 1,877.60 |
| | 3.D. Emissions from agricultural land | 1,001.60 |
| | 3.E. Burning of agricultural by-pro | 61.20 |
| **4.** | **Land use, land use changes, and forestry** | **-0.97** |
| | 4.A. Forest | -73.72 |
| | 4.B. Cultivation land | 8.60 |
| | 4.C. Wetlands | 3.32 |
| | 4.D. Residential lands | 7.83 |
| | 4.E. Others | 53.00 |
| **5.** | **Waste** | **2,581.25** |
| | 5.A. Landfill disposal of wastes in the city | 1,121.56 |
| | 5.B. Biological treatment of wastes in the city | 126.52 |
| | 5.C. Emissions from wastewater treatment activities | 1,333.13 |
| **TOTAL ESTIMATED GHG EMISSIONS** | | **18,192.76** |

More than half of these emissions were shared by the energy sector, including those used for transportation[6]. It was followed by the emissions from the agriculture and then waste sectors with 18% and 14% contribution, respectively. On the other hand, the LLUCF sector registered minimal negative contribution due to absorption of the forest.

However, in a review and calibration of the GHG inventory result conducted in 2020 assisted by C40, it was observed that the emission calculation for the transportation sub-sector has limitations in accuracy. Upon consultation with the Department of Natural Resources and Environment (DONRE), and the Department of Industry and Trade (DOIT), the discrepancy in terms of annual and monthly volume of fuel consumption was clarified. Hence, the baseline inventory results was recalculated providing a total GHG emission count of **17,936,602 $tCO_2e$** from the following sectors: energy, industrial processes and product use (IPPU), agriculture, land use, land use change and forestry (LULUCF), and waste. The energy sector yielded the highest share of 67% of the overall estimated emissions.

Table 3. Converted GHG emission results of Hanoi City in 2015 reporting by GPC

| GPC Code | Category by GPC Basic | GHG emissions ($tCO_2e$) |
|---|---|---|
| **I** | **STATIONARY ENERGY** | **11,999,882** |
| I.1 | Residential buildings | 6,860,125 |
| I.2 | Commercial and institutional buildings and facilities | 1,639,567 |
| I.3 | Manufacturing industries and construction | 3,500,189 |
| I.5 | Agriculture, forestry, and fishing activities | 1.25 |
| I.8 | Fugitive emissions from oil and natural gas systems | 0.16 |
| **II** | **TRANSPORTATION** | **3,355,475** |
| II.1 | On-road transportation | 3,184,611 |
| II.2 | Railways | 29,928 |
| II.3 | Water Transport | 140,936 |
| **III** | **WASTE** | **2,581,245** |
| III1.1/2 | Solid waste generated in the city disposed in landfills or open dumps | 1,121,595 |
| III 3.1/2 | Solid waste generated in the city incinerated or burned in the open | 126,519 |
| III 4.1/2 | Wastewater generated in the city | 1,333,132 |
| **TOTAL** | | 17,936,602 |

Under the same study, four GHG emission scenarios were developed for Hanoi, as follows:

[6]*The inventory was undertaken in 2016 using 2015 as base year. The 1996 and 2006 IPCC Guidelines were used as the primary methodologies in conducting the inventory. The 2000 Good Practice Guide was also referenced in the conduct of the inventory.*

**1. BAU scenario:**

No emissions reduction policy is applied.

**2. No new policy scenario:**

Current effective policies continue to be applied.

**3. Ambitious scenario:**

Emissions reduction actions are adopted to a higher level demonstrated by enacting additional policies that aim to bring down emissions.

**4. Extended emissions scenario:**

Emissions reduction actions are better implemented compared to the ambitious scenario thus allowing Hanoi to achieve carbon neutrality in 2050 and fulfilling its commitment to Deadline 2020.

Within the premise of the BAU scenario and using the recalculated GHG emission for 2015 as base year, future emissions were calculated for the years 2030, 2040, and 2050. Growth indicators such as population and GDP were also used in projecting future emissions. Presented in Table 5 is the projected GHGF emission of Hanoi under the BAU scenario.

GHG emissions from buildings (both residential and commercial) will continue to make up about one third of the total emissions. Meanwhile, the share of emissions of on-road transportation will increase slightly from 20% in 2030 to 21% in 2040 and to 22% in 2050.

Table 4. Projected GHG emissions of Hanoi under the BAU scenario

| Key sector/activity | 2030 | 2040 | 2050 |
|---|---|---|---|
| | Ton of CO2/year | Ton CO2/year | Ton CO2/year |
| Stationary energy<br>Residential activities | 11,035,444 | 14,538,169.00 | 18,232,301 |
| Stationary energy<br>Commercial services | 2,917,195 | 4,105,857.00 | 5,461,404 |
| Stationary energy<br>Industry-Construction | 6,547,977 | 9,524,315.00 | 13,045,549 |
| Transportation<br>Road traffic | 5,957,610 | 8,665,601.00 | 11,869,361 |
| Transportation<br>Inland waterway | 194,650 | 232,027.00 | 266,215 |
| Waste<br>Solid waste landfill | 1,471,784 | 1,696,490.00 | 1,889,250 |
| Waste<br>Solid waste incineration | 166,021 | 191,368.00 | 213,112 |
| Waste<br>Wastewater treatment | 1,749,368 | 2,016,454.00 | 2,245,570 |
| **Total** | **30,040,049** | **40,970,281** | **53,222,762** |

# VI. GHG Reduction/Avoidance Target and the Contribution of the *Promise of Hanoi*

In the Hanoi Green Growth Action Plan 2020, the Hanoi People's Committee Council declared its **intent to reduce its GHG emissions by 12.14% by 2025 and 18.71% by 2030** compared to business-as-usual (BAU) scenario[7]. The table below shows the target sector-specific GHG emissions reduction contributions of the city. It is expected that the industry sector will generate the most contribution to meeting the city's target by 2025, while the agriculture and forestry sectors' contributions will become the most instrumental for 2030 targets.

Table 5. GHG emissions reduction potential by sector: 2025 and 2030.[8]

| No. | Sector | GHG emissions reductions by 2025 (in million $tCO_2e$) | GHG emissions reductions by 2030 (in million $tCO_2e$) |
|---|---|---|---|
| 1 | Industry | **3.90** | 4.32 |
| 2 | Agriculture and forestry | 1.76 | **4.96** |
| 3 | Residential (Stationary fuel and electricity consumption) | 0.65 | 1.12 |
| 4 | Urban management (Including waste management) | 0.24 | 0.44 |
| 5 | Transport (on-road transportation) | 0.18 | 0.19 |
| **TOTAL** | | **6.68** | **13.76** |

[7] *Hanoi Green Growth Action Plan to 2025 with vision to 2030 (2020)*
[8] *Hanoi Green Growth Action Plan to 2025 with vision to 2030 (2020). The sectors were rearranged to match the categorization of IPPC.*

To complement the Green Growth Action Plan and to foster inclusive climate action across all stakeholders, the Hanoi People's Committee Council set ambitious reduction targets in the *Promise of Hanoi*. This City Promise comprises goals, targets and indicators, strategies, and actions in **three sectors of energy, transport, and waste, with two cross-cutting sectors—air quality and urban planning**[9]—inspired by the Promise of Seoul model. The Promise of Hanoi document specifies 11 strategies and detailed actions for four stakeholder groups: city government, business sector, CSOs/NGOs, and citizens. These actions can contribute to reducing 2,148,800 $tCO_2e$ by 2025 and an additional 2,296,200 $tCO_2e$ by 2030.

Table 6. Overview of GHG emissions reduction/avoidance potential of the Promise of Hanoi, 2025-2030.

| No. | Sector | Strategy | Potential GHG emissions reduction by 2025 in $tCO_2e$ | Potential GHG emissions reduction by 2030 in $tCO_2e$ |
|---|---|---|---|---|
| 1 | Energy | Improve energy efficiency of buildings | **676,500** | 1,645,800 |
| | | Promote the use of rooftop solar photovoltaic systems | 1,200 | **2,700** |
| 2 | Transport | Promote low carbon, efficient, and reliable public mass transport | 87,700 | 97,500 |
| | | Promote the use of CNG buses | 16,400 | 19,000 |
| | | Promote the use of electric bikes | Not applicable | 49,400 |
| 3 | Waste | Reduce waste disposal to landfills by improving recycling and composting | 54,000 | 72,000 |
| | | Reduce plastic waste generation | | |
| | | Improve efficiency of wastewater treatment | | |
| 4 | Air quality | Improve air quality monitoring system | Not applicable | Not applicable |
| | | Prohibit straw burning in rural areas | 1,094,000 - 1,109,000 | Not applicable |
| 5 | Urban agriculture and ecology | Expand urban green spaces | 204,000 | 409,800 |
| | | **TOTAL** | **2,148,800** | **2,296,200** |

[9] *The urban planning sector also encompasses urban ecology, agriculture, and water.*

# VII. Identification of Strategies and Actions in the *Promise of Hanoi*

To achieve the aforementioned GHG reduction targets and further pursue climate neutrality by 2050, the Hanoi People's Committee should spearhead implementation through its different city departments. A series of overarching actions can develop Hanoi's resilience and cultivate capacity to sustain awareness and collaborative action.

Inclusive and value-laden engagements with various community stakeholders enable expansion and diversification of the areas of climate action and in turn, generate larger impacts. While scientific data provides a basis for identifying priority sectors, engaging with stakeholders presents opportunities to discover indigenous, local knowledge and uncover pathways to possible new solutions. Therefore, CSOs and citizens play irreplaceable roles in achieving GHG reduction targets.


The identification of actions and strategies employed a methodological and participative process to ensure that contributions from public and private stakeholders receive consideration and attention in the Promise of Hanoi. Various areas of cooperation between the local government and stakeholder groups, as well as enabling policies, regulation, and planning tools that can reduce structural barriers to meaningfully engaging citizens, were identified to raise the probability of achieving the targets.

ICLEI and DONRE conducted a comprehensive examination of ongoing and pipelined programs of the Hanoi People's Committee as outlined in the existing development and sectoral plan.

**These plans include:**

**(a) 2015 city-level GHG inventory,**

**(b) Hanoi Green Growth Action Plan 2020-2025,**

**(c) Hanoi Climate Action Plan 2021-2030 (under finalization), and**

**(d) Programme 05/CTr-TU 2021-2025 on strengthening the planning and management of natural resources, environmental protection, as well as natural disasters and climate change response (for approval).**

Putting the local stakeholders at the center of the Promise of Hanoi presented an opportunity for the city to empower citizens to be the principal agents of achieving climate neutrality. Figure 6 demonstrates the various steps taken to actively engage the citizens. Consultations and workshops were conducted which attracted more than 300 participants to solicit inputs of different stakeholder groups such as citizens, private sector, CSOs/NGOs, cooperatives, and media. In particular, the stakeholders were asked of their existing strategies and programs which were deemed contributory in addressing climate change impacts and in mitigating GHG emissions.

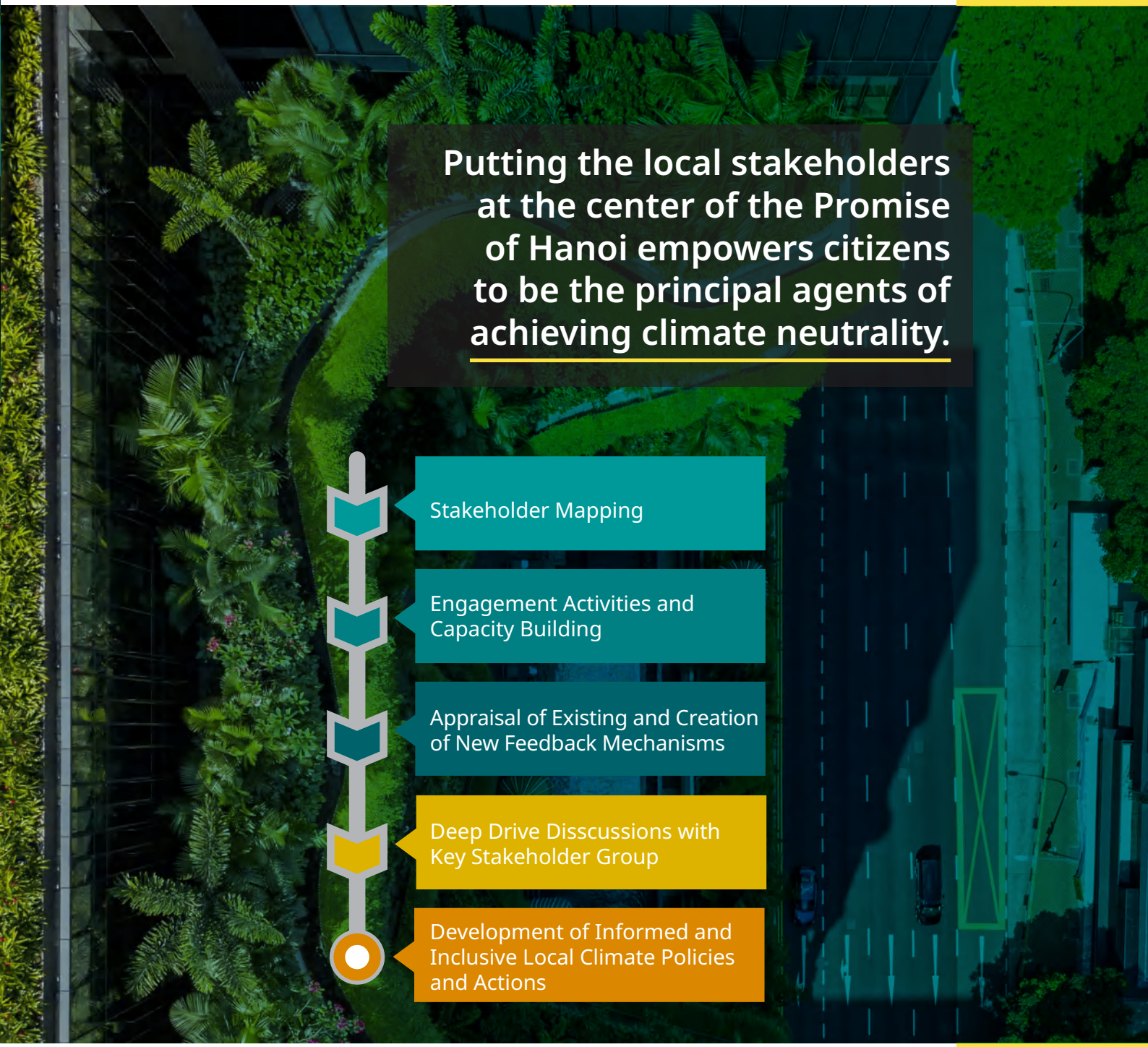



Figure 5. The stakeholder engagement framework followed by project implementation in Vietnam with an aim to increase public participation in the development and implementation of the Promise of Hanoi.

The Ambitious City Promises project provided tools and tested some of the innovative methods of maximizing public participation in planning and implementing climate actions. To ensure an extensive reach of stakeholders, including private individuals, a citizen engagement platform was established to solicit individual pledges in turning Hanoi into a safe, citizen-friendly, and climate resilient capital by 2030. The Promise of Hanoi's ideals have been tested in the pilot project on co-designing public space in the Cau Giay District. A myriad of stakeholders—from architecture students to local women's groups—submitted proposals for green visions of public spaces, which the evaluation committee successfully bridged with an infrastructure intervention to co-design a playground. The implementation of newfound community-led approaches will significantly contribute to the successful implementation of the Promise of Hanoi.


**The implementation of newfound community-led approaches will significantly contribute to the succesful implementation of the Promise of Hanoi.**

# VIII. Sector-specific Low Emission Development Solutions of the *Promise of Hanoi*

As a result of the processes described in the previous section, the Promise of Hanoi provides a compilation of mitigation targets, strategies, and actions according to the priority sectors of Hanoi (energy, transport, waste, air quality, urban planning) to be delivered by the Hanoi People's Committee, business sector, CSOs/NGOs, and the citizens. The Hanoi People's Committee and its departments will be taking the lead in implementing a series of overarching actions to reduce the city's emissions and to improve the city's resilience. CSOs, businesses, and citizens also play irreplaceable roles in the achievement of GHG reduction targets. The following table describes the general roles and tasks of the three main stakeholder categories while the succeeding subsections discuss the pledged actions for each sector.

Table 7. General roles and responsibilities in the implementation of Promise of Hanoi per stakeholder category.

| Stakeholder Group | General Roles and Responsibilities |
|---|---|
| **Hanoi People's Committee Council** | • Improve the city government's capacity to monitor and forecast climate events by upgrading its early warning system and disaster response strategies. This includes modernizing infrastructure facilities and capacity building local communities on disaster response.<br>• Improve drainage system, river dikes, and irrigation channels to prevent flooding during typhoon season. Ensure the adequate supply of water in anticipation of prolonged drought periods.<br>• Periodically conduct GHG inventory and build a robust emissions database in preparation for potential participation in domestic and international carbon markets. The conduct of city-level GHG inventory should be in parallel with that of the national inventory.<br>• Continue to mobilize awareness-raising activities for district authorities, public officials and employees, and community organizations to gain active support and participation in climate programs.<br>• Integrate climate change in training programs and curricula of secondary and tertiary education levels. |
| **CSOs/NGOs** | CSOs act as the bridge between the city government and the citizens and can accelerate the progress and enhance the effectiveness of different programs and interventions. CSOs should actively participate in the planning processes of city-wide programs to represent the voice of the larger public as well as to act as agents for the dissemination of factual information and encouraging citizen participation. |

| | General Roles and Responsibilities |
|---|---|
| **Private sector (Businesses and citizens)** | Follow through—in its own capacity and resources—with pledged climate actions through the online stakeholder engagement platform for climate action www.hanhdongvihanoi.org. |

The following subsections present these pledged solutions according to each priority sector.

# A. Energy

According to the 2015 GHG inventory of Hanoi conducted by the Department of Natural Resources and Environment (DONRE), the energy sector contributed to approximately 68% (equivalent to 12.17 million $tCO_2e$) of the city's total estimated GHG emissions. These emissions primarily originate in electricity use in residential and manufacturing buildings sub-sectors. Furthermore, the energy sector's share is projected to increase to 85% (42.74 million $tCO_2e$) of the total projected GHG emissions by 2030. Hence, mainstreaming efforts to improve energy efficiency and conservation can significantly bring down the city's GHG emissions in the energy sector. To execute this, Hanoi plans to make existing and new buildings more energy efficient. In addition, the city is committed to switching to renewable energy sources to supply its energy needs.

Table 8. Overview of objectives, strategies, targets of Promise of Hanoi - Energy Sector

| **Objective: Hanoi will reduce its GHG emissions in the energy sector by at least 925,000 $tCO_2e$ by 2025 and by at least 2,018,000 $tCO_2e$ by 2030.**[10] | |
|---|---|
| **Strategy** | **Target** |
| Enforce the National Standards on Energy Efficient Buildings | 100% of new buildings meet the National Technical Standards on Energy Efficient Buildings (QCVN 09:2017/BXD) by 2025. |
| Promote the use of rooftop solar photovoltaic systems | At least 1,200 $tCO_2e$ and 2,700 $tCO_2e$ of GHG emissions will be reduced by switching and expanding the use of rooftop solar photovoltaic systems by 2025 and 2030, respectively. |

[10] *Hanoi Green Growth Action Plan until 2025 with vision to 2030 (2020) & GIZ/DONRE report on "Analysis of air pollutant and greenhouse gas emissions from beehive cookstoves in Hanoi 2017-2020" (2020).*

## 1.1. Enforce the National Standards on Energy Efficient Buildings

47.8% of the total energy-related GHG emissions of Hanoi are attributable to energy consumption in buildings. Residential and commercial buildings contribute approximately 5.5 million $tCO_2e$ and 836,000 $tCO_2e$ respectively. It is estimated that the GHG emissions from the residential and commercial buildings will double every five years from 2015 to 2030 (see the following graph, which shows emissions nearly doubled from 2015 to 2020).

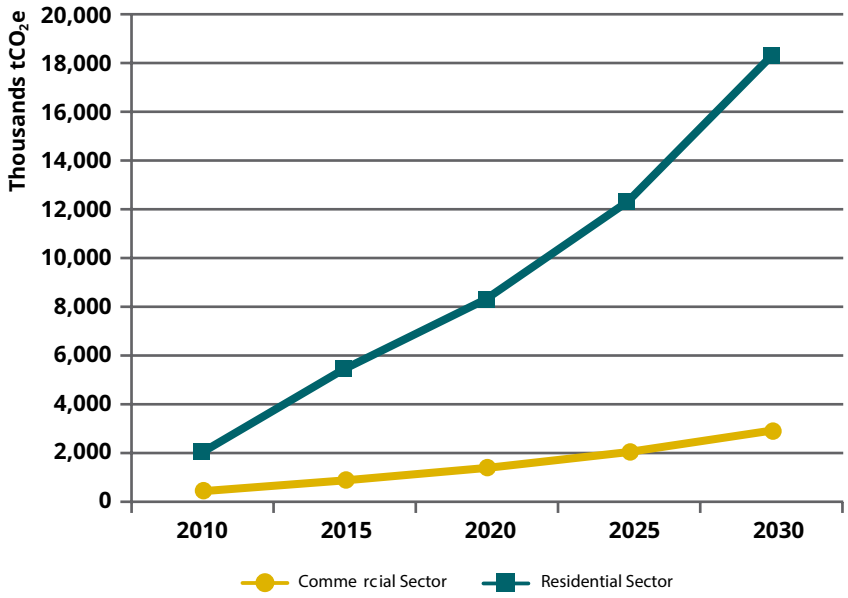



Figure 6. Estimation of GHG emissions in residential and commercial buildings sub-sectors, 2010-2030.[11]

As such, the Ministry of Construction (MOC) issued QCVN 09:2017 (National Technical Regulation on Energy Efficient Buildings) which includes regulation on building envelope, ventilation and air conditioning, the lighting and other electrical equipment in the building. Concrete measures include upgrading the building envelope to meet the insulation standards, switching to highly energy efficient air conditioners and electrical appliances, and upgrading all light bulbs into LED bulbs. This regulation is also in line with the National Renewable Energy Development Strategy 2016-2030 with an outlook until 2050. This sets the target to increase the percentage of households using high-performing (electrical) stoves and to lift the proportion of residential buildings with solar water heating. It is expected that the solid compliance of this regulation will significantly improve building efficiency.

### Target and Indicators

100% of new buildings meet the National Technical Standards on Energy Efficient Buildings (QCVN 09:2017/BXD) by 2025. By pledging to improve energy efficiency in residential and commercial buildings, Hanoi expects to cut down its GHG emissions by at least 676,500 $tCO_2e$ by 2025 and by at least 1,645,800 $tCO_2e$ by 2030 compared to the BAU scenario.[12]

[11] *Annex II, Hanoi Green Growth Action Plan until 2025 with vision to 2030 (2020)*
[12] *Annex II, Hanoi Green Growth Action Plan until 2025 with vision to 2030 (2020).*

Table 9. Performance indicators: Improve energy efficiency of new and existing buildings

| Indicator | 2025 | 2030 |
|---|---|---|
| Proportion of commercial buildings with highly energy-efficient air conditioners | 30% | 60% |
| Proportion of households with highly energy-efficient air conditioners | 25% | 30% |
| Proportion of commercial buildings with highly energy-efficient lighting systems | 60% | 100% |
| Proportion of households with highly energy-efficient lighting systems | 20% | 40% |
| Proportion of commercial buildings with solar water heaters | 30% | 75% |
| Proportion of households with solar water heaters | 10% | 20% |
| Proportion of commercial buildings' glass design and construction components made of energy-efficient glass materials | 5% | 15% |

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Invest and apply new technologies that save energy and reduce pollution in construction activities<br>• Provide guidance and instruct the conduct of energy audits and application of green energy standards to energy-intensive sectors and businesses<br>• Build and pilot test city-specific calculation tools to measure and monitor energy efficiency index of buildings<br>• Promote the use of renewable energy<br>• Conduct awareness-raising campaigns on energy savings practices for different stakeholders through existing events, such as Earth Hour and World Environment Day<br>• Formulate and enact green building and construction regulations<br>• Conduct awareness-raising campaigns that enhance awareness and educate on green building practices<br>• Apply eco-designs in construction<br>• Conduct energy audit to determine energy saving opportunities in public buildings and facilities |

## 47.8% of the total energy-related GHG emissions of Hanoi are attributable to energy consumption in buildings.


| Group | Action |
|---|---|
| **Businesses** | • Reduce the use of air conditioning in schools, offices, and workplaces by instructing occupants and users on energy efficient practices in the use of air conditioners (e.g. setting and keeping temperature at around 25°C).<br>• Apply better insulation and roofing in buildings that meet the standards set in QCVN 09:2017/BXD.<br>• Cultivate a "green office" culture and environment by adopting practices such as the installation and use of energy-saving devices (e.g. air conditioners, light bulbs, computers) and behavioral changes among employees to reduce unnecessary water and paper consumption.[13]<br>• Purchase energy-saving devices that meet the technical standards set under QCVN 09:2017/BXD for air conditioners, fans, water chiller and heater, and lighting systems. |
| **CSOs/NGOs** | • Implement community-level and community-driven initiatives that promote energy savings among households such as the "One Million Green Homes Initiative."[14]<br>• Conduct and disseminate research studies as well as advocate for the extensive use of renewable energy<br>• Raise awareness and build multi-stakeholder partnerships to leverage opportunities and resources to advance initiatives in improving energy efficiency in existing and new buildings. |
| **Citizens** | • Switch to LED light bulbs in households and offices, where applicable<br>• Reduce the use of energy-intensive appliances, whenever applicable<br>• Buy and use energy-efficient products<br>• Invest in renewable energy devices and equipment (e.g. solar water heating equipment, rooftop solar photovoltaic systems, etc.)<br>• Switch to high-performing and energy efficient cooking stoves<br>• Apply eco-design in the construction and renovation of houses and offices |

*[13]An example of such best practice is the Asian Institute of Technology's (AIT) initiative titled "Upscale and Mainstream Green Office Lifestyle in Vietnam". More information to the program can be found at www.aitvn.asia/project/go/*
*[14]More examples of initiatives implemented by CSOs can be found at www.hanhdongvihanoi.org*

### *One Million Green Homes Initiative*

The "One Million Green Homes" initiative was initiated in 2019 with the aim to install rooftop solar panels in one million residential buildings in Vietnam in combination with other energy efficiency solutions by 2030.

This initiative contributes to the implementation of Resolution 55-NQ/TW of the Central Party on the National Energy Development Strategy until 2030 with a vision to 2045. This initiative aims at promoting renewable energy, optimizing natural resources, and mobilizing the participation of the community in monitoring and implementing the national energy plan.

The pilot phase started in September 2019 in Hanoi as well as in Cam Mau and Daklak. By February 2020, 68 solutions have been applied in Hanoi, including the grid connection of rooftop solar panels.[15]


## 1.2. Promote the use of rooftop solar photovoltaic systems

The Decision No. 2023/QD-BCT, issued by the Ministry of Industry and Trade (MOIT) on 05 July 2019, approved the National Rooftop Solar PV Promotion Program, which calls for the implementation of pilot support programs, investment projects, and technical assistance on rooftop solar PV systems. The Hanoi Green Growth Plan 2020 also included the development and installation of rooftop solar PV panels as one of the priority measures to reduce the city's GHG emissions. This measure is also expected to relieve the demand pressure on the Hanoi Electricity Group (especially during peak seasons) while making use of the long daytime hours during summer.[16]

Table 10. Performance indicators: Promote the use of rooftop solar photovoltaic systems

| Indicator | 2025 | 2030 |
|---|---|---|
| Generating capacity of rooftop solar PV panels | 5 MW | 15 MW |



[15] *Source: https://baotainguyenmoitruong.vn/thuc-day-hop-tac-chuong-trinh-trieu-ngoi-nha-xanh-nam-2020-299471.html. Date 24 February 2020. Accessed on 25 September 2020.*
[16] *Hanoi Green Growth Action Plan until 2025 with vision to 2030 (2020).*

### Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Formulate and implement fiscal and non-fiscal incentives for building owners to encourage installation of rooftop solar PV panels. |
| **Businesses** | • Install rooftop solar PV panels in office and school buildings.<br>• Sell solar energy produced and/or energy savings with the local electric utility. |
| **CSOs/NGOs** | • Assist the city government in disseminating information on the implementation of the city's policies that promote the installation of rooftop solar PV panels in applicable buildings throughout the city. |
| **Citizens** | • Participate in information sharing and training on the benefits, procurement, installation, use, and maintenance of rooftop solar PV panels.<br>• Install rooftop solar PV panels on own houses, where applicable. |

## B. Transport

Energy use in the transport sector significantly contributes to the city's GHG emissions. The increasing volume of private cars exacerbates traffic congestion and air pollution. Both challenges pose risks to human health, particularly in acquiring respiratory related illnesses due to direct and frequent contact to smoke emissions. Therefore, the city government is intensifying its efforts to improve air quality in the city, particularly targeting the transport sector and the use of beehive stoves. Measures related to eliminating beehive stoves have already been discussed under the energy sector, so, this subsection will focus on pledged climate actions for the transport sector.

According to Hanoi's GHG inventory with 2015 as base year, the total estimated emissions of the transport sector is 2,871 thousand $tCO_2e$ and is projected to increase to 15,313 thousand $tCO_2e$ and 29,782 thousand $tCO_2e$ by 2025 and 2030 respectively.[17]

[17] *Hanoi Green Growth Action Plan until 2025 with vision to 2030 (2020).*

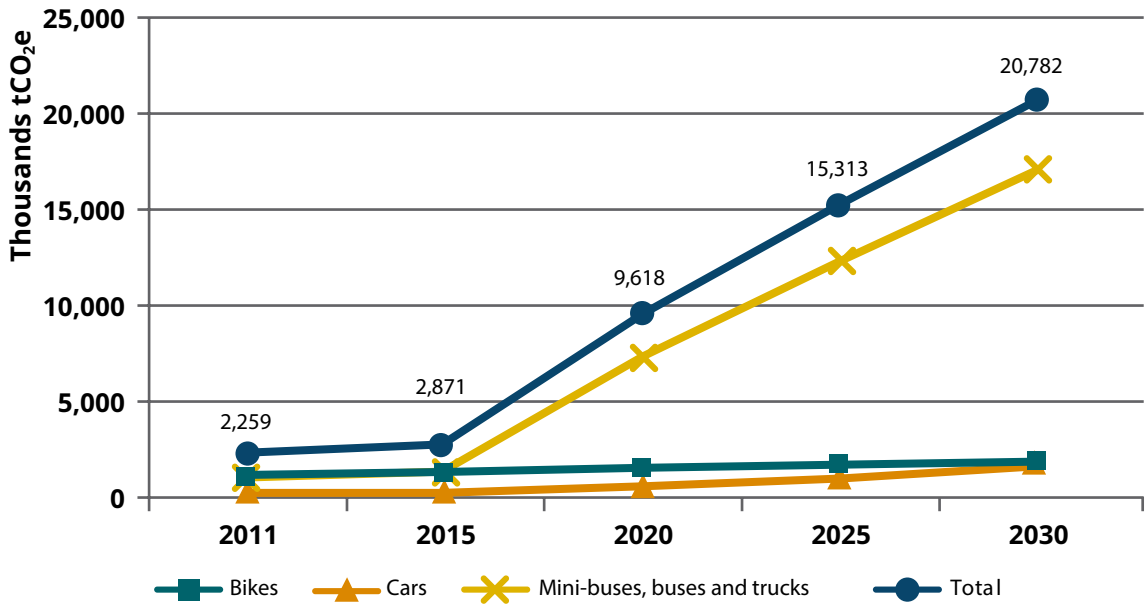



Figure 7. Estimated GHG emissions of the transport sector, 2011-2030

Hanoi endeavors to reduce its GHG emissions in the transport sector by at least 104,100 $tCO_2e$ by 2025, and by at least 165,900 $tCO_2e$ by 2030. **The key strategies to be pursued by Hanoi to meet these targets include the (a) promotion of low carbon, efficient, and reliable public mass transport, (b) promotion of the use of CNG buses, and (c) promotion of the use of electric bikes.**

Table 11. Overview of objectives, strategies, targets of Promise of Hanoi - Transport Sector

| **Objective: Hanoi will reduce its GHG emissions in the transport sector by at least 104,100 $tCO_2e$ by 2025 and by at least 165,900 $tCO_2e$ by 2030.[18]** | |
|---|---|
| **Strategy** | **Target** |
| Promote the use of low carbon, efficient, and reliable public mass transport | 100% of new buildings meet the National Technical Standards on Energy Efficient Buildings (QCVN 09:2017/BXD) by 2025. |
| Promote the use of CNG buses | At least 16.4 thousand $tCO_2e$ and 19.0 thousand $tCO_2e$ of GHG emissions reduction have been achieved by 2025 and 2030 respectively, by deploying and promoting the use of CNG buses in the city. |
| Promote the use of electric bikes | At least 5% of the conventional motorbikes have been switched to electric bikes thereby contributing to at least 49.4 thousand tCO2e GHG emissions reduction by 2030. |

[18] *Hanoi Green Growth Action Plan until 2025 with vision to 2030 (2020) & GIZ/DONRE report on "Analysis of air pollutant and greenhouse gas emissions from beehive cookstoves in Hanoi 2017-2020" (2020).*

## 2.1. Promote the use of low carbon, efficient, and reliable public mass transport

Statistics show that in 2016 alone, Hanoi had registered approximately 5.2 million motorbikes with an annual growth rate of 6.7%. This is followed by private cars with 485,000 cars registered with an annual growth rate of 10.2%. It is estimated that if 60% of the registered bikes and cars operate at the speed of 20 km/hour, the space occupied by these vehicles would exceed the current road infrastructure by 1.34 times on average or 3.72 times in the city center. Meanwhile, only 1,400 passenger buses and 24 BRTs operate in the city and this contributes to roughly 15% of the total passenger transport of citizens of Hanoi.

Table 12. Number of registered road vehicles per vehicle type, 2016.[19]

| Group | Number of Registered Vehicles | Annual Growth Rate |
|---|---|---|
| **Motorbikes** | 5,200,000 | 6.7% |
| **Businesses** | 485,000 | 10.2% |
| **Bus** | 1,400 | Not available |
| **BRT** | 24 | Not available |


As such, the Decision 5953 of Hanoi People's Committee approved the plan on reducing road transport vehicles congestion and improving air quality in Hanoi for the period of 2017-2020 with a vision to 2030. In 2017-2018, the Hanoi People's Committee focused on improving state management over the transport sector. In the following year of 2018-2020, the Committee shifted its focus on developing public mass transport and expanding the coverage of public transport systems in pursuant to Resolution 03/2013/NQ-HDND issued by the Hanoi People's Committee Council. Beginning in 2020, the Committee intensified its efforts to further develop its public mass transport to meet the citizens' transport demand. They are also striving to gradually restrict the use of private vehicles in certain areas at certain periods of time with an aim to ban the use of private motorbikes by 2030.

[19] *Source: http://www.tapchigiaothong.vn/infographic-hien-trang-phuong-tien-giao-thong-o-thu-do-ha-noi-d45975.html. Accessed on 01 September 2020.*

## Target and Indicators

A rate of 30-35% of public passenger transport has been achieved by 2025 thereby contributing to a GHG reduction of 87.7 thousand $tCO_2e$ by 2025.

A rate of 40-45% of public passenger transport has been achieved by 2030 thereby contributing to a GHG reduction of 97.5 thousand $tCO_2e$ by 2030.

Table 13. Performance indicators: Promote the use of low carbon, efficient, and reliable public mass transport

| Indicator | 2020 | 2025 | 2030 |
|---|---|---|---|
| Rate of public passenger transport | 20-25%[20] | 30-35% | 40-45% |

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Restrict the use of private vehicles and make public transportation commuter-friendly, convenient, and accessible.<br>• Continuously improve people-centered transportation planning.<br>• Develop a modern transportation network by upgrading additional highways, ring roads, landscape roads, and large public transport systems.<br>• Promote the use of public transport among citizens.<br>• Verify GHG emissions attributable to road vehicles. |
| **Businesses** | • Provide bicycle rental services at bus stations.<br>• Dedicated research and development and application of advanced technologies that make public transport smarter, safer, as well as more efficient and reliable. |
| **CSOs/NGOs** | • Preferential use of public transport over private vehicles whenever applicable.<br>• Walk or cycle to destinations whenever applicable. |
| **Citizens** | • Preferential use of public transport over private vehicles whenever applicable.<br>• Walk or cycle to destinations whenever applicable. |

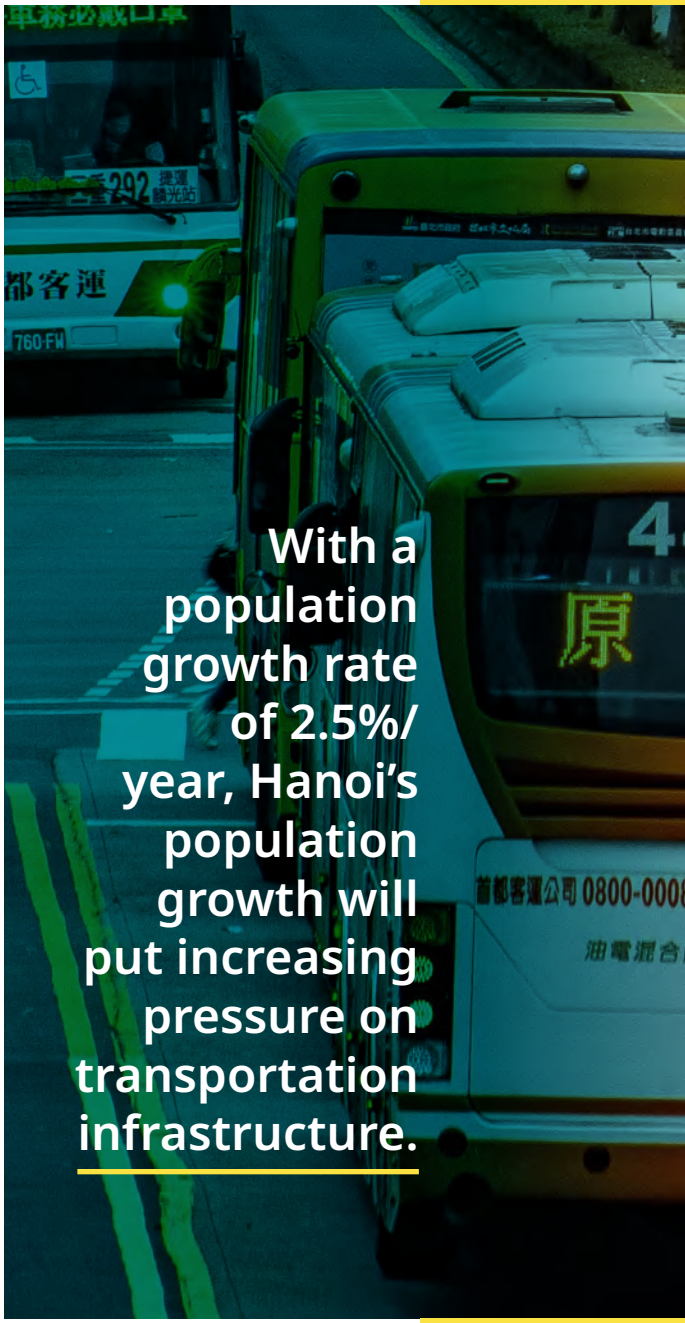
[20] *Hanoi 5-Year Socio-Economic Development Plan 2015-2020.*

## 2.2. Promote the use of CNG buses

With a population growth rate of 2.5%/year,[21] Hanoi's population will exceed 10 million by 2030. Associated with the population growth is the increasing pressure on infrastructure and demand for transportation. The annual growth rate for bikes is estimated at 6.7% while the annual growth rate for cars is approximately 10.2%.

While it is not yet possible to suppress the growth rate of transport vehicles, switching from conventional fuel such as gasoline and diesel to more climate-friendly fuel such as CNG and LPG can help to cut down the GHG emissions from the transport sector.

The introduction of CNG-fueled buses is indicated in Hanoi's Plan for "improving service quality and developing passenger public buses in Hanoi [for the] period of 2016-2020 with orientation until 2025." Three lines of CNG buses began operation in August 2018, and four more became operational by the third quarter of 2019. By developing and deploying CNG buses, Hanoi is determined to promote a high quality, climate-friendly public transport system.




### Target and Indicators

At least 16.4 thousand $tCO_2e$ and 19.0 thousand $tCO_2e$ of GHG emissions reduction have been achieved by 2025 and 2030 respectively, by deploying and promoting the use of CNG buses in the city.

Table 14. Performance indicators: Promote the use of CNG buses

| Indicator | 2025 | 2030 |
|---|---|---|
| Proportion of CNG buses in the public transportation system | 30% | 45% |

[21] *Hanoi Annual Statistic Book (2018)*

### Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Promote the use of CNG fuel in public transport<br>• Verify GHG emissions attributable to road vehicles<br>• Formulate and implement fiscal and non-fiscal incentives for transport companies that are using CNG as fuel |
| **Businesses** | • Deploy CNG buses for passenger transport services |
| **CSOs/NGOs** | • Assist the city government in the conduct of research as well as communication campaigns on the benefits of CNG as transport fuel thereby encouraging preferential use of CNG buses by the citizens |

## 2.3. Promote the use of electric bikes

In Vietnam, electric mobility is still at its early stages. Policies regulating the production and use of e-vehicles are yet to be put in place. Large-scale deployment of electric cars is still absent and availability of charging stations is very limited. Still, production and use of electric bicycles continue to be observed locally. With over five million motorbikes registered in Hanoi,[22] the potential for reducing GHG emissions in the transportation sector by switching to electric motorbikes is huge. At the national level, were e-bikes to account for about 7% of annual motorbike sales, a GHG emissions reduction of 345,000 $tCO_2e$ and 580,000 $tCO_2e$ could be achieved by 2025 and 2030, respectively. At the city level, Hanoi also aims to replace conventional motorbikes with e-bikes primarily due to the objective of reducing air pollution. In the long term, this measure is also expected to reduce the city's GHG emissions in the road transportation sub-sector and in the stationary energy sector as it envisions to align this with the country's transition towards renewable energy.

### Target and Indicators

At least 5% of the conventional motorbikes have been switched to electric bikes, thereby contributing to at least 49.4 thousand $tCO_2e$ GHG emissions reduction by 2030.

Table 15. Performance indicators: Promote the use of electric bikes

| Indicator | 2030 |
|---|---|
| Proportion of e-bikes achieved | 5% |

[22] *2016 data.*

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Verify GHG emissions attributable to road vehicles.<br>• Allocate land lots for charging stations of electric bikes.<br>• Develop and implement enabling policies including fiscal and non-fiscal incentive mechanisms for e-bikes and charging stations manufacturers and distributors |
| **Businesses** | • Conduct research and development to lower the cost of batteries for e-bikes<br>• Develop and expand charging stations within the city. |
| **CSOs/NGOs** | • Offer technical and financial support for the installation of charging stations in communities and neighborhoods.<br>• Conduct research and recommendations on charging technologies as well as strategic positioning of charging stations. |
| **Citizens** | • Switch conventional motorbikes to e-bikes. |

## *E-buses soon to operate in Hanoi*

Vingroup has registered 10 bus lines using Vinfast electric buses. Vingroup pledged to bring 150-200 electric buses into operation as well as to invest in a management hub for smart buses and charging stations at two ends of the bus lines.

They are also in discussion with the Registry Department to ensure that all Vinfast electric buses meet the current technical and environmental standards.

The Hanoi Department of Transport commented that there are still no technical norms or prices for electric buses. However, the deployment of electric buses aligns with the city's vision and contributes to the reduction of pollution and promotion of clean energy in the public transport sector.[23]

[23]*Source: https://tuoitre.vn/ha-noi-nghien-cuu-khai-thac-10-tuyen-xe-buyt-dien-20200907172621 49.html. Dated 07 September 2020. Accessed on 25 September 2020.*

# C. Waste and Water Management

According to the 2015 GHG inventory of Hanoi, GHG emissions from the waste sector accounted for 12.4% (equivalent to 2.21 million tCCO2e) of the total estimated emissions of the city. By 2030, it is projected to increase to 4.05 million $tCO_2e$. Emissions are primarily coming from the city's landfills and incinerators. Cutting down in-city waste generation, reducing waste to landfill by recycling and composting and improving waste treatment are effective measures to cut down GHG emissions by the waste sector.

Quickly expanding population brings with it, beside the increasing pressure on the urban infrastructure, an enormous volume of generated waste which needs to be disposed of.

The following table presents an estimation of municipal solid waste generation in Hanoi between 2009-2019. For the urban population, a generation factor of 0.7 kg/person/day was estimated, while the rural population's generation factor was only 0.3 kg/day(period of 1995-2000, as indicated in Vietnam Environment Status Quo Report 2017 on waste management).

Table 16. Estimated volume of municipal solid waste in Hanoi, 2011-2018

| Year | Urban population (in thousands) | Generation factor (kg/person/day) | Rural population (in thousands) | Generation factor (kg/person/day) | Total volume of waste generated (tonnes/day) |
|---|---|---|---|---|---|
| 2011 | 2,880.6 | 0.7 | 3,898.7 | 0.40 | 3,575.90 |
| 2012 | 2,958.1 | 0.7 | 3,999.2 | 0.41 | 3,710.34 |
| 2013 | 3,024.6 | 0.7 | 4,103.7 | 0.43 | 3,881.81 |
| 2014 | 3,573.7 | 0.7 | 3,691.9 | 0.44 | 4,126.03 |
| 2015 | 3,629.5 | 0.7 | 3,761.4 | 0.45 | 4,233.28 |
| 2016 | 3,699.5 | 0.7 | 3,823.1 | 0.45 | 4,310.05 |
| 2017 | 3,770.0 | 0.7 | 3,891.0 | 0.45 | 4,389.95 |
| 2018 | 3,874.3 | 0.7 | 3,975.3 | 0.45 | 4,500.90 |

An analysis of Hanoi's municipal solid wastes further showed that it is mainly composed of organic wastes and plastics with more than 50% and 30% share of the overall waste composition, respectively. This signals that promoting recycling and composting, in addition to other measures to reduce waste generation at source, would cut the city's GHG emissions in the waste sector while also ensuring a clean and healthy environment for the citizens.

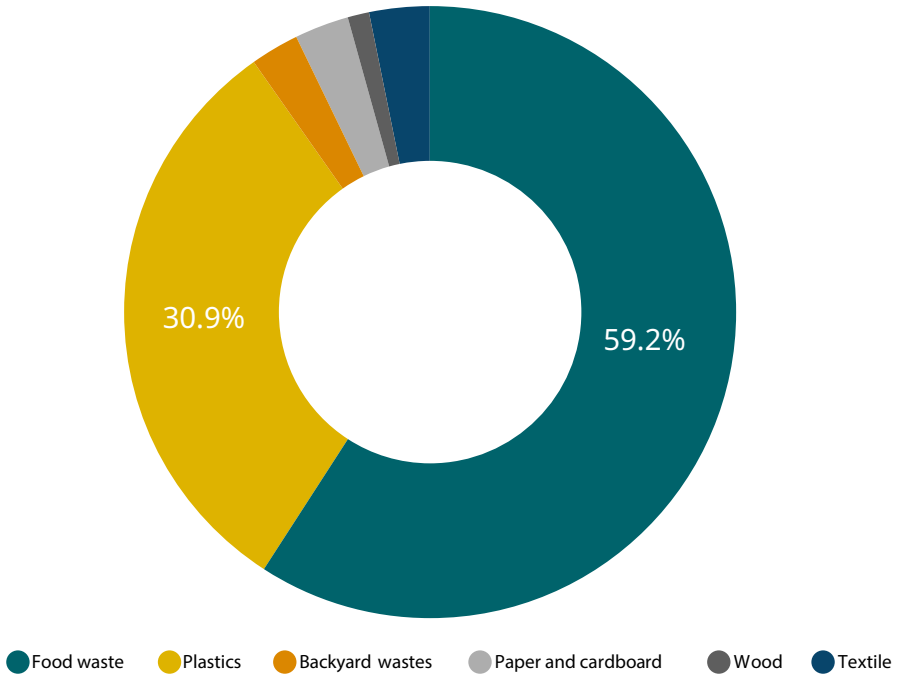



Figure 8. MSW composition of Hanoi

Hanoi commits to reducing its GHG emissions in the waste sector by at least 54,000 $tCO_2e$ and 76,000 $tCO_2e$ by 2025 and 2030 respectively. Its key strategies in meeting these targets include (a) reduction of waste disposal to landfills by improving recycling and composting, (b) reduction of plastic waste generation, and (c) improvement of efficiency of wastewater treatment.

Table 17. Overview of objectives, strategies, targets of Promise of Hanoi - Waste and Water Management Sector

| **Objective: Hanoi will reduce its GHG emissions in the waste sector by at least 54,000 $tCO_2e$ by 2025 and by at least 76,000 $tCO_2e$ by 2030.[24]** | |
|---|---|
| **Strategy** | **Target** |
| Reduce waste disposal to landfills through improved efficiency in recycling and composting | 100% of waste collected and treated are compliant with Vietnam's environmental standards by 2030.<br><br>At least 80% of urban MSW and at least 50% of rural MSW are sorted at source and recycled, composted, and/or properly disposed of by 2025.<br><br>100% of urban MSW and at least 70% of rural MSW are sorted at source and recycled, composted, and/or properly disposed of by 2030. |

[24]*Calculated using MACCC: Nam Son Treatment Plant estimates a treatment capacity of 1,642.5 tonnes helps to reduce 24,967 $tCO_2e$. Assuming that by 2025, 100% of industrial solid, 80% of MSW, and 50% of rural MSW are treated, the GHG emissions from the waste sector can be reduced by 54,000 $tCO_2e$. Assuming that by 2030, 100% of industrial solid wastes, 100% of MSW, and 70% of rural MSW are treated, the GHG emissions in the waste sector can be reduced by 76,000 $tCO_2e$.*

| Strategy | Target |
|---|---|
| Reduce plastic waste generation | All of Hanoi People's Committee public buildings and facilities shall eliminate single-use plastics and reduce the use of hard plastics by at least 80% by 2020.<br><br>At least 70-75% and at least 85% reduction of plastic packaging in supermarkets and commercial centers have been achieved by 2025 and 2030 respectively.<br><br>At least 60-65% and at least 80% reduction of plastic packaging in traditional markets have been achieved by 2025 and 2030 respectively. |
| Improve water conservation efforts and wastewater treatment efficiency | Annual water conservation campaigns in schools and universities have been undertaken<br><br>At least 45-50% of urban domestic wastewater are treated and compliant with relevant technical standards and regulations by 2025.<br><br>At least 60% of urban domestic wastewater is treated and compliant with relevant technical standards and regulations by 2030. |

## 3.1. Reduce waste disposals to landfills by improved efficiency in recycling and composting

Hanoi generates an average of 4,5000 tonnes of MSW daily. About 70-80% of these wastes are disposed of in landfills and disposal sites. Allocation of additional land for landfill expansion is not a feasible immediate solution by the city due to limited land availability. Additionally, odor, water, and air pollution caused by the landfill has caused unrest and protests from the neighbouring communities during the recent years. While for the waste-to-energy technologies to be put into operation, the immediate solution being implemented by the city government is to reduce MSW disposal to landfill through improved efficiency in recycling and composting.

## Target and Indicators

At least 80% of urban MSW and at least 50% of rural MSW are sorted at source and recycled, composted, and/or properly disposed of by 2025.

100% of urban MSW and at least 70% of rural MSW are sorted at source and recycled, composted, and/or properly disposed of by 2030.

Table 18. Performance indicators: Reduce waste disposal to landfills by improved efficiency in composting and recycling

| Indicator | 2025 | 2030 |
|---|---|---|
| Proportion of urban MSW sorted at source and recycled, composted, and/or properly disposed of | 80% | 100% |
| Proportion of rural MSW sorted at source and recycled, composted, and/or properly disposed of | 50% | 70% |

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Set up collection points for recyclable wastes such as plastic bottles, Tetra Pak milk packages in all communes.<br>• Improve collection system to increase the separation rate of garbage<br>• Conduct educational campaigns and training on waste sorting and recycling in schools and universities. |
| **Businesses** | • Set up waste segregation bins in public spaces, buildings, and commercial centers<br>• Integrate recycled and/or composted products in production processes. |
| **CSOs/NGOs** | • Conduct educational campaigns and training on waste sorting and recycling among households, schools, and universities.<br>• Encourage organic waste treatment at the household level. |
| **Citizens** | • Sort, recycle, and compost waste products at the household level. |


### *Collection and recycling of milk packages in schools*

The programme was endorsed by the Hanoi Department of Natural Resources and Environment, the Department of Education and Training with the support from Tetra Pak, Lagom, and several recyclers in Hanoi. The programme was implemented from September 2019 to July 2020 and has mobilized the participation of 803 schools, 30,000 teachers, and 500,000 students. By July 2020, approximately 244,061 kg of wastes (equivalent to 25 million milk packages) were collected for recycling. It is estimated that 2,711 $tCO_2e$ of GHG emissions have been avoided through this initiative.[25]

## 3.2. Reduce plastic waste generation

In June 2019, during the launch of the national campaign to combat plastic waste in Hanoi, Prime Minister Nguyen Xuan Phuc called for all line ministries and agencies, businesses, and citizens to join hands to combat plastic leakage to the environment. In response to this call, Hanoi issued the Document 3549/UBND-DT on 19 August 2019 directing the reduction of plastic waste generation as well as the elimination of single-use plastics in the city government's departments, agencies, and CSOs. Similarly, the Hanoi Green Growth Action Plan until 2025 with vision to 2030 also includes targets in reducing the use of non-biodegradable packaging in supermarkets, commercial centers, and traditional markets.

[25] *Report 7390/BC-STNMT-CCBVMT, EPA (2020).*

## Target and Indicators

All of Hanoi People's Committee public buildings and facilities shall eliminate single-use plastics and reduce the use of hard plastics by at least 80% by 2020.

At least 70-75% and at least 85% reduction of plastic packaging in supermarkets and commercial centers have been achieved by 2025 and 2030 respectively.

At least 60-65% and at least 80% reduction of plastic packaging in traditional markets have been achieved by 2025 and 2030 respectively.

Table 19. Performance indicators: Reduce plastic waste generation.

| Indicator | 2025 | 2030 |
|---|---|---|
| Reduction rate of non-biodegradable packaging in supermarkets and commercial centers | 70-75% | 85% |
| Reduction rate of non-biodegradable packaging in traditional markets | 60-65% | 80% |

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Encourage the use of environment-friendly alternatives to plastic bags in supermarkets and commercial centers<br>• Ban the use of single-use plastics and cutlery in public buildings and facilities per Plan 232/UBND by Hanoi PPC dated 25 October 2020<br>• Gradually ban the production of single-use plastic bags per Prime Minister's Instruction 3258/VPCP-KGVX dated 23 April 2019 in combination with fiscal and non-fiscal incentive schemes for manufacturers of biodegradable packaging options.<br>• Provide support including preferential treatment as well as fiscal and non-fiscal incentives for recycling companies, especially those that recycle single-use plastic items. |
| **Businesses** | • Bring into market environment-friendly packaging solutions and biodegradable alternatives to plastics<br>• Discontinue the production and use of plastic bags<br>• Promote recycling solutions for plastic wastes. |

| Group | Action |
|---|---|
| **CSOs/NGOs** | • Conduct campaigns that promote sustainable lifestyles including the reduced consumption of plastic products and offering alternative solutions<br>• Conduct campaigns, training, and implement projects on plastic waste recycling and upcycling. |
| **Citizens** | • Reduce plastic waste generation at the individual and household levels<br>• Practice proper waste sorting at the household level<br>• Consume local products with environment-friendly packaging. |


## *Hanoi People's Committee refuse single-use plastics*

Beginning 1 September 2020, the Hanoi People's Committee strictly implemented the reduction of the use of single-use plastics in meetings, workshops, and other activities led by the city departments and agencies. For example, city departments and agencies were instructed to use reusable containers instead of plastic bottles. Moreover, the Department of Finance has been required not to allocate funding for the procurement of single-use plastic products for city government-led activities since 2020.[26]



[26]*Source: https://laodong.vn/moi-truong/tu-192019-ha-noi-khong-dung-san-pham-nhua-dung-1-lan-750401.ldo. Dated 21 August 2019. Accessed on 25 September 2020. Statistics.*

## 3.3. Improve water conservation efforts and wastewater treatment efficiency

There are seven wastewater treatment facilities in Hanoi. At maximum capacity, these can only treat 22% of the total wastewater generation of Hanoi while the remaining 78% is discharged directly into water bodies such as lakes, rivers, and canals thus contributing to the degradation of the quality and living organisms in these water bodies. This practice also risks the health of populations living near the affected water bodies. Majority of large-scale industrial parks and facilities in Hanoi have already installed their own wastewater treatment facilities. So, the bigger challenge lies in managing wastewater from domestic sources and from smaller businesses located in residential areas. Therefore, Hanoi will undertake infrastructure investments to improve wastewater drainage and treatment systems to provide a cleaner and healthier environment for its citizens.

Coupled with improving wastewater treatment efficiency are Hanoi's campaigns on water conservation. This includes information dissemination and capacity building on adopting technologies for water reuse (e.g. rainwater harvesting and reuse for toilets and gardening). Such measures are expected to reduce water demand especially since groundwater supply in the city is depleting.

### Target and Indicators

At least 45-50% of urban domestic wastewater are treated and compliant with relevant technical standards and regulations by 2025.

At least 60% of urban domestic wastewater is treated and compliant with relevant technical standards and regulations by 2030.

Annual water conservation campaigns in schools, universities, districts, and communes have been undertaken from 2021 to 2025.

At least 50% of public buildings have installed functional rainwater collecting and reuse systems by 2030.

Table 20. Performance indicators: Improve wastewater treatment efficiency

| Indicator | 2020 | 2025 | 2030 |
|---|---|---|---|
| Proportion of urban domestic wastewater collected and treated in compliance with relevant technical standards and regulations | 22%[27] | 45-50% | 60% |
| Number of water conservation communication campaigns launched | | 5 per year | |
| Proportion of public buildings with functional rainwater collecting and reuse systems | | 20% | 50% |

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Upgrade, expand, and maintain the capacity of the city's drainage system<br>• Regularly monitor and regulate the quality of water bodies in the city to ensure early detection of violations and execute appropriate action<br>• Collaborate closely with local communities to strengthen clean-up and monitoring activities as well as in reprimanding violators |
| **Businesses** | • For small-scale production facilities within the residential areas, install and operate basic wastewater treatment equipment before discharging effluents to the city's drainage system. In the longer term, they may explore relocation of production facilities from residential areas to designated industrial areas equipped with a centralized wastewater treatment system.<br>• Install automated water quality monitoring equipment. |
| **CSOs/NGOs** | • Educate local households water conservation practices<br>• Assist the city government in educating residents and business owners about the importance of keeping clean water bodies to the environment and human health by avoiding the practice of direct waste disposal to these water bodies |
| **Citizens** | • Avoid discharging wastewater directly into open water bodies<br>• Assist the city government in clean-up and monitoring activities as well as in reprimanding violators<br>• Use water more efficiently |



[27] *Hanoi PPC, 2019.*

# D. Air Quality

Air pollution has become a significant concern for residents of Hanoi due to its impacts on health, particularly on children, elderly, and people with respiratory illnesses. In 2015, IIASA/VASTA conducted a study that estimated PM 2.5 concentration in some northern provinces of Vietnam including Hanoi. Due to significantly higher population and construction density, PM 2.5 concentration in Hanoi was found to be significantly higher than that of its neighboring provinces. Moreover, according to the 2016 National Environment Status Quo Report on Urban Environment, Hanoi has a notable number of days in a year with PM 10 and PM 2.5 concentrations that exceed the air quality standards per National Standards QCVN 05:10:2013/BTNMT issued by the Ministry of Natural Resources and Environment (MONRE).

Table 21. Estimated PM 2.5 concentrations in Hanoi, Bac Ninh, and Hung Yen, 2015

| Area | SO2 (thousand tonnes) | NOx (thousand tonnes) | PM2.5 (thousand tonnes) | NH3 (thousand tonnes) |
|---|---|---|---|---|
| Hanoi | 17.8 | 66.6 | 23.5 | 23.3 |
| Bac Ninh | 3.3 | 7.9 | 4.3 | 5.5 |
| Hung Yen | 2.5 | 7.7 | 4.7 | 8.2 |

Moreover, the accumulation of short-lived climate pollutants (SLCPs) such as particulate matter, methane, and ozone also have an impact on exacerbating climate change. Reducing SLCPs is therefore beneficial not only for safeguarding people's health but also for mitigating the effects of climate change. As the second largest city in Vietnam, protecting its citizens' health and living environment is a key task for the city government. It is estimated that more than 5 million of Hanoi's population is exposed to air pollution with PM 2.5 concentration of 35-50µg/m3 while the remaining population is exposed to ambient PM2.5 concentration of above 50µg/$m^3$.[28]

Hanoi is committed to improving the urban air quality condition by (a) improving its air quality monitoring system and (b) prohibiting straw burning in rural areas. Through these measures, the city is also expecting to contribute to GHG emissions reduction by up to 1,109,000 $tCO_2e$ by 2025.

[28] *IIASA/VAST, Projection of air quality in Hanoi and Northern Vietnam (2018).*

Table 22. Overview of objectives, strategies, targets of Promise of Hanoi - Air Quality Sector

| **Objective: Hanoi shall improve its urban air quality conditions while potentially contributing to a GHG emissions reduction of up to 1,094,000-1,109,000 $tCO_2e$ by 2025.** | |
|---|---|
| **Strategy** | **Target** |
| Improve air quality monitoring system | 100% of administrative districts are equipped with air quality monitoring systems by 2030. |
| Prohibit straw burning in rural areas | Straw burning in rural areas has been eliminated and has contributed to GHG emissions reduction of up to 1,094,000-1,109,000 $tCO_2e$ by 2025. |


## 4.1. Improve air quality monitoring systems

Measuring and monitoring pollutant concentrations is an important first step in meeting Hanoi's mission of addressing its poor air quality conditions. As of May 2020, only 35 air quality monitoring stations have been set up throughout the city with the assistance of various international development partners of the city.[29] This limited number of monitoring stations risks the completeness and accuracy of air quality data that is needed to inform effective interventions. Therefore, Hanoi shall deploy more automatic air quality monitoring stations as well as low-cost air quality monitoring sensors with the aim of developing a robust local air quality database that will be used for widespread information dissemination to the public about severe conditions in a timely manner.

### Target and Indicators

100% of administrative districts are equipped with air quality monitoring systems by 2030.

Table 23. Performance indicators: Improve air quality monitoring systems

| Indicator | 2025 | 2030 |
|---|---|---|
| Coverage of air quality monitoring systems in administrative districts of Hanoi | 75% | 100% |

[29] *Source: https://www.tienphong.vn/nhip-song-thu-do/ha-noi-co-them-24-tram-quan-trac-khong-khi-tu-dong-1664379.tpo#:~:text=Phó Chủ tịch UBND thành,Hà Nội lên 35 trạm*

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Identify air pollution hotspots to be used for strategic positioning and installation of automated air quality monitoring stations.<br>• Identify and build different partnerships and fundraising models to mobilize resources, including from international partners and businesses, for enhanced and more robust air quality monitoring.<br>• Develop and implement tools that shall facilitate timely, efficient, and effective information dissemination of air quality conditions to citizens. |
| **Businesses** | • Develop applications that connect with automated air quality monitoring stations to facilitate faster, timely, efficient and effective information dissemination of air quality conditions to citizens<br>• Assist the city government in the installation of low-cost air quality monitoring sensors throughout Hanoi via resource sharing mechanisms. |
| **CSOs/NGOs** | • Extend technical and financial assistance to the city government for the installation of low-cost air quality monitoring sensors throughout Hanoi.<br>• Assist the city government in information dissemination about the status of air quality conditions in Hanoi and lobby for the active participation of different stakeholders in the installation of low-cost air quality monitoring sensors (where applicable) and in taking conscious efforts in improving air quality conditions in the city. |

## *Hanoi received 24 automated air quality monitoring stations from THT (Korea)*

Vice Chairman of Hanoi People's Committee, Mr. Nguyen The Hung, led the handover ceremony of 24 air quality monitoring stations from THT Corporation, Korea. He commented that these stations have elevated the air quality monitoring efforts of the city as it strives to provide better response to the worsening air quality conditions in Hanoi. He added that Hanoi is leading cities in Vietnam in expanding air quality monitoring efforts thanks to the commitment of the city's departments, agencies, citizens, and various development partners locally and internationally.

This endeavor has increased the air quality monitoring stations throughout Hanoi to 35 functioning stations. The Department of Natural Resources and Environment was tasked to connect the new stations to the existing air quality monitoring network of Hanoi.[30]

[30] *Source: https://nhandan.com.vn/vi-moi-truong-xanh/tiep-nhan-24-tram-quan-trac-khong-khi-tu-dong-tai-ha-noi-459462/. Dated 27 May 2019. Accessed on 25 September 2020. General Statistics Office.*

## 4.2. Prohibit straw burning in rural areas

The draft Agriculture Development Plan until 2020 with a vision to 2030 by the Hanoi People's Committee recommends that the city reserve 144,000-146,000 hectares for rice production in its total agricultural area of 174,000 hectares. With more than half of its population living in rural districts, rice production remains an important source of livelihood and income for the rural population. It also remains an important sector in ensuring food security and economic prosperity in the city, thus, its continuous development is also a priority for the city government. Still, traditional post-harvest straw burning methods are still being practiced and have also received attention from the public in recent years due to its alarming impact on air quality. Therefore, the Document 125/UBND-DT dated 10 January 2018 by the Hanoi People's Committee identified several measures to reduce straw burning practices for the period of 2018 to 2020. Since then, the city government continued to actively implement different measures to eventually eliminate straw burning in agriculture areas of rural districts.

### Target and Indicators

Straw burning in rural areas has been eliminated and has contributed to GHG emissions reduction of up to 1,094,000-1,109,000 $tCO_2e$ by 2025.

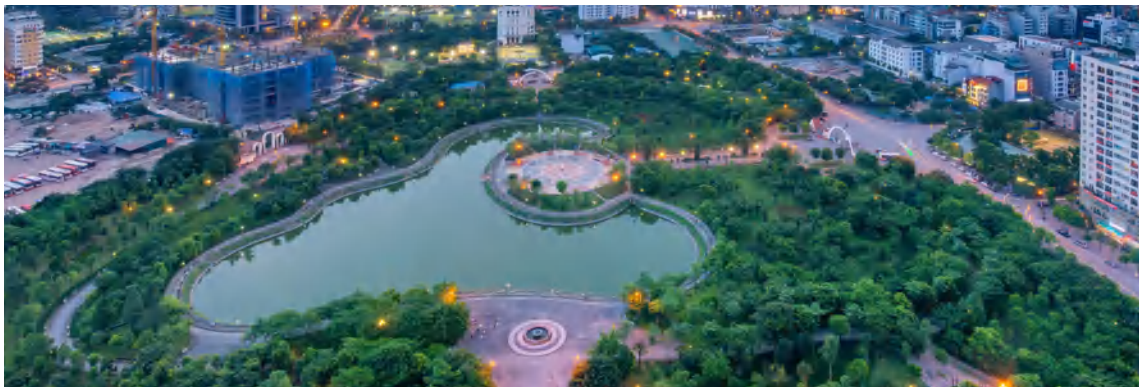
Table 24. Performance indicators: Prohibit straw burning in rural areas

| Indicator | 2020 | 2025 | 2030 |
|---|---|---|---|
| Volume of post-harvest straws burned in agricultural areas of rural districts | 100% | 0% | 0% |

### Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Regularly monitor and impose strict penalties to those that continue to practice straw burning in agricultural areas in rural districts<br>• Improve waste collection and composting of post-harvest straws in rural areas |
| **Businesses** | • Develop, pilot-test, and make commercially available modern technological solutions and alternatives to managing post-harvest straw wastes. |
| **CSOs/NGOs** | • Assist the city government in information dissemination about the air quality and health risks of straw burning practices as well as deliver capacity building training for farmers on alternative solutions to managing post-harvest straw wastes<br>• Liaise local farmers with businesses that buy and recycle straws for their production processes (e.g. planting of mushrooms, animal feed). |
| **Citizen** | • Refrain from burning post-harvest straw waste products |

# E. Urban Agriculture and Ecology



As the second most densely populated city in Vietnam with a rapid construction rate to keep up with the increasing population largely caused by continuous immigrant flows, Hanoi has been facing challenges in increasing surface temperature and urban heat island (UHI) effects. The figure below shows the historical average temperature in Hanoi from 2009 to 2019. The hottest months are recorded from May to September and peaks at June and July. However, in May 2020, it was reported that the city center experienced an extremely high temperature of up to 50°C. These are expected to increase further in the coming years due to climate change.

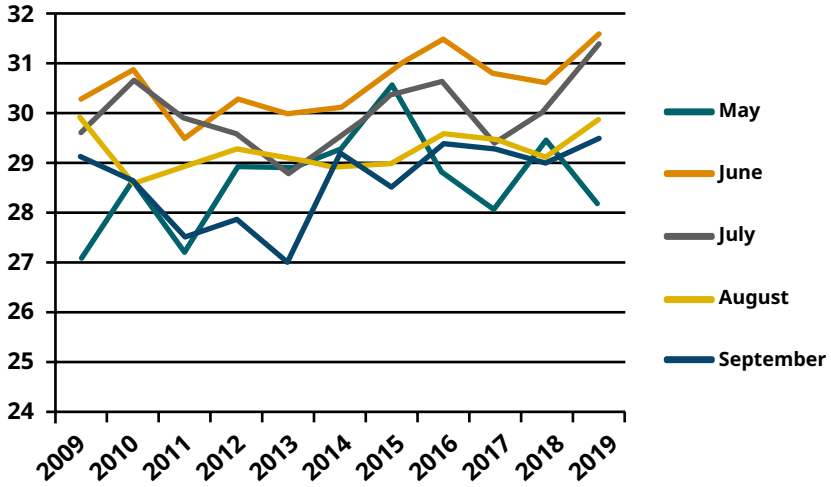



Figure 9. Average temperature in Hanoi for the months of May to September, 2009-2019.[31]

According to the Hanoi Master Plan, until 2030 with a vision to 2050, approximately 37.5% of the city's total land area will be allocated for development and construction in both urban and rural districts. In the central district, the construction per capita is approximately 50-52 m2. A green corridor along Day, Tich, and Ca Lo River will be reserved and development is strictly limited to protecting the natural ecology and water bodies in these areas thereby ensuring a functional drainage during rainy and flooding seasons. The Master Plan also sets the goal to develop Hanoi into a green and sustainable city with enhanced adaptive capacity to the impacts of climate change. Among the key strategies of the city to realize this is to expand green spaces throughout Hanoi.

[31] *General Statistics Office*

Table 25. Overview of objectives, strategies, targets of Promise of Hanoi - Urban Management Sector

| **Objective: Hanoi shall expand its urban green spaces thereby contributing to enhanced carbon sequestration of about 204,000 $tCO_2e$ and 409,800 $tCO_2e$ by 2025 and 2030 respectively.** | |
|---|---|
| **Strategy** | **Target** |
| Expand urban green spaces in Hanoi | Average green space in Hanoi has reached 8.1 m2 per capita thereby potentially contributing to GHG sequestration of up to 204,000 $tCO_2e$ by 2025.<br><br>Average green space in Hanoi has reached 13-15 m2 per capita thereby potentially contributing to GHG sequestration of up to 409,800 $tCO_2e$ by 2030. |

## Target and Indicators

Hanoi shall expand its urban green spaces thereby contributing to enhanced carbon sequestration of about 204,000 $tCO_2e$ and 409,800 $tCO_2e$ by 2025 and 2030 respectively.

Table 26. Performance indicators: Expand urban green spaces in Hanoi

| Indicator | 2020 | 2025 | 2030 |
|---|---|---|---|
| Average green space per capita | 2.2 m2[32] | 8.1 m2 | 13-15 m2 |

## Stakeholders Actions

| Group | Action |
|---|---|
| **City Government** | • Integrate green space allocation requirements in securing construction permits. |
| **CSOs/NGOs** | • Assist schools, businesses, and communities to plant more trees and in establishing urban gardens by providing resources such as staff capacity, technical assistance, co-financing, seedlings, and other materials and tools.<br>• Support the development of green public spaces including playgrounds for children, areas for physical exercises for adults, and green corridors. |
| **Citizens** | • Actively volunteer and participate in urban greening activities including maintenance of green public spaces. |

[32] *National Environment Status Quo Report 2016 on Urban Environment (2016)*

## F. Cross-cutting Actions

The following table showcases additional cross-cutting actions that do not directly result in GHG emissions reduction/avoidance but would bring enormous value in enabling and strengthening the implementation of sector-specific interventions that have been previously discussed.

Table 27. Cross-cutting climate actions

| Group | Action |
|---|---|
| **City Government** | • Improve systems monitoring and forecasting of climate and natural events, and of early warning systems to disasters<br>• Upgrade infrastructure for climate change adaptation and mitigation, such as on managing flood prevention and water supplies and sanitation<br>• Undertake periodical GHG inventory<br>• Continue to raise awareness on different climate actions and initiatives of the different stakeholders in the community<br>• Integrate climate change curricula into education and training programmes in primary to tertiary schools. |
| **CSOs/NGOs** | • Actively participate in consultation and planning processes for all city-wide programmes<br>• Disseminate accurate, relevant, and timely information to local citizens<br>• Mobilize community participation in climate actions . |
| **Citizens** | • Proactively learn and be engaged on government-led climate actions. |

# IX. Financing the *Promise of Hanoi*

Majority of the identified programs and projects are pipelined in the City's investment plan subject to the allocation of the government budget. However, some of the climate strategies and actions can only be realized with additional assistance from domestic and international financing institutions, development agencies, CSOs/NGOs, and the private sector. Non-monetary resources such as in the form of technical assistance, technology transfer, capacity building, and research studies can also be built through collaborations to elevate the implementation of these climate strategies and actions.

The table on the next page shows potential financial streams for the implementation of respective low-carbon strategies.

Table 28. Overview of potential financial sources for the implementation of the Promise of Hanoi

| No | Sector | Strategy | City Budget | Domestic and/ or International Financing Institutions | Development Partner | Private Sector |
|---|---|---|---|---|---|---|
| 1 | Energy | Improve energy efficiency of buildings | | | | |
| | | Promote the use of rooftop solar photovoltaic systems | | | | |
| 2 | Transport | Promote low carbon, efficient, and reliable public mass transport | | Loan | | |
| | | Promote the use of CNG buses | | | | |
| | | Promote the use of CNG buses | | | | |
| 3 | Waste and water management | Reduce waste disposal to landfills by improving recycling and composting | | | | |
| | | Reduce plastic waste generation | | | | |
| | | Improve water conservation efforts and efficiency of wastewater treatment | | Loan | | |
| 4 | Air quality | Improve air quality monitoring system | | | | |
| | | Prohibit straw burning in rural areas | | | | |
| 5 | Urban agriculture and ecology | Expand urban green spaces | | | | |
| 6 | Cross-cutting actions | Cross-cutting climate actions | | | | |

# X. Measurement, Reporting, and Verification (MRV)

The Department of Natural Resources and Environment (DONRE) of the Hanoi People's Committee shall be the primary agency responsible for the coordination, implementation, and monitoring of the Promise of Hanoi as an integral component of the city's climate action plan. Other city departments, however, will continue to support DONRE with these functions as well. The following tables describe the roles and responsibilities of each city department as well as outline the specific strategies each department shall be taking a lead on.

Table 29. Roles and responsibilities of different city departments in the implementation of Promise of Hanoi

| City Department | Roles and responsibilities |
|---|---|
| Department of Natural Resources and Environment (DONRE) | Lead and coordinate with other departments and agencies to implement the priority strategies and actions listed in the Promise of Hanoi consistent with its mandate per relevant Vietnamese laws and regulations<br><br>Focal agency for the implementation, monitoring, and reporting of the progress and milestones of the Promise of Hanoi. |
| Department of Planning and Investment (DPI) | Consolidate the plans of agencies, including the Promise of Hanoi, and endorse these to the Department of Finance for budget allocation every fiscal year. |
| Department of Finance | Allocate resources required by departments and agencies to implement the priority strategies and actions in the Promise of Hanoi |
| Department of Industry and Trade (DoIT)<br><br>Department of Transport (DoT)<br><br>Department of Construction (DoC) | Lead the implementation of assigned priority strategies and actions in the Promise of Hanoi.<br><br>Coordinate with other departments and agencies to ensure that implementation of priority strategies and actions are technically sound, economically feasible, and socially acceptable.<br><br>Coordinate with DONRE to provide timely data and progress reports to be consolidated and submitted to the Hanoi People's Committee |

| City Department | Roles and responsibilities |
|---|---|
| Department of Information and Communications (DoIC) | Instruct news agencies to regularly disseminate information to the public on the state of climate change impacts in the city, implementation progress of the Promise of Hanoi and other climate commitments and initiatives of the city governments and its partners, information for opportunities for participation and collaboration with the city government and other stakeholders for climate action. |
| District authorities | Mobilization of community groups and citizens to translate the Promise of Hanoi into concrete actions at the district level in collaboration with DONRE and other departments and agencies |
| CSOs/NGOs | Mobilization of community groups and citizens to translate the Promise of Hanoi into concrete actions in collaboration with DONRE and other departments and agencies<br><br>Act as a third party monitoring and verification entity to ensure that transparency, local inclusion, and just transition is observed in the implementation of the Promise of Hanoi. |

Table 30. Overview of lead implementing department/agency of priority strategies of the Promise of Hanoi

| No | Sector | Strategy | Implementing Department/ Agency |
|---|---|---|---|
| 1 | Energy | Improve energy efficiency of buildings | Department of Construction |
| | | Promote the use of rooftop solar photovoltaic systems | Department of Industry and Trade |
| 2 | Transport | Promote low carbon, efficient, and reliable public mass transport | Department of Transport |
| | | Promote the use of CNG buses | Department of Transport |
| | | Promote the use of electric bikes | Department of Transport |
| 3 | Waste and water management | Reduce waste disposal to landfills by improving recycling and composting | Department of Natural Resources and Environment |
| | | Reduce plastic waste generation | Department of Natural Resources and Environment |
| | | Improve water conservation efforts and efficiency of wastewater treatment | Department of Natural Resources and Environment |
| 4 | Air quality | Improve air quality monitoring system | Department of Natural Resources and Environment |
| | | Prohibit straw burning in rural areas | Department of Natural Resources and Environment |
| 5 | Urban agriculture and ecology | Urban agriculture and ecology | Department of Construction |
| 6 | Cross-cutting actions | Cross-cutting climate actions | Department of Natural Resources and Environment |

City departments involved in the implementation of the Promise of Hanoi are required to submit their progress reports to DONRE annually. These reports shall be submitted before December 5 of every year. DONRE will then submit a consolidated report to the Hanoi People's Committee.

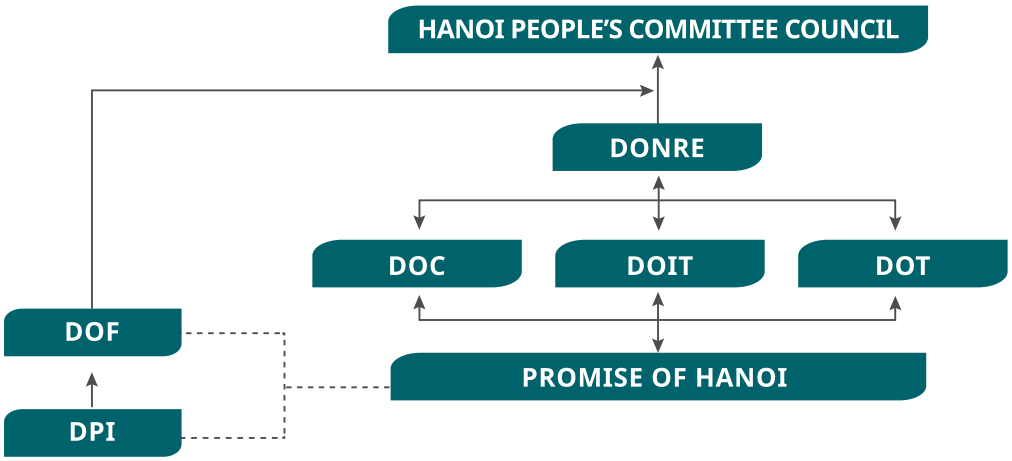



Figure 10. Reporting structure for the implementation of the Promise of Hanoi

DONRE, on behalf of the Hanoi People's Committee, shall also be responsible for the biennial reporting of its GHG emissions inventory as well as the progress and milestones achieved of its climate actions to the Ministry of Natural Resources and Environment (MONRE) which serves as the primary coordinating body of the national government for the implementation of the NDC. MONRE shall report and assist the National Committee on Climate Change (NCCC) in the preparation and submission of updates to the UNFCCC on its progress in delivering the country's NDC. Moreover, Hanoi will also continue to report its progress in delivering the Promise of Hanoi to the CDP-ICLEI Unified Reporting System. With Vietnam's recent submission of its updated NDC to the UNFCCC, the Hanoi People's Committee shall update and adjust its MRV plan per the instructions and guidance of NCCC and MONRE in aligning the country's MRV framework with the enhanced transparency framework.


Figure 11. Promise of Hanoi MRV implementation progress and milestones every 2 years to MONRE.

## Contact Information


ICLEI - Local Governments for Sustainability
World Secretariat
Kaiser-Friedrich-Str. 7
53113 Bonn, Germany
Tel.: +49-228 / 97 62 99-00
Email: city.promise@iclei.org
Web: http://iclei.org/

Southeast Asia Secretariat
Rms. 3&4, Manila Observatory
Ateneo de Manila University,
Loyola Heights,
1108 Quezon City
Philippines
Tel/Fax: +63-2/ 8426 0851
Email: iclei-sea@iclei.org
Web: https://icleiseas.org/


**AMBITIOUS CITY PROMISES**

Engaging citizens. Driving climate action.

ICLEI Local Governments for Sustainability


Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag