SDG 13: CLIMATE ACTION

Ziauddin University pledge to achieve sustainable goals in all their activities therefore, University plays their role to provide all support to create a healthy and sustainable environment by providing support participation to bring good change for climate as climate change is a crisis that will affect every part of society, and every country. Ziauddin University forefront their action to reduce the impact of climate change by working on climate issues through practices, low carbon use and education.

- **Low carbon energy used:**

Ziauddin University implemented energy efficient appliances in the entire University, to be recognized as the icon of the innovative, leading-edge educational institute that endeavors to international sustainability efforts for the Environment, Economy, and Equity.

The energy efficient appliances usage included Solar panels, R.O plant, HVAC, smart Heat Exchanger, centralized cooling system, Splits/ AC Inverters, LED lights, Energy Savers and many other equipment for minimizing the electrical energy consumption in the campus.

No.	Name	Place	Automation			Safety				Energy		Water		Indoor Enviironment				Llighting		Building Area (m^2)
			B1	B2	B3	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	
1.	**Ziauddin University North Site**	Karachi, Pakistan	x			x	x	x	x	x	x	x	x	x	x			x		34452.40
2.	**Ziauddin University Clifton Site**	Karachi, Pakistan	x	**x**	**x**	x	x	x	x	x	x	x	x	x	x	x		x		39451.18
3.	**Ziauddin University LinkRoad Site**	Karachi, Pakistan	x			x	x	x	x	x		x		x	x	x		x		28710.6
4.	**Ziauddin University KDLB Site**	Karachi, Pakistan	x	**x**	**x**	x	x	x	x	x		x		x	x			x		9580.64
5.	**Ziauddin University Sukkur Campus**	Sukkur, Pakistan	x			x	x	x	x	x	x	x		x	x	x		x		33315.36
	Total																			**145510.18**

Smart building implementation

$$= \frac{total\ smart\ building\ area}{total\ building\ area} \times 100\%$$

***Total Building Area:**

$$= \frac{145510.18\ m^2}{145510.18\ m^2} \times 100\%$$

$$= \mathbf{100}\%$$

Ziauddin University is striving hard to be recognized as the icon of the innovative, leading-edge educational institute that endeavors to international sustainability efforts for the Environment, Economy, and Equity. One of the very important key elements of sustainability is smart building implementation. Ziauddin University is implementing the concept of smart building with smart and energy-efficient appliances, smart security system, indoor environment and automation system that include the CCTV, Fire Extinguishers, Smoke Detector, Hand scanners & VHF Sets for smart security systems.

Solar panels, R.O plant, HVAC, smart Heat Exchanger, centralized cooling system, Splits/ AC Inverters, LED lights, Energy Savers and air dryers and many other equipment for minimizing the electrical energy and carbon footprint with complete automation and security in the campus.

- **Renewable Energy consumption to reduce the carbon:**

At Ziauddin University Link Road Site (Educational City), we had a total of 5 inverters of 127KW installed in the system. These inverters are connected to 404 solar panels installed on the parking lot. In 2021, we have more solar installed at the cafeteria and for street lights. Now, 127KW capacity has been extended to **225 KW** at the Link Road site.

Another **250KW** Solar Installed at Ziauddin University KDLB, Kemari Site. **51 KW** installed at Ziauddin University Boat basin site. **51 KW** installed at Ziauddin University North Site. **110 KW** solar installed at Ziauddin Sukkur Campus. **3 solar of 10 KW** are installed at multiple sites at Ziauddin University Clifton.

ZIAUDDIN UNIVERSITY

- **Educational Programmes on Climate Change:**

1. Session & Seminar on Sustainable Development Goals (SDGs)

Ziauddin University, Faculty of Nursing and Midwifery Community Stream organized Two-day activity on 'Sustainable Development Goals (SDGs)' on July 4th-5th, 2022 for students of BSN I and IV years who are future nurses. On the first day, Dr. Atif Anjum and Madam Farhana briefed students about the background and significance of SDGs. On the second day, Madam Farhana and Major Sadia Kanwal taught students about SDGs and gave them new ideas about what would they need to do and how would they work in the community. In this 2nd-day seminar, 210 participants including the faculty members and students attended the session. All participants made us proud and committed that they will work hard to achieve SDGs.

2. Exhibition & Poster Competition 2022

The 1st Eastern Medicine Exhibition and Poster Competition 2022 organized by College of Eastern Medicine, Faculty of Eastern Medicine and Natural Sciences was held on Wednesday October 12, 2022. Projects and posters (27) were presented by BEMS students from 1st to 4th year. Faculty members from different department of the University. Students from different department of the University. The overall idea was to promote project-based learning as an effective tool for students.

3. Participation in Research & Technology Expo

Highlights from 1st research and technology showcase organized by NEDUET and Sindh HEC it is being held at the expo centre on 19th and 20th May 2022. Data Acquisition, Processing and Predictive Analytics Lab (NCBC), Ziauddin University presented their Projects at the event.

4. ZU Dialogues: Global

Ziauddin University organized a ZU dialogue web series on Global Warming from Climate change to climate crisis Dr. Zulfiqar Umrani Director sustainability office host the event as a moderator.

- **Climate Action Plan with local government:**

Collaboration of ZU with Sindh Forest Department (SFD) For Urban Forest Tree Plantation

Ziauddin University is highly focused on green implementation that is why they have developed a horticulture department who is responsible for forest vegetation, planted vegetation and green house plantation etc. They are working day and night to make the environment clean and green.

Ziauddin University's innovative program(s) on climate change is **Forest Plantation** to all of their campuses nationwide. ZU has 2 campuses and 4 sites in three big cities of Pakistan (Karachi, Sukkur & Islamabad) and in two provinces (Sindh and Punjab), their geographical region belongs to the agricultural sector. All of the sites and campuses of Ziauddin University are striving hard to make the climate clean at national level.

They also make collaboration of ZU with Sindh Forest Department (SFD) which is under the Green Pakistan Programme for Urban Forest Tree Plantation. In this Collaboration SFD will provide environment friendly plants, labor and technical assistance, guidelines and protection of provided plants to the land of Ziauddin University Link Road Site, Educational City Ziauddin University is providing their land for the plantation on a large scale. ZU will provide water and proper maintenance to Urban Forestry Plantation for the surrounding community.




Urban Forest plantation at Ziauddin University Sukkur Campus, Sukkur City, Sindh


Urban Forest Area marking for plantation at Ziauddin University Clifton-Karachi City, Sindh.

ZIAUDDIN UNIVERSITY

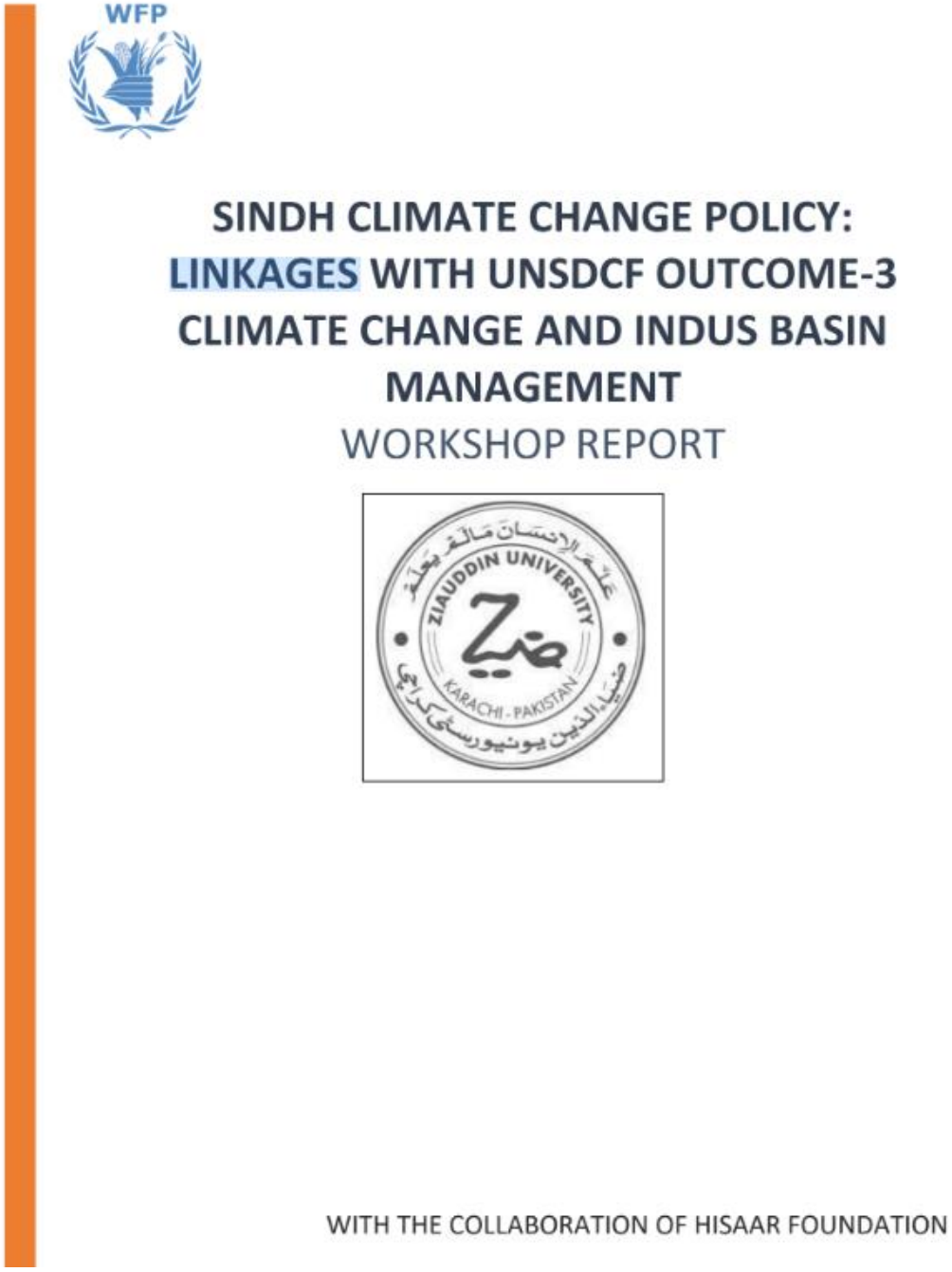
Urban Forest plantation in Collaboration with Sindh Forest Department at Ziauddin University Linkroad, Education City, Sindh

Urban Forest Plantation at Ziauddin University Islamabad Campus, Islamabad City, Punjab

Example of University program on Climate Change: Ziauddin University collaboration with Sindh Forest Department (SFD) for Urban Forest Tree Plantation

- **Co-operative planning for climate change disasters**

Ziauddin University collaborated with many non-governmental organizations for working related to sustainability and achieved SDG goals by implementation at our university. Dr. Zulfiqar Umrani, Director Sustainable Office has collaborated with WFP and Hisaar foundation for policy making on climate change. He also provides his views on policy making. The workshop report of draft policy was shared with WFP for final review and approval.



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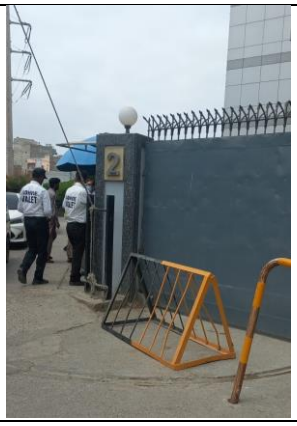
- **Commitment to carbon neutral university**

University focuses to implement all its activities and infrastructure to be carbon- free that is why it is practicing all the three scopes of carbon emission in our university. The example of gas emission reduction program following at our university are as follows:

Scope 1 Examples: University Fleet to reduce burning fuel from vehicles



1. Pedestrian Friendly Campus designed with Multiple entrances of building to reduce private vehicle inside the campus which directly reduces fuel burn from the vehicles.


2. Campus to Campus Shuttle Service to reduce carbon emission from private cars.

ZIAUDDIN UNIVERSITY

Scope 2 Example: Renewable Energy Sources (Solar System) is an indirect source to reduce gas emission by low energy purchased

Scope 3 Example:

1. Rideshare (Carpool) designed to encourage commuters to adopt healthy and sustainable transportation

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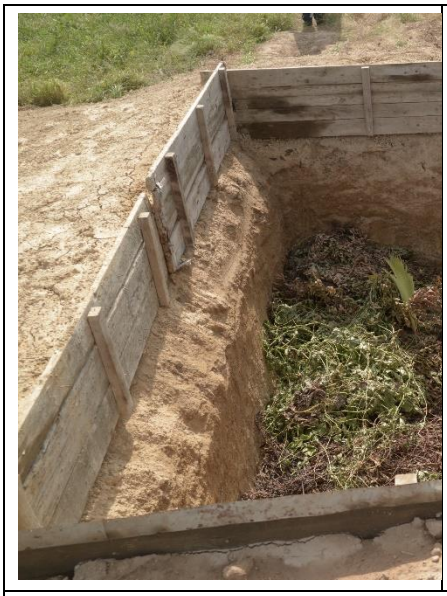




Scope 3 Example: 2.Example of Waste Disposal at Ziauddin University

Examples of Greenhouse gas emission reduction program at Ziauddin University

ZIAUDDIN UNIVERSITY

- **Innovative Programs in Energy & Climate Change:**

S. #	Innovative Program on Energy & Climate Change
1	**Program: Renewable Energy Generation using Vertical Axis Wind Turbine** **Scope (international / regional / national / local / etc.):** local **Description:** Ziauddin University Faculty of Engineering Science Technology & Management, Department of Electrical Engineering participated in the Pakistan Sustainability Week and present their project on "Renewable Energy Generation using Vertical Axis Wind Turbine". The project won the second prize in the Alternative Energy domain. **SDG:** Primarily focusing on United Nations Sustainable Development Goals SDG-7: Affordable and Clean Energy and SDG-9: Industry, Innovation, and Infrastructure. 
2	**Program: Urban Forest Plantation** **Scope (international / regional / national / local / etc.):** National **SDG:** Primarily focusing on United Nations Sustainable Development Goals SDG-13: Climate Action **Description:** Ziauddin University is highly focused on green implementation that is why they have developed a horticulture department who is responsible for forest vegetation, planted vegetation and green house plantation etc. They are working day and night to make the environment clean and green. ZU is planting environment friendly plants

on large scale to all of their campuses with regular maintenance to make the environment clean and green for their surrounding communities.

ZU Clifton Site

ZU Linkroad Site, Educational City

ZU Sukkur Campus

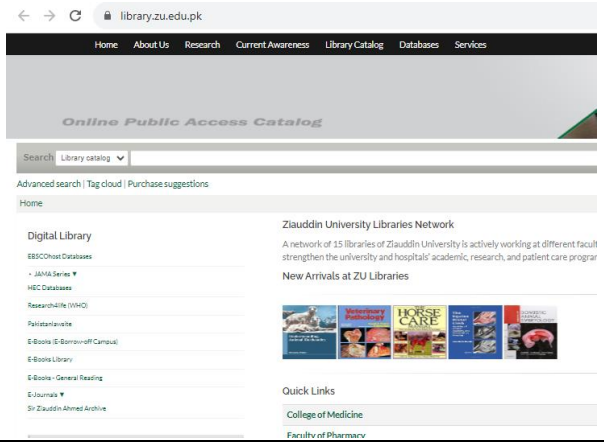
ZU Islamabad Campus

3

Program: ZU Digital Library

Scope (international / regional / national / local / etc.): National

Description: The digitalization of our university's library is a truly innovative initiative with a profound impact on sustainability, energy conservation, and climate change mitigation. By transitioning to a digital library, we significantly reduce our reliance on physical resources, thereby conserving energy and reducing our carbon footprint associated with printing, transportation, and paper production. This forward-thinking approach not only enhances resource efficiency but also enables remote access to educational materials, reducing the need for travel and lowering greenhouse gas emissions. It contributes to a more sustainable future by aligning our institution with the principles of energy efficiency and environmental stewardship, making it a vital component of our commitment to addressing climate change and fostering sustainability in the academic community.



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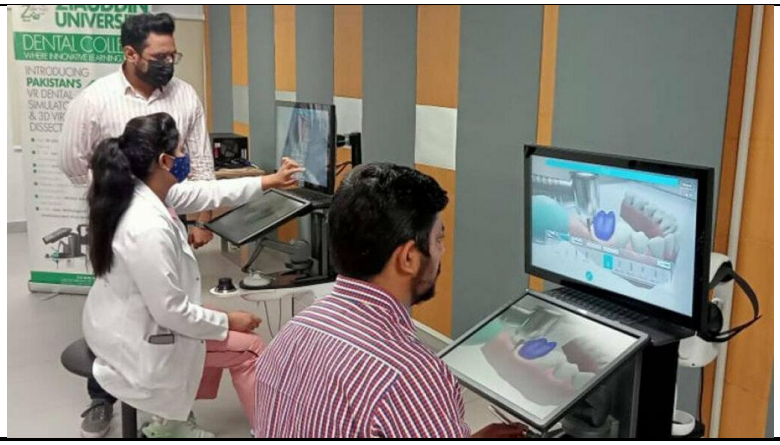
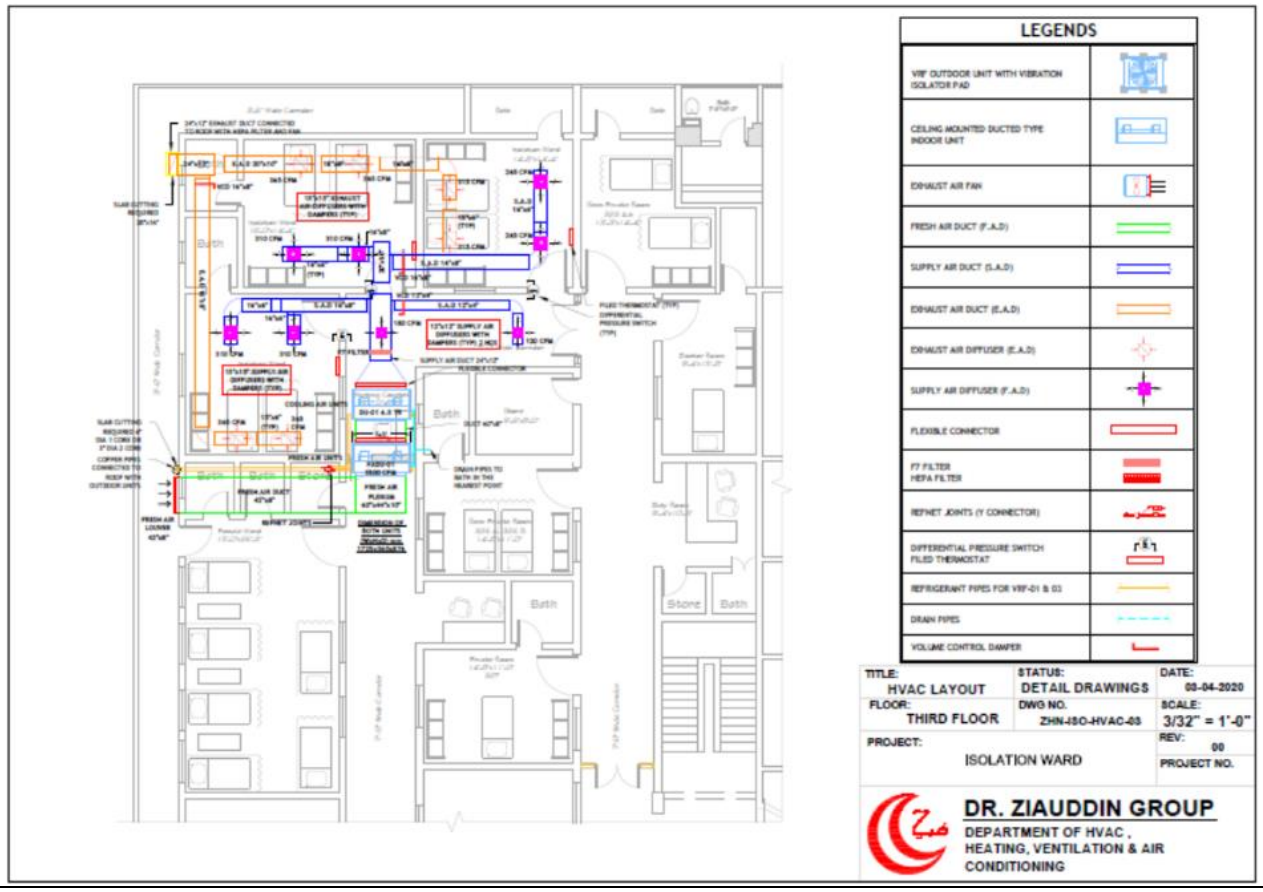
4	**Program: VR Dental Simulator are Example of Cut Down usage of Chemicals to Control Water Pollution** **Scope (international / regional / national / local / etc.):** local **Description:** Ziauddin University is very much concerned about sustainability in all its operations. Virtual Simulator allows students to refine their clinical skills in a sustainable manner. It helps student to scan simulated patient's mouth as if it was done manually then many toxic chemicals could be used to stop spreading germs. Therefore, use of technology in terms of VR Simulator helps to contributing sustainable environment and become a major source to control water pollution. To cut down usage of chemical and control water pollution ZU has launched the Virtual Reality Dental Simulation Lab, on November 25 2021. This is the first time such a lab has been made in Pakistan. VR simulation training is now a part of the ZU Dental undergraduate curriculum. This dental simulator training will help students excel in their professional skills before starting dental procedures on patients and also reduce the use of chemicals in training and preserved water and marine life. **Photos:**  
5	**Program: Anatomy 3D Virtual Dissection Table is an Example of Cut Down usage of Chemicals to Control Water Pollution** **Scope (international / regional / national / local / etc.):** local **Description:** Sustainability in all its operation is the foremost goal of Ziauddin University. To preserve cadavers in the anatomy lab formaldehyde is used and its toxic vapors are not hazardous for environment only but also impact human's life, not only this but it's a major source to pollute climate. To keep these potential hazardous in view and to minimize the or no use of chemical in anatomy labs which cause pollution, Ziauddin University stepped up and introduced a 3D Virtual Dissection Table, Anatomage; a powerful tool that will allow students to dissect complex structures with their fingers. The Anatomage Table and Digital Anatomy Lab inaugurated by Dr. Asim Hussain, Chancellor Ziauddin University makes Ziauddin University a technology leader not only in Pakistan, but in South Asia. Anamotage, designed with the latest 3D technology, allows students to visualize every structure of the body in great anatomic detail with also reduce the use of chemicals in training and preserved land, water and marine life    

6	**Program: Radio show/Webinar / ParentTraining Series & Online Meetings** **Scope (international / regional / national / local / etc.):** International/ Regional **Description:** Introducing webinars and online meetings at our university is a forward-thinking and innovative approach with broader implications for sustainability, energy conservation, and climate change action. By offering webinars, we're reducing the need for physical meetings and conferences, which often involve extensive travel and energy consumption. This not only minimizes our carbon footprint but also encourages more sustainable practices by reducing our reliance on transportation and energy-intensive event logistics. Additionally, webinars provide a platform for discussing and disseminating knowledge on sustainability, clean energy, and climate change, fostering awareness and education within and beyond our community. As we embrace this modern learning and communication method, we're simultaneously advancing our commitment to sustainability, energy efficiency, and the fight against climate change. **Photos:**   
7	**Program: ZEE Solar Cafe**

	Scope (international / regional / national / local / etc.): local **Description:** Ziauddin University prefers sustainability in all their operations and activities. One of their initiatives is covering Cafeteria shades with solar panel roofs. Such technology would reflect heat from the sun and use the sun's energy to power buildings and electric appliances. We think we have a multipurpose product that can provide shade to students from burning heat of sun and also generate renewable electricity and can change the view of a grey, empty space or old-style parachute Umbrella into a nice architectural function.  
8	**Program: Solar Parking** **Scope (international / regional / national / local / etc.):** local **Description:** Ziauddin University prefers sustainability in all their operations and activities. One of their initiatives is covering parking lots with solar panel roofs. Such technology would reflect heat from the sun and use the sun's energy to power buildings and electric appliances. We think we have a multipurpose product that can cover our cars, generate renewable electricity and can change the view of a grey, empty space into a nice architectural function.  
9	**Program: Solar Street Lights** **Scope (international / regional / national / local / etc.):** local **Description:** After successful implementation of Solar Parking and Solar Café Ziauddin University started a new chain of sustainability develop with the initiative of Solar Street lights**.** Such technology would reflect heat from the sun and use the sun's energy to bright the streets at night. We replaced all our old traditional street lights into new solar street lights in our Sukkur Campus and Link Road site. Which are not only attracted but also save our energy consumption. These street lights also help residents to move from surrounding without fear of darkness.   
10	**Program: Smart room sterilization / Airborne Infection Isolation (AII) Rooms**

Scope (international / regional / national / local / etc.): Local

Description: To maintain the sustainability and reduce the spread of air pollution Ziauddin University has designed Smart Sterilization Rooms in their hospital to avoid the spread of infectious and spreadable disease from one patient to other patients. Smart Sterilization Room used to reduce the spread of airborne infectious diseases such as TB, Covid-19, influenzas, Pneumonia etc. from the patient in the AII Room to the rest of the hospital or University. There are also innovations in room sterilization using UVC rays for biological pollutants attached to the surfaces such as benches, floors, and walls. UVC wavelengths can be remotely regulated so they can be used for multi-organic sterilization of pollutants (biological pollutants).



11

Program: Multi-Parameter Environmental Monitoring Device

Scope (international / regional / national / local / etc.): local

Description: Environmental monitoring is a critical issue of the world these days. Pakistan; the 5th highest a populated country faces challenges due to the polluted environment. With ever-increasing traffic and industrial requirements, pollution is growing at a fast pace in almost all of the big cities in Pakistan. Karachi, being the metropolitan city and the country & industrial hub is facing environmental pollution more vehemently. To overcome this issue many indoor and outdoor environmental devices are available in the market with limited sensors.

Our system is a fusion of the internet of things (IoT), Wireless Sensor Node (WSN), and Big Data & cloud computing. The system comprises hardware and software, whereas the hardware module includes multiple sensors like Temperature, Humidity, Particle Sensor (2.5 and 10mm), carbon-di-oxide, oxygen and voice sensor for environmental monitoring. Furthermore, to identify the exact location of polluted areas, a GSM

module is integrated in the system. In addition, the system is able to calculate and monitor the Air Quality Index. The whole system is integrated with a data center to store the live data; however, a web-based application is also developed to monitor sensor reading.