

Microplastics are infiltrating our brains Synthetic fibers to blame



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Microplastics are infiltrating our brains—Synthetic fibers to blame

■ M A Mohiemen Tanim

A recent study has unveiled a disturbing trend: microplastics, the tiny particles resulting from the degradation of plastic products, are increasingly being found in human brain tissues. This alarming discovery has far-reaching implications, particularly for the T&A industry, which heavily relies on synthetic fibers known to contribute significantly to microplastic pollution. As the evidence mounts, the industry must take decisive action to mitigate its role in this growing environmental and public health crisis.

Understanding the Microplastics Crisis

Microplastics are minuscule plastic fragments, typically less than five millimeters, originating from larger plastic debris breaking down over time. They are pervasive in the environment, present in the air we breathe, the water we drink, and the food we consume. A study published in May 2024 analyzed brain tissues collected at autopsy and found that the concentration of microplastics had increased by approximately 50% compared to samples collected in 2016. Researchers discovered an average of 4,800 micrograms of plastic per gram of brain tissue, or roughly 0.5% by weight, in individuals aged around 45 to 50 years old.

The implications of this finding are profound. Microplastics in the brain could potentially interfere with neurological functions, although the exact health impacts remain unclear. What is certain, however, is that the rising levels of microplastics in human tissues underscore the urgent need for action across all sectors,



particularly in industries that contribute significantly to plastic pollution.

Role of Synthetic Fibers in Microplastic Pollution

The T&A industry is a major contributor to microplastic pollution, primarily due to its reliance on synthetic fibers such as polyester, nylon, and acrylic. These materials, derived from petrochemicals, shed microplastics during the production process and during regular wear and washing of garments. According to a study by the International Union for Conservation of Nature (IUCN), synthetic textiles are responsible for 35% of the microplastics released into the oceans.

When synthetic fibers are washed, they release microfibers—tiny strands of plastic that are too small to be filtered out by wastewater treatment plants. These microfibers eventually make their way into rivers, lakes, and oceans, ingested by marine life and entering the food chain. A study published in *Environmental Science & Technology* found that a single load of laundry can release up to 700,000 microplastic fibers into the environment.

Global production of synthetic fibers has been steadily increasing, driven by the demand for affordable, durable, and versatile fabrics. In 2020, polyester alone accounted for over 52% of global fiber production, with over 60 million tons produced annually. As production continues to rise, so too does the environmental footprint of the industry, particularly in terms of microplastic pollution.

Urgent Need for Industry-Wide Action

Given the significant contribution of synthetic fibers to the microplastics crisis, the textile and apparel industry must take proactive steps to address the issue. Here are some key actions the industry should consider:

1. Invest in Sustainable Alternatives: The industry must shift towards sustainable materials that have a lower environmental impact. Natural fibers such as organic cotton, hemp, and wool offer biodegradable alternatives to synthetic fibers. While these materials may have their environmental challenges, they do not contribute to microplastic pollution. Investment in research and development of innovative materials, such as biodegradable synthetic fibers or recycled fabrics, is also crucial.

2. Improve Washing Technologies: One of the most significant sources of microplastics from textiles is the washing process. The industry should work with appliance manufacturers to develop washing machines equipped with filters that capture microfibers before they are released into the water system. Several companies have already started developing such technologies, but widespread adoption is necessary to make a significant impact.

3. Enhance Production Processes: Reducing the shedding of microfibers during manufacturing

is another critical area of focus. This can be achieved by improving the quality of synthetic fibers and exploring new manufacturing techniques that minimize fiber fragmentation. Additionally, textile companies should implement stringent waste management practices to prevent microplastics from entering the environment during production.

4. Consumer Education and Advocacy:

Educating consumers about the environmental impact of synthetic fibers and the importance of sustainable choices is vital. Brands can play a key role by promoting awareness campaigns and offering guidance on reducing microfiber pollution, such as using specialized laundry bags or washing clothes less frequently. Moreover, the industry should advocate for stronger regulations on microplastics and support initiatives aimed at reducing plastic pollution.

5. Collaboration and Innovation: Addressing the microplastics crisis requires collaboration across the entire supply chain, from fiber producers to garment manufacturers, retailers, and consumers. Industry stakeholders should come together to share best practices, invest in research, and develop solutions that can be implemented at scale. Public-private partnerships and collaboration with environmental organizations can also accelerate progress.

A Path Forward for the Textile and Apparel Industry

The findings of the 2024 study serve as a wake-up call for the textile and apparel industry. The presence of microplastics in human brains, along with their increasing concentration, highlights the urgent need for action. While the industry has made strides in recent years toward sustainability, much more needs to be done to address the specific challenge of microplastic pollution.

ZDHC publishes 'Air Emissions Guidelines V1.0'

The Zero Discharge of Hazardous Chemicals (ZDHC) has released the ZDHC Air Emissions Guidelines V1.0, marking a significant step in addressing air pollution in the textile, apparel, leather, and footwear industries. This first version builds upon the 2019 Air Emissions Position Paper, setting performance criteria for air emissions and supporting continuous improvement across the sector.

ZDHC's guidelines focus on managing input chemistry, particularly Volatile Organic Compounds (VOCs), to achieve cleaner output and reduce air pollution. Unlike other industry initiatives that target greenhouse gases (GHG), ZDHC emphasizes VOC content in input formulations, allowing suppliers to establish baselines and better understand air emission requirements. Future versions of the guidelines will expand to include testing.



The guidelines help suppliers evaluate their current air emissions performance and implement effective VOC emissions practices. Brands are encouraged to share these guidelines with their supply chain, urging suppliers to calculate their baselines, monitor VOCs and GHGs, and report their data on the ZDHC platform. This step-by-step approach aligns with ZDHC's philosophy of improving output by managing input, aiming to drive continuous improvement and sustainability in the industry.

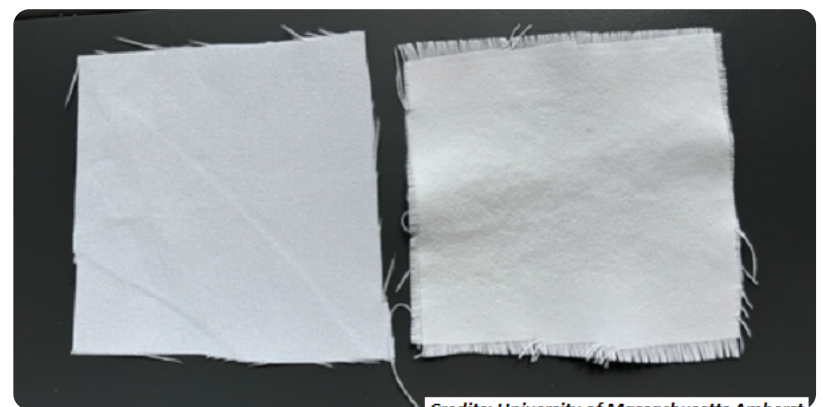


<https://downloads.roadmaptozero.com/output/Air-Emission-Position-Paper>

New PFAS-free Chalk-based fabric coating cools by upto 8°F

A team of scientists from the University of Massachusetts Amherst has developed a novel chalk-based fabric coating that can cool the air underneath by up to 8°F. This innovative solution, created by Professor Trisha L. Andrew, graduate student Evan D. Patamia, and undergraduate Megan K. Yee, offers a sustainable alternative to existing cooling fabrics, which often rely on synthetic particles or expensive polymers.

The fabric coating uses calcium carbonate, the main component in chalk and limestone, combined with biocompatible barium sulfate. This unique combination, integrated through a chemical vapor deposition (CVD) process, effectively deflects sunlight and pushes out natural body heat—a method known as radiative cooling.



Tested on a scorching summer day with temperatures exceeding 90°F, the coated fabric proved to be significantly cooler than untreated fabric. The air beneath the treated cloth was 8°F cooler than the ambient temperature and up to 15°F cooler compared to untreated fabric. This innovative approach not only enhances comfort in hot environments but also does so without any power input, making it an eco-friendly solution for those in extreme heat.



<https://www.sciencedaily.com/releases/2024/08/240821124457.htm>

Archroma, Kipaş Denim & Jeanologia collaborate to launch sustainable contra denim

Archroma, a global leader in specialty chemicals, has partnered with Kipaş Denim and Jeanologia to introduce the innovative Contra Denim collection, emphasizing sustainability and advanced aesthetics. The collaboration merges Archroma's DENIM HALO technology with Jeanologia's laser marking expertise, enabling brands to achieve striking, distressed denim looks while significantly reducing environmental impact.

Contra Denim addresses the traditional challenges of denim production, particularly for black and indigo fabrics. The collection offers deep, durable colors and vintage wash-down effects without the need for harmful chemicals or intensive manual labor. It utilizes resource-saving pretreatment and dyeing processes, cutting down on water and energy usage and reducing greenhouse gas emissions.

Kipaş Denim's ContraBlack collection, part



of the Contra line, has achieved an impressive Environmental Impact Measurement (EIM) score of 11, far surpassing industry standards. This new collection allows denim brands to explore creative designs while maintaining high sustainability and production efficiency standards.

This collaboration exemplifies Archroma, Kipaş Denim, and Jeanologia's shared commitment to leading the industry toward more sustainable and environmentally friendly textile production.



<https://www.archroma.com/press/releases/archroma-kipa%C5%9F-denim-and-jeanologia...>

LRQA partners with CertainT® for cotton traceability pilot in Pakistan

Applied DNA Sciences, a leader in PCR-based DNA technologies has been selected by LRQA to conduct a pilot isotopic testing project in Pakistan aimed at enhancing cotton traceability. This initiative, part of the U.S. Department of Labor-funded Global Trace Protocol project, seeks to reduce child and forced labor in global cotton supply chains. Through its CertainT® platform, Applied DNA will collaborate with Isotech to deploy isotope ratio mass spectrometry (IRMS) to verify the origin and authenticity of cotton across key points in the value chain, including farms, gins, and manufacturing units.

The project underscores the growing importance of traceability in textile supply chains, driven by new import regulations and demand for transparent sourcing. By integrating isotopic testing, DNA

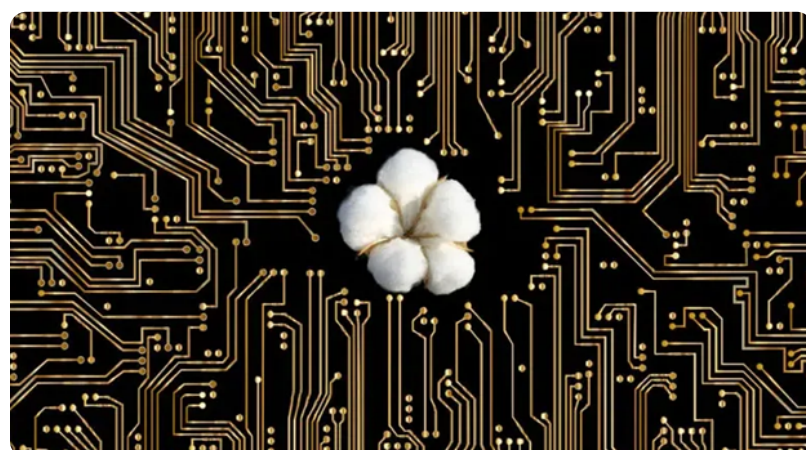


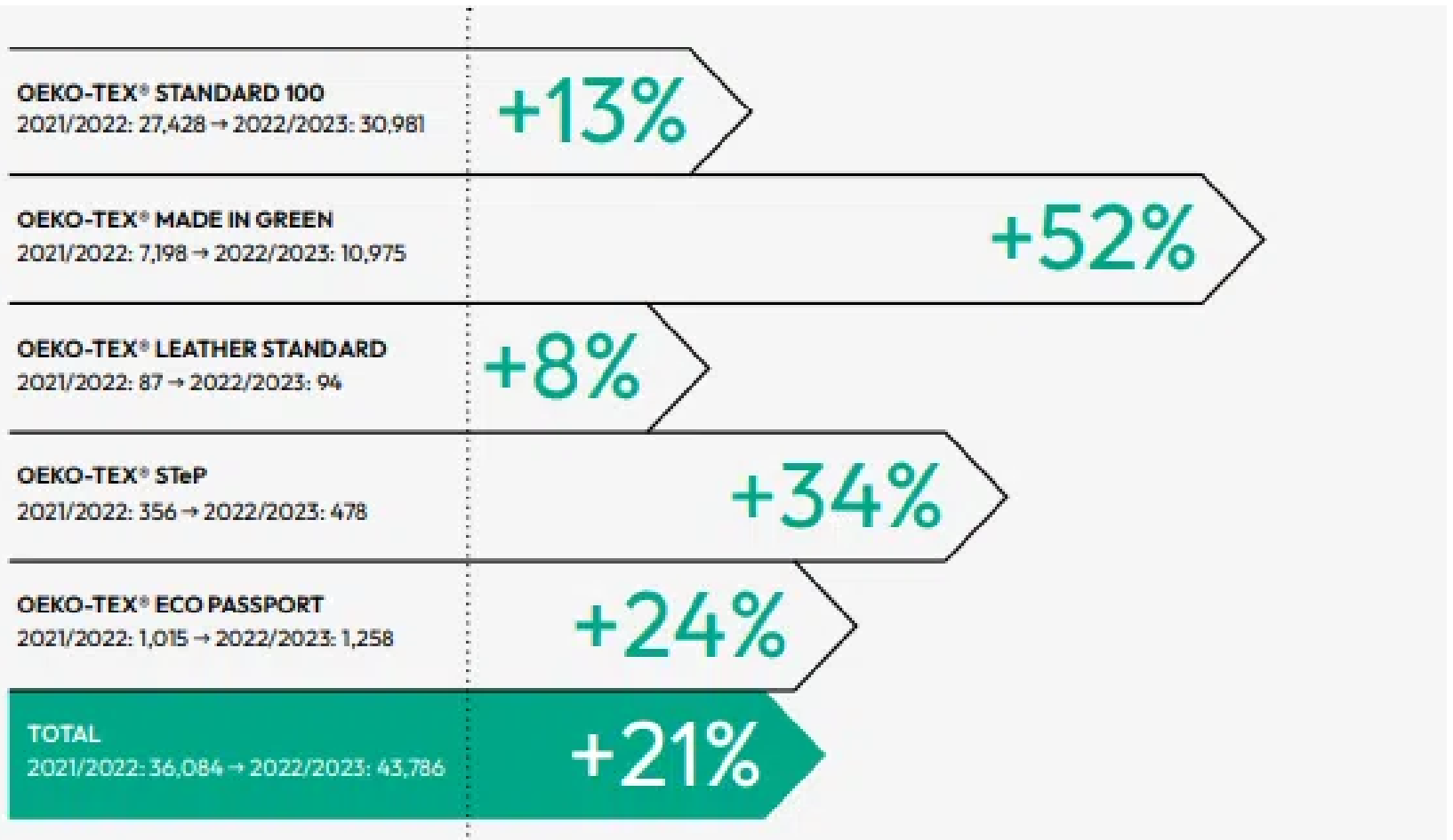
Figure: Cotton in a digital ecosystem – source: pixabay and Cotton Australia

CertainT platform promises a scalable solution for verifying cotton origin, helping suppliers meet compliance standards and reduce reliance on high-risk sources.

This pilot project marks a significant step toward enhanced due diligence and supply chain transparency in Pakistan's cotton sector, setting a

Precision Updates

MADE IN GREEN drives OEKO-TEX® growth with 52% surge in certifications



The OEKO-TEX® Association reported a 21% growth in issued certifications and labels during its 2022/2023 financial year, totaling over 43,000 between July 1, 2022, and June 30, 2023. The MADE IN GREEN label led with a 52% growth rate, reflecting the rising demand for sustainable products. OEKO-TEX® continues to drive industry transformation through collaboration across the global textile and leather supply chain.

In response to growing demands for corporate responsibility, OEKO-TEX® launched the RESPONSIBLE BUSINESS certification in November 2022. This tool supports companies in mitigating negative impacts from their operations and supply chains. Another significant development

was the OEKO-TEX® ORGANIC COTTON certification, connecting certified companies to facilitate responsible sourcing from field to finished product.

On the regulatory front, OEKO-TEX® imposed a general ban on the use of per- and polyfluorinated alkyl substances (PFAS/PFC) in products certified under key standards like STANDARD 100 and LEATHER STANDARD. Additionally, the association surpassed 1,000 STeP certified facilities, highlighting its growing influence in promoting sustainable manufacturing practices. With new partnerships and a focus on education, OEKO-TEX® is well-positioned to lead the industry toward more responsible and sustainable choices.



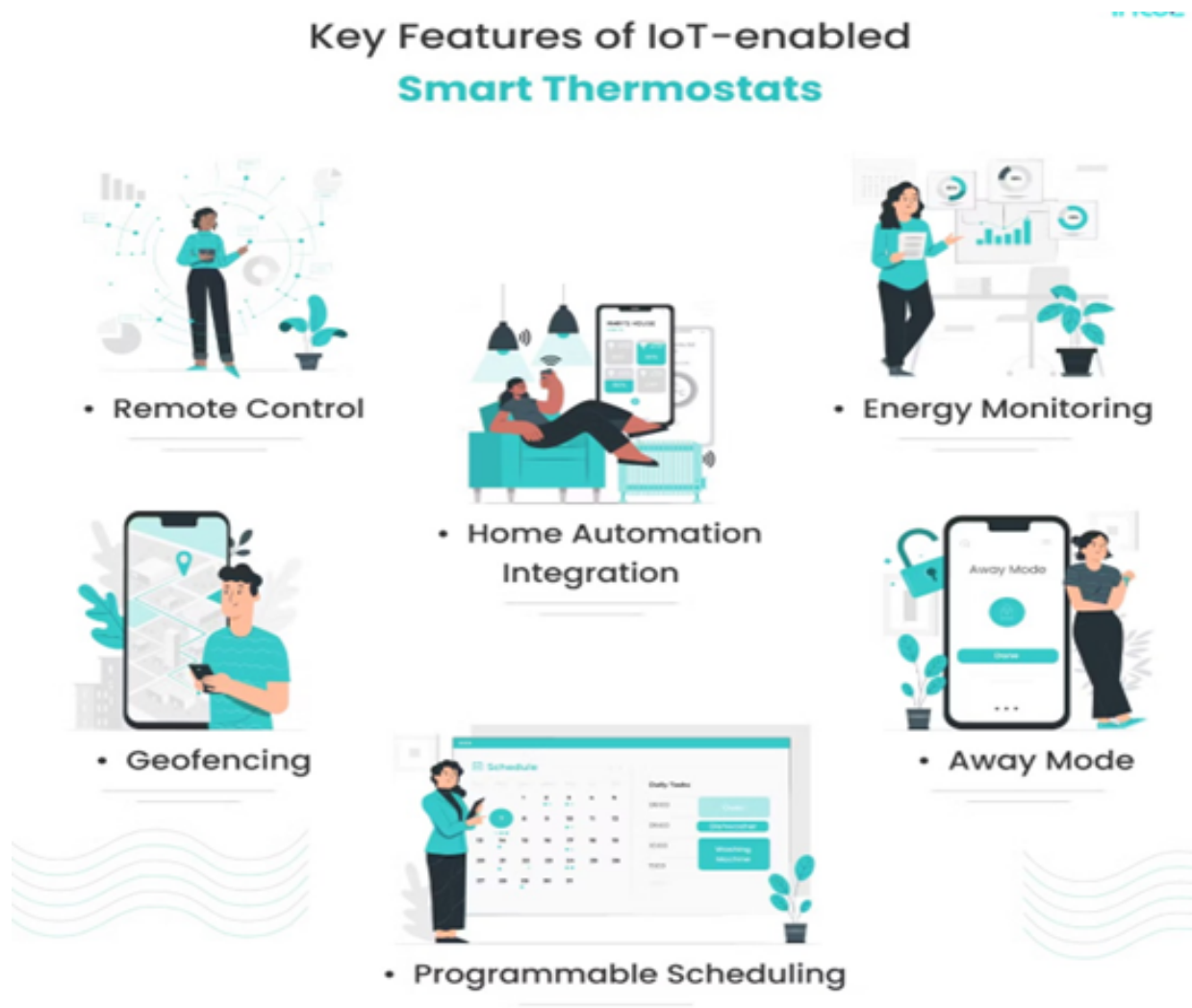
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HVAC 2.0: Technological innovations leading sustainability & performance

Shahrose Ishraq Khan



In recent years, the HVAC (Heating, Ventilation, and Air Conditioning) technologies have seen significant advancements, motivated by the need for enhanced efficiency, comfort, and environmental sustainability. New technologies are being developed to tackle the problems posed by rising global temperatures and changing energy needs. These technologies aim to improve the performance of HVAC systems. Here is an overview of the most notable innovations that are influencing the future of HVAC.

1. Integration of smart thermostats with the Internet of Things (IoT)

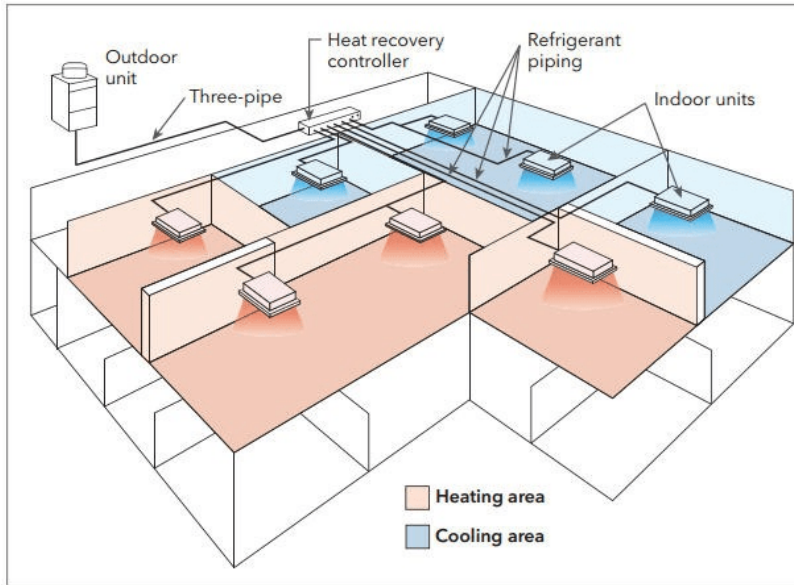
A significant advancement in HVAC technology is the introduction of intelligent thermostats. These devices use sophisticated machine learning algorithms to adjust to user behavior, optimizing

heating and cooling schedules according to occupancy patterns and preferences. Smart thermostats, when integrated into the Internet of Things (IoT), allow for remote management via smartphones and voice assistants. They also provide real-time information on system performance and energy use. This not only enhances comfort but also generates substantial energy savings.

2. Variable Refrigerant Flow (VRF) Systems

VRF systems are a notable advancement in HVAC technology. VRF systems, unlike conventional systems, use refrigerant as the medium for transferring heat, enabling the simultaneous heating and cooling of various zones inside a structure. This adaptability improves energy efficiency and comfort by offering customized temperature management

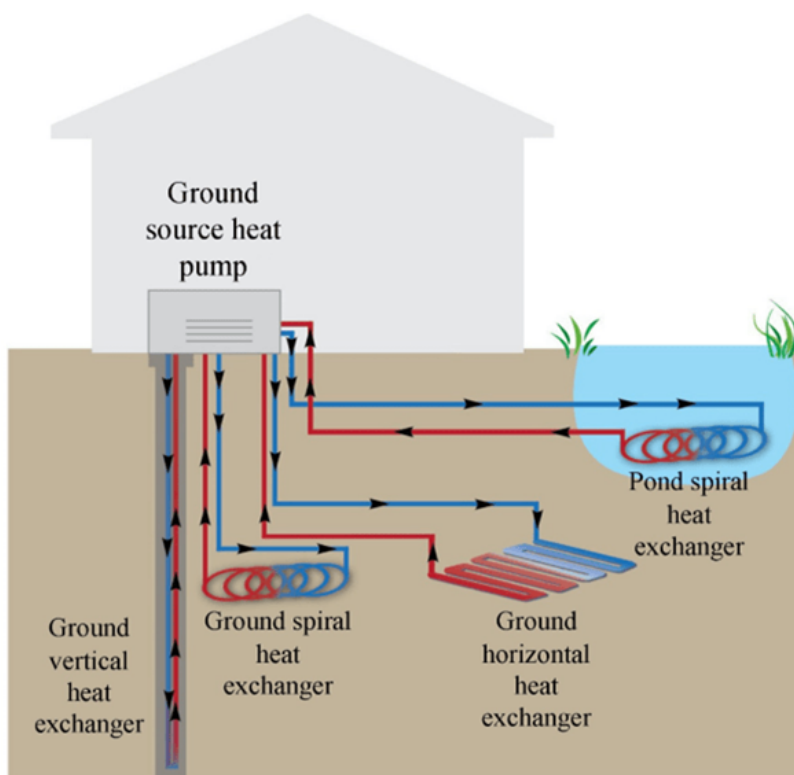
in different zones, hence decreasing total energy use and operating expenses.



Variable refrigerant flow systems can deliver cooling to some zones and heating to others, with no reheat needed (an air-source system is shown here).

3. Geothermal Heat Pumps

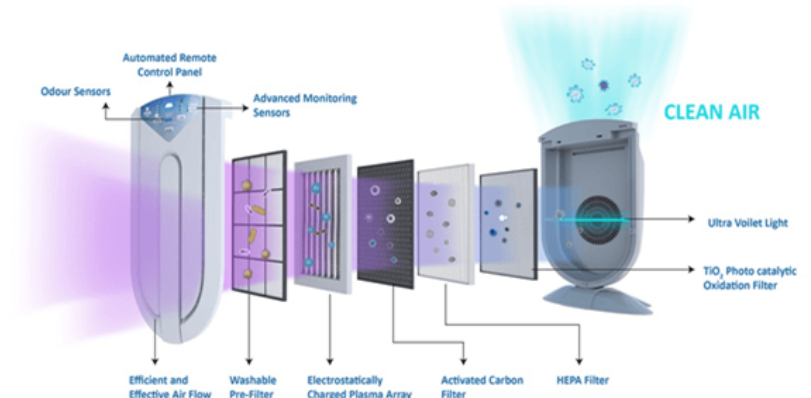
Geothermal heat pumps are transforming the HVAC industry by harnessing the consistent subterranean temperature of the earth to provide heating and cooling for buildings. These systems provide a very efficient and environmentally friendly alternative to traditional heating and cooling technologies. Geothermal heat pumps may achieve impressive energy efficiency by transferring heat with the earth. This reduces the need for fossil fuels and helps to minimize greenhouse gas emissions.



4. Enhanced Air Filtration and Purification

With the growing concern about indoor air quality, the significance of modern air filtration and

purification technologies is rising. HEPA filters and UV-C light systems are often used in HVAC systems to effectively trap particulate matter, allergies, and microbes. These technologies aid in the preservation of a more salubrious interior environment, especially in areas with a large number of people or specific requirements for air quality.



5. Utilization of Variable-Speed and Inverter Technology

The use of variable-speed and inverter technologies is improving the efficiency of HVAC systems by enabling precise regulation of motor speeds. Variable-speed and inverter-equipped units differ from typical systems by adapting their performance to real-time heating or cooling needs, rather than operating at a fixed pace. Not only does this enhance energy efficiency, but it also lowers the strain on components, resulting in extended system lifespans and reduced maintenance expenses.

6. Solar-assisted HVAC systems

Solar-assisted HVAC systems use solar energy in the heating and cooling process, providing a sustainable alternative to traditional energy sources. By using solar energy, these systems decrease dependence on grid electricity and decrease operating expenses. Solar-assisted systems are gaining popularity as part of a larger movement towards using renewable energy solutions in building design.



7. Environmentally-friendly refrigerants

The transition to environmentally benign refrigerants is a major advancement in the HVAC sector. Conventional refrigerants that have a significant influence on global warming are being substituted with alternative options that have a lesser impact on the environment. Refrigerants like R-32 and natural refrigerants such as carbon dioxide (CO2) are becoming more popular due to their lower Global Warming Potential (GWP) and less impact on the ozone layer.

8. Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs)

Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs) are sophisticated technologies developed to enhance ventilation efficiency while reducing energy wastage. These devices improve indoor air quality without

sacrificing energy efficiency by exchanging heat and moisture between entering and exiting air streams. ERVs and HRVs are especially beneficial in areas with severe climatic conditions, where proper ventilation is crucial while simultaneously prioritizing energy saving.

Conclusion

The most recent advancements in HVAC technology demonstrate an increasing focus on efficiency, sustainability, and user comfort. Using smart thermostats, innovative air filtration systems, geothermal heat pumps, and eco-friendly refrigerants are revolutionizing how we control and maintain interior settings. With the ongoing advancement of technology, the HVAC sector is positioned to provide more solutions that effectively tackle environmental issues while ensuring top-notch performance and comfort. Adopting these advancements advantages individual users and adds to a wider trend toward a more sustainable and energy-efficient future.

DuPont™ showcases Artistri® digital inks at Printing United Expo 2024

DuPont™ is set to showcase its cutting-edge Artistri® Digital Inks at the upcoming Printing United Expo, taking place from September 10-12, 2024, at South Lower – SL9124 in Las Vegas, Nevada. This event stands as a premier gathering for the printing industry, uniting professionals and innovators to explore the latest technologies and trends.

With over 35 years of expertise in inkjet technology, DuPont™ has established itself as a leader in digital printing solutions. The Artistri® Digital Inks are renowned for their exceptional quality, catering to various applications in commercial, packaging, and textile printing. By leveraging DuPont's proprietary dispersions, polymers, and advanced ink formulations, these inks provide versatile and reliable solutions that meet the diverse needs of customers worldwide.



At the Printing United Expo, attendees will have the unique opportunity to engage with DuPont's expert team, who will be on hand to address inquiries and provide insights into their innovative printing technologies. This expo promises to be an invaluable experience for industry professionals looking to stay ahead in a rapidly evolving market.

Future of Garment Production: Smart Needles with Embedded Sensor

■ M A Mohiemen Tanim



In the fast-paced world of garment manufacturing, technological innovation is essential for maintaining competitiveness. Among the latest breakthroughs in this sector is developing smart needles with embedded sensors. These advanced sewing tools are revolutionizing the way garments are produced, offering unprecedented precision, efficiency, and quality control.

What Are Smart Needles?

Smart needles are a new generation of sewing needles with tiny embedded sensors. These sensors monitor various parameters during the sewing process, such as needle temperature, pressure, stitch tension, and fabric resistance. The data collected is transmitted in real-time to a central system, allowing operators to make immediate adjustments or allowing automated systems to optimize the sewing process autonomously.

Unlike traditional sewing needles, which offer no feedback during operation, smart needles provide

detailed insights into the sewing conditions. This proactive approach helps in preventing defects, reducing waste, and improving overall productivity in garment manufacturing.

Key Features of Smart Needles

- » **Real-Time Monitoring:** One of the standout features of smart needles is their ability to provide real-time data on the sewing process. This includes information on stitch consistency, fabric tension, and needle wear. By continuously monitoring these factors, manufacturers can ensure that their garments are being produced to the highest standards.
- » **Predictive Maintenance:** The data from smart needles can be used to predict when a needle is likely to fail or become worn out. This allows for timely replacements, reducing downtime and preventing potential damage to fabrics.
- » **Adaptive Stitching:** Smart needles can adjust the stitching process based on the fabric type and

thickness. For example, the needle might change its speed or pressure when sewing through different layers of material, ensuring a consistent and high-quality finish.

» **Integration with Automated Systems:** These needles can be integrated with advanced sewing machines and robotic systems, allowing for a fully automated and optimized production process. The seamless integration helps in speeding up production while maintaining consistent quality.

Industry Applications

The applications of smart needles extend across various sectors of the garment industry:

» **High-Fashion and Luxury Garments:** Precision is paramount in high-fashion and luxury garments. Smart needles ensure that every stitch is perfect, reducing the likelihood of defects that could compromise the quality of a high-end product.

» **Activewear and Technical Textiles:** The demand for activewear and technical textiles, such as sportswear and outdoor gear, has increased significantly. These garments require precise stitching to ensure durability and performance. Smart needles can monitor and adjust stitching parameters to meet the stringent requirements of these fabrics.

» **Medical Garments:** In the production of medical garments and equipment, hygiene and precision are critical. Smart needles with embedded sensors help maintain strict quality control, ensuring that garments like surgical gowns and masks meet the necessary safety standards.

» **Mass Production:** For large-scale garment manufacturers, efficiency is key. Smart needles streamline the production process by reducing downtime and minimizing waste. The ability to monitor and adjust stitching in real-time allows for faster production cycles without sacrificing quality.

Leading Companies in Smart Needle Technology

Several companies are at the forefront of developing and implementing smart needle technology. These

industry leaders are driving innovation and setting new standards in garment production.

» **Groz-Beckert:** One of the most recognized names in the needle manufacturing industry, Groz-Beckert has been a pioneer in needle technology for decades. The company has recently invested heavily in smart needle research, developing a range of products that incorporate sensor technology. Their smart needles are designed to work seamlessly with their existing line of high-performance needles, offering enhanced precision and real-time monitoring.

» **Schmetz:** Another major player in the needle manufacturing industry, Schmetz has also embraced the trend of smart needles. Their product line includes needles equipped with sensors that can monitor stitch quality and needle wear. Schmetz's smart needles are particularly popular in the production of high-end garments, where precision is essential.

» **Organ Needles:** Organ Needles, known for their industrial sewing needles, has introduced smart needles aimed at high-speed and large-scale production environments. Their smart needles are equipped with advanced sensors that provide real-time feedback on needle performance, helping manufacturers maintain efficiency and quality during long production runs.

» **Brother Industries:** Although primarily known for its sewing machines, Brother Industries has made significant strides in smart needle technology. The company's smart needles are integrated into their advanced sewing systems, offering a complete solution for manufacturers looking to embrace the latest in garment production technology. Brother's smart needles are particularly well-suited for automated and robotic sewing processes.

» **Juki Corporation:** Juki, a leading manufacturer of industrial sewing machines, has partnered with needle producers to develop smart needles that are compatible with their automated systems. Juki's focus is on integrating smart needles into their high-speed production lines, ensuring that manufacturers can take full advantage of real-time

data and automation.

Impact of Smart Needles on Garment Manufacturing

The adoption of smart needle technology is transforming the garment manufacturing industry in several ways:

- » **Improved Quality Control:** By providing real-time data on the sewing process, smart needles allow manufacturers to catch defects early and make adjustments before they become major issues. This leads to higher-quality garments and reduced waste.
- » **Increased Efficiency:** Smart needles help reduce downtime by predicting when a needle needs to be replaced and ensuring that stitching is optimized for different fabrics. This results in faster production cycles and lower operational costs.
- » **Enhanced Sustainability:** By reducing waste and improving efficiency, smart needles contribute to a more sustainable manufacturing process. Manufacturers can produce garments with less

material waste and energy consumption, aligning with the growing demand for eco-friendly production methods.

- » **Cost Savings:** While the initial investment in smart needle technology may be high, the long-term cost savings are significant. Reduced downtime, fewer defects, and lower waste all contribute to a more cost-effective production process.

Challenges and Future Prospects

Despite the many advantages, there are challenges to the widespread adoption of smart needles. The technology is still relatively new, and the cost of implementing smart needles and the necessary supporting infrastructure can be prohibitive for smaller manufacturers.

As the technology matures and becomes more affordable, smart needles will likely become a standard tool in garment production. Companies that invest in this technology early on will have a competitive edge, benefiting from improved efficiency, quality, and sustainability.

Brückner Unveils Advanced Stenters for Knitted Fabrics

German manufacturer Brückner has launched advanced stenters specifically tailored for knitted fabrics, setting a new standard in textile finishing technology. These state-of-the-art machines are designed to enhance energy efficiency and boost production speed, meeting the industry's growing demand for sustainable and cost-effective solutions. The stenters are engineered to handle the delicate nature of knitted fabrics with precision, ensuring minimal tension and superior quality finishes. This innovation aligns with Brückner's commitment to sustainability, reducing energy consumption while optimizing resource use. As part of the company's



ongoing efforts to provide cutting-edge solutions, these new stenters position Brückner as a key player in modern textile manufacturing.



<https://www.brueckner-textile.com/en/products/stenters.html>

Automation

“T7:Textile factory 7.0” will redefine the future of european garment manufacturing

Faysal Ahmed

T7 overview Central view



The European textile and garment industry is on the brink of a major transformation, driven by the innovative Textile Factory 7.0 (T7) project. The T7 project is a joint venture spearheaded by the Niederrhein University of Applied Sciences, the Institute of Textile Technology (ITA) at RWTH Aachen University, the Association of the Northwest German Textile and Clothing Industry, the Association of the Rhenish Textile and Clothing Industry, the Textile Academy NRW, and Wirtschaftsförderung Mönchengladbach GmbH. This consortium of experts and stakeholders aims to integrate cutting-edge technologies with sustainable practices to redefine the European textile industry.

As a collaborative effort involving academic institutions, industry associations, and leading manufacturers, T7 is set to revolutionize how textiles

are made, bringing production closer to markets and setting new standards for the industry.

Innovative Technologies Driving T7

The T7 project leverages a range of advanced technologies to achieve its objectives:

1. Automated Cutting and Handling Systems

Automation plays a crucial role in the T7 initiative. Automated cutting machines, including laser and water jet cutters, provide precise and efficient fabric cutting. Robotic systems equipped with specialized grippers handle fabrics delicately, adapting to different textile types and shapes. These technologies significantly reduce waste and increase production speed.

2. Digital Fabric Management

Digitalization is another pillar of T7. The project employs sophisticated software solutions for pattern digitization, production planning, and real-time monitoring. These systems optimize production workflows, ensure consistent quality, and enable manufacturers to quickly adapt to changing market trends.

3. Smart Factories and Industry 4.0

T7 envisions the creation of smart factories, where interconnected machines and sensors collect and analyze data to improve operational efficiency. This Industry 4.0 approach allows for predictive maintenance, energy management, and seamless integration of various production stages, resulting in a highly efficient manufacturing environment.

Case Study: C&A's Factory for Innovation in Textiles (FIT)

One of the notable implementations of the T7 project is the Factory for Innovation in Textiles (FIT) by C&A in Mönchengladbach. This pilot project exemplifies the principles of T7, bringing

a portion of C&A's jeans production back from Asia to Europe. FIT focuses on innovative technology, carbon-neutral production, and sustainable fashion.

C&A's FIT utilizes highly automated manufacturing lines developed in collaboration with Robotextile and other T7 partners. The factory aims to produce up to 800,000 pairs of jeans annually, demonstrating that large-scale production can be both sustainable and economically viable.

The Future of Textile Manufacturing

The Textile Factory 7.0 project represents a significant step forward for the European textile industry. By prioritizing sustainability, embracing technological advancements, and promoting nearshoring, T7 is setting new benchmarks for textile manufacturing. It promises to transform the European textile sector into a global leader in sustainable and technologically advanced manufacturing. This initiative not only benefits the environment and local economies but also positions Europe as a competitive force in the global textile market.

STOLL's "CMS 703 Knit and Wear" offers an integrated automated digitized workflows

STOLL's "CMS 703 Knit and Wear" machine is outfitted with a comprehensive set of sophisticated knitting capabilities. This machine is dedicated to the production of premium seamless knitwear, accommodating a diverse range of sizes. It features a working width of 72"/183 cm and a gauge range from E 6.2 to 10.2, rendering it suitable for markets that require a variety of sizing options.

CMS 703 Knit and Wear launched in April 2024 and will showcase in ITMA ASIA+CITME from October, 2024 in Shanghai with some particular advancements as innovation :

- Knitelligence® Integration (Integrated automated digitized workflows)



- A central lubrication system (Minimize maintenance requirements)
- A multi-touch control interface
- Online connectivity through Ethernet
- Adjustable power tension settings
- An advanced take-down mechanism (Effective fabric management)



<https://www.stoll.com/en/products-and-solutions/machines/knit-and-wear/cms>

The implementation of Automated Needle Replacement Technology enhances overall productivity while reducing the need for manual intervention

The occurrence of needle breakage presents a significant challenge within the knitting industry. Needles utilized in knitting machines may break due to many reasons. Employing an inappropriate type or size of needle for the particular fabric or yarn being knitted may result in excessive stress on the needle, potentially causing it to break. For instance, thicker or more abrasive yarns necessitate the use of more stronger needles. The primary causes of needle breakage are:

1. Inaccurate Needle selection
2. Excess Yarn Tension
3. Misalignment of the needle beds or other parts
4. Mechanical Deterioration (Irregular inspection & Replacement)
5. Improper Handling or Setup of needle
6. Excessive Machine Speed

Needle breakage in knitting machines presents numerous drawbacks that impact both the production process and the quality of the finished product. When a needle breaks, the machine often has to be stopped to facilitate the replacement of the broken needle, resulting in considerable downtime. This disruption in the production reduces overall efficiency. and may lead to delays in order fulfillment. The following are some of the primary concerns:

1. Production downtime reduces overall efficiency
2. Maintenance cost is increased (due to Inspections & Replacements)
3. Fabric Defects might happen (Ex: Dropped Stitches, Holes etc.)



4. Broken needle can make damage to other parts, Ex: Needle Bed, Sinker
5. Productivity is decreased

The implementation of automation for needle replacement in knitting machines is crucial for improving efficiency, safety, and quality during the knitting process. Automated systems significantly decrease the time required for needle changes in comparison to manual methods, thereby reducing machine downtime and facilitating uninterrupted production, which ultimately enhances overall productivity. The level of precision and consistency attained through automation is challenging to achieve through manual efforts, guaranteeing that needles are replaced accurately everytime, which preserves consistent knitting standards and minimizes the chances of errors associated with incorrect needle installation.

The implementation of automated needle replacement significantly improves safety by decreasing the risk of injuries associated with handling sharp instruments. Additionally, it reduces

labor expenses by minimizing the reliance on skilled workers for routine operations. Automated systems are capable of identifying and replacing damaged needles instantaneously, thereby preserving machine availability and averting production disruptions.

This automation also reduces human errors, ensuring consistent fabric quality and preventing machine malfunctions. In high-speed operations, it facilitates rapid needle changes, ensuring operational efficiency without slowing down production.

Automated Needle Replacement Workflows:

1. Detection of broken needles:
 - a. Equipped with sensor & monitoring system
 - b. Sensors can detect irregularities; Ex: Breakage, Excessive mechanical deterioration etc.
 - c. When a needle is break or is about to break, the system detects it immediately
2. Automatic Stopping Mechanism:
 - a. The device ceases operation automatically when it identifies a broken needle
 - b. This prompt action safeguards the fabric from further harm
 - c. The halt also mitigates the potential for further damage to the machine
3. Automated needle replacement:
 - a. An automated robotic arm or actuator is employed to replace the broken needle
 - b. The system efficiently extracts the broken needle and positions a new one from a pre-loaded inventory
 - c. The process is fast and precise
 - d. After replacement, the machine is capable of swiftly resuming its operations
4. Self-Adjustment:
 - a. After the installation of a new needle, the machine initiates an automatic recalibration of the knitting head

b. This step verifies that the new needle is perfectly positioned

c. Perfect positioning is essential to maintain fabric quality

d. The machine is now prepared for use

Study: Shima Seiki MACH 2XS

The MACH2XS series from Shima Seiki, included in their WHOLEGARMENT® collection, features advanced sensors designed to monitor the knitting process in real-time. These sensors are capable of identifying irregularities that may arise from a broken needle. Although they do not specifically pinpoint the exact moment of a needle breakage, they can recognize disturbances in the knitting process, such as dropped stitches or fabric imperfections, which may suggest that a needle has broken. So, basically this machine can identify a broken needle by its sensors and monitoring system.

Figure: Shima Seiki MACH 2XS is equipped with a feature of broken needle detection capabilities.

When the machine detects problems such as a dropped stitch or inconsistent tension, potentially resulting from a broken needle. Because of detection, it can notify the operator or automatically halt the knitting process to avert additional defects. This prompt action is essential for minimizing downtime and decreasing the volume of defective fabric generated. By resolving the issue immediately upon detection, the machine contributes to sustaining high standards of production quality and efficiency.

In industrial knitting, the needle replacement is generally performed manually, and even in machines that are largely automated, this procedure necessitates human involvement. Nevertheless, the idea of automating needle replacement is gaining attention in the advancement of future knitting technologies, particularly as manufacturers strive for enhanced automation and efficiency in textile manufacturing.

Circularity

ACT urges to eliminate USA's double taxation on secondhand fashion

The ACT campaign, led by Rachel Kibbe, CEO and founder of ACT, is advocating for the reform of the U.S. tax system that imposes sales tax on second-hand items, including thrift clothing, accessories, and footwear. The campaign highlights that consumers are unfairly subjected to “double taxation”—paying sales tax both on the original purchase and again when the item is resold.

Supported by major fashion resale platforms like ThredUP and Vestiaire Collective, the petition calls for changes in tax policy to promote sustainability and make second-hand shopping more financially accessible. ACT argues that eliminating this double taxation would benefit



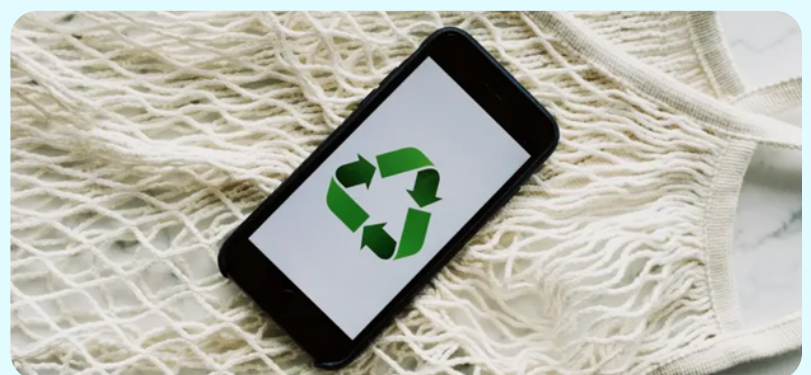
both consumers and businesses committed to sustainable fashion, potentially reducing textile waste, 85% of which currently ends up in landfills.



<https://finance.yahoo.com/news/act-campaign-aims-reform-double-103520604.html>

Brands embrace circularity with E.MacArthur Foundation initiative

In a significant move towards sustainability, major brands such as H&M, Nike, and Unilever have recently committed to the Ellen MacArthur Foundation's Circular Economy 100 (CE100) initiative. This program aims to accelerate the transition to a circular economy by fostering collaboration among leading companies, governments, and academics. Participants pledge to redesign products and business models to minimize waste and maximize resource efficiency. The initiative encourages the development of closed-loop systems where materials are continuously reused and recycled. By joining the CE100, these



brands are setting a precedent for industry-wide change, demonstrating a collective effort to address environmental challenges and drive innovation in sustainable practices. This commitment marks a crucial step in reshaping industries towards more circular and regenerative economic models.



<https://www.ellenmacarthurfoundation.org/ellen-macarthur-foundation-launches-new>

eBay, BFC & CFDA announces first-ever 'Pre-Loved Fashion Week'

eBay is launching its first-ever Pre-Loved Fashion Week on September 12, collaborating with the British Fashion Council (BFC) and the Council of Fashion Designers of America (CFDA). This initiative, spanning London and New York, will feature a live, shoppable runway show called "Endless Runway," showcasing pre-loved designs from top designers like Khaite, Off-White, and Christopher Kane.

The event aims to make authentic designer fashion accessible and tap into the growing global demand for sustainable, circular fashion. The runway shows will precede the SS25 Official Fashion Week schedules, with daily drops of curated pre-loved fashion on eBay. With pre-owned and



refurbished items accounting for 40% of eBay's gross merchandise volume, the platform emphasizes its role in promoting sustainability in fashion. As BFC CEO Caroline Rush noted, this event aligns with the 40th anniversary of London Fashion Week, celebrating both past and future fashion.



<https://www.fashionnetwork.com/news/Ebay-announces-first-ever-pre-loved-fashion>

Indorama & PepsiCo partner to build major PET recycling facilities in india

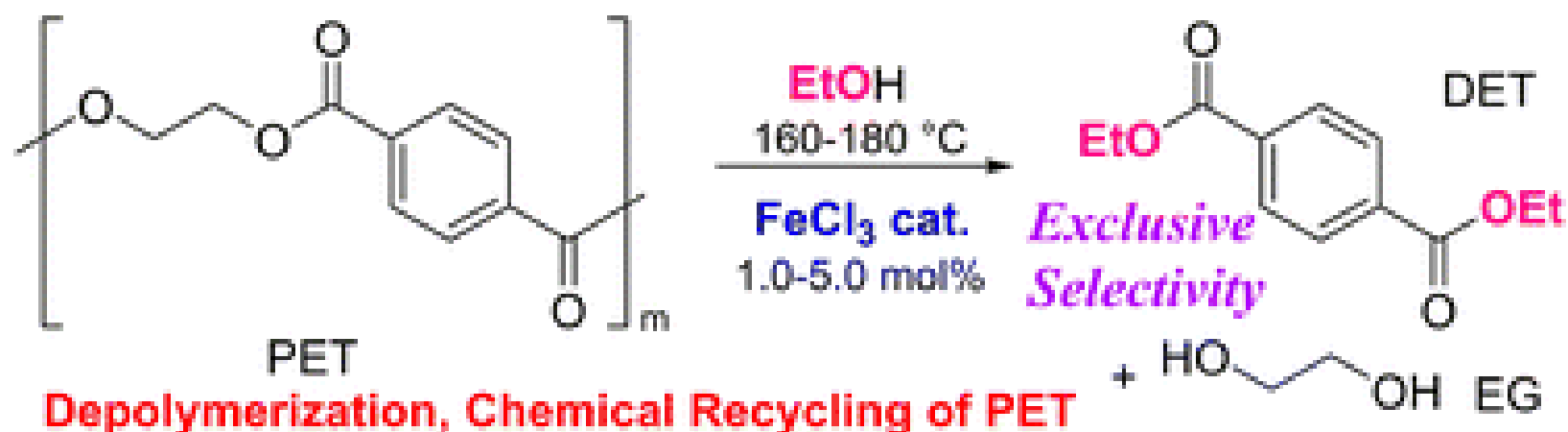
Indorama Ventures has partnered with PepsiCo's bottling company, Varun Beverages, to establish two polyethylene terephthalate (PET) recycling facilities in India. This joint venture, executed through Indorama's subsidiary IVL Dhunseri Petrochem Industries and Dhunseri Ventures, is a significant move towards fulfilling India's growing demand for recycled PET (rPET). Located in Kathua, Jammu and Kashmir, and Khurdha, Odisha, the facilities are expected to have a combined annual capacity of 100 kilotonnes (kt) of rPET upon completion in 2025.

The initiative is driven by India's regulatory push for increased recycled plastic content in packaging, with mandates set at 30% by 2025-26 and 60% by 2028-29. The venture aims to support the sustainability goals of beverage brands in India, aligning with the



nation's circular economy objectives. Yash Lohia, Indorama Ventures' ESG chair, emphasized the partnership's role in promoting environmental sustainability by converting post-consumer PET bottles into valuable resources. Indorama Ventures, already the world's largest PET recycler, aims to recycle 750,000 tonnes or 50 billion bottles annually by 2025, further underscoring its commitment to a circular economy.

Chemists from Japan & Malaysia develop low-cost plastic-textile recycling solutions



A team of chemists from Japan and Malaysia has unveiled a novel method for recycling polyethylene terephthalate (PET) plastics, potentially revolutionizing how mixed waste and textiles are processed. This innovative approach utilizes an iron-based catalyst and alcohol, offering a more efficient and environmentally friendly alternative to current recycling methods.

PET is widely used in various applications, from textiles to drink containers. While PET bottles can be recycled through melting and reforming, this often results in lower-quality plastic and necessitates meticulous separation from other materials. Recycling PET from mixed waste, particularly textiles is even more challenging due to the difficulty of separating polyester from other fibers, such as cotton.

The researchers' new method, published in *Industrial Chemistry and Materials*, addresses these challenges by breaking down PET at lower temperatures and without the need for corrosive chemicals. By mixing PET with ethanol and either ferric chloride (FeCl₃) or iron(III) bromide (FeBr₃)

at temperatures between 160°C and 180°C, the team successfully converted PET into its monomer components—diethyl terephthalate and ethylene glycol—throughout a couple of days. These monomers can be reused to produce high-quality PET or other materials.

In addition to PET plastics, the method was tested on a textile blend consisting of 65% PET and 35% cotton. The process effectively separated the PET from the cotton, yielding pure cotton and monomers in just 16 hours. Moreover, the method proved capable of selectively removing PET from other textile blends, showcasing its potential for diverse applications.

The use of ferric chloride as a catalyst is particularly promising due to its low cost and widespread availability in industry. The research team is now exploring the possibility of achieving similar results under even milder conditions, which could further enhance the method's commercial viability and environmental benefits. This breakthrough represents a significant step forward in the quest for sustainable plastic recycling.



<https://pubs.rsc.org/en/content/articlepdf/2024/im/d4im00081a>

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Craftevo Japan: Leading the Charge in Sustainable Textiles



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A Polyester that Returns to the Earth

In the dynamic world of sustainable fashion, Craftevo Japan, a brand under V&A Japan Corporation, is making waves with its innovative and eco-friendly textile solutions. Renowned for their dedication to environmental sustainability, Craftevo's products are designed to minimize waste and carbon emissions, setting a new benchmark in the textile industry.

Innovative Products

Craftevo's flagship product line, **ReTE**, features a revolutionary type of polyester that decomposes into water and carbon dioxide under specific composting conditions². This groundbreaking material is not only durable during regular use but also environmentally friendly at the end of its lifecycle. By returning used products for composting, consumers can actively participate in reducing landfill waste and lowering carbon emissions².

Product Details

1. ReTE Polyester: Engineered to break down through hydrolysis when exposed to moisture, heat, and microorganisms in compost². This

process significantly reduces the environmental footprint compared to traditional polyester, cutting CO₂ emissions by 40% during disposal². The ReTE polyester maintains its durability during regular use, ensuring that it meets the functional needs of consumers while being eco-friendly at the end of its life.

2. Collection and Composting: Craftevo encourages customers to return used products, which are then processed in composting facilities². This initiative promotes a circular economy, where products are returned to the earth in a sustainable manner. The company has set up collection boxes in stores and provides return options for customers, making it easy for them to participate in this eco-friendly initiative².

3. Product Identification Tags: Each product made with ReTE polyester comes with a unique identification tag, allowing for easy tracking and return for composting². This system ensures that every product can be properly processed at the end of its lifecycle, further reducing environmental impact.

Environmental Impact

The ReTE polyester is designed to break down through a process called hydrolysis, where moisture, heat, and microorganisms in compost cause the material to decompose into water and carbon dioxide². This process significantly reduces the environmental footprint compared to traditional polyester, cutting CO2 emissions by 40% during disposal². By encouraging customers to return used products for composting, Craftevo is actively promoting a circular economy and reducing landfill waste².

Market Presence

Craftevo has showcased its innovative textiles at various international events, including the Sustainable Fashion Expo and Premier Vision Paris². Their presence at these events highlights their commitment to leading the charge in sustainable fashion and textile innovation. These platforms have allowed Craftevo to connect with industry leaders, potential partners, and consumers who are passionate about sustainability.

Future Prospects

As the demand for sustainable products continues to grow, Craftevo Japan is well-positioned to expand its market reach. Their focus on creating environmentally responsible textiles aligns with global efforts to combat climate change and promote sustainability in the fashion industry. The company plans to continue innovating and expanding its product line to meet the evolving needs of eco-conscious consumers.

For more information about Craftevo Japan and their products, visit their [official website](<https://www.craftevo.com/>)¹.



Craftevo Japan is setting a remarkable example in the textile industry by combining innovation with sustainability. Their products not only meet the functional needs of consumers but also contribute to a healthier planet. In Bangladesh, RH CORPORATION is offering the products of Craftevo Japan to revolutionize the textile industry of Bangladesh under the umbrella of RH GREEN, for a greener and more sustainable future.

Source:

- (1) Craftevo ReTE (公式ホームページ) . <https://rete-craftevo.com/>.
- (2) V&A Japan Corp.. <https://www.craftevo.com/>.
- (3) Craftevo - V&A Japan Corp. at OutDoor by ISPO 2024. <https://outdoorexhibitors.ispo.com/onlinecatalog/2024/list-of-exhibitors/exhibitor/details/craftevo-v-and-a-japan-corp/?elb=167.1100.1771.1.111>.
- (4) CRAFTTEVO | 株式会社V&A JAPAN. <https://vajapan.jp/craftevo>.

Solar thermal solutions for textile industry's Net-Zero goal

M A Mohiemen Tanim

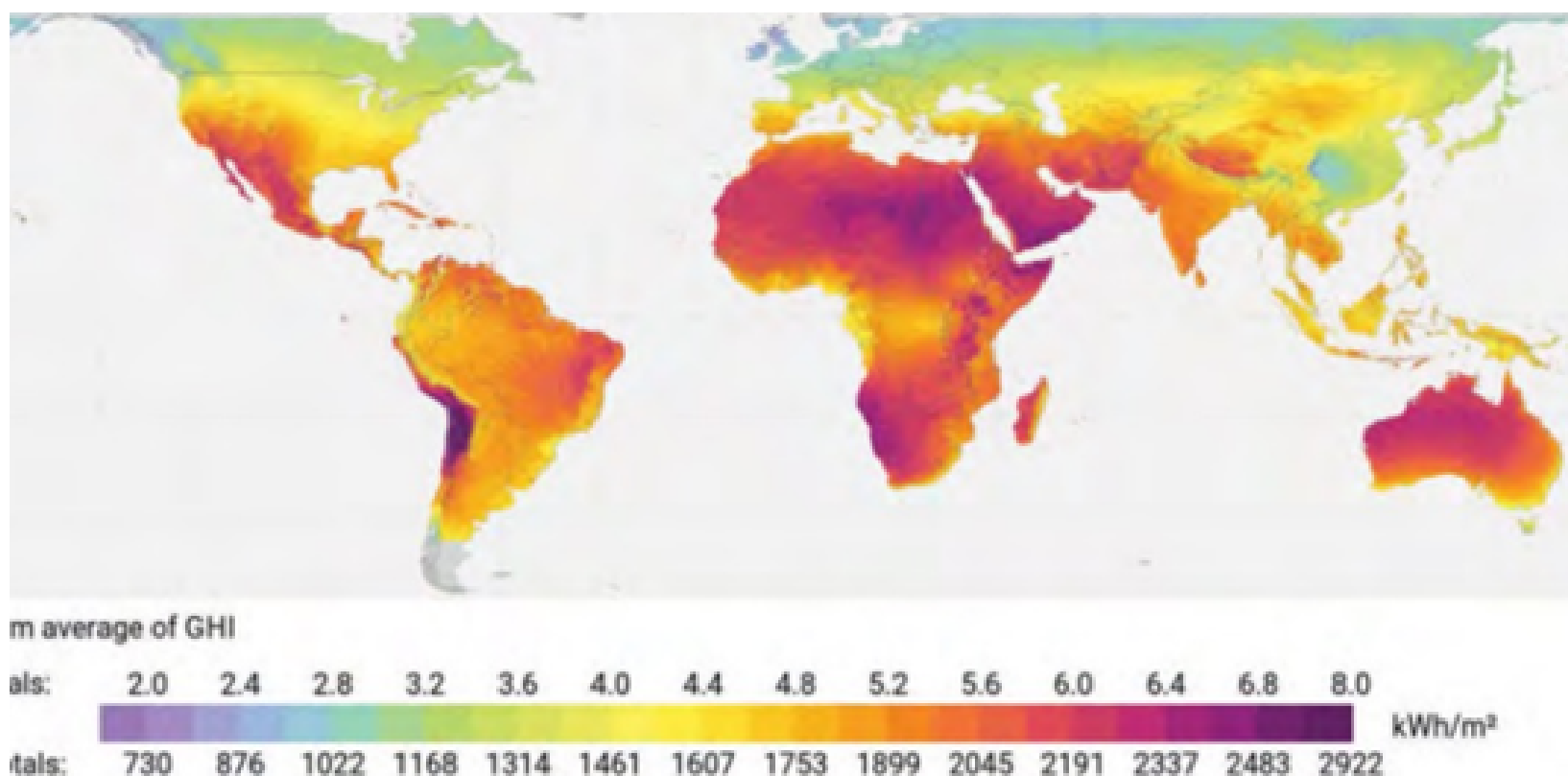


Figure: Global horizontal irradiation long-term yearly average Source: World Bank ESMAP 2020

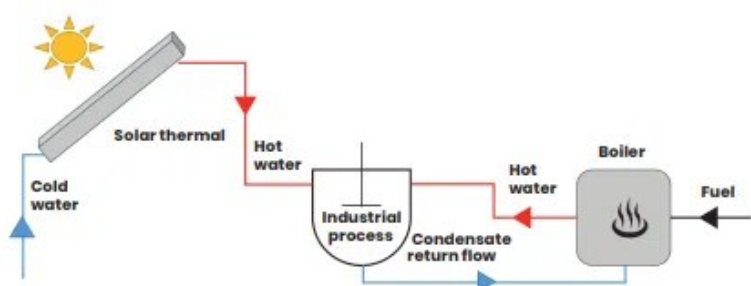


Figure: Solar thermal directly heating the water used in the industrial process

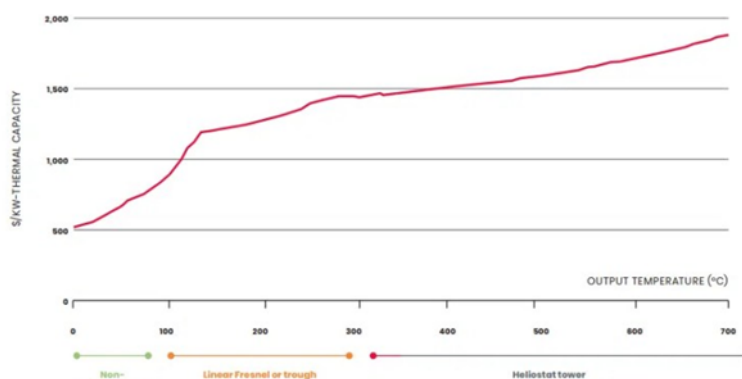


Figure: Capital costs per unit of thermal capacity for various solar thermal technologies

As the textile industry grapples with its significant carbon footprint, the pursuit of low-carbon energy sources becomes imperative for achieving net-zero emissions. Solar thermal technology, while less prominent compared to other renewable energy sources, offers a promising alternative for decarbonizing industrial heating processes.

Understanding Solar Thermal

Technology

Solar thermal technology harnesses sunlight to generate heat, unlike solar photovoltaics (PV) that produce electricity. There are two main categories of solar thermal technologies: non-concentrating and concentrating.

Non-Concentrating Technologies:

» **Flat-Plate Collectors (FPC):** These collectors absorb sunlight using a dark surface and transfer the heat to a circulating fluid. They are efficient at temperatures up to 100°C.

» **Evacuated Tube Collectors (ETC):** These consist of glass tubes with heat pipes in a vacuum, significantly reducing heat loss and reaching temperatures up to 120°C.

Concentrating Solar Thermal (CST) Technologies:

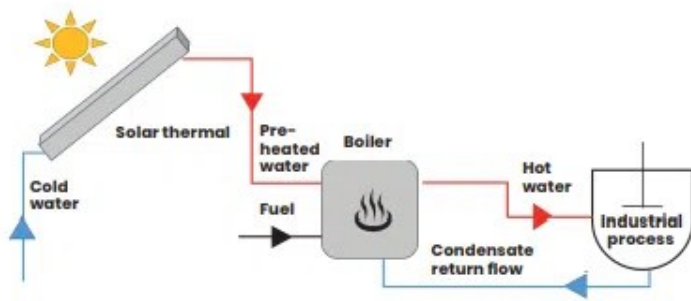


Figure: Solar thermal energy used to pre-heat boiler feed water

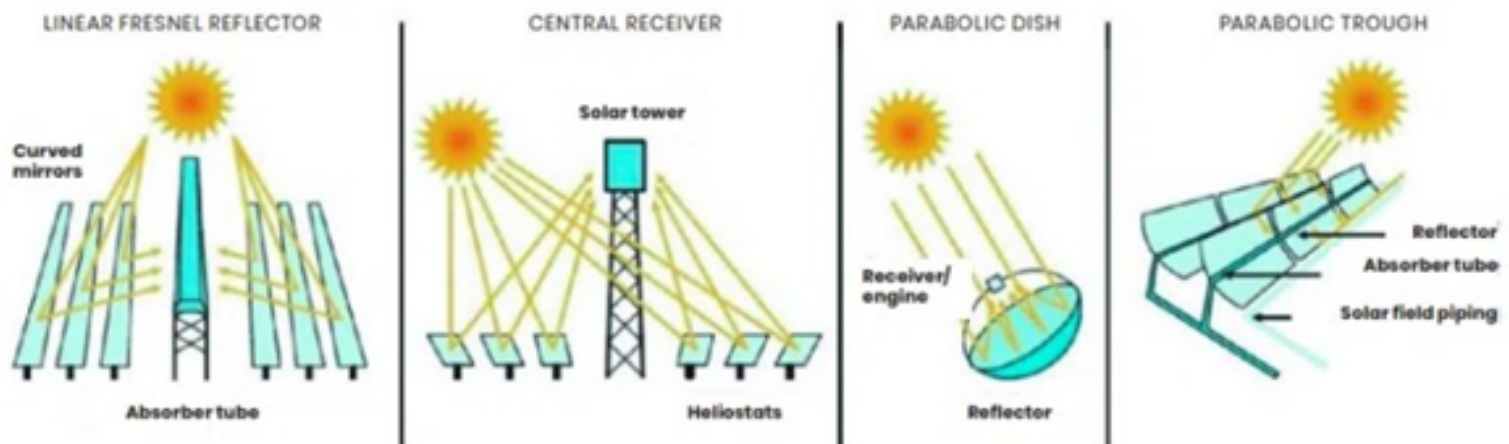


Figure: Demonstration of various configurations of concentrated solar technology

» **Parabolic Troughs:** Use mirrors to focus sunlight onto a receiver tube filled with heat transfer fluid, achieving temperatures up to 400°C.

» **Parabolic Dishes:** Focus sunlight on a receiver at the dish's focal point, reaching temperatures up to 1,200°C.

» **Power Towers:** Employ a field of mirrors to direct sunlight onto a central receiver at the top of a tower, providing high-temperature heat.

» **Linear Fresnel Reflectors:** Use mirrors to

focus sunlight on a fixed receiver, offering varied output temperatures.

Figure: Solar thermal energy used to pre-heat boiler feed water

Advantages of Solar Thermal Energy

» **Zero-Emission Heating:** One of the most significant advantages of solar thermal technology is its ability to provide zero-emissions heat. This aligns with global efforts to reduce greenhouse gas (GHG) emissions and comply with increasingly stringent environmental regulations.

» **Economic Viability:** The decreasing costs of solar thermal systems, driven by advancements in technology and economies of scale, are enhancing their economic feasibility. Financial incentives and supportive climate policies further improve the attractiveness of solar thermal energy.

» **Energy Security:** By diversifying energy sources, solar thermal systems can reduce reliance on imported fossil fuels, mitigating risks associated with fuel price volatility and supply disruptions.

» **Integration with Existing Systems:** Solar thermal technology is mature and can integrate with existing manufacturing processes. Emerging storage technologies can store excess solar heat for use during non-sunny periods, improving the reliability of solar thermal systems.

Challenges and Barriers

- » **Suitability for High-Temperature Heat:** The textile industry primarily uses steam for heating, which requires temperatures higher than those achievable by most non-concentrating solar thermal systems. Although concentrating solar thermal systems can reach higher temperatures, they are often more complex and costly.
- » **High Initial Costs:** The upfront capital investment for solar thermal systems, including installation and infrastructure modifications, can be substantial. This includes costs for solar collectors, storage systems, and integration with existing heating systems.
- » **Space Requirements:** Solar thermal installations require significant space for collectors and associated infrastructure. This can be a constraint for facilities in urban areas or those with limited available land.
- » **Geographical Limitations:** Solar thermal systems perform best in regions with high and consistent solar irradiation. Countries with lower solar resources or variable sunlight may find it challenging to achieve a consistent heat supply.
- » **Technical Expertise:** The adoption of solar thermal technology may be hindered by a lack of technical expertise and familiarity among stakeholders in the textile industry. There is also competition from more established energy sources and technologies.

Readiness for Adoption

- » **Availability of Solar Resources:** Countries like Egypt, Mexico, Morocco, and Pakistan have high solar resources, making them more suitable for solar thermal technology. In contrast, countries like Germany, Japan, and South Korea have lower solar resources, reducing the viability of solar thermal systems.
- » **Climate Policy Strength:** Countries with strong climate policies and supportive incentives for renewable energy are more likely to adopt solar thermal technology. For instance, Morocco and Spain have robust climate policies that

could facilitate the integration of solar thermal systems.

- » **Technology Supply Chain:** The maturity of the solar thermal technology supply chain varies by country. Countries with well-established supply chains, such as those in Europe and North America, are better positioned to implement solar thermal systems.
- » **Overall Readiness:** Composite readiness scores, considering solar resources, climate policy, and technology availability, indicate that countries like China, India, Italy, Morocco, and Spain are among the most prepared to adopt solar thermal technologies. However, challenges such as land constraints and competition with solar PV must be addressed.

Case Studies

While specific examples of solar thermal applications in the textile industry are limited, there are notable successes in other sectors:

- » **Barrington Brewery & Restaurant, Massachusetts:** This facility installed flat-plate solar thermal collectors to provide hot water for brewing and restaurant operations. The system's success led to an expansion, demonstrating the potential for solar thermal in industrial settings.
- » **Carlsberg Brewery, Greece:** Carlsberg's Olympic Brewery site uses parabolic trough solar collectors to meet up to 70% of the energy required for can pasteurization during peak sunny months. This installation is expected to reduce CO2 emissions significantly.

Conclusion

Solar thermal technology presents a viable low-carbon energy source for the textile industry, particularly in regions with high solar resources and supportive climate policies. While challenges such as high initial costs, space requirements, and technical expertise must be addressed, the potential benefits of zero-emissions heating and energy security make solar thermal a compelling option. As technology advances and costs decrease, solar thermal could play a crucial role in the textile industry's transition to net-zero emissions.

All's new report calls to adopt 'Low Carbon Thermal Energy' for textile industry



The Apparel Impact Institute (AII) has released a crucial new report, “Low-Carbon Thermal Energy Technologies for the Textile Industry,” marking the first of a two-part series aimed at transforming textile manufacturing’s energy use. This report assesses alternative energy sources and technologies, including sustainable biomass, solar thermal, electrification technologies, and natural gas.

The textile industry, responsible for around 2% of global greenhouse gas emissions, faces mounting pressure to reduce its environmental impact. The report highlights electrification technologies—such as electric boilers and heat pumps—as the most promising solutions for decarbonization, particularly

when powered by renewable electricity. However, challenges like high energy costs and limited renewable resources must be addressed.

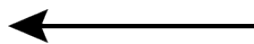
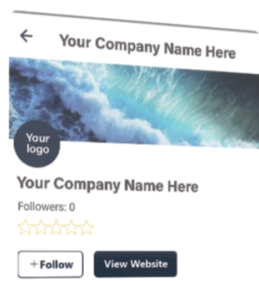
Other technologies, like biomass and solar thermal, offer potential but come with significant hurdles, including environmental risks and high investment needs. Natural gas, while mature, presents issues related to price volatility and methane leakage.

The report provides a readiness assessment for adopting these technologies in major textile-producing countries and offers tailored recommendations for industry stakeholders. This initiative is a key step towards achieving net-zero emissions in the global textile sector.

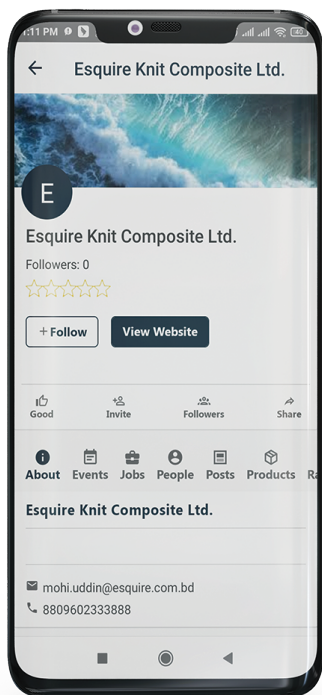


<https://apparelimpact.org/wp-content/uploads/2024/08/Low-Carbon-Thermal-Energy>

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