

Topic 5d - Practical guides - Part 1: Meteosat Third Generation

The composition of the Earth's atmosphere has far-reaching effects on your life. It influences your health, it affects agricultural crops and forestry, and it impacts aviation, all of which has large human and economic costs. It's critically important that we monitor the changing composition of the atmosphere so we can support efforts to mitigate the negative impacts and further our scientific understanding.

Air pollution is of particular importance because it's an invisible killer. The World Health Organization estimated that in 2012, 3 million premature deaths were caused worldwide by high levels of air pollution. Even in Europe, where air pollution levels have continued to decrease over past decades, there are still high levels of air pollution, and air quality problems persist. In the future, with the upcoming Meteosat Third Generation satellite system, thanks to the contribution of the Copernicus Programme, EUMETSAT will be in a strong position to support efforts to quantify, monitor, and forecast air pollution.

The Meteosat Third Generation, also known as MTG, is a dramatically improved continuation of the current operation of second generation satellites, which started in 2002 already. So now we are into 16 years of operation with the MSG satellite series. The MTG system consists of a twin satellite concept where one satellite is dedicated to imaging instruments only, while the other to sounding instruments, such as a Copernicus Sentinel-4.

The Sentinel-4 instrument is a UV-visible shortwave infrared spectrometer specifically designed to target European air pollution monitoring and forecasting. It will make hourly measurements of air pollutants across Europe with an 8 by 8 kilometer resolution. It will fly alongside the EUMETSAT Infrared Sounder, which is also a spectrometer, but measuring in the thermal infrared part of the spectrum. This provides complementary information, because it's sensitive to a different height range in the atmosphere, allowing us to separate the lowest part of the atmosphere, where pollution has its most direct effects, from measurements of pollution higher up.

These instruments will provide unprecedented information to support the monitoring and forecasting for air quality and air pollution, giving us more precise measurements much more frequently and allowing us to continuously monitor the evolving state of air pollution and atmospheric composition in Europe.

The first imaging satellite is up for launch in late 2021, where the first sounding satellite is due in 2023.