# VISHWAKARMA UNIVERSITY

## SDG 7 REPORT 2020


SUSTAINABLE DEVELOPMENT GOALS

VU VISHWAKARMA UNIVERSITY
*Maximising Human Potential*

University Grants Commission (UGC) Approved State Private University


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*Maximising Human Potential*

# About This Report

The United Nations "Transforming our World: the 2030 Agenda for Sustainable Development" which includes the 17 Sustainable Development Goals (SDGs) has great importance and significance to universities. The SDGs provide for a shared global vision towards sustainable development for all. Vishwakarma University (VU) firmly believes in the vital role that universities can play in the achievement of the SDGs, and has ingrained this aspect in all of its strategies and operations. As encapsulated in its motto - maximizing human potential, VU, since the year of its inception, has worked endlessly towards creating an enabling environment to ensure the wholesome development of its students - preparing them for life and livelihood.

VU has embarked on an exciting journey to transform the VU Campus to become an EcoCampus, which will be a testbed for innovative sustainability solutions for the future. The vision of the VU EcoCampus is to develop VU as "a global Sustainability thought leader, committed to contributing towards improving society, by providing an empowering partnership for the development of technology and educating the future generation". Sustainability with an aim to reduce the carbon footprint was the key theme of the function organised to celebrate the launch of the 'Eco Campus'.

This report showcases VU's commitment to the UN Sustainable Development Goals in which VU has been actively working in partnership with diverse stakeholders. One such example is VU's Certificate Programme in Sustainability Management in Cooperation with the Hof University of Applied Sciences Germany, a program in which students gain a deep understanding of state-of-the-art business management techniques and more importantly latest sustainable practices. Likewise, the Wilo Foundation- Vishwakarma University established through a grant from the Wilo Foundation, Germany promotes research in water treatment, purification and creates the much-needed social awareness about clean drinking water through its Water Quality Centre of Excellence.

Last year, for the first time in its history, VU published SDG reports under its Sustaibilibity mission which outlined the key initiatives undertaken by the Institute to meet the Sustainable Development Goals (SDGs) in 2019. This report provides a summary of the range of activities undertaken at VU during 2020 to meet the SDGs through its teaching, research, outreach and public engagement, and operations. VU conducts a diverse range of activities across the Institute, and this report showcases some of the many such initiatives. In spite of being severely impacted by the COVID-19 pandemic, VU continually strives to implement sustainability in all its core operations, including by creating a platform to showcase its efforts toward the SDGs in a comprehensive and detailed manner.

VU participated for the first time in the Times Higher Education (THE) Impact Rankings 2021, which looks at global universities' commitment and performance in furthering the SDGs. VU was ranked amongst the top 100-200 in the world for SDG7— Clean and Affordable Energy. The achievement is a recognition of VU's work in providing education to students from countries where energy crises are an issue. Likewise, VU ranked top 300 in the world for SDG6 — Clean Water and Sanitation which indicates a recognition of our education and research on water issues. 1,118 universities from 94 countries participated in this ranking exercise, which also saw VU's work recognized on several other SDG's.

VU continually strives to contribute to the sustainable development of the nation and society at large by developing educated and productive human resources that observe and adhere to the practices of equity, inclusiveness, excellence, ethics, and professional standards.

**Prof. (Dr.) Siddharth Jabade**
**Vice Chancellor**
**Vishwakarma University, Pune, India**

## VU's Participation in the THE Impact Rankings 2021

Vishwakarma University (VU) participated for the first time in the Times Higher Education (THE) Impact Rankings, which looks at global universities' commitment and performance in furthering the Sustainable Development Goals (SDGs). 1,118 universities from 94 countries participated in the ranking by submitting input during 2019, and the results were published on April 22, 2021, with VU ranked amongst top 100-200 in the world for SDG7 - Clean and Affordable Energy.


VU took part in the 4 SDGs listed below plus the mandatory SDG17, and the results were as follows:

### Overall Ranking 601-800

7 AFFORDABLE AND CLEAN ENERGY

# Ensure access to affordable, reliable, sustainable, and modern energy for all

Vishwakarma University (VU) is committed to promoting clean and affordable energy among the community through various innovations and modules. The focus lies on encouraging and motivating students to come up with innovative and sustainable solutions that can provide alternate sources of energy for the growing demands and at the same time not harm the environment. The motto is to become energy efficient through potential and unique Eco – Campus initiatives.

Prioritizing and aligned with the objective of creating a sustainable environment for the users of the University campus, this unique ECOCAMPUS has been founded and the Centre of Excellence for Energy and Sustainability has been established. An MoU between VU and the Integrated Environmental Solution (IES) was formalized on 19th March 2019. This is an Authorized Training Partnership agreement signed between both the beneficiaries for the future of energy conservation.

Faculty and students team have collaborated and focussed on carrying out simulation for the energy flow of all the buildings and the primary data collection of one building has been completed. The aim of the teams are to completely complete one room into a living laboratory to test the different energy measuring methods or technologies such as the Internet of Things, Artificial Intelligence, etc for determining energy parameters like energy flow, humidity, temperature and validating them with the help of IES, the physical modelling software.

https://www.vupune.ac.in/images/center-of-excellence/Booklet_Energy__Sustainability_CoE_.pdf

## Vision

To develop VU as a "global sustainability thought leader committed to improving the society by providing an empowering partnership for the development of technology and educating the future generation"

## Mission

To holistically address the sustainability at VU by using the following:

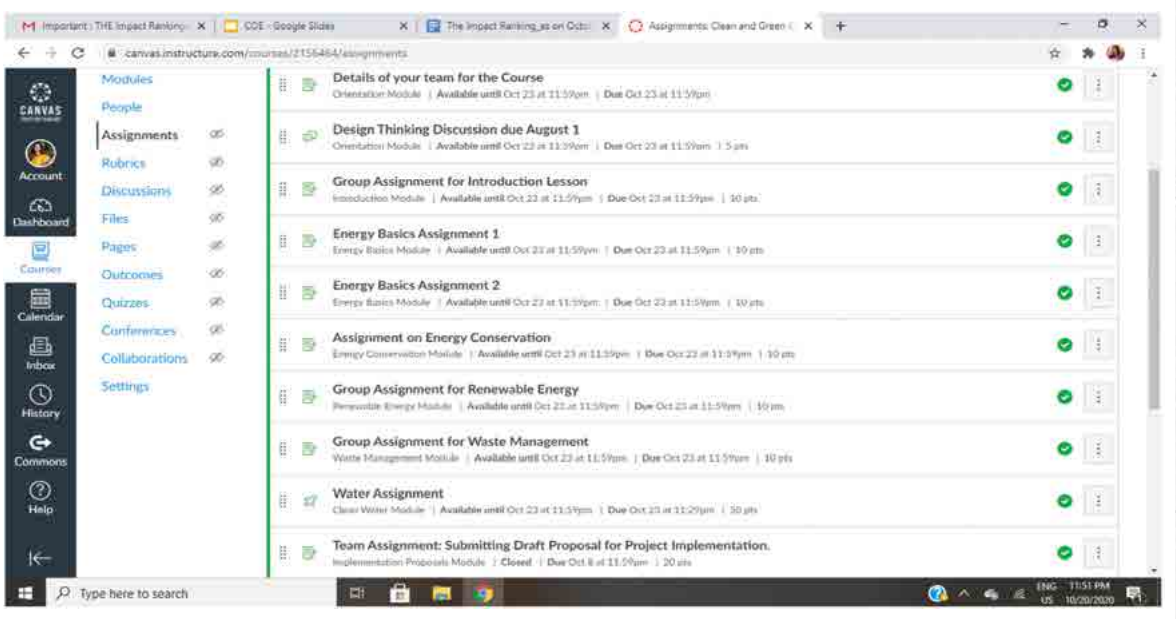

## Objectives

- To make the VU campus a "Living Laboratory" or "Testbed" for research and development of new technologies.
- To focus on the demonstration of projects which showcase state-of-the-art technologies and solutions addressing real-life problems.
- To assess the performance of various types of buildings by doing energy modeling and suggesting energy conservation measures.

**Energy Audit to identify areas where there is maximum energy wastage**

An energy audit not only entails taking measures to improve upon energy flow from inside to outside of the building and vice versa but also considers the well-being of the people. The working plan of the building, daily functioning of all the building units like different rooms, canteens, number of vehicles used and vehicle routing are observed to be a major source of wastage and energy loss. Since behaviour of users while using any room, solid wastage observed at canteens and ratio of vehicles used per person by total number of users at campus are different parameters to identify the areas where significant loss of energy occurs .

1. Electrical Energy use
2. Solid waste - Students undertook internships at Indo Universal Collaboration for Engineering Education (IUCEE) and have identified how to reduce and reuse the organics waste by working on Composting. They also observed that around 250 kg wastage is generated from the campus which can be treated and converted into compost. Four students along with two faculty members are part of the IUCEE Clean and Green Campus which was launched on July 16th, 2020.
3. Number of vehicles used and vehicle routing




## Training & Courses offered

• Training on different modules of IESVE, which can be used to create a 3D model of a building and simulate it for different weather conditions to identify the present or future energy consumption patterns.

• Training on data collection related to energy consumption data of various types of buildings, analyzing this data, and using it for finding base load and energy conservation measures. labs to automatically put them on hibernation mode, etc.

• An Energy Audit Elective is offered to students enrolled in the Mechanical Engineering and Architecture programs.

## Internships

| SR. NO. | YEAR | NUMBER OF STUDENTS | HOST ORGANIZATION | STATUS OF INTERNSHIP | NAME OF STUDENTS |
|---|---|---|---|---|---|
| 01 | August 2019 - December 2019 | 05 | IES | Completed | 1. Nishank Prabhune<br>2. Samarth Patil<br>3. Rohan Malji<br>4. Shubham Shelke<br>5. Pratik Swami |
| 02 | August 2020 - March 2021 | 07 | Qi Square | Completed | 1.Pratik Hawal<br>2.Shubham Sakhare<br>3.Bhushan Shete<br>4.Shubham Kulkarni<br>5.Jai Vaswani<br>6.Abhinav Patil<br>7.Somil Manke |
| 03 | Sep 2020 - June 2021 | 03 | IES | Completed | 1.Karan Jagtiani<br>2.Rajat Choudhary<br>3.Sarosh Dandoti |
| 04 | August 2020 - November 2020 | 04 | IUCEE team of Global Experts | Completed | 1.Vidhita Dadarkar<br>2.Omkar Bhujbal<br>3.Malay Khakhar<br>4.Neel Ranka |

## Research & Development

### a. Current Research Areas

1. Energy audit of buildings in a virtual environment
2. Energy conservation measures in the buildings
3. IoT based energy use calculation and analysis

### b. Student Project and Publications

| SR. NO. | PROJECT TITLE | INDUSTRY/ INSTITUTE NAME | NATURE OF COLLABORATION | NO. OF STUDENTS/ FACULTIES INVOLVED |
|---|---|---|---|---|
| 01 | Virtual Energy audit of Academic, Industrial and Commercial building<br>- Project work converted to a paper and presented at an International conference at Phuket 2018, published in IEEE XPLORE | Energy & Sustainability CoE at VU | Student Project/ research project | 5/4<br>3 - Computer<br>2 - Mechanical |
| 02 | Virtual Energy audit of Residential Bungalow<br>- Project work converted to a paper and presented at an International conference at Thailand 2020, published in IEEE XPLORE | | | 3/1<br>3 - Computer |
| 03 | Energy conservation of industrial building, Faurecia Automotive Seating Pvt. Ltd . (in process) | | | 5/2<br>4 – Computer<br>1 - Mechanical |
| 04 | Energy consumption analysis using Digital Twin Technology. (in process) | | | 7/2<br>3 – Mechanical<br>4 - Computer |

## Internships

| SR. NO. | PROJECT TITLE | INDUSTRY/ INSTITUTE NAME | NATURE OF COLLABORATION | NO. OF STUDENTS/ FACULTIES INVOLVED |
|---|---|---|---|---|
| 01 | Model Development and Data Analysis | IES | Internship | 03<br>1 - Mechanical<br>2 - Computer |
| 02 | Data Collection Analysis | IES | | 05<br>1 - Mechanical<br>2 - BSc Computer Science |
| 03 | Green Building, Energy Analytics, Development of Scripts & Algorithm to extract built Environment data | Qi Square | | 07<br>3 – Mechanical<br>4 - Computer |
| 04 | Visualization and Unity Development | IES | | 03<br>2 - Computer (TY)<br>2 - Computer (SY) |
| 05 | 1. To work on the BTRLYF platform to upload, analyze and report energy savings potential of buildings based on open-source data provided.<br>2. Collecting open-source data from multiple geographies, simulate the buildings, and verify the statistical fit between simulated and actual data | | | 06<br>3 - Computer<br>3 - BSc Statistics |
| 06 | 1.Creating a mobile application for calculating electricity consumption and/or Carbon footprint of a household using flutter.<br>2. Providing Analysis reports and Dashboards to monitor energy consumption and providing recommendations based on previously simulated IES-VE projects.<br>3. Creating an Energy Database of various residential and industrial hubs, location-wise.<br>4. Creating an informative website to display various research and virtual energy audit applications.<br>5. Allowing users to study and interact with previous case studies and Members of the Eco-campus at VU.<br>6. Allowing team members to post and add articles and various blogs related to programs and industrial connect with Eco-Campus<br>7. Implementation of various energy monitoring systems and pre-defined methodologies to calculate effective energy cost.<br>8. Development of a mobile application to control various appliances in the building of a campus. Also storing and monitoring the energy consumption through the same application.<br><br>Development of a New dashboard | Energy & Sustainability CoE of VU | | 04<br>4 - Computer Final year |
| 07 | IUCEE Clean & Green campus Course Phase 2 | At IES | | 01 - 1 - Computer Final year |

| SR. NO. | PROJECT TITLE | INDUSTRY/ INSTITUTE NAME | NATURE OF COLLABORATION | NO. OF STUDENTS/ FACULTIES INVOLVED |
|---|---|---|---|---|
| 08 | IUCEE Clean & Green campus Course Phase 2 | IUCEE team of Global Experts | Internship | 04<br>2 – Computer<br>2 – A&D |






## Guest Sessions





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