India

Reimagine clean urban air with pollution control

1. What was the problem?

Delhi is one of the world's most polluted cities. The city's air quality regularly exceeds safe limits, cutting life expectancy by nearly 12 years and threatening public health, food security and sustainability.

Team Synergy saw this as a challenge they could no longer ignore. They wanted to do more than raise awareness: they wanted to build a real solution for cleaner, healthier air in public spaces.

2. What did they do?

They designed the Eco Air Defender, a solar and wind-powered mobile air purifier built to clean outdoor urban air. With real-time air monitoring, a two-stage filtration system, and full portability, their invention offers a clean-tech solution that's both sustainable and accessible to public areas such as schools, parks and streets.

The device is scalable, energy-efficient, and designed to put the power of pollution control directly into communities' hands.

Shell NXplorers

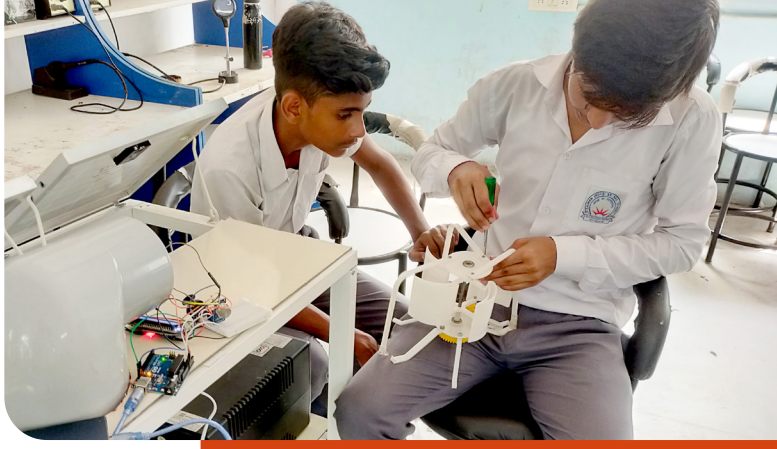
3. How did they use NXthinking?

RETHINK Traditional Methods

The team challenged the norms, moving beyond restrictive policies and stationary indoor devices to ask: what if clean air could move with the people who need it?

REDESIGN Clean Air Technology

They combined HEPA (High Efficiency Particulate Air) and activated carbon filters with a DC blower, powered entirely by solar and wind energy. The unit is mounted on wheels with a handle for mobility.



RESEARCH the Impact

Field testing in high-pollution zones like Karol Bagh and Shadipur showed significant AQI reductions after use, from 100 to 50 in one case. A built-in monitor displays live air quality data, creating instant awareness and engagement.

REPOWER with Renewable Energy

The team powered the entire unit with off-grid solar and wind sources. This not only avoids using fossil fuel energy but also ensures the purifier is sustainable and accessible to communities with less resources.

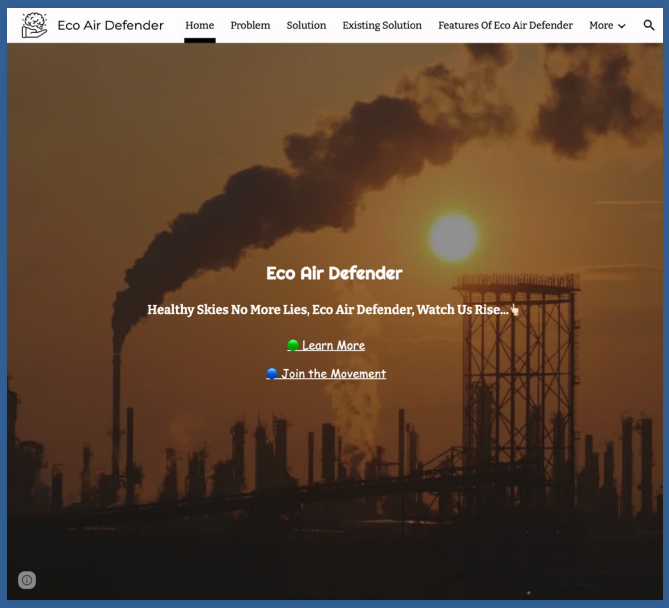
4. What was the solution?

Eco Air Defender is a renewable-powered, mobile air purifier for outdoor use. It filters out harmful PM2.5, PM10 and gases, reduces pollution levels quickly and engages citizens through live data.

The result: a scalable, zero-emission solution that turns clean air from a luxury into a right.

5. What was the result?

Eco Air Defender was successfully tested in multiple outdoor zones with heavy air pollution, reducing AQI by up to 70%. Its portable design and renewable power system make it especially well-suited for deployment in urban areas that are typically hard to reach. The team now plans to scale production and partner with municipal authorities to expand its use across Delhi. You can follow their journey here.



6. Sustainable Development Goals

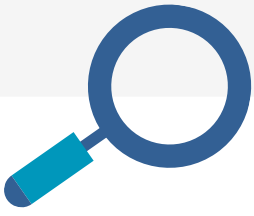
This project contributes to the following UN Sustainable Development Goals:

Reduces respiratory risk by actively removing harmful pollutants from outdoor air, promoting better public health.

Makes urban spaces safer and healthier through accessible air purification.

The solution is powered by renewable, available sources, reducing dependence on fossil fuels.

Tackles pollution and raises awareness through clean technology and real-time data.



"Breathing clean air shouldn't be a privilege – it should be a right. Living in Delhi, we felt the urgency every day. Shell NXplorers empowered us to stop waiting for change and start creating it. With the tools and mindset we gained through the programme, we turned our concern into action. That's how the Eco Air Defender was born – a solution that could help entire communities breathe easier."

Shell NXplorers student, India