

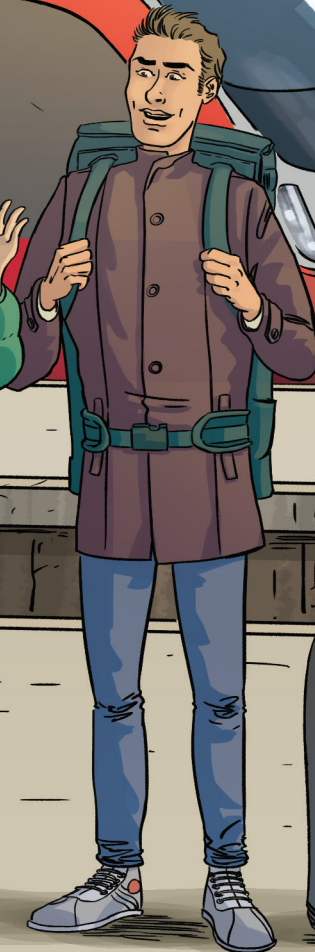
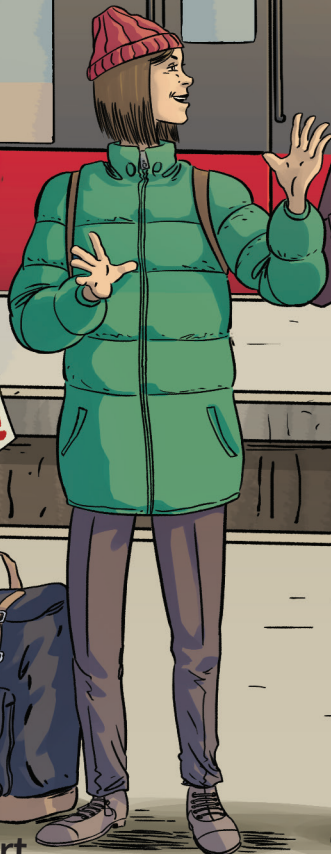
BRUNO PINTO - QUICO NOGUEIRA - NUNO DUARTE

Climate Change Challenge

Greenville



THERE IS
NO
PLANET B!



BRUNO PINTO - QUICO NOGUEIRA - NUNO DUARTE

Climate Change Challenge



This comic book is a product of the Bridging European and Local Climate Action (BEACON) project. The project aims to strengthen cooperation on climate action across borders from the local through regional, national, and EU levels to create a common ambition to achieve the Paris Agreement. BEACON brings together 34 municipalities, 57 schools and 11 organisations from seven European countries including Bulgaria, Czech Republic, Germany, Greece, Poland, Portugal, and Romania.

The BEACON project is financed by the European Climate Initiative (EUKI). EUKI is a project-financing instrument managed by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The overarching goal of EUKI is to foster climate cooperation within the European Union in order to mitigate greenhouse gas emissions. It does so by strengthening cross-border dialogue, cooperation exchange of knowledge, and experiences. For more information about BEACON and EUKI, visit www.euki.de/euki-projects/beacon.

The information and views set on in this book are those of the authors and do not necessarily reflect the official opinion of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

Note: This book is based on real facts. Some names and identifying details have been changed to protect the privacy of the individuals.

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PREFACE

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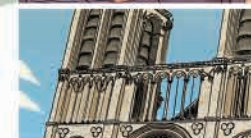
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Dear reader,

This comic book portrays the journey that I took with my younger brother Gabriel across Europe via train. When we were kids, we dreamed of taking a trip like this to many different destinations, but I honestly never thought we would do it together. In the transition from our childhood fantasies to the reality of two young adults discovering the world, our vision for the planet is less naïve, but still optimistic.

The trip was made in the context of my work reporting on the causes and consequences of climate change and how we in Europe can work towards a more climate-friendly future. As Gabriel and I came across different landscapes, countries, and people on our trip, we saw some of the responses to this challenge that calls upon all of humanity. We met people from other cultures who encouraged us to put ourselves in their shoes and rethink what's possible. Our firsthand experiences reinforced our understanding that climate change is complex and real, but that individuals, communities and cities can make a big difference in mitigating and adapting to it. Some of the ideas, experiences, and solutions we encountered throughout Europe can be found in this book.

Living this story with my brother was tough at times, but also rewarding. We were both learning about energy, forestry, urbanization, and sustainability through our own lenses. My brother enriched the trip with his interests in photography, drawing, history, and culture. Sometimes he showed me things that I didn't know, or that I knew, but didn't pay attention to and vice versa. This combination of Gabriel's interests in art and my interests in science is what inspired this comic book. If we look around, we can see countless examples of how the intersection of art and science leads to amazing outcomes and advancements that propel society forward. Whether through monuments and architectural feats, paintings, or films and video games, evidence of this symbiotic relationship and the power of using art to communicate scientific ideas is all around us.

We live in an extraordinary and unpredictable time that is full of challenges and possibilities. Particularly in the past two years many young people have come together to demand changes in the way policy and decision makers deal with climate change. Using drawings and written messages, shouting slogans and walking through the streets, they continue to make their voices heard. With this book, we follow their lead and hope to convey the spirit of European collaboration and exchange on climate change to a wider audience. We hope this book will encourage you to get to know other European realities and thereby it will make a small contribution to the transition to a climate neutral world. And - of course - that you will enjoy reading it.

Kind regards,
Sofia

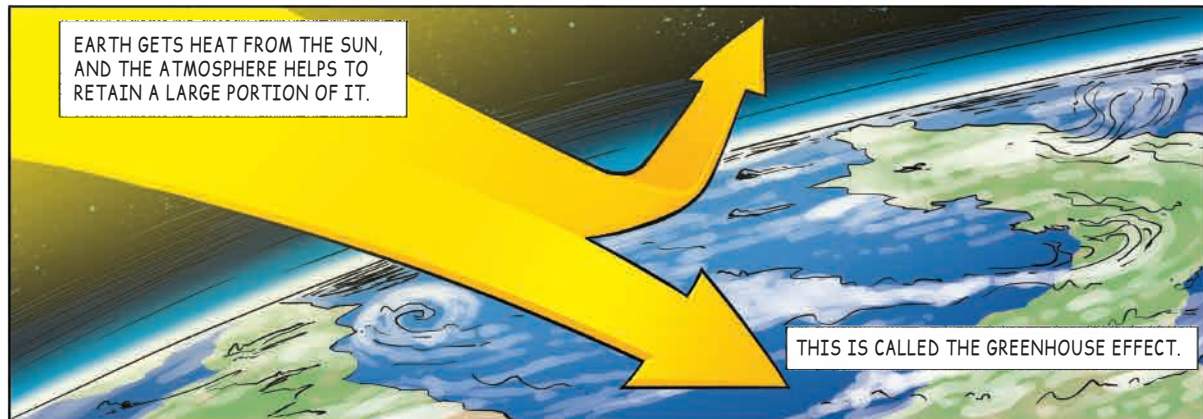


1. THE CHALLENGE

OK, I WILL TELL YOU THE STORY IN A NUTSHELL.



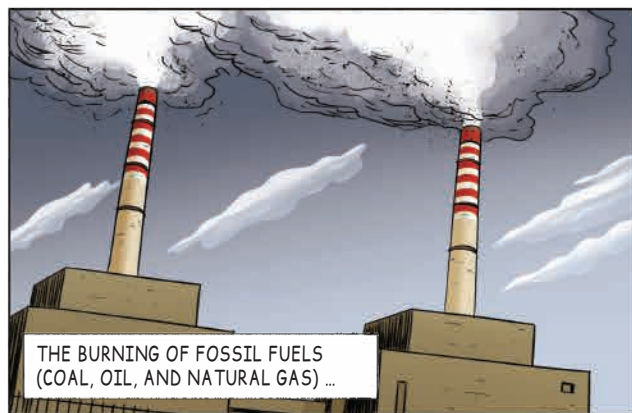
EARTH GETS HEAT FROM THE SUN, AND THE ATMOSPHERE HELPS TO RETAIN A LARGE PORTION OF IT.



THIS IS CALLED THE GREENHOUSE EFFECT.

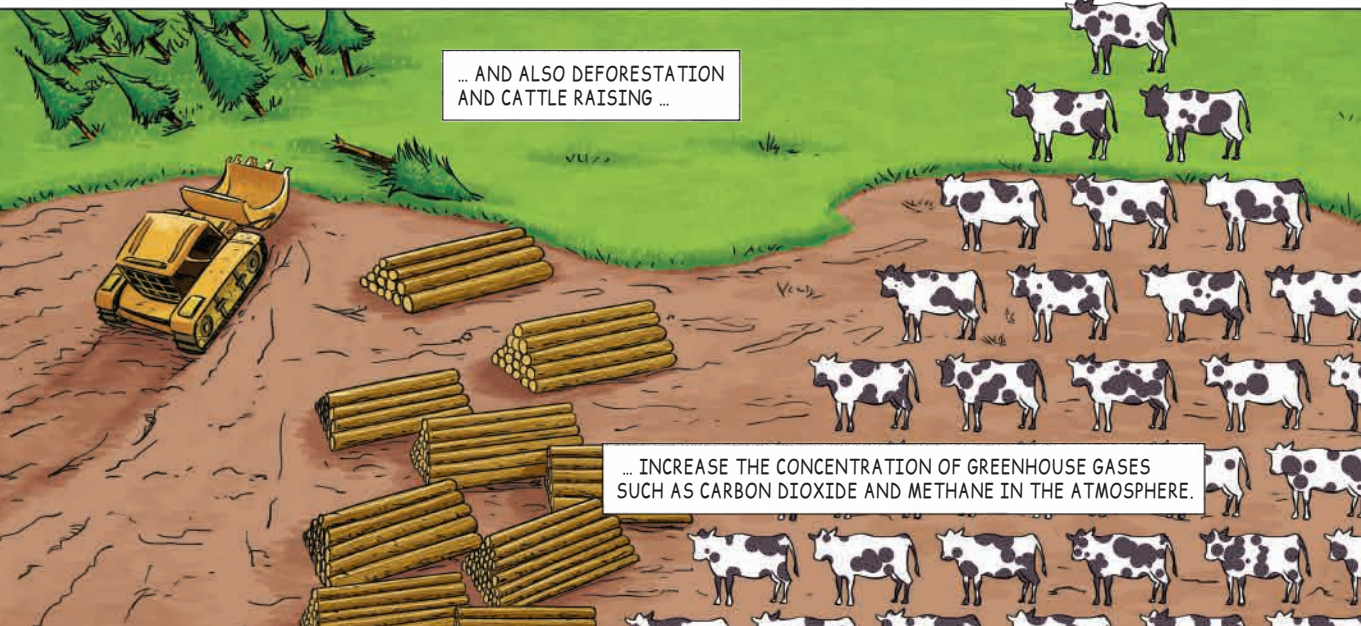


IT'S LIKE HAVING A BLANKET OVER YOUR BODY TO KEEP YOU WARM IN A COLD ROOM.



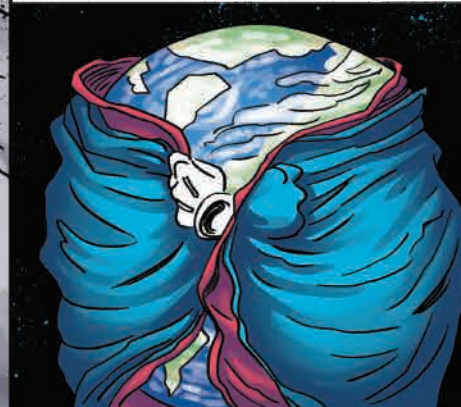
THE BURNING OF FOSSIL FUELS (COAL, OIL, AND NATURAL GAS) ...

... AND ALSO DEFORESTATION AND CATTLE RAISING ...

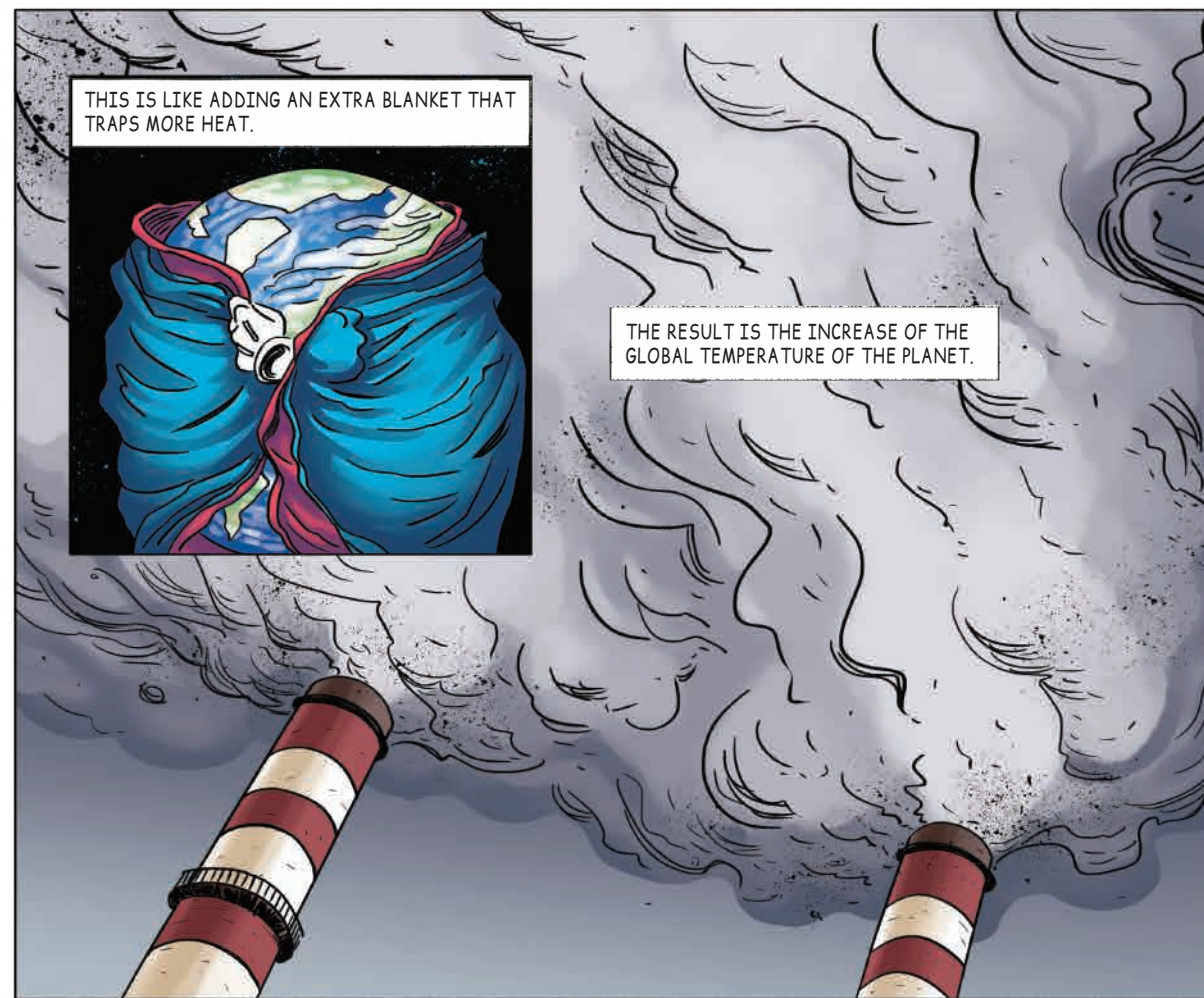


... INCREASE THE CONCENTRATION OF GREENHOUSE GASES SUCH AS CARBON DIOXIDE AND METHANE IN THE ATMOSPHERE.

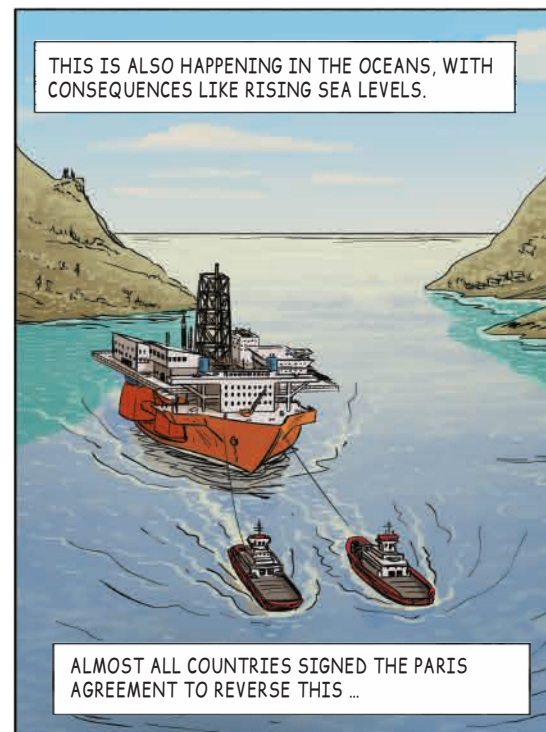
THIS IS LIKE ADDING AN EXTRA BLANKET THAT TRAPS MORE HEAT.



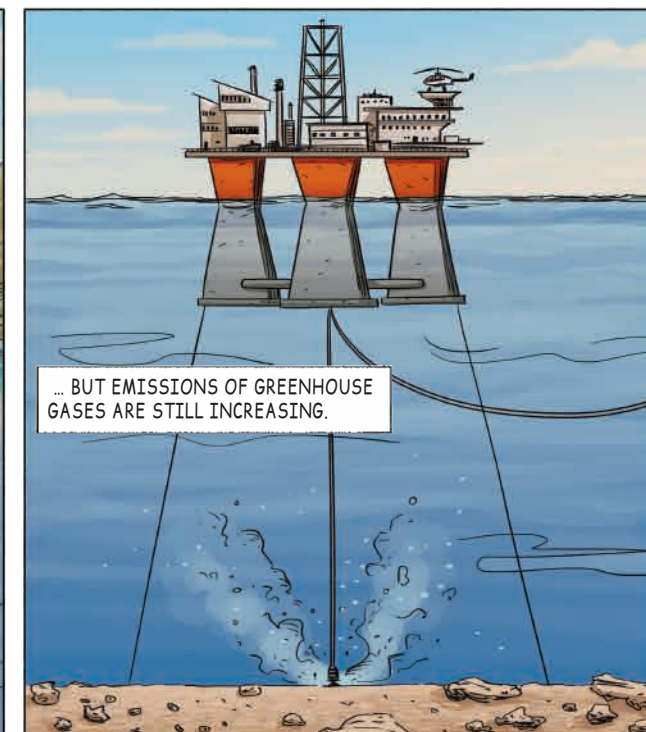
THE RESULT IS THE INCREASE OF THE GLOBAL TEMPERATURE OF THE PLANET.



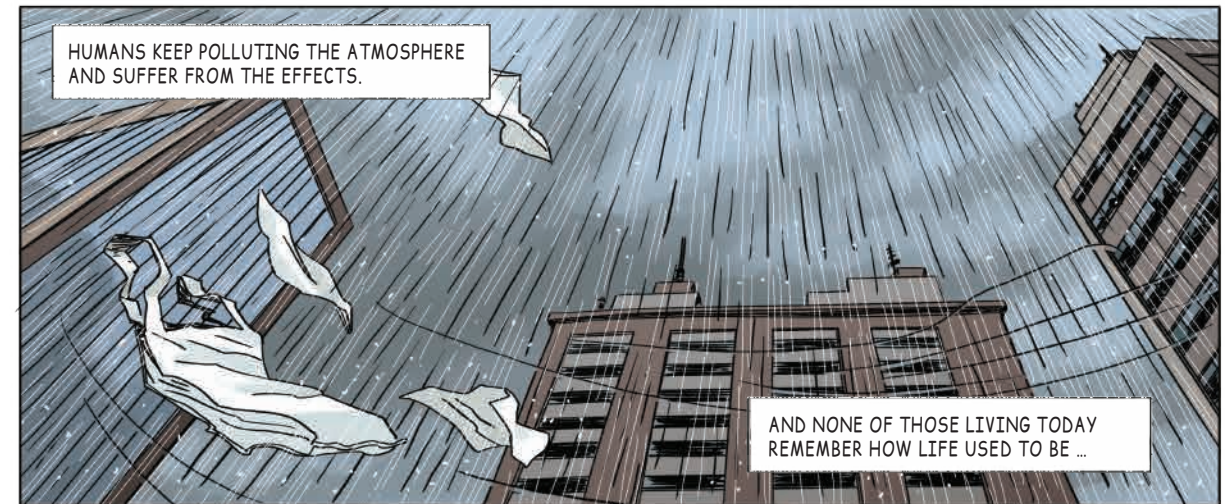
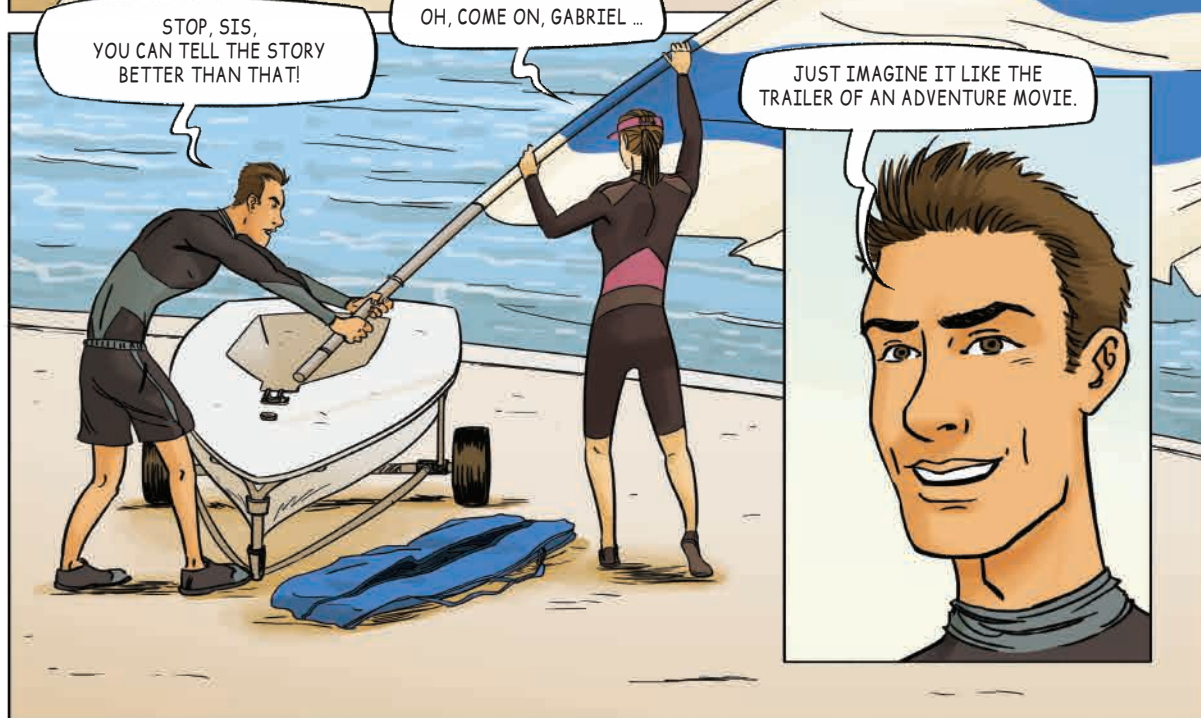
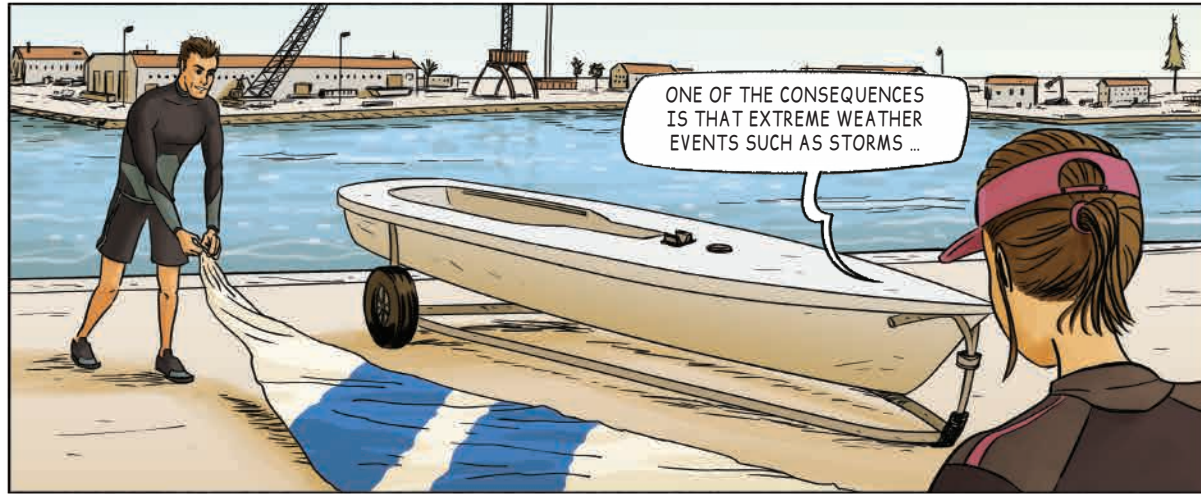
THIS IS ALSO HAPPENING IN THE OCEANS, WITH CONSEQUENCES LIKE RISING SEA LEVELS.

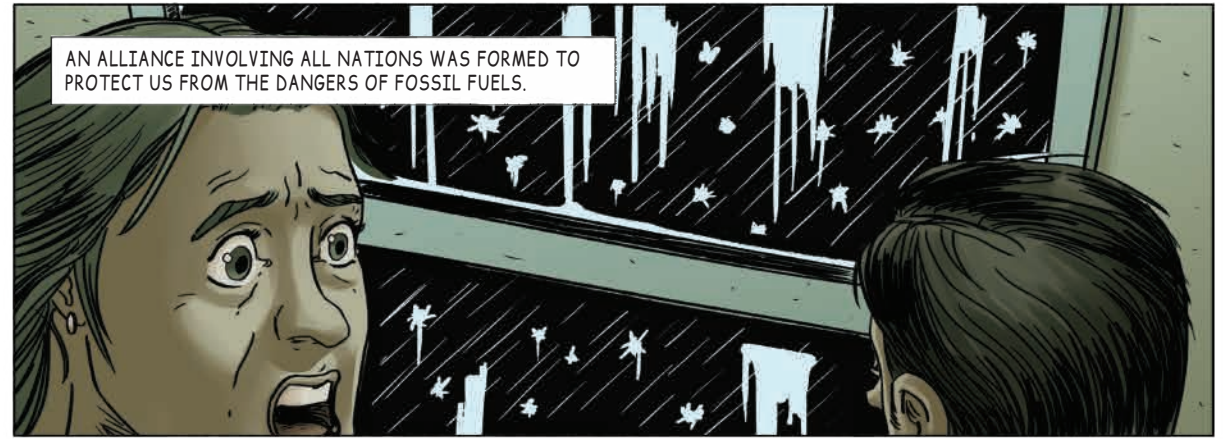
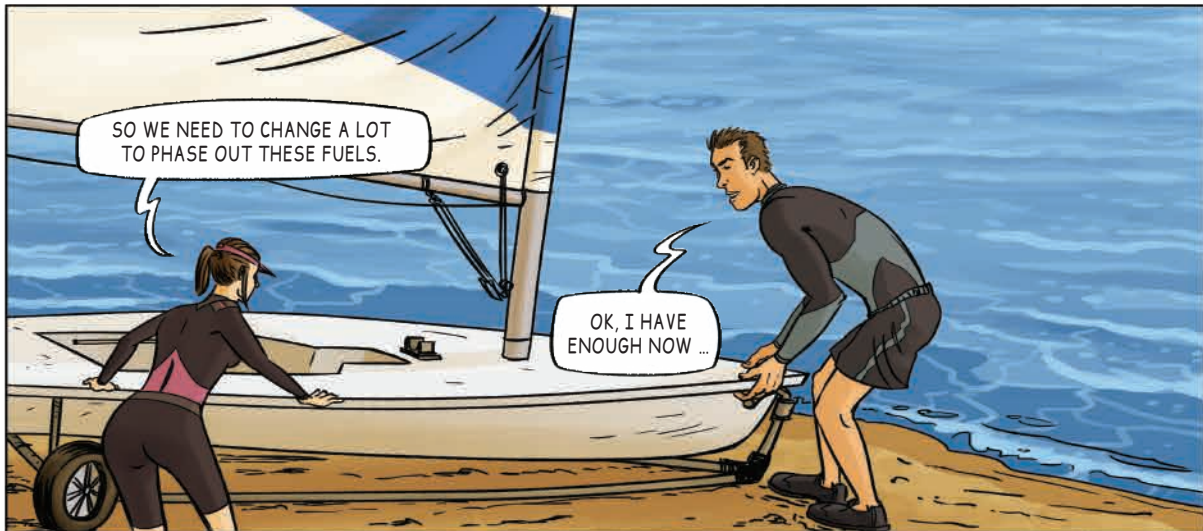
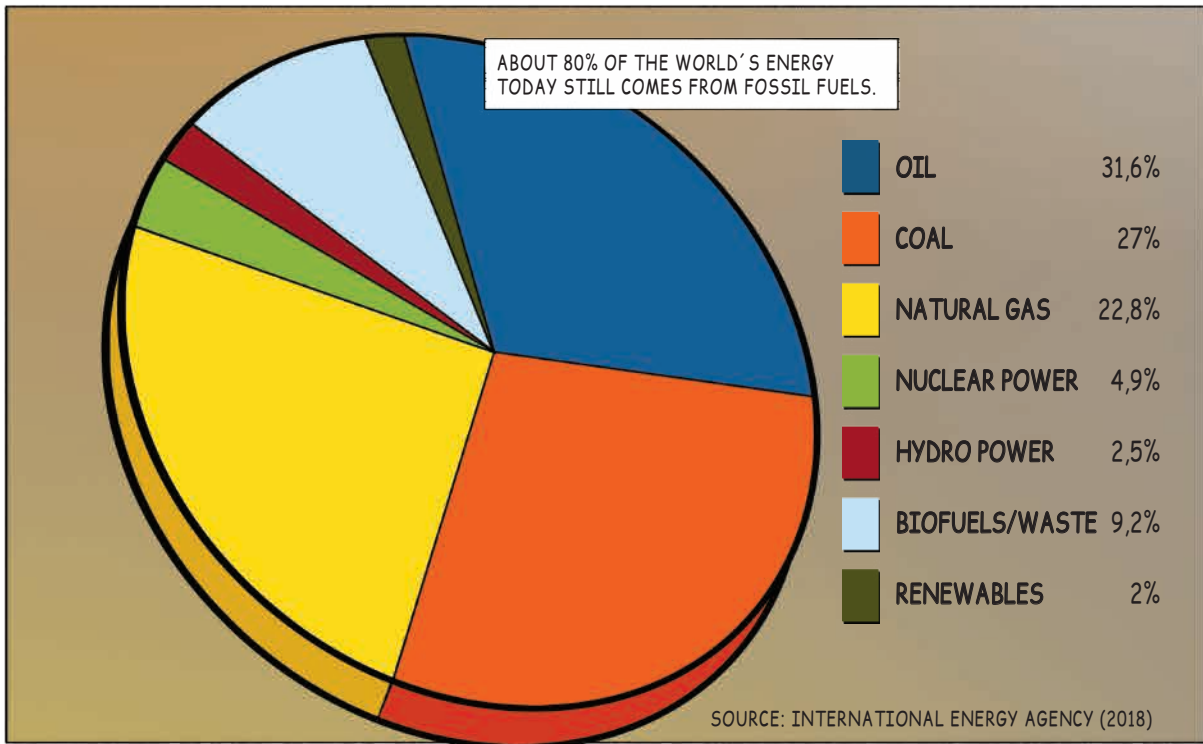


... BUT EMISSIONS OF GREENHOUSE GASES ARE STILL INCREASING.



ALMOST ALL COUNTRIES SIGNED THE PARIS AGREEMENT TO REVERSE THIS ...







NO, THIS WAS JUST TO GIVE YOU SOME CONTEXT. I THINK I TOLD YOU BEFORE ABOUT THESE THINGS.

NORMALLY, MY MIND DRIFTS OFF DURING YOUR LECTURES. BUT I'VE KIND OF MISSED THEM.

AND I'VE MISSED SAILING WITH MY ANNOYING LITTLE BROTHER.

HAAH! TELL ME MORE ABOUT YOUR FIRST JOB.



I'M ON A PROJECT CALLED "BEACON" THAT WORKS ON CLIMATE ACTION WITH NATIONAL GOVERNMENTS, SCHOOLS AND CITIES ACROSS EUROPE.

I'M CREATING A BOARD GAME ABOUT MITIGATION AND ADAPTATION TO CLIMATE CHANGE IN MUNICIPALITIES.

SOUNDS COOL!



I STILL DON'T KNOW HOW THE GAME WILL WORK. MAYBE IT WILL BE ABOUT MAYORS WHO INVEST IN RENEWABLE ENERGY.

AND THE ONE WHO GAINS THE GREATEST PROFITS FROM THESE INVESTMENTS WINS?

MAYBE. WHAT ABOUT YOU?

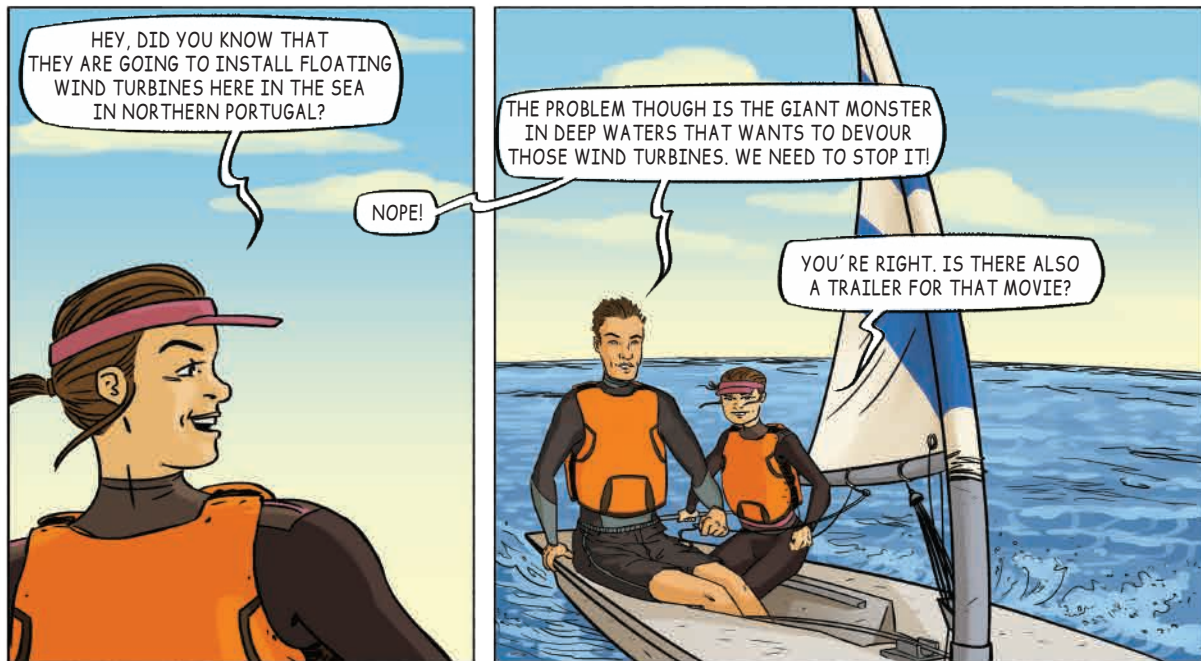
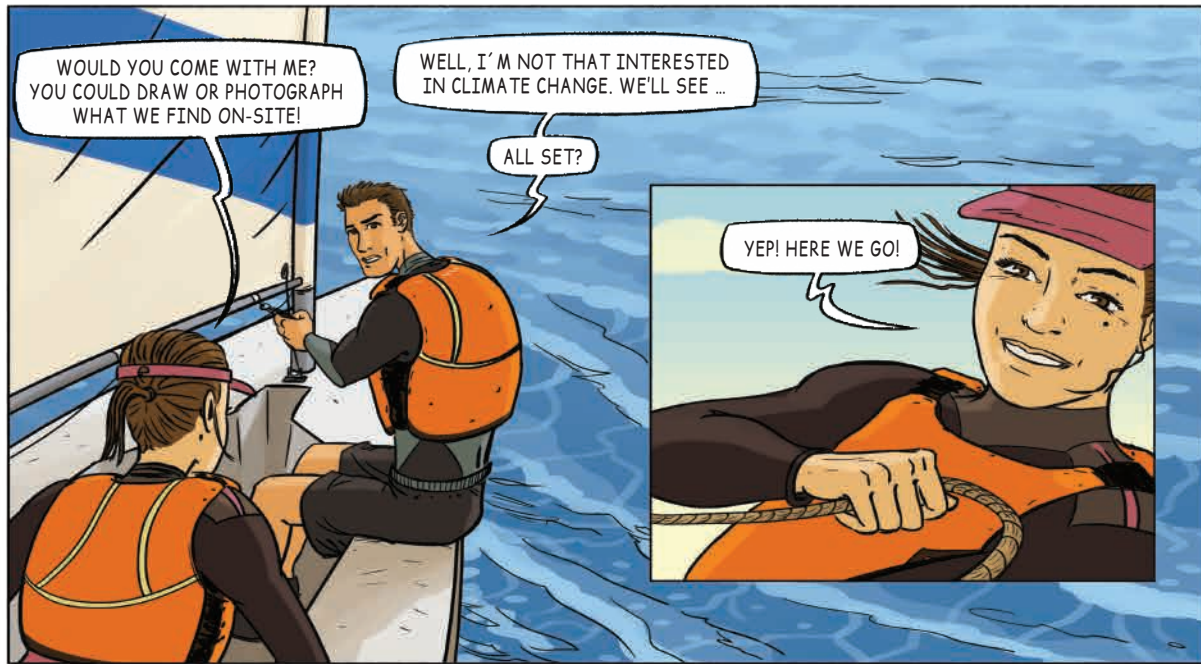
I'M TAKING A DRAWING CLASS. NOT SURE WHAT I'LL DO NEXT ...

ARE YOU ENJOYING IT?

YES. I'M GOING TO A WORKSHOP IN ROMANIA, TO GET MORE IDEAS AND INFOS FOR THE GAME.

YOU SHOULD EXTEND THAT TRIP AND TRAVEL TO OTHER PLACES. THAT WILL GIVE YOU A BETTER SENSE OF REALITY.

I DON'T KNOW IF MY BOSS WILL AGREE TO THAT PLAN.





WE DID! BUT ONLY IF YOU SHOWED US YOUR BOARD GAME. AND YOU NEVER DID.

THE THING IS ... I LOST IT SOMEWHERE IN MY FLAT.



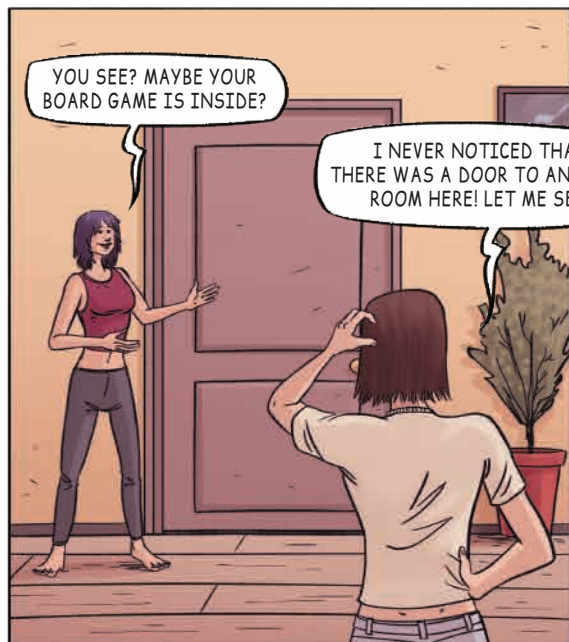
HAVE YOU HAD A LOOK IN THE EXTRA ROOM?

WHAT DO YOU MEAN?



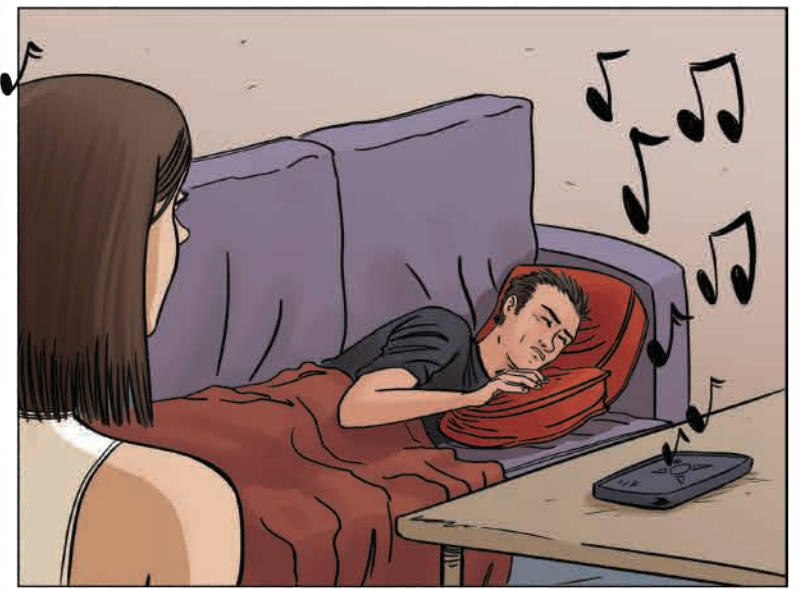
COME WITH ME, I'LL SHOW YOU!

ALL RIGHT ...



YOU SEE? MAYBE YOUR BOARD GAME IS INSIDE?

I NEVER NOTICED THAT THERE WAS A DOOR TO ANOTHER ROOM HERE! LET ME SEE!



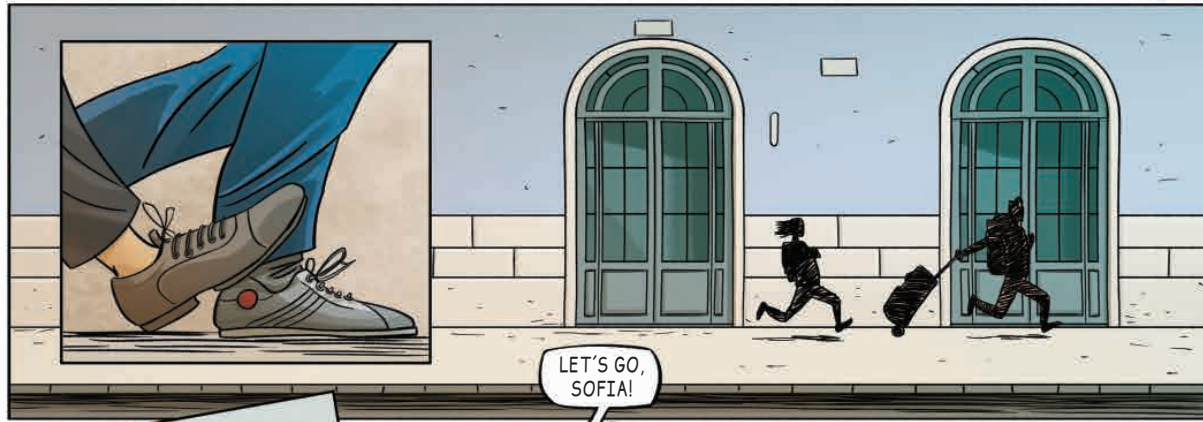
OH, GREAT! GABRIEL, WAKE UP, WE HAVE TO GO! QUICK!

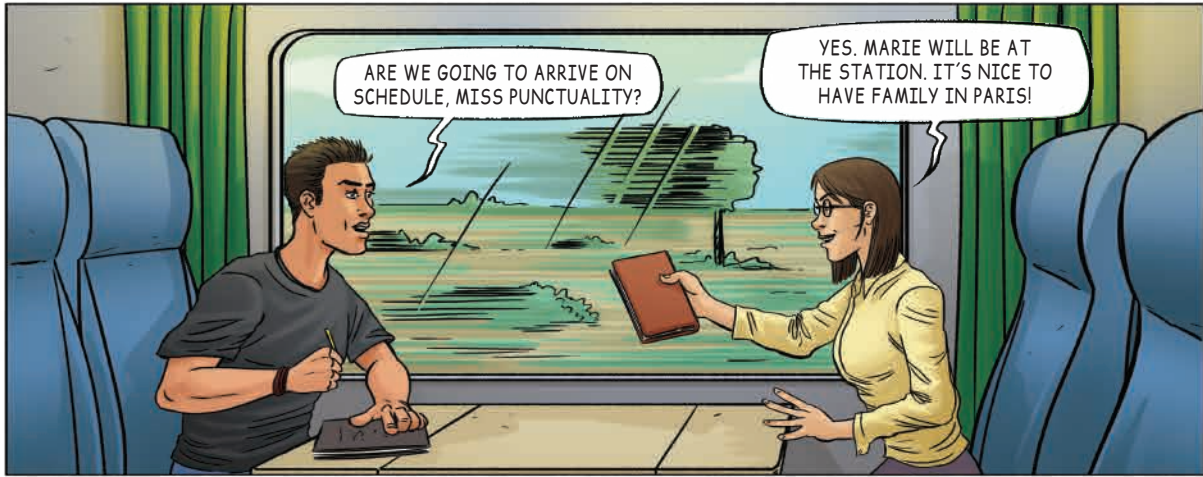
WHAT? WHAT'S GOING ON?



WE'RE LATE! WHY DID YOU TAKE MY PHONE? I HAD SET THE ALARM CLOCK ...

TO SEND A TEXT. I RAN OUT OF CREDIT ON MINE. SORRY ...





ARE WE GOING TO ARRIVE ON SCHEDULE, MISS PUNCTUALITY?

YES. MARIE WILL BE AT THE STATION. IT'S NICE TO HAVE FAMILY IN PARIS!



I LIKE YOUR DRAWINGS!



THANKS! AND WHAT IS YOUR BOOK ABOUT?

ENERGY COOPERATIVES ... PEOPLE JOINING EFFORTS FOR A COMMON GOAL.

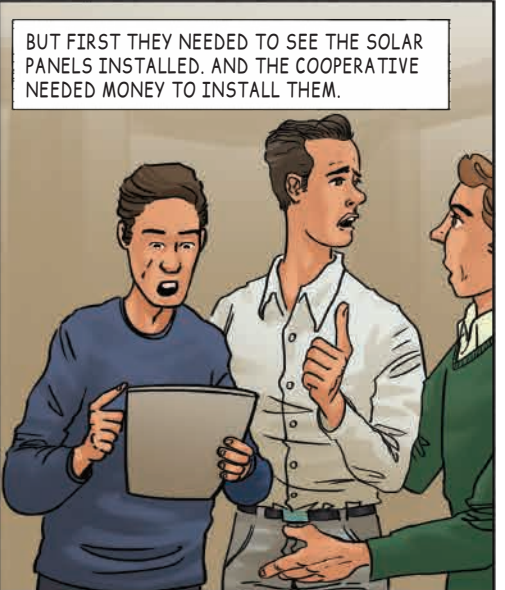


ANY OF THEM IN PORTUGAL?

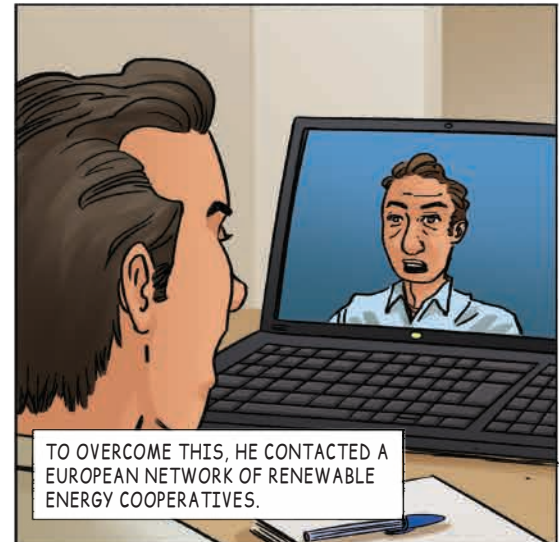
YES. A PORTUGUESE GUY LEARNED ABOUT THEM IN BARCELONA AND BROUGHT THE IDEA BACK HOME.



IN 2012, HE GATHERED A GROUP OF PEOPLE TO INVEST IN THESE PROJECTS AND EARN THEIR MONEY BACK WITH INTEREST.



BUT FIRST THEY NEEDED TO SEE THE SOLAR PANELS INSTALLED. AND THE COOPERATIVE NEEDED MONEY TO INSTALL THEM.



TO OVERCOME THIS, HE CONTACTED A EUROPEAN NETWORK OF RENEWABLE ENERGY COOPERATIVES.



THEY SAID: "WE'RE NOT A BANK, BUT WE'LL TRY TO HELP".



AND IT WORKED: THREE OF THE OLDEST COOPERATIVES AGREED TO LEND THE MONEY TO FINANCE THESE INITIAL PROJECTS AND SET THINGS IN MOTION.



GOOD. BY THE WAY, MOM JUST SENT A TEXT ASKING IF WE BROUGHT ENOUGH WARM CLOTHES WITH US!

IF WE ASKED I'M SURE SHE WOULD!

IF WE DIDN'T WHAT IS SHE GOING TO DO? SEND SOME BY MAIL?

I'M CALLING HER!



HI MOM. YES, EVERYTHING IS OK WITH US!



HOW ARE YOU AND DAD?



... AND HOW WAS YOUR TRIP?

IT WAS GOOD. WE SLEPT WELL ON THE TRAIN.

WOW, THIS CROISSANT IS DELICIOUS!



DO YOU REMEMBER WHAT HAPPENED THE FIRST TIME YOU VISITED US IN PARIS?

NO ...

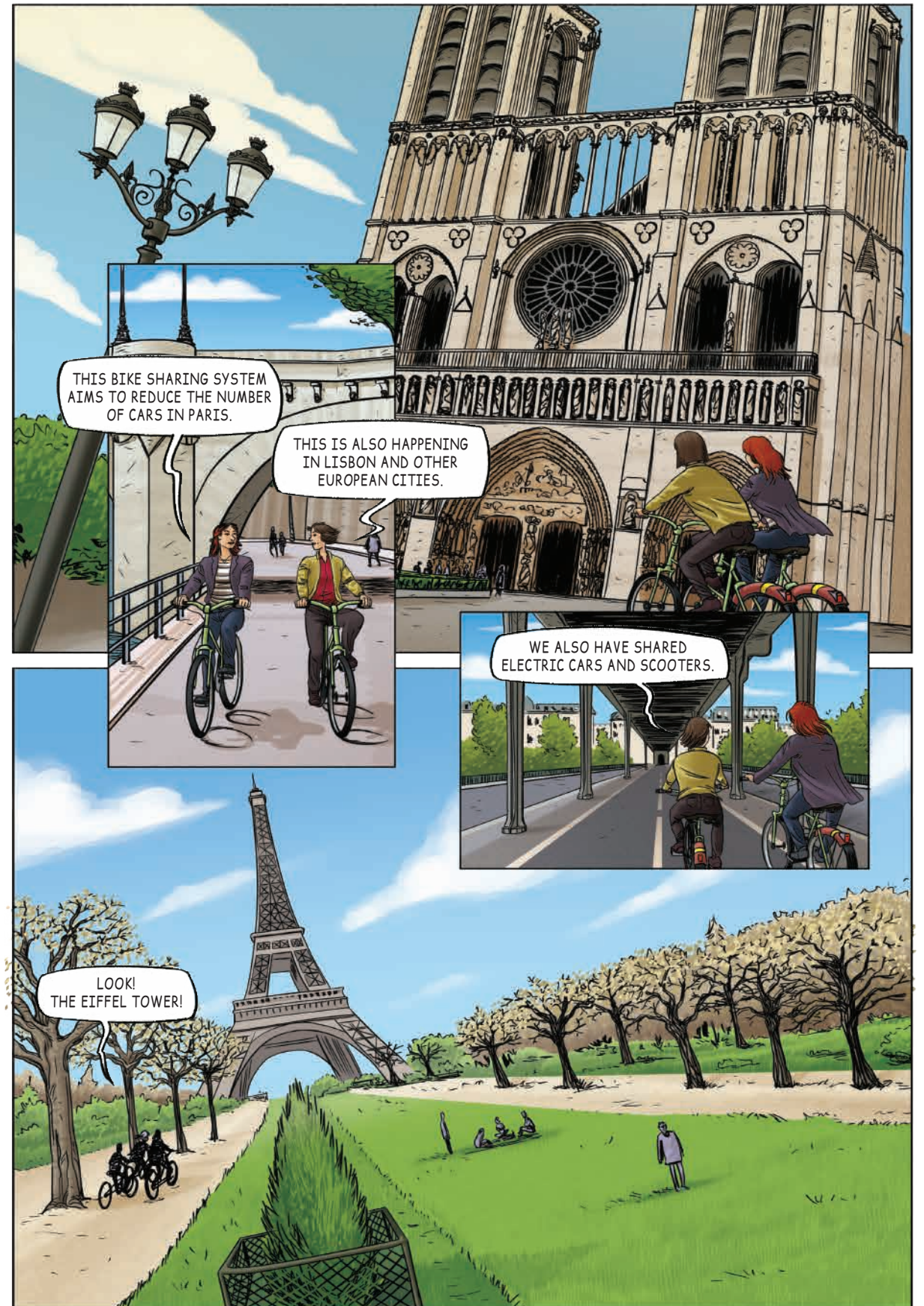
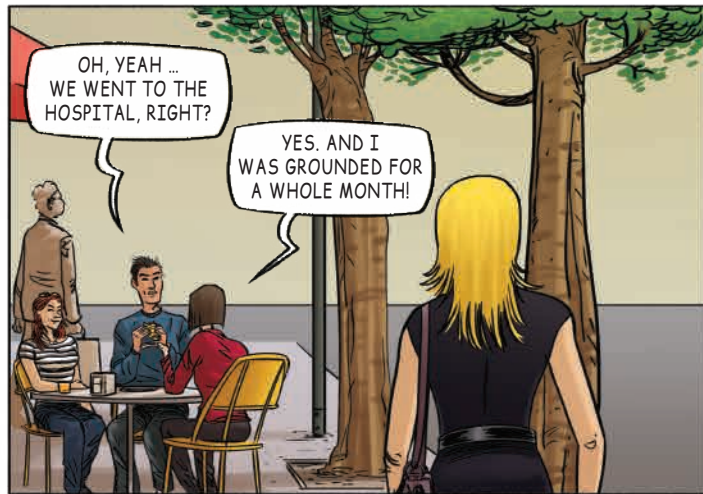


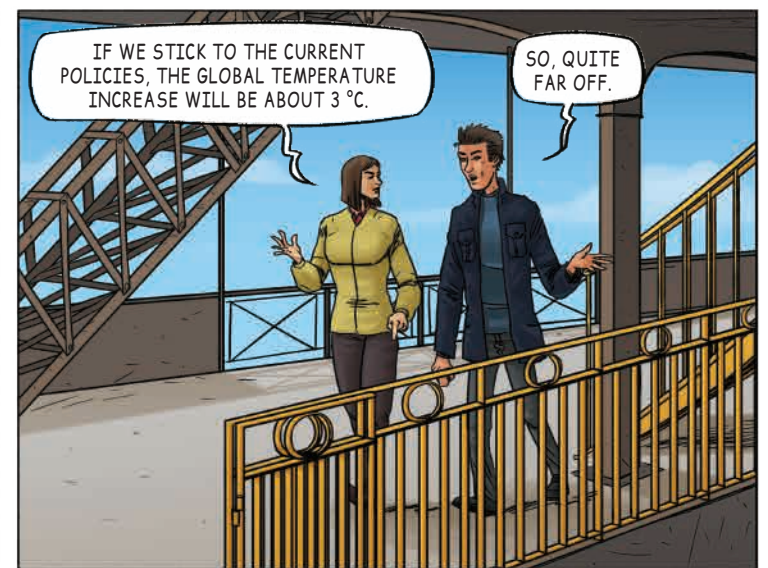
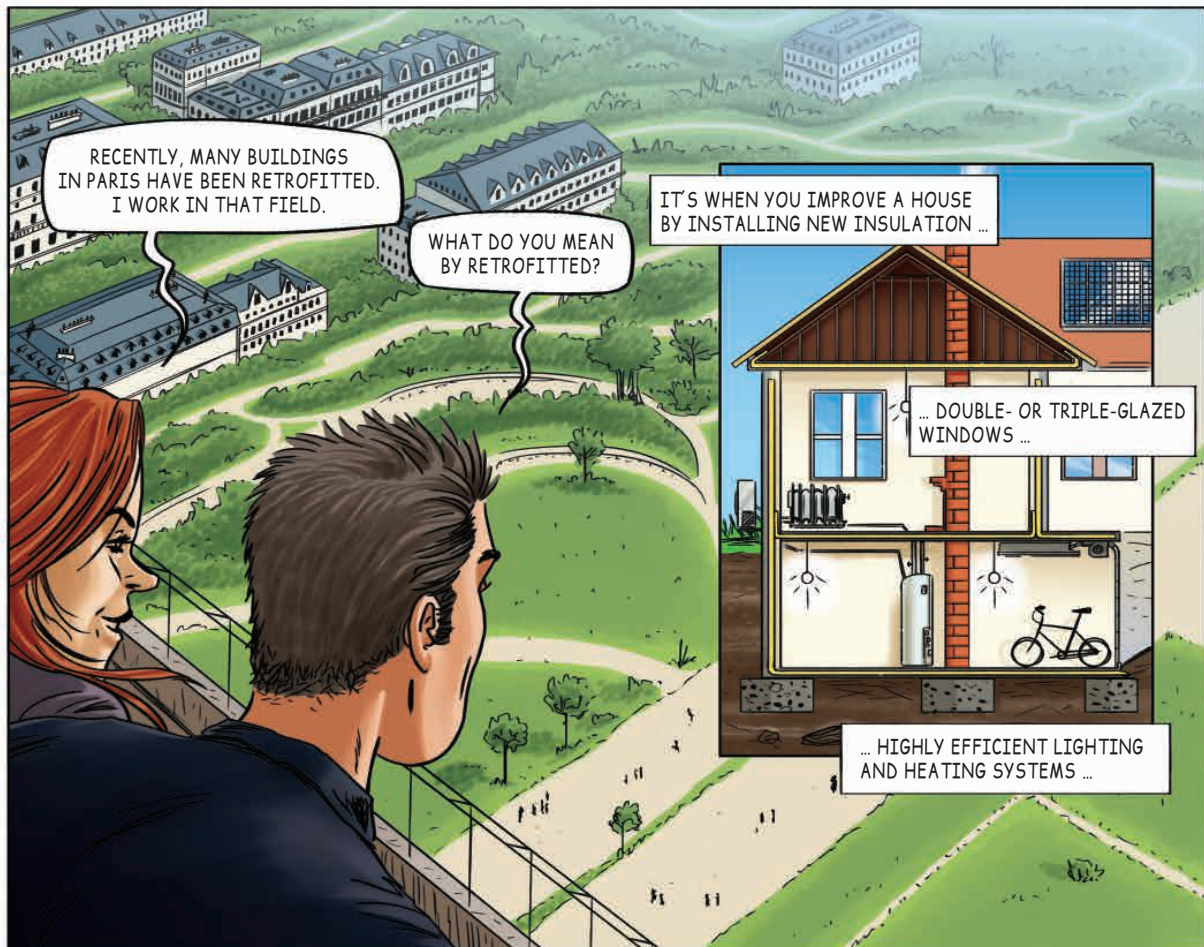
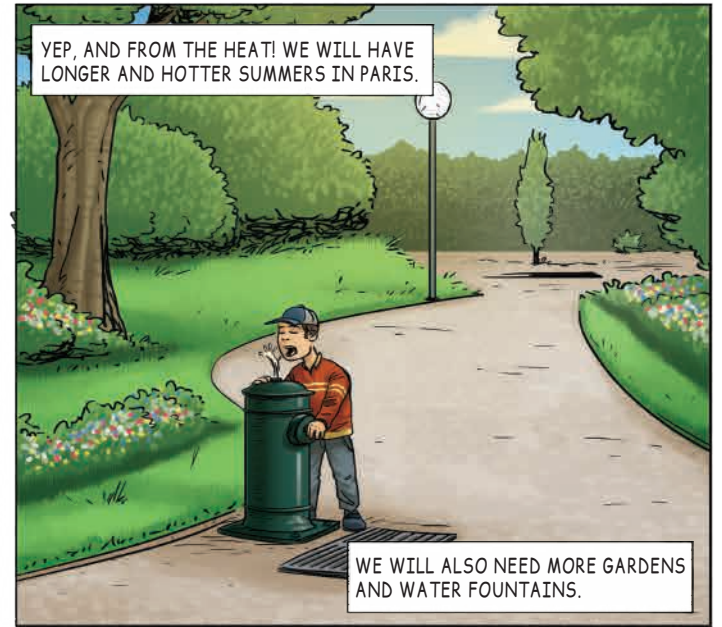
WHAT IS IT, GABRIEL? I SAID I DON'T WANT TO PLAY WITH YOU!

I'M GOING TO TAKE THE TOY HOUSE.



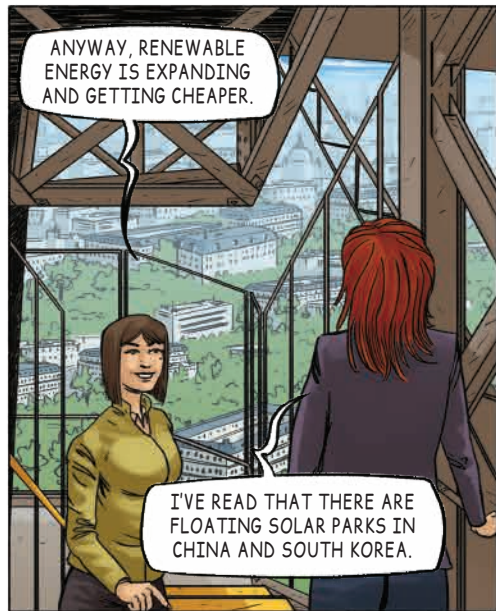
OH, YOU WANT IT? HERE IT IS!





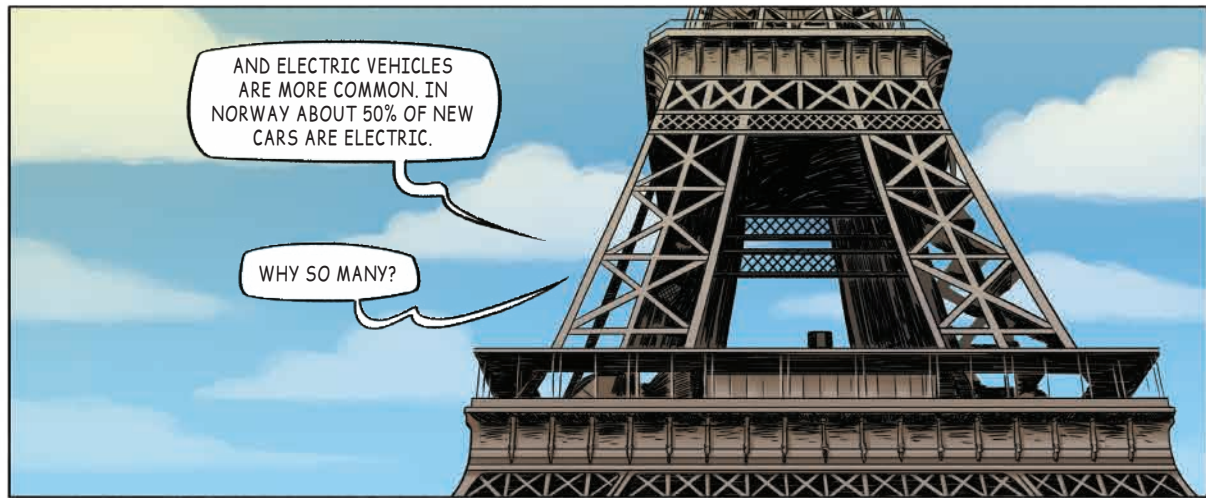


SHALL WE TAKE THE STAIRS?



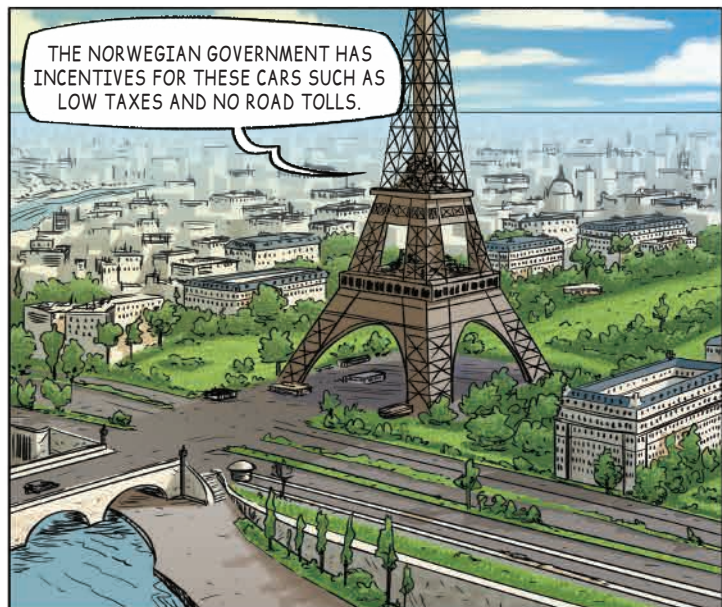
ANYWAY, RENEWABLE ENERGY IS EXPANDING AND GETTING CHEAPER.

I'VE READ THAT THERE ARE FLOATING SOLAR PARKS IN CHINA AND SOUTH KOREA.

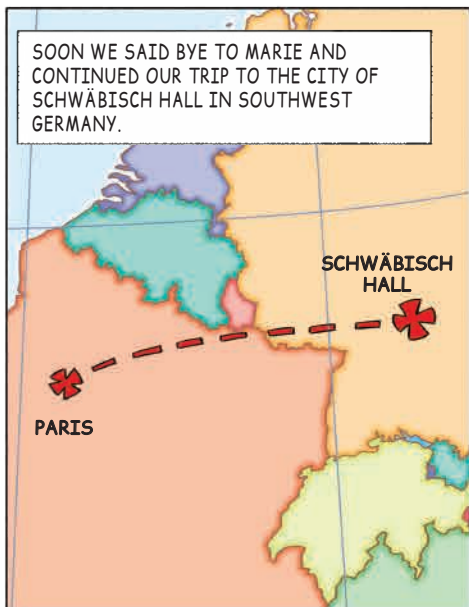


AND ELECTRIC VEHICLES ARE MORE COMMON. IN NORWAY ABOUT 50% OF NEW CARS ARE ELECTRIC.

WHY SO MANY?



THE NORWEGIAN GOVERNMENT HAS INCENTIVES FOR THESE CARS SUCH AS LOW TAXES AND NO ROAD TOLLS.



SOON WE SAID BYE TO MARIE AND CONTINUED OUR TRIP TO THE CITY OF SCHWÄBISCH HALL IN SOUTHWEST GERMANY.

SCHWÄBISCH HALL

PARIS



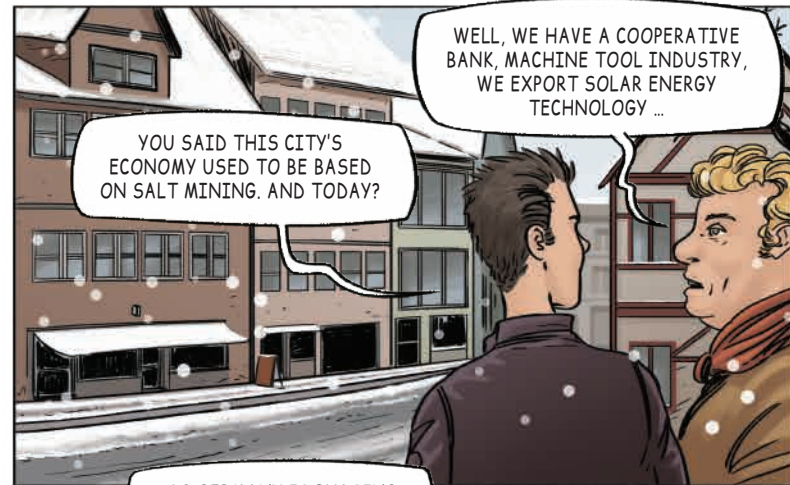
4. TALES OF TWO CITIES

OUR HOST WAS THOMAS, WHO WORKS FOR THE MUNICIPALITY ON ENERGY ISSUES.

IN THE SUMMER, I TAKE MY FAMILY TO SEE THEATRE PLAYS PERFORMED ON THESE STAIRS!



IT'S THE CITY HALL!



WELL, WE HAVE A COOPERATIVE BANK, MACHINE TOOL INDUSTRY, WE EXPORT SOLAR ENERGY TECHNOLOGY ...

YOU SAID THIS CITY'S ECONOMY USED TO BE BASED ON SALT MINING. AND TODAY?

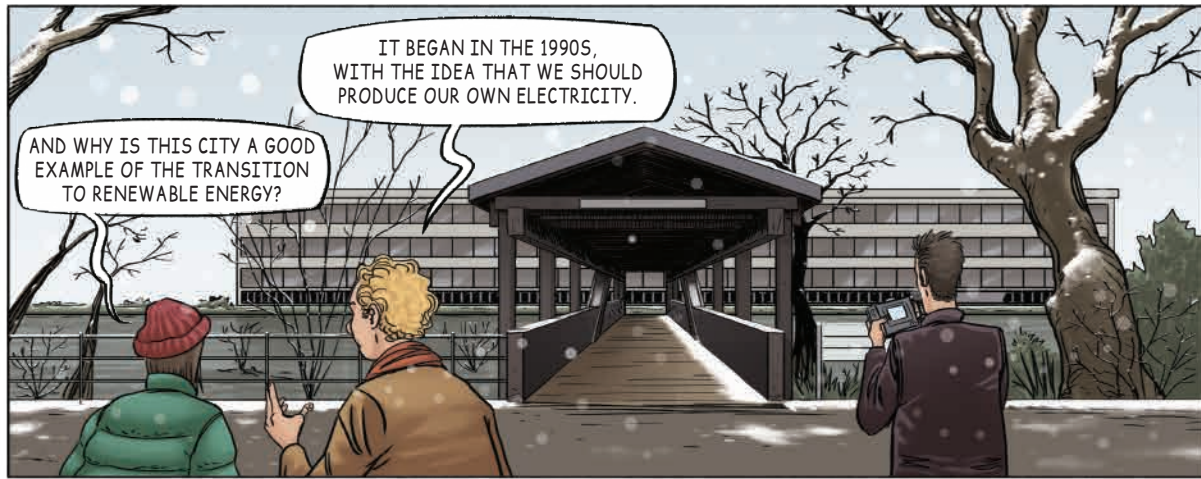


WE ALSO HAVE DAIRY PRODUCTS, ORGANIC MEAT, FORESTRY AND TOURISM ... IT'S A BIG MIX!



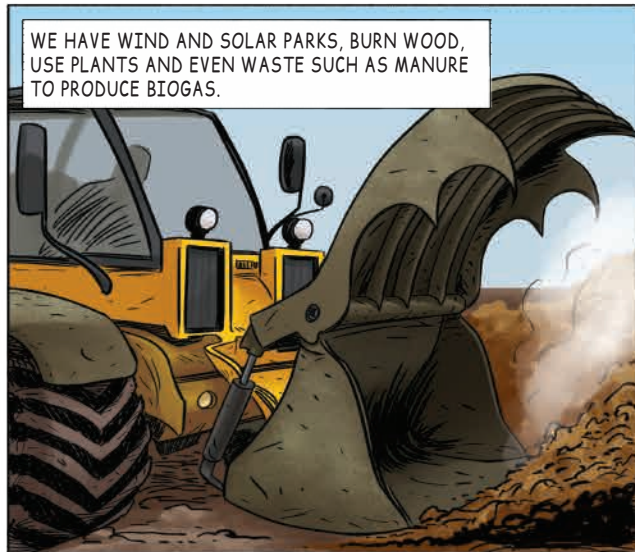
SO GERMANY IS PHASING OUT NUCLEAR ENERGY, RIGHT?

YES, IT IS SET TO BE COMPLETE BY 2022. THERE ARE DISCUSSIONS TO PHASE OUT COAL BY 2038 OR SOONER.



IT BEGAN IN THE 1990S, WITH THE IDEA THAT WE SHOULD PRODUCE OUR OWN ELECTRICITY.

AND WHY IS THIS CITY A GOOD EXAMPLE OF THE TRANSITION TO RENEWABLE ENERGY?



WE HAVE WIND AND SOLAR PARKS, BURN WOOD, USE PLANTS AND EVEN WASTE SUCH AS MANURE TO PRODUCE BIOGAS.



WHAT WAS ONCE PIG DUNG IS NOW A SOURCE OF ENERGY!



WE ALSO HAVE ELECTRICITY FROM SEVERAL SMALL DAMS SUCH AS THIS ONE.



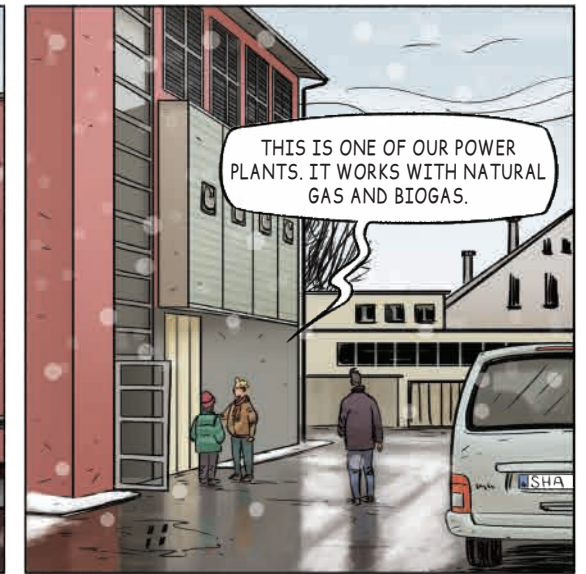
AND STILL USE SOME NATURAL GAS AND OIL.

SO YOUR ENERGY PRODUCTION IS ALSO A BIG MIX!



WHAT DO LOCAL PEOPLE THINK ABOUT THIS CHANGE?

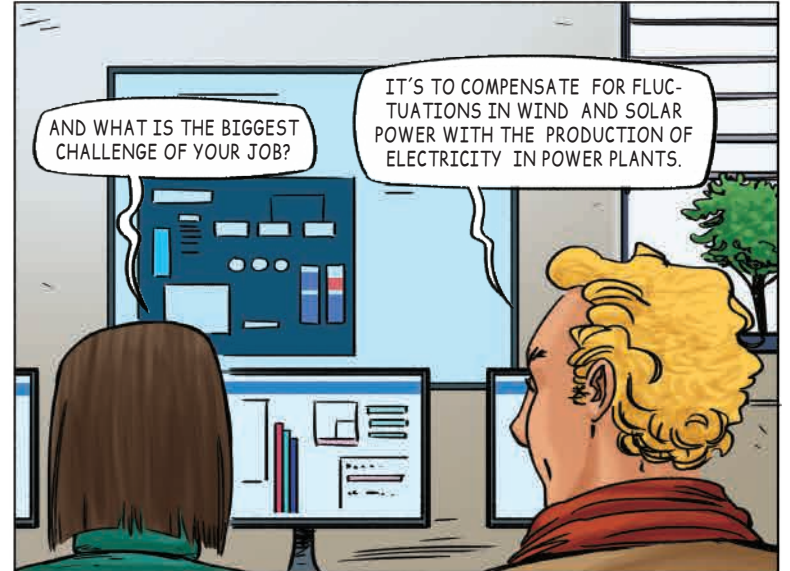
THE MAJORITY AGREES, BUT SOME DON'T LIKE WIND TURBINES NEAR OUR CITY!



THIS IS ONE OF OUR POWER PLANTS. IT WORKS WITH NATURAL GAS AND BIOGAS.



IT ALSO PRODUCES HEAT, WHICH WE DISTRIBUTE TO PRIVATE AND COMMERCIAL BUILDINGS.



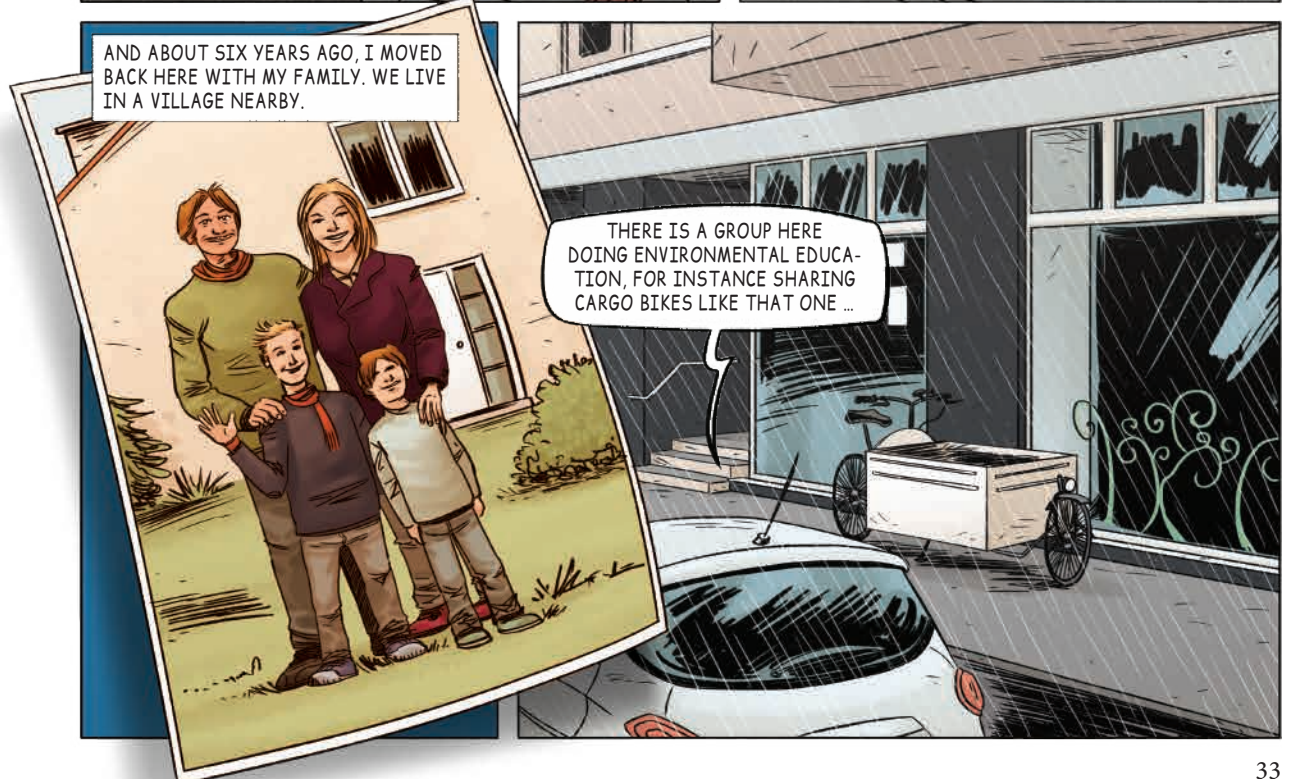
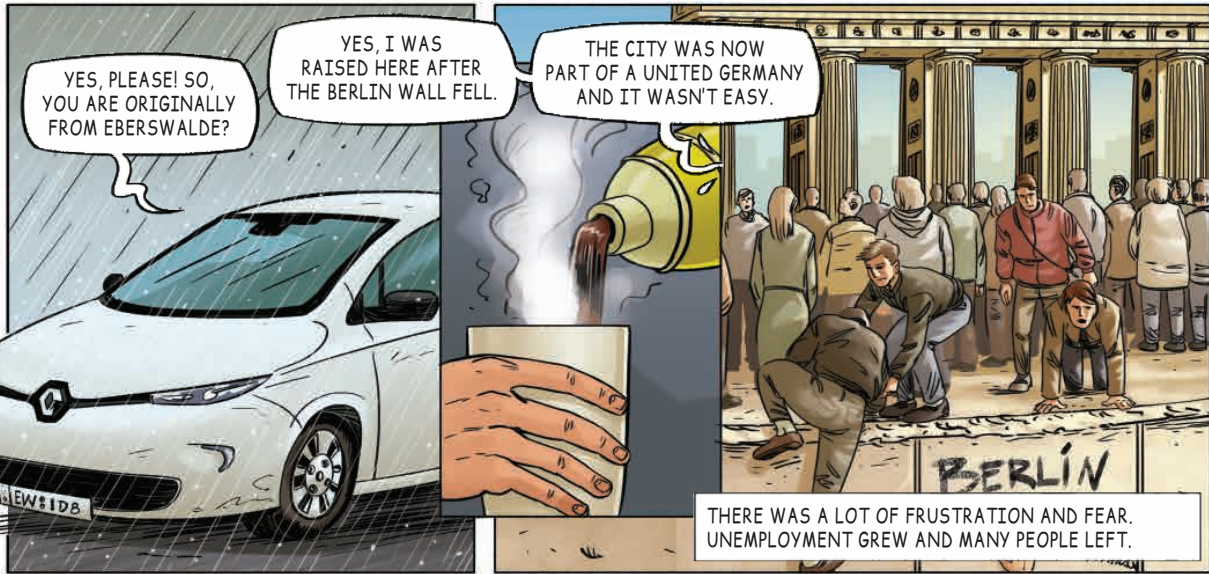
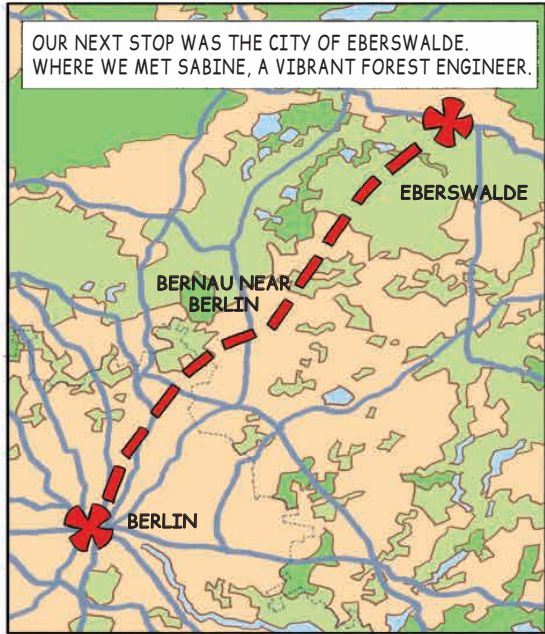
AND WHAT IS THE BIGGEST CHALLENGE OF YOUR JOB?

IT'S TO COMPENSATE FOR FLUCTUATIONS IN WIND AND SOLAR POWER WITH THE PRODUCTION OF ELECTRICITY IN POWER PLANTS.



I IMAGINE IT'S A BIT LIKE BEING A CONDUCTOR OF AN ORCHESTRA.

AN ENERGY ORCHESTRA, IN THIS CASE ...





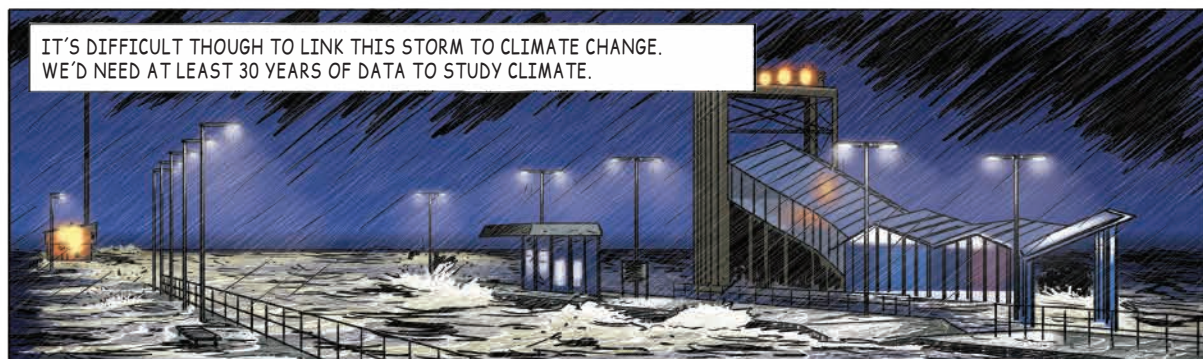
THE EDUCATION CENTER IS NOW HEATED IN PART WITH GEOTHERMAL ENERGY.

GEOTHERMAL IS THE USE OF HEAT WITHIN THE EARTH, RIGHT?

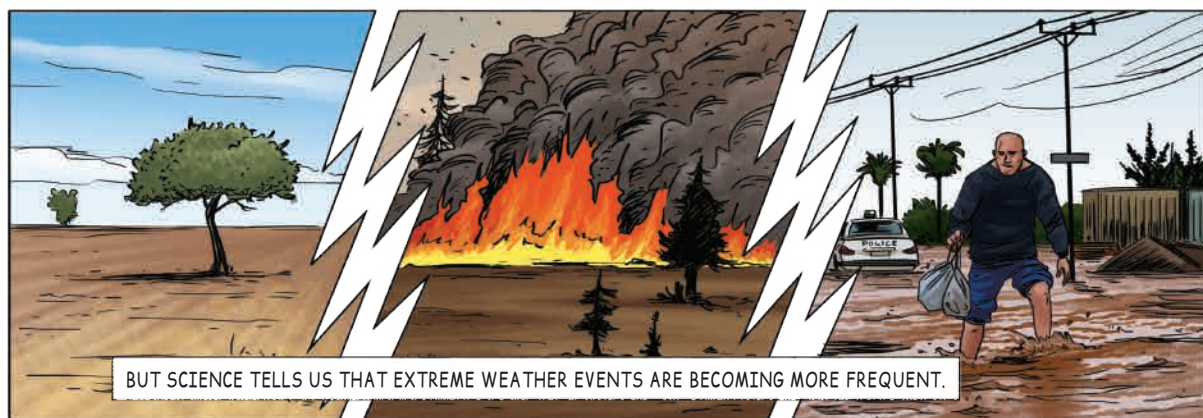
RIGHT. IN ICELAND IT'S VERY COMMON.



THIS FOREST GOT HIT BY STORM XAVIER, WHICH AFFECTED SEVERAL EUROPEAN COUNTRIES IN EARLY OCTOBER 2017.



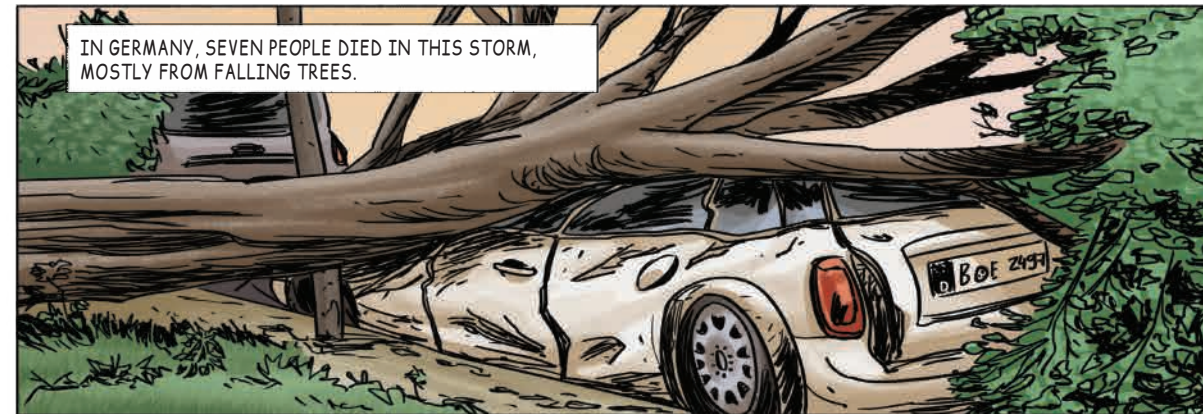
IT'S DIFFICULT THOUGH TO LINK THIS STORM TO CLIMATE CHANGE. WE'D NEED AT LEAST 30 YEARS OF DATA TO STUDY CLIMATE.



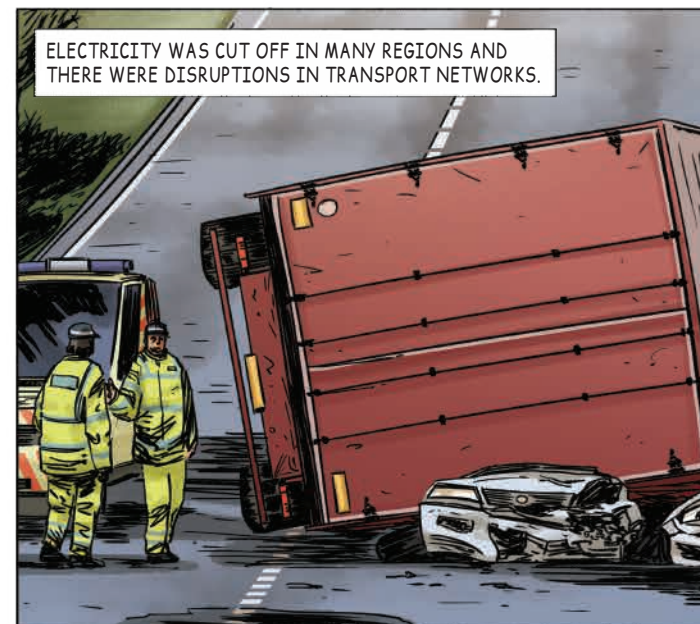
BUT SCIENCE TELLS US THAT EXTREME WEATHER EVENTS ARE BECOMING MORE FREQUENT.



DURING THIS STORM, STRONG WINDS, SOMETIMES EXCEEDING 150 KM/H, RESULTED IN DAMAGE TOTALING 324 MILLION EUROS.



IN GERMANY, SEVEN PEOPLE DIED IN THIS STORM, MOSTLY FROM FALLING TREES.



ELECTRICITY WAS CUT OFF IN MANY REGIONS AND THERE WERE DISRUPTIONS IN TRANSPORT NETWORKS.



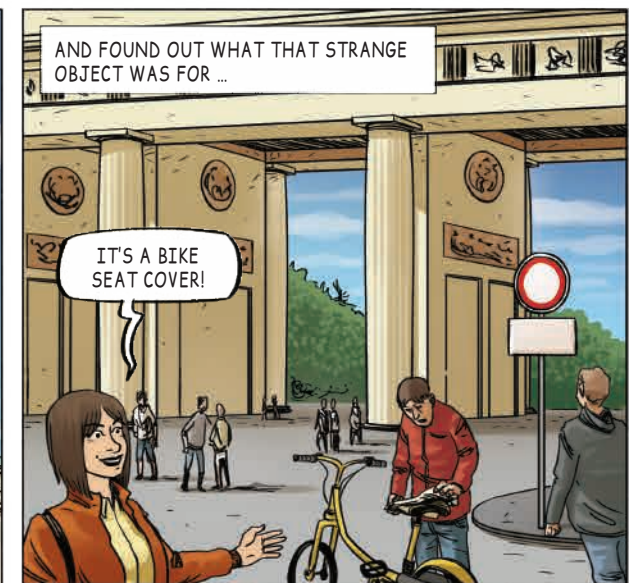
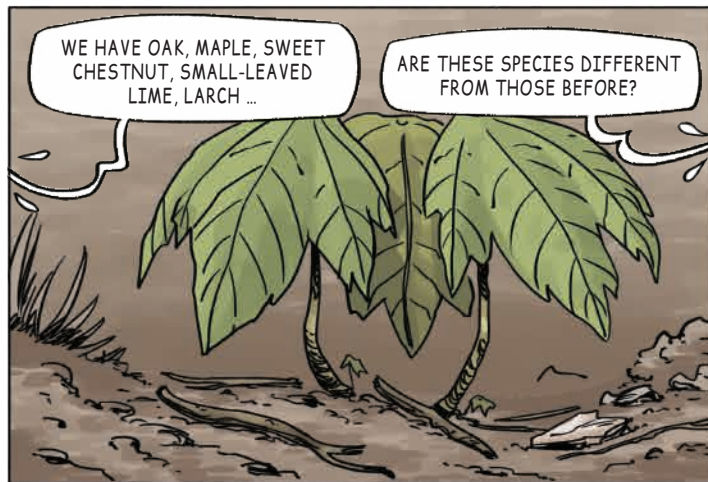
WE WERE COMING HOME WHEN I HEARD THE SOUND OF FALLING TREES IN THE FOREST.

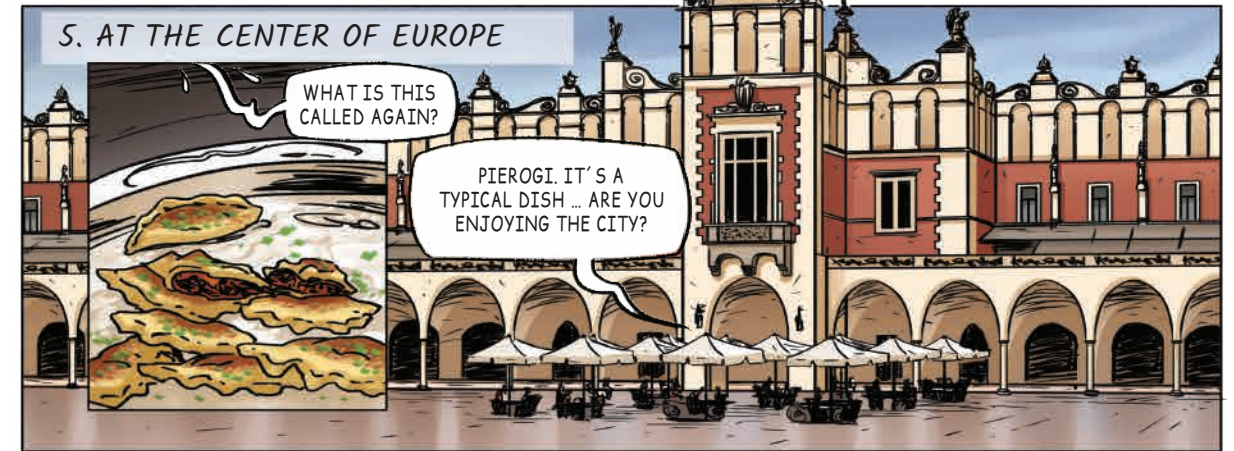


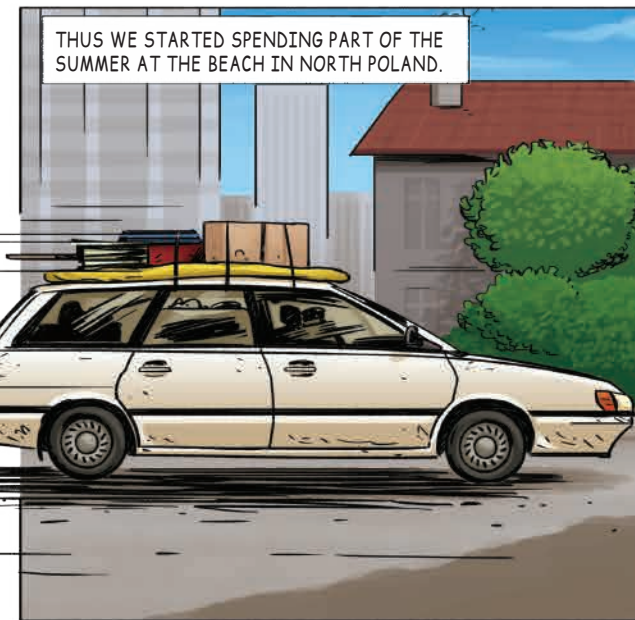
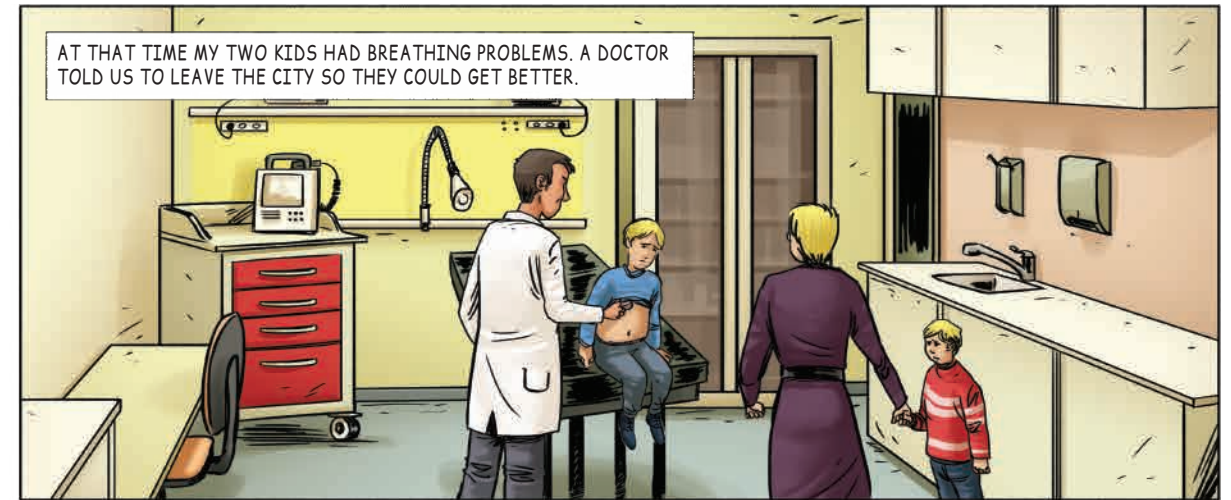
THE ROADS TO OUR VILLAGE WERE BLOCKED. BUT THE NEXT MORNING ONE OF THESE WAS CLEARED.



IN THIS CITY FOREST THE STORM LASTED ONLY ABOUT 20 MINUTES BUT AFFECTED THIS AND OTHER AREAS BADLY.



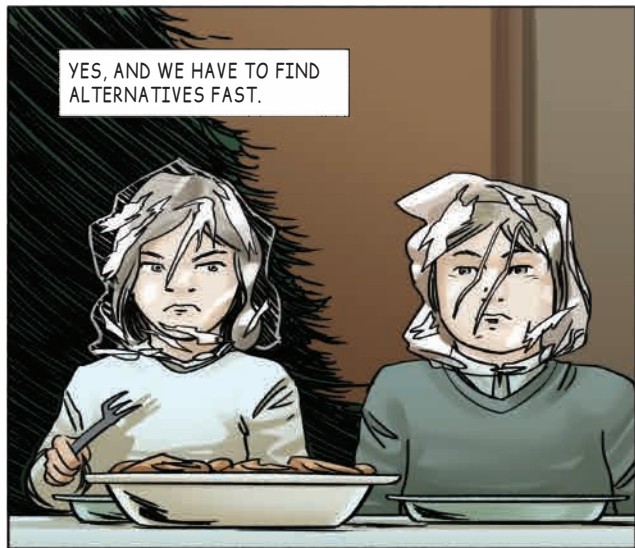






COAL IS OFTEN USED FOR HEATING AND TO PRODUCE ELECTRICITY. WE HAVE PLENTY OF IT IN POLAND!

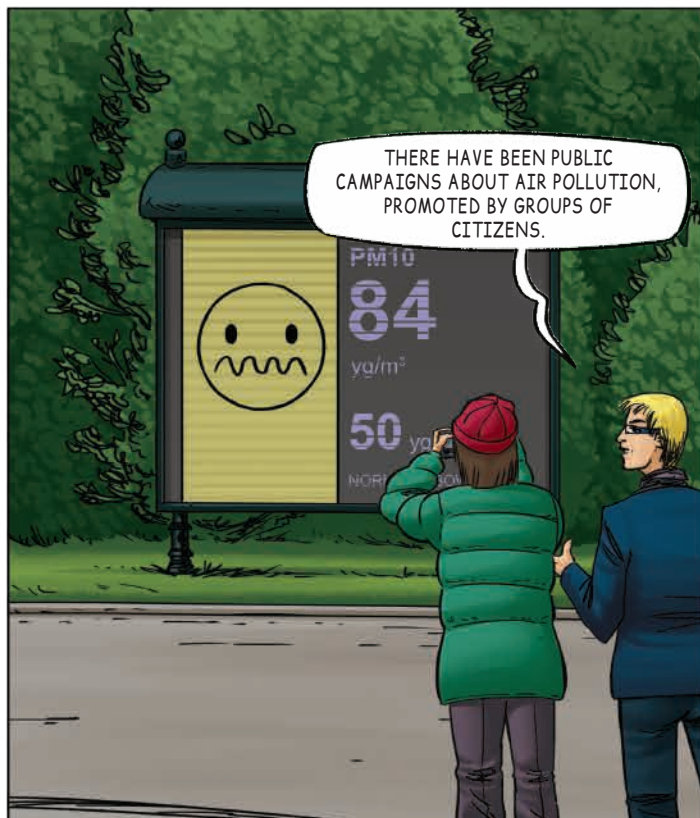
I IMAGINE THERE ARE WHOLE REGIONS OF THE COUNTRY WITH JOBS RELATED TO THE COAL INDUSTRY.



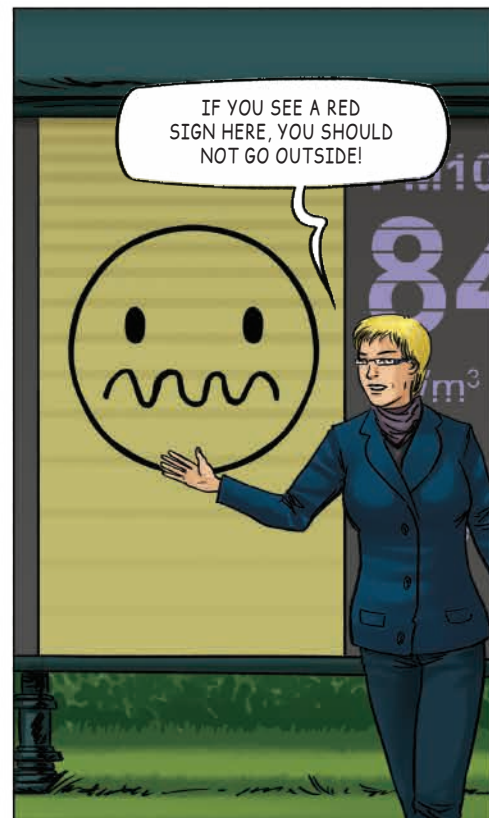
YES, AND WE HAVE TO FIND ALTERNATIVES FAST.



THIS INTENSE USE OF COAL IS ASSOCIATED WITH SERIOUS HEALTH PROBLEMS AND PREMATURE DEATHS.



THERE HAVE BEEN PUBLIC CAMPAIGNS ABOUT AIR POLLUTION, PROMOTED BY GROUPS OF CITIZENS.



IF YOU SEE A RED SIGN HERE, YOU SHOULD NOT GO OUTSIDE!



ARE THESE ACTIONS WORKING?

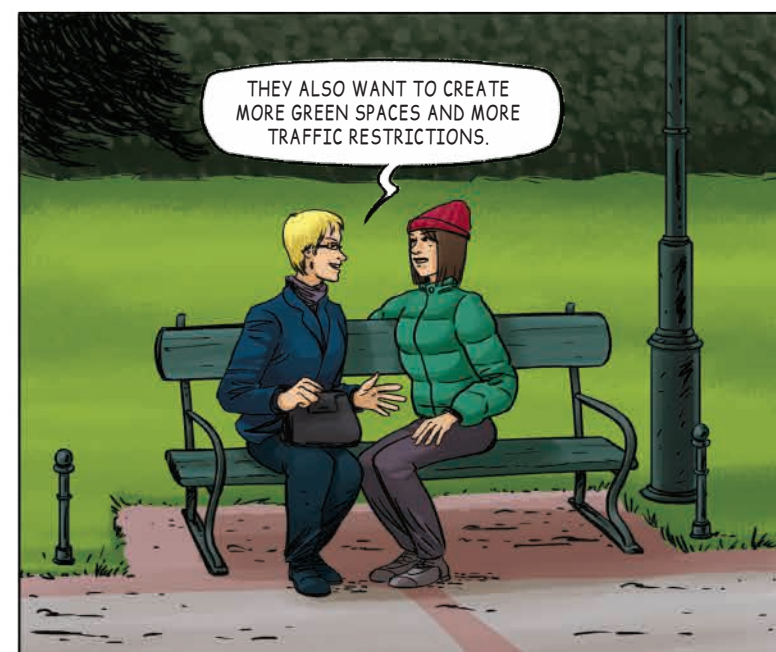
THERE IS MORE PUBLIC AWARENESS. AND SOME THINGS ARE IMPROVING ...



IN KRAKOW, FOR EXAMPLE, OLD COAL STOVES ARE BEING REPLACED BY OTHER HEATING SYSTEMS.



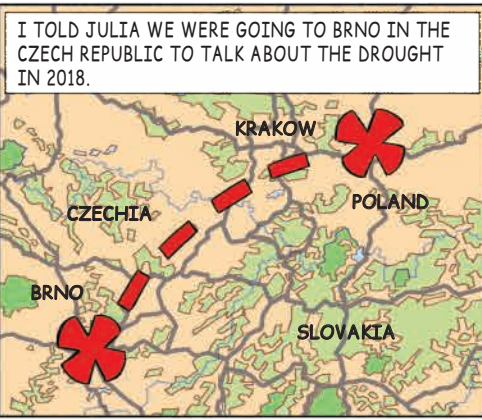
AND A STEEL COMPANY IS RECASTING SOME OF THESE OLD METAL STOVES INTO BICYCLE RACKS.



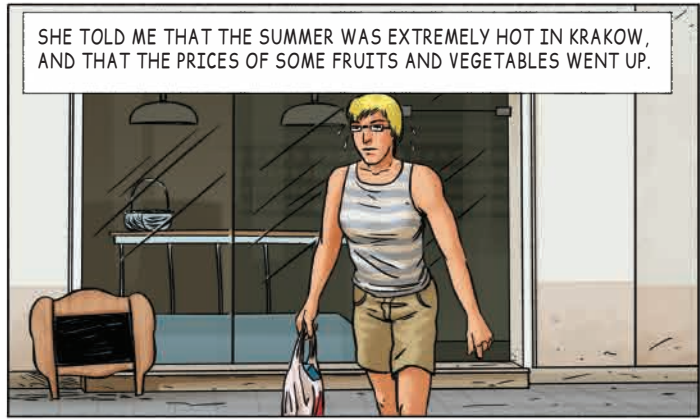
THEY ALSO WANT TO CREATE MORE GREEN SPACES AND MORE TRAFFIC RESTRICTIONS.



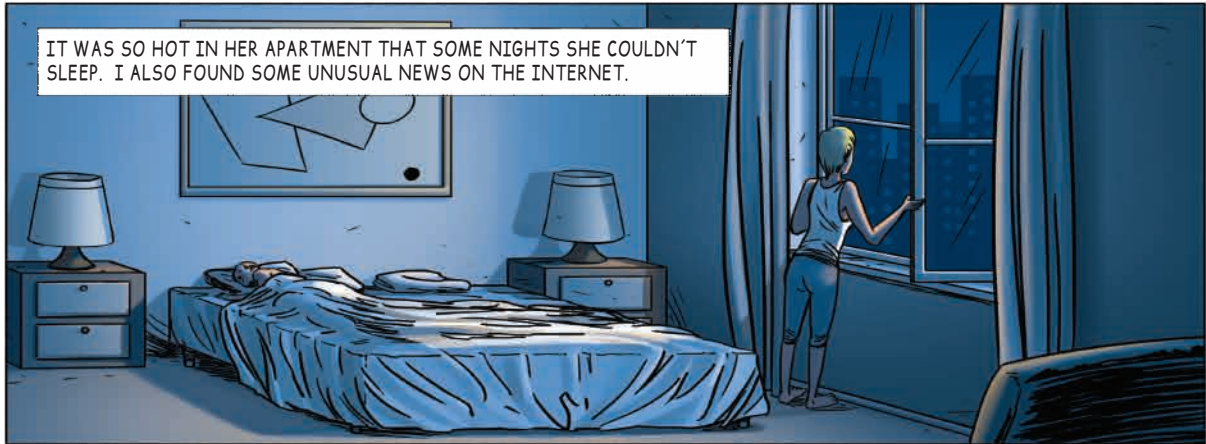
BUT I STILL WEAR THIS MASK WHEN THERE IS HEAVY SMOG. I HOPE I WON'T NEED IT SOMEDAY.



I TOLD JULIA WE WERE GOING TO BRNO IN THE CZECH REPUBLIC TO TALK ABOUT THE DROUGHT IN 2018.



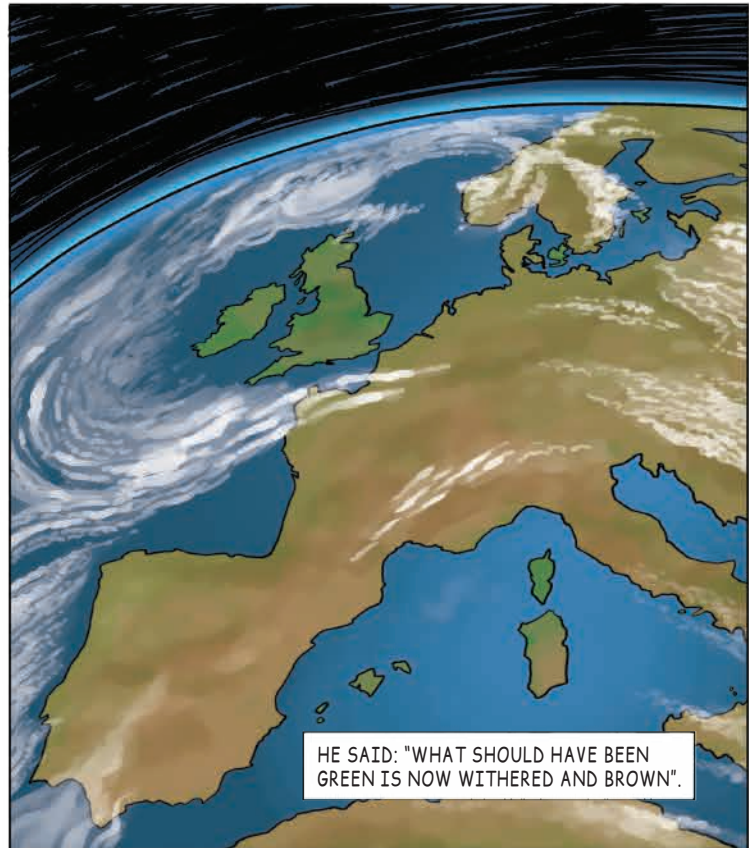
SHE TOLD ME THAT THE SUMMER WAS EXTREMELY HOT IN KRAKOW, AND THAT THE PRICES OF SOME FRUITS AND VEGETABLES WENT UP.



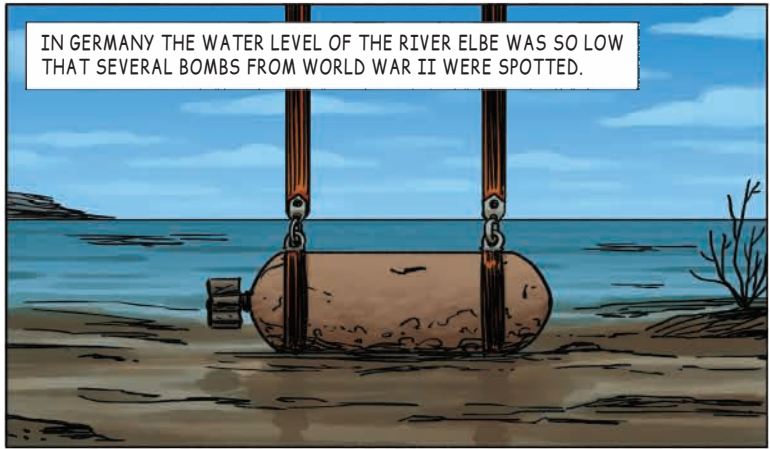
IT WAS SO HOT IN HER APARTMENT THAT SOME NIGHTS SHE COULDN'T SLEEP. I ALSO FOUND SOME UNUSUAL NEWS ON THE INTERNET.



FOR EXAMPLE, ASTRONAUT ALEXANDER GERST TOOK PICTURES OF A DRY CENTRAL EUROPE FROM THE INTERNATIONAL SPACE STATION.



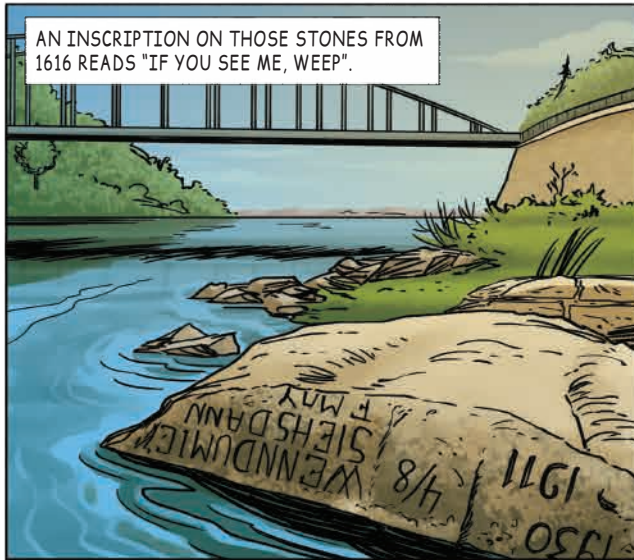
HE SAID: "WHAT SHOULD HAVE BEEN GREEN IS NOW WITHERED AND BROWN".



IN GERMANY THE WATER LEVEL OF THE RIVER ELBE WAS SO LOW THAT SEVERAL BOMBS FROM WORLD WAR II WERE SPOTTED.



IN DECIN, HERE IN THE CZECH REPUBLIC, THE "HUNGER STONES" WERE REVEALED DUE TO THE LOW WATER LEVEL.



AN INSCRIPTION ON THOSE STONES FROM 1616 READS "IF YOU SEE ME, WEEP".



IN BRNO, WE MEET PAVLINA. SHE IS A HOP PRODUCER, A PLANT USED IN BEER BREWING.

WOW, THE COFFEE CUPS ARE RE-USABLE!



I'LL GET YOU A COFFEE!

MY HUSBAND IS STUCK IN A MEETING. I LIKE THIS PLACE YOU PICKED!

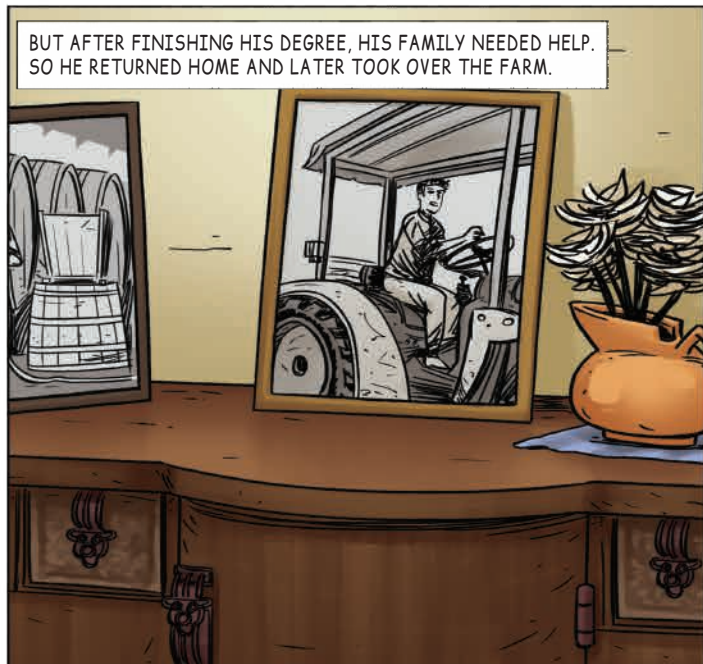
IT SEEMED APPROPRIATE TO MEET AT THE VEGETABLE MARKET.



MY HUSBAND GREW UP ON A FARM ABOUT 100 KILOMETERS FROM BRNO.



HIS PARENTS AND GRANDPARENTS HAD BEEN HOP GROWERS. HE WANTED TO DO SOMETHING DIFFERENT, SO HE STUDIED FORESTRY.

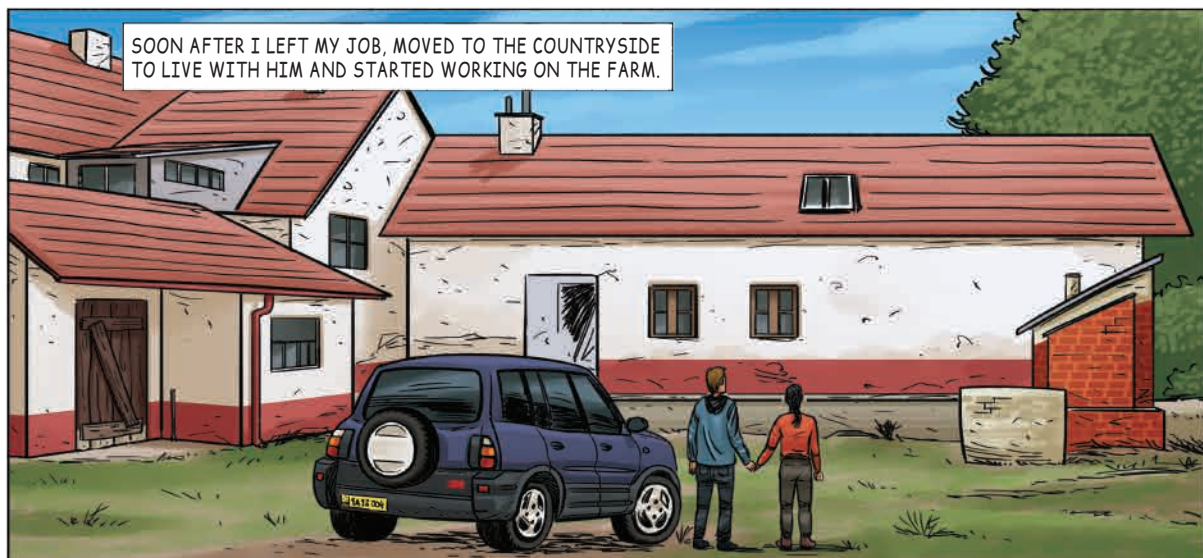


BUT AFTER FINISHING HIS DEGREE, HIS FAMILY NEEDED HELP. SO HE RETURNED HOME AND LATER TOOK OVER THE FARM.



AND HOW DID YOU ENTER THE STORY?

I STUDIED AGRICULTURE, AND THEN GOT A JOB HERE IN THE BEER INDUSTRY. THAT'S WHERE WE MET.



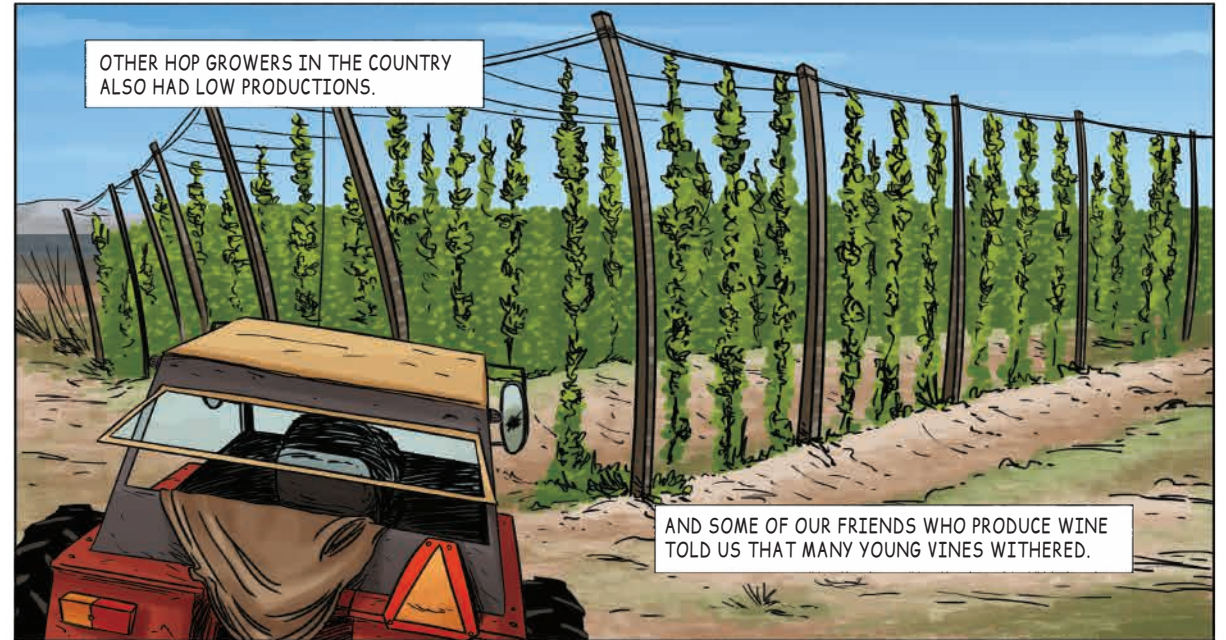
SOON AFTER I LEFT MY JOB, MOVED TO THE COUNTRYSIDE TO LIVE WITH HIM AND STARTED WORKING ON THE FARM.



I ALSO BEGAN TO RAISE CHICKENS. NOW, WE ALWAYS HAVE FRESH EGGS!

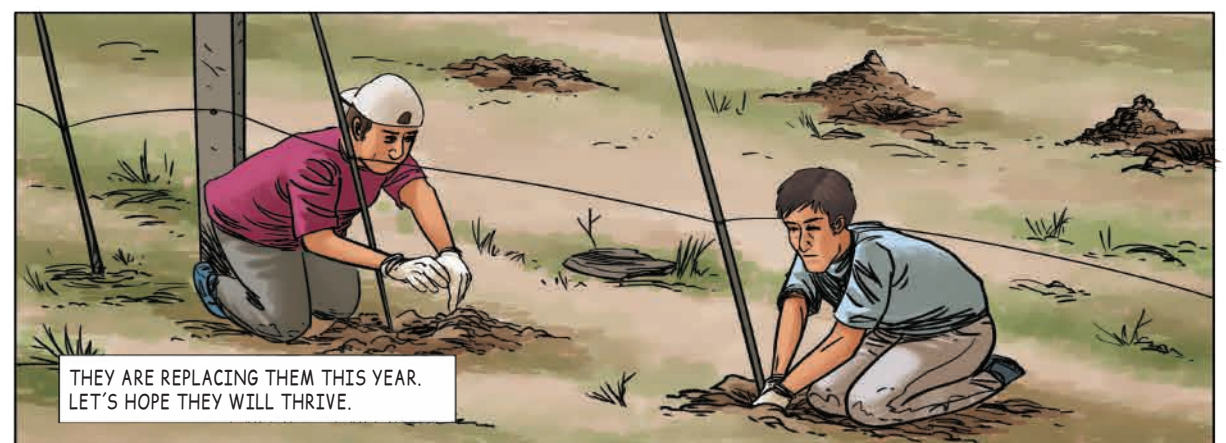


THE DROUGHT OF 2018 AFFECTED US, BECAUSE THE HOP HARVEST WAS LOWER THAN USUAL.



OTHER HOP GROWERS IN THE COUNTRY ALSO HAD LOW PRODUCTIONS.

AND SOME OF OUR FRIENDS WHO PRODUCE WINE TOLD US THAT MANY YOUNG VINES WITHERED.



THEY ARE REPLACING THEM THIS YEAR. LET'S HOPE THEY WILL THRIVE.



ARE THERE MORE EFFECTS OF THIS DROUGHT?

I RECALL THAT CROPS LIKE MAIZE AND POTATOES DIDN'T DO SO WELL ...



SOME FARMERS TOOK OUT MONEY LOANS TO COPE WITH LOSSES. OTHERS HAD TROUBLE IN FEEDING THEIR ANIMALS.



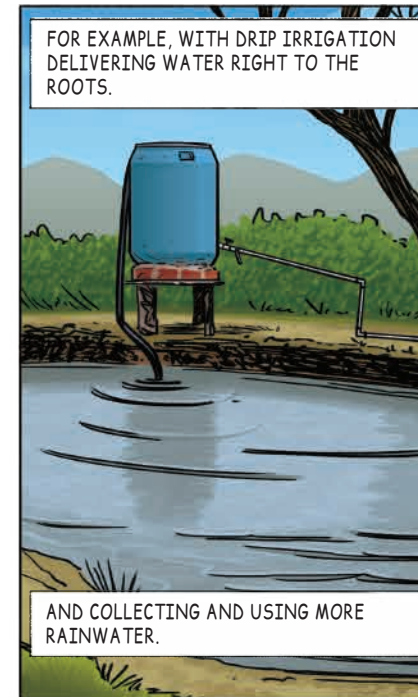
LET'S TAKE A LOOK AROUND THE MARKET!

GOOD IDEA! ALL THIS TALK ABOUT FOOD IS MAKING ME HUNGRY!



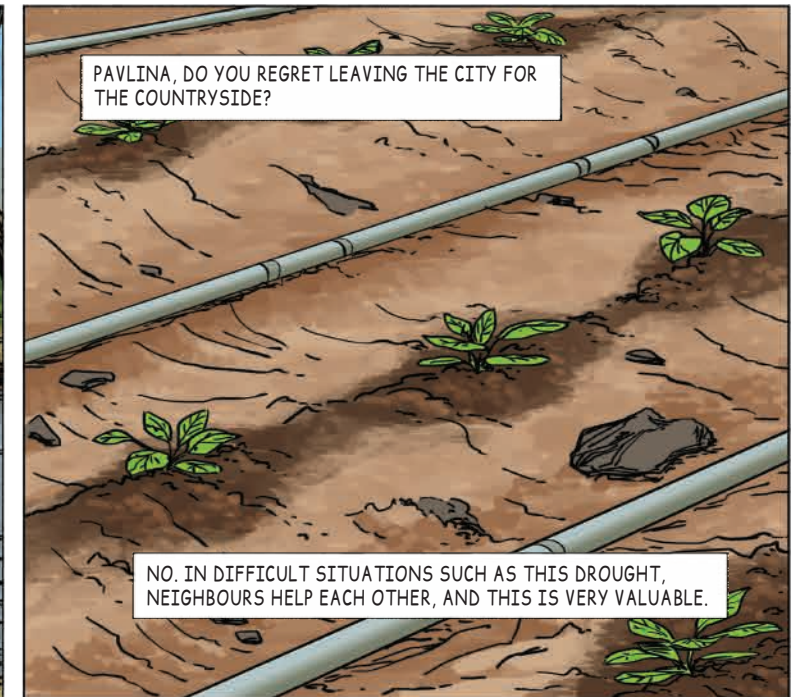
MAYBE IN THE FUTURE, WE'LL FIND NEW VARIETIES OF PLANTS THAT NEED LESS WATER.

YES. AND I'M SURE THE METHODS OF AGRICULTURAL PRODUCTION WILL ALSO CHANGE.



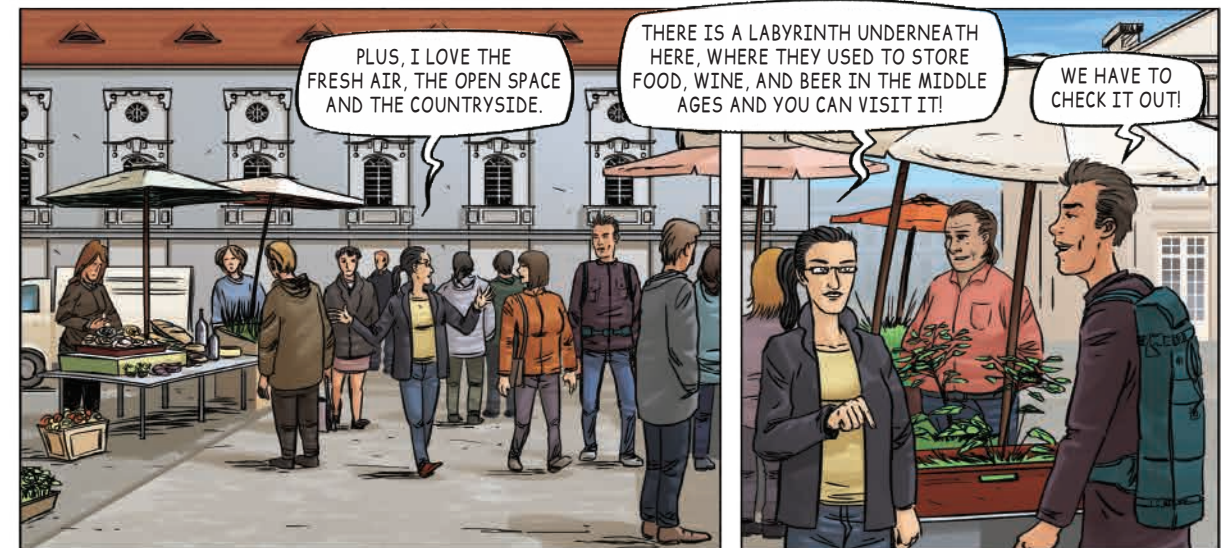
FOR EXAMPLE, WITH DRIP IRRIGATION DELIVERING WATER RIGHT TO THE ROOTS.

AND COLLECTING AND USING MORE RAINWATER.



PAVLINA, DO YOU REGRET LEAVING THE CITY FOR THE COUNTRYSIDE?

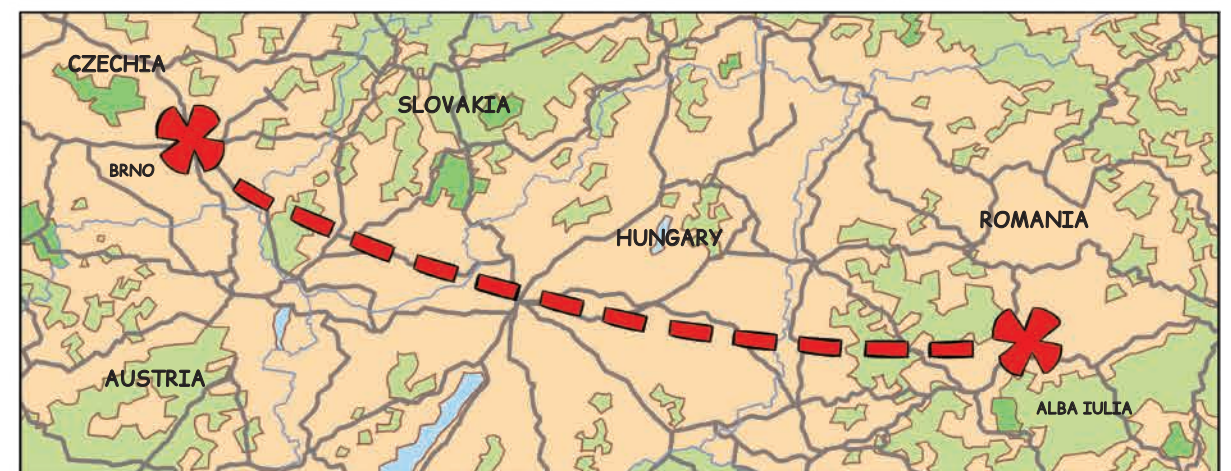
NO. IN DIFFICULT SITUATIONS SUCH AS THIS DROUGHT, NEIGHBOURS HELP EACH OTHER, AND THIS IS VERY VALUABLE.



PLUS, I LOVE THE FRESH AIR, THE OPEN SPACE AND THE COUNTRYSIDE.

THERE IS A LABYRINTH UNDERNEATH HERE, WHERE THEY USED TO STORE FOOD, WINE, AND BEER IN THE MIDDLE AGES AND YOU CAN VISIT IT!

WE HAVE TO CHECK IT OUT!



6. SHARING STORIES



AFTER CZECHIA WE TRAVELLED TO THE CITY OF ALBA IULIA IN ROMANIA.



HELLO, THERE. THIS IS THE HOTEL TRANSYLVANIA, RIGHT? WE ARE LOOKING FOR DRACULA!

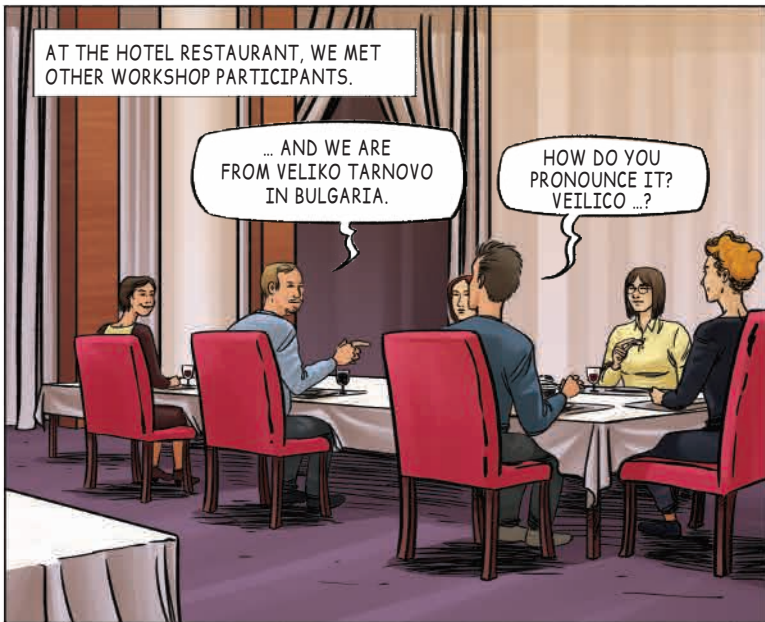
HA, HA, THAT'S FUNNY! HE IS BUSY RIGHT NOW, BUT YOU CAN LEAVE A MESSAGE.

DON'T MIND MY BROTHER. OUR NAMES ARE SOFIA AND GABRIEL LOPES.



OK. CAN I SEE YOUR ID-CARDS?

SURE!



AT THE HOTEL RESTAURANT, WE MET OTHER WORKSHOP PARTICIPANTS.

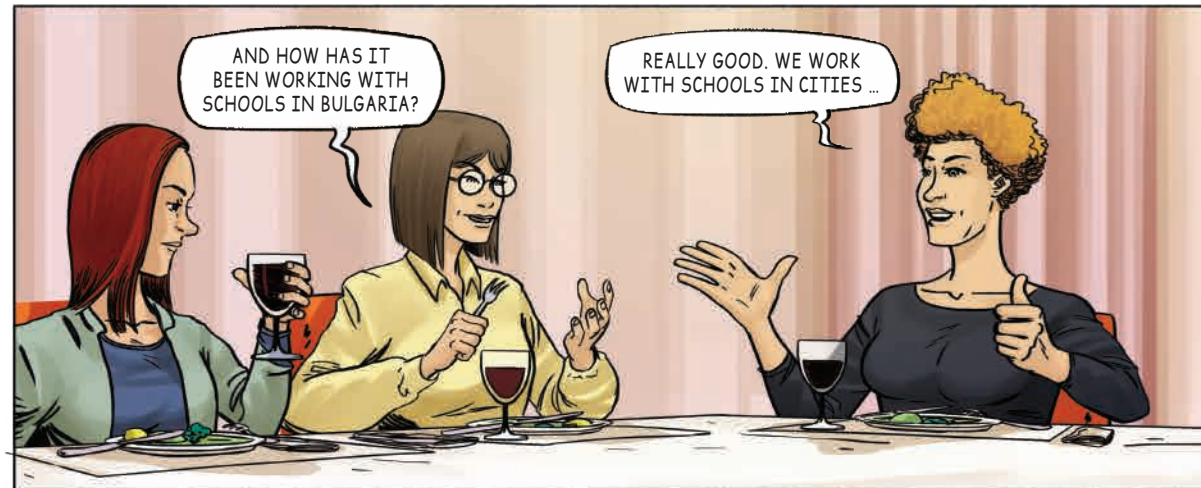
... AND WE ARE FROM VELIKO TARNOVO IN BULGARIA.

HOW DO YOU PRONOUNCE IT? VEILICO ...?



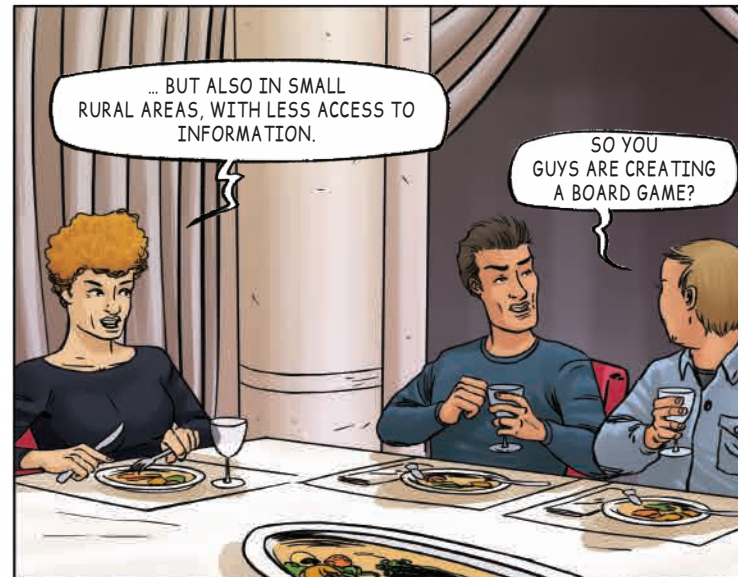
VELIKO TARNOVO! IT'S A MEDIEVAL CITY, WITH A NICE FORTRESS.

I LOVE FORTRESSES. I SHOULD VISIT SOMETIME.



AND HOW HAS IT BEEN WORKING WITH SCHOOLS IN BULGARIA?

REALLY GOOD. WE WORK WITH SCHOOLS IN CITIES ...



... BUT ALSO IN SMALL RURAL AREAS, WITH LESS ACCESS TO INFORMATION.

SO YOU GUYS ARE CREATING A BOARD GAME?

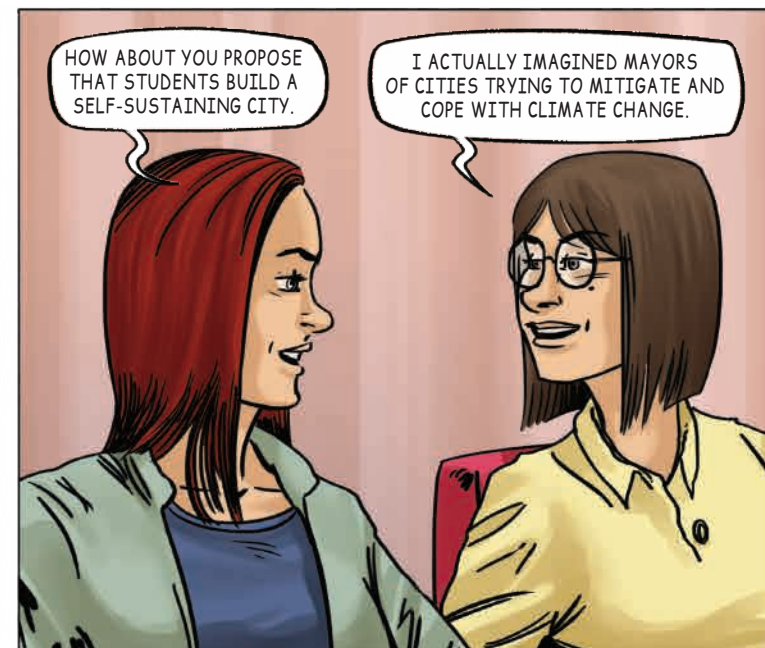


HOW DOES IT WORK? THE GAME, I MEAN!

I'M STILL THINKING ABOUT IT. MAYBE YOU HAVE SOME IDEAS?



I DON'T KNOW. A QUIZ GAME ON CLIMATE CHANGE?

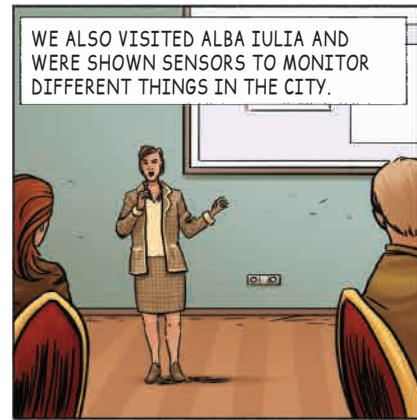


HOW ABOUT YOU PROPOSE THAT STUDENTS BUILD A SELF-SUSTAINING CITY.

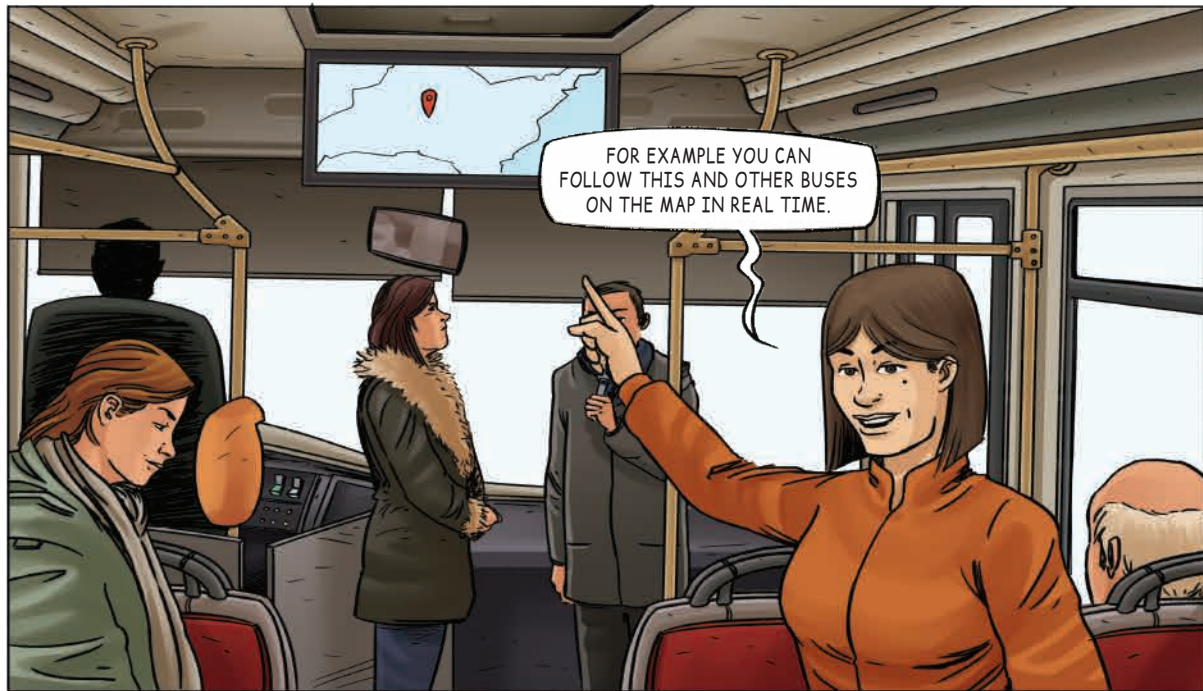
I ACTUALLY IMAGINED MAYORS OF CITIES TRYING TO MITIGATE AND COPE WITH CLIMATE CHANGE.



THIS EXCHANGE CONTINUED OVER THE NEXT TWO DAYS.



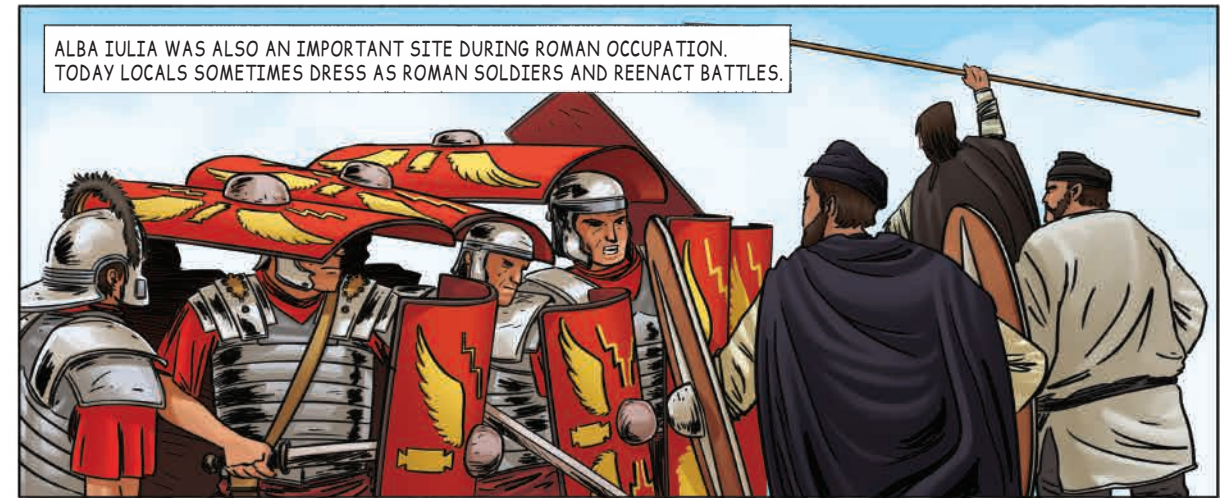
WE ALSO VISITED ALBA IULIA AND WERE SHOWN SENSORS TO MONITOR DIFFERENT THINGS IN THE CITY.



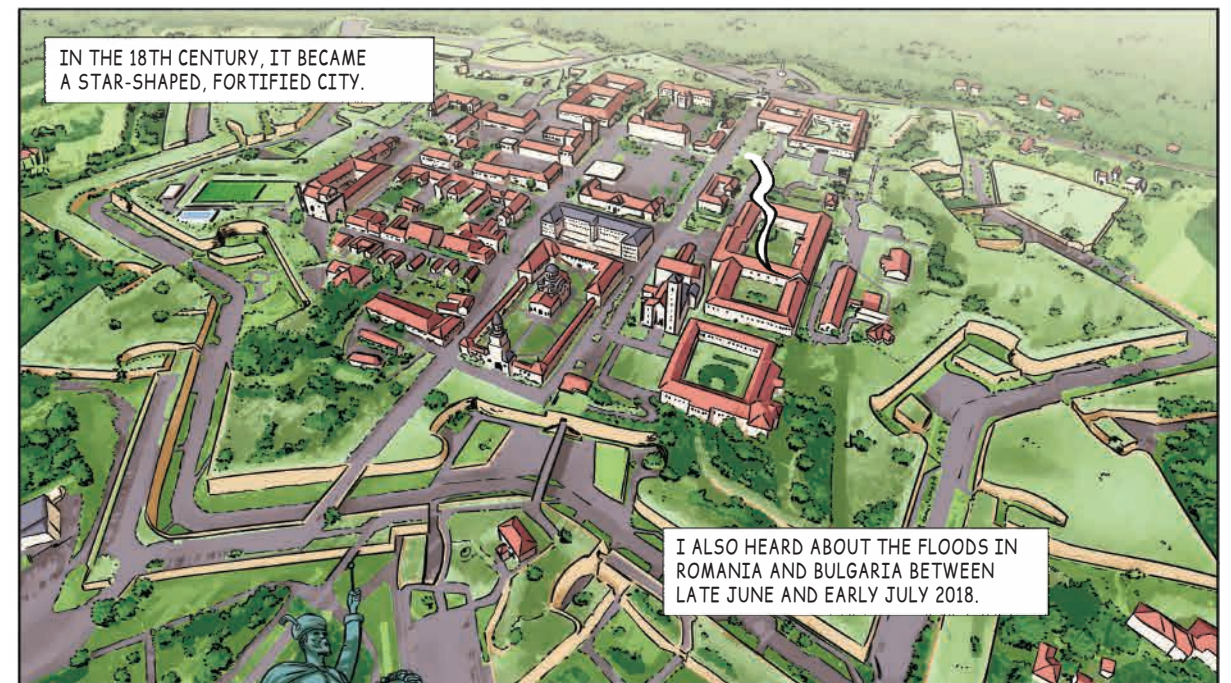
FOR EXAMPLE YOU CAN FOLLOW THIS AND OTHER BUSES ON THE MAP IN REAL TIME.



AND SIMULTANEOUSLY CHECK THE TRAFFIC AND AIR POLLUTION LEVELS ONLINE.



ALBA IULIA WAS ALSO AN IMPORTANT SITE DURING ROMAN OCCUPATION. TODAY LOCALS SOMETIMES DRESS AS ROMAN SOLDIERS AND REENACT BATTLES.

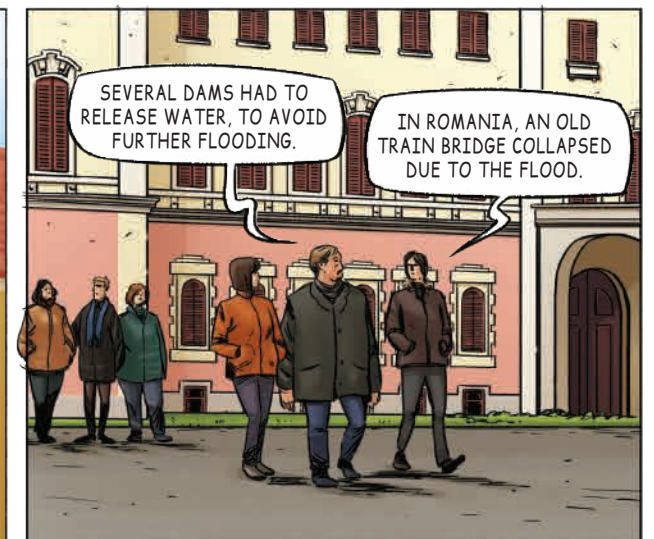


IN THE 18TH CENTURY, IT BECAME A STAR-SHAPED, FORTIFIED CITY.

I ALSO HEARD ABOUT THE FLOODS IN ROMANIA AND BULGARIA BETWEEN LATE JUNE AND EARLY JULY 2018.



IN BULGARIA, MORE THAN 100 HOUSES WERE AFFECTED.



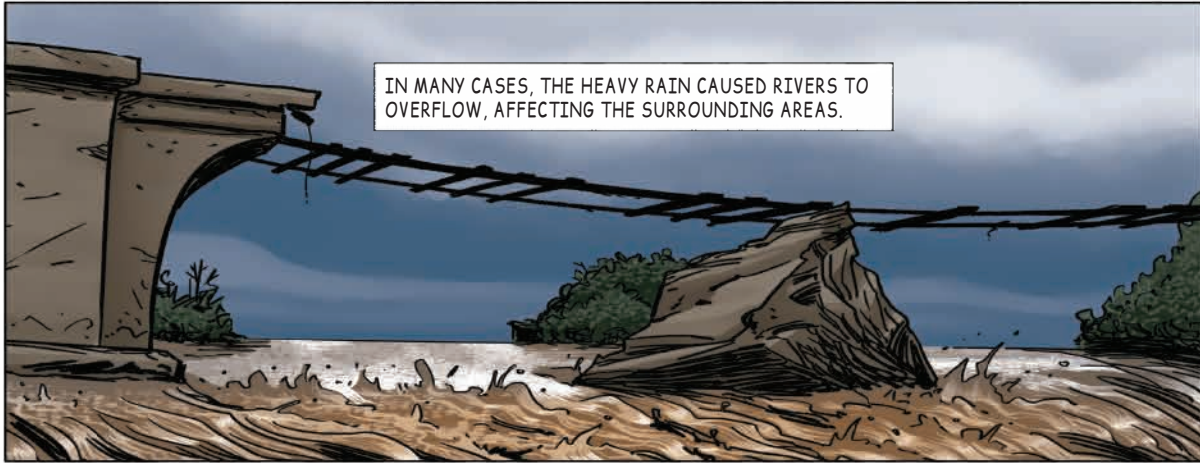
SEVERAL DAMS HAD TO RELEASE WATER, TO AVOID FURTHER FLOODING.

IN ROMANIA, AN OLD TRAIN BRIDGE COLLAPSED DUE TO THE FLOOD.

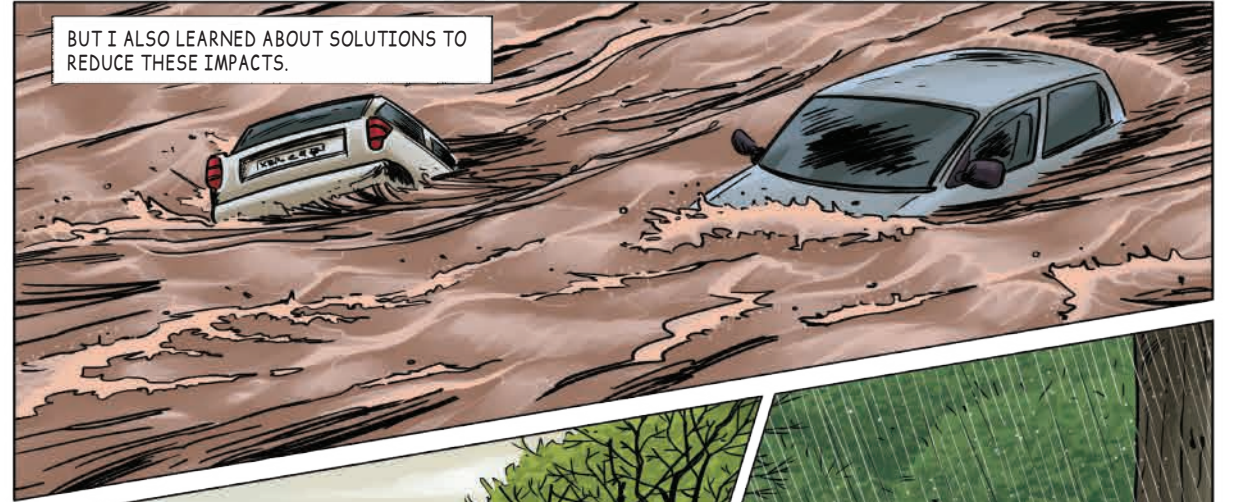
FORTUNATELY, NOBODY GOT HURT. THERE IS A VIDEO ABOUT IT ON THE INTERNET, YOU CAN WATCH IT HAPPENING.



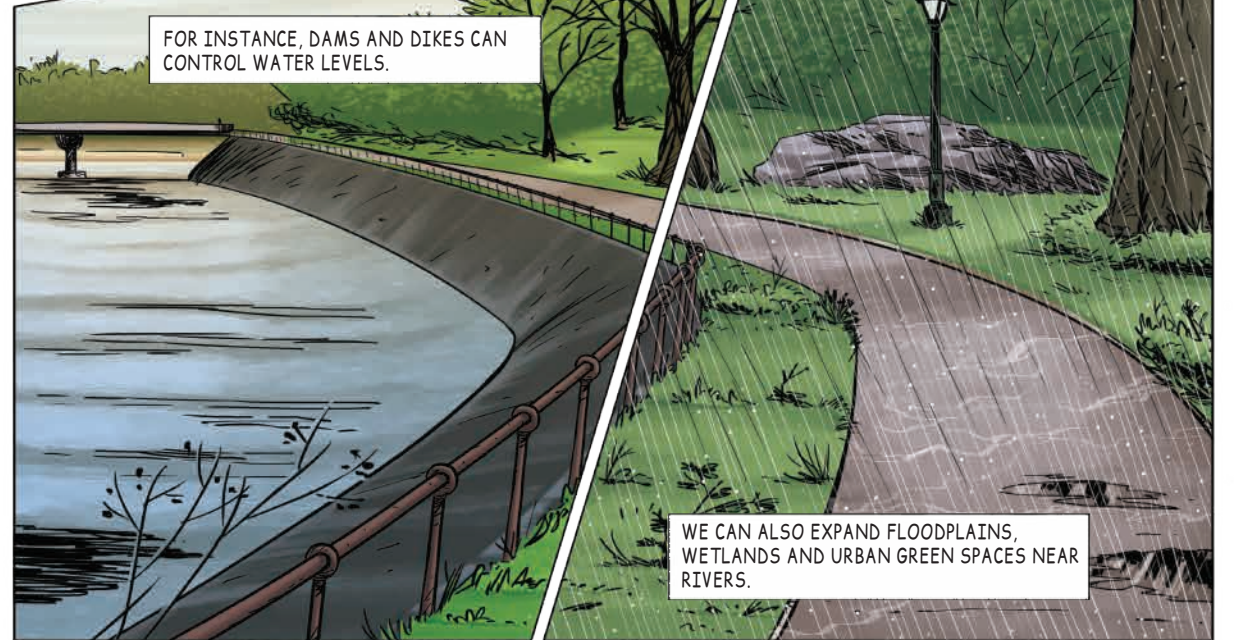
IN MANY CASES, THE HEAVY RAIN CAUSED RIVERS TO OVERFLOW, AFFECTING THE SURROUNDING AREAS.



BUT I ALSO LEARNED ABOUT SOLUTIONS TO REDUCE THESE IMPACTS.

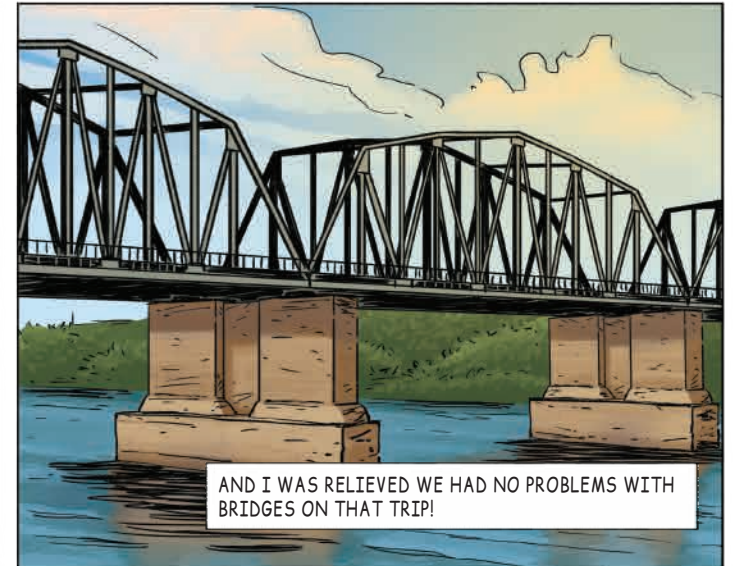
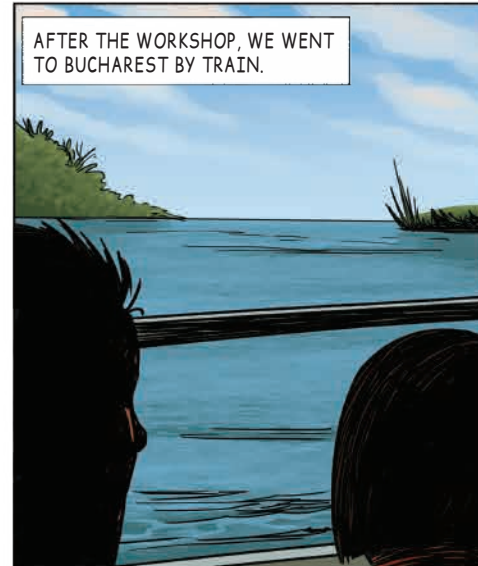


FOR INSTANCE, DAMS AND DIKES CAN CONTROL WATER LEVELS.

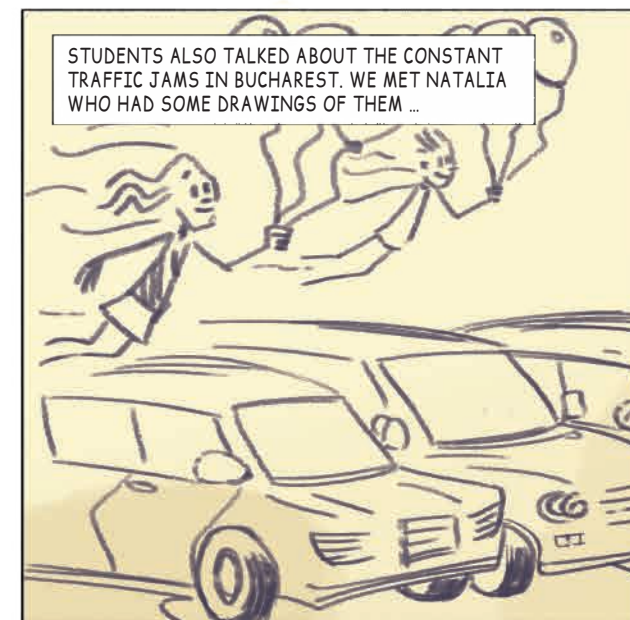
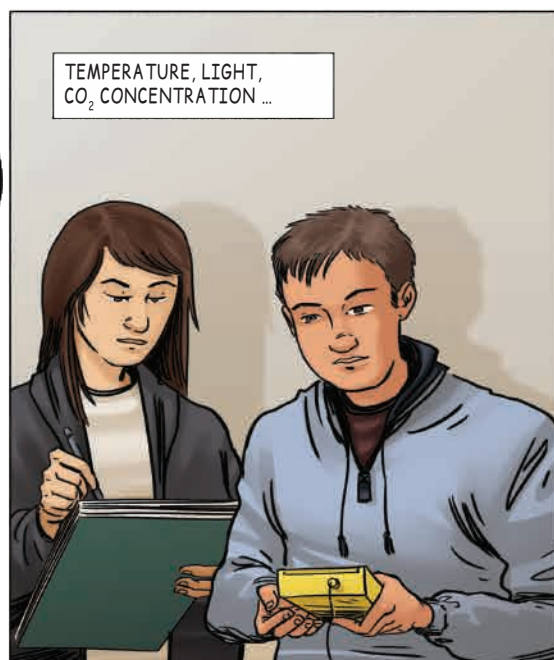
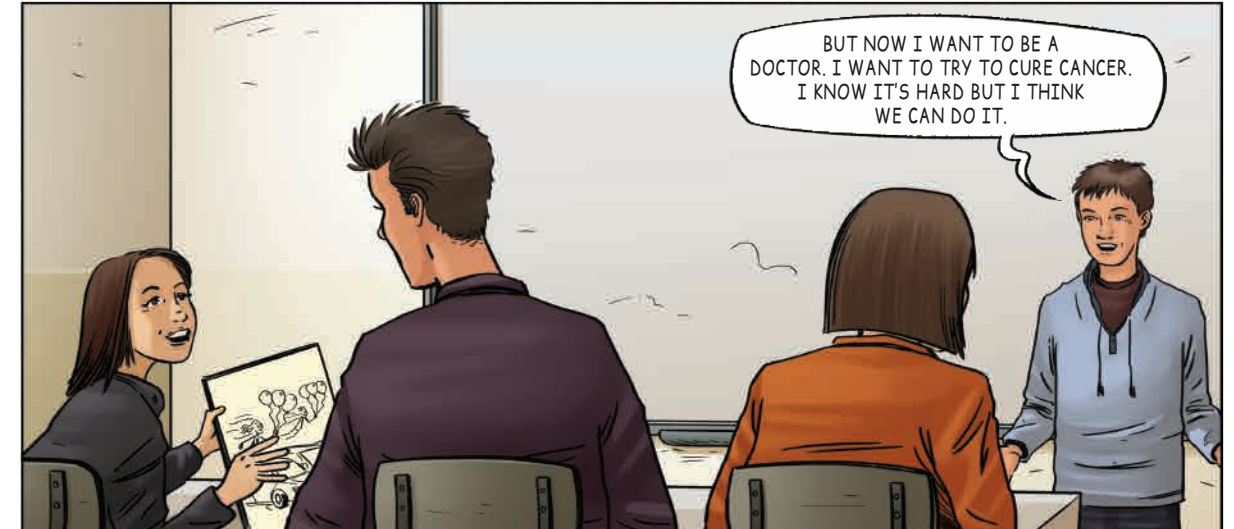
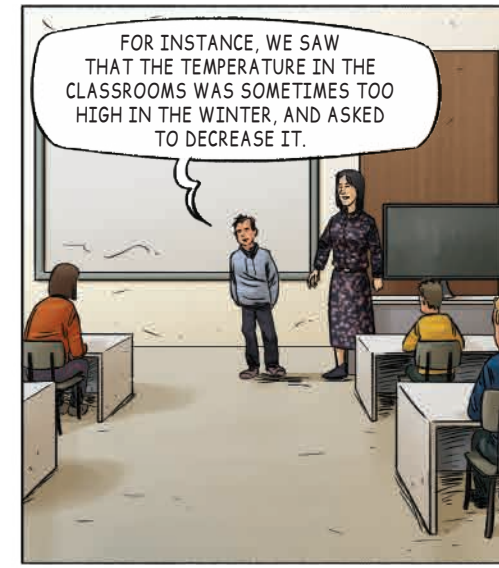
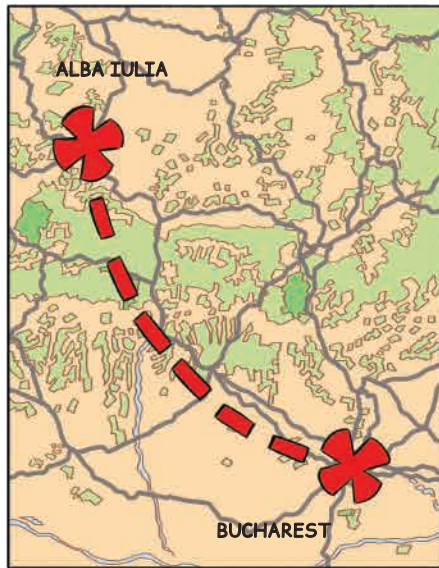


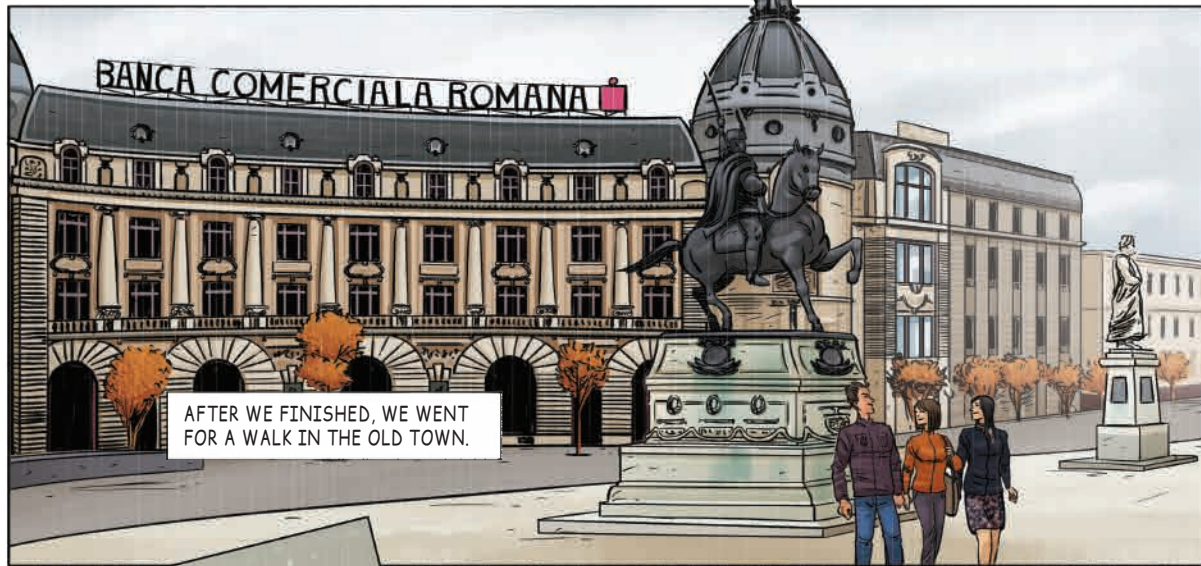
WE CAN ALSO EXPAND FLOODPLAINS, WETLANDS AND URBAN GREEN SPACES NEAR RIVERS.

AFTER THE WORKSHOP, WE WENT TO BUCHAREST BY TRAIN.



AND I WAS RELIEVED WE HAD NO PROBLEMS WITH BRIDGES ON THAT TRIP!





AFTER WE FINISHED, WE WENT FOR A WALK IN THE OLD TOWN.



THE GROUND WAS WET AND I SLIPPED.

IN THE HOSPITAL, THEY TOLD US I HAD SPRAINED MY ANKLE.



ANYWAY, I WOULD LIKE TO VISIT THE VILLAGE OF MATI IN GREECE BEFORE WE GO BACK HOME.

ARE YOU SURE?
YES. IT'S JUST ONE MORE STOP!



FINE BY ME. BUT IF WE MISS THE TRAIN BECAUSE OF YOUR ANKLE, YOU'RE BUYING LUNCH!

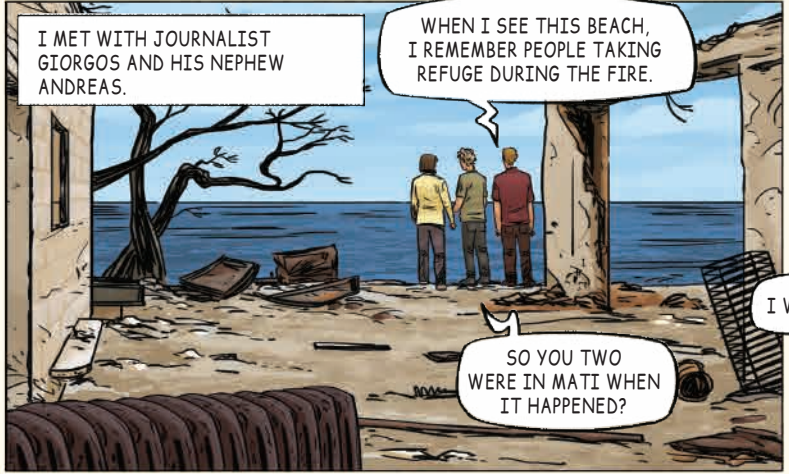


7. THE LAST STRETCH

WHEN WE ARRIVED IN ATHENS, GABRIEL WAS FEELING EXHAUSTED. SO, I WENT ALONE TO MATI.



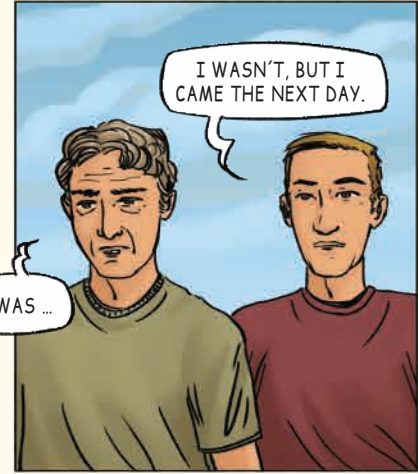
THIS VILLAGE BY THE SEA IS ABOUT 30 KILOMETERS FROM ATHENS, AND WAS HEAVILY AFFECTED BY THE FIRES OF 23 JULY 2018.



I MET WITH JOURNALIST GIORGOS AND HIS NEPHEW ANDREAS.

WHEN I SEE THIS BEACH, I REMEMBER PEOPLE TAKING REFUGE DURING THE FIRE.

SO YOU TWO WERE IN MATI WHEN IT HAPPENED?

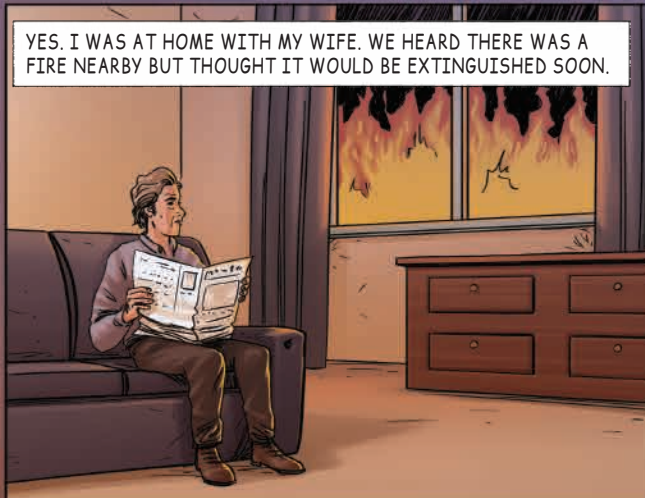


I WASN'T, BUT I CAME THE NEXT DAY.

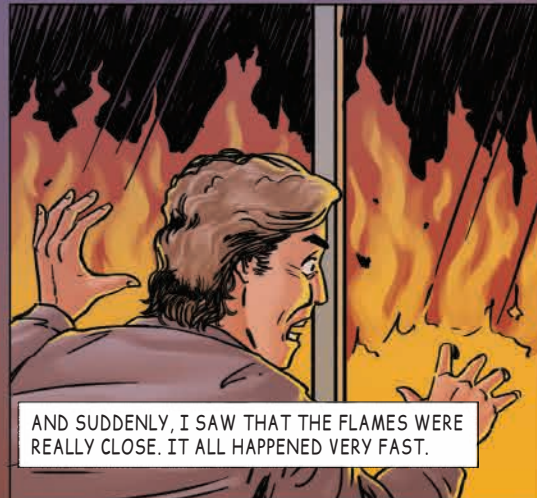
I WAS ...



GIORGOS, CAN YOU TELL ME BRIEFLY WHAT HAPPENED TO YOU THAT DAY?



YES. I WAS AT HOME WITH MY WIFE. WE HEARD THERE WAS A FIRE NEARBY BUT THOUGHT IT WOULD BE EXTINGUISHED SOON.



AND SUDDENLY, I SAW THAT THE FLAMES WERE REALLY CLOSE. IT ALL HAPPENED VERY FAST.



SO WE DECIDED TO RUN.



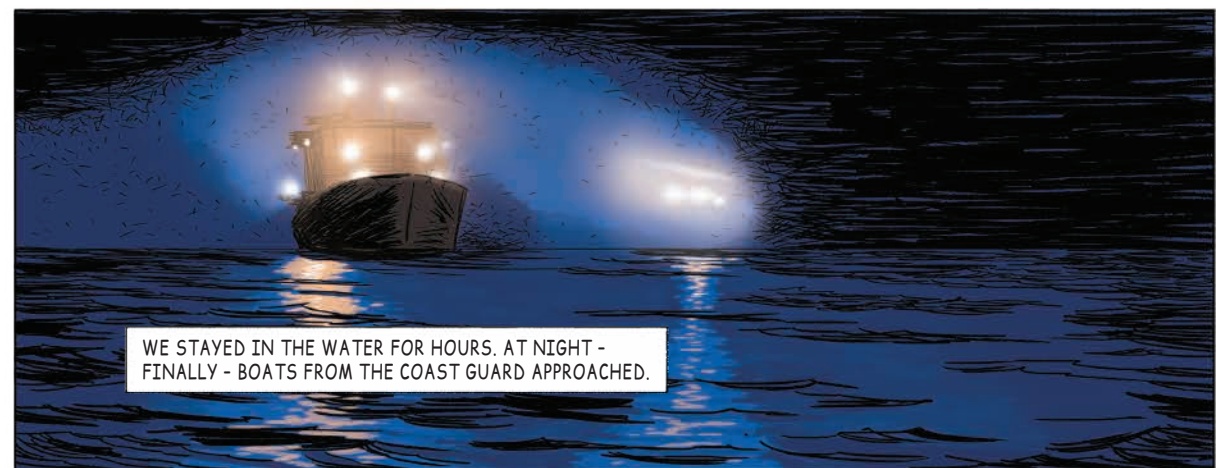
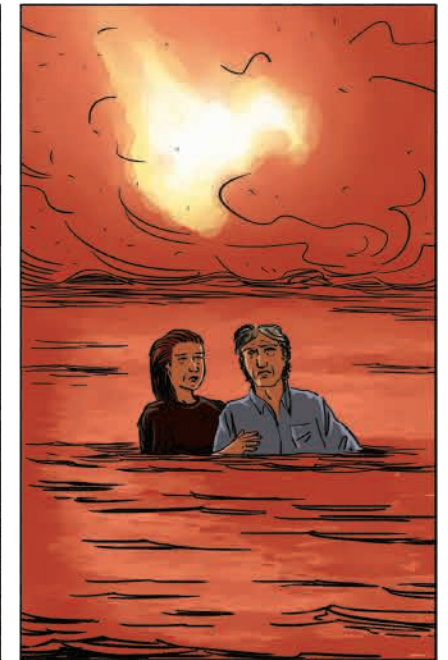
WHEN WE GOT OUT, THERE WAS THICK SMOKE AND WIND. WE RAN TOWARDS THE SEA.



THE FLAMES WERE CHASING US AND SCORCHING OUR BACKS!



AFTER QUITE A WHILE, WE MADE IT TO THE BEACH.



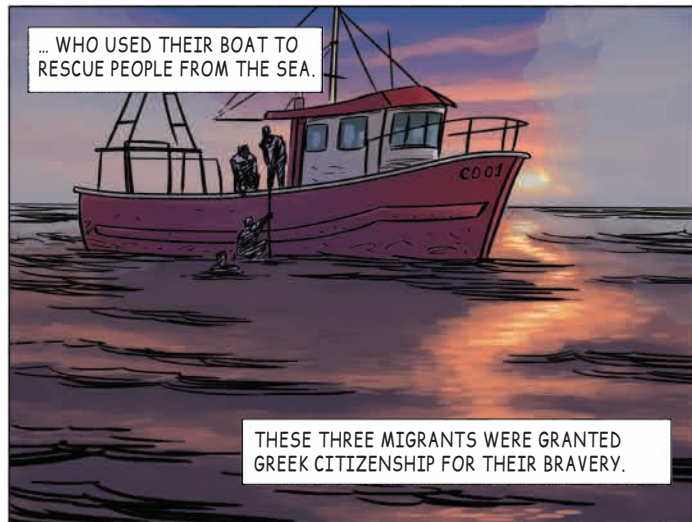
WE STAYED IN THE WATER FOR HOURS. AT NIGHT - FINALLY - BOATS FROM THE COAST GUARD APPROACHED.



LUCKILY OUR HOUSE HAD LITTLE DAMAGE AND WE COULD RETURN THE NEXT DAY.



WE HEARD ABOUT ONE ALBANIAN AND TWO EGYPTIAN FISHERMEN ...



... WHO USED THEIR BOAT TO RESCUE PEOPLE FROM THE SEA.

THESE THREE MIGRANTS WERE GRANTED GREEK CITIZENSHIP FOR THEIR BRAVERY.



WHAT ABOUT YOU, ANDREAS?

I CAME THE NEXT DAY, TO CHECK OUR HOUSE. THERE WAS HARDLY ANY DAMAGE.



BUT THE SURROUNDING WAS LIKE A WAR ZONE, BURNED CARS, PEOPLE EXAMINING THEIR HOUSES, A TOTAL FEELING OF DISORIENTATION.



AND THE STENCH WAS REALLY STRONG. A MIXTURE OF BURNT WIRE, METAL, ASPHALT, WOOD ...



GREEK AUTHORITIES SUCH AS CIVIL PROTECTION, POLICE AND FIRE SERVICE WERE NOT PREPARED FOR WHAT HAPPENED.

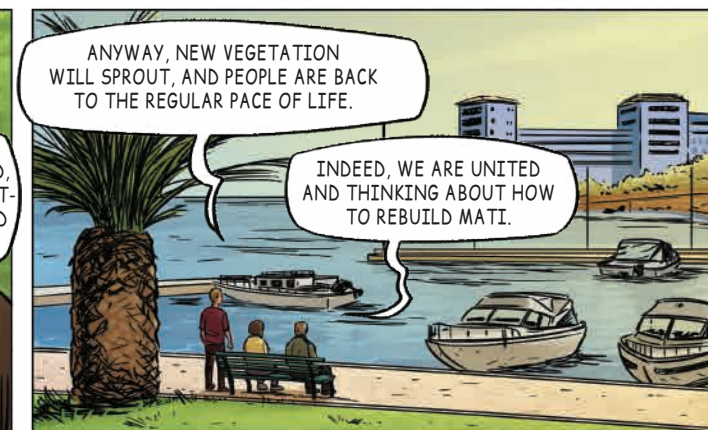


WE CANNOT LET THAT HAPPEN AGAIN.



DID YOU HEAR THAT THE GREEK GOVERNMENT IS ALLOWING NEW OIL AND GAS WELLS?

THE PORTUGUESE GOVERNMENT ALSO TRIED, BUT MANY PEOPLE PROTESTED, AND THE PROCESS DID NOT MOVE FORWARD.

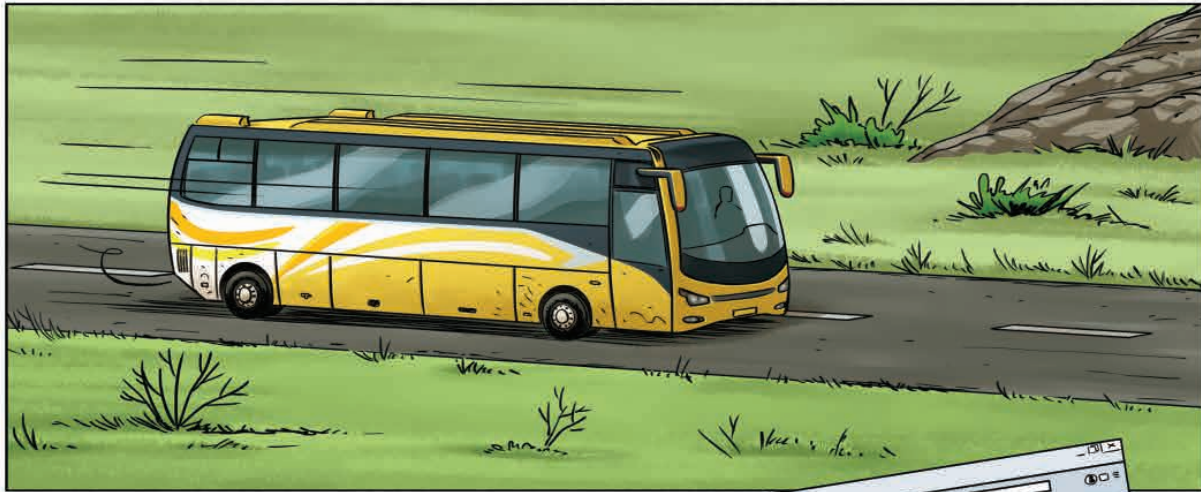


ANYWAY, NEW VEGETATION WILL SPROUT, AND PEOPLE ARE BACK TO THE REGULAR PACE OF LIFE.

INDEED, WE ARE UNITED AND THINKING ABOUT HOW TO REBUILD MATI.



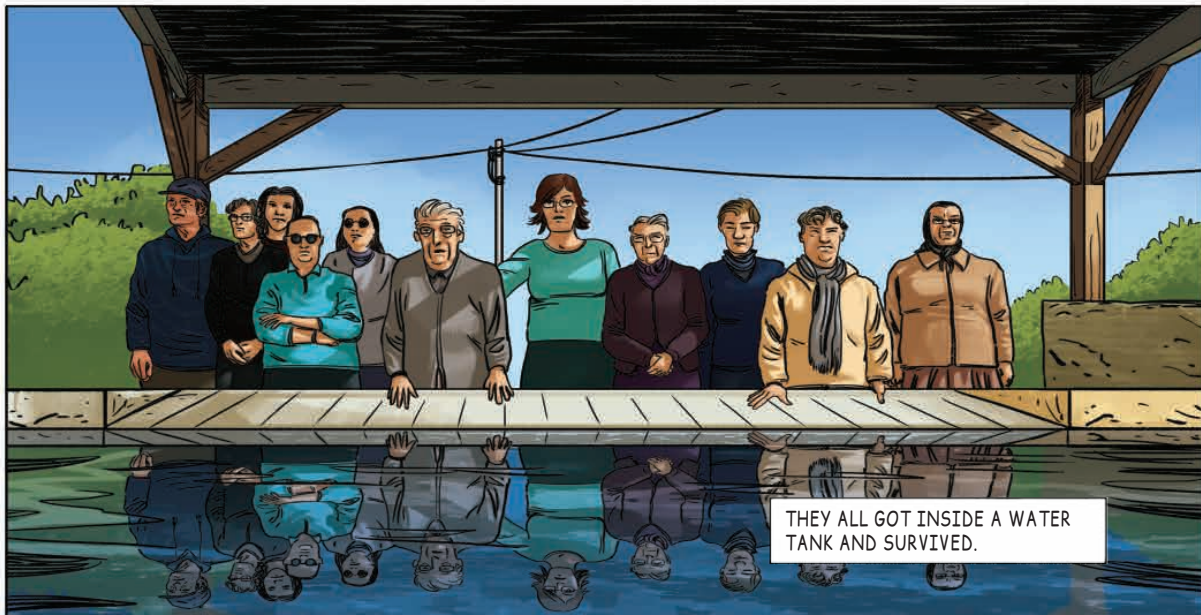
I WANT TO WRITE A BOOK ABOUT THIS FIRE. WE CANNOT FORGET WHAT HAPPENED.



MATI REMINDED ME OF THE FOREST FIRES IN PORTUGAL IN JUNE AND OCTOBER 2017.



AND THE STORY OF THE ELEVEN PEOPLE IN A VILLAGE THAT WAS COMPLETELY SURROUNDED BY THE FIRES.



THEY ALL GOT INSIDE A WATER TANK AND SURVIVED.



I TOLD GABRIEL ABOUT MY VISIT TO MATI.

HOW IS YOUR ANKLE?

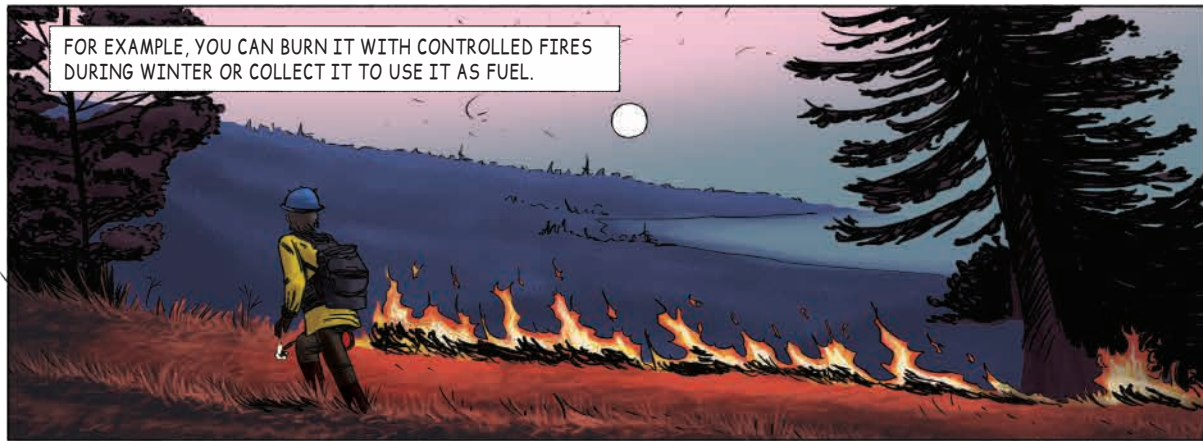
IT STILL HURTS A BIT. ANYWAY, I JUST HOPE WE CAN PREVENT THESE LARGE FIRES.

BUT HOW?

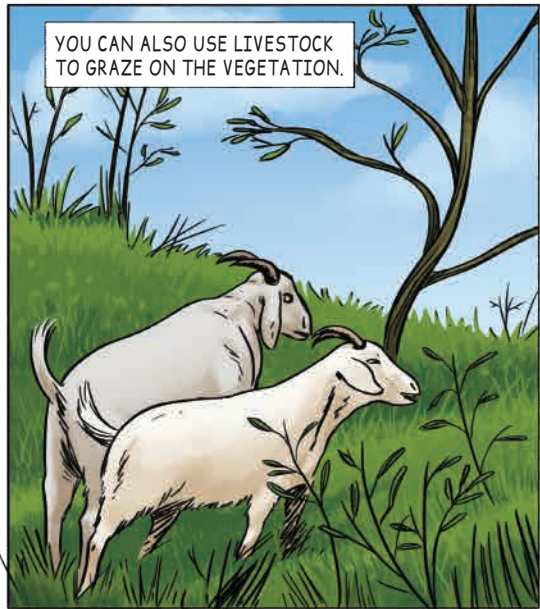
AS WE HAVE SEEN IN GERMANY, BY PLANTING TREE SPECIES THAT ARE LESS FIRE-PRONE.



ALSO, SOME RURAL AREAS ARE LESS POPULATED AND THIS PROMOTES THE ACCUMULATION OF VEGETATION. SOME OF THIS NEEDS TO BE CLEARED.



FOR EXAMPLE, YOU CAN BURN IT WITH CONTROLLED FIRES DURING WINTER OR COLLECT IT TO USE IT AS FUEL.



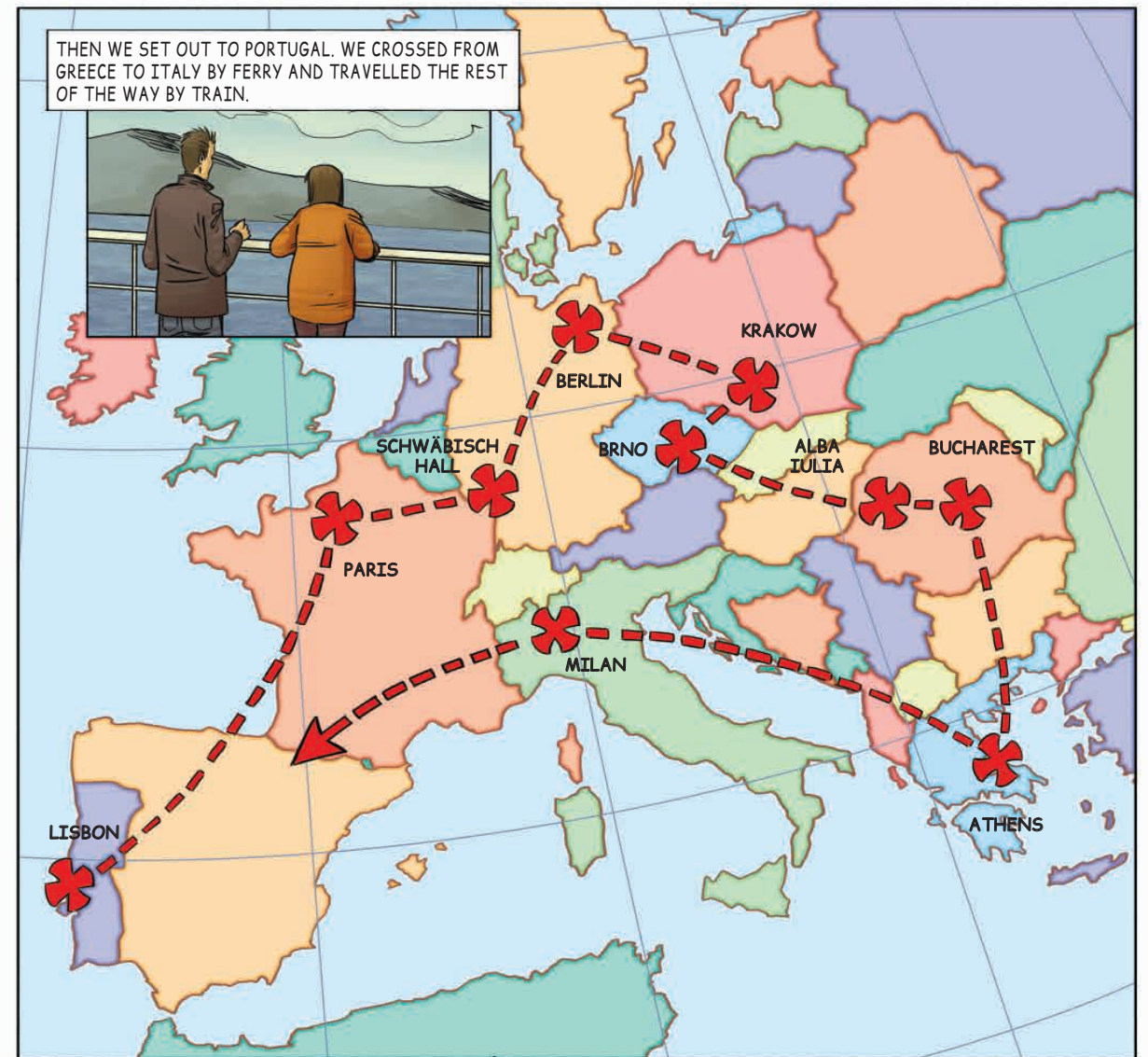
YOU CAN ALSO USE LIVESTOCK TO GRAZE ON THE VEGETATION.



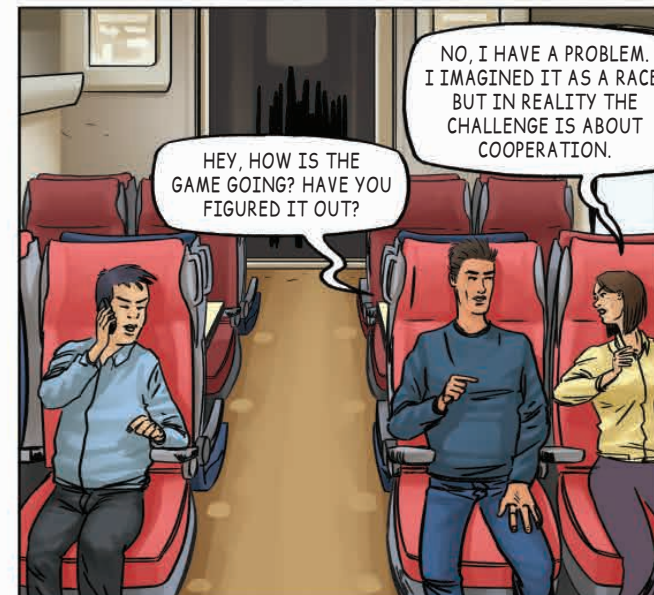
YOU SHOULD HAVE FIREBREAKS, SURVEILLANCE AND WARNING SYSTEMS.



AND WE MUST BE ABLE TO EXTINGUISH FIRES FAST.



THEN WE SET OUT TO PORTUGAL. WE CROSSED FROM GREECE TO ITALY BY FERRY AND TRAVELLED THE REST OF THE WAY BY TRAIN.



HEY, HOW IS THE GAME GOING? HAVE YOU FIGURED IT OUT?

NO, I HAVE A PROBLEM. I IMAGINED IT AS A RACE, BUT IN REALITY THE CHALLENGE IS ABOUT COOPERATION.



WHAT DO YOU MEAN?

COUNTRIES, OR CITIES, OR OTHER GROUPS OF PEOPLE SHOULD JOIN FORCES TO DEAL WITH CLIMATE CHANGE.



WE ARE ALL IN THIS TOGETHER. SO WE NEED TO SHARE INFORMATION AND EXPERIENCES TO REACH A COMMON GOAL.



CAN YOU CREATE A GAME IN WHICH THE PLAYERS ALSO HELP EACH OTHER?

IT'S HARDER TO DO. BUT I CAN TRY!



GABRIEL, DID YOU ENJOY THE TRIP?

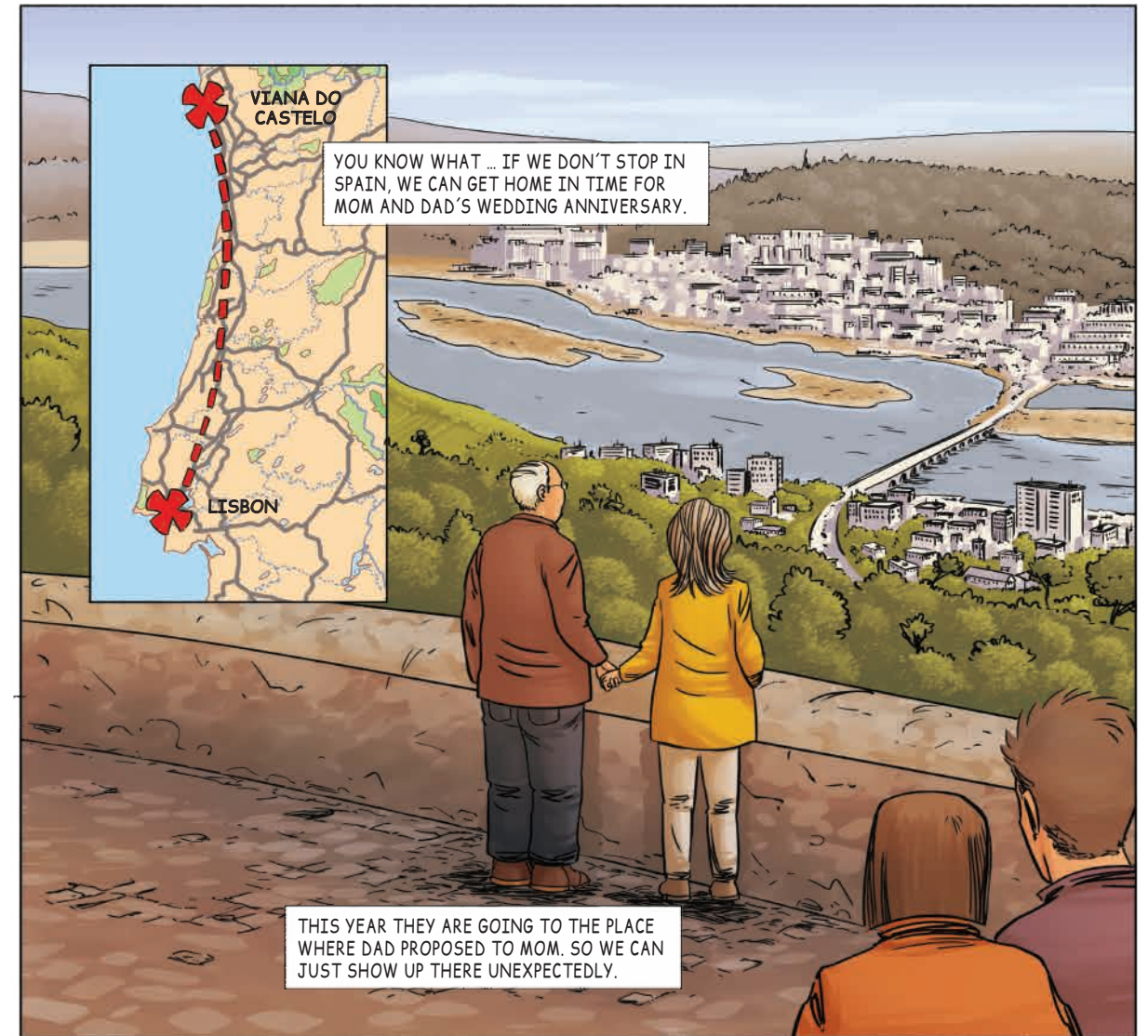


YEAH, IT WAS INTERESTING TO LEARN ABOUT ENERGY, URBANIZATION, FORESTS ... THE WEATHER DISASTERS ... WHAT DO YOU CALL IT?

EXTREME WEATHER EVENTS.



THAT'S IT! AND TO DRAW AND VISIT DIFFERENT PLACES IN EUROPE.



YOU KNOW WHAT ... IF WE DON'T STOP IN SPAIN, WE CAN GET HOME IN TIME FOR MOM AND DAD'S WEDDING ANNIVERSARY.

THIS YEAR THEY ARE GOING TO THE PLACE WHERE DAD PROPOSED TO MOM. SO WE CAN JUST SHOW UP THERE UNEXPECTEDLY.



SURPRISE!!

SURPRISE!!



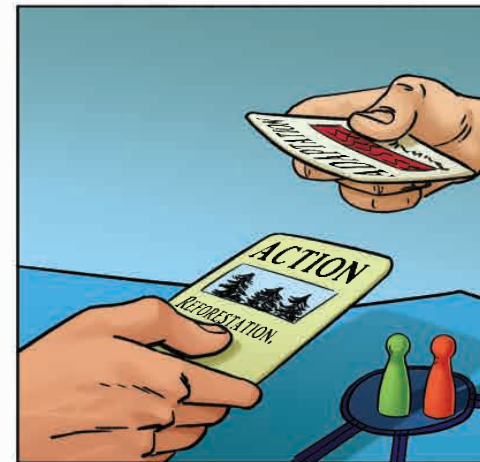
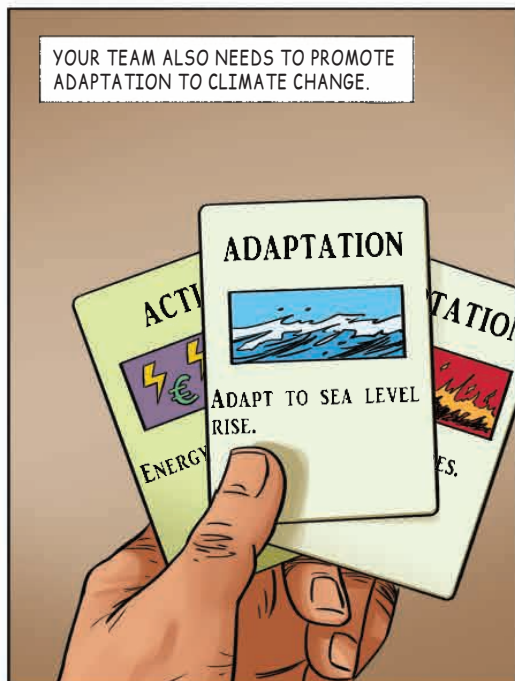
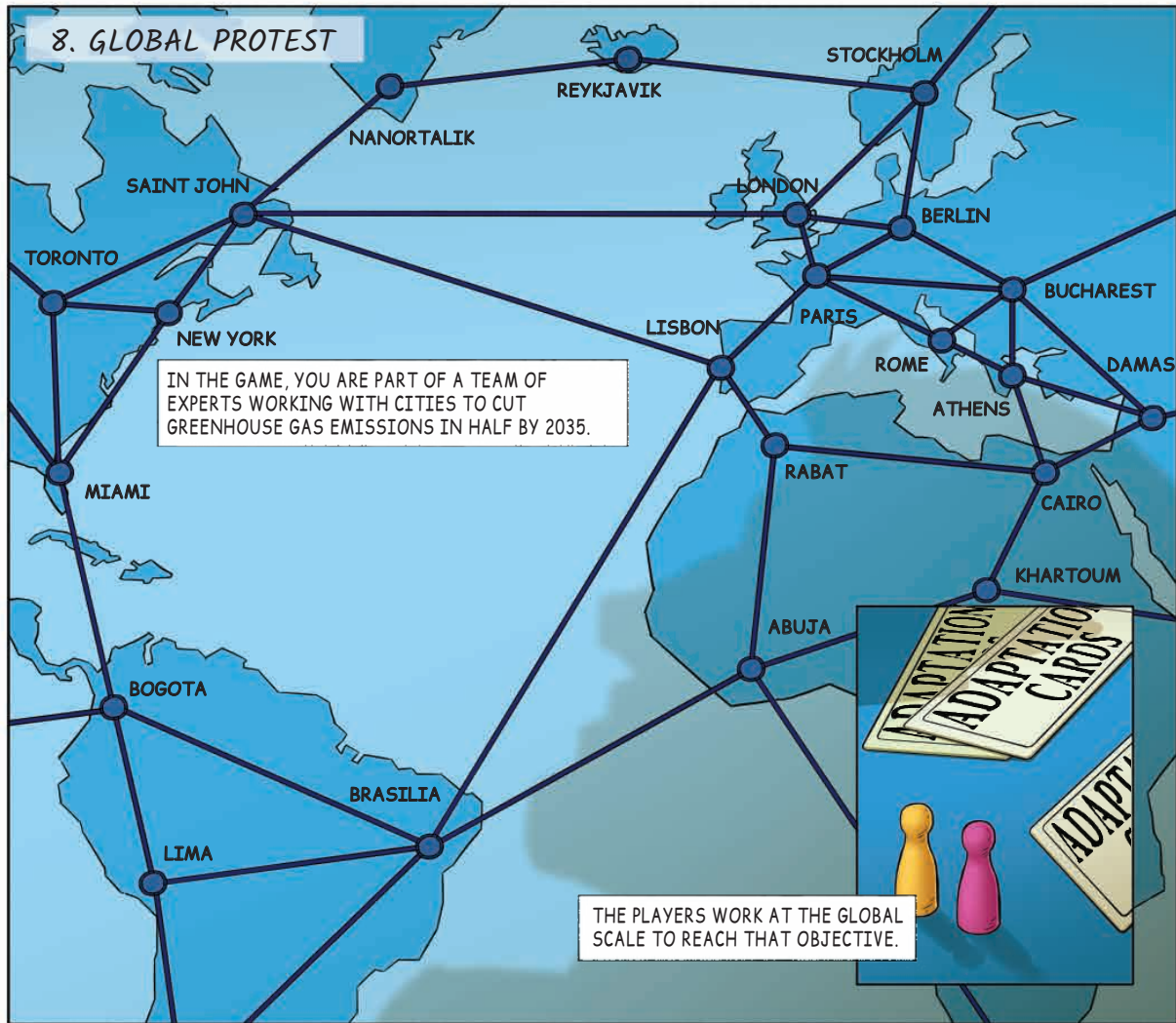
WHAT ARE YOU DOING HERE?

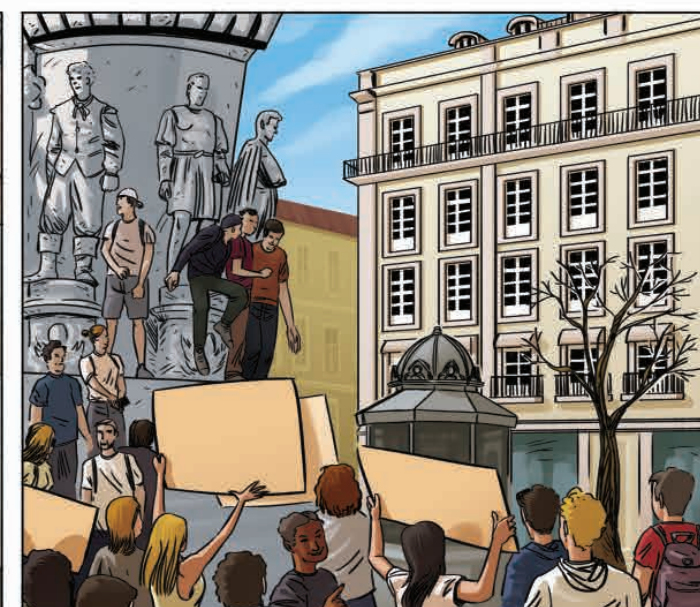
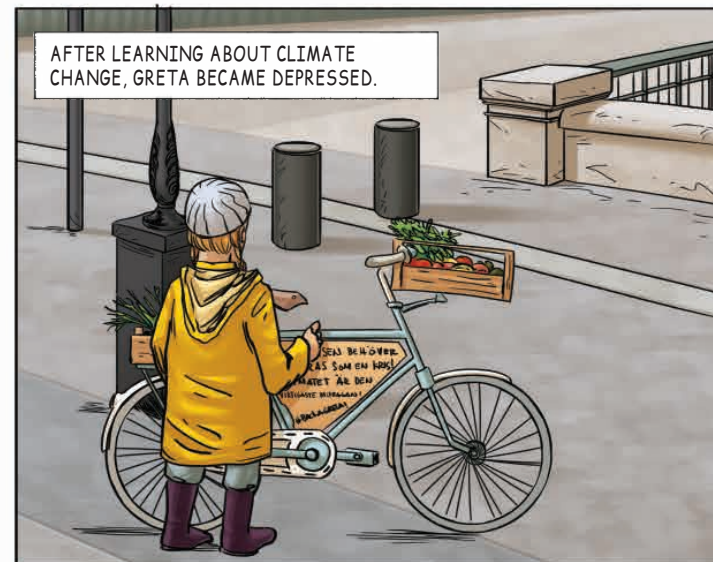
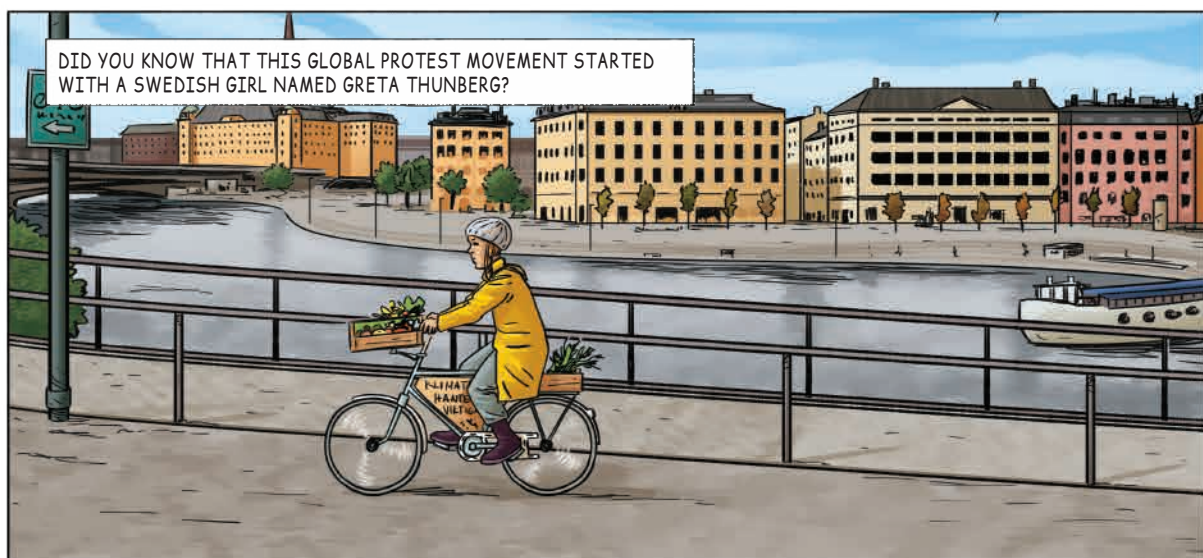
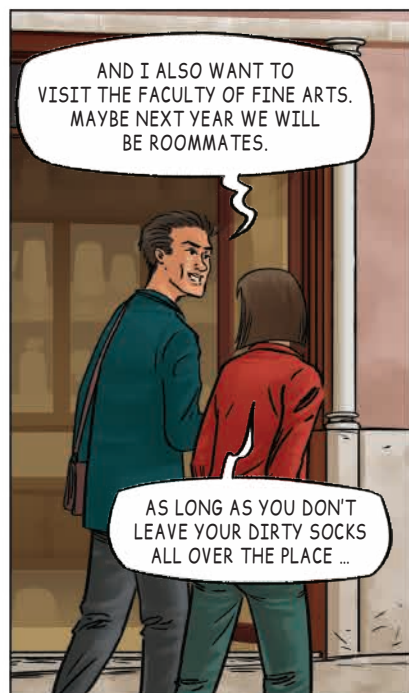
OH, MY GOD!

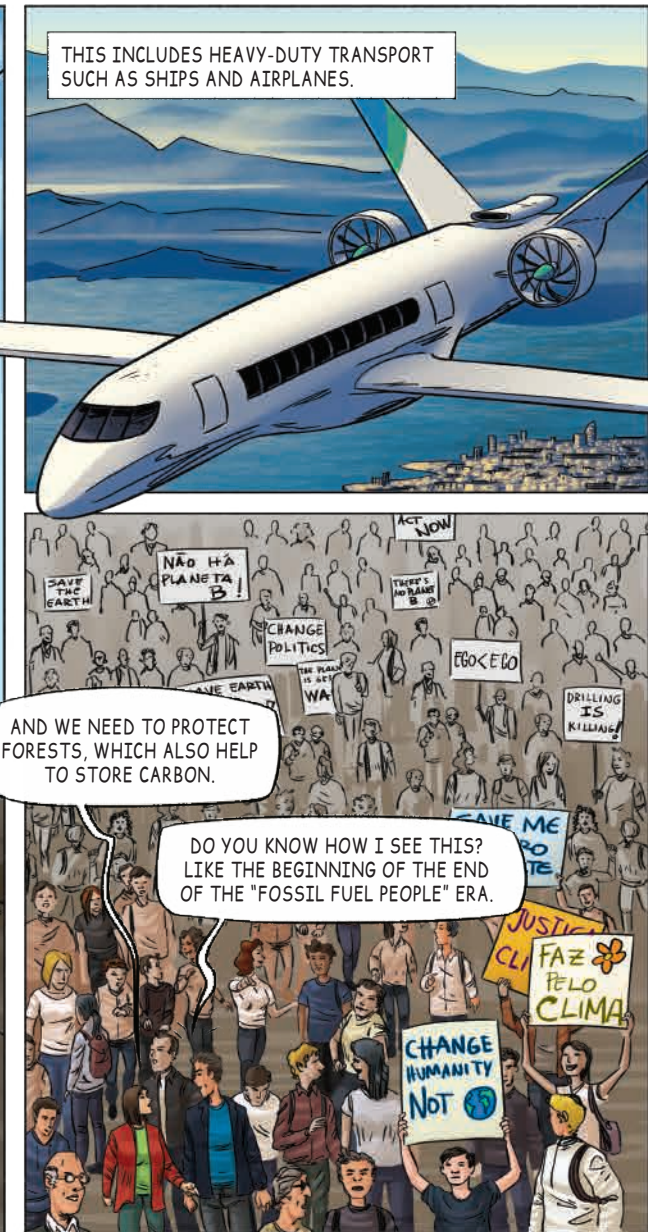
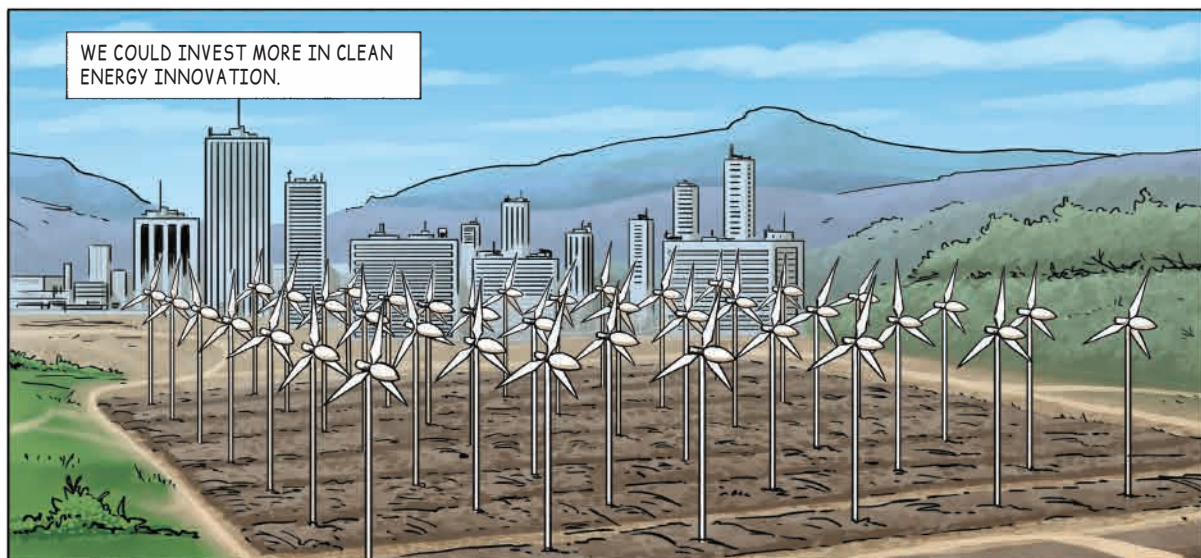
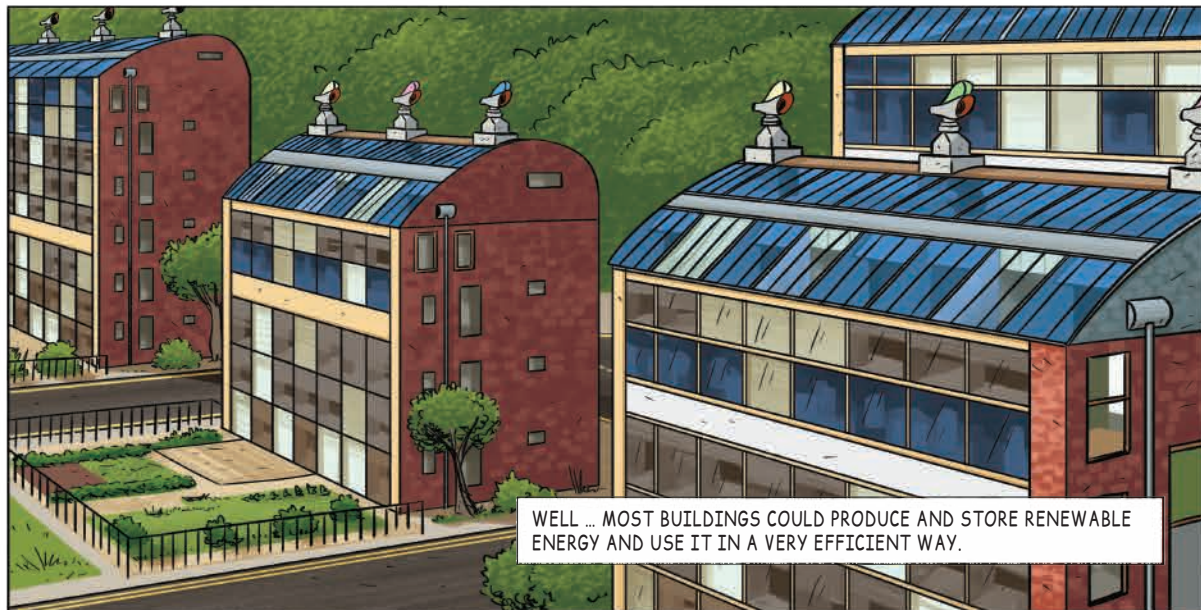


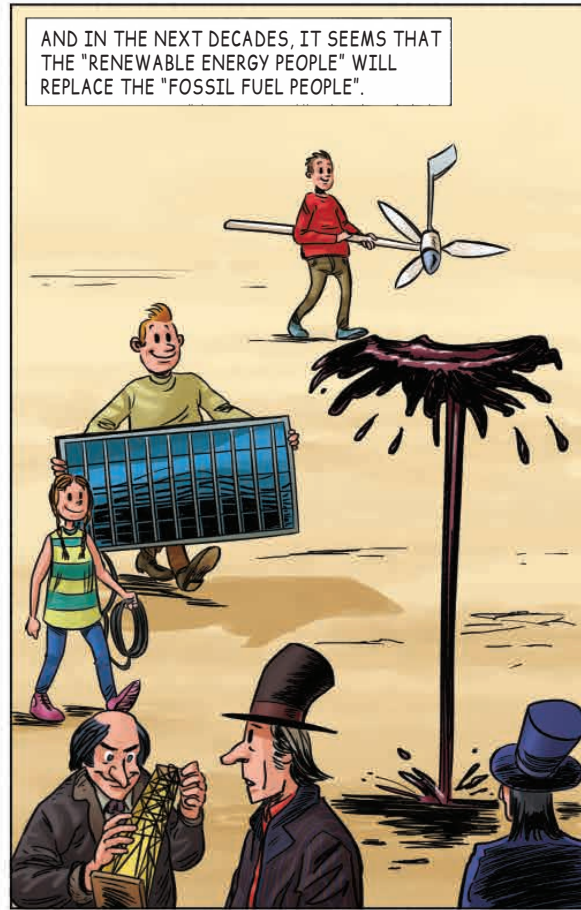
MOM? ARE YOU OK?

IS IT YOUR LOW BLOOD PRESSURE?



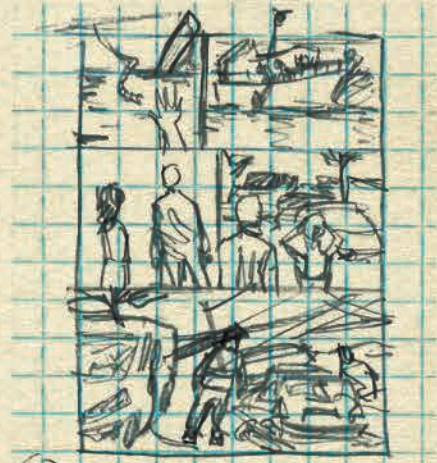
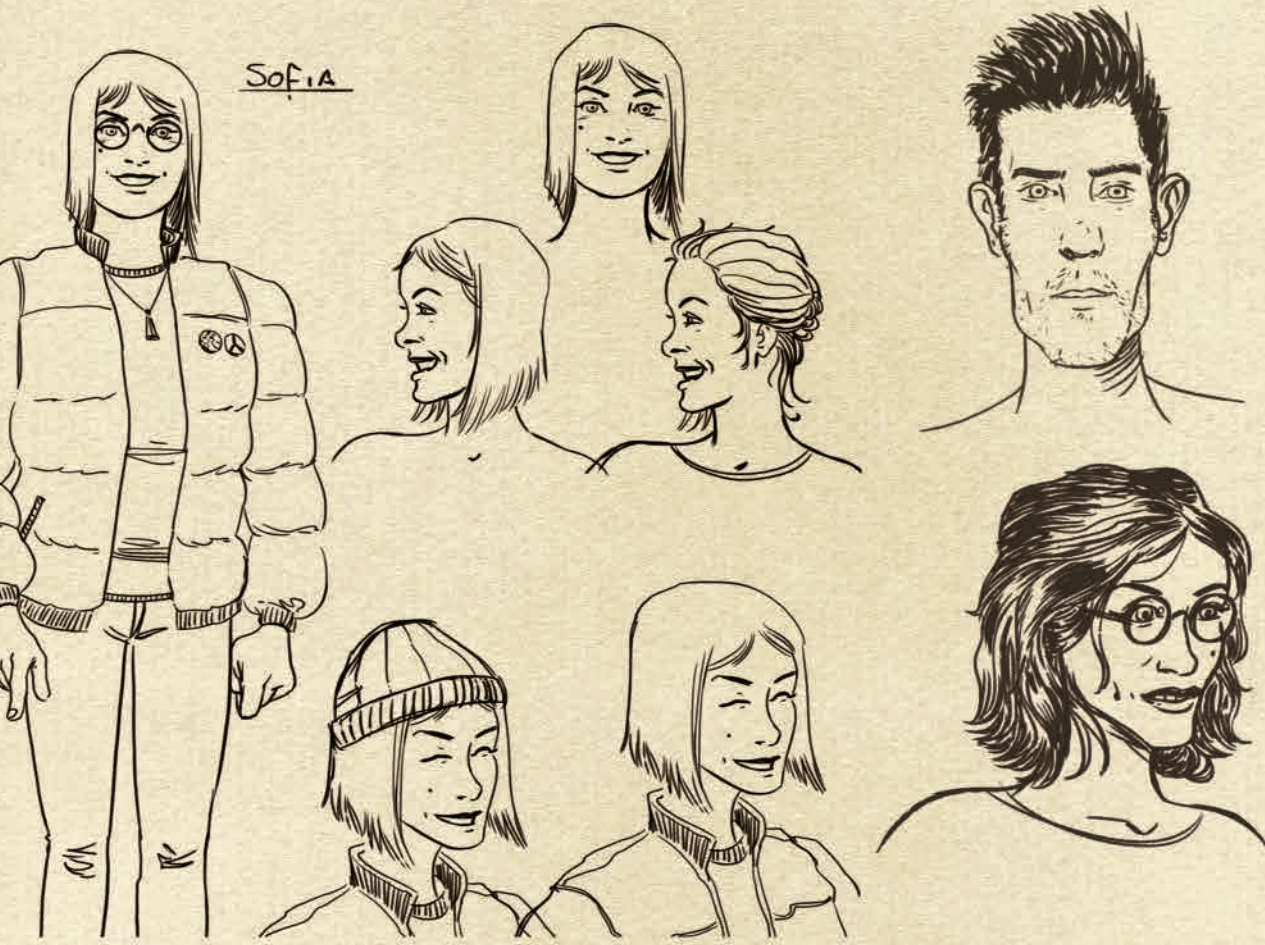






SKETCHES

Sofia



57

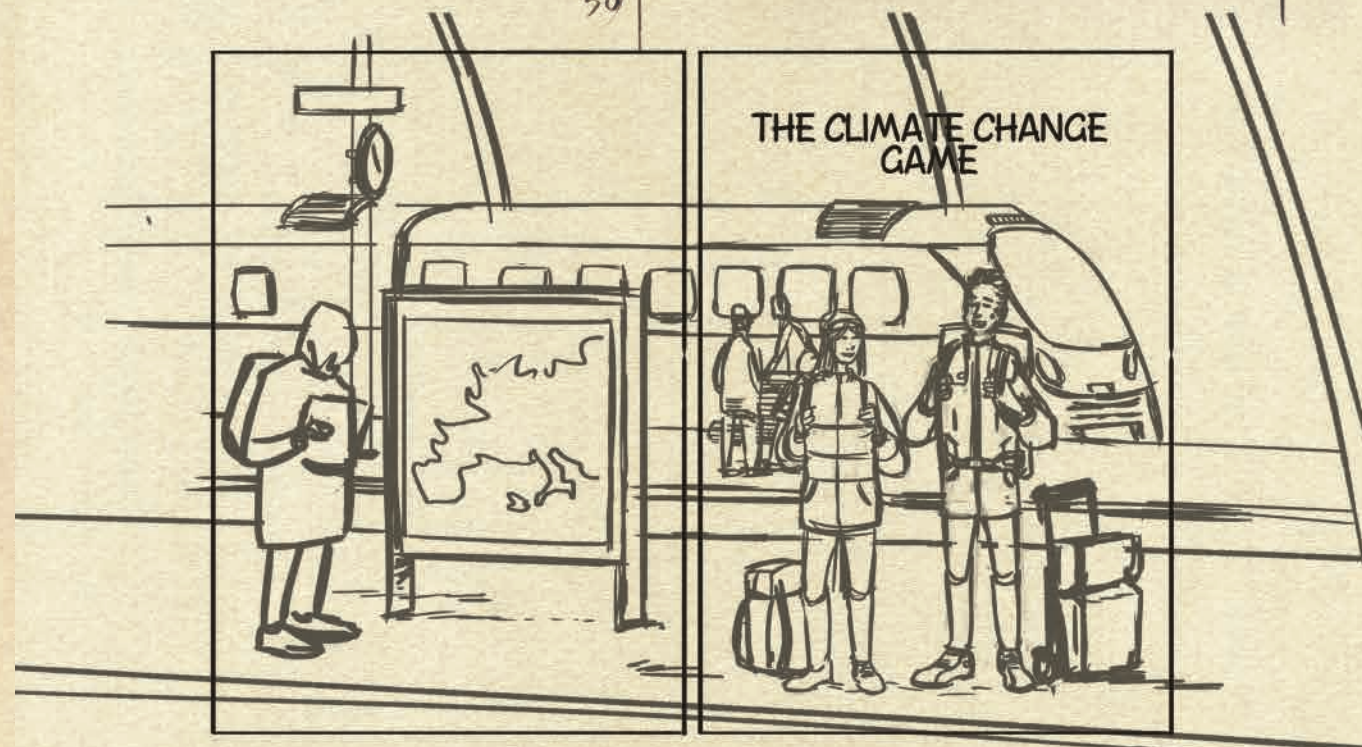


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"We have run out of excuses and we are running out of time. We have come here to let you know that change is coming whether you like it or not. The real power belongs to the people!"



Key words

Greenhouse gas (GHG) emissions

Climate change is driven by the release of greenhouse gases such as carbon dioxide (CO₂) or methane (CH₄) into the atmosphere. Greenhouse gases in our atmosphere trap part of the energy from the sun. At a lower concentration (around 300 parts per million or ppm) they are essential to the existence of the greenhouse effect that keeps our planet at a comfortable temperature (without them, earth would be a sub-zero cold rock in outer space!). But since the beginning of industrialization in the 19th century, and especially since the 1950s, the concentration of greenhouse gases has increased exponentially (we're now above 400 ppm), upsetting the delicate balance of energy in our atmosphere and leading to an unprecedented rise in global average temperatures.

Climate impacts

In 2020, global average temperatures are already around 1 °C higher compared to pre-industrial levels and will continue to rise if the output of GHG emissions is not reduced significantly and rapidly. Climate change bears high risks for humans and nature such as more frequent and more intense heat waves, droughts and resulting wildfires, as well as heavy rainfall, and floods. Vulnerable animals and plant species are particularly at risk. Tropical coral reefs are at risk of disappearing entirely within 30 years.

Fossil fuels

Fossil fuels such as coal, oil, and natural gas are still the dominant source of energy globally. GHG emissions caused by the burning of these fossil fuels in our cars, planes, houses, power plants, and factories have been and continue to be the key driver of climate change. The production and use of fossil resources is also linked to negative impacts on human health and the environment, for example through pollutants other than GHG emissions.

Renewable energy

In contrast to fossil fuels, renewable energy is produced from sources that do not deplete, such as wind, solar and geothermal. In addition to being renewable, they emit no or very little GHG emissions, making renewable energy technologies an important element of a sustainable energy system. In recent years, modern renewable energy technologies have grown rapidly and are now often cheaper to build than fossil energy technologies. To phase out fossil fuels fast enough, renewables need to be deployed faster, particularly in the heating and transport sectors.

Paris Agreement

In 2015, the global community adopted the Paris Agreement. In this agreement, the 197 signatory countries committed to containing the global temperature rise this century to well below 2 °C and pursue efforts to limit the increase to below 1.5 °C above pre-industrial levels. Governments have to submit plans (so called Nationally Determined Contributions), which outline their goal (or 'pledge') to contribute to the required global reduction in GHG emissions. These plans should also spell out the measures they intend to implement to reach this goal and their strategies for climate change adaptation. Cities, municipalities and civil society play an increasingly important role in helping countries reach these goals as progress in most countries has been too slow so far.

Climate change is a challenge for all of us, and only together will we be able to address it. On a journey through seven European countries Sofia, accompanied by her brother Gabriel, collects examples of how Europeans are combating climate change and creating more resilient communities.



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