GOVERNMENT OF MONGOLIA

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UNDP

Investment Case for Air Pollution Reduction in Mongolia

Executive summary

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Photo credit: Saruul Dolgorsuren

Acknowledgments

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Burden

Ambient air pollution

In Mongolia, it is estimated that more than

2,800

people die each year due to ambient air pollution (AAP).

AAP causes

US$269 million

(MNT 905 billion) in economic losses each year, equivalent to 2.4% of Mongolia's GDP.

Household air pollution

In Mongolia, estimates suggest that around

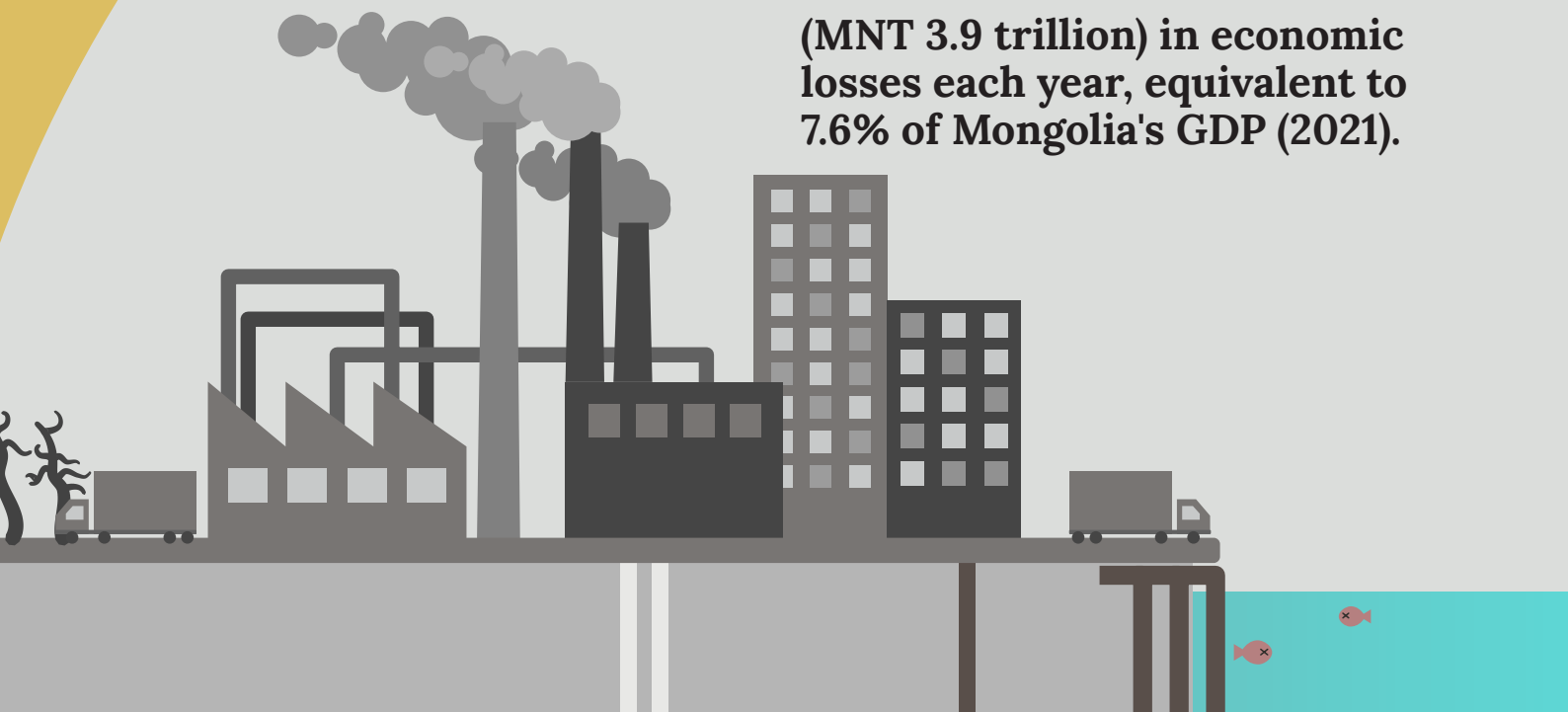
4,350

people die each year due to household air pollution (HAP).

HAP causes

US$1.2 billion

(MNT 3.9 trillion) in economic losses each year, equivalent to 7.6% of Mongolia's GDP (2021).



Why invest

Ambient air pollution

By 2055, investing now in proven interventions will avert

US$671 million

(MNT 2.3 trillion) in economic losses and save over

11,000 lives.

- Replace coal-based cookstoves with electric or gas
- Convert powerplants
- Reduce open fires
- Reduce road transport pollution

Household air pollution

Investing now in replacing coal-fueled stoves with a mixture of electric and gas stoves will avert

US$29 million

(MNT 97 billion) in economic losses over 31 years, generating an ROI of 4.8 to 1.

Note that due to limited data availability, only the cost of some AAP interventions could be determined.

Photo credit: Saruul Dolgorsuren

Executive summary

Air pollution accelerates climate change and damages all aspects of planetary health, including food systems and human health. Air pollution is linked to stroke, heart disease, respiratory diseases, lung cancer, adverse pregnancy outcomes and poor cognitive development. In addition, air pollution is associated with higher mortality rates, especially among the most vulnerable. Two major sources of air pollution: ambient air pollution (AAP), also referred to as outdoor air pollution, and household air pollution (HAP), also referred to as indoor air pollution, are of major concern in Mongolia.

This report includes findings from quantitative cost-of-illness analyses of the health, social and economic burden of AAP and HAP on the Mongolian population through ill-health, premature mortality, and reduced workplace productivity. The analysis includes the impact of air pollution on the six following diseases: acute lower respiratory infection, chronic obstructive pulmonary disease, ischemic heart disease, lung cancer, stroke and diabetes mellitus type 2.

The report further identifies relevant interventions to reduce air pollution in the Mongolian context and models the costs as well as health, environmental and economic benefits of these interventions.

Due to limited data availability, estimates of HAP burden and benefits are only provided for people living in urban areas of Mongolia (around 70 percent of the population). AAP estimates refer to the entire population.

Main findings of the investment case

Burden

Ambient air pollution

Ambient air pollution (AAP) in Mongolia causes more than 2,800 deaths and US$269 million (MNT 905 billion) in economic losses each year, representing 2.4% of GDP.

These economic losses are comprised of:

US$2.4 million (MNT 8.0 billion) in **healthcare expenditures,** with stroke and heart disease representing the biggest proportion.

US$4.8 million (MNT 16 billion) in **workplace productivity losses** from days absent from work and lower on-the-job productivity. This includes the time family members take off from work to care for children who become sick from exposure to outdoor air pollution.

US$262 million (MNT 881 billion) from **premature mortality** attributed to AAP representing the majority of the economic burden.

Household air pollution

Household air pollution (HAP) due to cookstove use causes around 4,350 deaths and US$1.2 billion (MNT 3.9 trillion) in economic losses each year, representing 7.6% of GDP.

Healthcare expenditures to treat illness associated with HAP equal totals **US$14 million (MNT 47 billion)** each year.

Environmental losses from carbon equivalent emissions reaches **US$107 million (MNT 360 billion)** each year.

Premature mortality due to HAP related illnesses results in **US$1.0 billion (MNT 3.5 trillion)** in economic losses each year.

Benefits

By acting now, the Government of Mongolia can reduce the national health and economic burden from air pollution. The investment case findings demonstrate that implementing air pollution control interventions would reduce costs and save lives.

Ambient air pollution

Together these four AAP reduction interventions can avert US$671 million (MNT 2.3 trillion) by 2055 (or US$21 million and 396 lives per year).

Replacing the traditional coal-based cookstoves with electric or gas cookstoves can save more than **9,000 lives** and avert **US$487 million (MNT 1.6 trillion)** in costs (287 lives and US$15.2 million per year).

Equipping coal-fired powerplants with $PM_{2.5}$ filters or replacing them with new, cleaner power plants, can save more than **2,818 lives and avert US$149 million (MNT 502 million)** in costs (88 lives and US$4.7 million per year).

Reducing open fires can save **448 lives and avert US$24 million (MNT 81 billion)** in costs (14 lives and US$ 0.7 million per year).

Reducing road-transport pollution by increasing the fuel efficiency of vehicles can save **217 lives and avert US$12 million (MNT 40 billion)** in costs (7 lives and US$0.4 million per year).

Household air pollution

Selecting one of these three HAP-reduction interventions to replace coal based cookstoves can offer the following benefits:

Transitioning to electric cookstoves can save **656 lives and avert US$54 million (MNT 97 billion)** in costs over 31 years (21 lives and US$1.7 million per year), generating an ROI of 5.6 to 1.

Transitioning to liquefied petroleum gas (LPG) stoves can save **322 lives and avert US$26.5 million (MNT 89 billion)** over 31 years (10 lives and US$853 thousand each year), generating an ROI of 7.2 to 1.

An intervention currently under consideration by the Mongolian government to transition <10% of households from coal to either electric or LPG stoves could save **350 lives and avert US$29 million (MNT 97 billion)** over 31 years (11 lives and US$926,000 each year), generating an ROI of 4.8 to 1.

Recommendations

The results of this analysis and the following recommendations can be used by national stakeholders to strengthen the rationale for bold actions that can begin to transition Mongolia to cleaner and more efficient technologies:

1. Strengthen coordination on air pollution among key stakeholders.

This will require high-level political commitment and contribution to coordinating mechanism from different sectors, including the Ministries of Health, Finance, Environment and Tourism, Road and Transportation Development and others. Of note, Mongolia will develop a national multisectoral action plan on pollution and health in the framework of this project.

2. Incentivize shifts to alternative energy sources for households.

To reduce HAP and AAP, Mongolia should focus efforts to shifting to liquefied petroleum gas or electric-powered stoves in Ulaanbaatar as this generates the most favorable returns on investment (ROIs), saves the most lives, and produces the most economic societal and environmental benefits.

3. Invest in the AAP interventions modelled under the investment case.

Reduce AAP by replacing traditional coal based cookstoves with electric or gas, modernising traditional power plants to be more efficient and produce less pollutants, as well as reducing open fires and road-transport pollution.

4. Scale up monitoring of air pollution.

Increase national air pollution monitoring throughout the country and support ongoing research efforts to better understand the causes of HAP and AAP.

5. Raise awareness of the dangers of air pollution and the benefits of its reduction.

Launch campaigns that raise public awareness of ambient and household air pollution's health effects.