



# Executive summary

A massive investment in electricity generation from coal-power is planned in Turkey. The country has plans to increase its coal fleet by over 80 new coal-fired power plants, making it the third largest investor in coal power after China and India.

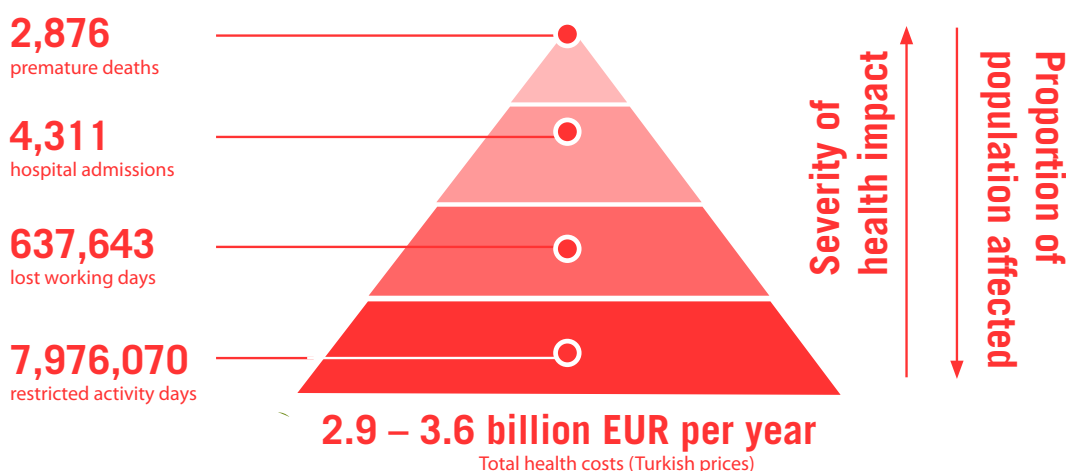
This continued reliance on coal comes at a cost that decision makers should be aware of: the unpaid health bill. This health bill is paid by individuals, national health care budgets, and by the economy at large due to productivity losses.

How is coal pollution making us sick? Coal power plants are an important contributor to air pollution in Turkey and in Europe, which European respiratory experts have called an 'invisible killer' and one of today's most important public health threats. Exposure to outdoor air pollution is linked to a number of health impacts including higher rates of respiratory and cardiovascular disease. This report developed by HEAL aims to provide:

- An overview of the scientific evidence on how air pollution impacts health and how emissions from coal power plants are implicated in this;
- The first ever economic assessment of the health costs associated with air pollution from coal power plants in Turkey;
- Testimonies from leading health advocates and medical experts on why they are concerned about coal, and;
- Recommendations for policy-makers and the health community on how to address the unpaid health bill in Turkey.

## The main findings

Emissions from coal-fired power plants in Turkey contribute significantly to the burden of disease from environmental pollution. The brand-new figures published in this report show that in Turkey impacts amount to 2,876 premature deaths, 3,823 new cases of chronic bronchitis in adults, 4,311 hospital admissions and 637,643 lost working days each year. The economic costs of the health impacts from coal combustion in Turkey are estimated at 2,9 billion up to 3,6 billion EUR per year. These costs reflect the prices for the Turkish economy, and are mainly associated with respiratory and cardiovascular conditions, which are two important groups of leading chronic diseases in Turkey.



**Figure 1: Health impacts associated with power sector (coal and lignite) emissions from Turkey**

## Top health concerns

Coal power generation adds to already poor outdoor air quality in Turkey - caused mainly by the transport sector, industrial processes, residential heating, and agriculture. Coal power plants release substantial amounts of particulate matter, sulphur dioxide, and nitrogen oxides - the latter contributing indirectly to the formation of ozone. Of these, the most worrying for health are fine particulate matter (PM<sub>2.5</sub>) and ozone. The report estimates that 20% of the health impacts from particulate matter in Turkey is caused by coal consumption in the power sector.

Significant evidence exists on how long-term exposure to these air pollutants affects the lungs and the heart. They include chronic respiratory diseases, such as chronic bronchitis, emphysema and lung cancer, and cardiovascular diseases, such as myocardial infarctions, congestive heart failure, ischemic heart disease and heart arrhythmias. Acute effects include respiratory symptoms, such as chest tightness and coughing, as well as exacerbated asthma attacks. Children, older people and patients with an underlying condition are more susceptible to these effects.

Other hazardous substances emitted from the smokestacks of coal power plants are heavy metals, such as mercury, and persistent organic pollutants (POPs), such as dioxins and polycyclic aromatic chemicals (PAHs). These can either be breathed in or taken up indirectly via food and water. Special concern arises from the large mercury emissions from coal power plants as mercury can impair the cognitive development of children and cause irreversible damage to vital organs of the foetus.

## The two-fold burden on human health: air pollution and climate change

Coal power generation is furthermore a major contributor to climate change, which was recognised by the Director-General of the WHO as the major public health challenge of the 21st century. There is no data available on the share of CO<sub>2</sub> emissions from coal plants in Turkey; the data for the EU-28 shows that coal in these countries contributes to approximately 20% of total greenhouse gas emissions. Evidence is growing that Turkey already experiences health impacts from climate change, and that health is particularly under threat from heat waves and water shortages in the Mediterranean region. While a phase out of coal in electricity and heat generation in Turkey is a prerequisite for preventing long term health impacts from climate change, it will also benefit people's health in the short term due to lower air pollution.

Decreasing the burning of fossil fuels, particularly coal, will bring huge public health benefits from tackling air pollution, avoiding health impacts from climate change and reducing climate change adaptation costs.

## **A breath of fresh air: what needs to be done**

From a health perspective, building new coal power plants would work against efforts to tackle chronic disease, create substantial costs for public health and lock in hazardous emissions for decades. A large coal power plant emits several thousand tons of hazardous air pollutants every year and has an average lifetime of at least 40 years. Building new coal power plants would mean that hazardous emissions and their effects on health would continue for many years.

The external costs to health from coal power generation have been missing from the debate on the future of Turkey's energy mix. These costs should be taken into consideration in all future energy investment decisions. Conversely, claims that domestic coal represents a cheap energy source need to be urgently revised. These considerations should lead to a moratorium on the building of new coal plants in Turkey and ultimately a phase out of coal.

## **The role of medical professionals and public health experts in reversing Turkey's coal future**

Public health experts and medical professionals can play a vital role, especially at the national and local level, in reversing this future coal scenario and ultimately making the phase out of coal a reality. They can draw on the scientific evidence presented in this report to highlight the role of coal in air quality and climate change discussions. They can also help relay the report's recommendations to policy-makers.

The engagement of public health experts will be crucial to ensure that externalities of coal - the unpaid health bill - are taken into account in future energy decisions in Turkey and elsewhere.