

The Nature of Energy

The Nature of Energy is a science fiction prototype as it explores a future in which energy has begun to become an issue as with the advancement in technology, they are faced with an ever-increasing amount of energy usage. While some people choose to revert to a way of living like we are currently, there are some that have chosen to continue to live in a city that is filled with smog as while technology advanced, the city suffered, and so do its inhabitants. This is purely due to a fear of change and losing what they have grown accustomed to over the years.

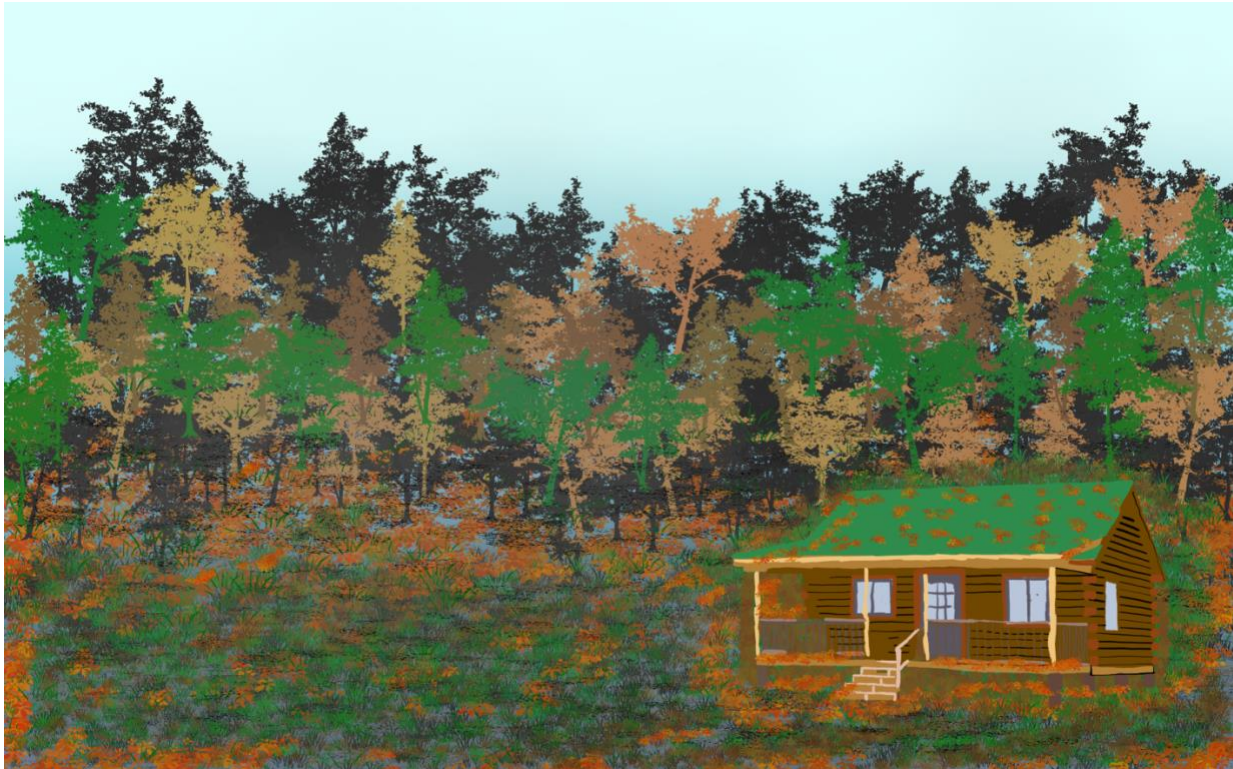
The story will explore what happens when our sources of energy are depleting and we are unable to keep up with the ever-increasing demand, and what scientific measures can we create to combat this issue.

The technology being used within this story is the compact X-ray free laser (CXFEL). This laser can look at things at an atomic level and is a strong imaging structure. It provides the capability of looking at things at a molecular level and can analyze photosynthesis at its molecular level to gain a better understanding. “Through the development of time-resolved crystallographic and solution scattering methods at XFELs, this thesis aims to deliver new information about the role structural changes play in guiding the charge separation reactions of photosynthesis.” (Dods)

Within the year 2099, society began to face an energy crisis. The increase in pollution and advancement of global warming, which blocked off certain methods of energy absorption, thus making them rely on wind and solar power. It became an important matter to preserve energy and find new energy sources, or ways to improve their already established systems put in

place. The scientists then began to focus all their efforts in finding a new way to improve their already established advanced solar panels.

The government funded development of an AI, named Aida, that was present within every home by the year 2119. Aida monitored electricity usage and cut users off when their levels became too high. While the AI helped, people began to become frustrated to the point that they left the cities in multitudes and began to settle out within the rural and uninhabited areas that were found outside the city. With this shift in living, we saw more people embrace an electric free life as we were able to live off the land and live freely without being controlled. However, as time went by everyone simply adapted to this new reality that contained an AI and people fleeing the polluted city. Aida was built to influence the citizens within the city to get them to change their ways and to draw attention to the issues that are arising. Yet also bring attention the fact that they are unable to harvest energy like they used to. Everyone grew accustomed to the cut offs in power, they never changed anything. Those that openly sought to change their way of life, either altered their energy consumptions daily, or they moved out beyond the forest to live within the Nature society and breathe the fresh open air that surrounded them unlike the air within the city.



Within the year 2159, Xander looked out towards the forest from his cabin. The cabin shielded him from the harsh wind blowing seemingly came out of nowhere. As he looked around the cabin he sighed with contentment as the electricity was still functioning and the heater was working as well. The cabins that surrounded him all seemed to be effectively shielding the other inhabitants within their small city that he had lived in all his life. Solar panels were mounted onto each roof, providing energy to those within, and their modest city was teeming with small cabins, shops, and markets. It was evident to all that the climate had begun changing vastly to the point it has begun to harm their way of living. Climate change was real, and they were currently living through some of the worst of it.

Xander had always felt as though he lacked purpose in his life and often felt out of place within his own society. His love of science was not unnoticed, and he quickly became the one that was relied upon to fix the solar panels or to find and implement new ways of harvesting energy. While he loved helping those around him, he began to feel frustrated as everything he

did seem to be in vain. They were still facing an energy crisis that was limiting all they could do even with their limited use of energy compared to those in the city.

He had been born into the beautiful Nature society in 2133, after his parents left the city in the year 2129 and had moved out into the wilderness and away from the city that was overfilled and suffered from pollution. His parents still communicated with the few family members that remained within the city and he heard about how those that still live within the city have their electricity usage limited. He found it rather odd that they rarely interact with each other as they are invested in the advanced technology, they have access to. One day he chooses to venture out beyond the forest to get a glimpse of the city and it was there that his missing purpose was discovered.

Meanwhile

Edme stood out on her balcony that overlooked a part of the city that was briefly untouched by the pollution, if even for a second, she was able to glimpse the marvelous city that she lived in. Edme was born into the Tech society and has known nothing else besides the city and having her energy consumption being controlled. She grew tired of it and sought some sort of change to her rather dull life. Working in a lab day and night was enjoyable at first, but as time went on, it became tiresome as the work she does seems to go to waste. Day in and day out, she spends her time researching ways to improve their energy absorption and ways for everyone to live comfortably without Aida having to shut down power to avoid over usage. At first, she was weary after the creation of Aida, but she began to see how effective it truly was, and it was forcing changes that needed to be made. While the AI was created with the intention of limiting usage to ensure that there was no over usage of energy within individual households. One day, after spending hours on end in her lab, she wandered out of the city with no true destination in mind in order to briefly escape her dull reality and breathe in the scent of nature.

Elsewhere

Xander sat on a boulder staring out at a lake that separated the city from the forest behind him when he noticed movement across the lake. He tilted his head in curiosity as he tried to make out the figure venturing closer to him. Within the outskirts of the city, Xander stood gazing out towards the smog filled city and couldn't help but notice the vast difference compared to the air within the Nature society.

“Hmm, that's odd, I thought no one else came out here at this time?” Xander questioned.

As the figure got closer, he could make out the figure of a woman. Deciding now was his chance to learn more about the Tech society within the city, he decided to approach her.

Earlier that day

Edme stared out of her apartment into the smoke-filled city. She often looked up at the sky and often wondered what the sunlight truly felt without it having to go through the smoke that filled the city. She often grew weary while working within the city itself, she wished to feel

the sun on her face and to have others experience this feeling as well. Spending hours upon hours within her lab had taken a toll on her. While she was a prominent up and coming scientist, she still faced the complication of Aida turning off the power in her lab daily.

One day she decided to venture out of the city in order to escape her life within, even if it was just for a few hours at best. She often thought of leaving the Tech city behind to go live within the Nature society that separated from the city years ago, but she knew she never could as it was her home, and she knew no one else. Though in reality, she was silently afraid of the change she would face, she had grown used to the advancement of the city and knew there would be a drastic adjustment should she ever leave. At least in her home she had family and friends to communicate, however, even her closest friends began to lose themselves and would stay inside and not venture out. She knew that one major issue for those that resided within the city, was that they did not leave their homes. If they simply went outside, even for a moment, there wouldn't be as much energy usage within each household. However, not everyone enjoys the outdoors and prefers the solitude and peace within their own space filled with their comforts. Whether that was games, television, books, other hobbies, or even work, it was a way for them to avoid breathing the smog filled air that was getting harder to breathe in. While Edme shares that sentiment where she wishes to be alone, she often ventures out of the city to escape the city occasionally.

She decided to forgo going to her lab that day and instead began to venture out of the city and began to head towards the lake that was next to the city. She knew that despite the seeming wall of trees, a community of the Nature society was beyond the dense forest on the other side. As she continued to walk towards her normal sitting spot, she was deep in thought while thinking of what to write within her journal for possible ideas she could test out to find a way of advancing energy absorption. Sadly, each thought proved to be ineffective the more she thought about it as it was evident it would not stand the test of time.

Present

Edme heard the crunching of leaves behind her and was startled as she was so distracted that she did not notice that there was another person out here oddly. The two stood facing each other from a distance and noticed the differences between them. Their clothes were different as Edme was still wearing her lab coat and what she normally wore to work. While the man before her was wearing what appeared to be a warm flannel, and jeans. Beyond just the differences in their clothes their appearance was another thing that set them apart. Edme's skin was rather pale due to the lack of sunlight that she received due to the ever-increasing amount of smog that permeates the city. While his was rather tan from clearly being out in the sun and exposed to sunlight with no barriers between his skin and the sun above them.

"You're from the Nature society, aren't you?" asked Edme.

The man didn't speak for a moment and then answered, "Yes, I am."

"Nice to meet you, my name is Edme, I work as a scientist within the city." stated Edme.

He hummed softly before responding to Edme, "My name is Xander. I am also a scientist from the Nature society." Xander calmly stated.

The two stood in facing each other for a time before beginning to talk between the two of them.

"I rarely ever feel the sunlight on my skin, and it is nice to escape the city time to time." stated Edme.

Xander tilted his head towards her and truly noticed the differences between them and how the two societies way of living affected those within them. He had heard that the Tech societies buildings within the city were covered with solar panels in hopes of absorbing as much sunlight as they could, even though they were hindered by the ever-increasing amount of smog within the city. While sunlight was difficult to absorb within the Tech city, they did create

alternate methods to gather energy, but they proved futile with the ever-changing city and advancements of technology.

“I must agree with you, I also like to escape my small city from time to time. I rarely ever get a break from fixing things and improving our energy harvesting methods out in the forest.” Xander stated tiredly.

The woman before him seemed to share the same exasperated look that Xander had after working tirelessly throughout the day.

“I do the same within my city. I spend hours on end within my lab looking for ways to improve our growing methods, but I am hitting a block.” stated Edme.

The two appeared deep in thought as they stared at the Tech city. Their brains seemingly working in overtime as their inquisitive minds began to comb over every possibility, they could think of to fix their ever-growing energy crisis.

“There must be something we can do to help improve our methods of harvesting energy. Those within the Tech city are not changing any of their habits in hopes of fixing their problems.” exclaimed Xander.

Edme took a deep breathe, savoring the clean air before responding to Xander.

“While Aida is meant to help, unfortunately, it can only do so much. People still use as much energy as they can before the power is shut off and then simply do nothing until it resets every day. If we could somehow improve the solar panels absorption rate within the city, then we could begin to truly harvest and store enough energy to last us longer than a mere few years.” stated Edme

The two then began to plot out a way for them to meet and work together to find a way to improve the solar panels for both societies.

“There has been an increase in research regarding lasers and x-rays. I have proposed a compact laser that is able to look at things from a microscopic level. I believe that if I could make the conduit for this laser, we would be able to analyze the how sunlight is absorbed through photosynthesis and in turn alter our already existing solar panels to better absorb the light.”

proclaimed Edme.

Xander hummed in thought as he pondered over what Edme had just said. The laser itself would have allow them to view other things, but the focus on photosynthesis would be the priority for now.

They both stared at each other and nodded in agreement, they then planned to venture into the city together to get to Edme’s lab so they could begin the long hours of work they knew were coming once they set foot within the Tech city. They agreed that within a week’s time since their meeting, they would once again meet at the lake and begin to make their journey towards Edme’s lab within the city.

One Week Later

The two now returned to the same spot they had met a week prior to meeting and proceeded to begin their journey towards the city to reach Edme’s lab. Although he was curious to see if what his parents told him about the city were true.

It was a shock to Xander as he entered the city and began to cough upon breathing the smoke-filled air. The valley he was in now, now seemed vastly different from the forest he had grew up in. He knew that the city was different from his home, but he never expected it to be this different. While they shared in the technology, those within the city suffered more as he noticed everyone had pale skin like Edme compared to his tanned skin. If one were to glance at them walking side by side, they could easily tell the difference and determine that he was from the Nature society.

Looking around at the city, it was clear to see why his parents had left in the first place. He couldn't imagine living within the Tech city since he was born and raised within the Sun and clean air within the Nature city, he grew up in.

The two quickly reached Edme's lab and began to work. It was a shock to Xander, when on his first day there, he experienced Aida turning the power off to conserve energy. He had never experienced this before and found it odd how people were so accepting of this occurring daily without change. After that first experience for Xander, they quickly began to work on the project at hand.

Hours turned into days, days turned into weeks, and weeks turned into months with Xander and Edme working tirelessly to find a way to somehow implement this advanced version of a free-electron laser that would be able to analyze things at an atomic level.

The key problem they encountered was building a structure that would work effectively for the laser itself. The main photoinjector for the laser begins to emit a UV light that is applied to a copper plate, and the freed electrons begin to pass through a special silicon crystal that then begins to go through a multitude of magnets to process the beam. A laser is then shot through this path of electrons and allows them to create a powerful x-ray that allowed them to analyze anything at a molecular level.

With the machine now created, they began to test it rigorously to ensure its accuracy and once it began to work, they began to analyze photosynthesis. After months of testing, they finally achieved the results that they had worked so tirelessly towards.

"We have finally done it!" exclaimed Xander.

The two stood in awe and excitement that they had been able to successfully use the laser in order to analyze photosynthesis in such great detail.

“The laser works, and we now have the information on how to improve our solar panels in both societies in order to improve our energy absorption.” Edme proclaimed rather proud in the work and effort the duo had achieved throughout their time together.

Realization struck the two of them as they realized there was more that the laser could do now.

“With this laser, we can analyze so much more and even create alternate ways of energy.”

Xander proclaimed with much enthusiasm as his brain began to think rather quickly of more ways they can improve.

The two stood admiring their hard work and finally began to relax ever so slightly as they continued their conversation.

“Ha-ha, one thing at a time. The hard part is over, now we can work towards a better future and not have to worry about our lack of energy as much anymore.” Edme laughed at Xander’s ever growing enthusiasm and was reminded of how enjoyable it was to work together with each other throughout these long months. Now they could finally get some rest after countless sleepless nights and hard work.

Thus, in the year 2159, a breakthrough was made as scientists, known as Xander and Edme, were able to create a compact X-ray free laser (CXFEL), which allowed them to analyze energy absorption and allowed them to increase the efficiency of the vast number of solar panels that covered the buildings within both the Tech and Nature cities that they lived within respectively. This marked a greater change for both societies as they were able to alter their energy consumption enough and no longer produce pollution as much as they did previously and the surroundings around them slowly began to look how they did prior to the energy crisis. Those within both societies learned that change is needed to preserve their way of life and we

need to be aware of our energy usage as technology continues to become more advanced as the years go by.

