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GreenTech: The Pathway to a Sustainable Global Economy

Largely impacted by the burning of fossil fuels, climate change has been contributing to extreme weather patterns all over the world. Scientists have been warning of a climate catastrophe and as a response, several corporations all over the world have undertaken a pledge to reduce emissions. As a result, there has been an increased uptake in the emergent CleanTech or GreenTech companies working towards providing sustainable solutions to everyday problems.

Whether it is reducing CO₂ emissions or protecting ecosystems, these companies use technology to solve challenges that the community around them faces. Although the market is relatively young, it has garnered a significant amount of investor interest due to the looming threat of climate change and the depletion of natural resources.

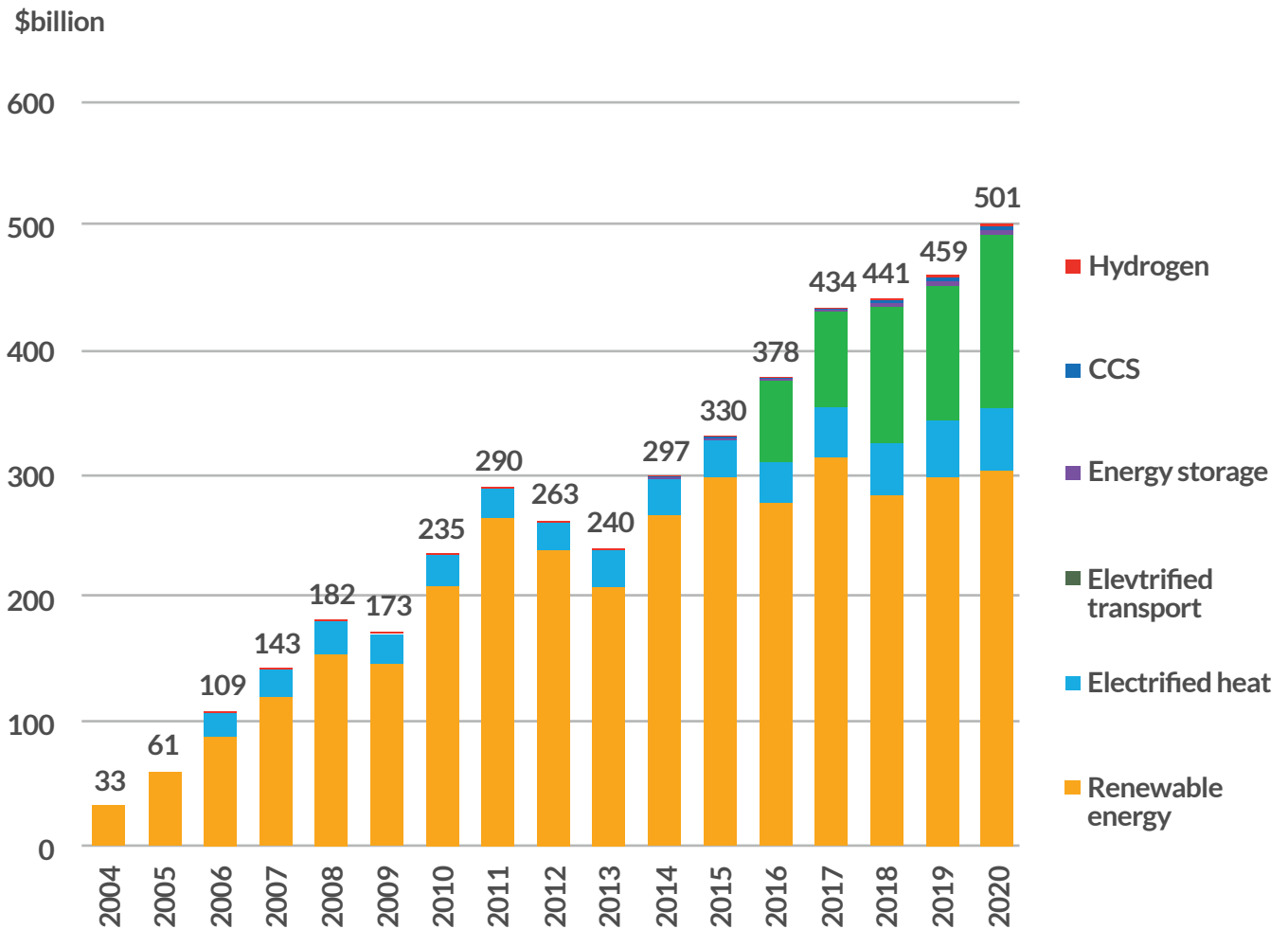
Globally, there has been a push from the international community, through multilateral forums and pacts like the Paris Agreement, to commit to reducing emissions and forging a path towards carbon neutrality. Initiatives such as eliminating single-use plastics have resulted in the emergence of players that are offering alternatives like bioplastics or paper substitutes.



Another frontier in this area is renewable energy to move the energy supply away from fossil fuels, which are a major contributor to climate change. This has created a greenfield

opportunity for companies and investors alike, as funding to renewable energy sources exceeded \$755 billion in 2021, clocking in a 27% increase in investment from 2020.¹

Global energy transition investment, 2004-2020



Source: BloombergNEF. Note: electrified heat figures begin in 2006, electrified transport in 2016: hydrogen and CCS in 2018.

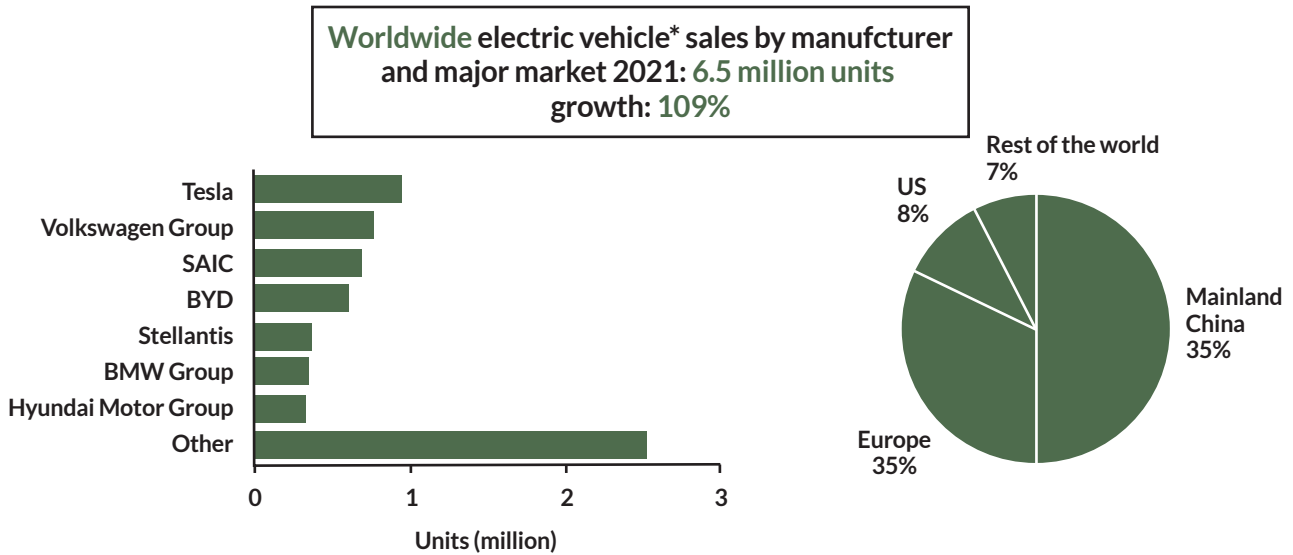
In 2020, renewable energy took up the largest share of new investments, clocking in at \$386B globally.² Interest and investment in greener methods of transportation also spiked with \$273B+ being invested in that sector.³

¹ <https://about.bnef.com/energy-transition-investment/>

² <https://about.bnef.com/energy-transition-investment/>

³ <https://www.investopedia.com/articles/investing/040915/investing-green-technologythe-future-now.asp>

Tesla Leads the EV market, But Competitors Gather

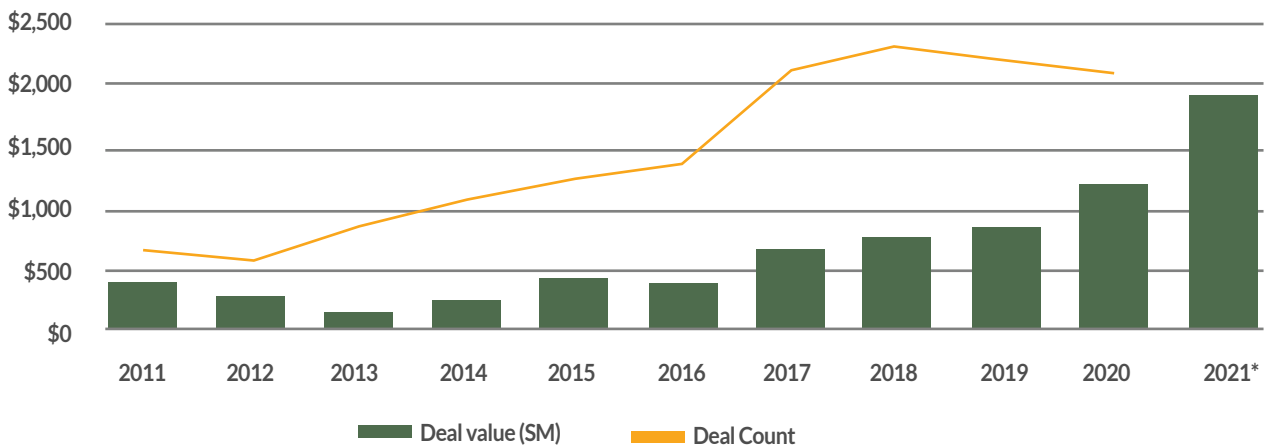


*includes battery electric vehicles and plug-in hybrid electric vehicles
 Source: Canalis estimates, February 2022

Similarly, VC activity in clean energy generation continued to grow even further in 2021 with startups in clean energy generation raising \$1.9 billion in investment across 103 deals through Q3 2021. This showed an

increase of 58.8% Y in comparison to 2020 total investments. Following the trend of previous years, solar and wind companies received the most VC investment.⁴

Clean Energy Generation VC Deal Activity



⁴ <https://www.canalis.com/newsroom/global-electric-vehicle-market-2021>

GreenTech Subsectors



**FUTURE
MOBILITY**



**CIRCULAR
ECONOMY**



**CLEAN
ENERGY**



**SMART
TECHNOLOGY**



AGTECH



DECARBONIZATION



ENERGY STORAGE

As per the International Energy Agency, the cheapest form of alternative energy is solar power. It is cheaper than new coal or gas-fired power plants in most countries with solar projects offering some of the lowest-cost electricity ever.⁵ The green technology and sustainability market is all set to hit a valuation of over \$42.6B by 2028.⁶

Besides newer companies popping up with sustainable solutions, more established ones

are adopting greener practices. Examples of these include global giants like IKEA, Unilever, Panasonic, and IBM.

IKEA sources 50% of its wood from sustainable foresters while 100% of its cotton comes from farms that use less water, energy, and chemical fertilizers. 75% of Unilever's nonhazardous waste does not make it to landfills' and it has more than tripled its share of suppliers that use sustainable practices.



⁵ <https://www.canalys.com/newsroom/global-electric-vehicle-market-2021>

⁶ <https://pitchbook.com/news/reports/2021-introduction-to-climate-tech-a-taxonomy-overview>

Most Valuable GreenTech Startups in the World

Name	Country	Valuation
Hozon	China	\$2B
Tier Mobility	Germany	\$2B
Commonwealth Fusion	United States	\$2B
Prometheus Fuels	United States	\$1.5B
Enpal	Germany	\$1.1B

As per the Global Impact Intelligence Report, there have been 47 climate tech/green tech unicorns since 2015, with 28 of them being minted in 2021 alone.⁸

The State of GreenTech in Pakistan

Zooming in on Pakistan, the country stands at number eight on this Climate Risk Index Scale. This scale which measures the long-term climate risk for countries puts Pakistan in a pretty high position from 1998 to 2017.

As such, Pakistan stands to benefit tremendously from adopting greener practices. The country was a signatory to the Paris Climate Agreement, promising to adapt and mitigate to avert the climate crisis being faced globally.



⁷ <https://pitchbook.com/news/reports/2021-introduction-to-climate-tech-a-taxonomy-overview>

⁸ <https://pitchbook.com/news/reports/2021-introduction-to-climate-tech-a-taxonomy-overview>

The Long-Term Climate Risk Index (CRI): the 10 countries most affected from 1998 to 2017 (annual averages)

CRI 1998-2017 (1997-2016)	Country	CRI score	Death toll	Deaths per 100000 inhabitants	Total losses in million US\$PPP	Losses per unit GDP in%	Number of events (total 1998-2017)
1 (100)	Puerto Rico	7.83	150.05	4.061	5033.16	4.204	25
2 (1)	Honduras	13.00	302.45	4.215	556.56	1.846	66
3 (3)	Myanmar	13.17	7048.85	14.392	1275.96	0.661	47
4 (2)	Haiti	15.17	281.30	2.921	418.21	2.642	77
5 (5)	Philippines	19.67	867.40	0.971	2932.15	0.576	307
6 (4)	Nicaragua	20.33	163.60	2.945	223.25	1.009	45
7 (6)	Bangladesh	26.67	635.50	0.433	2403.84	0.640	190
8 (7)	Pakistan	30.17	512.40	0.315	3826.03	0.567	145
9 (8)	Vietnam	31.67	296.40	0.350	2064.74	0.516	220
10 (44)	Dominica	33.00	3.35	4.718	132.59	21.205	8

Pakistan has incredible potential for switching to cleaner energy sources. As per the World Bank, if Pakistan utilizes just 0.071% of the country’s area for solar PV power generation, it would be enough to meet the country’s electricity demand. Moreover, energy generated through the wind is also a suitable and sustainable option as Pakistan has average wind speeds of 7.87 m/s in 10% of its windiest areas.¹⁰

For that very purpose, the country set aside PKR 47 billion in its 2019- 2020 budget. The money was to be spent on new initiatives

which would include climate-resistant urban settlements, the establishment of a Geomatic Centre for Climate Change and a Water, Sanitation and Hygiene Strategic Planning and Coordination Cell.¹¹

Currently, three foreign-funded projects are likely to be completed by their proposed time frame. These include “Capacity Building on Water Quality Monitoring” which is going to be completed by June 2023 at a cost of PKR 1,275 billion, “Climate Resilient Urban Human Settlements Unit” by June 2024 at the cost of PKR 59 million, and “Establishment of

⁹ <https://www.iea.org/reports/world-energy-outlook-2020>

¹⁰ <https://www.globenewswire.com/en/news-release/2021/07/28/2270030/0/en/Green-Technology-and-Sustainability-Market-to-Hit-USD-41-62-Billion-by-2028-Increasing-Investment-to-Promote-Sustainable-Energy-Worldwide-to-Augment-Growth-Fortune-Business-Insight.html>

¹¹ <https://storm4.com/wp-content/uploads/2022/05/GREENTECH-UNICORNS-2022-1.pdf>

Pakistan WASH Strategic Planning and Coordination Cell” by January 2023 at a cost of PKR 41.13 million.¹²

With many in the country switching to solar energy owing to the high costs of electricity and load shedding, the 17% sales tax on solar

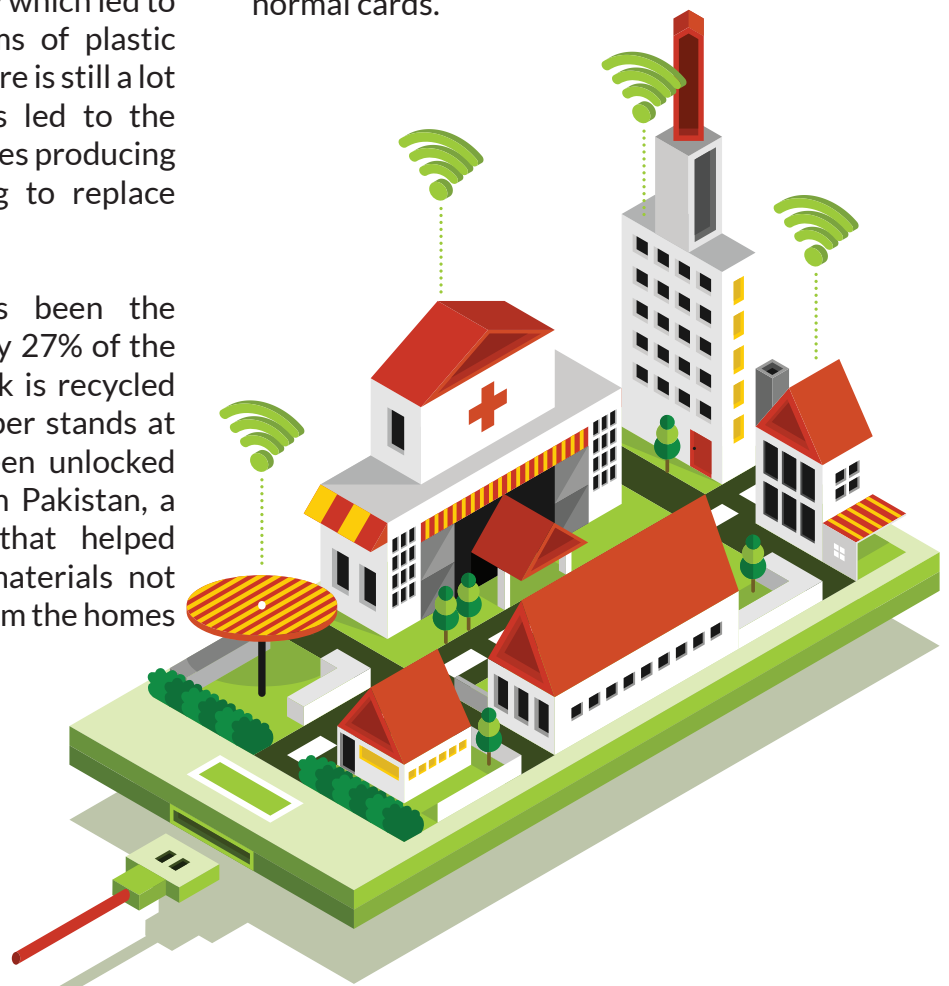
energy equipment might prove to be a deterrent. The tax which was proposed in the Finance Supplementary Bill 2021 was part of a set of fiscal reforms introduced to revive the IMF’s \$6 billion Extended Fund Facility for the nation.¹³

Adopting Greener Practices

The country has also been making leaps and bounds in adopting cleaner practices in other business areas. In 2020, Pakistan produced 3.9 million tonnes of plastic waste and around 70% of that plastic waste was left on landfills or water bodies. Even though a plastic ban was introduced in the country in 2019 which led to the halting of 600,000 kilograms of plastic bags being produced per year, there is still a lot that can be done. The ban has led to the emergence of numerous companies producing alternate methods of packaging to replace plastic.¹⁴

One notable achievement has been the recycling of Tetra Pak. While only 27% of the packaging produced by Tetra Pak is recycled worldwide, in Pakistan the number stands at 41%.¹⁵ This achievement has been unlocked through the help of Green Earth Pakistan, a Lahore-based recycling plant that helped Tetra Pak collect and recycle materials not only from its factories but also from the homes of customers.

Other businesses are also careening towards greener practices with TAG partnering up with IDEMIA GREENPAY in 2021 to launch the country’s first green debit card. The card was created from recycled PVC and was certified by Mastercard as being more sustainable than normal cards.



¹² <https://www.holoniq.com/climatetech-unicorns>

¹³ https://www.germanwatch.org/sites/germanwatch.org/files/Global%20Climate%20Risk%20Index%202019_2.pdf

¹⁴ <https://www.worldbank.org/en/news/feature/2020/11/09/a-renewable-energy-future-for-pakistans-power-system#:~:text=Pakistan%20has%20tremendous%20potential%20to,is%20also%20an%20abundant%20resource>

¹⁵ <https://www.weforum.org/agenda/2019/09/how-cleantech-can-help-power-pakistans-green-revolution/>

GreenTech Businesses in Pakistan

Services / Products	Companies
BIODEGRADABLE PRODUCTS, RECYCLING, SOLID AND LIQUID WASTE MANAGEMENT	O'naps, TrashIt, Crash Bin, 5 Mailay, Waste Hero, Saaf Suthra Sheher, Code Green, GreenEarth Pakistan, CleanGreen Pakistan, GeoLinks, EnviRite
SELF-SUFFICIENT BUILDINGS, RENEWABLE ENERGY, AND ENERGY SAVING EQUIPMENT	Modulus Tech, Tawanai, Fresh-Dri, Davaam, Jaan Pakistan, Eco-Energy, Solar Sigma, Ricult, Bfreeze, Green Tech Energy Solutions, Clean Power (Pvt.) Ltd, Trillium Pakistan (Pvt) Ltd, Akhter Solar Limited, Clean Power, Reon Energy Limited, Sky Electric, Pantera Energy, Orient Energy Systems, Hydropak International, AcroTech, PowerHub Enterprises, Chitral Engineering Works, Revgreen, Elahi Enterprises, Synergy Engineering Solutions, Sky Green Engineering, Iron Side Group, Enent, Brighterlite Pakistan, Company of Intelligent Systems and Network Research, Energy n Automation
WATER AND AIR MANAGEMENT	3W Systems Private Limited, PakVitae, Radical Growth Solutions, Bondh E Shams, MyWater
KNOWLEDGE MANAGEMENT, ADVOCACY AND COMMUNITY BUILDING	CleanTech Republik, Sohni Dharti Climateers, GreenBox, Women in Energy Pakistan, International Union for Conservation of Nature, Energy Informatics Group

¹⁶ <https://asiafoundation.org/2019/12/10/green-entrepreneurship-incubator-in-pakistan/>

¹⁷ [uspcas-e nust](#)



Saaf Suthra Sheher

Saaf Suthra Sheher (SSS) Private Limited specializes in sustainable environmental management solutions. They have recycled over 138,947 kg of waste, saved over 1700 trees and 2.7 million litres of water through their efforts.

Their range of services includes “Pappu Recycles” an initiative that helps people recycle their waste from home or work; a premium brand by the name of their Upcycled creates new products from waste or reuses them to create something new, supervised pulping of confidential paper archives and consultancy services for setting up waste management systems.¹⁸



Code Green

Code Green is a one-stop digital solution for eco-friendly products and packaging options in Pakistan to make the planet greener and healthier. Code Green sells eco-friendly alternatives to everyday products like reusable steel straws, biodegradable bamboo toothbrushes, reusable menstrual pads and shampoo bars that use zero packaging.

Their mission is to encourage people to make small, consistent and sustainable switches in their lifestyle for the betterment of the planet. They also showcase DIY projects to encourage more people to reuse and recycle.¹⁹



¹⁸ <http://saafsheher.com/home/>

¹⁹ <https://codegreenpk.myshopify.com/>



SKYELECTRIC

Sky Electric

SkyElectric is a producer of clean and cost-effective solar energy solutions for homes and businesses. SkyElectric provides intelligent solar plus storage solutions with remote monitoring. It is a privately held company based in Florida, United States with operations and presence in Islamabad, Lahore, Karachi, and other cities of Pakistan.

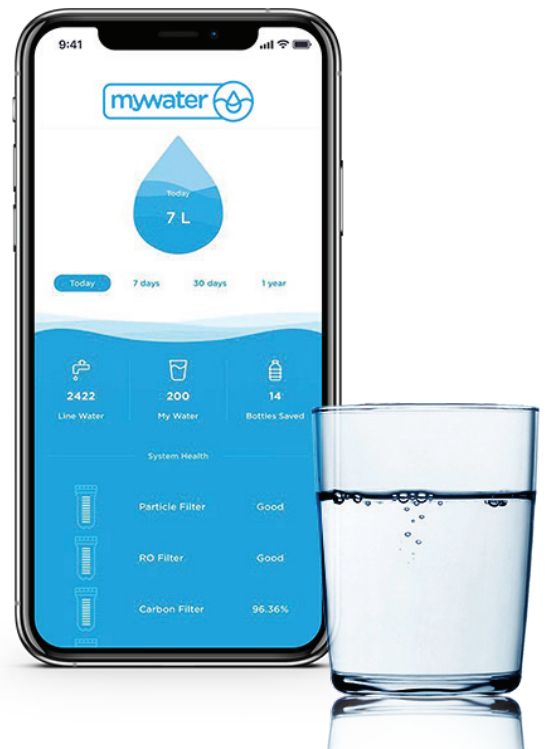
SkyElectric currently offers an intelligent solar, grid, and battery solution engineered to supply reliable energy for consumers in markets with unstable grids from the cleanest and cheapest cost sources.²⁰



MyWater

MyWater aims to reduce the usage of plastic bottles by providing instant purification of tap water into mineral water. It claims to save 70% of a household's monthly bottled water cost while its AI-enabled sensor technology allows users to monitor water quality in real-time. They have reduced plastic waste by saving more than 7,395,420 bottles of plastic.

Their app also updates customers on the health-status of filters, the number of glasses of water that have been consumed and how many plastic bottles they have saved by switching to MyWater²¹



²⁰ <https://www.skyelectric.com/>

²¹ <https://mywater.pk/>



Enent

Enent is a clean-tech electronics startup focusing on designing innovative products that reduce energy waste. Intellica is the first product of Enent's state-of-the-art load balancing technology, which enables consumers to reduce the energy that gets wasted due to imbalance in 3 phase loads. Intellica saves up to 20-25% of electricity bills for the consumer resulting in a reduction of 18,000 tons of CO2 emission every year (for every 1000 devices installed).²²



GreenTech

GreenTech is an Islamabad-based state-of-the-art company offering services in the field of Healthcare, Telecom, Renewable Energy, AI, IoT, transport, storage, renewable energy and smart-city tech. One of its key products is renewable energy solutions based on solar, wind, water and hydro power.²³

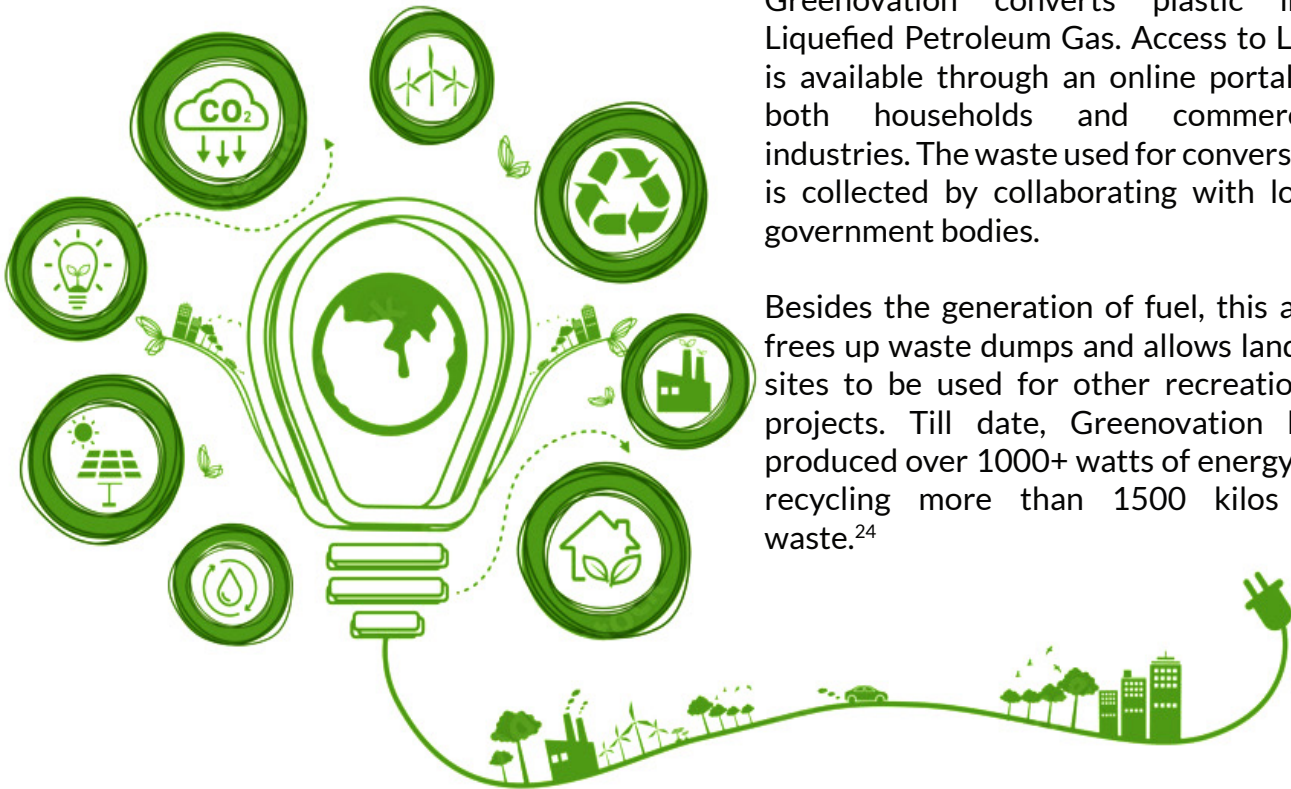
²² <https://enenttech.com/>

²³ <https://greentechwll.com/>

Greenovation

Pakistan's plastic recycling company, Greenovation converts plastic into Liquefied Petroleum Gas. Access to LPG is available through an online portal for both households and commercial industries. The waste used for conversion is collected by collaborating with local government bodies.

Besides the generation of fuel, this also frees up waste dumps and allows landfill sites to be used for other recreational projects. Till date, Greenovation has produced over 1000+ watts of energy by recycling more than 1500 kilos of waste.²⁴



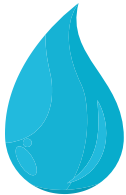
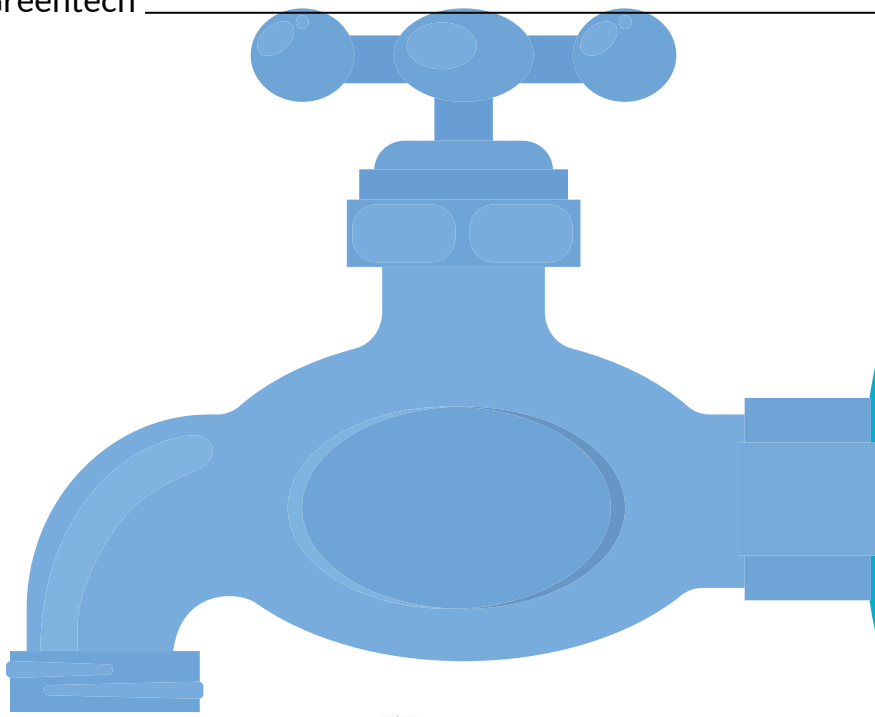
AquaCure (CIS)

AquaCure is a wireless Water Management system that uses a Supervisory Control and Data Acquisition (SCADA) system that addresses all water management related issues from water pumping tube wells through storage tanks to consumers by providing real-time data acquisition and control of water supply network.

It comprises of a sensory data acquisition and actuator network from inlets through to outlets of water supply network, thus any leak or malicious siphoning can be detected and reported in real time, without any delay and hustle to identify the fault location, saving water wastage and increasing service reliability.²⁵

²⁴ <https://greenovation.pk/>

²⁵ <http://cispvt.com/aquacure.php>



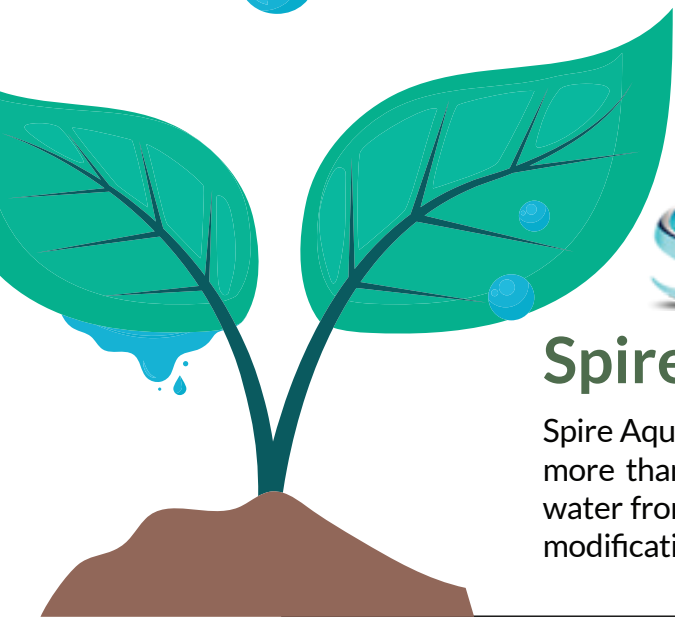
GeoAirCon

GeoAirCon® is the pioneer of ground sourced Climate Control technology in Pakistan. It utilizes temperate underground temperatures to dramatically cut down on Climate Control/ Air-Conditioning costs by 35% to 75% for industrial, commercial, residential and agricultural uses. Their indigenously developed low cost heat exchange technology is recognized nationally and internationally.²⁶



Spire Aqua Kit

Spire Aqua Kit is an IoT-based electro-mechanical kit that recycled more than 36,000 liters/ year of water at home by reusing grey water from washbasins, showers and baths without any structural modifications in the washrooms.²⁷



²⁶ <https://www.geoaircon.com/home>

²⁷ <https://www.teespire.com/product-spireaquakit.php>

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ABOUT THIS INDUSTRY ROUNDUP

Pakistan Software Export Board developed this paper by hiring services of independent consulting firms to prepare this roundup on Pakistan's GreenTech sector. The paper focuses on Pakistan-based companies in this vertical and apprises the reader of the expertise available in Pakistan in the GreenTech domain.

DISCLAIMER

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