



Capital University of
Science and Technology

Sustainability Report

2020-2021



Directorate of Sustainability and Environment

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Our Vision

To integrate resource conservation practices at CUST and to value and cherish nature that fosters the wellbeing of future generations through environmental sustainability.

Our Mission

CUST is engaged in going green and sustainability initiatives to ensure efficient resource conservation within the campus in the service of social responsibility to the planet and promote biodiversity that remains the answer to sustainable development.

Our Strategy

We strive to align our sustainability goals with the UN SDGs to build a stable natural environment. We aim to bring maximum change for the benefit of the planet and people through collaborating with disciplines and leading substantial pathways embedded with 4 R's of reduce, reuse, recycle, and rethink. In aligning with sustainability and environment commitments, CUST is dedicated to 6 key themes;

- ✓ Setting and Infrastructure
- ✓ Energy and Climate Change
- ✓ Water Conservation
- ✓ Research and Education
- ✓ Waste Minimization
- ✓ Transportation





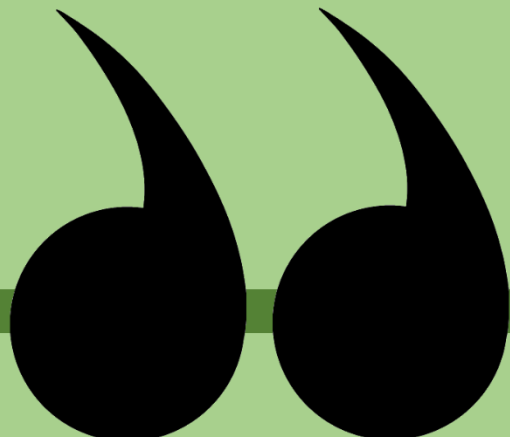
Message from Director

DSE initiative is aligned with the Sustainable Development Goals of the United Nation to promote environmental sustainability. CUST aims to fruition of clean and green drive by contributing to better tomorrows that it is privileged to serve. Efficient resources conservation using unique sustainable solutions is essential to social prosperity. DSE is highly committed to constructing an eco-friendly sustainable operating framework by incorporating environmental and social dynamics into processes of decision making. Becoming a sustainable and responsible educational institute not merely enhances our reputation but also enlightens a sense of pride to our students and faculty to be an integral part of an organization that cares for the planet. I believe that we need some of the world's greatest brains and minds fixed on trying to repair this planet.

Dr. Saira Ahmed

Director

Directorate of Sustainability and Environment



Introduction

Capital University of Science and Technology significantly contributes to implementing sustainable practices to address environmental issues. Front-runners of every department are collaborating for making the environment clean and green starting from engineering to business and social sciences. The aim is to encourage individuals to play a pivotal role in making the world a safer place for future generations through recycling initiatives and participating in free planting. CUST has been comprehensively engaged in extensive research, innovative teaching, and concrete environmental sustainability to ensure the availability and conservation of resources for future generations. Going green and sustainability has become the core value in campus action. The University is consistently making efficient investments in and taking significant steps for sustainability at the operational and programmatic levels.

The Directorate of Sustainability and Environment (DSE) is inclined to create sustainable strategies and leads those strategies and initiatives on campus physical infrastructure and programs in energy and climate, water conservation, transportation, and research and education. DSE empowers ambitious partnerships and collaborations that play a pivotal role in making the world sustainable.

All the university departments are integrated with DSE to ensure effective communication and collaborative works with them for the execution of sustainability-specific goals. The DSE focused key areas are communication, training, and education; assessments, evaluation, and reporting; events, campaigns, and talk; organizational effectiveness and infrastructural planning support. DSE emphasizes an economic model that focuses on the efficient use of resources and maximizing the product's life cycle.

Policies

Capital University of Science and Technology focuses on the going green and sustainability strategy to bring campus eco-system at equilibrium and ensure efficient utilization of resources. CUST has become a pillar and custodian in embedding sustainability in higher education through its dedicated teaching faculty. Students conduct comprehensive research to develop unique environment friendly solutions for making sustainable change. The going green policy also incorporates directing and inspecting human actions to take useful measures for mitigating adverse impacts on the natural resources and biophysical environment.

Currently, DSE is engaged in directing Waste Management, Recycling, and infrastructure that are aligned with its 6 key themes of sustainability.

Recycling Policy

Capital University of Science and Technology seeks maximizing the recycling of waste materials a top priority. The recycling policy is inclined towards substantial pathways embedded with 4 R's of reduce, reuse, recycle, and rethink. The waste management team uses a paper shredder which helps the institute to handle its paper waste effectively. Trash bins with labels of Plastics, Paper, Metals, etc., are placed within the campus, so the students and faculty can help the recycling team by pre-categorizing the waste to make the recycling process more efficient, fast, and easy.

Students also steered a cleaning drive at CUST where everyone gathered and picked up garbage and other plastic-related non-recyclable items and disposed them off. Not only did this make the university a cleaner place but it also spread awareness among the students and teaching staff to support our cause.

The recycling program also caught the attention of print and electronic media including Radio Pakistan and the director of DSE was invited to live broadcast her message on a live show at Radio Pakistan. The radio broadcasts have remarkably helped to spread the message of change which calls on the masses to become responsible members of society.



Waste Management Policy

Capital University of Science and Technology is committed to making sustainable environmental practices through effective resource management. The directorate of Sustainability and Environment (DSE) has proposed a waste management policy to contribute to the circular economy by eliminating toxic, organic, and inorganic waste from the campus. It's a pivotal initiative taken by DSE to significantly contribute to the SDGs of the United Nation at a local and regional level.



Solid waste plays a key role as a lot of waste ends up in the oceans and landfills which is causing problems for everyone by creating greenhouse gases (GHG) and increasing carbon emissions. Pakistan generates almost 48 million tons of solid waste per year which is increasing by the growth rate of almost 2.4% while the collection rate is only 60% which is also not being dumped properly. DSE-CUST is engaged in using multiple social media platforms such as Twitter, Instagram, and Facebook to create awareness not only among people on campus but also among individuals of twin cities for making the environment clean and green. This social media campaign is actively running with the chant of “Pick up-Clean up” with an aim of saving the Earth together. CUST waste management policy targets to adopt a ‘Base to zero approach’, achieve a recycling rate of 70 percent by 2023, and eliminate waste production by 10 percent by 2023 across the campus.

CUST Pedestrian Path Policy

Capital University of Science and Technology seeks to establish the Pedestrian path policy to accommodate pedestrians on campus and hence reinforcing the network. The master plan of campus has designed a framework by which the university can achieve the crucial research and academic mission of the institute while enhancing the life quality on campus, absorbing growth, and creating sustainable ethics. A keystone strategy of this pedestrian path framework is circulation and access within the campus. This policy is designed around an “integrated plan to circulation” that depends on well-utilized pedestrian networks. Besides reducing on-campus

vehicular traffic, means of active transportation even diminish greenhouse gas emissions and contribute to healthy lifestyles.

CUST has performed premeditated engineering and design efforts for supporting the pedestrian network viability on campus as a top priority. The university is facilitating and supporting on-campus pedestrian network through the following engineering and design efforts:

- At the design phase of the pedestrian path plan affecting paths and transportation on campus, engineering teams have identified ways to meet the pedestrians' needs. The Pedestrian Counseling Committee regularly reviews and provides input to pertain to pedestrians.
- As CUST is centrally located at Expressway so, the Pedestrian Counseling Committee has reinforced connectivity of bike routes outside campus premises through demarcating and evaluating connection points from Islamabad Expressway bike routes to entry points on campus.

The vehicle parking area on campus is developed and strengthened through car lanes, signage, shared lane markings, and bike boulevards.



CUST Parking Area Policy

Capital University of Science and Technology has designed a parking area policy to ensure efficient utilization of limited parking resources. All university faculty and students on the campus have to register their vehicles and must show a valid parking permit. Citations will lead to various Penalties and Sanctions such as fines and warnings. To mitigate vehicle traffic on the campus,

CUST has restricted entry of private vehicles to the campus except for unordinary circumstances. Also, parking spaces designated separately for faculty and students have been removed.

This policy aims to institute a formula of assigning parking permits grounded on the requestor's role on longevity and campus. The university seeks to close off-campus central areas to cars for cutting down on congestion. It will lead to a pedestrian-

friendly core campus. The university will use parking lots in the following ways:

- Cars must be parked merely in cars racks reserved by the university.
- Motorbikes must be parked only in bikes racks allotted by the university. They shall not be parked on sidewalks or lawns.
- Buses must be parked separately in buses racks to avoid vehicle congestion.
- Vehicles inadequately parked might be subject to the removal of a locking device.
- All vehicle operators intending to avail the campus parking facilities are required to register themselves for a parking permit to permanently affix to the vehicle.



CUST Day Care Center

Capital University of Science and Technology has taken a substantial step to facilitate employees and female students by offering daycare facility at the campus. This dedicated daycare access has significantly diminished the childcare burden on mothers. The facility seemed to be quite beneficial especially during COVID days in which front-liners were engaged in serving the humanity on campus and enrolled their kids in the daycare center. CUST Day Care Centre welcomes a nurturing, safe, stable, and inclusive environment where children can learn and grow.

Wellbeing Centre

Capital University of Science and Technology has created a dedicated hub for the well-being of students and faculty. The wellbeing center offers an array of welfare services to support students and staff throughout their university hours. The purpose is to provide psychological, social, and therapeutic support to the CUST community seeking health services. Wellbeing hub has a pharmacy and a full-time general practitioner responsible for healthcare assistance.



CUST Construction & Renovation Policy

Capital University of Science and Technology promotes stewardship to plan, design, construct and maintain the physical environment of the university. The purpose is to become sustainable, aesthetic, enduring, and contextual to protect the safety and welfare of the university community. The construction and renovation policy of CUST include:

- Improvement, alterations, or renovation of existing facilities within the campus.
- Modifications in utility systems such as heating, plumbing, air conditioning, gas, air, electrical, etc.
- Installation of major equipment that requires utility connections.
- Window coverings, floor coverings, furnishings, and interior decorating.
- Program planning, development, and facility design.
- Cost estimates or feasibility studies on construction and renovation.

Only authorized contractors are hired for such services to ensure compliance with campus standards. All vendors/contractors commence the contractual work after signing a contract for campus projects. Despite the contract amount, CUST management can request bids on a particular construction project. This policy seeks risk mitigation for the CUST associated with campus renovation, construction, and property maintenance as well.

Implementation of the Sustainable Development Goals



NO
POVERTY



ZERO
HUNGER



GOOD HEALTH
AND WELL-BEING



QUALITY
EDUCATION



GENDER
EQUALITY



CLEAN WATER
AND SANITATION



AFFORDABLE AND
CLEAN ENERGY



DECENT WORK AND
ECONOMIC GROWTH



INDUSTRY, INNOVATION
AND INFRASTRUCTURE



REDUCED
INEQUALITIES



SUSTAINABLE CITIES
AND COMMUNITIES



RESPONSIBLE
CONSUMPTION
AND PRODUCTION



CLIMATE
ACTION



LIFE
BELOW WATER



LIFE
ON LAND



PEACE, JUSTICE
AND STRONG
INSTITUTIONS



PARTNERSHIPS
FOR THE GOALS



No poverty is the first sustainable development goal defined by the United Nations. It focuses on eradicating poverty and bringing prosperity to society. The Capital University of Science and Technology has contributed tremendously to achieving this goal. There is a separate department known as “Volunteer in Service” that is striving hard to contribute to society to eradicate poverty and bring equality.

The event on the theme of “Mall of Humanity” was organized by the volunteers in Service (VIS) CUST and Helping Hand for Relief and Development. This event was held on Sunday- 25 October, 2020 at Gojra, Faisalabad. VIS Directorate organizing such activities and engaging the students in community service to give them flipside of real world as this has been reflecting in the vision of CUST Leadership. Team of Tabdeeli society and Manager VIS Directorate-CUST managed the event professionally. More than 500 families benefited from this event.





Zero hunger is the second sustainable development goal defined by the United Nations. This goal serves the purpose of seeking sustainable solutions to wipe out hunger and achieve food security. Students of CUST have completed their research projects to significantly contribute in this cause and eradicate hunger from the society. The projects directing to zero hunger include:

- Identification of stress induced miRNA and their targets in *Solanum tuberosum* by computational approaches.
- Bioremediation potential of high lead tolerant bacteria in reducing salinity.
- Chromium reduction and plant growth promotion by *Staphylococcus aureus* in wheat.

Good health and wellbeing are the third important sustainable development goal identified by the UN. It aims to promote wellbeing and a healthy lifestyle for all at all ages. This goal addresses all vital health priorities to ensure sustainable development by 2030. The Civil Defense comprehensive training three days' sessions were organized by VIS Directorate, CUST with collaboration of Office of the Chief Commissioner, Islamabad on 05, 06 and 07 October, 2020 at CUST.



Following all SOPs regarding Covid 19, the faculty and students of CUST participated in this training session.

The First Aid comprehensive training three days' sessions were organized by VIS Directorate, CUST with collaboration of Office of the Chief Commissioner, Pakistan Red Crescent (FCB) on 28, 29 and 30th September, 2020 at CUST. Trainers taught students important measures to be taken in first aid to a victim of an open wound.

VIS Directorate organized the on-campus ceremony (complying to Covid-19 protocols) with Al Khidmat Foundation on February 25th, 2021 to honor the best volunteer students from Capital University of Science & Technology.

Health and safety (H&S) awareness and training sessions were arranged for students. The first aim of the training was to save life. The second aim was to prevent the person condition from worsening. The third aim was to help the person recovery.

Also, DSE has organized awareness campaign on FM 97.6 regarding pandemic. Face book page was launched by Bioscience's students for spreading awareness of COVID 19, precautions, and scientific progress. Students actively participated in it and not only shared scientific knowledge but also shared motivational storied related to recovery from disease.



Quality Education is the fourth key sustainable development goal identified by the UN. The agenda is to provide free primary and secondary schooling to all boys and girls by 2030. Also, to eliminate wealth and gender disparities through achieving global access to quality education. There was a MoU renewal ceremony between VIS-CUST and Taaleem Foundation at their premises in Islamabad on October 01, 2021 to primarily focus on Education sector.

Teaching faculty has participated in QEC summer trainings on “faculty development program and skills and course content development from Aug-Sept, 2021.



Gender Equality is the fifth SDGs set by the United Nations to empower women and end gender discrimination through social cohesion. This goal substantially focuses on providing girls and women with equal access to healthcare, education, and representation in economic and political decision-making processes. A long track record of voluntary services to society showed that Al-Khidmat Raazi Hospital, Islamabad is one of the most appropriate partners for VIS-CUST that will provide equal placement opportunities to both male and female students



J.S Foundation has offered VIS-CUST to organize blood screening camp in the Campus during each semester. The students of concerned faculties i.e., Pharmacy and Health & Life Sciences will be given priority to assign them Jamila Sultana Foundation, Rawalpindi for VIS. So, male and female students will be treated equally for placement.





Clean Water and Sanitation is the sixth key sustainable development goal set by the United Nations. The purpose is to ensure safe drinking water to all communities through investing in hygiene and sanitation facilities that will restore aqua ecosystems. Student on campus have conducted research on water sustainability and completed their thesis work on 2 key issues i.e.

Bioremediation of lead contaminated water in surroundings dying industries, and Waste water treatment strategies as an opportunity to produce cheap fuels.

As part of sensitizing society towards sustainable actions and building industry-academia linkages, Capital University of Science and Technology (CUST) which is situated in the midst of the River Soan and the Kahuta Road, plans to seek corporate collaboration with Pakistan's leading telecom multinational, Ufone-Pakistan Mobile Telecom Ltd. The environmental-friendly hi-tech project is designed by the Directorate of Sustainability and Environment at CUST to determine the spatiotemporal patterns in water quality of River Soan. A total of 26 sites shall be surveyed along River Soan and its associated tributaries during pre- and post-monsoon seasons. It is worth mentioning here that all data will be stored on cloud via Ufone's data and internet devices. We will be uploading real-time data and assessing it using Ufone's latest high spectrum 4G internet.

The 5 main indicators of water quality that shall be stored via Ufone's cloud support shall be dissolved oxygen, PH levels, temperature, salinity and nutrients (nitrogen and phosphorus).

Affordable and Clean Energy is the seventh SDGs defined by the United Nations to invest in renewable energy and ensure global access to reliable and affordable energy services by the year 2030. CUST is focused on providing energy efficient, sustainable and environment friendly solutions to the several interdisciplinary problems to improve the quality of environment. Department of Mechanical Engineering is currently working on providing affordable and clean energy to communities.



Decent Work and Economic Growth is the eighth sustainable development goal identified by the United Nations that aims to promote productive employment, sustainable economic growth and decent work for all. Office of Research Innovation and Commercialization (ORIC) under the mentorship of Vice Chancellor initiated the concept of incubation Center at CUST. The purpose was to help CUST students and Alumni initiate new startups and develop their business by providing facilities like workspace, high speed internet, mentoring, and training.

ORIC is also providing technical and legal documentation support to these startups to get registered at Securities & Exchange Commission of Pakistan (SECP). Currently 05 startups are working at the CUST Incubation Center (CIC).

ORIC arranged a workshop on Freelancing to provide sufficient knowledge to develop their startups and sustain during pandemic.





Industry, Innovation and Infrastructure is the ninth SDGs specified by the United Nations. The aim is to encourage research and innovation and technology development in developing countries. Students of CUST has organized a Disease-Free Tissue culture Potato Tuber propagation in which they were involved in collection of seeds from different areas of country from oilseeds crops for future selection of elite genotypes.

The summit was organized by CUST to shed light upon the topic “Branding Pakistan: Complementarity through development of innovative export market of Sialkot”. The speakers in this summit were from renowned institutes of Pakistan as well as from CPEC.

Students of electrical engineering have completed their research project on ‘Water Irrigation System using PLC Design and analysis of thermal power fluctuations of damping unit for waste heat recovery’. The aim of this project is studying the effect thermal fluctuations of industrial waste heat on thermal energy storage using phase change materials. This project will help to establish the effectiveness of latent thermal energy storage systems in different industries in Pakistan.

Reduced Inequalities is the tenth SDGs defined by the UN to bring transformative change. It primarily focuses on reducing the inequalities at all levels including ethnicity, gender, age, income, disability, religion, origin and economic status. Students of Computer Sciences department have completed their final year project on “Smart wheel chair for disabled”. This project has been donated to the special student of CUST, who is unable to walk. The purpose is to design and implement a system that allow users with the feature of gesture control which use hand gesture recognition technology to improve users experience. User can use simple gesture to control the device without physically touching them. The designed system also has provision of joystick for special person who can easily move his/her hand.



Sustainable Cities and Communities is the eleventh vital sustainable development goal set by the United Nations. It aims to enhance the cities and make them sustainable. Promoting Sustainable development in Civil Engineering Practices has been a major concern for the CUST. Comprehensive research has been conducted on green materials, cement replacement materials, plastic waste as construction materials, net zero energy buildings, building simulations for energy conservation, green infrastructure developments, carbon footprint assessments etc. One of the major contributions from CUST come from its series of “Sustainability conference”, an event organized on yearly basis.

Multiple research projects have been completed by our students to ensure sustainable development and communities. These include ‘Automatic rotary bike parking system’ that will solve a problem by parking more bikes in less space, ‘Design and development of wall climbing robot for rough and irregular surfaces’, and ‘Design and manufacturing of levitating frictionless vertical windmill’ that can effectively implement in urban areas to provide green energy, effective utilization in street / domestic lighting and domestic appliances.

Responsible Consumption and Production is the twelve important SDGs specified by the United Nations. The purpose is to encourage efficient utilization of resources through sustainable practices. CUST is taking vital measures to encourage youth to contribute to the circular economy in Pakistan. A circular economy maintains a balance between input and output to maximize the efficient use of resources. Students of bioinformatics and biosciences completed their final year project on 'Influence of role Genes for Enhanced Biosynthesis of Potent Natural Products.' This project is a significant step towards the 'Base to zero' approach that depicts all entities should be aligned towards sustainability by 2050. This project also includes an economic model that focuses on the efficient use of resources and maximizing the product's life cycle.



Climate Action is the thirteen key sustainable development goals defined by the United Nations. This SDGs vision is to integrate measures of climate change into national planning and strategies to boost resilience. DSE is playing a significant role to become a pillar and custodian in embedding sustainability in higher education. The vision of inclusion of disabled youth should be encouraged specially to promote the importance of climate change in artificial intelligence. DSE has conducted the tree plantation drive in campus to preserve biodiversity. DSE has composed an article on Climate Change that reflects the evolution of research in the field of climate change which affects the marine life by carrying out the comprehensive assessment of usage of different communications elements and its process.

The implication of the results in the study contributes to the direction of future research in the discipline of climate change impacts on marine ecosystem and the importance of the process and elements of communication, and the importance of Aristotle strategy and paraphrasing. In this article material flows as well as biogeochemical cycles, eventually impacting the overall ecosystem functioning and services upon which people and societies dependence.



Life below Water is the fourteenth SDGs set by the United Nations to restore and protect ecosystems. Department of mechanical has engineering significantly contributed towards ocean engineering and has recently published a journal on “A use case of exclusive economic zone of Pakistan for wave power potential estimation”. The study primarily focuses on Ocean waves with continuous energy flux that can contribute to universal energy production. In this paper, a strategy is devised to estimate wave power potential for a developing country. Pakistan is considered as a use case on the basis of less renewable energy share and facing energy crises. The wave energy has its advantages of renewable, non-polluting and large storage; however, the technological solution to extract energy from oceans is still at early stages.



Life on Land is the fifteenth sustainable development goal defined by the UN to promote sustainable forests management and stop biodiversity loss. DSE has conducted a plantation drive to participate in the Clean Green Pakistan campaign. The campus has an animal house for the production of mice for research purposes. The facility is well equipped to produce animals for research experiments.

The Botanical Garden is located beside the pharmacy department and managed to grow medicinal plants for research purposes. Currently, we have several medicinal plants here including *Solidago virgaurea*, *Aloe vera*, *Salvia officinalis*, *Thymus vulgaris*, etc.

Moreover, a Seeds distribution campaign was arranged by the Faculty of Pharmacy, CUST. Basil leaves were distributed in small envelopes with a label upfront to help in planting the seeds. Basil leaves were chosen because of their high adaptability in any environment and due to their high medicinal values. After the launch of the project “Micro propagation of economically significant crops” Department of Bioinformatics and Biosciences, CUST has established and optimized culture room for incubation and culturing of sterile plants. Optimized temperature, light period/photoperiod and humidity conditions were set for efficient growth of sterile plants.



The Department of Bioinformatics and Biosciences has initiated the process of isolation of probiotics from several food materials namely, fermented fruits, vegetables and milk. These isolated strains have been tested for their probiotic nature with the aid of several biochemical tests. These strains can be restarted and cultured for the provision of probiotics to several biotechnology companies.



Peace, Justice and Strong Institutions is the sixteen sustainable development goal specified by the United Nations. This SDG seeks to promote inclusive and serene societies to overcome conflict and bring justice. The commemoration event was arranged by the Directorate of Sustainability and Environment (DSECUST) to celebrate the international ranking of CUST in UI Green metrics 2020.



The seventeenth and the last SDGs are Partnerships for the Goals that aim to strengthen equitable trade and revitalize the global partnership to promote sustainable development. CUST is engaged in partnerships with various institutes in the development sector to develop a strong bond with the community. There was a MoU renewal ceremony between VIS-CUST and Rifah Trust in CUST campus. The Trust mainly focused on Education, Health and Technical Trainings sectors.

The VIS Directorate-CUST principally renewed MoU with the NGO World for three years and it was decided that thirty (30) students will work with The NGO World as volunteer in every semester. The purpose is to strengthen coordination with VIS-CUST volunteers and engage them properly. The NGO World director showed his keen interest to hire CUST graduate as intern in his organization and for this purpose VIS Directorate-CUST played a mediator role between VIS-CUST Placement office and TNW.

As part of the partnership drive of VIS-CUST, there was a MoU renewal ceremony between VIS-CUST and Al-Khidmat Raazi Hospital. The students of concerned faculties i.e., Pharmacy and Health & Life Sciences will be given priority to assign them Al-Khidmat Raazi Hospital, Islamabad for VIS.

Islamabad Model School for Boys (IMSB), Banni Saran is a formal partner of VIS-CUST to depict the voluntary services to VIS-CUST for coordination with Directorate of Education Islamabad. Around 46 CUST volunteers provided free education to deserving community in slum area of Islamabad.



CUST is paying close attention to implement environmental sustainability for going green. We strive to participate in the ongoing national dialogue and seek to anticipate the steps required to deal with new challenges.

The logo features the words "GO GREEN" in a bold, sans-serif font. "GO" is in a darker green and is positioned above "GREEN", which is in a lighter green. The letters have a slight 3D effect with shadows. Several stylized green leaves are scattered around the text, with some appearing to grow from the letters themselves.

GO
GREEN

There is no planet B!