



AIR POLLUTION IN THE ENVIRONMENTAL

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Outlines

- Air Pollution
- Particulate Matter
- AQI - Air Quality Index
- Examples of Reventine and Reduction Measures/Policies
- Proposed Policies for Thailand, Bangkok and KMITL

What is Air Pollution?



A mixture of solid particles and gases in the air.

Air Pollution Causes



Combustion of fossil fuels

coal and oil for electricity and road transport, producing air pollutants like nitrogen and sulfur dioxide



Emission from industries & factories

releasing large amount of carbon monoxide, hydrocarbon, chemicals and organic compounds



Agricultural activities

the use of pesticides, insecticides, and fertilizers that emit harmful chemicals



Waste production

methane generation in landfills

Air Pollution Effects



On the Environment

- plant evolution by preventing photosynthesis
- contributes the formation of acid rain, atmospheric precipitations in the form of rain, frost, snow or fog

Global Warming

- abundance of carbon dioxide in the air is one of the causes of the greenhouse effect

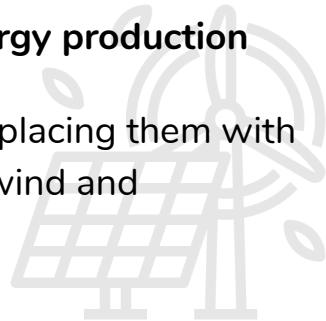
On Human Health

- human health conditions
- causing allergies, respiratory and cardiovascular diseases
- lung damage

Air Pollution Preventions

Renewable fuel and clean energy production

Move away from fossil fuels, replacing them with alternative energies like solar, wind and geothermal.



Eco-friendly transportation

Shifting to electric vehicles and hydrogen vehicles, and promoting shared mobility.



Energy conservation and efficiency

Adopting responsible habits and using more efficient devices.



Green building

Creating environmentally responsible and resource-efficient structures to reduce their carbon footprint.



What are Particulate Matter?

- PM stands for particulate matter and also called particle pollution.
- It is the term for a mixture solid particle and liquid droplets found in air.
- Particle pollution is made up of the number of component, including dust, dirt, soot, metal and other small particles.

Types of particulate matter

The particulate matter basis on size can classify into 2 categories,

1. Inhalable coarse particles: The diameter size of the particles range from 2.5 to 10 micrometers (PM10 – 2.5).
2. Fine particles: Usually found in haze and smoke and the size can range up to 2.5 micrometers (PM).

Sources of particulate matter

Human activities

- Agricultural operations
- Industrial processes
- Combustion of fossil fuel
- Construction and demolition
- NOx, Sox

Natural activities

- Windblown dust
- Wildfires

Health and environmental effects from PM

1. Health problems

- Premature death in people with heart or lung disease
- Nonfatal heart attacks
- Irregular heartbeat
- Aggravated asthma
- Decreased lung function

Health and environmental effects from PM(cont.)

2. Environmental problems

- Impaired visibility
- Acid rain
- Damaged ecosystem (ex. drying tree,making groundwater acidic)
- Depleting the nutrient in soil
- Damage forests and crops

What is AQI?

- Air quality index.
- Tell how clean or polluted air is.
- Focus on health effects.
- Divided into 6 categories.

EPA calculates the AQI

- Ground-level ozone
- Particle pollution
- Carbon monoxide
- Sulfur dioxide
- Nitrogen dioxide

Understanding AQI

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects.
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

Examples of revective and reduction measures/policies

1. Using drones to detect illegal emissions at factories in South Korea

- Developed by National Institute of Environmental Research in 2018.
- Equipped with video cameras and pollution sensors
- Measures the particulate and gaseous outputs of manufacturing plants suspected of skirting filtration standards
- As well as similar technology in China and USA



Examples of reventine and reduction measures/policies

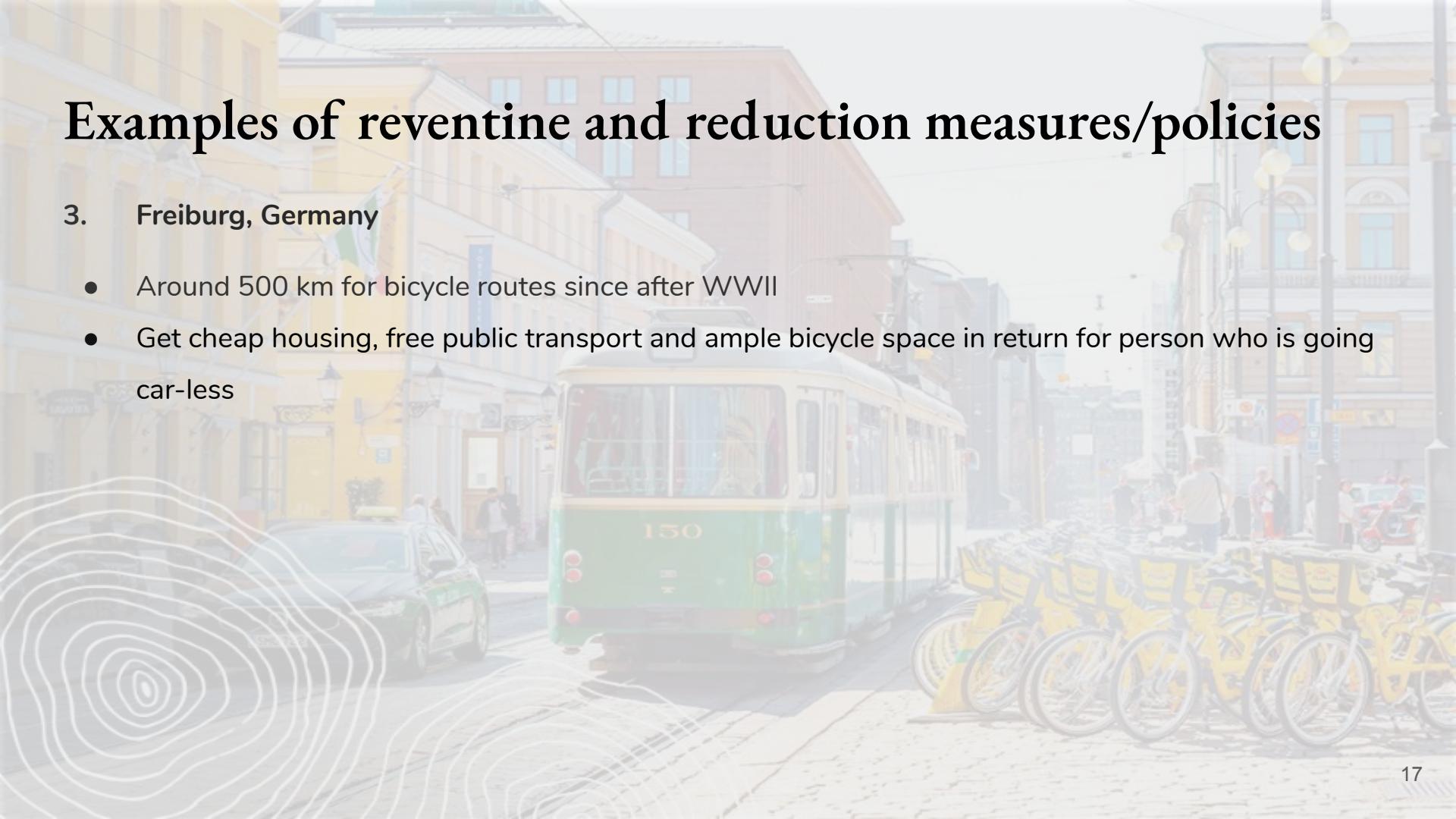
2. Helsinki, Finland

- City investing heavily to improve public transport
- Higher parking fees to be levied
- Inner city ring roads to be converted to residential and walking areas

Examples of reventine and reduction measures/policies

3. Freiburg, Germany

- Around 500 km for bicycle routes since after WWII
- Get cheap housing, free public transport and ample bicycle space in return for person who is going car-less



Proposed Policies for Thailand

- Tax (ex. Carbon tax)
 - Increase tax rate based on pollutants production
 - Any business that involved with pollutants production
- Support business that go green (e.g. Charge less tax)
- Prohibit farm burning (meadow)
 - Monitor an illegal farm burning (e.g. Use drone)

Proposed Policies for Bangkok

- Encourage public transportation
- Change old public transportation to new ones that emit less pollution
- Reduce the cost of eco car
- Reduce the cost of public transportation
- Design new transportation route system

Proposed Policies for KMITL

- Encourage students to use bicycle instead of car and motorcycle
- Encourage students to recycle
 - Give discount for students who bring their own cup
- Improve sidewalk (especially cross-train path)
- Provide shuttle buses to go around the area nearby the university

Q/A

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<https://www.conserve-energy-future.com/causes-effects-solutions-of-air-pollution.php>