NATIONAL ENVIRONMENT AGENCY
COLLABORATION WITH SCIC

NEA Announces Tighter Industrial Emission Standards for Better Air Quality

GOVERNMENT REPORTS

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Singapore has adopted the World Health Organisation's Air Quality Guidelines (WHO AQGs) for particulate matter (PM10), nitrogen dioxide (NO2), carbon monoxide (CO) and ozone (O3), and WHO Interim Targets for fine particulate matter (PM2.5) and sulphur dioxide (SO2) as air quality targets to be achieved by 2020. In light of this, the Ministry of the Environment and Water Resources (MEWR) together with the National Environment Agency (NEA) have developed a roadmap of abatement measures to work towards attaining the air quality targets.

Like many other major cities, industrial emission is one of the key sources of air pollution. In Singapore, industrial emissions are regulated under the Environmental Protection and Management (Air Impurities) Regulations. Taking into account higher international standards, availability of cleaner fuel as well as technology advancements, it is hence timely for Singapore to review and benchmark our industrial emission standards. As part of NEA's continued effort to further improve air quality and safeguard public health, industries in Singapore will soon have to meet tighter industrial emissions standards for a range of pollutants. The introduction of the more stringent standards will serve to improve our air quality as we strive towards achieving our air quality goals for 2020 and beyond.

New industrial plants will have to meet the tighter industrial emission standards with effect from 1 July 2015. Existing industrial plants will be granted a grace period, until 1 July 2018, to comply with the revised standards for compounds of mercury, lead, cadmium, ammonia and hydrogen fluoride, and until 1 July 2023 to comply with the revised standards for particulate matter (PM), nitrogen oxides (NOx), carbon monoxide (CO) and sulphur dioxide (SO2).

List of Revised Emission Standards

Substance	Current Standard (mg/Nm3)	Revised Standard (mg/Nm3)
Mercury and its compounds	3 (expressed as mercury)	0.05 (expressed as mercury)
Cadmium and its compounds	3 (expressed as cadmium)	0.05 (expressed as cadmium)
Lead and its compounds	5 (expressed as lead)	0.5 (expressed as lead)
Ammonia and ammonium compounds	76 (expressed as ammonia)	30 (expressed as ammonia)
Fluorine, hydrofluoric acid or inorganic fluorine compounds	50 (expressed as hydrofluoric acid)	10 (expressed as hydrofluoric acid)
Particulate substances including smoke, soot, dust, ash, fly-ash, cinders, cement, lime, alumina, grit and other solid particles of any kind	(i) 100 ; or (ii) where there is more than one flue, duct or chimney in any scheduled premises, the total mass of the particulate emissions from all of such flue, duct or chimney divided by the total volume of such emissions shall not exceed 100 mg/Nm3 and the particulate emissions from each of such flue, duct or chimney shall not exceed 200 mg/Nm3 at any point in time.	(i) 50 ; or (ii) where there is more than one flue, duct or chimney in any scheduled premises, the total mass of the particulate emissions from all of such flue, duct or chimney divided by the total volume of such emissions shall not exceed 50 mg/Nm3 and the particulate emissions from each of such flue, duct or chimney shall not exceed 100 mg/Nm3 at any point in time.
Carbon monoxide	625	250
Oxides of nitrogen	700 (expressed as nitrogen dioxide)	400 (expressed as nitrogen dioxide)
Sulphur dioxide (combustion sources)		(i) 1,700; or (ii) where there is more than one flue, duct or chimney in any scheduled premises, the total mass of the sulphur dioxide emissions from all of such flue, duct or chimney divided by the total volume of such emissions shall not exceed 1,700 mg/Nm3 on a daily basis.

Correction factors to be applied for the equipment for the expression of results are as follows:-

a. Boilers burning gaseous and liquid fuels: 3% oxygen;
b. Boilers burning solid fuels: 6% oxygen;
c. Incinerators: 11% oxygen;
d. Gas turbines: 15% oxygen

NEA has been in consultation with the industry and affected companies since early 2014 on the revision of industrial emissions standards. During this process, MEWR and NEA had also worked closely with the SCIC to understand industry's concerns and challenges faced. The grace period will give the existing industrial plants time to adjust their plans (e.g. upgrades of equipment) and processes so that they can meet the standards and still achieve their business outcomes.

Tightening the emissions standards will encourage industries to continually review and improve their industrial processes, equipment design and daily operational protocols to reduce emissions of pollutants. This move is also in line with the government's continued efforts to support the long-term sustainable growth of industries here.