

The global cost of air pollution

[listening test questions]

Author: C. Watts

Date: 15/04/2022

Time: 10:50

Level: **** [B1/B2/C1]

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Lecture: https://youtu.be/IBAVjHxX09w	MP3: DOWNLOAD	PowerPoint Download: DOWNLOAD
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Check these words before listening:

Key vocabulary

1. Emissions.
2. Pollutant.
3. Detrimental.
4. Hazardous.
5. Gross Domestic Product.
6. Disabilities.
7. Economy.
8. To tackle.
9. To decarbonize.
10. Coal.
11. Methane.
12. Manure.
13. Chemical fertilisers.
14. Residue.
15. Plant-based.
16. Culprit.
17. Affordable.
18. Electrification.
19. Renewable.
20. Catastrophic.

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Teacher

LISTENING TEST QUESTIONS

Aim: to develop the students' ability to listen to a 10 min+ lecture, to take notes and then use those notes to answer a range of test-type questions.

Lesson Time: Approximately 1:30-2:00 hours

Lesson Plan

Lead in

- Ask Students to read the 'title' & predict the content of the lecture.
- Ask students to write down key terms & language from the discussion.
- Feed in / check key vocabulary.

Three types of lesson

Lesson#1: [hard]

1. Students listen once & take notes.
2. Give 5 minutes to tidy notes.
3. Listen again & add to notes (use a different colour pen).
4. Distribute questions – set 20-25 minutes to answer.
5. Feedback: distribute or project answers.

Lesson #2: [medium]

1. Students listen once & take notes.
2. Distribute questions: set 15 minutes for students to answer the questions from their notes.
3. Listen again. Students answer the missed questions as they listen.
4. Give extra 10 minutes to consolidate answers.
5. Feedback: distribute or project answers.

Lesson #3: [easy]

1. Distribute questions. Students have 10 minutes to look at the questions.
2. Students listen & answer the questions.
3. Give 5 minutes to tidy answers.
4. Students listen again. Check answers & answer missed questions.
5. 5-10 minutes to tidy answers.
6. Feedback: distribute or project answers.

Full URL Links:

Video: <https://youtu.be/IBAVjHxX09w>

MP3: <http://academic-englishuk.com/wp-content/uploads/2022/04/Air-pollution-audio-AEUK.mp3>

PPT: <http://academic-englishuk.com/wp-content/uploads/2022/04/Air-Pollution-2022-AEUK.pptx>

The global cost of air pollution

1. Overview: What do these figures refer to? Match the figures to the information.

	Figure		Information
1.	PM2.5	A.	The World Health Organisation's target.
2.	110 PM2.5µg/m ³	B.	Most heavily polluted cities are in India.
3.	13 out of 15	C.	PM2.5 levels of the top 50 most polluted cities.
4.	Between 106 and 58.	D.	Hotan in China – The world's most polluted city.
5.	Between zero and ten.	E.	A global indicator of the world's most polluted cities.

1.		2.		3.		4.		5.	
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2. Name THREE health effects of air pollution stated by the National Geographic Society (2022).

i.	
ii.	
ii.	

___ / 3

3. What does this data from the World Bank (2018) refer to?

	Data	Information
i.	9 million	
ii.	16%	
iii.	3x	
iv.	15x	

___ / 4

4. The economic costs of air pollution: Select one answer for each question only.

i. According to the World Bank, who suffers the most from the economic negative effects of air pollution?

- a) Lower-middle and upper-middle income countries.
- b) Middle and upper income countries.
- c) Lower and middle income countries.
- d) Lower-middle income countries.

- ii. How much does air pollution cost India per year?
 - a) \$15 billion.
 - b) \$50 billion.
 - c) \$115 billion
 - c) \$150 billion.

- iii. How much of its GDP does air pollution cost China each year?
 - a) 6%
 - b) 6.6%
 - c) 16%
 - d) 16.6%

- iv. How much did disabilities cost the Chinese economy in 2018?
 - a) \$2 billion.
 - b) \$20 billion.
 - c) \$200 billion.
 - d) \$220 billion.

- v. How much did premature births cost the Chinese economy in 2018?
 - a) \$9 billion.
 - b) \$90 billion.
 - c) \$99 billion.
 - d) \$900 billion.

- vi. Which air pollutant affects crops the most?
 - a) NOx
 - b) CO
 - c) Ozone
 - d) PM

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5. Tackling air pollution: Answer the following questions.

i.	Where would comprehensive policies need to be implemented?
	1.
ii.	How could the Clean Air Scenario cut pollutant emissions in energy?
	1.
	2.
	3.
iii.	How could the Clean Air Scenario cut pollutant emissions in farming?
	1.
	2.

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6. Transport: Are these statements true, false or not given?

		T / F / NG
i.	Transport contributes the most to air pollution.	
ii.	Electric vehicles produce hardly any emissions at the pipe.	
iii.	Freight vehicles are more energy efficient than they were in the past.	
vi.	Policies are being implemented that promote the blending of true low-carbon fuels and electrification.	
v.	Railway transportation is using biofuels.	
vi.	Prohibiting petrol and diesel vehicles from going into city centres could help reduce air pollution.	
vii.	More cycle lanes and pedestrian zones are being implemented in city centres all around the world.	

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7. What are the TWO urgent goals put forward to drastically reduce its air pollution issues in developing countries?

i.	
ii.	

___ / 2

8. The nations most at risk: Answer the following question.

In what TWO ways do poorer nations suffer the most from air pollution?			
i.		ii.	

___ / 2

9. The speaker's final recommendation: Complete the gaps in the following text.

It is, therefore, vital that all n _____ come together to implement practical and long-lasting s _____ to prevent the effects of air p _____ from becoming so c _____ that they cannot be r _____.

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Total Score ___ / 40

The global cost of air pollution **ANSWERS**

1. Overview: What do these figures refer to? Match the figures to the information.

	Figure		Information
1.	PM2.5	A.	The World Health Organisation's target.
2.	110 PM2.5µg/m ³	B.	Most heavily polluted cities are in India.
3.	13 out of 15	C.	PM2.5 levels of the top 50 most polluted cities.
4.	Between 106 and 58.	D.	Hotan in China – The world's most polluted city.
5.	Between zero and ten.	E.	A global indicator of the world's most polluted cities.

1.	E	2.	D	3.	B	4.	C	5.	A
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2. Name THREE health effects of air pollution stated by the National Geographic Society (2022).

i.	<i>heart disease / lung cancer / respiratory diseases [such as emphysema]</i>
ii.	<i>long-term damage of people's nerves / brain / kidneys / liver / and other organs / [which in turn leads to] shorter life expectancy</i>
ii.	any of these

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3. What does this data from the World Bank (2018) refer to?

	Data	Information
i.	9 million	<i>9 million premature deaths</i>
ii.	16%	<i>16% of all deaths worldwide.</i>
iii.	3x	<i>more deaths than from AIDS, tuberculosis, and malaria combined</i>
iv.	15x	<i>more than from all wars and other forms of violence</i>

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4. The economic costs of air pollution: Select ONE answer for each question only.

i. According to the World Bank, who suffers the most from the economic negative effects of air pollution?

- a) Lower-middle and upper-middle income countries.
- b) Middle and upper income countries.
- c) Lower and middle income countries.
- d) Lower-middle income countries.

ii. How much does air pollution cost India per year?

- a) \$15 billion.
- b) \$50 billion.
- c) \$115 billion
- c) \$150 billion.

iii. How much of its GDP does air pollution cost China each year?

- a) 6%
- b) 6.6%**
- c) 16%
- d) 16.6%

iv. How much did disabilities cost the Chinese economy in 2018?

- a) \$2 billion.
- b) \$20 billion.
- c) \$200 billion.**
- d) \$220 billion.

v. How much did premature births cost the Chinese economy in 2018?

- a) \$9 billion.
- b) \$90 billion.**
- c) \$99 billion.
- d) \$900 billion.

vi. Which air pollutant affects crops the most?

- a) NOx
- b) CO
- c) Ozone**
- d) PM

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5. Tackling air pollution: Answer the following questions.

i.	Where would comprehensive policies need to be implemented? 1. <i>Especially in countries where air pollution is dangerously high.</i>
ii.	How could the Clean Air Scenario cut pollutant emissions in energy? 1. <i>Decarbonizing the power sector.</i> 2. <i>Using solar and wind resources.</i> 3. <i>Capturing and storing carbon from power stations.</i>
iii.	How could the Clean Air Scenario cut pollutant emissions in farming? 1. <i>Composting and anaerobic digestion.</i> 2. <i>Using organic residual products.</i>

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6. Transport: Are these statements true, false or not given?

		T/F/NG
i.	Transport contributes the most to air pollution. <i>(With regard to transport, which is considered to be the biggest culprit at 24%..)</i>	T
ii.	Electric vehicles produce hardly any emissions at the pipe. <i>(Electric cars produce zero emissions 'at the pipe').</i>	F
iii.	Freight vehicles are more energy efficient than they were in the past. <i>(Slowly freight vehicles are becoming more energy efficient)</i>	T
vi.	Policies are being implemented that promote the blending of true low-carbon fuels and electrification. <i>(Policies that promote the blending of true low-carbon fuels and electrification are necessary to decarbonize freight transport)</i>	F
v.	Railway transportation is using biofuels	NG
vi.	Prohibiting petrol and diesel vehicles from going into city centres could help reduce air pollution. <i>(Banning petrol and diesel cars from entering major city centres would help combat the amount of SO₂, CO and NO_x being emitted from cars).</i>	T
vii.	More cycle lanes and pedestrian zones are being implemented in city centres all around the world.	NG

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7. What are the TWO urgent goals put forward to drastically reduce its air pollution issues in developing countries?

i.	<i>Developing cleaner energy or renewable resources [and stop investing in cheap fossil fuels namely coal].</i>
ii.	<i>Governments to enforce anti-pollution laws [more rigidly across the whole country and coordinate with all the different constituencies].</i>

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8. The nations most at risk: Answer the following question.

	In what TWO ways do poorer nations suffer the most from air pollution?	
i.	<i>Health</i>	ii. <i>Economy</i>

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9. The speaker's final recommendation: Complete the gaps in the following text.

It is, therefore, vital that all <u>nations</u> come together to implement practical and long-lasting <u>solutions</u> to prevent the effects of air <u>pollution</u> from becoming so <u>catastrophic</u> that they cannot be <u>reversed</u> .
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Total Score ___ / 40

The global cost of air pollution transcript

Hello and welcome to this short lecture on the global cost of air pollution. I've divided my talk today into three key parts. I'll begin with a short definition of air pollution, then I'll discuss the economic cost of air pollution including the health effects. After this, I'll look at a number of solutions to help reduce air pollution for developed and developing countries and finish with a summary of the lecture's key points.

Ok, so let's begin with a short definition of air pollution. Air pollution concerns the emission of harmful pollutants into the atmosphere which can have a detrimental impact on the health of humans and the planet. These pollutants include particulate matter (PM), ozone, carbon monoxide (CO) and nitrogen oxides (NOx) which stem from factories, motor vehicles, forest fires and fossil fuels to name a few. PM2.5 is used as a global indicator of the world's most polluted cities, of which Hotan in Xinjiang, in Western China is currently the most, with an average of 110 PM2.5µg/m³, and a rating ranging from unhealthy to hazardous. Moreover, according to the World Air Quality Report (2021) thirteen of the fifteen most heavily polluted cities are in India, with cities in Bangladesh, Pakistan and Indonesia also featuring in the top 50, due to PM2.5 levels over 90. Just to put this into context, the World Health Organisation's PM2.5 safe rating target is between zero and twelve.

When a country has a PM2.5 rating of unhealthy, it can cause serious health effects. The National Geographic Society (2022) state that recent research provides clear evidence that the long-term health effects from air pollution include heart disease, lung cancer and respiratory diseases such as emphysema. They also emphasise that air pollution can also cause long-term damage to people's nerves, brains, kidneys, livers, and other organs which in turn leads to a shorter life expectancy. In addition, the World Bank (2018) report that air pollution is the largest environmental cause of disease and premature death. Air pollution causes more than 9 million premature deaths accounting for 16% of all deaths worldwide. That's three times more deaths than from AIDS, tuberculosis and malaria combined, and 15 times more than from all wars and other forms of violence. Overall, the PM2.5 ratings of some of the most polluted cities in the world are considerably higher than the World Health Organisation's PM2.5 safe rating target which suggests that much more needs to be done to lower air pollution levels.

Ok, now let's look at the economic costs of air pollution. Perhaps unknowingly, air pollution can affect a nation's economy significantly in three ways: reduced labour productivity, health expenditures and agricultural losses. According to The World Bank, although the estimated cost of the negative effects of air pollution was \$8.1 trillion, equal to 6.1% of global Gross Domestic Product (GDP) in 2019, an increase from the \$2.9 trillion or 3.3% of GDP in 2018, it is generally the lower-middle and upper-middle income countries which suffer the most. For example, McCarthy (2020) reveals that air pollution costs India \$150 billion, the equivalent to 5.4% of their GDP every year, and in China, it is a cost of \$900 billion each year, or 6.6% of their GDP. This is most likely due to the rise in sick leave and being incapable of work as a result of the growing likelihood of workers and their families becoming ill, as well as in the increase in medical costs associated with sick leave and premature births which in 2018, cost the economy \$200 billion and \$90 billion respectively. In addition, the OECD (2022) reports that high levels of concentration of pollutants, and particularly of ozone, also reduce crop yields and thus affect agricultural productivity. According to the TM5-FASST calculations, and in line with the larger literature, crop yields are projected to be negatively affected in all regions, with big differences between regions and crops. In many regions, wheat and oil seeds are more affected than the other crops, with high losses in many countries, including Japan, Korea and the USA. Thus, it is clear that as

air pollution is one of the major risks to our health, and thus has a considerable influence on the state of a nation's economy, workable solutions for this problem must be found, and quickly.

So, now let's look at some possible solutions. One possible way of tackling the problem of air pollution is to implement more comprehensive policies, especially in countries where the levels are dangerously high. Amann et al. (2020) claim that the Clean Air Scenario could drastically cut pollutant emissions within the next twenty years through practices in energy, such as decarbonizing the power sector, using solar and wind resources in place of coal for supplying electricity, and capturing and storing carbon from power stations. Farming creates a considerable amount of air pollution especially nitrogen oxide so suggestions include composting and anaerobic digestion to avoid the production of nitrogen and methane in the treatment of manure, and using organic residual products as soil amendments instead of chemical fertilisers for crop nutrient requirements can all have a huge impact on reducing pollution.

With regard to transport, which is considered to be the biggest culprit with over 24% of global emissions, it can be divided into three main categories: private, freight, and public transport. Private transport refers to people's private cars, vans and motorcycles. The primary solution here is electrification of cars. This is supported by Greenpeace (2020) who argue that as electric cars produce zero emissions 'at the pipe', coupled with the fact that if the electricity that powers them is renewable, then those emissions are also zero. Freight transport refers to the transportation of goods and personnel from one place to the other by road, rail, sea or air. At present freight transport accounts for 17% of all CO₂ emissions making it the key focus to reduce harmful emissions. Slowly freight vehicles are becoming more energy efficient but stronger policies are needed to accelerate the establishment of infrastructure to support zero-emission vehicles. Policies that promote the blending of true low-carbon fuels and electrification are critical to decarbonize freight transport. There is evidence of decarbonizing happening now in the aviation and the shipping industry which are both working hard to reduce their carbon footprint through the research and development of biofuels and hydrogen power. With regards to public transport, governments need to focus on more efficient and affordable electrified public transport, greener infrastructure such as cycling lanes and pedestrian zones, and banning petrol and diesel cars from entering major city centres.

I'd now just like to specifically focus on developing countries. WHO puts forward two urgent goals to drastically reduce its air pollution issues. The first is a need to set their sights on developing cleaner energy and renewable resources and stop investing in cheap fossil fuels namely coal. The second is for developing country's governments to enforce anti-pollution laws more rigidly across the whole country and coordinate with all the different constituencies clearly. Currently, many cities have different policies and regulations regarding air pollution.

Ok, let's summarise. Today I've spoken about what air pollution is, some of the most polluted cities in the world and the health effects of air pollution. I've also discussed the economic costs of air pollution in terms of labour, health and agriculture and I've offered possible solutions to reducing air pollution in both developed and developing countries. From the data in today's lecture, it is quite apparent that poorer nations suffer the most, not only in terms of health, but also regarding the economy. It is, therefore, vital that all nations come together to implement practical and long-lasting solutions to prevent the effects of air pollution from becoming so catastrophic that they cannot be reversed.

Written by AEUK
Spoken by C. Watts

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