

HAZE FACTS

What is Haze?

The haze we see in our city skyline is caused by tiny particulates suspended in the atmosphere. At high concentrations, these particulates scatter and absorb sunlight resulting in diminished horizontal visibility thereby giving the atmosphere a characteristic opalescent appearance.

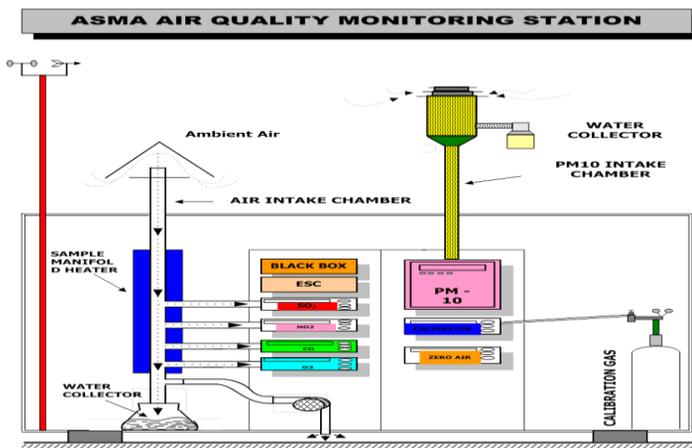


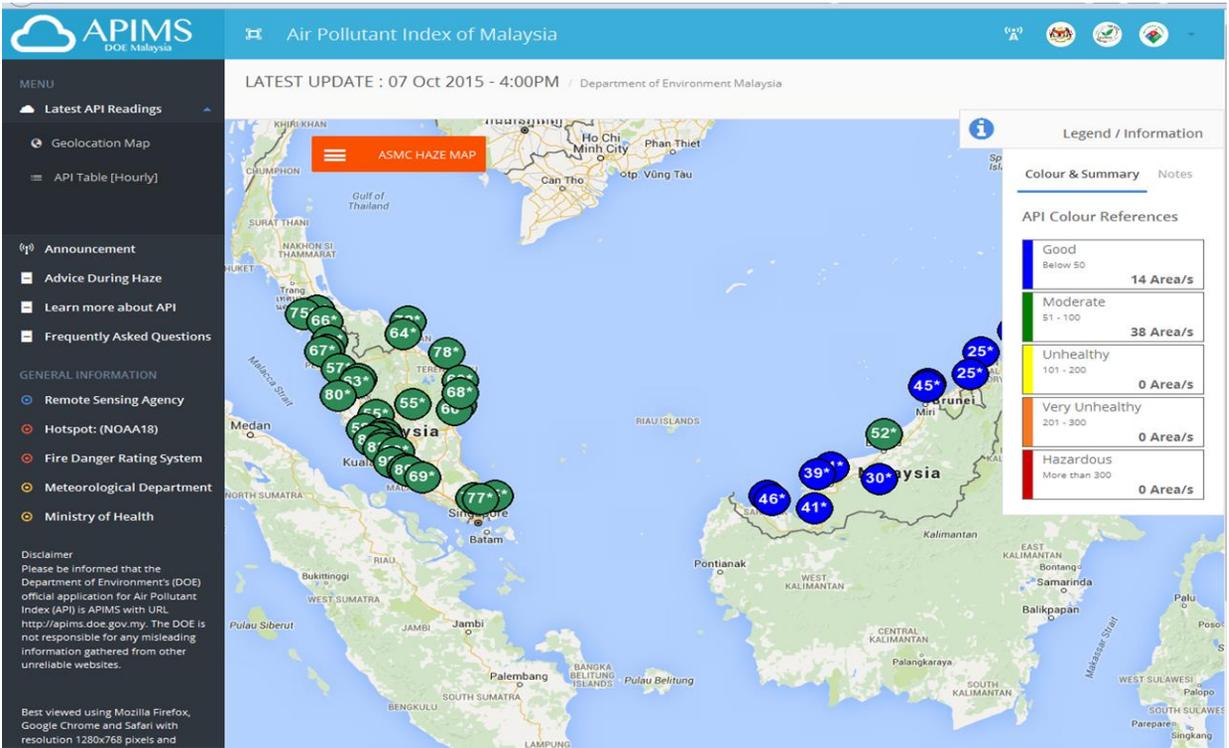
Haze Particles - Their Origin

The particles that cause the haze phenomenon can originate from many sources, some of which are natural and some anthropogenic. Natural sources include the oceans, forests and ground surface. However the majority of the particulates are from human activities which include open burning, forest fires, land clearing, vehicular emissions combustion of fossil fuels in industrial boilers.

How do we measure the haze?

The Department of Environment (DOE) monitors the air quality status through a network of 52 automatic stations. During haze, the dominant pollutant is tiny particles less than 10 micron in size known as PM10. Haze is measured and communicated to public in terms of Air Pollutant Index (API).

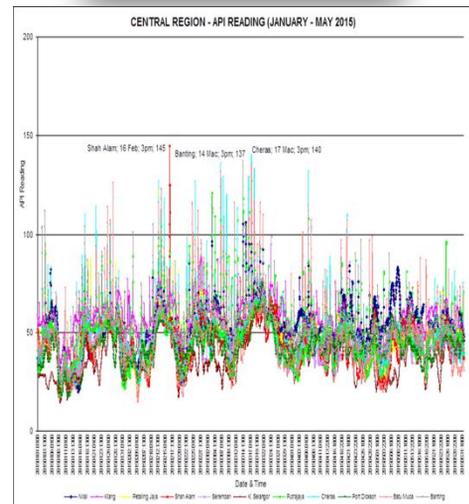
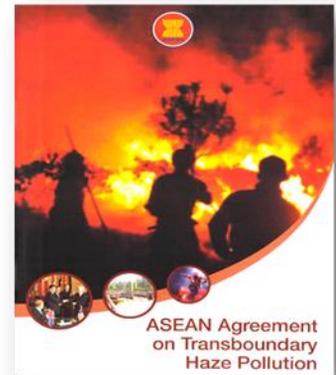




What is API?

Generally, an API system is developed in easily understood ranges of values instead of using the actual concentrations of air pollutants, as a means for reporting the quality of air or level of air pollution. The API ranges from Good 0 – 50, Moderate 51 – 100, Unhealthy 101 – 200, Very Unhealthy 201 – 300 and Hazardous above 300.

The API calculation formula used in Malaysia and many other ASEAN countries like Singapore, Indonesia, Brunei and Thailand is proposed by the United States Environmental Protection Agency (USEPA) based on a study on factors of exposure of pollutants to human health. Air Pollutant Index (API) is a measurement of the effects of 5 major air pollutant concentrations (fine particulate matter measuring less than 10 micrometers (PM₁₀), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and ground-level Ozone (O₃)) on a normal human's health over a specific time of exposure. The pollutant with the highest concentration will be automatically selected to be calculated for the index at that time.



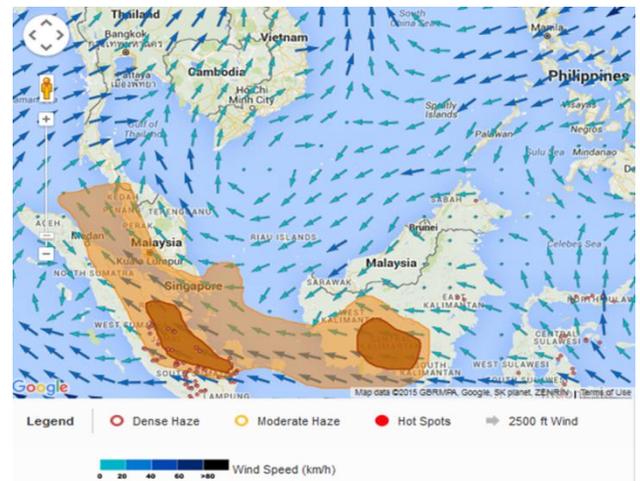
Malaysian API Versus Singapore PSI?

- The difference between the API readings in Malaysia and the Pollutant Standard Index (PSI) in Singapore is due to the different calculation of the index. Singapore has implemented the PSI calculation based on fine particulate matter measuring less than 2.5 micrometers (PM2.5) since April 1st 2014, while Malaysia's API still uses fine particulate matter measuring less than 10 micrometers (PM10). This causes quite a big difference in the measurement of API and PSI especially during haze occurrences. This is because more than 80% of fine particulate matter in the haze is PM2.5. Factors such as standard and low extent of the PM2.5 "breakpoints" in measuring PSI PM2.5 causes higher readings than that calculated based on PM10 readings. Although there is a difference in the calculation, the indicators of Good, Moderate, Unhealthy, Very unhealthy and Hazardous are still the same for both PM2.5 and PM10. In addition, measurement of PM2.5 and PM10 are both acceptable to international requirements such as the United States Environmental Protection Agency (USEPA).
- Department of Environment (DOE) has developed a new Ambient Air Quality Standard by incorporating the new pollutant, PM2.5 as one of the main pollutants to be calculated in the API system. Measurement of PM2.5 in the National Air Quality Monitoring Station Network is expected to be implemented in stages until the year 2017.



Why does the API not correspond to hazy condition & reduced visibility outside?

This is simply because the API calculation system is based on the concentration of fine particulate matter measuring less than 10 micrometers (PM10) over the last 24 hours. For example, measurement at 8.00 am today, takes into account the average concentration of PM10 from 8.00 am the day before. This factor sometimes causes the readings to not match the visibility at that time or does not reflect the situation outside which is very hazy. It happens especially when an area starts to get hazy. Thus, the readings will take some time to reach "unhealthy" level due to the concentration of the 'in-situ' PM10 is just starting to build up. The haze will get worse when high level of water vapour in the air (relative humidity) surrounds the fine particles, causing the visibility to worsen.



What Causes The Haze To Clear?

In our changing atmosphere, just as there are hazy days, there are also days which are clear and clean. What can bring about this change? Particulates in the atmosphere are removed through several processes. A proportion, particularly the heavier particles, settles to the ground or onto surfaces by gravitational sedimentation.

The finer particles are removed by a process called "rainout" involving condensation of water vapour onto minute particles to form water droplets eventually producing clouds. Particles are also removed below cloud by collision and adhesion with falling raindrops through another process called "washout".

Yet another removal mechanism involves the role of turbulence in transporting the haze particulates up to the higher levels of the atmosphere for more effective dispersion. In this case, widespread heavy rain/thunderstorms with strong updrafts and downdrafts are more effective, whereas light rain showers of short duration are usually quite inefficient in cleansing the atmosphere in a severe haze situation.