

Trees: Nature's Best Air Scrubbing System

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FREEPORT, Texas (AP) — Before Houston and its suburbs were built, a dense forest naturally purified the coastal air along a stretch of the Texas Gulf Coast that grew thick with pecan, ash, live oak and hackberry trees.

It was the kind of pristine woodland that was mostly wiped out by settlers in their rush to clear land and build communities. Now one of the nation's largest chemical companies and one of its oldest conservation groups have forged an unlikely partnership that seeks to recreate some of that forest to curb pollution.

The plan drafted by Dow Chemical and the Nature Conservancy is only in its infancy and faces many hurdles. But it envisions a day when expensive machines used to capture industrial pollutants might be at least partially replaced by restoring some of the groves of native trees that once filled the land.

"It looks very promising at the early stage of the research," said Mark Weick, director of sustainability programs for Dow. "But for this to become something that is an emission control, everyone needs to know it works."

Many plants, and especially trees, capture pollution naturally when it hits their leaves. Trees with the biggest leaves and the widest canopies capture the most pollutants, especially nitrogen oxide, a common byproduct of combustion that can irritate lungs and contributes to the formation of ground-level ozone. The reforestation proposal imagines emissions from Dow's largest North American factory drifting downwind into the trees near Freeport, Texas.

Dow and the Nature Conservancy began a six-year, \$10 million collaboration in 2011, when they came together to look at ways natural resources could be used to save the company money.

After reading an obscure notation by the federal Environmental Protection Agency that suggested reforestation could improve air quality, the two groups decided to research how the idea might work and whether it could be cost-effective.

Scientists used a complex model from the U.S. Forest Service that considers everything from wind patterns to the size of tree leaves and the overall canopy to estimate the air-quality improvements that might come from 1,000 acres of forest.

"The big discovery was that you could combine the traditional infrastructure with reforestation and still meet regulation," said Laura Huffman, the conservancy's director in Texas.

The trees, Huffman said, may not completely replace traditional technology, but they could complement it, allowing factories to use smaller, cheaper equipment.

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The research found that over 30 years a 1,000-acre forest would remove 4 to 7 tons of nitrogen oxide annually, said Timm Kroeger, a senior environmental economist with the conservancy. A traditional mechanical "scrubber" removes about 50 to 70 tons annually.

So a 10,000-acre forest equals one average industrial scrubber, he explained. And in this part of Texas, where open land is ample, reforestation is within reach.

The cost of the project not including the land would be about the same as using traditional forms of pollution control, Weick said.

Organizers hope to work with a landowner interested in reforesting, probably with help from conservation tax credits. Or the Nature Conservancy or the federal government would buy the land and give it to Dow free of charge.

A recent progress report determined that the cost of cleaning a ton of nitrogen oxide through reforestation was \$2,400 to \$4,000, compared with \$2,500 to \$5,000 using traditional equipment.

The research is still being reviewed by other scientists. And before any formal plan could be adopted, it would have to win approval from state and federal regulators, who would require any pollution-cleansing method to be quantifiable and enforceable. Trees may not fit the bill. Unlike machines, they are living organisms that are subject to diseases, droughts and other threats such as hurricanes or fires.

Back in 2005, another scientific group researched a similar idea and decided it would not pay off.

"The conclusion that we reached was that what they were trying to do was difficult and that the degree of uncertainty was larger than the benefits," said Mark Estes, a senior air quality scientist with the Texas Commission on Environmental Quality.

Even if it wins broad support, the plan won't be approved anytime soon. In Texas, it can take up to four years to change clean-air rules. And that's before any proposal moves up to the EPA.

As he looked out over land ripe for reforestation, Jeff Wiegel, the conservancy's director of strategic initiatives in Texas, was realistic about the pace of progress.

"It's a long road toward that," he said.

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