

Clean Air Network

**CAN**

健康空氣行動

CLEAN AIR NETWORK

# ANNUAL REPORT

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# OUR VISION

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**We envision Hong Kong to become a world-leading clean air city meeting WHO air quality standards.**

Since 2009, Clean Air Network (CAN) is a non-profit organisation with charitable status, exclusively dedicated to improving Hong Kong's air quality. Led by our three key pillars of work, Advocacy, Empowerment and Knowledge, CAN's mission is to tackle air pollution for the dual goals of improving public health and combating the climate crisis.

CAN's vision is to drive positive progress in bringing Hong Kong's air quality in line with the World Health Organisation's (WHO) recommended safety levels in order to benefit public health and mitigate climate change. To achieve our mission, CAN focuses on building knowledge, forging strategic collaborations and advocating for solutions across multiple sections of society in Hong Kong. Without losing sight on the issue of air pollution from regional activities, marine vessels and power plants, our current primary focus is on roadside pollution and indoor air impact.

ABOUT US

## OUR STORY

Since 2019, Clean Air Network has been relentlessly leading the air quality movement in Hong Kong.

Over the past 14 years, the organisation has weaved together different sections in society, from professionals to academia, policymakers and the community. This has led to the building of a collaborative, cross-disciplinary and intergenerational network held together by the goal of making clean air a reality in Hong Kong.

In recent years, CAN is proud to have paved the way for landmark policy changes to take place in Hong Kong since 2014, which has reduced the concentration of the major air pollutants at ambient and roadside levels. In 2017, the first-ever government-led walkability study was conducted in the city, after our ongoing campaigning efforts. Since then, our work has focused on raising

awareness about the need to review and tighten Hong Kong's regulatory framework to limit air pollution, such as the Air Quality Objectives.

In the post-pandemic era, our work has become increasingly important and awareness of the importance of air quality to human health is at the forefront of public conversation. On the back of this momentum for change, CAN continues its commitment to foster greater cross-sector collaboration, education and action on what we believe is a right:

— Clean Air for All.





## BOARD MEMBERS

### BOARD CHAIR

Samantha Hon (Appointment from March 2024)

Tong Zhao (Appointment until March 2024)

### BOARD OF DIRECTORS

Stephen Howard

Christopher Roberge

Richard Williamson

Sally Wright (Appointment until March 2024)

Yan Yan Yip

Tong Zhao (Appointment from March 2024)

### BOARD ADVISORS

Mau Tong Kitty Lin

Dr. Anthony Ng

Dr. Kwok Keung Ng

Joseph Poon

Po Tang

Wen Yee Wendy Yung

## MESSAGE FROM CEO



Dear friends,

We are delighted to be able to share our organisation's past year of achievements. Here at Clean Air Network, we have continued to work tirelessly to bring about positive change for both human health and the environment.

As Hong Kong has resumed post-pandemic normalcy, the need to reprioritise clean air has never been more vital. The shift in awareness about the multitude of threats from climate change and the transmission risks posed by unventilated spaces has underscored the urgency of our mission at CAN.

To pursue our goal to bring Hong Kong's air in line with the World Health Organisation's safety guidelines, CAN has pressed on with our three key pillars: Advocacy, Empowerment and Knowledge.

This year, we are pleased to see new commitments from the Hong Kong Government to tackle air pollution, such as the laying out of a green transformation roadmap for public buses and taxis and plans to bring in green methanol bunkering for local and ocean-going vessels. This came after months of mounting pressure from campaigning efforts launched by CAN, alongside other NGOs and civic society.

We are additionally proud to have organised the city's first-of-its-kind IAQ Forum, which spotlighted the much-overlooked issue of poor indoor air and its impact on our health and living environment. The event brought together experts from a wide range of fields, in order to foster cross-sector collaboration and ignite new discussions on the topic.

Another major milestone was our inaugural Clean Air Day hosted in November, which further underpinned our efforts to empower Hong Kong's grassroots community with the knowledge to take clean air actions.

Besides, we thanked for the effort by Tong Zhao (served as Board Chair during Sep 2020 - Mar 2024) and Sally Wright (served as Board Director during Dec 2021 - Mar 2024), and welcome our new Board Chair Samantha Hon (appointed since Mar 2024)

As we move forward, we remain committed to the pursuit of clean air for all in Hong Kong. I wish to thank you all for your continued support in our mission.

**PATRICK FUNG**  
Chief Executive Officer





# TOWARDS CLEAN AIR IN HONG KONG

At Clean Air Network, our activities continue to be led by our mission to champion clean air in Hong Kong. As the only dedicated air issue-focused non-profit organisation in the city, our work has centred upon cross-sector collaboration, awareness-raising and education to address the dual and interconnected impacts of air pollution on public health and climate change.

Between July 2023 and June 2024, CAN has led numerous projects and activities. The impact of our work over this year can be summarised through three key categories: Advocacy, Research and Education.

Our projects over these three categories have been designed to not only improve the public's understanding of clean air and empower them with environmental knowledge, but to also push forward impactful long-term emission control strategies on a governmental level. We have additionally continued our efforts to maintain a consistent media presence across all our platforms to disseminate clean air actions, tips and the latest happenings at CAN, as part of our comprehensive effort to clean up Hong Kong's air.





# ADVOCACY

## 01 HKSAR Government Policy Address 2023: Key Commitments to Clean Air

The 2023 Policy Address delivered by the Hong Kong Government's Chief Executive in October 2023 furthered the city's commitments to tackling the dual issues of air pollution and climate change. It came as a result of CAN's ongoing advocacy efforts to urge for greater action.

## CAN'S ONGOING ADVOCACY EFFORTS TO DRIVE AIR QUALITY POLICY CHANGE

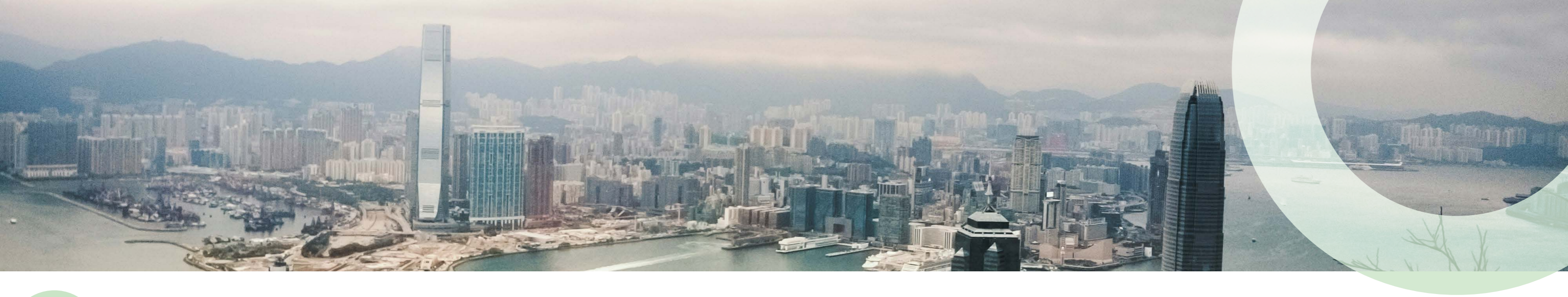
It came as a result of CAN's ongoing advocacy efforts to urge for greater action. In particular, our campaigning efforts honed in on Hong Kong's severe roadside air pollution issue. CAN's Annual Air Quality Review revealed that roadside air quality concentrations in Hong Kong remained 500% above the safety standards laid out by the World Health Organisation (WHO).

CAN also continued placing pressure on the Government by increasing our media coverage of zero-emissions new energy public transport systems, which raised awareness of the promising solutions that green transportation holds to tackle both air quality and the climate crisis at the same time.



“ Roadside air quality concentrations remained **500% above** the safety standards by WHO, according to our Annual Air Quality Review. ”





## KEY POLICY PROPOSAL BY THE GOVERNMENT

### ● *Developing Green Transportation Initiatives*

In the Policy Address, the Government pledged to formulate a green transformation roadmap for public buses and taxis within the first half of 2024, pushing forward the plans that had originally been set for 2025. Although other commercial vehicles, including public light buses and goods vehicles, were not named in the plan, the plan laid out intentions to conduct trials on new energy heavy duty vehicles.

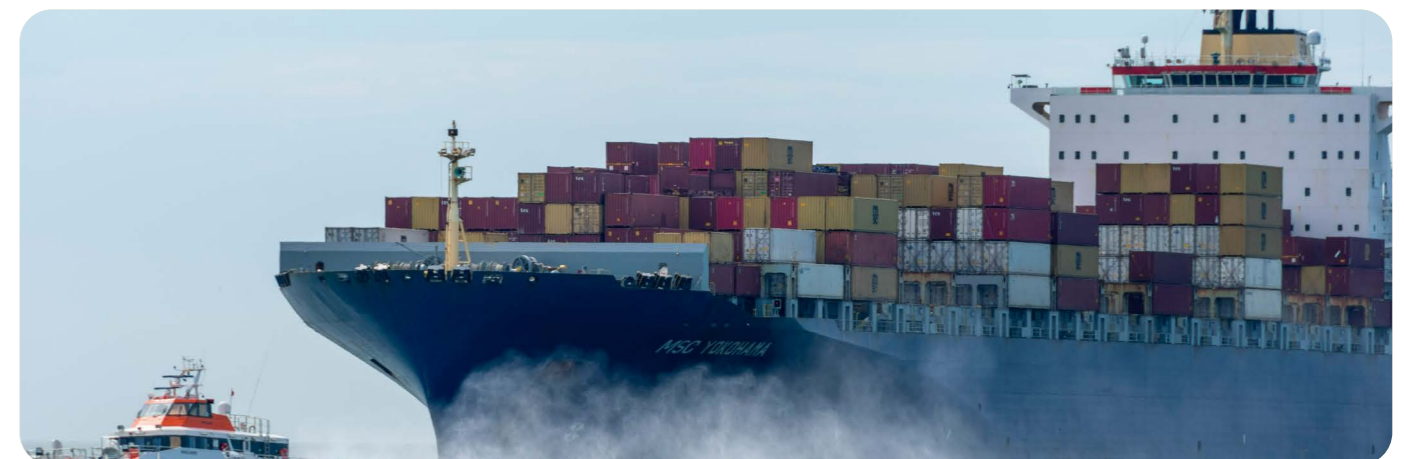


### ● *Embracing Green Maritime Fuels*

CAN was also pleased to see the government take action to introduce a plan for green methanol bunkering for local and ocean-going vessels in 2024. This marks Hong Kong's departure from its sole focus on liquefied natural gas (LNG), bringing it closer in line with the International Maritime Organisation's global goal of reaching net-zero emissions in international shipping by 2050. We believe that the implementation of green methanol bunkering will help Hong Kong maintain its competitiveness with neighbouring ports across Asia, such as Busan and Singapore, which have already introduced greener maritime fuels.

### ● *Formulating Hydrogen Development Strategy*

The 2023 Policy Address additionally saw the formulation of the Strategy of Hydrogen Development in the first half of 2024. This was laid out as part of Hong Kong's wider effort to promote and use and supply of new energy in sea, land and air transport with the goal of bringing down the city's overall carbon emissions.





## OUR RESPONSE & RECOMMENDATION FOR WAY FORWARD

While CAN welcomes these major step changes in the Government’s environmental plan, we believe that far more stringent action is necessary.

### ● *Strengthening the Environmental Plan*

In response to the 2023 Policy Address, roadside air pollution remaining at levels far beyond the WHO’s safety limits, the measures, which includes the need for inclusion of a commercial vehicular fleet more aggressive targets to clamp down on roadside air pollution in Hong Kong. With

### ● *Accelerating the Electrification of Transport*

This roadmap must also be accompanied by stronger targets to raise the number of electric buses and taxis in the city. If we continue on our current pace of introducing 700 electric buses and 3,000 electric taxis by 2027, just 12% and 16% of the respective vehicle fleet will have been electrified—far short of what is needed to bring Hong Kong’s transportation system in line with global carbon neutrality goals. Hong Kong’s electrification efforts would also be aided by a government push for comprehensive fast-charging deployment, which would work to incentivise further uptake.



### ● *Diversifying Green Maritime Fuels*

Other key recommendations set forward by CAN include the need to explore further diversification of green maritime fuel. While the government has listed hydrogen and ammonia as fuels that will be investigated, we believe that there should be a fast-track push for these to be implemented as soon as possible. These advancements present an opportunity for Hong Kong’s shipping industry to become an international leader and role model for other ports.

### ● *Developing a Roadmap for Green Hydrogen*

Finally, CAN has urged the government to double down on its focus on the development of green hydrogen. Without a clear roadmap and timeline set, Hong Kong’s overall target of reaching zero-emissions is hampered.







# KNOWLEDGE

## 02 Clean Air Schools for Hong Kong Project

Clean Air Network's ongoing flagship program, the Clean Air Schools for Hong Kong (CASHK) project, has been core to our organisation's social and environmental impact over the past year. The project, conducted in collaboration with the Hong Kong University of Science and Technology (IENV-HKUST), aimed to help schools to get to know the air quality in their premises, as well as solve the problem at the source.





# CASHK'S ENVIRONMENTAL IMPACT

For over 15 months, researchers working on this project have been collecting and analysing air quality data from 8 schools. These schools were selected based on their location in Tuen Mun and Sham Shui Po, which represent highly densely populated districts with high traffic. The Clean Air Schools program offered monitoring at a 1-hour average time period rather than every 8-hours as per EPD data. This enables greater understanding about the fluctuations and intra-day changes in air quality, and better identification of more specific causes and trends.

With the 15-month air quality monitoring coming to an end in 2024, CAN published its final quarterly report in March. Compared to Q1 (August-October 2022) and Q5 (August-October 2023), improvements were observed in the outdoor air quality.

## IMPACT SUMMARY

- Collected high-resolution air quality data over 15 months from 8 schools
- Discovered indoor sources like disinfectants as major pollution contributors in classrooms
- Tested and promoted mitigation measures like fresh air units that reduced CO<sub>2</sub> and PM levels



Indoor Monitor



Outdoor Monitor

## Concerns over Indoor Air Quality

However, it was noted that IAQ in certain classrooms remained less than ideal, due to the use of air conditioners without adequate ventilation (closed windows and doors). This led to the accumulation of CO<sub>2</sub> within

classrooms, which increases the incidence of adverse outcomes among students, including insufficient concentration, dizziness, and headaches.

## Our Action

In addition to identifying air quality trends within schools, CAN worked with researchers and technological solution providers to test the effectiveness of mitigation measures and used results to promote relevant clean air actions and knowledge to schools. In one of the tests,

we observed improvements in IAQ in classrooms where fresh air units (FAUs) were installed

particularly with regard to lower concentrations of CO<sub>2</sub> and particulate matter (PM) pollutants, by 28% and 18%, respectively.

One of the most interesting research outcomes of the project included the finding

that sources of PM pollution is not limited to outdoor infiltration into the premises. In the age of Covid-19, disinfectants (vaporised chlorine dioxide) were a major source of pollution inside classrooms.

## Fresh Air Units







## CASHK'S SOCIAL IMPACT

Throughout the 15-month program, a number of workshops for both teachers and students served the basis to further solidify knowledge and understanding of air pollution, indoor air environments and key clean air actions or mitigation measures.

The workshop for teachers, for example, provided a solid foundation for educators on the issue of air pollution. Attended by teachers from the 8 participating schools in the project, the first course delivered the basics, from the different types of air pollution to the impacts of indoor air quality. The second workshop was an action-focused course designed in collaboration with the organisation Humans Matter, in order to foster and encourage long-term behavioural changes that would benefit our air. It focused on human factors, such as our emotions, lifestyle habits and provided positive motivational framing to engage educators in the clean air movement.

### IMPACT SUMMARY

- Conducted workshops for teachers on air pollution basics and behavioural changes
- Developed a teaching kit with lesson plans and Clean Air Action Plan framework for schools
- Held review meetings with principals, teachers, and parents to discuss data and future actions
- Provided interactive workshops and air monitoring activities for students
- Launched a mobile app for real-time air quality data and exposure reduction tips





## ● Educational Resources for Teachers

To supplement, CAN developed a Teaching Kit, a collection of condensed yet comprehensive educational resources. It equips teachers with information, fact files, lesson plans and activities that allow them to lead to air pollution classes and experiments with their students. Our dedicated website, Air-ducate, additionally includes a Clean Air Action Plan, which is a free and online framework to help primary schools create a tailor-made journey to become a clean air school.

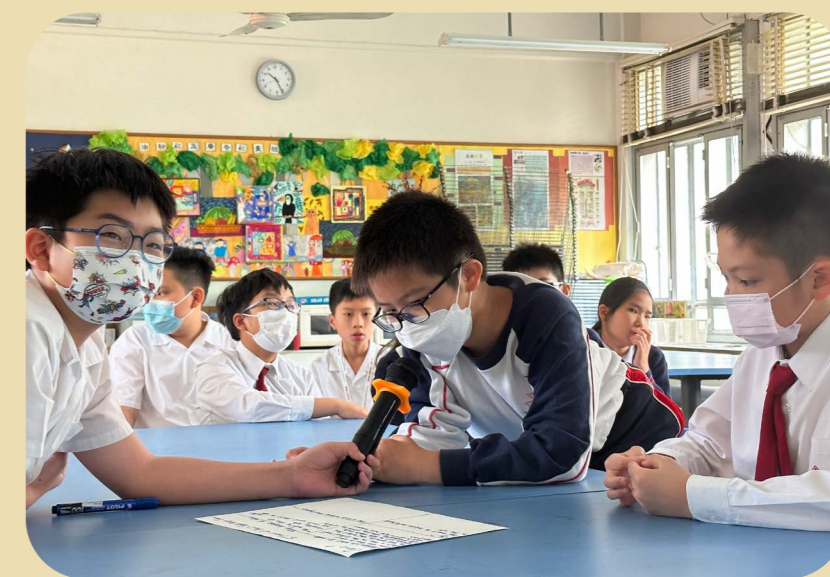
## ● Review Meetings with Schools

Further rounding out the program was a twice-held review meeting, which gathered principals, teachers and parents to not only look back on the air quality data collected, but also exchange ideas and discuss future actions.



## ● Workshops for Students

For students, the project provided an interactive workshop to assist with learning about air pollution within classrooms. It was followed up with an outdoor activity, which involved students investigating the air around their respective campuses by installing air pollutant collectors. Students then analysed the results they collected, further solidifying their understanding of air quality.



## ● Clean Air Schools Mobile App

Furthermore, our Clean Air Schools for Hong Kong project spearheaded the creation of an eponymous mobile app. Developed for the 8 schools participating in our program, it provides educators and students with real-time air quality information, enabling them to make informed choices about their daily activities. It also offers supportive health messages to recommend actions that would reduce their individual exposure to the air pollutants. Over time, the use of the app has supported users' knowledge and insights into the issue of air quality.





## IAQ FORUM: CLEAN AIR FOR SCHOOLS & BEYOND FORUM

In February 2024, CAN organised the IAQ Forum, entitled the Clean Air for Schools and Beyond Forum. Over the course of the 4-hour conference, we shined a spotlight on the much-overlooked issue of indoor air quality (IAQ).

The Forum, which drew in 100 guests, saw 12 expert speakers take to the stage to share their knowledge and ideas on how to tackle IAQ in the city from their respective industries. Speakers were represented across a wide range of sectors, spanning the environment, education, social welfare, architecture, health and more.

“  
12 experts  
shared their  
insights  
with 100  
attendees  
at our IAQ  
Forum.”



The event was split into three sessions, with the first segment focused on specific challenges facing Hong Kong and a highlight of CAN's Clean Air Schools project. Following this, the second session saw speakers touch on different comprehensive solutions to make future-ready buildings a reality, as well as the health implications of continued inaction on indoor air pollution. To conclude the Forum, a panel of experts convened to discuss the way forward to bring about green and healthy indoor environments in Hong Kong.





## ● Challenges and Insights of IAQ Management in the Post-Pandemic Era

This cross-disciplinary event was held in light of increasing concerns about Hong Kong's indoor environment in the post-pandemic age. Despite the fact that humans spend 90% of our time indoors, in homes, offices and schools, the quality of the air we breathe for the majority of the

day is currently not properly regulated and monitored. However, public awareness of IAQ has heightened dramatically in recent years, with research emanating from the Covid-19 pandemic spotlighting the link between viral transmission and poorly ventilated indoor spaces.

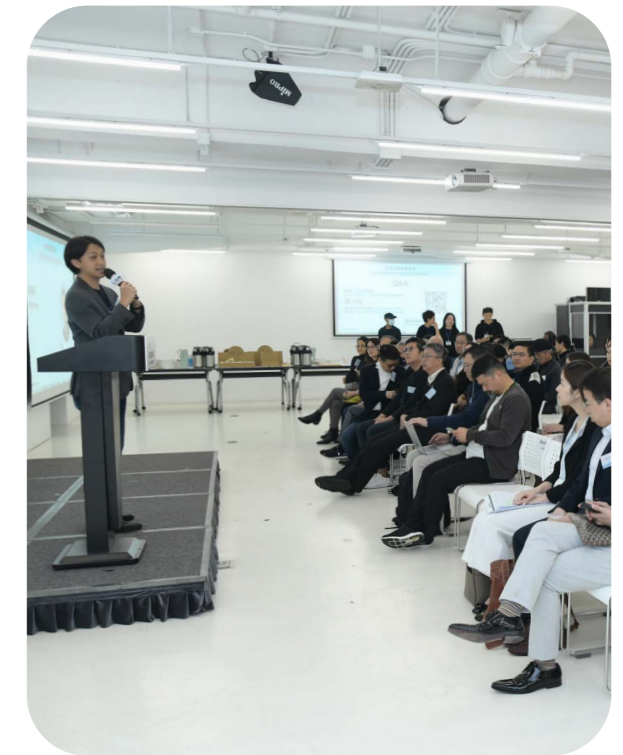


Besides presenting the latest scientific findings on the health impacts of poor IAQ and developments since the pandemic, the Forum also shined a light on a number of interrelated IAQ issues. These included the particular vulnerability of children and

the elderly to poor health outcomes as a result of indoor air pollution exposure, and the broader socio-environmental issues of liveability and decarbonisation in Hong Kong.

## ● Key Takeaways

Throughout the expert presentations and panels, three main themes arose: the importance of data, government regulation and cross-sector collaboration. Experts consistently emphasised the need for data monitoring to be a top priority, providing the basis for personalised, customised and specific real-time solutions. Regulatory frameworks were also pinpointed as a major area to speed up progress on IAQ in Hong Kong, aided by collaborative efforts across different sections of society, from grassroots groups to academia, institutions and the construction industry.



## ● Way Forward

Overall, CAN hoped to use this Forum to create a platform that fosters collaboration across multiple sectors and industries to tackle IAQ. It represented the city's first multi-disciplinary, expert-led conference dedicated to Hong Kong's indoor environment, showcasing our organisation's commitment to address the most pressing issues through a holistic approach.

This call for cross-sector collaboration was underlined by Patrick Fung, CEO of CAN, over the course of the Forum.

"The critical issue of indoor air quality in Hong Kong requires the full collaboration of the local government and people from all walks of life, from real-time data collection, education and promotion to behavioural changes and policies," Fung shared.

**“Discussions during this Forum will not end here. We aim to promote more in-depth discussions with other sectors and audiences at future events.”**





# EMPOWERMENT

## 3.1 Clean Air Day 2023

CAN organised the city's inaugural Clean Air Day on 4th November 2023, held at H.A.N.D.S. in Tuen Mun. The goal of the event was to raise awareness of air pollution in the city, inspire clean air actions across the community and to engage the public in a number of exciting game booths, exhibitions and sports competitions.



“The first-of-its-kind Clean Air Day 2023 drew in over 200 guests and participants. Centred on the theme “Breathe Right”, we celebrated the achievements over the previous month as part of our Road to Clean Air Day series of events.





## EVENT HIGHLIGHT

### ● *Engaging the Senses to Experience Air*

Kicking off with a movie screening of the Damon Gameau directed climate crisis documentary '2040', the lead-up of events included everything from Clean Air Walks across Sham Shui Po and Tuen Mun, to a 5-kilometre community run led by local association Pegasus Athletics Club. The run culminated in a meaningful donation of

54,010 kilocalories worth of food to charity Food-Co, matching the estimated energy burned by the participants of the run. There was even a 'Hike for a Clear Horizon' that took place on the mountain trails of Kowloon Bay, which collected useful air quality data on this popular hiking route in Hong Kong.



### ● *Inspiring Action Through Education & Engagement*

Besides reflecting on the numerous events held during October through exhibitions, Clean Air Day 2023 marked an opportunity to bring the public together through engaging activities. The Cube Challenge, for example, invited primary and secondary

school students to design creative solutions to improve air quality on their campus. Meanwhile, younger children participated in mini sports games and competitions, which drew in the participation of over 60 families.







## ● Driving Changes for the Next Generation

Other major milestones that took place on the day included the Clean Air Action Week Pledge that saw 10 schools vow to take positive clean air actions for 5 days, a series of student-led game booths that encouraged greater public awareness on air pollution, and a series of high-level university and secondary school workshops to further educate youths.



## IMPACT & OUTCOME

As a whole, Clean Air Day 2023 marked the beginning of a new chapter in CAN's efforts to promote the issue of air pollution in Hong Kong. The success of this event is evidenced in a follow-up survey, which showed that

82% of participants were 'satisfied' or 'very satisfied' with their experience and that 76% believed that Clean Air Day contributed to enhancing their knowledge about air pollution.



# BYOB Coffee Roaster



## EMPOWERMENT

### 3.2 Clean Air Neighbourhood Project

CAN continues to promote education on air pollution through its Clean Air Neighbourhood project, a program that was launched to address the information gap when it comes to air pollution exposure hotspots around neighbourhoods in Hong Kong.



## PROJECT HIGHLIGHT

### Empowering Underserved Populations Through Education

The aim of these engaging, effective and scalable activities was to improve understanding and knowledge of air pollution and mitigation methods within schools, families and the wider community. We specifically targeted education among children, caregivers and underprivileged sections of society in order to have the greatest social impact as well.

### Inspiring Youth Engagement

As with the previous phase of the Clean Air Neighbourhood project, CAN aims to arouse the interest of youths and encourage greater participation in societies, activities, clubs and groups that centre on both air pollution and wider environmental issues in the future. We envision a cascading impact as well, with students continuing to share their learnings and clean air actions with the local community to benefit residents in their neighbourhood.

## NEW PHASE: EXPANDING TO WESTERN NEW TERRITORIES

With the first phase of the project wrapped up in the previous year, CAN has launched a new phase in January 2024 to prioritise schools in the Tuen Mun, Yuen Long and Tin Shui Wai districts. In addition to the six lessons held throughout the first half of the year, including one outdoor fieldwork activity, the program schedule included an introductory assembly, the provision of an air pollution handbook, campaigning ideas and action plans.





# OTHER WORKS

## 4.1 Annual Air Quality Review 2023

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Every year, CAN analyses air quality data from the Environmental Protection Department's monitoring stations every year to understand local pollution trends. We published our review of 2023 data in January 2024.





## OUR OBSERVATIONS

### ● Rebound in Air Pollution

#### Air Pollutant Concentrations Changes

- Roadside ozone +32%
- General PM<sub>2.5</sub> +29%
- Roadside PM<sub>10</sub> +24%

#### Comparing to the WHO standards:

- Roadside NO<sub>2</sub> 530% above
- Roadside PM<sub>2.5</sub> 340% above

As Hong Kong society returned to normalcy in the post-pandemic period, 2023 marked a year of rebounds in air pollution. The annual average concentration of ozone pollution, in particular, reached a record high in 2023. This backwards trend has brought Hong Kong even further away from WHO's air quality safety standards.

safety limits laid out by the WHO. Roadside PM<sub>2.5</sub> concentrations, on the other hand, exceeded the global safety benchmark by 340%.

One of the most worrying trends is the sharp uptick in particulate matter pollutants, posing a serious threat to public health. While the concentration of PM<sub>2.5</sub>, a group 1 human carcinogen, increased to 22 µg/m<sup>3</sup> at roadside stations, exceeding WHO standards by 2.6-fold, the general PM<sub>2.5</sub> concentration in urban areas increased by nearly 30% to 18 µg/m<sup>3</sup>, a level 3.4-times higher than WHO standards.

In addition to ozone pollution, annual average concentrations of most other major pollutants rebounded by double-digits in 2023, reaching levels close to that of the pre-pandemic era in 2019. The largest increases were observed in roadside ozone concentration (+32%), general PM<sub>2.5</sub> (+29%) and roadside PM<sub>10</sub> (+24%). The only improvement was seen in roadside NO<sub>2</sub> concentrations, which decreased slightly (-2%) and may be attributed to the rise in the number of electric vehicles.

Yet despite this improvement in roadside NO<sub>2</sub> concentrations, the level still remained 530% higher than the recommended

### ● Pollution Hotspots

District-based data showed that the northern and western parts of Hong Kong experienced worse air quality throughout 2023. Of the 15 general monitoring stations, air pollution data in Tuen Mun, Yuen Long and North District consistently topped the charts. In particular,

“Tuen Mun station recorded the highest annual average concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, becoming one of the most polluted districts in our city.

Sources of pollution in Tuen Mun vary widely, from road traffic to navigation, power plants and regional emissions.

With ozone concentration at Southern station exceeding that of Tap Mun in 2023, which has traditionally been the most ozone-polluted in previous years, CAN noted that ozone is now becoming an increasingly local problem. Tap Mun, located far away from urban areas, used to record the highest concentrations of ozone due to regional emissions.







## POLICY RECOMMENDATIONS

Looking ahead, CAN concluded in the review that a number of key policies must be put in place to address the rebound in air pollution in Hong Kong.

### ● *Accelerating Green Transport*

Firstly, green transport plans must be expedited. In this regard, a roadmap to transition all commercial vehicles, in addition to buses and taxis, must be implemented. Other positive steps forward include incentivisation policies like subsidies for zero-emission vehicles, electronic road pricing, setting out low-emission zones and improving infrastructure for pedestrians and cyclists.



### ● *Tackling Maritime Emissions*

Another issue to address is emissions from maritime transport, as navigation remains a chief source of pollution in Hong Kong. Policies such as diversifying green fuel options, such as hydrogen and ammonia, as well as the development of shore power facilities at cruise terminals would help combat emissions from this industry.



### ● *Combating Ozone Pollution*

To tackle ozone pollution, CAN urged the government to focus on both regional and local solutions as soon as possible. This is particularly important in light of the climate crisis, which will bring rising temperatures—conditions that are favourable for ozone formation.

### ● *Strengthening Air Quality Standards*

Finally, Hong Kong's Air Quality Objectives (AQOs) must be further tightened. At its current pace, the Government's targets for air quality in Hong Kong are still very conservative, falling far short of the safety standards laid out by the WHO. Without swift action, the threat to public health will only continue to deteriorate.





# OTHER WORKS

## 4.2 Spotighting Cruise Ship Emissions

With tourism back in full swing, the danger of cruise ship emissions must be considered by the Government while formulating its plans for cruise tourism. In December 2023, CAN published an op-ed to highlight the severity of cruise ship emissions and the risk it is posing to public health.

## MARITIME EMISSIONS: A SIGNIFICANT CONTRIBUTOR TO AIR POLLUTION

In our article, we spotlighted the huge impact that the maritime industry has on Hong Kong's overall emissions. In particular, navigation accounts for 36% of the total  $\text{NO}_x$  emissions in the city, leading that of power generation and road transport. As

cruise ships essentially operate as hotels on water, its use of energy is vast, with research estimating that a single cruise ship docked for one day could emit exhausts equivalent to that of 34,400 idling tractor-trailers.

### ● *Monitoring Cruise Emissions at Kai Tak*

Monitoring air quality in the Kai Tak Cruise Terminal Rooftop Park to compare pollution levels with and without cruise berthing in November 2023, CAN revealed that the average  $\text{NO}_2$  concentration in the Rooftop Park was significantly higher when there was one cruise ship at berth than when there was no cruise ship docked. It

represents a difference of nearly 3-times.

With one cruise ship docked, the  $\text{NO}_2$  concentration was as high as  $96.1 \mu\text{g}/\text{m}^3$ , exceeding the annual average standard ( $10 \mu\text{g}/\text{m}^3$ ) set out in the WHO Global Air Quality Guidelines by almost 9-fold.

### ● *Proposed Regulatory Measures*

Our findings shed light on the urgent need for the Government to include greener measures governing the cruise industry in Hong Kong. We proposed a relaunch of the government's cruise tourism plan to include installing shore power facilities at Kai Tak Cruise Terminal and study the feasibility

of shore power at Ocean Terminal as well. Regulating cruises to make shore power a requirement while berthing in Hong Kong would also be a welcome measure. To monitor air pollution levels, cruises should also have devices installed and real-time data made public.



# ACKNOWLEDGEMENT

## Clean Air Day 2023

- Cheddar Media
- CLP
- Dyson
- Parks & Trails
- People's Place
- RS Group
- Onebite
- Towngas

## Clean Air Schools for Hong Kong

- AD & FD of Pok Oi Hospital Mrs. Cheng Yam On Millennium School
- Chan's Creative School
- HKUST Institute for the Environment
- Lui Cheung Kwong Lutheran Primary School
- SKH St. Andrew's Primary School
- Society of Boys' Centres Chak Yan Centre School
- St. Francis of Assisi's English Primary School
- The Hong Kong Eng Clansman Association Wu Si Chong Memorial School
- Yan Chai Hospital Law Chan Chor Si Primary School

## "Clean Air for Schools and Beyond" Forum

- Business Environment Council
- DLA Piper
- Health in Action
- Hong Kong Association of the Heads of Secondary Schools

## Clean Air Neighbourhood

- CCC Kei Yuen College
- CCC Tam Lee Lai Fun Memorial Secondary School
- Community Philanthropy
- Halfcup Squat
- JC VOLUNTEER TOGETHER – School Based Programme, Caritas Hong Kong
- Mu Kuang English School
- North Point Happy Teens Club, Hong Kong Christian Service
- Picture Book Store
- Queen Elizabeth School Old Students' Association Tong Kwok Wah Secondary School
- Rolling Books
- The Yuen Yuen Institute MFBM Nei Ming Chan Lui Chung Tak Memorial College
- Tin Shui Wai Community Development Network
- Tuen Mun Recycling Station
- TWGHs Yau Tze Tin Memorial College
- Yan Oi Tong Chan Wong Suk Fong Memorial Secondary School
- Yuen Long Public Secondary School

## Special thanks to

- Charitable Choice
- RS Group
- The Robert H. N. Ho Family Foundation Hong Kong
- WYNG Foundation
- ZeShan Foundation



Clean Air Network  
**CAN**  
健康空氣行動

✉ info@hongkongcan.org  
✉ (+852) 3971 0106  
🌐 www.hongkongcan.org  
f @ youtu be in @cleanairnetwork

23/F, Chun Wo Commercial Centre,  
23-29 Wing Wo Street Sheung Wan, Hong Kong

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