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Winds of change

A STORY OF CARBON NEUTRALITY

As climate change impacts warrant immediate action, the Paris Agreement —Law 1844 of 2017— established specific goals and commitments for countries to build a future on, a future wherein the planet's temperature does not exceed 2° C. however, it'd be best to keep temperature at 1.5° C max.

This is why Colombia, looking to prevent temperatures from rising even more, thereby affecting us all, has committed to becoming carbon neutral by 2050. This implies that the same amount of greenhouse gases (GHG) that are emitted will also become absorbed. We'd then be preventing the country from warming up even more and helping the planet in the process.

But... What's the cause of the increase in temperature in planet Earth?
Chemical substances called greenhouse gases (GHG) are produced by us when we drive a car or take a bus, when we waste our food or leave the lights on without needing to, among other daily activities that can be replaced by clean, sustainable ones. Whatever the case, such gases become trapped in the atmosphere thus creating a thin layer of them, and when this happens, what is called the greenhouse effect is thereby created, which keeps the Earth just warm enough to be inhabitable. However, when there is an excess of GHG in the atmosphere, the greenhouse effect increases dramatically and so does the average temperature of the planet because of it, creating climate change.

So, what should we do?
All adults, institutions, governments, companies and even kids must commit to setting forth actions to address climate change adequately. You too can be part of the change with small actions like taking care of water and energy!

The Colombian government is already making progress with the French government's support through some of their agencies, such as the AFD and Expertise France. Hence the Long-Term Climate Strategy of Colombia (E-2050) looking to build a climate-resilient adaptative country, a carbon-neutral country.

Please join us reading a story which facts took place in 2050. That's right: the very year we hope to have had achieved carbon neutrality. This is a story through which we intend to show the changes that are to be made possible by us today in order to achieve our goals, the very transformations humanity is to produce, that is, if we plan on continuing to inhabit the planet.

Valeria

NARRATOR

Hi. I'm Valeria and we're in 2050. Today I'd like to tell you a story about the journey that changed the lives of my family and me.

Martín

VALERIA'S DAD

Rocío

VALERIA'S GRANDMA

Myriam

VALERIA'S MOM

Tomás

VALERIA'S BROTHER

Jorge

VALERIA'S GRANDPA

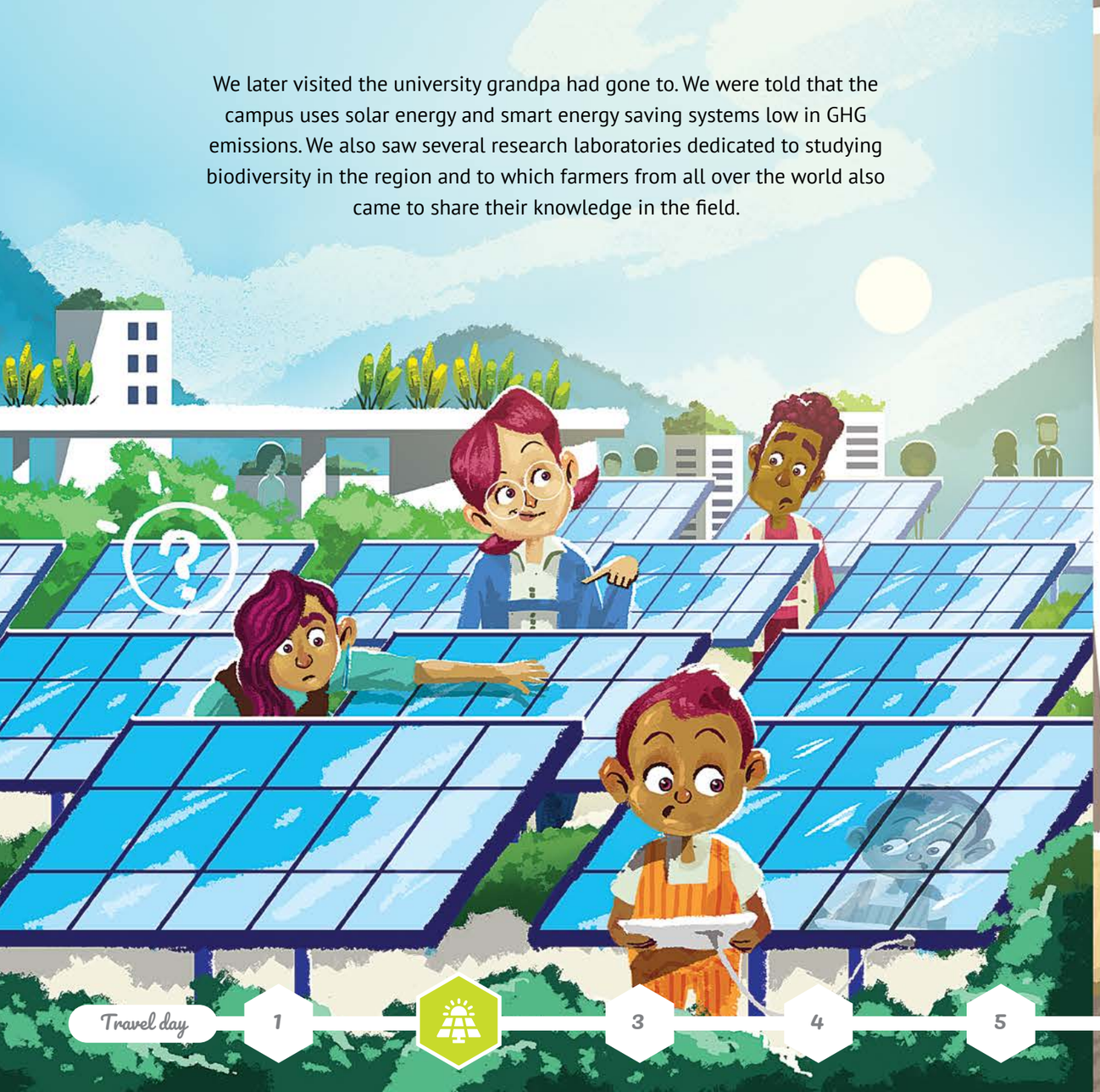
It all started when grandpa called my parents to invite them to work on his new project. Although I didn't quite understand what it was about, I knew I needed help from mom, who's an architect, and dad, who's a teacher. The bad news was that grandpa lived far away and we'd have to move. The idea of leaving our friends and getting away from our daily lives left my brother Tomás and I very sad and unhappy.

Dad then came up with a great idea for the trip: to visit places where grandpa had lived and recreate the photos that, at the time, he had taken. This way, when we reached our destination, we will have known more about his life, not to mention the lots of fun we'd have in the process. Neither my brother nor I, however, knew the idea would change our lives.

In our first day of travel, we arrived at a city a bit smaller than ours. There, my parents took us to the neighbourhood where grandpa lived throughout his entire youth. The building where he grew up no longer existed, but in its place, there was now a completely eco-efficient shopping centre that helped reduce greenhouse gas emissions –or GHGs, as they tend to call them– that affected the temperature of the Earth.

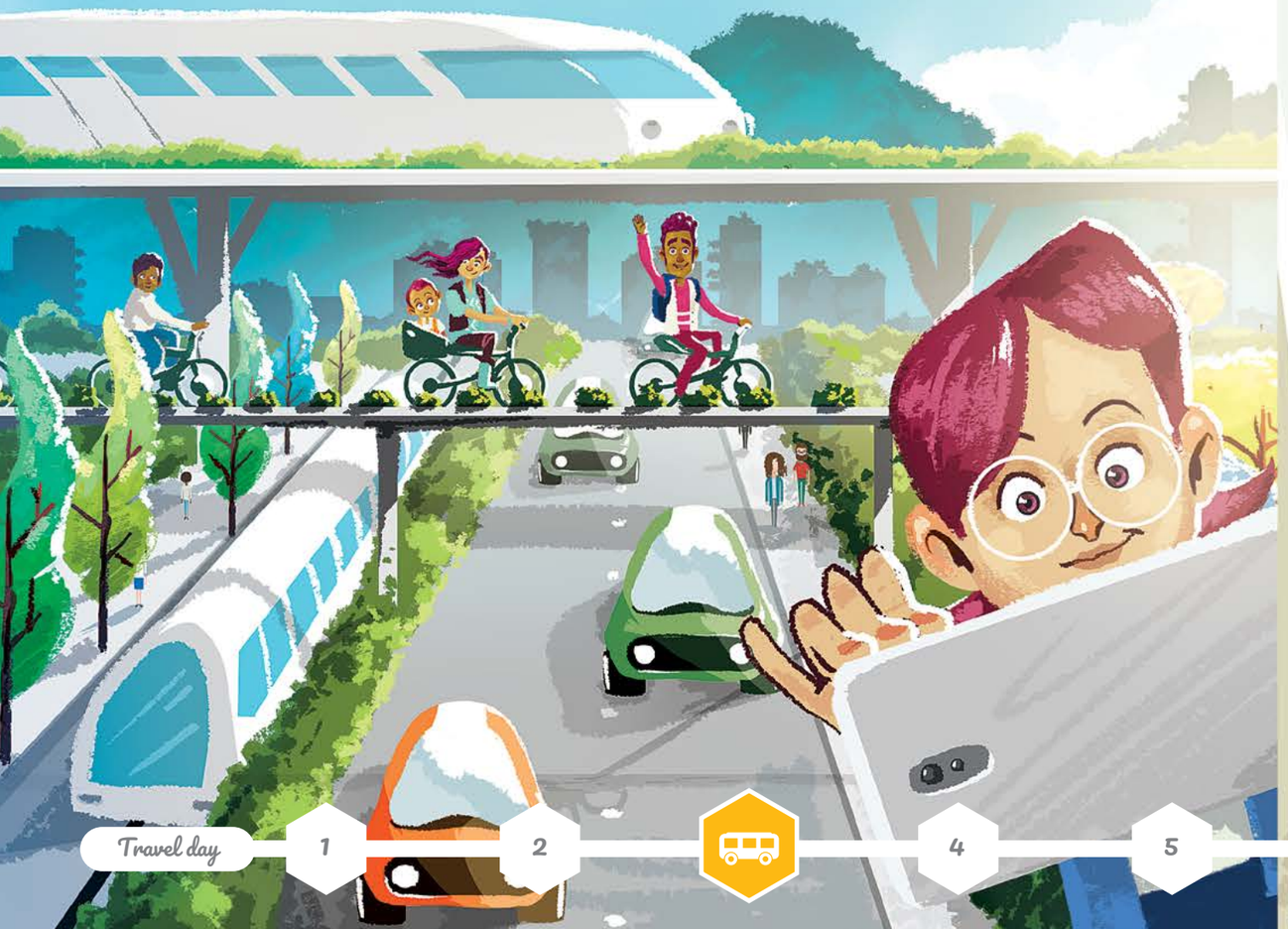
Mom explained that when grandpa was very young, he made a small vegetable patch in the house and planted a vertical garden on the facade of his building. He also dreamed of a future where every home had renewable energy and helped improve the air we breathe. Interesting enough, in the place where grandpa grew up was now a building, exactly like the one he had imagined.

We later visited the university grandpa had gone to. We were told that the campus uses solar energy and smart energy saving systems low in GHG emissions. We also saw several research laboratories dedicated to studying biodiversity in the region and to which farmers from all over the world also came to share their knowledge in the field.



Grandpa was always passionate about environmental issues. For this reason, although he studied mechanical engineering, he was always up to date on new technologies that would allow us to produce energy in more efficient ways and reduce GHG emissions. This led him to work in many places and to perform very different tasks, as he was always thinking about more sustainable ways of living on the planet.

Next stop was the place where grandpa and grandma met. It was fun to go around the city using electric mass transit as well as bicycles, skateboards, and other types of public vehicles that further helped reduce GHG emissions. Tomás made new friends riding a bike and looked each time happier knowing he was helping the planet.



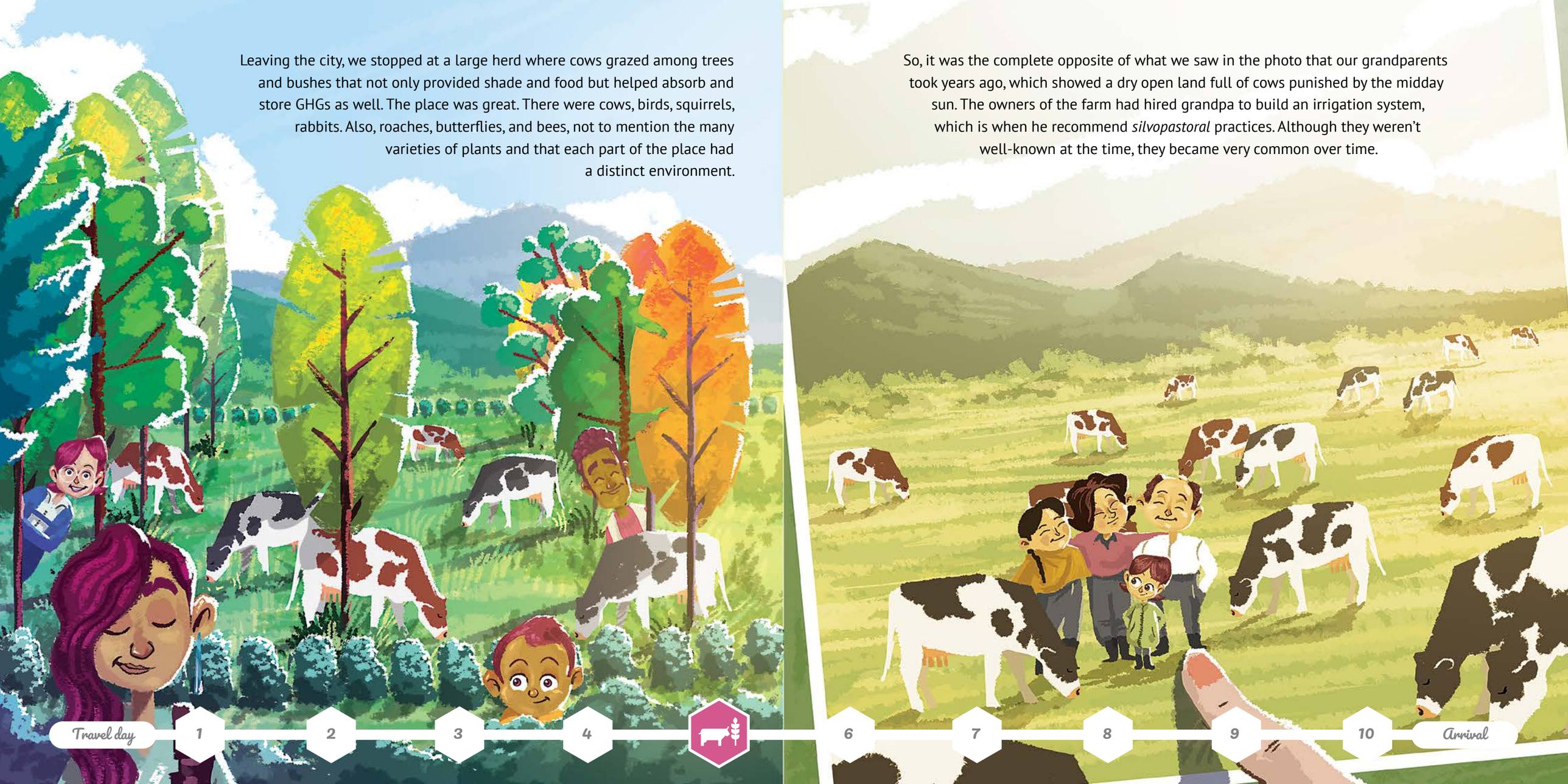
While we waited for one of the electric buses, dad remembered that my grandparents met at a location very similar to ours. As at the time traffic jams were frequent and delays usual, after seeing each other they ended up talking, so much so that they also ended up falling in love. Dad explained to us that she, like him, believed in finding better ways of inhabiting planet Earth and because of it she now travelled the world teaching new generations everything she learnt and built with grandpa.

During the trip we also learnt that grandpa's first job was in an oil refinery which, thanks to him, became a hydrogen plant! There, dad told us that grandpa had the great idea of proposing to the company making a change on production: discarding fossil fuels to use renewable energy instead, thus helping reduce carbon emissions, which are harmful to the planet.

Mom showed us a photo of grandpa working there. Although he first started working repairing oil-processing machines, he later envisioned a better way to produce fuels using hydrogen. That's how in my grandfather's time blue hydrogen began to be produced. Now there is also green hydrogen, which is much cleaner, they said.

Leaving the city, we stopped at a large herd where cows grazed among trees and bushes that not only provided shade and food but helped absorb and store GHGs as well. The place was great. There were cows, birds, squirrels, rabbits. Also, roaches, butterflies, and bees, not to mention the many varieties of plants and that each part of the place had a distinct environment.

So, it was the complete opposite of what we saw in the photo that our grandparents took years ago, which showed a dry open land full of cows punished by the midday sun. The owners of the farm had hired grandpa to build an irrigation system, which is when he recommend *silvopastoral* practices. Although they weren't well-known at the time, they became very common over time.

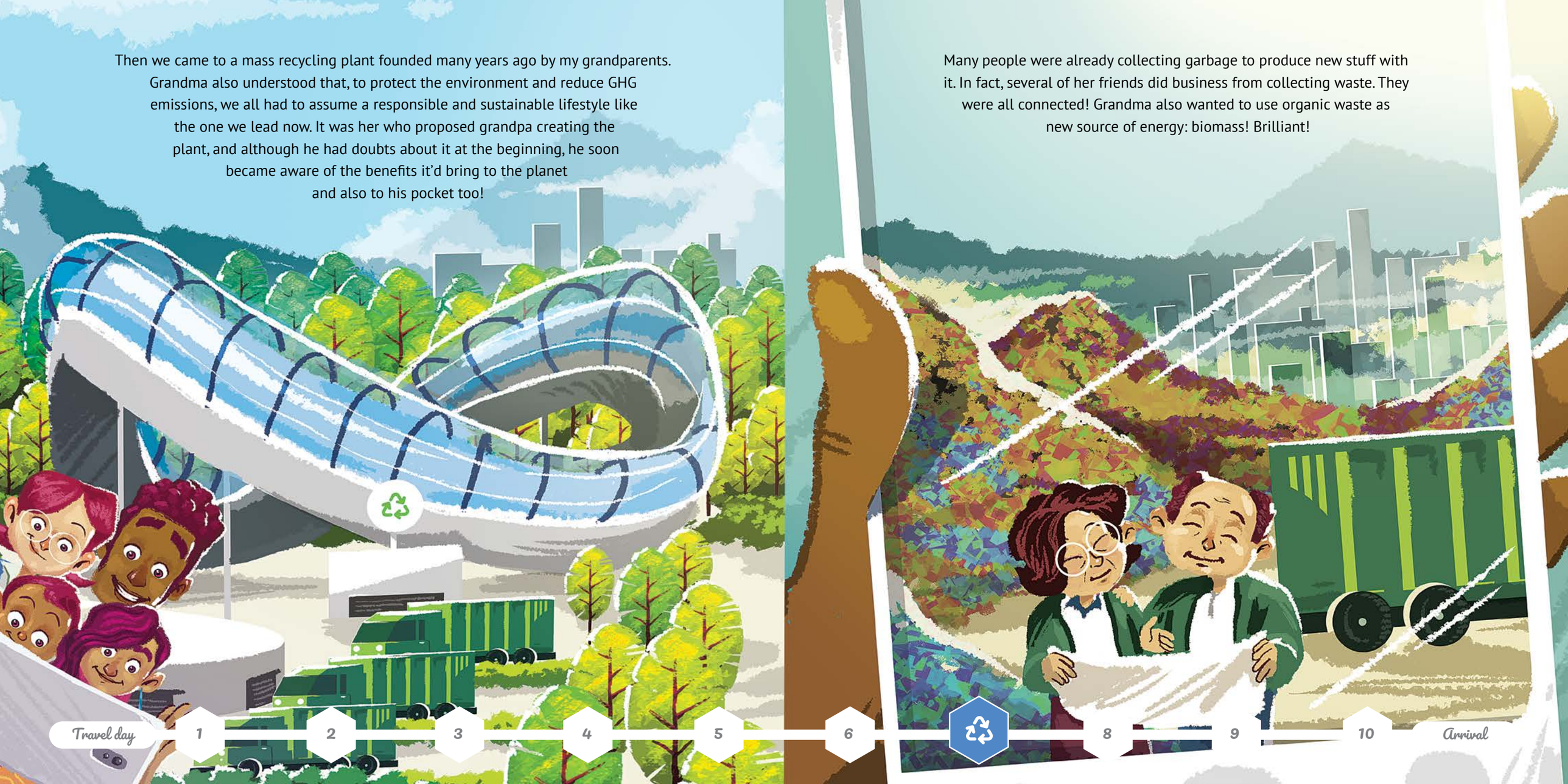


Next stop on our trip was a seaside town, a magical landscape! My mom explained that our grandparents were part of the team of engineers and scientists that designed the tidal turbines. Tomás was happy to get to know the coast and to have left home to discover other landscapes.

We also learnt that they conceived the idea of harnessing energy from Earth. Although this technology stopped being used because it was not entirely ecological, at that time communities far from the coast benefited from geothermal energy. These were times of very rapid change and great joint-efforts.

Then we came to a mass recycling plant founded many years ago by my grandparents. Grandma also understood that, to protect the environment and reduce GHG emissions, we all had to assume a responsible and sustainable lifestyle like the one we lead now. It was her who proposed grandpa creating the plant, and although he had doubts about it at the beginning, he soon became aware of the benefits it'd bring to the planet and also to his pocket too!

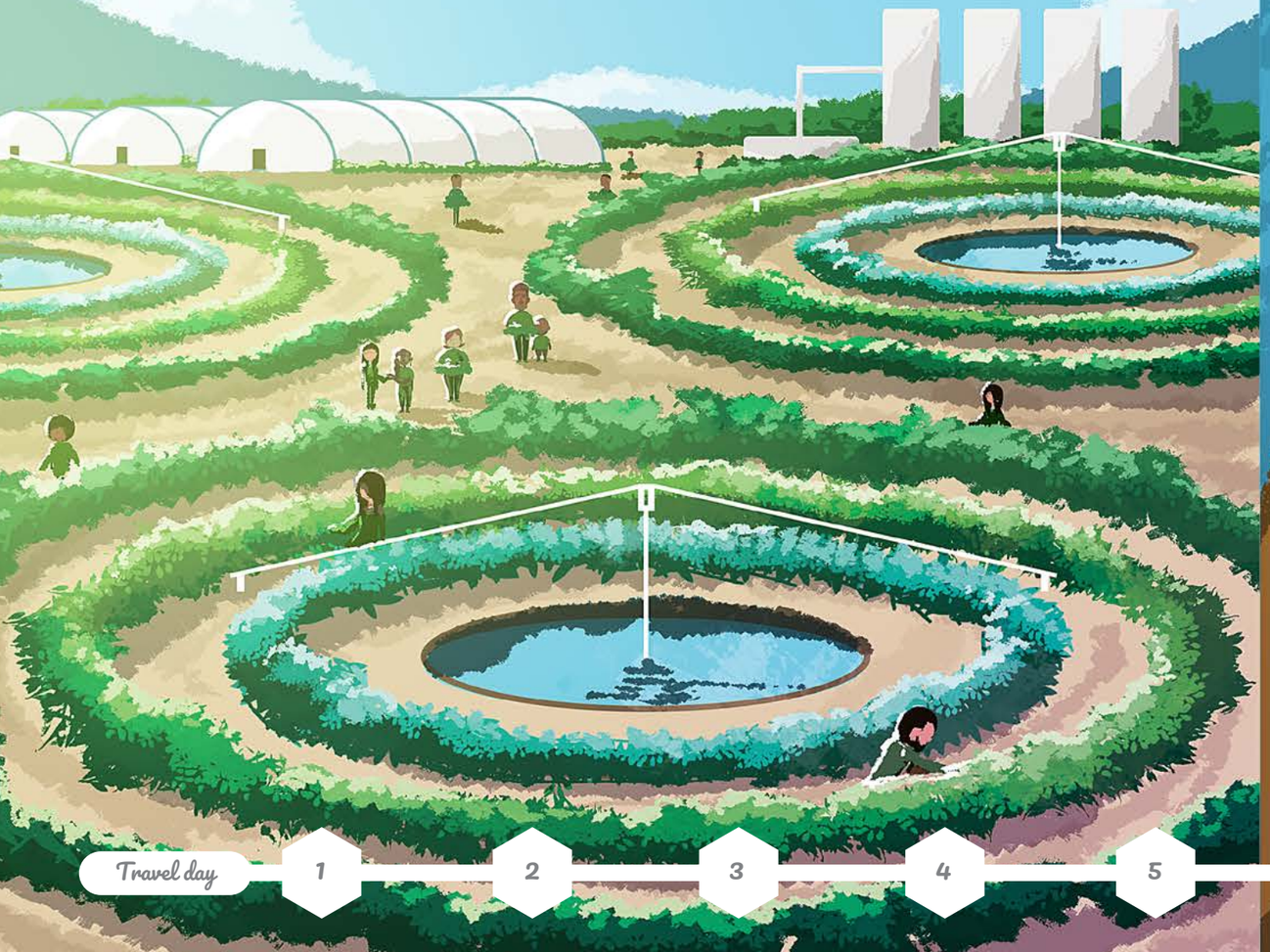
Many people were already collecting garbage to produce new stuff with it. In fact, several of her friends did business from collecting waste. They were all connected! Grandma also wanted to use organic waste as new source of energy: biomass! Brilliant!



Our next destination was an indigenous community. Many years before, my grandparents went there as guests and the land where the indigenous people lived was declared a natural reserve. An ecological restoration process then began with support from the community and international organizations. Tomás couldn't wait to hear these stories told by grandpa!

Mother explained that a few years ago the jungles in the country became threatened by the uncontrolled expansion of cattle farms and massive crops and, in general, by poor land use planning. Fortunately, deforestation was stopped in time and significant reforestation efforts made it possible to capture and absorb large amounts of carbon in a healthy forest network.

As we left the forest, we stopped at a town where grandpa had moved when grandma began her journey around the world. There he advised a self-sustainable land project to improve nutrition in the community. So, we visited the circular gardens he helped make and learnt about organic fertilizers. We were told grandpa learnt about these long-age practices from the indigenous communities near town and that these are now replicated in thousands of urban and rural nurseries all around the country.

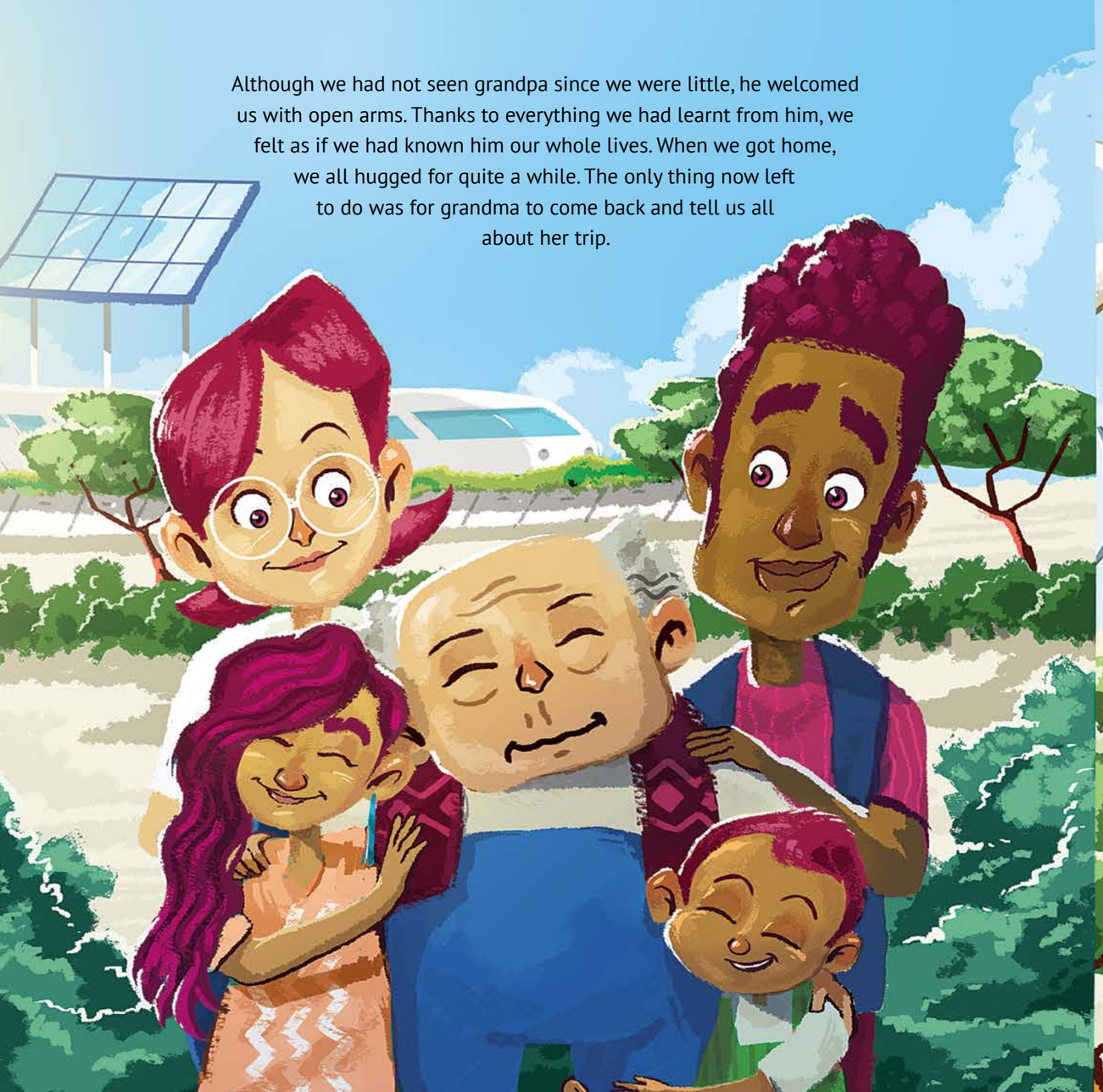


We also learnt that grandpa wanted food-producing industries to reconcile with indigenous practices so that they could develop better practices on water, soil, and biodiversity management, which helped reduce GHG emissions. I never imagined someone could have such a power of change! At that moment I really felt like I wanted to see grandpa.

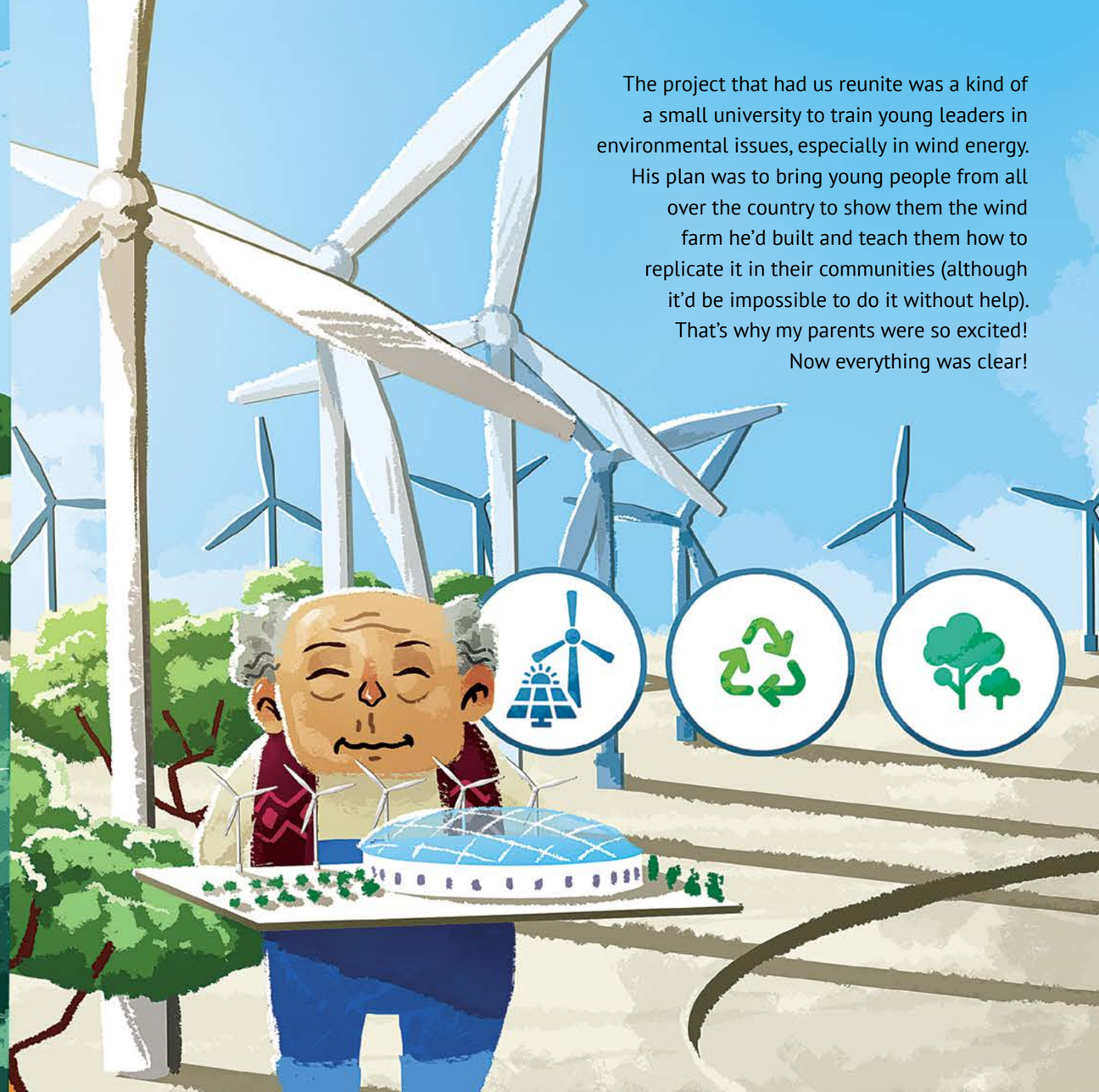
Everything made me think about what my job would be in the future. I figured I could become an architect just like mom, or a specialist in circular economy, or perhaps a doctor, a farmer, a designer of renewable energy systems, among other important careers. Tomás said that he wanted to be a teacher like dad and grandma: he was dreaming of teaching others everything he had learnt.

This last picture of my grandparents made me think they were able to adapt to different situations. They were real chameleons! I really admire how they and their friends managed to change the way of thinking of many people, start fresh ideas, and thank to it, stop the effects of climate change in their time. Now I know this is how they achieved something very important for the country, which is what we know as *carbon neutrality*.

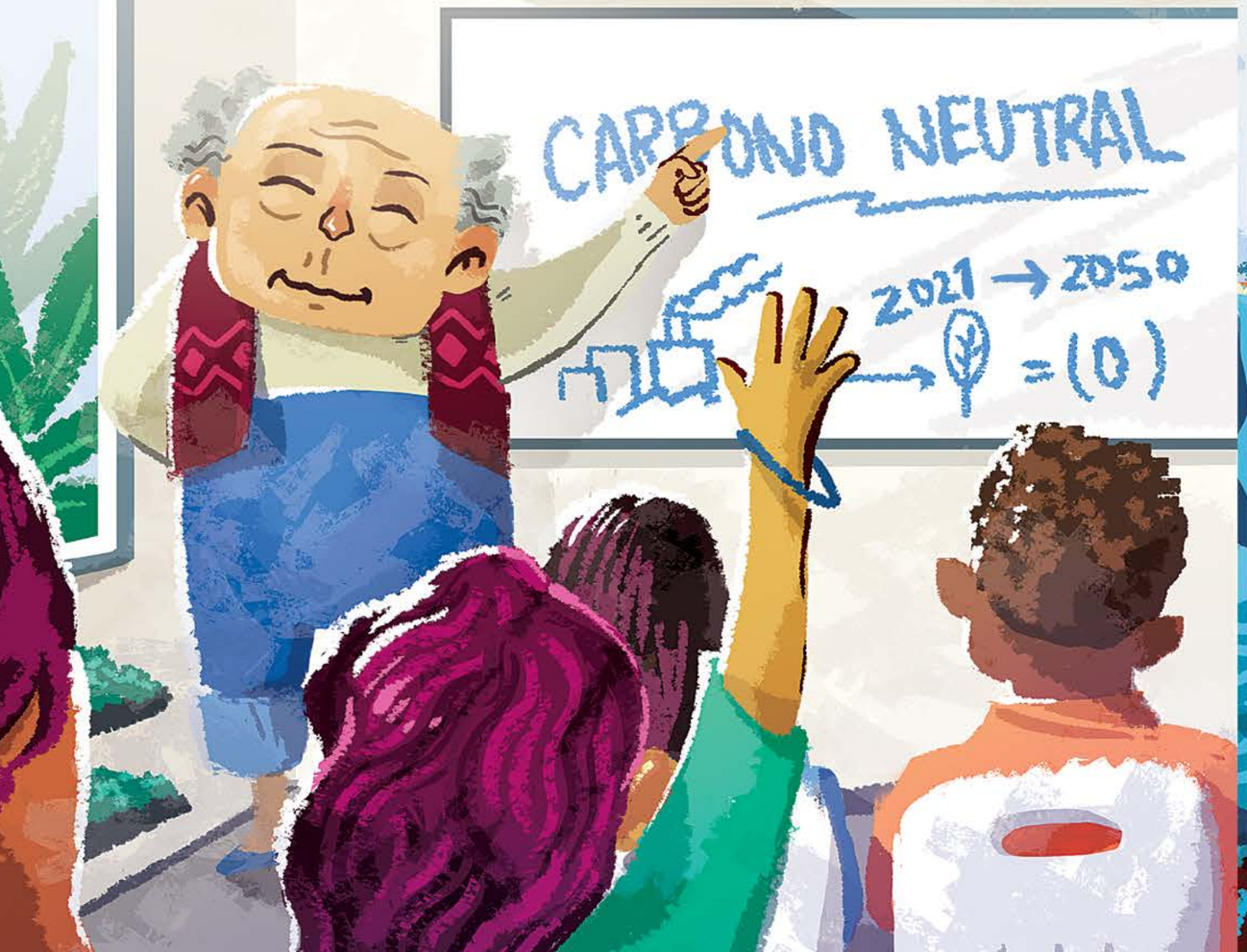
Although we had not seen grandpa since we were little, he welcomed us with open arms. Thanks to everything we had learnt from him, we felt as if we had known him our whole lives. When we got home, we all hugged for quite a while. The only thing now left to do was for grandma to come back and tell us all about her trip.



The project that had us reunite was a kind of a small university to train young leaders in environmental issues, especially in wind energy. His plan was to bring young people from all over the country to show them the wind farm he'd built and teach them how to replicate it in their communities (although it'd be impossible to do it without help). That's why my parents were so excited! Now everything was clear!



Although Tomás and I had to make new friends, learn other routines, and hang out in unfamiliar places, it was not difficult to get used to. Like grandparents throughout his life, it was a matter of adjusting.



Mom and dad were right: in this new place we were going to be even happier. So, I always remember the phrase with which our grandparents welcome young people visiting their university: “We must not fear the winds of change but use them to propel us in a new direction”.

At the beginning of the trip, we were scared because we didn't know how moving would affect our lives. Rather quickly, however, we learnt that change isn't bad at all and that it can teach us many things. As I learnt from my grandparents' lives, carbon neutrality is the result of actions and decisions taken on time. Now I understand that such changes have helped us live in balance, that is, in harmony with our planet and that we all can contribute to positively change the world. Today my purpose is to help these practices and systems endure and continue to evolve. We therefore will continue to improve our well-being and way of living in harmony with the environment.

Glossary

Adaptation
The capacity we have to respond and readjust ourselves individually and socially to situations or conditions that are new or different from those we were used to. Adaptation brings with it a permanent transformation in ways and means of life.

Biomass
All organic matter that can be used as a source of energy. We can obtain it from nature without human intervention, residues from agricultural or livestock activities and from plant crops created to obtain energy. Biorefineries are the places wherein biomass is converted into energy, fuels, and chemicals.

Global warming
The process Earth undergoes due to the increase in average temperature caused by climate change.

Climate change
Change in the global climate system —that is, in temperature, rainfall, and humidity, among others— caused by human activities producing excessive accumulation of chemical substances called greenhouse gases (GHG) in the atmosphere. These substances retain an important part of infrared radiation or heat from the sun that bounces off the earth's surface. The main consequence of climate change is the loss of people's quality of life, as it reduces crop productivity and increases risk of disasters due to natural phenomena such as landslides, floods, and hurricanes. It also increases the possibility of contracting diseases such as dengue and malaria and losing many services biodiversity provides us with.

CARBON

Carbon absorption
It is the ability of ecosystems to remove carbon dioxide (CO_2) from the atmosphere through photosynthetic processes and carbon storage in their tissues. Technologies are currently being designed to fulfil this function.

Carbon emissions
Amounts of carbon dioxide (CO_2) emitted into the atmosphere per year as a result of biological processes and human activities such as cutting down trees, ploughing the land, and burning fossil fuels in engines and boilers, among others.

Carbon neutrality
State in which the amount of greenhouse gases (GHG) produced by human activities is the same amount of GHG absorbed by nature or the use of some technology. In this way, an annual net balance equal to zero is achieved.

Fossil fuels
Non-renewable energy sources, which means at some point they will end. These come from the remains of prehistoric animals and plants that –due to time, heat, and high pressures in the earth's crust– fossilized or liquefied forming carbon-rich compounds called hydrocarbons. Fossil fuels produce a large amount of energy when burned, some of which are coal, oil, and natural gas. These, in turn, are used to produce electricity, transport, and cook, among other activities. When fossil fuels are burned, however, a large amount of CO_2 is released.

Deforestation
Definitive destruction of forests to make way for other covers such as pastures and crops or to create enough space for different types of infrastructure. Deforestation brings with it the death of several species of animals and plants, in addition to depletion of soils (as they become directly exposed to the sun) and loss of watercourses as well as of sources of water.

Ecoefficient
All processes in which resources are used in the best way while creating a minimum amount of waste and carbon emissions. In other words, when goods and services are created using fewer resources, thereby generating less waste and pollution.

Circular economy
Production and consumption system promoting adequate use of materials, water, and energy. It allows ecosystems to recover and materials to be reused or used for a long time through technological innovations and collaborations between different people and sustainable businesses.

Greenhouse gases (GHG)
Chemical substances in a gaseous state capturing infrared radiation or heat from the sun that bounces off the earth's surface. When a few gases become trapped in the atmosphere, thus creating a thin layer of them, the greenhouse effect is created, a natural process thanks to which the planet maintains an average temperature close to 14° C, which, in turn, allows life on Earth to sprout. Without the greenhouse effect the average temperature of the planet would become minus 19° C. Unfortunately, however, for several decades now an over-accumulation of such gases has taken place, which is why greenhouse effect is increasing dramatically and so is the average temperature of the planet because of it, thereby creating climate change.

RENEWABLE ENERGY

Wind, solar, tidal, geothermal
Energies obtained from natural sources, thereby producing clean energy indefinitely, such as wind, sun, sea, and heat from the Earth's core.

Blue hydrogen
An element produced for energy purposes using hydrocarbons chemically decomposed by heat. Mainly, blue hydrogen is extracted from natural gas or coal deposits.

Green hydrogen
An element produced for energy purposes using renewable energy sources such as solar panel fields or wind farms to create clean energy to power machines.

Mass recycling plant
Site wherein residue and waste are processed to become new materials. When waste reaches the plant, it undergoes various stages. Machines and people help classify it dependant of its type.

Ancestral practices
The particular way in which local communities interact with the natural environment they inhabit and that has been taught throughout the generations. It contributes to our understanding of the environment in general.

Silvopastoral practices
A form of land organization comprised of trees, shrubs, and pastures with livestock production. A system seeking to provide shade and food for animals and improve soil conditions.

Oil refineries
Industrial plants wherein products are made from petroleum. Among them, gasoline, asphalt, and oil. These processes emit many gases and pollute the planet greatly.

Natural reserves
Specific natural areas protected because of their importance for wildlife, flora, and fauna.

Climate resilience
The capacity ecosystems and societies have or that can develop in order to face climate change impacts, thereby being able to adapt and continue to develop without experiencing different types of stress due to climate change.

Ecological restoration
Putting an ecosystem back to its original state before it became degraded so it can regain its natural function. The resulting ecosystem must be a self-sustaining system guaranteeing the conservation of its species, goods, and services.

Smart-energy saving systems
Objects and networks designed to save energy and that can be turned on or off automatically depending on whether we need a power source. For example, a lighting control prevents us from using more light than we need.

SUSTAINABILITY

Self-sustaining land
Means of satisfying human needs in a sustainable way, that is, without taking more than we need, thereby also ensuring resource availability for everyone.

Electric mass transportation
Public transport system that uses electrical energy instead of fossil fuels for its operation. This way, many more people can move around without emitting large amounts of greenhouse gases.

Travel Guide