Media Briefing

TOXIC AIR: THE PRICE OF FOSSIL FUELS

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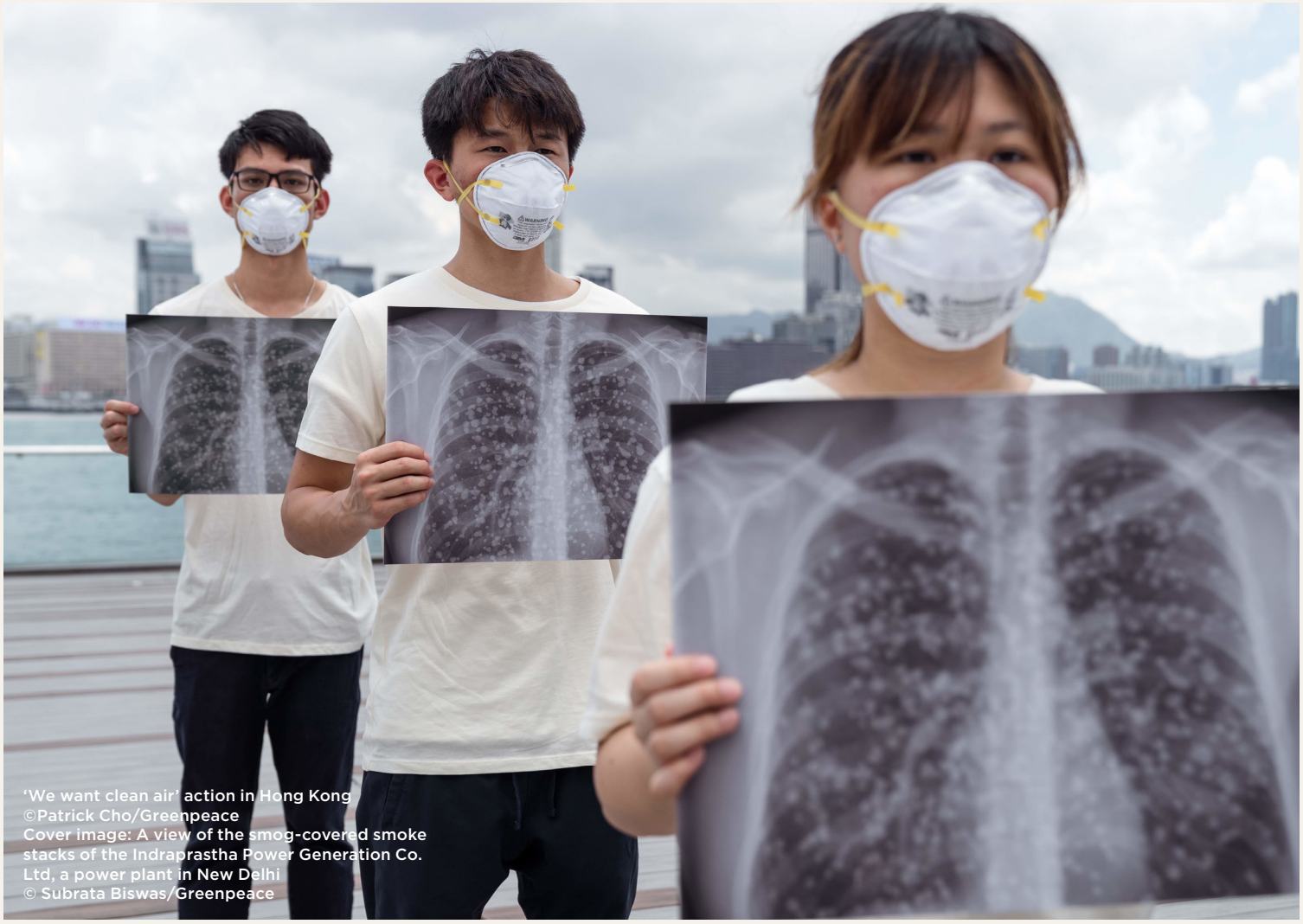

‘We want clean air’ action in Hong Kong
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Cover image: A view of the smog-covered smoke stacks of the Indraprastha Power Generation Co. Ltd, a power plant in New Delhi
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View of Suralaya coal power plant in Cilegon city, Banten Province, Indonesia.
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TOXIC AIR: THE PRICE OF FOSSIL FUELS

This report reveals the cost of air pollution from fossil fuels and highlights solutions that can protect our health and benefit our communities. Air pollution generated from burning fossil fuels is attributed to approximately 4.5 million premature deaths worldwide every year, the report shows. Air pollution increases the incidence of chronic and acute illnesses and contributes to millions of hospital visits and billions of work absences due to illness each year. It also damages our economies and the environment.

For the first time, Greenpeace Southeast Asia and the Centre for Research on Energy and Clean Air (CREA) have quantified the global cost of air pollution from fossil fuels, finding that it has reached an estimated US$8 billion per day, or roughly 3.3% of the world's GDP. While coal, oil and vehicle companies continue to push outdated technologies, our health and our communities are paying the price.

Yet while toxic air pollution is a global threat, the solutions are increasingly available and affordable. Moreover, many of the solutions to air pollution are also the solutions to climate change. Renewable energy and clean energy-powered mass transport systems not only reduce toxic air pollution, but are also critical to limiting the global temperature increase to below 1.5 °C from pre-industrial levels.

1. COSTS

Air pollution from burning fossil fuels, primarily coal, oil, and gas, is attributed to approximately 4.5 million premature deaths worldwide each year, a figure that exceeds global road accident deaths by more than threefold.[1] The incidence of stroke has been linked to $PM_{2.5}$ exposure, and 600,000 deaths from stroke annually can be attributed to fossil fuel derived $PM_{2.5}$ exposure.

Fossil fuel generated air pollution costs the world an estimated US$2.9 trillion per year, or roughly 3.3% of global GDP. Exposure to fossil fuel generated $PM_{2.5}$ alone is attributed to an estimated 1.8 billion days of work absences due to illness each year worldwide, equating to approximate economic losses of US$101 billion per year.

KEY FINDINGS

Pollutant	Impact	Total Number	Total Cost (Million US Dollars)
		Central Estimate*	Central Estimate*
NO_2	Premature Deaths	500,000	335,000
	New Cases of Asthma in Children	4,000,000	16,000
	Number of Children Living with Asthma Due to Air Pollution	16,100,000	
Ozone	Premature Deaths**	1,000,000	379,000
	Asthma (Number of Emergency Room Visits)	5,600,000	1,000
$PM_{2.5}$	Premature Deaths**	3,000,000	1,766,000
	Asthma (Number of Emergency Room Visits)	2,700,000	350
	Preterm Births	2,000,000	91,000
	Work Absences (Days)	1,755,200,000	101,000
Combined Pollutant Total	Premature Deaths	4,500,000	2,480,000
	Total Economic Cost		2,880,000

*Values shown represent a central estimate, upper and lower bounds of a 95% confidence interval are provided in 'Toxic air: The price of fossil fuels'
** The cost of premature deaths relates to the number of years of life lost based on life expectancy

Air pollution is a major health threat to children, particularly in low income countries. **Worldwide an estimated 40,000 children die before their fifth birthday because of exposure to $PM_{2.5}$ pollution from fossil fuels.** Air pollution from fossil fuel-related fine particulate matter (or $PM_{2.5}$) contributes to an estimated 2 million preterm births each year.

NO_2, a byproduct of fossil fuel combustion in vehicles, power plants and factories, is linked to roughly 4 million new cases of asthma in children each year, with approximately 16 million children worldwide living with asthma due to exposure to NO_2 pollution from fossil fuels. Exposure to $PM_{2.5}$ and ozone from fossil fuels is attributed to roughly 7.7 million asthma-related trips to the emergency room each year.

Pollutant	Impact	Central Estimate*
NO_2	Total Cost to Economy	US$351 billion
	% GDP	0.4%
Ozone	Total Cost to Economy	US$380 billion
	% GDP	0.4%
$PM_{2.5}$	Total Cost to Economy	US$2.2 trillion
	% GDP	2.5%
	Work Absences (days)	1,755,200,00
Global cost of all pollutants	Total Cost to Economy	US$2.9 trillion
	% GDP	3.3%

*Values shown represent a central estimate, upper and lower bounds of a 95% confidence interval are provided in 'Toxic air: The price of fossil fuels'

The economic cost of air pollution reflects pollution concentrations, population size and the availability and cost of healthcare. We found that China Mainland, the United States and India bear the highest costs from fossil fuel air pollution worldwide, at an estimated US$900 billion, US$600 billion and US$150 billion per year, respectively.

Yet while the cost of our reliance on coal, oil and gas continues to soar, life-saving alternatives are increasingly widespread and affordable.

2. SOLUTIONS

Many solutions to fossil fuel air pollution are also the solutions to climate change. Clean transport and renewable energy not only bring significant reductions in toxic pollutants such as $PM_{2.5}$, NO_2 and ozone, but also help to keep climate change-causing greenhouse gases out of the atmosphere.

Moreover, solutions to the air pollution crisis have been shown to bring significant financial returns. According to a study published by the United States Environmental Protection Agency, every US$1 invested under the United States Clean Air Act yielded at least US$30 in return[2]. Likewise, a weekly car-free day in Bogota, Colombia yielded US$3.20 to US$4.30 in health benefits for every US$1 invested in the program, according to a study published in the Journal of Urban Health.[3] The financial benefits of air pollution reduction are visible in high- and low-income countries alike.

A. Transport

In cities around the world, private cars clog our streets with traffic, and diesel and petrol engines spew dangerous pollutants, threatening our health.

A transition to affordable and carbon neutral transport is critical to ensuring healthy cities. Effective public transport systems and good walking and cycling infrastructure enable mobility, reduce air pollution and greenhouse gas emissions, and correlate with a decrease in rates of cardiovascular disease, cancer, obesity, diabetes, mental illness, and respiratory disease[4].

One of the most important ways that governments can catalyze sustainable transport is to set a phase-out date for diesel, gas, and petrol cars, and to introduce comprehensive and affordable public transport, with safe walking and cycling infrastructure. We need to move away from private cars as the primary mode of transport, and initiatives like car-free days allow us to imagine what our cities would look like without traffic and pollution.

B. Clean energy

A phase-out of existing coal, oil and gas infrastructure is not only essential to avoid the worst impacts of global climate change, but it brings major health benefits due to the associated reduction in air pollution.

Research shows that the closure of coal-fired power plants can yield health benefits that exceed the value of electricity generated[5] According to a study published in the Proceedings of the National Academy of Sciences, an expanded fossil fuel phase-out and investment in clean energy sources could reduce premature deaths related to air pollution worldwide by up to nearly two thirds[6].

The transition to renewable energy is essential both to prevent catastrophic climate change and to protect our health. While fossil fuel companies continue to market outmoded technologies, our communities pay the price. A just transition to renewable energy is possible, but we can't afford to delay it any longer.

METHODOLOGY

Researchers used published global datasets describing surface level concentrations of $PM_{2.5}$, ozone and NO_2 to perform a health impact assessment and subsequent cost calculation for the year 2018.

The health impacts are determined by combining pollutant concentration maps[7,8] with country-level health statistics[9] and functions that describe the incidence of health outcomes for a given pollutant concentration[10]. The assessment incorporates recent research that quantifies the contribution of fossil fuels to global air pollution levels and health impacts. Total health costs are then determined using published estimates of the disease or impact specific cost, adjusted to the level of economic output or income in each country.

Further details on the methodology are available in the report.

ENDNOTES

1 World Health Organization. Global Health Observatory (GHO) data. Available at: https://www.who.int/gho/road_safety/mortality/en/

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