

# **Public Guide to the Clean Air Green Paper**

**Interdisciplinary Research to  
Propose Policy-led Solutions**

By  
Thailand Clean Air Network



**Public Guide: Clean Air Green Paper**  
**Interdisciplinary Research to Propose Policy-led Solutions**

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Research Team  
August, 2022

## Research Team

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# 1 Foreword

*“Clean air is a basic requirement of human health and well-being. Air pollution, however, continues to pose a significant threat to health worldwide” World Health Organization (2006)<sup>1</sup>.*

The majority of the world’s population has been experiencing levels of air pollution that far exceed those recommended by the World Health Organization (WHO).<sup>2</sup> It is estimated that more than 7 million premature deaths annually are linked to exposure to air pollution.<sup>3</sup> Substantial research has shown that air pollution has been the cause of between 4 – 9 million deaths annually worldwide, culminating in several hundred million years of life lost in total. With the increasing health risk induced by air pollution, on September 22, 2021, the WHO tightened guidelines on air pollution levels revising the recommended annual average concentrations of PM<sub>2.5</sub> to not exceed 5 µg/m<sup>3</sup> instead of the previous limit of 10 µg/m<sup>3</sup>.

Southeast Asia is one of the most polluted regions in the world, with approximately 2.4 million premature deaths in 2016 being attributable to air pollution.<sup>4</sup> Thailand is one of the Southeast Asian countries that has continuously been grappling with its air pollution problem,<sup>5</sup> especially since the heavily polluted days experienced in Bangkok and in many other provinces since 2019. Based on the Air Quality Life Index (AQLI) analysis, Thailand is ranked as the 4th most polluted country in Southeast Asia, with the nationwide PM<sub>2.5</sub> level having increased 22.7% between the years 2000 and 2020. Breaking that number down by the country’s various regions, northern, northeastern, central, and southern Thailand saw the increase of 30%, 28.9%, 18.2%, and 6.7%, respectively.

At the provincial level, Bangkok, Nakorn Ratchasima, and Chiang Mai are the three leading provinces in terms of PM<sub>2.5</sub>-induced health burden with an estimated 4.1 – 13.9 million years of life loss and an estimated life expectancy reduction of 1.8 years on average. These numbers demonstrate the severity of air pollution and its health impact on the country’s population, which are on par with health issues linked to smoking, food safety, alcohol consumption, and road accidents.<sup>6</sup> Despite steps taken by the government to include PM<sub>2.5</sub> air pollution as part of the national agenda since 12 February 2019, PM<sub>2.5</sub> levels in Thailand still continue to exceed the WHO recommended guidelines in every province (Figure 1), impacting the health of everyone in the country<sup>7</sup>.

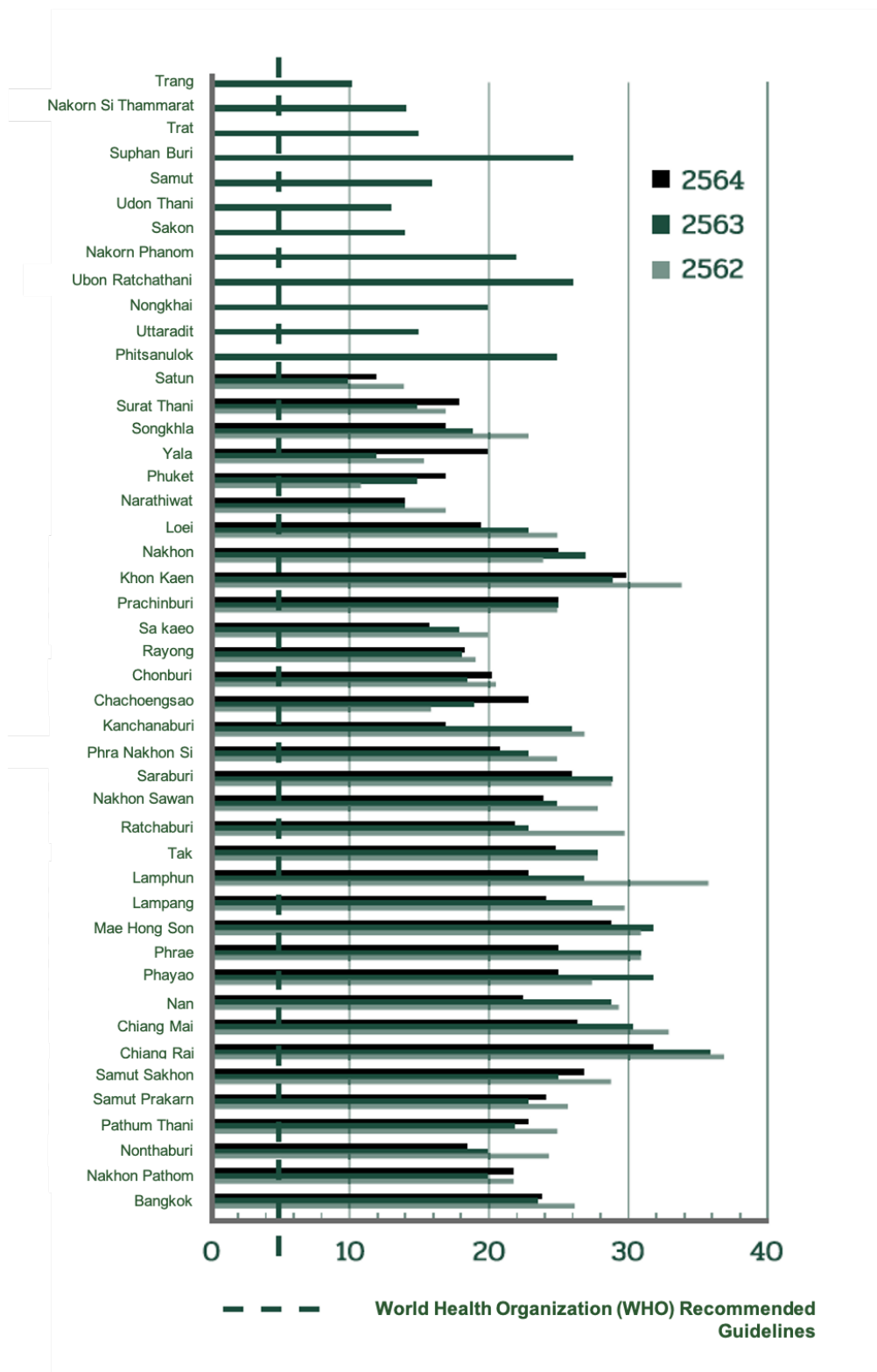


Figure 1: Average Annual PM 2.5 by Province from B.E. 2562 – 2564 (micrograms/cubic meter/year) <sup>8</sup>

The Thailand Clean Air Network (or Thailand CAN) previously published the ***Clean Air White Paper***, which introduced 9 “basic facts” to help explain the PM2.5 air pollution problems in Thailand. Subsequently, the ***Clean Air Blue Paper*** was published that delved deeper into the impacts of PM2.5 and its overall impact on Thai society from all dimensions. The findings from these two publications point to the fact that air pollution – including PM2.5 – come directly from the source and also from the accumulation of smaller particulate matter and the suspension of other chemicals of various sizes. The sources of air pollution include both natural and man-made sources, with the latter being the major cause and takes the form of emissions from the agricultural, forestry, transboundary, urban development, transportation, energy, mining, and waste management sectors.

The ***Clean Air Green Paper***<sup>9</sup> is a continuation of the work from the previous two publications, with the main aim of enhancing the understanding of air pollution issues among the public, policymakers, legislators, legal enforcers, and all stakeholders. This paper connects air pollution problems with comprehensive solutions that will lead to an integrated and sustainable clean air management for Thailand.

The Clean Air Green Paper was also developed in parallel with the research and the development of the ***Draft Act on the Integrated Management of Clean Air for Health***, the citizen-supported draft clean air legislation which was lodged under the Act to Submit Petition for Introducing the Law.

The Clean Air Green Paper differs from the previously published Blue Paper and White Paper in that this document adopts an interdisciplinary approach to develop policy-led solutions for clean air. Through collaborative work by experts in various related fields, the document proposes policy solutions in the areas of legislation, environmental economics, and civil society.

The Green Paper also ensures the solutions proposed do not focus only on the “manifestation” of the problems but also on their “root cause”. The proposed solutions featured in the paper therefore include both “paradigm shift” and the “practical actions”. Central to the paradigm shift is the “eco-centric” paradigm, comprising several concepts such as sustainable development, clean energy, green economy, and green mining. At the practical level, then, solutions are proposed that are based on the eco-center paradigm and include several interdisciplinary proposals in policy, legislation, environmental economics, and civil society among others.

The Green Paper begins with the paradigm discussion, covering the various enabling concepts and how they can be integrated. The discussion is then followed with an exploration of the practical level actions required, leading to a set of solutions that are aligned with the central “eco-centric” paradigm.

This ***Public Guide to the Clean Air Green Paper*** has been developed to summarize the key messages from the Clean Air Green Paper, digesting the content so it is more concise and



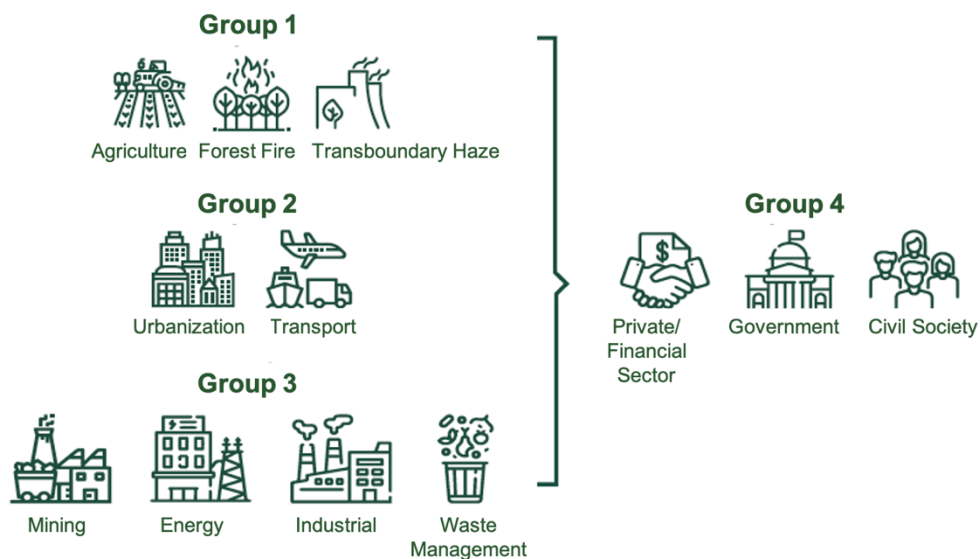
accessible to the public; thereby giving the public a comprehensive view of the sources of air pollution in Thailand and how the problems can be solved in an integrated and sustainable manner.

The proposed solutions covered in the Green Paper are classified into 3 main categories:

- Group 1 – Policies and measures focused on clean air in the agricultural sector, including forest fires and transboundary haze,
- Group 2 – Policies and measures focused on clean air in the urban environment and transportation, and
- Group 3 – Policies and measures focused on clean air in the industrial, energy, mining, and waste management sectors.

Also discussed are the roles of the public, private sector, banking and financial sector, and the government in shaping these clean air policies and measures.

The 3 groups of “issue-based” solutions are always discussed with the “actor-based” roles of the various stakeholders (see Figure 2), culminating in a set of proposed solutions both at the paradigm level and also at a practical actionable level.



*Figure 2: Classification of Issues-Based Solutions*

## 2 Paradigm Analysis

This chapter presents core paradigms in clean air management for the following sectors: agriculture, forestry, transboundary haze, urban development, transportation, industrial, energy, mining, waste management, public sector, private sector, financial sector, and the government. The above aspects are then organized into 3 groups, and their common paradigms are also presented. The summary of the discussion is provided here.

### 2.1 Core Paradigms for these Individual Sectors

▪

#### 2.1.1 Agriculture

Core paradigm underpinning the agricultural sector comprises the following concepts:

- Alleviate poverty and inequality in accessing natural resources for small-scale farmers,
- Restructure markets for agricultural produce to increase competitiveness and support the growth of eco-friendly products,
- Change the mindset and ignite awareness among policymakers to ensure that the problems of air pollution and its related health impact due to biomass burning are prioritized,
- Transform agencies under the Ministry of Natural Resources and Environment and other related ministries from their current coordination role to lead the integrated management of forest and forest fire,
- Prioritize incentive-based (“carrot”) measures in clean air management within the agricultural supply chain, instead of solely focusing on enforcement-based measures (“stick”) as has been previously used, and thereby enable the transition towards an environmentally-friendly food security system,
- Increase focus on the use of preventive measures to prevent biomass burning rather than the use of curative measures to solve the problems after they arise, along with increase funding to adequately manage biomass burning when they occur,
- Promote sustainable agriculture to be mainstreamed rather than to remain currently as merely a niche market,
- Adapt agricultural land utilization to be suitable with the local environment,
- Emphasize on the importance of clean air management in the agricultural sector, whilst taking into account the joint benefits with the management of other environmental problems such as climate change and clean energy,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures in clean air management in the agricultural sector,
- Support the participation of farmers and relevant entrepreneurs in the agricultural product supply chain, and in particular, address the excessive market power wield by large agricultural and food market players, which is being supported by the banking and financial sector, and

- Prioritize collaboration with international organizations on clean air management in the agricultural sector, with emphasis on the role of the agribusiness industry with respect to human rights.

### **2.1.2 Forestry**

Core paradigm underpinning the forestry sector comprises the following concepts:

- Alleviate poverty and inequality in accessing natural resources for forest inhabitants,
- Increase focus on the use of preventive measures to avoid forest burning rather than the use of curative measures to handle the problems after they arise, along with increase in adequate funding to manage forest fires when they occur,
- Change mindset and ignite awareness among policymakers to ensure that the problems of air pollution and its related health impact due to forest burning are prioritized,
- Transform agencies under the Ministry of Natural Resources and environment and other related ministries from their current coordination role to lead the integrated management of forest burning,
- Prioritize incentive-based measures in clean air management to address monoculture farming in forest reserves, instead of the current sole focus on only using enforcement-based measures,
- Shift the paradigm in forest fire management to enable local community engagement through the implementation of Community-based Fire Management,
- Emphasize on the importance of clean air management in the forestry sector which takes into account the joint benefits that come with the management of other environmental issues such as climate change and clean energy,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures for clean air management in the forestry sector,
- Support the participation of forest communities and relevant private sector entrepreneurs in the forest product supply chain, and in particular, address the excessive market powers wield by a few large agribusiness companies, which is currently supported by the banking and financial sector, and
- Prioritize collaboration with international organizations in the clean air management in the forestry sector, with emphasis on the role of agribusinesses industry with respect to human rights.

### **2.1.3 Transboundary Haze**

Core paradigm for the transboundary haze management comprises the following concepts:

- Increase the severity of penalties imposed for transboundary haze among Member States, while in parallel adopt the use of incentive-based measures to also manage clean air internationally,

- Seek sufficient funding, experts, knowledge, and other resources to manage transboundary, while also accounting for large discrepancy in economic development among ASEAN Member States – such as access to satellite technology needed to detect hotspots and enable the linkage with air pollution health impact,
- Emphasize on the importance of clean air management, considering the joint benefits with the management of other environmental problems such as climate change and clean energy,
- Encourage and support for genuine collaboration for clean air management within ASEAN through sub-regional cooperation,
- Apply principles adopted at the international level in the management of long-range transboundary air pollution,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures in transboundary haze management,
- Enable the participation of farmers and forest communities, as well as, relevant private sector and multinational corporations in the management of transboundary haze,
- Increase focus on the use of preventive measures to prevent biomass and forest burning, rather than the use of curative measures to handle the problems after the fact, along with support for adequate funding to address the root cause, and
- Emphasize on the importance of collaboration with international organizations, outside of ASEAN, in clean air management, considering the roles of businesses with respect to human rights.

#### **2.1.4 Urban Development**

Core paradigm for the urban development sector comprises the following concepts:

- Emphasize on the importance of sustainable city development, especially the Clean Air City concept,
- Emphasize on the importance of clean air management in urban development, considering the joint benefits with the management of other environmental problems such as climate change and clean energy,
- Change the mindset and ignite awareness among policymakers, both at the central government and local administration levels, to ensure that the problems of urban air pollution are prioritized,
- Emphasize on urban development concepts, including urban policies, urban planning, and infrastructure usage, that do not only focus on economic development without due consideration on the environmental impacts and particularly air quality,
- Transform agencies under the Ministry of Interior, Ministry of Natural Resources and Environment and other related ministries from their current coordination roles to lead the integrated management of sustainable urban development,
- Elevate incentive-based (“carrot”) measures in urban clean air management, instead of solely focusing on the enforcement-based measures (“stick”) as has been the case, to move towards sustainable urban development,

- Increase focus on the use of preventive measures rather than the use of curative measures to solve the air pollution problems after the fact, along with increase funding for green urban development initiatives,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures in clean air management in the urban development sector, as well as increase participation by civil society,
- Enable the participation of urban communities, slums dwellers, relevant private sector players, as well as enterprises and financial institutions with the market power to guide the direction of urban development, and
- Emphasize on inspiring and supporting civil movements.

### **2.1.5 Transportation**

Core paradigm for the transportation sector comprises the following concepts:

- Emphasize on the importance of clean air management in transportation, considering the joint benefits with the management of other environmental problems such as climate change and clean energy,
- Encourage the use of clean energy in transportation, rather than the current reliance on fossil fuel,
- Develop alternative modes of transportation, rather than the current reliance on the use of private vehicles,
- Transform the role of the state regulatory bodies from their current coordination roles to lead systemic and integrated urban development in parallel with urban transportation management,
- Support economic incentives to encourage the use of clean energy vehicle in parallel with legislative and enforcement measures,
- Emphasize on inspiring and supporting civil movements, and
- Develop a database to monitor, investigate, and evaluate both preventive and corrective measures in clean air management in the transportation sector, as well as to increase participation by civil society.

### **2.1.6 Industrial**

Core paradigm for the industrial sector comprises the following concepts:

- Emphasize on the importance of environmental protection, conservation, and restoration by the government, rather than solely focusing only on economic development driven by the industrial sector,
- Change the mindset and ignite awareness among policymakers, both at the central government and local administration levels, to ensure that the problems of air pollution in the industrial sector are prioritized,
- Develop eco-industrial town,

- Transform agencies under the Ministry of Industry, Ministry of Natural Resources and Environment, Ministry of Interior, Ministry of Public Health and other related ministries from their current coordination roles to lead the integrated management for sustainable urban development,
- Elevate incentive-based (“carrot”) measures for clean air management in the industrial sector, instead of solely focusing on the enforcement-based measures (“stick”) as previously used, and thereby move towards sustainable development,
- Emphasize on the importance of clean air management in the industrial sector, considering the joint benefits with the management of other environmental problems such as climate change and clean energy in the industrial sector,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures in clean air management in the industrial sector,
- Enhance civil society participation in the monitoring and resolution of air pollution problems, and
- Increasingly focus on the use of preventive measures to prevent industrial air pollution rather than the use of curative measures to handle problems after the fact, along with increased provision of adequate funding.

### **2.1.7 Energy**

Core paradigm for the energy sector comprises the following concepts:

- Emphasize on the importance of environmental protection, conservation, and restoration by the government, rather than solely focusing on economic development driven by the energy sector,
- Establish a systemic energy management paradigm based on sustainable and environmentally friendly energy management concept, with an emphasis on an effective use of clean and renewable energy,
- Include environmental and societal impact cost into the pricing of fossil fuels,
- Elevate incentive-based (“carrot”) measures for clean air management in the energy sector, instead of solely focusing only on enforcement-based measures (“stick”) as previously used, to move towards sustainable development,
- Enhance competition in the energy market, rather than enabling only a few conglomerates to dominate the market,
- Increase focus on designing policies that truly enhance competitiveness of entrepreneurs in the energy sector, rather than the current policies that provide only basic support without sustainably elevating their capabilities to compete,
- Emphasize on the importance of clean air management in the energy sector, considering the joint benefits with the management of other environmental problems such as climate change and clean energy management,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures in clean air management in the energy sector, and

- Increase participation of civil society in environmental management, from the policy level to regulatory and operational levels.

### **2.1.8 Mining**

Core paradigm for the mining sector comprises the following concepts:

- Emphasize on the importance of environmental management in setting governmental policies that address pollution from the mining sector through the adoption of the green economy concept,
- Adopt the green mining concept to manage the polluting mines and to bring about clean air,
- Transform agencies under the Ministry of Industry, Ministry of Natural Resources and Environment, Ministry of Interior, Ministry of Health and other related ministries from their current coordination roles to lead the integrated management in the mining sector,
- Elevate incentive-based (“carrot”) measures in clean air management of the mining sector, instead of solely focusing on enforcement-based measures (“stick”) as previously used, to move towards sustainable development,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures for clean air management in the mining sector,
- Enhance participation by civil society communities affected by mining pollution in the consideration and approval process for mining projects and in the subsequent project monitoring process, and
- Emphasize on the importance of clean air management in the mining sector, considering the joint benefits with the management of other environmental problems such as climate change and clean energy management.

### **2.1.9 Waste Management**

Core paradigm for the waste management sector comprises the following concepts:

- Emphasize on the importance of waste management that employs the Circular Economy concept, rather than the current focus on the linear economy concept,
- Emphasize on the adoption of Sustainable Consumption and Production Principle rather than a singular focus on either sustainable consumption or sustainable production in isolation,
- Emphasize on Extended Producer Responsibility rather than a tunnel focus on only the Polluter Pays principle,
- Transform agencies under the Ministry of Natural Resources and Environment, Ministry of Interior, Ministry of Industry, Ministry of Public Health and other related ministries from their current coordination roles to lead an integrated waste management system,

- Elevate incentive-based (“carrot”) measures in waste management, instead of solely focusing on only the enforcement-based measures (“stick”) as had been the case, to move towards sustainable development,
- Emphasize on the importance of clean air management in the waste management sector, considering the joint benefits with the management of other environmental problems such as the relationship between clean air and waste management and climate change,
- Develop database and support research to monitor, investigate, and evaluate both preventive and corrective measures in clean air management within the waste management sector, and
- Enhance participation by civil society in the monitoring and resolving air pollution problems.

#### **2.1.10 Public Sector**

In developing the core paradigm for the public sector, a 4-step Social Movement Pathway has been considered, namely:

- (1) Acknowledge
- (2) Learn & Understand
- (3) Awareness
- (4) Exercise

The public sector first needs to be able to acknowledge the accurate information about air pollution and its health impact. The acknowledgment of this information then enables the public to learn and understand real-life causes and impacts of the air pollution problems, which in turn then leads to awareness and a desire to exercise their legal rights in various forms to call for the recognition and protection of their basic rights to good health.

Based on this Social Movement Pathway, the following concepts form the core paradigm for the public sector are as follow:

- Emphasize on the development of accessible knowledge base in air pollution health impact and on the distribution of such knowledge to the public,
- Develop incentives and support systems to enable social movement,
- Prioritize civic engagement to drive the political will needed to effectively solve the problems,
- Transfer the burden of proof of the health impact from air pollution from the public back to the polluter,
- Prioritize capacity building to enhance the public’s ability to adjust and help resolve the air pollution problems, and
- Introduce the concept of Participatory Democracy to cultivate active citizens.



### **2.1.11 Private, Financial, and Banking Sectors**

In developing the core paradigm for the private, financial, and banking sectors, it is important to understand that their core tenet is the maximization of profits. These sectors will therefore become involved in the clean air management only if they are able to continue making profits and survive in the business environment. Accordingly, new legislations without enough economic incentives will not be able to garner adequate participation from the private sector.

Based on the understanding above, the core paradigm for the private, financial, and banking sectors comprises the following concepts:

- Policymakers and entrepreneurs in these sectors should increase their attention on environment sustainability through the Environmental, Social, and Governance (ESG) framework, rather than the current sole focus that has only been on financial profitability,
- Legislations and legal frameworks should emphasize the importance of environmental protection through mandatory corporate social responsibility rather than only as voluntary measures,
- Private, financial, and banking sectors should adopt the UN Guiding Principles on Business and Human Rights in their business operation,
- Emphasize on the transparency of business practices in the private, financial, and banking sectors that can be validated,
- Emphasize on economic and social incentives to adapt business practices to become more sustainable in lieu of relying on only current voluntary measures, and
- Regulators should educate the public and investors on the environmental impacts of their financial institutions and/or investee companies.

### **2.1.12 Government**

Core paradigm for the government sector comprises the following concepts:

- The government must respect, protect, and fulfill the basic human rights that are related to the environment and clean air,
- The government must enable the public to exercise both their substantive rights and procedural rights to clean air,
- The government must reform the legislative infrastructure for clean air and environmental management to include both incentive-based (“carrot”) and enforcement-based (“stick”) measures, with more focus on incentive-based measures, and
- The government must enable more public participation, as well as, more decentralization, and co-management.

## **2.2 Common Paradigms among Focus Groups**

### **2.2.1 Common Paradigm for Agricultural, Forestry, and Transboundary Haze Management**

For the first focus group, comprising the agricultural, forestry, and transboundary haze management sectors, open burning is a shared issue. Additionally, agricultural and forestry lands are generally in the same vicinity and illegal monoculture plantations and agricultural activities in the forest are not uncommon. Compounding the effect is the transboundary haze issue which, in Southeast Asia, tends to occur from biomass and forestry burning. Management of clean air in these 3 sectors, therefore, require a common paradigm that comprise of the following concepts:

- Recognize the differentiation in the poverty levels and different economic development both domestically and regionally,
- Elevate clean air management through incentive-based measures across the supply chain instead of solely focusing on only enforcement-based measures,
- Emphasize the importance of clean air management, considering the joint benefits with the management of other environmental problems such as the relationship between clean air, climate change, and clean energy management,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures in transboundary haze management,
- Enable participation of stakeholders including farmers, forest communities, and relevant private and financial sectors,
- Increase focus on the use of preventive measures to prevent biomass and forest burning rather than the use of curative measures to handle the problems after the fact, along with increased funding supply, and
- Emphasize on the importance of collaboration with international organizations on clean air management, considering the roles of enterprises with to respecting human rights.

### **2.2.2 Common Paradigm for Urban Development and Transportation Sectors**

Considerations for the urban development and transportation sectors are closely linked as transportation plays a large role in enabling the movement of people and goods within an urban environment. Effective public transportation systems will help reduce the need for personal vehicle use, which consequently reduces traffic congestion and vehicular emissions. Additionally, encouraging or enabling the use of clean vehicle energy will also reduce air pollution. Management of clean air in the urban environment and in the transportation sectors, therefore, require a common paradigm that comprise the following concepts:

- Emphasize on the importance of clean air management in the urban development and transportation sectors, considering the joint benefits with the management of other environmental problems such as the relationship between urban design, public transportation system design, clean vehicle energy, and climate change,

- Transform agencies under the Ministry of Interior, Ministry of Transport, Ministry of Energy, Ministry of Industry, Ministry of Natural Resources and Environment, and other related ministries from their current coordination roles to lead the integrated management for sustainable urban development and transportation system,
- Elevate incentive-based (“carrot”) measures in clean air management for the urban and transportation sectors, instead of solely focusing on enforcement-based measures (“stick”) as previously used, to move towards sustainable development,
- Increase focus on the use of preventive measures rather than the use of curative measures to handle the air pollution problems after the fact, along with increased provision of funding support,
- Develop database to monitor, investigate, and evaluate both preventive and corrective measures for clean air management in the urban development and transportation sectors, as well as to support civil society participation, and
- Emphasize on inspiring and supporting civil movements in the urban and transportation clean air management sectors.

### **2.2.3 Common Paradigm for Industrial, Energy, Mining, and Waste Management Sectors**

The industrial, energy, mining, and waste management sectors are all part of the production process, and all contribute to air pollution. Mining is in the beginning of this process, while industrial activities are in the middle and waste management at the end. The energy sector, on the other hand, is involved throughout the process, and is a prominent source of air pollution. Management of clean air in these sectors, therefore, require a common paradigm that comprise the following concepts:

- Emphasize on the importance of protection, conservation, and restoration of the environment by the government, rather than the sole focus on economic development driven by the energy, industrial, mining and waste management sectors,
- Elevate incentive-based (“carrot”) measures in clean air management in these sectors, instead of solely focusing on enforcement-based measures (“stick”) as previously used, and thereby moving towards sustainable development,
- Emphasize on the importance of clean air management in these sectors, considering the joint benefits with the management of other environmental problems such as the relationship between clean air, climate change, clean energy and waste management,
- Enhance civil society participation in the monitoring and the resolution of air pollution problems,
- Transform agencies under the Ministry of Industry, Ministry of Energy, Ministry of Natural Resources and Environment, Ministry of Interior, Ministry of Health and under related ministries from their current coordination roles to lead the integrated management in these sectors,
- Develop database and research to monitor, investigate, and evaluate both preventive and corrective measures in clean air management in these sectors.

#### **2.2.4 Common Paradigm for the Public, Private, Financial, and Government Sectors**

The public, private, financial, and government sectors are important stakeholders both as economic actors causing air pollution, but also as affected parties impacted by air pollution. They are also important Change Agents able to drive the needed adjustments to enable sustainable management of clean air. The roles of these stakeholders will need to be changed, as will be discussed in the subsequent chapters.

### **3 Clean Air Management Recommendations**

This chapter presents operational level recommendations in clean air management for each of the 4 focus groups discussed in Section 2.2. This chapter also presents recommendations for each individual sector discussed in Section 2.1, which include recommendations in the policy, legislation, environmental economics, civil society, and other aspects. Finally, the chapter summarizes key contents included in the Draft Act on Regulating the Integrated Management of Clean Air for Health, a citizen-driven draft legislation proposed to parliament by the Thailand Clean Air Network.

Contents in Chapter 3 can be summarized as follows.

#### **3.1.1 Operational-Level Recommendations**

#### **3.1.2 Recommendations for Focus Group 1 (Agricultural, Forestry, and Transboundary Haze)**

- The government should utilize community-based fire management concept as a basis for enacting or improving legislations related to agricultural and forest fire management both at the national and international levels.
- The government should enable local community participation by those residing in and around forest areas. These community forest conservation efforts must be provided with sufficient budgetary support, and when successfully implemented they will cultivate a visceral bond between the people and the forest. These efforts should be carried out both at the national and regional levels through ASEAN.
- The government should ensure integrated and coordinated management among agencies under various units within a ministry as well as seamless collaboration when working across different ministries.
- The government should ensure integrated and coordinated management of biomass burning and forest fires that lead to transboundary haze problems at the ASEAN level. This should be managed through the ASEAN Coordinating Center for Transboundary Haze Pollution Control (ACC), which was set up specifically to deal with regional transboundary haze issues.

- The government should integrate the management of pollution caused by biomass burning and forest fire with the management of other environmental problems, thereby ensuring co-benefits from an integrated design of national and organizational strategies. Clean air management should be carried out in parallel with climate change responses and clean energy management.
- The government should adjust the form of community funding support from outright grants to conditional grants tied to the achievement of sustainable and environmentally-friendly production practices. These conditional grants will help drive behavioral changes among farmers and forest communities to get involved in the conservation, restoration, and protection of forests, and thereby help to curtail future forest fires.
- The government should introduce the Payment for Ecosystem Services (PES) system into forest management. This system should also be expanded, through collaboration at the ASEAN-level, to address forest burning that leads to transboundary haze issues.
- The government should use conditional grants to incentivize farmers living on steep mountainous terrains to transition to perennial crops or agroforestry in lieu of their current monoculture farming practices.
- The government should not attempt to manage air pollution in isolation, but should instead collaborate with educational institutions, private sectors, and local NGOs to raise awareness and share knowledge with local farming communities across the country on sustainable farming practices that do not rely on biomass and forest burning. Such collaboration should also be extended beyond national boundaries and also be implemented at an ASEAN regional level.
- The public should be aware of the health impacts from air pollution caused by biomass and forest burning, as well as the basic human right to life and longevity unencumbered by the impact of air pollution. The public should also be encouraged to learn about and suggest solutions to mitigate air pollution problems.
- Those who are subject matter experts within civil society should demand that there be knowledge and awareness building on the health impact of air pollution among local communities. There should be a collaborative effort with relevant stakeholders and agencies to help ensure that local administrations are able to manage local air pollution problems through the appropriate use of technologies. They should also help ensure that local administration personnel are equipped with the requisite knowledge and capabilities required to perform this role.
- The government should consider restructuring relevant organizations and agencies responsible for biomass and forest burning management to enable them to not only manage air pollution but also bring about clean air.

- The government should consider restructuring relevant organizations and agencies responsible for clean air management to be able to implement policies, monitor policy actions, and evaluate the results throughout the agricultural and forest products supply chain.
- The government should respect, protect, and enable people's rights to be involved in resolving biomass and forest burning as well as transboundary haze issues through mechanisms such as whistleblowing protection, complaint lodging, and litigations.
- The government should consider the use of Prescribed Burning in agricultural and forestry areas where burning is unavoidable and also increase penalties for violators to ensure sustainable development both at the national and regional levels.
- The government should ensure continuous forest fuel management through methods such as the reduction of forest fuel accumulation and firebreak placements at both the national and ASEAN regional levels.
- The government should amend existing legislations, such as the Community Forest Act B.E. 2562, or enact new ones that would address the structural issues that underpin the biomass and forest burning activities happening at present. The government should also ensure effective enforcement of these legislations to bring about clean air.
- The government should establish or support the establishment of a database to monitor and evaluate actions and provide initiatives to reduce biomass and forest burning among local communities.
- The government should enable local communities to co-exist and gain benefit from the forests, thereby incentivizing community members to also want to protect the forests and reduce forest burning activities.
- The government should not block, but rather encourage civic movements to propose effective legislations that would manage biomass and forest burning both at the national and regional levels and through international collaboration.
- Local community members should cooperate and comply with legislations on biomass and forest burning to help reduce burning-induced air pollution and ensure clean air for all.
- The government should encourage the development of a logistical system that utilizes agricultural and forestry waste both at the national and regional level.
- The government should support the establishment of markets for agricultural and forestry waste to generate additional value for these materials.

- The government should encourage industrial applications of agricultural and forestry waste, thereby value-adding to these materials.
- The government should encourage a voluntary carbon trading scheme in the agricultural and forestry sectors at the national level, and should also collaborate with other ASEAN governments to establish this scheme at a regional level.
- The government should support sustainable agricultural practices and standards both at the national and regional levels.
- The government should support the establishment of Supply Chain Traceability System to enable transparent “farm/forest to fork” tracing of agricultural and forest material products.
- The government should enact clean air legislation that enables the management of air pollution caused by biomass and forest burning. Such legislation should enable systemic and integrated management across all stakeholders with strong civil society participation. The legislation should comprise multiple measures, mechanisms, and tools ranging from developing a clean air master plan to establishing a clean air for health fund and providing incentive measures at the local community level.
- The government should establish an effective legal framework to monitor and control air pollution caused by biomass and forest burning, e.g., an establishment of air quality index, the use of local administrative legislations, and the use of disaster prevention and relief mechanisms.
- The government should establish a legal framework to prevent air pollution and to enable clean air, e.g., support for sustainable agricultural practices, establish sustainable food production standards, and enable agroforestry in the national forests. Such a framework should also enable regional collaboration with other ASEAN nations.
- Civil society, especially local communities, should adjust their attitudes and beliefs towards biomass and forest burning. This includes amending their bias against the use of agricultural machinery and to be open to reevaluating inaccurate or incomplete knowledge that they have long held. They should also consider the long-term public interest and should take responsibility for the impact of their burning activities.
- Civil society should collaborate to reduce production costs for agricultural and forest products. This can be achieved by being receptive to gaining support from other civil society alliances and also calling on the government to also render support domestically and through cooperation with other ASEAN nations.

- Civil society should use social sanctions against businesses and enterprises that do not contribute to the reduction of burning. They should support local farmers and forest communities, recognizing that these are the most vulnerable groups of people in terms of bargaining power, economic ability, and social respect.
- Civil society, especially local farmers and forest communities, should collaborate with various stakeholders and sectors to improve their own knowledge and capabilities.
- The government should cultivate awareness and enhance knowledge among local farmers and forest communities in the management of agricultural and forestry waste through the use of appropriate technologies.
- The government should raise awareness and support knowledge about the dangers of air pollution caused by biomass and forest burning, including the risk of premature death. The government should also continuously report on the air quality index throughout all areas in the country.
- The government should consider the hill tribe communities that have been living in the protected forests prior to these areas being declared as conservation areas. This would enable these communities to continue living in these areas with conditions and regulations appropriate to the local context.
- The central government should support budget, resources, and manpower to local administrations to enable their work in agricultural and forest fire management.
- The government should manage biomass burning and forest fire through legislative measures and penalties against illegal and unsafe burning, in conjunction with the use of incentive-based measures.
- The government should encourage perennial crop farming in the forests and highlands in place of monoculture farming by supporting research and knowledge distribution, as well as, establishing the markets for these products for these communities.
- The government should establish channels for various forest communities to exchange knowledge and collaboratively analyze the causes and impacts of forest burning, which should culminate in appropriate resolutions to the problem in various areas.
- The central government should ensure capacity building, through the provision of training, tools, and technologies, for local administrations to enable co-management of air pollution with their local communities.



- The government should support the training of volunteer forest firefighters and ensure that there are enough qualified personnel in all areas. The government should also establish a systematic database of qualified forest firefighters.
- The government should utilize forest management manual from the International Tropical Timber Organization (ITTO) as a basis for forest fire management in the country.

### **3.1.3 Recommendations for Focus Group 2 (Urban Development & Transportation)**

- The government should encourage Work-from-Home arrangements to help reduce the use of personal vehicles for commuting.
- The government should improve and manage the public transportation system to ensure efficiency, speed, and comfort, thus making the system conducive for people to use in lieu of personal vehicles.
- The government should encourage reduction of the reliance on motor vehicles by improving footpaths and bicycle lanes throughout the city to ensure they are usable and safe. The government should also integrate foot- and bicycle-based travels into the planning of the city transportation system.
- The government should enable clean-energy vehicles by investing in the basic infrastructure required such as power grid and adequate charging stations for electric vehicles in the city.
- The government should manage the use of urban traffic zoning to reduce congestion and air pollution, e.g., regulate parking fees, manage parking zones, collect road usage fees, and limit the number of vehicles.
- Civil society should encourage sustainable and environmentally friendly means of transportation among the people in the city.
- Civil society should create movements to demand the government better manage urban areas and public transportation systems to help reduce air pollution.
- Civil society should take personal actions to reduce air pollution such as using personal vehicles responsibly and utilize car-sharing and carpooling to reduce the need for personal vehicles.
- The civil society should get involved with the government in monitoring and supporting sustainable urban development.

#### 3.1.4 Recommendations for Focus Group 3 (Industrial, Energy, Mining, and Waste)

- The government should enhance environmentally friendly policies in the industrial, energy, mining and waste management sectors. Specifically, environmental and ecosystem protection and conservation should be amongst the core national policies with appropriate funding support.
- The government should include Circular Economy concept into the national strategy to (1) prepare for future shortages of natural resources, (2) resolve waste-induced environmental problems, (3) reduce greenhouse gas emissions, and (4) create value-added and market for new businesses able to utilize circular economy concept and methods.
- The government should review legislations in the industrial, energy, mining, and waste management sectors, as most existing ones focus on economic development without due regards to environmental protection.
- Health legislations should be integrated with environmental legislations.
- The government should support the ***Draft Act on Regulating the Integrated Management of Clean Air for Health***, or adopt the concepts proposed in this draft.
- The government should ensure sufficient air quality monitors in the industrial, mining, and waste management zones, as well as, in the communities affected by air pollution from these sectors. These monitors should also be supplemented with digital technologies enabling close monitoring of particulate matters when they are at dangerous to human lives.
- The government should enable participation by civil society in policy making, regulation, operation, and protection of environment and natural resources impacted by activities from the industrial, mining, energy, and waste management sectors.
- The government should equip relevant staff responsible for these sectors with the knowledge to manage, monitor, and provide suggestions in resolving air pollution problems.
- The government should increase awareness among executives and staff of organizations and agencies responsible for air pollution management on the advantages and disadvantages of economic incentives as compared with enforcement-based measures. The government should also increase awareness among the same group about the evaluation of negative economic, social, and environmental impacts from air pollution from activities in the industrial, mining, and waste management sectors along with how to evaluate clean air management measures.

- The government should enact pollution control legislation governing the emissions of hazardous substances from both stationary sources and fugitive sources.
- The government should develop and publicly publish a database of air pollution sources in the industrial, energy, mining, and waste management sectors.
- The government should support continuous research to study, monitor, and evaluate health, economic, and social impacts of air pollution, and the measures used to combat the problems in the industrial, energy, mining, and waste management sectors.
- The government should educate the public on how to best protect themselves from air pollution and provide opportunities for affected communities to participate in pollution monitoring activities with the public health agencies.
- The government should utilize various economic incentives to manage air pollution in the industrial, energy, mining, and waste management sectors instead of using only conventional enforcement-based measures.
- The government should enact financial, tax, and societal measures to encourage clean air management in the industrial, energy, mining, and waste management sectors.
- The government should establish a Clean Air Fund to support sustainable management of air pollution problems.
- The government should encourage enterprises in the industrial, energy, mining, and waste management sectors to publicize their environmentally friendly production processes to their customers through, e.g., environmental labeling and environmental performance accreditation.
- The government should support the use of renewable energy instead of fossil fuel in the industrial, energy, mining, and waste management sectors.
- The government should accelerate policies encouraging efficient use of energy and renewable energy, and policies on climate change in the industrial, energy, mining, and waste management sectors. Such policies should also be enforced at the local levels.
- The government should install effective pollution control devices and strictly enforce a limit on emissions in the industrial, energy, mining, and waste management sectors.
- Civil society should demand the protection of their rights and be open to receiving information on environmental and health impacts from the government and relevant stakeholders.

- Civil society should increase awareness and understanding of clean air management in the industrial, energy, mining, and waste management sectors, as well as, understand the linkages between air pollution and health impact.
- Civil society should encourage the labor force to upskill and re-skill themselves in preparation for the green economy, green mining, renewable energy, and sustainable production process. At the same time, the government should also support such upskilling and reskilling efforts.
- Civil society should collaborate with local administrations in the management of air pollution in the industrial, energy, mining, and waste management sectors.

### **3.1.5 Recommendations for Focus Group 4 (Public, Private, Financial, Government)**

- The government should enable the public, private, and financial sectors to access updated information about air pollution, air quality situation, and pollution sources.
- The government should amend the Securities and Exchange Act B.E. 2535 to set guidelines on the disclosure of the enterprises' information, especially on environment-related information.
- The government and the private and financial sector should support continuous research to evaluate main sources and impacts of air pollution, and should encourage systemic research covering the economic, societal, and health aspects.
- The government should encourage an evaluation of environmental impacts from the activities of the private and financial sectors, with the public providing the necessary impact data.
- The government should provide channels to receive and respond to suggestions and participation in air pollution management from the public, private, and financial sectors.
- The government should build awareness among society members about air pollution health impacts on the most vulnerable groups of people, and enable collaboration among the public, private, and financial sectors to protect those vulnerable groups.
- The government should enhance awareness on the danger of air pollution, the methods to protect oneself against air pollution, and the benefits of better air quality.
- The government should support an organization responsible for knowledge development, knowledge distribution, and effective legal enforcement on issues related to clean air.

- The government should establish a supporting structure to enable the public, private, and financial sectors to drive environmental agendas, especially those related to clean air, and to enhance participation and co-management.
- The government should support processes to raise environmental awareness among personnel in the government, private, and financial sectors through, e.g., educational outreach programs for people of all ages.
- The government should support an establishment of environment-focused political parties.
- The government should design legislations and regulations that enable cooperation among the public, private, and financial sectors in demanding the protection of their human rights without being inhibited by high and undue transaction costs.
- The government should enable participation of the public sector in clean air management in collaboration with the government, private, and financial sectors through mechanisms such as through committees or working groups.
- The government should utilize economic incentives, e.g., conditional funding support, to enable the public, private, and financial sectors to adapt themselves towards more environmentally friendly activities.
- The government should utilize economic incentives in encouraging consumers to alter their consumption behaviors and for enterprises to alter their production processes to be more environmentally friendly.
- The government should design tax incentives that are high enough to encourage behavioral changes and are reflective of the negative environmental impacts from the production and consumption processes.
- The government should establish a Clean Air for Health Fund and design methods to maintain this Fund in accordance with the provisions stated in the Draft Act for Regulating the Integrated Management of Clean Air for Health.
- The government should review current legislations to ensure opportunities for citizens to be involved in the design of public policies.
- The government should strive to enact, and enforce, a core Act to enable citizens' involvement in public policy design.
- The government should enact legislation to promote activities related to sustainable clean air management among enterprises in the public, private, and financial sectors.

- The government should support establishment of self-sustainable social enterprises in the public, private, and financial sectors.
- The government should support the Draft Act on Regulating the Integrated Management of Clean Air for Health, or adopt the concepts proposed in this draft.
- The government should enact enforcement measures that require all business enterprises to consider societal and environmental impacts of their activities. These measures should be designed to incorporate adequate public participation.
- The government should establish clear and strict guidelines governing the financial institutions' support for enterprises whose activities are the sources of air pollution.
- The government should tangibly adopt the National Air Quality Action Plan, with establishments of key performance indicators, incentives, and punitive measures. The public should also be allowed to participate in the evaluation of these performance measures.
- The government should enact stricter air quality legislations and standards.
- The government needs to establish Pollution Release and Transfer Registers, Air Quality Index, and Air Quality Health Index for all areas.
- All financial institutions should officially adopt the principles outlined in the UN Guiding Principles on Business and Human Rights (UNGP).
- All financial institutions, with support from the government, should declare policies for the inclusion of hazardous pollution preventive measures in their credit and financial services agreements with their polluting borrowers and or business counterparts.
- The government should enact legislation and regulations linking the financial institutions' liabilities to environmental degradation.
- The government should amend the Financial Institution Act B.E. 2551 to include guidelines on environmental risk evaluation to be undertaken by borrowers of commercial banks and should include Article 30/1 in Section 3 on Financial Institution Regulation.
- The government should drive the establishment of the Green Credit policy requiring financial sectors to move credits and loans away from polluting industries to environmentally friendly, clean, and energy-efficient industries.

- The government should develop air quality monitoring and analysis tools that alert and inform the public of air pollution levels and their related health impacts with support from the public, private, and financial sectors.
- The public sector should be able to access information relating to societal and environmental impacts from activities in the private and financial sectors, with support from the government.
- The government should enable effective community participation at the local level.
- The government should encourage public participation both at the local and national levels through the development of initiatives related to clean air management.
- The government should openly share information on clean air management initiatives to the public sector both at the local and national levels.
- The government should heed public opinions when approving projects and initiatives.
- The government should consult and collaborate with the public in amending and enacting clean air related legislations.
- The government should enable the public to be involved in determining measures regulated to the government agencies' actions on clean air management.
- The government and the financial sectors should develop financial literacy awareness to improve the public's ability to make informed financial and investment decisions and to enhance their knowledge about the impact of their investments.
- The government should intervene between the interests of the producers and consumers, ensuring that the overall public interests are upheld above all else. The government's intervention can include both government-driven legislations and social measures.

## **3.2 Issue-Specific Proposals**

### **3.2.1 Agriculture**

#### **3.2.1.1 *Legislative Proposals***

- Monitoring and Control Measures
  - Comprehensive air quality standards should be defined.
  - Nuisance incidents should be managed and alleviated.
  - Local administration legislations should be enforced.

- Disaster Prevention and Mitigation Laws should be enforced.
- Pollution Prevention and Clean Air Enabler Measures
  - Sustainable agriculture should be encouraged.
  - Food production standards should be defined.
  - Committees and organizations responsible for regulating and monitoring governmental action to resolve air quality violations should be established.
  - Legislations related to biomass open burning should be reviewed and amended.
  - Government agencies should be tasked to encourage, incentivize, and educate farmers to drive behavioral change, and to utilize punitive measures as appropriate.

#### *3.2.1.2 Environmental Economic Proposals*

- When biomass burning is required, it should be properly managed with environmental and meteorological conditions taken into consideration. This will ensure that the pollution from the burning is not beyond what can be naturally absorbed.
- Targets and specific measures to reduce burning in rice paddies and corn fields should be established in addition to existing measures focused on sugar cane burning.
- Conditional assistances should be utilized in place of unconditioned grant support for farmers, and these conditions must encourage behavior changes both in terms of limiting biomass burning and increasing crop selection.
- Collaboration with educational institutions, private sector, and local NGOs should be initiated to support the education of farmers on alternatives to biomass burning.
- Price difference between fresh/unburned sugar canes and burned ones should be increased to more than THB30 per one metric ton to incentivize sugar cane farmers to move away from burning their crops for harvesting. This initiative is aligned with the Extended Producer Responsibility framework.
- Education should be provided to farmers on the utilization of harvesting machines.
- Cooperation among individual / small-time farmers should be encouraged to enable harvesting machines to be utilized effectively and economically.
- The sharing economy concept should be adopted to enable the sharing of agricultural machinery. This can be done through the machine rental market with open competition, and it can be incentivized through, e.g., reduction of import taxes, availability of low-interest loans, and exemption of profit tax for investors in this market.



- Logistical support for the selling of agricultural waste should be expanded to enable farmers to sell their waste economically. This needs to be done in parallel with the development of the appropriate transportation route and ascertaining the capacity and number of transportation vehicles required.
- Agroforestry should be encouraged in place of monoculture farming on the mountainous slopes, to help reduce burning sustainably.
- Markets for agricultural waste should be established. Farmers should be encouraged to use agricultural waste as mulch on their lands to help improve soil quality.
- Agricultural waste should be channeled for use in advance industrial sectors to maximize their value, and infrastructure to collect and store this agricultural waste should also be developed in parallel.
- Voluntary carbon trading should be encouraged to provide added benefit to the proper management of agricultural waste.
- Sustainable agriculture and agricultural production standards should be encouraged and established, in parallel with an awareness training on food safety issues.
- Food traceability system should be established to enable tracing of food from its origins to the consumers.

#### *3.2.1.3 Civil Society Proposals*

- Local communities should be educated to adjust their attitudes towards biomass burning and the use of agriculture machinery, and to be better equipped with accurate knowledge.
- Civil society movements and social sanctions should be utilized to discourage the use of products borne out of biomass burning.
- Farmers should be supported to enable self-sufficiency through leadership and group developments, as well as, through coordination with various sectors.

### **3.2.2 Forestry**

#### *3.2.2.1 Paradigm and Policy Proposals*

- The paradigm used in forest fire management, which is related to the paradigm of human-forest relationship, should be based on Community-Based Fire Management concept. The

government, local communities, private developmental organizations, and relevant civil society should all be involved in the conservation, protection, and equitable utilization of forest resources.

- The Controlled Fire Use paradigm should be utilized, instead of solely focusing only on fire suppression.
- Co-management concept, with local communities as genuine partners, should be utilized instead of a complete reliance on government agencies.
- Bottom-up approaches should be utilized instead of solely focusing on top-down approaches.

#### *3.2.2.2 Legislative Proposals*

- Clear legal policy should be defined based on the concept of an integrated forest management.
- Clear and comprehensive legislations and regulations should be enacted to allow local communities access to natural forest resources and enhance the collective responsibility in natural resource management.
- Legal framework to manage and mitigate uncontrolled burning should be enacted and enforced in parallel with local measures and incentives, taking into consideration the needs of the local communities.
- Relevant agencies under the Ministry of Natural Resources and Environment should collaborate and co-manage forest fires in an integrated manner. Organizational and authority revisions may be required.
- Financial and human resources should be provided to local administrations responsible for forest and forest fire management to enable effective operations in accordance with the Determining Plans and Process of Decentralizing to Local Governance Organization Act, B.E. 2542
- Some legislations related to forest and forest fire management, e.g., the Community Forest Act B.E. 2562, may need to be revised.
- The Clean Air Act should be enacted to enable integrated and systemic management of forest fire induced air pollution as well as participation of local communities based on the co-management concept.

### 3.2.2.3 *Environmental Economic Proposals*

- Local communities' rights to utilize the forestry areas should be supported along with appropriate incentives to encourage community members to also protect these forests and reduce forest burning.
- Local community members should be encouraged to be involved in the conservation and restoration of forests, and the reduction of forest burning. Various economic tools and incentives should be utilized based on the appropriate local contexts.
- Appropriate economic measures based on the Polluter Pays Principle (PPP) should be established and applied to private enterprises that benefit from the forest.
- Valuation of forest ecosystem services should be conducted.
- Tools to monitor and evaluate forest fire reduction initiatives should be developed.
- Perennial plantations in the highlands should be encouraged, which would be in place of monoculture farming, to reduce burning in the forest areas. Education and markets need to be provided for local communities.
- Legislation on the use of lands should be amended to benefit perennial plantations, and research into perennial plantations appropriate in the highlands should be supported.
- Preventive measures, rather than corrective measures, should be the primary focus.
- Flexible prescribed burnings should be utilized to ensure continuous management of forest fire sources.
- Traceability system should be established to enable the tracing of food from its origins to the consumers.
- The Action Plan to drive the national strategy on air pollution resolution beyond 2024 should be developed, as there needs to be a continuous plan to resolve the air pollution problem in the forestry sector.

#### 3.2.2.4 *Civil Society Proposals*

- Local communities in the forestry areas should be encouraged and supported to be involved in forest management.
- Knowledge exchange forums should be established to enable forest communities around the country to exchange knowledge and understand air pollution problems and their sources in the various areas.
- Cooperation and collaboration among civil society should be encouraged. The sharing of best practices and viewpoints on air pollution should be supported to enable better understanding of the issues among local community members.
- Dialogues, educational sessions, technologies, and resources should be provided to local administrations and communities to enhance their participation in the monitoring and prevention of air pollution. Local communities should also be encouraged to develop local measures to prevent and manage forest fires locally.
- Continuous educational outreach and awareness efforts should be supported to ensure local communities are aware of the dangers and the impacts of air pollution and forest burning.
- Hilltribe communities living in protected forest areas should be allowed to continue their access to the forest resources under appropriate management scheme co-developed by the government and community members.
- Databases of open burning in the agricultural and forestry sectors should be developed to enable discernment of fire sources and rapid detection of forest fires.
- Private sectors and international organizations should be encouraged to provide funding and resources to local communities to fill the gap where there is shortfall in governmental support.
- Budget for local forest fire management should be increased sufficiently, and legislation governing the use of the budget should be amended to enable effective forest fire management.
- Sufficient training programs for volunteer forest firefighters should be conducted, and a database of certified firefighters should be developed. These firefighters should be supported when they are injured or killed on the job.

### **3.2.3 Transboundary Haze**

#### **3.2.3.1 *Legislative Proposals***

- A core agency, with appropriate supporting bodies, responsible for the management of transboundary haze should be established and a regulatory agency responsible for investigating transboundary haze issues should also be established.
- National legislation focused on transboundary haze should be enacted. Under such legislation, the owner or possessor of transboundary pollution sources outside the Kingdom of Thailand and all other associated actors should be liable to be prosecuted when such pollution causes harm to the health, resources and economy of those within the Thai borders.
- Effective scientific tools and sufficient manpower (including volunteers) should be organized along national borders to monitor the potential for transboundary haze. Efficient reporting and timely alert mechanisms should be established.

#### **3.2.3.2 *Environmental Economic Proposals***

- ASEAN central organization should be established to enable collaborative air pollution resolution at the regional level.
- Common regional standards and framework on air pollution, e.g., common air quality index target, inclusion of PM2.5 in the air quality index calculation, air quality impact assessment framework, should be established.
- International traceability system should be established.
- Research and development work to raise awareness on air pollution impacts should be supported.
- Sub-regional collaboration to manage air pollution problems should be considered.
- Developed countries with financial and knowledge resources should support those with less capabilities.
- Markets for agricultural and forestry waste should be established to add values to the waste and thus reduce the incentive to burn.
- ASEAN-level collaboration on climate change and air pollution management should be carried out in parallel.

#### 3.2.3.3 *Civil Society Proposals*

- Measures for individual protection should be supported in parallel with international collaboration to combat these problems.
- Education should be provided to local community leaders on their rights to breathe clean air and how they can support their community members in combating these problems under the purview of protecting their human rights.
- Measures, policies, and agreements should be established within the local community to reduce both internal and transboundary air pollution, with support from local administrations.
- Local community members and civil society, especially in areas impacted by transboundary haze, should drive the call for resolution. To enhance the effectiveness of the call, health impact information and severity of the pollution should be collected through mobile applications or other technologies.
- Education should be provided to local community leaders and members to ensure awareness and understanding of the air pollution problem. Local administration officers should also be provided with training to enable effective work and coordination to combat the air pollution issues.
- Collaboration between the people, local communities, and international counterparts should be continuously supported, with a focus on controlling pollution at the source, the development of monitoring tools, and support for collaborative decision- making.

#### 3.2.3.4 *Other Proposals*

- Air pollution resolution should be driven in parallel with climate change management.
- International collaborative platform should be established to enable the sharing of best practices and coordination in resolving air pollution problems.

### 3.2.4 **Urban Environment**

#### 3.2.4.1 *Paradigm Proposals*

- The paradigm of Sustainable Urban Development should be used as the basis for policies and legislations related to urban design and management, with an increased focus on the environment and the ecosystem to create a better counterbalance with economic and social development. The target of being a Clean Air City in every aspect should be the

common striving goal that can be achieved through systemic, effective, and sustainable management.

#### *3.2.4.2 Policy Proposals*

- Legal policy in urban management under the Sustainable Urban Development paradigm should be established.
- Central government structure should be amended to enable integrated urban development, especially between agencies responsible for policy making and agencies responsible for urban design. Such development should be based not only on economic and social development, but also on environmental considerations.
- Urban development organizations should be established with careful considerations of various relevant factors including the context of Thai society.

#### *3.2.4.3 Legislative Proposals*

- Urban development strategies should be fair and equitable for all stakeholders and should be supported by an appropriately established legal framework.
- Legal framework on the management and development of urban environments in ways that will enable sustainable assurance of clean air should be strictly enforced.
- Some existing legislations may need to be amended to enable effective urban clean air management. Examples can be taken from other countries but must be appropriately adjusted to fit with the local context.
- Urban design legislation and building control legislation should be connected and integrated, if not combined into a single legislation.
- Specific legislation on sustainable urban development should be enacted, with a focus on environmental and clean air management within the urban environment.

#### *3.2.4.4 Environmental Economic Proposals*

- Existing measures should be used in conjunction with economic measures, e.g., enforcement-based, or legal measures can be used to attain the minimum target of green areas required and economic measures can then be used to incentivize construction of additional green areas beyond the minimum requirement.

- Environment tax or fees, assessed based on the severity of environmental and air pollution problems in conjunction with policies to increase green space should be implemented.
- An Urban Green Development Fund can be established. Interested community members can deposit money into the Fund, in exchange for receiving dividends and tax breaks. The Fund should be used to support or invest in entrepreneurs looking to develop sustainable agricultural practices and urban green areas.
- The enforcement of measures should be in alignment with the existing system and should consider impacts on the financial system, the stakeholders of green area development, and opportunity costs from the loss of green area usage.
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- Economic measures in land management such as Conservation Easement, Purchased Development Right (PDR), and Transferred Development Right (TDR), which have been used in other countries, should be adapted for use in Thailand. Post-implementation analysis of these measures should be conducted.

#### 3.2.4.5 *Civil Society Proposals*

- Civil society organizations or social enterprises, established through collaboration among people in the civil society, should be encouraged as they will have greater power to drive changes.
- The government should adopt a sustainable urban development paradigm as a basis when making policies and legislations related to urban management. Environment and ecosystem should be considered, to counterbalance with economic and social development.
- Vulnerable groups of people without means to avoid air pollution or to protect themselves should be accorded protection in a systematic and effective manner.
- Citizen empowerment should be emphasized to enable people to monitor the initiatives to sustainably combat air pollution. This empowerment effort should be based on educating people on air pollution, especially in the urban environment.
- Civil society members should also do what is possible at an individual level to help reduce air pollution and support a call for change, for e.g., reducing the use of personal vehicles, reducing open burning, and supporting the push for a Clean Air Act.



#### 3.2.4.6 *Other Proposals*

- Systemic actions should be carried out, taking into consideration the local context, e.g., consideration of prevailing winds in the urban design process to ensure unblocked wind paths which will help alleviate air pollution problems, reduce heat island effects and manage heat-induced urban stress from people living in the city.
- Other environmental factors and problems should also be considered in urban management and urban infrastructure design to reduce environmental problems that impact the health of people in the city.

### 3.2.5 **Automotives and Transportation**

#### 3.2.5.1 *General Proposals – Promotion of Clean Energy Vehicles*

- Vehicle and vehicle exhaust inspection should be strictly enforced to ensure compliance with established standards, especially diesel-engine vehicles which are major contributors to air pollution.
- Continuous monitoring of black smoke from vehicles, especially cargo trucks, should be ensured throughout the days and nights.
- New emissions and fuel quality standards should be adopted without further delay, with appropriately defined punitive measures to enforce compliance along with incentives to encourage participation. Feasibility studies on the adoption of Euro-5 and Euro-6 emissions standards should also be conducted.

#### 3.2.5.2 *General Proposals – Incentives to Reduce the Use of Personal Vehicles*

- Transportation by non-motorized vehicles such as walking, cycling, and rowing should be encouraged through improvements of walkways, bicycle lanes, and waterways to ensure comprehensive coverage and safety for users. Such modes of transportation should also be included in urban transportation planning.
- Measures to support Work-from-Home and Work-from-Anywhere arrangements should be encouraged.
- Limitations should be placed on parking areas within the urban zone to discourage the use of personal vehicles.
- Limitations should be placed on the quota of new vehicle registrations and the cost of registration should be increased. However, an improvement in the public transportation system is also required to ensure people have options to not use personal vehicles.

- Investments should be put into improving the public transportation system to help reduce the use of personal vehicles, consequently reducing air pollution.
- Public transportation system improvement fund should be established to improve the system and – when necessary – subsidize fares to ensure accessibility for people of all income levels. Taxation and congestion fees can be used to collect money into the fund.
- Sufficient parking zones should be provided in the suburban/outskirt areas, to allow people to park their personal vehicles outside the city and to use public transportation system to travel into the midtown/urban areas.
- Public bus system should be improved to ensure comfort for the people. This may be enabled by open competition among an increased number of bus operators.

#### 3.2.5.3 *Legislative Proposals*

- Factors beyond CO2 emission should be included in the design of vehicle excise tax, as factors such as fuel type, engine age, vehicle size and weight, and engine size can contribute to the vehicle's pollution emission levels.
- High-emission vehicles should be assessed higher excise tax compared to their low-emission counterparts such as electric or hybrid vehicles.
- Surcharges should be assessed on vehicles emitting higher CO2 than is appropriate and should be charged based on the amount of excess CO2 emitted.
- Fossil fuel tax should be increased. In doing so, measures to support low-income vehicle users should be established.
- Fees for treatment and management of toxic fumes should be collected in conjunction with the collection of annual vehicle tax and they should be calculated based on the level of emissions generated by each vehicle.
- Benefits such as tax reduction or exemption should be given to people choosing not to use personal vehicles or to use clean-energy vehicles.

#### 3.2.5.4 *Environmental Economic Proposals*

- (Medium-term Measure) Deposit-Refund System should be utilized to support proper and environmentally friendly disposition of equipment associated with older vehicles. For example, old tires and batteries may be used to subsidize the costs of new tires and batteries.

- (Medium-term Measure) Parallel use of incentives and enforcements should be utilized to encourage / enable behavior changes especially among enterprises in the private sector.
- (Medium-term Measure) The cost of parking personal vehicles, especially in an urban area, should be increased. For example, midtown parking fees should be more expensive than parking fees for suburban/outskirt areas or areas connected to public transportation.
- (Medium-term Measure) Road pricing scheme should be used, differentiating the fees for road usage at various times of the day and on various days to match with the level of traffic congestion and the type and size of the vehicles.
- (Long-term Measure) Electric vehicles should be supported through tax incentives and constructions of supporting infrastructure such as provisions of charging stations. Standards governing the use of electric vehicles should also be established, as well as, a system to properly manage outdated or expired batteries.
- (Long-term Measure) Government agency vehicles should be changed into electric ones as an example for the public.

#### 3.2.5.5 *Civil Society Proposals*

- Civil society should push the government to develop high-quality public transportation systems that are equitable, accessible, comprehensive, and integrated into the entire urban transportation infrastructure.
- Civil society should get involved in the development of public services both at the local and national levels, acting as the “owner” of the national budget and as “humans” deserving the basic rights to breathe clean air.
- Civil society should take actions and initiatives to help reduce air pollution, for e.g., reducing personal vehicle usage through carsharing and carpooling as well as getting involved in the monitoring and evaluation of the government's initiative to reduce vehicular pollution.

### 3.2.6 **Industrial**

#### 3.2.6.1 *Policy and Legislative Proposals*

- Environmental quality standards for the various areas should be clearly defined, with strict punitive measures against violators enforced..

- Sufficient budget and human resources should be allocated for environmental agencies to monitor, protect, and prevent environmental violations.
- Environmental violations should be prosecuted, especially those causing severe air pollution impacting a wide range of people. Emphasis should be placed on this issue by both the executive and judicial branches of the government.
- Citizens' rights to access information relating to the environment and environmental impacts should be clarified. Citizens should be allowed access to the Pollution Release and Transfer Registers to obtain information regarding the release of toxic pollutants by factories.
- Measures and mechanisms to enforce compensation for damages caused by air pollution should be established.
- Citizens' rights to file civil lawsuits should be expanded to enable lawsuits to be brought early when citizens detect the impacts from pollution, rather than having to wait until the onset of their health deteriorating.
- Civil society and public organizations should be enabled to claim for damages in the public interest, and the burden of proof should be put upon the polluters rather than the people bringing forth these lawsuits.
- The Pollution Control Department (PCD) should be granted expanded authority to manage environmental and pollution problems through, for e.g., establishment of national environmental and pollution resolution strategies and enactment of national environmental quality standards.
- Internal structures of relevant ministries, such as the Ministry of Natural Resources and Environment, Ministry of Industry, Ministry of Health, and Ministry of Interior, should be reformed to enable more effective actions against air pollution and clean air management.

#### 3.2.6.2 *Environmental Economic Proposals*

- Executives and personnel of agencies responsible for air pollution resolution should be educated and made aware of the importance, advantages, disadvantages, and effectiveness of incentive-based measures to combat these problems. They should also be educated on how to assess the industrial air pollution impacts on society, economy, and the environment, as well, how to evaluate clean air management measures.
- Economic incentives such as pollution fees and taxes should be utilized more.

- Factories should be encouraged to disclose their product and production process information to their customers, especially when their process is environmentally friendly.
- Eco-industrial cities should be developed in areas where there are industrial factories to enable these factories and communities to co-exist sustainably.

#### 3.2.6.3 *Civil Society Proposals*

- Civil society's roles throughout the country should be expanded to enable their involvement in the conservation, monitoring, and protection of the environment.
- Relevant legislations should be amended to enable and to encourage public involvement and access to information related to the environment and pollution.

#### 3.2.6.4 *Other Proposals*

- Research and development initiatives related to air pollution management and resolution should be encouraged, especially ones that can demonstrate the link between industrial air pollution and the health and economic impacts.
- Digital technologies to comprehensively monitor industrial air pollution continuously and in real-time should be supported, and this information should be made readily available to the public to enable the public to submit evidence of pollution release from nearby factories in a timely manner.

### 3.2.7 **Energy**

#### 3.2.7.1 *Paradigm and Policy Proposals*

- Clean and renewable energy should be concretely encouraged through integrated measures to develop these energy sources, utilizing both enforcement-based measures and economic incentives.
- Renewable energy should be encouraged as a replacement for fossil fuels, as fossil fuels are the key sources of air pollution and greenhouse gases. Cease policies that have inhibited the development of the country's renewable energy sector.
- Coal-fuel electricity should be reduced and replaced by electricity generated from renewable energy sources.
- Power plants emitting PM2.5 should have their activities curtailed especially in areas severely affected by the pollution. These plants should be replaced by plants utilizing renewable energy sources.

- Fuel tax should be increased to reflect the negative impacts on the environment and on people's health, especially its role in causing air pollution.
- Community power plants should be supported, and their presence assured throughout all localities. Their operations should be linked with the buying of agricultural waste from farmers to reduce open burning. Investments should be made on high-standard storages for agricultural waste and their associated logistical systems.
- The Feed-in Tariff (FiT) system should be amended from the current fixed rate for natural energy sources and inflation-based rate for biofuels to regressive rates.
- Policies to encourage more efficient use of energy should be enacted in parallel with policies to support renewable energy. Knowledge and experience from initiatives in other countries should be adapted to support an integrated management of pollution, energy, climate, agricultural production, and human behaviors. Experience has shown that such integrated management plays a large role in reducing air pollution.

#### *3.2.7.2 Legislative Proposals*

- Review the economic and industrial development legislations to ensure they are better balanced with environmental and health legislations. Policies and measures should be reformed, supported by strong political will and clearly defined goals. Civil society should push for these reforms to happen in the political sector.
- Continuity of aligned energy policies and legislations should be supported, with legislations that well integrate energy policies and legal measures.
- The Office of the Energy Regulatory Commission should be the sole unit responsible for approving power plant construction and operation (One-Stop Service concept).
- The Office of the Energy Regulatory Commission should revise its strategy to consider the balance between business development and the protection of environmental and public benefits. Civil society should be allowed to inspect the Commission's work to ensure transparency.

#### *3.2.7.3 Environmental Economic Proposals*

- Economic incentives should be utilized more to manage air pollution in the energy sector, rather than solely focusing only on enforcement-based measures.
- Diverse economic incentives should be utilized to encourage the production and use of renewable energy rather than the current focus on FiT trading and price intervention.

#### 3.2.7.4 *Civil Society Proposals*

- Civil society should be encouraged and supported to get involved in the energy management process, including policymaking, regulation, and operation especially when the process is related to the environment. Citizens and academics should be included in the National Energy Policy Board and the Energy Conservation Promotion Fund Committee.
- Civil society should call for the protection of their rights and open-mindedly receive information from the government and other related stakeholders.
- Civil society should encourage members of the labor force to adapt and upskill to align with the development of clean energy and environmentally friendly production processes. In parallel, the government should also support labor adaptation and upskilling to ensure efficiency and effectiveness.
- Civil society should transition away from fossil fuels and towards renewable energy. The government should support this transition through infrastructure enhancement.

### 3.2.8 **Mining**

#### 3.2.8.1 *General Proposals*

- Up-to-date pollution control equipment should be installed to control pollution being released from mines, metallurgical plants, and new factories being constructed.
- Air quality monitors should be installed around the mining areas and areas where communities are affected by mining-induced pollution. The air quality information from these monitors should always be made accessible to the public.
- Non-attainment areas with lower air quality than standard must be regulated to prepare plans to reduce the pollution before new construction and mining projects can be approved.
- All stakeholders in areas where air pollution originates need to be jointly responsible for the management of air quality in those areas.
- Release of hazardous substances into the air must be strictly controlled covering both static and diffusive sources.
- Databases on air quality and air pollution in local communities affected by mining-induced pollution should be established.

- Research into the health and environmental impact of mining in the local areas should be encouraged. Innovations to enhance environmental quality and clean air in mining should also be supported through fundraising in the mining sector.
- Labor forces in the mining sector should be upskilled to be able to work with new environmentally friendly technologies that can help reduce air pollution. Education, training, and work experience are all means to support this upskilling.
- Mining operators should be required to publish their continuous improvement and disaster mitigation plans regularly. Third party stakeholders should be allowed to audit locations of the mines and their waste management systems. Collateral should be kept throughout a mine's operating life, and open access to information on the mining operations should be granted to stakeholders who may be impacted by the operations.

#### *3.2.8.2 Policy and Legislative Proposals*

- The monitoring, regulation, and evaluation of policy, plan, and legislative enforcement should be ensured. Relevant agencies should work to coordinate and harmonize to manage mining induced air pollution. Existing governmental infrastructure should be utilized, with public participation, to enforce health and environmental legislations in an integrated manner.
- Relevant legislations in the mining sector should be improved and/or amended to include clean air management and EIA/EHIA at internationally acceptable levels.
- Green mining should be encouraged and regulated based on internationally accepted standards.
- Legislative measures should be enacted to ensure public participation in the approval of mining projects, especially by affected communities.

#### *3.2.8.3 Environmental Economic Proposals*

- Economic incentives, such as Environmental Damage Insurance Bonds, should be utilized to reduce mining induced air pollution, rather than solely focusing on only enforcement-based measures.
- Tools and mechanisms to manage pollution emission such as the Emission Offset program should be utilized and included in the consideration for the approval of mining and metallurgy operations.



- Mining operators should be required to use environmentally friendly and effective machineries. Incentives should be designed to support the operators in accessing and/or importing such machineries in economical ways.

#### *3.2.8.4 Civil Society Proposals*

- Selected representatives from civil society should have a seat in the committee(s) responsible for approving mining operations. Such representatives should be knowledgeable about mining, mining impacts, and other related matters in the area.
- Civil society should call for the protection of the rights to their communities, the right to breathe clean air, and the right to live in a good environment, as well as, to be provided protection from mining impacts by the government.
- Awareness should be raised among civil society members of the health and safety impacts from poor air quality induced by mining and the long-term environmental impact. Mining operators should be responsible for preventing and mitigating the impacts and compensating for damages.
- Civil society members should be educated on the necessity of ensuring that people are involved in policy making to assure the highest public benefits and in monitoring the government's enforcement of existing legislations.

### **3.2.9 Waste Management**

#### *3.2.9.1 Circular Economy Policy Proposal*

- Circular Economy should be designated a national strategy to manage the ever-growing volume of waste. The strategy will enable waste to be reduced from the household level through initiatives such as waste separation, 3Rs concept, and zero-waste effort

#### *3.2.9.2 Legislative Proposals*

- New legislation should be enacted that manages waste and product lifecycles in an integrated and comprehensive manner. Waste should be managed from the initial source and should be reused or recycled as much as possible before disposing.
- The aforementioned legislation should be based on sustainable waste management, circular economy, waste hierarchy, polluter pays principle, extended producer responsibility and public participation.
- A specific authority responsible for waste management should be established. This authority should be responsible for defining national waste management policy and work

plan, performance indicators and evaluation scheme, waste management framework, and coordination between local administration and other relevant stakeholders including the private sector.

- Roles for various relevant sectors should be defined in waste management, with proper integration and coordination between stakeholders including the government (national and local), private sector (producers), and public sector (consumers). The private sector should have expanded responsibility in integrated waste management.

#### *3.2.9.3 Enterprises and businesses should be required to manage their products throughout the life cycles, with the responsibility in paying for waste management and recycling.*

- Targets in waste management and use of recyclable materials for product development should be defined. Recycling infrastructure and responsible parties should be established.
- Various measures should be utilized to enable effective enforcement of related legislations. Examples include installments of air quality monitors around waste management and recycling areas, support of digital technologies to monitor pollution, enhancement of local administration's authorities in local waste management, utilization of economic incentives to encourage proper waste management, and utilization of social measures such as award programs for enterprises that use circular economy concept.
- Local environmental protection measures in the EIA/EHIA regulations should be amended. Air pollution should be controlled at the waste-to-energy power plants.

#### *3.2.9.4 Environmental Economic Proposals*

- The Deposit-Refund System should be utilized to manage difficult-to-dispose and hazardous waste.
- Fees for the disposal or recycling of new products should be defined and collected at the points of sale to ensure sufficient funding to manage or recycle the products at the end of the product life. The amount of fees to be collected should be based on the levels of difficulty in managing each product.
- Tax measures should be utilized to support the procurement of recycling equipment by both the government and private sector. Measures such as tax exemption and tax credit for investment can be used.
- Emphasize should be placed on solving the problems related to waste management by adopting the Extended Producer Responsibility concept.

- Take-Back Principle should be adopted to encourage the maximization of resource utilization, recycling, and waste reduction.

#### *3.2.9.5 Civil Society Proposals*

- At the household level – reduction of community waste, waste separation, appropriate disposal of waste, re-utilization of waste, and reduction of trash burning in the community.
- Beyond the household level – involvement with government in policy and decision making, and in monitoring the government’s waste management efforts.

### **3.2.10 Roles of the Civil Society**

#### *3.2.10.1 Conceptual Proposals*

- Citizens’ involvement aligned with the concept of participatory democracy should be encouraged, which will enable the Green Movement to take place among civil society.
- Existing legislations should be amended to enable public participation in public policymaking, and this should be beyond just the provision of information and opinions.
- New legislation should be enacted to enable more public participation and be more effectively enforced.
- Public education should be provided on the health impacts of air pollution. Education begets awareness and understanding, which will drive the people to get involved in the clean air movement.
- Legislations and regulations should be designed to enable people to work together in calling for the protection of their human rights without being inhibited by high and undue transaction costs.
- Burden of proof of the damages caused by air pollution should be on the responsibility of the polluter.

#### *3.2.10.2 Policy, Legislation, and Enforcement Proposals*

- Channels for civil society to access information on air pollution sources, health impacts, and pollution management should all be developed to enable public participation in the monitoring of clean air management.
- Awareness should be raised among civil society on the benefits of improving air quality.

- Organization or authority should be established that is responsible for educating the public strategically and continuously.
- A Citizen Watchdog system should be encouraged that would enable citizens to be involved in monitoring the government's law enforcement and the implementation of policies and measures.
- *Opinion-level Public Participation:* Legislations should be amended to enable the public to truly share their opinions on policies and measures.
- *Consultancy-level Public Participation:* Legislations should be amended to enable the public to provide consultancy to policymakers through inclusion of public representatives in various committees.
- *Management-level Public Participation:* Legislations should be amended to enable the public to co-manage with the government that is devoid of undue sanction or influence.
- *Legislation-level Public Participation:* Legislations should be amended to enable the public to propose citizen-driven legislations and not be subject to prohibitively costly transaction costs, such as simplifying the procedure for signatory collection and limiting the definition of "financial legislations" which is currently being used as a tool to limit citizens' right to propose new laws to be deliberated by parliament.
- *Monitoring-level Public Participation:* (1) Procedures in environmental case litigation should be amended to concretely ensure environmental justice for the people. (2) Measures and infrastructure should be established that support the public to report on, to sue, and to pressure polluters and government agencies responsible for environmental protection to be held to account. (3) Citizens should be aware of their duties to monitor the government's efforts and drive the political will to resolve these issues concretely. (4) Civil society should be enabled to create environmental movements effectively through initiatives such as Citizen Science and to establish a Green Party.
- Civil society should be made aware of the health impact of air pollution on vulnerable groups.
- Economic measures and incentives should be utilized to protect vulnerable groups from air pollution.
- Legislations should be enacted to encourage enhanced civil society involvement in environmental protection and especially in the area of clean air management.

### **3.2.11 Roles of the Private and Financial Sectors**

#### ***3.2.11.1 Policy Proposals***

- All financial institutions should officially acknowledge the principles outlined in the UN Guiding Principles on Business and Human Rights (UNGPR). This will open up the venue for people affected by PM2.5 to notify relevant authorities and for the clients of these financial institutions' clients responsible for generating the pollution to manage the damages.
- Green Credit policy requiring financial sectors to move credits and loans away from pollution-induced industries to environmentally friendly, clean, and energy-efficient industries should be supported.
- Policy should be defined that requires financial institutions to screen polluting and PM2.5-inducing businesses more carefully, and PM2.5 should be categorized as a material ESG issue.
- Measures to prevent the emission of hazardous levels of PM2.5 should be clearly stipulated as conditions in credit agreements and agreements on other financial services with polluting business and enterprises. Such conditions should also be clearly defined in the financial institutions' policy.

#### ***3.2.11.2 Legislative Proposals***

- The Environmental, Social, and Governance (ESG) framework should be utilized in the legislations rather than remain only at the policy-level.
- Short-Term: Environmental accounting and environmental risk assessment standards should be established, with appropriate auditing protocol included as part of business loan arrangement.
- Short-Term: Commercial banks should provide financial credits for businesses and enterprises to perform environmental risk assessment and environmental accounting.
- Long-Term: Articles 30/1 should be included in Section 3 of the Financial Institution Act B.E. 2551 to bring sustainable business development and ESG framework into the Act.
- The Securities and Exchange Act B.E. 2535 should be amended to include guidelines on the disclosure of enterprises' information, especially environment-related information.

- Legislations and regulations linking financial institutions with environmental damages should be enacted.
- Voluntary measures should be upgraded to enforcement-based measures to require businesses to consider social and environmental costs in their operations rather than a sole focus on profit maximization.

#### *3.2.11.3 Environmental Economic Proposals*

- Environment impact assessments should be encouraged, evaluating the impacts from the operations of financial institutions and private businesses.
- Tax measures and incentives should be amended and/or designed to be able to trigger behavior changes among businesses to support air pollution resolution.

#### *3.2.11.4 Civil Society Proposals*

- Civil society should access and monitor information related to the operations of businesses and financial institutions to ascertain whether those organizations support environmental protection.
- Civil society should clearly demonstrate their stance to only support businesses and investments that support/enable clean air and to not support polluting businesses.
- Financial literacy should be provided to civil society members to enable them to make informed financial and investment decisions.
- Civil society should play a role in monitoring business' social and environmental impacts. The concept of Social License to Operate should be adopted.

#### *3.2.11.5 Other Proposals*

- Continuous research to evaluate main sources and impacts of air pollution, including PM2.5, should be supported.

### **3.2.12 Roles of the Government**

#### *3.2.12.1 The Government's Roles in Establishing Legal Right to Breathe Clean Air*

- A paradigm linking human rights with clean air.
- The substantive right to breathe clean air as a basic human right.
- The procedural right to access clean air to ensure protection of the substantive right to breathe clean air.

### *3.2.12.2 The Government's Role to Respect, Protect and Fulfill Citizens' Right to Breathe Clean Air*

- The government, as a UN Member, has an obligation to ensure the attainment of the Sustainable Development Goals. In this respect, the government should support the public's Green Movements, enable greater public participation, enhance decentralization, and open a new dimension in co-management. The government also has an obligation to implement legislations that align health and environmental issues in accordance with the WHO international obligations.
- The government has a duty to reform the public infrastructure to enable integrated management among various agencies, co-management with the civil sector, regulation of relevant agencies to perform their duties under the laws, alignment between environmental protection and public health, protection of citizens' rights in relation to air pollution, and sufficient allocation of budget. These government duties are there to assure the protection of every citizen's right to breathe clean air.
- The government is responsible to elevate the right to breathe clean air as a basic human right, and as such, is obligated to respect, protect, and fulfil such right.
- In accordance with the UN recommendation, the government is responsible for (1) air quality and health impact monitoring, (2) determination of air pollution sources, (3) reporting of air quality information to the public, (4) establishing strict legislations and standards on air quality, (5) developing national air quality action plan, (6) enforcing air quality related legislations, and (7) evaluating all the efforts to improve air quality.
- The government is responsible for ensuring awareness among its citizens on air quality and the resultant impacts from deteriorating air quality. Specifically, the government should (1) monitor and report air quality index and air quality health index daily, (2) provide timely information on the sources of air pollution, (3) collect, assess, and analyze relevant information to enable timely public alert on air pollution conditions, and (4) establish effective process to evaluate health impacts of various activities and initiatives.
- The government is responsible for defining the process for citizens to participate in policymaking, legislation development, and regulation of the management of clean air for health.
- The government is responsible for ensuring that citizens have access to environmental justice by (1) receiving and processing complaints from the people affected by air pollution, and (2) providing support and recommendations to people wanting to bring environmental lawsuits on matters related to air pollution.

### *3.2.12.3 The Government's Roles in Encouraging Behavior Changes among Private Businesses*

- The government should increase the adoption of economic tools in conjunction with enforcement-based measures systematically, based on the Polluter Pays Principle (PPP) and with the aim of reflecting environmental costs in the prices of products.
- The government should define criminal and civil liability to be imposed on the owner of the sources of transboundary haze.
- The government should utilize key economic measures, including (1) the Clean Air for Health Fund, (2) clean air for health taxation mechanism, (3) air pollution management fees, (4) deposit-refund system, (5) pollution release and transfer registers, (6) ecosystem damage risk insurance, and (7) measures to support enterprises and activities promoting clean air.

### **3.2.13 Summary of Recommendations from the Draft Clean Air Act**

#### *3.2.13.1 Considerations in the Systematic Management of Thailand's Environmental Legislations: From Air Pollution to Clean Air*

1. Legislations are not silver bullets that will solve all issues. In developing legislation, it is important to also establish an ecosystem that enables the transition towards sustainable development. A single piece of legislation cannot manage all aspects of the problem, especially one that is so complex and multifaceted as air pollution and clean air management.
2. Legislations need to be improved and amended regularly as legislative innovations, novel concepts, and new frameworks are constantly being researched and developed. This is particularly the case with environmental legislations, which is a relatively new field of law where ongoing advancements are being developed continuously. Not utilizing up-to-date concepts, paradigms, and framework in the enactment or amendments of environmental legislations is dangerous and the government will have to bear the full burden of the consequential impact of inaction.
3. The popular beliefs are that existing legislations are adequate or that enacting too many will not achieve any positive result to the public should be seriously reevaluated. It is important to reconsider if the existing legal framework and infrastructure truly suffice in resolving the complex issues being faced in the country. Along this vein, it should be reassessed if new legislations being propose are aimed at addressing the shortfalls in existing legislations. Therefore, rather than blindly following the crowd, it would be more appropriate to reconsider these outdated beliefs based on the research and evidence-based facts from subject matter experts.



4. From the points discussed in (2) and (3), proposing a new or an amendment to a single legislation is not the solution. Rather, a full and systematic review of the existing legal structure and structural problems are required. A prime example is the lack of integration among the various legislations and the lack of coordination among government agencies under the purview of different ministries which have prevented legal enforcement to be truly effective in resolving the air pollution problem.
5. The lack of paradigm clarity, the inability to amend existing paradigms, and the absence of cohesive direction of existing paradigms have led to the enactment of many existing legislations which conflict with their initial objectives, and where the emphasis has been on form over substance. This has led to questions over the legitimacy of existing legislation and consequently caused problems with legal enforcement as these laws have deviated substantially from their original objectives.
6. Conflict in legislative direction as outlined in (5) beget the limitations in legislations, which should have supported greater equity and social justice, and, above all else, brought about environmental justice to the country. Environmental justice is a core tenet of environmental legislation and an important cornerstone to achieve bona fide sustainable development.
7. Consideration in (5) points to the imminent need to have to integrate and align strategic direction between the underlying mental paradigm, policy, law, and law enforcement aspects during the drafting of various legislations.
8. There are three options in enacting or amending environmental legislations:
  - Enact a single comprehensive legislation to solve all environmental issues, which will require such legislation to reform the authoritative arrangement in the management of natural resources and environment to be aligned with the sustainable development concept.
  - Enact legislations specific to the various specific environmental issues, such as the water resource management legislation.
  - Amend existing environmental legislations which are dispersed and unintegrated one-by-one, e.g., amending the mining legislation, national park legislation, community forest legislation, and national reserved forest legislation.
9. From the options outlined in (8), the Thailand Clean Air Network (Thailand CAN) chose the second option, i.e., enacting a specific clean air legislation to manage air pollution problems which are highly complex by nature and therefore require specialized management to adequately address them.

10. Thailand CAN's choice to propose the draft Clean Air Act through a citizen-driven process, that involves collecting a minimum of 10,000 citizen signatories to support the proposed draft legislation to parliament, demonstrates public participation at the legislation-making level. The evaluation of this citizen-driven draft Act should therefore be based not only on the merits from the draft content itself, but also on the important role to drive a social movement to catapult dialogue and learning among civil society members.

#### *3.2.13.2 Summary of Key Concepts from the Draft Act on Regulating the Integrated Management of Clean Air for Health*

- The Draft establishes the “right to breathe clean air,” stipulating that the government is obligated to ensure access by the people. Specifically, people have rights to live in a clean air environment and not be subjected to premature deaths. These rights are associated with the right to health and the right to life, both part of the basic human rights that must be protected.
- The Draft integrates health and environmental aspects, ensuring that air pollution management should be looked upon not only as an environmental issue but also as a public health issue. This is particularly critical for people in the vulnerable groups, e.g., children, pregnant women, elderly, cardiovascular patients, and outdoor workers/labor forces. These people are most susceptible to air pollution and should be especially protected.
- The Draft establishes an infrastructure to regulate the management of clean air, ensuring that relevant legislations and regulations are effectively enforced. The proposed infrastructure comprises a Joint Committee on Clean Air for Health Policies at the highest policy level, followed by a Regulatory Committee on Clean Air for Health Management at the regulatory level and a Clean Air for Health Organization at the operational level. Such infrastructure also ensures appropriate coordination and alignment between the central government, provincial administration, and specific local areas.
- The Draft utilizes incentives in parallel with enforcement measures, establishing legislative clauses on economic tools to encourage and/or discourage behavior changes among individuals and enterprises to move toward more sustainable practices. Examples of these economic tools include the Deposit-Refund System and the Pollution Release and Transfer Registers.
- The Draft focuses on “co-management”, linking government management systems with local/community management systems resulting in a community-based management paradigm, whereby communities play a primary role in clean air management in their areas with support from the government.

- The Draft enables the utilization of tools and measures specific to local contexts rather than a one-size-fits-all approach. This is important because haze and air pollution issues differ from one area to the next, each with different sources and therefore solutions.
- The Draft focuses on systemic integration, rather than disparate and disjointed actions by agencies and organizations under different ministries and agencies. This is important because air pollution problem is highly complex involving many stakeholders, and its resolution will require more than a single organization or a single solution.
- The Draft establishes regulations on transboundary haze, enacting measures to prevent and manage the problem while also defining liabilities for owners and/or operators of the source of transboundary haze that may have originated elsewhere but causes health impact to the people in Thailand.

## 4 Epilogue

As mentioned at the beginning of the document, this Public Guide to the Clean Air Green Paper has been developed to summarize key messages from the I Clean Air Green Paper: Interdisciplinary Policy Solutions for Clean Air. The full Green Paper can be found at [https://thailandcan.s3.ap-southeast-1.amazonaws.com/pdf/ebooks/Clean\\_Air\\_Green\\_Paper\\_TH.pdf](https://thailandcan.s3.ap-southeast-1.amazonaws.com/pdf/ebooks/Clean_Air_Green_Paper_TH.pdf)

In addition to the Green Paper, the Clean Air Blue Paper had also been published to delve deep into the impacts of PM2.5 air pollution on various aspects of life in Thailand based on in-depth research, interviews, surveys, and stakeholder meeting throughout the country. The Clean Air Blue Paper can be found at [https://thailandcan.s3.ap-southeast-1.amazonaws.com/pdf/ebooks/Clean\\_Air\\_Blue\\_Paper\\_EN.pdf](https://thailandcan.s3.ap-southeast-1.amazonaws.com/pdf/ebooks/Clean_Air_Blue_Paper_EN.pdf)

Prior to the publication of the Blue Paper, the Clean Air White Paper had also been published to introduce 9 “basic facts” to help understand PM2.5 problems in Thailand. The Clean Air White Paper can be found at [https://thailandcan.s3.ap-southeast-1.amazonaws.com/pdf/ebooks/Clean\\_Air\\_White\\_Pape\\_EN.pdf](https://thailandcan.s3.ap-southeast-1.amazonaws.com/pdf/ebooks/Clean_Air_White_Pape_EN.pdf)

Thailand Clean Air Network (Thailand CAN) hopes that the knowledge contained in these publications will prove useful to develop strategies to manage the air pollution problem that would sustainably bring about clean air in Thailand.

# **Strategic Partners of the Thailand Clean Air Network**

World Resources Institute

Stockholm Environment Institute

Centre for Research on Energy and Clean Air

Circular Design Lab

Network of People Affected by Air Pollution

Network of Parents Against Air Pollution

Sueb Nakhasathien Foundation

BIGTrees Foundation

Thai Environment Institute

Thailand Consumer Council

State Enterprises Workers' relations Confederation (SERC)

EnLaw Thai Foundation

CivicNet Foundation

Thai Health Promotion Foundation

Infinite Vision Co., Ltd.

BioThai Foundation

SOS Earth Co., Ltd.

Tuen Channel

Palo IT (Thailand) Ltd.

Common Ground (Thailand) Co., Ltd.

Adapt Brand Consultants

WHY NOT Social Enterprise Co., Ltd.

IQAir

AirGradient

Thai Prompt Co., Ltd.

Smart Air Thailand

Wedo Air Thailand

Bangkok Art & Cultural Center

Artist: Taweesak Molsawat

Artist: Supmanee Chaisansuk

Artist: Thanawat Maneenawa (TAM:DA Brand)

Artist: Danaiphat Lertphutthitrakarn (MueBon)

The Modern Melody Studio Co., Ltd.

KX Knowledge Xchange

Refill Station Co., Ltd.

Clazycrew Co., Ltd.

Artberry Co., Ltd.

KCA AgriVenture Co., Ltd.

Ratchathewei Engineering Co., Ltd.

Satun Runrueng Partnership Ltd.,

Café Velodome

Mute Mute Café

Thunder Bird Hostel, Chiang Mai

Puffy Café & Roasters, Chiang Mai

Chan Ruam Store, Lampang

Eight Café, Ratchaburi

From some of roll.lab, Chiang Mai

Tai Toon Coffee Bar, Udon Thani

Normal Shop: Zero Waste Community

Advisor: Assist. Prof. Dr. Danny Marks, Environmental Politics & Policy, School of Law & Government, Dublin City University

Advisor: Peter Smith, Independent Sector Policy Specialist

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