

A HANDBOOK

FOR



DREAMERS
AND THINKERS

To all the dreamers and thinkers of the last few decades,
who have grown up to consciously take less and give
more to our shared home.

With thanks to Corinne Lucas.

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CHAPTER THREE
CLEAN OUR AIR
EARTHSHOT





I was born in 1970, a year after the Apollo 11 Moon landing, and I think it was fate that I grew up wanting to be an astronaut. When I was little, I lived near Tokyo in Japan and visited the planetarium with my parents and older brother so I could learn more about the stars. But it was always very difficult to see them at night in the city. Then, when I was five years old, we moved to Hokkaido, a northern island in Japan. There was no light pollution there, and I was able to see stars in the night sky for the first time.

At school we learned that human beings are made of almost exactly the same things as stars and planets: oxygen, hydrogen and nitrogen. We humans are siblings of these stars and the planets, and part of the same universe.

Before I became an astronaut, I always thought space was the most incredible place. But when I first saw our home planet through the windows of the Space Shuttle, I suddenly thought, *Oh, maybe it's the Earth that's the special place.* I could see the shining blue of the ocean and the clouds moving. I felt like it was alive, and it was more beautiful than I had imagined.

To Do :

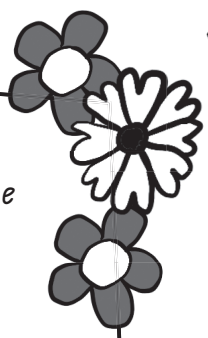
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From space I could also literally see the air we breathe - a delicate thin blue line of atmosphere - and in that moment I realised how precious our atmosphere is. Whether you're in space or on Earth, air is a limited resource. Against the vastness of space it's just this paper-thin atmosphere that separates us from an airless world. So we are very lucky.

But from a distance you can also clearly see the damage that humanity has brought on our home. You can see forest fires, deforestation, impure water and air pollution over industrial areas.

The ground feels so steady under our feet, but when you look from the outside you can see how fragile our planet really is. But if we have the determination and skills to carry people like me into space, then we can certainly clean our air too.

A thing about astronauts is, we are all rivals; everyone wants to go to space first. But another thing we know is that we must support each other, not only to further space exploration, but for a purely practical

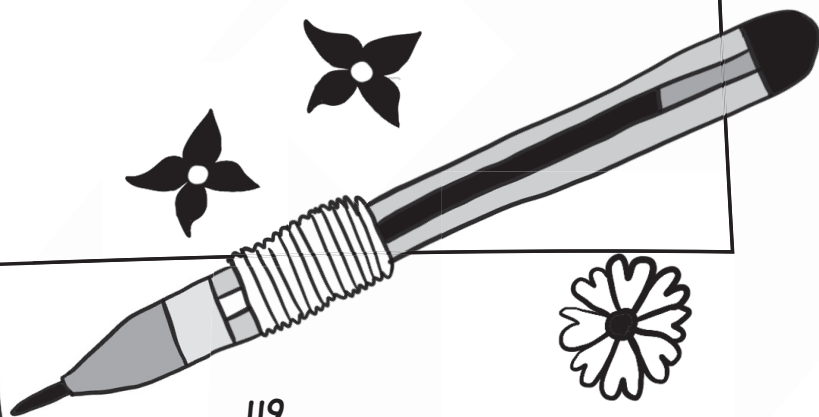




reason - to survive. In the Space Station, if the air was contaminated or full of chemicals, it would be a disaster, and we would all have to do everything in our power to clean it because our lives depended on it. We know today that the air on our planet is polluted, so we need to act with the same urgency to clean it - our lives depend on it.

Our planet is our spacecraft, and we are all members of its crew. If we unite our strengths and share our information, we can defeat our global challenges. Just imagine the future we could have if we choose to do so - a world with clean, safe air, where every child can see stars.

Naoko Yamazaki, 2023





MYTH BUSTER!

Saying which countries are most to 'blame' for air pollution is a bit of a tricky subject. Yes, it is true that countries such as China and India produce a large amount of today's air pollution. But it's not really true (or fair) to say that they are the ones responsible for the state of the air we all breathe. To start with, these nations have A LOT of people in them – added together there are almost three billion people in China and India. That's close to half of the global population.



**THE BIG AIR
POLLUTERS ARE COUNTRIES WITH
LOADS OF HUGE FACTORIES, LIKE
CHINA AND INDIA.**

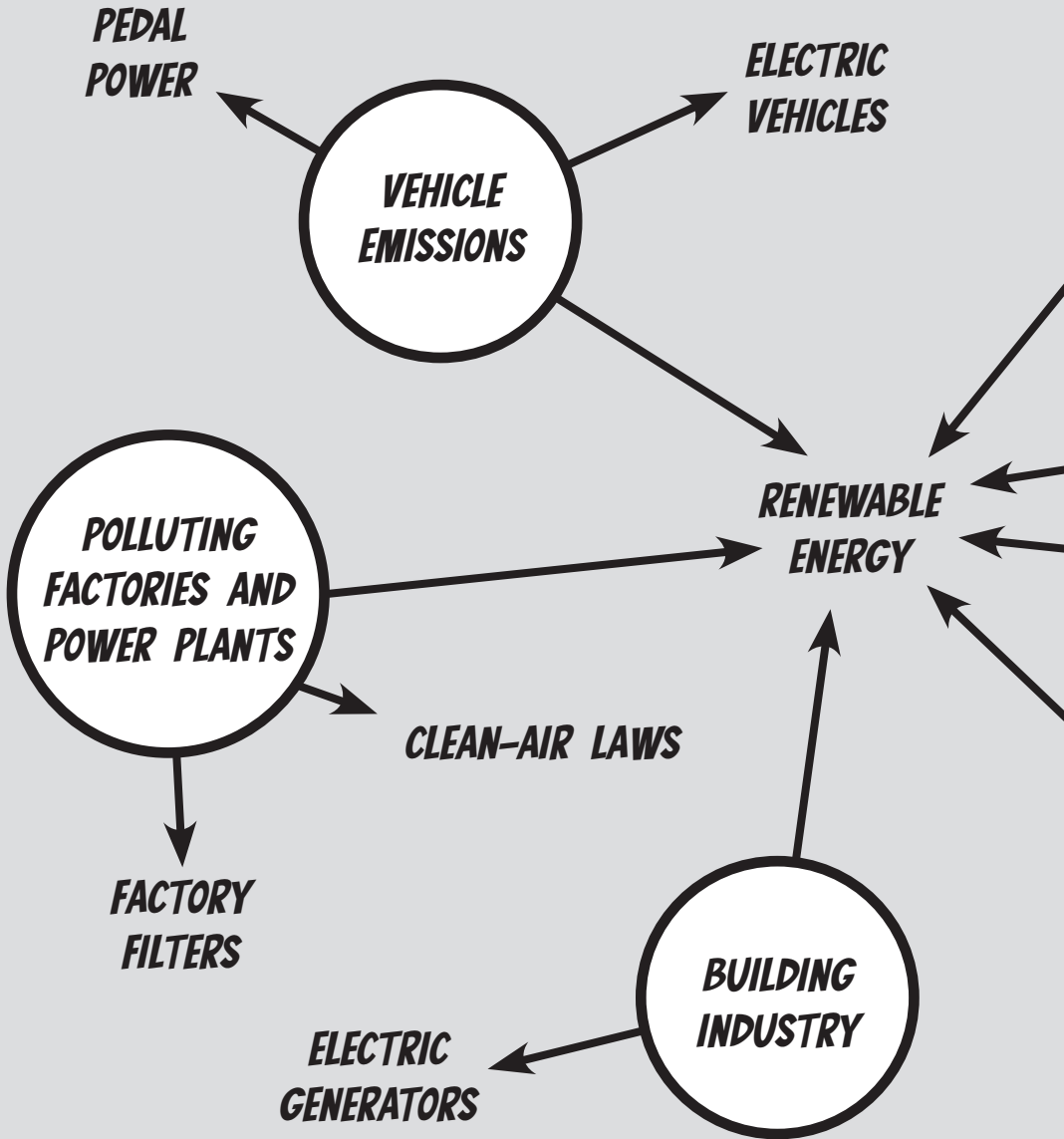
So when you look at the amount of air pollution they create per person, it's actually lower than many smaller nations. Then we have to look at why they're creating so much pollution. Often countries in Europe and North America ask other nations to make products for them, because it is cheaper. So if a factory in India is making lots of products for the UK, for example, then who is responsible for the air pollution?



**IT'S A
MYTH.**

A lot of people would say the UK. There's even a name for this: it's called 'offshoring'. Lastly, if we take a look at our history, Europe and North America have produced far more air pollution over the last two hundred years than Asia. They just went through their industrial revolutions earlier than most Asian countries. So no, it's not true or fair to only blame air pollution on the biggest polluters today. Whilst air pollution has the biggest impact on those nearby, once it enters the skies there are no barriers to stop it from reaching the lungs of all the people on Earth. Air pollution is everyone's problem and responsibility, so we all must work hard to reduce it, and to do so now.

PROBLEMS AND SOLUTIONS



KEY



SOLUTIONS



**SMART FARMING
TECHNIQUES**



**TYRE
DUST**



**NEW
TYRE
TECH**



**ENERGY-EFFICIENT
STOVES**



CLEAN OUR AIR EARTHSHOT 2022 WINNER

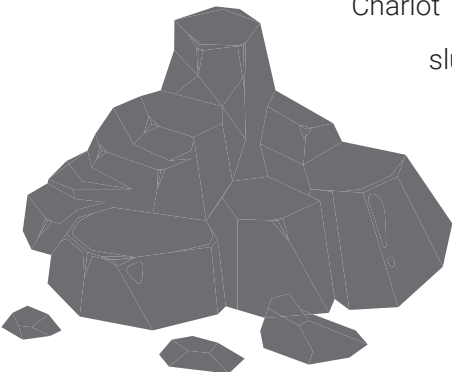


MUKURU CLEAN STOVES

We've seen ways that nature can bounce back and recover when times get hard. ***But it's not just nature that's tough; humans are too.*** And people like ***Charlot Magayi are beacons of hope, lighting the way to a greener future.*** The way she turned her personal hardship into positive action makes her a deserving ***Clean Our Air Earthshot 2022 winner.***

Charlot's journey to the Earthshot stage has not been a smooth one. Raised in Mukuru, one of the largest slums in Nairobi, Kenya, she was orphaned by the age of ten and became a mum by sixteen.

Forced to leave school and make money to raise her daughter, Charlot started selling charcoal around the slum. She used this same charcoal to heat the stove to cook her daughter's meals. But when Charlot's daughter



was just two years old, she accidentally knocked over the stove, badly burning herself and changing Charlot's life forever.

It was an incredibly scary time, but once her daughter had recovered and she'd saved up tuition money, Charlot went back to school, determined. She wanted to make sure this sort of accident didn't happen again, so she set out to build a sturdier stove. But Charlot soon discovered that the dangers of these stoves go far beyond burns.

Traditional open-flame stoves, like the ones used by Charlot, are not just used by millions across Kenya, but they're how **BILLIONS** of people around the world cook food for their families. Solid fuels, such as charcoal and wood, are burned to heat the stove, but the flames release harmful smoke into people's homes. This household pollution is incredibly toxic and can lead to breathing problems, strokes, heart diseases and lung cancer. It's tragically killing millions of people every year and impacting the health of billions more. And once it drifts outside of the home, the smoke knows no borders and affects us all because carbon dioxide is released during the burning process. The simple and nourishing act of cooking, when done this way, becomes an unhealthy and harmful one.



Once she realised this, Charlot's mission evolved. Using **locally available waste metal**, she designed a stable stove that uses half the amount of fuel than traditionally needed. It can also be heated with alternative fuels, which are far less polluting, having an impact on people's health and the environment from day one. Aware that the solution was no good if people couldn't afford it, Charlot's stoves are **cheaper** than traditional ones too, costing \$10. And because they need less fuel, they're **less expensive to run**. Because of Charlot turning her personal suffering into a community solution, over **two hundred thousand people** in Kenya are now using her Mukuru Clean Stoves, breathing cleaner air, reducing pollution and saving money. The benefit of the stoves doesn't end there though. Because less fuel is needed, it



doesn't take as long for the girls and women who typically collect it to gather. Young girls can use this extra time to focus on their education, improving their health and future all at once.

As a result of winning the prize, Charlot is expanding her business. She's building a second factory and developing even better stoves. And as a female business owner, she is passionate about **empowering women**, which is why she employs a mostly female staff. **Her impact is huge.** Charlot's new goal is to reach **one million customers** by 2025, and **ten million people** across Africa by 2032. Thanks to people like Charlot, we're one step closer to removing household air pollution and cleaning our air.

THE GOOD NEWS

CLEAN OUR AIR



Water is vital to our survival, and it's part of the reason why Earth is the only planet (we know of) that supports life. But there's something else that keeps Earth from being just another rocky planet in the solar system.

The atmosphere. This delicate, thin blue line circling our planet is our lifeline among the stars. We might not be able to see the air we breathe (*most of the time*), but this invisible protector needs our help. From the buildings along our skylines and cars on the road, to the farms producing our food and the stoves in our kitchens, every day we are polluting the air we breathe, harming all life across the planet. ***But history shows us that humans are superstars too.***

We can come together to breathe a little easier, just like when the world united to protect the ozone layer (see page 26).

So let's all be superstars and save our air, not only for ourselves, but for future generations to come.