



# Smog Free Project

SAVES THE ENVIRONMENT BY TURNING SMOG  
INTO DIAMONDS

Gabriela Penkova 700791  
Telematics and business applications  
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## I. INTRODUCTION

### 1. WHAT IS IMPORTANT?

Living in our technological world, we rarely think about what really matters. Yes, we can invent robots doing our work and all become managers. Yes, we can live in a house fully connected with us, so we do not have to push the button to switch the lights. However, are these technologies most urgent today? Are they vital for our life? Making our everyday life easier, will not reduce illness among people. In fact, we will start to feel the need of a new technology improving our health.

I do not want to convince you that technology makes our life worst. I want you to ask yourself why we don't focus our attention on the most important aspects of life – nature; happiness; healthy lifestyle; self-improvement etc. Why we put more effort and spend more money on things that harm us instead of concentrating on what we cannot live without. Nature! Are we trying to develop healthier nature – are we planting trees, are we protecting endangered species from extinction. Instead of helping, we are destroying. We have already made major damage on nature and now is time to try to restore its previous health.

However, it is very hard and takes great amount of time and effort to invent technology, which can heal our nature immediately. Nevertheless, with small steps we can achieve our greater aim. There are many technologies helping in improving our environment.



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## 2. WHAT COULD BE IMPROVED?

Nowadays, one of the biggest problems we face are related to the pollution. The air we breathe has great impact on our health. We have to reduce smog in our cities.

What is smog? Smog is a yellowish or blackish fog formed mainly by a mixture of



pollutants in the atmosphere, which contains fine particles and ground level ozone. Smog, which occurs mainly because of air pollution, can also be defined as a mixture of various gases with dust and water vapor. Smog also refers to hazy air that makes breathing difficult. The atmospheric pollutants or gases that form smog are released in the air when fuels are burnt. When sunlight and its heat react with these gases and fine particles in the atmosphere, smog is formed. It is purely caused by air pollution. The main sources of these precursors are pollutants released directly into the air by gasoline and diesel-run vehicles, industrial plants and activities, and heating due to human activities. Smog is harmful and it is evident from the components that form it and effects that can happen from it. It is harmful to humans, animals, plants and the nature as a whole. Many people deaths were recorded, notably those relating to bronchial diseases. The tiny toxic particles known as PM 2.5 can be inhaled into the lungs. Research from Berkeley Earth, a non-profit that conducts scientific investigations on climate change, shows that 1.6 million people die each year of air pollution in China—a harsh reality of modernization.

## II. INOVATIVE TECHNOLOGY



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## 1. SMOG FREE PROJECT

Dutch designer and architect Daan Roosegaarde has visited the capital of China - Beijing (Peking). The extremely polluted air inspires him to look for an answer to solve this big problem. On July 2015, he and his team of experts have created the Smog Free Project and launched their idea at the Kickstarter site. In their presentation, they promised to build a tower, which purifier the air from the smog in the area. After being filtered, the clean air is returned to the environment without the smog particles.

Furthermore, instead of throwing the waste back in the environment they decided to transform it into beautiful jewelries and use it as a reward for the people helping them funding their idea. After only about month, they managed to do both gathering all the money needed as well as building the first tower in Rotterdam.





## 2. SMOG FREE PROJECT – ELEMENTS

### ➤ THE FIRST ELEMENT: THE TOWER



Smog Free Tower is 23-foot-tall tower that vacuum in the smog particles. It is a  $7.0 \times 3.5$  m modular system, energy-friendly and patented ionization technology, lightweight construction with LEDs. The tower sucks in dirty air like a giant vacuum cleaner. Ion technology then filters it, before returning smog-free air through the tower's vents. By creating a field of ions, all the particles on the nano scale get positively charged, therefore when the ground is negatively charged, you can drag them to the ground, and purify the air – 80 percent more clean. The great thing about the technology is that is safe and to have 30,000 cubic meters of clean air purified, it takes an hour and only uses about

30 Watts, which is like a light bulb, says Daan Roosegarde.



## ➤ THE SECOND ELEMEN: THE JEWELLERY



One of the greatest things about the whole project is that Roosegaarde thinks about the future as a place where we should not have waste. He decided instead of throwing the dust gathered from the tower, to use it as something, which can give joy to people. How? – By creating souvenirs. Roosegaarde designed Smog Free Rings, Smog Free Cubes, Smog Free Cufflinks, Smoke Free Earrings and Smog Free Awards of compressed smog particles. “We started to look at the smog particles and realized that most of it exists out of carbon. And what happens when you put carbon under a lot of pressure for two or three weeks, you get... diamonds. We are taking a thousand cubic meters of smog air and compressing this in a sort of smog ring, and there will be different versions, so if we compress it really, really a lot, you get like a real diamond-diamond. The largest series will be that we compress it a little bit less so it gets crystallized, so you still see it is smog, but it’s beautiful and by sharing or selling a diamond ring like that, a smog ring, you donate a thousand cubic meters of clean air to the city of Beijing.” – Said Roosegaarde.

### III. PRACTICAL APPLICATION

#### 1. THE TOWER NOWADAYS



This is the first made Smog Free Tower in Rotterdam. It was finished in September 2015. The basic idea for the towers is to be located at city parks where people gather to enjoy a couple hours breathing clean air.

Confirming their project as successful, they share: “We are happy to see such a broad range of interested and caring visitors, ranging from playing kids during school



vacation, to picnicking locals, to national and international journalists, to busloads of tourists. It is nice to witness visitors experiencing clean air every day and becoming more aware of its importance.” Although they have to measure over a long period of time the last tests with the technology from the Smog Free Tower held just outside a parking garage in the city show effects up to 75%. In total, they processed 1112 cubes and gathered smog from 1.112.000 m<sup>3</sup> of polluted air!

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## 2. LOCATIONS





The tower is now open for public at Vierhavensstraat 52 in Rotterdam NL, and will travel around the world. On the map above are shown the possible places for future launches – Beijing, Mexico, Paris and Los Angeles. On 28<sup>th</sup> of April 2016 at Kickstarter site was published that this summer the tower is going to Beijing.

Beijing smog air





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### 3. JEWELERS



As Kickstarter with a goal of raising 50,000 euros (\$54,350), it ended up raising 113,153 euros in less than two months. Probably the most important aspect of this



project is the clever idea behind the production of jewelers out of the smog particles. By approach he not only reward people who donate money for the project, but also dispose of unnecessary waste as well as persuade people to buy a beautiful ring whether or not they support the cause.



The team makes the jewelers by themselves in their office in Netherlands. The price list from the Kickstarter site is – Pledge €50 – smog free cube; Pledge €90 – two smog free cubes; Pledge €250 – smog free earrings or cufflinks.





## IV. CONCLUSION

However, there are many issues associated with this project.

Firstly, this tower is a prototype. It is only one and have to be transported around the world. Therefore, it is still tested and promoted in different countries. Roosegaarde's latest goal is to install his towers in 20 to 25 public parks in Beijing. He plans to offer leases to bring down costs. Yet, the task is not easy. "You have to build trust; it's China," "It's a very sensitive, political topic." he says. He would like to expand later to other developing nations like India and Mexico, which face similar air pollution problems.

Secondly, Daan hasn't quite figured out the correct compression technology to produce diamonds—at least not yet—but he has managed to turn carbon into jewelry.

Moreover, the area, which provides clean air, is too small – only 30,000 cubic meters of clean air purified.

To conclude, this project aim is not to solve the world problem with pollution. Such small technology will not be able to clean even the air of a city. The purpose of the tower is to make a statement that we have not forgotten our problems and we will never stop searching for solutions. In one of his presentations, Roosegaarde says - "Smog Free Park is not intended as a final solution but as a sensory experience of a clean future. In collaboration with the government, NGOs and clean-tech industry, you can become part of the solution instead of the problem."

"I BELIEVE WE SHOULD DO MORE, NOT LESS, AND MAKE MODERN CITIES LIVABLE AGAIN."

## V. REFERENCES

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