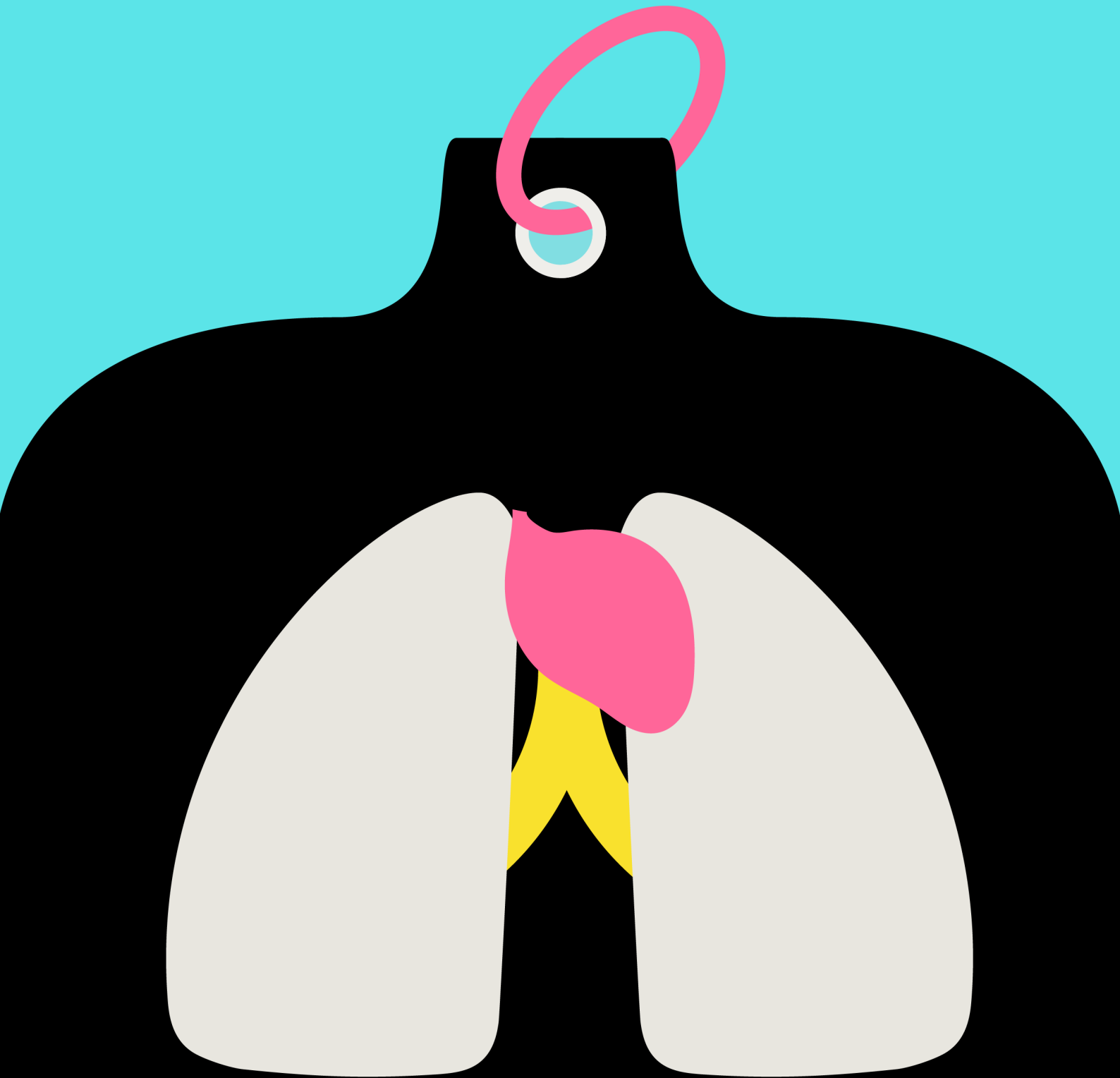


Hidden Price Tags

HOW ENDING FOSSIL FUEL SUBSIDIES WOULD BENEFIT OUR HEALTH



HEALTH AND ENVIRONMENT ALLIANCE (HEAL)

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Preface



Dr Gro Harlem Brundtland, Deputy Chair of The Elders, was Norway's first woman Prime Minister, the Director-General of the World Health Organization from 1998-2003 and the UN Special Envoy on Climate Change from 2007-2010. As the Chair of the World Commission of Environment and Development (known as the Brundtland Commission), she put sustainable development on the international agenda with the publication of the Commission's landmark report Our Common Future in 1987.

The urgency for climate action could not be greater. Only if global emissions peak no later than 2020 is it possible for us to reach the central goal of the Paris Agreement: to keep the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C, in order to protect healthy life on earth.

All countries have a role to play in implementing the Paris Agreement, but the world's wealthiest nations must lead the way. At the most recent G20 summit in July 2017 in Germany, world leaders rebuked the United States' isolated stance on climate change, with 19 of the G20 countries renewing their pledge to implement the Paris Agreement.

One of the most powerful and effective ways to work towards the goals set in the Paris Agreement would be to take immediate steps to phase out fossil fuel subsidies, a promise made by the G20 in 2009 that has yet to be delivered.

The reasons for phasing out fossil fuel subsidies are clear.

Burning fossil fuels makes our air unbreathable. Their combustion releases fumes that cause many respiratory diseases or makes them worse. This results in premature deaths – the World Health Organization (WHO) estimates that 6.5 million people die each year

because of air pollution exposure. Air pollution caused by fossil fuels also leads to lost working days, lost productivity and the public health costs of treating respiratory diseases. Unsurprisingly, the effects are the greatest on the most vulnerable members of society: children, pregnant women, the elderly and the poor.

Fossil fuels cause climate change. The temperature increases and extreme weather events associated with climate change have direct impacts on the health and wellbeing of people all over the world.

As a result, the Lancet Commission on Health and Climate Change, the United Nation's Sustainable Development Goals and the WHO all recommend the elimination of fossil fuel subsidies to protect human health.

The true cost of fossil fuel powered energy remains hidden by artificially low prices that do not take into account the environmental and health costs these fuels cause. All of us pay twice for fossil fuel subsidies – once when scarce public funds are used to subsidise fossil fuel energy and secondly when society deals with the health costs associated with burning fossil fuels. Ultimately fossil fuel subsidies pay the polluter instead of making the polluter pay.

Phasing out fossil fuel subsidies represents an incredible opportunity for our health and our climate. The

International Monetary Fund (IMF) and others have shown that air pollution deaths could be reduced by more than half if oil, gas and coal prices reflected their true costs to society, CO₂ emissions could be reduced by up to 20% and we could save trillions of dollars in health costs. This report recommends that all G20 countries set a deadline for the phase out of all fossil fuel subsidies by no later than 2025. It also suggests that health can provide a compelling new way to gain support for addressing this politically difficult issue. Investments in health are ultimately investments in sustainable development, so the report recommends that public funds freed up by ending subsidies to fossil fuels be reallocated towards universal health coverage. Providing free and universal healthcare can also help to build support for ending fossil fuel subsidies and can help protect the most vulnerable people in society from any increased costs.

This report reflects the views of a wide coalition of medical professionals, key decision makers and concerned citizens, who collectively call on governments to stop subsidising early death, ill-health and catastrophic climate change. It encourages us all to choose health and end fossil fuel subsidies.

**Dr Gro Harlem Brundtland,
Deputy Chair of The Elders**

About the campaign

Choose Health aims to build momentum for the phase out of fossil fuels subsidies, especially for coal power generation, by stimulating awareness and engagement in the medical community. As a coalition of health and medical professionals, key decision makers and concerned citizens, we call on governments to stop subsidising early death, ill health and catastrophic climate change. We want an end to fossil fuel subsidies.

www.healthoverfossilfuels.org



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About HEAL

The Health and Environment Alliance (HEAL) is a leading European not-for-profit organisation addressing how the environment affects health in the European Union (EU). With the support of more than 75 member organisations, representing health professionals, not-for-profit health insurers, patients, citizens, women, youth and environmental experts, HEAL brings independent expertise and evidence from the health community to different decision-making processes. Members include international and Europe-wide organisations, as well as national and local groups.



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Executive Summary

The burning of fossil fuels is driving climate change with disastrous consequences all over the world. But it also has major impacts on our health. Production and use of oil, coal and gas results in the release of hazardous air pollution which impact people's health in many ways.

Every year fossil fuel combustion cuts short the lives of an estimated 6.5 million people worldwide because of respiratory infections, strokes, heart attacks, lung cancer and chronic lung

disease. According to the International Energy Agency, fossil fuel energy is the main culprit for air pollution, and coal-fired energy generation causes nearly half of all ambient air pollution.

Despite a growing awareness of the climate and health harm caused by fossil fuels, and high-level commitments to lead the world on to a decarbonisation path, governments around the world continue to provide billions worth of public funds to support the production of oil, gas and coal.

Back in 2009, leaders of the G20, the twenty most economically powerful countries in the world, agreed to put an end to subsidies for fossil fuels. Nearly a decade later, and after the landmark Paris Climate Agreement, policymakers still need to move from words to actions. G20 nations continue to spend valuable taxpayer money on exploration and production of health-harming fossil fuel energy and thus create a high burden on health.

Fossil Fuel Subsidies Versus Health – An Inconvenient Truth That Costs Lives

Government funding of fossil fuels never pays off for the public. On the contrary, citizens pay twice - first for the subsidies, and second through the harm these fuels do to their health, which leads to higher healthcare costs and lost productivity.

In this report, the Health and Environment Alliance (HEAL) seeks to shed light on the damage to health caused by government subsidies to the fossil fuel industry.

It brings together for the first time the health costs arising from fossil fuel use and contrasts them with the subsidies paid by governments to the coal, oil and gas industry. In addition, the report offers insights into the key role of the G20 and the European Union in the fossil fuel subsidies debate and provides some compelling, tangible examples of new health investments that could be achieved by re-allocating fossil

fuel subsidies. Finally, it provides a prescription for urgent action.

The Hidden Price Tag: How ending fossil fuel subsidies could benefit our health shows that G20 governments paid out 444 billion USD (416 billion Euro) in subsidies to fossil fuel companies in 2014, but the use of fossil fuels resulted in estimated health costs of at least six times this amount: 2.76 trillion USD (2.6 trillion Euro).

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



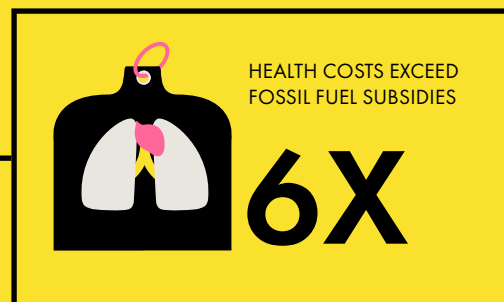
\$444 USD bn

Oil, gas and coal subsidies



\$2.76 USD tn

Health costs from fossil fuels:



Re-allocating public funds to boost health, not harm it

The report contains separate sections on China, Germany, India, Poland, South Africa, Turkey and the UK as seven economically powerful

countries which continue to award fossil fuel subsidies, despite all of these countries suffering high costs from air pollution. In each country

section, examples are given of how national subsidies could be used differently for the benefit of health.

Key messages on ending fossil fuel subsidies

A fossil fuel subsidy phase out would be the first in a number of steps in decarbonising the world – but it would bring along immediate benefits to health, in at least four ways:

- + **Cut premature deaths and disease from fossil fuel-induced air pollution**
- + **Decrease health care costs from respiratory and cardiovascular illnesses**
- + **Contribute to prevent catastrophic health impacts from future climate change**
- + **Free funds for public health, renewables and other health promoting policies**

The report highlights the key role that the G20 and the European Union could hold in changing the public perception towards fossil fuel

subsidies. It urges governments to reallocate the public funds freed up through fossil fuel subsidy reform to projects benefiting public health

such as the transition to clean renewable energies or the funding of universal health care.

Investing public funds to boost health could go a long way

The report shows how the funds could be re-allocated to boost health in the report's seven country spotlights. For example, in China all rural households currently relying on unhealthy coal for cooking (57.6 million) could be equipped with a clean solar stoves, significantly improving indoor air quality. In Germany, the 5.1 billion Euro represent taxpayer money that is sufficient to provide more than

300,000 households with a solar installation, powering their homes with clean fuels as well as fund the transition for all of Germany's 15,000 coal power plant workers for the coming five years. In countries such as Turkey and Poland, fossil fuel subsidies represent valuable public funds that could greatly strengthen the nation's health systems by i.e. in Poland being used to build more

than 34 new clinics and increase the number of the nation's physicians by 30,000.

Health (and climate) win - A prescription for urgent action

With this report, HEAL aims to build up public pressure for fossil fuel subsidy reform. Our goal is a complete phase out of fossil fuels subsidies by 2020 in developed countries and by 2025 in developing countries. In order to achieve this, HEAL puts forward a five point “call to action” to policy-makers:

- + **Identify the funds that fuel disease**
- + **Participate in peer reviews for greater transparency**
- + **Communicate the benefits of ending fossil fuel subsidies**
- + **Re-use the funds freed up to benefit health and climate**
- + **Prioritise a just transition and social equality in subsidy reform.**

HEAL Methodology

A combination of data provided by the International Monetary Fund (IMF) and the Overseas Development Institute (ODI) together with Oil Change International (OCI) has been used in the report. By juxtaposing the two data sets, HEAL has illustrated for the first time the extent of health costs caused by fossil fuel combustion, and the subsidies that drive it.

For production subsidy estimates for G20 countries, ODI/OCI figures for the years 2013/2014 were used. This includes national subsidies delivered through direct spending and tax breaks, investments by

majority state-owned enterprises (SOEs) and public finance from majority government-owned banks and financial institutions. For the health costs resulting from a nation's consumption of oil, gas and coal, HEAL used data provided by the IMF and based on a publication entitled “Getting energy prices right” by Parry et al. from 2014.

The IMF's health costs include premature death due to air pollution. The assessment is based on how much pollution is inhaled by people living near industrial and energy installations. This pollution intake is then evaluated on the basis of

latest evidence on the relationship between air pollution exposure and mortality rates for pollution-related diseases. Lastly, the resulting health impacts are monetised by looking at how people in different countries value the trade-off between money and risk to health.

The health costs numbers provided by IMF and presented in this HEAL study are serious underestimates as they cover costs associated with premature deaths but not those relating to ill-health, such as days of medication, hospitalisation or loss of productivity.

I.

The problem with fossil fuel subsidies

1. INTRODUCTION: FOSSIL FUEL SUBSIDIES - HOW OUR TAXES FINANCE WHAT MAKES US SICK

The air we breathe is polluted and this pollution is costing us the lives of the most vulnerable in our society.

According to reports from 2013¹, outdoor air pollution is the most toxic environmental carcinogen, killing 6.5 million people every year, more than passive smoking. The problem's main culprit has long been identified: fossil fuels. But whereas anti-smoking policies and the fight against tobacco have made considerable progress in the last decade and attracted the support of policy makers across subject areas, the fight against air pollution has only just begun. The reasons for political short-sightedness and policies that keep working against the public interest are similar to those that prevailed with tobacco in the past: a lack of awareness on the one hand and powerful commercial interests that keep oil, gas and coal central to our energy mix on the other hand. This results in policies that drive producer's profits whilst leaving ordinary people to deal with the aftermath.

Over the past 20 years in Europe, recognition is growing that air pollution is a public health concern - per se and also because of the fact

that climate change is making air pollution worse and vice versa. The resulting health impacts are serious and have both imminent and long-term effects. On a short-term basis air pollution represents a serious health risk to people worldwide by causing respiratory and heart diseases and premature death. But in the longer term, it is climate change that poses great risks to human health and is widely considered the greatest health threat in the 21st century.² The interconnectedness of these two threats caused by our dependence on fossil fuels results in the urgent need to act if we are to assure life on earth for future generations.

IF FOSSIL FUELS NEED TO STAY IN THE GROUND, WHY ARE WE HANDING OUT PUBLIC MONEY TO SUPPORT THEM?

Scientists have determined that at least two-thirds of the world's current, proven reserves of oil, gas, and coal must not be burned if we are to avoid raising global temperatures above two degrees Celsius (with 1.5 degrees being the world's preferred scenario). While fossil fuels have played a crucial part in powering

the world economy and delivering unprecedented affluence to huge numbers of people since the 18th century, those same fuels are now threatening life on earth.

This scientific recognition has not yet fully translated into policy change: each year roughly 444 billion USD in tax money are handed out by the world's wealthiest governments (the G20) to the fossil fuel industry. Globally this number is even higher. This industry then expands and releases more carbon emissions, impeding our ability to keep temperature rise below the crucial 1.5 degrees Celsius, as well as increasing acid rain, air pollution and the risk of oil spills. Hundreds of individual policies assure that the oil, gas and coal industry keeps operating worldwide at a time when the world needs to reduce its carbon footprint.³ Some research even aims to show that between 1980 and 2010, subsidies to fossil fuels have driven 36 percent of global carbon emissions meaning that if we had eliminated fossil fuel subsidies back then, global carbon emissions would be a third lower than they were in 2010.⁴

But in addition to increasing CO₂ emissions, subsidising this harmful

industry had another hidden price tag. It damages public health by increasing air pollution and the health risks associated with climate change. It also puts a burden on health systems and government budgets overall by locking in billions of funds that could be used more efficiently for public services such as health, education or overall poverty reduction. In many countries, the health costs associated with air pollution are often many times higher than the government subsidies paid to producers. Fossil fuel subsidies

increase the price gap between fossil fuels and renewable energies, making fossil fuels appear cheaper and increasing their consumption while decreasing incentives for producers and ultimately consumers to switch to renewable and healthier energies, which on average receive only a quarter of the support given to oil, gas and coal in the world's wealthiest 20 nations.

The International Energy Agency (IEA) views the elimination of fossil fuel subsidies as one of

four policies required to keep the world below a crucial two degree warming target.

It has estimated that partially phasing out fossil fuel subsidies by 2020 would result in a reduction of greenhouse gas emissions by 360 million tonnes.⁵ This represents 12 percent of the required reduction needed to keep the world below two degrees. The International Monetary Fund (IMF) estimates an even higher reduction of CO₂ emissions at 20 percent.⁶

Five key reasons to get rid of fossil fuel subsidies

Fossil fuel subsidies:



HELP CAUSE AIR POLLUTION AND GLOBAL WARMING, CUTTING THE LIVES OF MILLIONS OF PEOPLE SHORT EACH YEAR



BENEFIT THE RICH MORE THAN THE POOR, LEAVING MILLIONS OF PEOPLE IN ENERGY POVERTY WHILST PUMPING PUBLIC FUNDS INTO PRIVATE CORPORATIONS' POCKETS



INCREASE THE PRICE GAP BETWEEN FOSSIL FUELS AND RENEWABLES, WHICH MAKES FOSSIL FUELS SEEM CHEAPER AND DISCOURAGES INVESTMENT IN GREEN ENERGY



CREATE A SIGNIFICANT BURDEN ON GOVERNMENT BUDGETS AND DIVERT RESOURCES THAT COULD BE USED TO PROMOTE BETTER HEALTH



THREATEN OUR CLIMATE AND LIFE ON EARTH, AND FLY IN THE FACE OF THE 2015 PARIS CLIMATE ACCORD WHICH AGREED TO LIMIT GLOBAL WARMING TO 1.5 DEGREES

Despite the evidence of harm done by the subsidisation of fossil fuels, governments are reluctant to initiate their phase out. The G20 was designated in 2009 as the premier forum for

international cooperation among the 20 leading industrialized and emerging countries. This group has made fossil fuel subsidies and their climate risk regular agenda items at G20 meetings and

committed to their phase out already in 2009. Their words have not been followed by tangible action despite the urgency and commitments made to meet the objectives of the Paris Agreement.

WHAT'S THE PARIS AGREEMENT?

The Paris Agreement is a landmark climate agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gases emissions mitigation, adaptation and finance starting in the

year 2020. As of December 2016, 194 UNFCCC members have signed the Paris Agreement, 131 of which have ratified it. It calls on all nations to do their best to keep global warming to less than 2 degrees Celsius above pre-industrial temperatures or below 1.5 degrees Celsius as a best case scenario. The agreement as a whole is seen as a signal that the era of fossil fuels is over and as a driver for fossil fuel divestment.

2. HOW FOSSIL FUELS ARE BAD FOR HEALTH AND CLIMATE

Decades of research conducted worldwide show that the number of premature deaths increases with rising air pollution levels⁷. Additional long-term studies strengthen this correlation by demonstrating that people living in highly polluted cities die earlier than people living in less polluted cities. Air pollution from burning fossil

fuels (in industrial production, for energy generation, in transport etc) produces a number of compounds that are harmful to our health: nitrogen oxide (NO_x), sulphur dioxide (SO_x), volatile organic compounds and small airborne particulates (PM₁₀ and PM_{2.5}). These compounds impact our health by causing impaired lung function,

asthma attacks, strokes, heart attacks and eventually premature death. Each 10 microgram/cubic meter increase in PM_{2.5} concentrations increases the risk of all pollution-related death by 9.8 percent.⁸ Children are particularly vulnerable. In 2012 the deaths of 169,250 children under five were attributable to ambient air pollution.⁹

Health facts



NOT ALL FOSSIL FUELS ARE EQUALLY BAD

SOME FOSSIL FUELS SUCH AS LIQUEFIED PETROLEUM GAS (LPG) CAN HAVE SIGNIFICANT HEALTH BENEFITS IF THEY ARE USED TO SUBSTITUTE I.E. BIOMASS OR COAL AS A HOUSEHOLD COOKING FUEL. IN MANY DEVELOPING NATIONS, THE RESULT HAS BEEN BETTER INDOOR AIR QUALITY.

THE DEADLY CONSEQUENCES OF AIR POLLUTION

The World Health Organization (WHO) estimates:



1 IN 8
OF GLOBAL DEATHS



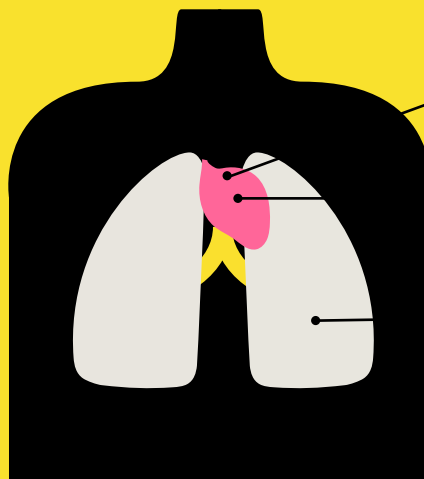
6.5 MILLION PEOPLE
DIE EVERY YEAR

The World Health Organization (WHO) estimates that around **6.5 million people die every year – one in eight of all global deaths – because of air pollution exposure.**¹⁰

That means air pollution – indoor and outdoor – is the world's largest single environmental health risk and most of it stems from the combustion of fossil fuels. There is a strong link between air pollution exposure and cardiovascular diseases, such as strokes and ischemic heart disease, as well as between air pollution and cancer. This is in addition to air pollution's role in the development of respiratory diseases, including acute respiratory infections and chronic obstructive pulmonary diseases.

Air pollution in the European Union (EU) alone leads to nearly half a million premature deaths a year, according to the European Environment Agency. Their latest Air Quality in Europe report concluded that in 2014, around 85 percent of the urban population in the EU were exposed to fine particulate matter (PM_{2.5}) at levels deemed harmful to health by WHO. The energy sector represents the largest single source

AIR POLLUTION IS RESPONSIBLE FOR:



34% OF
STROKE

27% OF
HEARTH DISEASE

36% OF
LUNG DISEASE

DEATHS WORLDWIDE

Source: World Health Organization

of human-made greenhouse gas emissions globally, with energy production and use contributing to around two thirds of global greenhouse gas (GHG) emissions.¹²

Air pollution costs society on various levels: it increases the burden of disease from stroke, heart disease, lung cancer, both chronic and acute respiratory diseases and others. Air pollution has also a more direct

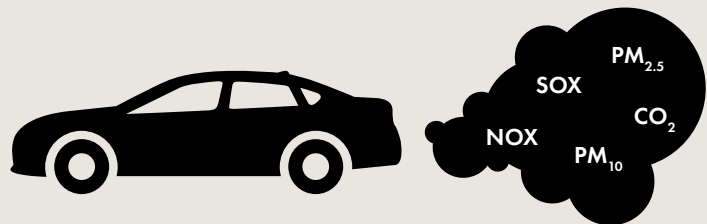
effect on the economy. Illness and premature death from air pollution cause a decline in productivity and can ultimately also reduce a nation's income. It also reduces our quality of life. These effects have partly been quantified in the past: for example, HEAL's "The Unpaid health bill: How coal plants make us sick" showed that adding morbidity costs to the costs associated with premature deaths could increase costs by up to 45%.¹³

Health facts



ACCORDING TO THE LANCET COUNTDOWN REPORT (2016)¹⁴, ENERGY PRODUCTION AND USE IS THE MAIN CULPRIT FOR AIR POLLUTION, LEADING TO HIGH NEGATIVE HEALTH IMPACTS AMOUNTING TO A VALUE OF 3.5 TRILLION USD - ~5 PERCENT OF GDP- IN OECD COUNTRIES, INDIA, AND CHINA. ABOUT HALF OF THE AMBIENT AIR POLLUTION IS THE RESULT OF COAL-FIRED ENERGY GENERATION.

The transport sector is another key source of greenhouse gas emissions, contributing to 14 percent of global emissions in 2010¹⁵ and being a key source of major air pollutants and half of all the world's nitrogen emissions.



“Good air quality is crucial to patients with chronic respiratory diseases, who account for more than 315,000 Europeans dying every year. Fossil fuels are one of the causes of air pollution that threaten high standards of patients’ quality of life, as well as the achievements of reducing the burden on the EU national health systems and UN targets to reduce premature deaths from chronic respiratory diseases by 25 percent by 2025. Fossil fuels are a threat to human health and politicians have the responsibility to act now!”

- MIKAELA ODEMYR, PRESIDENT, EUROPEAN FEDERATION OF ALLERGY & AIRWAYS DISEASES PATIENTS’ ASSOCIATION (EFA)

WHO signals climate change as the defining public health challenge of 21st century

Fossil fuels do not only increase air pollution and the corresponding health harm, they also have long-term health impacts through their contribution to climate change.

On top of the millions of early deaths from poor air quality, climate change is expected to lead to approximately 250,000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress. Health impacts have already occurred in poor and middle-income countries worldwide, where in addition to natural catastrophes like floods and droughts, changing weather patterns are already impacting our global food supply by having already reduced global agricultural production, especially in African nations. This way, climate change affects the social and environmental determinants of health – clean air, safe drinking water, sufficient food

and secure shelter.¹⁷ Additionally, rising temperatures have an impact on mortality, morbidity and productivity, for instance in the increased production of ground-level ozone which directly negatively impacts respiratory health.¹⁸ Climate change is projected to increase the number of people affected by vector-borne diseases (e.g. dengue fever, hantavirus and Japanese encephalitis) as well as by toxins from algal blooms through changes in the distribution and lifecycles of these pathogens.

THE DISASTROUS IMPACTS OF CLIMATE CHANGE WILL IMPACT THE WORLD'S POOR MORE THAN THE RICH, BUT CLIMATE CHANGES' IMPACT ON HEALTH DOES NOT SPARE HIGH-INCOME NATIONS.

In Europe, more frequent heatwaves are predicted in the near future resulting in more hospital admissions¹⁹ and longer allergy seasons are already evident. Globally, according to the WHO, an estimated 12.6 million deaths were attributable to modifiable environmental factors in 2012, accounting for 23 percent of all deaths worldwide. These are deaths that could be prevented with sound environmental policy. Many of these could be influenced by, or are related to, the driving forces of climate change.²⁰

“Non-communicable diseases (NCDs) are the leading causes of death worldwide and account for nearly two thirds of all global deaths. But the global NCD epidemic can be significantly reduced if we take action now. Reducing air pollution could save millions of lives as NCDs account for 70 percent of air pollution deaths. Effective strategies include establishing air quality standards, reducing emissions from coal power plants and transitioning to clean fuels. But this will only work if we call on governments to end all support currently provided to one of the world’s most polluting industries.”

- KATIE DAIN, EXECUTIVE DIRECTOR, NCD-ALLIANCE

Links to poverty, migration and food insecurity

Throughout the coming century, it will require strong social systems to shield people from the greatest expected impacts of unmitigated climate change.

Climate change is expected to increase poverty, increasingly drive

migration and conflict, and worsen food insecurity, which can lead to malnutrition and starvation. The effects of climate change on human health are worsened by factors such as poor governance, already existing socioeconomic inequalities and weak health systems. Therefore,

the people most severely affected by climate change are those who are least responsible. In our globalised society however, health is likely to be affected everywhere through social unrest, population displacement and economic impacts resulting from climate change.²¹

3. WHAT ARE FOSSIL FUEL SUBSIDIES?

The term “subsidy” is widely used in economics but its definition depends on the context.

Commonly, a **fossil fuel subsidy** is any government action that lowers the cost of fossil fuel energy production, raises the price received by energy producers, or lowers the price paid by energy consumers.²² A binding and universal definition of what constitutes a **fossil fuel subsidy** does not exist, discussions continue on what this concept should include.

THUS, INSTITUTIONS OFTEN ESTIMATE SUCH SUBSIDIES USING THEIR OWN APPROACH DEPENDING ON METHODS OF CALCULATION AND COUNTRIES COVERED.

This results in a wide range of estimates on the value of fossil fuel subsidies and possible gaps when compared.²³ The World Trade Organization describes a subsidy as “any financial contribution by a government, or agent of a government, that confers a benefit on its recipients”.²⁴

Subsidies are commonly being differentiated based on their beneficiary. This includes:

Producer subsidies, which reduce the costs of production encouraging producers to increase their output even if this means e.g. keeping unprofitable power plants operating.

Consumer subsidies, which keep prices below market level and therefore raise the demand for fossil fuels. This type of subsidy can be found often in low- and middle-income countries where it is often claimed to support poor households in the provision of affordable energy. Whereas true in some cases, the benefits are generally found to be proportionally greater for the rich than for the poor.²⁵ Consumer subsidies can also benefit producers indirectly because they are likely to increase fuel consumption which ultimately also increases air pollution.

Organisations such as the Overseas Development Institute (ODI) and Oil Change International (OCI) look at producer subsidies and other fossil fuel industry support delivered through direct spending and tax breaks, investments by majority state-owned enterprises (SOEs)

and public finance from majority government-owned banks and financial institutions. The ODI/OCI shows that the governments of the world’s 20 wealthiest nations, known as the G20, spent 444 billion USD in 2013/2014 to keep harmful fuels artificially cheap.²⁶

THIS IS MORE THAN THREE TIMES WHAT THE WORLD SPENDS ON PHARMACEUTICAL RESEARCH AND DEVELOPMENT.²⁷

Next to the above, the International Monetary Fund (IMF) includes “externalities” in its definition of subsidies. These are costs arising as a consequence of fossil fuel combustion. They affect other parties without this being reflected in market prices and therefore represent an indirect subsidy, according to the IMF. Such environmental, social and health costs include air and water pollution and damage to buildings and agriculture from dirty fumes. The IMF taxes those externalities separately and adds them to direct subsidies, referring to the total amount as ‘post-tax subsidy’.

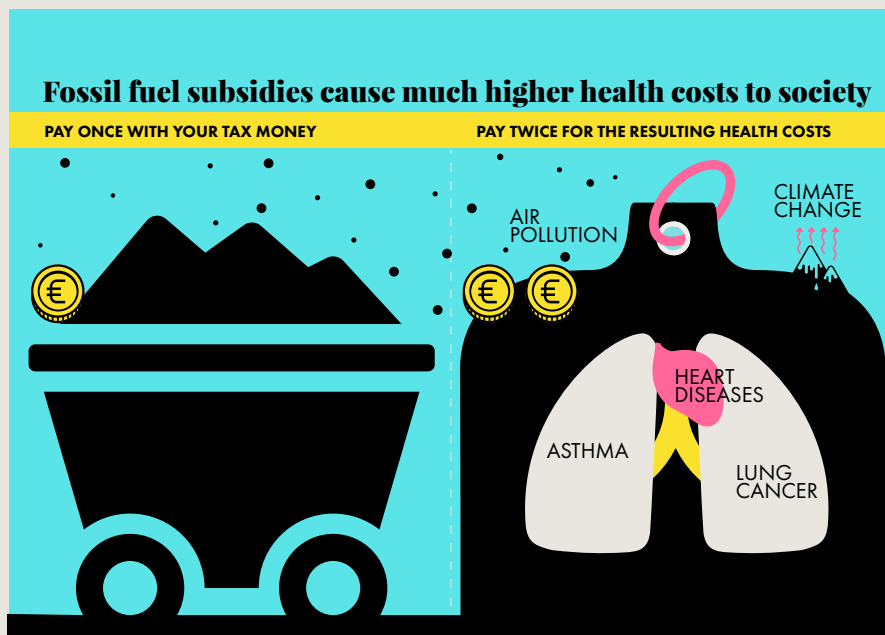
Externalities: The hidden subsidy in non-priced health costs

Externalities represent the most hidden form of public support to the fossil fuel industry - they are the costs that result from air pollution, climate change and environmental degradation.

These are not carried by the industry but paid for by the public. These externalities of fossil fuel production and consumption come in different

forms; some are easy to see, such as the pollution escaping the smoke stacks or oil spills damaging our waters, which are hurting especially local communities. But there are also other, less obvious impacts such as the health costs from asthma and heart disease as well as the long-term impacts of sea level rise and climate change on food production and health.

These health and other costs for the public are not reflected in the price of oil, gas and coal, making them cheaper than they should be, nor are the polluters asked to pay. Thus, subsidies hamper a swift transition to clean, affordable renewables. Subsidies do not ultimately reduce the costs of energy or electricity for the consumer. In fact, they simply distribute the costs in a different way, making the public pay twice: first by having public funds spent to subsidise a dirty industry and second, to pay for the even higher costs of the health bill associated with burning fossil fuels. When these 'external costs' or societal externalities of fossil fuel subsidies are factored in, government support to the industry is more than 5.3 trillion USD according to the IMF, which in 2013 was more than all the world's governments spent on health.²⁸ **Understanding and monetising the impacts fossil fuels have on the public and especially on human health is critical for evaluating the true cost of fossil fuels and for making informed choices around the future of energy production.**



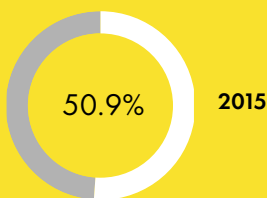
SUBSIDISING OIL, GAS AND COAL THEREFORE MEANS SUBSIDISING DISEASE, PREMATURE DEATH AND CLIMATE CHANGE. HEALTH COSTS ASSOCIATED WITH AIR POLLUTION MAKE UP THE BIGGEST PART OF THESE COSTS.

Health facts



THE EFFECT OF AIR POLLUTION ON MORTALITY IS MEASURED IN “PREMATURE DEATHS”. THE FIGURE IS MADE UP OF THE FRACTION OF TOTAL DEATHS IN THE POPULATION FROM RESPIRATORY DISEASE, HEART ATTACKS OR STROKES THAT CAN BE ATTRIBUTED TO EXPOSURE TO AIR POLLUTION.

HEALTH COSTS FROM AIR POLLUTION REPRESENT THE BIGGEST CHUNK OF EXTERNALITIES FROM FOSSIL FUELS.



Source: International Monetary Fund (IMF)

Unpriced costs to health through air pollution

According to the IMF, the health externalities from air pollution related to premature deaths alone stood at 2.7 trillion USD in 2015 out of a total figure of 5.3 trillion USD, which includes subsidies and all externalities. These costs are an

underestimation, as they are based solely on premature deaths from air pollution exposure and do not include health costs from ill-health nor health care costs carried by patients and the health care system from an increase in these and other illnesses.

Unpriced costs to health through climate change

Whereas the costs to health from air pollution are usually more easily understood and occur almost imminently in highly polluted places (increased coughing, asthma attacks that lead to doctors' visits or the inability to work), fossil fuels also contribute to a warming planet, as their burning releases large quantities of CO₂.

The IMF estimates that costs from global warming amount to 1.2 trillion USD in 2015 but does not differentiate between damage to health as opposed to other aspects of life. Its estimates are based on the external costs of carbon emissions and valued, for example, for coal via the illustrative damage value of carbon dioxide of 35 USD/ton. This value can confidently be considered too low. In Germany, for example, the amount suggested by the Federal Environment Agency is already set at much higher levels of 80 Euro/ton (85 USD).

Other studies have attempted to quantify the health costs of climate

change to some degree: The WHO estimates direct damage costs to health from climate change to be between 2 - 4 billion USD / year by 2030. This figure does not consider potential costs from health-determining sectors, such as agriculture and water and sanitation. In the US, a study by scientists from the Natural Resources Defense Council (NRDC) investigated the health costs of just six climate change-related events (ozone smog pollution, heat waves, hurricanes, mosquito-borne infectious disease, river flooding, and wildfires), and found the estimated costs totalled more than 14 billion USD in 2008.²⁹

ESTIMATED DIRECT DAMAGE COSTS TO HEALTH FROM CLIMATE CHANGE BY 2030



HEAL's approach to subsidies and unpriced costs

In this report, HEAL uses a combination of data provided by the IMF and the ODI/OCI, resulting in two sets of numbers and pointing for the first time to the health costs arising from fossil fuels while putting the costs in relation to the subsidies that drive them. This report does not consider damage done by fossil fuel consumption to the environment, property or other objects but only lists part of it in Annex 1, Table 1.

Production subsidy estimates for G20 countries for the years 2013/2014 are taken, as provided by the ODI/OCI. The subsidies therein include national subsidies delivered through direct spending and tax breaks, investments by majority state-owned enterprises (SOEs) and public finance from

majority government-owned banks and financial institutions. Second, in order to arrive at health costs from fossil fuels in the same set of countries, HEAL is breaking down externality cost data provided by the IMF resulting from a nation's consumption of oil, gas and coal. The resulting health costs represent currently unpriced costs of fossil fuels that are not reflected in the price of oil, gas and coal but that are carried by society.

In this report, the health costs estimates are extracted from the IMF but based on Parry et al (2014)³⁰ which look exclusively at how changes in pollution exposure affect mortality rates in relevant populations. Whereas the IMF's health costs are available for

each country of relevance for this report, they are most certainly an underestimate due to their limited definition of what health costs contain. Where better estimates are available, this report cites other, more complete studies to arrive at the most realistic estimate of the health costs from air pollution from fossil fuel use in Part II.

HOW ARE THE HEALTH COSTS CALCULATED?

To arrive at an estimate of costs arising from air pollution caused premature deaths, the approach used here and based on Parry et al (2014) assesses how much pollution is inhaled by people living in the region in question given the emissions emitted by industrial and energy installations, e.g.,

coal power generation in the respective area. This pollution intake is then evaluated based on the latest evidence of the relationship between air pollution exposure and elevated health risks and considering baseline mortality rates for pollution related diseases. Lastly, the resulting health impacts are monetised by looking at how people in different countries value the trade-off between money and risk to health, such as provided by OECD in 2012.³¹

4. SPOTLIGHT ON TWO OF THE MOST HARMFUL SUBSIDISED FUELS: COAL AND DIESEL CARS

Utilising public funds to proactively support greater fossil fuel use does not make sense when the associated health risks and costs are factored in.

But change is coming. Clean and renewable technologies provided an estimated 19.3 percent of global final energy consumption in 2015 and employed almost 10 million people

in 2016.³² Some fossil fuels subsidies make sense in the short run. For example, in India where millions of people struggle from energy poverty, subsidies for liquid petroleum gas can help transition poor households from greatly polluting and harmful biomass or coal burning and provide great benefits for health. But these cannot offer lasting solutions as the global climate crisis demands a full transition to renewable energies.

Fossil fuels are the main cause of health problems associated with exposure to polluted air. Whereas all fossil fuel subsidies need to be eliminated for a transition to clean energy to take place, the pollution caused by two fossil fuels does the most significant harm to human health: coal combustion and pollution from vehicle exhaust pipes.

Subsidising coal – cutting lives short worldwide

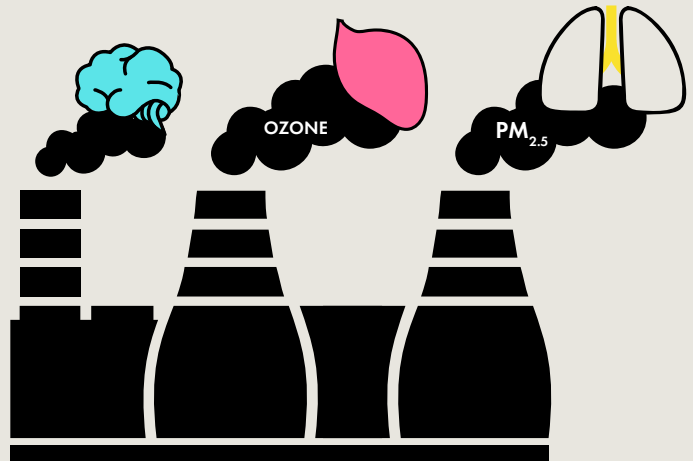
“The threat to human health from climate change and fossil fuel use has been grossly underestimated. In particular, coal power represents a threat to human health and needs to be rapidly phased out.”

- PROF. HUGH MONTGOMERY, LANCET COMMISSION CO-CHAIR AND DIRECTOR OF THE UCL INSTITUTE FOR HUMAN HEALTH AND PERFORMANCE

A 2017 report by the ODI shows how six European countries have spent around 875 million Euro (934 million USD) subsidising coal since 2015, despite joining the Paris Agreement from the same year.³³ The same report estimates the aggregated amount of funds going to the coal industry from 10 European countries, that produce 84 percent of Europe’s energy-related greenhouse gas emissions, at 6.3 billion Euro (6.7 billion USD) per year between 2005 to 2016 through a total of 65 subsidies identified. According to the IMF, coal receives the biggest chunk of global fossil fuel subsidies if its high health and environmental damage or “externalities” are taken into account.

Coal is the most polluting fossil fuel, responsible for deadly smog in urban areas throughout the developing world and for sending dark clouds of pollution across country borders. Fine particulate matter, mercury and dioxins in coal fumes can travel over 1,000 kilometres by the wind.³⁴ All of these pollutants plus sulphur dioxide and nitrogen oxides cross national borders. A recent report by HEAL and others, “Europe’s Dark Cloud: How coal-burning countries are making their neighbours sick”, shows fumes from coal plants in Germany cause 2,490 premature deaths in neighbouring countries, including UK, Netherlands, Belgium, France, Italy, Czech Republic and Poland as well as deaths in Germany itself.³⁵

OF THE EMISSIONS, THE MOST WORRYING FOR HEALTH FROM COAL POWER COMBUSTION ARE FINE PARTICULATE MATTER (PM_{2.5}) AND OZONE, AS BOTH SHORT AND LONG-TERM EXPOSURE ARE CAUSING SIGNIFICANT DAMAGE TO HUMAN HEALTH.³⁶ AS POLLUTANTS CAN TRAVEL OVER LONG DISTANCES, THE WHOLE POPULATION IS AFFECTED BY POLLUTION THROUGH COAL GENERATION.



Subsidising Diesel - struggling to breathe in our cities

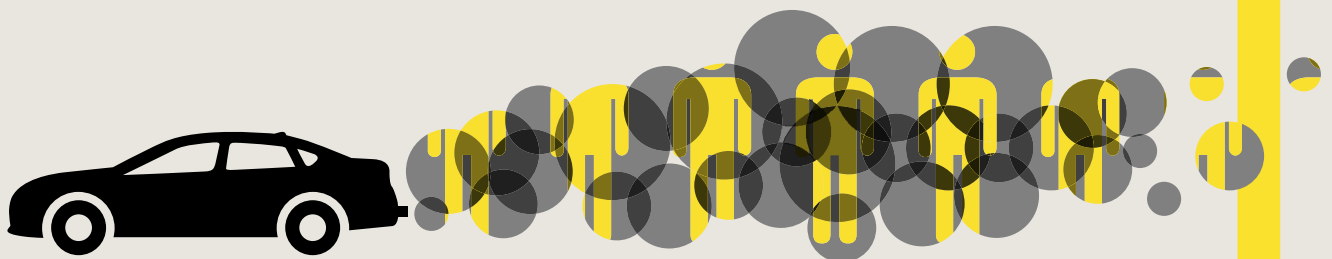
Many governments support diesel by taxing it less than petrol. A 2015 study done by Transport and Environment concluded that through this lower taxation, diesel cars were indirectly subsidised in the European Union (EU) by almost 27 billion Euro (28.8 billion USD) in 2014 alone³⁷. Germany, France and Italy are among the highest subsidisers. France, for example, awarded diesel cars with a whopping 7.9 billion Euro (8.4 billion USD) subsidy in 2014.

The transport sector is also major source of air pollutants, including particulate matter. Over half of global NO_x emissions are produced by the transport sector.³⁸ In many cities pollution from vehicle exhaust pipes is the most significant source of ill health and premature death.

THE WHO HAS CLASSIFIED DIESEL EXHAUST AS A POTENTIAL HUMAN CARCINOGEN.³⁹

The contribution of diesel emissions to the concentration of ground level ozone presents a hazard for both healthy and vulnerable individuals, causing e.g. a

reduced lung capacity, irritation of the respiratory system and causing coughing and choking. A correlation has been established between ozone pollution in cities and an increase in hospital admissions for respiratory problems. The average contribution of local traffic to urban NO₂ and PM₁₀ concentrations is estimated at 64 percent and 34 percent, respectively.⁴⁰



“Diesel fumes pose substantial risks to public health and the environment. But the good news is that we can reduce the tens of thousands of deaths caused by air pollution each year in British cities by tackling the single biggest source of emissions. We need to call on the Government to stop providing tax incentives in the form of lower road tax and fuel duty on diesel, which are, in effect, subsidies for these vehicles. The UK Prime Minister has already told us she recognises the risk diesel poses to health, removing these incentives would be an important step towards the complete phase out of diesel fuels, which would benefit health throughout the life course.”

- PROF. DAVID MCCOY, DIRECTOR, MEDACT

II.

Report Findings And Regional Examples

1. THE HEALTH BENEFITS OF FOSSIL FUEL SUBSIDY REFORM

A fossil fuel subsidy phase out would be the first in a number of steps in decarbonising the world – but it would bring along immediate benefits to health, in at least three ways. A phase out of fossil fuel subsidies would:

1. Cut premature deaths and disease from fossil fuel-induced air pollution

According to the IMF, cutting fossil fuel subsidies and adequately taxing oil, gas and coal taking into account their negative impacts could result in an average 55 percent decrease of premature deaths from air pollution globally.⁴¹ This estimate is based on two assumptions: first, direct charges

on emissions reflecting environmental damages per ton must be imposed to promote the efficient reduction in fuel use and therefore reduce local air pollution and second, the adoption of emissions control technologies as coal prices are raised. Under these scenarios, the IMF predicts that some countries could see

even greater cuts in premature deaths. For example, Poland, Turkey, Serbia, Bosnia, Bulgaria and Romania could see an average 62 percent decrease in air pollution deaths. Germany, Spain, Belgium or France would still be likely to achieve on average 25 percent reduction in premature deaths.

2. Prevent catastrophic health impacts from future climate change

Aside from the lives saved by improved air quality, carbon emissions would be reduced. In 2010, a world without subsidies since 1980 would have meant 36 percent lower carbon emissions, according to one expert study.⁴² The IMF estimates that a phase

out of subsidies and accompanying externalities could result in a 20 percent reduction in CO₂, “which is very significant and would represent a major step towards the de-carbonization ultimately needed to stabilize the global climate system”. That would

mean countering the specific health and social consequences of climate change caused events such as floods and droughts as well as heat-related premature deaths, direct injury, the spread of infectious diseases, and mental health effects.

3. Free funds for public health, renewables and other health promoting policies

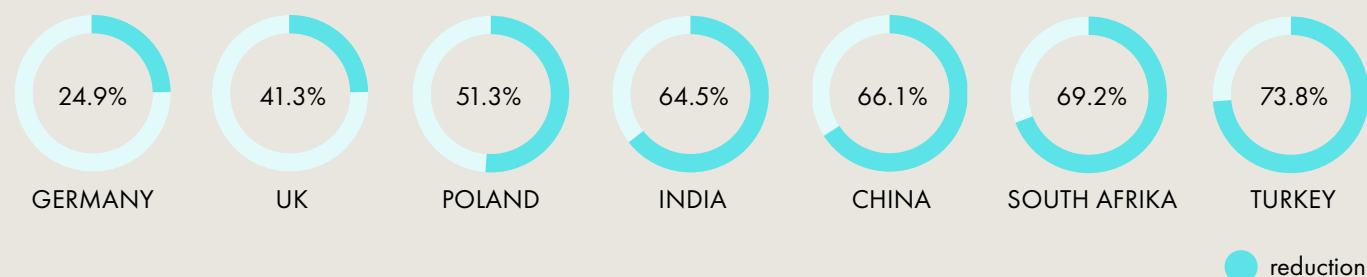
The elimination of fossil fuel subsidies would mean unspent public funds and a potential new revenue to fund socially needed policies. These could include policies aiming at a just transition to a green economy, but also more direct health policies

such as health care funding or poverty reduction (for more specific suggestions please see the recommendations of this report). Making the switch to renewables and healthier energy choices could contribute to achieving higher

energy security, cleaner outdoor air worldwide and better indoor air quality in developing nations, healthier employment opportunities in the renewable sector as well as preserving biodiversity.

Avoiding early deaths from air pollution

By eliminating fossil fuel subsidies and implementing corrective taxes on oil, coal and gas, 24.9 to 73.8% of premature deaths could be avoided in the seven countries listed below.



Did you know?

ENDING SUBSIDIES TO COAL, OIL, GAS WOULD BE A HUGE BOOST FOR THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

Source: Parry et al. 2014, "Getting energy prices right"

ELIMINATE POVERTY AND HUNGER BY 2030

A Report from the UN Food and Agriculture Organization suggests that eliminating extreme poverty and hunger sustainably by 2030 would require an estimated average of 265 billion USD additionally a year. Of this, 89 to 147 billion USD would need to come from public funding, putting total global annual public spending requirements at 156 to 214 billion USD.⁴³ This is less than half of what is spent now by G20 governments on supporting the production of fossil fuels.

CLOSING THE HEALTHCARE GAP

A 2017 report by the Nordic Council of Ministers suggests that scrapping fossil fuel subsidies would bring the world closer to achieving the health targets within the SDGs. According to the research, current fossil fuel subsidies are 13 times the amount needed to close the basic health care gap⁴⁴, referring to the 33.3 billion USD required to finance reproductive, maternal, new-born, child and adolescent health.⁴⁵

2. TWO KEY PLAYERS: THE G20 AND THE EU

G20 – the world’s wealthiest nations pulling the strings

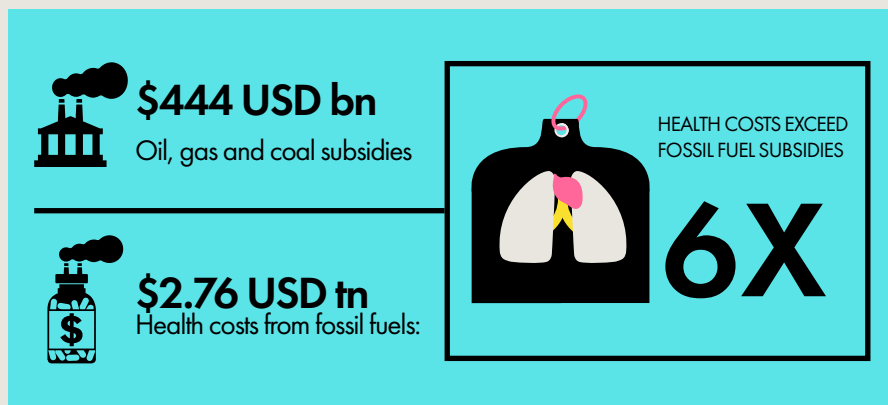
Whereas the commitments outlined in the Paris Agreement require action from all of the world’s governments, the world’s wealthiest 20 nations account for 82% of global energy-related CO₂ emissions.⁴⁶

In view of the mounting evidence on the dangers of fossil fuels, the G20 committed in 2009 to end fossil fuel subsidies. More precisely, they agreed “to phase out and rationalise over the medium term inefficient fossil fuel subsidies” and acknowledged that this will need to be done while protecting the poor and providing targeted support to those potentially hit by subsidy reform.

With the Paris Agreement, the G20 re-committed to this promise recognising the need to phase out greenhouse gas emissions from fossil fuels between 2050 and 2100 and to shift to cleaner energies to avert climate change’s catastrophic impacts on health and the environment.

Yet, production support totalled 444 billion USD in 2014 out of which 70 billion USD was direct spending and tax breaks for fossil fuel producers, another 286 billion USD was considered investment expenditure of state-owned-enterprises and finally,

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



88 billion USD were spent by G20 on public finance.⁴⁷ According to a new 2017 report G20 governments are providing nearly four times more public finance to fossil fuels than to clean energy.⁴⁸

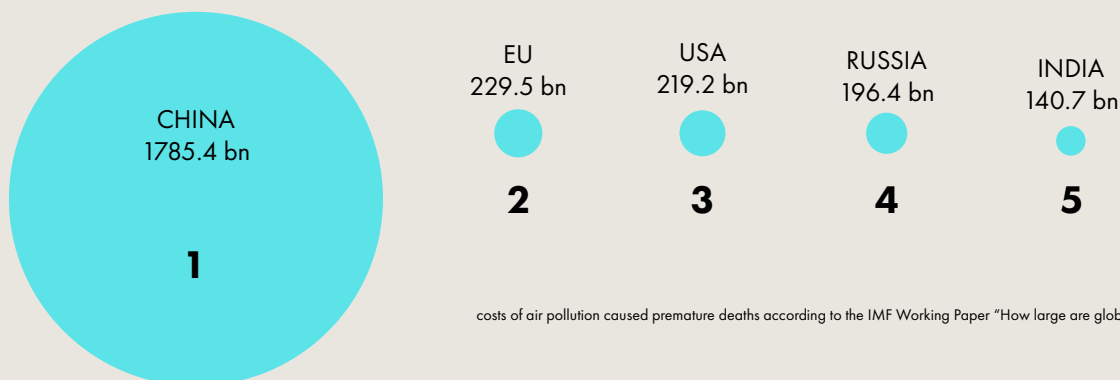
It is because the G20 represent the world’s wealthiest nations that they play a key role in not only setting an example to the rest of the world but also, in making the Paris Agreement’s goal happen. Without the full commitment of G20 nations, the world is heading for a much warmer climate than human health and wellbeing could handle.

The G20 have every reason to act: health costs from air pollution-caused

premature deaths alone stand at 2.756 trillion USD (2.5 trillion Euro), six times the subsidy amount.⁴⁹ More than 3.8 million premature deaths are estimated to occur alone in G20 countries from air pollution.

Whereas some G20 nations have already made a first step towards fossil fuel subsidy phase out by initiating the suggested peer-review process, most of them have not seen their yearly subsidies decrease. Table 1 in Annex 1 offers an overview of fossil fuel subsidies and health costs from fossil fuels in G20 countries (plus Poland, which was included to the overview due to the country’s high air pollution problem and simultaneous reliance on coal for its future energy needs).

Top 5 within G20: health costs from fossil fuels



costs of air pollution caused premature deaths according to the IMF Working Paper “How large are global energy subsidies”, 2015.

WHAT ARE G20 PEER REVIEWS?

In an effort to build momentum for the phase out of fossil fuel subsidies, a peer review program (also known as open method of coordination) was announced in 2013, through which countries

voluntarily engage in an information-sharing process developed to shed light on their current subsidies in place. The peer reviews are an important step towards increased transparency and accountability of the G20 countries fossil fuel subsidies, and furthermore aim to share experiences, policy tools and expert advice on how to address them.

The European Union – not walking the talk

Tackling climate change has been a priority of the European Union for several years reflected in the climate and energy packages for 2020 and 2030; however when it comes to eliminating harmful subsidies, the EU still has to walk the talk.

In 2016, the European Commission presented its 'Clean energy for all Europeans' package, which mentions the phase out of fossil fuel subsidies as a key measure towards a clean energy transition. Now all EU leaders need to match this willingness with both a concrete plan and explicit endorsement to phase out fossil fuel subsidies as soon as possible.

Several EU development banks subsidise fossil fuels through numerous mechanisms. In addition, regulatory loopholes exist. According to a 2016 report by CAN Europe, the European Investment Bank (EIB) provided 7 billion Euro (7.5 billion USD) in funding for fossil fuel projects from 2013 to 2015. The EIB also lent 38.4 billion Euro (41 billion USD) for co-fired generation of biomass and coal in 2015, and, at the end of 2015, approved a 600 million

Top 10 European countries: health costs from fossil fuels



* costs of air pollution caused premature deaths according to the IMF Working Paper "How large are global energy subsidies", 2015.

Euro (640 million USD) loan to a Spanish company for gas pipeline infrastructure.

Another example comes from the European Bank for Reconstruction and Development (EBRD) which made investments of 5 billion Euro (5.3 billion USD) in fossil fuel exploration from 2013 to 2015.⁵⁰ Meanwhile the Connecting Europe Facility (CCF), which is designed to expand cross-border infrastructure,

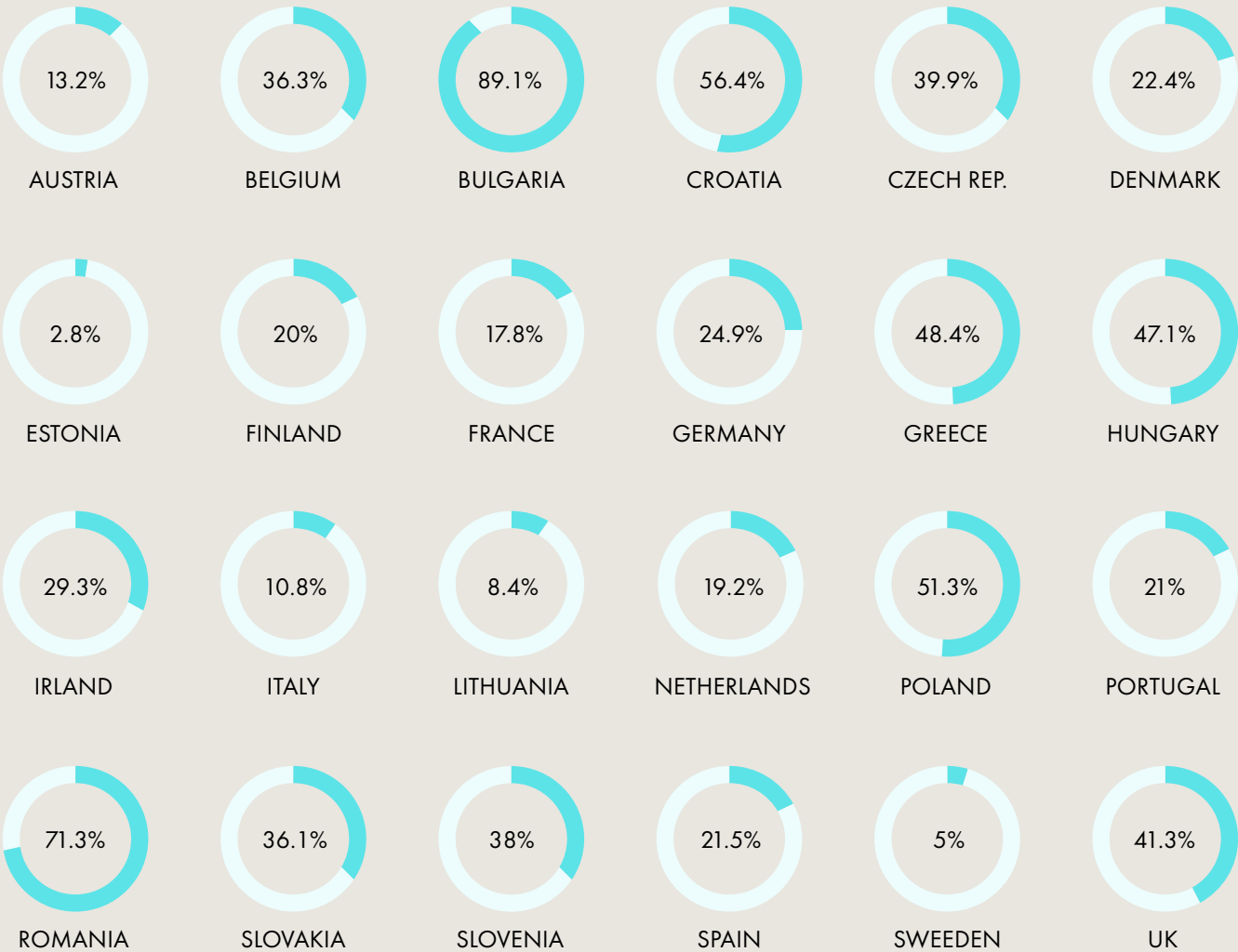
is being used to fund gas pipelines – 800 million Euro (854 million USD) in 2014-16.⁵¹ However, by far the biggest gas pipeline project (40 billion Euro/43 billion USD) is the Southern Gas Corridor which aims to link Azerbaijani gas fields to consumers as far away as Italy by 2020. EIB and EBRD loans for the Albania-Greece-Italy section are expected to be the biggest single loans in the history of either of these two banks.

In a letter to the President of the EIB, a group of 27 NGOs pointed out that: “if the Southern Gas Corridor does materialise and ends up pumping more gas into Europe, the chances of meeting the EU’s climate and energy targets for 2030 and its longer-term decarbonisation objectives, would hardly be attainable”.⁵²

This generous support to the fossil fuel industry does not come without a price: external health costs caused by the countries of the European Union through a heavy use of oil, gas and especially coal amount to at least 229.5 billion USD (215 billion Euro) from air pollution caused premature deaths alone.⁵³ EU development banks continue to fuel the fire by

subsidising fossil fuel projects at home and abroad. The health care costs that European health systems are burdened with through an increase in non-communicable diseases are not yet included here nor is the loss of life quality of those suffering, for example, increases in asthmatic attacks or other ill-health.

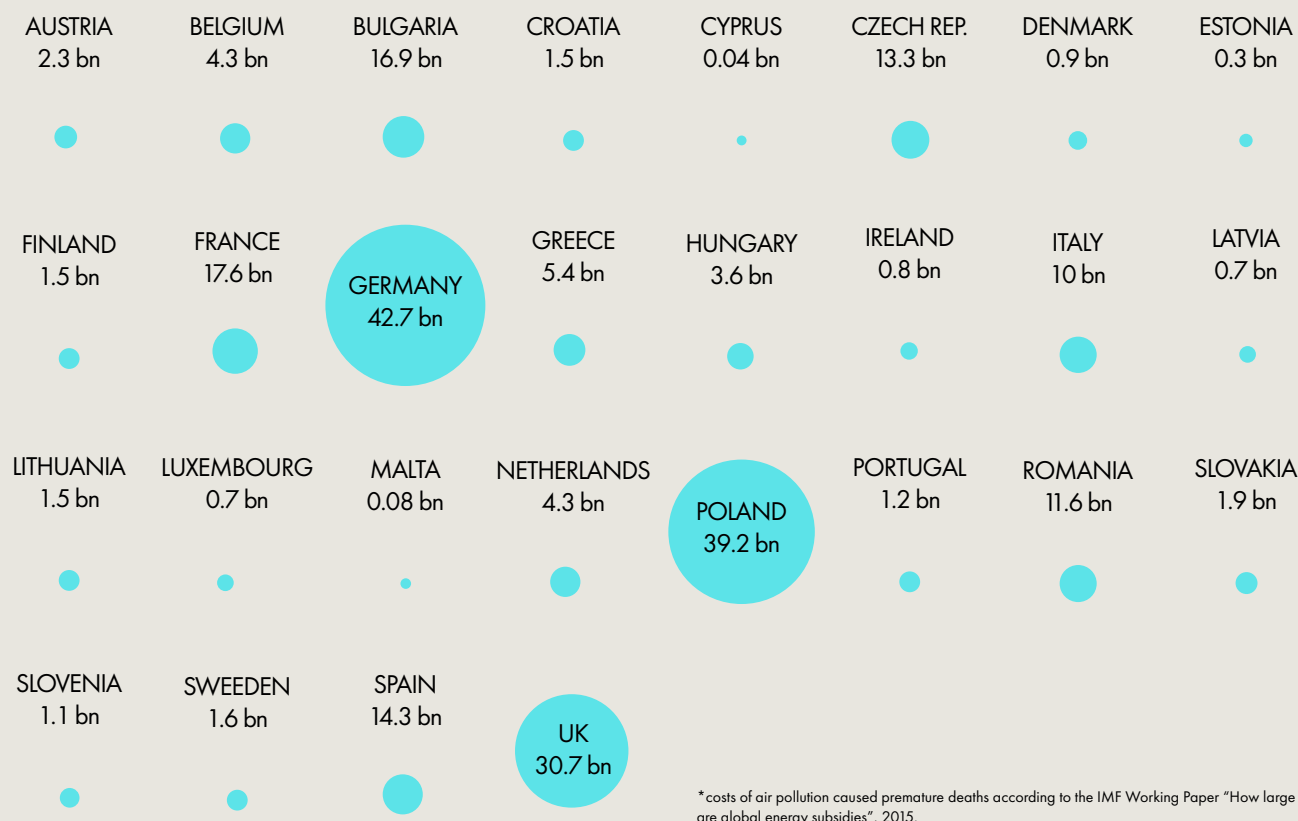
Potential reduction of air pollution deaths in countries of the European Union*



* The table is based on Parry et al. and shows the percent reduction in countries’ nationwide deaths from air pollution from eliminating fossil fuel subsidies and implementing corrective taxes on fossil fuels.

reduction

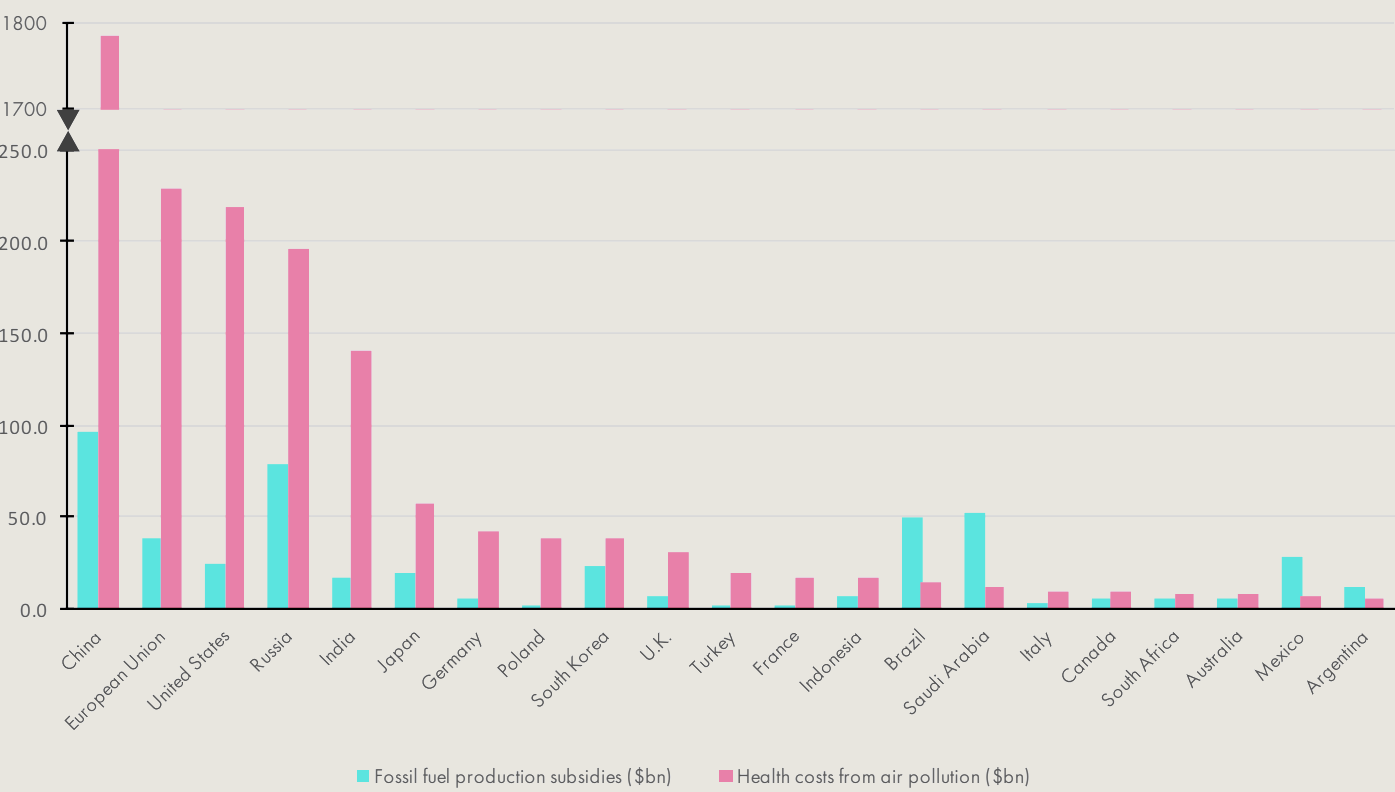
Health costs from fossil fuels in countries of the European Union*



3. COUNTRY STUDIES- SEVEN NATIONS FUELLING ILL-HEALTH WITH PUBLIC FUNDS

In the following section, the situation in seven countries is described in greater detail, including their reliance on fossil fuels in their energy mix, the subsidies paid to industry and the health costs resulting from the country's use of oil, gas and coal. The countries have been picked on the basis of two main criteria: 1) they all show a high number of premature deaths and other health impacts from air pollution and 2) their energy mix is highly reliant on fossil fuels and especially on the most health-harming one, coal.

Health costs of fossil fuels in relation to fossil fuel subsidies in G20 countries

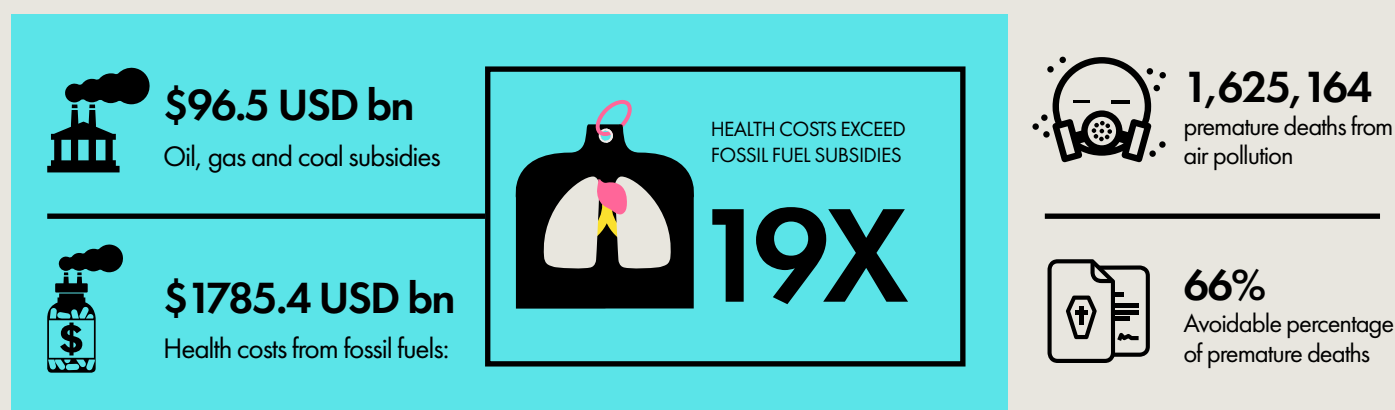




China

CHOKING ON CONTRADICTIONS

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

China's phenomenal economic growth over the last few decades has been largely fuelled by coal.

At the start of the 21st century, China was producing 75 percent of its energy from coal.⁵⁴ It's currently burning about half the coal used in the world⁵⁵ which has come at a terrible human cost: at the end of 2016, air quality in major north Chinese cities exceeded World Health Organization health recommendations by 100 times.⁵⁶ 17 percent of all deaths in China

are estimated to be caused by air pollution, with stroke being the main cause of death. Roughly 4,400 people die from air pollution every day.⁵⁷ The impact on the economy is large: study estimates vary⁵⁸ but range from 112 billion to 1.5 trillion USD lost in economic productivity from air pollution.

Beijing, Shanghai and Guangzhou are just some of the Chinese cities in which air quality is poor, resulting in higher health risks to the cardiovascular system, cerebrovascular system and an

increase in the probability of cancer and premature death for its inhabitants. Respiratory experts from the Chinese Academy of Engineering expect that PM_{2.5}, now a major cause of smog in China, will replace smoking as the top risk factor for lung cancer.⁵⁹ China's costs to health from fossil fuels through air pollution-caused premature deaths stood at around 1.7 trillion USD in 2015. The majority of this amount stems from China's use of coal as it is responsible for filling the air with harmful PM_{2.5}.

Did you know?

ONE OF CHINA'S LEADING CAUSES OF DEATH LINKED TO AIR POLLUTION

Air pollution has become a major risk factor for stroke, and is demonstrated to have a large hazardous effect on stroke burden worldwide. On the long run, it is thought of increasing the risk of clots in the brain by

raising blood pressure, making blood thicker and hardening arteries. Acute effects of air pollution however are thought of as the rupture of plaques that build up in arteries causing blockages in the brain.⁶⁰

China provides support to the coal industry through the provision of billions of dollars' worth of subsidies to both consumers and producers. Subsidies to the coal industry alone were estimated at 252 billion CNY (37.7 billion USD) in 2014 and CNY 120 billion (18 billion USD) in 2015.⁶¹ This number increases to 96 billion USD if oil and gas are included and if subsidies are extended to include public finance and state-owned investments.⁶²

THE RICH BREATHE EASIER IN CHINA

Just like with the wider health impacts of climate change, air pollution is causing inequalities by placing the burden on the

poor. China's rising middle-class can afford to seek shelter, drive to work, work inside, have their children play in costly indoor playgrounds⁶³, purchase costly home air filters or even leave the city when necessary while the unprivileged struggle to find the

resources to guard themselves from the poisonous air and oftentimes can only afford ineffective face masks.⁶⁴ On top of that, awareness of the negative health impact of air pollution is lower among low-income household, underestimating the risks.

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

Even though the country's electricity supply still relies strongly on coal, China sees itself as the global provider of new energy technologies. The Chinese government has been very clear in recent years about the need to make skies blue again⁶⁵, to move away from coal, to reduce or eliminate "inefficient" fossil fuel subsidies and to decarbonise the economy. In 2017, the Chinese

government has ordered the vast majority of its provinces to stop permitting new coal power projects. This way, 28 of China's 31 mainland provinces do not currently have the conditions to build new coal capacity.⁶⁶

Furthermore, China's solar thermal capacity accounts for more than 70 percent of the world solar thermal

market and together with the EU, the country is the leader today in terms of total renewables-based electricity generation. In 2015 China became the world's largest generator of solar power.⁶⁷ A 2017 report says that China's wind and solar industries could grow to such a point that they are able to replace fossil fuel energy sources by up to 300 million tonnes of standard coal per year by 2030.⁶⁸

Eliminating subsidies to fossil fuels can be considered a first but crucial step towards making this a reality. If China committed to an early deadline, it would bring the biggest benefits. If China eliminated subsidies to fossil fuels and its energy prices would reflect their true costs, up to 66 percent of currently occurring premature deaths could be avoided, because of improved air quality through less coal use.⁶⁹

The current health costs of 1.7 trillion USD could be reduced which would release funds for other, much needed social investments. The phase-out should be designed in a socially just way and happening gradually so that negative social effects are sufficiently mitigated.

China took a big step on transparency by participating in a voluntary peer review of its fossil

fuel subsidies in 2016, working with the US. However, the result left a lot to be desired: Chinese officials didn't provide estimates of the nine identified subsidies, referring to a rapidly changing policy field, and identifying mostly petrol subsidies, leaving out coal for the most part. In addition, no clear deadline for the phase out was given.

Which would you choose?

IF YOU HAD 96BN USD WOULD YOU SPEND IT ON



OIL, GAS AND COAL

OR



57+ MILLION SOLAR STOVES

PROVIDE ALL RURAL HOUSEHOLDS CURRENTLY RELYING ON COAL WITH A CLEAN SOLAR STOVE*



11,000+ HEALTH CLINICS

BUILD HEALTH DAY CLINICS IN RURAL AREAS **



420,000+ DOCTOR SALARIES

IMPROVE DOCTOR PER PATIENT RATION BY HIRING NEW DOCTORS FOR A PERIOD OF 10 YEARS***

*Calculation based on World Bank estimate of 72,43 USD per solar cooker; 57.6 million rural households to use coal as cooking fuel

** Calculation based on building costs of 690 USD per square meter for a day centre of 4000 square meters in China

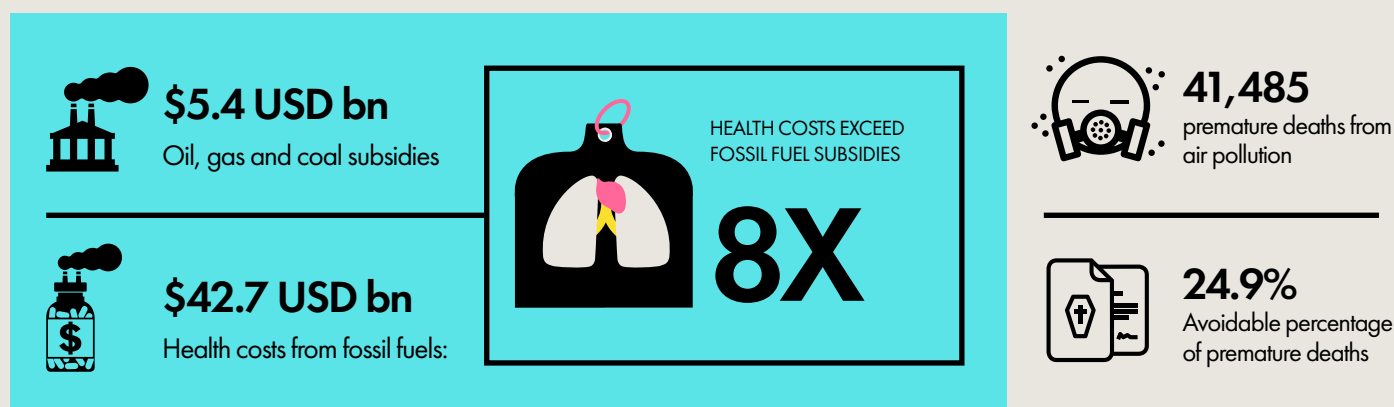
*** Calculation based on estimated average yearly salary of 7,500 USD for a hospital doctor



Germany

CLIMATE CHAMPION WITH AN UNHEALTHY APPETITE FOR COAL

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

Despite priding itself as a champion of “energy transition” towards renewables, Germany remains the world’s leading producer of lignite⁷⁰ for power production.

Coal - including lignite – also remains the country’s main source of power generation, providing for nearly half⁷¹ of Germany’s electricity and causing considerable health impacts. In 2013, coal combustion alone is estimated to have created health costs that ranged between 6.1 and 11.8 billion Euro and caused more than 4,000 premature deaths from air pollution.⁷²

The German government continues to provide financial assistance to coal in the billions, fuelling the nation’s air pollution and health bill. A recent study by the ODI considers Germany’s progress on phasing out subsidies to coal mining as good; however, national coal subsidies alone still totalled 3.2 billion Euro in 2016.⁷³ Recent subsidies include 150 million Euro a year in 2014 to subsidise the use of coal for industrial processes, through tax breaks for energy intensive industries⁷⁴ or 1.86 billion Euro a year given as aid to the state of North Rhine Westphalia to support the sale of hard coal from German coal mines to electricity and steel producers.⁷⁵ Germany

also provided subsidies in the form of public finance for domestic and international oil, gas and coal projects, totalling roughly 2 billion Euro in 2014. Overall production support to fossil fuels reached 5.4 billion USD in 2013/2014.⁷⁶

In addition, transport is a key source of air pollution in cities. Diesel vehicles emit nitrogen oxide (NOx) which is to blame for 10,400 premature deaths alone. According to the German environment agency, subsidies for diesel amount to 7.8 billion EUR annually⁷⁷, causing damage to the environment worth 33 billion Euro; more than four times higher than the subsidy.

POLLUTING AND HEALTH HARMING COAL-FIRED POWER STATIONS TO RECEIVE 1.6BN SUBSIDY

In 2015, the German government decided that operators of eight of Germany's oldest and most

polluting lignite coal power plants would receive a cost-based subsidy for halting production but retaining capacity for four years, preceding their full closure. These subsidies amount to 1.6 billion Euro, to be paid in yearly instalments of 230 million Euro, spread over the coming 7 years and going straight into the pockets of Germany's most profitable energy companies. This way, lignite power station operators will benefit

from public money for keeping old, inefficient plants running, plants that have contributed to thousands of cases of ill-health and premature death throughout their operating years. The five coal-fired power plants in the reserve are responsible for roughly 1,430 premature deaths a year.⁷⁸ The Frimmersdorf power plant was responsible for 15,818 lost days of work, 1,105 cases of asthma and, 46 hospital admissions.⁷⁹

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

Subsidising fossil fuels does not only threaten the lives of thousands of people today due to air pollution, it also severely hinders Germany's ability to meet its climate objectives for 2020

and 2030. According to the IMF, Germany could reduce premature deaths from air pollution by 24.9 percent if its fossil fuels were to be priced according to their true costs which would include the harm

done to health and climate. In order to truly lead on a fossil fuel subsidy phase out, Germany needs to eliminate all oil, gas and coal subsidies by 2020 latest.

“By eliminating fossil fuel subsidies, Germany can avoid thousands of unnecessary premature deaths and illnesses. For a nation advocating a renewable energy future, phasing out fossil fuel subsidies should be a priority.”

- PROF RAINER SAUERBORN, PROFESSOR OF GLOBAL HEALTH & CLIMATE CHANGE AT HEIDELBERG UNIVERSITY AND VISITING PROFESSOR AT THE HARVARD SCHOOL OF PUBLIC HEALTH

Germany has made the first steps: information on its subsidies is made available to the public bi-annually and the country is participating in a fossil fuel subsidy peer review process with Mexico as part of the G20 countries' longstanding commitment to phase out subsidies. In addition, Germany has signed a communiqué at the 2015 Paris Climate negotiations, committing to phase out inefficient fossil fuel subsidies and it has also asked for fossil fuel subsidy reform again in 2016 as part of the G7.

Which would you choose?

IF YOU HAD 5.4BN USD WOULD YOU SPEND IT ON⁸⁰



**OIL, GAS AND
COAL**

OR



**300,000+ SOLAR
INSTALLATIONS**

OF 3 KWP PROVIDED TO
HOUSEHOLDS*



**15,000 COAL
POWER PLANT
WORKERS**

RETRAINED AND/OR SUPPORTED FOR
RE-EMPLOYMENT IN OTHER INDUSTRY
OVER COMING 5 YEARS**



**100,000+ CHILD
CARETAKERS'
SALARIES**

A YEAR ***

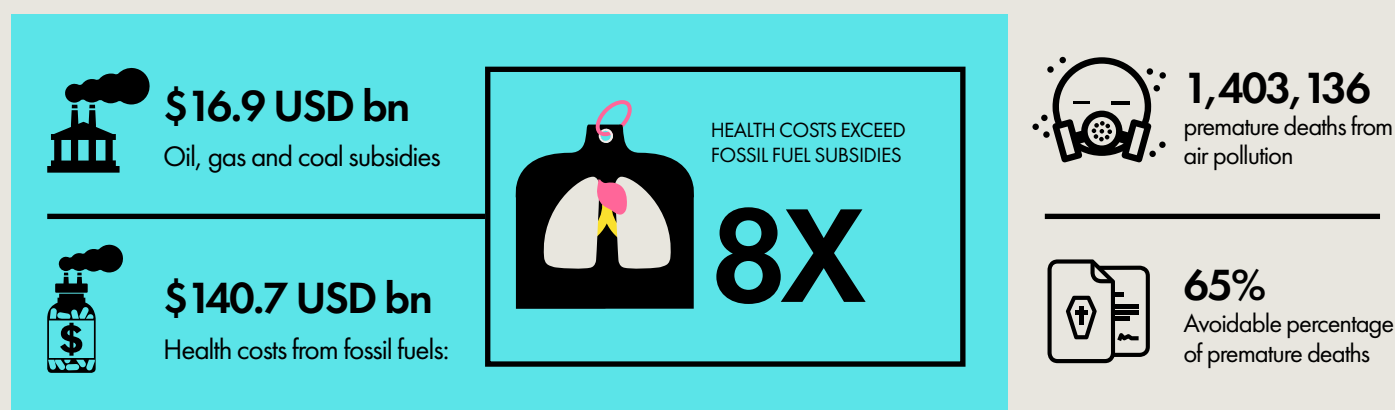
* Calculation based on domestic system of 3 kWp with average installation cost of 1,776 Euro per kWp
** Calculation based on 250 million Euro per year required for a just transition of 15,000 coal power plant workers
*** Calculation based on average yearly salary of a caretaker of 2,379 Euro



India

TACKLING AIR POLLUTION AND ENERGY POVERTY

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

OUTDOOR AIR POLLUTION

13 of the 20 most polluted cities of the world are Indian⁸¹, with both indoor and outdoor air quality representing a huge problem and the biggest risk factor driving most premature death and disability combined⁸² through lower respiratory and other common infectious diseases, cardiovascular diseases and chronic respiratory diseases. Coal is the main source for energy production in India, with two thirds of electricity generated from coal, and thus a key contributor to outdoor air pollution leading to the early deaths of more than 1.4 million Indians every year.⁸³ Coal-based power accounts for 70 percent of

India's CO₂ emissions⁸⁴ and receives millions in national subsidies. In 2014, India was both the world's third-largest coal producer and third-largest coal consumer.⁸⁵

It is estimated that India supported the production of oil, gas and coal with a staggering 16.9 billion USD a year in 2013 and 2014, mostly through support for state-owned or state-controlled enterprises.⁸⁶

Yet, the Energy and Resources Institute (TERI) estimates that India has enough coal plants running or under construction to meet demand until 2026.⁸⁷ By then renewables could be cheap enough to provide all new capacity as the cost of renewable energy is declining.

INDOOR AIR POLLUTION

Coal power generated electricity is not the only culprit to blame for India's gruesome air pollution. Up to 30 percent of India's outdoor air pollution is being driven by the country's bad indoor air quality.⁸⁸ A fourth of India's population lives in energy poverty, not having access to regular sources of electricity. This is why it is biomass mostly such as dung cakes, firewood, and crop residues along with some use of coal and kerosene that are being burned domestically, which cause considerable indoor air pollution. About 700 million households for example burn biomass for cooking

and heating, which has terrible knock-on effects for health. Some of the main products subsidised are LPG and kerosene, however, mostly used for household lighting and cooking and, formerly, diesel and petrol, which now have been completely deregulated. The subsidisation of LPG was intended to accelerate the transition to clean household fuels. Despite LPG consumption and the

subsidies linked to it being heavily skewed in the favour of higher income groups and the urban areas of country, 400 million households have been helped to make the switch from burning solid fuels to the healthier LPG option with the help of subsidy schemes since 1980. But population growth has resulted in over two thirds of households burning highly carbon-emitting

biomass fuels for cooking with resulting health impacts.

In addition, although the country has found ways to provide access to LPG to hundreds of millions, usage often remains low at first. Ways are needed to enhance usage and thus reduce use of health harming biomass fuels to very low levels.

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

Subsidies to the world's most polluting industry have helped create a burden to society in the form of health costs from air pollution at least eight times higher than the actual subsidy.⁸⁹

But India has ambitious renewable energy targets: it plans to have renewables, nuclear and large hydroelectric power plants, account for more than half (56.5%) of its installed power capacity by 2027⁹⁰, as committed to under the Paris Agreement.

Electricity generated from wind is expected to set a new record this year for the third year in succession⁹¹ and the IEA estimates that it will one day be the world's second largest solar market.⁹² Whereas, fossil fuels still receive more than eleven times as much financial support as clean energy,⁹³ the

reality is that subsidies to fossil fuels are declining while support to renewable energy is increasing.

This development is good news for India where air pollution from fossil fuels represents a huge burden on its population as well as additional costs for health care providers through an increasing number of air pollution related illnesses and national productivity losses due to premature deaths. The IMF estimates that reforming fossil fuel subsidies and pricing oil, gas and coal according to their true costs to society could help India avoid 65 percent of premature deaths currently taken by the countries toxic air.⁹⁴

Whereas both consumer and producer subsidies need to be phased out for the benefit of health and climate, it is

crucial to recognise that one-fourth of India's population - equal to the total population of the United States of America - does not have access to energy at all. In the case of India, it is of crucial importance to address subsidy reform in a manner that benefits the poor, reduces energy poverty, empowers women as the main users of household fuels and improves the health of the most vulnerable in society. The fiscal benefits of subsidy reform could be used to curb India's excessive dependence on traditional fuels and improve efforts to provide clean cooking energy to the rural poor at an adequate level of affordability. Whereas LPG is often distributed with the help of state subsidies, providing clean cooking opportunities for the rural poor can be considered a cost-effective investment benefitting the health of many.

“Next to improving air quality in India, which is an urgent matter from a public health perspective, fossil fuel subsidy reform could provide funds that could be used to advance India's plans for Universal Health Coverage, as this would also be immensely helpful in reducing poverty.”

- **PRADEEP GUIN**, SENIOR RESEARCH ASSOCIATE, FELLOW, CENTRE FOR ENVIRONMENTAL HEALTH, PUBLIC HEALTH FOUNDATION OF INDIA

KEROSENE SUBSIDIES BLOCKING TRANSITION TO SOLAR LAMP PROVISION

Kerosene, the “poor man’s fuel” in India is used by millions of households in rural India to meet basic lighting needs. Government subsidies make the fuel more affordable by selling it for half its market value (relatively little is

still used for cooking). However, the light produced from kerosene lamps is of low quality and even though the fuel is considered somewhat less health-harming than burning wood or cow dung cakes, it is responsible for serious negative health impacts. In addition:

- Kerosene poisoning among children remains a public health problem.⁹⁵
- Kerosene smoke is particularly rich in black carbon, a potent greenhouse pollutant.

For financial, health, safety and environmental reasons, a switch to solar power is desirable, but remains unattainable as long as subsidies for kerosene represent an obstacle, discouraging the poor to switch to solar. A recent report⁹⁶ estimated that without kerosene subsidies, solar lamps would be financially more viable than kerosene lamps. In addition, it is estimated that as much as half of subsidised kerosene is simply sold on the black market since it can be used in diesel engines.

Which would you choose?

IF YOU HAD 16.9BN USD WOULD YOU SPEND IT ON



OIL, GAS AND COAL

OR



375 MILLION SOLAR LAMPS

PROVIDED TO HOUSEHOLDS*



32,000 EXTRA DOCTORS

TRAINED FOR RURAL AREAS **

OR

24% OF WHAT IS NEEDED TO IMPLEMENT HEALTHCARE

COVERAGE FOR ALL INDIANS.***



* Calculation based on average price of one solar lamp per household of 22.5 USD

** Calculation based on AIIMS (All India Institutes of Medical Sciences) cost estimate of 1.7 crore Rupees (approximately 264,859 USD) to educate a doctor

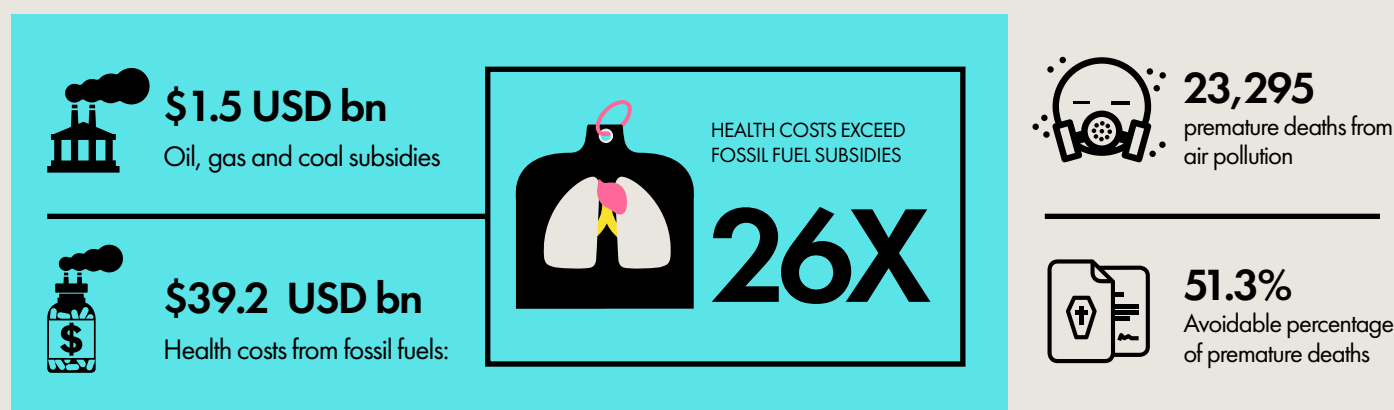
*** Calculation based on estimation of 3.8 percent of GDP needed for universalising healthcare services in India. GDP 2011 of 1.823 trillion USD



Poland

BLACK TREASURE, BLACKER LUNGS

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

Coal is Poland's black treasure: the country produces over 80 percent of its electricity from highly-polluting coal in outdated power plants, while many Poles use old stoves and waste or low-quality coal to heat their homes.

Three quarters of the European homes that still use coal for heating are located in Poland with an average Polish family using around 3 tonnes per year, producing 8.5 tonnes of CO₂.⁹⁷

This high dependence on coal makes Poland a country with high air pollution in Europe, with 33 of Europe's most polluted 50 cities⁹⁸ being in Poland, and contributes to

at least 23,295 premature deaths from air pollution a year. Other estimates note the number even higher at 48,000 early deaths from air pollution.⁹⁹ According to the International Energy Agency air pollution is "one of the largest environmental health risks" Poles face.

Often justified by referring to the need to maintain energy security and save coal worker jobs, the Polish government manages to keep its unhealthy energy policies up and fund them annually with at least 920 million Euro (3805 million Zloty) in coal subsidies.¹⁰⁰ An additional 1-2 billion Euro have been awarded in pension subsidies for miners according to the National Chamber of Control.¹⁰¹ Whereas

coal mining subsidies are decreasing slowly, support to coal-fired power remains high and is even increasing such as for the so-called "stranded cost compensation scheme" under which the government provides funds to coal power plant operators if they cannot cover the costs of production.¹⁰² In 1990 and 2003, subsidies to the mining industry reached 2 percent of GDP.

About two-thirds of the financial support the Polish coal industry received from 1990 to 2012 was paid by final consumers through their energy prices. For example, in 2010-2012, each consumer was obliged to pay roughly 8 Euro more per MWh for coal derived electricity due to additional fees in the electricity

bill as well as an additional 3 Euro per MWH in taxes through state support. This way, in the year 2012 the average Polish citizen spent

214 Euro¹⁰³ supporting mining and energy production in Poland through a variety of state subsidies. In a year where the average household

monthly income per capita in Poland was 302 Euro, Poles were funding their own ill-health with more than half a month's salary.

SEVEN THOUSAND EARLY DEATHS - SEVEN BILLION DOLLAR TROPHY

Poland is the biggest beneficiary of the EU's Emission Trading Scheme's Article 10c, which allows power plants in lower-income member states in Central and Eastern Europe to emit

greenhouse gases for free, under the condition that the countries invest an agreed amount of money into the modernisation and diversification of their energy systems. Polish energy companies will receive an estimated value of nearly 7.5 billion Euro between 2013 and 2020 of which the vast majority is, and will continue to be spent on subsidising coal power. A main beneficiary of these subsidies is Belchatow, the

most harmful plant in terms of air pollution in the EU, accounting for the largest CO₂ emission.¹⁰⁴ Pollution from Belchatow is estimated to cause approximately 1,270 premature deaths a year, which means that another six years of free emissions permit by the Polish government would add up to 7,620 more premature deaths attributable to this coal power plant alone.

But fossil fuel subsidies alone are not what causes the strain on the Polish budget. The true costs of coal subsidies run much higher: by funding coal power generation the Polish government continues to drive its production and therewith its negative impact on society. The size of these societal externalities varies from at least 8 to 16 billion Euro in health costs¹⁰⁵ up to 39.2 billion USD (36.7 billion Euro) as estimated by the IMF, encompassing costs from premature deaths from air pollution.

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

Poland formally committed to phase out fossil fuel subsidies every year since 2009 as part of the G20. However, the Polish government has no plans to phase out coal but rather keeps citing its necessity for energy security, independence from Russia and coal miner jobs, making coal subsidies an integral part of the equation. Yet, its mines are in debt and whereas three out of 14 state-owned mines were competitive one year ago, only one was in 2015¹⁰⁶ This way in Poland, subsidies are keeping a dying industry alive, instead of providing long-term sustainable solutions to the ca.

80-100,000 people currently still employed in the Polish coal sector.

Eliminating coal subsidies would result in reduced coal production as other energy sources would be able to compete with now the cost of unsubsidised coal, eventually resulting in a higher use of renewable energy sources such as wind or hydropower. The freed funds through subsidy reform could be used to support workers training or provide other social benefits or expand social safety nets. Consequently, the IMF estimates that eliminating subsidies and pricing especially

coal in Poland according to its true costs would result in a decline of premature deaths from air pollution of 51.3 percent. This would be accompanied by reduced health care costs from treating respiratory and cardiovascular diseases caused by air pollution as well as by an increased productivity from fewer incidents of ill-health among the population.

“Poland’s heavy dependence on coal for energy generation places an enormous burden on the health of our population. As the HEAL report shows, cardiovascular and respiratory disease from air pollution is causing huge costs to the economy, reaching 13% of Polish GDP. As an epidemiologist studying health effects of air pollution, I feel obliged to demand effective action by the Polish government to cut emission of harmful substances to the air, especially from coal combustion in households. There is a strong need for an energy transition towards clean and healthier sources of energy and the phasing out of coal.”

- MICHAL KRZYZANOWSKI, VISITING PROFESSOR, ENVIRONMENT RESEARCH GROUP, KING ‘S COLLEGE LONDON

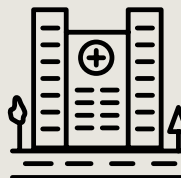
Which would you choose?

IF YOU HAD 1.5 BN USD WOULD YOU SPEND IT ON



**OIL, GAS AND
COAL**

OR



**34+ NEW
HOSPITALS**

BUILD NEW HOSPITALS IN UNDER-SERVED AREAS*



**30,000+ DOCTOR
SALARIES**

A YEAR**



**57,000+
TEACHER SALARIES**

A YEAR***

* Calculation based on estimation of hospital building costs in Poland of 860 USD per m². Hospital estimated size 16,500 m²

** Calculation based on average yearly salary of a hospital doctor of 16,702.26 USD

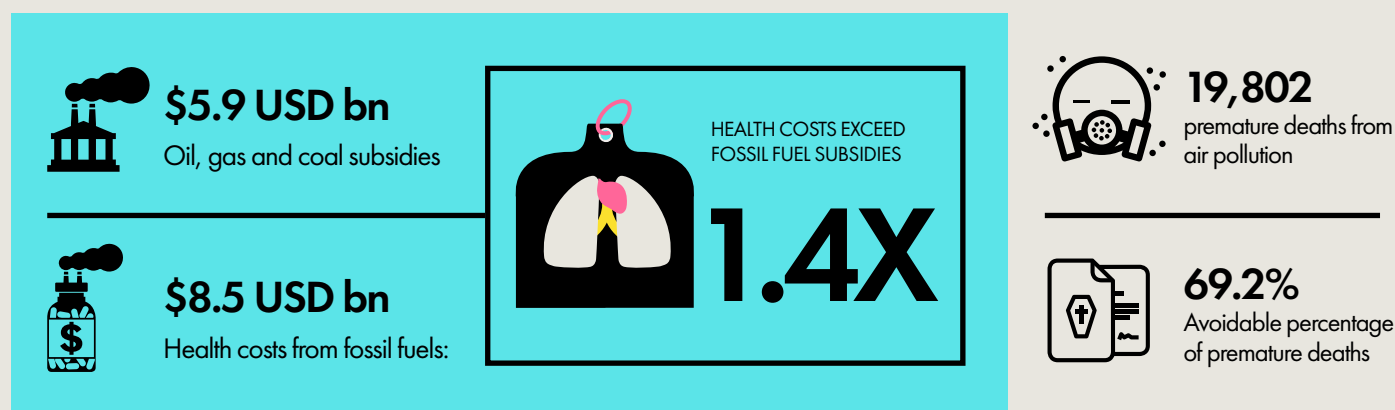
*** Calculation based on average yearly salary of a teacher in Poland of 8,718 USD



South Africa

DEVIL IN THE DUST

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

South Africa has the ninth-largest coal reserves in the world representing 95 percent of all African coal¹⁰⁷, is the seventh-largest coal producing country and is the fifth-largest coal exporter.¹⁰⁸

The country relies on coal for more than 90 percent of its electricity.¹⁰⁹ South Africa is also the biggest source of emissions in Africa and it is ranked twelfth in the world.¹¹⁰

This preference for coal is reflected in the country's health profile. A recent study suggests that 7.4 percent of all deaths in South Africa were caused by air pollution resulting in losses to society of 20 billion USD¹¹¹. Coal has huge health impacts on the country's

population in terms of particulate pollution and heavily contributes to an estimated 19,802 premature deaths from particulate matter in 2013.¹¹² High PM concentrations typically occur near townships, which are commonly poor, overcrowded and inadequately serviced areas. The main sources of PM were domestic combustion of coal and biomass, coal pollution from highly industrialised areas such as Secunda (in the coalfields of the Mpumalanga province, home to eleven coal-fired power stations and the largest source point of CO₂ in the world¹¹³) and coal power stations, some of which had been mothballed but were re-commissioned due to power shortages.¹¹⁴ Two new power station, Kusile and Medupi, are planned to

be completed in 2017 and will be two of the world's largest, burning roughly 17 million tons of coal a year, exacerbating pollution levels. For the new Kusile plant alone, estimates suggest the external health costs - the cost of treating people for conditions such as cardiopulmonary diseases - will be 15 million USD over its 50-year lifespan.¹¹⁵

UNDERPINNING THESE COSTS TO HEALTH AND ECONOMY ARE PUBLIC SUBSIDIES.

Three state-owned enterprises in South Africa – PetroSA (oil & gas), Transnet (pipelines) and Eskom (coal

electricity generation) received 5.4 billion USD in state support in 2013 & 2014¹¹⁶, which carry costs to health through air pollution caused premature deaths at least 1.4 times their amount. Additionally, the subsidies also greatly inhibit climate action and question South Africa's ability to meet the goals set out under the Paris Agreement.

South Africa's leading utility is Eskom, which provides approximately 95 percent of the country's electricity and was responsible for 45 percent of South Africa's total CO₂ emissions in 2011.¹¹⁷ Emissions from the coal-fired power plants it operates are responsible for 2,200 to 2,700 premature deaths each year.¹¹⁸ Residents of the Highveld region for example, one of the country's highly

polluted areas, are not only exposed to Eskom's 12 coal plants but also to hundreds of mines, causing them to be three times as likely to die from cardiovascular diseases than elsewhere in the country. Eskom's electricity generation in the area is also responsible for 51 percent of premature deaths due to respiratory illnesses.

COAL MINERS - THE FIRST VICTIMS OF SOUTH AFRICA'S UNHEALTHY ENERGY BUSINESS

In countries like South Africa, as opposed to Western countries where technology has significantly modernised the process, coal mining is still a dirty and dangerous job, greatly impacting the health of those oftentimes forced by poverty to engage with it. 7.3 percent of South African coal miners had coal workers' pneumoconiosis, a restrictive lung disease caused by the inhalation of dust and more widely known as black lung disease. Other resulting health conditions include chronic obstructive lung disease or accelerated losses in lung function. A 2002 study concluded that, at retirement, the lungs of a South African coal miner had aged by five years compared to those of a non-miner.¹¹⁹ It is not uncommon for those working in and living around coal mines to be too poor to afford themselves access to the electricity they produce.¹²⁰ Yet, it is the coal industry and not the coal miner receiving subsidies to keep their lights on.

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

Phasing out fossil fuel subsidies would not only free up funds to be used for renewables or other health promoting purposes, but it would also eliminate roughly 8.5 billion USD in associated health costs from air pollution and save at least another 20 billion USD worth of other damages caused by global warming. The resulting benefits would be reflected in a reduction of premature deaths from air pollution of 69.2 percent.¹²¹

Next to phasing out subsidies for oil, gas and coal, South Africa needs to implement strict air pollution measures to ensure air quality standards are adhered to and to stimulate the investments into renewable, healthy energy sources. The conditions for a healthy energy future are given: South Africa has an average of more than 2,500 hours of sunshine per year and average direct solar radiation

levels range between 4.5 and 6.5kWh/m² per day, placing it in the top three in the world.¹²² The international consulting firm Frost & Sullivan recently estimated that South African solar installations could be providing grid power for as little as half the cost of coal by 2020.¹²³

“The hidden costs of continued use of fossil fuels ensures that the most impoverished and vulnerable communities in South Africa remain trapped in a never-ending cycle of ongoing exposure-disease-poverty-death. The best available science overwhelmingly supports an immediate transition to renewable energy: not only are the direct costs becoming increasingly affordable, but the health benefits contribute significantly to the Sustainable Development Goals”

- DR RAJEN NAIDOO, ASSOCIATE PROFESSOR/HEAD OF DISCIPLINE, OCCUPATIONAL AND ENVIRONMENTAL HEALTH, SCHOOL OF NURSING AND PUBLIC HEALTH, UNIVERSITY OF KWAZULU-NATAL

Despite the successful Renewable Energy Independent Power Producer Program (REIPPP), which has resulted in 102 new projects around solar and wind energy being commissioned since 2011,

renewables still make up less than 5 percent of the country’s electricity generation.¹²⁴ Increasing this share and providing more jobs in renewables while phasing out fossil fuel subsidies is crucial if South Africa

is to shift power structures away from big coal interests, create healthy full time employment in the renewable sector while delivering services to poor and rural communities and empowering those affected.

Which would you choose?

IF YOU HAD 5.9 BN USD WOULD YOU SPEND IT ON



OIL, GAS AND COAL

OR



66,000+ DOCTOR SALARIES

A YEAR*



144,000+ NURSE SALARIES

A YEAR**



20% OF NATIONAL HEALTH INSURANCE PROGRAM FUND

BY 2025 EVERY YEAR***

* Calculation based on average yearly salary of a doctor in SA of 40,824

** Calculation based on average yearly salary of a nurse in SA of 18,700

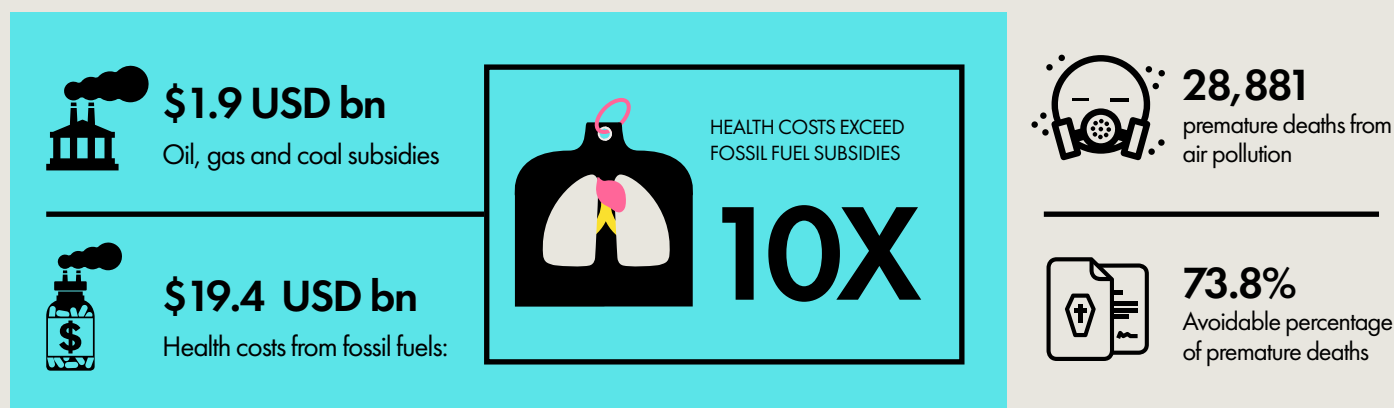
*** Calculation based on estimation that a national health insurance program (NHI) will cost 30 billion USD by 2025



Turkey

SWIMMING AGAINST THE TIDE: TOWARDS A COAL DEPENDENT FUTURE

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

In Turkey, electricity power production grew 60 percent alone between 2005-2015¹²⁵, resulting in the country increasing its coal fired power generation (from 26,6 to 29,1 GWh) as well as renewables generation (from 0,3 to 6,5 GWh) to meet the rising demand.

The push for more coal power generation adds to an already serious air pollution situation: at least 28,881 people die prematurely every year from ambient PM_{2.5}.¹²⁶ Air quality measurements in Turkey show that citizens all over the country breathe air that is considered harmful to health. The air in the country has an annual average of 34 µg/m³ of PM_{2.5}

particles.¹²⁷ That's 3.4 times the level considered safe by the WHO, which also estimates that 846,068 years of life are lost every year in Turkey.

Cities like Istanbul or Ankara rank even higher with concentrations four or five times the safe level.¹²⁸ But the problem is widespread: According to the European Environment Agency (EEA), in 2012 97.2 percent of the urban population in Turkey was exposed to unhealthy air with air pollutant PM₁₀ concentrations above the EU air quality objectives.¹²⁹

The Turkish government is currently pushing for a huge increase in coal power generation: planned coal power plants for Turkey amount to

67 GW in capacity¹³⁰ compared to current operating capacity, standing in stark contrast to climate change mitigation and environmental protection strategies defined as increasing efficacy of climate change combat and protecting environment in Turkey's official Energy Efficiency Strategy Paper.¹³¹ With roughly 70 coal power plant units in the pipeline¹³², most of which are planned to extract domestic lignite coal, every additional coal power plant translates into several thousand tons of hazardous air pollutants emitted every year. A recent research by WWF-Turkey and Bloomberg New Energy Finance identifies that if Turkey's electricity capacity from coal raises to 35 GW by 2030, Turkey's

greenhouse gas emissions would grow by an estimated 94 percent¹³³ in a time when at least 75 percent of current proven fossil fuel reserves need to stay under the ground for us to assure a safe climate for humankind, this represents an unacceptable increase.¹³⁴

Fossil fuel subsidies therefore do not only pose an enormous cost to Turkish society but to people worldwide. Although official data is scarce and non-transparent, the pool of knowledge on fossil fuel subsidies in Turkey is increasing.

Studies estimate that around 730 million USD (684 million Euro) were accrued to the coal sector alone in the form of subsidies in 2013.¹³⁵

Moreover, the Turkish government's subsidies to fossil fuel producers are between 300 million - 1.6 billion USD (281.1 – 1.5 billion Euro) per year depending on investments made in a given year and not including several subsidies for which no cost estimates are available.¹³⁶ This amount reflects only national public subsidies, making the amount increase to nearly 2 billion USD

(1.9 billion Euro) if public finance payments are included.

Subsidising power plants with public funds equals to directly harming the health of millions of citizens resulting in health costs of at least 19.4 billion USD (18.2 billion Euro). Another 13.2 billion USD (12.4 billion Euro) are estimated by the IMF in damages from global warming.¹³⁷

This is more than what it spent on public health in 2014 (22 billion USD (82 billion lira)).¹³⁸

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

To meet its energy demand, Turkey requires convenient and reliable energy solutions which renewables could offer. A recent analysis by Bloomberg New Energy Finance and

WWF-Turkey indicates that by 2030, Turkey could meet almost 50 percent of its power demand from renewable sources, with such a strategy also being cost comparable to the coal

dominated strategies.¹³⁹ Moreover Turkey's geography allows for great solar and wind energy potential which can be the driving force behind a healthier energy future.

“Air pollution is one of the most important public health problems in Turkey. Fossil fuels and especially coal increase air pollution levels and cause more premature deaths and diseases. Turkey needs to immediately stop subsidising fossil fuels and set up an effective action plan for cleaner air.”

- PROF. KAYIHAN PALA, HEAD OF THE DEPARTMENT OF PUBLIC HEALTH IN ULUDAG UNIVERSITY

Given this context, subsidising fossil fuels and especially coal, when alternative options are available, contributes to a rising public health threat for the Turkish society, stemming from already skyrocketing air pollution levels and

health risks due to climate change in the longer run. The economic cost of air pollution related diseases is not sufficiently considered by public authorities despite creating an unrecoverable burden on the national economy and people's lives.

Eliminating coal subsidies would result in reduced coal production as other energy sources would be able to compete with unsubsidised coal, eventually resulting in a higher use of renewable energy sources.

Consequently, studies estimate that Turkey could reduce premature deaths from air pollution by up to 73.8 percent by phasing out fossil fuel subsidies and by having fossil fuels accurately priced.¹⁴⁰ This would be accompanied by reduced health care costs from treating

respiratory and cardiovascular diseases caused by air pollution as well as an increased α spurred by a decreased in the number of incidents of ill-health among the population. For this, Turkey needs to initiate a phase out of its fossil fuel subsidies, consisting of greater transparency

in reporting its subsidies and the elimination of especially those subsidies that further fund the exploration and expansion of coal. A stronger renewable energy policy needs to be established and the use of healthy renewables needs to be incentivised.

Which would you choose?

IF YOU HAD 1.9 BN USD WOULD YOU SPEND IT ON



**OIL, GAS AND
COAL**

OR



**60,000+
SPECIALISTS
DOCTOR SALARIES**
A YEAR*



**22,500+ TEACHER
SALARIES**
A YEAR**



**44+ NEW
HOSPITALS**
BUILD NEW HOSPITALS IN
UNDERSERVED AREAS***

* Calculation based on average yearly salary of a specialist in Turkey of 10,517.16 USD

** Calculation based on average yearly salary of a teacher in Turkey of 28,110 USD

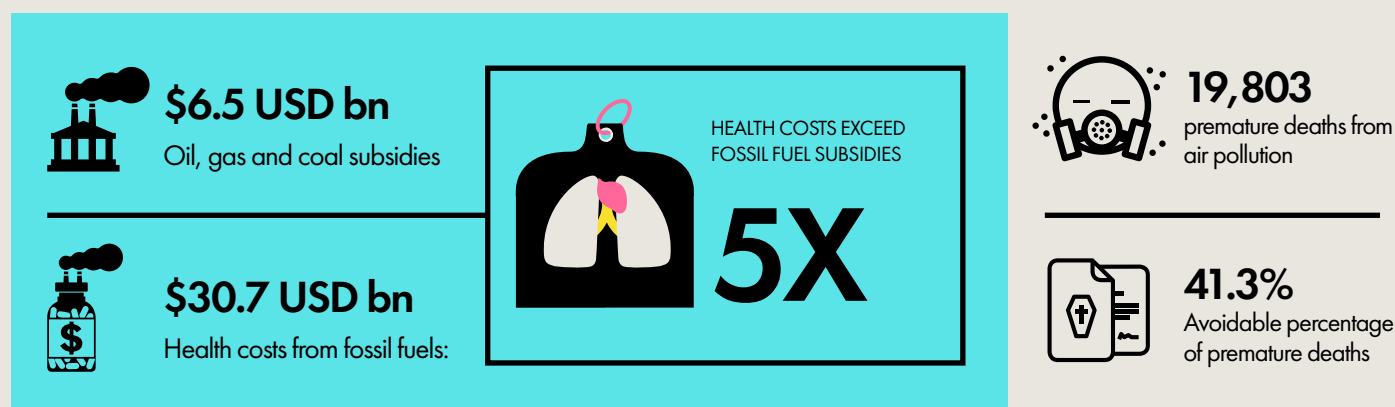
*** Calculation based on estimated building costs of 860 USD per m² in Turkey. Hospital estimated size 16,500 m²



United Kingdom

SUBSIDY REFORM FOR THE BENEFIT OF HEALTHY CITIES

HEALTH COSTS VS. FOSSIL FUEL SUBSIDIES



THE HEALTH IMPACTS OF FOSSIL FUEL SUBSIDIES

The UK government plans to close all coal-fired power stations by 2025¹⁴¹, switching to more gas and increasing the share of renewables.

The UK claims it does not subsidise the production of fossil fuels, resulting in very low transparency, inhibiting progress towards a healthier energy future. But despite its coal phase out commitments and the harm to human health done through

especially coal, the UK keeps awarding coal-fired power with taxpayer money.

According to a new study, the UK currently pays annual average coal subsidies of 434 million Euro.¹⁴² Existing large coal, gas and nuclear power stations will provide 85 percent of backup power in 2020-21, despite the government's commitment to taking action on coal and climate change.¹⁴³ Overall,

the British government spent an estimated 6.5 billion USD a year in 2013 and 2014 on subsidies to fossil fuel companies¹⁴⁴ including oil and gas, and is the only country in the G20 that has actually increased support in recent years.¹⁴⁵ This way, fossil fuels receive 1.5 times as much financial support as clean energy.

ABERTHAW COAL-FIRED POWER STATION: AWARDED WITH PUBLIC FUNDS DESPITE AIR POLLUTION DEATHS

Although the Aberthaw power station, a coal-fired power plant located in Wales, has been identified as producing twice the legal amount of harmful emissions for seven years and its pollution has been causing widespread sickness and premature deaths, it has been awarded a 10 million British Pounds state subsidy to produce electricity for the year 2017-2018.

The Aberthaw coal power station has been generating for 45 years, and according to Greenpeace & Friends of the Earth it has likely caused the premature deaths of over 3,000 people in Wales and 18,000 throughout a wider area. Furthermore, the resulting air pollution has been estimated to be responsible for 195,000 days of illness per year including 35,000 days sick of leave. The total annual societal costs of the premature deaths due to NO₂ pollution resulting from Aberthaw's emissions is 226.4 million British Pounds, with Wales accounting for 37.9 million British Pounds alone.¹⁴⁶

“It is ridiculous that we are still subsidising fossil fuels on a large scale when they are responsible for harming human health and causing devastation to the natural environment & human prosperity through climate change. It is even more absurd when we consider that now we have viable affordable alternatives.”

- **CAROLINE JESSEL**, LEAD FOR SUSTAINABILITY AND HEALTH, SOUTH REGION - NHS ENGLAND SOUTH EAST

Next to draining the public budget, government subsidies to oil, gas and coal come with their own costs we did not bargain for: costs to health in the UK are estimated by the IMF to be at least 30.7 billion USD in 2015, almost five times more than the actual subsidy, placing a huge burden on budgets and people's health. Whereas this estimate only consists of the costs associated with premature deaths from air pollution, the Royal College of Physicians uses another methodology including the costs stemming from reduced productivity and an added burden on the health service. They arrived at an estimate of costs to individuals and society of 20 billion GBP (27.1 billion USD).¹⁴⁷

Coal alone has caused almost 3,000 early deaths in 2013, with total health costs estimated between 4 to 7.8 billion Euro (4.3- 8.3 billion USD).¹⁴⁸

But it's not mainly coal that is to be blame for the nation's harmful air. Diesel-run vehicles are increasingly making life in bigger cities risky. For people living in urban areas (over 80 percent of UK residents¹⁴⁹), outdoor air pollution is now a significant health risk. Nearly 40 percent of all NOx emissions and PM₁₀ pollution within London comes from diesel vehicles¹⁵⁰ which receive state subsidies in the form of lower road tax and fuel duty on the basis that they emit less CO₂ than petrol cars,

ignoring the increasing health risk they bring.

NOx has been linked to cancer, asthma, stroke and heart disease. Increasingly links are also being established to diabetes, obesity, and even changes linked to dementia.¹⁵¹⁻¹⁵² In London, nearly 9,500 people a year die prematurely due to two key pollutants, fine PM_{2.5} and nitrogen dioxide (NO₂).¹⁵³ Yet, in 2015 dozens of highly polluting diesel generators received the required cash injection to be built, through consumer-funded subsidies worth 175 million GBP (237.3 million USD) over 15 years.

OPPORTUNITIES THROUGH FOSSIL FUEL SUBSIDY REFORM

With the decision to phase out all coal, the UK has made a crucial commitment to tackle climate change and air pollution. However, reforming fossil fuel subsidies is the first step towards becoming a fossil fuel free nation. The UK needs to eliminate its subsidies by 2020.

The IMF estimates that cutting subsidies in advanced nations such as the UK, and allowing fossil fuels such as oil, gas and coal to reflect their true price, could cut premature deaths by 41.3 percent.¹⁵⁴ According to the UK Health Alliance, a complete phase out of coal in the UK would cut premature deaths by 1,600, prevent more than 1 million incidents of lower respiratory symptoms and cut costs by 3.1 million GBP (4.2 million USD).

ADDITIONALLY, ELIMINATING COAL USE WOULD HAVE SIGNIFICANT ENVIRONMENTAL BENEFITS, INCLUDING THE REDUCTION OF UK'S GREENHOUSE GAS EMISSIONS BY 17 PERCENT, A 22 PERCENT REDUCTION IN NOX AND EVEN A 44 PERCENT REDUCTION IN SO₂.¹⁵⁵

In addition, eliminating diesel subsidies and cutting down on diesel cars in cities is also needed to boost health.

Alternatives are plenty. The cost of wind and solar is rapidly falling in the UK. The latest Department of Business, Energy & Industrial Strategy (BEIS) cost estimates and those done by the statutorily independent Committee on Climate Change, suggest onshore wind and solar will be cheaper than gas by 2020.¹⁵⁶

But even for consumers these benefits are sometimes difficult to see: whereas any money raised from taxpayers for renewables via their electricity bills shows up as a green subsidy¹⁵⁷⁻¹⁵⁸, nothing the UK government does to help fossil fuel companies is billed in the same terms.

Which would you choose?

IF YOU HAD 6.5BN USD WOULD YOU SPEND IT ON



OIL, GAS AND COAL

OR



48,000+ NURSE SALARIES
A YEAR*



74,000+ JUNIOR DOCTOR SALARIES
A YEAR**



300,000+ SOLAR INSTALLATIONS
OF 3 KWP PROVIDED TO HOUSEHOLDS***

* Calculation based on yearly average salary adult nurse of 45,153.50 USD

** Calculation based on average salary junior doctor in year 1 of 29,202.70 USD

*** Calculation based on average solar panel cost of 6,450.50 USD per household installation for a system size 3kW

III.

Choose health -

End fossil fuel subsidies

1. RECOMMENDATIONS FOR POLICY MAKERS

The evidence on health harm and the quotes presented in this report add to the growing number of voices demanding an end to public funds supporting fossil fuels. From the Director-General of the WHO, Dr Margaret Chan, to the founder of Tesla and SpaceX, Elon Musk; from the President of the World Bank, Jim Yong Kim, to the Governor of the Bank of England, Mark Carney – they all agree: fossil fuel subsidies have to go. Yet, progress has been slow and no concrete action have followed the promises made.

If we are to keep global temperatures below 1.5 degrees Celsius and protect human life on earth, eliminating fossil fuel subsidies is a first of many but crucial step to get there. But as this report has shown, no more funding to air polluting fossil fuels also has immediate and long-reaching health benefits. It finally is also the economically smart decision as it will save billions of dollars in health costs that will – again – be carried by the society and the taxpayer, not the polluter.

Policy makers: walk the talk for health and the climate

Support and implement a complete phase out of fossil fuel subsidies for oil, gas and coal to boost health and renewables

We request of governments to regulate subsidies for the benefit of public interest, for cleaner air, for a healthier climate, for healthier people in the short and long run and for a smarter use of public funds. Phasing out government spending to fossil fuels is the first step in speeding up the transition to renewable, healthy energies and assuring healthy living conditions for future generations. Fossil-fuel subsidy reform should be considered a priority for every nation advocating for a renewable energy future. We believe that ending subsidies is possible and necessary for developed nations by 2020 and for low-income economies by 2025, allowing some flexibility for health-benefitting policies such as the subsidisation of LPG or other, less harmful household fuels.

Commit to reallocating the public funds freed up through fossil fuel subsidy reform to purposes benefitting public health such as the transition to renewable energies or investments in policies promoting health directly such as the funding of universal health care in developing nations or efforts to strengthen health systems and public health in higher-income countries.

It is crucial for fossil fuel subsidy reform to be executed in a manner that protects the poor and vulnerable from potentially rising energy prices as only this way we can reduce energy poverty, improve indoor and outdoor air pollution and make a significant contribution to global climate action.



CALL ON G20 LEADERS

As a group, the G20 must set a deadline and commit to eliminate fossil fuel subsidies preferably by 2020 and by latest 2025 in the case of less developed nations.



CALL ON THE EU

EU financial institutions must shift subsidies away from fossil fuels and towards healthy renewable energy sources. The EU needs to show leadership and pave the way for a G20 fossil fuel subsidy phase out.

THE BELOW RECOMMENDATIONS OUTLINE POSSIBLE STEPS TOWARDS A COMPLETE PHASE OUT OF FOSSIL FUEL SUBSIDIES TO BE UNDERTAKEN BY NATIONAL GOVERNMENTS.

1) Identify the funds that fuel disease

BE CLEAR: DEFINE FOSSIL FUEL SUBSIDIES

Government support for fossil fuels and fossil fuel companies takes many forms, which makes it notoriously hard to identify and measure, also because there is still interpretation on the definition agreed upon. The definition should include producer and consumer subsidies as well as unpriced costs. Proceedings on identifying subsidies need to be transparent for all stakeholders to be involved.

PEER REVIEWS - A USEFUL TOOL FOR TRANSPARENCY

Participate in voluntary peer reviews as a first step in identifying harmful subsidies to be eliminated for the benefit of health and climate. These will pave the way for a transparent and fair reform process of fossil fuel subsidies.

2) Communicate the benefits of ending fossil fuel subsidies

Ending fossil fuels subsidies is a win-win for our health and the climate. Policy-makers need to communicate on these benefits, as well as on alternatives to current harmful subsidies system.

KEY MESSAGES ON FOSSIL FUEL SUBSIDIES

► **Ending fossil fuel subsidies means a healthier population**

Subsidies are there to serve the public, they are coming from our elected governments and should be invested in things that make our lives better, whether that means more equal, more just, more comfortable, safer or healthier, not to serve

companies interests. Ending current harmful fossil fuel subsidies would result in healthier people as a number of deaths and disease from fossil fuel induced air pollution as well as from climate change would be avoided. The IMF estimates that reforming

subsidies and having fossil fuels reflect their true costs to health and climate could result in a 55 percent decrease of premature deaths worldwide. It is not solely fewer fossil fuels that brings health benefits - the renewable energies that will take their place will not only decrease carbon emissions but have their own major health implications worth millions of dollars.¹⁵⁹

► **Ending fossil fuel subsidies means that we are freeing up large amounts of money**

Every country on earth spends public funds, tax payer money, on support for oil, gas and coal. The amounts vary from a couple of million USD to billions USD worth of subsidies to the industry. If the additional costs to society are considered, some countries such as China even spend trillions supporting a deadly industry. Fossil fuel subsidy reform would free up money that could be used for other purposes. This is especially valuable in countries that deal with high rates of poverty. For example, Bangladesh, Pakistan, and Nigeria spent more on fossil fuel subsidies than they received in foreign aid. But even for middle and high-income

nations, reforming fossil fuel subsidies can free billions for social services or healthy investments. In 2014 India has freed 15 billion USD by cutting its gasoline (already in 2010) and diesel subsidies, allowing for the money to be used as cash transfers to population groups in need subsequently.¹⁶⁰

► **Ending fossil fuel subsidies means that our healthcare costs decrease thanks to less air pollution and global warming-related illnesses**

Beyond the direct health care costs resulting from complications, air pollution also imposes substantial burden on public and private health funders. A 2010 RAND Corporation study found that nearly 30,000 hospital admissions and emergency-room visits could have been avoided throughout California alone between 2005 and 2007, if federal clean-air standards had been met. These cases led to higher hospital care cost of approximately 193 million USD.¹⁶¹ Improving air quality can lower pollution-related health spending. Ending harmful subsidies is therefore not only a win for people's health but also for national

health budgets. In times when many health systems struggle due to austerity politics, it is ludicrous to spend public money funding further disease and health costs.

► **Ending fossil fuel subsidies means that we are serious about fighting climate change and understand the importance of renewable energy sources**

Climate change carries high social and economic costs. Flood and droughts are just the tip of the iceberg when it comes to costs to society. A study done by the International Institute for Sustainable Development concludes that a complete removal of direct subsidies on the production of fossil fuels by non-state companies alone would result in a steady decline in greenhouse gas emissions between now and 2050 as more oil, gas and coal would be left in the ground.¹⁶² Similarly, the IMF estimated in its study that a complete removal of fossil fuel subsidies would decrease global CO₂-emissions by 15-23 percent¹⁶³, a considerable reduction in emissions to make a significant contribution to meeting global targets on climate change.

3 Re-use the freed funds to benefit health and climate

Commit to reallocating the public funds freed up through fossil fuel subsidy reform to projects benefitting public health such as the transition to renewable energies or investments in other health promoting policies such as the funding of universal health care or efforts to strengthen health systems where appropriate. Where appropriate funds need to be utilised to protect those potentially suffering from fossil fuel subsidy reform such as former workers in the fossil fuel industry.

► **Put just transition and social equality first in subsidies reform**

Set up funds to assist those currently employed in the fossil fuels sector by

providing safety nets and re-training for workers. In low and middle income countries, measures need to be taken to counter increased energy prices possibly arising from fossil fuel

subsidy reform to avoid harming the poor in the transition to sustainable energy provision.

► **Provide tangible alternatives to fossil fuel subsidies**

The transition process to health-promoting energy and economic systems without harmful fossil fuel subsidies needs to be holistic (consider poverty, demographic circumstances, living conditions etc). When allocating funds, renewable energy technologies and other health promoting alternatives should be prioritised. Consider carbon pricing or similar policies that allow for environmental damage to be priced accordingly, resulting in lower demand for fossil fuels compared to renewables.

► **Invest freed up money in universal health coverage**

Investing in universal free health services is a policy that would bring tangible benefits to the population at risk of disadvantages from subsidies reform. In addition it would bring large economic returns. In fact, there is good evidence to support an expanded role for health promotion and disease prevention to increase value for money and create a return on investment for health and other sectors, as well as potentially promoting an increase in economic productivity.¹⁶⁴ Investing in universal free health services

can also deliver enormous political benefits to political leaders who bring affordable healthcare to their people.¹⁶⁵ Some developing countries are already using improved health care services as a stimulus to win popular support for fossil fuel subsidy reform. For example, the Government of Sudan, is making use of the funds gained through subsidy reform to provide free medicines to children under five.¹⁶⁶ Additionally, the Islamic Republic of Iran has utilised the money freed by cutting fossil fuel subsidies to implement universal health coverage reforms.¹⁶⁷

“One of the best political strategies to reduce fossil fuel subsidies is to simultaneously launch universal free health services. The savings from the former can fund the latter. Combining these policies can deliver significant health, economic and environmental benefits and deliver huge political benefits to leaders who bring free healthcare to their people.”

- **ROBERT YATES**, SENIOR FELLOW, CHATHAM HOUSE

Whereas health certainly isn't the only area governments could invest the freed money in, compared to other areas such as infrastructure or even education, health has the advantage of delivering results quickly as population groups will enjoy increased access to health services or better quality care.

2. CALL FOR ACTION FOR HEALTH AND MEDICAL PROFESSIONALS:

Health and medical professionals have a unique role to play in encouraging a transition from fossil fuels to healthy energy sources worldwide. They should speak out about the adverse health effects

caused by fossil fuel subsidies and point to both the harm done to human health and the funds wasted on unhealthy policies. The health sector should initiate debates on healthy energy options with the ministry of

health, ministry of energy and other governmental institutions, as well with the public. Raising awareness about the interlinkages of fossil fuel subsidies and health will help benefit public health in the short- and long-run.

Annex I - Table 1: Key figures for G20 countries

COUNTRY	AIR POLLUTION DEATHS**	FOSSIL FUEL SUBSIDIES (BN)* ⁴	HEALTH COSTS FROM FOSSIL FUELS (BN)* ⁵	HEALTH COSTS IN RELATION TO FOSSIL FUEL SUBSIDIES* ⁶	OTHER COSTS TO SOCIETY FROM FOSSIL FUELS (BN)* ⁷
	A	B	C	D	E
ARGENTINA	9,865* ³	12.6	5.89	0.5x	7.1
AUSTRALIA	777	5.3	8.39	1.6x	17.6
BRAZIL	62,246	49.7	14.4	0.3x	19
CANADA	9,466	5.4	9.8	1.8x	22.4
CHINA	1,625,164	96.5	1785.4	18.5x	468.9
EUROPEAN UNION	231,554	39-200* ⁸	229.5	8x	149.3
FRANCE	21,138	1.5	17.6	11.7x	15.3
GERMANY	41,485	5.4	42.7	7.9x	33.4
INDIA	1,403,136	16.9	140.7	8.3x	91.6
INDONESIA	162,41	7	16.9	2.4x	20.1
ITALY	29,482	3.5	9.9	2.8x	13.9
JAPAN	64,428	19.7	57.8	2.9x	47.2
MEXICO	26,484	28.7	7.4	0.3x	16
POLAND*	23,295	1.5	39.2	26.1x	13.8
RUSSIA	104,379	79.2	196.4	2.5x	72.3
SAUDI ARABIA	6,285	51.9	12.3	0.2x	9.3
SOUTH AFRICA	19,802	5.9	8.5	1.4x	20.8
SOUTH KOREA	20,37	23.2	38.65	1.7x	24.9
TURKEY	28,881	1.9	19.4	10.2x	13.2
UNITED KINGDOM	19,803	6.5	30.7	4.7x	22.1
UNITED STATES	91,045	24.2	219.2	9.1x	237.8
G20 TOTAL	3,866,292	444*⁹	2,758	6.2x	1,228

* Poland is not part of the G20 and therefore not included in the total G20 figure.

** Based on Narain, U. et al. (2016). The cost of air pollution: Strengthening the case for economic action. A World Bank/Institute for Health Metrics and Evaluation (IHME) report.

**³ Argentina's figure is based on WHO's Global Health Observatory (GHO) and assumes the population of Argentina in 2010 to have been 40.1m.

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Institute (ODI/OCI) report, except for: European Union (EP ENVI Committee 2017 report), Poland (Warsaw-based WISE economic think tank, 1990-2012 figures)

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*⁶ Column consists of columns B and C as provided by Coady, D. et al. (2015) and is intended to highlight part of the size of externalities arising from fossil fuel production and consumption. As opposed to IMF this report does not consider those externalities subsidies but portrays them as costs to health that could be avoided through a switch to renewable energies.

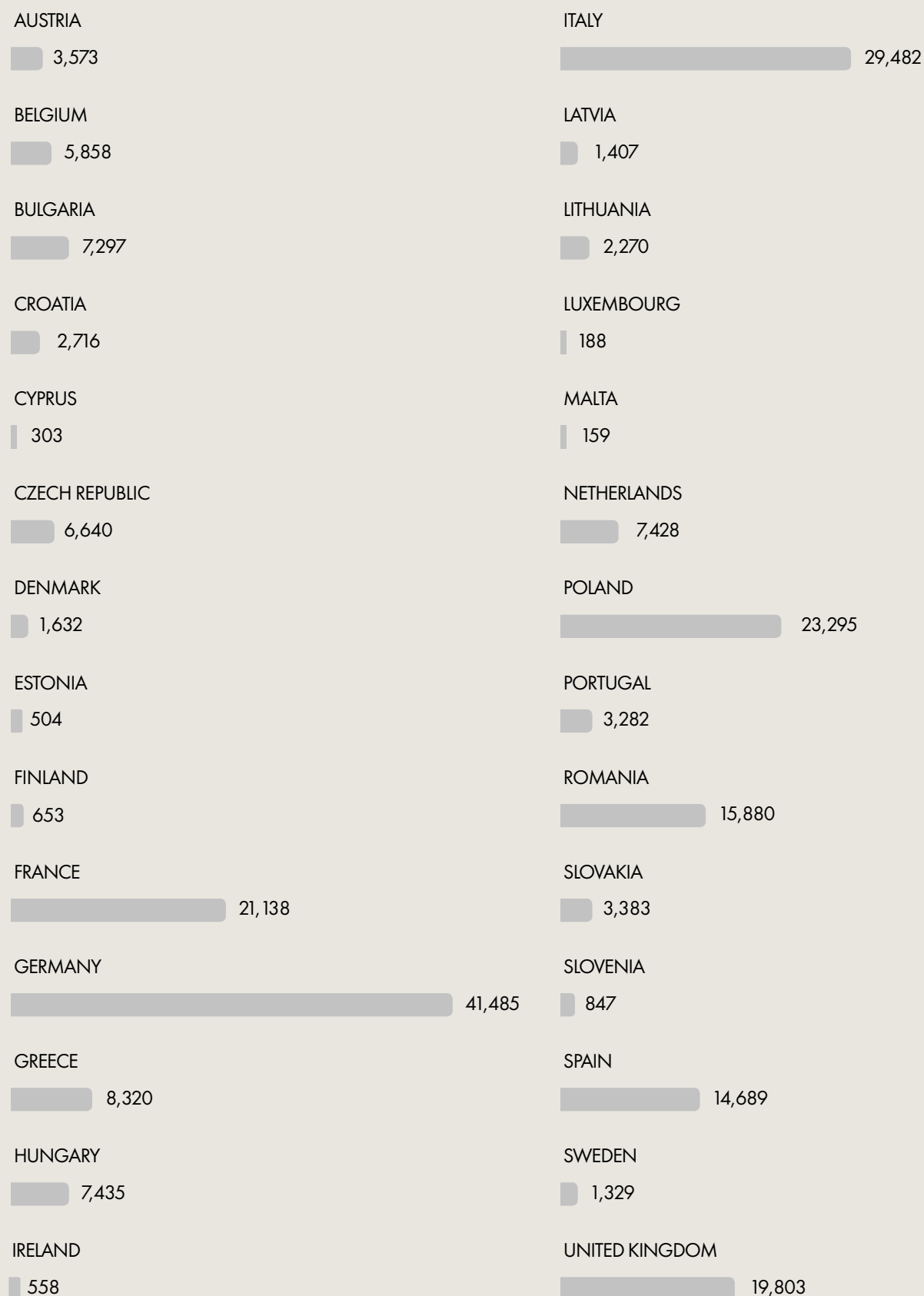
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*⁸ Figure based on European Commission (2014) and whereas it includes both producer and consumer subsidies, the latter are very low (ca 1 mn).

*⁹ Total is excluding Poland and the EU as relevant individual EU countries have been added up.

Annex II - Table 2

Premature deaths from air pollution in countries of the European Union*



*costs of air pollution caused premature deaths according to the IMF Working Paper "How large are global energy subsidies", 2015.

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