

Green Textiles

Team Zelini

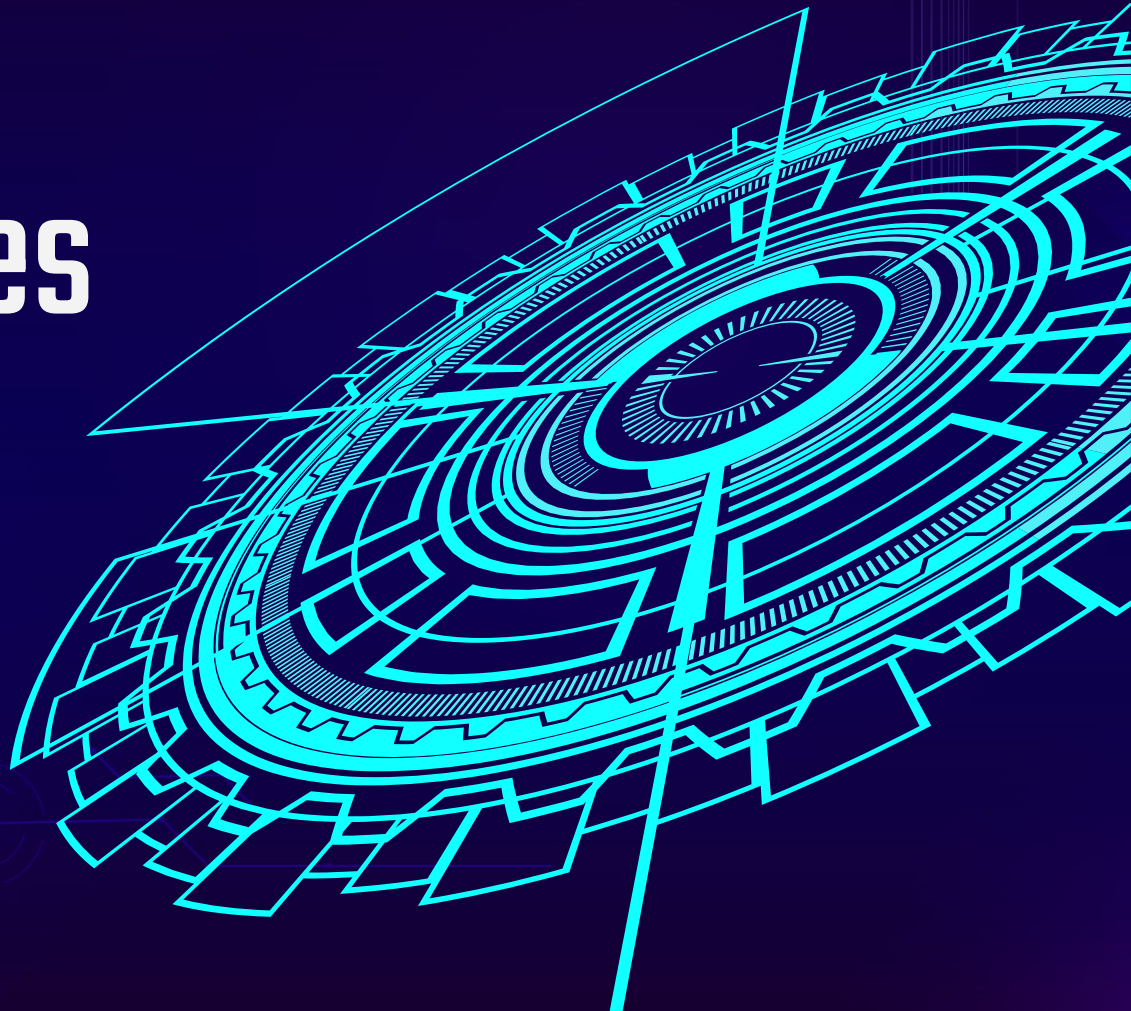




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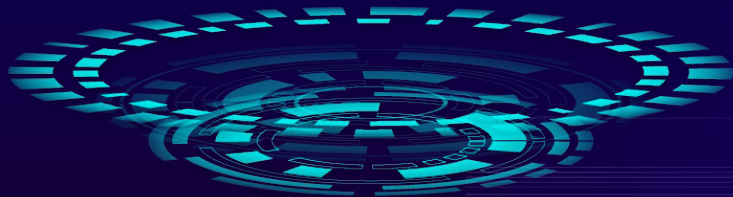
How the turbine works?

This technology is beyond our hopes and dreams.



INTRODUCTION

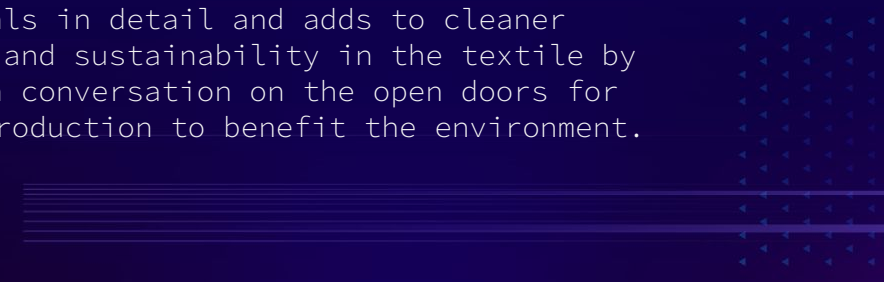
We have, on this journey, put in our efforts towards having a positive impact on the world. This is our end product and we are proud of what we have been able to do. We believe this idea is beneficial to the world and its people.



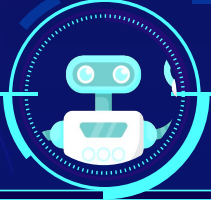


ABSTRACT

The public awareness and the developing perception of social insight about the climate, and environment have constrained the textile industry to create friendly and sustainable products. Thus, these days numerous organizations and associations center around the natural method of production. To make an environment-friendly product, the primary change factors have been connected to eco-materials so less innocuous waste is produced, reusing/reusing, lesser use of energy, water, and synthetic substances. This solution underscores the ecological impacts of materials in detail and adds to cleaner production and sustainability in the textile by starting a conversation on the open doors for change in production to benefit the environment.



OUR TEAM



Aashna Kumar

Team Leader, keeps us on track and has an amazing aesthetic.



Abhinav Vallur

The man at the computer, graphic designing is not a problem with him around.



Goutam Chari

Analyst extraordinaire, data is ripped to shreds in front of him.



PROBLEM

The rise of fast-paced industrialization, the constant expanding populace of the world and the equal decrease of clean water production, the fast expansion in energy costs and natural issues, the colossal sanctions of the laws identified with the climate made it important to create and use for ecological cycles and synthetics, for what it's worth in different areas in the textile industry, which is at the center of the areas that produce a lot of clean water, energy consumption, and wastewater. Along with the waste creation additionally shows a quick increase. Productions, for example, the variation of recuperation in environmental damage, ecological protection by reduced consumption and emissions, the use of alternative materials, and methods to abolish pollution have become extremely important.

The Problem

- Textile industry is the second largest polluter of water
- Almost 20,000 litres of water is used to produce 1 cotton T-shirt and 1 pair of jeans
- Most of the water that is given out is wastewater which consists of:
 - o Dyes
 - o Formaldehyde
 - o Lead
 - o Mercury
 - o Other carcinogenic substances
- This contaminated water is then released into streams and other water bodies
- If the water is not treated before it is released, it can significantly lower the oxygen concentration in the water, which is extremely harmful for aquatic flora and fauna



PROBLEM

The huge development of the worldwide economy lately has additionally caused a blast in consumption. While a portion of this development in consumption is important for individuals to proceed with their lives, the rest isn't. Like wealth, consumption is likewise demonstrating lopsided dispersion. Despite the fact that consumption of per individual has ascended in enormous zones of the world, these increments are not the equivalent for everyone, and the contrasts between the increments are tremendous. 86% of individual consumption costs are completed by the most biggest associations of the world, while the poor are burning-through 1.3 %. An individual in North America is assessed to average around multiple times in excess of an individual in China or India and around multiple times more than somebody in Bangladesh. Today, the uses of 100 million individuals living in mechanically created areas relate to the utilization of more than one billion individuals living in immature districts of the world, just to meet principal necessities. This case is risky in light of the fact that it has two opposing appearances and the two of them put incredible focus on the worldwide environment.^{1,2}

Individuals who can not go through adequate to supply their central prerequisites are constrained to make short-go decisions that regularly have long-term adverse effects since Instances of natural issues brought about by less consumption and poverty incorporate cyanide fisheries which compromising the reef environment of poor anglers in Southeast Asia, ranchers in Africa consuming trees for rice bread, obliterating backwoods and expanding destitution and hardship by quickening disintegration and desertification.



PROBLEM

Alongside the mechanical advancements lately, improvements in the textile industry just as in numerous areas have assumed a significant function in the expansion of ecological issues. The fundamental ecological effect in the textile industry is shown by the release of high measures of substance getting into the climate. Other significant components are high chemical and water use, energy utilization, air contamination, strong waste and smell development. Ecological issues identified with material and article of clothing area; it begins with drugs that are utilized in the development of normal strands and the outflows in the creation of engineered filaments. From this second on, a progression of cycles are being completed in which a huge number of various synthetic compounds, huge loads of water and extensive measure of energy are utilized to get the strands arrive at the last material item. In this audit study, the ecological issues that material has arisen have been inspected and it has been clarified that answers for the issues can be made inside the extent of maintainability and cleaner creation. The idea of cleaner creation has additionally been talked about in detail and the relationship with maintainability has been advanced.





**WHAT HAS BEEN DONE
TILL NOW**

International Organizations who have put a step towards sustainability

The United Nations Environment

Program (UNEP): It is an activity that, one of the fundamental worldwide natural specialists, as a protector of the climate, sets the ecological plan universally and empowers reliable utilization of the ecological component of a practical turn of events. Set up in 1972, UNEP started to chip away at the cleaner production in 1989 with the choice to find natural advances. In 1990, the International Cleaner Production Information Network was set up through the Cleaner Production Program and the Cleaner Production Centers were set up with the UNIDO association to create limited advancement ventures in the developing countries. UNEP likewise distributes a few distributions indicating the upsides of cleaner production.

The United Nations Industrial Development Organization (UNIDO):

Constituted in 1966 to quicken transition economies and manage environmental growth in developed nations, UNIDO is a private sector of the United Nations. UNIDO helps and supports industrial growth, globalization, and ecological maintainability and sustainability for the poverty rates decrease.

The World Business Council for Sustainable Development (WBCSD):

It was shaped by consolidating the Business Council for Sustainable Development (BCSD) and the World Industry Council for the Environment (WICE) in 1995. It is a worldwide association made by around 200 huge organizations cooperating to accelerate the change into a more sustainable world. It has been engaged with a few cleaner creation ventures with UNEP.



wbcsd



UNEP



UNIDO

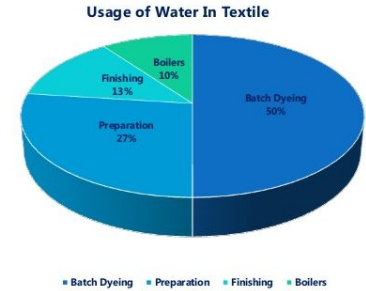


Our Water System

HOW IS WATER USED?

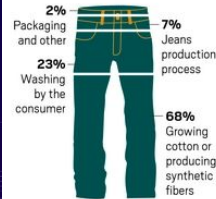
Freshwater is an asset that is getting exhausted each day. As of now, around 500 million individuals keep up their lives in territories slope to the absence of water and it is foreseen that by 2025 this figure will be multiple times that between 50-75% of the total populace. In the textile industry, the consumption of water is in each phase of the wet finishings to ship synthetic compounds to materials and to wash the material prior to moving to the following stage. Aside from these products in materials, there is additionally water utilization during cooling water, heater, steam drying, and cleaning. The normal water expenditure of a medium-sized material industrial facility delivering around 8,000 kg textile fabric/day is 1.6 million liters, roughly. Of these, 16% are spent in coloring, and half of it is devoured in printing. Contingent upon the color utilized in the coloring, 30-50 liters of water for each kilogram of texture is devoured. During yarn coloring, around 60 liters of water is spent per kg of yarn. Wastewater delivered during the coloring cycle establishes around 1/5 of all-out wastewater. To acquire the necessary quickness esteems and to clean the machines, water is required, as well. The measure of water spent on texture fabricated to cover a couch is around 500 gallons. During regular coloring and completing cycles of 1000 kgs of texture, around 200,000 kilograms of water is debased and in these stages, a lot of steam and boiling water is devoured for energy. To deliver a cotton shirt, around 2,500-3,000 of water is burned-through. Most of this water is spent during the development of cotton, while the sum spent on wet material preparing is in the runner up Textiles, one of the most concentrated enterprises as far as synthetic use is the material and it is the primary number of contamination after horticulture for clean water.

Pie Graph Of Water Uses In Textile



3,781
liters

Water used during the life cycle of a pair of Levi's jeans



11 billion kilograms

Amount of clothing that ends up in U.S. landfills each year—that's 32 kg per person

1 billion liters

Amount of water saved by Levi's since 2011 by using new garment finishing processes

15%

Percentage of recycled cotton that can be used in a new pair of jeans, using current technologies

3 years

Average life of a pair of Levi's jeans

33.4
kilograms

CO₂ emissions during the life cycle of a pair of Levi's jeans



HOW IS WATER USED?

The Textile Industry is compelled to consider water saving on account of numerous reasons, referenced previously. In view of mechanical and private extension, a decrease of water tables, and wellsprings of clean water, competition for clean water rises. For the most part, expenses of water and waste can establish 5% of production costs. The underlying aftereffects of water and wastewater issues have started to be felt in material medicines. In China and India, for instance, new organizations don't get awards to uphold except if they offer a case that persuades them that they will help settle water utilization and wastewater problems. Nowadays, in the material, security and reuse of water are getting fundamental quickly and they can have gigantic points of interest through marked down the charge of bought water, by this route diminishing underway costs, diminishes the cost for wastewater treatment, and dodging from releasing encroachment. Water preservation estimates lead to an additional decrease in warm and electrical energy consumption. Agreeing to, water preservation strategies for material factories are; utilization of programmed shut-off valves, steam control valves, low material to alcohol proportion frameworks, flocculation of clean water of shade printing, utilize single phase of preparing, water protection measures in coloring hardware and great housekeeping. Reuse of wastewater can give critical reserve funds, for example, lessening water, energy, and compound utilization. Dense steam and cooling water which are perfect can be effectively recuperated and their warm force recuperation improves rate of profitability.

Water Use in Textile Processing

Processing Subcategory	Water Use Minimum, gal/lb of production	Water Use Median, gal/lb of production	Water Use Maximum, gal/lb of production
Wool	13.3	34.1	78.9
Woven	0.6	13.6	60.9
Knit	2.4	10.0	45.2
Carpet	1.0	5.6	19.5
Stock/Yarn	0.4	12.0	66.9
Nonwoven	0.3	4.8	9.9
Felted Fabrics	4.0	25.5	111.8

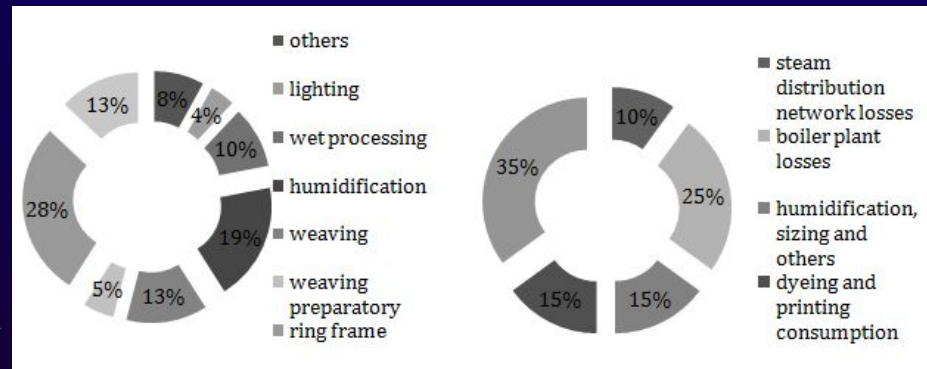
ENERGY CONSUMPTION

Moreover, Textile plants consume a huge amount of energy, to warm, dry, and work the machines which cause with going up the greenhouse gasses emanation and carbon footprints. These cases are because of the long and complex structure of the textile industry. It is assessed that the yearly material creation in 2008 is 60 billion kilograms of texture, and 1.074 billion kWh of power and 6-9 trillion liters of water are important to deliver it. It has been accounted for that for assembling and shopper use, the absolute warm and electric energy necessities are 18.8-23 MJ and 0.45-0.55 kWh per meter of texture, respectively.

Different kinds of energy are required in the production for the activity of the machines and the execution of the cycles, for the atmosphere molding and enlightenment of the climate in which the creation is to be figured out. Power is the fundamental fuel wellspring of chilling, controlling of temperature, lighting, and office hardware in the apparatus and material industry. The starch and fabric fabricating measures is the principle use of electrical energy in the material business and adding up to almost 3/4 or 4/5 of the absolute energy need in a material factory, while barely 15 to 20% of the electrical force is spent for running different machines in material wet handling

To create steam; fuel, LPG, coal, and city gas are usually used. Aside from the little amount of energy needed to work the apparatus of material, for the most part, the required energy for synthetic cycles is warm and it is by and large gave by steam. The greenhouse gasses which are come out after the burning of petroleum products are utilized to create steam. The present circumstance makes a commitment to carbon impressions of materials, principally. Therefore, to diminish it, the incredible potential is found in the utilization of inexhaustible energy.

Warm energy is prevailing in the substance treatment measure, prevalently used to warm water and dry material materials, while turning and weaving are overwhelmed by power energy in energy utilization designs

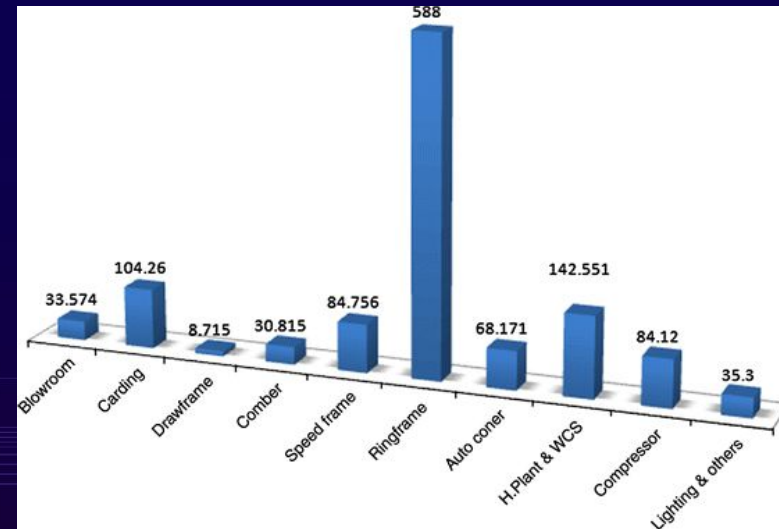


ENERGY CONSUMPTION

Fabric is one of the areas that produce greenhouse gasses in the most extreme sums. Continuous carbon footprints of textiles, 'installed energy' inside the merchandise, which is completely utilized energy in the assembling cycle, is critical to characterize the carbon impression of any goods. The carbon impression of a material item relies upon crude material sort and its handling. At the point when the commitments of the cotton materials treated in the ceaseless framework to the cycle-based outflow are inspected about a portion of the absolute discharge comes from drying, 40% and 10% come from washing, steaming, and substance utilization, individually. For knitwear completing cycle outflow caused by warming the water in the fumes process.

Disregarding the compound handling energy necessity is just around 38 % of the all-out material creation energy need, use of energy is very inefficient. Between 1990 and 2005, efficiency jute fiber items, crude texture, and polyester chips expanded and their fossil fuel byproduct densities diminished by about 2.07, 1.90, and 0.72%, thus. While in cotton yarn the inverse is valid, for example, the thickness of emanation has ascended by about 7.37%, which shows that cotton string creation is wasteful

Reduction in the consumption of energy is an unavoidable stage to handle the issues of the worldwide ecological disintegration and crisis of energy. The energy can be rationed through the altering of cycles, apparatus, and substance remedies and utilizing of ongoing innovations. Dissemination of warmth through apparatus which having at high fevers and inadequately kept up steam pipes lead to energy misfortune. Helpful segregation guarantees hesitance to convectional heat move from machines and lines to the surrounding air by means of lesser expenditure of fume and fuel. Besides, protection reduces the danger of consumption by diminishing the external surface temperatures and make more agreeable the workplace.



ENERGY CONSUMPTION SHARE IN A TEXTILE INDUSTRY

Technical Field	Electricity
Fiber Production	21.5
Twisting	1.7
Spinning	44.2
Yarn production	1.5
Knitting	11.7
Weaving	24.8
Dyeing	28.4
Clothing manufacturing	15.4
Others	12
Total	161.44 out of 257.9

OUTLINE OF OUR SOLUTION

We believe that the process of water consumption and energy consumption in the production of textiles are the most concerning areas in the system. We have devised a solution to solve this problem which affects us to solve the SDGs. What we think will work is a closed water system, so there will be a set amount of water which is needed for the plant. After that water is used in the fabrication of material the polluted water gets redirected to a storage area and the water comes out from a pipe at a height, the water then goes into 4 turbines at different levels so the speed doesn't decrease and electricity is generated. After this is done the polluted water will go through a filtration system and the clean water is reused

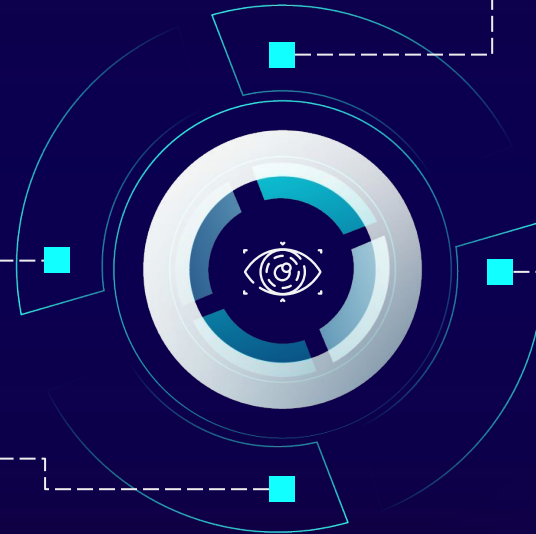
SWOT ANALYSIS

STRENGTHS

It leads to ZERO carbon emissions, meaning it is a completely green source of energy as it has minimal effect on the environment.

THREATS

Popularising and implementation of this method could take some time as producers may not want to go through the hassle of changing the placement of pipes and such.



WEAKNESSES

Placement of the turbine is a time consuming job and a big investment, even with its hefty returns.

OPPORTUNITIES

These alternative methods bring down pollution caused by textile plants by above 50%.

PRODUCT OVERVIEW



How it works

Water flow

Require a flow of just $1-8\text{m}^3/\text{s}$ per turbine. The height for water to drop can be as low as 1.5m, which makes installing the turbine in the factory easy and convenient.

Maintenance

The only moving part is the generator, reducing the chance of failures and maintenance



Energy produced

Turbine produces energy 24/7, with 15kW of power produced on-grid Power electronics of the turbine

Other benefits

No carbon emissions at all
Everything from flow-regulation to the startup and shutdown of the turbines can be controlled autonomously from the electrical cabinet, with no need for manual assistance

BUSINESS MODEL OF OUR SYSTEM

TARGET ASSESSMENT

We have to analyse and adapt to our audiences unique wants and requirements.

PITCH

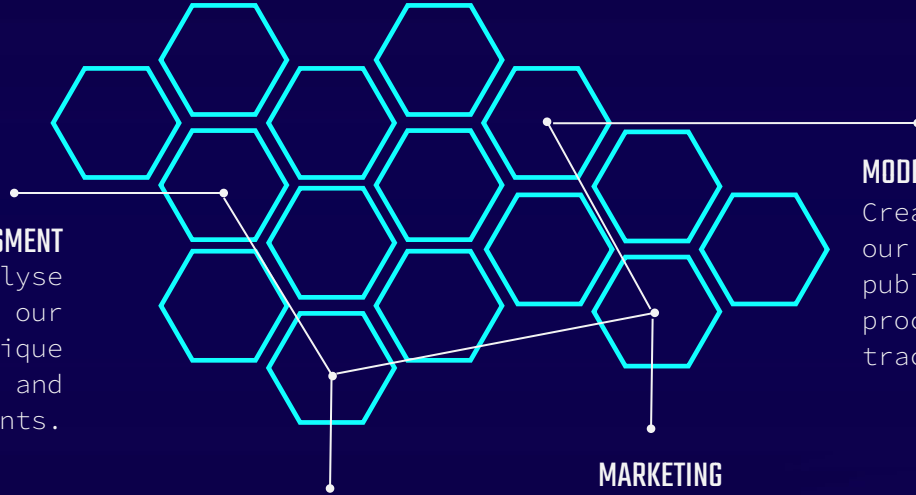
Contact and encourage the analysed companies to be a part of the change.

MARKETING

Earn sponsorship and advertising resources. Increase our target audience to more textile industries

MODEL CREATION

Create a model of our system and go public after the process gains more traction.



The Micro Hydro Power Plant

┌
Vortex turbines are a type of micro hydro-power plant, which are one of the eco-friendliest renewable energy sources available on the market today.

Vortex Turbines



How it works

Unlike regular turbines which require a very large quantity of water to produce a sufficient amount of power

└

Economic Benefit

\$5,26,886

Total Cost of Electricity

100%

Payment for electricity no longer required

10

Years of returns guaranteed.

\$ 5,26,886

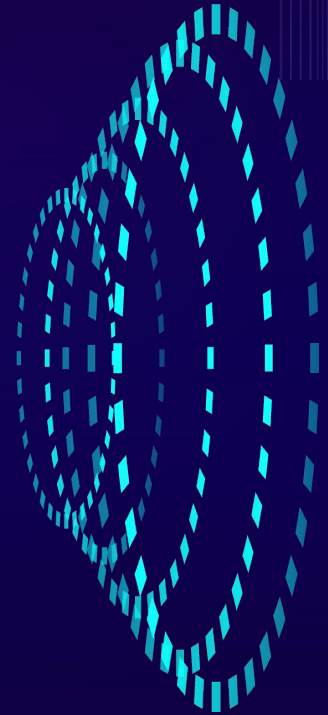
Amount available

The extra money can be sold to customers for profit and that money can be treated as resources for future use.

Furthermore, money is no longer being used to procure electricity, it can be used to shift to more sustainable, eco friendly methods of production.

Since our method uses alternate raw materials which are less harmful to the environment, it has low external cost and high social benefit. Our system also utilises these raw materials efficiently keeping the cost of production low and makes the ability to produce higher. The hydro electric part is self sustainable and eco-friendly. It has high durability and low maintenance cost along with high yields for a long period of time. It is also a step further for eco-friendly energy production with high social benefits.

**We can do a lot
More than just
Our water system**



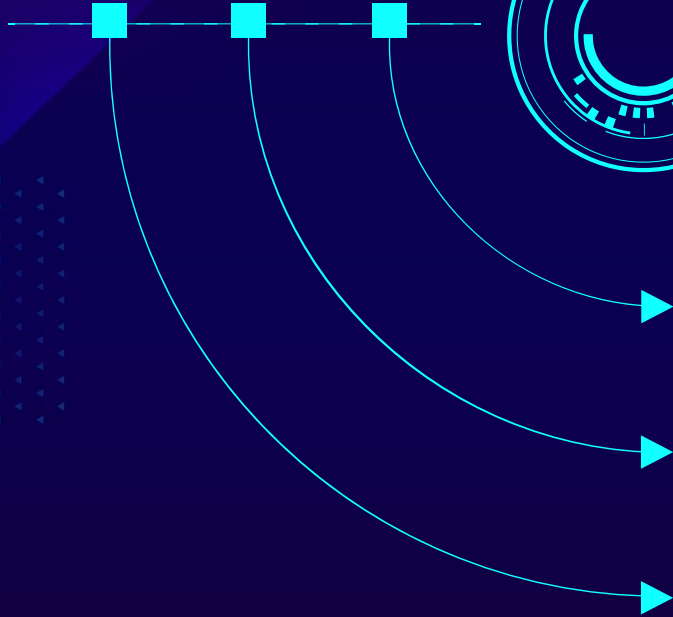
PURPOSE	CHEMICAL	ALTERNATIVE
Sizing	Starch	Water-soluble PVA
Desizing	Hydrochloric acid	Amylases
Scouring of cotton	Sodium hydroxides	Pectinases
Bleaching	Hypochlorites	Hydrogen peroxide
Oxidation of vat and dye	Potassium dichromate	Sodium perborate
Thickener	Kerosene	Water based polyacrylate copolymers
Hydrotropic agent	Urea	Dicyanamide
Water repellent	C8 fluorocarbons	C6 fluorocarbons
Crease every chemical	Formaldehyde based resin	Polycarboxylic acid
Wetting agents and detergents	Alkylphenol ethoxylates	Fatty alcohol phenol ethoxylates
Neutralization agent	Acetic acid	Formic acid
Peroxide killer	Sodium thiosulphate	Catalases
Mercerization	Sodium hydroxide	Liquid ammonia
Reducing agents	Sodium sulphide	Glucose, Acetyl acetone
Dyeing	Powder form sulphur dye	Pre-reduced dyes
Flame retardant	Bromium diphenyl ethers	Combination of inorganic salts and phosphorous
Shrink proofing	Chlorination	Plasma treatment

Benefits of using the Alternatives

One of the main problems being faced by the textile industry is the pollution caused by the raw materials it uses. Producers aren't willing to switch over to greener methods of production as it costs more and would increase the cost of production. This is something they do not have the funds for. Our water system reduces the need to spend on electricity and the energy required to use for produce goods. Therefore companies are free to allocate their funds towards greener methods of production. The chemicals used in the current production method have a high load on the environment unlike the alternatives we have proposed.



OUR PLANS



The first year

Create a pitch for companies, advertise our idea on the Internet extensively.

1 to 2 years later

Approach companies and enter deals with them to utilise our processes.

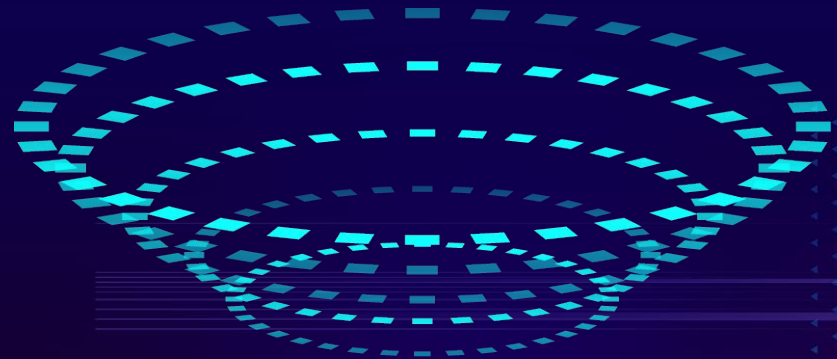
The next decade

Use our first company as a model and expand. Try to popularise this method and make it a movement.

CONCLUSION

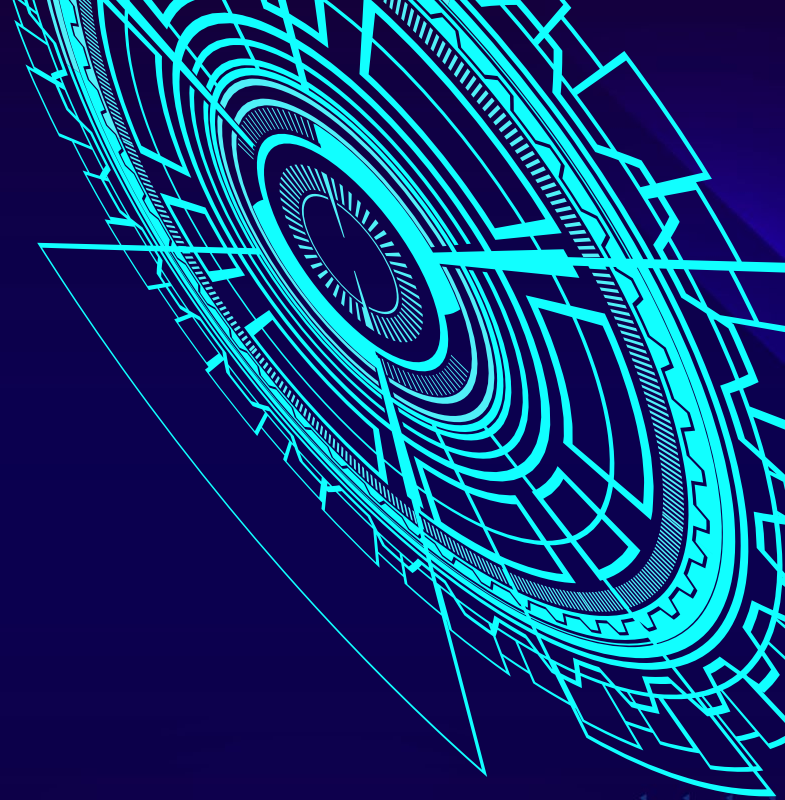
Sustainability is significantly more than a moving word at a specific time. The three key components of sustainability are; a financial and social turn of events, environmental security, and everyone should be considered the same and in relation to the others. Sustainability is extremely pivotal in light of the fact that it keeps up individuals personal satisfaction with securing a variety of biological systems on the planet with different ways; ensuring resource assets are protecting, giving energy reserve funds, diminishing waste amount, interest later on and economy with reusing/reusing. In particular, it guarantees the presence of species. A secure business climate is made by regarding basic freedoms, making sure about social equity and ensuring the working rights inside the extent of sustainability. Cleaner production isn't only a popular expression, yet in addition one of the essential ways to deal with sustainability. It is a precise methodology that includes distinguishing contamination causing production and advances that lead to the wasteful use of energy and crude materials, uncovering focuses that need improvement, and executing cleaner creation openings.

There are worldwide associations and foundations around the globe to guarantee cleaner creation and along these lines of sustainability. The arrangements sought after in these organizations are for the most part European Union strategies, however different devices can be utilized relying upon the application regions of cleaner production. The arrangements sought after in these foundations are by and large European Union ecological strategies. Based on their own homegrown guidelines, the European Union (EU) advance the reception of tough ecological arrangements at the global level with enactments dependent on various issues. The EU is likewise driving the molding of approaches about the climate in non-part nations. The decision of which devices are utilized to decide the utilization of cleaner creation openings as indicated by their application zones relies upon the issue in activity and the work to be finished.



CONCLUSION

The deep rooted environmental effects of textiles are influenced by the crude materials, their inception and the strength of the item, notwithstanding the production development. The image that arises when the consumption of textile items from crude materials and their resulting natural impacts are striking a direct result of their compound, energy, water use, bundling and strong waste creation, the development of unsavory scents and commotion contamination. Expanded textile utilization because of enhancements in the total populace and upgrades in expectations for everyday comforts alongside the natural impacts of the material, require the improvement of the ecological exhibition of this industry. In this sense, the idea of maintainability has gotten a matter of worry in the material area.



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