

ARCTIC HOTSPOT

WHERE IT'S WARMING FASTER THAN ANYWHERE ELSE.

Heat waves and expanding deserts, devastating hurricanes and floods—all around the world, people and places are being affected by climate change more than ever. But the place on our planet that is changing more drastically than anywhere else as a result of climate change is...

... THE ARCTIC.

What?

YOU MEAN THAT FARAWAY ICY AREA AROUND THE NORTH POLE IS BEING CALLED THE HOTSPOT OF HUMAN-CAUSED CLIMATE CHANGE?

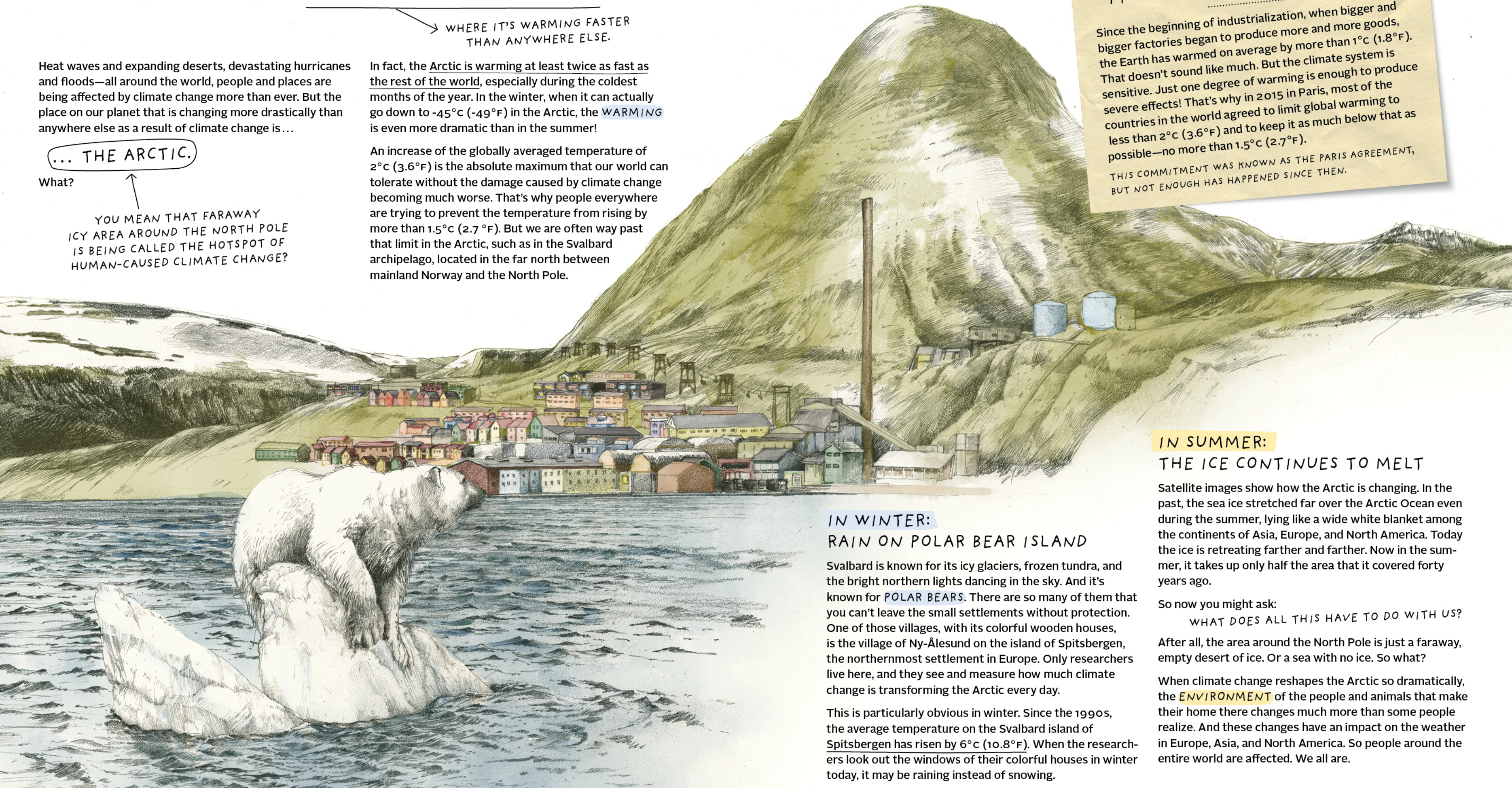
In fact, the Arctic is warming at least twice as fast as the rest of the world, especially during the coldest months of the year. In the winter, when it can actually go down to -45°C (-49°F) in the Arctic, the **WARMING** is even more dramatic than in the summer!

An increase of the globally averaged temperature of 2°C (3.6°F) is the absolute maximum that our world can tolerate without the damage caused by climate change becoming much worse. That's why people everywhere are trying to prevent the temperature from rising by more than 1.5°C (2.7°F). But we are often way past that limit in the Arctic, such as in the Svalbard archipelago, located in the far north between mainland Norway and the North Pole.

NOT ONE DEGREE MORE
IT'S GOT TO STOP AT 1.5°C (2.7°F)

Since the beginning of industrialization, when bigger and bigger factories began to produce more and more goods, the Earth has warmed on average by more than 1°C (1.8°F). That doesn't sound like much. But the climate system is sensitive. Just one degree of warming is enough to produce severe effects! That's why in 2015 in Paris, most of the countries in the world agreed to limit global warming to less than 2°C (3.6°F) and to keep it as much below that as possible—no more than 1.5°C (2.7°F).

THIS COMMITMENT WAS KNOWN AS THE PARIS AGREEMENT, BUT NOT ENOUGH HAS HAPPENED SINCE THEN.



IN WINTER: RAIN ON POLAR BEAR ISLAND

Svalbard is known for its icy glaciers, frozen tundra, and the bright northern lights dancing in the sky. And it's known for **POLAR BEARS**. There are so many of them that you can't leave the small settlements without protection. One of those villages, with its colorful wooden houses, is the village of Ny-Ålesund on the island of Spitsbergen, the northernmost settlement in Europe. Only researchers live here, and they see and measure how much climate change is transforming the Arctic every day.

This is particularly obvious in winter. Since the 1990s, the average temperature on the Svalbard island of Spitsbergen has risen by 6°C (10.8°F). When the researchers look out the windows of their colorful houses in winter today, it may be raining instead of snowing.

IN SUMMER: THE ICE CONTINUES TO MELT

Satellite images show how the Arctic is changing. In the past, the sea ice stretched far over the Arctic Ocean even during the summer, lying like a wide white blanket among the continents of Asia, Europe, and North America. Today the ice is retreating farther and farther. Now in the summer, it takes up only half the area that it covered forty years ago.

So now you might ask:

WHAT DOES ALL THIS HAVE TO DO WITH US?

After all, the area around the North Pole is just a faraway, empty desert of ice. Or a sea with no ice. So what?

When climate change reshapes the Arctic so dramatically, the **ENVIRONMENT** of the people and animals that make their home there changes much more than some people realize. And these changes have an impact on the weather in Europe, Asia, and North America. So people around the entire world are affected. We all are.

THE “BAD” GREENHOUSE EFFECT

THE GREENHOUSE EFFECT CAUSED BY HUMAN ACTIVITY IS MAKING THE EARTH WARMER AND WARMER.

The climate has changed many times during the history of the Earth (90 million years ago there was a rain forest at the South Pole—no joke!). We have been living in a warm period for around 10,000 years, which has given the world a stable and, for our taste, perfect climate, with an average temperature of 15°C (59°F). Some even suspect that it is only thanks to this warm period that people were able to invent farming and settle down, which allowed populations to grow. Unfortunately, the “bad” side of the greenhouse effect is now increasing—and that’s not good news.

In 1896 another physicist, Svante Arrhenius, started to think long and hard about the climate. At that time, factory chimneys were getting rusty and dirty, because the industrial age was already relying on the burning of coal. Arrhenius realized that temperatures rise when people release large amounts of greenhouse gases into the atmosphere.

But it was not until the 1950s that it was possible to prove that carbon dioxide concentrations were really increasing. They have increased by more than 40 percent since the beginning of industrialization and are far higher today than at any time in the past 800,000 years. That is why we talk about the anthropogenic GREENHOUSE EFFECT CAUSED BY HUMAN ACTIVITY. This is added to the natural effect and leads to the climate change that we are experiencing today and that continues to get worse.

If people continue to live as we have been, if greenhouse gas emissions do not decrease, the temperatures could rise by more than 4°C (7.2°F). You will find out what this will mean to the Earth, and how we can prevent it, in part 3 of this book.

Due to the **INCREASING AMOUNT OF GREENHOUSE GASES** in the atmosphere, more thermal radiation remains trapped in the Earth’s atmosphere instead of bouncing back into space.

HUMAN-MADE GREENHOUSE GASES MAINLY COME FROM...



1. ... burning coal, oil, and gas as humans use more and more energy...



4. Then there is the **TRAFFIC OF GOODS AND PEOPLE** on the roads, seas, and rivers, and in the air.



5. Many greenhouse gases also come from **CUTTING DOWN AND BURNING FORESTS** to use the land for pasture, or to grow crops to fatten up cattle and pigs.



This isn’t smart, because the forest is a climate protector. It slows global warming by absorbing large amounts of the carbon dioxide that we humans release into the atmosphere.



2. ... to **BUILD and HEAT OUR HOMES...**



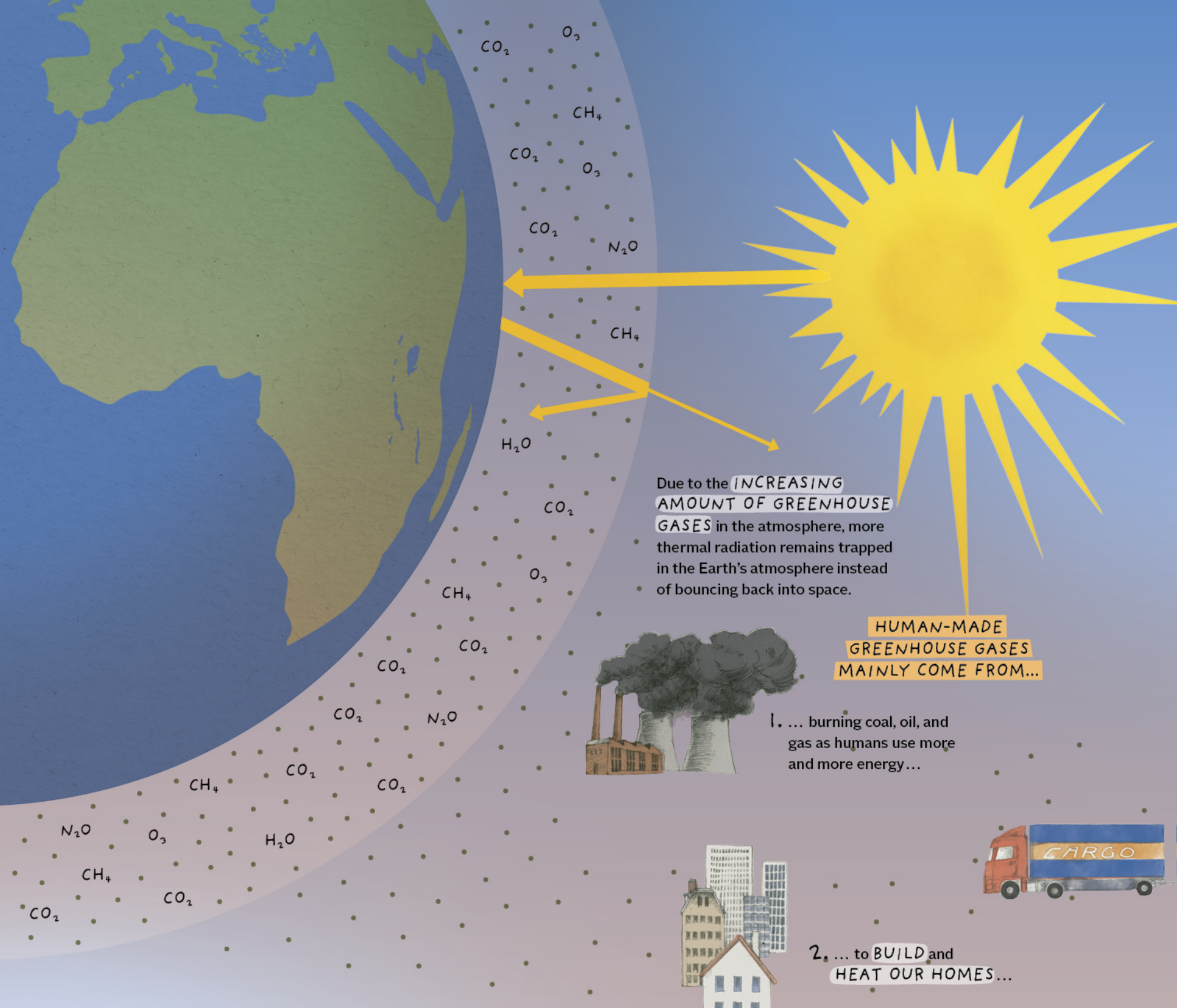
3. ... or to produce goods as people **BUY AND USE** more and more things—clothes, cars, furniture, computers, frozen pizza... and then these goods are also transported around the globe.



6. **ANIMAL FARMING AND AGRICULTURE** also produce greenhouse gases.



Always buying new clothes (mostly imported from Asia), eating fresh bananas from South America, running all those devices plugged into the power grid, plane trips to go on vacation... our modern lifestyle is taking a toll on the planet!





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AUTHOR

KATHARINA WEISS-TUIDER accompanied the **MOsAic** expedition as communications manager at the Alfred Wegener Institute. As a participant in the expedition, she was able to explore the Arctic and experience its changes for herself. She has a doctorate in literary studies from LMU Munich and has had a long career as a freelance author, writing about the environment, climate, food, and agriculture. She lives in Berlin with her husband, with whom she works to protect the climate, environment, and animals. The protection of the Arctic has been especially important to her ever since she saw her first polar bear in the wild.



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ILLUSTRATOR

CHRISTIAN SCHNEIDER was born in Darmstadt and studied illustration in Hamburg. He loves nature in all its facets, which he captures on paper with colored pencil. He especially enjoys glimpses of the foxes that live in his neighborhood—a touch of wilderness in the urban jungle of Berlin.



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GRAPHIC DESIGNER

STEPHANIE RODERER was born in Munich and studied new media and design in Austria before establishing her own design company. She loves hiking in the outdoors, which is where she gets her best ideas. When she's not in the mountains, you'll probably find her in her Munich studio, where she polishes and shapes those ideas.

First published in English by Greystone Books in 2023
Originally published in German in 2021 as *Expedition Polarstern: Dem Klimawandel auf der Spur* by Katharina Weiss-Tuider © 2021 by cbj Verlag, a division of Penguin Random House Verlagsgruppe GmbH, München, Germany
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23 24 25 26 27 5 4 3 2 1

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Greystone Kids / Greystone Books Ltd.
greystonebooks.com

Cataloguing data available from Library and Archives Canada

ISBN 978-1-77164-956-8 (cloth)
ISBN 978-1-77164-957-5 (epub)

Editing by Linda Pruessen
Copy editing by Chandra Wohleber
Proofreading by Alison Strobel
Indexing by Stephen Ullstrom
German edition design by Stephanie Roderer
English edition cover design by Jessica Sullivan
Cover illustrations by Christian Schneider

Printed and bound in Malaysia on FSC® certified paper at Imago Group. The FSC® label means that this product is made of material from well-managed FSC®-certified forests, recycled materials, and other controlled sources.

Greystone Books thanks the Canada Council for the Arts, the British Columbia Arts Council, the Province of British Columbia through the Book Publishing Tax Credit, and the Government of Canada for supporting our publishing activities.

The translation of this work was supported by a grant from the Goethe-Institut.



Greystone Books gratefully acknowledges the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and səllwətatʷ (Tseil-Waututh) peoples on whose land our Vancouver head office is located.