

## Health and Environment Alliance (HEAL)

## HEALTHY ENERGY



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## Which energy options for a healthy energy future?

Access to affordable and clean energy is one of the UN Sustainable Development Goals (SDGs), and is essential for human health and well-being. However, electricity generation also has negative impacts on human health. Specifically, fossil fuel based energy is causing a large burden of disease and mortality through emissions of toxic air pollutants, such as fine particles, acid gases and heavy metals. It also generates greenhouse gases. In fact, electricity production is one of the largest drivers of climate change, the health effects of which can already be observed - including in Europe. Climate change is a huge threat to public health and it is paramount that we avoid dangerous rises in temperature levels by staying well below a two degrees' Celsius increase.

To achieve this, fossil fuels must be phased out as fast as possible. The 2015 UNFCCC COP21 Paris agreement states that mid-century is the

very latest date by which our economies must be decarbonised.

Some proposed alternatives to the current fossil fuel mix of coal, oil and gas come with serious, large-scale risks. In particular, nuclear energy and hydraulic fracturing (shale gas) cannot be seen as acceptable options from a health perspective.

While renewable energy sources, such as wind and biomass, come with very low carbon emissions, these sources are also associated with certain health concerns.

Every form of power generation has trade-offs with smaller or larger negative effects on human health. It is important to prioritise those energy forms that come with the least impacts on health, both in the long and the short term.

### HEAL'S GOALS

- Governments to phase-out fossil fuels in energy generation by 2050, and replace them with 100 percent renewable and safe energy sources, as well as to encourage energy savings.
- Countries to eliminate all fossil fuel subsidies by 2025 in a manner that protects the poor and affected communities.

## HOW DO WE GET THERE?

The necessary major shift in power generation from fossil fuels to renewable energy sources should be carried out under a public health perspective.

1

### *Healthy energy decisions are underpinned by Health Impact Assessments*

**Comprehensive health impact assessments**, which cover the full life-cycle associated health risks and which compare several energy options as well as technical solutions, should be developed and applied for all energy decisions. This approach will **minimise the health impacts from power generation in the future** and lead to the choice of options that provide for the smallest cumulative negative health impacts in the long and the short term.

2

### *Reducing energy demand through energy efficiency and energy savings*

A healthy energy supply is needed to power our societies and our health systems in a sustainable way. Reducing our energy demand by **improving energy efficiency and increasing energy savings** should be an overriding priority.

Priority should be given to **developing clean energy storage technologies and decentralised energy generation from renewable sources** before the construction of new electricity grid lines. When planning the construction of new power lines in the vicinity of residential areas, options to reduce exposure to electromagnetic fields should be pursued on the basis of an assessment of their potential health risks.

3

### *Reducing energy poverty and increasing energy access*

In creating a healthy energy future, we should aim to simultaneously increase **access to energy**, reduce environmental health inequalities and address and reduce **energy poverty**.

4

### *Ensuring a just transition for workers in the energy sector*

Workers from fossil fuel industries should receive support for retraining and re-employment in the phase-out period, while subsidies to the fossil fuel industry need to be withdrawn as quickly as possible.

5

### *Engaging and amplifying health evidence and voices*

Medical and health professionals can make an important contribution to the transition of our energy systems. They can achieve this by sharing knowledge about how different forms of energy generation are linked to health as well as the health risks from climate change, by informing policy processes and the development of health impact assessments, and by engaging in education and outreach activities with the general public.





*“The dangerous impacts of coal on health from exposure to air pollution... and the major contribution that burning coal and the release of greenhouse gases has in changing the long-term climate almost certainly undermines the use of coal as a long-term fuel.”*

**Lancet Commission on Health and Climate Change, 2015**

## Recommendations for a healthy energy future in Europe

Coal (lignite and hard coal)		
Recommendations	Major public health risks	Climate risks
<p>Reduce by half the capacity of coal power plants in Europe over the course of the next ten years (by 2025) and ensure that all coal power stations are closed by 2040 at the latest</p> <p>No construction of new coal power plants</p> <p>Phase out coal in residential heating by 2040</p> <p>No Carbon Capture and Storage (CCS) technology for coal</p> <p>Operate existing coal power plants with the best available pollution control equipment</p>	<p>Air pollution:</p> <ul style="list-style-type: none"> <li>• Associated with additional mortality, cardiovascular and pulmonary morbidity, cancer and adverse birth outcomes</li> <li>• Major source of mercury: linked with impaired cognitive development in children</li> <li>• Contamination from other heavy metals, persistent organic pollutants (POPs) and radioactive substances possible from coal mining and ash disposal</li> <li>• Mental health effects possible due to coal mining impacts on communities</li> </ul>	<p>&gt;40 percent of global CO<sub>2</sub> emissions from energy use; methane emissions during coal mining; short-lived climate pollutants</p>

Oil		
Recommendations	Major public health risks	Climate risks
<p>Phase-out oil in power generation and in residential heating by 2050</p>	<ul style="list-style-type: none"> <li>• Air pollution from combustion (see above)</li> <li>• Extraction causing local air pollution and contamination of water and soils with organic pollutants: carcinogenicity, reprotoxicity, neurotoxicity, teratogenicity</li> <li>• Transport associated with risk of large-scale contamination in case of accidents</li> </ul>	<p>&gt;30 percent of global CO<sub>2</sub> emissions from energy use; methane emissions during oil extraction; short-lived climate pollutants.</p>



## Natural gas (conventional)

Recommendations	Major public health risks	Climate risks
Phase-out natural gas in power generation and in residential heating by 2050	<ul style="list-style-type: none"> <li>Air pollution from combustion (see above), but to a lesser degree than coal or oil</li> <li>Possible local contamination of groundwater during extraction</li> </ul>	ca. 20 percent of global CO <sub>2</sub> emissions from energy use; methane leakage at extraction sites and from pipelines; short-lived climate pollutants

## Shale gas and oil (fracking)

Recommendations	Major public health risks	Climate risks
"No" to fracking and an end to all exploratory fracking in Europe immediately	<ul style="list-style-type: none"> <li>Risk of contamination of water resources with organic pollutants and heavy metals</li> <li>Local air pollution due to increased transport operations</li> <li>Seismic activity and contamination from radioactive substances possible locally</li> </ul>	Climate impact can be similar to conventional fossil fuels (because of methane release)

## Nuclear

Recommendations	Major public health risks	Climate risks
<p>Phase-out nuclear power in Europe by 2050 at the latest, starting with those reactors that have the highest risk of failure</p> <p>No construction of new nuclear power stations</p> <p>Safest possible disposal of nuclear waste</p>	<ul style="list-style-type: none"> <li>Uranium mining associated with local radioactive and chemical contamination</li> <li>Small radioactive and chemical emissions to air and water during power plant operation with potential effects on local communities</li> <li>Nuclear waste storage associated with substantial risk of groundwater contamination and accidents</li> <li>Low probability but potentially large impact accidents during power plant operation: fatalities, cancer, mental health impacts</li> </ul>	Small greenhouse gas emissions from infrastructure construction and transport of fuel and waste



## Use of waste as energy

Recommendations	Major public health risks	Climate risks
<p>Ban burning of waste in residential furnaces</p> <p>Operate waste burning plants with best available air filters</p> <p>Prioritise reduction of waste and recycling</p>	<ul style="list-style-type: none"> <li>Waste burning in household furnaces is associated with harmful indoor air pollution, especially with carcinogenic substances</li> <li>Waste burning facilities emit persistent organic pollutants which accumulate in the environment: reprotoxic, neurotoxic, carcinogenic</li> </ul>	<p>Emissions during the production of resources that are later burned as waste; short-lived climate pollutants</p>

## Solar

Recommendations	Major public health risks	Climate risks
<p>Solar energy as a clean and renewable source should receive high political and public support</p>	<ul style="list-style-type: none"> <li>No emissions during operation</li> <li>Environmental health risks linked to resources used in manufacturing of solar cells and equipment as well as waste disposal</li> </ul>	<p>Very low life cycle emissions of greenhouse gases</p>

## Wind (onshore and offshore)

Recommendations	Major public health risks	Climate risks
<p>Carry out health impact assessment during planning stage</p> <p>Involve health experts, local residents in decision-making early in the planning stage</p>	<p>Health risks need to be further assessed:</p> <ul style="list-style-type: none"> <li>No pollutant emissions during operation</li> <li>Flickering shadows can lead to annoyance</li> <li>Noise emissions from moving blades and gear noise can lead to sleep disturbance and stress related disorders in local residents</li> <li>No evidence for health impacts from low frequency noise, but few studies on long-term exposure</li> </ul>	<p>Very low life cycle emissions of greenhouse gases</p>

## Hydroelectric

Recommendations	Major public health risks	Climate risks
<p>Carry out health impact assessment during planning stage, together with public consultation process</p>	<p>Mental health impacts associated with landscape change and resettlement</p>	<p>Emissions during the first phase after construction due to biomass decomposition, otherwise low emissions</p>



## Bioenergy (biogas, wood, straw, manure, etc.)

Recommendations	Major public health risks	Climate risks
<p>Develop and apply strict sustainability criteria for the production of biomass and the use of bioenergy, especially concerning human health</p> <p>Bioenergy plants should operate with the best available pollution control technique</p> <p>Only the least emitting stoves should be allowed for residential burning of biomass, no solid fuel combustion in areas with bad air quality</p>	<ul style="list-style-type: none"> <li>• Combustion of solid or liquid fuels causing air pollution</li> <li>• Emissions of air pollutants during transport and production of biomass feedstock</li> <li>• Biomass production can negatively influence water availability, ecosystems and biodiversity, and can result in competition for land as well as increased food prices</li> <li>• Use of pesticides in biomass production leading to various environmental health impacts</li> </ul>	<p>Low life cycle emissions of greenhouse gases, strongly dependent on type of bioenergy, length of transport, fossil fuel input during production, and land-use change</p>

## Geothermal and heat pumps

Recommendations	Major public health risks	Climate risks
<p>Carry out health impact assessment during planning stage, together with public consultation process</p>	<p>No emissions during operation</p>	<p>Heat pumps require additional electricity, which is associated with greenhouse gas emissions</p>

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