

rise, and buyers are actively choosing brands that are more ethically and environmentally responsible. Therefore, switching to renewables is an important way for companies to demonstrate that they are listening to what the customers want and are taking the necessary steps to safeguard the planet

4. Competitiveness

During energy crises that cause blackouts amid global energy shortages, companies are likely to choose supplier companies that can meet their quality requirements and production deadlines. By investing in renewables and thereby establishing independent reliable energy sources, suppliers will be able to meet production deadlines and achieve an edge over their competitors. Additionally, due to the reduced costs of production, lower prices can be offered to buyers, further reinforcing this competitive advantage.

5. Efficiency

Switching to a new source of power and measuring energy usage allows companies to identify the processes and machines that are most energy-intensive. This information can then be used to streamline the production process involved in manufacturing and replace outdated, energy-intensive machinery and equipment with more efficient ones.

Examples of Transition towards Renewable Energy

- There are several substitutes for electric heating like steam, gas heating, or direct or indirect-fired heating. These achieve cost reductions. However, since electric heating only requires a small initial investment due to the convenience and simplicity of equipment construction, it is still used for small-capacity local heating purposes.
- Simple changes involving controlling the steam pipe temperatures, regulating the air-fuel ratio in boilers, and setting up heat exchangers using warm waste water can denote a major positive change.
- Some industries have started post-production of textile waste as steam. Others have set up waste-to-energy gasification plants.
- In Japan, some textile industries have changed from conventional boilers to water-tube boilers to improve efficiency.
- A textile company in Atlanta has prepared seven of its manufacturing plants to use 100-percent renewable electricity; and 89 percent of its overall electric

from the grid, purchased as renewable energy certificates (RECs) or generated on-site.

- China has introduced some advanced machines for textile industries.
- Textile industries in the Philippines and Iceland use geothermal energy.
- The abundantly available sugarcane bagasse is now being converted into biomass by the sugar mills to generate electricity and subsequently feed it to the grid. This helps them earn carbon credit for it and it makes the project quite viable for them.

Policy Options for Renewable Energy Transition

1. Global

The United Nations Secretary-General outlines five critical actions the world needs to prioritize now to transform our energy systems and speed up the shift to renewable energy.

- a. Make renewable energy technology a public good by making efforts to remove global road-blocks to knowledge sharing, technological transfer and intellectual property rights barriers.
- b. Improve global access to components and raw materials by ensuring improved global access to components and raw materials.
- c. Level the playing field for renewable energy technologies by promoting global collaboration, streamlining domestic policies and practices, and incentivising investment in renewable energy projects.
- d. Shift energy subsidies from fossil fuels to renewable energy by withdrawing explicit subsidies and tax breaks and.
- e. Triple investments in renewables by holding the global financial systems accountable, pushing them to align their lending portfolios towards accelerating the renewable energy transition.

2. Domestic

Through policy interventions, the government of Pakistan should.

- a. Ease and incentivise the renewable energy transition.
- b. Encourage competition, innovation and investment within the renewable energy market system
- c. Introduce and implement Renewable Portfolio Standards (RPS).
- d. Promote green financing.
- e. Create awareness about the benefits of renewables.

Navigating Renewable Energy Transition In Pakistan's Textile Sector

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Significance of Pakistan's Textile Sector

The textile industry in Pakistan has traditionally been a dominant sector, both in terms of its contribution to the GDP and employment generation. It is the country's largest manufacturing industry, accounting for around 60% of the total exports, contributing about 8.5% to the GDP and employing about 45% of the total labour force in the country.

Challenges of Competitiveness

Pakistan's textile industry operates in a highly competitive global market with its close competitors being India, China, Vietnam and Bangladesh. While the Western buyers' demands are increasing in terms of innovation vis-à-vis compliance with numerous international standards involving labour and climate protection. As the global focus on sustainable practices intensifies, Pakistan's textile sector must adopt environmentally friendly manufacturing processes to ensure compliance with relevant international obligations and to address the issue of cost efficiency by introducing Renewable Energy and technology efficiency in their manufacturing processes.

The Climate Factor

The United Nations describes climate change as a long-term shift in temperatures and weather patterns. Since the 1800s, human activities have driven climate change primarily through burning fossil fuels. Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures. The average temperature of the Earth's surface is now about 1.1°C warmer than it was in the late 1800s. The consequences of climate change now include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity.

The textile industry is a major contributor to global warming; 10 per cent of global greenhouse gas emissions are accounted for by clothing and footwear production, which is more than all international and maritime shipping combined. The textile industry's GHG emissions from energy usage are largely due to the reliance on fossil fuels. Moreover, the textile industry holds the record for one of the lowest efficiencies in energy utilisation. Around 50 per cent of the energy input to the textile industry is lost through the

manufacturing lines. Therefore, optimisation and development of manufacturing processes that take into account energy efficiency and loss are essential when considering ways to lower the carbon footprint of the industry.

Increasing Compliance Conditions

Given that the textile industry's energy-intensive manufacturing processes produce large amounts of greenhouse gas emissions. Transitioning to renewable energy is crucial for the industry to reduce its carbon footprint and move away from its dependence on fossil fuels, towards a more sustainable future. Aligned with the UN Sustainable Development Goal 7, i.e., "ensure access to affordable, reliable, sustainable and modern energy for all", many companies in the industry are being urged to adopt renewable energy and move away from fossil fuels. With this commitment, several global initiatives have emerged to encourage businesses to move towards 100% renewable energy. Following are a few examples of the relevant international climate compliance pledges.

1. The Fashion Pact

The Fashion Pact is envisioned to be a united fashion industry pioneering new approaches to contribute to a nature-positive, net-zero future. The fashion and textile industry contributes significantly to greenhouse gas (GHG) emissions. According to an industry report, the impact occurs primarily through its electricity use in earlier stages of the supply chain such as raw material processing, preparation and assembly. Accelerating the transition of the fashion industry to renewable energy is a powerful way to decarbonize operations and supply chains. It is also a meaningful way in which collective action can play a transformational role in mitigating climate change.

2. Carbon Border Adjustment Mechanism (CBAM)

The European Union's CBAM, introduced in October 2023 aims to prevent 'carbon leakage' by subjecting the import of certain groups of products from 3rd (non-EU and non-EFTA) countries to a carbon levy linked to the carbon price payable under the EU Emissions Trading System (ETS) when the same goods are produced within the EU. Currently, iron and steel, cement, fertilisers, aluminium, electricity, and hydrogen are in the scope of the CBAM. The scope will additionally include certain precursors and a

limited number of downstream products. Further scope extensions to include additional products (such as chemicals and polymers) are to be determined by 2026, and the full inclusion of all EU ETS products is planned by 2030.

3. RE100

RE 100 is the global corporate renewable energy initiative bringing together hundreds of large and ambitious businesses committed to 100 renewable electricity. Members of the RE100 have global operations and span sectors from manufacturing and pharmaceuticals to fashion and technology. Led by Climate Group, RE100's mission is to accelerate change towards zero carbon grids at scale. It was established in partnership with CDP. H&M, Burberry, and another 300 influential companies have also joined the RE100, including Nike, Kering, Ralph Lauren and Chanel, marking an important step for apparel's movement towards sustainability.

Advantages of the Renewable Energy

1. Cheaper

The textile industry should note that adopting energy-intensive tactics can help save up to 15 per cent in expenses. The cost of renewables including wind, solar and battery storage has considerably decreased over the last 10 years. Investing in renewables may seem like a significant cost initially, but investors can expect a payback from this within five years after investing. Additionally, a new report from IRENA (The International Renewable Energy Agency) shows that almost two-thirds of renewable power added in 2021 had lower costs than the cheapest coal-fired options in G20 countries.

2. Environment Friendly

It is a fact that fossil fuel dependency needs to come to an end. Having changed the very foundations that support life on earth, the urgency to move towards a greener, renewable future needs to be a priority for every industry. For GHG and global warming targets to be met, the textile industry must explore ways to reduce its carbon footprint, and renewable energy offers a viable solution.

3. Customer Care

It is becoming increasingly important for companies to be sustainable. Conscious consumerism is on the