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Clean Air for Smaller Cities in the ASEAN Region

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Why focus on clean air?

In many cities across Asia, millions of people are exposed to dangerous levels of air pollution, severely affecting their wellbeing and ultimately the economies they are part of. Exposure to indoor and outdoor air pollution increases the risk that people will develop cardiovascular diseases and some forms of cancer.

The numbers are telling. In 2012 alone, the World Health Organization (WHO) estimates that 3.3 million deaths were linked to indoor air pollution and that 2.6 million deaths were related to outdoor air pollution in low- and middle-income countries in South-East Asia and Western Pacific regions.

The source of all this damage is harmful gases and small particulates which can enter deep into our lungs. These pollutants can be traced to vehicles, industries, along with heating, cooking and construction activities. One type of pollutant, black carbon, absorbs sunlight and warms our atmosphere, contributing to climate change. What this means is that the pollution created at the local level—a city for example—contributes to global warming.

Air pollution is a symptom of expanding cities and growing vehicle ownership. The lack of safe, comfortable, and affordable public transport options, along with poor enforcement of emissions standards, makes the situation even worse. If air pollution is not addressed, this problem will continue to inflict more damage—to us and to the planet.

More than ever, this needs to change.



7 out of 10 cities

in developing Asian countries have air that is dangerous to breathe



7 million premature deaths
(or one in eight of total global deaths)
annually are linked to air pollution

(source: WHO)

The Clean Air for Smaller Cities Project: Improving Air Quality While Addressing Climate Change



“Municipal governments should put the reduction of local pollutants and greenhouse gases from the transportation sector high on their agenda. This is why Emission Inventories are crucial to establish a basis for policy making and strategic planning in air quality management in rapidly urbanizing cities. These inventories should be complemented by the formulation of Clean Air Plans for each city.”

Mr. Karlansyah,
Deputy Minister for Environmental
Pollution Control, Ministry of the
Environment of Indonesia

THREE REASONS WHY LOCAL GOVERNMENT LEADERS SHOULD CONSIDER CLEAN AIR PLANS

- 1 A cost effective way to address climate change (local action with a global impact)
- 2 Clean Air Plans support local governments in taking strategic decisions to reduce air pollution
- 3 Benefit from technical assistance available from the Ministry of Environment to implement emission inventories

Most efforts to improve air quality in Asia have focused on large cities. However, many smaller cities in the region also suffer from high levels of air pollution, and they are growing at such a rate that this problem is only likely to worsen. Moreover, smaller cities often face financial and technical challenges to gather scientific data on air quality and to formulate measures that reduce air pollution.

This is where the project Clean Air for Smaller Cities comes in. The project empowers stakeholders to develop and implement Clean Air Plans, a strategic approach to reduce air pollution in cities based on scientific emission inventories. Clean Air Plans help to systematically improve air quality and contribute to deliver important co-benefits such as climate change mitigation, better health for local citizens, more tourism and increased overall quality of life.

4 STEPS IN CAP DEVELOPMENT AND IMPLEMENTATION



Scaling up of the project in indonesia

The project's success in Indonesia owes mostly to the active participation of local stakeholders, especially the Ministry of Environment, but also to the private and public sector, civil society and local universities. As of 2014, the project has marked several milestones:

- Air quality monitoring strategies for two Indonesian cities
- Emission inventories for two Indonesian cities (mostly financed by the project)
- Replication of emission inventories in thirteen Indonesian cities (mostly financed by the cities)
- Budget secured for Air Quality Management teams (AQMt) and institutional development at the local level (Palembang, among other cities in Southeast Asia)
- Clean Air Plans for two Indonesian cities
- 'Vision and Goal' and 'Focal Discussions' to enhance public participation in six Indonesian cities (two of which were financed by the project).

The Clean Air Plans developed by Indonesian counterparts through the project are one step ahead of "traditional" anti-pollution strategies because they are based on the findings of scientific emission inventories. This allows for a quantification of air pollution reduction.

WHAT IS AN EMISSION INVENTORY?

Not all sources of dirty air contribute the same type and amount of air pollution. This is why we need emission inventories—a cost-effective, comprehensive approach to identify all sources of air pollutants during a specific period of time, and in a particular area. Not only are these inventories a solid scientific foundation to create strategies to reduce air pollution, such as Clean Air Plans, they are also a mandatory requirement for Indonesian cities (Government Regulation No. 41/ 1999 on Air Pollution Control). The added benefit of emission inventories is that they can also be used to calculate greenhouse gas emissions, as part of the national framework for collecting data on climate change.

The achievement of the project Clean Air for Smaller Cities owes just as much to the project personnel as to the enthusiasm and commitment of the Ministry of the Environment, academia, and local and central government staff who were involved at various stages of the development of the Clean Air Plans.

Creating these plans is not just a matter of ticking off a checklist—it requires long term perseverance and vision, as demonstrated by Palembang and Solo.

WHAT HAS MADE THE CLEAN AIR FOR SMALLER CITIES PROJECT A SUCCESS?

SECURING LONG-TERM FUNDING COMMITMENTS

Funding from the Central State Budget made it possible to replicate emission inventories in several cities, and also to elaborate a guideline for emission inventories based on the experience from Solo and Palembang.

CARRYING OUT SCIENTIFIC EMISSION INVENTORIES

The emission inventories that were carried out as a basis for the Clean Air Plans led to measures that were integrated into city-level strategic plans. This illustrates how emission inventories allow for targeted pollution reduction measures.

LINKING LOCAL POLLUTION TO CLIMATE CHANGE

The project demonstrated to government stakeholders at the city level how emission inventories are a core component for tackling climate change at the local level, while contributing to reach national targets to reduce carbon dioxide emissions.

ENSURING THE SUSTAINABILITY OF THE PROJECT

The project has created a solid network of partnerships with the Ministry of Environment, local universities and municipalities. Individuals trained through the project continue to share their skills through ongoing emission inventory development training managed by the Ministry of Environment's National Training Centre.

COLLECTING INPUT FROM A WIDE SPECTRUM OF STAKEHOLDERS

All emission inventories and Clean Air Plans were a blend of bottom-up and top-down approaches, merging international practice with local resources and capacity. This has made it possible to build local ownership of the plans while developing local skills.

INSTITUTIONALIZATION OF TRAIN FOR CLEAN AIR (T4CA)

The project Clean Air for Smaller Cities has developed training materials on various topics on Air Quality Management, which are provided to institutions that will sustain the training in the future.

The main host institution is the Ministry of Environment, which aims to train some 500 cities through its National Training Centre. Other potential hosts are the Association of Indonesian Municipalities (Apeksi) and the Indonesian Society of Sanitary & Environmental Engineers (IATPI).

CASE STUDIES - PALEMBANG



POPULATION	PRIVATE VEHICLE OWNERSHIP (CARS)	PRIVATE VEHICLE OWNERSHIP (MOTORBIKES)
1.5 million	109,181	544,321

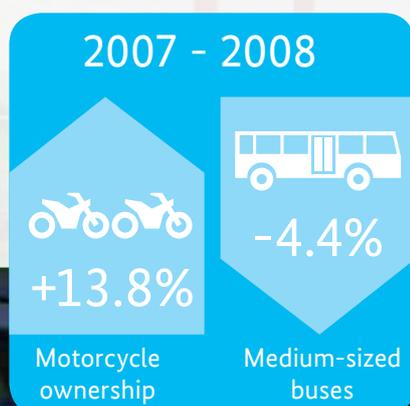
With a rising population and increasing private vehicle use, Palembang—the capital of South Sumatra province and the island’s second largest city—is being challenged to accommodate economic growth while improving its residents’ quality of life. If current trends continue, by 2030 the number of private vehicles is likely to double in parallel with a decline in public transport. Trying to solve the problem with more roads to accommodate the expected increase in traffic would be unaffordable and, in the long run, unsustainable, as new roads tend to relieve traffic congestion only for a short period of time. This is why a more comprehensive strategy is required to reduce the need for private vehicles.

Palembang has already made major efforts in this direction, including initiating a Bus Rapid Transit system called Trans Musi to decrease public reliance on private vehicles. However, these efforts must be integrated into a long-term plan that addresses all sources of air pollution in a systematic way.

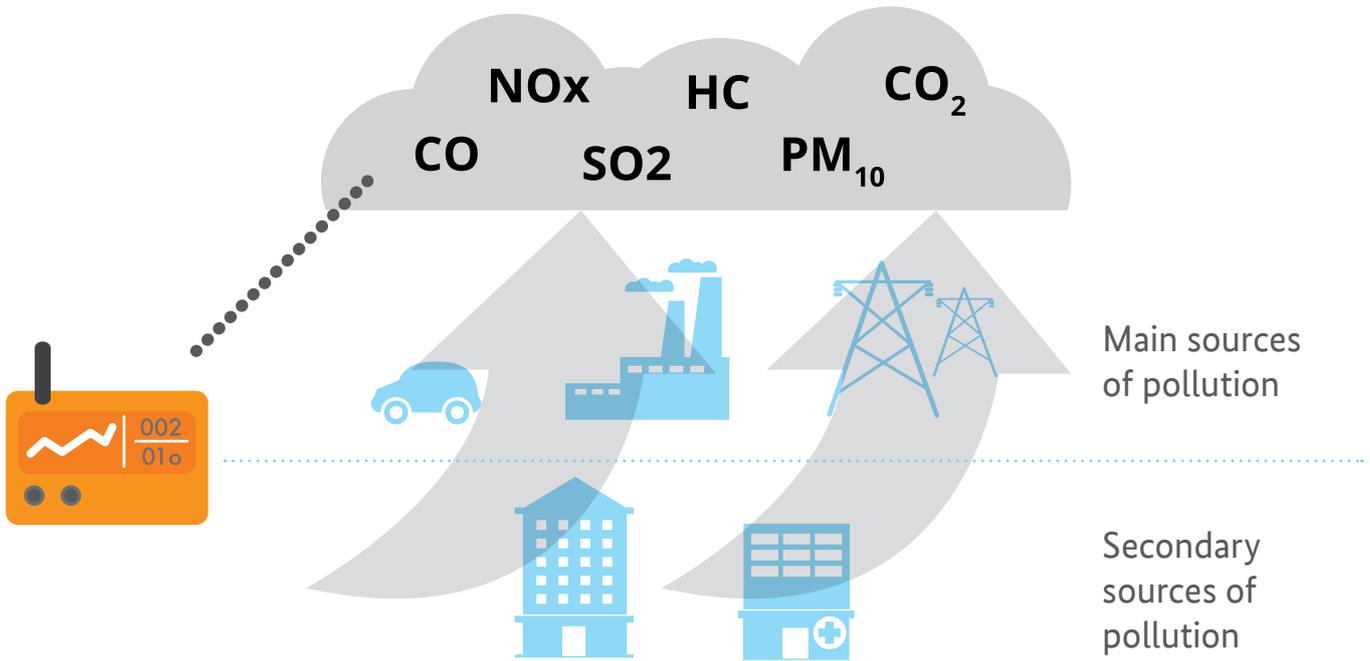
Going forward with the Clean Air Plan

The project Clean Air for Smaller Cities is not the first effort to improve Palembang’s air quality. At the city level, a bylaw on air quality provides a basis for the development of a Clean Air Plan, and in fact there has been a previous attempt to develop such a strategy. However this failed to attract public support.

Kicking off the process toward a comprehensive Clean Air Plan, the project Clean Air for Smaller Cities started with an emission inventory in Palembang in 2011. The emission inventory was elaborated by Sriwijaya University’s Centre for Environmental Research in close coordination with the Environmental Protection Agency of Palembang.



SNAPSHOT OF EMISSION INVENTORY IN PALEMBANG



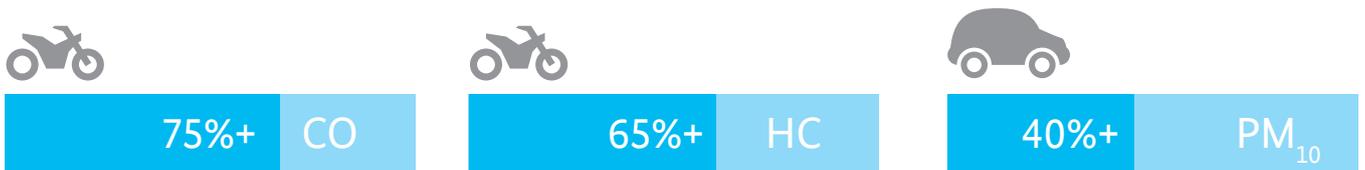
Scope: identification of all potential sources and estimation of annual emission amount of each pollutant.

Air pollutants and greenhouse gases: carbon monoxide (CO), nitrogen oxide (NOx), sulphur dioxide (SO₂), hydrocarbon (HC), particulate matter up to 10 micrometer (PM₁₀) as well as carbon dioxide (CO₂).

Source categories: stationary sources such as industry and hospitals, area sources with many small emitting points such as residential areas, and mobile sources such as cars, motorcycles and trucks.

The results of Palembang’s emission inventory offered deep insights in terms of where air pollution is coming from. The data revealed that vehicles, along with large industries (fertilizer, oil refinery, electricity generation, and crumb rubber), produce significant amounts of all measured pollutants. Other important sources of pollution include hotels, hospitals, crematoriums, and smaller enterprises (food and beverage, and cement batching among others).

PRIVATE VEHICLES PRODUCE THE MAJORITY OF CO, HC AND PM₁₀ IN PALEMBANG

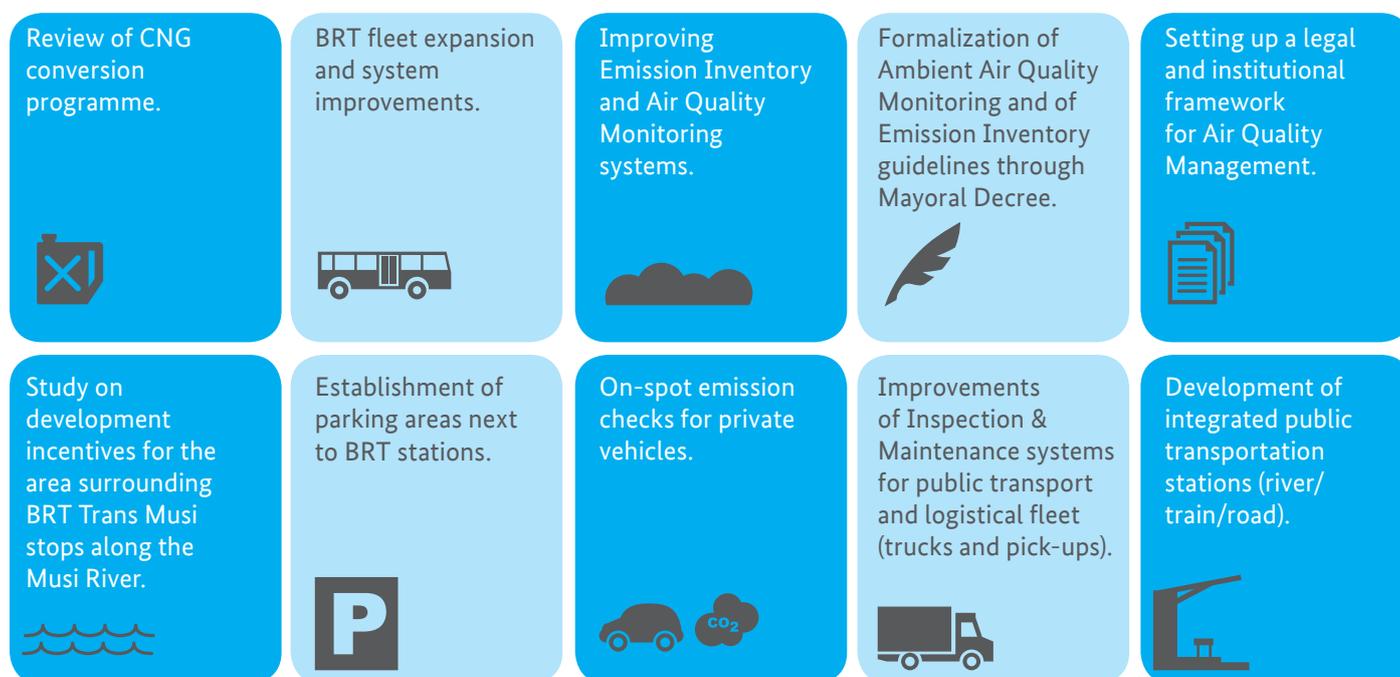


The results of the emission inventory provided the foundation for a preliminary Clean Air Plan, which was developed in 2013 through a consultative process—a key feature of the GIZ approach. The consultation gathered input from many stakeholders, assessed existing measures to improve air quality in the city, and lead to increased local ownership of the Clean Air Plan. Finally, the project helped to establish an administrative structure at the city level with the responsibility to implement the Clean Air Plan.

After several elements of the Clean Air Plan were integrated into the city's Medium Term Development Plan, GIZ and ASEAN were also mentioned in Palembang's By-Law number 2/2013 on Sustainable Development. Several provisions in this By-Law are supportive of the Clean Air Plan measures for Palembang. This is another very positive development that shows the political commitment for air quality by the Government of Indonesia.

The clean air plan for Palembang seeks to partly integrate both local air quality management and climate change mitigation strategies, contributing to Indonesia's national framework for mitigating greenhouse gases.

WHAT MEASURES DOES THE CLEAN AIR PLAN FOR PALEMBANG PROPOSE?



STEPS TAKEN IN PALEMBANG TOWARDS A CLEAN AIR PLAN

- Road Map elaboration
- Vision and goal workshops as well as Focal Discussion Groups conducted
- Setting up of a Clean Air Board
- Elaboration of an air quality monitoring strategy, support in its implementation and donation of air quality monitoring equipment
- Emission Inventory completed for baseline year 2010

CASE STUDIES - SOLO



POPULATION	PRIVATE VEHICLE OWNERSHIP (CARS)	PRIVATE VEHICLE OWNERSHIP (MOTORBIKES)
522,935	32,534	218,776

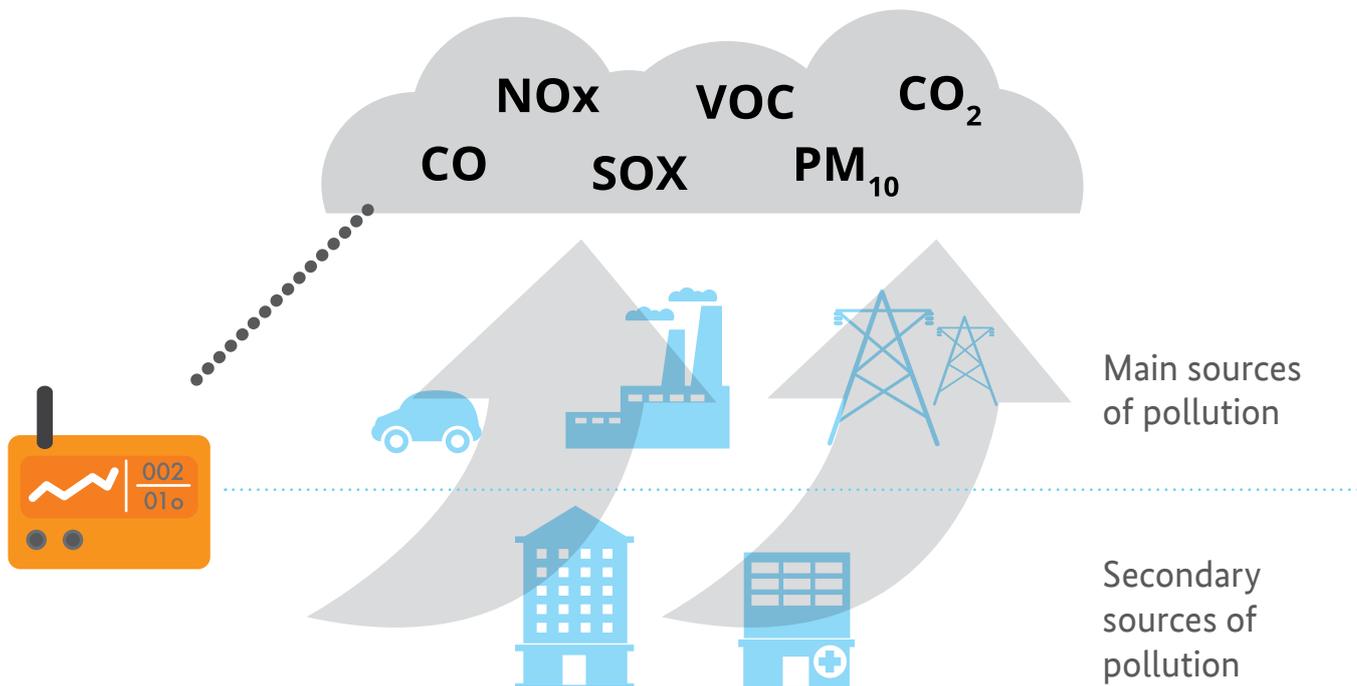
Solo, located in the centre of Java, is a city whose rich history and culture continue to draw thousands of visitors every year. The city has experienced fast-paced development since the economic crisis of 2008, which the municipality is trying to manage without losing its traditional roots. Compared to Palembang (see previous case study), Solo has fewer residents and a relatively slower growth rate. Nevertheless, the city has to cope with issues that are common to fast expanding cities: poor spatial planning, inadequate transportation planning and management, and lack of air quality management. As in Palembang, the use of private vehicles has spiked while the use of public transportation has declined, a vicious circle which threatens to further congest the city's roads unless the problem is addressed.

Solo has pushed through several actions to cut down on air pollution, for example a Bus Rapid Transit system, pedestrian-only areas, and introducing a regular, mostly educational event called Car Free Day. Despite these measures, air pollution continues to be a growing problem. This was confirmed in 2009 by the fact that upper respiratory infections were the most common ailment found in patients in Solo.

Going forward with the Clean Air Plan

The emission inventory in Solo, the first of its kind ever implemented in the city, was carried out in 2013 by the 11 March University of Solo with the support of the project Clean Air for Smaller Cities. This undertaking is a major improvement over a 2011 appraisal of ambient air quality that was implemented by the municipality at several locations in the city, but which only revealed an incomplete picture of air pollution. The 2013 emission inventory was a critical starting point to determine in a much more comprehensive way Solo's main sources of air pollution, and where they are located.

SNAPSHOT OF EMISSION INVENTORY IN SOLO



Scope: identification of all potential sources and estimation of annual emission amount of each pollutant.

Air pollutants and greenhouse gases: carbon monoxide (CO), nitrogen oxide (NOx), sulphur oxide (SOX), volatile organic compound (VOC), particulate matter up to 10 micrometer (PM₁₀), as well as carbon dioxide (CO₂).

Source categories: stationary sources such as industry and hospitals, area sources with many small emitting points such as residential areas, and mobile sources such as cars, motorcycles and trucks.

The emission inventory revealed that by a substantial margin, vehicles were the main source of pollution for all types of air pollutants and carbon dioxide.

Once the emission inventory was completed, the project organized a stakeholder meeting to communicate its results to the public and also shared the results with local media. The socialization was immediately followed by the kick-off of the Clean Air Plan development process, with the support of the Clean Air for Smaller Cities personnel, staff from 11 March University and senior decision-makers from Solo municipality. From the results of the emission inventory and early findings, it was decided that the Clean Air Plan would focus on industrial and transport sectors.

WHAT MEASURES DOES THE CLEAN AIR PLAN FOR SOLO PROPOSE ?

<p>Development of integrated public transportation stations (river/train/road).</p> 	<p>Further development of Batik Trans fleet (BRT system).</p> 	<p>Establishment of Car Free Zones.</p> 	<p>Inspection and Maintenance system improvements for public transport and logistical fleet.</p> 	<p>Increased frequency of inspection and maintenance checks for private vehicles.</p> 
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**Clean Air for Smaller Cities
in the ASEAN Region**

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