

CURING CHRONIC COAL

How phasing out coal power generation
can **save lives, improve health**
and strengthen the economy in Poland



HEAL gratefully acknowledges the financial support of the European Union (EU) and the European Climate Foundation (ECF) for the production of this publication. The responsibility for the content lies with the authors and the views expressed in this publication do not necessarily reflect the views of the EU institutions, CINEA and funders. The European Climate, Infrastructure and Environment Executive Agency (CINEA) and the funders are not responsible for any use that may be made of the information contained in this publication.

HEAL EU transparency register number: 00723343929-96



LEAD AUTHORS

Weronika Michalak, Poland Director, HEAL
Vlatka Matkovic, Senior Science Policy Officer, HEAL
Anne Stauffer, Deputy Director, HEAL

EDITORS

Jacek Karaczun, HEAL
Zoe Casey

RESPONSIBLE EDITOR

Genon K. Jensen, Executive Director, HEAL

MODELING AND TECHNICAL ANALYSIS

Lauri Myllyvyrtä, Lyder Ulvan, Erika Uusivuori,
Centre for Research on Energy and Clean Air (CREA)

GRAPHIC DESIGN

Marzena Wasilewska-Lasa, Polska Grupa Infograficzna,
infograficy.pl

HEAL would like to thank Marta Anczewska from CAN-Europe
for her review and input into this report.

HEAL
Curing Chronic Coal, Poland
Report 2023

PUBLISHED IN JANUARY 2023

CONTENTS

1.	Introduction	4
	Poland's energy system depends on coal	
	Air pollution from coal-fired power plants	
	The political situation on coal power generation	

2.	The health benefits of phasing out coal power in Poland	7
	Health impacts avoided with an early coal phase out by 2030	
	How an early coal phase out would protect children's health	
	How an early coal phase out could prevent hospital admissions for adults	
	How an early coal phase out could avoid productivity loss	
	How an early coal phase out would avoid early deaths	
	Health costs avoided with a 2030 or 2035 phase out, compared to 2049	
	Case study: Belchatow	

3.	What the science says: the health effects of fossil fuel combustion	16
	Health impacts of air pollution	
	Climate change and its impact on public health	
	Health sector engagement	

4.	Recommendations	20
	Recommendations for national-level decision-makers	
	Recommendations for local authorities	
	Recommendations for the health sector	

5.	References	23
-----------	-------------------	-----------

INTRODUCTION

Poland's energy system depends on coal

With **over 72%** of electricity produced from coal combustion, Poland's energy generation strongly depends on coal. In fact, this is the highest dependency for any of the EU countries. In November 2022, the total installed capacity of all coal power plants in Poland amounted to **60,1 GW**, of which **36 GW (60%)** were conventional power plants, including the world's largest lignite-fired unit - the Bełchatów power plant¹.

Power generation in Poland is characterised by high CO₂ emissions. They are three times higher than the EU average, while the average age of the coal-fired power plant is 47 years².

Coal combustion for heat and electricity is a major structural contributor to air pollution and greenhouse gas emissions in Poland³. It affects the health of Polish people who become ill and die prematurely as a result of breathing polluted air. They also suffer from the impacts of climate change.



Air pollution from coal-fired power plants

Air pollution is the greatest environmental challenge for public health in Poland. According to the European Environmental Agency's annual reports, over 45,000 people die every year as a result of breathing polluted air³. Moreover, Poland's coal combustion emits nearly 200 mio tonnes of carbon dioxide (CO₂) which fuel climate change⁴.

Poland is among the countries with the highest air pollution levels in the European Union. Successive reports from the European Environmental Agency (EEA) reveal that pollution concentrations exceed the EU air quality standards, and are much higher than maximum concentrations recommended by the World Health Organization (WHO) - many times throughout the year⁵.

Most air pollution in Poland originates from solid fuel combustion in domestic heating systems, from road, marine and aviation transport, as well as from coal-fired power plants⁶. The most harmful air pollutants from coal combustion include particulate matter, ozone, polycyclic aromatic hydrocarbons, e.g. benzo(a)pyrene, benzene, heavy metals, carbon oxide, nitrogen oxides and sulphur dioxide. Based on the differences in their formation, pollution can be divided into primary – emitted directly from the source (e.g. SO_x, NO_x, CO₂, NH₃ and PM) – and secondary pollutants which form when primary contaminants are physically and chemically transformed (SO₃, tropospheric ozone, formaldehyde, secondary aerosols, H₂SO₄, NH₄, and NO₃). Power plants are also the main emitters of mercury in Europe.

People who breathe polluted air suffer a higher risk of chronic diseases, premature death, and other health risks of air pollution, as well as from impacts resulting from the intensified climate change by emission of greenhouse gases to the atmosphere.



The political situation on coal power generation

Unfortunately, despite taking action under the EU's climate policy, Polish authorities have not set an official, legally binding date for phasing out coal power generation as well as coal mining. This calls into question the country's ability to reach climate neutrality by 2050. Poland is the only EU-27 country that has not set a phase out date. Other European countries, which are not member states and have no plans to shift away from coal, include Serbia, Bosnia and Hercegovina, Kosovo and Turkey⁷.

The strategy document on Poland's Energy Policy by PEP 2040, adopted by the government in 2020, foresees a reduction of greenhouse gas emissions by **30%** and a **23%** improved energy efficiency by 2030. This approach is based on the primary energy consumption forecasts from 2007 and the implementation of nuclear energy in 2033. According to the referenced document, the share of coal in electricity generation shall not exceed **56%**, while in 2040, it shall be no more than **28%**⁸. This approach is inconsistent with Poland's commitments under the Paris Agreement and the European Union's climate and energy 2030 targets. The document will be reviewed in 2023.

In March 2022, the government adopted the power sector transformation programme and made a decision to separate coal assets from the energy companies in which the State Treasury has shares. It means that coal-fired power plants will be grouped in a separate entity with **100%** of the State Treasury, to the National Energy Security Agency⁹, which will bring together power plants responsible for **55%** of the electricity generated in Poland (and two lignite mines - Turów and Bełchatów). Transferring unprofitable power plants to a state-owned entity creates the risk of subsidizing them from the state budget, contrary to economic calculations, and postponing the coal phase-out.

The current situation of Poland's dependence on fossil fuels is aggravated by the impacts of the war in Ukraine. There is a continued challenge of setting a long-term transformative strategy for the Polish energy sector by 2050, a need of increasing investments in renewable energy, in line with EU policies on climate and energy and RePowerEU, as well as setting a coal phase out date and pathway¹⁰.

THE HEALTH BENEFITS OF PHASING OUT COAL POWER IN POLAND

Polish energy generation is heavily dependent on the burning of coal, with over 70% of power generated by coal plants.

The analysis in this report considered **52 coal-fired power plants**, which contribute the majority of air pollutant emissions. In addition, 39 gas installations were included, as well as 50 combined heating and power plants (CHP).

IN THIS ANALYSIS, THREE SCENARIOS WERE EVALUATED, FOR WHICH HEALTH IMPACTS AND RELATED COSTS WERE CALCULATED

2030

All fossil fuel-fired power generation plants are phased out by the end of 2030. Power generation from biomass and biogas follows the Polish Energy Plan (PEP) until 2040 and is then frozen at the 2040 level.

2035

Same as for 2030 but all fossil fuels power generation phased out by the end of 2035.

2049

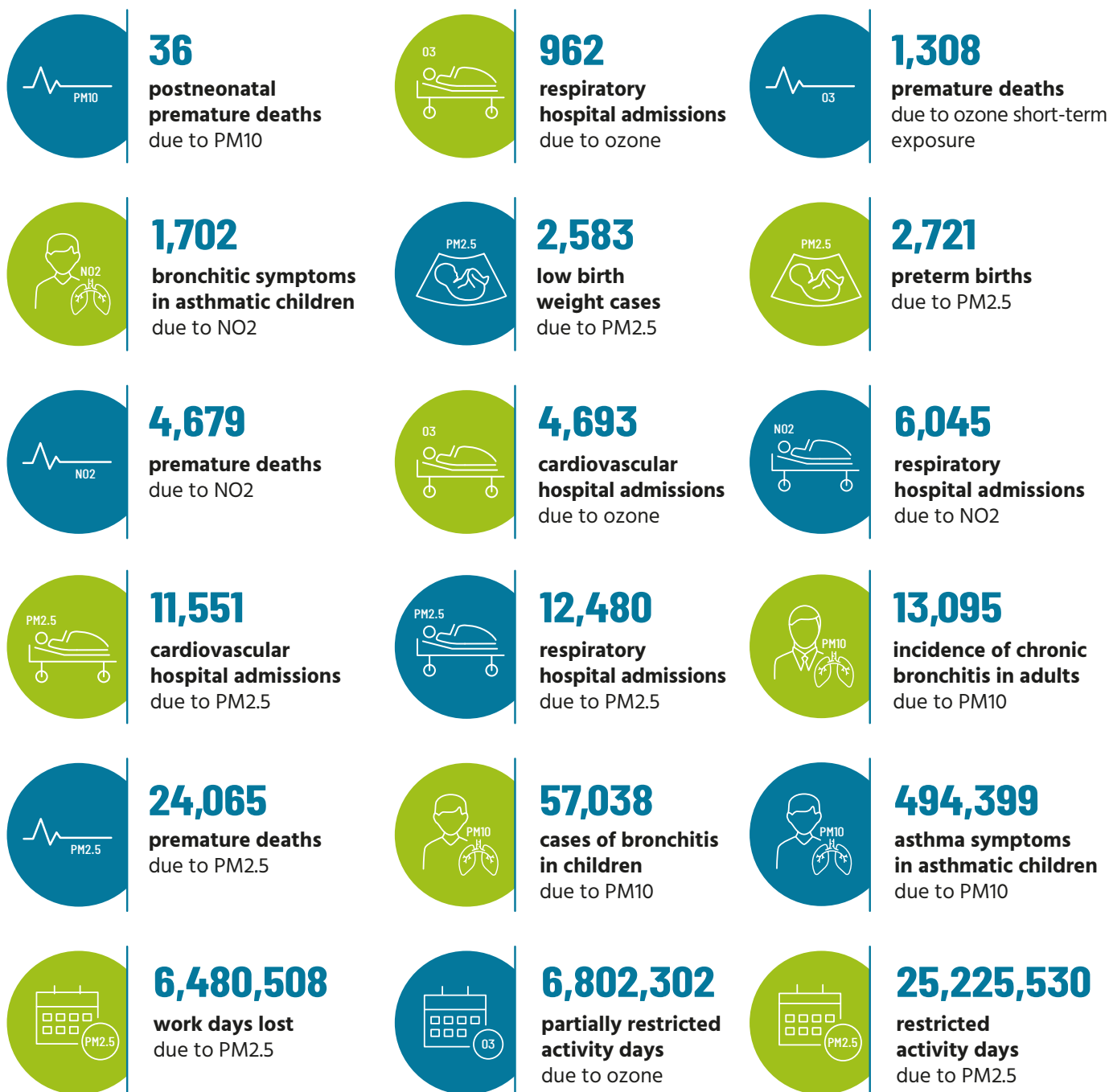
All fuels follow the PEP until 2040, and then coal is phased out by the end of 2049 and other fuels are frozen at the 2040 level (PEP2040 scenario).

Health impacts were calculated up until the year 2060. These were much greater under the PEP2040 scenario, in which the majority of coal-fired CHP plants would be replaced with gas-fired ones and some existing gas CHP plants would be closed after 2030 in order to align with the PEP.

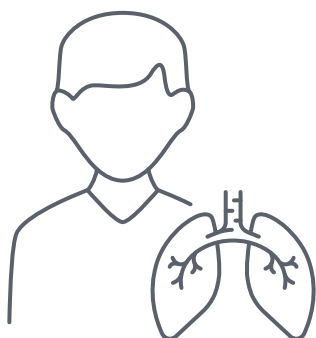
Health impacts avoided with an early coal phase-out by 2030

The earlier the coal phaseout, the more health impacts would be avoided.

HEALTH IMPACTS AVOIDED with an early coal phase-out by 2030



How an early coal phase out would protect children's health

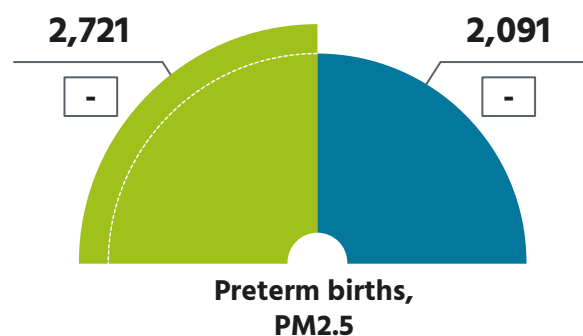
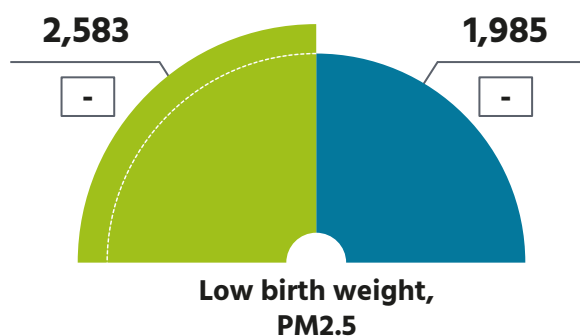
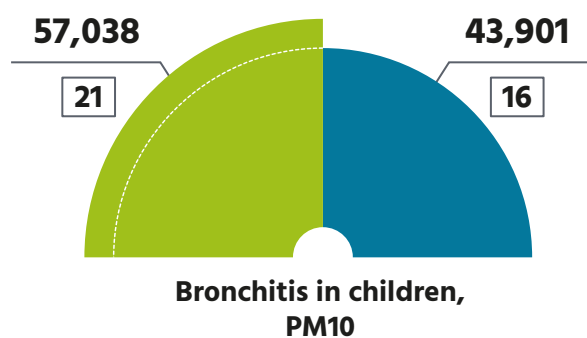
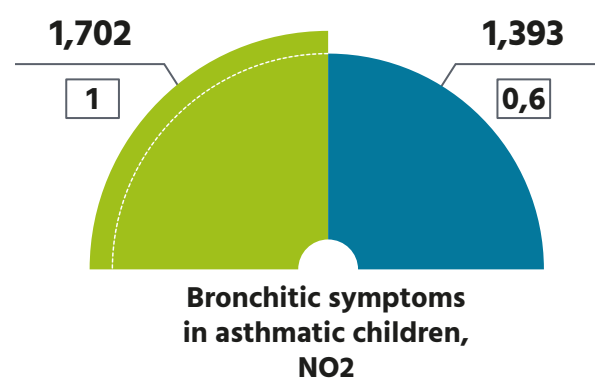
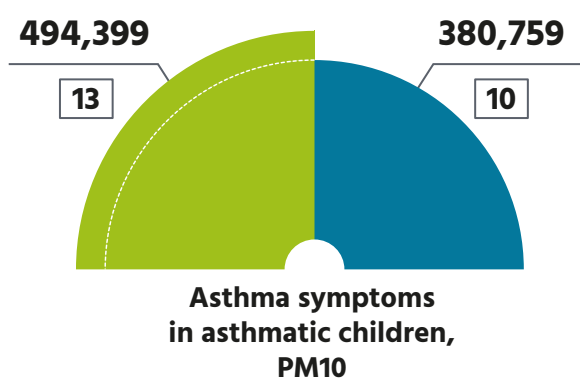


Avoided impacts
with an early,
2030 phase-out



Avoided impacts
with an early,
2035 phase-out

x costs saved, EUR mln



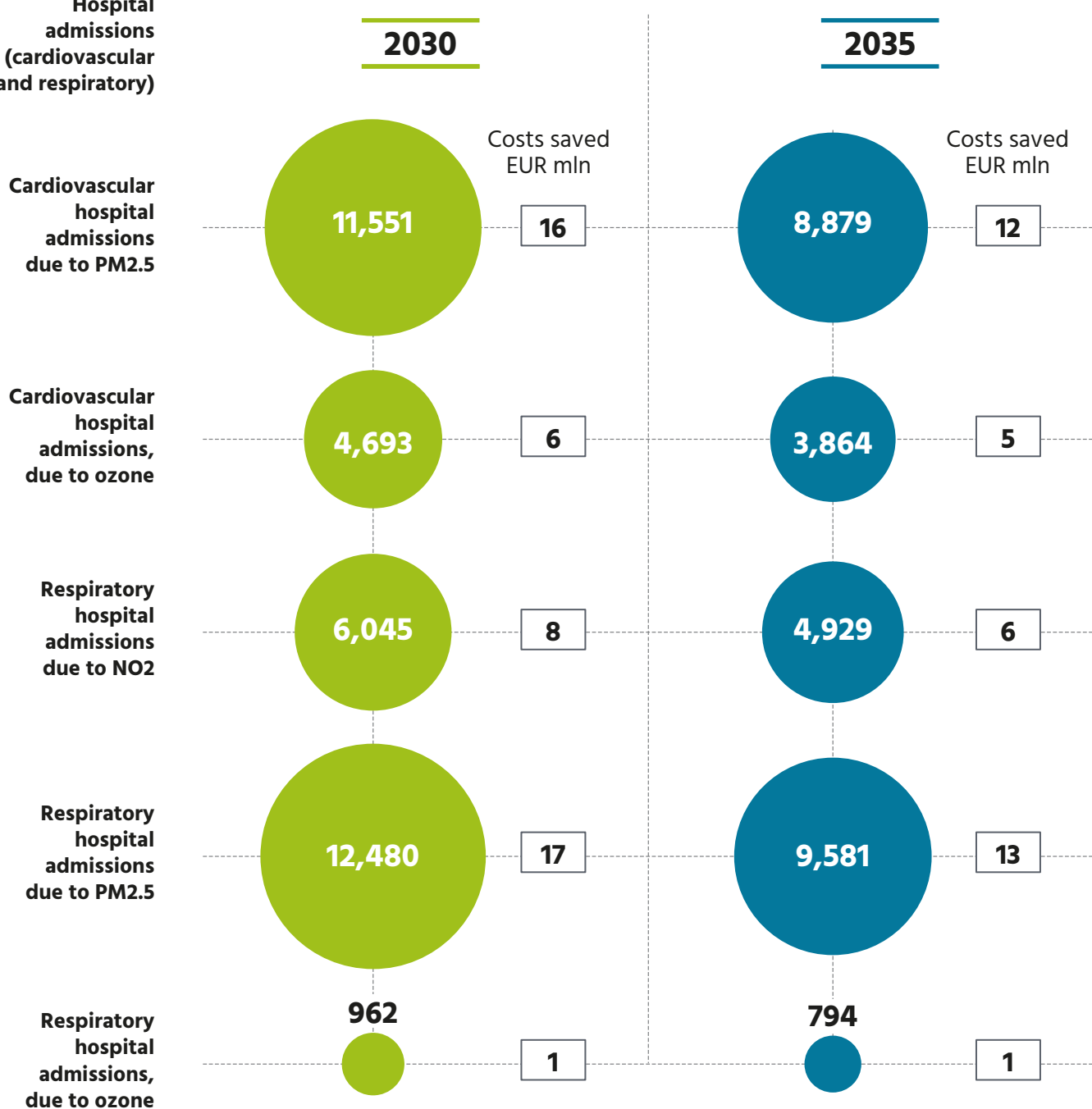
How an early coal phase out could avoid hospital admissions for adults



Hospital admissions
(cardiovascular and respiratory)

AVOIDED HEALTH IMPACTS AND COSTS

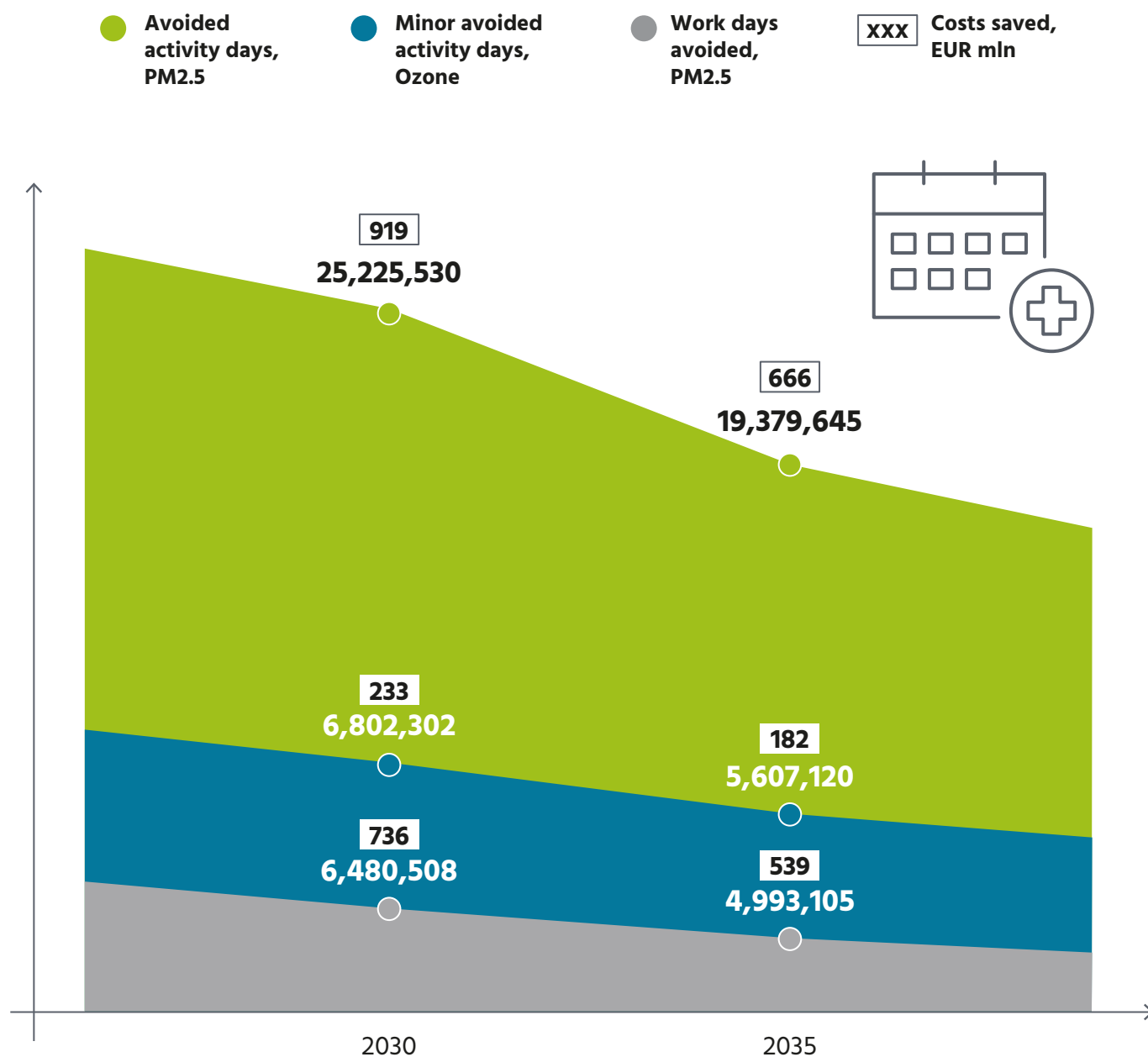
with an earlier coal phase-out, 2030 and 2035



How an early coal phase out could avoid productivity loss

PRODUCTIVITY COULD BE STRENGTHENED

with an earlier coal phase-out as well as billions of Euros saved



How an early coal phase out would avoid premature deaths

Phasing out coal and gas-fired electricity generation by 2030 would prevent **24,065** early deaths from PM pollution, compared to phasing out coal in 2049. Phasing out coal and gas by 2035 would save an additional **5,287** lives. Compared to a 2049 phase out, **18,778** early deaths could be avoided.

PREMATURE DEATHS FROM PM POLLUTION

per scenario, for the years 2022-2060



33,806

15,028

9,741

2030
Coal phase-out

2035
Coal phase-out

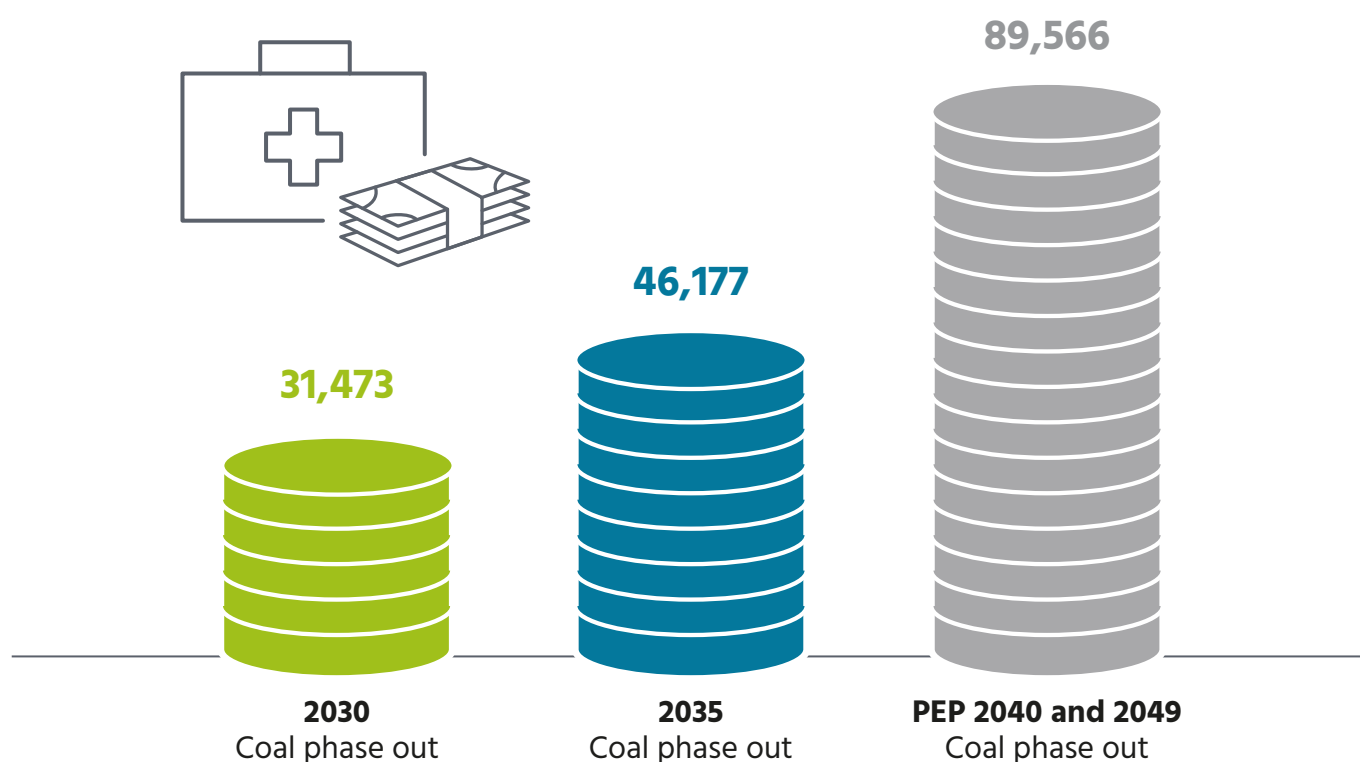
PEP 2040 and 2049
Coal phase-out

Health costs avoided with a 2030 or 2035 phase-out, compared to 2049

Even with an early 2030 phase out, health cost will still have occurred from the health impacts of air pollution until the phase out date. For 2030, these amount to up to **31 EUR billion**, and for 2035 to up to **46 EUR billion**, while 2049 would mean health cost of up to **89 EUR billion**.

TOTAL CUMULATIVE COSTS (ALL HEALTH IMPACTS)

per scenario, in EUR mln



With an early coal phase-out in 2030, **58 EUR billion** could be saved compared to 2049. A phaseout in 2035 would mean a saving of **43 EUR billion** compared to 2049.

Case study: Bełchatów

The Bełchatów power plant is Poland's largest coal plant, with a capacity of 5,102 MW. It provides over 20% of the electricity produced in Poland. Bełchatów is also the EU's most polluting plant when it comes to CO₂ and air pollutants. In 2021, **33.2 megatonnes of CO₂** were emitted from burning lignite at the plant.



The Polish Energy Group (PGE) has announced that Bełchatów power plant will be closed in 2036.

PREMATURE DEATHS PER SCENARIO, CUMULATIVE



3,530

5,754

Bełchatów 2030
Phase-out

Bełchatów 2035
Phase-out

COSTS PER SCENARIO, CUMULATIVE

in EUR mln



9,570

14,717

Bełchatów 2030
Phase-out

Bełchatów 2035
Phase-out

HEALTH IMPACTS FOR BELCHATÓW PHASE-OUT



Belchatów 2030 phase-out



Belchatów 2035 phase-out



70,370
111,218

asthma symptoms
in asthmatic children
due to PM10



1,784
2,872

incidence of chronic
bronchitis in adults
due to PM10



373
588

low birth weight
due to PM2.5



170
266

bronchitic symptoms
in asthmatic children
due to NO2



584
929

respiratory
hospital admissions
due to NO2



392
619

preterm births
due to PM2.5



8,159
12,880

cases of bronchitis
in children
due to PM10



1,724
2,768

respiratory
hospital admissions
due to PM2.5



394
641

long-term mortality
due to NO2



3,470,714
5,576,747

restricted activity days
due to PM2.5



84
136

respiratory
hospital admissions
due to ozone



3,028
4,937

long-term mortality
due to PM2.5



594,760
965,327

minor restricted
activity days
due to ozone



1,585
2,547

cardiovascular
hospital admissions
due to PM2.5



5
8

postneonatal
mortality
due to PM10



877,314
1,413,336

work days lost
due to PM2.5



413
670

cardiovascular
hospital admissions
due to ozone



102
169

short-term mortality
due to ozone

WHAT THE SCIENCE SAYS: THE HEALTH EFFECTS OF FOSSIL FUEL COMBUSTION

Health impacts of air pollution

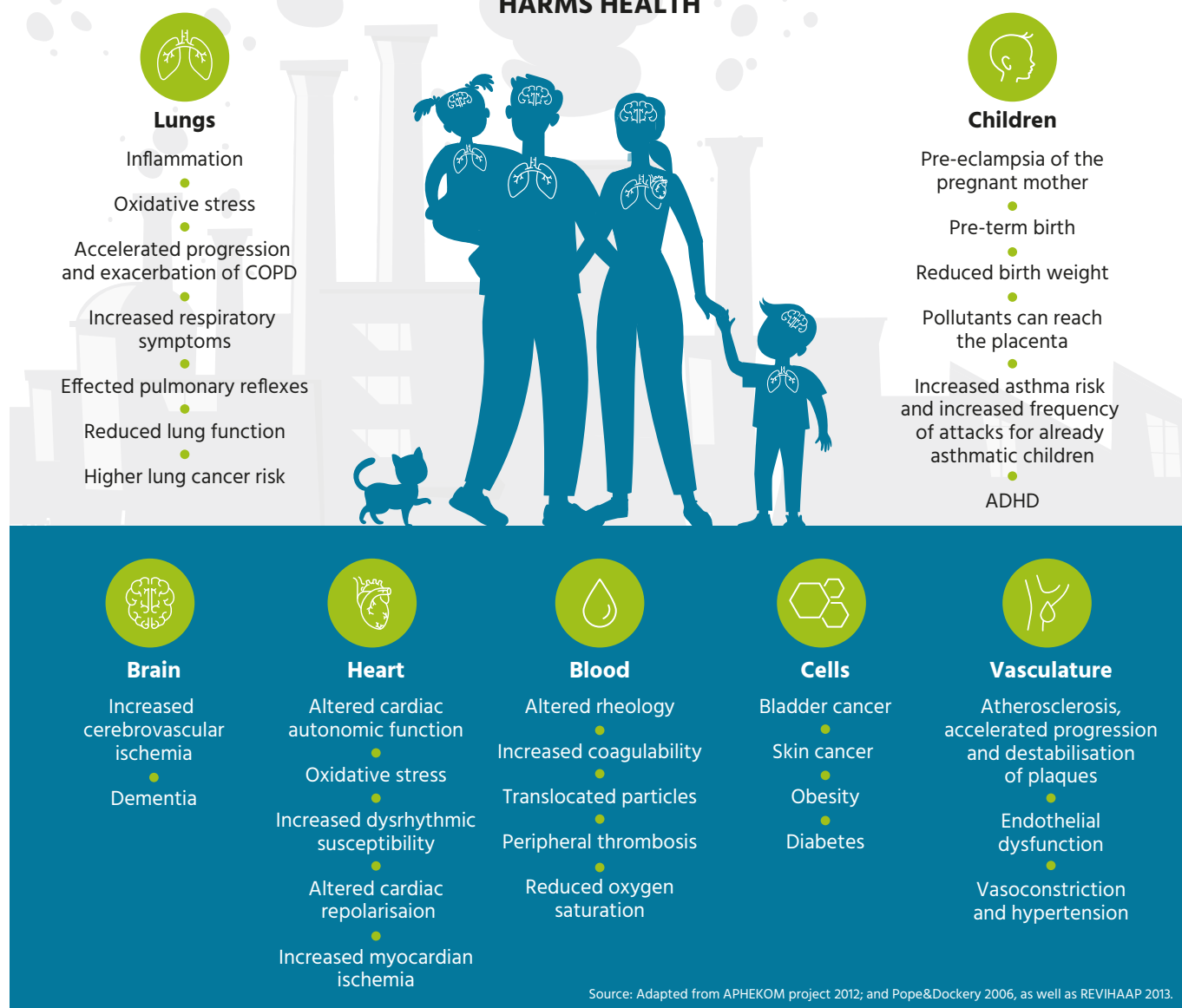
As mentioned above, **the combustion of fossil fuels, mainly coal and gas in the Polish case, generates significant volumes of air pollution harmful to health¹²**. The World Health Organisation classifies breathing polluted air as the principal environmental hazard for public health. Additionally, scientists emphasise that health risk occurs at pollution concentrations much lower than previously expected¹³. At present, experts warn that no air pollution level is safe (i.e. not detrimental to human health).

The main compounds emitted during the combustion of fossil fuels include particulate matter, nitrogen oxides, sulphur oxides, heavy metals¹⁴ and persistent organic compounds¹⁵. Harmful substances emitted by coal-fired power plants can travel long distances, crossing state borders. Moreover, sulphur and nitrogen oxides react with other substances in the air, creating secondary particles. Air pollution from coal power generation is also a key factor for poor air quality in cities, where the EEA estimates that 96% of inhabitants of European cities breathe air with a concentration of particulate matter and ozone that exceeds the values set out by the World Health Organisation¹⁶.

There is plenty of scientific research evidence confirming the impact of breathing polluted air over a sustained period of time on different organs and systems in the human body. This includes, but is not limited to, the respiratory system (chronic pneumonia and bronchitis, COPD, lung cancer, pulmonary emphysema, asthma), the cardiovascular system (cardiac failure, disturbed cardiac rhythm, ischaemic heart disease, arrhythmia, hypertension, atherosclerosis, excessive blood clotting, and arterial embolisms leading to cardiac infarctions)¹⁷, the hormone system (fertility problems, thyroid gland problems), the nervous system (including changing mood, ADHD, depression, poor concentration, deteriorated cognitive functions, IQ deterioration), lung cancer, urinary bladder cancer, brain cancer, gestation irregularities, prenatal damage, premature births, pre-eclampsic condition in pregnant women, smaller head circumference at birth and lower birth weight, development disorders in children, neurodegenerative disorders in the elderly, or even Alzheimer's disease or diabetes.

Children, the elderly – especially those suffering from cardiovascular and respiratory system disorders – and pregnant women are among the groups most vulnerable to the impacts of air pollution.

HOW AIR POLLUTION FROM COAL-FIRED POWER PLANTS HARMS HEALTH



The detrimental impact of pollution can be observed even before birth – in more polluted areas, babies have lower birth weights, smaller head circumferences and premature births occur more often. Air pollution was observed to contribute to an IQ reduction in children, as well as a higher risk of developing asthma, diabetes and other chronic diseases later in life.

Even though many health consequences occur following short-term exposure, even at low pollution concentrations, it is important to note that short-term contact with airborne harmful substances can lead to health problems, including cardiac infarction, ischaemic heart disease symptoms, stroke, arrhythmia and consequently even death. The number of hospitalisations due to the diseases above increases on and right after the days when a high concentration of particulate matter is recorded.¹⁸

Additionally, the health effects of air pollution entail numerous economic consequences. Absenteeism due to ailments caused by pollution requiring a doctor's certificate and hospitalisation, reduces work performance, requires care of ill children, burdens household budgets and hence generates costs for the whole economy.

Climate change and its impact on public health

The combustion of fossil fuels emits many harmful greenhouse gases which cause and accelerate climate change, harming the health of people in all countries in the world. Numerous scientific reports, including but not limited to The Lancet Countdown, emphasise that no continent, country or community is resistant to climate change's health effects. It affects many health-determining social and environmental factors – clean air, safe tap water, a sufficient amount of food and safe shelter. It contributes to the emergence of many health hazards, including in Poland. Climate change impacts health in different ways: it increases the frequency most vulnerable to the impacts of air pollution (thunderstorms, heavy rainfall, droughts and heat waves), disturbs water management, limits the cultivation of certain plants or reduces crop yields and leads to the spreading of vector diseases (e.g. borreliosis, malaria, dengue fever) and extended allergy seasons. In the long-term, it disturbs food safety and triggers armed conflicts (e.g. due to migration caused by a lack of access to clean water, food or safe shelter). **Every 1°C temperature increase in Europe will increase the mean total number of deaths and hospitalisations due to respiratory system diseases by two or three times.** Just like breathing polluted air, climate change will most severely affect seniors, children and patients with comorbidities. On a global scale, climate change will contribute to health deterioration in billions of people. The incidents can be linked with physical health effects, including but not limited to infections, injuries or even death, as well as psychological symptoms such as stress, anxiety, trauma and depression.¹⁹

The World Health Organization estimates that in 2030-2050, climate change will lead to ca. 250,00 additional deaths a year globally, due to malnutrition, malaria, diarrhoea and heat stress. It is estimated that the direct cost of health damage (i.e. excluding costs in areas such as agriculture) will range from 3 to 4 USD billion a year by 2030. Unfortunately, developing countries with poorly developed health infrastructure, will be most affected by the consequences.²⁰

The issue of climate change and its health impact is multi-faceted and complex. For example, there are interlinked long-term complications resulting from extreme weather events, while global warming also has an effect on mental health.

More information can be found in HEAL publications on climate change, materials published by the Climate Coalition, and the programmes and initiatives of national centres dealing with public health, such as NIZP-PZH²¹ (e.g. the "Climate" project carried out by the National Health Programme which is financed by the Minister of Health). The studies carried out by decision-makers and those commissioned by politicians lack urgent recommendations. Such recommendations, if correctly implemented on the national level, would protect public health from the consequences of worsening climate change in Poland.

Health sector engagement

The health sector (including doctors, nurses, public health experts and patients) have become more concerned about the consequences of fossil fuel combustion for public health, as well as about the health impacts of climate change and air pollution. The engagement of health experts in policy and public debates on these issues plays a significant role in the move towards phasing out coal-based power generation, in particular on the national and local levels.

In 2011, over 500 health protection and crisis management specialists, including representatives of physicians' associations, leading medical research institutions and public health organisations, appealed to the Polish government to ban the construction of new coal-fired power plants that do not have carbon dioxide capturing and storing facilities, and to gradually close down the existing plants.²²



WHO's 2021 special report for the COP26 Climate Summit in Glasgow on climate change and its health impact proposes a set of priority actions for public health experts, governments and political decision-makers, calling them to urgently act given the current climate and health crisis.

The Lancet Countdown, a unique interdisciplinary research collaboration, brings together **120 leading experts** representing academic institutions and UN agencies worldwide. In their annual reports, they evaluated climate change health impacts in five key areas and over forty indicators. The Lancet Countdown has underlined that Europe as a region has the highest risk for heat-related health impacts in the world.²³

An open letter, signed by six hundred organisations representing **46 million medical doctors and health care employees and 3,400 individuals from 102 countries**, was officially submitted to the chairpersons of the COP26 and COP27 Presidencies. The appeal's authors warn that the climate crisis is the biggest single hazard to humankind's health and call global leaders to take measures to save the climate and protect public health, by maintaining the global warming level below 1.5°C.²⁴

In September 2022, over 1,000 healthcare employees and 200 organisations operating in the healthcare area, appealed to governments around the world to develop and adopt a treaty that requires an end to our dependence on fossil fuels.²⁵

In 2020, a group of Polish health protection experts from the Physicians for the Climate initiative, appealed to the Polish President, Sejm and Senate (Polish Parliament chambers), ministries and local governments to protect public health in the face of climate change, by combating the causes of global warming and to minimise the effects of climate change.

RECOMMENDATIONS



*for national-level decision-makers
and politicians*

- 1 Move away, as quickly as possible, from coal and fossil gas combustion to generate heat and electricity by closing down coal- and gas-fired power plants and coal mines. Do not invest in new capacities based on fossil fuel combustion.
- 2 Immediately set a binding date for the phasing out of coal combustion for heat and power generation.
- 3 Make conscious choices for energy strategies and measures, based on a health and environmental impact assessment, considering the economic benefits and costs of local, national and global impacts.
- 4 Consider the scientific evidence confirming the harmful impact of fossil fuel combustion emissions on the health of people in Poland. Involve science and health sector representatives in deliberations and decision-making on the energy transition.
- 5 Organise transparent, inclusive and timely public consultations to include experts' and people's opinions on the future of energy and heating policy issues.
- 6 Implement reliable and science-based education (for primary, secondary and tertiary levels) on the health impacts of air pollution and climate change; develop prevention programmes to mitigate the health effects of climate change and air pollution; include the topic of climate change and air pollution's health impact in the curricula of medical studies.
- 7 Avoid false solutions, that offer a misleading sense of solving the problem, e.g. replacing coal with gas instead of a determined and well-planned end to combusting any fossil fuels and burning biomass.
- 8 Widely support the development of renewable energy sources, including clearly presented and effectively communicated mechanisms for renewable and prosumer-based power generation; eliminate the current barriers to the development of renewable energy sources, develop and support energy efficiency; disseminate and finance energy measures.
- 9 Prepare Just transition mechanisms for the power sector including training and vocational support programmes.
- 10 Provide public statistics and data concerning the health effects of power generation based on fossil fuels combustion.
- 11 Fully support the EU's climate policy; and set ambitious national objectives for greenhouse gas emission reduction and the share of renewable energy in the energy mix, as well as energy savings.

for local authority representatives



- 1 Promote solutions for the development of dispersed, prosumer-based, civic renewable power generation.
- 2 Present transparent and clear rules to people on how to use subsidies to allow them to end fossil fuel-powered heating and electricity.
- 3 Engage people in solution planning and implementation, and use participatory tools at every stage of strategic decision making on the energy transition and the region's future.
- 4 Engage local healthcare experts in deliberations and decisions on the health effects of the dependence on fossil fuel combustion and how to switch to healthy energy.
- 5 Provide reliable air quality monitoring, and air quality and weather forecasts (including extreme weather incidents) and inform people about how to protect themselves against pollution and the effects of climate change (using the Regional Safety Centre's alert messages).
- 6 Educate people about the energy transition, the benefits of phasing out fossil fuel combustion and the use of renewable energy sources. and local media).



for the health sector

Become engaged in public and policy debates on the health effects of fossil fuels in Poland and energy transition, including on clean air, mitigating the effects of climate change and health prevention.

Raise decision-makers and society's awareness of the health consequences of air pollution and climate change resulting from the combustion of fossil fuels, and talking to patients about these issues.

Emphasise the total costs – considering external health costs – of energy generation based on fossil fuels and the health benefits resulting from a gradual phasing out of fossil fuel combustion.

Promote health impact assessments as a tool for correctly analysing the health consequences of all decisions, plans and strategies.

Encourage the active participation of the representatives of the Ministry of Health in developing and implementing activities and strategies concerning clean air, energy and climate policies.

Disseminate publications confirming the disastrous impact of air pollution and climate change on public health, taking into account particularly vulnerable groups: children, pregnant women, elderly and chronically ill persons. For example, The Lancet Countdown, publications of the World Health Organisation and national centres, such as the National Public Health Institute and the National Institute of Hygiene.

Support letters and appeals calling for the protection of public health against the negative impact of environmental factors including, but not limited to, air pollution and climate change; join existing initiatives established by the health protection sector's representatives.

False solutions



During the phasing out of coal power generation, it is crucial to avoid becoming dependent on the combustion of other fossil fuels especially fossil gas, or other combustion which is harmful to health. The promotion of fossil gas, including transforming coal-fired power plants into gas-fired ones (e.g. plans concerning Ostrołęka C) or burning wood biomass as a heat and electrical energy generation source, are examples of false solutions.²⁶

REFERENCES

¹The same time, the share of renewable energy sources reached ca. 18%, which means a 1.4% increase compared to the same period in the previous year, when the record-breaking level of power generation and consumption was reported, sources:

<https://www.ure.waw.pl/badania-statystyczne/wynikowe-informacje-statystyczne#informacja-statystyczna-o-energii-elektrycznej>,

<https://www.forum-energii.eu/pl/dane-o-energetyce/za-rok-2021>

power generation: 179.4 TWh, +14% y/y, consumption: 180.3 TWh, +5.4% y/y, source:

<https://www.forum-energii.eu/pl/dane-o-energetyce/za-rok-2021>

² <https://energetyka24.com/elektroenergetyka/analizy-i-komentarze/polska-energetyka-jako-test-kobayashi-maru-komentarz>

³ According to emission volumes, it is low-stack emission, meaning coal combustion in household heating systems, transport, industry and electrical energy generation.

⁴ CO₂ emissions from the Polish facilities covered by the European Union's Emissions Trading System (EU ETS), including the aerospace sector, in 2021, amounted to nearly 192 M tonnes of CO₂. This level was 11.5% higher than emissions in 2020

<https://energia.rp.pl/co2/art36322571-znaczacy-wzrost-emisji-co2-w-polsce-winnny-eksport-pradu>

⁵ <https://www.eea.europa.eu/publications/air-quality-in-europe-2020-report>

⁶ The authors of the report focus on combusting coal to generate electricity and heat in power plants and cogeneration plants. Although this is not the only source of harmful air pollution and greenhouse gas emissions, coal combustion is the energy carrier that generates the highest emissions in the EU (it contributes to ca. 20% of the total greenhouse gas emissions). It is also the main contributor to the high air pollution level in Poland.

Furthermore, coal combustion negatively impacts health both near a power or cogeneration plant's stack, and far since flue gases released from the stack can travel thousands of kilometres, often crossing state borders.

⁷ <https://beyond-coal.eu/europes-coal-exit/>

⁸ <https://www.dziennikustaw.gov.pl/M2021000026401.pdf>

⁹ <https://www.wnp.pl/energetyka/termin-utworzenia-nabe-zostal-przesuniety,640612.html>

¹⁰ [https://polskirynekwegla.pl/sites/default/files/StPu/01/2021.12_o%20importcie%20w%C4%99gla%20kamiennego%20\(aktualizacja\).pdf](https://polskirynekwegla.pl/sites/default/files/StPu/01/2021.12_o%20importcie%20w%C4%99gla%20kamiennego%20(aktualizacja).pdf)

¹¹ <https://www.gov.pl/web/premier/zalozenia-do-aktualizacji-polityki-energetycznej-polski-do-2040-r-pep2040--wzmocnienie-bezpieczenstwa-i-niezaleznosci-energetycznej>

¹² Nevertheless, energy sector pollution emissions are not the dominant pollution source in Poland. Low-stack emissions, i.e. coal (and other substances) combustion in household heating systems, are the key cause of severe air pollution.

¹³ In 2021, WHO updated the recommended maximum levels of various substance:

<https://www.who.int/news-room/feature-stories/detail/what-are-the-who-air-quality-guidelines>

¹⁴ Mercury emission raises serious concerns as the substance may impair the development of cognitive functions in children and irreversibly damage essential organs in a foetus; the same applies to lead emissions.

¹⁵ Including carcinogenic and mutagenic dioxins, benzene and polycyclic aromatic hydrocarbons, e.g. benzo(a)pyrene.

¹⁶ Calculations for 2020,

<https://www.eea.europa.eu/publications/status-of-air-quality-in-Europe-2022/europes-air-quality-status-2022>

¹⁷ Mortality rate due to cardiovascular system diseases increases by 12-14% when the particulate matter concentration goes up by 10 micrograms.

¹⁸ <https://www.eea.europa.eu/themes/air/country-fact-sheets/2021-country-fact-sheets/poland>

¹⁹ More about the health effects of climate change – see:

<http://healpolska.pl/publikacje/>

²⁰ <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health#:~:text=Climate%20change%20affects%20the%20social,malaria%2C%20diarrhoea%20and%20heat%20stress up by 10 micrograms>

²¹ <https://www.pzh.gov.pl/klimat/>

²² Starting with those which combust lignite – because of their greater negative health impact.

²³ <https://www.lancetcountdown.org/>

²⁴ <https://healthyclimateletter.net/>

²⁵ https://www.dw.com/en/health-groups-call-for-fossil-fuel-nonproliferation-treaty/a-63107797?maca=en-rss_en_environment-22607-xml-mrss

²⁶ The European Commission considers biomass a renewable energy source and subsidises investments based on this fuel. Such an approach is criticised by ecological organisations, because wood combustion emits significant amounts of air pollution and greenhouse gases.

The Health and Environment Alliance (HEAL) is the leading not-for-profit organisation addressing how the environment affects human health in the European Union (EU) and beyond. HEAL works to shape laws and policies that promote planetary and human health and protect those most affected by pollution, and raise awareness on the benefits of environmental action for health.

HEAL's over 90 member organisations include international, European, national and local groups of health professionals, not-for-profit health insurers, patients, citizens, women, youth, and environmental experts representing over 200 million people across the 53 countries of the WHO European Region.

As an alliance, HEAL brings independent and expert evidence from the health community to EU and global decision-making processes to inspire disease prevention and to promote a toxic-free, low-carbon, fair and healthy future.

HEAL is independent of any political party or commercial interest. The alliance receives funding from the European Union, governments and private foundations as well as through membership contributions. We do not accept funding from sources with commercial interests.

HEAL's EU Transparency Register Number: 00723343929-96

HEAL gratefully acknowledges the financial support of the European Union (EU) and the European Climate Foundation (ECF) for the production of this publication. The responsibility for the content lies with the authors and the views expressed in this publication do not necessarily reflect the views of the EU institutions, CINEA and funders. The European Climate, Infrastructure and Environment Executive Agency (CINEA) and the funders are not responsible for any use that may be made of the information contained in this publication.



Contact:
info@healpolska.pl
www.healpolska.pl
www.facebook.com/HEALPolska
www.env-health.org