

Author's Note

I have structured this paper in six distinct parts. A breakdown of each of these parts is as follows:

A general overview of our current energy crisis

1. Implications for the future
2. The faults of our current policy
3. Alternative forms of energy that can be used in the future
4. Fictional Story
5. Costs associated with these energy forms

I have further structured the story in a vignette-style. I have included six different accounts of people's lives sometime in the future within the next fifty years. Each of these accounts is centered on a different natural source of energy that can be used in the future and outlines the shortcomings of these forms of energies. Many of these accounts take place in a different year and in a different cultural setting.

A Glimpse into the Future

Our Energy Crisis: A Context

It has recently been projected that by year 2100, the temperature of the earth may increase up to twenty degrees Fahrenheit, and sea levels may rise sixteen feet. In the near future, coastal areas will become flooded with seawater, and many of the small islands will disappear forever from the face of the earth. Global warming is posing an even greater threat than previously thought. As recent experiences with hurricanes Katrina and Rita show, environmental disasters are costly, not just for those impacted directly, but also for others because of economic interdependence. The destabilizing effect on the world economy that global warming will bring is an area of concern. Future energy security is also in jeopardy. Depleting a nonrenewable resource quickly does not appear as a sound policy.

In a world where the population has increased six fold in the past two centuries, the burning of fossil fuels for energy is causing warming of the planet at a rate that is ultimately detrimental to life. Due to changing water currents, Europe may get much colder, and eventually uninhabitable. The size of the United States and similar bodies of land will shrink considerably. Climatic changes in the past were associated with mass migrations. Given that there are no new frontiers to be claimed, such migrations will invariably lead to conflict and wars. Wars bring destruction, savagery, and suffering. It sounds much more appealing to live in a world at peace than a savage world.

The Future

The future holds many possibilities. It is projected that a new flight will be made that will orbit the earth in less than two hours. Wallpaper will become a commodity of the past along with wall-paint as plasma screens infinitesimally thin will be placed on walls and will be able to change color and texture by the will of the owner. A new robot will be introduced that will have capacities similar to those of human beings, complete with artificial emotions. This is the future we imagine.

Many prophesy that we will enter a future of advanced technology and sky-highways, but is it possible that history will repeat itself? The future could end up being a replay of the past. We may lapse into a repetition of the era of horse-drawn wagons and an economy based on primary and secondary economic activities. Burning fossil fuels will lead to a depletion of valuable resources we depend on, as these fossil fuels are nonrenewable. After these resources have run out, we will either be forced to derive our energy from nuclear sources or change our lifestyles in a way so that we will no longer need these energy sources, perhaps leading a lifestyle of the past.

Using nuclear energy will create massive amounts of waste that will have to be discarded using a special procedure that alone will cost a fortune. Even this will not be enough, as the question of where this waste will be deposited arises. In addition, nuclear energy will cause radiation that will cause long-term damage to the population, causing an increase in tumors, cancers, birth defects, and premature death. Abandoning energy altogether is a much more potent solution. If we abandon energy altogether, automobiles will have to go, with no alternative that exists to replace them. Planes will go out of business, and ships will be more expensive, permanently cutting off our ties with the rest of the world, forcing us to become more self-sufficient. Tourism will become a thing of the past. We may find ourselves moving to more mild climates, and in a severely overcrowded place. We will essentially be lapsing into a cycle of the past. Is this the future we want? The future is not as far away as we think – maybe only fifty years.

Current Political and Environmental Policies

The truth is inevitable: gasoline as a primary natural commodity will eventually cease to exist. Growing political instability in Iraq, developing economies like those of China and India, and the non-renewability factor of gasoline itself all play substantial roles in diminishing our gas supply for future generations.

Here in the United States, of course, it does not help that the current president is essentially avoiding the escalating energy crisis on hand and is currently directing his efforts at trying to institute a permanent tax cut policy. As Thomas Friedman puts it, “How will they [future historians] possibly explain why President George W. Bush decided to ignore the energy crisis staring us in the face and chose instead to spend all his electoral capital on a futile effort to undo the New Deal, by partially privatizing Social Security?” Thomas Friedman brings up a valid point. It comes off as both hypocritical and ironic that the president is financing the United States military with our own tax dollars, and is also financing the enemy terrorist organizations and other belligerent regimes of the Middle East by purchasing oil. [NYT]

The economic growth in China and India also plays a role in depleting oil resources. However, it would be highly hypocritical to blame these countries. It might just happen that as these countries develop, and their populations are able to earn a higher amount of disposable income, they might want to purchase cars and lead a lifestyle similar to the Americans. The United States still far exceeds China in its oil consumption with a 20 million barrel-a-day consumption rate compared to China’s 6.5 million.

Alternate Energy Sources: Fuel Cells

An alternate energy source to both electricity and gasoline is the fuel cell. The hydraulic fuel cell that could replace natural gas would work by combining hydrogen gas and oxygen gas together to make water. The water then would flow through the fuel cell, generating electricity. The water could then be either stored in a tank until it is emptied, or turned into steam and released into the atmosphere, or even dumped directly onto the streets. The fuel cell, would work similar to the way a battery works, except that it would require a constant replenishing of hydrogen and oxygen to perform a reverse-electrolysis process, making water, instead to splitting it, and using this as fuel.

Unlike the use of fossil fuels, that are nonrenewable resources and are susceptible to depletion, hydrogen and oxygen are abundant resources in the earth's atmosphere that do not have this problem. Hydrogen is the most abundant resource in the world, at about 70%, and most of that is stored in the oceans. Oxygen is abundant and will not be depleted as easily as commodities such as natural gas and other such fuels will.

Furthermore, an advantageous point in using fuels cells is that they are much more environmentally friendly than natural gas or other fossil fuels. Fuel cells will not release as many greenhouse gases (in fact, none) into the earth's atmosphere that cause global warming. Unlike the current sources we derive our energy from both hydrogen and oxygen is safe and non-toxic.

The adoption of fuel cells will also dramatically reduce the amount we pay for energy. It would not cost nearly as much to use fuel cells as it would to drill natural gas out of the earth, or to ship coal to different locations. The materials used in fuel cells would be in abundant supply free of charge. Moreover, it would be nearly impossible to claim ownership of individual atoms of hydrogen or oxygen, and therefore, the energy supplied would essentially be supplied at no cost for materials, with at most the cost for the fuel cell itself.

The use of fuel cells would also prove to be more benign to other creatures, as the incidence of oil spills and other oil-shipping accidents would not occur. Even humans would not have to worry about outdated oil-storage mechanisms leaking oil into their drinking water and contaminating it, because oil storage plants would not exist.

Fuel cells suggest that it is possible for nature and energy to coexist in a mutual way. Plants would take in carbon dioxide, and release oxygen, which would be used in fuel cells, in the production of energy. The fuel cell solution seems ideal in every way. However, one drawback would be that most of the hydrogen on the planet is locked up in water. It would take energy to separate this hydrogen from the water. Therefore, the energy produced from the hydrogen may actually require even more energy to be spent to make it.

In addition to hydraulic fuel cells, that use hydrogen and oxygen atoms for fuel, there could also be other types of fuel cells. For example, there have recently been developments in fuel cells using methane and oxygen gas and combining them to make methanol. These types of fuel cells are based on compounds that are found in nature separately. They do not require energy to be spent for obtaining the source materials.

The fuel cell idea is currently undergoing research. Although it seems like a plausible solution, it will need to be developed further.

Alternate Energy Sources: Renewable Energy Sources

Wind energy has been harvested for centuries in Holland, mainly to pump sea water out, and would be effective if implemented here in the United States. On windy days, the wind would work to turn a fan, which would be attached to a generator to produce electricity. It is both cheap and natural, with no unintended consequences.

Tidal energy is also another form of energy that could be used in the future. Setting up a turbine in the middle of the ocean, and using the ocean's tides to turn it and generate electricity is also a natural way to produce electricity, which, also, has been used in other countries effectively.

A third source of energy is geothermal energy. A vat of water would be placed inside a volcano. The heat from the volcano would turn the water into steam, and the steam, as it rises, would turn fan to generate electricity. Like wind and tidal energy, this form of energy would also work to supply our energy.

Unfortunately, because of nature's fickleness, and increasing demand of energy by a growing population, we are not able to rely on these sources of energy, however advantageous they may be. Furthermore, this energy could only be generated near coastal areas, where there is a lot of wind and a lot of tide, and in places where there are many volcanoes, like the Pacific Ring of Fire, and it would have to be exported to other places. The cost to transport the energy might be high.

Pending research could result in a way we could overcome the inconsistency factor and effectively use forms of renewable energy, but there is no proposed solution yet, and it could take many years and many dollars for a solution to be developed.

Provincetown, Massachusetts, USA

Year 2042

Beep. Beep. Beep. Beep. The alarm read 7:05 AM. Its piercing blare ricocheted off the Stevens' tangerine-colored walls and filled the room, despite its unwelcome presence. Little Mitchell groaned and grudgingly lifted his six-year-old self from his bed. He clamped his hands firmly over his eyes, not allowing any light to penetrate through and extinguish the last bit of sleep he still had left in them. "Mitchell!" yelled his mother fiercely, "You better be dressed and ready by the time I come up there."

"Yes, mother," he replied frantically. He sincerely wished that school were canceled that day. He promptly withdrew his hands from his face and opened his eyes to see if it had snowed. It had not. He quickly scampered into the bathroom, located his toothbrush, squirted a drop of paste on it, and stuck it in his mouth. Ten minutes later, he came out of the bathroom fully dressed and ready for school. He skipped down the stairs, taking two at a time, and joined his family at the breakfast table. He gobbled up his entire breakfast in a record time of two minutes and rushed out the door. The clock read 7:17 AM. He had three minutes until school started.

That morning was cooler than usual, with light winds that made it seem cooler than it actually was. The sun was hiding behind an array of thick clouds and seemed to be waiting for the right moment to make its appearance. Mitchell's father escorted his son onto the driveway, and strapped him into the car. With a serene smile on his face, he inhaled deeply, then hastily scrambled into the car and prepared to drive off. He fished out the car key from somewhere and stuck it in the appropriate slot in the car to start the electric engine. Mitchell instinctively pushed a large black rubber button located on the dashboard for his father, lowering the mini windmill that was mounted atop the car. The mini windmill had been busy spinning all night, charging the car's battery while the brutal northerly winds had been gusting at 40 miles per hour.

Impulsively, as soon as he began to drive off, Mitchell's father tuned in on the radio to listen to the weather report, as was habit. He smiled, as he discovered that the cold northerly winds would remain strong for the day. He looked at the onboard instruments and figured that if the weather forecast was correct, his car battery would be fully charged by the evening, which would last him through the following week. He made a mental note to raise the windmill again when he parked at the remote parking space reserved exclusively for him of his company or he would have to fork out 500 dollars for a gallon of gas to make it home.

Mitchell's father dropped his son off at school, and drove to work. He parked his car in a parking spot, unobstructed by any structures nearby, raised the windmill, turned off the engine, and sat in the car for a moment. He began thinking about the implications of purchasing the wind energy system. He had bought it a few years ago when the price of gasoline shot up to a point that he was unable to afford it. He preferred this source of energy

to gasoline because it was widely available, did not induce any unintended environmental consequences, and it was a highly renewable resource. However, nature did tend to be somewhat fickle, sometimes causing days when the car did not get charged at all.

As he left his car, he smugly congratulated himself again for being an early adopter of a technology that was subsidized at the time of its introduction. If he had waited for it to become popular, then we would have had to forego the hefty discounts he received at the time of purchase. He commended himself for his instincts, as he confidently boarded the elevator for another day of work.

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Arlington, Illinois

Year 2040

A feeling of nostalgia washed over Grette as she thumbed through old photographs of herself in Skagen. Her family had owned a large house on the beach, where she was free to frolic and play without a single care in the world. “Grette! Nå til middagsmad!” *Grette, lunch is ready!* called her aunt.

“Coming,” she responded. She came to the dinner table and wafted the smell of the food her aunt had prepared. *Åh*, she thought, *at least some things never change*. She ate heartily under the brilliant chandelier of her new house in Illinois. The chandelier had always puzzled her, just as most everything else did in this house. She wondered how electricity could be generated in a place that was so far from water. When she had lived in Denmark, energy had been generated by the constant drone of the tidal waves of the ocean just behind her house. It was difficult for her to imagine any other way to generate electricity.

Grette took a mouthful of food and closed her eyes. She pretended she was back in her home in Denmark, the country of her birth, with the peaceful soothing of the sea in the background, rocked her conscience back and forth. She opened her eyes, half-expecting to find herself in Denmark. But she found herself instead in America, which was nothing like her Denmark. The absence of the sea to her was like the absence of a limb. Grette longed for it, and felt incomplete without it.

Grette felt a longing for the sea. In all its sweet rocking, Grette suddenly remembered its rage. She wondered why the ocean had to rise and destroy everything she had grown up with. She shuddered as she remembered how the dikes failed, and the water kept rising, submerging everything in its path. It had trashed her family home that had been in her family for generations. It had left her homeless and vulnerable.

In the aftermath of the flood, when her house lay in ruins and two of her family members were lost forever, Grette had wondered what had caused the sea to become so angry. Never before in the nearly 500 years her family had lived in that house had there been flooding. Grette’s questions were answered when she watched the news. They had blamed it on a phenomenon called “global warming.” Although at the time, at the age of four, Grette

did not know what that was, or what was it that caused it, she was determined to reclaim the land she left behind and save its people.

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Dunedin, New Zealand

Year 2048

A place in the mountains – where the smoky clouds from above kissed the mountaintops - that was the place Hollie desperately wanted to experience. Actually, she knew that it was not technically a mountain – more like a dormant volcano – but it hardly made any difference to her. She longed to climb to the top and experience the wonders. Her father worked in the plant where geothermal energy was made. The heat from the volcano would warm the water that was continuously pumped into it, and convert it into steam, which would then run the turbines to generate electricity. However, she was never allowed up to the top. All she could see was the base of volcano, lush green, and covered with various forms of vegetation. The top, however, was mystical place, shrouded in dense clouds that blocked the top from public view. Hollie wanted to see what it was that her father experienced up there everyday.

Her father had always told her that it was unsafe to go up there. He worried about sudden eruption. Even though he felt the rush of adrenaline and the feeling of adventure whenever he went down the pit in the volcano, he was fiercely protective of his family and wanted to keep them as far away as possible. Hollie had lived in Dunedin all her life. However, she had not once been to the top of the volcano, and she constantly longed to go up there. This was how she felt at eight.

By the time Hollie had reached the age of twelve, she had developed a better sense of the perils of traveling to the top of the volcano. It was at this age that she first learned about the largest natural disaster in the history of New Zealand when the volcano erupted. The sudden spouting of the volcano did not give people time to escape, killing thousands. Even though the quest for energy had drawn people to the volcano, the images of what it could do were haunting.

As she grew older, and learned more about it, she grew concerned about her father and wanted the whole family to leave Dunedin. However, her father was tied to the plant for life, it seemed, for lack of better employment opportunities that matched his skills.

It was from this family background that Hollie came when she applied to college. She was interested in developing safer, alternate forms of energy that would not be as menacing as working in a volcanic pit.

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Toulouse, France

Year 2051

“Que faites-vous, Alsatia?!” *What are you doing, Alsatia?* Madame Gaulle demanded to know with scorn on her face. Alsatia pointed her toe until she felt it cramp. A drop of sweat rolled down her flushed face. Every day, it was the same torture; she would work for hours on her ballet, but Madame Gaulle, the most reputed ballet instructor in France, was never satisfied with her work. " Plus dur!" *Even more!* urged Madame Gaulle. Alsatia bit her lip and flinched as she mustered all her might to point her toe. Her entire leg screamed in excruciating pain. She cursed Madam Gaulle to herself for being so cruel. “Bon.” *Good.* She said approvingly. Alsatia was done for the day. She slipped a pair of black pants over her tights, wrapped herself tightly in a coat, and walked down the cobblestone street to find her driver waiting in the car. Alsatia clambered inside and she shut the door.

Long before her eyes could spot the building through the reflective glass windows of her car, she could hear the voices of angry protestors. She ushered to the driver to move faster so she could see what had caused the commotion, but she already knew. The dissidents were protesting the new nuclear power plant that was being constructed. Alsatia felt mildly annoyed for the traffic problems that it caused. The nuclear power plants had been a saving grace to France because their trains and trams ran smoothly, while the rest of the world was coming to terms with the exorbitant price of gasoline. France was where Marie Curie had began her work on radioactive elements, and it had always been in the forefront of nuclear technology. Years of experience had made it safer for deployment near large population centers. The fission and fusion processes were contained within the thick cement walls, which were further lined with endless layers of stainless steel to prevent radiation. *How ignorant must these people be to protest a nuclear plant?* wondered Alsatia.

Today’s protests were a bit different from the usual. The protesters were carrying placards with pictures of people who had perished from the unusually high rate of cancer. She vaguely remembered a newspaper story about that, and also recalled that the nuclear power authority had vehemently denied that they had anything to do with it. They had placed all the blame for these incidences on the agricultural sector, accusing them of using too many harmful fertilizers that formed runoff and seeped into people’s drinking water.

The placards touched a chord in Alsatia’s heart. Her demeanor towards the protestors softened. She now understood why they opposed the plant in their town. She had an urge to join the protestors, but refrained. For all their practical purposes, nuclear energy was the most sustainable source of energy that was widely available in Toulouse. She would have no business meddling in matters that did not concern her. With a heavy heart, Alsatia sauntered away from the protest.

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Ankara, Turkey

Year 2049

Adil’s father was a high-ranking government employee, but he did not agree with all government policies. He was opposed to the ban on Kurdish language in Turkish media. He

also did not believe that declaring Kurdish people as “mountain Turks” resolved their identity issues. However, he generally kept his views concealed for fear of any retribution. They lived in a humble, two-bedroom apartment in the center of Ankara.

Turkey had a sweltering hot climate, and the sun beat down mercilessly on its inhabitants. The Turks had devised a way of converting some of the oppressive heat into air conditioning by installing solar panels on the roofs of buildings. It was a simple, yet ingenious creation that eliminated the need for expensive energy fixtures that cost outrageous prices. The solar panels had completely changed the lifestyle of the Turks in Ankara. Petty thieves no longer found refuge on the roofs of patios on top of the house after they had acquired their prizes unless they wanted to be fried to death by the 300-degree temperature of the solar panels. Solar power allowed cheap and natural energy usage that did not yield harmful byproducts. Adil had always thought it ironic that the very thing that caused them discomfort could be used to counteract itself.

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Once fall approached, the scorching Turkish heat began to cool off slightly, and one late summers day, Adil decided to sit in the front of his house and enjoy the pleasant breeze. He began daydreaming about nothing in particular and shut his senses to the patting of the footsteps. He was in a state of bliss, when suddenly a man emerged from behind him and clamped his hand over Adil’s mouth to prevent him from screaming and drawing attention.

“Search the house,” yelled the man to another. An army of men flocked inside Adil’s apartment. Suddenly, a piece of solar panel chipped off the roof and cut a deep scar into Adil’s arm as it fell to the ground. He flinched in pain. Adil struggled to escape, but he was futile in his attempts. He hoped that if he stayed perfectly still, the man would relax his grip. Apparently, Adil was wrong. He heard a gun shot within his house and heard his father groan. Adil became hysterical.

A few moments later, the men brought his father out in thick steel chains. Adil knew that that would be the last time he would ever see his father again, and made every effort to look at him one last time before he was taken away.

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It had been one week exactly since they had taken his father away. Adil knew not why or what they had done to his father, but found himself harboring tremendous rage against the men who had taken him. Unable to sleep, Adil crept outside and sat in the chilly breeze, trying to cool his nerves. Suddenly, he felt someone grab his arm firmly. He was prepared this time. He swiftly swung around and punched his aggressor in the face. He heard a groan that sounded all too familiar. “Baba!” exclaimed Adil, as he flung himself upon his father and gave him a hug.

“I’ve come for you and your mother. There’s no time to explain. We have to leave this country by dawn.”

“Dawn?” repeated Adil, confused, “...Why...”

“I’ll explain later. Come on,” interrupted Adil’s father. With that, the family set sail for America – the land of the free and home of the brave.

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Chandigarh, India

Year 2053

There was one and only one thing Nani expected from her grandson Rajeev in sacrificing everything she had to give him a first-rate education: get into a reputedly good college and get a decent job afterwards. Rajeev had grown up with this value from the time he had been orphaned and his grandmother had taken him in. Rajeev was not born into poverty, like most others in his village; rather, he was robbed of his parents and his large fortune by the Mafia. In one day, Rajeev went from being pampered by multiple servants, to being forced to potty train himself. Losing most of his life’s luxuries, Rajeev and his younger brother retreated to a small village where neither sophisticated forms of energy nor running water were used and was taken in by his grandmother. Due to the lack of other forms of energy, Rajeev’s grandmother was forced to adopt the ancient way of producing electricity that Rajeev’s ancestors had once used. Rajeev often watched with innate fascination as his grandmother scooped up cow dung and made patties that they could burn for fuel. Even now, twelve years later, it never ceased to amaze Rajeev that something so simple could change one’s life so much. If it hadn’t been for the dung, his late-night studying sprees would never have occurred and he would not be where he was today. Now, he was eagerly waiting for a letter from MIT to notify him of their admission decision.

It was his interest in cheap, clean forms of energy that drove him to apply to MIT, where he could pursue an education in that field, and perhaps develop a new cheap energy source altogether.

“Beta, when do you find out whether or not you got in?” asked Nani.

“Tomorrow, Nani,” replied Rajeev. The corners of Nani’s mouth turned up and formed into a reassuring smile. “It’ll be fine. Don’t worry too much,” she said.

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Rajeev was unable to sleep that night and sprang out of bed to make better use of his time. He remembered to collect some cow dung from the barn, place it in the vat, and wait for the methane gas to be utilized to give himself some light, feeling the warm rush of blood through his body every time his heart thumped. He was unable to do anything more than sit. The morning finally came, and everyone became busy with his or her work. He knew that at

this moment, the postman was probably bicycling with his mail at snail pace, taking his sweet time. This drove Rajeev crazy. He pledged that if he did not get into college, he would improve the infrastructure in small towns and villages in India as his second career choice.

Rap tap tap. Someone knocked on the door. Rajeev sprinted from his chair and opened the door so fast that he took the postman by complete and utter surprise. "Here you are," he said, as he handed Rajeev his letter. Rajeev took the letter and ripped it open. He let out a cry of disbelief and tears filled his warm, brown eyes.

"What happened - did you get in?" asked Nani, but she already knew the answer, and her face became bright with delight for her grandson.

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Toulouse, France

Year 2055

It was a clear, crisp day with not a cloud in the sky when it happened. Suddenly, the glass in her windows blew out with a deafening sound, and her house shook violently. Alsatia was dumbstruck. She had managed to shield herself from the glass, and emerged, wondering what had happened. People began to stream out onto the streets in panic. "Alsatia, *mon chere*, we must go," signaled her mother.

Alsatia was confused. "Where?" she asked, perplexed. "Out," responded her mother.

"Out?" she retorted. Now she was thoroughly confused, "what does that mean, and why?"

Alsatia looked out what was left of the window. Then she heard it: "We are all dead! The nuclear plant has exploded!" Desolate children were crying in the streets with no one to console them. Her vision became blurred as she went to her drawers and grabbed on to whatever lay near to take as a memento.

They ran to their Cessna parked behind their house. The windows were blown, but the plane looked okay otherwise. Alsatia boarded the plane as fast as she could, still numb to her emotions. It was not until the Cessna lifted off the ground that she felt it. The plane flew low, because the windows were blown, and the wind was intense. She could barely keep her eyes open, but that mattered little to her because she did not want to keep them open.

When they landed at an airport, at a safe distance away from Toulouse, they were too shaken to have faith in the nuclear power plants that dotted France. Her family became a refugee to the United States, and Alsatia was forced to adapt to a new life.

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Los Angeles, California

Year 2049

Adil sat in his California condominium examining his scar. He had discovered that his father had been banished from Turkey because of his political views. Adil was sad to leave Turkey, but was also excited and eager to adjust to new life in America. He had made friends quickly, and no longer felt like an outsider. The scar on his arm was a constant reminder of the trauma that preceded his exile. What are the odds of being injured by a solar panel?

Massachusetts Institute of Technology

Year 2056

“To all the new students, I extend my welcome to my research group on fuel cells. Although fuel cells have been around for the last few decades, significant deficiencies still exist between energy output and demand for energy. It is your job to investigate on how we could make the fuel cells smaller, cheaper, longer lasting, yet environmentally friendly. I will summarize my goals and directions for your benefit. However, before we get into that, we should introduce ourselves so that you get to know each other,” said the professor.

Mitchell, Grette, Hollie, Alsatia, Adil, and Rajeev all sat, listening intently to the professor speak. One by one, they filed to the front of the room, and introduced themselves. The professor seemed impressed by the diversity.

“We need fresh ideas to explore. The ideas must be debated vigorously and experiments to support the ideas must be planned carefully. All ideas will be scrutinized and critiqued. It takes numerous ideas to be mined to find a gem. Don’t be afraid to be wrong; that way you will inhibit yourselves,” said the professor. Soon after, the brainstorming began.

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“Yeah!!” exclaimed the six students as they slapped each other high fives. Four years had passed since they had begun their research, and they had succeeded. They had succeeded in reducing the size of the fuel cell, in addition to making it more effective. For their work, they had gained international recognition.

They opened the pizza box and began eating. The professor entered the room a while later. “What is all this celebrating?” he asked. The students looked at each other, perplexed. What did he mean? Didn’t they just help end the energy problems of the world?

“I congratulate you on a job well done on improving the efficiency of the fuel cell. However, we have only put a small dent in the world’s energy problems. As the population continues to grow, and the demand for energy rises, we cannot pretend that we have solved the energy needs of the world. In fact, I am not even sure that is possible unless we reduce the appetite for energy. This means newer forms of transportation, newer means for industrial production, newer forms of residential appliances, and more earth-friendly ways of

living,” orated the professor. The students knew at once that the solution to the energy problem was not just a scientific one, but also a societal and a cultural one.

“To fuel cells!” exclaimed Rajeev, as he lifted his glass to the center of the circle.

“To conservation!” exclaimed Alsatia, as she raised her glass. The six students and the professor clinked glasses of champagne and took a long sip.

Afterward

The four types of energy proposed in the above passage are certainly possibilities for the future. However, there is still ongoing research to determine the most effective use and implementation, and to find answers to all the questions about sustainability.

These energy sources are renewable, and we will not have to worry about inflationary prices as supply diminishes. The growing population and increased demand for energy might pose a problem, however. The growing demand for energy, coupled with the instability of the level of supply might lead to shortages at some times, and surpluses at others. However, there is currently research that will help solve these problems. Research will cost both a fair amount of money, as well as time, but hopefully it will yield a plausible solution and will result in an effective alternate to fossil fuels as energy by the next half-century.

Ideally, a new, sustainable form of energy will be implemented and used by the next fifty years, if research is actively done. It will likely cost a few billion dollars in research, but will save us trouble in the far future. However, it is not effective if researchers do not have the support of the government. To accomplish any goal, we all need to work together.

Works Cited

New York Times article by Thomas Friedman: "Geo-Greening by Example"