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# The Environmental and Health Impacts of Coal Thermoelectric Plants

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# The Environmental and Health Impacts of Coal Thermoelectric Plants

## Chapter 1

Assessment of health effects of the air pollution  
associated with emissions from Coal Thermoelectric  
plants



## Executive Summary

Air pollution is a source of concern for individuals, scientists and regulators and has been a focus of considerable research activity in recent years. There are many sources which contribute to air pollution and some of these pollutants can negatively impact on human health. One of the contributors to pollution is the burning of coal, which is a widely available, abundant combustible and, consequently, widely used for a variety of purposes including electricity generation. Health concerns have been raised regarding the safety of several aspects of coal use and this Report attempted to respond to three major issues.

In **Chapter 1**, health effects related to pollution from coal-thermoelectric plants are reviewed. Overall, from the studies with reasonable methodology, no increased or decreased health risks were associated with coal plant pollution in either workers in such plants or residents in the vicinity of plants. There is currently no evidence of an increased risk of death or other health effects associated directly with pollution from coal power plants.

In **Chapter 2**, the effects of fine particle pollution to which coal emissions contribute are presented. Short term effects of exposure to fine particulates have been consistently reported in adults with increased risk of all-cause mortality, more specifically cardiovascular and respiratory mortality. Long-term exposure to fine particulates reveals consistently increased mortality rates associated with increasing levels of PM<sub>2.5</sub>. In addition, decreases in air pollution levels have been associated with decreases in adverse health effects. The *Commercial, Institutional and Household* sector emissions represent 52% of PM<sub>2.5</sub> in EU-27. The *Energy Production and Distribution* sector is a major contributor of SO<sub>x</sub> and it has shown the greatest decrease since the 1990s: emissions of PM<sub>2.5</sub> and PM<sub>10</sub> have been reduced by a factor 3. In Italy, the *Energy Production and Distribution* sector is the eighth largest contributor to PM<sub>2.5</sub>, and the eighth largest contributor to PM<sub>10</sub> emissions, and emissions from these sources have dropped markedly over the past decades.

In **Chapter 3**, some recent estimations of the contribution of coal emissions to mortality from air pollution are discussed. Coal-fired power stations are emitting a certain quantity of PM<sub>2.5</sub> although these emissions are far lower than those resulting from other human activities such as household heating and road traffic and have been falling consistently and significantly in recent time. The *Stichting Onderzoek Multinationale Ondernemingen* (Centre for Research on Multinational Corporations; SOMO) has produced a Report which attempted to compute the contribution of ENEL's coal power plants to the global burden associated with PM<sub>2.5</sub> pollution in Italy. However, their report failed to a large extent to provide a robust, scientifically sound estimation.

To reach the European goals of air pollution limits for 2020, all sectors require to make efforts to reduce their emissions of atmospheric pollutants recognising that frequently the largest contribution to local pollution may be a variety of dispersed sources. However, specific actions must target the major sources of Particulate Matter emissions, namely Household Heating Sources and pollution from Road Traffic sources. Household use of coal, wood and biomass burning should be discouraged and solutions with low emission of PM<sub>2.5</sub> should be preferred.

To investigate and monitor the impact of air pollution on health, it is absolutely essential to prepare viable models that take into account all sources of pollution and not simply refer to a single, potential source. This is an absolute principle if the focus is, as it should be, on improving Public Health.