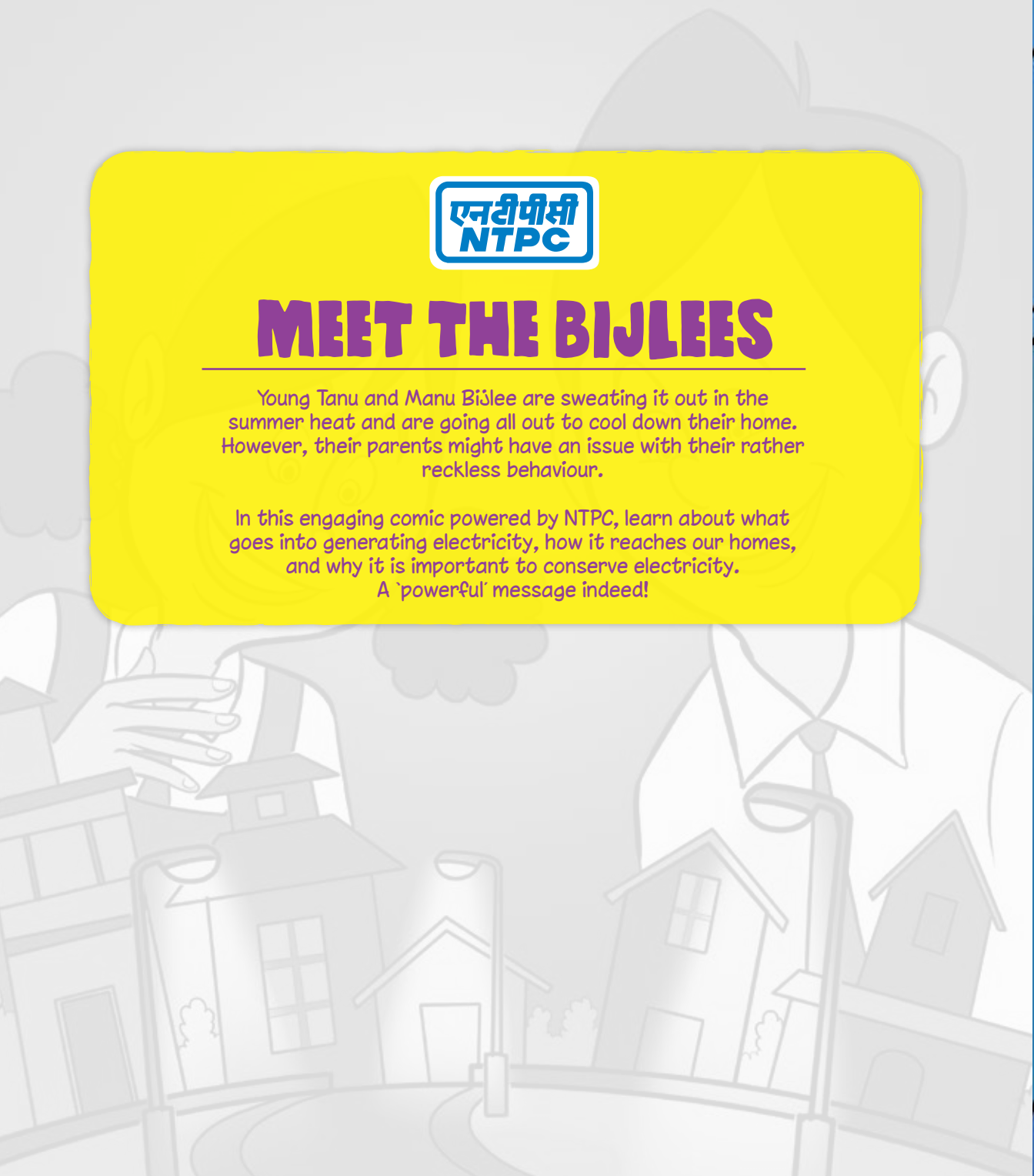
एनटीपीसी
NTPC

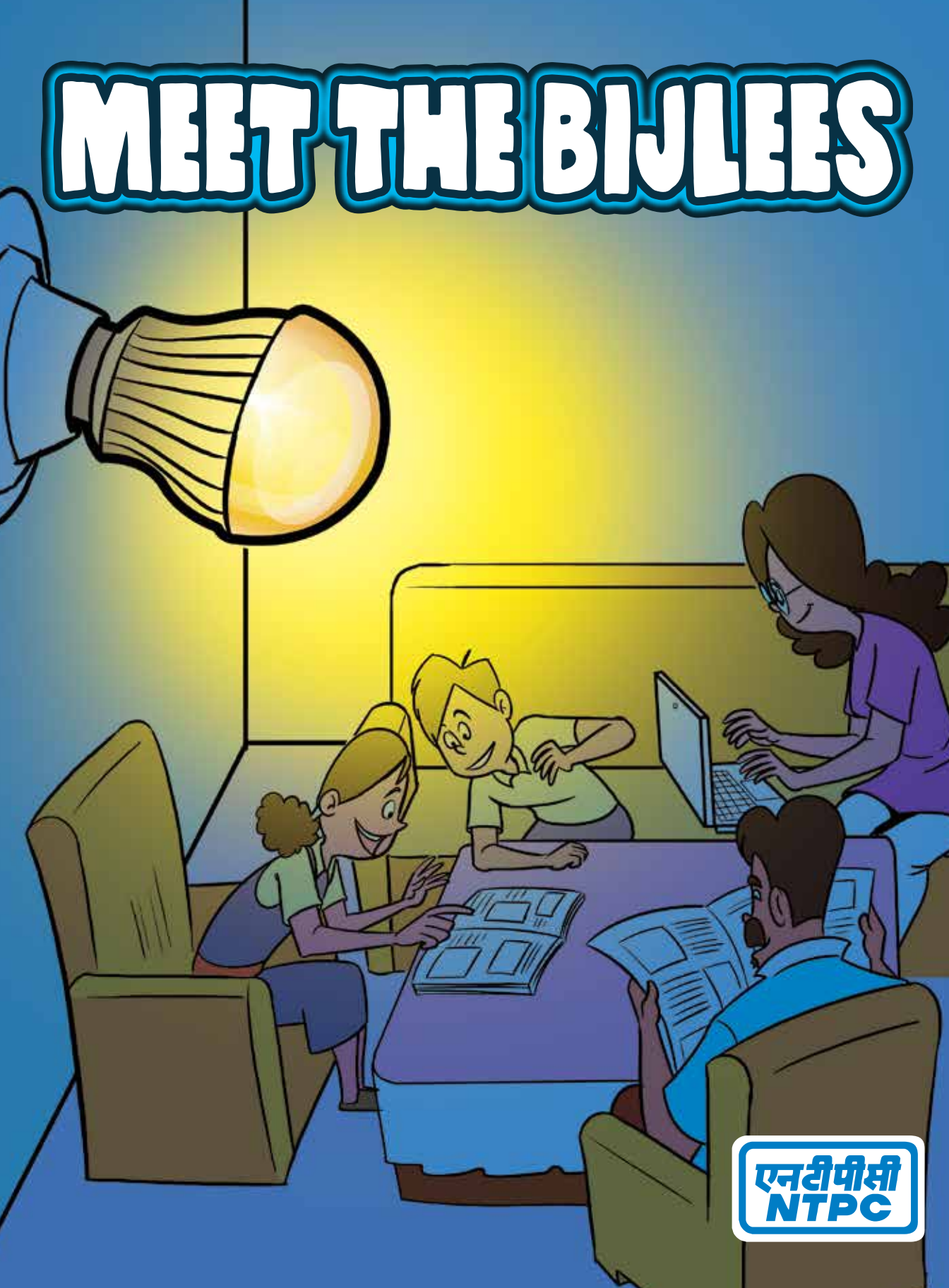
MEET THE BIJLEES

Young Tanu and Manu Bijlee are sweating it out in the summer heat and are going all out to cool down their home. However, their parents might have an issue with their rather reckless behaviour.

In this engaging comic powered by NTPC, learn about what goes into generating electricity, how it reaches our homes, and why it is important to conserve electricity. A `powerful' message indeed!



MEET THE BIJLEES



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MEET THE BIJLEES

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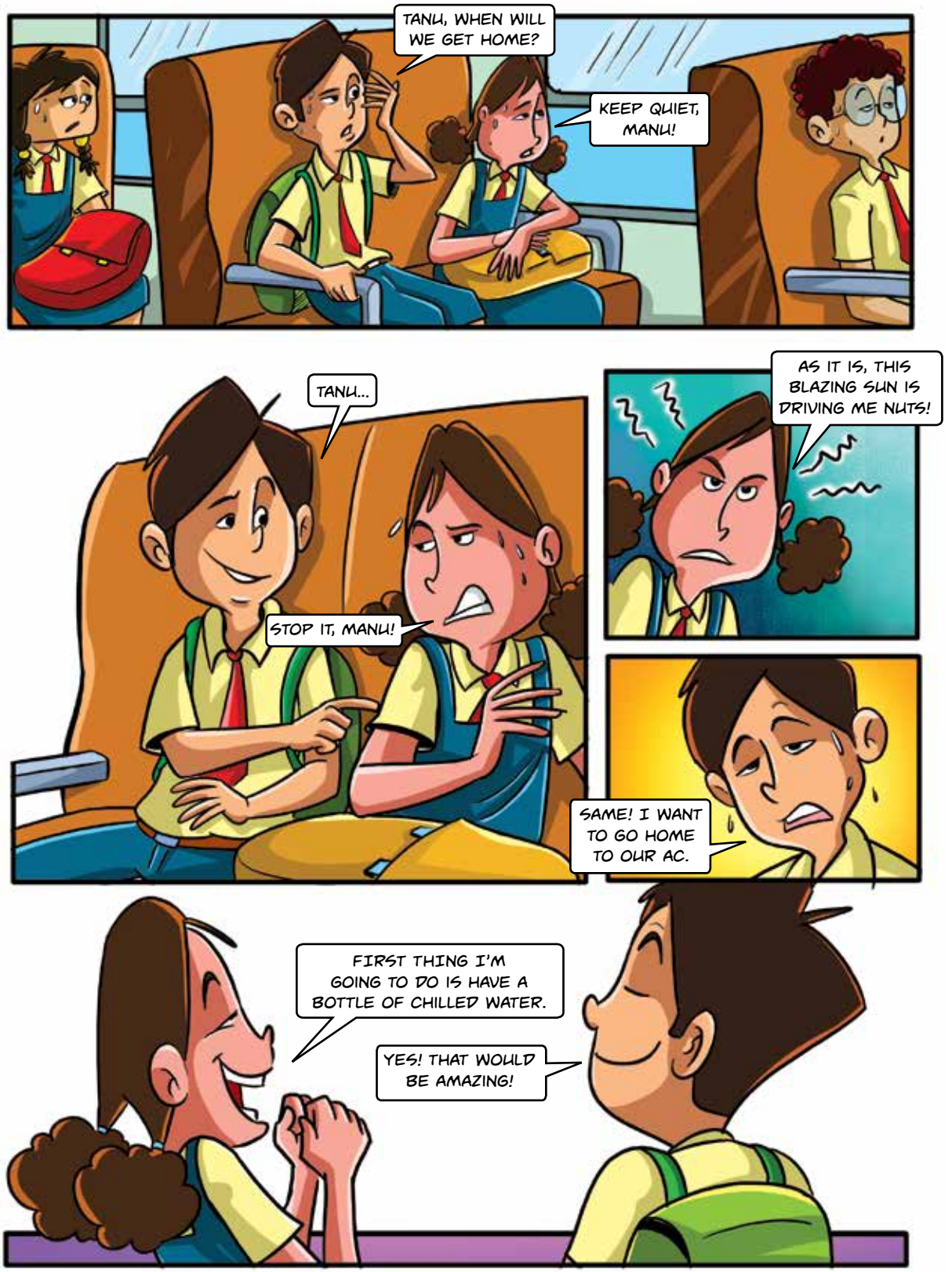
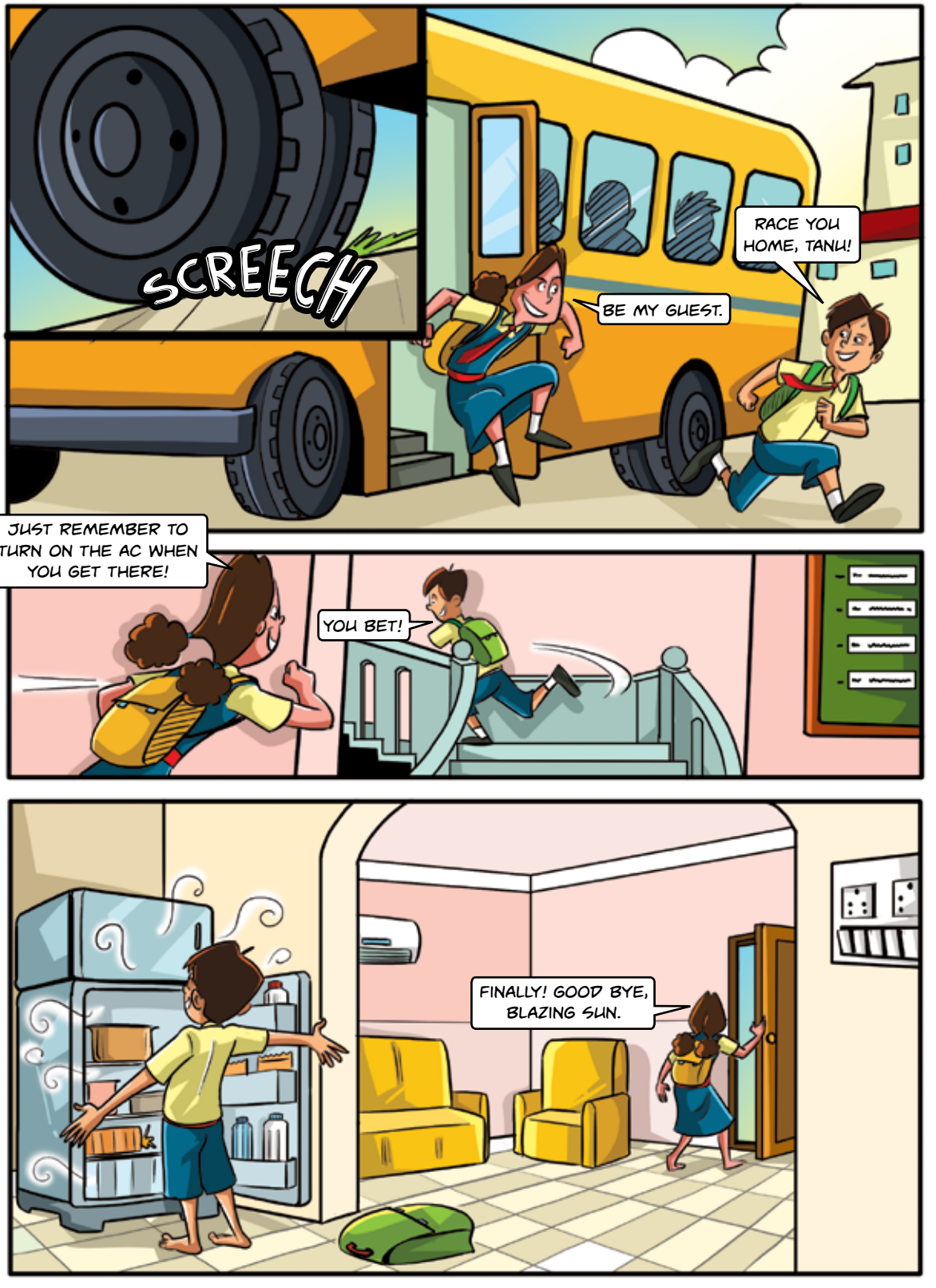
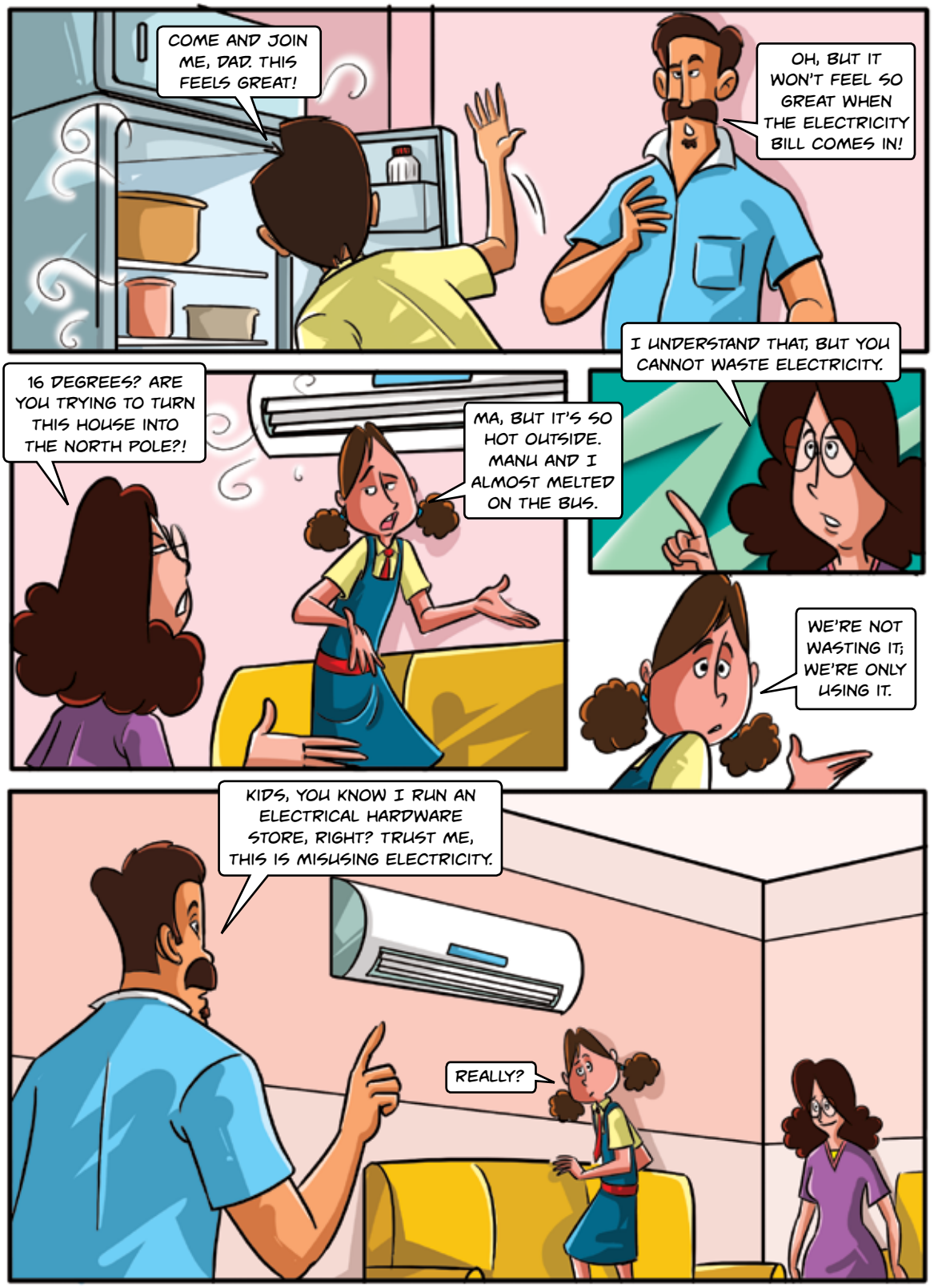
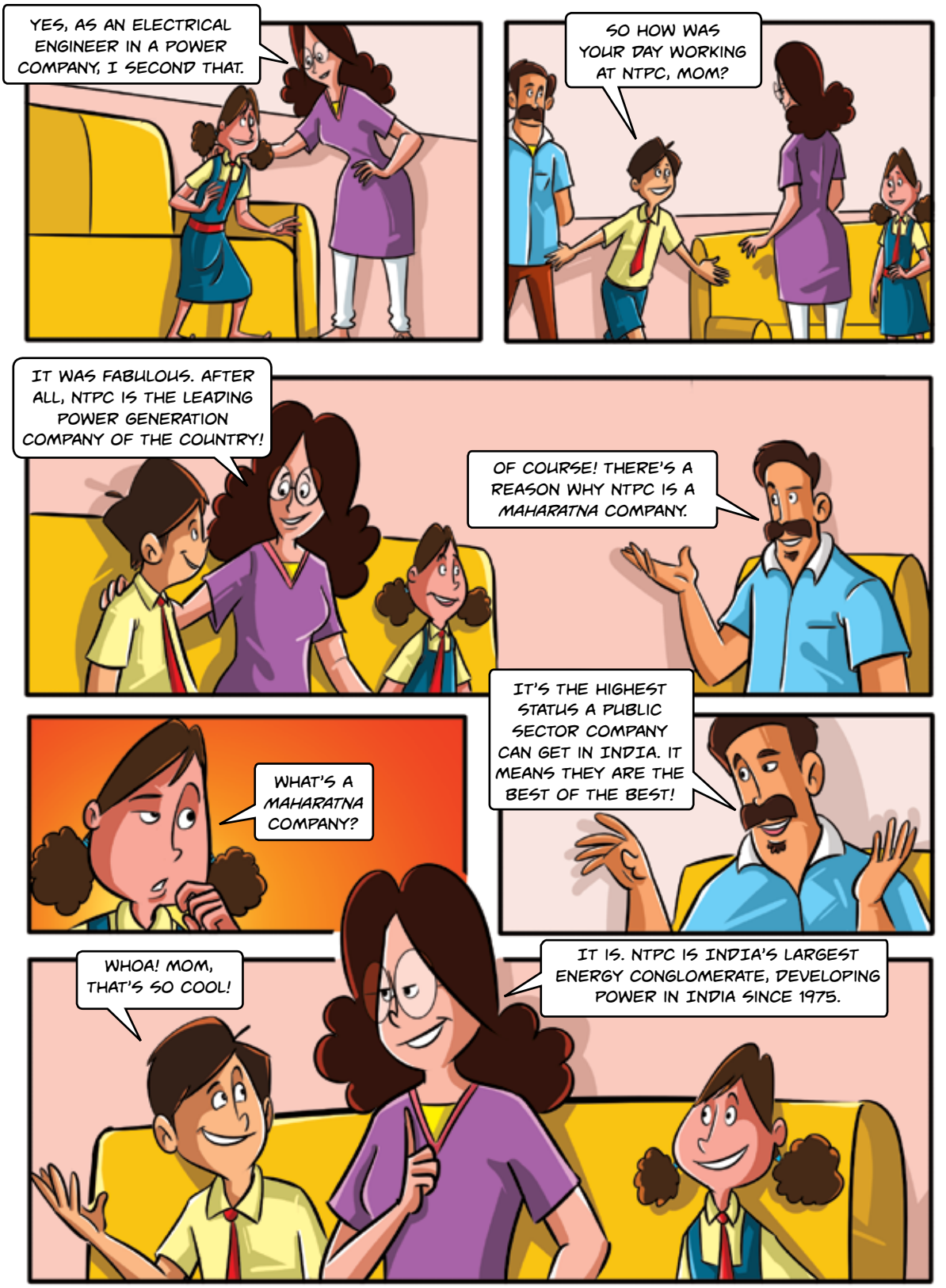

TANU, WHEN WILL WE GET HOME?
KEEP QUIET, MANU!
TANU...
STOP IT, MANU!
AS IT IS, THIS BLAZING SUN IS DRIVING ME NUTS!
SAME! I WANT TO GO HOME TO OUR AC.
FIRST THING I'M GOING TO DO IS HAVE A BOTTLE OF CHILLED WATER.
YES! THAT WOULD BE AMAZING!

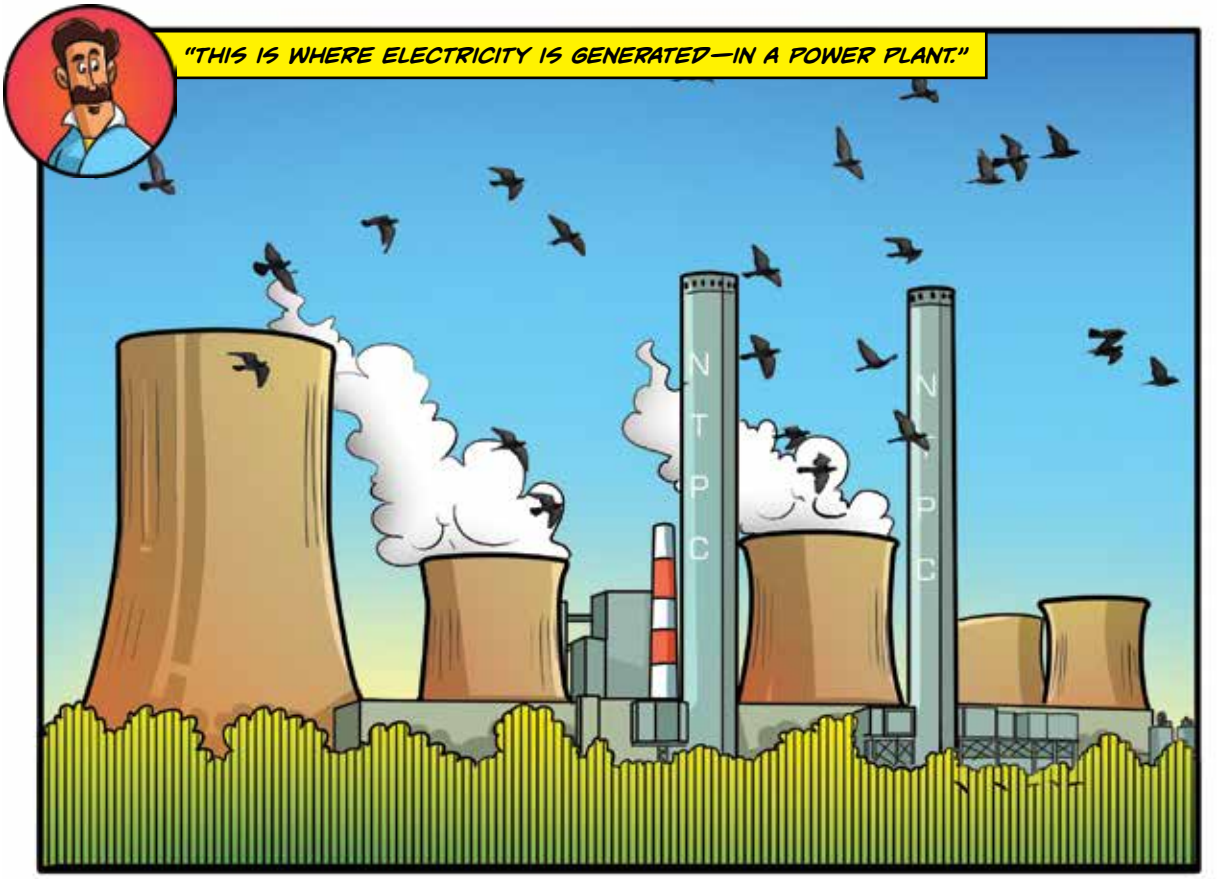

SCREECH
RACE YOU HOME, TANU!
BE MY GUEST.
JUST REMEMBER TO TURN ON THE AC WHEN YOU GET THERE!
YOU BET!
FINALLY! GOOD BYE, BLAZING SUN.

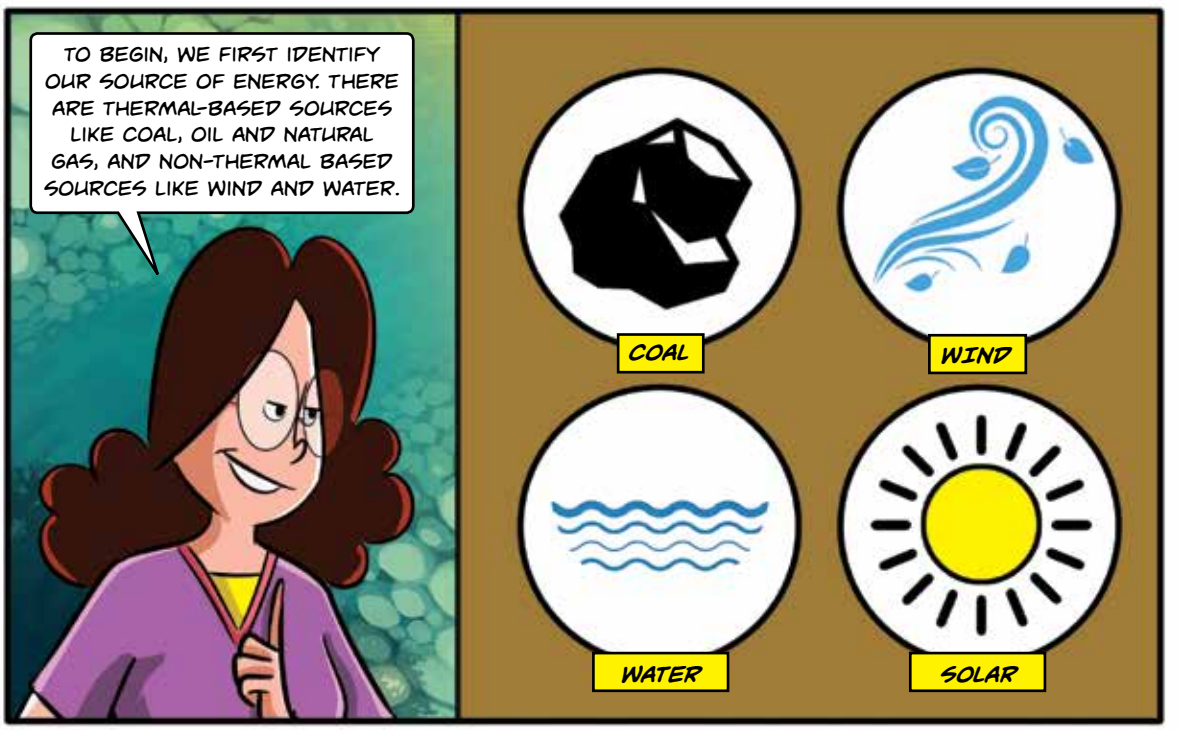

HELLOOO, WINTER!
AH! THIS IS THE BEST!
HI, KIDS. WE'RE HOME!
HEY, DAD!
HEY, MOM!
HUH?!
EEK! WHAT ARE THE TWO OF YOU DOING?
WE'RE CHILLING!
HEH HEH! PUN UNINTENDED.

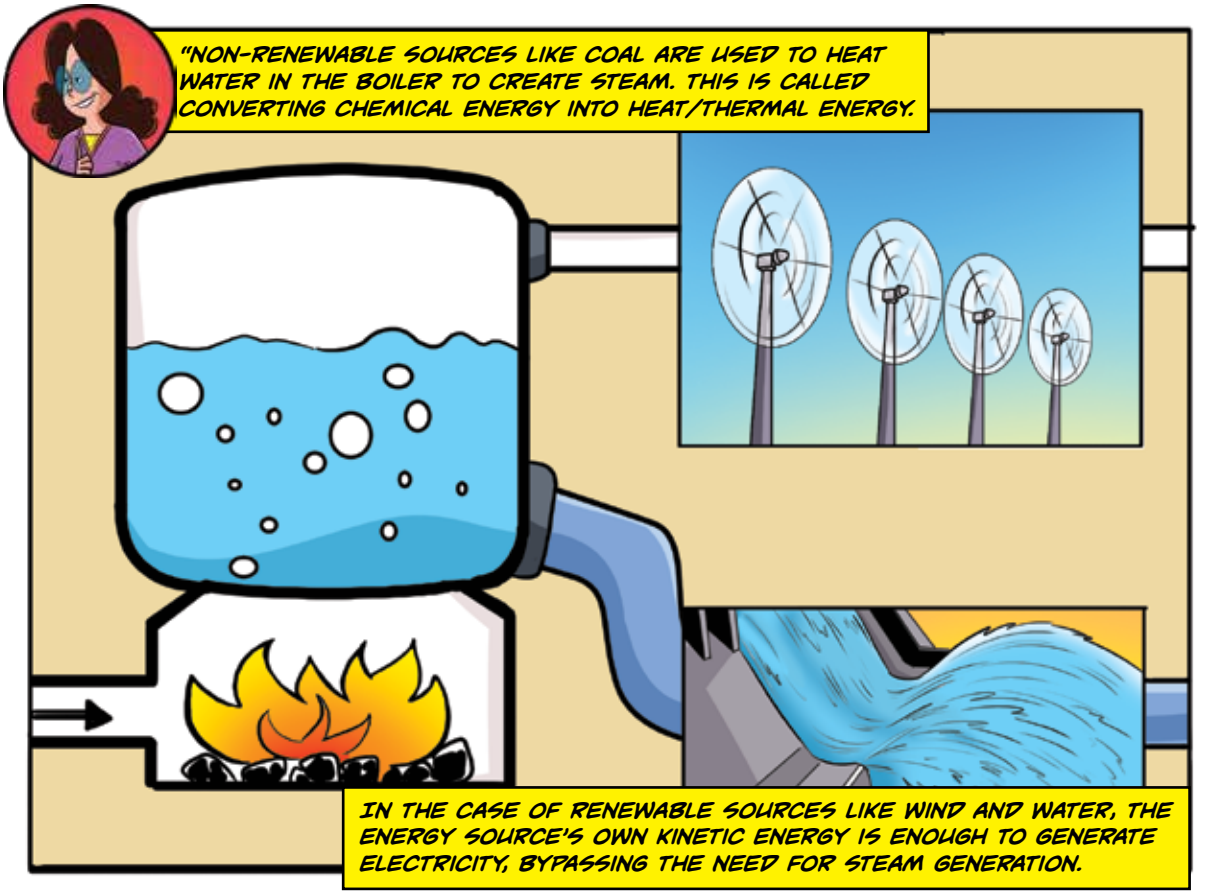

COME AND JOIN ME, DAD. THIS FEELS GREAT!
OH, BUT IT WON'T FEEL SO GREAT WHEN THE ELECTRICITY BILL COMES IN!
I UNDERSTAND THAT, BUT YOU CANNOT WASTE ELECTRICITY.
16 DEGREES? ARE YOU TRYING TO TURN THIS HOUSE INTO THE NORTH POLE?!
MA, BUT IT'S SO HOT OUTSIDE. MANU AND I ALMOST MELTED ON THE BUS.
WE'RE NOT WASTING IT; WE'RE ONLY USING IT.
KIDS, YOU KNOW I RUN AN ELECTRICAL HARDWARE STORE, RIGHT? TRUST ME, THIS IS MISUSING ELECTRICITY.
REALLY?

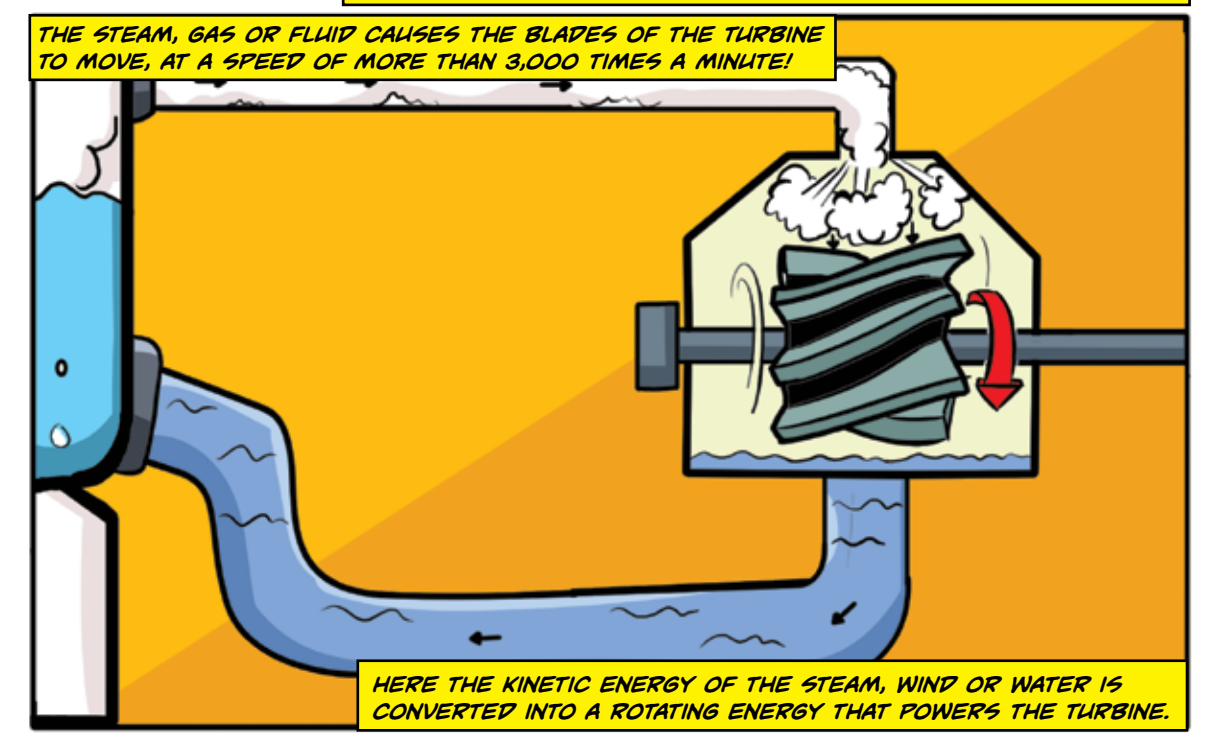

YES, AS AN ELECTRICAL ENGINEER IN A POWER COMPANY, I SECOND THAT.
SO HOW WAS YOUR DAY WORKING AT NTPC, MOM?
IT WAS FABULOUS. AFTER ALL, NTPC IS THE LEADING POWER GENERATION COMPANY OF THE COUNTRY!
OF COURSE! THERE'S A REASON WHY NTPC IS A MAHARATNA COMPANY.
WHAT'S A MAHARATNA COMPANY?
IT'S THE HIGHEST STATUS A PUBLIC SECTOR COMPANY CAN GET IN INDIA. IT MEANS THEY ARE THE BEST OF THE BEST!
WHOA! MOM, THAT'S SO COOL!
IT IS. NTPC IS INDIA'S LARGEST ENERGY CONGLOMERATE, DEVELOPING POWER IN INDIA SINCE 1975.

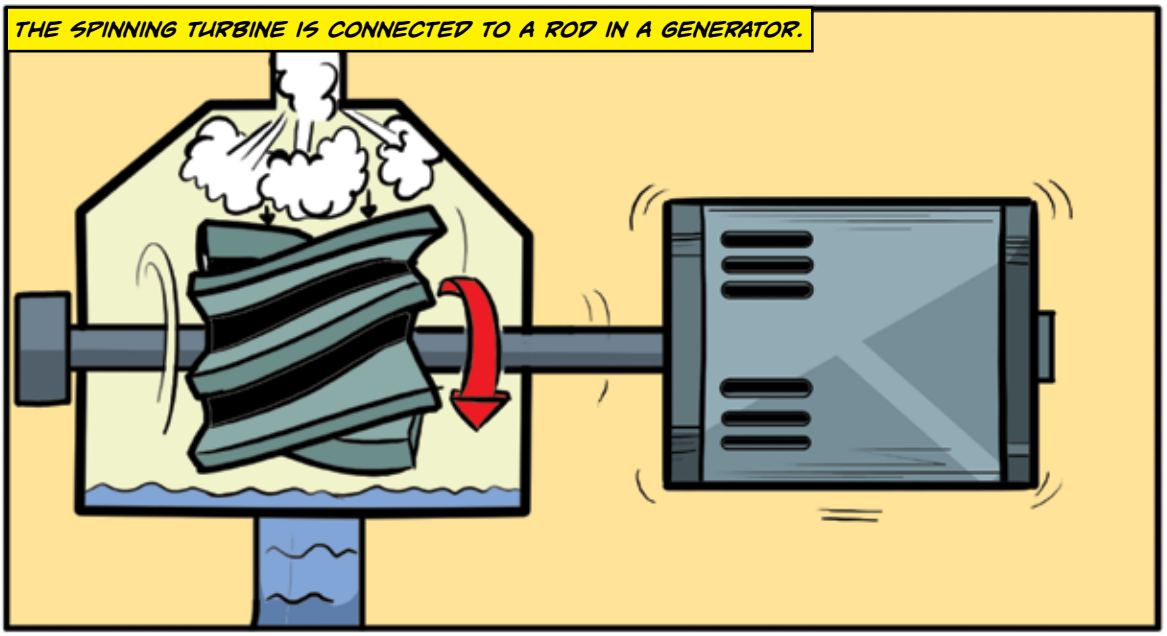

WOW! THAT'S BRILLIANT.
BUT WHAT DOES 'DEVELOPING POWER' MEAN?
IT MEANS GENERATING ELECTRICITY, MANU.
AND... WHAT DOES 'GENERATING' MEAN EXACTLY?
IT MEANS CREATING ELECTRICITY, TANU.
BUT HOW DO YOU CREATE ELECTRICITY?
IT STARTS WITH...
WAIT, HOLD ON. I'LL BRING SOME PICTURES.

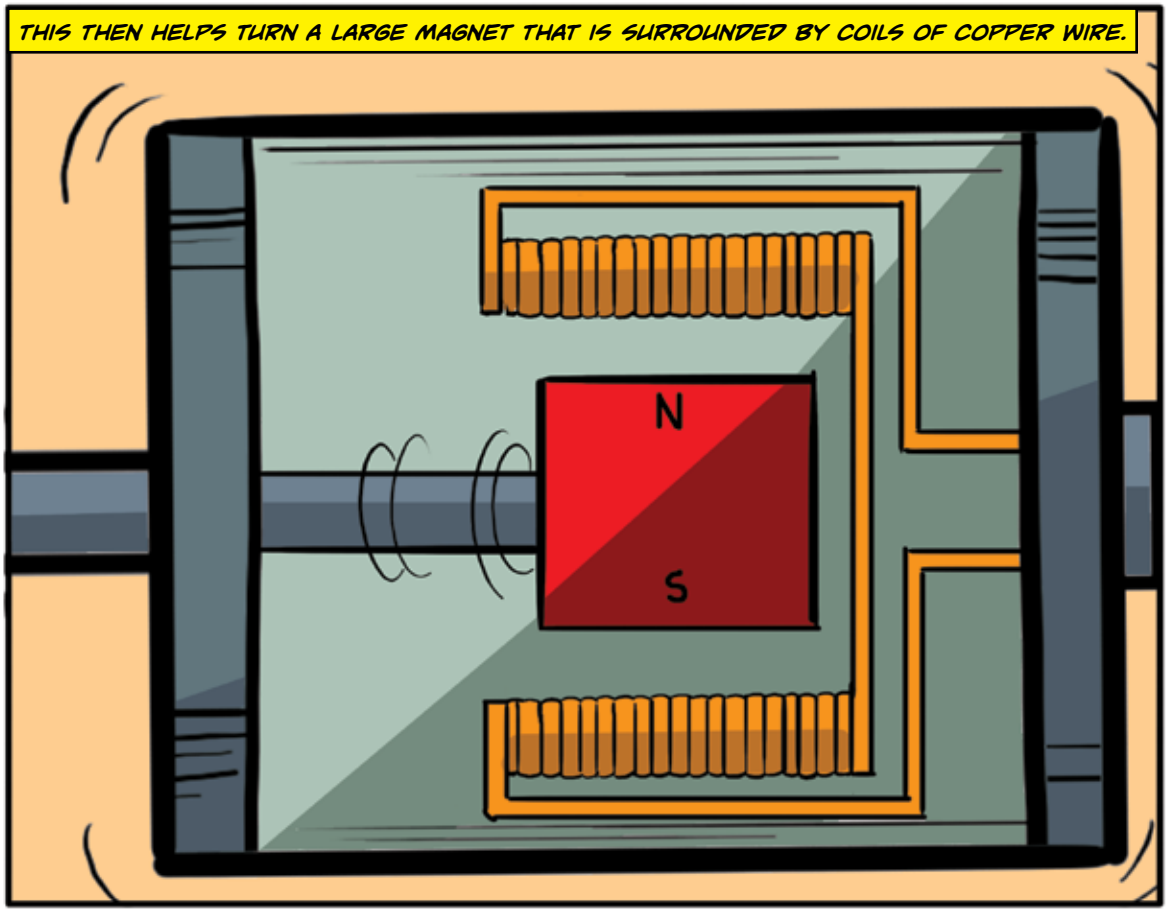

"THIS IS WHERE ELECTRICITY IS GENERATED—IN A POWER PLANT."
NTPC
NTPC

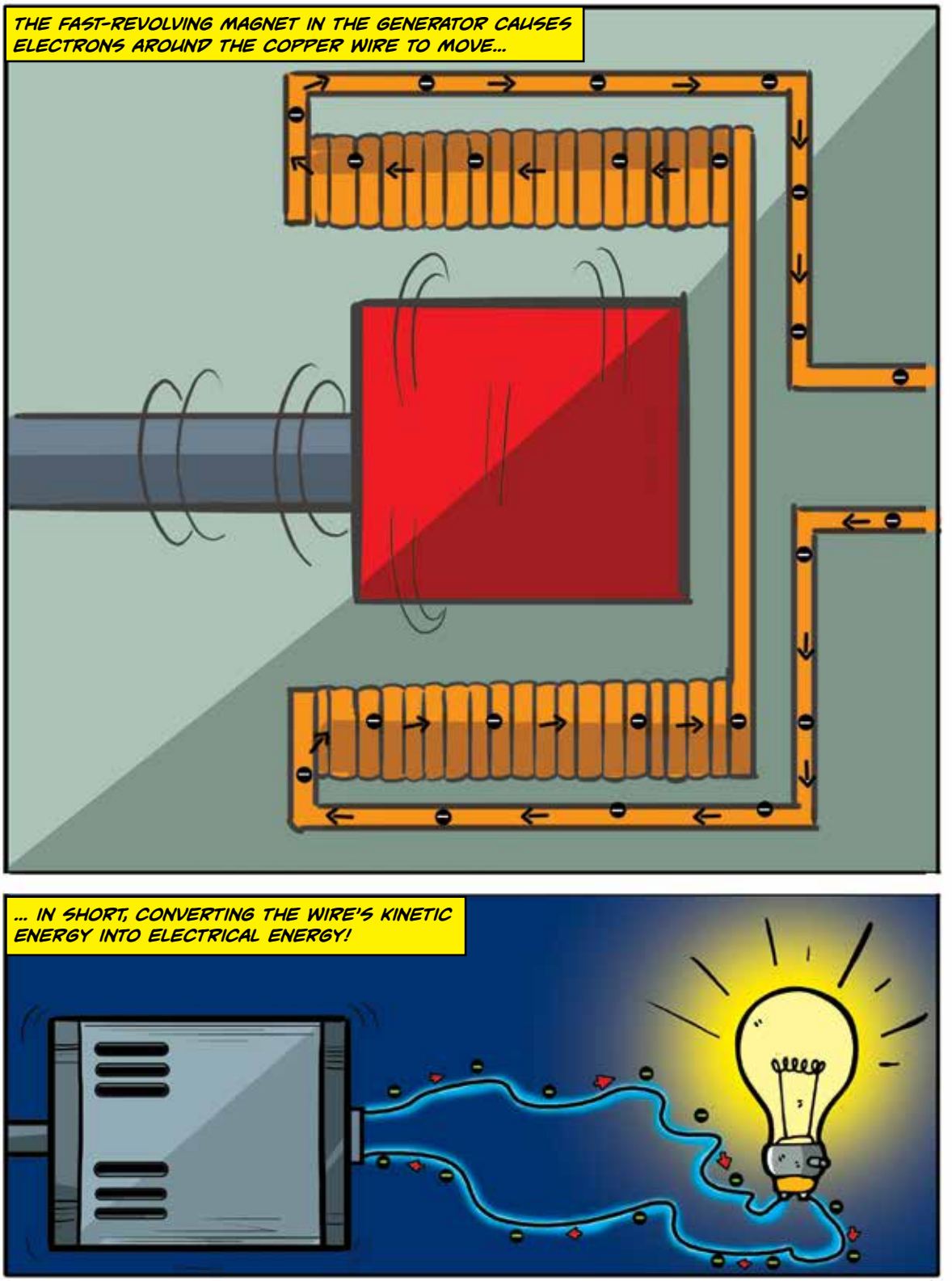

TO BEGIN, WE FIRST IDENTIFY OUR SOURCE OF ENERGY. THERE ARE THERMAL-BASED SOURCES LIKE COAL, OIL AND NATURAL GAS, AND NON-THERMAL BASED SOURCES LIKE WIND AND WATER.
COAL
WIND
WATER
SOLAR


"NON-RENEWABLE SOURCES LIKE COAL ARE USED TO HEAT WATER IN THE BOILER TO CREATE STEAM. THIS IS CALLED CONVERTING CHEMICAL ENERGY INTO HEAT/THERMAL ENERGY.
IN THE CASE OF RENEWABLE SOURCES LIKE WIND AND WATER, THE ENERGY SOURCE'S OWN KINETIC ENERGY IS ENOUGH TO GENERATE ELECTRICITY, BYPASSING THE NEED FOR STEAM GENERATION.

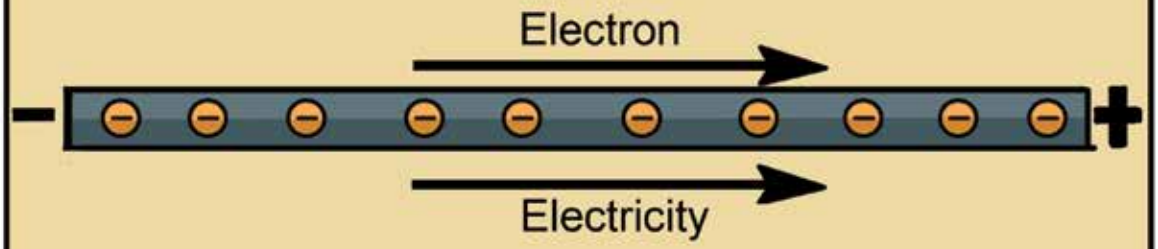

THE STEAM, GAS OR FLUID CAUSES THE BLADES OF THE TURBINE TO MOVE, AT A SPEED OF MORE THAN 3,000 TIMES A MINUTE!
HERE THE KINETIC ENERGY OF THE STEAM, WIND OR WATER IS CONVERTED INTO A ROTATING ENERGY THAT POWERS THE TURBINE.


THE SPINNING TURBINE IS CONNECTED TO A ROD IN A GENERATOR.

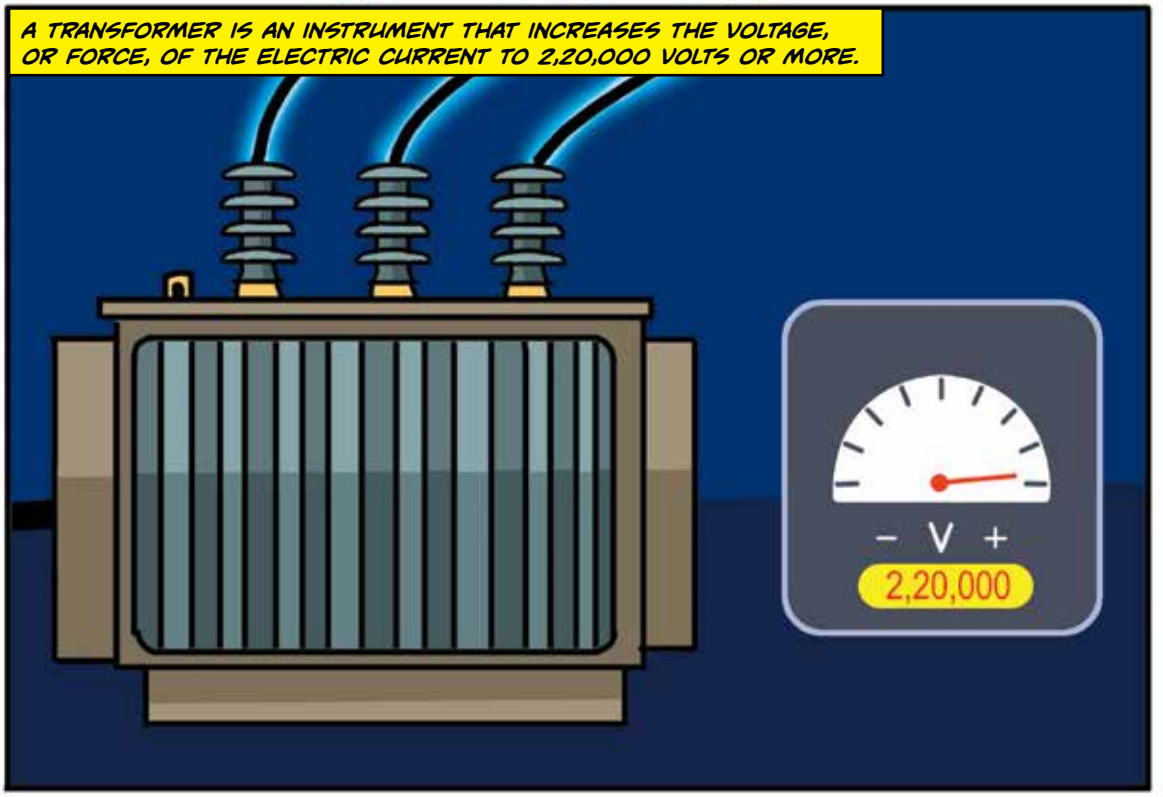

THIS THEN HELPS TURN A LARGE MAGNET THAT IS SURROUNDED BY COILS OF COPPER WIRE.
N
S

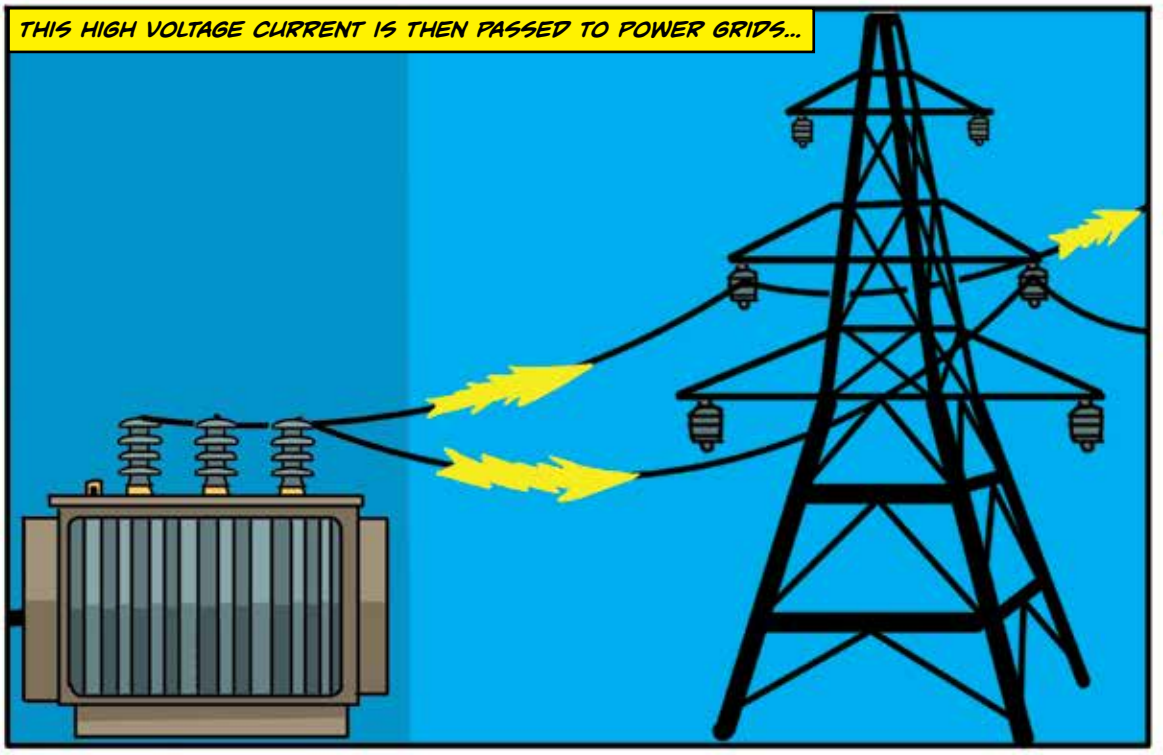

THE FAST-REVOLVING MAGNET IN THE GENERATOR CAUSES ELECTRONS AROUND THE COPPER WIRE TO MOVE...
... IN SHORT, CONVERTING THE WIRE'S KINETIC ENERGY INTO ELECTRICAL ENERGY!

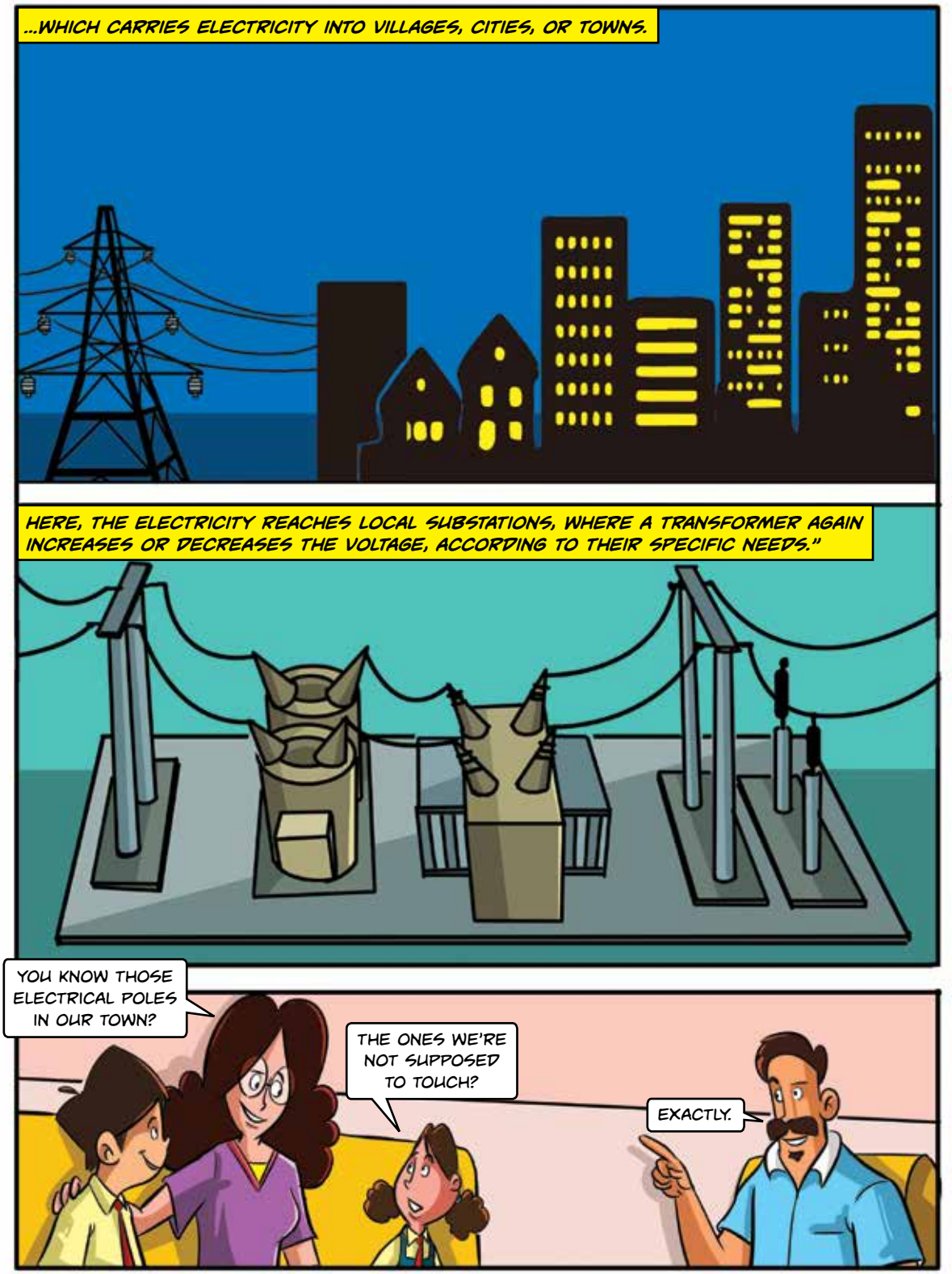
THE MOVEMENT OF ELECTRONS THROUGH A WIRE IS CALLED ELECTRICITY.

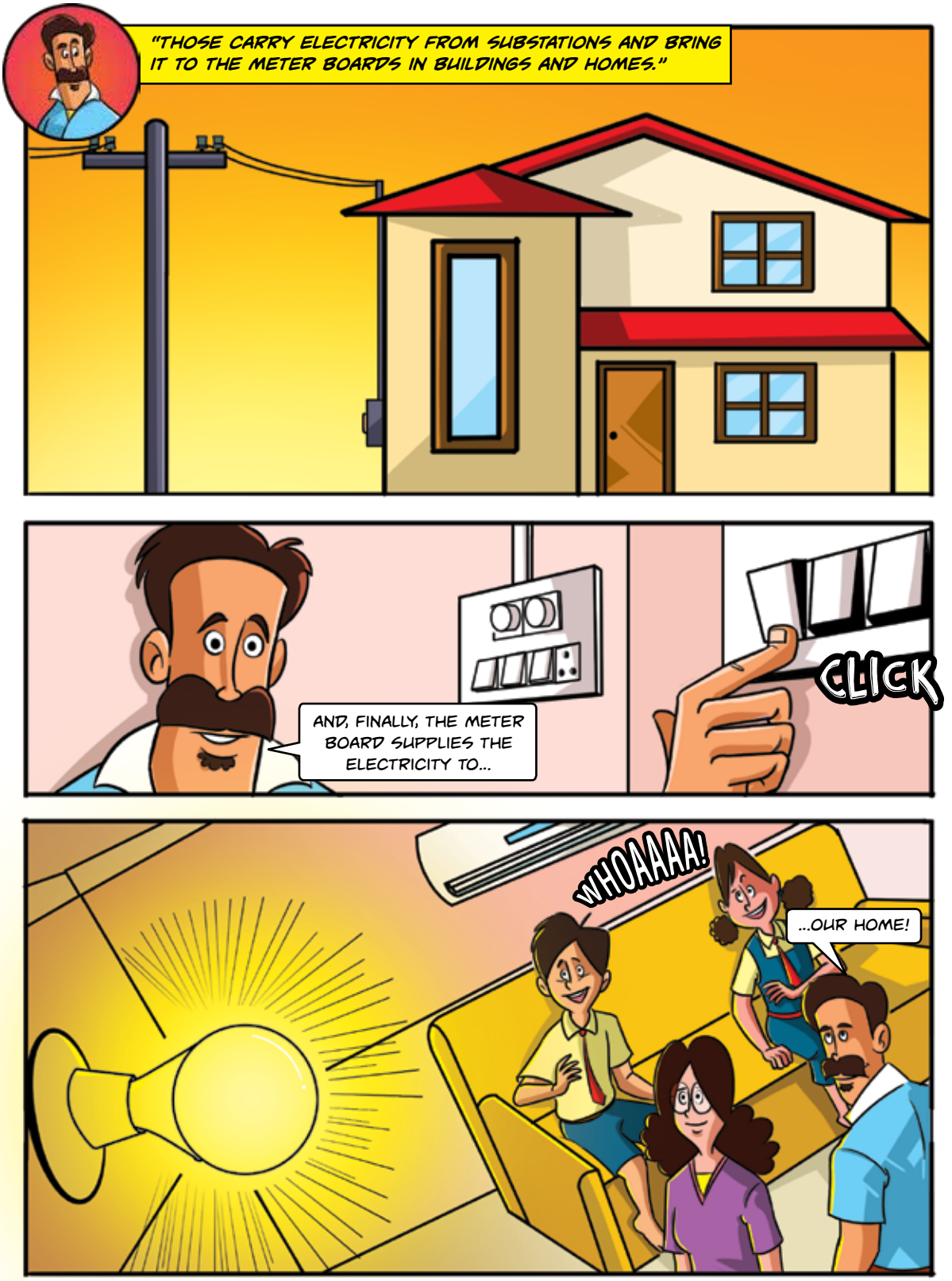


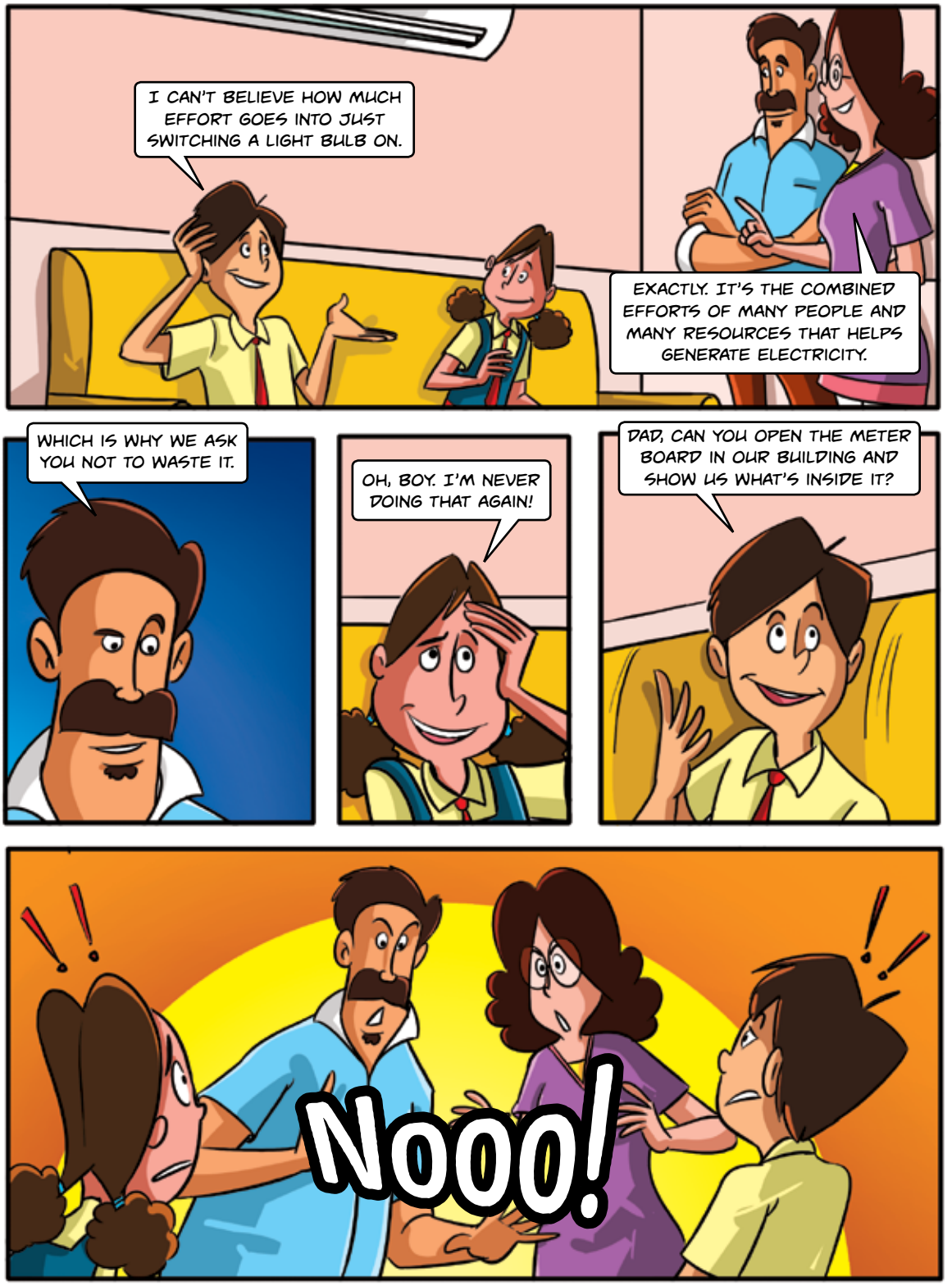
THIS ELECTRICITY IS THEN CARRIED FROM THE GENERATOR TO A TRANSFORMER OUTSIDE.


A TRANSFORMER IS AN INSTRUMENT THAT INCREASES THE VOLTAGE, OR FORCE, OF THE ELECTRIC CURRENT TO 2,20,000 VOLTS OR MORE.
– V +
2,20,000

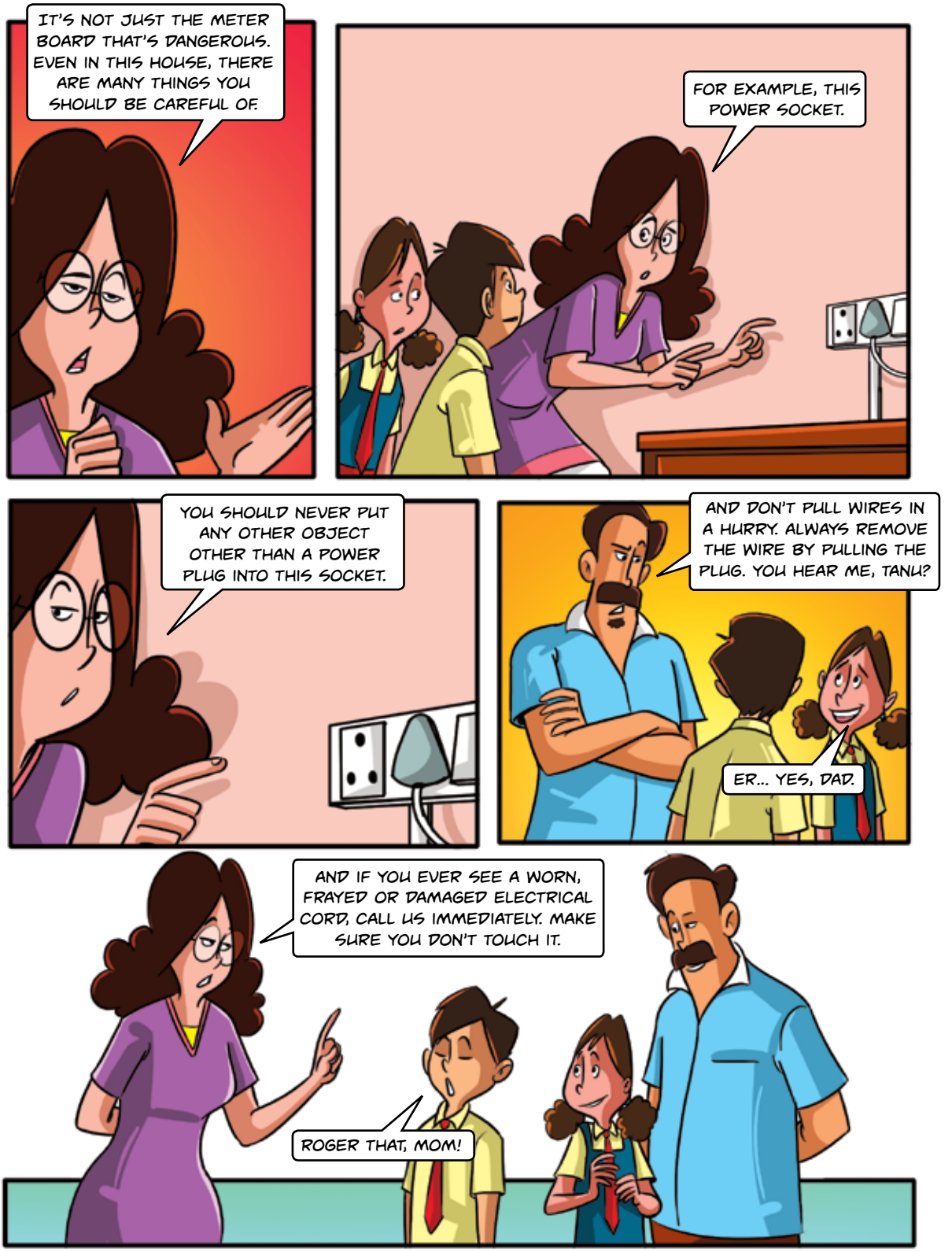

THIS HIGH VOLTAGE CURRENT IS THEN PASSED TO POWER GRIDS...

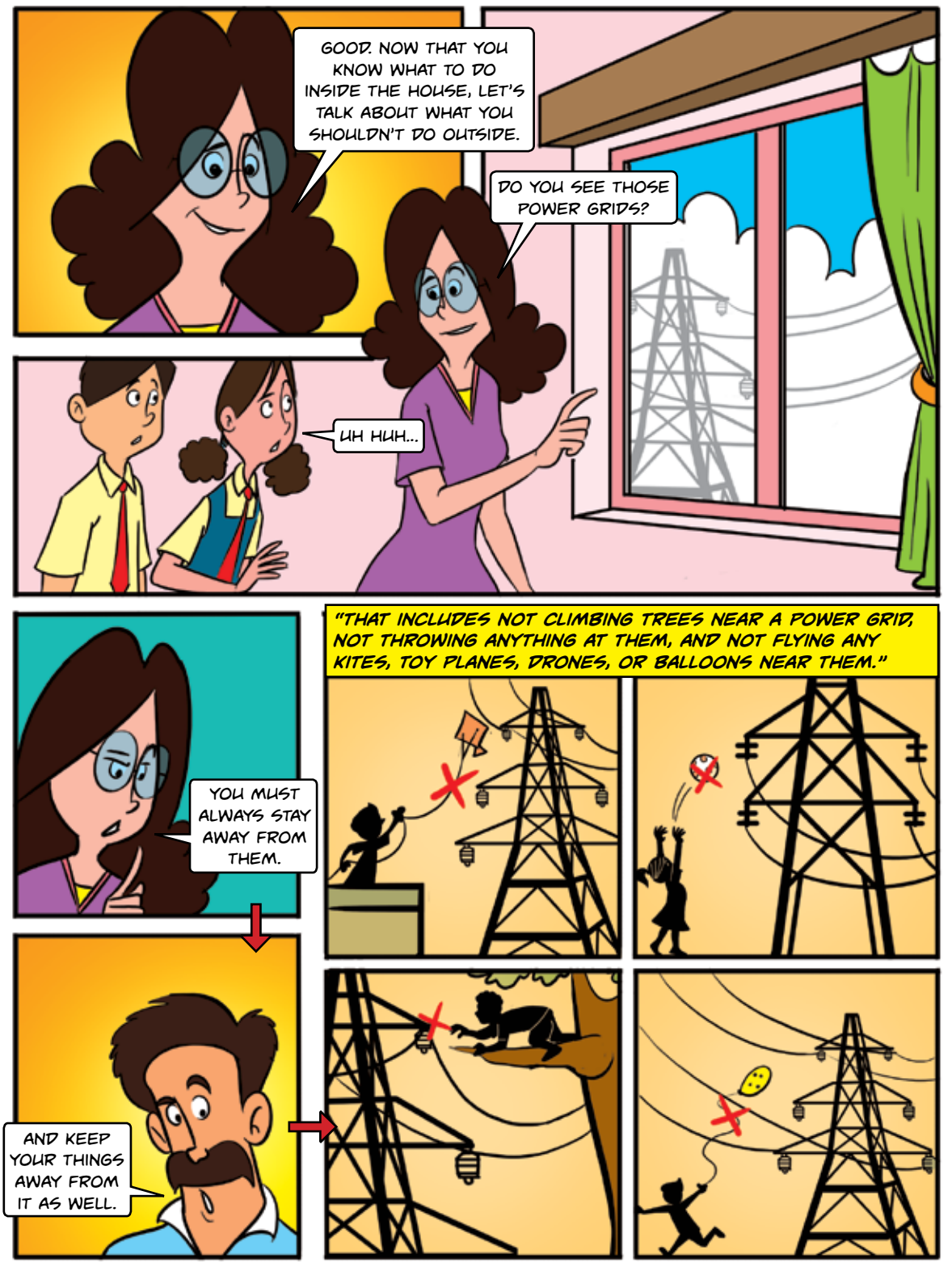

...WHICH CARRIES ELECTRICITY INTO VILLAGES, CITIES, OR TOWNS.
HERE, THE ELECTRICITY REACHES LOCAL SUBSTATIONS, WHERE A TRANSFORMER AGAIN INCREASES OR DECREASES THE VOLTAGE, ACCORDING TO THEIR SPECIFIC NEEDS."
YOU KNOW THOSE ELECTRICAL POLES IN OUR TOWN?
THE ONES WE'RE NOT SUPPOSED TO TOUCH?
EXACTLY.

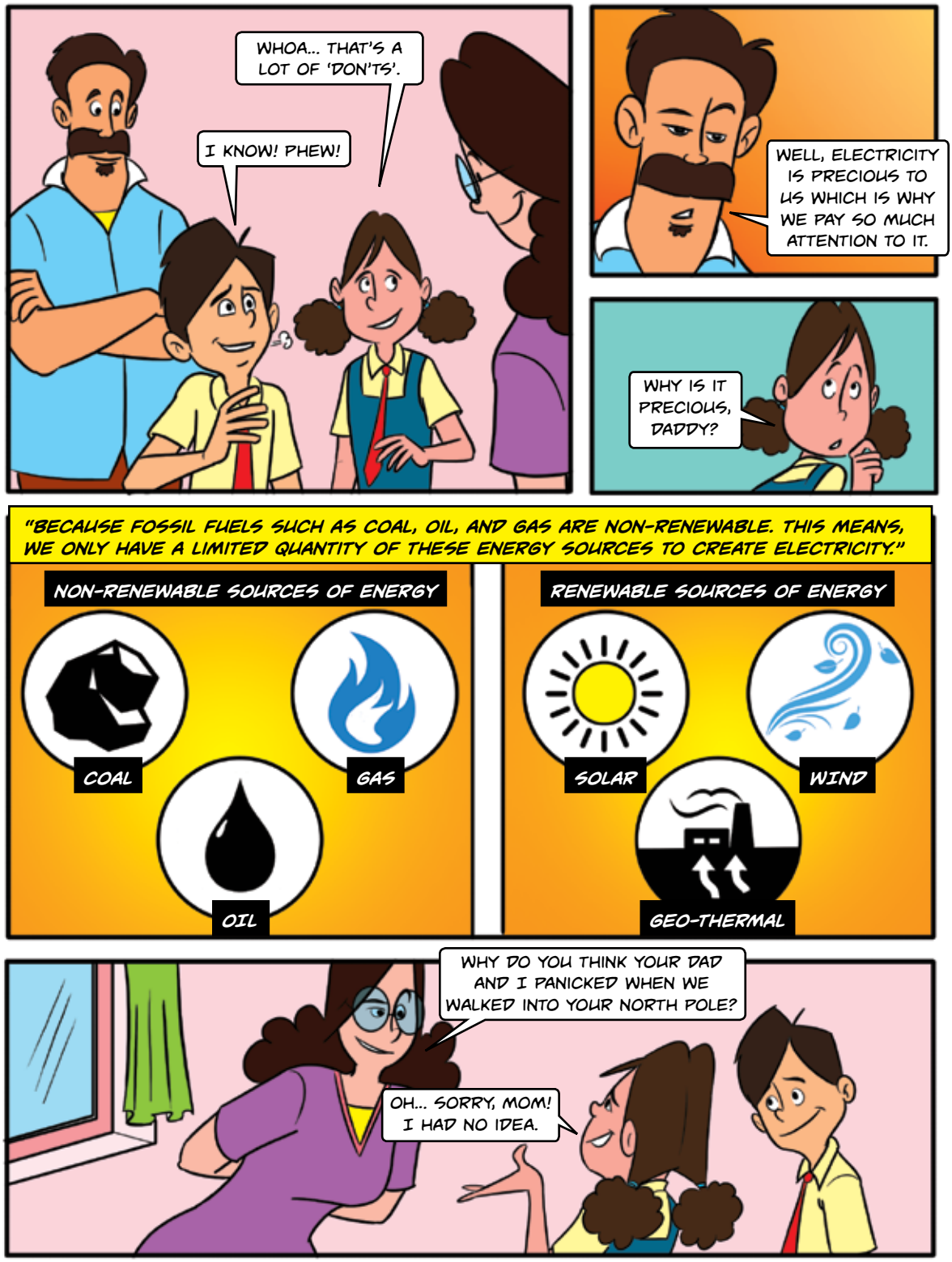

"THOSE CARRY ELECTRICITY FROM SUBSTATIONS AND BRING IT TO THE METER BOARDS IN BUILDINGS AND HOMES."
AND, FINALLY, THE METER BOARD SUPPLIES THE ELECTRICITY TO...
CLICK
WHOAAAA!
...OUR HOME!

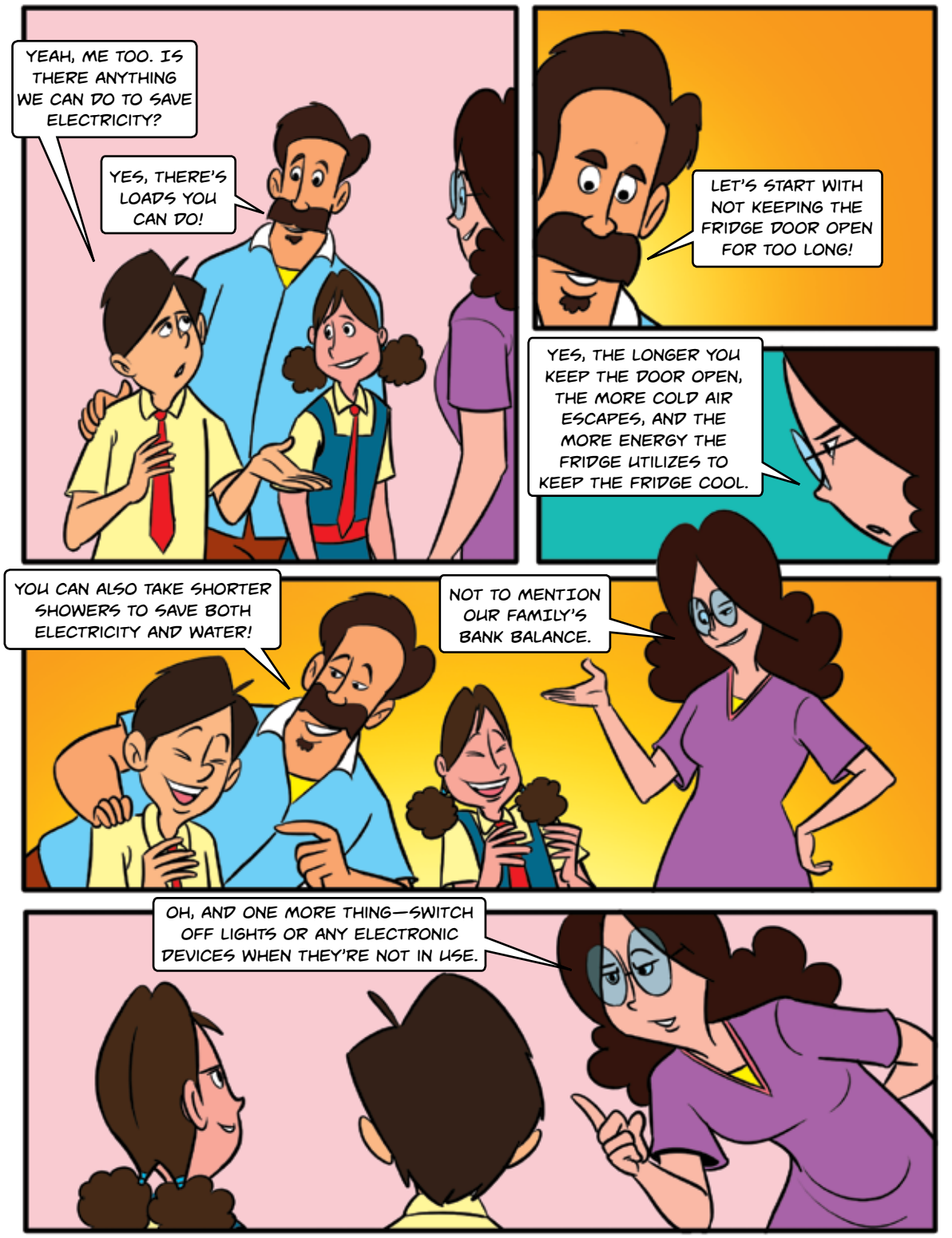

I CAN'T BELIEVE HOW MUCH EFFORT GOES INTO JUST SWITCHING A LIGHT BULB ON.
EXACTLY. IT'S THE COMBINED EFFORTS OF MANY PEOPLE AND MANY RESOURCES THAT HELPS GENERATE ELECTRICITY.
WHICH IS WHY WE ASK YOU NOT TO WASTE IT.
OH, BOY. I'M NEVER DOING THAT AGAIN!
DAD, CAN YOU OPEN THE METER BOARD IN OUR BUILDING AND SHOW US WHAT'S INSIDE IT?
Nooo!

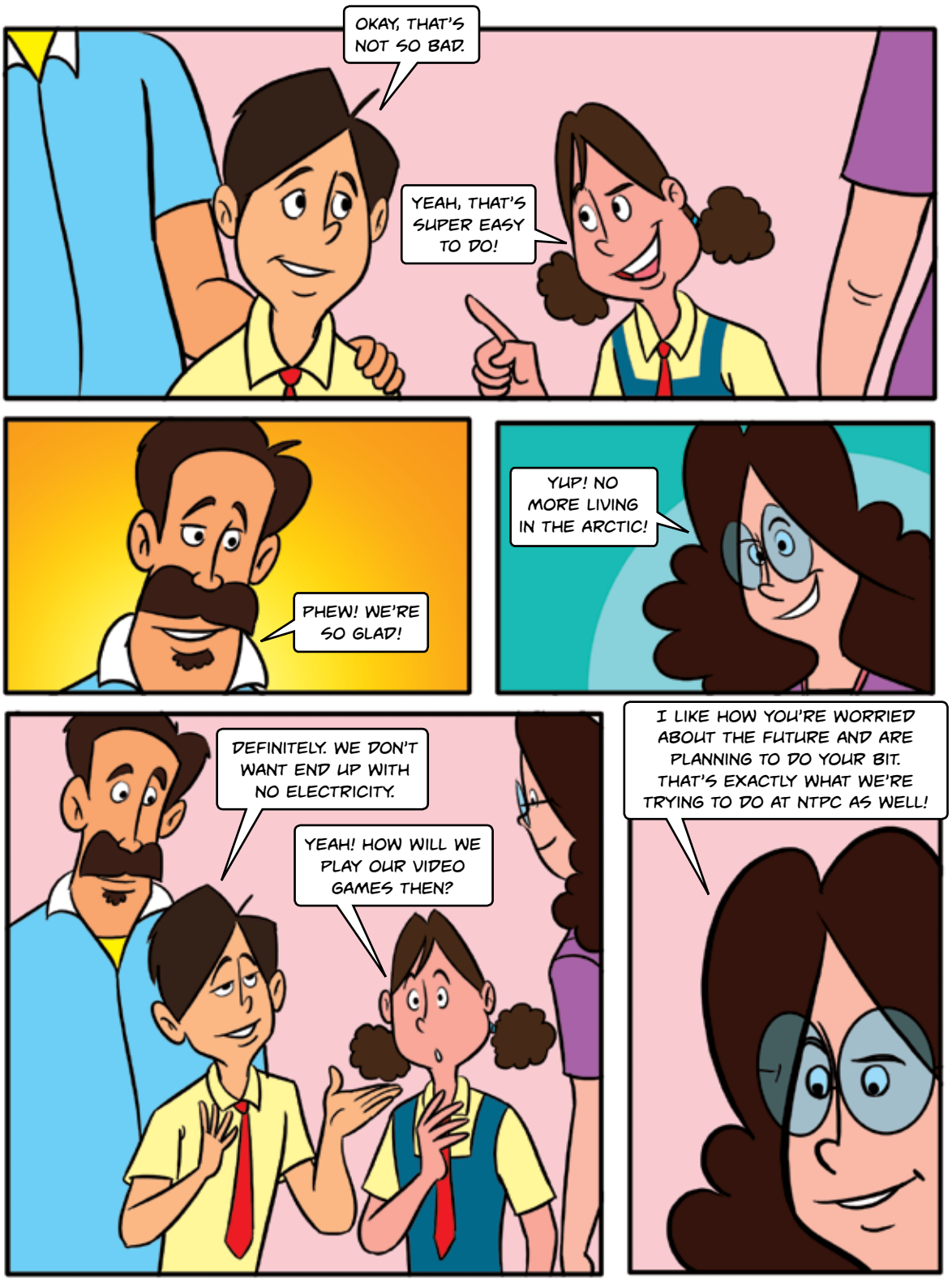

KIDS, ELECTRICITY IS A FASCINATING THING, BUT IT IS ALSO DANGEROUS AND CAN CAUSE SERIOUS HARM TO YOU.
YES, IT IS NOT SOMETHING YOU PLAY WITH OR TREAT CASUALLY.
EVEN AT MY OFFICE, WE TAKE PRECAUTIONS TO WORK SAFELY.
HOW IS ELECTRICITY DANGEROUS, MOM?
BECAUSE ELECTRICITY MOVES QUICKLY THROUGH WATER AND OUR BODIES...
...ARE 70% WATER!
EXACTLY. SO IF THE CURRENT RUNS THROUGH A HUMAN BODY, IT CAN CAUSE SERIOUS HARM.
UH OH! I'M NEVER GOING NEAR ANY METER BOARD, EVER!
HAHA! PHEW! I'M SO GLAD!

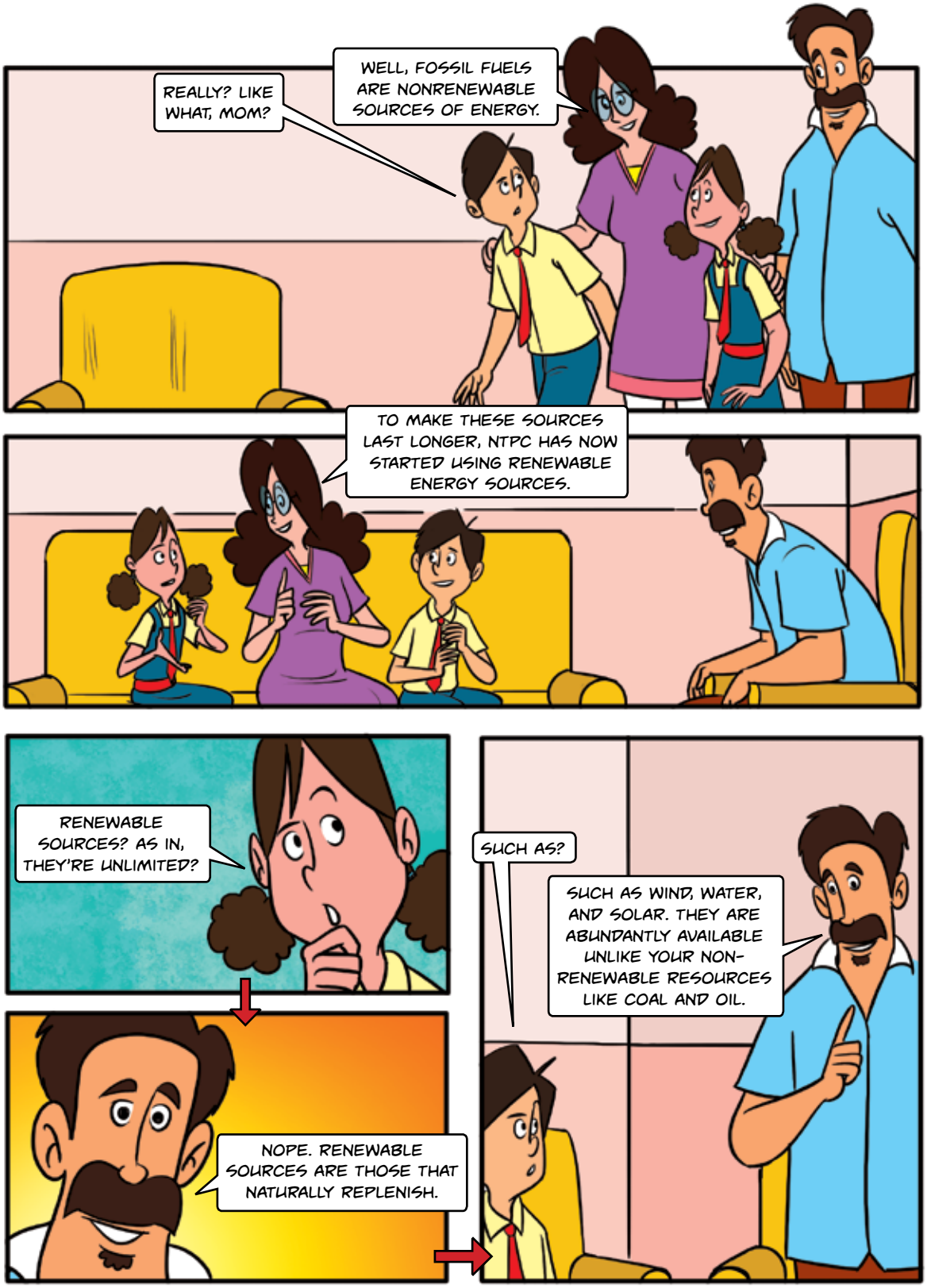

IT'S NOT JUST THE METER BOARD THAT'S DANGEROUS. EVEN IN THIS HOUSE, THERE ARE MANY THINGS YOU SHOULD BE CAREFUL OF.
FOR EXAMPLE, THIS POWER SOCKET.
YOU SHOULD NEVER PUT ANY OTHER OBJECT OTHER THAN A POWER PLUG INTO THIS SOCKET.
AND DON'T PULL WIRES IN A HURRY. ALWAYS REMOVE THE WIRE BY PULLING THE PLUG. YOU HEAR ME, TANU?
ER... YES, DAD.
AND IF YOU EVER SEE A WORN, FRAYED OR DAMAGED ELECTRICAL CORD, CALL US IMMEDIATELY. MAKE SURE YOU DON'T TOUCH IT.
ROGER THAT, MOM!

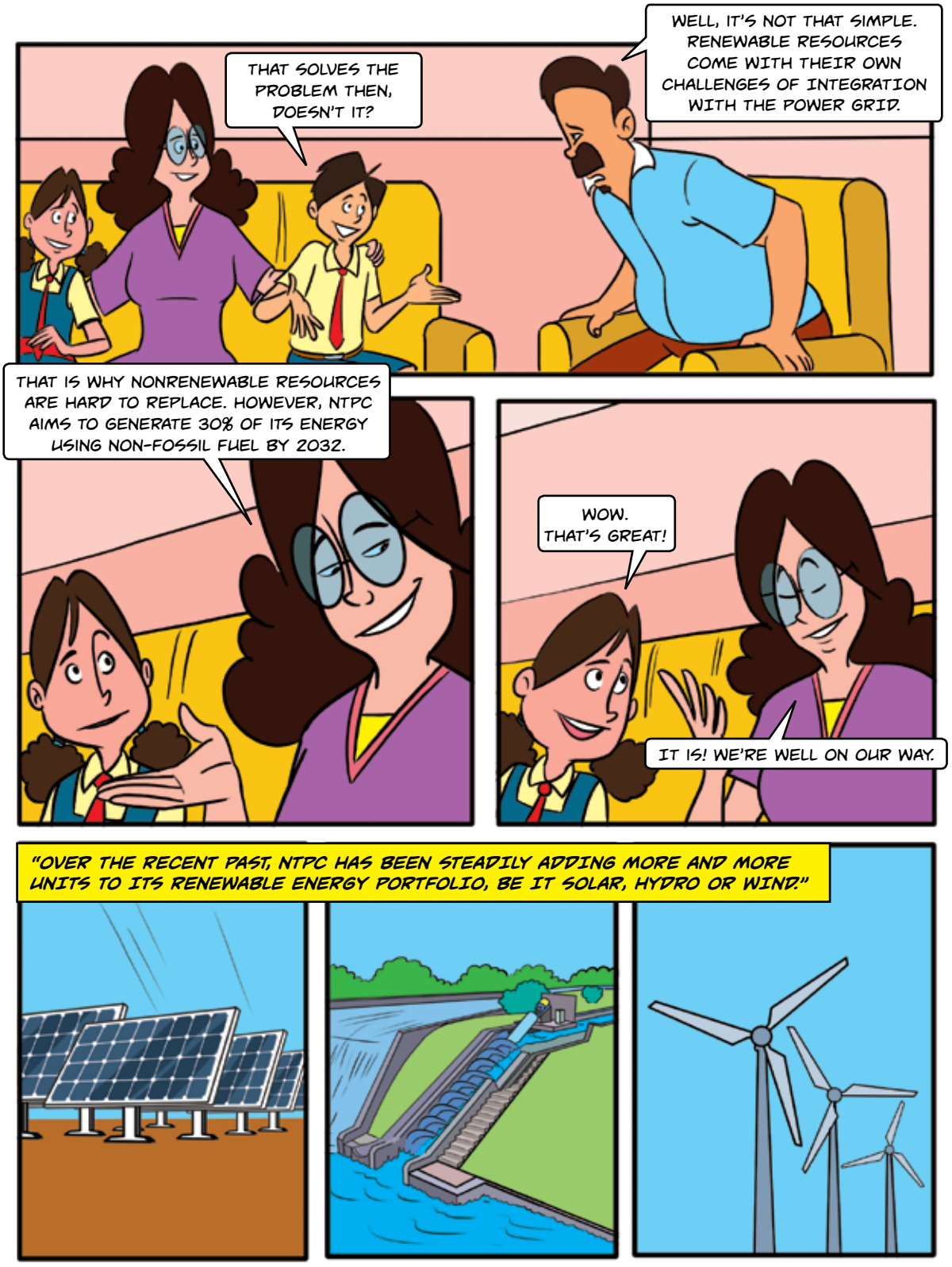

GOOD. NOW THAT YOU KNOW WHAT TO DO INSIDE THE HOUSE, LET'S TALK ABOUT WHAT YOU SHOULDN'T DO OUTSIDE.
DO YOU SEE THOSE POWER GRIDS?
UH HUH...
"THAT INCLUDES NOT CLIMBING TREES NEAR A POWER GRID, NOT THROWING ANYTHING AT THEM, AND NOT FLYING ANY KITES, TOY PLANES, DRONES, OR BALLOONS NEAR THEM."
YOU MUST ALWAYS STAY AWAY FROM THEM.
AND KEEP YOUR THINGS AWAY FROM IT AS WELL.

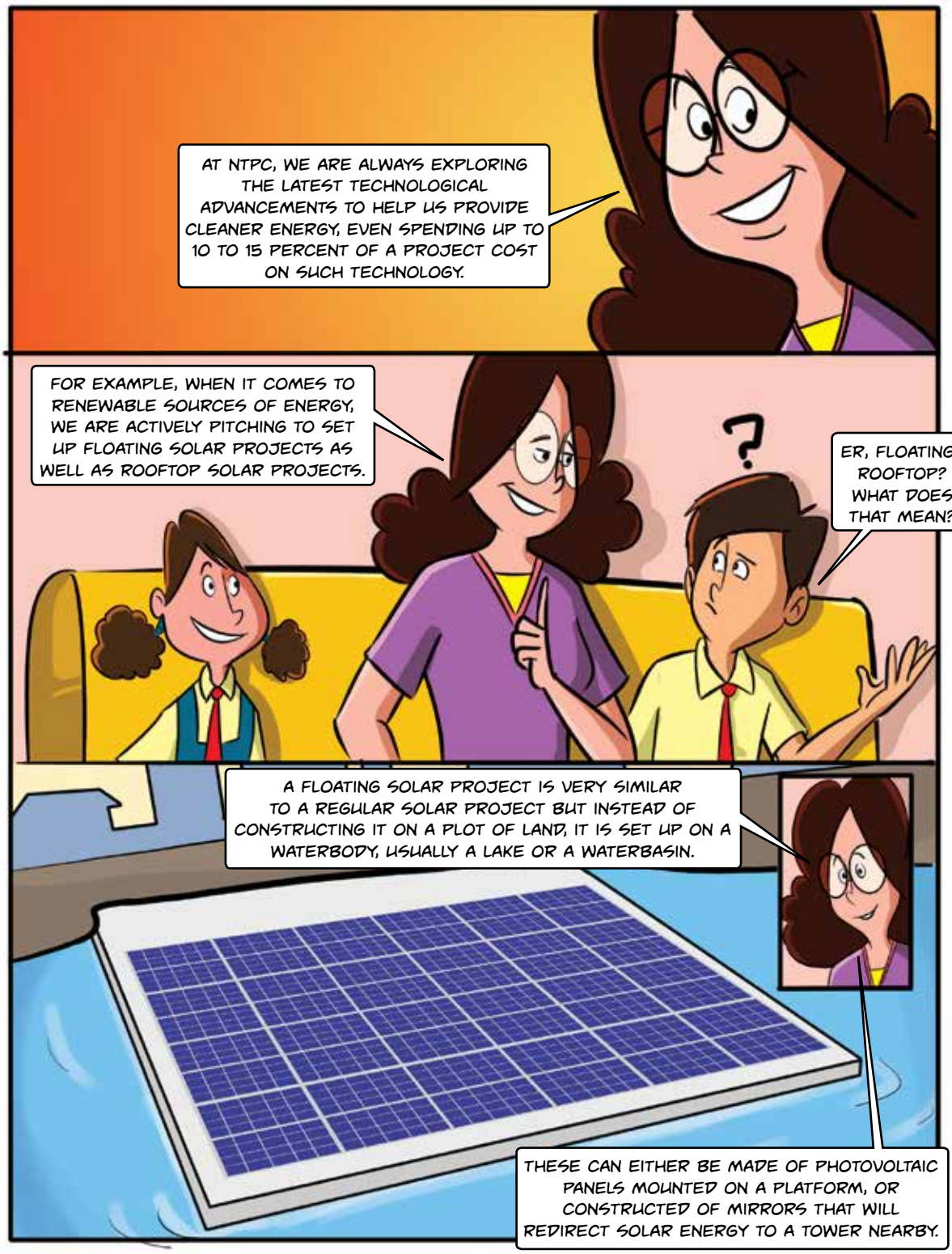

WHOA... THAT'S A LOT OF 'DON'TS'.
I KNOW! PHEW!
WELL, ELECTRICITY IS PRECIOUS TO US WHICH IS WHY WE PAY SO MUCH ATTENTION TO IT.
WHY IS IT PRECIOUS, DADDY?
"BECAUSE FOSSIL FUELS SUCH AS COAL, OIL, AND GAS ARE NON-RENEWABLE. THIS MEANS, WE ONLY HAVE A LIMITED QUANTITY OF THESE ENERGY SOURCES TO CREATE ELECTRICITY."
NON-RENEWABLE SOURCES OF ENERGY
COAL
GAS
OIL
RENEWABLE SOURCES OF ENERGY
SOLAR
WIND
GEO-THERMAL
WHY DO YOU THINK YOUR DAD AND I PANICKED WHEN WE WALKED INTO YOUR NORTH POLE?
OH... SORRY, MOM! I HAD NO IDEA.

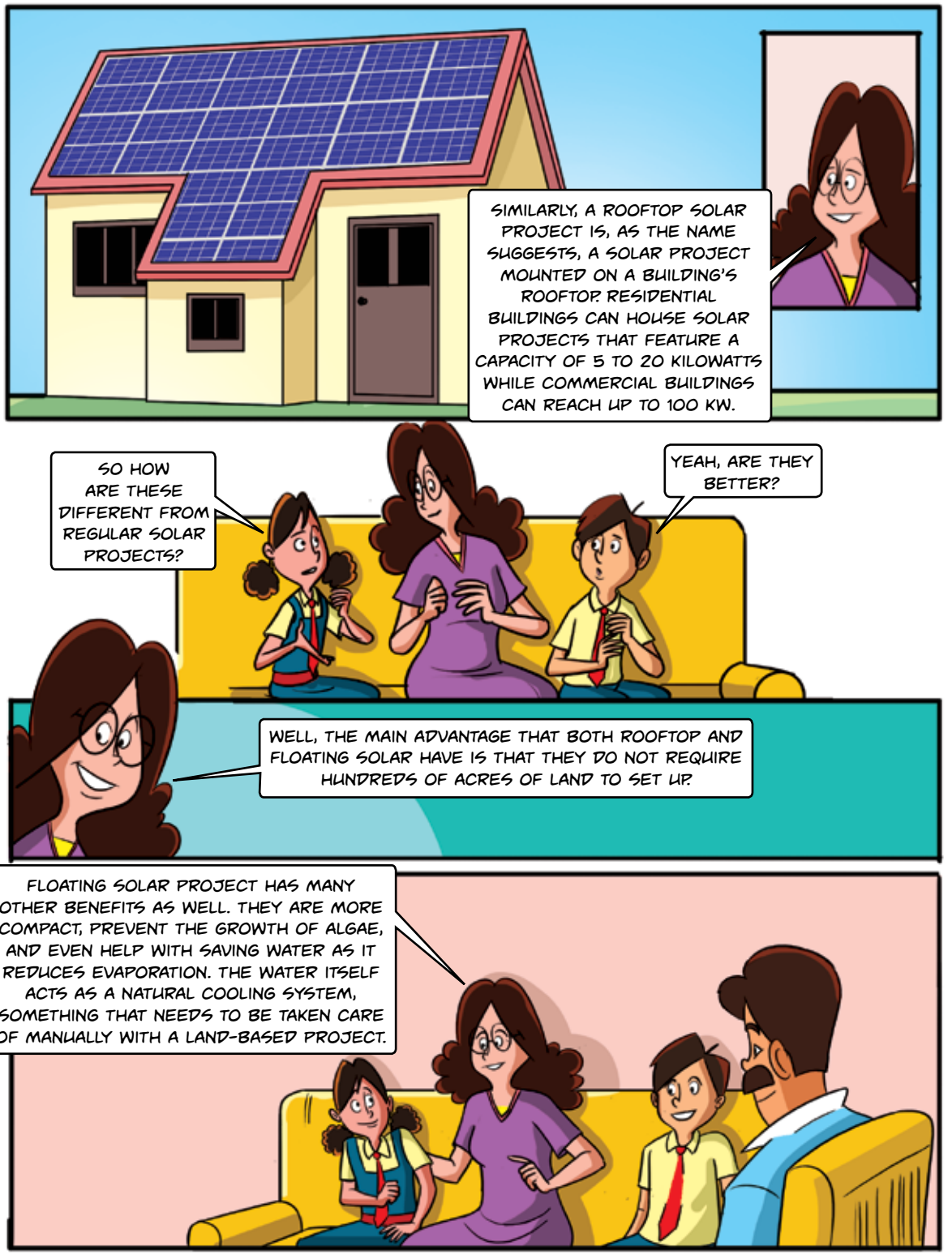

YEAH, ME TOO. IS THERE ANYTHING WE CAN DO TO SAVE ELECTRICITY?
YES, THERE'S LOADS YOU CAN DO!
LET'S START WITH NOT KEEPING THE FRIDGE DOOR OPEN FOR TOO LONG!
YES, THE LONGER YOU KEEP THE DOOR OPEN, THE MORE COLD AIR ESCAPES, AND THE MORE ENERGY THE FRIDGE UTILIZES TO KEEP THE FRIDGE COOL.
YOU CAN ALSO TAKE SHORTER SHOWERS TO SAVE BOTH ELECTRICITY AND WATER!
NOT TO MENTION OUR FAMILY'S BANK BALANCE.
OH, AND ONE MORE THING—SWITCH OFF LIGHTS OR ANY ELECTRONIC DEVICES WHEN THEY'RE NOT IN USE.

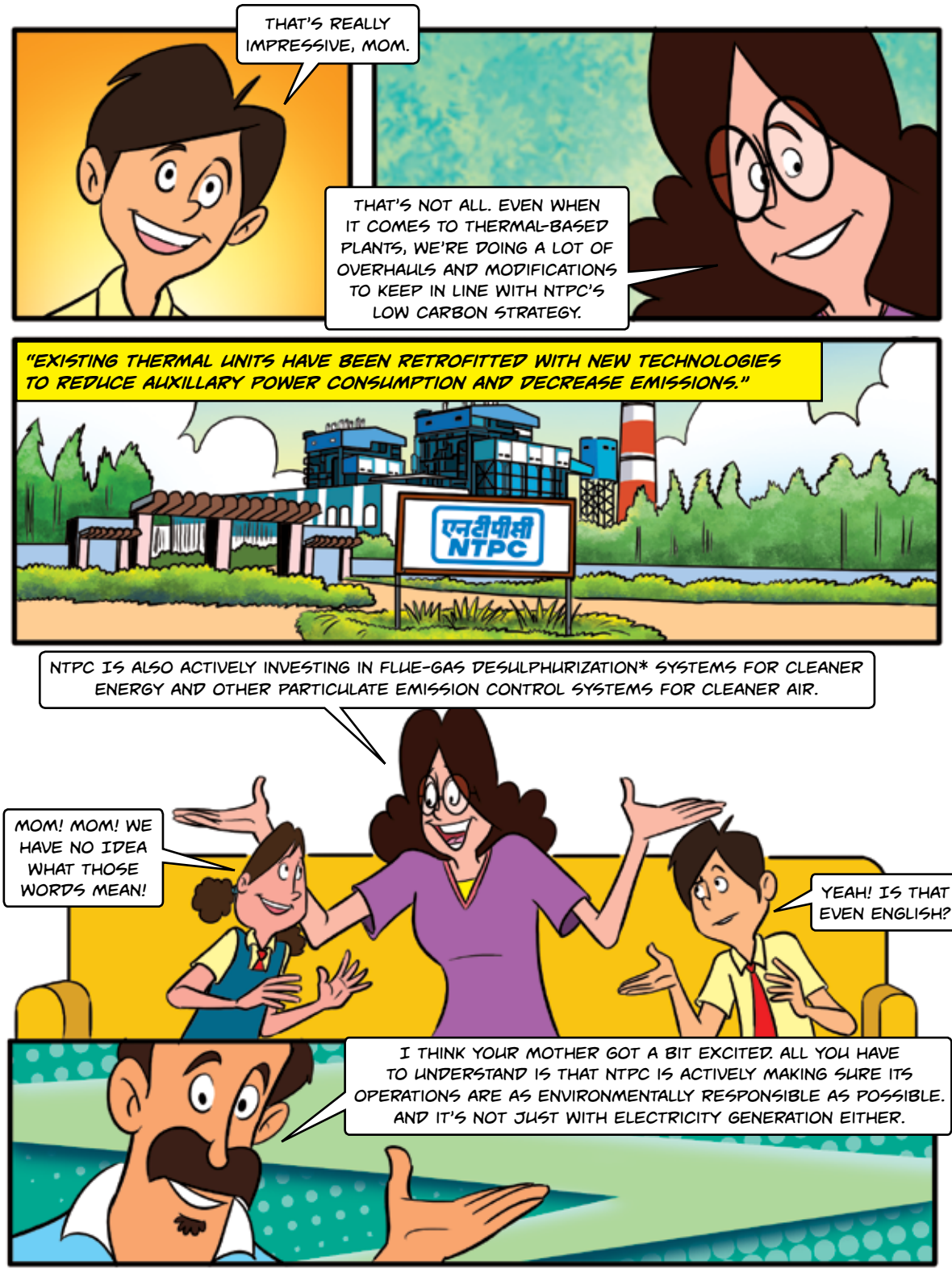

OKAY, THAT'S NOT SO BAD.
YEAH, THAT'S SUPER EASY TO DO!
PHEW! WE'RE SO GLAD!
YUP! NO MORE LIVING IN THE ARCTIC!
DEFINITELY. WE DON'T WANT END UP WITH NO ELECTRICITY.
YEAH! HOW WILL WE PLAY OUR VIDEO GAMES THEN?
I LIKE HOW YOU'RE WORRIED ABOUT THE FUTURE AND ARE PLANNING TO DO YOUR BIT. THAT'S EXACTLY WHAT WE'RE TRYING TO DO AT NTPC AS WELL!


REALLY? LIKE WHAT, MOM?
WELL, FOSSIL FUELS ARE NONRENEWABLE SOURCES OF ENERGY.
TO MAKE THESE SOURCES LAST LONGER, NTPC HAS NOW STARTED USING RENEWABLE ENERGY SOURCES.
RENEWABLE SOURCES? AS IN, THEY'RE UNLIMITED?
NOPE. RENEWABLE SOURCES ARE THOSE THAT NATURALLY REPLENISH.
SUCH AS?
SUCH AS WIND, WATER, AND SOLAR. THEY ARE ABUNDANTLY AVAILABLE UNLIKE YOUR NON-RENEWABLE RESOURCES LIKE COAL AND OIL.

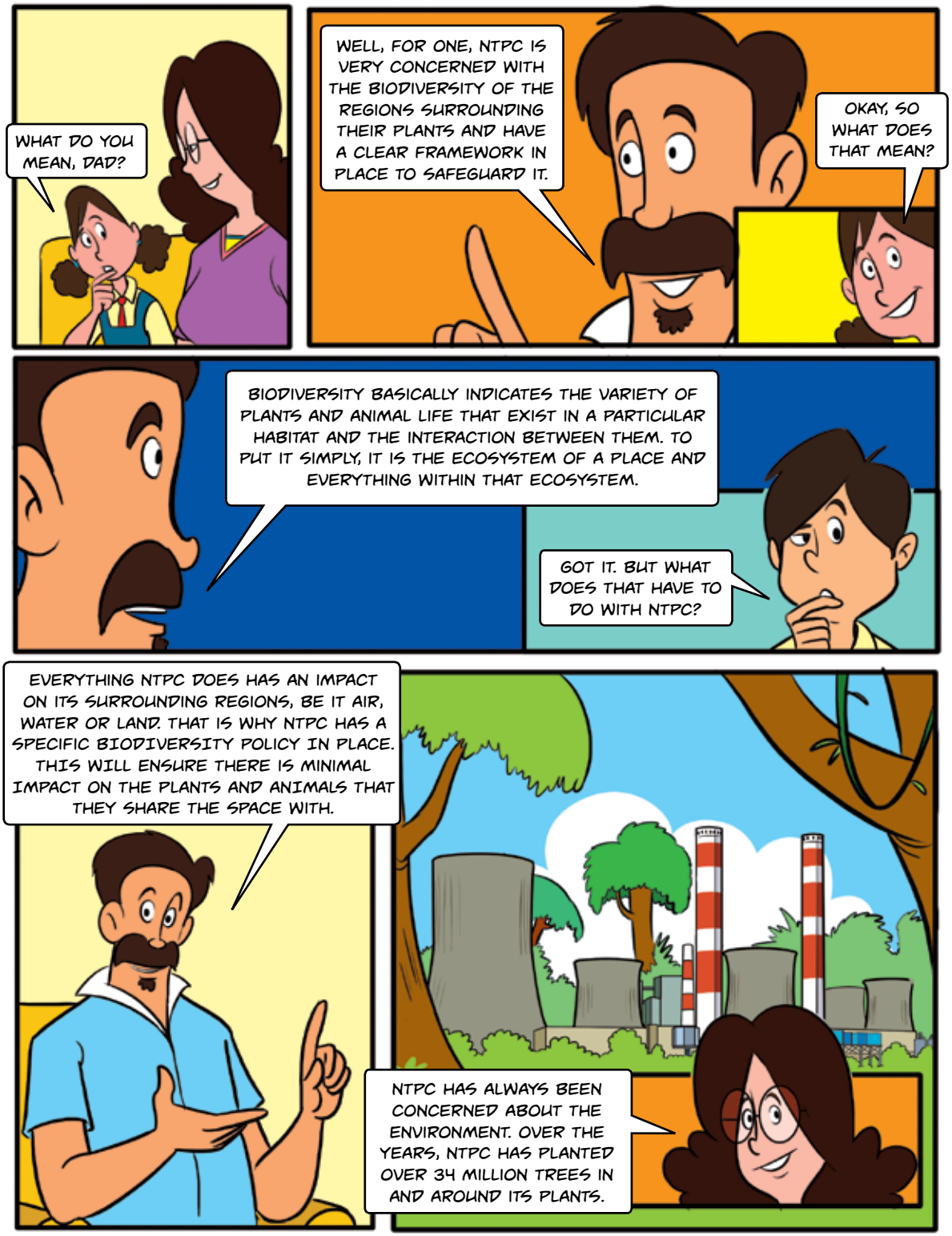

THAT SOLVES THE PROBLEM THEN, DOESN'T IT?
WELL, IT'S NOT THAT SIMPLE. RENEWABLE RESOURCES COME WITH THEIR OWN CHALLENGES OF INTEGRATION WITH THE POWER GRID.
THAT IS WHY NONRENEWABLE RESOURCES ARE HARD TO REPLACE. HOWEVER, NTPC AIMS TO GENERATE 30% OF ITS ENERGY USING NON-FOSSIL FUEL BY 2032.
WOW. THAT'S GREAT!
IT IS! WE'RE WELL ON OUR WAY.
"OVER THE RECENT PAST, NTPC HAS BEEN STEADILY ADDING MORE AND MORE UNITS TO ITS RENEWABLE ENERGY PORTFOLIO, BE IT SOLAR, HYDRO OR WIND."

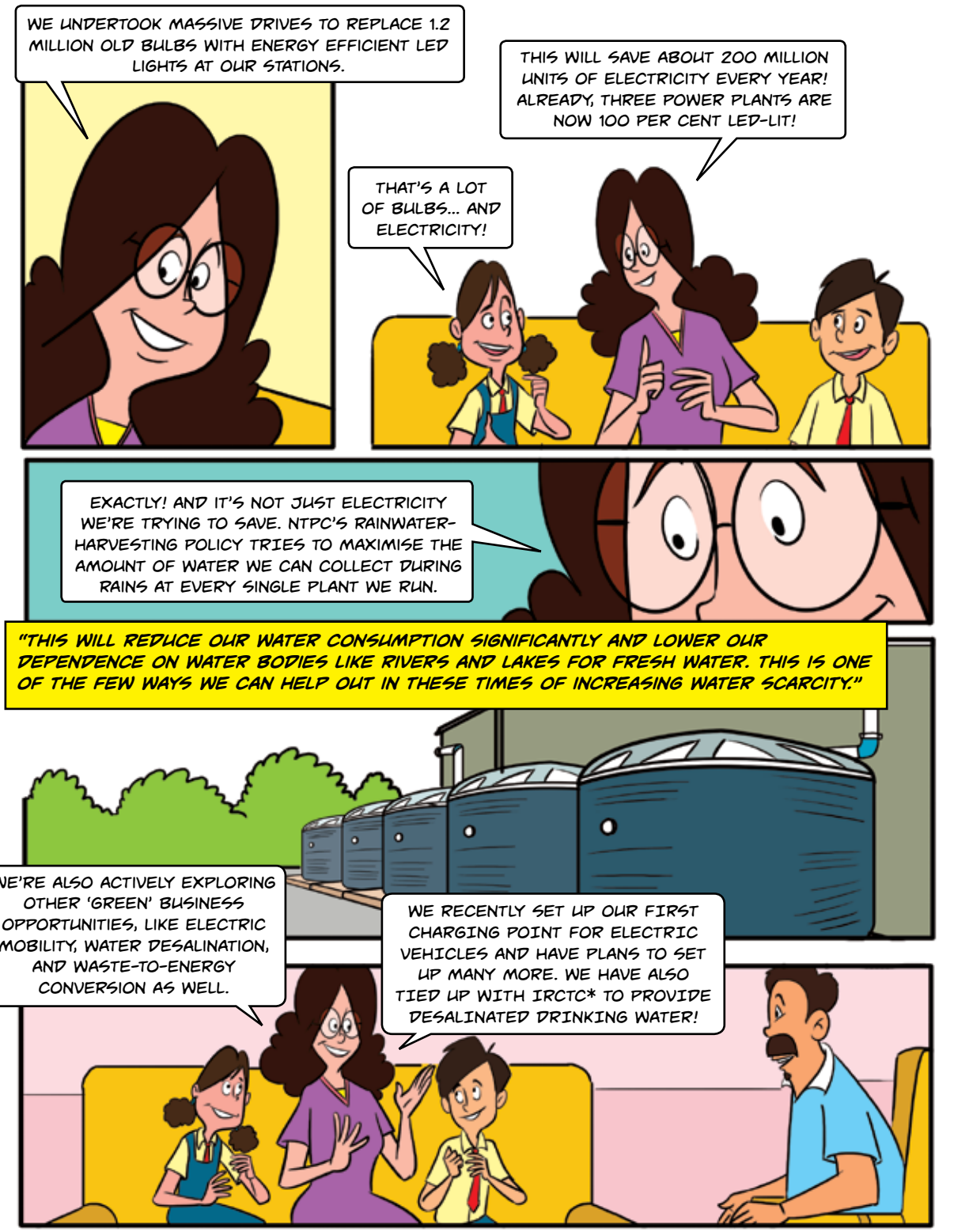

AT NTPC, WE ARE ALWAYS EXPLORING THE LATEST TECHNOLOGICAL ADVANCEMENTS TO HELP US PROVIDE CLEANER ENERGY, EVEN SPENDING UP TO 10 TO 15 PERCENT OF A PROJECT COST ON SUCH TECHNOLOGY.
FOR EXAMPLE, WHEN IT COMES TO RENEWABLE SOURCES OF ENERGY, WE ARE ACTIVELY PITCHING TO SET UP FLOATING SOLAR PROJECTS AS WELL AS ROOFTOP SOLAR PROJECTS.
ER, FLOATING? ROOFTOP? WHAT DOES THAT MEAN?
A FLOATING SOLAR PROJECT IS VERY SIMILAR TO A REGULAR SOLAR PROJECT BUT INSTEAD OF CONSTRUCTING IT ON A PLOT OF LAND, IT IS SET UP ON A WATERBODY, USUALLY A LAKE OR A WATERBASIN.
THESE CAN EITHER BE MADE OF PHOTOVOLTAIC PANELS MOUNTED ON A PLATFORM, OR CONSTRUCTED OF MIRRORS THAT WILL REDIRECT SOLAR ENERGY TO A TOWER NEARBY.


SIMILARLY, A ROOFTOP SOLAR PROJECT IS, AS THE NAME SUGGESTS, A SOLAR PROJECT MOUNTED ON A BUILDING'S ROOFTOP. RESIDENTIAL BUILDINGS CAN HOUSE SOLAR PROJECTS THAT FEATURE A CAPACITY OF 5 TO 20 KILOWATTS WHILE COMMERCIAL BUILDINGS CAN REACH UP TO 100 KW.
SO HOW ARE THESE DIFFERENT FROM REGULAR SOLAR PROJECTS?
YEAH, ARE THEY BETTER?
WELL, THE MAIN ADVANTAGE THAT BOTH ROOFTOP AND FLOATING SOLAR HAVE IS THAT THEY DO NOT REQUIRE HUNDREDS OF ACRES OF LAND TO SET UP.
FLOATING SOLAR PROJECT HAS MANY OTHER BENEFITS AS WELL. THEY ARE MORE COMPACT, PREVENT THE GROWTH OF ALGAE, AND EVEN HELP WITH SAVING WATER AS IT REDUCES EVAPORATION. THE WATER ITSELF ACTS AS A NATURAL COOLING SYSTEM, SOMETHING THAT NEEDS TO BE TAKEN CARE OF MANUALLY WITH A LAND-BASED PROJECT.

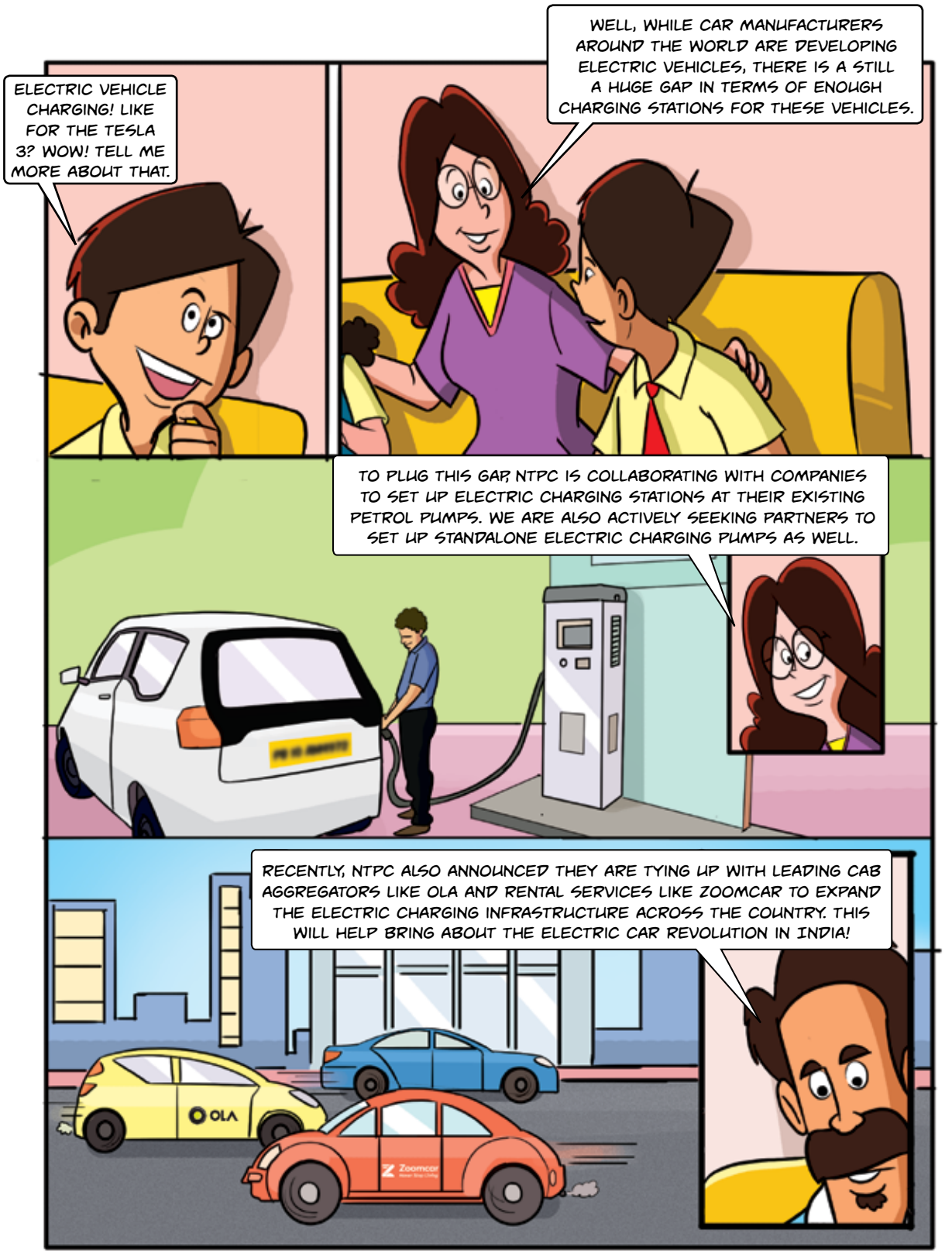


*FLUE GAS-DESULPHURIZATION IS A SET OF TECHNOLOGIES USED TO REMOVE SULFUR DIOXIDE FROM EXHAUST FLUE GASES OF FOSSIL-FUEL POWER PLANTS.

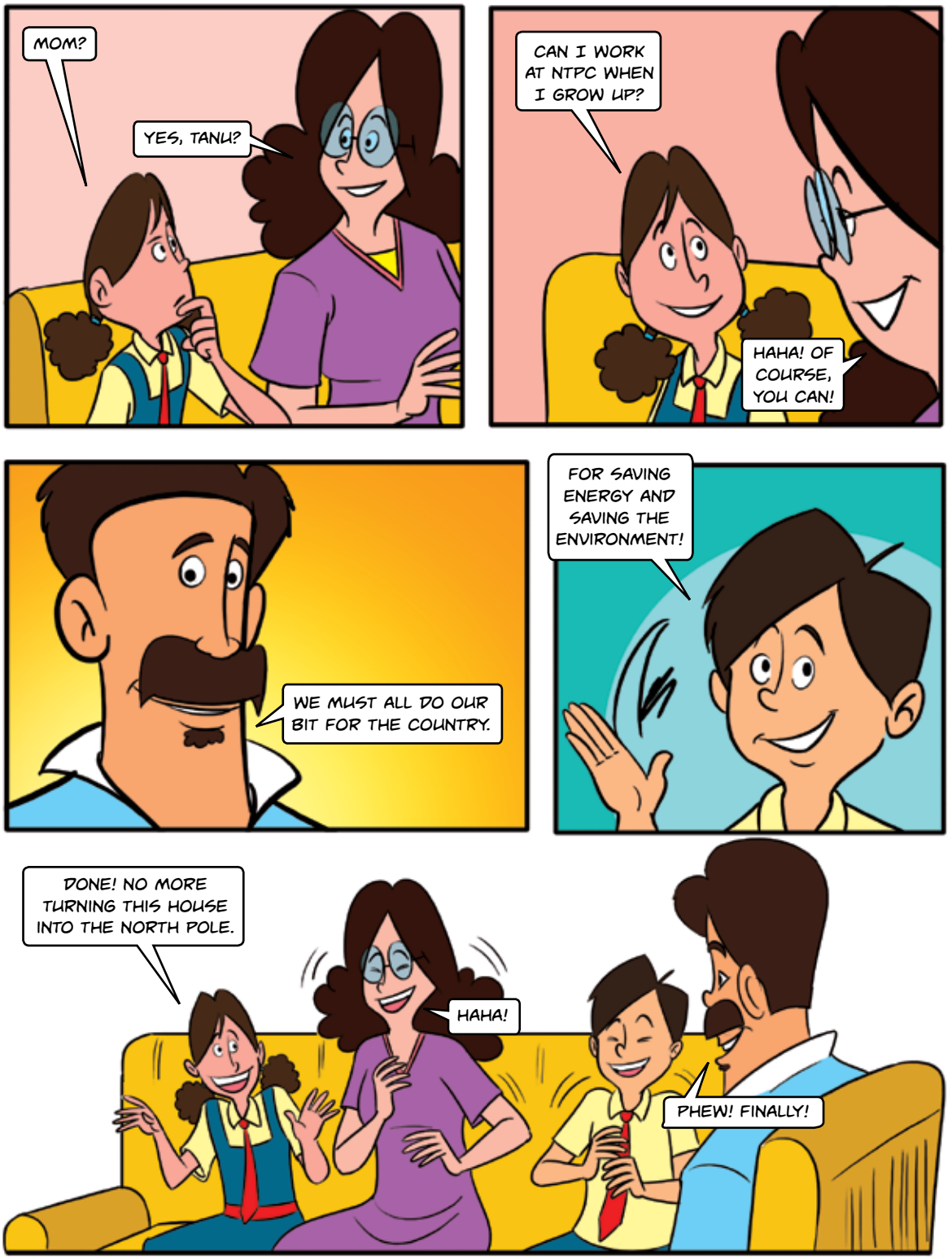

WHAT DO YOU MEAN, DAD?
WELL, FOR ONE, NTPC IS VERY CONCERNED WITH THE BIODIVERSITY OF THE REGIONS SURROUNDING THEIR PLANTS AND HAVE A CLEAR FRAMEWORK IN PLACE TO SAFEGUARD IT.
OKAY, SO WHAT DOES THAT MEAN?
BIODIVERSITY BASICALLY INDICATES THE VARIETY OF PLANTS AND ANIMAL LIFE THAT EXIST IN A PARTICULAR HABITAT AND THE INTERACTION BETWEEN THEM. TO PUT IT SIMPLY, IT IS THE ECOSYSTEM OF A PLACE AND EVERYTHING WITHIN THAT ECOSYSTEM.
GOT IT. BUT WHAT DOES THAT HAVE TO DO WITH NTPC?
EVERYTHING NTPC DOES HAS AN IMPACT ON ITS SURROUNDING REGIONS, BE IT AIR, WATER OR LAND. THAT IS WHY NTPC HAS A SPECIFIC BIODIVERSITY POLICY IN PLACE. THIS WILL ENSURE THERE IS MINIMAL IMPACT ON THE PLANTS AND ANIMALS THAT THEY SHARE THE SPACE WITH.
NTPC HAS ALWAYS BEEN CONCERNED ABOUT THE ENVIRONMENT. OVER THE YEARS, NTPC HAS PLANTED OVER 34 MILLION TREES IN AND AROUND ITS PLANTS.



*INDIAN RAILWAYS CATERING AND TOURISM CORPORATION


ELECTRIC VEHICLE CHARGING! LIKE FOR THE TESLA 3? WOW! TELL ME MORE ABOUT THAT.
WELL, WHILE CAR MANUFACTURERS AROUND THE WORLD ARE DEVELOPING ELECTRIC VEHICLES, THERE IS A STILL A HUGE GAP IN TERMS OF ENOUGH CHARGING STATIONS FOR THESE VEHICLES.
TO PLUG THIS GAP, NTPC IS COLLABORATING WITH COMPANIES TO SET UP ELECTRIC CHARGING STATIONS AT THEIR EXISTING PETROL PUMPS. WE ARE ALSO ACTIVELY SEEKING PARTNERS TO SET UP STANDALONE ELECTRIC CHARGING PUMPS AS WELL.
RECENTLY, NTPC ALSO ANNOUNCED THEY ARE TYING UP WITH LEADING CAB AGGREGATORS LIKE OLA AND RENTAL SERVICES LIKE ZOOMCAR TO EXPAND THE ELECTRIC CHARGING INFRASTRUCTURE ACROSS THE COUNTRY. THIS WILL HELP BRING ABOUT THE ELECTRIC CAR REVOLUTION IN INDIA!
OLA
Zoomcar


MA, YOU ALSO MENTIONED SOMETHING ABOUT TURNING WASTE TO... ENERGY? HOW DOES THAT WORK?
I'M GLAD YOU ASKED, TANU. WASTE-TO-ENERGY PLANTS ESSENTIALLY CONVERT GARBAGE TO A PROPER FUEL SOURCE THAT CAN BE USED TO GENERATE ELECTRICITY.
LIKE ACTUAL GARBAGE?
YES, LIKE ACTUAL GARBAGE. IMAGINE THE TENS OF THOUSANDS OF TONNES OF GARBAGE THAT PILE UP IN LANDFILLS IN OUR CITIES. NTPC WILL COLLABORATE WITH THE MUNICIPALITY AUTHORITIES TO HAVE THIS GARBAGE DELIVERED TO OUR PLANTS, WHERE IT WILL BE TREATED AND CONVERTED TO FUEL THROUGH BURNING.
WASTE-TO-ENERGY PLANTS ARE AN AMAZING WAY TO DEAL WITH OUR GROWING AMOUNT OF GARBAGE. I RECENTLY READ ABOUT HOW THE SOLID WASTE GENERATED FROM CITIES AND TOWNS IN INDIA HAS THE POTENTIAL TO GENERATE POWER OF APPROXIMATELY 500 MEGAWATTS A YEAR.
OF COURSE, WE HAVE TO FOLLOW VERY STRICT RULES AND REGULATIONS TO MAKE SURE THERE IS PROPER WASTE SEGREGATION AND NO UNWANTED CONTAMINANTS POLLUTING THE AIR DURING THE PROCESS. NTPC ALWAYS STRIVES TO FULFIL ITS COMMITMENT TO THE ENVIRONMENT ON EVERY COUNT!


MOM?
YES, TANU?
CAN I WORK AT NTPC WHEN I GROW UP?
HAHA! OF COURSE, YOU CAN!
WE MUST ALL DO OUR BIT FOR THE COUNTRY.
FOR SAVING ENERGY AND SAVING THE ENVIRONMENT!
DONE! NO MORE TURNING THIS HOUSE INTO THE NORTH POLE.
HAHA!
PHEW! FINALLY!