Multi-jurisdictional Comparative Study on Air Pollution Control Regulations

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A collaboration between

Clean Air Network and Linklaters

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1 Background and Introduction

1.1 About Clean Air Network

Established in 2009 in Hong Kong, Clean Air Network ("**CAN**") is a charitable institution exempt from tax under section 88 of the Inland Revenue Ordinance (Cap. 112 of the Laws of Hong Kong) envisioning a Hong Kong with clean air. Its mission is to encourage the public to speak out about the health impacts of air pollution, and in doing so to urge the government to take appropriate measures to make our air cleaner.

1.2 Air pollution in Hong Kong

Air pollution is one of the greatest environmental risks to health globally and causes at least 1,500 avoidable deaths in Hong Kong each year. Due to its compact urban form, the street-level pollution – mainly caused by vehicular emission – is a major pollution and public health problem in Hong Kong. Hong Kong has never achieved its roadside air quality objectives ("**AQOs**"), which are measured by annual average concentration of nitrogen dioxide. In 2017, the incidences of non-compliance in nitrogen dioxide levels at one roadside station exceeded the AQO 272 times (a maximum of 18 breaches are permitted). As demonstrated in many cities, public policy intervention is one of the most effective ways to clean up air. CAN believes that lives could be saved by holding the Hong Kong government accountable to deliver legislative measures and standards that ensure air quality meets the international safety standards set by the World Health Organisation ("**WHO**").

1.3 Key questions

This report is a comparative study of the air pollution control strategies and legislation at both national and state/city levels in the jurisdictions of Hong Kong, the United Kingdom (National); the city of London; the European Union (Regional); United States (National); California (State); Japan (National); the city of Tokyo; and Singapore (National). The key questions addressed in this report are as follows:

1.3.1 Do the laws and regulations of your jurisdiction expressly provide for public health protection from air pollution as an objective? If so, how?

1.3.2 What public health objectives (if any) are integrated into the operative parts of relevant laws and/or regulations of your jurisdiction?

1.3.3 What are the AQOs (including, but not limited to, clear targets and express timelines) under the laws and regulations of your jurisdiction?

1.3.4 What is the process for setting such AQOs under the laws and regulations of your jurisdiction?

1.3.5 Do laws and regulations of your jurisdiction prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?

1.3.6 What are the best practice guidelines in your jurisdiction (if any) which apply in respect of compliance with requirements on health protection from air pollution and AQOs?

1.3.7 Please provide details of any case law interpreting your jurisdiction's domestic and international obligations in respect of air pollution control strategies.

2 Executive Summary

While there are well established air pollution laws and regulations in Hong Kong, which may arguably be similar to those offered by other countries, Hong Kong's laws and regulations, together with their enforcement, appear to be less robust than the laws and regulations of other commonwealth jurisdictions such as the United Kingdom and metropolitan cities such as Tokyo.

The air quality objectives contained in Hong Kong's air pollution legislation does not explicitly protect human health nor does the setting of these objectives include a consultative process, as seen in jurisdictions such as California. We also note that Hong Kong's targets are set once every five years while in other jurisdictions these targets are refreshed annually. Most notably absent in Hong Kong's legislation are any administrative or legal consequences for non-compliance with air quality objectives.

As of the date of this report, the Hong Kong government issued certain guidelines in respect of compliance with requirements on health protection from air pollution and air quality objectives. However, these guidelines provide overviews of the prevailing air pollution control regulations, rather than any best practices to help ensure compliance with such regulations. Moreover, it is unclear to what extent compliance with such guidelines is monitored or enforced by the Hong Kong government.

2.1 Public health protection as an express legal objective

The Air Pollution Control Ordinance (Cap. 311 of the Laws of Hong Kong) ("**APCO**") contains the AQOs of Hong Kong, which are stipulated as the air quality standards that should be achieved to promote "the conservation of air in the public interest" and "the best use of air in the public interest." Pursuant to section 7A of the APCO, the Secretary for the Environment must review the AQOs at least once in every 5-year period to ensure that they are the appropriate objectives toward meeting this goal.

Notably, the APCO does not provide for protection of public health from air pollution as an objective. Instead, the APCO's objectives focus on controlling the emissions of air pollutants and on setting non-binding AQOs in air control zones.

However, the Environmental Protection Department has stated that the Secretary for the Environment should take into account several guiding principles when setting the AQOs, including that the AQOs should be set with a view to protecting public health, and that the AQOs should be updated by benchmarking against the Air Quality Guidelines ("**AQG**") and interim targets published by the World Health Organization. Protecting public health is therefore a consideration in setting Hong Kong's AQOs, albeit one not enshrined in the legislation.

The absence of any reference to public health in the APCO's objectives contrasts with legislation in the majority of the other jurisdictions surveyed. The following jurisdictions expressly provide for the protection of public health as an objective:

2.1.1 **Tokyo**: the ordinance to Improve the Urban Environment and Protect the Health of Citizens and the Environmental Basic Regulation in Tokyo states that its aim is to allow citizens to lead safe and healthy lives by implementing policies for environmental protection. For Japan as a whole, Article 1 of the Air Pollution

Control Act provides for public health protection from air pollution as a central objective.

2.1.2 **The European Union (the "EU")**: Directive 2008/50/EC was enacted to address ambient air quality and cleaner air for Europe ("**Air Quality Directive**") which consolidated a number of earlier directives. The recitals to the Air Quality Directive refer to the need to "protect human health and the environment as a whole" and "set appropriate objectives for ambient air quality taking into account relevant WHO standards, guidelines and programmes" (recital 2). It also emphasises the significant negative impacts on human health of fine particulate matter ($PM_{2.5}$) (recital 11). A second directive, Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air ("**Fourth Daughter Directive**"), contains recitals citing scientific evidence which shows the carcinogenic effects of these pollutants, and state "that there is no identifiable threshold below which these substances do not pose a risk to human health." (recital 3). Public health is thus a central objective of both directives.

2.1.3 **California**: the statutory text of the Protect California Air Act of 2003 explicitly provides that its purpose is to (among other things) protect public health and welfare from actual or potential adverse effects which may reasonably be anticipated to occur from air pollution. For the United States in general, the Clean Air Act of 1970 ("**CAA**") authorises the Environmental Protection Agency ("**EPA**") to establish National Ambient Air Quality Standards ("**NAAQs**") to protect public health and welfare and to regulate emissions of hazardous air pollutants ("**HAPs**").

2.2 Air quality objectives

Hong Kong's AQOs, pursuant to the APCO, are shown in Schedule 1. As shown in that schedule, Hong Kong's air quality standards in some cases show potential for improvement compared to certain other jurisdictions, including Singapore and the UK.

2.3 Process for setting air quality objectives

As noted in paragraph 2.1 above, pursuant to section 7A of the APCO, the Secretary for the Environment must review the AQOs at least once in every 5-year period to ensure that appropriate objectives are established and maintained to promote the conservation of air in each air control zone, and to promote the best use of air in each control zone in the public interest. In accordance with this method, the AQOs set out in Schedule 1 came into effect on 1 January 2014.

Setting standards

Hong Kong's process for setting air quality standards is similar to that of other jurisdictions: e.g. the EU's long-term objective in setting its air quality standards is to not exceed the WHO's guideline risk levels, which represent the levels at which health risks are minimised. Other aspects of Hong Kong's process for setting air quality objectives share other positive similarities with those of other jurisdictions. For example, the Environmental Protection Department has stated that the Secretary for the Environment's tasks in setting the AQOs should include an appraisal of the latest developments in air science and in regard to the health effects of air pollution. This approach is similar to the scientific evidence-based process in the EU, where considerations of the negative effects of $PM_{2.5}$ pollutants informed the Air Quality Directive's emphasis in minimising exposure of the population to such fine particles.

Studies and public consultation

In Hong Kong, and in connection with past reviews of the AQOs, the Environmental Protection Department commissioned relevant studies and consulted the public. This approach is similar to the consultative process (involving industry groups, NGOs and technical working groups) which preceded the Air Quality Directive in the EU. Similarly, in California, law specifically mandates public comment and peer review as key elements in developing the rules and regulations to achieve healthful air quality.

Compliance with AQOs and targets

There are no administrative consequences imposed on governmental authorities for non-compliance with AQOs pursuant to the APCO in Hong Kong.

However, the Director of Environmental Protection is empowered to impose liability on private citizens and corporations if they are found to be contributing to air pollution. Under section 10 of the APCO, the Director of Environmental Protection may issue an air pollution abatement notice if it determines that emission of air pollutants from a polluting process is contributing to existing or imminent air pollution. If no abatement measures are taken after the notice is given, the person concerned commits an offence and is liable for fines of up to HK$500,000 and imprisonment for 12 months.

Notably, the AQOs do not appear to be expressly mentioned as factors which the authorities should take into account when considering whether to issues such a notice. However, they will probably be incorporated by implication in some of those factors, e.g. in technical memoranda issued under the APCO.

This omission stands in contrast to the EU, where failure to meet limit values could lead to the European Commission taking legal action against an EU member state (a "**Member State**") and to possible fines being imposed.

Please also note that the APCO is supplemented by 25 pieces of subsidiary regulations[1] enacted by the Environmental Protection Department and set out in Schedule 3, which relate to air pollution control. The subsidiary regulations stipulate, among other factors, approved emission standards and vehicle design standards, approval processes for the installation of furnaces, ovens and chimneys, and licensing requirements for specified procedures to control air pollutant emissions. A person who fails to comply with the approval and licensing processes commits an offence and would be liable for fines up to HK$500,000 and imprisonment for 12 months.

Such subsidiary legislation helps the Hong Kong regulatory framework to address key sources of pollution – mainly industry and transportation – which are stringently addressed in other jurisdictions, and which do not appear adequately dealt with by the APCO alone.[2]

As an example, to combat harmful industrial air pollution, under section 4 of the Air Pollution Control (Fuel Restriction) Regulations (Cap 311I), a person who uses a restricted liquid or solid fuel in any relevant plant in the Shatin fuel restriction area commits an offence and would be liable to a fine up to HK$20,000 and imprisonment for 6 months. In addition, to reduce the level of lead emissions from motor vehicles, the Air Pollution Control (Motor Vehicle Fuel) Regulation (Cap 311L) creates a number of offences prohibiting petrol

[1] The subsidiary legislation was not specifically reviewed for the purposes of this report. Please see schedule 3 for the full list of subsidiary legislation.

[2] Please note that this report and Hong Kong questionnaire does not analyse and/or review the subsidiary legislation.

suppliers and retailers from distributing leaded petrol and motor vehicle diesel that do not comply with the fuel composition specifications set out in Cap 311L. Offenders would be liable for a fine up to HK$50,000.

The Director of Environmental Protection's power under section 43 of the APCO to enact subsidiary legislation has led to the development of Hong Kong's air pollution regulatory regime in a piecemeal fashion: the APCO is now supplemented by 25 pieces of subsidiary regulations, which deal with (among other matters) emission and vehicle design standards, as well as licensing requirements for specified procedures to control air pollution emissions. This development can be contrasted with jurisdictions such as Singapore and the UK, which rely on one centralised and comprehensive piece of air pollution legislation that sets out both air quality objectives and relevant offences for non-compliance.

Timing to achieve targets

Section 8 of the APCO provides that the Air Pollution Control Authority is charged with the responsibility to "aim to achieve the AQOs as soon as reasonably practicable and therefore to maintain the quality so achieved." However, the APCO does not expressly state a definitive timeline to achieve the AQOs, stating only that they should seek to be achieved "as soon as reasonably practicable." Other jurisdictions such as Singapore and the EU have specific dates for achieving air quality targets.

2.4 Best practice guidelines for compliance with requirements on air pollution

As mentioned above, the AQOs adopted by Hong Kong are benchmarked against the AQGs and recommended interim targets published by the WHO. Unlike jurisdictions such as the UK, the EU, Hong Kong does not have any best practice guidelines. The Hong Kong government has issued certain guidelines, available on the Environmental Protection Department's website, in relation to controlling air pollution emissions when installing furnaces and chimneys and operating and maintaining dry-cleaning machines. [3] However, the guidelines provide overviews of the prevailing air pollution control regulations rather than best practices. Moreover, it is unclear to what extent it monitors or enforces compliance with these guidelines. Notably, the EPA in the USA has issued best practice guidelines for motor vehicles to reduce traffic-related pollution exposure. The EPA has also set new vehicle emission standards and a new gasoline sulphur standard. There are no such guidelines in Hong Kong, where emissions from motor vehicles is one of the major sources of air pollution.

Please see the responses in question 5 of the country reports in Schedule 2 for more details on best practice guidelines.

2.5 Case law in relation to Hong Kong's domestic and international obligations for air pollution control

Among the 35 cases[4] in Hong Kong which deal with the issue of air pollution, most of the decisions concern appeals against the Director of Environmental Protection's refusal to grant licences under the APCO and orders requiring appellants to take immediate measures to abate their levels of air pollutant emissions.

[3] Relevant guidelines are available at www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/air_guidelines.html.

[4] A search on the Hong Kong Judiciary's website at the time of writing reveals that there are 35 judgments to date concerning APCO.

From the case law available, two cases are particularly relevant to Hong Kong's domestic legal approach in respect of air pollution control:

2.5.1 In 2007, the applicants in **Clean Air Foundation Limited and Gordon David Oldham v The Government of HKSAR** (HCAL 35/2007) sought declarations that the Government had been in breach of the Basic Law, the Bill of Rights and the International Covenant of Economic, Social and Cultural Rights ("ICESCR"), for failing to implement appropriate legislation to reduce air pollution. However, leave for judicial review was denied in the Court of First Instance. The presiding judge held that the court had no jurisdiction in evaluating the merits of the policies that the government had adopted in combatting air pollution.

2.5.2 Similarly, in **Chu Yee Wah v Director of Environmental Protection** (CACV 84/2011), the court held that it was reasonable for the Director of Environmental Protection to consider whether to grant a permit by measuring the impact of such a decision against the standard of acceptable environmental quality, as indicated by the AQOs. Critically, in response to the applicant's argument that the AQOs represent the minimal standards of acceptable air quality, the court held that it did not have discretion to decide matters of policy.

The above cases reflect the Hong Kong courts' reluctance to opine on matters of government policy.

Among the jurisdictions surveyed, the EU judiciary has shown a demonstrably more robust approach in interpreting a Member State's obligations in relation to air pollution control:

2.5.3 The European Commission has regularly brought actions against Member States to the Court of Justice of the European Union for non-compliance with the Air Quality Directive. The Court of Justice (the "Court") has interpreted the obligations under the Air Quality Directive strictly. In **Commission v Poland**, Case C-336/16 EU: C:2018:94, the Court of Justice held that the fact that Poland had exceeded the limit values for PM_{10} concentrations in the ambient air was sufficient to establish the Member State's failure to fulfil obligations under the Air Quality Directive.

2.5.4 In **Janecek v Freistaat Bayern,** Case C-237/07, the Court found that where there is a risk that the Air Quality Directive emission limit values may be exceeded in a particular district, individual citizens in the concerned district whose health may be impaired as a result are entitled to require competent national authorities to draw up an action plan to combat atmospheric pollution.

While these judgments do not show the Court having an active role in deciding policy, they do demonstrate its willingness to reinforce the Member States' obligations under the Air Quality Directive.

2.5.5 Similarly, in the UK, ClientEarth, an environmental non-profit organisation, has successfully obtained court orders requiring the Secretary of State to ensure any air quality plans published are fully compliant with the EU's Air Quality Directive (see **R (ClientEarth) v Secretary of State for the Environment, Food and Rural Affairs** [2011] EWHC 3623 and [2013] UKSC 25.

Various jurisdictions have also held environmental pollution to the standard of strict liability, which is a legal doctrine that makes a person or company responsible for their actions or products which cause damage or loss, regardless of any negligence, fault or intention on

their part. **In Commission v Italy,** Case C-68/11 EU: C:2012:815, the Court, in finding that Italy had not complied with the Air Quality Directive, noted that liability for non-compliance was strict. It was immaterial whether failure to fulfil obligations was intentional, negligent or owing to technical difficulties. A similar approach has been taken by the judiciaries in the United States and Japan. No such position is clearly stated in Hong Kong case law.

Schedule 1
Hong Kong Air Quality Objectives compared to UK and Singapore

Pollutant	Hong Kong			UK objectives			Singapore objectives (2020)	
	Averaging time	Concentration limit (µg/m^3)	Number of exceedances allowed	Averaging time	Objective (varying dates) (µg/m^3)	Number of exceedances allowed	Averaging time	Targets by 2020 (µg/m^3)
Sulphur dioxide	10-minute	500	3	15-minute	266	35	Not applicable	
	24-hour	125	3	24-hour	125	3	24-hour	50
Respirable suspended particulates (PM_{10})	24-hour	100	9	24-hour	50	35	24-hour	50
	Annual	50	Not applicable	Annual	40	Not applicable	Annual	20
Fine suspended particulates ($PM_{2.5}$)	24-hour	75	9	Not applicable			24-hour	37.5
	Annual	35	Not applicable	Annual	25	Not applicable	Annual	12
Nitrogen dioxide	1-hour	200	18	1-hour	200	18	1-hour	200
	Annual	40	Not applicable	Annual	40	Not applicable	Annual	40
Ozone	8-hour	160	9	8-hour	100	10	8-hour	100
Carbon monoxide	1-hour	30,000	0	Not applicable			1-hour	30,000
	8-hour	10,000	Not applicable	8-hour	10,000	Not applicable	8-hour	10,000
Lead	Annual	0.5	Not applicable	Annual	0.5	Not applicable	Not mentioned	

Shaded green cells indicate instances where other jurisdictions' standards are more stringent those of Hong Kong. Shaded orange cells indicate where other jurisdictions' standards are less stringent than those of Hong Kong.

The targets for the United Kingdom are drawn from Schedule 2, in the section relating to the United Kingdom. The targets for Singapore can be found at: https://www.mewr.gov.sg/docs/default-source/default-document-library/cos-2015-media-factsheet---spore-39-s-air-quality.pdf

Schedule 2
Air Pollution Control Questionnaires

California

Question	Response
Please provide an executive summary of your responses to questions 1-6 below.	(1) States may enact local legislation and regulations as part of their SIP. A state's legal framework may set more stringent requirements than NAAQs but must implement laws and regulations to achieve NAAQs as a minimum. California has enacted robust environmental laws and regulations and in most of its localities achieves better-than-minimum air quality. Some examples of California's legal framework are Protect California Air Act of 2003, California Global Warming Solutions Act of 2006, Health and Safety Code and California Environmental Quality Act of 1970. (2) The California Air Resources Board is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. From requirements for clean cars and fuels to adopting innovative solutions to reduce greenhouse gas emissions, California has pioneered a range of effective approaches that have set the standard for effective air and climate programs for the nation, and the world. (3) California sets goals and monitors compliance in four areas, including ozone, carbon monoxide and particulate matter, as a part of its SIP. As described in Part (b) of our response to Question 3 below, after public notice and comment periods, California publishes its goals to meet Federal air quality standards. Air quality standard setting in California commences with a critical review of all relevant peer reviewed scientific literature. The Office of Environmental Health Hazard Assessment uses the review of health literature to develop a recommendation for the standard. The recommendation can be for no change or can recommend a new standard. (4) The goal of California environmental enforcement programs is to achieve compliance with each and every regulation the agency adopts. To achieve this goal, California Air Resources Board pursues cases of non-compliance, brings those companies into compliance, and assesses penalties that act as a deterrent to future non-compliance. The most notable example is the Volkswagen case. (5) There are no legislatively-proscribed best-practices in California. There are incentives for individuals and corporations to exceed state air quality standards and environmental goals, but best practices, *per se*, are only discussed at the state-level in an academic context.

	(6) The state of California's courts play a role in enforcing the Federal Clean Air Act. Furthermore, the Attorney General of California defends challenges to California's clean air laws.
1. Do laws and regulations of the State of California expressly provide for public health protection from air pollution as an objective? If so, how?	The Clean Air Act of 1970 ("**CAA**"), among other things, authorizes the Environmental Protection Agency ("**EPA**") to establish National Ambient Air Quality Standards ("**NAAQs**") to protect public health and public welfare and to regulate emissions of hazardous air pollutants. One of the goals of CAA was to set and achieve NAAQs in every state in order to address the public health and welfare risks posed by certain widespread air pollutants and therefore each state was directed to develop state implementation plans ("**SIPs**"), applicable to appropriate industrial sources in the state, in order to achieve these standards. States may enact local legislation and regulations as part of their SIP. A state's legal framework may set more stringent requirements than NAAQs, but must implement laws and regulations to achieve NAAQs as a minimum. California has enacted robust environmental laws and regulations and in most of its localities achieves better-than-minimum air quality. Some examples of California's legal framework follow. **Protect California Air Act of 2003** (the "**PCAA**"):[5] The State of California passed the PCAA after finding and declaring that "the people of the State of California have a primary interest in safeguarding the air quality in the state" and, among other things, emissions from nonvehicular sources "are a significant contributing factor to unhealthful levels of air pollution" and "must be controlled to protect public health and the environment." The statutory text of the PCAA specifically provides that its purpose is to, among other things, protect public health and welfare from any actual or potential adverse effect which reasonably may be anticipated to occur from air pollution. **California Global Warming Solutions Act of 2006**:[6] This California State Law fights global warming by establishing a comprehensive program to reduce greenhouse gas emissions from all sources throughout the state. The Act requires the California Air Resources Board ("**CARB**") to develop regulations and market mechanisms to reduce California's greenhouse gas emissions to 1990 levels by the year of 2020, representing an approximately 30% reduction state-wide,

[5] https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=26.&title=&part=4.&chapter=4.5.&article= [42503]

[6] https://www.arb.ca.gov/cc/ab32/ab32.htm

	with mandatory caps beginning in 2012 for significant emissions sources. The bill also allows the Governor to suspend the emissions caps for up to a year in case of emergency or significant economic harm. "The [Act] is supported by legislative findings that global warming poses a 'serious threat' to the 'economic well-being, public health, natural resources, and the environment of California,' and that global warming will have 'detrimental effects on some of California's largest industries.'" CARB enforcement programs issue permits and registrations, provide training and support to local air districts for stationary source program implementation and enforcement, address complaints from the public, and provide compliance assistance. Each year these programs evolve and improve. 2016 saw significant program improvements made to diesel program enforcement, complaint processing, portable equipment registration, supporting disadvantaged communities, and developing new SEP programs. CARB focuses on ensuring that regulatory compliance rates are high and targeted emission reductions are achieved, especially as regulatory implementation deadlines established in the state implementation plan are reached. CARB also accelerated efforts to assess compliance rates in key programs, both to help focus resources and to provide a metric for assessing program effectiveness.[7] **Health and Safety Code** (Air Resources – 39000-39005) To date, the State of California has enacted numerous statutory provisions that expressly cite public health protection from air pollution as an objective. These statutes establish programs intended to evaluate, monitor and control air contaminants and air pollution. **California Environmental Quality Act of 1970** (the "**CEQA**"):[8] While not directly related to clean air or public health, the CEQA is California's broadest environmental law. CEQA helps to guide the Department of Fish and Wildlife during issuance of permits and approval of projects. Courts have interpreted CEQA to afford the fullest protection of the environment within the reasonable scope of the statutes (see response to question 6). CEQA applies to all discretionary projects proposed to be conducted or approved by a California public agency, including private projects requiring discretionary government approval.

[7] https://www.arb.ca.gov/enf/reports/2016_enf_annual_report.pdf

[8] https://www.wildlife.ca.gov/Conservation/CEQA/Purpose

2. What public health objectives (if any) are integrated into the operative parts of relevant laws and/or regulations of the State of California?	In 1967, the California legislature passed the Mulford-Carrell Act, which established CARB, a board within the California Environmental Protection Agency. CARB, in partnership with local air districts, oversees all air pollution control efforts to attain and maintain health-based air quality standards in California.[9,10] CARB is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. From requirements for clean cars and fuels to adopting innovative solutions to reduce greenhouse gas emissions, California has pioneered a range of effective approaches that have set the standard for effective air and climate programs for the nation, and the world.[11] Reducing air pollution and protecting public health guide CARB's actions. In order to attain these goals, CARB engages in the following activities: • Set the State of California's air quality standards at levels that protect those at greatest risk – children, older adults and people with lung and heart disease; • Identify pollutants that pose the greatest health risks, such as diesel exhaust particles, benzene in gasoline and formaldehyde in consumer products; • Measure our progress in reducing pollutants utilizing the nation's most extensive air monitoring network; • Verify automakers' emissions compliance at CARB's Haagen-Smit Laboratory in El Monte; • Research the causes and effects of air pollution problems – and potential solutions – using the best available science and technology; • Study the costs and benefits of pollution controls, paying particular attention to individuals and

[9] https://www.arb.ca.gov/legis/as2017.pdf

[10] https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=26.&title=&part=1.&chapter=1.&article=

[11] https://ww2.arb.ca.gov/about

	communities most at risk; and • Lead California's efforts to reduce climate-changing emissions through measures that promote a more energy-efficient and resilient economy.[12]
3. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under the laws and regulations of the State of California? (b) What is the process for setting such air quality objectives under the laws and regulations of the State of California?	(a) The Federal government sets NAAQs and Federal law requires that all states attain the NAAQs through SIPs, which must demonstrate how the state will attain NAAQ goals. Nonattainment areas must develop plans to attain the NAAQs, and attainment areas must develop plans to maintain attainment. Failure of a state to reach attainment of the NAAQs by the target date can trigger penalties, including withholding of federal highway funds.[13] California, through CARB, sets goals and monitors compliance in four areas, including ozone, carbon monoxide and particulate matter, as a part of its SIP. As described in Part (b) below, after public notice and comment periods, California publishes its goals to meet Federal air quality standards.[14] For example, in order to meet NAAQs in 2016, CARB developed a SIP strategy, part of which is excerpted below: "Approximately 80 percent of the reductions needed to meet the ozone standard in 2031 will come from regulatory actions associated with ongoing implementation of the existing control program, combined with new regulatory measures identified in the State SIP Strategy. The remaining 20 percent will come from additional efforts to enhance the deployment of these cleaner technologies through new incentive funding, efficiency improvements in moving people and freight, and support for the use of advanced transportation technologies, such as intelligent transportation systems and autonomous vehicles. These actions will be implemented through proposed measures for each sector that are designed to provide further emission reductions from the deployment of cleaner technologies necessary to meet the South Coast's Extreme ozone nonattainment area needs. The approaches contained in these measures include: • Incentive programs to further accelerate technology penetration; • Identification of additional regulatory approaches based on further technology assessments;

[12] Id.

[13] https://ww2.arb.ca.gov/resources/national-ambient-air-quality-standards

[14] https://www.arb.ca.gov/planning/sip/2016sip/2016statesip.pdf

	• Increased efficiency in moving people and freight; • Use of emerging transportation technologies, such as intelligent transportation systems and autonomous and connected vehicles; and • Further federal actions, including support for demonstration programs, and supporting policies to achieve reductions from sources under federal and international regulatory authority." For more information on NAAQs, please see the US Federal CAN Questionnaire. California also has ambient air quality standards ("**CAAQs**"), which predate the EPA's formation in 1970 and the original NAAQs, which were adopted in 1971. In 1959, California enacted legislation requiring the state Department of Public Health to establish air quality standards and necessary controls for motor vehicle emissions California law continues to mandate CAAQs, which are often more stringent than national standards, although attainment of the NAAQs has precedence over attainment of the CAAQs.[15] (b) "Air quality standard setting in California commences with a critical review of all relevant peer reviewed scientific literature. The Office of Environmental Health Hazard Assessment ("**OEHHA**") uses the review of health literature to develop a recommendation for the standard. The recommendation can be for no change or can recommend a new standard. The review, including the OEHHA recommendation, is summarized in a document called the draft Initial Statement of Reasons ("**ISOR**"), which is released for comment by the public, and also for public peer review by the Air Quality Advisory Committee ("**AQAC**"). AQAC members are appointed by the President of the University of California for their expertise in the range of subjects covered in the ISOR, including health, exposure, air quality monitoring, atmospheric chemistry and physics, and effects on plants, trees, materials, and ecosystems. The Committee provides written comments on the draft ISOR. ARB staff next revises the ISOR based on comments from AQAC and the public. The revised ISOR is then released for a 45-day public comment period prior to consideration by the Board at a regularly scheduled Board hearing."[16] California law authorises CARB to develop and adopt specific rules and regulations needed to achieve healthful air quality. Similar to the US federal regime, regulatory agencies in California, such as CARB, must

[15] https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

[16] https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

	comply with a formal rulemaking process which involves the proposal of a draft Initial Statement of Reasons ("**ISOR**"), which is published for public comment and peer review by the Air Quality Advisory Committee. The ISOR is revised based on comments received and then rereleased for another round of public comments before adopting final rules and regulations.[17,18]
4. Do laws and regulations of the State of California prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	The goal of CARB enforcement programs is to achieve compliance with each and every regulation the agency adopts. To achieve this goal, CARB pursues cases of non-compliance, brings those companies into compliance, and assesses penalties that act as a deterrent to future non-compliance. The following is an example of enforcement actions taken by CARB in 2016 and early 2017. Volkswagen and sister companies Audi and Porsche installed defeat devices in 85,000 diesel-fueled vehicles sold in California, although these vehicles did not comply with emissions standards. CARB engineers identified these illegal actions, and the resulting enforcement settlement is historic in scope: US$25 billion in civil and criminal penalties nation-wide and six company staff indicted for criminal acts. The resulting settlement agreement negotiated between the companies, consumers, the United States, and CARB addresses each of the illegal vehicles, compensates consumers for misleading them, and mitigates harm to the environment and to zero emission vehicle markets. As a condition of settlement here in California, the companies will pay more than US$1.4 billion in mitigation and investments that will reduce emissions and support zero-emission technologies so critical to California's low carbon and clean air future. In addition to Volkswagen, CARB settled 220 cases in more than 15 different regulatory programs, assessing more than US$13 million in penalties, and closed 2,900 citations, collecting an additional US$2.8 million in penalties. In 2016, staff initiated a policy to develop new Supplemental Environmental Projects ("**SEPs**") benefiting disadvantaged communities. This policy is being implemented now, in 2017. In 2016, violators paid more than US$1.8 million of penalty funds to support existing SEPs including over US$1,000,000 to the School Bus SEP to upgrade school buses, more than US$722,000 to the California Council on Diesel Education and Training for funding equipment and scholarships at community colleges to train diesel mechanics on proper maintenance of diesel engines, and US$35,343 for training students on small off-road engine repair.

[17] https://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

[18] https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/Regular-Rulemaking-Flowchart_FINAL_June-2014-2.pdf

5. What are the best practice guidelines in the State of California (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	There are no legislatively-proscribed best-practices in California. There are incentives (see e.g. below) for individuals and corporations to exceed state air quality standards and environmental goals, but best practices, *per se*, are only discussed at the state-level in an academic context. According to a concept paper published by CARB in February 2018,[19] best practices are being researched presently and publication thereof may be forthcoming. **<u>Carl Moyer Program</u>** The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) provides grant funding for cleaner-than-required engines and equipment. Local air districts administer these grants and select which projects to fund. CARB works collaboratively with the districts and other stakeholders to set guidelines and ensure the Program reduces pollution and provides cleaner air for Californians. The Carl Moyer Program achieves reductions in emissions of key pollutants which are necessary for California to meet its clean air commitments under regulatory requirements. Eligible projects include cleaner on-road trucks, school and transit buses, off-road equipment, marine vessels, locomotives, agricultural equipment, light duty vehicle scrap, and lawn mowers.[20]
6. Please provide details of any case law interpreting the State of California's domestic and international obligations in respect of air pollution control strategies.	The state of California's courts play a role in enforcing the Federal Clean Air Act (see questionnaire re: US federal law). For example, in 2004, EPA took the position that it had no power under the federal Clean Air Act to regulate greenhouse gas (GHG) pollution, forcing Massachusetts, California and other states to file suit. In April 2007, the U.S. Supreme Court ruled that greenhouse gases are "air pollutants" under the CAA. As a result of California's victory in Massachusetts v. EPA, EPA began regulating GHG pollution.[21] Further, the Attorney General of California defends challenges to California's clean air laws. For example, the Attorney General has successfully defended the Cap and Trade program in two separate lawsuits. The Cap and Trade program is a cornerstone of CARB's efforts to reach the target of getting to 1990 emission levels of GHGs by 2020. The program applies to the largest emitters in the state, reaching approximately 85% of total

[19] https://ww2.arb.ca.gov/sites/default/files/2018-02/capp_concept_paper_february_2018.pdf

[20] https://www.arb.ca.gov/msprog/moyer/moyer.htm

[21] https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/Massachusetts_v_EPA.pdf

	state-wide GHG emissions. **Our Children's Earth Foundation v. California Air Resources Board**[22] Petitioner challenged provisions in California's Cap and Trade program that allow a limited amount of a party's compliance obligations to be met with offset credits (verified greenhouse gas emission reductions from sources not covered by the program). The court held that CARB did not exceed its power under the California Global Worming Solutions Act of 2006. **California Chamber of Commerce v. State Air Resources Board**[23] Petitioners challenged one aspect of the Cap and Trade program's method for distributing allowances (permits to emit greenhouse gases), specifically CARB's use of auctions to distribute a portion of such allowances (the remainder is distributed by other means, including free distribution). The Attorney General successfully defended the Cap and Trade program at the trial court and court of appeal, and in June 2017, the State Supreme Court denied plaintiffs petitions for review, effectively bringing the case to a close. "…we hold that the Legislature gave broad discretion to the Board to design a distribution system, and a system including the auction of some allowances did not exceed the scope of legislative delegation. Further, the Legislature later ratified the auction system by specifying how to use the proceeds derived therefrom." **Communities for A Better Environment v. South Coast Air Quality Management Dist.**[24] Labour organizations and environmental group brought action against air quality management district, challenging issuance of permits enabling oil refinery's project to produce ultra-low sulfur diesel. In interpreting CEQA, courts accord the CEQA Guidelines great weight except where they are clearly unauthorized or erroneous.

[22] https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ocef-v-arb-offsets-case-1st-dca-opinion.pdf?

[23] https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/cal-chamber-v-abr-3rd-dca-opinion.pdf

[24] 48 Cal. 4th 310, 226 P.3d 985 (2010)

European Union

Question	Response
Please provide an executive summary of your responses to questions 1-7 below.	The European Union ("**EU**") has adopted broad policy objectives relating to air quality, which are closely linked to the protection of human health. The EU adopts a science-based approach to the development of air quality standards, making reference to the guidelines adopted by the World Health Organisation. Air quality standards are primarily governed by a framework directive and the fourth daughter directive which collectively set out limit values and target values for Particulate matter **PM_{10}**[25] and **$PM_{2.5}$**[26], sulphur dioxide, nitrogen dioxide, lead, benzene, and carbon monoxide, as well as arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons. Member States are required to implement air quality plans to the extent those limit values and target values are exceeded for a period of time, failing which the European Commission has powers to enforce breaches of the directive through the European Court of Justice. Separately, national emissions of certain pollutants (nitrogen oxides, sulphur dioxide, non-methane volatile organic compounds, ammonia and fine particulate matter) are regulated through a separate directive, which incorporates provisions of the UN's Gothenburg Protocol. (See Q(1)(iv) for a description of the Gothenburg Protocol) A directive regulating the pollutant emissions from the combustion of fuels in medium sized plants has recently been enacted as part of the EU's current Clean Air Policy Package, which supplements existing legislation on other industrial emissions. Targeted regulations have also been passed focusing on particular sources of emissions.
1. What is the legal framework for air quality law and regulation in the EU?	Within the EU, air pollution is regulated mainly by way of directives, i.e. legal acts which require Member States to achieve a particular result without dictating the means of achieving that result. These are distinguished from regulations which are self-executing and do not require any implementation. Pursuant to article 193 of the Treaty on the Functioning of the European Union ("**TFEU**"), Member States may maintain or introduce more stringent measures relating to any of the EU provisions. In 2013, the European Commission (the "**Commission**") adopted a Clean Air Policy Package which

[25] **PM_{10}** refers to atmospheric particulate matter (PM) that have a diameter of less than 10 micrometres.

[26] **$PM_{2.5}$** refers to atmospheric particulate matter (PM) that have a diameter of less than 2.5 micrometres.

Question	Response
	comprised proposals for air quality objectives for the period up to 2030. As part of the policy proposal, the Commission would adopt: i. the clean air programme for Europe, which outlines measures to ensure that existing targets are met and setting out new air quality objectives for the period up to 2020[27]; ii. a revised national emissions ceilings directive, with strict emission ceilings for the six main pollutants; iii. a proposed directive to reduce pollution from medium-combustion plants; and iv. a proposal to approve amended rules on long-range transboundary air pollution (the Gothenburg Protocol) at EU level. The legislations enacting the twin-track proposals of implementing air quality standards and emission mitigation controls are set out below. **(i) Air Quality Directives under the Clean Air Programme** The EU has enacted and consolidated air quality directives which set pollutant concentrations thresholds that shall not be exceeded in a given period of time, with the aim of harmonising air quality standards throughout the EU. The directives currently in effect are: • directive 2008/50/EC on ambient air quality and cleaner air for Europe ("**Air Quality Directive**") which consolidated a number of earlier directives; and • directive 2004/107/EC of the European Parliament and of the Council relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air ("**Fourth Daughter Directive**"). The existing directives were consolidated in part into the Air Quality Directive in order to incorporate the latest health and scientific developments (recital 3) and it is anticipated that once experience is gained by Member States in respect of the implementation of the Fourth Daughter Directive, that it will be merged with the provisions of the Air Quality Directive (recital 4).

[27] These also build upon the 2005 Thematic Strategy on Air Pollution (COM (2005) 446 final); and the objectives relating to the environment and health as set out in article 7 of the Sixth Environmental Action Programme (decision 1600/2002/EC), and in the Seventh Environmental Action Programme (decision 1386/2013/EU).

Question	Response
	In October 2013, the EU signed the Minamata Convention on Mercury, which establishes a global regulatory framework to minimise the health impacts from mercury. The Convention sets out a range of measures, including measures intended to control air emissions from coal-fired plants, coal-fired industrial boilers, certain non-ferrous metals production operations, waste incineration and cement production. **(ii) National Emission Ceilings Directive** The EU has enacted directive 2016/2284/EU on the reduction of national emissions of certain atmospheric pollutants (the "**National Emission Ceilings Directive**") which imposes emission ceilings (or limits) for emissions for five key air pollutants (nitrogen oxides, sulphur dioxide, non-methane volatile organic compounds, ammonia and fine particulate matter) that harm human health and the environment. The National Emission Ceilings Directive entered into force on 31 December 2016. **(iii) Medium Combustion Plant Directive** The EU has enacted directive 2015/2193/EU on the limitation of emissions of certain pollutants into the air from medium combustion plants (the "**MCP Directive**"), which regulates pollutant emissions from the combustion of fuels in plants with a rated thermal input equal to or greater than 1 megawatt (1 MWth) and less than 50 MWth. The MCP Directive entered into forced on 18 December 2015. The MCP was enacted further to the Seventh Environmental Action Programme (decision 1386/2013/EU) (the "**7th EAP**"). Note that in the context of industrial emissions the EU has also enacted: • directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (the "**LCP Directive**"), which regulates pollutants into the air from large combustion plants – those whose rated thermal input is equal to or greater than 50 MW. The LPC entered into force on 27 November 2011. • directive 2009/125/EC establishing a framework for the setting of eco-design requirements for energy-related products (the "**Eco-design Directive**"), which regulates the pollutants from small combustion plants and appliances. • directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (the "**IED Directive**"), which adopts an integrated approach taking into account the whole environmental performance of the plant, covering emissions to air, water and land, generation of waste, use of raw materials, energy efficiency, noise, prevention of accidents, and restoration of the site upon closure,

Question	Response
	as well as emission limit values based on the best available techniques. • directive 1994/63/EC and directive 2009/126/EC on petrol storage and distribution, which aim to prevent emissions to the atmosphere of volatile organic compounds by imposing measures on key steps in the storage and distribution of petrol from terminals, to service stations, and to individual vehicles. **(iv) Implementation of the Gothenburg Protocol** The Protocol to Abate Acidification, Eutrophication and Ground-level Ozone of 1999 (as revised in 2012) (the "**Gothenburg Protocol**") is a protocol to the United Nations Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution of 1979 (the "**Convention**"). The Gothenburg Protocol sets out specific emission reduction commitments for each Convention state. It was revised in 2012 to include new emission reduction commitments. As per the Commission's Clean Air Policy Package, these commitments were approved by the European Council on 17 July 2017. The National Emission Ceilings Directive (defined above) implements the reduction targets set out in the Gothenburg Protocol. The Commission has also enacted a range of regulations regarding emissions from different sources.[28]
2. Do EU laws and regulations expressly provide for public health protection from air pollution as an objective? If so, how?	Protection of public health is included as a priority in the EU's Clean Air Programme.[29] In addition, 7th EAP sets out European environment policy until 2020, and reiterated that the "*Union has agreed to achieve levels of air quality that do not give rise to significant negative impacts on, and risks to, human health and the environment*" (recital 15). Priority Objective 3 of the 7th EAP is to "*safeguard the Union's citizens from environment-related pressures and risks to health and well-being*" (article 1(c)). To achieve these air quality objectives by 2020, the EU aims to ensure that outdoor air quality in the Union has

[28] For example, regulations govern air emissions from road vehicles - both light-duty vehicles (Commission Regulation (EU) 2017/1151; Commission Regulation (EU) 2017/1154; Commission Regulation (EU) 2016/646; Commission Regulation (EU) 2016/427; Commission Regulation (EC) No 692/2008; Regulation (EC) No 715/2007) and heavy duty vehicles (Commission regulation (EU) 2016/1718; Regulation (EC) No 595/2009; Commission Regulation (EU) 582/2011). See the Commission's "Environment" page for Clean Air for further details: http://ec.europa.eu/environment/air/index_en.htm <accessed 6 April 2018>.

[29] For example, the Commission noted that "*air pollution is the number one environmental cause of premature death in the EU, responsible for ten times the toll of road traffic accidents*." (see Communication, page 5).

Question	Response
	significantly improved, moving closer to World Health Organisation ("**WHO**") recommended levels, while indoor air quality has improved, informed by the relevant WHO guidelines (Annex, paragraph 54a, 7th EAP). **Air Quality Directive** The recitals to the Air Quality Directive refer to the need to "*protect human health and the environment as a whole*" and "*appropriate objectives set for ambient air quality taking into account relevant World Health Organisation standards, guidelines and programmes*" (recital 2). In addition, there is emphasis on the significant negative impacts on human health of fine particulate matter ($PM_{2.5}$) (recital 11). Article 1 (Subject matter) lays down measures aimed at the following: 1. *"defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole;* 2. *assessing the ambient air quality in Member States on the basis of common methods and criteria;* 3. *obtaining information on ambient air quality in order to help combat air pollution and nuisance and to monitor long-term trends and improvements resulting from national and Community measures;* 4. *ensuring that such information on ambient air quality is made available to the public;* 5. *maintaining air quality where it is good and improving it in other cases;* 6. *promoting increased cooperation between the Member States in reducing air pollution."* **Fourth Daughter Directive** The recitals to the Fourth Daughter Directive state that "*scientific evidence shows that arsenic cadmium, nickel and some polycyclic aromatic hydrocarbons are human genotoxic carcinogens and that there is no identifiable threshold below which these substances do not pose a risk to human health. Impact to human health and the environment occurs via concentrations in ambient air and via deposition*." (recital 3). To achieve the aim of minimising the harmful effects on human health, paying particular attention to sensitive populations, and the environment as a whole, the Directive prescribes maximum target values for airborne arsenic, cadmium and nickel and polycyclic aromatic hydrocarbons. These are described further in response to question 4 below.

Question	Response
	National Emission Ceilings Directive Article 1 (Objectives and subject matter) of the National Emission Ceilings Directive says that the Directive establishes emission reduction commitments in "*order to move towards achieving levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment*". The recitals of the National Emission Ceilings Directive also refer to public health as an objective in numerous places, for example: • Recital 10: "*This Directive also contributes to reducing the health-related costs of air pollution in the Union by improving Union citizens' well-being, as well as to favouring the transition to a green economy*"; and • Recital 27: "*The aim of this Directive, inter alia, is to protect human health*". **MCP Directive** The objectives of the MCP Directive is the improvement of environmental quality and human health (recital 33). Article 1 (Subject Matter) of the MCP Directive states that the purpose of the Directive is to lay down rules to control emissions of sulphur dioxide, nitrogen oxides and dust into the air from medium combustion plants, and "*thereby reduce emissions to air and the potential risks to human health and the environment from such emissions*".
3. What public health objectives (if any) are integrated into the operative parts of relevant EU laws and/or regulations?	**Air Quality Directive** The operative parts of the Air Quality Directive refer to the "*the aim of avoiding, preventing or reducing harmful effects on human health and/or the environment as a whole*". In particular, this aim is integrated into the operative concepts of "*limit value*" and "*target value*" (as set out in the Schedules 1 to 3 to this questionnaire), which are calculated by reference to the harmful effects on human health and informed by guidelines set by the WHO. The Directive also prescribes "*long-term objective*" levels with the aim of providing effective protection of human health and the environment. Recognising the lack of evidence to indicate a threshold level below which **$PM_{2.5}$** would not pose a risk to human health, the Air Quality Directive mandates a general reduction of concentrations in the urban background (to ensure that large sections of the population benefit from improved air quality) (recital 11). To achieve this, Member States must ensure that the "*national exposure reduction targets*" laid down in section

Question	Response
	B of Annex XIV are met by 2020 (article 15(1)), and that the average exposure indicators for the year 2015 do not exceed the "*exposure concentration obligation*" level set out in section C of Annex XIV (article 15(2)). This is explained in response to question 4 below. This approach is combined with a target value and a prospective limit value for **$PM_{2.5}$** (recital 11; article 16). It is anticipated that following a review by the Commission, a legally binding national exposure reduction obligation will be established to replace the national exposure reduction target (article 32(1)). Further, the Air Quality Directive establishes a reporting system to ensure that the public are notified in the event that levels of **sulphur dioxide** and **nitrogen dioxide** in ambient air exceed stated thresholds in Section A of Annex XII (article 13(2); article 19). An alert threshold indicates a level which there is a risk to human health from brief exposure for the population as a whole and immediate steps are to be taken by Member States. The threshold levels will be measured over three consecutive hours at locations representative of air quality over at least 100 km2 or an entire zone or agglomeration, whichever is smaller. For example, for sulphur dioxide, the threshold will be 500 µg/m3 and for nitrogen dioxide it is 400 µg/m3 (section A, Annex XIII). For **ozone**, both an alert threshold and an information threshold (i.e. a level beyond which there is a risk to human health from brief exposure for particularly sensitive sections of the population and for which immediate and appropriate information is necessary) are prescribed in Annex XII (article 19). **National Emission Ceilings Directive** The operative parts of the National Emission Ceilings Directive contain the following public health objectives: • Article 6(2)(b) requires member states to take air quality objectives into account (which include the limit values and target values as defined in the Air Quality Directive and outlined above) when drawing up their national air pollution control programmes; and • Article 11(1) requires that the Commission report on progress towards "*ambient air quality guidelines published by the World Health Organisation*" and evaluate "*the health, environmental and socioeconomic impacts*" of the National Emission Ceilings Directive.
4. (a) What are the air quality objectives (including, but	**(a) air quality objectives (including, but not limited to, clear targets and express timelines)**

Question	Response
not limited to, clear targets and express timelines) under EU laws and regulations? (b) What is the process for setting such air quality objectives under EU laws and regulations?	At a policy level, the Commission in its Communication of the Clean Air Programme has indicated that "*[t]he long-term EU objective for air pollution implies no exceedance of the World Health Organisation guideline levels for human health (which may also develop over time) and no exceedance of the critical loads and levels which mark the limits of ecosystem tolerance. The new strategy pursues two priorities in parallel: to achieve full compliance with existing legislation by 2020 by the latest, and to set a pathway for the EU to meet the long-term objective*." To this end, the new air policy objectives to be achieved by 2030 are to reduce health impacts (specifically, premature mortality due to particulate matter and ozone) by "-52%" (which is approximately 58,000 deaths) and to achieve the ecosystem area exceeding eutrophication limits of "35%" (Communication, page 6). **Air Quality Directive** • The Air Quality Directive establishes binding standards for ambient air quality, through setting limit values for concentrations of various pollutants: Particulate matter PM_{10} and $PM_{2.5}$, sulphur dioxide, nitrogen dioxide, lead, benzene, and carbon monoxide. • Member States are required to establish zones and agglomerations reflecting population density (article 4, and as those terms are defined in article 2). In these zones and agglomerations, Member States are required to undertake assessments of air pollution levels using measurements, modelling and other empirical techniques, and report air quality data to the Commission (articles 5, 6 and 7). • Limit values (defined in article 2) are levels fixed on the basis of scientific knowledge, with the aim of avoiding, preventing or reducing harmful effects on human health and/or the environment as a whole. These levels must be attained within a given period and not to be exceeded once obtained. The time periods are subject to a successful application to the Commission for an extension (article 22). • The Directive prescribes annual average limits and short-term (one day or one hour) limits, which Member States must not exceed throughout the zones and agglomerations, subject to a margin of tolerance (article 13). The levels and deadlines vary for different pollutants: ○ For **sulphur dioxide, PM_{10}, lead and carbon monoxide**, concentrations in ambient air must not exceed the limit values laid down in Annex XI (*Limit Values for the Protection of Human Health)* (article 13) (see Schedule 1 to this questionnaire). These limit values were

Question	Response
	to be met by 1 January 2005. ○ For **nitrogen dioxide** and **benzene**, concentrations in ambient air must not exceed the limit values laid down in Annex XI (*Limit Values for the Protection of Human Health)* (article 13) (see Schedule 1 to this questionnaire). These limit values were to be met by 1 January 2010. ○ For **$PM_{2,5}$**, Member States are obliged to take all necessary measures not entailing disproportionate costs to ensure that concentrations did not exceed the target value laid down in Annex XIV (*National exposure reduction target, target value and limit value for $PM_{2,5}$*) by 1 January 2010 (article 16). The limit values prescribed for $PM_{2,5}$ were calculated in two stages: stage one (for 25 µg/m3) must have been met 1 January 2015; and stage two (for 20 µg/m3) by 1 January 2020. Member States are also obliged to seek to reduce exposure to $PM_{2,5}$ with a view to attaining the national exposure reduction target by 2020 (as laid down in Annex XIV) (article 15) (see Schedule 2 to this questionnaire). ○ For **ozone**, target values (to be achieved by 1 January 2010) and long-term objectives are set out in Annex VII (article 17) (see Schedule 3 to this questionnaire). • Where levels of pollutants in ambient air exceed any limit value or target value, taking into account any relevant margin of tolerance in each case, Member States must establish air quality plans for those zones and agglomerations in order to achieve the related limit value or target value specified in Annexes XI (Limit Values) and Annex XIV (Target Values) (article 23). These plans must set out measures established to attain the limit values or target values. Member States are permitted to discount natural sources of pollution when assessing against limit values (article 20). • Where a breach occurs after the relevant deadline has expired, the air quality plan must "*set out appropriate measures, so that the exceedance period can be kept as short as possible*" (article 23). The information that should be included in the air quality plans are prescribed in section A of Annex XV. Air quality plans must be communicated to the Commission without delay, but no later than two years after the end of the year when the first exceedance was observed (article 23). • Where there is a risk that levels of pollutants will exceed the alert thresholds in Annex XII, Member States are required to draw up action plans "*indicating measures to be taken in the short term in*

Question	Response
	order to reduce the risk or duration of such an exceedance." (article 24(1)). There is a stricter threshold relating to levels of ozone (article 24(2)). **Fourth Daughter Directive** • Member States must take all necessary measures to ensure that from 31 December 2012 concentrations of arsenic, cadmium, nickel and benzoapyrene (the "**Fourth Daughter Directive Pollutants**") in ambient air do not exceed the target value laid down in Annex 1 (article 3(1)) as follows: o Arsenic: 6 ng/m3 o Cadmium: 5 ng/m3 o Nickel: 20 ng/m3 o Benzoapyrene: 1 ng/m3 • For the zones and agglomerations in which the levels of the Fourth Daughter Directive Pollutants exceed the target levels, Member States shall demonstrate the application of all necessary measures set out in the directive, in particular at the predominant emission sources, in order to attain the target values (article 3). • Member States are required to conduct assessments of concentrations of ambient air quality with respect to the Fourth Daughter Directive Pollutants, which may be supplemented by modelling techniques (article 4). • Member States are required to report to the Commission assessment information on a yearly basis, as well as information relating to any zone and agglomerations where any target value is exceeded (article 5(1)). **National Emissions Ceiling Directive** • Member States must limit their annual anthropogenic emissions of sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and fine particulate matter (the "**National Emission Ceilings Directive Pollutants**") in accordance with a series of Member State-specific targets (article 4(1)). These reduction commitments are set out for any year from 2020 to 2029, and stricter ones for any year from 2030 onwards.

Question	Response
	• Member States must take necessary measures to limit their 2025 National Emission Ceilings Directive Pollutants emissions based on a linear trajectory for their target from 2030 onwards (article 4(2)). They need not meet this 2025 target if it is economically or technically more efficient not to do so, so long as they still meet their emission reduction commitment for 2030. If they do not plan to meet the 2025 target, this must be outlined in the Member State's national air pollution control programme. • Annex II sets out the Member State-specific reductions that must be made in a series of tables. For example, compared with 2005 emissions, Belgium must have a 66% reduction in its sulphur dioxide emissions for any year from 2030, whereas Cyprus must make a 93% reduction (annex II, table A). • To achieve their obligations under article 4, Member States must draw up, adopt and implement national air pollution control programmes (article 6). These must be updated at least every four years. If the obligations in article 4 are not complied with (or if there is risk of non-compliance), Member States must update the emission reduction policies and measures within 18 months of submitting their emission data. • Member States must prepare national emission inventories and projections in relation to the National Emission Ceilings Directive Pollutants (article 8). These must be submitted to the Commission and European Environment Agency, who must review such data to ensure its accuracy (article 10). **MCP Directive** • Member States shall apply the emissions limit values set out in Annex II to medium combustion plants in order to reduce their emissions to air and the potential risks to human health and the environment (article 6(1)). • From 1 January 2025, emissions of sulphur dioxide, nitrogen oxide and dust from an existing medium combustion plant with a rated thermal input greater than 5 MW shall not exceed the emission limit values set out in tables 2 and 3 of Part 1 of Annex II, and from 1 January 2030, emissions of sulphur dioxide, nitrogen oxide and dust from an existing medium combustion plant with a rated thermal input less than or equal to 5 MW shall not exceed the emission limit values set out in Tables 1 and 3 of Part 1 of Annex II (article 6(2)). Various exemptions to compliance with the

Question	Response
	limit values apply (article 6(3), (5), (6), (8)), and the competent authority may grant a limited time derogation from the obligation to comply with the emission limit values (article 6(11)). • Obligations are also imposed on the operators to comply with emissions limits, and to record and monitor results (article 7). • Compliance with the Directive requires registration with a permit (article 5). Deadlines for registration apply for existing combustion plants (article 5). • The MCP Directive does not apply to waste incineration and co-incineration plants, internal combustion engines in non-road mobile machinery, gas turbines on offshore platforms, reactors in the chemicals industry (article 2). **(b) the process for setting such air quality objectives** In developing the EU's Clear Air Policy Package: • As explained in response to (a) above, the EU's long-term objective will be to not exceed the WHO guideline risk levels. For example, the WHO guidelines are expressly referenced in recital 3 of the Air Quality Directive. • As explained in the Commission's Q&A document on the EU Clean Air Policy Package, the policy proposals were based on the "*latest scientific findings*"[30]. The Commission worked with the WHO to review and validate the WHO air quality guidelines and developed "*the most advance EU emission projection model currently available*". (Commission, Questions and Answers on the EU Clean Air Policy Package, dated 18 December 2013, question 14) • The Commission also recognised that the air quality standards under the Air Quality Directive are less stringent than the WHO air quality guidelines on air pollution, which represents the level where health risks are minimised. However, the Commission noted that it was clear that further tightening of existing EU air quality standards would be ineffective unless real cuts in air pollution from the main sources were apparent. As many Member States were facing infringement cases for failing to reach the existing standards, proposing stricter standards would be counter-productive. (Commission, Questions and Answers on the EU Clean Air Policy Package, dated 18 December

[30] See also: item 54(i) of the Annex to the 7th EAP (cited above), which requires: "*implementing an updated Union air quality policy, aligned with the latest scientific knowledge*…"

Question	Response
	2013, question 8). • Generally, all directives on air quality will pass through the ordinary legislative process as set out in the TFEU (initiative by the Commission, adoption by the Council and the Parliament), and may be subject to trilogue negotiations amongst the three bodies. Implementing measures are adopted and modified by the Commission, assisted by a committee composed of representatives from all EU Member States. Further information can be found on the Commission's website. **Air Quality Directive** The Air Quality Directive adopted and consolidated the existing air quality objectives that were established in the previous ambient air quality framework directive[31] and daughter directives. The Air Quality Directive however did introduce new measures in respect of $PM_{2.5,}$ targeting exposure of the population to fine particles. In this regard, the Commission's Proposal for the Air Quality Directive sets out a summary of its consultation process (for instance, it held approximately 13 main meetings with stakeholders including industry groups, Member States and NGOs, and held over one hundred meetings with technical working groups), from which it received evidence that • there is a health risk from $PM_{2.5}$, • $PM_{2.5}$ is a better metric for anthropogenic contributions to ambient levels of particulate matter, and • the risk from the coarse fraction (between $PM_{2.5}$and PM_{10}) cannot be ignored. From this, it considered five possible options for controlling human exposure to $PM_{2.5}$. (Explanatory Memorandum to the Commission's Proposal for a Directive on ambient air quality and cleaner air for Europe (COM(2005) 447), page 4). **Fourth Daughter Directive** As explained in the Commission's Proposal for the Fourth Daughter Directive, the ambient air concentration levels for arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons were concluded by the

[31] In the Council directive 96/62/EC on ambient air quality assessment and management (the Framework Directive, now repealed), it was noted that "*the numerical values for limit values, alert thresholds and, as regards ozone, target values and/or limit values and alert thresholds are to be based on the findings of work carried out by international scientific groups active in the field*." (recital).

Question	Response
	Working Groups (comprising of experts of Member States, industry, non-governmental organisations, the European Environment Agency, the WHO and other representatives of international scientific groups), which aimed to minimise the harmful effects on human health. More specifically (as set out in section 7, draft Explanatory Memorandum): • This assessment was based on the concept of unit risk, which corresponds to the extra risk to conceive cancer, if continuously exposed to 1 µg/m3 for a lifetime. • For those pollutants where WHO provide a unit risk, the thresholds related to an acceptable excess lifetime risk. • As the WHO provides no recommendations as to what level of risk is acceptable, the Working Group adopted the approach of using an additional lifetime risk of one in a million as the starting point (as used for directive 98/83/EC on the quality of water intended for human consumption). • Where no unit risk could be provided the assessment of impacts on human health has regard to non-cancer effects. The proposed protection levels were supported by the Scientific Committee for Toxicity, Ecotoxicity and Environment. • In summary, the Working Group recommended that: ○ For arsenic, instead of a unit-risk-approach (as adopted by the WHO), they supported a "pseudo-threshold" approach concluding that annual mean concentrations of total arsenic below a range of 4 to 14 ng/m3 would minimise harmful effects on health (section 7.1, draft Explanatory Memorandum) ○ For cadmium, an annual mean of the total concentration of 5 ng/m3 should not be exceeded to prevent adverse non-cancer effects (adopting the WHO recommendation), which corresponds to accepting at most an excess life-time risk of 20 cases per million (section 7.2, draft Explanatory Memorandum) ○ For mercury, based on a LOAEL (lowest-observed-adverse-effect-level)-approach, an annual average concentration of 50 ng Hg(0) per m3 should not be exceeded in ambient air (Section 7.3, draft Explanatory Memorandum) ○ For nickel, the Committee for Toxicity, Ecotoxicity and Environment considered that a

Question	Response
	concentration of 20 ng/m3 provided reasonable protection from carcinogenic effects (Section 7.4, draft Explanatory Memorandum) ○ For polycyclic aromatic hydrocarbons, based on the WHO's unit risk of 8.7 x 10-5 (ng/m³)-1 for BaP, an annual average concentration was found to be 0.01 ng/m3 (section 7.4, draft Explanatory Memorandum). • These were largely incorporated into the Commission's Proposal (see section 11, draft Explanatory Memorandum). **National Emissions Ceiling Directive** • The emission reductions for between 2020 to 2029 are identical to those set out in the Gothenburg Protocol (recital 7). The targets for 2030 onwards are based on: ○ the estimated reduction potential of each Member State contained in the Thematic Strategy on Air Pollution report 16 of January 2015 (the "**TSAP Report**"); ○ an examination of the differences between national estimates and those in the TSAP Report; and ○ the political objective to maintain the overall health impact reduction by 2030 (compared with 2005) as close as possible to that of the Commission proposal for the National Emission Ceilings Directive (recital 14).
5. Do EU laws and regulations prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	Legal and administrative responsibility for compliance with EU laws rests with each Member State in the manner set out below for each relevant directive. **Air Quality Directive** Pursuant to article 30 of the Air Quality Directive, penalties for non-compliance of the national provisions implementing the Directive shall be determined by Member States, which shall also take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive. Examples include declarations, mandatory orders and directions from national courts addressed to the relevant national authority for failure to comply with the requirements of the directive. The Air Quality Directive also includes annual reporting obligations on Member States to the Commission (articles 27 and 28), which is assisted by the Ambient Air Quality Committee (article 29). Member States are

Question	Response
	otherwise required to designate at the appropriate levels the competent authorities and bodies responsible for assessment and measurement of ambient air quality (article 3). **Fourth Daughter Directive** Article 9 (penalties) of the Fourth Daughter Directive is identical to article 30 (penalties) of the Air Quality Directive (outlined above). **National Emissions Ceiling Directive** In their national air pollution control programmes, Member States must cover the responsibilities attributed to national, regional and local authorities for the implementation of the programmes (annex III, part 1, paragraph 1(a)(ii)). In outlining the measures and policies selected for adoption to comply with emission reduction commitments, the national air pollution control programmes must set out the competent authorities responsible for those policies (annex III, part 1, paragraph 1(a)(c)). Article 18 (penalties) of the National Emission Ceilings Directive is (except for a minor amendment) identical to article 30 (penalties) of the Air Quality Directive (outlined above). **MCP Directive** Members States are obliged to set up effective systems to check compliance with the requirements of the MCP Directive (article 8(2)), and in the event of non-compliance, Member States must ensure that the competent authority requires the operator to take any measures necessary to ensure that compliance is restored without delay (article 8(3)). Where non-compliance causes a significant degradation of local air quality, the operation of the medium combustion plant shall be suspended until compliance is restored (article 8(3)). Member States must also designate the competent authorities responsible for carrying out the obligations arising from the MCP Directive (article 10). Article 16 (penalties) of the MCP Directive is substantially the same as article 30 (penalties) of the Air Quality Directive (outlined above). **Enforcement action by the Commission** In the event of non-compliance by the Member State, under EU law the Commission is empowered to: • Take infringement action (pursuant to article 258 TFEU). The Commission provides the Member

Question	Response
	State with a formal notice requesting further information. This is usually followed by a reasoned opinion with a formal request to comply with EU law[32], and if the non-compliance continues the Commission can make a reference to the European Court of Justice (the "**Court**"). Member States must take measures necessary to comply with the judgment of the Court. • Request the Court to impose financial penalties where a Member State fails to rectify the violation (article 260 TFEU). In that event, the Commission may refer the country back to the Court a second time, where it may also propose the Court to impose financial penalties. The penalty can take the form of a lump sum or penalty payment. Financial penalties may also be requested at the first judgment (under article 258 TFEU) where a Member State has failed to properly implement legislation for a Directive within the deadline. • Request that the Court orders interim measures before judgment is given (article 279 TFEU). Such measures are only sporadically granted by the Court, where there is urgency (i.e. a risk of serious and irreparable harm) and a *prima facie* case. . We have not identified any examples of the Court granting interim measures in the context of air pollution matters, although the Court has found in one case[33] that immediate economic harm outweighed the longer term ambient air objectives.

[32] For example, on 15 February 2017, the Commission sent a final warning to Germany, France, Spain, Italy and the UK of continued breaches of air pollution limits for nitrogen dioxide (see: European Commission Press Release 'Commission warns Germany, France, Spain, Italy and the United Kingdom of continued air pollution breaches', 15 February 2017). A Ministerial meeting with 9 Member States (Czech Republic, Germany, Spain, France, Italy, Hungary, Romania, Slovakia and the United Kingdom) was also held on 30 January 2018 in Brussels to discuss the continuing air pollution breaches (see Press Statement by Commissioner Karmen following Air Quality Ministerial meeting, Brussels, 30 January 2018; and European Commission Press Release).

[33] In ***Commission v Austria*** Case C-320/02 R ECLI:EU:C:2003:543 (2 October 2003), Austria passed a national law implementing a ban on driving lorries carrying certain types of goods, pursuant to its policy to improve ambient air quality and protection of public health. In ongoing proceedings, the Commission applied for interim measures for the ban to be suspended, alleging that the ban would have a direct and significant effect on the activity of haulage undertakings in the market and more generally on the proper working of the internal market. The Court weighed up the balancing interests and the Court found, at paragraphs 90 – 108, that the pursuit of the EU's policy on ambient air quality is determined on the basis of long-term objectives and since the air pollution in the contested area that the Austrian regulation was targeted to improve would only be addressed by a structured approach over the medium term, that objective would not be jeopardised by the temporary non-application of the regulation. By contrast, it stressed the seriousness of serious economic effect and financial stability of many Community undertakings. On that basis, the Court decided that the interim measures should be extended.

Question	Response
	However, in other areas of environmental law more broadly, the Court has more frequently granted interim measures, in particular in the context of habitat preservation or wildlife management.[34]
6. What are the best practice guidelines in the EU (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	We have not identified best practice guidelines that apply specifically to air quality regulation. However, the Commission has issued guidance relating to implementation of environmental law more generally. For example: • Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Implementing European Community Environmental Law (SEC (2008) 2851) (COM (2008) 773 Final) • Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Improving the delivery of benefits from EU environment measures: building confidence through better knowledge and responsiveness (COM (2012) 95 Final) **Air Quality Directive** • The Commission publishes examples of best practices for short term action plans, including examples of best practice for the protection of sensitive population groups, such as children (article 24(4)). An example provided to the Commission for a short term action plan can be found at p. 55 of this report produced for the Commission dated 2012. • Reporting under the Air Quality Directive is made public, free of charge, and made available on the Internet or other accessible means (including information about ambient air quality levels, postponement decisions pursuant to article 22(2), any exemptions pursuant to article 22(2), air quality plans as provided in article 22(2) and article 23 and programmes referred to in article 17(2)) (article 26(1)). • Member States shall also make available to the public annual reports for all pollutants covered by

[34] For example, interim measures were granted in ***Commission v Poland*** Case C-441/17 R (20 November 2017) to order Poland to cease the application of various forest management plans that were inconsistent with the EU's Habitats Directive (Council Directive 92/43/EEC), given the immediate risk of irreparable harm for the damage habitats and the integrity of the Natura 2000 Puszcza Bialowieska site. In ***Commission v Malta*** Case C-76/08 R (24 April 2008), in the context of ongoing infringement proceedings, as an interim measure the Court ordered Malta to refrain from adopting measures in respect of the hunting of quails and turtle doves on spring migration. The Court found that the interest in protecting the common heritage of the Community outweighed any interest in the hunting fraternity in Malta.

Question	Response
	the Air Quality Directive (article 26(2)). **NECD** • The NECD required the Commission to set up a European Clean Air Forum to, amongst other purposes, "*exchange experience and good practices*" (article 12). The first EU Clean Air Forum met on 16 and 17 November 2017. Although it does not set out any best practice guidelines, the report of the Forum outlines different approaches to tackling air pollution, through the contributions of its various speakers.
7. Please provide details of any case law interpreting the EU's regional and international obligations in respect of air pollution control strategies.	The following cases interpret provisions of the **Air Quality Directive**: (i) ***Commission v Poland***, Case C-336/16 EU:C:2018:94 (22 February 2018) • The Commission brought an action before the Court on the basis that Poland was not in compliance with the daily and annual limit values for PM_{10} (particulate matter composed of a mixture of organic and non-organic substances present in the air) in several zones and agglomerations and that it had not correctly transposed the provisions of the Air Quality Directive concerning air quality plans, and had therefore failed to fulfil its obligations. • In its judgment, the Court found that: ○ The fact of exceeding the limit values for PM_{10} concentrations in the ambient air is sufficient in itself to establish a failure to fulfil obligations (paragraph 62). ○ Data derived from Poland's annual reports show that from 2007 to 2014, it regularly exceeded the daily limit values for PM_{10} concentrations in 35 zones and, that the annual limit values for such concentrations in nine zones. The Court determined that the exceedance was regarded as persistent (paragraph 63). ○ The obligation on Poland to establish air quality plans (in the event that the limit values for PM_{10} concentrations in ambient air and being exceeded) has been binding since 11 June 2010. Poland had adopted plans subsequently setting deadlines for ending such exceedances as between 2020 and 2024 depending on the zones. The Court held that such long deadlines were not justified (paragraph 97). ○ Accordingly, the Court held that Poland had failed to fulfil its obligations under Article 13(2),

Question	Response
	the second subparagraph of Article 23(1) and Article 22(3) of the Air Quality Directive. ○ While the Court did not make any specific orders requiring Poland to take certain actions, if Poland continues to be in breach of the relevant regulations and prescribed air quality limits, the Commission could bring further court action and a fine could then be imposed by the Court against Poland. ○ Since the judgment was handed down, Poland has amended its legislation on air quality and the environment and has introduced its own Clean Air programme. (ii) ***Commission v Bulgaria***, Case C-488/15 EU:C:2017:267 (5 April 2017) • The Commission brought an action before the Court on the basis that Bulgaria was not in compliance with the daily and annual limit values for PM_{10} concentrations pursuant to Article 13(1) of the Air Quality Directive. In particular, the Commission alleged that Bulgaria had exceeded the daily and annual limit values systematically and continuously from 2007 until at least 2013 in five zones and agglomerations; and failed to keep exceedances as short as possible as required under Article 23(1). • In its judgment, the Court found: ○ Exceeding the limit value is sufficient for a finding to be made that there has been an infringement of the provisions of Article 13(1) (paragraph 69). ○ Data from the annual air quality reports showed that Bulgaria exceeded the daily and annual limit values for PM_{10} concentrations in six zones and agglomerations from 2007 until 2014 (paragraph 71). ○ Bulgaria's arguments relating to (i) the application of the conditional exemption in Article 22(1) should apply, and that (ii) its efforts to reduce PM_{10} levels were hindered by its socio-economic situation, were not accepted by the Court (paragraphs 72-73 and 76-77). ○ The air quality plans pursuant to Article 23(1) may be adopted only on the basis of the balance between the aim of minimising the risk of pollution and the various opposing public and private interests. Therefore, the fact that a Member State exceeds the limit values for PM_{10} concentrations is not in itself sufficient to find that Member State has failed to fulfil its

Question	Response
	obligations under Article 23(1). Compliance with the provision will be determined on a case by case basis (paragraph 106-107, 108). ○ That Bulgaria had not implemented appropriate and effective measures to keep the exceedance period for limit values for PM_{10} concentrations as 'short as possible', within the meaning of the second paragraph of Article 23(1) (paragraph 117). ○ Accordingly, the Court held that Bulgaria had failed to fulfil its obligations under Article 13(1) (in conjunction with Annex XI) of the Directive, and the second paragraph of Article 23(1) of the Air Quality Directive (paragraph 119). (iii) ***ClientEarth***, Case C-404/13 EU:C:2014:2382 (19 November 2014) • ClientEarth, an environmental NGO, brought a case against the UK government for failure to comply with limit values for nitrogen oxide in 16 zones and agglomerations. The UK's air quality plans showed that these limits would not be achieved until 2020, or in the case of London, 2025. ClientEarth claimed that this failed to comply with the Air Quality Directive, which required compliance no later than 2015. The case went before the UK's Supreme Court, which made a reference to the Court in respect of four questions: (1) Where, under the Air Quality Directive, in a given zone or agglomeration conformity with the limit values for nitrogen dioxide was not achieved by the deadline of 1 January 2010 specified in Annex XI of the Directive, is a Member State obliged pursuant to the Directive and/or article 4 TFEU to seek postponement of the deadline in accordance with article 22 of the Directive, and (2) If so, what circumstances (if any) may a Member State be relieved of that obligation? (3) To what extent (if at all) are the obligations of a Member State which has failed to comply with article 13 affected by article 23 (in particular its second paragraph)? (4) In the event of non-compliance with articles 13 or 23, what (if any) remedies must a national court provide as a matter of European law in order to comply with article 30 of the Directive and/or article 4 or 19 TFEU? • The Court found: ○ (1) and (2) Article 22(1) must be interpreted to mean that, in order to postpone by a

Question	Response
	maximum of five years of the deadline specified by the directive for achieving conformity with the limit values for nitrogen dioxide specified in Annex XI, a Member State is required to make an application for postponement and to establish an air quality plan when it is objectively apparent, having regard to existing data, and notwithstanding the implementation by that Member State of appropriate pollution abatement measures, that conformity with those values cannot be achieved in a given zone or agglomeration by the specified deadline. There is no exception under the Directive to the obligation from Article 22(1) (paragraph 35, operative part I). ○ (3) Where it is apparent that conformity with the limit values for nitrogen dioxide established in Annex XI of the Directive cannot be achieve in a given zone or agglomeration by a Member States by 1 January 2010, and that Member State has not applied for postponement of that deadline under Article 22(1), the fact that an air quality plan which complies with the second subparagraph of article 23(1) has been drawn up, does not, in itself permit the view to be taken that the Member State has nevertheless met its obligations under article 13 (paragraph 49). ○ (4) Where a Member State has failed to comply with the second subparagraph of article 13(1) and has not applied for a postponement of the deadline as provided by article 22, it is for the national court having jurisdiction, should a case be brought before it, to take, with regard to the national authority, any necessary measure, such as an order in the appropriate terms, so that the authority establishes the plan required by the directive in accordance with the conditions laid down (paragraph 58). ○ The UK Supreme Court subsequently made an Order in this regard – please see Q(7)(i) of the UK Questionnaire. (iv) ***Janecek v Freistaat Bayern***, Case C-237/07 (9 October 2008) • An action was brought by Mr Janecek, who lived on Munich's central ring road. Measurements taken at the station approximately 900 m south of Mr Janecek's house showed that in 2005 and 2006, the limit value fixed for emissions of PM_{10} exceeded much more than 35 times. • The German court (Bundesverwaltungsgericht) referred three questions to the Court for preliminary

Question	Response
	ruling: (1) Is Article 7(3) of Council Directive 96/62 to be interpreted as meaning that a third party whose health is impaired is entitled to the preparation of an action plan even if, irrespective of any action plan, he is in a position to enforce his right to avoid any detriment to his health as a result of the emission limit value for particulate matter PM_{10} being exceeded, by bringing an action for intervention by the public authority? (2) If so, is a third party who is affected by such concentrations of particulate matter PM_{10} as could be detrimental to health entitled to have an action plan drawn up laying down the measures to be taken in the short term to ensure strict compliance with the emission limit value for particulate matter PM_{10}? (3) If the answer to question 2 is in the negative, to what extent must the measures included in an action plan serve to reduce the risk of exceeding the limit value and to limit the duration of such an occurrence? Can an action plan be limited, on the principle of "one step at a time", to measures which, while not guaranteeing compliance with the limit value, nevertheless contribute in the short term to improvements in ambient air quality? • In its judgment, the Court found: ○ (1) where there is a risk that the limit values or alert thresholds may be exceeded, persons directly concerned must be in a position to require the competent national authorities to drawn up an action plan, even though, under national law, those persons may have other courses of action available to them for requiring those authorities to take measures to combat atmospheric pollution (paragraph 42). ○ (2) and (3) Member States are obliged, subject to judicial review by the national courts, only to take such measures – in the context of an action plan and in the short term – as are capable of reducing to a minimum the risk that the limit values or alert thresholds may be exceeded and of ensuring a gradual return to a level below those values or thresholds, taking into account the factual circumstances and all opposing interests (paragraph 47). (v) ***Commission v Italy***, Case C-68/11 EU:C:2012:815 (19 December 2012) • The Commission brought an action against Italy on the basis that the limit values applicable to

Question	Response
	concentrations of PM_{10} in ambient air were exceeded in numerous Italian zones and agglomerations for a number of consecutive years. In particular, for the years 2005-2007, the data showed that the limit values were exceeded in 55 zones. On the Commission's case, Italy had not adopted measures necessary to ensure compliance with the limit values applicable to concentrations of PM_{10} and had not submitted a request for exemption under article 22 of the Air Quality Directive. • Italy argued that there were technical reasons why the limit values were not complied with within the given time-limit: (i) the complexity of the process of PM_{10} formation, (ii) the impact of the weather on concentrations of PM_{10} in the atmosphere, (iii) insufficient technical knowledge of the process of PM_{10} formation which led to the imposition of time limits too short for compliance with those limit values, (iv) the fact that various EU policies to reduce Pm1- precursors did not produce the results expected, and (v) the absence of a link between EU policy concerning air quality and, inter alia, that aiming at reducing greenhouse gas emissions. • The Court did not accept any of Italy's argument, noting that where a finding of non-compliance had been made (as in this case), "*it is irrelevant whether the failure to fulfil obligations is the result of intention or negligence on the part of the Member State responsible, or of technical difficulties encountered by it*" (paragraph 63). The Court further held that force majeure (which may apply to justify non-compliance) did not apply, as Italy's arguments were too general and vague (paragraph 65). • Accordingly, the Court found that by failing to ensure that, for the years 2006 and 2007, concentrations of PM_{10} in the ambient air did not exceed the limit values set out in article 5(1) of Directive 1999/30 in 55 Italian zones and agglomerations, Italy failed to fulfil its obligations under that provision (paragraph 67).

Schedule 1

Limit values for sulphur dioxide, nitrogen dioxide, benzene, carbon monoxide, lead and PM_{10} in Annex XI (*Limit Values for the Protection of Human Health*) of the Air Quality Directive

B. **Limit values**

Averaging Period	Limit value	Margin of tolerance	Date by which limit value is to be met
Sulphur dioxide			
One hour	350 µg/m³, not to be exceeded more than 24 times a calendar year	150 µg/m³ (43 %)	— (1)
One day	125 µg/m³, not to be exceeded more than 3 times a calendar year	None	— (1)
Nitrogen dioxide			
One hour	200 µg/m³, not to be exceeded more than 18 times a calendar year	50 % on 19 July 1999, decreasing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2010	1 January 2010
Calendar year	40 µg/m³	50 % on 19 July 1999, decreasing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2010	1 January 2010
Benzene			
Calendar year	5 µg/m³	5 µg/m³ (100 %) on 13 December 2000, decreasing on 1 January 2006 and every 12 months thereafter by 1 µg/m³ to reach 0 % by 1 January 2010	1 January 2010
Carbon monoxide			
maximum daily eight hour mean (2)	10 mg/m³	60 %	— (1)

Averaging Period	Limit value	Margin of tolerance	Date by which limit value is to be met
Lead			
Calendar year	0,5 µg/m³ (3)	100 %	— (3)
PM_{10}			
One day	50 µg/m³, not to be exceeded more than 35 times a calendar year	50 %	— (1)
Calendar year	40 µg/m³	20 %	— (1)

(1) Already in force since 1 January 2005

(2) The maximum daily eight hour mean concentration will be selected by examining eight hour running averages, calculated from hourly data and updated each hour. Each eight hour average so calculated will be assigned to the day on which it ends i.e. the first calculation period for any one day will be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on that day.

(3) Already in force since 1 January 2005. Limit value to be met only by 1 January 2010 in the immediate vicinity of the specific industrial sources situated on sites contaminated by decades of industrial activities. In such cases, the limit value until 1 January 2010 will be 1,0 µg/m³. The area in which higher limit values apply must not extend further than 1 000 m from such specific sources.

Schedule 2

Target values and limit values for $PM_{2.5}$ as in Annex XIV (*National exposure reduction target, target value and limit value for $PM_{2,5}$*) of the Air Quality Directive

D. **Target value**

Averaging period	Target value	Date by which target value should be met
Calendar year	25 µg/m³	1 January 2010

E. **Limit value**

Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
STAGE 1			
Calendar year	25 µg/m³	20 % on 11 June 2008, decreasing on the next 1 January and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2015	1 January 2015
STAGE 2 (1)			
Calendar year	20 µg/m³		1 January 2020

(1) Stage 2 — indicative limit value to be reviewed by the Commission in 2013 in the light of further information on health and environmental effects, technical feasibility and experience of the target value in Member States.

Schedule 3

Target values and long-term objectives for Ozone in Annex VII (*Ozone target values and long term objectives)* of the Air Quality Directive

B. **Target values**

Objective	Averaging period	Target value	Date by which target value should be met (1)
Protection of human health	Maximum daily eight-hour mean (2)	120 µg/m^3 not to be exceeded on more than 25 days per calendar year averaged over three years (3)	1.1.2010
Protection of vegetation	May to July	AOT40 (calculated from 1 h values) 18 000 µg/m^3 · h averaged over five years (3)	1.1.2010

(1) Compliance with target values will be assessed as of this date. That is, 2010 will be the first year the data for which is used in calculating compliance over the following three or five years, as appropriate.

(2) The maximum daily eight-hour mean concentration shall be selected by examining eight-hour running averages, calculated from hourly data and updated each hour. Each eight -hour average so calculated shall be assigned to the day on which it ends. i.e. the first calculation period for any one day will be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on the day.

(3) If the three or five year averages cannot be determined on the basis of a full and consecutive set of annual data, the minimum annual data required for checking compliance with the target values will be as follows:

— for the target value for the protection of human health: valid data for one year,

— for the target value for the protection of vegetation: valid data for three years.

C. **Long-term objectives**

Objective	Averaging period	Longterm objective	Date by which the longterm objective should be met
Protection of human health	Maximum daily eight-hour mean within a calendar year	120 µg/m^3	not defined
Protection of vegetation	May to July	AOT40 (calculated from 1 h values) 6 000 µg/m^3 · h	not defined

Hong Kong

<table>
<tr><th>Question</th><th>Response</th></tr>
<tr><td>Please provide an executive summary of your responses to questions 1-6 below.</td><td></td></tr>
<tr><td>1. Do laws and regulations of Hong Kong expressly provide for public health protection from air pollution as an objective? If so, how?</td><td>The APCO does not provide for protection of public health from air pollution as an objective. The legislation focuses on control of emission of pollutant in the air and sets non-binding air quality objectives in air control zones. In fact, “public health” is not mentioned in the APCO.</td></tr>
<tr><td>2. What public health objectives (if any) are integrated into the operative parts of relevant laws and/or regulations of Hong Kong?</td><td>Not applicable. See one above.</td></tr>
<tr><td>3. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under the laws and regulations of Hong Kong?
(b) What is the process for setting such air quality objectives under the laws and regulations of Hong Kong?</td><td>(a) Schedule 5 to the APCO prescribes the following AQOs for an air control zone:
<table>
<tr><th>Pollutant</th><th>Averaging time</th><th>Concentration limit[i] ($\mu g/m^3$)</th><th>Number of exceedances allowed</th></tr>
<tr><td rowspan="2">Sulphur dioxide</td><td>10-minute</td><td>500</td><td>3</td></tr>
<tr><td>24-hour</td><td>125</td><td>3</td></tr>
<tr><td rowspan="2">Respirable suspended particulates (PM_{10})[ii]</td><td>24-hour</td><td>100</td><td>9</td></tr>
<tr><td>Annual</td><td>50</td><td>Not applicable</td></tr>
<tr><td rowspan="2">Fine suspended particulates ($PM_{2.5}$)[iii]</td><td>24-hour</td><td>75</td><td>9</td></tr>
<tr><td>Annual</td><td>35</td><td>Not applicable</td></tr>
<tr><td rowspan="2">Nitrogen dioxide</td><td>1-hour</td><td>200</td><td>18</td></tr>
<tr><td>Annual</td><td>40</td><td>Not applicable</td></tr>
<tr><td>Ozone</td><td>8-hour</td><td>160</td><td>9</td></tr>
<tr><td rowspan="2">Carbon monoxide</td><td>1-hour</td><td>30,000</td><td>0</td></tr>
<tr><td>8-hour</td><td>10,000</td><td>0</td></tr>
</table></td></tr>
</table>

Question	Response

Lead	Annual	0.5	Not applicable

[i] All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293Kelvin and a reference pressure of 101.325 kilopascal.

[ii] Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 μm or less.

[iii] Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less.

(b) Under section 7A of the APCO, the Secretary for the Environment must review the AQOs at least once in every 5-year period to ensure that they are the objectives that should be achieved and maintained in order to (a) promote the conservation of air in each air control zone in the public interest and (b) promote the best use of air in each air control zone in the public interest. The AQOs set out in Schedule 5 to the APCO (listed in (a) above) came into effect on 1 January 2014.

Although the APCO does not provide for protection of public health from air pollution as an objective, the Environmental Protection Department has stated that the Secretary for the Environment will take into account the following guiding principles when setting the AQOs:

(a) the AQOs should be set with a view to protecting public health;

(b) the AQOs should be updated by benchmarking against the Air Quality Guidelines ("**AQG**") and interim targets published by the World Health Organization ("**WHO**"); and

(c) a progressive approach be adopted in updating the AQOs with a view to achieving the WHO AQG as a long-term goal with reference to international practices, latest technological developments and local circumstances[35].

[35] Review of Air Quality Objectives. (2018, February 20). Retrieved April 17, 2018, from http://www.epd.gov.hk/epd/english/environmentinhk/air/air_quality_objectives/aqoreview2016.html

Question	Response
	The Environmental Protection Department has also stated that the Secretary for the Environment's key tasks in setting the AQOs are as follows: (a) appraising the latest development in respect of air science and the health effects of air pollution; (b) examining the current air pollution levels and trends, and progress and effectiveness of committed air quality improvement measures; (c) identifying new practical air quality improvement measures and conducting cost benefit analysis of the measures; (d) developing an air quality management plan for further improving air quality; and (e) assessing air quality in future under different control scenarios and the scope for further tightening the AQOs[36]. In connection with past reviews of the AQOs, the Environmental Protection Department has commissioned a study[37] and consulted the public[38].
4. Do laws and regulations of Hong Kong prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	There are no administrative or legal consequences imposed on governmental authorities for non-compliance with air quality objectives pursuant to the APCO. Section 8 of the Ordinance provides that the Air Pollution Control Authority needs to "aim to achieve the air quality objectives as soon as reasonably practicable and thereafter to maintain the quality so achieved". Hence, there are no timelines for the air quality objectives (as finally determined) to be achieved. It should be achieved "as soon as reasonably practicable". However, in respect of liability on private citizens and corporations, under section 10 of the APCO the Director of Environmental Protection (or an authorised officer) may issue an air pollution abatement notice where it is satisfied that the emission of air pollutants from a

[36] Ibid.

[37] *Agreement No. CE57/2006 (EP) Review of the Air Quality Objectives and Development of a Long Term Air Quality Strategy for Hong Kong - Feasibility Study* (Rep.). (2009, July). Retrieved April 17, 2018, from Environmental Protection Department website: http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/studyrpts/files/Final_Report_091013.pdf *Agreement No. CE57/2006 (EP) Review of the Air Quality Objectives and Development of a Long Term Air Quality Strategy for Hong Kong - Feasibility Study* (Rep.). (2009, July). Retrieved April 17, 2018, from Environmental Protection Department website: http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/studyrpts/files/Final_Report_091013.pdf

[38] Air Quality Objectives Review Public Consultation (Publication). (2009). Retrieved April 17, 2018, from Environment Bureau, Hong Kong SAR Government website: http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/pub_consult/files/book_en.pdf

Question	Response
	polluting process is causing or contributing to air pollution which exists or which is imminent. If the notice is not complied with, then a person commits an offence and is liable to fines of up to HK$500,000 and imprisonment for 12 months. The air quality objectives are not expressly mentioned as factors which the authorities should take into account when considering whether to issue such a notice, but will likely be incorporated by implication in some of those factors, for example in technical memoranda issued under the APCO. Moreover, the APCO is supplemented by 25 pieces of subsidiary regulations enacted by the Director of Environmental Protection to control air pollution. The subsidiary regulations expressly specify, among others, emission and vehicle design standards and licensing requirements for specified procedures to control air pollution emissions. The subsidiary regulations also create offences for non-compliance, and offenders would be liable for fines up to HK$500,000 and imprisonment for 12 months.
5. What are the best practice guidelines in Hong Kong (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	The WHO announced in October 2006 its AQGs and has recommended interim targets in the guidelines for countries to improve their air quality[39]. Hong Kong's former and current AQOs are benchmarked against the AQGs and interim targets published by the WHO[40]. The Hong Kong government has issued guidelines on the Environmental Protection Department's website concerning the control of air pollution emissions for various activities and specified works. However, rather than best practice guidelines, most of the guidelines are used to educate citizens about the prevailing air pollution control regulations and how to comply with them.

[39] *Air quality guidelines : global update 2005 : particulate matter, ozone, nitrogen dioxide, and sulfur dioxide*. (2006). Copenhagen, Denmark: World Health Organization.

[40] Air Quality Objectives. (2017, August 4). Retrieved April 17, 2018, from http://www.epd.gov.hk/epd/english/environmentinhk/air/air_quality_objectives/air_quality_objectives.html

Question	Response
6. Please provide details of any case law interpreting Hong Kong's domestic and international obligations in respect of air pollution control strategies.	The APCO contains no provisions in respect of ex-Hong Kong / international air pollution control references, such as international standards or guidelines. There are a handful of cases relating to the APCO. Most of them involved appeals against decisions of the relevant authority, where the authority required the appellants to change certain equipment in use which allegedly were in breach of the relevant air pollution control standards or the authority's refusal to grant licences under the APCO. Clean Air Foundation Limited and Gordon David Oldham v. The Government of the Hong Kong Special Administrative Region (HCAL 35/2007) • The applicants mounted judicial review proceedings against the HKSAR government and sought declarations that the Government had been in breach of the Basic Law, the Bill of Rights and the International Covenant for Economic, Social and Cultural Rights ("**ICESCR**") for failure to ensure that adequate legislation was in place to combat air pollution. • Hartmann J accepted that it is prima facie arguable that the constitutional right to life under Art 28 of the Basic Law and Art 2 of the Bill of Rights may apply in the context of air pollution, imposing some sort of duty on the Government to combat air pollution. • Hartmann J also accepted that Art 12 of the ICESCR would prima facie impose some duty on state authorities to combat air pollution even if it cannot be an absolute duty to ensure with immediate effect the end of all pollution. • However, leave to proceed with the judicial review was refused, because the applicants were challenging policy in how the government went about combatting air pollution. The court has no jurisdiction over the merits of the policies adopted by the Government (following Reyes J in *Ng Ngau Chai v The Town Planning Board* (HCAL 64/2007). • "If Government has the power under s.7 of the APCO to update air quality objectives, either generally or in respect of particular areas, it is inevitable there

Question	Response
	will be reasons why – if, in fact, there has been no updating – that it has declined to do so. Those reasons will be based on social and economic factors and, importantly, on an assessment of whether, all matters being taken into account, there is sufficient benefit to be obtained at this time in adopting more stringent objectives." (Hartmann J) Chu Yee Wah v Director of Environmental Protection (CACV 84/2011) • Tang JA held that the court should not decide whether the Director of Environmental Protection has a discretion, under s10(2) of the Environmental Impact Assessment Ordinance ("**EIAO**"), to refuse a permit even when the Air Quality objectives have not been exceeded and the report being otherwise compliant. • The Court held that it was reasonable to consider the issue of public health by measuring it against the standard of an acceptable environment quality, represented by the Air Quality Objectives. • In response to the submission that the Air Quality Objectives represent the minimum standard of acceptable air quality, the court held that it is not up to the court to decide matters of policy.

Japan

Question	Response
Please provide an executive summary of your responses to questions 1-6 below.	
1. Do laws and regulations of Japan expressly provide for public health protection from air pollution as an objective? If so, how?	Japan introduced the Air Pollution Control Act (the "**APCA**") in 1968. Article 1 of the APCA provides for public health protection from air pollution as an objective – please see the translation of Article 1 below: **Air Pollution Control Act** (Purpose) Article 1: The purposes of this Act are to protect the health of citizens and to protect the living environment from air pollution by, among other things, controlling emissions, etc. of Soot and Smoke, Volatile Organic Compounds, and Particulates associated with the business activities of factories and workplaces and with the demolition, etc. of buildings, etc., by promoting the implementation of measures against hazardous air pollutants and by setting maximum permissible limits for automobile exhaust; and to protect victims where air pollution has caused harm to human health by providing for the liability of business operators for damages.
2. What public health objectives (if any) are integrated into the operative parts of relevant laws and/or regulations of Japan?	The APCA sets out certain regulations to achieve the public health objectives. These regulations are divided into the following categories: • Regulation of Soot and Smoke Emissions (Articles 3 to 17) • Regulation of Volatile Organic Compound Emissions (Articles 17-2 to 17-14) • Regulations on Particulates (Articles 18 to 18-19) • Promotion of Measures Against Hazardous Air Pollutants (Articles 18-20 to 18-24)

	• Maximum Permissible Limits for Automobile Exhaust (Articles 19 to 21-2) In addition to the APCA, the Basic Environment Law (the "**BEL**") sets out the duty of the Japanese government to establish environmental quality standards with regards to air pollution. These environmental quality standards are separate from the regulations contained in the APCA. The environmental quality standards in the BEL only provide for efforts to be made to meet such standards (i.e. they are not legally binding on the Japanese government). The Ministry of the Environment (the "**MOE**") published the Environmental Quality Standards for air pollution based on the BEL on 8 May 1973. The Environmental Quality Standards are not required to be updated periodically. The BEL only provides that the Environmental Quality Standards should be continuously reviewed and updated to reflect the latest scientific findings and technology (Article 16-3 of the BEL). Details of the Environmental Quality Standards in English can be found on the MOE website (https://www.env.go.jp/en/air/aq/aq.html).
3. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under the laws and regulations of Japan? (b) What is the process for setting such air quality objectives under the laws and regulations of Japan?	(a) Air Quality Objectives The APCA sets out air quality objectives for each category of the regulations mentioned above. The standards and methods of implementation vary depending on the particular regulation: (i) Regulation of Soot and Smoke Emissions • Regulatory standards of emission (i.e. the regulation of emission concentration) • Regulatory standards for controlling total emissions • Measures concerning the seasonal use of fuel (ii) Regulation of Volatile Organic Compound Emissions • Regulatory standards of emission (i.e. the regulation of emission

	concentration) Due to the difficulty in controlling emissions and dispersal of Volatile Organic Compounds, the APCA provides that the measures shall be implemented through an appropriate combination of regulation and voluntary efforts by business operators to control the emission and dispersal of Volatile Organic Compounds. (iii) Regulation of Particulates The APCA categorises two types of particulates: One is "Specified Particulates" i.e. asbestos. The other is "Ordinary Particulates", which are any Particulates other than Specified Particulates. For Ordinary Particulates, the regulations address the following issues: • Regulatory standards relating to the structure of facilities that generate and emit or disperse Ordinary Particulates • Regulatory standards relating to the operation and management of facilities that generate and emit or disperse Ordinary Particulates For Specified Particulates, the regulations address the following issues: • Regulatory standards for site boundaries concerning the land adjacent to facilities that generate and emit or disperse Specified Particulates • Obligation of Measuring of Specified Particulate concentrations • Regulatory standards for activities that emit or disperse Specified Particulates (iv) Promotion of Countermeasures for Hazardous Air Pollutants The principles under the APCA relating to countermeasures for

	addressing hazardous air pollutants are not legally binding. However, for designated hazardous air pollutants (e.g. benzene, trichloroethylene and tetrachloroethylene), there are emission standards set out in the APCA which are legally binding. (v) Maximum Permissible Limits for Automobile Exhaust • Maximum permissible limits for the quantity of automobile exhaust • Maximum permissible limits for the properties of automobile fuel • Maximum permissible limits for the quantity of substances contained in automobile fuels. (b) Process for Setting Air Quality Objectives The APCA does not set out any specific numeric emission standards and provides that specific emission standards shall be prescribed by an ordinance of the Ministry of the Environment. The Enforcement Regulation of the APCA is an ordinance which provides the specific emission standards for different types of air pollutants. In addition, if a prefecture determines that the standards are not sufficient to protect human health or living conditions on the basis of that prefecture's specific natural and social conditions, it may establish, by Prefectural Ordinance, standards that are stricter than the government's standards. A number of prefectures have stricter standards than those of the government, such as Tokyo, Kanagawa and Chiba.
4. Do laws and regulations of Japan prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	(a) Notification of Setting in Place Facilities (Article 6, Article 17-5, Article 18-6 and Article 18-23 of the APCA) When a person wishes to set up a facility which may emit Soot and Smoke, Volatile Organic Compounds, Particulates and/or Hazardous Air Pollutants, that person shall submit a notification to the relevant prefectural governor providing relevant information including the name of the facility owner, the address of the

	facility, the structure of the facility, the way of disposing of relevant smoke. (b) Order for improvement, order to observe standards (Article 9, Article 14, Article 18-11 and Article 18-13 of the APCA, etc) The prefectural governor may give an order (such as an order for modification of a proposed plan, order for improvement of a function of facilities, order to observe standards defined in APCA) to facility owners or another appropriate person. (c) Continuous Monitoring of Air Pollution Levels (Article 22 of the APCA) Prefectural governors shall continuously monitor the level of air pollution and report the results to the Minister of the Environment. Prefectural governors are required to report these results to Minister of the Environment once a year. (d) Emergency Measures (Article 23 of the APCA) Where serious air pollution is likely to harm human health or living conditions, , the prefectural governor shall give orders or seek the co-operation of the appropriate person who can reduce emissions of Soot and Smoke and Volatile Organic Compounds and automobiles as specified by a Cabinet Order. (e) Public Announcements of Air Pollution Levels（Article 24 of the APCA） Prefectural governors shall make public the level of air pollution. Prefectural governors must continuously report their findings through the Internet or through other appropriate methods. (f) Special provision of tort law（Articles 25 to 25-6 of the APCA） The APCA provides that a business operator releasing harmful emissions shall be liable to compensate for any resulting damages (i.e. this liability is a liability without fault (strict liability)). (g) Reporting and Inspection by the Minister of the Environment or a prefectural

	governor（Article 26 of the APCA） Reporting and Inspection (i.e. an on-site inspection by officials) by the Minister of the Environment or by a prefectural governor pursuant to Article 26 shall be executed where there is an urgent necessity to do so in order prevent harm to human health or to living conditions due to air pollution. (h) State Assistance for improvement of facilities（Article 29 of the APCA） The State shall endeavour to provide financial assistance, technical advice and any other assistance necessary for the improvement of facilities releasing harmful emissions. (i) Promotion of Research（Article 30 of the APCA） The State shall endeavour to promote research into air pollution. (j) Penal regulations（Article 33 to 37 of the APCA） • The APCA sets out certain penal regulations. If the facility owner/employee violates an order to change plans or improve/cease to use facilities due to serious risk of air pollution or occurrence of accidents, it may be sentenced to imprisonment (maximum of one year) or financial penalties may be imposed (maximum of JPY one million). • If the facility owner/employee violates an order to improve the function of the facilities on the occurrence of accidents or exceeds the threshold of air pollutant permitted by law, it may be sentenced to imprisonment (maximum of six months) or financial penalties may be imposed (maximum of JPY500 thousand). • If the facility owner/employee does not comply with the obligation to report on the establishment or change of facilities or exceeds the seasonal threshold of air pollutant permitted by law, it may be sentenced to imprisonment (maximum of three months) or financial penalties may be imposed (maximum

	of JPY300 thousand). • Financial penalties may be imposed on facility owners/employees for failure to comply with other orders and/or reporting obligations set out in APCA. In addition to the above, financial penalties mentioned above will be imposed to the legal entity to which the facility owner/employee belongs.
5. What are the best practice guidelines in Japan (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	In Japan, no best practice guidelines have been published that apply generally in respect of compliance with the requirements on health protection from air pollution and air quality objectives. However, as we mentioned section 2 above, the MOE sets out environmental quality standards in Japan based on the BEL in English. Details can be found on the MOE website (https://www.env.go.jp/en/air/aq/aq.html).

6. Please provide details of any case law interpreting Japan's domestic and international obligations in respect of air pollution control strategies.	Judgment of the Yokkaichi chapter of the Tsu District Court, 24 July 1972, *hanji* 672-30 (Yokkaichi Asthma Trial) This trial is one of four major pollution related trials in Japan (the other three trials did not relate to air pollution). The Court considered the conditions which were necessary for joint tort liability for air pollution to apply under article 719 of the Civil Code of Japan. In order for this article 719 to apply, each tortfeasor shall satisfy the necessary conditions of the relevant tort. (The necessary conditions are that each tortfeasor must be a person who has intentionally or negligently infringed any right of others, or legally protected interest of others. Also, a causal relationship between infringement activity and damage should be proven). However, if a tortfeasor has a strong joint connection to joint infringement activity which has a causal connection with the relevant damage, that tortfeasor shall be deemed to have an individual causal connection. Judgment of the Okayama District Court, 23 March 1994, *hanta* 845-46(Kurashiki Air Pollution Trial) The Court considered Article 25 of the APCA which provides for a special provision of tort law. Based on article 25 of the APCA, the defendants in this case were liable for damage without having caused such damage. The Court held that Article 25 provides for liability without fault (i.e. strict liability).

London

Question	Response
Please provide an executive summary of your responses to questions 1-6 below.	While the regulation of London's air quality falls within the remit of EU legislation, local government in London is responsible for reviewing local air quality levels and working towards national targets. In London, a policy document outlining a detailed air quality reduction strategy has been published, which boroughs must have regard to when implementing improvement measures. Compliance is measured against various pollution limit values set by the EU. Any necessary enforcement action would be taken against the UK as an EU Member State as opposed to London specifically. Public health protection is the overriding objective of policy goals in this area and the recommendations link closely to the health impacts of pollution.
1. What is the legal framework for air quality law and regulation in the UK?	Action to manage and improve air quality is largely driven by EU legislation. In the UK, responsibility for meeting air quality limit values is devolved to the national administrations in Scotland, Wales and Northern Ireland. The UK Government and the devolved administrations are required under the Environment Act 1995 to produce a national air quality strategy. The strategy sets out the UK's air quality objectives and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. Local authorities in the UK are required to review air quality in their area and designate Air Quality Management Areas ("**AQMAs**") if improvements are necessary. Where an AQMA is designated, local authorities are also required to work towards the objectives of the relevant local air quality strategy. An Air Quality Action Plan ("**AQAP**") describing the pollution reduction measures must then be put in place and AQAPs must have regard to the Strategy (as defined below). These plans contribute to the achievement of air quality limit values at local level. Further detail is set out at section 5 below. In London, the Mayor is responsible for preparing an Air Quality Strategy (the "**Strategy**"). The current Strategy is available here:

	https://www.london.gov.uk/sites/default/files/Air_Quality_Strategy_v3.pdf. While the overall responsibility for delivering the Strategy falls on the Mayor, other organisations, including the UK Government and other authorities, London boroughs and businesses in the private sector will also need to take action if EU limit values are to be achieved in London. The Mayor is therefore required to work with these other organisations and individuals when working to carry out the Strategy. In 2017, the UK Government launched the Clean Air Zone Framework (the "**CAZF**") which designates particular areas where targeted action is needed to improve air quality. The CAZF focuses on measures that can be taken by local areas to reduce emissions caused by transport. The most polluting vehicles (such as old buses, taxis, coaches and lorries) will be discouraged from entering the zones through the introduction of charges. Such zones will be introduced in Birmingham, Leeds, Nottingham, Derby and Southampton in 2020, while a similar regime known as the Ultra Low Emissions Zone ("**ULEZ**") will be introduced in London in 2019. The ULEZ will operate 24 hours a day, 7 days a week within the same area as the current Congestion Charging Zone and will be in addition to the pre-existing Low Emissions Zone (a traffic pollution charge scheme with the aim of reducing the exhaust gas emissions of diesel-powered commercial vehicles in Greater London). If vehicles within the ULEZ do not meet specified exhaust emissions standards, a daily charge will be payable. Revenue raised from these charges will be used by Transport for London to help maintain a greener transport fleet and reduce pollution. To help road users prepare for the introduction of the ULEZ, a Toxicity Charge has been introduced between the hours of 7am-6pm on weekdays. This will be replaced by the ULEZ when introduced in 2019.
2. Do London's laws and regulations expressly provide for public health protection from air pollution as an objective? If so, how?	Yes. The objective of the Strategy is to improve the air quality in London so that the health of Londoners is improved, with a vision of (i) making London a more pleasant place to live and work; (ii) reducing the burden on health services; (iii) enhancing London's reputation as a "green city"; and (iv) making London cleaner while safeguarding biodiversity (paragraph 1.5 of the Strategy). The Strategy suggests that the most

	effective way of doing this is to achieve the EU's air quality limit values as soon as possible and sets out a number of policy recommendations and actions that the Mayor of London will take to reduce air pollution. For further detail on the health impacts of air pollution in London, please refer to paragraph 1.7 of the Strategy. While the Mayor of London is legally responsible for preparing the Strategy, the Strategy itself does not have the force of law. Rather, it is a policy document providing a framework for delivering improvements to air quality. Please note the current Strategy was prepared by Boris Johnson in 2010 and will be replaced in 2018 by Sadiq Khan's Environment Strategy (the "**Environment Strategy**"), a draft of which is available here: https://www.london.gov.uk/sites/default/files/london_environment_strategy-_draft_for_public_consultation.pdf. This survey focuses on the recommendations of the existing Strategy as opposed to the new Environmental Strategy.
3. What public health objectives (if any) are integrated into the operative parts of London's laws and/or regulations?	The measures taken to achieve the objectives set out in the Strategy include improving access to information about the health benefits of poor air quality and directing information about poor air quality to those most at risk of health problems. Even once limit levels in London have met the EU's recommendations, the Strategy recognises that further action must be taken to reduce dangerous concentrations in the air, as poor air quality below the stated limit values still has the potential to damage human health.
4. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under London's laws and regulations? (b) What is the process for setting such air quality objectives under London's laws and regulations?	Air quality objectives in the UK are based on EU limit values for seven pollutants: benzene, 1.3 butadiene, carbon monoxide, lead, NO2, PM10 and PM2.5 and sulphur dioxide. UK domestic legislation sets a national exposure reduction target to be achieved by 2020. The limit values are set out in the Ambient Air Quality Directive 2008 (2008/50/EC) which is incorporated into UK law through the Air Quality Standards Regulations 2010. For further detail regarding the UK domestic legislation which incorporates EU limit values into UK law, please refer to section 4 of the UK questionnaire. As mentioned above, the Government's National Air Quality Strategy provides the

	Government's policy framework for air quality management and assessment in the UK. It identifies air quality standards and objectives for key air pollutants which are designed to protect health and the environment. It also sets out how different sectors (industry, transport and local government) can contribute to achieving the air quality objectives, though it includes little direct guidance on policy, nor does it constitute an action plan. The Mayor of London has a legal responsibility to prepare and to keep under review an Air Quality Strategy for the Greater London area and specific requirements regarding what must be included are provided in the Greater London Authority Act 1999.
5. Do London's laws and regulations prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	The Mayor has powers to ensure London boroughs meet their statutory Local Air Quality Management ("**LAQM**") requirements, through being a statutory consultee for all the documents produced by boroughs as part of their LAQM procedures. Under the LAQM framework set by the Government under the Environment Act 1995, the boroughs must regularly review and assess air quality within their boroughs and designate AQMAs where UK standards and objectives are currently not being met. At the time the Strategy was introduced, all 33 London boroughs had designated AQMAs. AQAPs must be produced for each AQMA, setting out a plan to work towards achievement of air quality standards and objectives. Ultimately, the Mayor has powers to direct London boroughs in their air quality duties. Compliance is measured by reference to the EU's limit values. Failure to meet limit values could lead to the European Commission taking legal action against Member States and possible fines being imposed. The legal consequences of non-compliance are therefore dealt with at a national level as opposed to a London-specific level.
6. What are the best practice guidelines affecting London (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	• Londonair is an arm of the London Air Quality Network (a body formed to coordinate and improve air pollution monitoring in London) and is provided by the Environmental Research Group of King's College London. Londonair is primarily a monitoring site; the measurements taken by Londonair are used to track air pollution across London and create models that can assess how different

	government policies can affect air pollution. While Londonair is primarily a monitoring facility, it does also publish guidance on the health effects of air pollution and actions that can be taken to improve air quality in London. These include using cleaner transport or fewer vehicles (acknowledging the fact that the major source of pollution in London is road transport). Further information is available on the Londonair website here: https://www.londonair.org.uk. • In its 2016 report titled "Lethal & Illegal: Solving London's Air Pollution Crisis", the Institute for Public Policy Research supported by Greenpeace published a set of recommendations for London's local government to consider when implementing policies to reduce air pollution. The recommendations include, amongst others, extending London's ultra-low emissions zone on an accelerated timescale, procuring only hybrid or zero emissions buses, devolving vehicle excise duties to the London level, requiring taxis to be zero-emissions capable and phasing out diesel vehicles. The report is available here: https://secure.greenpeace.org.uk/page/-/Final%20IPPR%20air%20pollution%20report%20281016.pdf. • The National Institute for Health Care and Excellence ("**NICE**") has published a set of best practice guidelines for local authorities, transport authorities, local governments, employers, healthcare professionals and members of the public. The guidelines include recommendations relating to a range of activities, including planning, development management, clean air zones, driving and walking/cycling. Please note that these guidelines are not specific to London. The NICE guidelines are available here: https://www.nice.org.uk/guidance/ng70/chapter/Recommendations.
7. Please provide details of any case law interpreting London's domestic and international obligations in respect of air pollution control strategies.	N/A – legal proceedings are taken against the UK Government (specifically, against the Department for Environment, Food & Rural Affairs) at a national level.

Singapore

Question	Response
Please provide an executive summary of your responses to questions 1-6 below.	Public health protection from air pollution is a key objective of Singapore government policy, and has been so since the earliest legislation on the topic (the Clean Air Act) was passed in 1971. Legislation, regulations, monitoring and strict enforcement regimes aim to ensure that the quality of air in Singapore is one of the best in Asia and is rated well within the "Good" and "Moderate" range of international standards, despite dense urban population and heavy industry. Financial penalties are common in cases of failure to adhere to the rules (see Question 4 below) and the National Environment Agency ("**NEA**") provides comprehensive information and advice about and air quality in Singapore on its website[41]. The Singapore government's stated goal is to look for innovative ways to improve air quality, including for example the new greenhouse gas emission tax contained in the Carbon Pricing Bill passed last month that is set to come into effect from 2019, which will tax all facilities producing 25,000 tonnes or more of greenhouse gas emissions per year S$5 per tonne until 2023, with the intention to increase this to S$10/S$15 by 2030[42]. A further key concern for Singapore is the air pollution / transboundary haze caused by the large-scale burning of forests and crops in Indonesia, which pollutes the air in a way that is harder for the Singaporean government to control. In addition to the Transboundary Haze Pollution Act of 2014 which aims to reduce transboundary haze pollution by imposing financial penalties on the perpetrators (via their branches located in Singapore), the NEA and the Ministry of the Environment and Water Resources ("**MEWR**") are working with Indonesia's State Ministry of Environment and the Jambi Provincial Government in Indonesia to encourage land clearing without the use of fire and

[41] http://www.nea.gov.sg/anti-pollution-radiation-protection/air-pollution-control.

[42] http://www.straitstimes.com/singapore/singapore-budget-2018-carbon-tax-of-5-per-tonne-of-greenhouse-gas-emissions-to-be-levied.

	to prevent and minimise the damage caused by peatland fires. The NEA is also constantly monitoring the haze in the atmosphere, and provides 1-hour and 24-hour updates on air quality across the country[43].
1. Do laws and regulations of Singapore expressly provide for public health protection from air pollution as an objective? If so, how?	The following are the primary laws relating to the issue of air pollution in Singapore: • the Environmental Protection and Management Act (a consolidation of existing environment related legislation, originally enacted as the Environmental Pollution Control Act 1999 and then revised in 2002) • the Transboundary Haze Pollution Act 2014; and • the Carbon Pricing Bill, enacted in March 2018, under the authority of which various regulations have been passed. Some but not all of these laws and regulations have the effect of reducing air pollution and expressly provide for public health protection from air pollution as an objective. For example, the Environmental Protection and Management Act grants the NEA the power to prohibit work and processes if it has reason to believe that the emission of air impurities, trade effluent or hazardous substances from any premises is likely to, amongst other things, be injurious to public health or safety[44]. The Director-General is also granted the right to direct the immediate execution of any work or act authorised under the Act which he considers necessary to, amongst other things, prevent injury or danger to public health[45]. In addition, the Environmental Protection and Management (Vehicular Emissions) Regulations (the "**EPM(VH)R**") grant the Director-General the power to prohibit or restrict the use of motor vehicles if the Director-General thinks the prohibition or restriction is necessary to safeguard public health from excessive levels of air pollution[46].

[43] https://www.haze.gov.sg/.

[44] Clause 39 of the Environmental Protection and Management Act (as revised in 2002).

[45] Clause 46 of the Environmental Protection and Management Act (as revised in 2002).

[46] Regulation 22 of the Environmental Protection and Management (Vehicular Emissions) Regulations.

2. What public health objectives (if any) are integrated into the operative parts of relevant laws and/or regulations of Singapore?	See above.
3. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under the laws and regulations of Singapore? (b) What is the process for setting such air quality objectives under the laws and regulations of Singapore?	Process: In July 2011, the NEA formed the Advisory Committee on Ambient Air Quality (the "**ACAAQ**") which advised on air quality targets to safeguard public health in Singapore. The ACAAQ included members of various public and private institutions (including the National Health Group and the Singapore Health Services). The NEA and the MEWR reviewed ACAAQ's recommendations (along with the Sustainable Singapore Blueprint commitments launched in 2009) to generate a set of interim air quality targets to be achieved by 2020, and a set of longer-term targets for cleaner air. These targets are pegged to the WHO AQGs and are constantly being reviewed. The targets can be found here: https://www.mewr.gov.sg/docs/default-source/default-document-library/cos-2015-media-factsheet---spore-39-s-air-quality.pdf. Since the ACAAQ completed its work in 2011, there do not appear to be any public plans for it to reconvene or revise its advice. In addition, the MEWR has set the below key targets to keep the air clean: 1. To maintain the Pollutant Standards Index (PSI) for ambient air within the 'good' range for 85% of the year, and within the 'moderate' range for remaining 15%. 2. Lower the annual ambient level of fine particulate matter (PM2.5) to 12 µg/m3 by 2020 and maintain it at this level till 2030. 3. Keep annual ambient level of sulphur dioxide under 15µg/m3 till 2030.
4. Do laws and regulations of Singapore prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	Non-compliance with environmental laws and regulations has legal repercussions in Singapore, and penalties can be imposed on individuals or companies who fail to comply with legislation. **Motor Vehicle Pollution** The EPM(VE)R state that it is an offence for a vehicle to emit visible smoke while in use

	on the road (as smoke contains fine particulate matter which is a danger to public health)[47]. Fines of up to S$2,000 can be imposed on the owners of smoky vehicles for their first offence, rising to up to S$5,000 for subsequent offences. It is also an offence under the EPM(VH)R for drivers to leave engines idling when the vehicle is stationary (except when in traffic or in a limited set of specific circumstances), and penalties for non-compliance are S$2,000 / S$5,000 as above. **Transboundary Haze Pollution** Transboundary haze in Singapore is a major issue which is detrimental to the air quality, and in addition to working with the Indonesian government to try and minimise the burning of forests in Indonesia (which is the key cause of the transboundary haze), Singapore has passed the Transboundary Haze Pollution Act of 2014 which penalises entities which engage in conduct (either in or outside Singapore) which (i) causes, or (ii) condones any conduct by another entity or individual which causes or contributes to, any haze pollution in Singapore. Non-compliance with any Regulations passed under this Act is punishable by a fine not exceeding S$10,000 for each offence (or more if the offence is continuing)[48]. As this penalty can only be imposed, for jurisdictional reasons, within Singapore, the financial penalty acts as a disincentive only for those companies with a branch or assets in Singapore, against whom/which the penalty can be imposed. In 2015, the NEA served notice on the Indonesian paper manufacturing company, Asia Pulp and Paper ("**APP**"), on the basis that four of the company's suppliers were responsible for causing the particularly serious haze which occurred in 2015. To date, no fines appear to have been imposed on APP by the NEA. However, the Singapore government did urge several companies to boycott the products of APP to indicate public discontent with its contribution to the haze. **Air Pollution** Under the Environmental Protection and Management Act it is an offence for an occupier

[47] Regulation 19 of the Environmental Protection and Management (Vehicular Emissions) Regulations.

[48] Clause 24(1) and (2) of the Transboundary Haze Pollution Act 2014.

	of any industrial or trade premises not to maintain fuel burning equipment and air pollution control equipment in efficient condition, or not to keep air pollution control equipment working in a proper and effective manner[49] and there are various other offences relating to dark smoke arising from chimneys and causing, permitting or allowing the emission of air impurities[50]. Breaches can result in the imposition of fines of up to S$20,000 for the first offence and S$1,000 for every day during which the offence continues after conviction, and up to S$50,000 for each second and subsequent conviction and S$2,000 for every day during which the offence continues after conviction[51]. The Environmental Protection and Management (Air Impurities) Regulations also impose fines of up to S$10,000 for first convictions (and S$300 per subsequent day) and up to S$20,000 (and S$500 per subsequent day) for owners/occupiers of industrial premises who fail to carry out the requisite tests in relation to the emission of air impurities from the consumption of fuel in or on the premises[52]. **Greenhouse Gas** The Carbon Pricing Bill which was passed in Parliament on 20 March 2018 imposes a new 'carbon-tax' which aims to discourage greenhouse gas emissions and promote the use of cleaner forms of energy instead. The tax will impose a financial disincentive on facilities producing 25,000 or more metric tonnes of greenhouse gas emissions per annum by charging them S$5 per tonne until 2023, with the intention to increase this to S$10/S$15 per tonne by 2030. It is estimated that this tax will be levied on around 30 to 40 of the largest carbon emitters in Singapore, who together contribute 80% of Singapore's greenhouse gas emissions[53]. The Bill also imposes a reporting obligation on facilities which emit at least 2,000 but less than 25,000 metric tonnes of greenhouse gases, meaning that they must have their emissions measured and reported, but they will

[49] Clause 10 of the Environmental Protection and Management Act (as revised in 2002).

[50] Clauses 11 and 12 of the Environmental Protection and Management Act (as revised in 2002).

[51] Clause 67 of the Environmental Protection and Management Act (as revised in 2002).

[52] Regulation 7 of the Environmental Protection and Management (Air Impurities) Regulations (as revised in 2002).

[53] http://www.straitstimes.com/singapore/singapore-budget-2018-carbon-tax-of-5-per-tonne-of-greenhouse-gas-emissions-to-be-levied.

	not be taxed on them as long as they remain below 25,000 metric tonnes annually.
5. What are the best practice guidelines in Singapore (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	The NEA provides information on its website[54] about air pollution, its causes, the damage it results in, how it can be prevented and what the government is doing to reduce air pollution for the benefit of public health. The NEA also maintains a specific website focusing on the problem of transboundary haze pollution[55] and providing up-to-date air quality information and public guidance.
6. Please provide details of any case law interpreting Singapore's domestic and international obligations in respect of air pollution control strategies.	N/A

[54] http://www.nea.gov.sg/anti-pollution-radiation-protection/air-pollution-control.

[55] http://www.haze.gov.sg.

Tokyo

Question	Response
Please provide an executive summary of your responses to questions 1-6 below.	
1. Do Tokyo's laws and regulations expressly provide for public health protection from air pollution as an objective? If so, how?	Yes. The ordinance to Improve the Urban Environment and Protect the Health of Citizens and the Environmental Basic Regulation in Tokyo (the **"Ordinance**") aims to allow citizens to lead safe and healthy lives by implementing policies for environmental protection. The Ordinance sets out three main target areas and imposes specific responsibilities on certain entities as below: **1. Greenhouse Gases** **The aspects of the Ordinance that pertain to the reduction of greenhouse gases are described below:** • The responsibilities of the mayor of Tokyo – to come up with strategies to reduce greenhouse gas emissions, to financially support industry participants that set up facilities that contribute to the reduction of greenhouse gas emissions, and to announce annually the amount of greenhouse gas emissions that Tokyo produces. • The responsibilities of industry participants (companies) – companies must ensure that they take measures to reduce greenhouse gas emissions and cooperate with the mayor of Tokyo in implementing his/her strategies to reduce emissions over the course of their business activities. Companies that fail to achieve a certain level of greenhouse gas emissions reduction may be remonstrated. For further information on how these companies may be remonstrated, please refer to the answers for question 4 below. • The responsibilities of the citizens of Tokyo – the citizens of Tokyo must cooperate

	with the mayor in implementing his/her strategies to reduce greenhouse gas emissions in their daily lives. **2. Automobile Gas Emissions** **The aspects of the Ordinance that pertain to the reduction of Automobile Gas Emissions are described below:** • The mayor shall take measures to reduce automobile gas emissions in areas where automobile gas emission levels are inordinately high. • The retailers of automobiles must explain in writing the level of emissions of the vehicles they sell and other important regulatory articles in the Ordinance (e.g., drivers must turn off vehicle engines when stopped) associated with automobile emissions at the point of sale. Retailers who contravene these rules with no valid reason may be remonstrated, by means of a formal letter from the mayor warning them not to contravene the rules further. Subsequent failure to heed this warning will result in public disclosure of the names of those retailers that violate the rules by the mayor, on the Tokyo City public website and through a public announcement made within the city of Tokyo. **3. Strategies Addressing Factory Pollution** **The aspect of the Ordinance that pertain to the reduction of Factory Pollution is described below:** Factories must not produce harmful gaseous emissions, noxious gases, noise, or dump industrial sewage above a certain threshold that may cause harm to human health or the environment. Factories who infringe this rule are disciplined by means of a formal letter from the mayor warning them not to contravene the rules further. Subsequent failure to heed this warning will result in the public disclosure of the names of those factories that violate the rules by the mayor, on the Tokyo City public website and through a public announcement within the city of Tokyo. Severe cases may result in imprisonment (a maximum term of one year) or the imposition of financial penalties (up to a maximum of JPY one million).

2. What public health objectives (if any) are integrated into the operative parts of Tokyo's laws and/or regulations?	The public health objective of Tokyo's laws is to allow the citizens of Tokyo to lead safe and healthy lives now and in the future.
3. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under Tokyo's laws and regulations? (b) What is the process for setting such air quality objectives under Tokyo's laws and regulations?	**3 (a)** The Ordinance. Under the Ordinance, the mayor determines the annual targets for air quality metrics; these targets are published annually. With regards to greenhouse gas emissions, the overarching goal is to achieve a 30% reduction in greenhouse gas emissions by 2030, compared to the base year 2000. **3 (b)** The mayor sets the annual air quality objectives based on an analysis of the efforts made in the previous year. The objectives are published together with current air quality levels.
4. Do Tokyo's laws and regulations prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	In addition to the relevant laws and regulations in Japan, the Ordinance sets out the reporting obligations of facility owners. The Government of Tokyo has the right to publicise the names of those that do not comply with such reporting obligations, as explained in further detail below. Pursuant to the Ordinance, the Government of Tokyo may remonstrate owners which are in non-compliance with these reporting obligations in the following ways: **1. Publication of Names** (i) The mayor of Tokyo may publicise the name of the individual or entity that does not comply with any advice, counsel or order made under the Ordinance. **2. Financial penalties** (i) If the facility owner or employee violates an order to change business plans, or to improve or cease using facilities due to a serious risk of air pollution or occurrence of accidents which would result from continued use, such factory owner or employee may be sentenced to imprisonment (up to a maximum of one year), or financial penalties may be imposed (up to a maximum of JPY one million).

	(ii) If the facility owner or employee violates an order to improve the functioning of the facilities to avoid the occurrence of accidents; exceeds the threshold of air pollutants permitted by law; or operates facilities without the registration required by the Ordinance, financial penalties may be imposed (up to a maximum of JPY 500 thousand). (iii) If the facility owner or employee does not comply with registration obligations required by the Ordinance other than those listed above, or if there are false statements in the relevant registration, financial penalties may be imposed (up to a maximum of JPY 250,000). In addition to the above, the same financial penalties mentioned above will be imposed on the legal entity which the facility owner owns, or which employs the relevant employee. In sum, as noted above, for facilities that do not comply with the additional restrictions set out in the Ordinance, the Government of Tokyo is able to sentence factory owners to imprisonment (to the extent they are individuals) and impose financial penalties on factory owners (whether they are individuals or corporate entities).
5. What are the best practice guidelines affecting Tokyo (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	The Tokyo Metropolitan Government sets out guidelines and targets that apply in addition to the laws and regulations of Japan. Details can be found at the website of Tokyo Metropolitan Government (http://www.kankyo.metro.tokyo.jp/en/automobile/index.html (English) or http://www.kankyo.metro.tokyo.jp/air/air_pollution/index.html (Japanese)). No best practice guidelines exist for Tokyo other than those reflected above.
6. Please provide details of any case law interpreting Tokyo's domestic and international obligations in respect of air pollution control strategies.	N/A

United Kingdom

Question	Response
Please provide an executive summary of your responses to questions 1 – 7 below.	Modern UK legislation on air pollution primarily consists of regulations that implement European Union directives, though, there is some non-EU based domestic legislation which has its origins in the industrial revolution and the fall out from the Great Smog of 1952. The legislative and statutory instruments in the UK which aim to improve air quality all have implicit objectives to improve human health (whether through preambles in the European Union directives or through the historical context in which they were conceived), but notably none contain any measurable health objectives to be achieved by any pre-determined time frames.
1. What is the legal framework for air quality law and regulation in the UK?	**A. Legislation** The legal framework for air quality law and regulation in the UK is largely driven by European legislation with further domestic statutes implementing and supplementing this to regulate environmental quality and public health. (i) **European directives and associated implementing instruments**[56] *The UK's implementing regulations for the Air Quality Directive and the Fourth Daughter Directive* The Air Quality Standards Regulations 2010 (the "**AQSR**") implement: • the EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe (the "**Air Quality Directive**"); and • the EU Directive 2004/107/EC that sets targets for levels in outdoor air of certain toxic heavy metals and polycyclic aromatic hydrocarbons (the "**Fourth Daughter Directive"**).

[56] Please see response 1 of the European Union questionnaire for further details on the directives referenced.

	These regulations primarily apply to England and equivalent regulations exist in Scotland, Wales and Northern Ireland as air quality is a devolved matter. Administrations in Scotland, Wales and Northern Ireland are responsible for their own air quality policy and legislation. Scotland has implemented certain higher objectives for air quality than England in relation to PM_{10}, $PM_{2.5}$ and Benzene.[57] The UK government leads on international and European legislation. The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a consolidated regime of environmental permitting in England and Wales. These regulations make amendments to the AQSR and require the Secretary of State to consider, when preparing an air quality plan, whether to include measures imposing lower emission limit values for medium combustion plants than those set out in the Medium Combustion Plant Directive (Directive (EU) 2015/2193),[58] if that would make a noticeable improvement to air quality. *The UK's implementing regulations for the National Emission Ceilings Directive* The National Emission Ceilings Regulations 2018 transpose into UK legislation the requirements of the National Emission Ceilings Directive (Directive 2016/2284/EU) relating to national emission ceilings for certain atmospheric pollutants. The Regulations will become effective from 1 July 2018. The ceilings are similar to the UNECE Gothenburg Protocol[59] which sets national emission limits (ceilings) for SO_2, NO_X, NH_3 and volatile organic compounds. (ii) **Domestic statutes and statutory instruments** *The Clean Air Act 1993 (the "**CAA 1993**") and associated regulations* The CAA 1993 has its origins in Acts of 1956 and 1968 and aims to reduce pollution from smoke, grit and dust. It gives local authorities powers to designate Smoke Control Areas (i.e. an area where it is an offence to emit smoke

[57] See Table 2 "National air quality objectives and European Directive limit and target values for the protection of human health" of The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1) and set out at 0

[58] See para (iii) of response 1 of the European Union questionnaire for more details on the Medium Combustion Plant Directive

[59] See para (iv) of response 1 of the European Union questionnaire for more details on the implantation of the Gothenburg Protocol

	from a chimney unless using an approved fireplace or fuel). In particular, the CAA 1993: • prohibits emissions of smoke within smoke control areas, unless using an exempted appliance or an authorised fuel; • prohibits emissions of dark smoke from any chimney, or from industrial or trade premises, subject to certain exemptions; • requires approval of many commercial furnaces to ensure they don't emit too much smoke, grit and dust; • requires approval of many furnace chimneys to ensure they are high enough to disperse any residual emissions; and • prohibits cable burning except under an environmental permit. The Clean Air (Miscellaneous Provisions) (England) Regulations 2014 consolidate six sets of regulations[60] concerning clean air, made under enabling powers which were repealed and re-enacted as part of the CAA1993. *The Environment Act 1995 (the "**EA 1995**") and associated regulations* Part IV of The Environment Act 1995 sets out provisions for protecting air quality in the UK and for local air quality management. Local authorities are required to review the quality of air within their area. Such reviews have to consider: (i) the air quality for the time being; and (ii) the likely future air quality; and must be accompanied by an assessment of whether any prescribed air quality standards or objectives are being achieved or are likely to be achieved within the relevant period. The Air Quality (England) Regulations 2000 (as amended) is the statutory instrument for the EA 1995. These regulations came into force on 6 April 2000 and prescribe the relevant period and set the air quality objectives for

[60] Dark Smoke (Permitted Periods) (Vessels) Regulations 1958 (SI 1958/878); Clean Air (Height of Chimneys) (Exemption) Regulations 1969 (SI 1969/411); Clean Air (Arrestment Plant) (Exemption) Regulations 1969 (SI 1969/1262); Control of Atmospheric Pollution (Appeals) Regulations 1977 (SI 1977/17); Control of Atmospheric Pollution (Exempted Premises) Regulations 1977 (SI 1977/18); Control of Atmospheric Pollution (Research and Publicity) Regulations 1977 (SI 1977/19).

	England. Section 80 of the EA 1995 requires the Secretary of State for Environment, Food and Rural Affairs to prepare and publish a strategy containing policies with respect to the assessment or management of the quality of air. The most recently published Air Quality Strategy for England, Scotland and Northern Ireland was in 2007 (the "**Air Quality Strategy 2007**"). The strategy sets out the UK's air quality objectives and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. The aim of the strategy is to provide a "*clear, long-term vision for improving air quality in the UK*" with due emphasis placed on the "*risk to health and environment from air pollution*". (iii) **International Agreements** The UK is a party to: (a) the 1985 Vienna Convention for the Protection of the Ozone Layer and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer and five subsequent amendments (London 1990, Copenhagen 1992, Montreal 1997, Beijing 1999, Kigali 2016); and (b) the 1979 Convention on Long-Range Transboundary Air Pollution and protocols (the "**Convention**") including: • The 1984 Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe; • The 1998 Aarhus Protocol on Persistent Organic Pollutants (POPs); • The 1998 Aarhus Protocol on Heavy Metals; and • The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone.[61]

[61] Please see response 1 of the European Union questionnaire for further details of the various regulations passed by the European Union in respect of the air emissions from both light-duty and heavy-duty vehicles.

	B. Prospective strategies and plans Following the Client Earth case (see response 7 below) the government was ordered to consult on and produce a plan to reduce emissions, particularly in urban areas. The two main plans produced were: (i) the Clean Air Zone Framework (May 2017); and (ii) the UK plan for tackling roadside nitrogen dioxide concentrations (July 2017). These plans were subsequently rejected by the courts as non-compliant and the government has been ordered to produce a new plan by October 2018. Therefore, the below summary has been provided for the purposes of relevant context only.[62] (i) *UK plan for tackling roadside nitrogen dioxide emissions 2017 (the "**AQP 2017**")* The AQP 2017 supplements the UK's pledge to invest £2.7 billion overall in air quality and cleaner transport.[63] Unlike greenhouse gasses, nitrogen dioxide is concentrated in certain areas with the main contributor being road vehicles (in particular, diesel cars). Due to the geographical-specific nature of this issue, the government suggested a localized approach with local authorities taking the lead with assistance from the government. Specifically, a three-pronged approach was put forward in the plan in order to: • establish a £255 million Implementation Fund to assist and support local authorities to deliver targeted action with the appropriate research conducted to support any such action; • set up a Clean Air Fund to allow for improvements to local bus fleets and generally make infrastructure changes to avoid the need for local councils to set up charging zones; and • set aside further funds to retrofit buses and provide funding for additional low-emission buses.

[62] NB: in ClientEarth No. 3 Mr Justice Garnham found the AQP 2017 to be unlawful on the basis that it failed to include information required by the legislative regime and failed to provide sufficient measures for 25 local authorities in England. Mr Justice Graham granted a mandatory order requiring Wales to produce a compliant plan by July 2018 and the Secretary of State to produce a compliant supplement for the 45 areas in England by 5 October 2018. See response 7 below for further a full summary.

[63] The government had pledged (as at the date of plan): (i) £1 billion for ultra low emission vehicles; (ii) £290 million towards a National Productivity Investment Fund (i.e. for reducing transport emissions); (iii) £89 million for a Green Bus Fund (further supplemented by a low emissions bus scheme) to put over 1200 new low carbon buses on the roads; (iv) £11 million for an Air Quality Grant to help local authorities to improve air quality; (v) £27 million to retrofit old vehicles (mainly buses) through a Clean Bus Technology Fund and Clean Vehicle Technology (as further boosted by an additional £40 million in February 2018); (vi) £1.2 billion to be invested in a Cycling and Walking Investment Strategy; and (vii) £100 million ring-fenced for and Air Quality Fund to be available through to 2021 for Highways England to improve air quality on its network.

	(ii) *The Clean Air Zone Framework 2017* The Department for Environment Food & Rural Affairs ("**DEFRA**") published a framework report in May 2017 to provide guidance to local authorities when implementing a Clean Air Zone.[64] The Framework suggested a range of methods for implementing Clean Air Zones from simply raising awareness of the healthier options available to the public (e.g. by improving infrastructure design for cyclists)[65] to removing pecuniary charges for "low emission" (i.e. fully electric or hydrogen-fuelled) vehicles moving through a Clean Air Zone. The framework document was ultimately designed to look forward to the government's long-term goal, for all newly manufactured cars and vans to be zero emissions by 2040. With a view to achieving this goal it set out minimum vehicle standards in Annex A with each vehicle set out in its own class (e.g. bus, coach, taxi etc.).[66] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/612592/clean-air-zone-framework.pdf
2. Do laws and regulations of the UK expressly provide for public health protection from air pollution as an objective? If so, how?	Policy aims, such as public health protection from air pollution, are largely implicit rather than expressly listed in UK legislation. As noted above, no targeted or measurable health objectives are included in any of the laws or regulations applicable to the UK. The recitals to the Air Quality Directive and National Emission Ceilings Directive list protection of human health as an objective of the directive (*see Response 2 of the European Union questionnaire*). The CAA 1993 does not contain express objectives although public health protection is implied. The CAA 1993 consolidates previous acts from 1956 and 1968 that were introduced following the Report of the Beaver Committee into Air Pollution that was established after numerous deaths linked to smog in 1952. The 1993 Act

[64] A Clean Air Zone is a defined area marked for attention by the government where action is required to be taken in order to improve the air quality. The government distinguished between two types of Air Zones: (i) a Non-charging Clean Air Zone; and (ii) a Charging Clean Air Zone. The main difference between the two being that within the latter type of zone vehicle owners are required to pay a charge to enter and move within the zone, whereas within the former type of zone charge based restrictions are not implemented. Examples of non-charging restrictions include: (i) setting age limits for taxis and private hire vehicles; (ii) implementing anti-engine idling conditions; and (iii) restricting the access and use of non-road mobile machinery (e.g. cranes and other construction machinery).

[65] See the government's local transport note on cycle infrastructure design. The government has since refreshed this guidance (published in 2008) in light of the new opportunities to encourage cycling introduced in the Traffic Signs Regulations and General Directions 2016 with a Cycling and Walking Investment Strategy (published in 2017).

[66] The framework document notes that a full process and timetable for the long-term updating and tightening of the standards will take place by the end of 2018 (see para. 134).

	also makes a number of amendments to public health legislation, such as the Public Health Acts of 1936 and 1961.[67]
3. What public health objectives (if any) are integrated into the operative parts of relevant laws and/or regulations of the UK?	The Air Quality Directive in England, the AQSR, includes protection of human health as an objective for target values and long-term objectives for ozone (see Schedules 3 and 4). Under the AQSR, the Secretary of State must maintain a high level of protection for human health in zones where the long-term objectives for ozone have been attained (section 20(2)(c)). What would constitute a "high level of protection" is not defined and so it is not clear exactly how this would apply in practice. Under the CAA 1993, local authorities must be satisfied that actions must not be "prejudicial to health" when considering: • applications for exemptions from the requirement to install an arrestment plant (to filter or capture grit and dust) for new non-domestic furnaces (section 7(2)); • applications for approval outside of the requirements of height of chimneys of furnaces (section 15(2)); and • plans for the erection or extension of certain types of building which propose to construct a chimney (section 16(2)).
4. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under the laws and regulations of the UK? (b) What is the process for	The air quality objectives are listed in Schedule 2 (*Limit values*) and Schedule 3 (*Target values*) of the AQSR. The National Emission Ceilings are listed in Schedule 3 (*National emission ceilings and national emission reduction commitments*) of the National Emissions Ceiling Directive. Please see Schedule 1 for a table summarising these UK air quality objectives and the European directive limits. As noted above, much of the domestic legislation originates from EU directives and regulations which have direct effect in the UK.[68] The AQSR is the key such legal instrument which sets air quality objectives. The annual average concentration of nitrogen dioxide in the air must be no higher than 40µg/m3 across a calendar year in

[67] None of the Clean Air Acts of 1956, 1968 and 1993 contain preambles that cite improvement of public health as an objective. The Clean Air Act 1956 was enacted in response to the "Great Smog" of 1952 where a smog descended over London where 12,000 people are thought to have died, as reported by the BBC. The original legislation, therefore, can be viewed as a reactive response to a historic concern for the impact of pollution on human health – a concern that can be argued remains applicable to the current iteration of the Act.

[68] Under section 2(2) of the European Communities Act 1972 UK government ministers have the power to implement EU directives and rulings of the European Court of Justice into UK law, allowing these to have direct effect in the UK

setting such air quality objectives under the laws and regulations of the UK?	every assessed location in each of the 43 air quality reporting zones of the UK. Additionally, an hourly average concentration over 200µg/m3 must not be reached more than 18 times in a year.[69] The UK currently fails to meet statutory air quality limits for nitrogen dioxide.[70] Please see response 4(b) of the EU Questionnaire on the process for setting air quality objectives.
5. Do laws and regulations of the UK prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	**A. Administrative & legal responsibility** Responsibility for meeting air quality limit values is devolved to the national administrations in Scotland, Wales and Northern Ireland. The Secretary of State for Environment, Food and Rural Affairs has responsibility for meeting the limit values in England and DEFRA co-ordinates assessment and air quality plans for the UK as a whole. The UK Government and the devolved administrations are required under the EA 1995 to produce a national air quality strategy. This was the Air Quality Strategy 2007, as described in response 1. Part IV of the EA 1995 and Part II of the Environment (Northern Ireland) Order 2002 requires local authorities in the UK to review air quality in their area and designate air quality management areas if improvements are necessary. Where an air quality management area is designated, local authorities are also required to work towards the objectives of the Air Quality Strategy 2007 prescribed in regulations for that purpose. An air quality action plan describing the pollution reduction measures must then be put in place. These plans contribute to the achievement of air quality limit values at local level. The Air Quality (England) Regulations 2000 (as amended) (the "**AQER**") prescribe the relevant period and set the air quality objectives for England. Where any of the prescribed objectives are not likely to be achieved within any part of a local authority's area within the relevant period, the authority concerned has to designate that part of its area as an air quality management area (section 83(1) of the EA 1995). An action plan covering the designated area must then be prepared setting out how the authority intends to exercise its powers in relation to the designated area in pursuit of the achievement of the prescribed objectives (section 84(2) of the EA 1995). The AQER prescribes the period within which a county council has to submit proposals to a district council which is preparing an action plan within the county council's area (regulation 3(1)).

[69] See nitrogen dioxide limits listed in Schedule 2 (*Limit values*) of The Air Quality Standards Regulations 2010.

[70] See DEFRA's report "Air Pollution in the UK 2016" published in September 2017. Two zones out of 43 zones failed to meet the limit value for hourly mean nitrogen dioxide. 37 out of 43 zones exceeded the limit value for annual mean nitrogen dioxide.

	Under Reg 3 of the AQSR, the Secretary of State for DEFRA is designated as the competent authority for the purposes of the Air Quality Directive and Directive 2004/107/EC. In *R. (on the application of Shirley) v Secretary of State for Communities and Local Government*,[71] it was held that although the Secretary of State for Communities and Local Government was the designated competent authority obliged by the Air Quality Directive to achieve the specified threshold air quality values, he was under no wider duty or freestanding responsibility to take any specific actions in relation to permits or development consents as a consequence of the Directive's requirements, including the power to call in planning applications for his own determination under the Town and Country Planning Act 1990 (s.77). As mentioned above at response 1, nitrogen dioxide pollution is a geographic-specific issue. Accordingly, the Environment Act 1995 (Feasibility Study for Nitrogen Dioxide Compliance) Air Quality Direction 2017 requires local authorities to carry out studies to identify how to meet legal limits for nitrogen dioxide. The study gave the 23 authorities identified as having the greatest air quality issues until 31 March 2018 to produce an initial plan, with final plans due by 31 December 2018.[72] The purpose of the study was to identify the best option to deliver compliance with legal limits for nitrogen dioxide in each area for which each local authority is responsible, in the shortest possible time. There is a power to hold inquiries under the CAA 1993 in appropriate cases either in connection with a provision of that Act or with a view to preventing or dealing with air pollution at any place. **B. Enforcement & non-compliance** If the Secretary of State is satisfied that a local authority has failed to perform any of its functions, he may declare the authority to be in default, and make remedial directions, or if the local authority defaults, transfer functions. The Environment Agency regulates the release of pollutants into the atmosphere from large and complex industrial processes. They also regulate emissions from some large-scale food processing factories and pig and poultry rearing activities. The Environment Agency works with local authorities, the Highways Agency and others to manage the government's Air Quality Strategy 2007 in England and Wales. The strategy sets air pollution standards to protect

[71] [2017] EWHC 3059 (Admin)

[72] See paragraph 3 and schedule 2 to the report

	people's health and the environment. The Environment Agency generally aims to begin with issuing cautions and notices but ultimately *does* have the power to issue a variable monetary penalty.[73] For penalties under EU regulations please see response (5) of the of the European Union questionnaire. Generally, the power of enforcement lies with the European Commission (the "**Commission**"), which will at first instance deliver a "*reasoned opinion*" on the alleged infringement after which, if the Member State has still not compiled, the matter will be referred to the Court of Justice of the European Union (the "**CJEU**") which holds the power to levy fines.[74] The UK has previously been issued warnings to address its nitrogen dioxide emissions – most notably in 2017 when the Commission sent a final warning to the UK with the possibility of taking the matter to the Court of Justice of the EU.
6. What are the best practice guidelines in the UK (if any) which apply in respect of compliance with requirements on health protection from air pollution and air quality objectives?	The Air Quality Strategy 2007, as described in response 1 above, sets out air quality objectives and policy options to further improve air quality in the UK. The aims of the Air Quality Strategy 2007 include public health protection. The EA 1995 required the strategy to include statements on "standards relating to the quality of air", and "objectives for the restriction of the levels at which particular substances are present in the air". The strategy recognises that air pollution can have a serious effect on people's health. The strategy states the UK Government's and devolved administrations' primary objective is to ensure that access to outdoor air without significant risk to their health, where this is economically and technically feasible. The air quality objectives in the Air Quality Strategy 2007 are a statement of policy intentions or policy targets. As such, there is no legal requirement to meet these objectives except in as far as these mirror any equivalent legally binding limit values in EU legislation. • A briefing titled "Air Quality - A Briefing for Directors of Public Health" was published by DEFRA and Public Health England in March 2017. The document sets out useful background on the main pollutants in a user-friendly format with case studies and a tool kit for organising collective action at the local level. • An Air quality plan for nitrogen dioxide (NO2) in UK was published in July 2017. The plan acknowledged

[73] Please see the Environment Agency's document of Offence Response Options for the full list of responses available to it (and derived from the Regulatory Enforcement and Sanctions Act 2008 (RES Act), the Environmental Civil Sanctions (England) Order 2010, the Environmental Civil Sanctions (Miscellaneous Amendments) Regulations 2010 and the Control of Mercury (Enforcement) Regulations 2017) as well as its enforcement and sanctions policy

[74] See Article 258 (ex Article 226 of the Treaty establishing the European Union (the "**TEC**") of the Treaty on the Functioning of the European Union (the "**TFEU**") which gives the Commission the power to refer matters to the CJEU. The CJEU then has the power under Article 260(2) of the TFEU (ex Article 288 of the TEC) to "*take the necessary measures*" which may include a "*lump sum or penalty payment to be paid by the Member State*"

	poor air quality as the largest environmental risk to public health in the UK and documented DEFRA's proposals to meet the legal requirement to reduce nitrogen dioxide set out in the ASQR. The plan was found to be unlawful in the ClientEarth No.3 case (see response 7 below for analysis of why the plan was rejected and above at response 1 for an summary of the contents of the plan). • A policy paper titled "A Green Future: Our 25 Year Plan to Improve the Environment" was published by DEFRA in January 2018 which includes details of the Clean Growth Strategy which reaffirms the UK's commitment to "mitigate climate and deliver clean, green growth". Although the focus of the report is on maintaining natural landscapes and preserving nature, it recognises "often hidden additional benefits in every aspect of the environment for national wellbeing, health and economic prosperity". • A new clean air strategy is due to be published in 2018 (see response 1 which sets out why a further iteration of the Air Quality Strategy 2007 is required).
7. Please provide details of any case law interpreting the UK's domestic and international obligations in respect of air pollution control strategies.	The main case law on this matter has come from ClientEarth, an environmental organisation, who has brought a number of judicial review claims against the UK government seeking orders requiring the Secretary of State to ensure any air quality plans published are fully compliant with the EU regulations and meet the limit values for nitrogen oxide. (i) **ClientEarth challenges to the 2011 Air Quality Plan (the "AQP 2011")**[75] The UK government had failed to ensure that certain zones were within limits of nitrogen dioxide by 1 January 2010, as required by the Air Quality Directive. The government's AQP 2011 showed that these limits would not be achieved until 2020, or in the case of London, 2025. ClientEarth claimed that this failed to comply with the Air Quality Directive, which required compliance no later than 2015. After being dismissed at first instance[76] (with the Court of Appeal[77] upholding the decision that the government was not required to apply for a postponement under the article 22 of the Air Quality Directive), the case went

[75] [2011] EWHC 3623 (Admin); [2012] EWCA Civ 897; [2013] UKSC 25; [2015] 1 C.M.L.R. 55

[76] [2011] EWHC 3623 (Admin)

[77] [2012] EWCA Civ 897

	before the UK Supreme Court and ultimately was referred to the Court of Justice of the European Union (the "**CJEU**") (see the EU questionnaire for full details). As a result of the CJEU's findings,[78] the Supreme Court ordered that an air quality plan be created in accordance with Article 23 of the Air Quality Directive. A new air quality plan was produced by DEFRA in 2015 (the "**AQP 2015**"). The AQP 2015 was modelled at five-yearly intervals and had a deadline of 2025 and 2020 for London and the rest of the zones respectively. The High Court granted a declaration that the AQP 2015 failed to comply with EU and domestic law as cost was not a factor when fixing the target date for compliance. The Court held that a modified version of the AQP 2015 had to be produced. The Secretary of State applied for an extension of time to publish the aforementioned modified version of the AQP 2015, relying on the fact that local and general elections were due to take place at the time of publication and the principle of a "*purdah*" period of three weeks preceding elections where sensitive decisions were to be avoided. This was rejected by the Court, as it was held that "*purdah*" was not a rule of law and did not override the government's obligation to comply with its statutory duty or court orders. Therefore, the court would extend time for the draft plan to be the day after locally elected officials took office. The final plan's deadline would remain unchanged. Once the AQP 2011 was published, ClientEarth also sought an order for DEFRA to supplement the plan. They argued that the draft failed to identify measures to be applied within the devolved administrations, and there was a disconnect between the various documents as to the option of employing non-charging clean air zones. This application was refused, as there was a risk that involving local authorities and devolved administrations would slow the process. (ii) **ClientEarth challenge to the AQP 2015**[79] ClientEarth then challenged the lawfulness of the AQP 2015 on the grounds that compliance would not be achieved by the deadline of 2015, and considering this raised various procedural issues in relation to what (if any) recourse the European Union could have against the non-compliant Member State.[80] It was found to be deficient by Mr Justice Garnham in November 2016. ClientEarth argued that the AQP 2015 was flawed by two errors of law as the Secretary of State erred in her approach to: (i) the requirement of Article 23 that periods of exceedance

[78] Please see response 7 of the European Union questionnaire for further details

[79] [2016] EWHC 2740 (Admin); [2016] EWHC 3613 (Admin) and [2017] EWHC 1618 (Admin)

[80] Please see response 7 of the European Union questionnaire for a full analysis of the procedural issues raised and the CJEU's findings

	should be kept "*as short as possible*"; and (ii) the approportionate weight to considerations of cost, political sensitivity and administrative difficulties. ClientEarth also claimed the Secretary of State failed to carry out a proper assessment of measures other than mandatory Clean Air Zones which were likely to be effective in ensuring compliance with the directive in "*as short as possible*" a time. Mr Justice Garnham viewed the discretion granted to Member States under Article 23 of the Air Quality Directive to be '*narrow and greatly constrained*'[81] and that air quality plans were to be "*devised in such a way as to meet the limit value in the shortest possible time"*.[82] He found the AQP 2015 to be deficient as they failed to comply with Article 23(1) of the Air Quality Directive and Regulation 26(2) of the AQSR as: • the Secretary of State was required to: (i) aim to achieve compliance by the soonest date possible; (ii) choose a route to that objective which reduces exposure as quickly as possible; and (iii) take steps which mean meeting the value limits is not just possible, but likely; • the Secretary of State erred in fixing on a projected compliance date of 2020 (and 2025 for London); and • the Secretary of State erred by adopting too optimistic a model for future emissions. Mr Justice Garnham ordered that, rather than quashing the AQP 2015, it should remain in place until it was replaced by a new plan.[83] In April 2017, Mr Justice Garnham extended the time to publish a modified air quality plan to the day after 2017 local elections,[84] namely the plan entitled the "*UK plan for tackling roadside nitrogen dioxide concentrations*" described (and defined as the AQP 2017) at response 1 above). (iii) **ClientEarth challenges to the AQP 2017**[85] ClientEarth challenged the lawfulness of the AQP 2017 (published in July 2017). Firstly, ClientEarth argued that the original draft of the AQP 2017 was defective because of failures to: (i) adequately identify measures to be

[81] [2016] EWHC 2740 (Admin) at paragraph 46.

[82] [2016] EWHC 2740 (Admin) at paragraph 47.

[83] [2016] EWHC 3613 (Admin)

[84] [2017] EWHC 1618 (Admin)

[85] [2017] EWHC 1966 (Admin); [2018] EWHC 315 (Admin); and [2018] EWHC 398 (Admin);

	applied within Scotland, Wales and Northern Ireland; and (ii) reflect the findings set out in the Secretary of State's own technical report which accompanied the plan.[86] Mr Justice Garnham rejected the application seeking a supplement to the draft air quality plan as the proposals were not considered unlawful at the stage. ClientEarth then challenged the AQP 2017 on the ground that it too failed to meet DEFRA's legal obligation.[87] Mr Justice Garnham held the AQP 2017 was unlawful as it did not contain measures sufficient to ensure substantive compliance with the Air Quality Directive and the ASQR in its application to the 45 local authority areas; (ii) it did not include the information required by Annex XV to the Air Quality Directive and Schedule 8 to the ASQR, in respect of 45 local authority areas; (iii) and it contained no compliant air quality plan for Wales. A supplementary plan must be produced by 5 October 2018. ClientEarth was given continuing liberty to apply so that it could bring the matter before the court if there was a failure to comply with the terms of the court order. One of the reasons which Mr Justice Garnham gave for this decision was a recognition that the issue of compliance is significant as it "*exposes the citizens of the UK to a real and persistent risk of significant harm*".[88]

[86] [2017] EWHC 1966 (Admin)

[87] [2018] EWHC 315 (Admin)

[88] [2018] EWHC 398 (Admin)

Schedule 1

National Air Quality Objectives[89]

[89] Please note that these were obtained from the DEFRA website here: https://uk-air.defra.gov.uk/air-pollution/uk-eu-limits and are up to date as of when they were accessed on 10 April 2018.

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	**Applies**	**Objective**	**Concentration measured as [10]**	**Date to be achieved by (and maintained thereafter)**	**European Obligations**	**Date to be achieved (by and maintained thereafter)**
Particles (PM_{10})	UK	50 µg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31 December 2004	50 µg/m^3 not to be exceeded more than 35 times a year	1 January 2005
	UK	40 µg/m^3	annual mean	31 December 2004	40 µg/m^3	1 January 2005
	Indicative 2010 objectives for PM_{10} (from the 2000 strategy and Addendum) have been replaced by an exposure reduction approach for $PM_{2.5}$ (except in Scotland – see below)					
	Scotland	50 µg/m^3 not to be exceeded more than 7 times a year	24 hour mean	31 December 2010	50 µg/m^3 not to be exceeded more than 35 times a year	1 January 2005
	Scotland	18 µg/m^3	annual mean	31 December 2010	40 µg/m^3	1 January 2005
Particles ($PM_{2.5}$) Exposure Reduction	UK (except Scotland)	25 µg/m^3	annual mean	2020	Target value - 25 µg/m^3	2010
	Scotland	10 µg/m^3		31 December 2020	Limit value - 25 µg/m^3	1 January 2015
	UK urban areas	Target of 15% reduction in concentrations at urban background		Between 2010 and 2020	Target of 20% reduction in concentrations at urban background.	Between 2010 and 2020

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	**Applies**	**Objective**	**Concentration measured as[1]**	**Date to be achieved by (and maintained thereafter)**	**European Obligations**	**Date to be achieved by (and maintained thereafter)**
Nitrogen dioxide	UK	200 µg/m^3 not to be exceeded more than 18 times a year	1 hour mean	31 December 2005	200 µg/m^3 not to be exceeded more than 18 times a year	1 January 2010
	UK	40 µg/m^3	annual mean	31 December 2005	40 µg/m^3	1 January 2010
Ozone	UK	100 µg/m^3 not to be exceeded more than 10 times a year	8 hour mean	31 December 2005	Target of 120 µg/m^3 not to be exceeded by more than 25 times a year averaged over 3 years	31 December 2010
Sulphur dioxide	UK	266 µg/m^3 not to be exceeded more than 35 times a year	15 minute mean	31 December 2005	-	-
	UK	350 µg/m^3 not to be exceeded more than 24 times a year	1 hour mean	31 December 2004	350 µg/m^3 not to be exceeded more than 24 times a year	1 January 2005
	UK	125 µg/m^3 not to be exceeded more than 3 times a year	24 hour mean	31 December 2004	125 µg/m^3 not to be exceeded more than 3 times a year	1 January 2005
Polycyclic Aromatic Hydrocarbons	UK	0.25 ng/m^3 B[a]P	as annual average	31 December 2012	1.0 ng/m^3	31 December 2012

National air quality objectives and European Directive limit and target values for the protection of human health						
Pollutant	**Applies**	**Objective**	**Concentration measured as[1]**	**Date to be achieved by (and maintained thereafter)**	**European Obligations**	**Date to be achieved by (and maintained thereafter)**
Benzene	UK	16.25 µg/m^3	running annual mean	31 December 2003	-	-
	England and Wales	5 µg/m^3	annual average	31 December 2010	5 µg/m^3	1 January 2010
	Scotland, Northern Ireland	3.25 µg/m^3	running annual mean	31 December 2010	-	-
1,3-butadiene	UK	2.25 µg/m^3	running annual mean	31 December 2003	-	-
Carbon monoxide	UK	10 mg/m^3	maximum daily running 8 hour mean/in Scotland as running 8 hour mean	31 December 2003	10 mg/m^3	1 January 2005
Lead	UK	0.5 µg/m^3	annual mean	31 December 2004	0.5 µg/m^3	1 January 2005
		0.25 µg/m^3	annual mean	31 December 2008	-	-

National air quality objectives and European Directive limit and target values for the protection of vegetation and ecosystems						
Pollutant	**Applies**	**Objective**	**Concentration measured as[1]**	**Date to be achieved by (and maintained thereafter)**	**European Obligations**	**Date to be achieved by (and maintained thereafter)**
Nitrogen oxides	UK	30 µg/m^3	annual mean	31 December 2000	30 µg/m^3	19 July 2001
Sulphur dioxide	UK	20 µg/m^3	annual mean	31 December 2000	20 µg/m^3	19 July 2001
	UK	20 µg/m^3	winter average	31 December 2000	20 µg/m^3	19 July 2001
Ozone: protection of vegetation and ecosystems	UK	Target value of 18,000 µg/m^3 based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved, so far as possible, by 2010	Average over 5 years	1 January 2010	Target value of 18,000 µg/m^3 based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved, so far as possible, by 2010	1 January 2010

United States

Question	Response
Please provide an executive summary of your responses to questions 1-6 below.	(1) Yes. The Clean Air Act of 1970 establishes National Ambient Air Quality Standards to protect public health and public welfare. (2) Some of the key public health objectives integrated into the operative parts of relevant US laws and/or regulations are reducing exposure to radon, researching on the short-term and long-term effects of air pollutants (including wood smoke) on human health, encouraging productive and enjoyable harmony between humanity and the environment, promoting efforts to help prevent or eliminate damage to the environment and biosphere and stimulating human health and welfare. (3) Examples of quality objectives under US laws and regulations include: a. the level of the national 8–hour primary and secondary ambient air quality standards for ozone (O_3) is 0.075 parts per million (ppm), daily maximum 8–hour average; b. the level of the annual primary ambient air quality standard for sulfur dioxide is 0.030 parts per million (ppm), not to be exceeded in a calendar year; c. national primary and secondary ambient air quality standards for lead and its compounds are: 1.5 micrograms per cubic meter, maximum arithmetic mean averaged over a calendar quarter; Some of the key processes/examples for setting air quality objectives include: a. conducting air research; b. strengthening air quality standards for ground-level ozone based on extensive scientific evidence;

	c. designating areas meeting and not meeting the air quality standards; and d. issuing federal emissions standards for new motor vehicles and non-road engines. (4) Yes, the US laws and regulations prescribe clear administrative and legal responsibility for compliance by taking Civil Administrative Actions and imposing criminal/civil liability and a general duty on the owners and operators of stationary sources producing, processing, handling, or storing hazardous substances. (5) At the federal regulatory level, best practices are with respect to specific pollutants. There is not a single best-practices standard under federal law. (6) There is little case law in the United States court system interpreting environmental laws. However, there is robust quasi-judicial interpretative guidance through the various administrative procedures of the EPA and Department of Justice. Examples can be found in our response to Question 6. A complete list can be found at https://www.epa.gov/enforcement/criminal-press-releases-2018.
1. Do laws and regulations of the United States of America ("**US**") expressly provide for public health protection from air pollution as an objective? If so, how?	**Clean Air Act of 1970 (and corresponding amendments)**[90] The Clean Air Act of 1970 ("**CAA**"), among other things, authorizes the Environmental Protection Agency ("**EPA**") to establish National Ambient Air Quality Standards ("**NAAQs**") to protect public health and public welfare and to regulate emissions of hazardous air pollutants. One of the goals of CAA was to set and achieve NAAQs in every state in order to address the public health and welfare risks posed by certain widespread air pollutants and therefore each state was directed to develop state implementation plans ("**SIPs**"), applicable to appropriate industrial sources in the state, in order to achieve these standards (see California summary for an example of an SIP). When Congress enacted the CAA it recognized that hazardous air pollutants ("**HAPs**") pose a significant health and environmental risk and established a separate program to

[90] https://www.epa.gov/laws-regulations/summary-clean-air-act

	regulate these pollutants. This program, known as the National Emission Standards for Hazardous Air Pollutants (“**NESHAP**”) program, required EPA to list HAPs that might “cause, or contribute to, an increase in serious irreversible or incapacitating reversible illness." For each listed pollutant, EPA was required to establish emission standards that provided for "an ample margin of safety to protect public health." To accelerate development of emission standards for HAPs, Congress completely overhauled the NESHAP program with Title III of the CAA Amendments of 1990 (“**1990 Amendments**”). The new program, set forth at CAA § 112, 42 U.S.C.A. § 7412, calls for the development of technology-based standards for the control of HAPs. Section 112 lists 188 regulated HAPs and requires EPA to develop a list of categories of sources that emit these HAPs in significant quantities. EPA must then develop "maximum achievable control technology" (“**MACT**”) standards for new and existing major sources in these categories. States were not required to update their SIPs based on the 1990 Amendments, but the Federal government published guidelines to facilitate state compliance with MACT. The initial focus of the MACT standards was on "major sources" of HAPs, a category that includes sources with the potential to emit 10 tons per year or more of any single HAP or 25 tons per year or more of any combination of HAPs. However, Congress found that small, widely dispersed emissions of hazardous air pollutants can, individually or in the aggregate, present significant risks to public health. The EPA, pursuant to its statutory authority described above, promulgates regulations under Title 40 of the Code of Federal Regulations. **National Environmental Policy Act** (“**NEPA**”)[91] Promotes the enhancement of the environment and established the President's Council on Environmental Quality (“**CEQ**”). The law was enacted on January 1, 1970. The purpose of NEPA is to ensure that environmental factors are weighted equally when

[91] United States. National Environmental Policy Act of 1969. Pub.L. 91–190, Approved January 1, 1970. 42 U.S.C. § 4321 *et seq.*

	compared to other factors in the decision-making process undertaken by federal agencies and to establish a national environmental policy. The act also promotes the CEQ to advise the President in the preparation of an annual report on the progress of federal agencies in implementing NEPA. It also established the CEQ to advise the President on environmental policy and the state of the environment. NEPA establishes this national environmental policy by requiring federal agencies to prepare an environmental impact statement to accompany reports and recommendations for Congressional funding. NEPA is an action-forcing piece of legislation, meaning the act itself does not carry any criminal or civil sanctions, and therefore, all enforcement of NEPA must occur through the court system. In practice, a project is required to meet NEPA guidelines when a federal agency provides any portion of financing for the project. However, review of a project by a federal employee can be viewed as a federal action, and in such a case, it requires NEPA-compliant analysis performance.
2. What public health objectives (if any) are integrated into the operative parts of relevant US laws and/or regulations?	The CAA is enacted under the section of the US Code entitled "Public Health and Welfare" and cites those general goals. For example, the growth in the amount and complexity of air pollution brought about by urbanization, industrial development, and the increasing use of motor vehicles has resulted in mounting dangers to the public health and welfare. One of the purposes of the relevant section of the US Code is thus to protect and enhance the quality of the Nation's air resources, so as to promote the public health and welfare and the productive capacity of its population. Other objectives include reducing exposure to radon, and researching on the short-term and long-term effects of air pollutants, including wood smoke, on human health.[92] The first part of NEPA, which is entitled Congressional declaration of purpose, states: "The purposes of this chapter are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and

[92] http://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter85/subchapter1/partA&edition=prelim

	natural resources important to the Nation; and to establish a Council on Environmental Quality." Under the 1990 Amendments, EPA must identify and list not less than 30 hazardous air pollutants from sources that present the greatest threat to public health. EPA must also identify and list the categories of area sources accounting for 90% or more of all area source emissions of the 30 hazardous air pollutants and develop emission standards for these sources. These standards can be based on MACT, or on generally available control technology ("**GACT**"), a lesser standard.[93]
3. (a) What are the air quality objectives (including, but not limited to, clear targets and express timelines) under US laws and regulations? (b) What is the process for setting such air quality objectives under US laws and regulations?	(a) NAAQs for pollutants are considered harmful to public health and the environment. The CAA identifies two types of national ambient air quality standards. ***Primary standards*** provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.[94] • There are numerous examples of specific targets and timelines in regulations promulgated by EPA. Some such examples follow: o The level of the national 8–hour primary and secondary ambient air quality standards for ozone (O_3) is 0.075 parts per million (ppm), daily maximum 8–hour average; o The level of the annual primary ambient air quality standard for sulfur dioxide is 0.030 parts per million (ppm), not to be exceeded in a calendar year; o National primary and secondary ambient air quality standards for lead

[93] https://www3.epa.gov/airtoxics/overview.html

[94] https://www.epa.gov/criteria-air-pollutants/naaqs-table

	and its compounds are: 1.5 micrograms per cubic meter, maximum arithmetic mean averaged over a calendar quarter.[95] (b) The EPA has set NAAQs for six principal pollutants (fine particles, ground-level ozone, sulfur dioxide, nitrogen dioxide, carbon dioxide, and lead), which are called "criteria" air pollutants. Periodically, the standards are reviewed and may be revised by the EPA. The current standards are listed below. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$). • EPA's air research provides the critical science to develop and implement outdoor air regulations under the CAA and puts new tools and information in the hands of air quality managers and regulators. • To reflect new scientific studies, EPA revised the national air quality standards. After the scientific review, EPA decided to retain the existing standards for carbon monoxide. EPA strengthened the air quality standards for ground-level ozone in October 2015 based on extensive scientific evidence about ozone's effects. • EPA has designated areas meeting and not meeting the air quality standards for the 2006 and 2012 PM standards and the 2008 ozone standard, and has completed an initial round of area designations for the 2010 sulfur dioxide standard. The agency also issues rules or guidance for state implementation of the various ambient air quality standards – for example, in March 2015, proposing requirements for implementation of current and future fine particle standards. EPA is working with states to improve data to support implementation of the 2010 sulfur dioxide and nitrogen dioxide standards. • For areas that have not met the national air quality standards, states are required to adopt SIP revisions containing measures needed to meet the standards as expeditiously as practicable and within time periods specified in the CAA (except

[95] Id.

	that plans are not required for areas with “marginal” ozone levels). • EPA is helping states to meet standards for common pollutants by issuing federal emissions standards for new motor vehicles and non-road engines, national emissions standards for categories of new industrial equipment (e.g., power plants, industrial boilers, cement manufacturing, secondary lead smelting), and technical and policy guidance for SIPs. EPA and state rules already on the books are projected to help 99 percent of counties with monitors meet the revised fine particle standards by 2020. The Mercury and Air Toxics Standards for new and existing power plants issued in December 2011 are achieving reductions in fine particles and sulfur dioxide as a byproduct of controls required to cut toxic emissions. • Vehicles and their fuels continue to be one of the primary causes of air pollution. EPA in 2014 issued standards commonly known as Tier 3, which consider the vehicle and its fuel as an integrated system, setting new vehicle emissions standards and a new gasoline sulfur standard beginning in 2017. The vehicle emissions standards will reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will enable more stringent vehicle emissions standards and will make emissions control systems more effective. These rules further cut the sulfur content of gasoline. Cleaner fuel makes possible the use of new vehicle emission control technologies and cuts harmful emissions in existing vehicles. The standards will reduce atmospheric levels of ozone, fine particles, nitrogen dioxide, and toxic pollution.[96] Under the Administrative Procedure Act (APA), federal agencies must give interested persons the right to petition for the issuance, amendment, or repeal of a rule. 5 U.S.C. §

[96] https://www.epa.gov/clean-air-act-overview/air-pollution-current-and-future-challenges

	553(e). In addition, some environmental statutes provide citizens the opportunity to petition EPA for specific rulemaking actions.[97] EPA provides public notices about regulatory and other actions it takes, often related to its permitting authorities. Many public notices seek comment *(e.g., proposed EPA actions)* or participation from the public *(e.g., public meeting notice)*; some are for informational purposes only *(e.g., announcing a final report)*.[98]

4. Do US laws and regulations prescribe clear administrative and legal responsibility for compliance with air quality objectives and targets? If so, how? For example, do laws and regulations impose legal consequences for non-compliance?	EPA and authorized states make decisions about compliance monitoring based on:
	
	• implementing an EPA or state plan, or
	
	• "for cause" - that is:
	
	  ○ as a result of tips complaints, or
	
	  ○ as a follow-up to previous monitoring activities.[99]
	
	Civil Administrative Actions are non-judicial enforcement actions taken by EPA or a state under its own authority. These actions do not involve a judicial court process. An administrative action by EPA or a state agency may be in the form of:
	
	• a notice of violation, or
	
	• an order (either with or without penalties) directing an individual, a business, or other entity to take action to come into compliance, or to clean up a site.[100]
	
	States may impose criminal and civil liability for environmental crimes:
	
	• Environmental civil liability is strict; it arises simply through the existence of the environmental violation. It does not take into consideration what the responsible

[97] https://www.epa.gov/aboutepa/petitions-rulemaking

[98] https://www.epa.gov/publicnotices

[99] https://www.epa.gov/compliance/clean-air-act-caa-compliance-monitoring

[100] https://www.epa.gov/enforcement/enforcement-basic-information

	party knew about the law or regulation they violated. • Environmental criminal liability is triggered through some level of intent.[101] A general duty is imposed on the owners and operators of stationary sources producing, processing, handling, or storing hazardous substances to: (1) identify the hazards that may result from a release; (2) design and maintain a safe facility to prevent a release; and (3) minimize the consequences of accidental releases should they occur. In addition, facilities storing certain hazardous substances above specified threshold quantities must prepare formal risk management plans that include hazard assessments and programs to prevent and respond to accidental releases of regulated substances.[102] Please see response to question 6, below, for examples of civil and criminal enforcement actions.
5. What are the best practice guidelines (if any) which apply in respect of compliance with US requirements on health protection from air pollution and air quality objectives?	At the federal regulatory level, best practices are with respect to specific pollutants. There is not a single best-practices standard under federal law. Regarding individual action, some best practice guidelines have been published for motor vehicles: Several strategies are being used by communities and schools across the country to reduce traffic-related pollution exposure, many of which can be applied in schools. For example: a) upgrade filtration systems used in classrooms; b) locate air intakes away from pollution sources; c) provide training to school staff and students on indoor air quality and ventilation; d) avoid strenuous activities, such as physical education class and sports, during peak traffic times;

[101] Id.

[102] https://www.epa.gov/sites/production/files/documents/gendutyclause-rpt.pdf

	e) reduce car and bus idling, upgrade bus fleets, and encourage active transportation like walking and biking to school; f) consider improvements to site layout, such as locating classrooms further from the roadway; and g) consider installation of solid and/or vegetative barriers.[103] Regarding best practices on the state level: EPA is helping states to meet standards for common pollutants by issuing federal emissions standards for new motor vehicles and non-road engines, national emissions standards for categories of new industrial equipment (e.g., power plants, industrial boilers, cement manufacturing, secondary lead smelting), and technical and policy guidance for SIPs. EPA and state rules already on the books are projected to help 99 percent of counties with monitors meet the revised fine particle standards by 2020. The Mercury and Air Toxics Standards for new and existing power plants issued in December 2011 are achieving reductions in fine particles and sulfur dioxide as a byproduct of controls required to cut toxic emissions.[104] Vehicles and their fuels continue to be one of the major causes of air pollution. EPA in 2014 issued standards commonly known as Tier 3, which consider the vehicle and its fuel as an integrated system, setting new vehicle emissions standards and a new gasoline sulfur standard beginning in 2017. The vehicle emissions standards will reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will enable more stringent vehicle emissions standards and will make emissions control systems more effective. These rules further cut the sulfur content of gasoline. Cleaner fuel makes possible the use of new vehicle emission control technologies and cuts

[103] https://www.epa.gov/schools/basic-information-about-best-practices-reducing-near-road-pollution-exposure-schools

[104] https://www.epa.gov/clean-air-act-overview/air-pollution-current-and-future-challenges

	harmful emissions in existing vehicles. The standards will reduce atmospheric levels of ozone, fine particles, nitrogen dioxide, and toxic pollution.[105]
6. Please provide details of any case law interpreting US domestic and international obligations in respect of air pollution control strategies.	**Introduction** There is little case law in the United States court system interpreting environmental laws. However, there is robust quasi-judicial interpretative guidance through the various administrative procedures of the EPA and DOJ. Please find some examples below. A complete list can be found at https://www.epa.gov/enforcement/criminal-press-releases-2018. Enforcing environmental laws is a central part of EPA's Strategic Plan to protect human health and the environment. EPA works to ensure compliance with environmental requirements. When warranted, EPA will take civil or criminal enforcement action against violators of environmental laws. Learn more about our enforcement goals. One of EPA's top priorities is to protect communities disproportionately affected by pollution through our environmental justice (EJ) work. EPA is integrating EJ into areas such as: • enforcement and compliance program planning and implementation, • identifying cases to pursue, and • developing solutions to benefit overburdened communities.[106] **Civil Enforcement** **Volkswagen Violations** The EPA has resolved a civil enforcement case against Volkswagen AG, Audi AG, Dr. Ing. h.c. F. Porsche AG, Volkswagen Group of America, Inc., Volkswagen Group of America Chattanooga Operations, LLC, and Porsche Cars North America, Inc. (collectively

[105] Id.

[106] https://www.epa.gov/enforcement/enforcement-basic-information

	"Volkswagen"), subject to reservations set forth in three partial settlements. These settlements resolve allegations that Volkswagen violated the CAA by the sale of approximately 590,000 model-year 2009 to 2016 diesel motor vehicles equipped with "defeat devices" in the form of computer software designed to cheat on federal emissions tests. The major excess pollutant at issue in this case is oxides of nitrogen (NO_x), and is a serious health concern. • On June 28, 2016, Volkswagen entered into a multi-billion dollar settlement to partially resolve the alleged CAA violations based on the sale of 2.0 liter diesel engines that were equipped with software designed to cheat on federal emissions tests, known as "defeat devices." The settlement was formally entered and took effect on October 25, 2016. • On **December 20, 2016,** Volkswagen entered into a second settlement to partially resolve the alleged CAA violations based on the sale of 3.0-liter diesel engines that were equipped with software "defeat devices" designed to cheat on federal emissions tests. • On **January 11, 2017**, in civil resolutions of environmental, customs, and financial claims, Volkswagen AG agreed to pay US$1.5 billion which covers EPA's claim for civil penalties against Volkswagen as well as U.S. Customs and Border Protection claims for customs fraud. In addition, the EPA agreement requires injunctive relief to prevent future violations. The agreements also resolve the alleged violations of the Financial Institutions Reform, Recovery and Enforcement Act.[107] **Shell Chemical LP - Norco, Louisiana Clean Air Act Settlement** The complaint alleges that Shell Chemical violated the CAA and regulatory requirements, which resulted in excess emissions of pollutants, including volatile organic compounds (VOCs), various hazardous air pollutants (HAPs) including benzene, and nitrogen oxides

[107] https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement

	(NO_x). The allegations include violations of: • New Source Review/Prevention of Significant Deterioration (NSR/PSD) and Minor New Source Review, 40 C.F.R. Parts 51 and 52 • New Source Performance Standards (NSPS), 40 C.F.R. Part 60, Subparts A, VVa and NNN. • National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 C.F.R. Part 61, Subparts A and FF. • NESHAP, 40 C.F.R. Part 63, Subparts A, G, SS, and YY. • Title V permits at the Norco facility. • Louisiana SIP requirements The consent decree requires Shell Chemical to take the following actions to resolve the CAA claims: • Submit and implement waste gas minimization plans, which are detailed plans for reducing the amount of waste gas that will be sent to flares. • Undertake a root cause analysis and implement corrective action for "reportable flaring incidents" (*i.e.*, greater than 500,000 standard cubic feet per day waste gas flow above baseload flows). • Operate an existing flare gas recovery system at the facility. • The above flare gas recovery system must be available for operation for a high percentage of time. • Install and operate flare monitoring and control equipment in order to assure high combustion efficiency at all flares subject to the settlement. • Operate fenceline monitoring stations to detect the presence of benzene from the

	Norco plant. Monitoring data will be made publicly available on the internet. Shell Chemical will pay a civil penalty of US$350,000. Louisiana Department of Environmental Quality will receive US$87,500 of the civil penalty.[108] **<u>Criminal Prosecutions</u>** The DOJ can formally prosecute criminal violations of the CAA. As can be seen from the examples below, criminal liability applies to both corporates and individuals for CAA violations. **Volkswagen Clean Air Act Violations** • On **January 4, 2016**, the DOJ filed a complaint on behalf of EPA against Volkswagen AG, Audi AG, Volkswagen Group of America, Inc., Volkswagen Group of America Chattanooga Operations, LLC, Porsche AG, and Porsche Cars North America, Inc. for the alleged violations of the CAA. • On **January 11, 2017**, Volkswagen agreed to plead guilty to three criminal felony counts and agrees to pay a US$2.8 billion criminal penalty.[109] **Volkswagen Senior Manager Sentenced to 84 Months in Prison for Role in Conspiracy to Cheat U.S. Emissions Tests** On December 6, 2017 the former general manager of Volkswagen AG's U.S. Environment and Engineering Office was sentenced to 84 months in prison for his role in VW's scheme to sell "clean diesel" vehicles containing software designed to cheat U.S. emissions tests. Oliver Schmidt, 48, a citizen and resident of Germany, was sentenced by U.S. District Judge Sean F. Cox of the Eastern District of Michigan, who also ordered Schmidt to pay a

[108] http://www.jurist.org/paperchase/2018/02/settlement-reached-with-shell-chemicals-over-clear-air-act-violations.php

[109] https://www.justice.gov/opa/pr/united-states-files-complaint-against-volkswagen-audi-and-porsche-alleged-clean-air-act

	criminal penalty of US$400,000. Schmidt pleaded guilty on August 4 to one count of conspiracy to defraud the United States, to commit wire fraud and to violate the CAA.[110] **Construction Company Sentenced for Clean Air Act Violations in Puerto Rico** A construction company was sentenced on August 16, 2017 to a fine of US$1.5 million dollars and three years of probation for violating the CAA. Aireko Construction Company ("**Aireko Construction**") failed to comply with the Asbestos National Emission Standards for Hazardous Air Pollutants during the illegal removal of asbestos containing materials from the Minillas North Tower in May 2012, according to court documents. As part of a plea agreement with the government, Aireko Construction was also ordered to pay US$172,020 to cover a baseline medical examination and follow up medical examination for victims exposed to asbestos fibers in the aftermath of the illegal activity.[111]

[110] https://www.justice.gov/opa/pr/volkswagen-senior-manager-sentenced-84-months-prison-role-conspiracy-cheat-us-emissions-tests

[111] https://www.justice.gov/opa/pr/construction-company-sentenced-clean-air-act-violations-puerto-rico

Schedule 3
Hong Kong Air Pollution Control Subsidiary Regulations

Chapter Number	Instrument Title
311A	Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulations
311B	Air Pollution Control (Dust and Grit Emission) Regulations
311C	Air Pollution Control (Smoke) Regulations
311D	Air Pollution Control (Appeal Board) Regulations
311E	Air Pollution Control (Air Control Zones) (Declaration) (Consolidation) Order
311F	Air Pollution Control (Specified Processes) Regulations
311G	Air Pollution Control (Specified Processes) (Specification of Required Particulars and Information) Order 1993
311I	Air Pollution Control (Fuel Restriction) Regulations
311J	Air Pollution Control (Vehicle Design Standards) (Emission) Regulations
311K	Air Pollution Control (Specified Processes) (Removal of Exemption) Order 1993
311L	Air Pollution Control (Motor Vehicle Fuel) Regulation
311M	Air Pollution Control (Specified Processes) (Removal of Exemption) 1994
311N	Air Pollution Control (Specified Processes) (Specification of Required Particulars and Information) Order 1994
311O	Air Pollution Control (Open Burning) Regulation
311P	Air Pollution Control (Asbestos) (Administration) Regulation
311Q	Air Pollution Control (Specified Processes) (Removal of Exemption) Order 1996
311R	Air Pollution Control (Construction Dust) Regulation
311S	Air Pollution Control (Petrol Filling Stations) (Vapour Recovery) Regulation

Chapter Number	Instrument Title
311T	Air Pollution Control (Dry-Cleaning Machines) (Vapour Recovery) Regulation
311U	Air Pollution Control (Emission Reduction Devices for Vehicles) Regulation
311W	Air Pollution Control (Air Pollution Control (Volatile Organic Compounds) Regulation
311X	Air Pollution Control (Air Pollutant Emission) (Controlled Vehicles) Regulation
311Y	Air Pollution Control (Marine Light Diesel) Regulation
311Z	Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation
311AA	Air Pollution Control (Ocean Going Vessels) (Fuel at Berth) Regulation