CONFIDENTIAL

Nuclear Energy - The Better Energy

Business plan

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Executive Summary

Problem and Solution

Our planet is currently in the middle of a climate crisis. Excessive dependence on fossil fuels, increasing energy demands, population explosion and rising global temperatures call for a shift to an energy source that can fulfill our increasing demands and is environment friendly. Nuclear power has proven to be that option. It has the ability to meet all our energy demands and is also cleaner than any other available energy source. The problem, however, lies in the limited knowledge and awareness about nuclear energy within the society. Irrational fears and false impressions abound within the public and pose the greatest obstacle to this transition within the society, which is absolutely necessary to combating our climate crises.

Our solution to the problem is to create an interface that connects the general public with reliable information from experts in the field. To do this, a comprehensive website aiming to inform people about the importance and benefits of using nuclear power has been developed. The website has been designed specifically to introduce the general public to nuclear science, starting from its basic applications to nuclear power production being the need of the day. The website comprises of interactive features such as fun-facts, quizzes and articles written by credible authors who are educated in the subject. Each component has been created to tactfully deal with one particular aspect of Nuclear Energy that the general public is usually concerned about.

One of the latest features of our website includes an 'Article of the Month' section where every month, a new article related to Nuclear Energy and its consequences in our everyday life is posted. We are now working to convert this into a biweekly feature. Regular newsletters to keep the public up-to-date with recent advancements in the nuclear industry have also been included in the website. The uniqueness of our product lies in the fact that it comes from the point of view of an ensemble of graduate students from various backgrounds who can relate to the general public from different yet complementary perspectives. This site is a journey through everything that nuclear science has to offer in the present age.

We are currently in the process of converting our venture into a non-profit organization in order to reach the society at a larger scale. We have organized outreach events in the past and plan to continue doing so for the general public. We are also in the process of collaborating with various institutions (described later in the text) to reach people both in and outside of the US.

Market

Our short-term target market includes the following:

- STEM graduate students (attending academic conferences all over the country)
- STEM students in general (at universities in and outside of the state of Indiana)
- Students from related disciplines (for ex., sustainability and environmental science)

These goals would then be extended to a medium-term target market involving students across a wide range of disciplines (with and without a science background) and teachers. Our long term target market includes the following:

- Personnel working in nuclear power plants

- General public that lives around nuclear power plants
- Private companies that supply nuclear reactor components

Why is now the right time?

Competitive Edge

Our product is a website designed specifically for a general audience with a non-science educational background. In order to reach the public, the content on our website has been written in an easily comprehensible and engaging manner.

One of the defining traits of our website is that it includes interactive features like quizzes and fun-facts to engage the public in an efficient way, a feature which other nuclear energy awareness platforms do not possess. Another unique characteristic of our product is that it is run by an ensemble of students coming from entirely different geographical regions and educational backgrounds. Our product is a collection of properly compiled and reliable information taking into account both scientific as well as policy considerations.

Additionally, since we are a group of students who are not in any way related to any profit-making company, our interest in promoting awareness about the peaceful use of nuclear energy is a completely social cause. Our product hence stands out in the market as a more trustworthy and unbiased source of information.

Why NOW

Our planet is currently experiencing a climate crisis. In order to meet the politically agreed-upon goal of keeping the average global temperature rise below two degrees Celsius, we need to reduce our emissions and adopt cleaner sources of energy. Out of all the available 'clean' sources of energy, nuclear power is the most promising and produces completely green and carbon-free energy.

Adopting nuclear energy will allow our society to produce enough power to meet our increasing energy demands (which solar and wind power alone cannot do) and at the same time, protect our planet from the emerging climate emergency. There is, however, a lack of knowledge and awareness in society regarding the safe use of nuclear power to produce electricity. Misinformation and media-driven hysteria have given rise to irrational fear and misconceptions about nuclear power in the general public. The negative attitude of the society towards nuclear power proves as a roadblock to the expansion of the nuclear energy sector and to the smooth operation of nuclear power plants, increasing their capital costs and forcing society to depend on other carbon-emitting energy sources. This vicious circle leads to burning more and more coal and increased rates of global warming. Now is the time to break this circle, adopt nuclear energy and act to save our planet!

Company and Team Overview

Company Leadership, Core Experience, Capabilities and Resources

Our team is an ensemble of graduate students coming from a diverse range of geographical regions and educational backgrounds. This makes our team especially experienced in

understanding the various problems and issues of people worldwide. We are therefore qualified to connect with the public at the ground level and help to provide them trustworthy information about the peaceful uses of nuclear energy and guide them to a path of sustainability.

Our founder, Nirupama Sensharma is a 5th year PhD Candidate in Nuclear Physics at the University of Notre Dame. Originally from India, she has first-hand experience working in various nuclear power plants in India. Having gained experience in this field and by interacting with various nuclear scientists as well as the people who live around nuclear power plants, she became an ardent supporter of nuclear power. She intends to use her expertise and knowledge to advocate the use of nuclear power as the cleanest source of energy and an absolute necessity to combat the climate crises.

Our Editor and Head of Marketing, Max Nguyen is from Vietnam and he is a 2nd year Masters' student in Global Affairs at the University of Notre Dame. He is interested in the policy-making side of nuclear energy. As a Masters student of Global Affairs, he has worked with political decision-makers and writes about different countries' experience with nuclear energy. His excitement about the prospect of the use of a clean, efficient source of energy to combat climate change is the strength of our team.

Our content writer, Hrafn Traustason is an Icelandic native and a 4th year PhD Candidate in Nuclear Chemistry at the University of Notre Dame. He is passionate about clean energy initiatives. He has been working with uranium for the last four years and his network of distinguished people in the field of nuclear chemistry is a valuable asset to our team.

Our second content writer, Sara Gilson comes from New Jersey. She is a 3rd year PhD Candidate in Actinide Chemistry at the University of Notre Dame. Her studies in actinide chemistry led to her interest in nuclear energy. She also has gained some experience working with Gen IV Nuclear Reactor Designs and Fuel Cycles from TU Delft. Her association with our venture would allow us to stay updated with all the new developments in the field of nuclear energy.

Our undergraduate member and third content writer, Lydia Schaecher is from Columbus, Nebraska. She is a senior at the University of Notre Dame with a double major in Environmental Sciences and Philosophy is interested in sustainable alternatives to fossil fuels from an Environmental Sciences perspective, and has spent multiple undergraduate classes researching and writing about perceived issues facing nuclear power, namely public opinion and nuclear waste disposal.

Goals and Objectives

Our vision behind developing 'Nuclear Energy – The Better Energy' is to bridge the gap between our research and our responsibilities towards society. Spreading awareness is the only way to counter the fear and stigma associated with Nuclear Energy. In the present age of technology, our society is constantly evolving and moving towards advancement. To combat our current climate crises, we need to cut down our carbon emissions and find a way to progress using resources that are sustainable. Embracing Nuclear Energy is the step that will take us closer to a safer environment.

Through our product, we hope to achieve a society that shares our views of Nuclear Energy as a necessary and safe alternative energy source. The use of our product for educational purposes can help the society make well-informed decisions about the future of nuclear power, with full knowledge of it's potential to positively impact our planet's climate. Thus, our ultimate goal is to reach as many people as possible, to spread awareness and to bring a change in the generally negative perception of nuclear power in our society. This would eventually promote a much smoother and efficient licensing, construction, and operating process for nuclear power plants for the government and other private companies. The increased support for nuclear energy as a sustainable replacement for fossil fuels will significantly decrease the total amount of carbon emissions, thereby protecting our planet from its current climate crises.

Product or Service

Value Proposition

There is a dearth of good sources of information about nuclear energy for the general public, with the information available on most websites being either too technical or unreliable. Trustworthy websites such as the U.S. Nuclear Regulatory Commissions website are too technical to be useful sources of information, while personal blogs on the subject are rife with misinformation and/or biased. Our product will deliver much-needed trustworthy information about nuclear energy, tailored specifically to a general audience. The creators of and contributors to our website come from a broad range of backgrounds and have a well-rounded host of experiences with nuclear energy that qualify us to provide fact-informed, comprehensive, yet accessible information about nuclear science.

With access to accurate information about nuclear energy, our product will help create a society that, mindful of our need to reduce our dependence on fossil fuels and to switch to sustainable alternative energy sources, will be supportive of nuclear power. A positive public perception of nuclear power will decrease the amount of time that it takes to license and construct nuclear power plants, leading to reduced capital costs and an increase in investors' willingness to construct more plants. The valuable information that our product provides to the public will, in time, deliver even more valuable positive changes to the nuclear energy sector at large. A fact-informed positive perception of nuclear energy will allow our society to transition from fossil fuels to a sustainable, reliable, and safe form of sustainable energy: nuclear power.

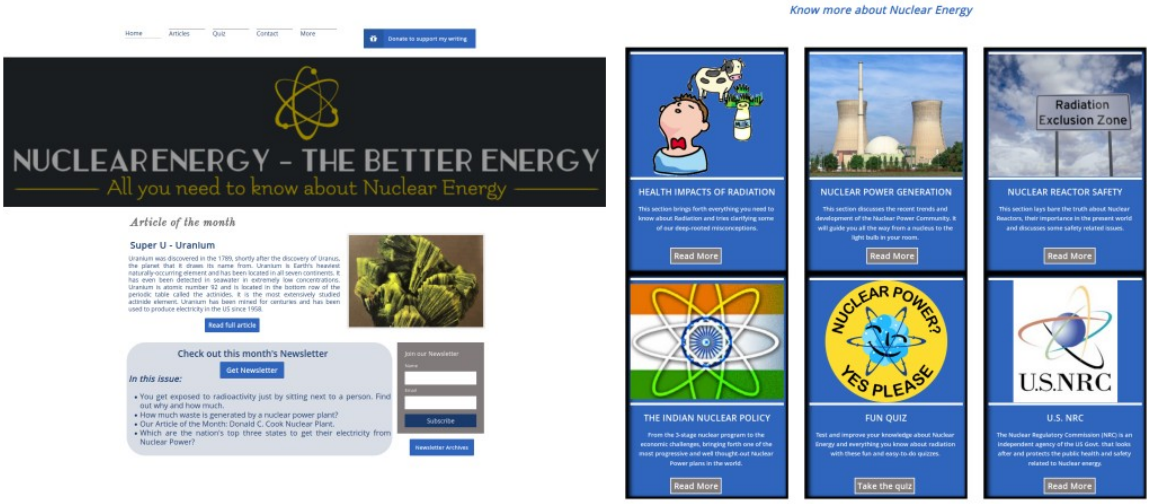
MVP Visualization

Below is the screenshot of the homepage of our website. Also shown are the major sections. Our website has been divided into the following sections:

- Health impacts of radiation
- Nuclear Power Generation
- Nuclear Reactor Safety
- The Indian Nuclear Power Program (Nuclear power programs of other countries will be included in the future as well)
- Fun Quiz (Sample Quiz: Quiz 1)

Our sample newsletter can be found here: [January 2020 Newsletter] and a sample article of the month can be found here: [Super U – Uranium.] Both are featured on our homepage.

We are also currently in the process of starting a YouTube channel and upload short informational videos. We will link this channel to our website to attract more traffic.



Strategic Advantage

People interested in learning about nuclear energy are forced to go to the United States Nuclear Regulatory Commission (US NRC) website as a good source of information. While this website is reliable and rife with information, it is very technical and does not appeal to the general public.

Various blogs focused on providing information about nuclear energy are also available on the web. However, it is unclear how trustworthy they are, and bloggers may not have sufficient scientific background to provide accurate information about the benefits of nuclear power. These blogs can also be difficult for the general public to find and follow.

Since our venture is being run by graduate students at the University of Notre Dame, most of whom have experience working in the nuclear energy sector (and are also actively researching in this field), we are much more qualified to be providing reliable information. Moreover, since we will be operating as a nonprofit, we will reach out to students and teachers of secondary education and provide outreach to connect with the public at the most basic level. As a nonprofit, we also do not face the pressure of turning a profit and can therefore operate more efficiently.

In order to connect with the society, our website has been designed as an interactive platform with easy-to-read and understand content, fun-facts, quizzes, articles and newsletters. None of the above mentioned competitors provide all of these resources in a compiled and concise way as we do.

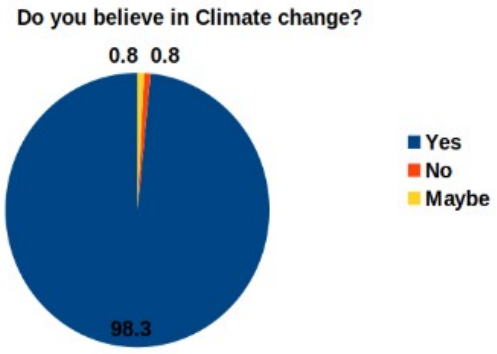
Customer Validation Evidence

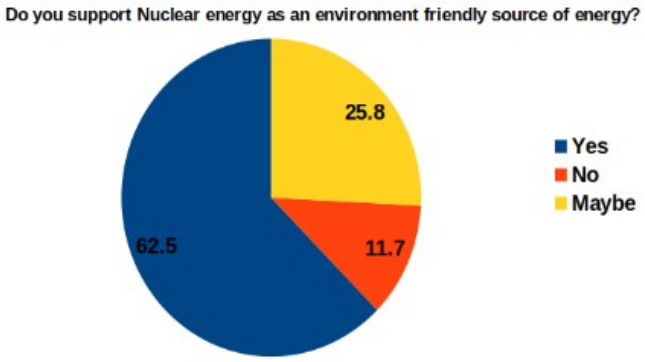
We created a survey aimed to gauge the awareness and understanding of the society regarding the use of Nuclear Energy. We received a total of 120 responses from people in the age group of

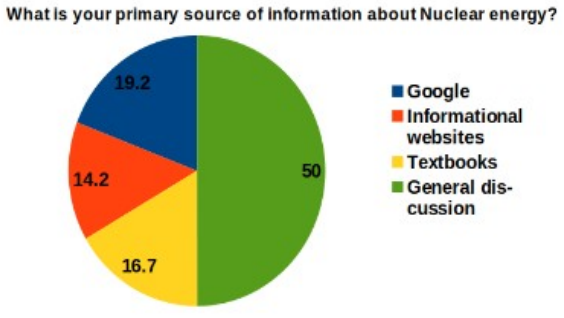
18 to 72. From the received responses, it was seen that although 98% of the participants believe in climate change, only 63% support the use of nuclear power as an environment friendly source of energy. The charts from the survey are shown below. Another question in the survey aimed to know the source of information about nuclear energy prevalent within the general public. We found that half of the participants rely on general discussions as their primary nuclear energy information source, whereas 19% rely on random net surfing. While general discussion platforms are helpful in various situations, the lack of hard facts and reliable information can further spread misconceptions among the general public. Random net surfing also leads many readers to unreliable information sources which can not be verified.

Our product intends to increase the number of people who believe in nuclear power as an environment friendly source of energy by promoting awareness. Through our website, we intend to provide a reliable source of information which is concise, interactive, easy to read and understand and connects well with the general public.

Another survey was sent out to gauge the interest of the public in purchasing merchandise (stickers) to show their support for nuclear energy. We have received 116 responses so far and the results from the top three performing stickers are shown in the bar graph below. The survey indicated that most of the participants were willing to pay for our stickers. We have printed out these stickers and will start selling them to our customers soon.







Market Opportunity

Market Size & Growth Rate

In the short term, we are marketing our products to Notre Dame students. Our first target is STEM students as nuclear energy should elicit the most interest from this population. There are approximately 8,000 undergraduate students, a quarter of whom major in STEM disciplines. Thus, we're looking at about 2,000 undergraduate students who may take an interest in our activity. There is no data on how many STEM students are there at the graduate level, but assuming similar proportion; we should have approximately 3000 x 25% = 750 graduate students in STEM. Therefore, our initial pool includes 2,750 STEM students. A conservative assumption of attracting only 10% of that group leads us to an initial market of 275 students with an interest in our products.

In the medium term, we want to expand our activities to other universities in the South Bend-Elkhart region as well. Those include St. Mary's, Holy Cross, IU-South Bend and Bethel College. We will use our short and medium term markets to generate starting revenue and use it to fund our long-term market goals involving the general public.

In the long term, once we have gained sufficient traction among customers of our product, we will target a larger population (starting from the people that live around nuclear power plants) that is representative of the 'general society'. We also plan to solicit sponsorship from two types of companies: providers of nuclear energy and providers of nuclear energy components. The former category includes companies like American Electric Power (which owns Indiana Michigan Power), Exelon Corp (Chicago-based). The latter consists of suppliers of nuclear energy components.

Market Segmentation

We segment the student market by their majors. We assume that STEM students would take the most interest in our project. Next, we have students with interest in environmentalism. On the periphery, we are looking at students of other disciplines. This segmentation has been done because nuclear energy is a controversial topic. We suppose that STEM students would be the most receptive to this idea. Once we have gained increasing credibility on our channels (website, YouTube), we will move on to other segments of our target market involving a general public to increase viewership and readership.

Competitive Analysis

A quick google search on "Nuclear energy" yields a number of single articles about what it is, along with a number of government websites dedicated exclusively to nuclear power. Oftentimes, government websites contain highly technical language, whereas our channels translate scientific facts into everyday parlance. Those websites include:

- The U.S. Nuclear Regulatory Commission (www.nrc.gov)
- The U.S. Energy Information Administration (www.eia.gov)
- The Office of Nuclear Energy (www.energy.gov/ne/)

In addition, there is one think tank whose display of data directly competes with us – The Nuclear Energy Institute (www.nei.org). The NEI, however, consists primarily of industry leaders, while we are students of diverse background. Moreover, we're not financially motivated, so we appear more trustworthy. In addition, our website is more interactive.

Barriers to Entry

Our barriers for the moment remain technical. For instance, we need experienced personnel in video editing to create educational videos. We also need greater manpower and creativity to organize advocacy events that promote greater use of nuclear energy.

Business Model Rationale

Customer Relationship-Building Strategies

To build up the relationship with our customers, we would be doing the following:

- Organize outreach events for middle/high school students and teachers.
- Make use of social media (Facebook and LinkedIn).
- Connect with young scientists and students at academic conferences.
- Collaboration with institutions and other experts in the nuclear energy sector.
- Organize interactive competitions (quiz, debates) for our customers.
- Make YouTube videos and connect with the youth by making short informational videos about the peaceful uses of nuclear energy.

Key Partners

Our first key partner is Prince Rautiyal, a graduate student working in the field of nuclear waste management at the Sheffield Hallam University, a public university in Sheffield, England. He is willing to provide us with content for our website and videos for our YouTube channel. With his specialized knowledge and expertise in the field of nuclear waste management, he can provide our team with accurate and insightful information about this sensitive topic, which is a major worry for those who have a negative perception of nuclear energy. Rautiyal's contributions will help us connect with the public and provide them relevant information about the issues related to nuclear waste and how to handle it.

We are also working to partner up with NDEnergy at the University of Notre Dame. Through this partnership, we aim to connect with companies operating nuclear power plants in the United States and provide outreach for them as a way to connect with the local population living around those power plants.

Revenue Streams, Margins, & Cash Flows

To generate revenue through our venture, we would be selling merchandise to our customers. We have already validated this revenue stream and our customers are willing to purchase stickers to show their support for nuclear energy. Moving forward, we would also start selling t-shirts, hats and other merchandise.

We are also working on starting a magazine that we would be selling to our customers who subscribe to it. Our team member, Lydia Schaecher is currently working on our first issue of the magazine.

Also, since we are working to register our venture as a non-profit, we would start accepting donations, grants and gifts. We will also start fundraising as soon as we claim a non-profit status.

Go-To-Market Strategy & Goals

Key Assumptions, Risk Factors & Contingency Plans

We have started our venture with the following assumptions:

- Most people believe in climate change, but don't believe that nuclear energy is the solution. This assumption has been validated with an awareness survey, the results of which are displayed in the section *Customer Validation Evidence*.
- Most people don't support the use of nuclear energy because they are misinformed and do not have complete (and unbiased) information.
- Our customers would be willing to purchase our merchandise. This assumption has also been validated with a survey, the results of which are shown under the section *Customer Validation Evidence*.
- Companies that operate nuclear power plants would be willing to sponsor our venture as we can provide outreach for their local population by connecting with them through our easy-to-read and approach website (and other products).

Some of our risk factors are as follows:

- Some of the assumptions as listed above might have other in-built considerations that we are not accounting for.
- It might be more difficult to connect with private companies in the energy sector.
- We may not be able to do as much fundraising as required by our venture and may have to rely on some of our other low-cost revenue streams to finance our project.

Here are some of our contingency plans:

- In addition to selling nuclear energy support stickers, we will sell other merchandise like t-shirts, hats, refrigerator magnets, pins as well.
- As and when our partnership with various organizations strengthens, we would be organizing information panels with experts from the nuclear energy sector for our customers to interact with on a regular basis.

Beachhead

The first market that we would be focusing on are University students in the state of Indiana. There are 60 colleges and universities of various types in Indiana who want to be more informed about how to solve the climate crisis through the use of nuclear energy. We will provide them with a reliable source of information through our product and acquire subscribers for our paid services. We will start with an informational campaign and reach our proposed market through social media. After acquiring customers, we will sell our merchandise, organize quiz competitions/debates (with a small admission fee) and sell magazines/newsletters.

Follow-On Markets & Offerings

After gaining some customers from the universities in the state of Indiana, our target will be to collaborate with companies that operate nuclear power plants and are involved directly/indirectly in the nuclear energy sector. We would also aim to receive sponsorship from them. We will also target other universities in the United States and try to reach more students on a national level.

Key Milestones & Critical Success Factors

- Reach 1000 followers on Facebook page by August, 2020.
- Reach 1000 views of our YouTube videos.
- Increase the amount of time people spend on our website (Currently, our customers spend an average of approximately 4 minutes on our website).
- Get 500 subscribers for our magazine.
- Sell 1000 nuclear energy support stickers.

Investment & Use of Funds

We have received a donation of $300 from Prof. Don Howard at the University of Notre Dame to print out the first batch of our stickers and pamphlets. We would be selling the stickers for $2 each. If we are able to sell up to 150 stickers, we would be able to cover up the operating costs of our website. Moreover, we will also be getting funds through magazine subscriptions and by organizing quiz competitions/discussion forums. We will, however, need some capital to get the first few batches of magazines printed. We will also need funds to be able to organize events (competitions, forums, outreach) for our customers.

Feasibility - Metrics That Matter

Funding requirements & planned sources

- Our website is already launched. We need approximately $300 for renewing our site hosting and domain name for this year, however. The renewal is due in May, 2020.
- The cost estimate for our stickers is approximately $1.10 per sticker. We currently have funding to print about 200 stickers and we will spend the remaining money to print pamphlets for advertising our website. We need $1000 to print other merchandise (t-shirts, hats, magnets) and other advertising material.
- We also intend to print out the first issue of our magazine. The cost estimate of printing an eight-page magazine at FedEx is approximately $5. We are aiming to sell at least 100 magazines and would therefore need a capital of $500 to start with our first issue. The next issues would be paid for from the subscription fees.
- The net total amount that we would need to successfully start our venture is approximately $2000.

Cash Burn Rate

Since we are targeting to become a non-profit organization, we do not anticipate producing a positive cash flow especially for the first few months after our launch and beach head phases.