

Groundbreaking air-cleaner saves polluting industrials

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This is a picture of the researcher and inventor of new air cleaning technology. Mathew Johnson from the University of Copenhagen. Credit: University of Copenhagen

Industries across Europe are threatened with shutdown as European Union emission rules for Volatile Organic Compounds are tightened. Now an air cleaning invention from the University of Copenhagen has proven its ability to remove these compounds. And in the process they have helped a business in Danish town Aarhus improve relations to angry neighbors.

Inventor, Copenhagen chemist Matthew Johnson, presented evidence for the air cleaning [invention](#) at the conference "First International Education Forum on Environment and Energy Science" held on Hawaii December 14 to 18.

In deepest secrecy the inventor Matthew Johnson from the Department of Chemistry at the University of Copenhagen has been collaborating with an investor, INFUSER, in mounting and testing a revolutionary air cleaning device at the industrial plant, "Jysk Miljoerens" in Danish town Aarhus. The reason for keeping the testing secret was that they wanted to be absolutely sure that they could in fact remove the pollution before going public. Now their measurements are concluded and the results are in. And the device actually works.

Natural way to remove air pollution

At the department of Chemistry atmospheric chemist Matthew Johnson invented and patented the air cleaning method which is based on the natural ability of the [Earth atmosphere](#) to clean itself. In a process triggered by sunlight, polluting gasses rising into the sky start forming particles when they come across naturally occurring compounds such as ozone. The newly formed [particles](#) are washed out of the atmosphere by rain. Once the rain hits the ground, the atmosphere is clean again. In other words the whole process is nature's own purifications works, explains Professor Johnson.

"I have investigated the self-cleaning mechanism of the atmosphere for years. Suddenly I realized, that the mechanism is so simple, that we could wrap it in a box and use it to clean indoor air. This makes for a better indoor climate, and in this particular case it also removes smells from this industrial process allowing the company to stay in business and making the neighbours happy," says Matthew Johnson.

Frutifull collaboration between business and research

For the INFUSER CEO Lars Nannerup the new air cleaning method was a heavensent. For some time he had wanted to establish a cleantech

business delivering green and sustainable solutions to industry.

-For INFUSER, collaborating with the University of Copenhagen has been extremely fruitful. We have been operating in an electrifying field between fundamental research and commercial development. This is an area where pure theory and good ideas are tested outside the very competent walls of the university. And we have been extraordinarily successful. We are excited to be able to bring to market this revolutionary technology. We are proud that it is a Danish invention, and we're proud that this invention helps making the world a better and a cleaner place," says Nannerup.

Low energy consumption allows climate friendly air treatment

In scientific terms, Matthew Johnsons patented process is known as an atmospheric photochemical accelerator. The whole process is housed in five aluminium boxes on the roof of the Aarhus business. Compared to traditional methods the new process outshines by removing pollution rather than diluting it, as is the case when we send smoke up a chimney. The method requires no filters, so maintenance is inexpensive. It consumes very little energy, so its climate impact is negligible. Finally it removes the need for a chimney which would have been costly to erect. For all these reason INFUSER and the photochemical air-purification was the right choice for Jysk Miljoerens.

Photochemistry solved pressing problem for environmental business

The company Jysk Miljoerens makes a living separating oil from bilge water in ships, so that the oil may be recycled. For manager Bent Naldal all the parameters were important, but above all he is just happy that the

new method has managed to remove the smells from his wastewater treatment plant. Because the smells were threatening to put him out of business.

"It's no big secret, that we've faced challenges in getting rid of the smells originating in our treatment plant. For this reason we were very happy when INFUSER got in touch, saying that they had a solution to our problem. Unlike other solutions that we've investigated to combat smells and [air pollution](#) we can now see, that INFUSER delivered. They've solved a pressing problem for Jysk Miloerens, and for the city of Aarhus," says CEO Naldal.

Perfect example of collaboration between industry and academia

For the University of Copenhagen it has been an especial pleasure to follow the collaboration between [inventor](#) and investor. The university unit for technology transfer has helped Johnson in the patenting process, in getting financing to conduct experiments and in drawing up the licensing agreement with INFUSER. Unit leader Anna Haldrup feels that the air cleaning technology is a perfect example of how universities can help industrial partners.

Provided by University of Copenhagen

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