



# HINDUSTAN

INSTITUTE OF TECHNOLOGY & SCIENCE  
(DEEMED TO BE UNIVERSITY)

## REPORT ON SUSTAINABLE DEVELOPMENT GOALS 2022



## Content outline

Clean Energy	3
Clean Water and Sanitation – Report	31
Responsible Consumption and Production – Report	50
Social Activities conducted with Partnership – Report	56
Waste Management – Report	74
Clean Energy – Policy	83
Ethical Source of Food Supplies – Policy	86
Sustainable Waste Management - Policy	89
Report on Partnerships for the Goals	96

# **Report on Clean Energy**

## **Reducing Carbon Emission**

HITS is working hard to reduce energy consumption, increase efficiencies, use more renewable energy sources, and reduce its carbon footprint. We have ambitious targets to reduce our carbon emissions from our activities to reduce our impact on the natural environment. We aim to deliver 40% reduction in co2 by 2023 from 2011 level and compensate for remaining emissions by developing research and low carbon technology solutions.

## **Initiatives towards Clean Energy**

1. Generating our own energy from renewable sources such as
  - Solar panels;
  - Solar water heating and
  - Biogas Plants
2. Existing Lighting to be upgraded to LED lighting
3. Cutting down on the need for air conditioning



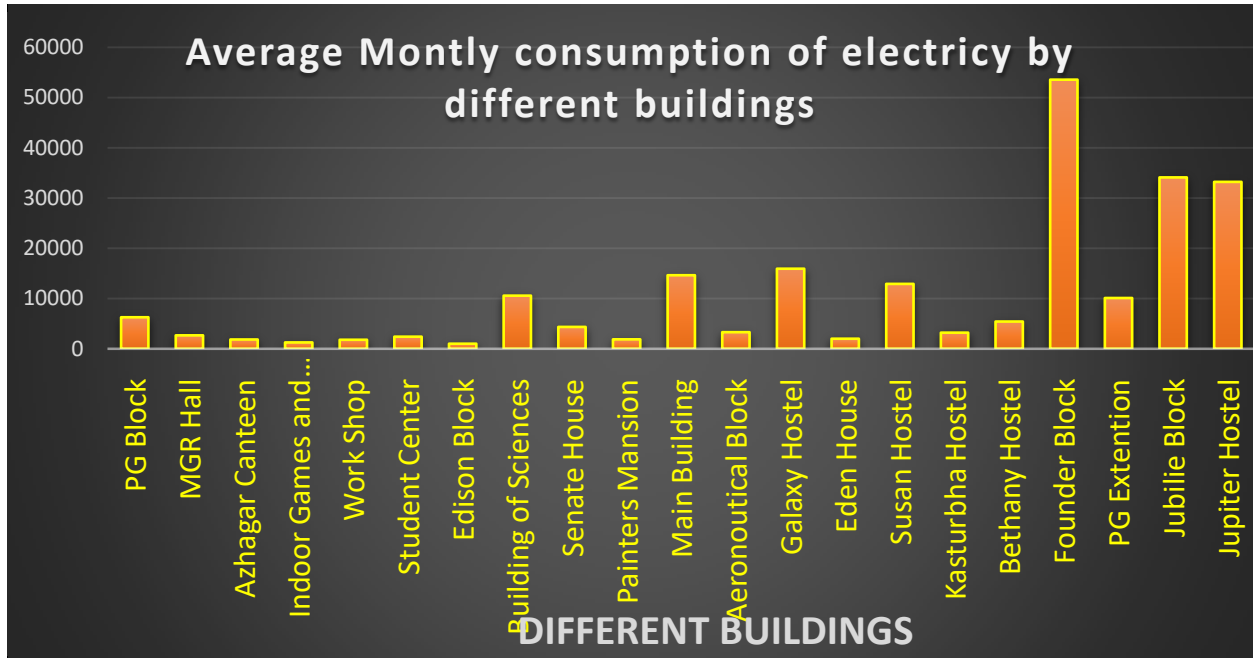
### **Report on 100 KW solar Power Generation System**

100 KW on-grid solar power generation system was installed in our campus on May-2014. Installations were done through TATA Power Solar. Multi-crystalline solar power panels are utilized for power generation depends on the environmental condition. A total of 440 panels with each panel capacity of 230 W are used for generation. Solar panels were placed in the roof top and it occupies around 10000 Square meters. Every 88 panels are connected to an inverter and a total of 5 inverters are in place. The power obtained from the inverters are synchronised with the electricity board supply and distributed to the UPS and lighting loads. The total value of the project is Rs.87.5 Lakhs.

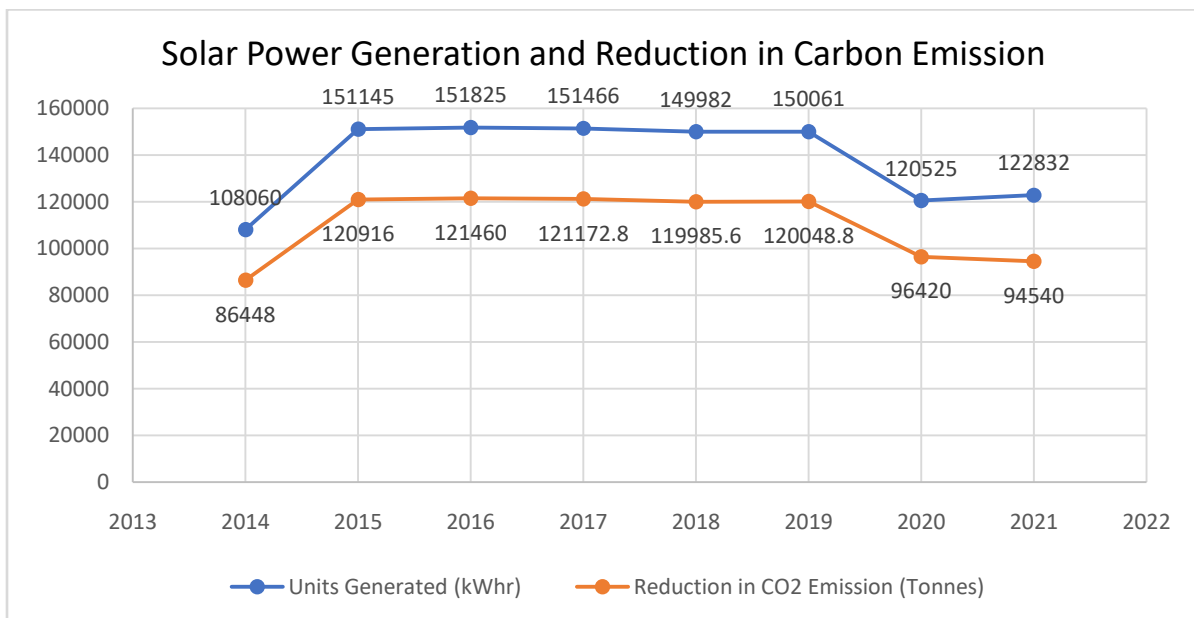
### **System Information**

- Capacity – 100 KW
- PV Panels – 440 (230WP/each)

- Inverters – 5 (20 KVA/each)
- Area – 10000 Sq.Ft.
- Data Logger - Solar-Log 1200 GPRS
- Year of Establishment – May 2014



**Table: The year-wise power generation and the environmental contributions are shown below.**

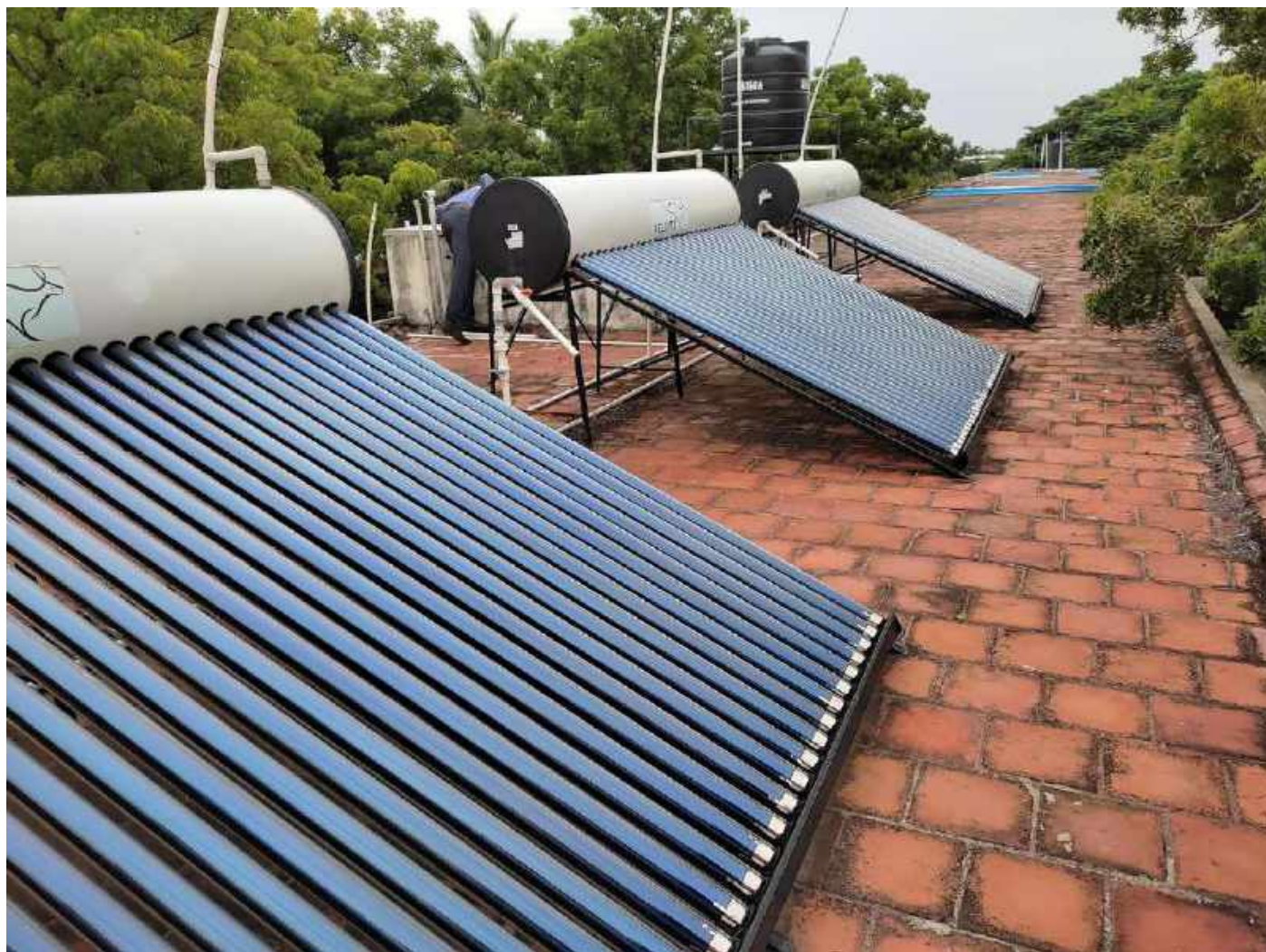


## **Solar panels for generating electricity**



## **SOLAR WATER HEATERS**

Solar water heating is one of the most common and cost-effective uses of solar energy. Solar heating systems, convert the heat energy from the sun into useful energy by heating water or any thermic fluid for use in multiple applications as given below. Solar water heating systems use collector panels to capture the sun's radiation and convert it into useful heat in the form of hot water. HITS started Installation of Solar water heaters in the year 2011 and its functioning and utilized in all the hostels.



**SOLAR WATER HEATERS INSTALLED AT HITS WOMEN'S AND MEN'S HOSTEL**

<b>Year</b>	<b>Electricity Utilization for Water Heaters (kW)</b>	<b>The capacity of Solar water heaters Installed (kW)</b>	<b>Place of Installation</b>	<b>% Reduction in Electricity Consumption</b>
2014	2050	300	All Hostels	14.36
2015	2100	350	„	16.76
2016	2500	334	„	14.63
2017	2750	334	„	12.51
2018	3000	334	„	11.31
2019	3500	307	„	8.45

2020	3500	325	„	12.50
2021	3800	350	„	13.25
2022 (Till June)	1950	350	„	8.40

### **SOLAR WATER HEATERS CARBON EMISSION MITIGATES**

<b>Year</b>	<b>Capacity (k.W)</b>	<b>Total Power Saving (kWh)</b>	<b>Financial Saving (in Lakhs)</b>	<b>Co2 Emission Mitigated (in tons)</b>
2014	300	450,000	36	9225
2015	350	525,000	42	10,763
2016	334	501,000	40.08	10,271
2017	334	501,000	40.08	10,271
2018	334	501,000	40.08	10,271
2019	307	460,500	36.84	9440
2020	325	480,600	38.74	10125
2021	340	490,200	39.20	10225
2022 (Till June)	340	235,600	21.50	6245

**By installing solar water heaters we have mitigated 46k tons of carbon dioxide.**

### **BIOGAS PLANTS**

The purpose of the project is to contribute to the reduction of carbon dioxide and methane emissions into the atmosphere through the promotion of the use of biogas for cooking instead of LPG.

### **BIOGAS PLANT INSTALLED AT HITS**

<b>Year</b>	<b>The capacity of Biogas plant installed (in M3)</b>	<b>The total capacity of installed Biogas plant (in M3)</b>	<b>Biogas generated (in M3)</b>
2011	90	90	65
2012	0	90	68
2013	165	255	130
2014	0	255	145



2015	0	255	138
2016	0	255	155
2017	0	255	169
2018	150	405	321
2019	0	405	316
2020	0	405	355
2021	0	405	386
2022	0	405	402

The option available for management of this enormous kitchen waste was open land disposal and as animal feed. The reactor was filled with 2/3 rd of its capacity with mixed kitchen waste, cow dung and sewage in definite proportional. The retention period was maintained for 40 days. The study was mainly based on biogas manure quality which was produced after the digestion of kitchen waste. The biogas manure which produced by kitchen waste is good of fertilizer.

**REPLACING CFL LAMPS WITH LED**

LEDs are well known for their efficiency, which translates to energy savings for the consumer energy savings for the consumer. Nevertheless, they have many other characteristics that make them the best choice from a sustainability perspective too. The replacement of these lights is part of a more significant energy saving initiative that also includes the retrofitting of interior light fixtures with more efficient bulbs across campus to create a unified standard of lighting. All the compact fluorescent (CFL) bulbs are planned to be replaced with LED's



**Figure: 2x2 Drop Ceiling LED Light Fixtures**

### **Centre for Clean Energy and Nano convergence (CENCON)**

**About Centre :** The Centre for Clean Energy and Nano Convergence Centre (CENCON) was established in collaboration with Quantum – Functional Semiconductor Research Centre (QSRC) of Dongguk University with an objective to promote basic and applied research. **The centre was inaugurated by His Excellency, Dr. A. P. J. Abdul Kalam, former President of India on 6<sup>th</sup> January 2011.** The center aims to work towards clean energy solutions incorporating the quintessence of Nanotechnology. CENCON is one of the members of the international Consortium on nanotechnology along with KTH Sweden and Dongguk University South Korea. The Centre strives to contribute to the Nation's growing need for sustainable energy. As the name goes, an environmental friendly green technology has been developed for the fabrication of nanomaterial and the same is being explored for various energy applications.

The Centre has collaboration with international institute like KTH Sweden, Uppsala University, Sweden, Dongguk University, South Korea, University of Queensland, Australia and national expertise from IIT Mumbai, IIT Madras and Anna University Chennai. The Centre is capable of predicting modulated properties of various functionalized nanomaterial. The Centre is accomplished with synthesis and characterization of Nanomaterial for various applications like Lithium ion batteries, solar cells, luminescent device, sensors and visible range photocatalysts.

### **IURC Programme**

Cities are growing and changing so fast that the expanding demography can mean more economic activity and wealth, but it can also mean added strain on energy, water, health, transport and housing facilities. This is why the European Union (EU) has launched a two-year

programme, **IURC International Urban and Regional Cooperation** to promote international urban cooperation where Europe's cities want to link up with other cities and regions of the world. In the present proposal of IURC, **Hindustan Institute of Technology and Science, Chennai (HITS)** contemplates to undertake a pilot study in the District of Chengalpet near the City of Chennai, Tamil Nadu along with the **Trier University of Applied Sciences, Germany (TUAS)** to launch bilateral and multilateral cooperation through city-to-city pairings for networking at global level to realize measures for an ecologically sustainable and greener development. The City of Trier had already agreed to extend extensive support to the district of Chengalpet in the form of study visits and thematic networks which will help us realize the sustainable development goals and in turn will provide a substantial frame to apply for the European research funding to implement the project at a larger scale.

The underlying role of educational institutions as such would be the transfer of knowledge and development of technology, where the Trier University has already implemented a successful urban conversion project based on "Quarter concept" in one of its campuses, the **Environmental campus Birkenfeld** which is currently the Germany's first and only "**Zero Emission Campus**". Hence, the project proposal aims to study the feasibility of waste-to-energy conversion, hydrogen clean energy mobility by establishing a zero-emission region in the selected region of **Tiruporur panchayat town** which demands severe measures to manage waste. This could conclusively help the selected region, its regional inhabitants and the surroundings in the Chengalpet district to study its viability and substantiality. The pilot study would entail Indo-European expertise and cutting-edge technologies within the framework of the program to develop the same including Hydrogen Technologies for Sustainable Energy via city pairing which could also serve as copy template to other regions as well. Apart from academic and scientific cooperation, the city of Trier could be paired to cooperate in this project to provide assistance, guidance, share recommendations, review actions and implement the technology in other urban regions with HITS and TUAS serving as research and innovation hubs. Academic and administrative representatives from the participating cities can take part in learning exchanges and capacity building activities (e.g. Study tours, trainings, thematic events and networking even beyond this project throughout all other IURC projects) and will develop together an action plan over the course of the cooperation that can produce useful and transferable results.



### Official Launch of IURC in India (February, 2022)

The IURC programme in India was officially launched on 24<sup>th</sup> February, 2022 on the IURC Forum with more than 24 cities across the globe participating in the event. The event was held in the presence of **Mr. Sanjay Kumar, Additional Secretary, Ministry of Housing and Urban Affairs, India**; Dr. Ronald Hall, Senior Expert, Directorate General of Regional and Urban Policy, European Commission; Ms. Kamilla Kristensen-Rai, Counsellor, Delegation of the European Union, Mr. Pablo Gandara, Team Leader of IURC Asia & Australasia, while Dr. Panagiotis Karamanos, Country Coordinator for IURC India introduced the key programme elements and explained the benefits for Indian cities. It was organized jointly by the Delegation of the European Union to India and the Ministry of Housing and Urban Affairs, India.





**Conferences/Seminar/Workshops conducted (including Co-ordinator with fund allocated)  
/ funding agency**

<b>Name of the Conference / Seminar/ Workshops</b>
Workshops on “Modeling and Simulations of Nanomaterials using VASP” and “Synthesis and Characterization of Nanomaterials” held on 20 -21 <sup>st</sup> Feb 2017
NATIONAL CONFERENCE ON CHEMISTRY DRIVEN CLEAN PROCESSES AND ALTERNATE ENERGIES   Event Date: Wednesday, 7th, February 2018
Workshop on “Synthesis & Characterization of Materials for Solar cell Applications, 9 <sup>th</sup> April 2018
The International Symposium on “The Smart Future with Innovation in Materials” and workshop on Chemical Vapour Deposition technique held on 30 <sup>th</sup> October 2018
Conducted US INDIA Partnership free job Oriented Training on “Installation of Solar Water Pump” between 28 July and 4 August 2021 under the Grant support of 11,360 \$ from University of Nebraska, USA through Alamo Colleges District, USA.

**Funded Project details (From the commencement of Centre):**

<b>Sl. No</b>	<b>Year of Sanction</b>	<b>Title of Project</b>	<b>Funding Agency</b>	<b>Amount Received</b>	<b>Current status of Project</b>
1	2013	Enhancement of Photovoltaic efficiency by down conversion phosphors for underwater Solar panels towards Navel applications	NRB, DRDO	24,46,280	Completed April 2018
2	2017	Development of a Photoelectrochemical Cell (PEC) using Si based (In)GaN Nanowires for Hydrogen production by Splitting of Water under Visible Light	NPDF, SERB	18,70,000	Completed September 2018

3	2018	Edge Saturated Si <sub>2</sub> N Nano-ribbon As High – Capacity Anode Materials For Next Generation Mg-ion Batteries	TARE, SERB	18,30,000	Completed October 2022
4	2019	Sn integrated 3D, porous carbon based scaffolds as high capacity anode for Sodium-ion batteries	TARE, SERB	18,30,000	Ongoing
5	2021	Carbon-Based Materials with High Antibacterial Activity for Face Mask Application to combat COVID 19	TARE, SERB	18,30,000	Ongoing

**List of Publications from 2021-2022**

<b>S. No.</b>	<b>PUB. YEAR</b>	<b>TITLE</b>	<b>JOURNAL NAME</b>	<b>AUTHORS</b>	<b>Index</b>
	2022	Efficient Sensing of Selected Amino Acids as Biomarker by Green Phosphorene Monolayers: Smart Diagnosis of Viruses (Adv. Theory Simul. 10/2022)	Advanced Theory and Simulations 5 (10), 2270025	P Panigrahi, Y Pal, A Panigrahi, H Bae, H Lee, R Ahuja, T Hussain	Scopus

2	2022	Supercapacitive performance of exfoliated graphitic carbon nitride nanoflakes	IOP Conference Series: Materials Science and Engineering 1263 (1), 012022	V Ragupathi, P Panigrahi, NG Subramaniam	Scopus
3	2022	Efficient Sensing of Selected Amino Acids as Biomarker by Green Phosphorene Monolayers: Smart Diagnosis of Viruses	Advanced Theory and Simulations 5 (10), 2200357	P Panigrahi, Y Pal, A Panigrahi, H Bae, H Lee, R Ahuja, T Hussain	Scopus
4	2022	Superalkali functionalized two-dimensional haeckelite monolayers: A novel hydrogen storage architecture	International Journal of Hydrogen Energy 47 (78), 33391-3340	Y Pal, P Anees, H Bae, H Lee, R Ahuja, T Hussain, P Panigrahi	Scopus
5	2022	Two-Dimensional Bismuthene Nanosheets for Selective Detection of Toxic Gases	PK Panda, H Bae, P Panigrahi, Y Pal, H Lee, T Hussain, R Ahuja	<i>ACS Appl. Nano Mater.</i> 2022, 5, 2, 2984–2993	Scopus



6	2022	Smart apparel using nano graphitic carbon nitride/PVA in a cotton cloth for military application	Heliyon 8 (8), e10345	S Krishnaswamy, P Panigrahi, PP Kala, S Sofini, GS Nagarajan	Scopus	
7	2022	Enhanced UV emissions in Polypyrrole/PVA composite for smart apparels	Optik 266, 169596	S Krishnaswamy, P Panigrahi, P Ramakrishnan, S Sofini, GS Nagarajan	Scopus	
8	2022	Two-dimensional nitrogenated holey graphene (C <sub>2</sub> N) monolayer based glucose sensor for diabetes mellitus	Applied Surface Science, 573, 30 January 2022, 151579	LJ Andreas, M Sajjad, N Singh, P Panigrahi, D Singh, T Hussain, R Ahuja,	Scopus	WOS
9	2022	Enhancement of photoluminescent intensity of epoxy thin film by nano graphitic carbon nitride	Physica B: Physics of Condensed Matter	K.Srimathi, Sooraj Gunasekar Pritamghosh, Veena.R, Puspamitra Panigrahi Ganapathi Subramaniam Nagarajan	Scopus	WOS
10	2021	Selective decoration of nitrogenated holey graphene (C <sub>2</sub> N) with titanium clusters for enhanced hydrogen storage application	International journal of hydrogen energy 46 (10), 7371-7380	P Panigrahi, M Desai, MK Talari, H Bae, H Lee, R Ahuja, T Hussain.	Scopus	WOS

11	2021	Two-dimensional Janus monolayers of MoSSe as promising sensor towards selected adulterants compounds	Applied Surface Science 542, 148590	P Panigrahi, D Jini, H Bae, H Lee, R Ahuja, T Hussain	Scopus	WOS
12	2021	Application of Germanene monolayers as efficient anchoring material to immobilize lithium polysulfides in Li-S batteries	Applied Surface Science 558, 149850	P Panigrahi, Y Pal, T Hussain, R Ahuja,	Scopus	WOS
13	2021	Enhanced near-infrared downconversion luminescence in Zn <sub>x</sub> Nb <sub>(1-x)</sub> O composite host co-doped Bi <sup>3+</sup> /Yb <sup>3+</sup> phosphor for Si solar cell applications	Materials Science in Semiconductor Processing 122, 105486	PS David, P Panigrahi, S Raman, GS Nagarajan	Scopus	WOS
14	2021	Enhancing energy storage efficiency of lithiated carbon nitride (C <sub>7</sub> N <sub>6</sub> ) monolayers under co-adsorption of H <sub>2</sub> and CH <sub>4</sub>	International journal of hydrogen energy 46 (38), 19988-19997	P Panigrahi, D Acharya, SR Selvi, R Ahuja, T Hussain	Scopus	WOS

15	2021	Study of photoluminescence quenching behavior of polystyrene thin film by nano graphitic carbon nitride	Optik 248, 168204	S Krishnaswamy, P Panigrahi, A Raja, GS Nagarajan	Scopus	WOS
16	2021	Tailoring the Pore Size, Basicity, and Binding Energy of Mesoporous C <sub>3</sub> N <sub>5</sub> for CO <sub>2</sub> Capture and Conversion,	Chemistry–An Asian Journal 16 (23), 3999-4005	S Kim, G Singh, CI Sathish, P Panigrahi, R Daiyan, X Lu, Y Sugi, IY Kim	Scopus	WOS
17	2021	Exploring the Full Potential of Functional Si <sub>2</sub> BN Nanoribbons As Highly Reversible Anode Materials for Mg-Ion Battery	Energy Fuels 2021, 35, 15, 12688–12699	TH Puspamitra Panigrahi, Yash Pal, Rajeev Ahuja	Scopus	WOS
18	2021	Scalable fabrication of graphitic-carbon nitride thin film for optoelectronic application	Materials Today: Proceedings	V Ragupathi, P Panigrahi, NG Subramaniam,	Scopus	WOS
19	2021	First Principles Study of TiO <sub>2</sub> as Visible Light Catalyst with Ni Doping.	Proceedings of 28th National Conference on Condensed Matter Physics, 159-166	AA Dorothy, P Panigrahi	Scopus	WOS

**Guest lectures Organized related to theme 2019-2022**

**International Workshop and Guest Lecture**

### **“Sustainable Energy & Smart Grid” on 8 Aug. 2019.**

Prominent speakers at the event included Dr. Joseph Antony, Associate Professor, School of Chemical & Process Engineering, University of Leeds, UK; Mr. N. Nallarasan, GM (SO & PSDF), NLDC, Power system operation Corp.8 Ltd., Delhi; Dr. R. Gnanadass, Professor, Pondicherry Engineering College; Dr. Petros Aristidou, Assistant Professor, Dept. of EEE, University of Leeds, UK; Dr. Velraj, Professor & Director, Anna University, Chennai; Dr. Sakthi Ganesh, Managing Director, Velev Motors, Chennai; and Dr. S. Umashankar, Associate Professor, Prince Sultan University, Saudi Arabia.

Guest Lecture on “Strategies and Practice of Zero Emission, Circular Economy and Material Flow Management” by Prof. Dr. Peter Heck, Managing Director, Institute for Applied Material Flow Management, Germany was organized on 16 Aug. 2019.

Online Lecture on “Sustainable Development - How can you HELP?” by Dr. Ngien Su Kong, Associate Professor & Head, Department of Civil Engineering, Universiti Malaysia Pahang, Malaysia was scheduled on 30 Apr. 2020.

Guest Lecture on “Waste Water Transport and Treatment” by Prof. Ian Holman, Head, Civil Engineering, Service Engineering and Food Technology, Cranfield University, UK on 19 Sept. 2020.

Webinar on “Energy Management, Energy Audit & Career Opportunities” by Dr. P. Dharmalingham, Director, Ensava Consulting & Training Pvt. Ltd., & Former Director & Head, National Productivity Council, Chennai, was organized on 20 May 2020.

### **Online Webinar on Chemical Engineering Responses to Environmental Challenges**

Date: 21-08-2020

Resource Person: Dr.B.Sujan Kumar, Associate Professor, BIT Sindri, Jharkand.

The Online Webinar mainly focused on the Environmental Challenges. Around 50 participants from different schools across the state registered for the conference.

### **Online Webinar on Renewal Energy Production & Supply**

Date: 10-08-2020

Resource Person:

Dr. Krishna Rubigha, Founder & CEO, Ampere Voltege Consulting Pvt. Ltd

The Online Webinar mainly focused on the Renewal Energy Production & Supply

### **Online Webinar on Recent Advancements in Renewable Energy**

Date : 27-08-2019

Resource Person: **Dr. R. Vinu**, Associate Professor, Department of Chemical Engineering, IIT Madras

The lecture mainly focused on the fundamentals of conversion of renewable and non-renewable feed stocks to biofuels, chemicals and materials via different techniques including catalytic fast pyrolysis, catalytic fast hydro pyrolysis, microwave assisted pyrolysis, and microwave assisted solvolysis, the various processes involved in the utilization different feedstock like lignocellulosic biomass, lignin, microalgae, waste plastics, waste oils, e-wastes, municipal solid wastes (MSW) and coals.

- Industrial Visit to Biogas Plant managed by Carbon Loops Pvt. Ltd. at Loyola College campus was scheduled on 18 Feb. 2020.

### **Conferences Organized related to theme**

The Department of Chemical Engineering organized a two-day virtual International Conference on Health, Energy and Materials – ICHM'22 during 28-29 April, 2022 via MS Teams platform. Around 136 participants from different institutions across the country registered for the conference. Dr. B. Vivekanandan (HOD, Department of Chemical Engineering) welcomed the gathering and highlighted the importance of the conference theme towards integration of research, technology and practice in the field of Health, Energy & Materials. Dr. S.N. Sridhara (Vice Chancellor), HITS delivered the presidential address and emphasised the need for innovative technologies to improve the quality of life to all sections of the society. The Inaugural address was given by Dr. Angelina Geetha (Dean Engineering & Technology), HITS. She emphasized on the importance of novel research in the field of health, energy and materials and expressed her contentment in organizing the conference.

The first day had two keynote address and one scientific address from Scientists and Academicians across the country. The inaugural scientific talk was given by Mr. Balachander G, Founder and Director, Ecologikol Advisors India Pvt Ltd & Bookwater Tech Pvt Ltd, Chennai. He addressed the delegates on energy and comfort optimization through 3D whole building simulation. Chief Guest Prof. Imre Berger, Founding Director, Max Planck Bristol Centre, UK addressed on the discovery on a druggable pocket and a drug on the spike protein of SARS-Covid virus. The Guest of Honour, Dr. Venu Vangala, Deputy Director at Interface Chemistry, University of Bradford, UK gave a keynote address on the crystallography.

The second day of the conference, 29<sup>th</sup> April commenced with an Invited Lecture by Dr. Vidhya Venugopal, Professor, Sri Ramachandra Institute of Higher Education and Research, Chennai. She emphasised on climate variability impacts in occupational health. The keynote address for the day was delivered by Dr. Srdja Drakulic, Senior Scientist, Cytiva, Uppsala, Sweden. He presented on production of biologics, upstreaming process. This was followed by an invited lecture by Dr. Padmesh T.V.N. Department of Chemical Engineering, Manipal International Univeristy, Malaysia where he explained about the process of chemical industries. ICHM'22 had 60 oral presentations with the department staffs as session chairs. Dr.

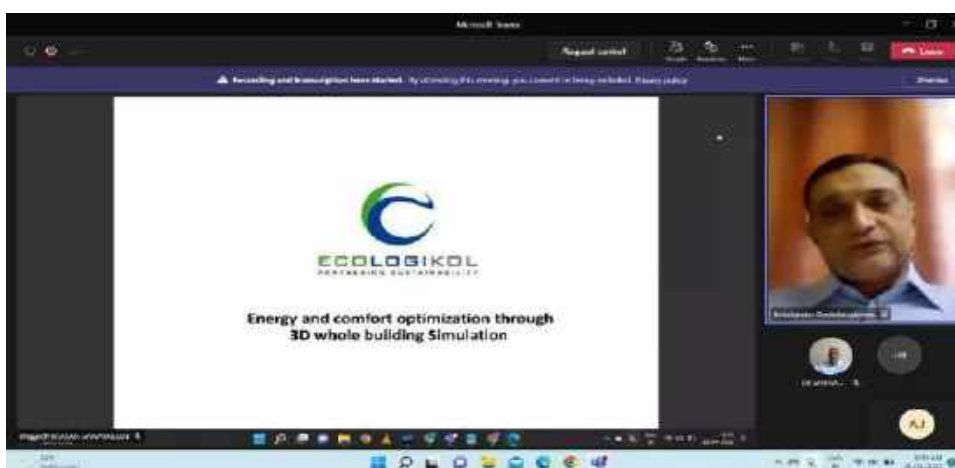
Sakthidasan J (Co-convenor, HITS) gave the valedictory address. The feedback form link was provided to the delegates.



**Welcome Address - Dr. B. Vivekanandan  
HOD, Chemical Engineering, HITS**



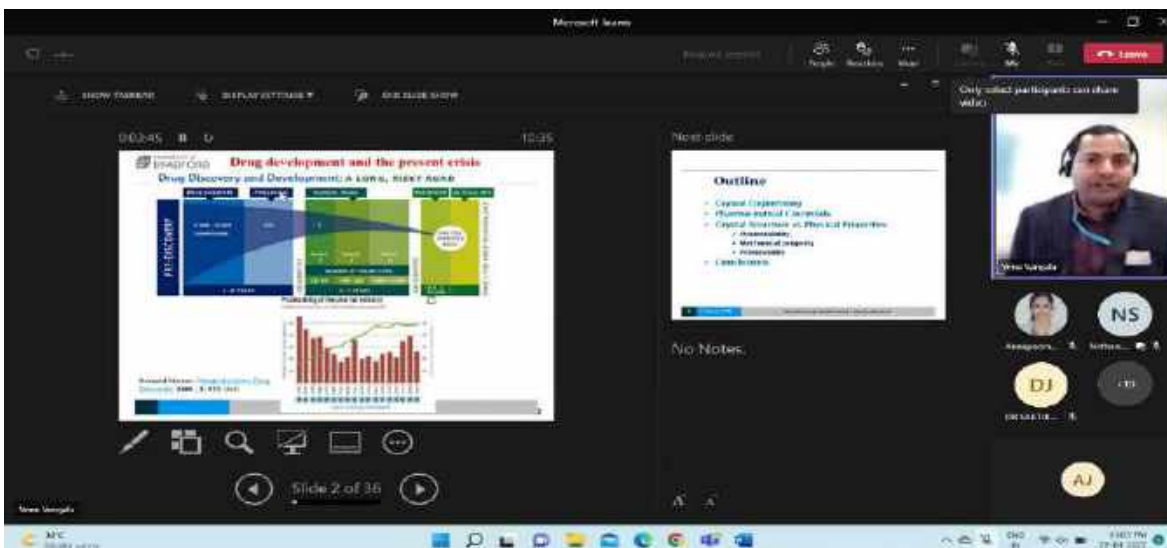
**Presidential Address - Dr. S. N. Sridhara  
Vice Chancellor, HITS**



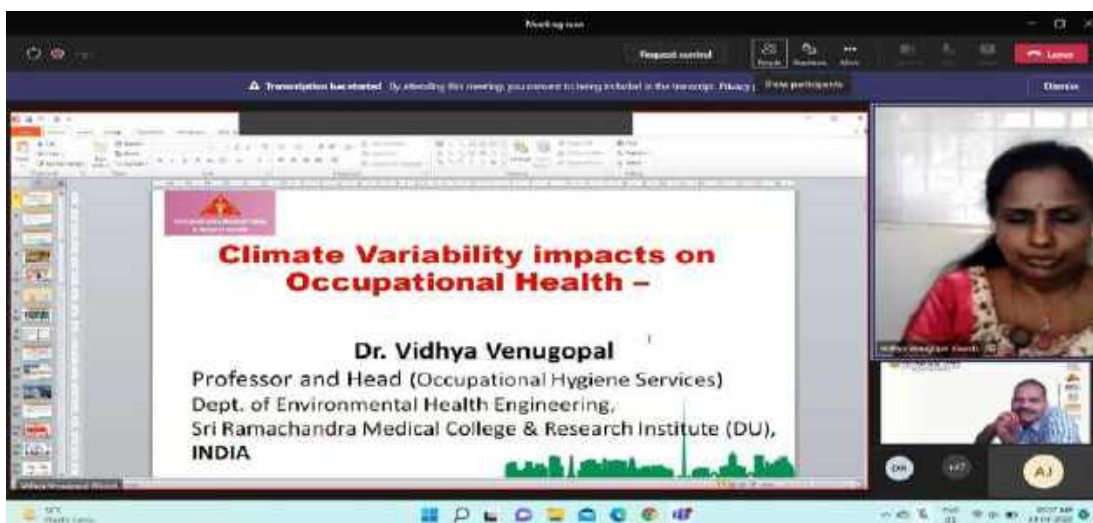
**Inaugural Scientific talk – Mr. Balachander G  
Founder and Director – Ecologikol Advisors India Pvt Ltd & Bookwater Tech Pvt Ltd,  
Chennai**



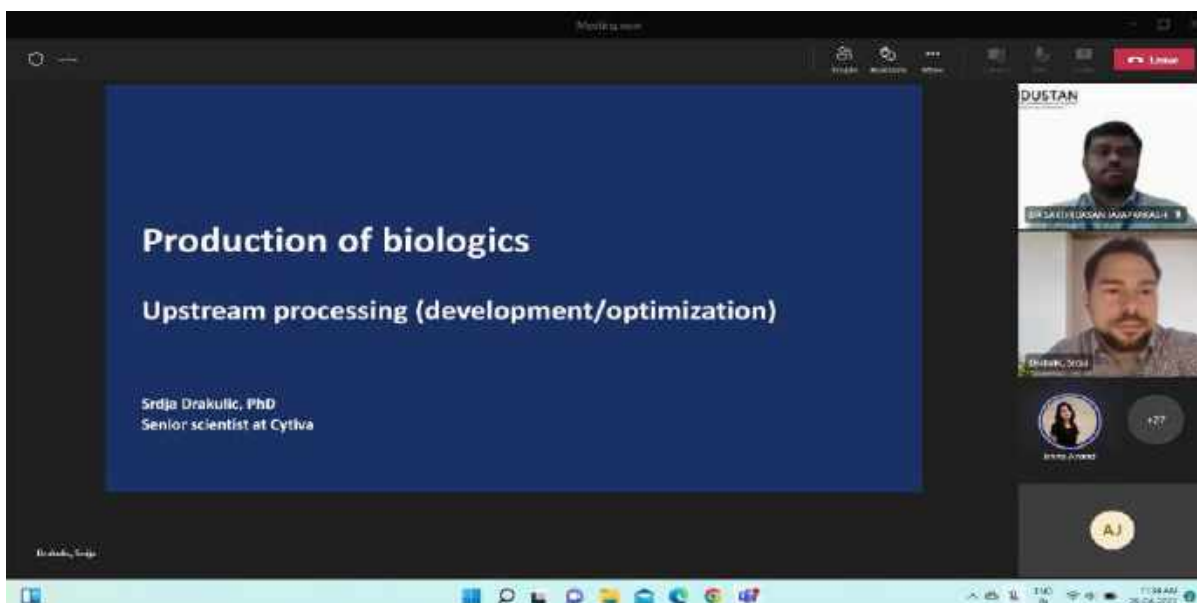
**Keynote  
Address – Prof. Imre Berger  
Founding Director, Max Planck Bristol Centre, UK**



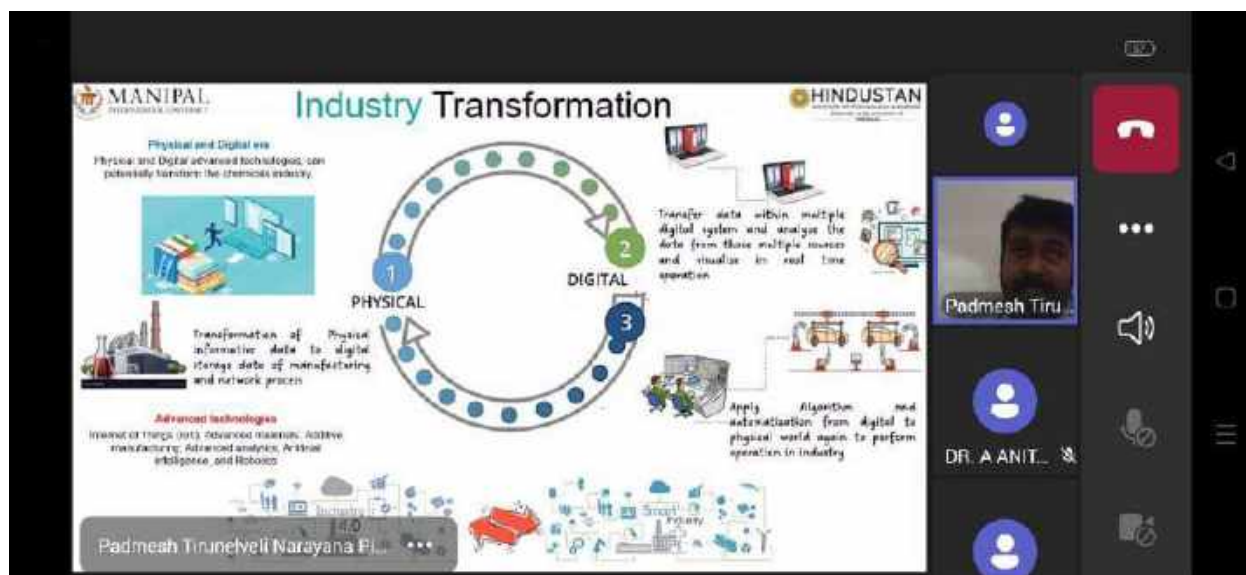
**Invited lecture - Dr. Venu Vangala**  
**Deputy Director at Interface Chemistry, University of Bradford, UK**



**Invited**  
**Lecture – Dr. Vidhya Venugopal**  
**Professor, Sri Ramachandra Institute of Higher Education and Research, Chennai**

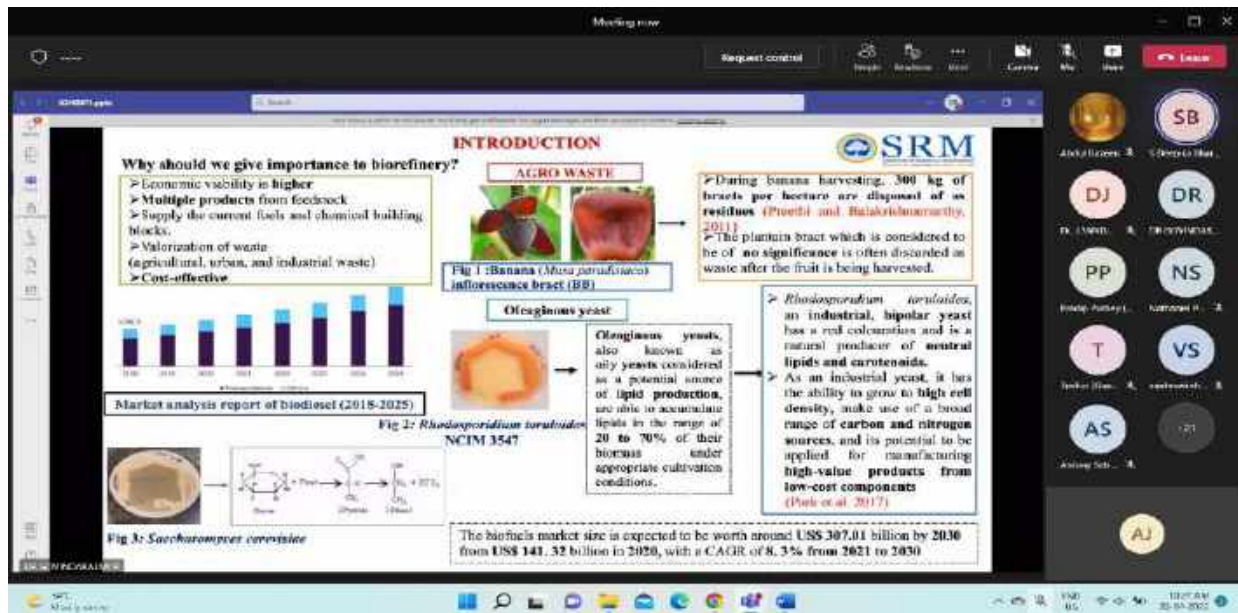


**Keynote address – Dr. Srdja Drakulic,  
Senior Scientist, Cytiva, Uppsala, Sweden**



**Invited Lecture – Dr. Padmesh T.V.N.  
Department of Chemical Engineering, Manipal International University, Malaysia**





- Department of Electronics and Communication Engineering along with department of Electrical and Electronics Engineering have successfully conducted a national level Technical symposium “CHARGE’22” on 3 Apr 2022
- Technical seminar on “IoT with Arduino Projects “was conducted in association with Institutions Innovation Council and IEEE Signal Processing society through online mode on 31 Jan 2022
- Seminar has been conducted on “Microgrid Hybrid Control System with PV DG & GRID” on 10 Mar 2022.
- Awareness program Green Energy(Solar)-A step towards future by M.S Renewable energy and Aimer Foundation on 21 July 2022.
- Successfully organised International Conference on Smart Grid and Electric Vehicle ICSGEV 2021 During July 14-15 2021 in collaboration with University of Leeds, UK. The conference was sponsored by Royal Academy of Engineering, UK
- Conducted US INDIA Partnership free job Oriented Training on “Installation of Solar Water Pump” between 28 July and 4 August 2021 under the Grant support of 11,360 \$ from University of Nebraska, USA through Alamo Colleges District, USA.
- Ms. K. Lindsay Shantha Rubia, was awarded with second place in Renewable Energy theme in Smart e-Hackathon on Sustainable Rural Development 2021 hosted by Indian Institute of Technology, Madras.
- Webinar on Energy for Next Generation on 8/5/22 by Mr John Rooby, Senior Technical Audit Engineer, MAPS, Kalpakkam organized by EEE dept.

## National Conference on Water, Energy and Environment (WEECON'19)

Date: March 21-03-2019 & 22-03-2019

### Resource Persons:

- Dr. Saravanan Pichiah, Head, Environmental Nanotechnology Laboratory, IIT (ISM), Dhanbad, Jharkhand
- Dr. Akshaya Panigrahi, Principal Scientist, Crustacean Culture Division, ICAR-Central Institute of Brackish Water, Aquaculture, Chennai
- Dr. Venkata Mohan S., Principal Scientist, Bioengineering and Environmental Science Lab, Indian Institute of Chemical Technology, Hyderabad, India
- Mr. Jayannathann K, India Regional Operation Manager, International Water Association (IWA), Chennai

WEECON'19 was organized by Department of Chemical Engineering, HITS, in collaboration with Indian Institute of Chemical Engineers (IChE) and Association of Biotechnology Led Enterprises (ABLE). The objective of WEECON'19 was to integrate research, technology and practice in the field of Water, Energy & Environment and bring together Scientists, Academicians, Students, Consultants across the Nation to share their knowledge. It also provided an interdisciplinary platform to discuss about the challenges encountered and recent innovations in the field of Water, Energy and Environmental Management.



**Electives offered related to theme**

Sub Code	Subject Name	Regulation	Description
CYF252	Waste to energy conversion technology	2015	The course emphasizes on the chemical and biochemical processes for converting waste to energy for cleaner environment
CYF352	Industrial Pollution Prevention and Control	2015	This course describes the types of industrial pollutants and methods adopted to minimize and prevent the release of the pollutants into the environment.
CYF351	Bio refineries	2015	This course provides knowledge on the biofuels, bioenergy, processing of biodiesel and the current and future EU regulations.
CHD353	Water science Engineering	2015	Covers various technologies involved in water purification & reuse.

CHC353	Energy Engineering	2015	Deals with energy efficiency, energy services, facility management, plant engineering, environmental compliance and alternative energy technologies.
CHC4254	Fuels and Furnaces	2018	Describes heat energy to fuel and the use of furnace in the energy production
CYD4293	Alternate fuels	2018	This course imparts knowledge on the various alternate fuels employed in CI and SI engines to control the automotive exhaust emissions

### Publication details (2018-19)

1. Comprehensive study on the effect of CuO Nano fluid prepared by one step chemical synthesis method on the behaviour of waste cooking oil biodiesel in CI engine. S.Induja, Journal of Thermal Science and Engineering Applications, August 2019.
2. Particulate matter in stack emissions, generated by various fuels- a comparative study. S.Sumathi, Eco. Env. & Cons.25 (2):2019 Comprehensive study
3. Calcium-boro-phosphates supported NiO catalyst for enhanced oxidation of carbon monoxide and hydrocarbons, B.Gajalakshmi, S.Induja, P.S.Raghavan, Rasayan Journal of Chemistry, April 2018.

### Hydrogen production- 3 papers

- Growth of gallium nitride nanowires on sapphire and silicon by chemical vapor deposition for water splitting applications, Applied Surface Science, 2018
- Photocatalytic hydrogen production using bench – scale trapezoidal photocatalytic reactor- International journal of hydrogen Energy, 2019
- Performance Square and Trapezoital Photoreactors for Solar Hydrogen Recovery from Various Industrial Sulphide Wastewater using CNT/Ce<sup>3+</sup> doped TiO<sub>2</sub>- International journal of hydrogen Energy, 2019

### Hydrogen storage – 7 papers

- Remarkable Improvement in Hydrogen Storage Capacities of Two-dimensional Carbon Nitride (g-C<sub>3</sub>N<sub>4</sub>) Nanosheets Under Selected Transition Metal Doping- International journal of hydrogen Energy
- Light Metal Decorated Graphdiyne (GDY) Nanosheets for Reversible Hydrogen Storage, Nanotechnology Vol. 29, No.35, (2018) **Nanotechnology**,

- Enriching the Hydrogen Storage Capacity of Carbon Nanotube Doped with Polyolithiated Molecules, **Appl Surf Sci** (2018).
- Manipulating energy storage characteristics of ultrathin boron carbide monolayer under varied scandium doping. **RSC Adv.** 7, 8598–8605, 2017, doi: 10.1039/C6RA24890J.
- Hydrogen storage properties of light metal adatoms (Li, Na) decorated fluorographene monolayer. **Nanotechnology** 06, 26 (27), 275401, 2015, doi:10.1088/0957-4484/26/27/275401.

### **Energy storage papers – 12**

- Designing strategies to tune reduction potential of organic molecules for sustainable high capacity battery application. **J. Mater. Chem. A**, 5, 4430–4454, 2017, doi: 10.1039/C6TA09760J.
- Assessing the electrochemical properties of polypyridine and polythiophene for prospective applications in sustainable organic batteries. **Phys. Chem. Chem. Phys.** 19, 3307–3314, 2017.
- Enhanced electrochemical performance of nanopyramid-like  $\text{LiMnPO}_4/\text{C}$  cathode for lithium-ion batteries, **Applied Surface Science**, 495, 143541.
- Li and Mn-rich  $\text{Li}_4\text{Mn}_5\text{O}_{12}-\text{Li}_2\text{MnO}_3$  composite cathode for next generation lithium-ion batteries, **Journal of Energy storage**, Vol 24, 100754.
- Electrospun 3D CNF– $\text{SiO}_2$  fabricated using non-biodegradable silica gel as prospective anode for lithium-ion batteries, **Ionics**.
- g- $\text{C}_3\text{N}_4$  doped MnS as high performance electrode material for supercapacitor application, Vol. 246, 88-91, **Materials Letters**.
- Spherical  $\text{LiZnBO}_3$ : Structural, Optical and Electrochemical Properties, **Material Science for Energy Technologies** 2, 267-271(2019).
- Enhanced Electrochemical Performance of  $\text{LiCoBO}_3$  Cathode Material for Next Generation Lithium-ion batteries. **Applied Surface Science**, 449, 421-425  
 $\text{LiMn}_{0.5}\text{Co}_{0.5}\text{BO}_3$  Solid Solution: Towards High Performance Cathode Material for Next generation Lithium-ion battery. **International Journal of Hydrogen Energy**, 43, 4108 - 4111.
- Enhanced Electrochemical Performance of  $\text{LiMnBO}_3$  with Conductive glassy phase: A prospective Cathode Material for Lithium-ion Battery, **Ionics**, 23: 1645–1653
- Electrochemical performance of Sol-gel derived Hexagonal  $\text{LiMnBO}_3$  cathode material for Lithium-ion Batteries, **Nano Hybrids and Composites**, 17, 106 -112 (2017),  
 Synthesis and Morphological Influence on High Capacity  $\text{LiMnBO}_3$  Cathode Material for New Generation Lithium Ion Batteries, **ECS Transactions**, 62: 123 – 128(2014).

### **Solar cell -1 paper**

- Enhanced near IR downconversion luminescence in  $\text{Eu}^{3+}-\text{Yb}^{3+}$  co-doped V activated ZnO host: An effort towards efficiency enhancement in Si-Solar cells, **Materials Letters** 249 (2019) 9–12- D.Padma sheeba

### **Publication Update 2022**

<b>Authors</b>	<b>Title</b>	<b>Journal / Source Title</b>
Prabakaran B.	Experimental investigation of compression ignition engine fueled with Biobutanol and upgraded waste engine oil for performance	Cleaner Engineering and Technology
Padmanaba Sundar S.S., Vijayabalan P.	Pyrolysis of disposed plastic food containers and its potential in diesel engine by doping with nano particle at optimum injection timing	Sustainable Energy Technologies and Assessments
Bharti M.K., Chalia S., Thakur P., Sridhara S.N., Thakur A., Sharma P.B.	Nanoferrites heterogeneous catalysts for biodiesel production from soybean and canola oil: a review	Environmental Chemistry Letters
Sadanand A., Nagarajan R.V., Devadas M.	The façade wall: A focus on the green architecture of Laurie Baker's houses	International Journal of Energy Production and Management
Chandrappa S., Murthy D.H.K., Reddy N.L., Babu S.J., Rangappa D., Bhargav U., Preethi V., Mamatha Kumari M., Shankar M.V.	Utilizing 2D materials to enhance H <sub>2</sub> generation efficiency via photocatalytic reforming industrial and solid waste	Environmental Research
John J.G., Hariram V., Gajalakshmi B., Jeffrey J.A., John C.B.	Emission characteristics of third grade oil converted sesame biodiesel	International Journal of Vehicle Structures and Systems
Sadanand A., Nagarajan R.V., Devadas M.	The façade wall: A focus on the green architecture of Laurie Baker's houses	International Journal of Energy Production and Management
Chandrappa S., Murthy D.H.K., Reddy N.L., Babu S.J., Rangappa D., Bhargav U., Preethi V., Mamatha Kumari M., Shankar M.V.	Utilizing 2D materials to enhance H <sub>2</sub> generation efficiency via photocatalytic reforming industrial and solid waste	Environmental Research

Gowrishankar D., Kumar G.D., Prithviraj R., Sanjay V., Hariharan D., Vignesh M.	Synthesis and performance evaluation of fuel from waste plastics	International Journal of Vehicle Structures and Systems
Kanpurrani V., Vallikannu A.L.	Emission analysis of combustion process from the transportation in smart city	AIP Conference Proceedings
Rajamanickam S.K., Kasinathan S.	Fatty acid ethyl ester from Manilkara zapota seed oil: a completely renewable biofuel for sustainable development	Environmental Science and Pollution Research
Prabakaran B.	Challenges in Blending the Diesel– Ethanol Blends Using Butanol as Co-solvent Along with Diesel for Replacing the Neat Diesel to Fuel Compression Ignition Engines Suitable for Low-Temperature Application	Energy, Environment, and Sustainability
SekharS.C., KaruppasamyK., VedaramanN., SathyamurthyR., Vijayabalan P., Elshiekh A., Nadanakumar V., Manokar A.M.	Process optimization and characterization of manila tamarind seed oil extracted by the soxhlet method	International Journal of Energy for a Clean Environment
Yoganantham C., Joanna P.S.	Performance analysis of sustainable GFRP beam using HVFA ECC infill	Journal of Green Engineering

## Projects

Submitted Project Titled "Large-scale Hydrogen Production from Sulphide Wastewater Using Solar Energy" to SERB under Core Research Grant on 09 Mar. 2020. Team Members Mr. N. Vimalraj & Mr. T. Santhakumar (Students) accompanied by Dr. V. Preethi at Universiti Malaysia Pahan

## REPORT ON CLEAN WATER AND SANITATION

### WATER CONSUMPTION PER PERSON

#### **Volume of Water used in the University: Total**

The total number of students at HITS including UG and PG	: 8420
The total number of staffs working at HITS including Teaching and non-teaching faculties	: 1000
The total number of students staying in hostel	: 1000
The total number of day scholars at HITS campus	: $8420+1000-1000 = 8420$

The total amount of water consumed by the day scholars :  $8420 \times 10 = 84200$  L/day

(Considering 10L of water percapita demand)

The total amount of water consumed by the Hostellers :  $1000 \times 150 = 150,000$  L/day

(Considering 150L of water percapita demand)

The total amount of water consumed at HITS :  $150,000+84200 = 234.2$  KLD

#### **Volume of water Used in the University: Inbound (Treated / Extracted Water)**

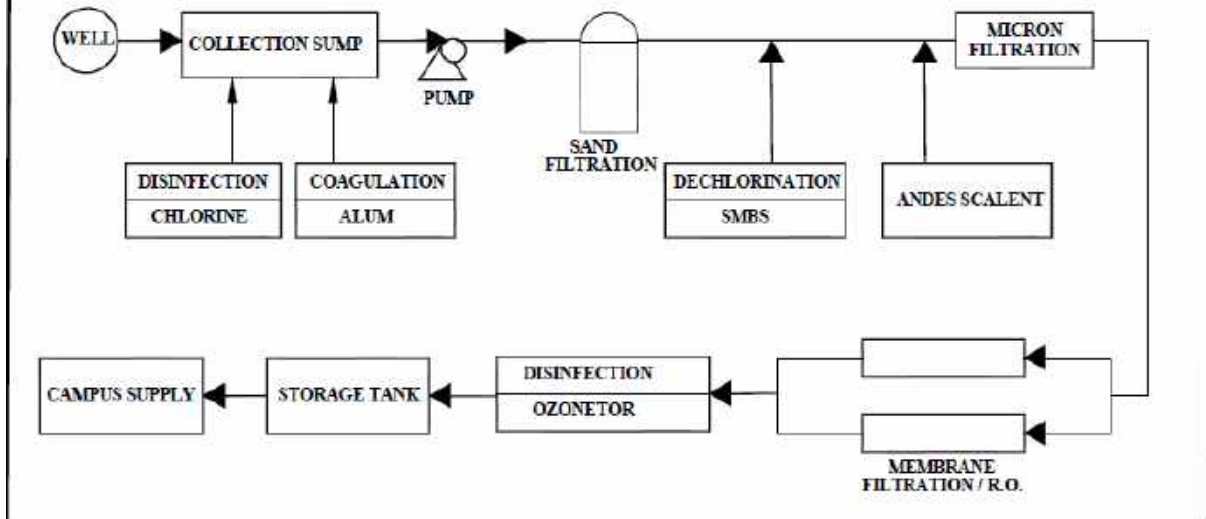
Water which is needed for the entire community of the HITS was taken directly from the Wells, which is located within the campus. The well water is taken directly to the RO plant and advance water treatment is given to the water which includes Disinfection, Filtration, membrane filtration, Micro - filtration and the hardness removal.

The capacity of RO plant is about 4500 litres per Hour and is been operated 8 times in a day

Total volume of treated water used at HITS campus was about  $4500 * 8 = 40$  KLD



## REVERSE OSMOSIS WATER TREATMENT PLANT CAPACITY 4500 Ltrs/Hr.



**FLOW CHART FOR THE RO PROCESS**

## **Volume of water used in the university, collected from Rain Water**

In view of non-availability of Municipal Water connection and diminishing Ground Water Table to dangerous level, necessary measures are incorporated to collect Rain water to recharge existing wells and a water pond/lake inside the campus. Nearly 6 wells are located within our campus and out of this 5 wells were exclusively serves as a principal source of water supply for the entire campus. All rain water are taken to these wells through various storm conduits and the surface recharge for the wells been carried out. All wells are of about 35 feet depth and 20 feet in diameter.

Almost Entire water usage of about 234.2 KLD was totally depends on the Wells located Within the campus.



### **Volume of water used in University: reused / recycled Water**

HITS campus population almost produces about 120 KLD of waste water mainly from hostels and canteens. For treating the generated wastewater, HITS has designed its own “Sewage treatment plant” and started functioning efficiently in the campus which is of capacity 150 KLD. Basically the wastewater which is generated from the various parts of the campus is collected and taken to the STP plant through conduits, where advanced biological treatment is given to the wastewater. The treated water is re-used for gardening and the agricultural activities throughout the campus, which makes our campus a clean and green environment.

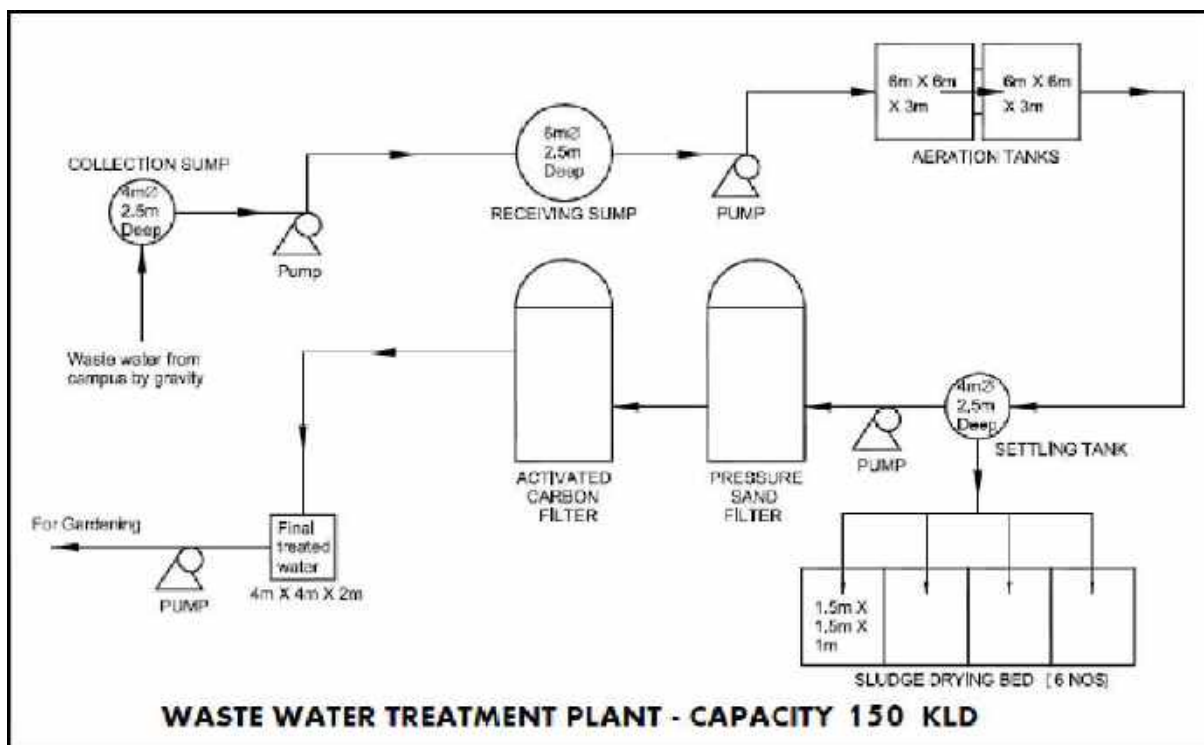


## RECYCLED WATER USED FOR GARDENING ACTIVITIES

### WATER USAGE AND CARE

Does your University as a body have a process in place to treat Waste Water: YES

For treating the generated wastewater, HITS has designed its own “Sewage treatment plant” of capacity 150 KLD. The wastewater which is generated from the various parts of the campus is collected and taken to the STP plant through conduits, and advance biological treatment is given. The treated waste water is used for the flushing as well as the gardening activities.





**RECEIVING SUMP**



**AERATION TANK**



**CLARIFIER TANK**



**ACTIVATED CARBON FILTER**



## PRESSURE SAND FILTR





**Does your University as a body have a processes to prevent polluted water entering the water system, Including the pollution caused by accidents and incidents at the University?.**  
**- YES**

In connection with prevention of pollutants entering the water source, all the wells are protected with proper mesh, so that the unwanted entry of debris in to the wells are prevented.



**WELLS PROVIDED WITH MESH TO PREVENT THE DEBRIS ENTRY**

### **Free drinking water for students, staffs and visitors:**

4 Drinking water fountains is been operated with in the Campus to fulfil the drinking needs of the Campus Population and the visitors.

### **WATER REUSE**

#### **Volume of water used in the University: Total**

190 KLD

#### **Volume of water used in the University: Reused / Recycled Water**

150 KLD

### **WATER TREATMENT**

We have a Centralized Water treatment plant for treating the water and use it for drinking purpose, This academic year, we installed three more RO plants at campus Hostels.





**All the rainwater is collected into the existing wells on the campus for the usage of the University**



Capturing rainwater can be a valuable way to reduce and aim to eliminate a building's use of municipal potable water, without requiring reductions in water use by occupants. However, it is, of course, more effective in rainy climates than dry ones.

HITS has initiated and executed the rooftop rainwater harvesting in all the buildings of the Institute of Science and Technology, including hostels and guesthouse

The rainwater collected from building rooftops of buildings connected to a standard header and led to a trickling sand filter. The filtered water is used for domestic purposes after chlorination. Rainwater harvesting is also done by diverting stormwater drains and runoff from rooftops to bore wells for recharge. For this, a pit of size 2m x 2m x 2m is excavated around the dry bore well, and the casing pipe is fitted with a v-wire filter. Filter media is filled in the pit around the well. The stormwater drains and rooftop rainwater are diverted into this pit gets filtered into the borewell through the v-wire filter. Rainwater is collected from the roof and stored in large tanks. The water is then used for the flushing of toilets and prevents the drinking water from the mains being used.

## RAINWATER HARVESTING PLANTS AT HITS

Sl: No	Campus	Buildings / Blocks	Number of Rainwater Harvesting	Quantity of water collected
1	HITS Bay View Campus	Founders Block	2	13000
2	HITS Bay View Campus	Jubilee Block	3	13000
3	HITS Bay View Campus	Main Admin Block	4	13000
4	Hindustan Arts and Science	Whole College	1	11000

**At HITS we have harvested approximately 10,00,000 Liters of rainwater in 2021, our goal is to double the rate of rainwater harvesting by 2022.**

## INITIATIVES TOWARDS SDG6

### Centre for Sustainable Technologies (CENSTEC)

The CENSTEC was established during the year 2014. Its objectives are to promote interdisciplinary activities that lead to sustainability associated with Built Environment, to develop cost effective solutions in the areas of green building materials, health monitoring of structural systems, water, air, solid waste management, renewable energy related to environmental resources and also to develop technologies for cleaner production.

The research activities of the CENSTEC includes synthesis of green building materials (artificial aggregates from ceramic waste, lathe waste, plastic waste, fly ash and GGBS), health monitoring of structural systems, production of renewable energy (hydrogen from sulphide wastewater, biogas production from solid waste, energy efficient buildings), treatment of pollutants and CO2 sequestration.

### CENTRE OF EXCELLENCE IN SUSTAINABLE INFRA-STRUCTURE (CENSIS)

Need in today's Infra-structural design and construction lies in the dimension of ecological and environmental sustainability. The proposed centre of excellence will provide the necessary inputs for different types of infra-structural systems ranging from residential to heritage structures and systems. The centre will have

Material cell

Model and prototype test cell

Analytical Model cell

Knowledge source cell and

Consultancy cell

Material cell will provide basic material characteristics at meso, micro and nano levels. Model and prototype cell will conduct model and prototype experiments, which will guide in the development and implementation of green and sustainable technology in different disciplines.

Analytical Model cell is the core for developing, numerical testing and consulting for different field problems. Knowledge source cell will provide facilities for storage of data and developmental activities. Consultancy cell offers consultancy, advice and solution to practical problems.

### **Courses Offered**

B.Tech in Environmental Engineering and Water Resources

### **Programmes Organized**

- On 24<sup>th</sup> February 2022 Department of Chemical Engineering organized online webinar (MS Teams) for “Need for Water Treatment” by Ms. Heera Balachandran Technical Director, Pentagon Enviro Engineering Company, Former Scientific Officer, Indira Gandhi Centre for Atomic Research. HITS students and faculty participated.

2<sup>nd</sup> INTERNATIONAL CONFERENCE ON SUSTAINABLE ENVIRONMENT ENERGY AND CONSTRUCTION on Dec 2020, International Journal of Hydrogen Energy (IJHE) brought a special issue covering a large number of scientific works. It covered topics related to hydrogen production, fuel cells, super capacitors, and batteries.

Unnat Bharat Abhiyan: NSS Cell and Rotaract Club of HITS began Unnat Bharat Abhiyan activities in the adopted villages. The Village survey and Household survey were completed in Kayaar village on 20 July 2019. NSS Cell also conducted various competitions among Government School students on the theme “Rain Water Harvesting” on 13 Aug. 2019. One Student One Tree project: One Student One Tree scheme was inaugurated by Dr. M. P. Poonia Vice Chairman, AICTE on 7 Sept. 2019.

Guest Lecture on “Waste Water Transport and Treatment” by Prof. Ian Holman, Head, Civil Engineering, Service Engineering and Food Technology, Cranfield University, UK on 19 Sept. 2020.

Mr. R.J.T. Nirmal Raj, Professor, was invited as a speaker in the 13th Annual Global Water Alliance Conference held at Novotel Hotel on 6 & 7 Jan. 2020.

Mr. Nelson Dias and Ms. T. Varsha won the First prize in Debate on the theme “Walk for Water” conducted by the Athena Literary Club. They also won Second & Third prize in Elocution conducted by HITS as a part of H2O Movement - Walk for Water.

Online Creative Writing Contest on theme “Water, Oh! Water...” was organized. Students partook under different genres of writing, namely, Short Story, Sonnet, Haiku, and Essay Writing.

Chaatra 3rd Vishwakarma Award on 18 Dec. 105 teams from various Institutions in Tamil Nadu and Puducherry exhibited their product under 8 different categories such as Waste Management, Energy, Farm and Flock, Land, Livelihood, Water etc., for evaluation. Felicitations was given by Mr. Ramesh, Dy.Director, and AICTE

“WALK FOR WATER” an event proposed by Par Anand Charitable Trust, Friends for Good Health (USA), and Healing Lives (UAE) was conducted on 1 Oct. 2019. The event held under the aegis of Dr. Sanjana Jon, a New York-based Philanthropist and Designer celebrity primarily observed Thiru S.R.L. Idhayavarman, Member, Legislative Assembly, Thiruporur Constituency; and Mr. Vijay Yesudas, Playback Singer & Actor as special guests.

### **International Projects**

Collaboration with Uppsala University, Sweden . Developing a smart photocatalysts from edge modified TiO<sub>2</sub> sheet integrated with NiO nanoparticle for cost effective reduction of CO<sub>2</sub> clean fuel CH<sub>4</sub> to be submitted to DST Nano mission.

Estimation of shock levels and its impact on the underwater axi-symmetric bodies due to water entry and pyro shock AERO Dr. K. Ramajeyathilagam & Mr. Stanley Samlal worth of 6.65 Lakhs, with funded by NSTL,11.07.2018, ONGOING.

Team Water Raiser got qualified as Finalist.

### **Clean water**

- Study of optical and electrical property of NaI-doped PPy thin film with excellent photocatalytic property at visible light- polymer bulletin.

- Efficient Adsorption Characteristics of Pristine and Silver-Doped Graphene Oxide Towards Contaminants: A Potential Membrane Material for Water Purification. *ChemPhysChem* 19 (17), 2250-2257.

#### CO2 reduction and Adsorption Paper

- Adsorption mechanism of graphene-like ZnO monolayer towards CO2 molecules: enhanced CO2 capture - *Nanotechnology* 27, 015502, 2016, doi:10.1088/0957-4484/27/1/015502.
- Tuning electronic and optical properties of TiO2 with Pt/Ag doping to a prospective photocatalyst: a first principles DFT study. *Materials Research Express*

AR.Mahesh kumar, M,kannan and G.nataraj ,A study on performance ,emission and combustion characteristics of diesel engine powered by nano emulsion of waste orange peel oil biodiesel,*Renewable Energy* 146 (2020) pp 1781-1795

(Impact factor 4.9)

M. Arunkumar , M. Kannan , G. Murali, Experimental studies on engine performance and emission characteristics using castor biodiesel as fuel in CI engine in *Engine, Renewable Energy* 131 (2019) pp 737-744 ( impact factor 4.9)

R.T. Sarath Babu, M.Kannan ,An experimental investigation on performance of CI engine when using LTC with blending of diesel, biodiesel and ethanol in *Int. J. Heavy Vehicle Systems*, Vol. 25, Nos. 3/4, (2019) pp 442- 454 ( impact factor 0.475)

G. Paramaguru, M. Kannan,N.Senthilkumar, P.Lawrece, “Effect of temperature on biogas production from food waste through anaerobic digestion “, in *Desalination and water treatment*, ISSN 1944-3994 doi: 10.5004/dwt.2017.21189, 85 (2019) pp 68–72 (Impact factor 1.234)

G. Paramaguru, M. Kannan, P. Lawrence, D. Thamilselvan , “ Effects of total solids on biogas production through anaerobic digestion of food waste” in *Desalination and water treatment issn-1944-3994,doi: 10.5004/dwt.2017.20167* in 2019 (Impact factor 1.234)



## **Patent**

- A PULSED DIRECT CURRENT (PDC) FED ELECTROCOAGULATION SYSTEM AND METHOD FOR WASTE WATER TREATMENT, KARTHIKEYAN K (2022-03-11)
- Mr. Vijay Samuel G, Dr. A. Anitha, Dr. Govindarajan R awarded International Patent: Australian Government Patent number: 2021106354. Title of invention: SYSTEM AND METHOD FOR SIMULTANEOUS REMOVAL OF ORGANIC POLLUTANTS AND HEAVY METAL FROM WASTEWATER. Date: 3 November 2021.

**REPORT ON**  
**ACTIVITIES CONDUCTED WITH RESPONSIBLE CONSUMPTION AND**  
**PRODUCTION**

**Eat Right Campus Award**

Hindustan Institute of Technology and Science receives the Eat Right Campus Award 2022 from Thiru. Ma. Subramanian Honb'le Minister for Health and Family Welfare, and Thiru. T. M. Abarasan, Honb'le Minister for MSME. Government of Tamil Nadu. The event was held on 14 October 2022 at Urban Square, Chennai.

The 'Eat Right Campus' initiative led by FSSAI aims to promote safe, healthy and sustainable food in campuses such as schools, universities, colleges, workplaces, hospitals, tea estates etc. across the country. The objective is to improve the health of people and the planet and promote social and economic development of the nation.

**HITS team receives the Eat Right Campus Award 2022 from Chief Guests; Thiru. Ma. Subramanian, Hon'ble Minister for Health & Family Welfare, Govt. of Tamil Nadu and Thiru. T. M. Anbarasan, Hon'ble Minister for MSME, Govt. of Tamil Nadu on 14<sup>th</sup> October 2022 at Urban Square, Guindy.**

[www.hindustanuniv.ac.in](http://www.hindustanuniv.ac.in)

**Millets for Food sustainability and food security**



Department  
of food  
technology

celebrated World Food Day, Nutri cereal exhibition, ME2MILLET challenge, and Eat Millet campaign on 18/10/2022. Vice Chancellor, Provice chancellor, and Chief guest Dr. Rita Narayan, head of the Department of Food process engineering, TANUVAS graced the occasion.

The International Year of Millets stands to provide a unique opportunity to increase global production, ensure efficient processing and consumption, promote better utilization of crop rotations, and encourage better connectivity throughout food systems to promote millets as a key component of the food basket.

The International Year will **(i)** elevate awareness of the contribution of millets for food security and nutrition **(ii)** inspire stakeholders on improving sustainable production and quality of millets, and **(iii)** draw focus for enhanced investment in research and development and extension services to achieve the other two aims

1.Campaign to create awareness among university students to improve the use of millet dishes.

Pamphlets were distributed to students by Hindustan Mascot.

2. Millet, the Nutri - cereal exhibition showcased about 153 millet dishes prepared by the students to the audience.



3. A ME2MILLET challenge was conducted among students and faculty of HITS to showcase their talent on millet-based recipes.

"Sulatha Haridas of the Food Technology Department, Consultant Dietician Has Recently Got Records from America Book of Records, India Book of Records.

In her Core Subject Food, Nutrition & Dietetics she got a record on "Most Number of Therapeutic Diet Preparation " on 1 February ,2021 From ``America Book of Records".

She is also environmentally conscious and loves to create artifacts from eco-friendly waste materials. During lockdown she got a Record from India Book of Record on 'Best out of Waste' crafts as confirmed on October 7, 2020."



**Name of the Club:** Culinary club

**Name of the Coordinator:** Dr. A.Surendra Babu

**Name of the activity:** Preparation of wheat bread, mixed fruit jam and distribution to local orphanage

Student of culinary club of Dept. of Food Technology along with five interested students had prepared wheat breads of 10 kg equal to 20 bread packets at the Baking unit present in Jupiter hostel on 16.10.19 (Wednesday) at 3.00 pm. The baked breads were packed in a polyethylene covers. Next day i.e., on 17.10.19 (Thursday) at 10.00 am a mixed fruit jam was prepared by the students at the Madurai Azhagar canteen using 2 kg of papaya, guava, banana, apple & pineapple. A jam of 6 kg jam was obtained and it is

packed in a sterilized glass bottle of 500 g capacity and cooled to room temperature. Later, the 10 kg bread packets and a 6 kg mixed fruit jam were packed in a corrugated boxes. At 4.30 pm the faculties of Food Technology, Dr.A.Surendra Babu, and Dr.P.Sankarganesh along with the students took the food products to the El-Shadai children home (Orphanage), Kelambakkam.



**REPORT  
ON  
VARIOUS  
SOCIAL  
ACTIVITI  
ES  
CONDUCT  
ED**



**REPORT  
ON THE  
TALK  
“ENVIRON  
MENT  
AND US”  
on 13<sup>th</sup>  
OCTOBER  
2022**



The Nature  
Club of  
HITS and  
Department  
of Chemical  
Engineering  
&  
Biotechnolo  
gy  
organized a  
talk on  
“Environme

nt and Us” on 13<sup>th</sup> October 2022 at Stephen Hawkins Hall, Jubilee Block. The speaker Mr.

Chandrasekaran Venkatraman is a retired banking professional who currently volunteers as a Birds Educator at Suzhal Arivom, Chennai. He has been travelling to many places for the past 10 years due to his passion for nature and has been observing and documenting the species of birds wherever he goes. Along with this, he clearly learns about birds scientifically from evolutionary development to contemporary times. He shares the experience and knowledge he has gained in a simple way to many school students and common people. Here at HITS, Mr. Chandrasekaran Venkataraman, gave an engrossing talk on environment around us with a special emphasis on Role of Birds as ecosystem service providers. He also highlighted all the major environmental threats the world faces right now as a consequence of human activities. He has suggested the ways on what and how an individual can play a role on combating the environmental crisis.

The event was followed by a nature walk around HITS campus and students got to know the different species of birds that lives inside HITS campus.



Introduction of the speaker by Dr. B. Vivekanandan, HOD, Department of Chemical Engineering and Biotechnology



Nature walk along HITS campus to see the species of birds in the campus

## ASSOCIATION OF NGOs



### Rotaract Club of HITS

#### About Rotary

Rotary International is a global community of committed professionals working together to serve others and advance peace. More than 1.2 million members in over 34,000 Rotary clubs worldwide volunteer in communities at home and abroad.



## **About Rotaract**

Rotaract is a service club for young men and women ages 18 to 30 who are dedicated to community and international service. Its membership totals over 184,000 in more than 8,000 clubs worldwide. Rotaract clubs are self-governing and self-supporting and can be either university- or community-based. Individual Rotary clubs sponsor Rotaract clubs and offer guidance and support, making the Rotaract clubs true “partners in service” and key members of the family of Rotary.

## **Service Projects**

Rotaract clubs carry out two service projects each year, one that assists the local community and one that helps a community in another country. These projects are a great way for Rotaract clubs to get involved in their own community, connect with young adults globally, and attract new members.

## **Information on six community service priorities:**

- **Peace and conflict prevention/resolution,**
- **Disease prevention and treatment,**
- **Water and sanitation,**
- **Maternal and child health,**
- **Basic education and literacy, and**
- **Economic and community development.**

## **ROTARACT CLUB OF HITS**

RCHU conducts many events for the welfare of the society and to the poor background children's. It joins with community rotaract clubs in the district and with the other international district of rotaract club. Mainly RCHU concentrates on the fund raising events

The list of events conducts based on services

- Club services
- Community service
- Professional service
- International service

<b>Sl. No</b>	<b>Academic Year</b>	<b>No. of programmes Organised</b>	<b>No. of Volunteers</b>	<b>No. of Students donated blood</b>	<b>No. of awards Received</b>
<b>1</b>	<b>2021-22</b>	<b>20</b>	<b>200</b>	<b>472</b>	<b>4</b>
<b>1</b>	<b>2020-21</b>	<b>16</b>	<b>200</b>	<b>472</b>	<b>4</b>
<b>2</b>	<b>2019-20</b>	<b>20</b>	<b>200</b>	<b>488</b>	<b>2</b>
<b>3</b>	<b>2018 – 19</b>	<b>22</b>	<b>200</b>	<b>676</b>	<b>2</b>
<b>4</b>	<b>2017 – 18</b>	<b>16</b>	<b>200</b>	<b>674</b>	<b>2</b>
<b>5</b>	<b>2016 -17</b>	<b>15</b>	<b>200</b>	<b>559</b>	<b>2</b>

**Programmes organised in the Academic Year 2021-2022**

<b>Sl. No</b>	<b>Date</b>	<b>Programme</b>	<b>No. Of Participants</b>	<b>Place</b>
1	28.07.2021	ARIMA Awards for Rotaractors	50	Online
2	17.07.2021	Covid Warrior Award	20	HHO/GUINDY
3	14.07.2021	Y's Men club Installation	30	KC TECH
4	31.08.2021	Installation of Rotaract Club	50	HHO/GUINDY
5	13.08.2021	Board Official Training	50	Online
6	7.08.2021	Awareness program on Mensural Hygiene	50	online
7	17.09.21021	Swachh Pakhwada	100	HITS
8	24.09.2021	NSS Day	100	online
9	25.09.2021	Children Home visit	25	Perumbakkam
10	25.09.2021	Y's Men Centenary Year	100	100 Orphanages
11	2.11.2021	Diwali celebrations	25	Padur
12	14.11.2021	Children's Day Celebrations	25	Thirupporur
13	25.11.2021	Blood Donation Camp	128	HITS
14	10.12.2021	Best Youth Award	7	Asanur
15	12.12.2021	Beach cleaning Campaign	140	Besant Nagar

16	25.12.2021	Blanket Donation Drive	25	Adopted Villages
17	26.12.2021	Best Presentation Award	20	Anna University
18	26.12.2021	Breaking Down Barriers	50	ONLINE
19	28.12.2021	India Area Youth convocation	10	
20	21.01.2022 to 23.01.2022	Blood Donation Camp	344	HITS
21	14.02.2022	Robotics Workshop for Govt School Students	25	ADOPTED VILLAGES
22	24.02.2022	Skill Development Program	20	PADUR
23	06.03.2022 & 07.03.2022	Napkin Donation Drive	10	KELAMBAKKAM
24	08.03.2022	School Cleaning Drive	100	PADUR
25	10.03.2022	Dental Screening Camp	20	HITS
27	17.03.2022 to 20.03.2022.	Rotaract Conference	20	KALPAKKAM
28	08.04.2020 to 10.04.2022	Rotary Youth Leadership camp	25	HITS
29	13.04.2022	Kidney Health Screening	25	HITS
30	30.04.2022	Y's Men District Conference		
31	April 2022	Rotary Citation	100	online
32	20.05.2022	"SYNERGY 2022	1	Chennai Trade Centre
33	11.06.2022	Y;s Men International India Area Convention	25	Hotel Hilton
34	14.06.2022	7 <sup>th</sup> Annual DRR Visit	50	HITS
35	19.06.2022	PETS &SETS 2022	2	chennai

36	21.06.2022	Donation of Chairs	2	KELAMBAKKAM
37	26.06.2022	Rotaract Awards	10	JEPPIAR
38	28.06.2022	International Day of Drug Awareness	100	YMCA
39	9.07.2022	Bird Net Installation	20	HITS
40	16.07.2022	Y's men club Installation	25	HITS
41	17.07.2022	Donation of School Uniforms and shoes	5	Thandalam
42	18.07.2022 to 24.07.2022	NSS SPECIAL CAMP	50	Adopted villages
43	06.08.2022	Rotaract club Installation	150	HITS

#### 1. **ARIMA Awards for Rotaractors**

Rotaract club of Hindustan University Received the following awards during the Annual District Rotaract Awards "ARIMA".which was held on 28th June 2021.

Most Supportive Club - Rotaract Club of Hindustan University.

Outstanding President - Rtr. Gokulakrishnan - Rotaract Club of Hindustan University.

Outstanding International Services Project (College Based) - Black Pearl - Rotaract Club of Hindustan University.

Outstanding Community Service (College Based) - Magizh v3.0 - Rotaract Club of Hindustan University.

Star Of Rotaract - Rtr. Johncy Saji Mathew - Rotaract Club of Hindustan University.

Star Of Rotaract - Rtr. Vishnu Vardhan V - Rotaract Club of Hindustan University.

#### 2. **Covid Warrior Award**

The following members received "Covid Warrior Award" from Y's Men club of Mylapore on 17th July 2021. The Awards were distributed by HRM.Ym.Dr.Anand Jacob Verghese,ICME(21-22),Area president Elect (21-22) Mr.K.Gnanasekaran.NSS coordinator Mr.Mujibur Rahman, Final year Mechanical Ys Hindustan Youth President(20-21) Mr.Albinus Sanjeevan ,3rd Year IT, Y's Hindustan Youth President (21-21)

#### 3. **Y's Men club Installation:**

The Installation of Y's Hindustan youth club was held on 14th July 2021 at KCG college of technology along with other sister clubs sponsored by Y's Men club of Mylapore.

#### 4. **Installation of Rotaract Club**

Rotaract Club of Hindustan University, Family of Rotary Club of Chennai capital, Rotary International District 3232, has completed its 7th Installation ceremony on 31st July 2021, Saturday at Hindustan international school CIAE, Guindy along with the Rotaract clubs of Hindustan college of arts and science, KCG College of technology, HIET, and newly chartered club Rotaract Club of Chennai capital under the presence of chief guest Rtn.Gopalakrishnan, District youth service Director and guests of honor from the parent club and special invitees from District Rotaract Council.



**5. Board Official Training**

The board officials of Rotaract club of Hindustan University were trained by experts from District Rotaract Council from 13th to 15th August 2021 in online mode. Totally 40 students were trained in various avenues of Rotaract.

**6. Awareness program on Mensural Hygiene**

Rotaract club of Hindustan University along with Rotaract club of Sophia college for women conducted an awareness seminar on menstrual hygiene among women on 7th August 2021..Rtn.Dr.Gayathri Krishnamoorthy was the speaker and more than 100 participant actively took part in the event.

**7. Swachh Pakhwada**

NSS cell of HITS along with NCC and Office of Students affairs conducted "Swachhata Pakhwada" a cleanliness campaign in and around HITS campus on 17th September 2021. Dr.S.N.Shridhra Vice chancellor and Dr.J.W. Alexander Jesudasan, Pro Vice chancellor were the chief guest and more than 200 students participated in the event

**8. NSS DAY**

NSS cell of HITS conducted "NSS Day" on 24th September 2021 in online mode.. Dr.B.S.Murty, Professor,Civil Department,UBA Coordinator,IIT Madras gave a talk on "Unnat Bharat abhiyan and its opportunities for students" . More than 100 students participated in the event.

**9. Children Home visit**

Rotaract club of Hindustan University conducted an event "Share the love" in New life and New hope Children's home ,Perumbakkam on 25th september 2021. The team spent entire day with the children and conducted games and distributed prizes.

**10. Y's Men Centenary Year**

Y's men club of Hindustan youth celebrated Y's Men centenary year along with other y's clubs of Hindustan group of Institutions by giving 10000 foods to orphanages and old age homes on 23rd,24th and 25th September 2021.Dr.Anand Jacob Varghese, India Area president, Y's men international flagged off the event on 23rd September 2021 at HHO, Guindy.

### 11. Diwali celebrations

Nss cell of HITS Celebrated "diwali celebrations "along with Rotaract club and Y's Hindustan youth on 2nd November 2021 in Padur and Thandalam villages. Sweets, Cloths and Crackers were distributed to 50 Families of tribal communities



### 12. Children's Day Celebrations

Nss cell of HITS Celebrated Children's Day on 14th November 2021 in Thirupporur Irular Colony. Competitions were conducted among childrens and prizes were distributed . More than 50 childrens participated in the event.



### 13. Blood Donation Camp

Nss cell along with Round Table India -181 (Madras Knights) organized a blood donation camp on 25th November 2021 in MGR Auditorium, HITS. Tr.Santhosh Raj, Area Chairman,RTI was the chief guest and Tr.Sunil Bajaj ,chairman( Madras Knights) was the special Invitee. A Total of 128 students donated their blood and certificates were distributed to all.



### 14. Best Youth Award

Mr.Albinus Sanjeevan,Final year ,CSE, Received" Best Youth All Rounder Award" and Ms.Shree Chandra,3rd Year, Aerospace received "Best Leadership Award in the" Regional Youth camp 2021" Organized by Y's Men International,India Area,South India region on 10th to 12th December 2021 at Asanur.

#### 15. Beach cleaning Campaign

The NSS cell of HITS in association with Urbaser Sumeet and Greater Chennai Corporation conducted a Beach Cleaning Campaign to spread awareness about saving our natural resources and keeping the environment clean on 12th December 2021 at Broken Bridge,Besant Nagar.More than 100 students actively participated in the event and created awareness.



#### 16. Blanket donation Drive

Rotaract club of Hindustan university along with Rotaract club of Shenergy, Secundrabad distributed 150 blankets to the needy in view of Christmas celebrations on 25th December 2021. The blankets were distributed in Chennai, Chidambaram and Hyderabad by the Rotaractors.



#### 17. Best Presentation Award

Rotaract club Of Hindustan University has received "Best Presentation Award - college based "in the Group Rotaract Meet "Excelerate" conducted by Rotary International district 3232 on 26th December 2021 at Vivekananda Auditorium, Anna University. The award was presented by Rtr.PP.Kamuvel, District Rotaract Representative.

#### 18. Breaking Down Barriers

Rotaract club of Hindustan university has organized a talk by Rtn. Manju K Manohar, PMP, International coach on “Breaking Down Barriers” for the benefit of Volunteers on 28th of December 2021 in zoom platform. In this session, there was a brief discussion on career guidance and how to build a resume impressively.

#### 19. **India Area Youth convocation**

Yy. Shree chandra, Aerospace(3rd Year), and Yy. Albinus sanjeevan IT (Final Year) received "Best camper "award in the India Area Youth convocation conducted at Hindustan campus from 21 to 23rd January 2022. The awards were Distributed by HRM. Ym. Dr. Anand Jacob Verghese, President, India Area, Y's Men International along with Y's Men Officials. both of them selected for International Youth Convocation.

#### 20. **Blood Donation Camp**

Rotary club of Chennai Capital along with Kcg Charitable Foundation organized a Blood Donation Camp on 14th Feb 2022 at MGR Auditorium. Rtn Dr. NandaKumar, District Governor( Elect), Rotary District 3232, has inaugurated the camp along with Rtn. Rajiv sampat, President, Rotary club of Chennai Capital and Rtn. Vishal, RCCC, Rtn. Ravindran. Blood Donation Chairman, Rotary club of Mithra. Totally 344 units were collected from students and staffs. Dr. S. N. Sridhara, Vice Chancellor and Dr. A. Prabakaran, Head - Student affairs) graced the occasion.



#### 21. **Robotics Workshop for Govt School Students**

NSS cell of HITS along with Department of ANRO organized a "A free Robotic Workshop" for Government school students in HITS adopted Villages. The workshop was conducted in Thirupporur, kelambakkam, Illalur and Kayaar Government Schools. More than 500 students were trained to make a robot by the team of Mechatronics students.

#### 22. **Skill Development Program**

NSS cell of HITS along with Department of Fashion, Design & Arts in association with Padur Panchayat organized a two days skill development workshop on " Aari



Embroidery" on 6th and 7th March 2022 in Padur Village for 30 Womens. The event was inaugurated by Mrs.KAS.Thara Sudhakar,President,Padur Village in the presence of Dr.AFrose Farid, Professor,HITS along with NSS volunteers. Dr.S.N.Sridhara,Vice chancellor and Dr.A.Prabhakaran,Head -Student affairs Distributed the certificates for the participants on the Valedictory function.



### 23. Napkin Donation Drive

"Femella" A sanitary napkin Donation Drive was organized on 8th March 2022 by NSS cell along with Rotaract club of Hindustan university in view of Women's day in Govt. Girls Higher Secondary School, Kelambakkam on 8th March 2022. 500 napkins were donated to Govt School Students. Napkins were donated by Hindustan Students.



#### 24. School Cleaning Drive

NSS Cell of HITS along with Rotaract club of Hindustan University organized a School Cleaning drive in Padur Govt. Middle school on 10th March 2022. The cleaning drive was inaugurated by Dr.S.N.Sridhara, Vice Chancellor along with the village president and more than 80 students were actively participated in the event.



#### 25. Dental Screening Camp

NSS Cell of HITS along with Y's Hindustan youth organized a Free Dental Screening camp by Chettinad Dental Research Institute on 10th March 2022 in HITS campus . More than 100 Students and staffs were benefitted.

#### 26. Rotaract conference

20 students( comprising Hindustan,KCG,HCAS,HIET) have participated in the "ROTASIA" South Asia Rotaract Conference held at Esthell village Resort, from 17<sup>th</sup> March 2022 to 20th March 2022.



#### 27. Rotary youth Leadership Camp

Rotary Youth Leadership Academy(Awards) RYLA –ATHIBAN was hosted by Rotaract Clubs of Hindustan University, HIET, KCG College of Technology, Hindustan College of Arts and Science sponsored by Rotary Club of Chennai Capital at HITS Campus on 8,9,10th of April 2022. Rtn. Vivek Harinarain IAS(Rtd), Founder & MD, Tennex Consultant Pvt Ltd & Rtn. Sesha M Sai, Honorary Consul General Republic of Seychelles presided over the event as Chief Guests and delivered a special address. Rtn. Rajiv Sampat, President – RCCC, Rtn. Vishal Jindal (Youth Service Director - RCCC), Rtr. Vidya Ragu (District RYLA Chairperson) and special invitees Rtr. PP. Kamuvél (DRR), Rtr. PP. Dinesh Kumar (DRS) and many other special speakers graced the occasion. More than 150 Rotaractors attended the event with full enthusiasm.



**28. Kidney Health Screening Camp**

Y's Hindustan Youth along with Y's club of OMR Chennai organized a " Kidney Health screening camp" on 13th April 2022 at HITS campus in association with School of allied health sciences Department ,HITS. Dr.N.Gopalakrishnan.Director, Institute of Nephrology, MMC was the chief guest HRM.Ym.Dr.Anand Jacob verghese,India Area President, Y's Men International. KCG charitable foundation started a legacy project called KCG Fashion Bank on the same day.



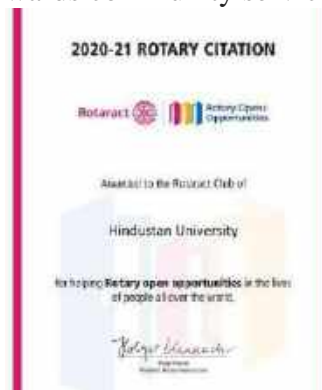
## 29. Y's Men District Conference

"Y's hindustan youth club received "" Best Youth Club"" award during the Madras District Conference of Y's Men International on 30th April 2022 at Hotel Abu sarovar portico, Kilpauk. The following awards were received during conference  
Yy. Albinus sanjeevan,IT Final year ""Outstanding youth""Award  
Yy. Sree chandra,Aerospace,3rd Year ""Best Youth "" Award  
Ym. K. Gnanasekaran,NSS Coordinator "" Appreciation award for Rural service.  
Ym. Dr. Selvamuthu Krishnan,PED, Appreciation award for Image building and also  
Dr. Rajeev,Associate Prof. received Appreciation award for "" RSD leadership"" and  
Y' s men club of OMR received award for extension works"



## 30. Rotary Citation

Rotaract club of Hindustan received Rotary Citation for the year 21-22 for the outstanding contribution towards community service from Rotary International."



## 31. "SYNERGY 2022

Mr.K.Gnanasekaran, Rotaract Faculty advisor, HITS has attended the Rotary Conference " Synergy 22" from 20<sup>th</sup> May 2022 to 22<sup>nd</sup> May 2022 held at Chennai Trade Centre, Chennai."

## 32. Y;s Men International India Area Convention

Shree Chandra Y, Final Year, Aerospace was awarded &quot;Best Youth Award in India Area, Y's men International on the occasion of 40th India Area convention at Hotel

Hilton, Chennai on 11th June 2022. The award was given by HRM. Ym.Dr. Anand Jacob Verghese, Area President, India Area, Ys Men International in the presence of Ym.Dr. Kim Sang- Chae, International president, Ys Men International. More than 15 youths were participated in the convention along with NSS coordinator, HITS."



**33. 7<sup>th</sup> Annual DRR Visit**

The District Rotaract Representative Visit was organized by Rotaract Club of Hindustan University on 14 th June 2022 to Present and submit the Annual report to Rotaract District officials. Rtr.PP.Kamuvel, District Rotaract Representative, was the chief guest and Rotarians from Rotary club of Chennai capital graced the occasion. Around 50 Rotaractors attended the event"

**34. PETS &SETS 2022**

Rtr .Harikrishnan, President (Elect) and Rtr.Nithyasri, Secretary (Elect) of Rotaract club of Hindustan university attended Training sessions for the President and Secretar at Sri Sankara Senior secondary school Auditorium on 19 th June 2022 conducted by District Rotaract Council, District 3232."

**35. Donation of Chairs**

NSS team has donated 10 chairs to Government Girls High secondary School, Kelambakkam on 21st June 2022. The chairs were donated by Mr. Aravindan, (Alumnus of Aero- 2012 Batch) Founder, Magizh Arakkattalai.

**36. Rotaract Awards**

Rotaract club of HITS has received the following awards in the District Rotaract Awards conducted by District Rotaract Council at Jeppiaar Engineering College on June 26th 2022. Rtr. Nithyasri, Star of Rotaract award Rtr. Madhu, Star of Rotaract award. Rotaract team- Best international project, Mr. K. Gnanasekaran, Mr. Sarveswaran and Mr. Mathankumar have received recognition for the support rendered to District 3232.



**37. International Day of Drug**

NSS team along with Department of sports have participated in “Torch Run and Sporting activities” organized by Chennai Customs Zone on the day of “International Day against Drug Abuse” on 28th June 2022 at YMCA, Nandanam. Shri.M.V.S Choudary IRS, Chief

commissioner of Customs has inaugurated the event along with customs officials. More than 100 students from HITS actively participated in the event.

**38. Bird Net Installation**

NSS team along with HITSAA initiated the Bird Nest Installation and tree plantation on the day of SportX(Alumni Sports Event) on 9th July 2022 at HITS . Mr.Vilson, Founder,Birds Welfare Association has donated the Nest and Trees.

**39. Y's men club Installation**

Y's Hindustan Youth club along with Y's men club of Chennai OMR,Y's youth club of KC Tech and Y's youth club of HIET had their installation on 16th July 2022 at HITS Campus. PWAf Ym.C.R.Devendra, District Governor, Madras District was the Installing officer and Ym.C.Madhan, Area Secretary-India Area was the Induction officer for the occasion. Dr.S.N.Sridhara,VC,HITS and Ym.Prof.K. Sunderajan, IPDG, Madras District were the Guest of Honours.

**40. Donation of School Uniforms and shoes**

Y's Hindustan Youth club, Y's men club of Chennai OMR club along with Lions club of Sathankuppam donated School Uniforms and Shoes to 30 underprivileged students at Idyankuppam, near Thirupporur on 17<sup>th</sup> July 2022. The shoes were donated by Mr. Kamal, HITSAA President.

**41. NSS SPECIAL CAMP**

"National Service scheme team of Hindustan Insitute of Technology and science had its Special Camp from 18th July 2018 to 24th July 2022 at Sirudavoor Village. Dr.S.N.Sridhara, Vice Chancellor, HITS inaugurated the camp along with Dr.Prabhakaran, Head(Student Affairs). A total of 48 students along with 4 Faculty attended the camp. NSS team conducted the following activities at the campsite during the stay.

conducted Village survey

Identified the Problems in the village

Created awareness about cleanliness

Created awareness about Traffic regulations

Painted Public offices and School Buildings

Cleaned the schools and create awareness among school children

Conducted competitions among villagers about Swachh Mission

Conducted Dental camp in association with Chettinad Health city

Conducted Veterinary Camp in association with Government Hospital

Conducted an Eye Camp in association with Sankara Nethralaya, Pammal

Donated the essential items for the School(Govt. High School, Sirudavoor)

Created awareness about Swachh Bharath Mission and took SWachh Pledge along with the public in Sirudavoor, Amoor, Manambathy, Agaram, and Thiruporur villages. "

**\*\*\*Separate Report Attached**

**42. Rotaract club Installation**

Rotaract Club of Hindustan University along with Rotaract clubs of KCG, HIET and HCAS had its installation on 6<sup>th</sup> august 2022 at HITS Campus, Padur. Rtn. Selvakumar, District Youth service Director, Rotary District 3232 was the guest of honor and PHF.

Rtn. Ashok verghese, Director, HITS was the Chief guest for the installation ceremony. Rtn. Kishore Reddy, President, Rotary club of Chennai Capital, Rtn. Ram swaroop, Secretary, Rtn. Manoj Kumar Bhaiya, Youth service director and officials from Rotaract District graced the occasion.



#### 43. Dental Screening camp

The NSS team of HITS along with Y's men club of Chennai OMR and Y's men club of HIndustan Youth organized a Dental screening camp on 11th August at Campus



clinic,HITS in association with Chettinad Dental Research Institute for the benefit of Staff and Students. More than 300 members benefitted .



#### 44. Independence Day celebrations.

NSS cell of HITS along with Tamil Mutram Tamil Sangam, Thirupporur organized a Poem competition in view of 75th Independence day celebrations on the topic "Pavala vizha aandil Bharatham" on 13th August 2022 for HITS adopted village youngsters at Everest Katral Maiyam, Thiruporur.



#### 45. Gram Sabha at Padur and Independence Celebrations at Govt Schools.

NSS cell of HITS along with Rotaract Club of Hindustan and Y's men club of Chennai OMR celebrated 76th Independence day on 15<sup>th</sup> August 2022 at Govt Girls High School, Kelambakkam. Refreshments were distributed to 550 students.

The NSS cell of HITS and Unnat Bharat Abhiyan team participated in the Gram Sabha conducted by Padur Panchayat on 15th August 2022. UBA coordinator Mr.K.Gnanasekaran created awareness among the villagers about the "Skill Development and training " conducted by Hindustan group of institutions and pamphlets were distributed.



## WASTE MANAGEMENT REPORT

### **Recovery of Hydrogen from Sulphide Industrial Waste (Funded by SERB, DST)**

Sulphide ( $S^{2-}$ ) in wastewater is corrosive and has a very unpleasant odour. As the most reduced form of sulphur, sulphide has a high oxygen demand of  $2 \text{ mol O}_2/\text{mol S}^{2-}$  and its discharge depletes oxygen. Millions of tons of  $H_2S$  is desulfurized and detoxified every year in petroleum refineries with unrecoverable energy input. Also natural gas fields contain about 30%  $H_2S$  in their output, which is certainly a non-negligible amount. Considering all these resources and the intrinsic toxicity of  $H_2S$ , it becomes obvious that the visible light mediated photocatalytic decomposition of  $H_2S$  could cause the twin benefits of sustainable solar hydrogen production and an aesthetic environmental abatement.

### **CO<sub>2</sub> Sequestration:**

The catalytic conversion of carbon-di-oxide with ethanolamine solution that sequesters carbon-di-oxide and results in zero emission of carbon-di-oxide. Though the Monoethanolamide solutions are used for CO<sub>2</sub> sequestration in the conventional system itself, the way of sprinkling with the help of new designed reactor for portable attachment in vehicules helps in control of CO<sub>2</sub> emissions.

Received Hindustan Innovative Awards 2017 for this innovative research on CO<sub>2</sub> Sequestration

### **Biogas production from food waste along with novel waste materials**

Refuse is too often regarded as useless, unwanted and therefore discarded. Waste is defined as “anything rejected as worthless, or in excess of what is required”. But Byrne (Byrne, 1997) said that waste is material, which has no direct value to the producer and so must be disposed of. Bailie et al. (Bailie et al., 1996) insist that “for practical purposes, the term ‘waste’ includes any material that enters the waste-management system”, i.e. organized programmes and central facilities established not only for final disposal of waste but also for recycling, reuse, material reclamation, composting and incineration (Igoni et al., 2008).

MSWM is one of the major environmental problems of Indian megacities. Municipal solid waste generally includes degradable (paper, textiles, food waste, straw and yard waste), partially degradable (wood, disposable napkins and sludge) and non-degradable materials (leather, plastics, rubbers, metals, glass, ash from fuel burning like coal, briquettes or woods, dust and electronic waste) (Jha et al., 2011; Herat, 2009; Tchobanoglous et al., 1993). The food wastes have high organic content and hence its treatment by the process of bio-methanation is most viable as it produces useful products like biogas and enriched manure. In this study, we have conducted lab-scale bio-methanation studies for biogas recovery from food waste generated from hostels in Hindustan Institute of Technology and Science (HITS). We have achieved maximum quantity of biogas production from food waste along with novel waste materials.

The kitchen food waste generated from the canteens and mess along with the shredded leaves are transported to the composting yard and these organic waste are bio-degraded at the composting yard under controlled conditions.

The organic manure will be the end product of the composting plant and it is sold to our staff and local farmers in Padur village.







**Source Reduction**

**TOTAL WASTE GENERATED AND RECYCLED AT HITS**

Years	2015	2016	2017	2018	2019	2020	2021
Total wastage generated	1,14,400	1,70,400	2,02,800	1,20,900	218,809	180,750	195,000
Plastic	17,070	7,550	4,920	7,600	10,277	8240	11580
Papers	17,000	50,800	39,800	58,400	62,775	45000	53480
Total waste Recycled	34,070	58,350	44,720	66,000	73,052	53240	65,060

Percentage of waste Recycled	30%	34%	22%	55%	33%	29%	31%
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**The HITS diverts more than 50 % of its waste from landfills.**

**We have recycled an average of 34 % waste,**

**Our goal is to reduce the E-waste generation**

**WASTE SEGREGATION BINS AT HITS**



**Paper and E Waste are sold to authorized Dealers**

Color of BIN	White Bin	Yellow Bin	Blue Bin	Black Bin
Types of Waste	Paper waste	Glass, Metal Waste and E- waste.	Plastic Waste	Food Waste

Reduce	<ul style="list-style-type: none"> <li>• Print and copy on both sides;</li> <li>• Use email to exchange documents and memos instead of printing or faxing;</li> <li>• Use electronic data storage instead of hard copy files.</li> </ul>	<ul style="list-style-type: none"> <li>• Broken items may be recycled as scrap wood or metal.</li> </ul>	<ul style="list-style-type: none"> <li>• Just say no to straws &amp; disposables inside the campus</li> </ul>	<ul style="list-style-type: none"> <li>• Engage with students to find out what could be improved and recruit them to sample new food items you'd like to offer.</li> <li>• Awareness posters</li> </ul>
Recycle	<ul style="list-style-type: none"> <li>• Reuse paper printed on one side for internal memos, "draft" documents or scratch pads;</li> <li>• Use recycled-content, chlorine-free paper products, and use soy or other agri-based inks for printing projects.</li> </ul>	<ul style="list-style-type: none"> <li>• E-waste is segregated and send to vendors for recycling;</li> <li>• Recycling depots for recyclable containers are found inside and outside campus buildings.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a reusable bottle for drinks and use your backpack when carrying extra items, instead of using plastic and paper bags</li> </ul>	<ul style="list-style-type: none"> <li>• Compost food waste for gardens.</li> <li>• Provide food scraps to farmers;</li> </ul>

## **RECYCLING OF HITS CAMPUS PAPERS**

As a part of green initiative program, all used papers of the HITS campus are recycled to M/S ITC LTD (PAPER BOARDS & SPECIALITY PAPERS DIVISION).

## **USAGE OF ECO-FRIENDLY BICYCLES**

As a Green campus initiative, Management have purchased nearly 200 bicycles. Students and staff members are strictly instructed to use only bicycles with in the campus. This initiative is to control the vehicular emission with in the campus area.

## **DONATION OF BOOKS**

At the end of every semester exams, the donation box for books is available in all hostels to collect the books and the books will be re-distributed and available to needy students. For request for collection of books contact the Dean Students Affairs, Hindustan Institute of Technology and Science, Bay View Campus, Kelambakkam, Chennai -603103.

## **BOOK SWAPPING AT SRMIST**

Students of SRMIST came together for networking through a healthy exchange of books. Book swap was a successful and interactive initiative where the students have to go with books in hand. Swapping allows you to have the items you want, give someone else the things they have been searching for, while saving you both the cost of buying entirely new products. Trading your items also helps the environment, because you are not helping to create the need for more products to be made.

These new products require new packaging, which eventually ends up in landfills. If you bypass the new products when you are able to swap for the same items, you are not contributing to that cycle.

## **PROGRAMMES ORGANISED**

### **CONFERENCE**

Dr. R.M. Kuppan Chetty, Associate Professor, ANRO being honoured towards his Paper Presentation on “IoT Enabled Smart Waste Bin with Real Time Monitoring for Efficient Waste Management in Metropolitan Cities” at the 1st International Conference on “Automation, Mechatronics, & Robotics” at Philippines.

### **REDUCTION OF E-WASTE**

The E-waste collected from the hostels and from other sites will be transferred for recycling to the local vendors on a monthly basis. **The E- waste for recycling can be submitted to the IT**



**Department on Friday in between 08.00 a.m. to 16.00 p.m.** The collected items will be sent to local retailers for recycling services.

### **E-WASTE COLLECTED AND RECYCLING**

<b>Year</b>	<b>E-waste Collected</b>
<b>2016</b>	CRT Monitors & TFT Monitors 448 Nos Keyboards 7Nos UPS seven Nos Inkjet Printers–10 Nos Dot-matrix Printers–16 Nos LaserJet Printers–24 Nos CPU cabinets–140 Nos
<b>2017</b>	Canon / HP Used Cartridges–135 Nos
<b>2018</b>	CPU Cabinets Units–104 Nos CRT monitors –37 Nos TFT Monitors–162 Nos HDD–153 Nos CD Writers–24 Nos RAM–125 Nos Printers–14 Nos Laptop Battery–24 Nos Motherboards without processor– 177Nos SMPS Units–137 Nos Keyboards & Mouse–76No Networking Passive Cables, Switches, Racks, Hubs–130 nos
<b>2019</b>	Canon / HP Used Cartridges–225 Nos
<b>2020</b>	HP/Cannon Empty Used Cartridges–282 Nos
<b>2021</b>	HP/Cannon Empty Used Cartridges–270 Nos

Guest Lecture on “Waste Water Transport and Treatment” by Prof. Ian Holman, Head, Civil Engineering, Service Engineering and Food Technology, Cranfield University, UK on 19 Sept. 2020.

Dr. R.M. Kuppan Chetty, Associate Professor, ANRO being honoured towards his Paper Presentation on “IoT Enabled Smart Waste Bin with Real Time Monitoring for Efficient Waste Management in Metropolitan Cities” at the 1st International Conference on “Automation, Mechatronics, & Robotics” at Philippines.

<b>Author</b>	<b>Research Paper</b>	<b>Research Area / Journals</b>
Prabakaran B.	Experimental investigation of compression ignition engine fueled with Biobutanol and upgraded waste engine oil for performance	Cleaner Engineering and Technology

Chandrappa S., Murthy D.H.K., Reddy N.L., Babu S.J., Rangappa D., Bhargav U., Preethi V., Mamatha Kumari M., Shankar M.V.	Utilizing 2D materials to enhance H <sub>2</sub> generation efficiency via photocatalytic reforming industrial and solid waste	Environmental Research
Mayakrishnan J., Selvakumar R.	Effect of variable compression ratio on performance and emissions in compression ignition engine fuelled with waste cooking oil with copper oxide nano fluid blends	International Journal of Vehicle Structures and Systems
Gowrishankar D., Kumar G.D., Prithviraj R., Sanjay V., Hariharan D., Vignesh M.	Synthesis and performance evaluation of fuel from waste plastics	International Journal of Vehicle Structures and Systems
Asaithambi P., Govindarajan R.	Hybrid Sono-Electrocoagulation Process for the Treatment of Landfill Leachate Wastewater: Optimization through a Central Composite Design Approach	Environmental Processes
John Presin Kumar A., Sivakumar S., Balaji R., Nadarajan M.	A Novel Banana Leaf Waste-Based Activated Carbon for Automobile Emission Control	Lecture Notes in Mechanical Engineering

## CLEAN ENERGY POLICY

<b>POLICY CREATED DATE</b>	<b>2011</b>
<b>POLICY REVIEW DATE</b>	<b>Every Six Month</b>
<b>CREATED BY</b>	<b>Electrical Engineering Department</b>
<b>RESPONSIBILITY</b>	<b>HOD EEE</b>

The issue of renewable energy sources that have great potential to give solutions to the long standing energy problems of India has been considered. It has been stated that renewable energy

Sources are an important part of India's plan to increase energy security and provide new generation with ample job opportunities. India's plans to move towards green technology and address environmental concerns associated with the country and the world have been characterized.

Understanding the above mentioned importance of clean energy, policy is implemented in Hindustan Institute of Technology and Science (HITS) for sustainable and clean energy.

Hindustan University won the Best Green Campus Award for the project Hindustan University Green Yuvatharang (HUGY). Bay Range Hindustan campus is built amidst a lush green stretch of over 150 acres abutting beautiful lakes. The green atmosphere is conducive for a calm and peaceful academic pursuit. The green campus has around 800 trees. This reduces the overall temperature in the campus by 3 to 4 degree Celsius and they absorb the entire atmospheric pollutants spewed by the vehicular emissions.

### **The Centre for Clean Energy and Nano Convergence Centre (CENCON)**

The Centre for Clean Energy and Nano Convergence Centre (CENCON) was established in collaboration with Quantum – Functional Semiconductor Research Centre (QSRC) of Dongguk University with an objective to promote awareness, importance, basic and applied research in clean energy.

### **Initiatives**

As a part of the energy awareness and conservation programme, HITS have and will hosts numerous workshops and training sessions on a regular basis. Energy Conservation week will be observed every year during month of march. The 3rd and 4th days of the aforesaid week, will be observed as 'No Air Conditioner' and 'No Automobile' days respectively.

### **USE OF ALTERNATIVE ENERGY SOURCES**

1.5kW Micro Wind Turbine had been installed on the roof top of Founders' block during January 2012 as a means of energy conservation.

100 kW Solar rooftop grid connected Power system is installed at our university which produces 800 Units of electricity per day. 1kg of coal when burnt produces 840g/kWh of Co<sub>2</sub> emission to the atmosphere. Co<sub>2</sub> being a green house gas, causing global warming will be prevented. By this green and clean installation, 67.2kg of Co<sub>2</sub> emission to the atmosphere is prevented. The electricity cost will be saved to the extent of Rs.6000 per day.

SOLAR PANEL CLEANING ROBOT (SOPAC), Massive price drops for solar technology are driving more installations, and solar power is expected to represent the cheapest form of energy around the globe. The efficiency losses of solar power plants are due to dust and other types of dirt layered over the panel. The efficiency loss is estimated around 25% in India and 35% the Middle East (monthly) due to less light coming through the solar cells. SOPAC is an autonomous, self-driven, battery operated solar panel cleaning robot works on a cost-effective solution to increase the efficiency of solar energy.

ASME's International Human Powered Vehicle Challenge will be hosted every year to provide an opportunity for the students to develop practical and sustainable modes of transportation.

Prime academic, tutorial, administrative and other spaces in all buildings are designed to take maximum advantage of ample Day Light and Cross Ventilation available outside free of cost.

All Residential Blocks and Hostels are equipped with and regularly use Solar Water Heaters and Cookers. Ample use of Solar Photo Voltaic cells can be witnessed in the campus to generate Solar Power.

Energy saving Devices are used in the campus: Light with Reflector and Solar Lamp

A Wind Mill has been installed in the campus and it is utilized to pump water out of the well.

### **Replacement of conventional lightings with LEDs**

All the newly constructed hostel blocks are installed with 10 W LED lamps and the hostel toilets and corridors are installed with 20 W and 15 W LED lamps. A few of the washrooms/ restrooms in the academic buildings are equipped with occupancy sensor based CFL light.

Biodiesel heavy vehicles and solar powered cars in campus: busses operating within the campus are powered with 30% biodiesel. These vehicles have covered more than 60,000 km without any breakdown.

### **Design of an Energy Efficient Building**

Implementing a whole-building systems approach to new construction.

The design should make efficient use of water and electricity and other natural resources and energy sources.

The design should strive to meet the Energy Star requirements for sustainability, the Leadership in Energy and Environmental Design (LEED) standards, and the International Green Construction Code (IgCC).

The design should take into consideration building orientation. The way a structure is situated on a site and the placement of windows, rooflines and other features is critical for efficiency.

Utilizing an energy modeling software is an effective way to estimate a building's energy use.

Purchase ENERGY STAR labeled office equipment which can save as much as half the electricity of standard office equipment.

### **Private Virtual Desktop Cloud Infrastructure (VDI)**

Advantage of VDI over traditional Desktop is its lower power consumption, (37Watts/Node) which sums up to an annual saving of around INR 1 million.

### **The transportation policy**

The transportation policy at HITS is unique. The students residing in the hostels are encouraged to use bicycles. They are not permitted to own any vehicle that uses fossil fuel.

Battery operated vehicles to reduce emission.

### **Programmes / Courses Offered**

Students are a critical voice in moving campuses to be more sustainable and transition towards 100 percent renewable energy. Various programmes and courses will be introduced in upcoming academic years with relevant to clean energy and sustainable energy. It allows us to train young activists, future leaders and researchers to advocate for clean energy off-campus and in their communities.

Proposed courses are:

Ph.D in Energy Efficient Architecture

Ph.D in Renewable Energy

B.Arch in **Energy** Efficient Design

## **ETHICAL SOURCE OF FOOD SUPPLIES POLICY**

<b>POLICY CREATED DATE</b>	<b>2011</b>
<b>POLICY REVIEW DATE</b>	<b>Every Six Months</b>
<b>CREATED BY</b>	<b>HOD Bio-Tech and Food Technology</b>
<b>RESPONSIBILITY</b>	<b>HOD Bio-Tech</b>

HITS's sustainable procurement policy focuses on sustainability, seasonality and provenance.

HITS is a purchaser with more than 57 suppliers, so it is essential to develop trusting, mutually beneficial, long-term relationships to guarantee the quality and safety of products across our supply chain.

We respond to client and customer expectations through our values by promoting purchasing policies that increase the use of environmentally sound and ethically sourced products. We encourage our suppliers to share our ethical principles and procurement commitments. As such, we expect them to comply with our supply chain code of conduct, which covers human rights, business ethics and environmental management practices.

Our approach to sustainable supplies includes sourcing products that meet industry marques and partnering with suppliers from the regions where we operate. We believe that, wherever possible, we should purchase fairly traded and ethically sourced products. This ensures better trading conditions for producers and helps us build lasting relationships with global suppliers that have sustainable business.

HITS's sustainable procurement policy focuses on sustainability, seasonality and provenance. We continually review our logistics arrangements in order to reduce delivery miles.

Eco-actions include promoting the use of ceramic mugs or glass cups for beverages to save on paper products, recycling office supplies such as discarded paper, purchasing recycled paper, and using refillable pens.

The institution has also placed large bins at different points on each floor to segregate wet and dry waste. To ensure this, and minimize the use of garbage bags, it does not allow dustbins at individual class rooms.

As a part of green initiative, we have replaced the plastic tableware in cafeteria with reusable cutlery.

Supporting local Organic Farmers and Their Communities by purchase of organic vegetables and providing awareness programme.

### **Expectations from Suppliers**

- We expect our suppliers to support the ethical standards set out in this Policy with regard to workplace safety, environment, and fair pay and employment conditions in their work place.
- The Policy sets out the standards that we expect all of our suppliers to comply with when producing and supplying products for HITS.
- Suppliers shall not engage in acts of bribery and corruption and shall not falsify documents and records.
- Employment is freely chosen, there is no forced, bonded or involuntary labour. Suppliers will ensure that personal protective equipment is available and workers are trained in its use.
- HITS supports ILO Convention 138 with regard to the appropriate age of workers and will not work with suppliers who use child labour.
- Wages and benefits paid for a standard working week meet, at a minimum, national legal standards or industry benchmark standards, whichever is higher. In any event wages should always be enough to meet basic needs and to provide some discretionary income.
- In any event, workers shall not on a regular basis be required to work in excess of 48 hours per week and shall be provided with at least one day off for every 7 day period on average. Overtime shall be voluntary, shall not be excessive, shall not be demanded on a regular basis and shall always be compensated at a premium rate.
- There is no discrimination in hiring, compensation, access to training, promotion, termination or retirement based on race, caste, national origin, religion, age, disability, gender, marital status, sexual orientation, union membership or political affiliation.
- The facility shall comply with national and local environmental laws and regulations *f* The facility shall dispose of its production waste in accordance with local environmental laws and regulations *f* The facility must have identified and documented its key environmental impacts and implemented controls to minimize its impact on the environment with respect to solid waste disposal, hazardous chemicals storage and management, air and water emissions.

## **Compliance with the Policy**

HITS's expects its suppliers to comply with all aspects of this Policy, and will be extending its coverage of audited facilities and compliance monitoring processes to include these standards.

HITS's is committed to working in partnership with its suppliers to help achieve compliance with this Policy. In the event where any supplier is unwilling or unable to demonstrate continuous improvement towards full compliance with our standards, the trading agreement between Woolworths Limited and the supplier will be terminated.

## **Key Contacts**

For more information on HITS's Ethical Sourcing and Sustainability policies visit our website at [www.hindustanuniv.ac.in](http://www.hindustanuniv.ac.in)



## SUSTAINABLE WASTE MANAGEMENT POLICY

<b>POLICY CREATED DATE</b>	<b>2011</b>
<b>POLICY REVIEW DATE</b>	<b>Every Six Months</b>
<b>CREATED BY</b>	<b>HOD Civil and Chemistry</b>
<b>RESPONSIBILITY</b>	<b>HOD Civil</b>

Hindustan Institute of Technology and Science (HITS) is committed to enhancing the health and wellbeing of its campus community, to increasing safety practices, to reducing consumption of energy and fuels, to minimizing emissions, and to reducing solid and hazardous wastes. Members of the University community are expected to integrate into their daily operations best practices to reduce, reuse, and recycle materials, consistent with municipal, state, and central rules and guidance.

### **Purpose**

HITS's endeavors to adopt practices that reflect a comprehensive approach to conserving resources and reducing and managing waste. Waste prevention, reuse, recycling, and composting are prioritized over landfill disposal. In order to minimize our environmental footprint; to provide guidance to the University community on best practices for reducing and recycling waste; and to promote adherence to environmental law, this policy establishes a sustainable, solid waste management program that communicates acceptable methods of handling, storing, recycling, and disposing of materials.

### **Policy Implementation**

#### *I. Waste management requirements*

A. Adherence to applicable law and University procedures. All members of the HITS community are expected to handle, store, recycle, and dispose of materials in accordance with applicable law and University procedures, including all laws, regulations, and guidance documents referenced in this policy (see "Related Information" below; unless otherwise noted, the versions of such laws, regulations, and procedures currently in effect are to be followed). Specific guidelines relating to different types of waste are identified below.

B. Municipal solid waste. Waste streams such as non-hazardous wastes, recyclables, food wastes, and construction and demolition debris should be handled pursuant to sustain HITS's Recycling Guidelines.

C. Electronic waste. Indian law bans most forms of electronic waste from landfills in the state. All University-owned electronic waste will be recycled through Facilities Management's E-Cycling Program.

D. Hazardous waste. All University-generated hazardous waste must be labeled, handled, stored, and disposed consistent with the Office for Research Safety (ORS) guide developed to ensure that the management and disposal of hazardous waste at HITS is conducted consistent with applicable law.

E. *Universal waste*. All University-generated universal waste must be labeled, handled, stored, recycled, and disposed consistent with HITS's Universal Waste Guide.

Any questions regarding the categorization of different types of waste or the guidelines applicable to their management and disposal should be directed to either sustain HITS guide line or ORS.

### ***Implementation responsibilities***

A. Department and vendor leaders are responsible for:

- i. Reviewing operations to determine where waste can be reduced at its sources of generation;
- ii. Acquiring, to the extent feasible and practicable, items that are durable, have minimal packaging, or are readily recyclable when discarded;
- iii. Assessing purchasing decisions, making every attempt to purchase items only when needed and in amounts that are not excessive;
- iv. Ensuring employees have access to compliant waste containers, including containers for recycling; and
- v. Assuring only trained and certified employees, students, and vendors generate and label specially-regulated or hazardous wastes.

B. HITS faculty, staff, students, and vendor personnel are responsible for:

- i. Separating defined waste types and placing identified waste materials in the appropriate containers; and
- ii. Handling specially-regulated or hazardous wastes only if trained and certified to do so.

C. HITS's Office of Procurement and Payment Services is responsible for:

- i. Prioritizing procurement of goods and services that have a less negative effect on human health and the environment;
- ii. Promoting the purchase of durable and environmentally preferable products and prioritizing these purchases over procurement of single-use or disposable products; and
- iii. Establishing contracts with vendors when necessary to responsibly handle University-generated waste.

D. HITS's Office of Facilities Management is responsible for:

- i. Establishing policies for the management of construction and

- demolition and executing construction and demolition contracts that include specific construction debris recycling targets;
- ii. Facilitating the removal of regulated refrigerants from refrigerators and freezers and maintaining the pertinent records required by law or regulation;
- iii. Managing collection areas for the drop-off of universal waste in each building;
- iv. Providing standard trash containers; and
- v. Maintaining contracts with custodial service providers responsible for collecting non-regulated waste.

E. Northwestern's Office of 5's is responsible for:

- i. Maintaining up-to-date procedures and training on the proper disposal of hazardous, radioactive, biological, and potentially infectious wastes generated in teaching or research laboratories;
- ii. Providing approved containers for the disposal of hazardous, radioactive, biological, and potentially infectious wastes in teaching or research laboratories; and
- iii. Managing contracts for the disposal of all hazardous wastes and for hazardous waste emergency response services.

F. HITS's Center for Sustainable Energy and Environment (CSEE) is responsible for:

- i. Maintaining procedures for the handling and disposal of hazardous and universal waste in non-research areas;
- ii. Training all non-research employees handling hazardous waste about proper waste handling procedures, safe use of personal protective equipment, and emergency procedures; and
- iii. Ensuring non-research departments follow all contractual hazardous waste and hazardous waste emergency response services requirements.

G. HITS's Office of Human Resources, through its my HR Learn system, serves as a records repository of completion of required trainings for those employed by HITS. For various reasons, Office of 5's or CSEE may maintain other training records outside of the HR Learn system.

### **Consequences of Violating this Policy**

HITS faculty, students, or staff who fail to comply with the laws, regulations, and ordinances referenced in this policy could be subject to disciplinary action under Institutions policies and procedures, including termination of employment or academic dismissal.

The Institution may terminate its relationship with any third-party contractor who violates this policy. Individuals who knowingly and deliberately release hazardous materials in

violation of law could also be subject to criminal penalties.

**INTELLECTUAL PROPERTY DEVELOPMENT – CONTRIBUTION TOWARDS UN’S SUSTAINABLE DEVELOPMENT GOALS**

<b>IPR Title (Patent/Copyright)</b>	<b>Date of publication</b>	<b>Faculty Name</b>	<b>Designation</b>	<b>Department</b>
SOLAR POWER PLANT TO PRODUCE 10 HRS OF POWER ENABLING INDUSTRIES TO WORK FOR ONE SHIFT SOLELY ON SOLAR POWER	2022	MR. JESUDAS. F.W, .DR. S. NAGARAJAN	Associate Professor	
DESIGN AND DEVELOPMENT OF DOUBLE BASIN SOLAR STILL WITH THERMO ELECTRIC MODULE WITH CONDENSING CHAMBER	2022	DR.D.G.HARRIS SAMUEL, RAVISHANKAR SATHYAMURTHY	Professor	Mechatronics
A SYSTEM AND METHOD FOR UNMANNED AERIAL VEHICLE FOR ASSISTING IN AN EMERGENCY/DISASTER	2022	SINHA, ANURAG, SREEJA, P. S	Assistant Professor & Associate Professor	
A SYSTEM FOR SOLAR POWER LOAD MANAGEMENT	2021	Parvathy A.K, Dev Balaji	Professor, Assistant Professor	Electrical & Electronics
PLATE COLLECTOR TO HEAT WATER FOR DOMESTIC APPLICATIONS USING NATURAL FIBRE AS THERMAL INSULATOR	11-04-2019	Dr. Hariram	Professor	MECH

Method for Managing the SAR value, QoS, and Energy consumption in Wideband Code Division Multiple Access	22-10-2020	Dr. Meenakshi N.	Asst. Professor	IT
Networks				
IMPROVED SOLAR POWERED LOW COST TYRE PRESSURE SENSING ASSEMBLY WITH BIFURCATION FOR AUTOMOBILES	14/03/2011	Mr. Muthukumaran G	Associate professor	EIE
Intelligent Circuit for Automatic cut-off for Portable Immersion Heater	30/06/2014	Mr.Sambath M	Assistant Professor	CSE
		Mr. Sudalai Muthu T	Assistant Professor	CSE
		Mr. Thangakumar J	Assistant Professor	CSE
Solar Power Automatic Tapioca Harvester	30/06/2014	Mr. Sudalai Muthu T	Assistant Professor	CSE
		Mr.G.Muthukumaran	Associate Professor	EIE
Solar power production for 10 hrs a day using static solar panels	14/11/2014	Mr. Frank Wingston Jesudas	Associate professor	IT
		Dr. Nagarajan	Professor	IT
Design and Development of Double Basin Solar Still with Thermo Electric Module with Condensing Chamber	05-07-2016	Dr. D.G. Harris Samuel	Professor	MECH
		Mr. Ravishankar Sathyamurthy	Research Scholar	MECH
Solar Powered Automatic Tapioca Harvester (SoPoTaHa)	17/08/2012	Mr. Ashok Verghese	Director	HITS
		Mr.Sudalai Muthu T	Assistant Professor	CSE
		Mr. MuthuKumaran G	Associate professor	EIE
A Service Robot for	27-04-2020	Dr.D.Dinakaran	Professor	CAR

COVID-19 Isolation Wards		Dr M M Ramya	Professor	CAR
		Dr RM Kuppan Chetty	Associate Professor	CAR
		Mr J Akash	Student	CAR
		Mr P Sivaprakasam	Student	CAR
		Dr G K Kumar	Professor, Anesthesia	GH, Chengalpattu
		Dr D Sudhakaran	Professor, Anesthesia	GH, Chengalpattu
Speech Communication for Aphasia Disorder (SCAD) using Machine Learning Technique	20-10-2020	Dr. Thangakumar J	Professor	CAR
		Dr. P. Ranjana	Professor	CAR
		M. Rajmohan	Associate Professor	CAR
Raising the efficiency of the Indian farmer by switching him from crops to electricity generation project	09-01-2012	Mr. Frank Winston Jesudas	Professor	IT

## AWARDS

The institution has been bestowed with Good Green Governance award five times consecutively in recognition of environment friendly initiatives in its 150 acres lush green campus. It has successfully implemented 5S Workplace Management. Hindustan believes in benchmarking with the best and ensures that highest standards of quality are implemented it envisages and challenges convention to build a future beyond and aims at achieving the status of World Class University.

- Good Green Governance G3Award 2013 under the Higher Educational Institution Category in recognition for spear-heading Green University Revolution in India.
- Won SRISHTI's Award for Good Green Governance on the Earth Day in 2018. HITS HAND BOOK 2018 - 2019 Ranked No. 3 in Tamil Nadu in Top Engineering Colleges by Competition Success Review (CSR-GHRDC) Survey.
- Good Green Governance Award 2017 Australian Service Excellence Award Congratulations Team Hindustan Achievement Talk Good Green Governance Award 2017 was given to Hindustan University at New Delhi by Mr. Kalyan Patra, CEO of SHRISHTI Publications on 22nd April 2017.
- Greenmetrics Award 2017,2018 and 2019

## **REPORT ON PARTNERSHIPS FOR THE GOALS**

**17.2.1** The “Goa Declaration” is the first of its kind academic declaration towards achieving the UN’s sustainable development goals, and the ceremony was witnessed by Dr. Bhushan Patwardhan, Chairman of the National Assessment and Accreditation Council (NAAC); Shri Avinash Rai Khanna, Vice Chairman of Indian Red Cross Society & Vice President of Bharatiya Janata Party; Padma Bhushan & Padma Shri Dr. Anil Prakash Joshi, Founder, Himalayan Environmental Studies and Conservation Organization (HESCO); Shri Shaurya Doval, Founder, India Foundation; and Prof. Lawrence Pratchett, Former Pro Vice Chancellor, International, University of Canberra, Australia. PACT2030 is a carbon-neutral conclave and is the brainchild of QS I-GAUGE, a renowned brand for Indian education ratings, **from the UK based QS Quacquarelli Symonds Group**. The event brought together the top universities and luminaries of Indian Higher Education; worked towards building consensus and sharing best practices, and perspectives among the delegates of the conclave to lay down a set of principles and promises to achieve sustainable development goals (SDGs) leading to the formation of the “Goa Declaration”. Sustainable Development Goals 2030, originally envisioned by United Nations (UN) was the foundation for the guidelines that are set in the Goa Declaration Document. The Chairman of the National Assessment and Accreditation Council (NAAC), Dr. Bhushan Patwardhan graced the conclave as the Chief Guest and opined, "Knowledge, Action, Character and Mental Strength are important for quality education and desired change is possible only through education." Mr. Ashok Verghese, in his presentation provided a glimpse of the institution contribution towards SDGs, overview of the institutional global rankings, and also highlighted the way forward plan of HITS and its association with International Urban and Regional Cooperation., Australasia and Asia. He explained the proposal to work on IURC Project involving HITS and TUAS—Implementation of Zero Emission HITS Campus, based on the IfaS (Institute for Applied Material Flow Management) Model. The Vice-Chairman of Indian Red Cross Society and Vice President of Bharatiya Janata Party, and the Guest of Honour, Shri Avinash Rai Khanna, addressed the gathering and laid down a five-point agenda for the higher education institutions. To him, "Leadership, Research, Teaching and Learning, Campus Operations, and Quality of Service are the most important aspects that every institution must

emphasise upon to make a larger contribution to the SDG Agenda.”Shri Dr. Anil Prakash Joshi in his keynote address of the conclave said, "like GDP (Gross Domestic Product), GEP (Gross Environment Product) must be initiated and practised by the Government to ensure the wellbeing of the country in an environmental perspective". While Shri Shaurya Doval iterated the responsibilities of institutions to provide quality education to every student, Prof. Lawrence Pratchett observed that SDG is a complex model but it is very important for making the world a better place to live.



## GOAL 3: GOOD HEALTH AND WELL-BEING

### 17.2.4

- Taking cognizance of the severe pandemic situation in India, the faculty of **Trier University of Applied Sciences, Germany** with whom Hindustan Institute of Technology and Science (HITS) is enjoying a partnership through DAAD since 2018, have come forward to donate Rs 50 Lakhs worth equipment and kits such as Oximeters, Oxygen Concentrators, Medical FFP Masks and Protection Kits which were distributed to the deserving covid affected communities near Padur village where the institution is located. Trier University got support from various organisations such as C V Association of Catholic Student fraternities, Rotary Club, General German Automobile Association,



Association of German Engineers and R. Stahl for the logistics of the equipment and other requirements.

### **17.4.1**

- Foodanzaa'22, an Expo and Food Festival and Awareness programme on “Food Adulteration” in association with FSSAI, was organised on 15 March 2022. Dr. T. Anuradha, Food Safety Officer, **Food Safety and Standards Authority of India (FSSAI)**, Kanchipuram District presided over the event as the Chief Guest

### **17.4.2**

- Introduced B. Sc. Food Science Nutrition and Dietetics programme for the academic year 2021 - 2023.

### **17.4.2**

- Introduced Integrated M. Sc. Food Technology Programme from 2022 - 2023.

### **17.4.3**

- Dr. T. Sivapriya, Professor & Head, published a book on “Introduction to Functional Foods and Nutraceuticals”.
- She also published 2 Book Chapters titled, “Emerging Trends in Disease and Health”, and “Advances in Food Science and Nutrition”.

### **17.4.3**

- International Webinar on “Managing **Gut Microbiota Health**” by Dr. Tolulope J Ashaolu was conducted on 14 Dec. 2021.

### **17.4.3**

National Webinar on “Integrating **Health and Longevity with Superfoods**” by Dr. Kalavani Ashok, Head, Dept of Home Science, Queen Marys College Chennai; and Mr. Manimaran, Regional Director, South India zone was conducted on 29 and 30 Sept. 2021.

### **17.4.3**

Seminar on “**Food Product Development** and Capacity Building for Budding Entrepreneurs” by Ms. S. Dhanupriya, Director, DPro Food Consultants was organised on 22 Nov. 2022.

### **17.4.3**

Seminar on “Entrepreneurship Possibilities and **Skill Development in Fermented Foods**” by Mr. Abha Appasamy, Director, Abbas Probiotics was organised on 9 Dec. 2021.

### **17.4.3**

Virtual Quiz on “**Nutrify Your Minds**” and Cross Word Puzzle, “Nutri Tinge Maze” were organised on 25 and 26 Sept. 2021.

### **17.2.1**

Dr. K. Srimathi, Associate Professor, has obtained “Carbon Based Materials with High Antibacterial Activity for Face Mask Application to Combat COVID 19 (2021-2024)” project worth Rs. 18,30,000/, sanctioned by Science and Engineering Research Board-Teachers Associateship for Research Excellence (SERB-TARE).

## **GOAL 4: QUALITY EDUCATION**

### **17.2.4**

Officials **from Taiwan** Economic and Cultural Centre (TECC), India, Mr. Peter Chen, Director, TECC; Dr. Chin Tsan Wan, Director, Science Division and Ms. Ellie Chiang, Secretary to Director, Science Division, visited HITS on 17 Nov. 2021 to exchange MoU intending to offer Mandarin Language to students of HITS. Dr. Peter Chen gave a presentation on the achievements of Taiwan Universities, and briefed on the possible **collaborations with Taiwan institutions in various aspects** with special emphasis on Mandarin Language teaching. This was followed by exchange of MOU ceremony for collaboration with HITS for offering Mandarin Language for HITS students.



CODE, the Centre for Open and Digital Education, HITS signed an MoU with the International Skill Development Corporation, ISDC, UK on the 31 of January 2022.

### **17.4.3**

A total of 53 students [32 (Enrolled in 2021-22) & 21 (Enrolled in 2020-21)] from Ethiopia, Lesotho, Nigeria, Djibouti, Dubai, UAE, Malaysia, Iran, **Srilanka, and Nepal** were admitted into various programmes of study

### **17.2.3**

AICTE Training and Learning Academy, also known as “ATAL,” is an initiative by AICTE to plan and help in **imparting quality technical education** in the country. It promotes conducting Faculty Development Programs (FDPs) with the help of a grant. The Department of Civil Engineering has received a grant of Rs. 93000 to conduct a five-day FDP on “**Intelligent Transport Systems**” between 5 and 9 July 2021. Intelligent Transport Systems

(ITS) is an area where day-to-day traffic and transport problems are addressed and solved using a variety of multi-branch technologies such as sensors, data analytics, simulation, advanced electronics, and new computing and communication technologies. Toll collection using FASTag, traveler information systems, route guidance systems, advanced traffic control systems, traffic police control systems are some examples. The core is in civil engineering, especially, transportation engineering, since the basic infrastructure for all such ITS applications depends on the provision and maintenance of roads and highways. Civil engineers evaluate the impact of ITS applications and choose the ones that optimally help solve the congestion issues. “ITS” is a well-known field elsewhere in advanced countries, and it is catching up fast in India.

### **17.2.3**

Mr. Albinus Sanjeevan D., Mr. Arvinth S. and Ms. Samita R., pre-final year, B.Tech. IT Cyber Security are selected for the fall batch of Semester Exchange Programme with a scholarship of JPY 200,000 (Given monthly while staying in Japan) from 21 September 2021 to 31 January 2022 at **Shibaura Institute of Technology, Tokyo, Japan**. The team is thrilled on their threshold and anticipate **personal and professional development** while upholding values of Hindustan

**INTERNATIONAL WEBINAR ON SUSTAINABLE DEVELOPMENT GOALS | Event Date: Thursday, 31st, March 2022**



**Mr. Ronnie Antony, Starlight Experimental Education Institute, Taiwan, Teach SDGs Global Ambassador, Taiwan Coordinator, ETC Sweden** addressed a Webinar on “**Integration**

**of Sustainable Development Goals Education in the Curriculum** and the Scope of Global SDG Projects”. The event was organised by Dr. K. C. G. Higher Education Leadership Management Centre and the Office of International Affairs on 31 March 2022. Dr. Ilavazhagan, Director International Affairs upon delivering the welcome address stressed on the importance of creating awareness among staff and students about the UNSDG goals and its effective implementation at HITS. While introducing the speaker, Mr. Ronnie, Dr. A. Sherine Joy, Head Languages and HELM Centre stated that he has been a pioneer in championing the cause for environmental awareness and sustainable development during the pandemic era. Teach SDGs Global Ambassador, Taiwan Coordinator, ETC Sweden addressed a Webinar on **“Integration of Sustainable Development Goals Education in the Curriculum** For example, for Gender Equality: SDG5 – books suggested were that of Malala’s “Magic Pencil” for school kids of age 7-12; “No Truth without Ruth: The Life of Ruth Bader Ginsberg”, “Kathleen Krull” for ages 10-12; for SDG 6 Clean Water and Sanitation-books titled “A Drop Around the world” by Barbara Mckinney and “The Water Princess” by Susan Verde were included; similarly for SDG 11– Sustainable Cities and Communities-“The Journey” by Francesca Sanna was added. Mr. Ronnie emphasized that for Higher Education syllabus there should be incorporation of SDG oriented study and practical projects. He stated that a small STEP (acronym for ‘S’ay the problem without blame, ‘T’hink of solutions-safe and respectful, ‘E’xplore the consequences and what could happen if . . . , and ‘P’ick the best solution . . . make your plan) in this direction would definitely pave for enabling the education fraternity to implement SDGs and thus work toward transforming the world. Further, Mr. Ronnie insisted that students should explore the possibilities of taking up projects related to SDGs connect to local issues and take action since it makes a difference. Mr. Ronnie answered the queries during the session regarding the projects and informed that the staff should enroll in Teach SDGS and be aware of the global conferences related to SDG and proposed on the possible collaborations with institution for joint conferences, workshops and projects. Dr. Sherine proposed the vote of thanks. The session was attended by over 70 participants.



**Dr. Peter Koenig**

*Professor & Head, Institute for Automotive Technology, Trier University of Applied Sciences, Germany.*



I beseech everyone to take responsibility for your life, and be an example for others by showing values and constantly strive to find real values in life. There are three types of responsibilities that I would like each one of you to develop upon:

1. Reflect on what you hear and read; and not to accept the statement of others.
2. Need to speak up if something is wrong. Try to change the world a little around with your charm, character, potential, positivity, and good wealth.
3. Develop and guide others irrespective of nationality, gender, race, religion to be better—make this world a little bit better every day.

I have been associated with Hindustan for over 3 years and working on the DAAD Project with the Department of Automobile Engineering. I take this opportunity to welcome young learners to visit Germany as we share a good partnership with India and I would be honoured to offer my support in any possible way. Wishing all success to Hindustan!

**H.E. Dr. Grace Akello**

*Ambassador of Uganda to India*



I feel doubly honoured to be in Hindustan Institute of Science and Technology. First, this institute has conferred upon me the prestigious academic award of Honoris Causa. Secondly, I attach great value to this honorary award because it has been given to me at the most auspicious of all times of the year. This is the time of year when the world honours the mothers of its people. It has taken many years for the world to place equal value on the female part of humanity.

Females, over thousands of years of the evolution of the human species, have been gentle, silent strength and inspiration that propelled humanity to achievement. When I looked at the number of Indian women as professors, heads of departments, engineers, and technicians, I said, "Hail the spirit of India because India has recognised that its humanity is made of women and men." Thank you for making India grow and grow and grow. As for my Honoris Causa from this prestigious university, I dedicate this degree to all women everywhere on planet earth.

**17.4.2**

Vice Chancellor and the Director, HITS signed an MOU with Trier University of Applied Sciences (TUAS) Germany **for a Dual Master Degree Programme on “International Material Flow Management”** in the presence of Dr. Griese, State Secretary, Ministry of Education, Germany on 22 Oct. 2019.

### **17.4.3**

Workshop on “Effective Communication **Skills** at Workplace” for **Non-teaching Faculty** was held from 1 to 3 Feb. 2022 .

### **17.4.3**

Guest lecture on higher education opportunities for engineering and **management students** - HELM centre | event date: monday, 18th, july 2022

A Five-day Workshop on “Research Insights” was held between 22 August 2022 and 26 August 2022 at HITS. The workshop was jointly organized by Dr. Sherine Joy, Head, Dr. K.C. G. Verghese Higher Education Leadership Management Centre and Dr. J.M.Mathana, Dean Research, Centre for Research and Consultancy. Inaugural session was held on 22 August 2022,

Dr. J. M. Mathana, Dean Research welcomed the dignitaries and participants. She briefed the objectives of the workshop. Dr. Nandakumar, Director Research, HITS explained the importance of scholars attending the workshop and improving the quality of research and publishing in reputed scopus indexed journals. The importance of citations, H index was also reiterated and this would increase the visibility of the institution and improve the rankings.



Dr, KCG Verghese Higher Education Leadership Management Centre (HELM) in collaboration with HITS Alumni Association (HITSAA) organised a guest lecture on the “Importance of Innovation and Research in Higher Education and Opportunities for Students.” The session was led by HITS Alumna (Mech-2016) Dr. Suman Kumar, Founder & Tech-Lead, VPE Ltd., and Director, Ramanujam School of Sciences.





## **GOAL 5: GENDER EQUALITY**

### **17.2.3**

On 29 January 2022. Dr Pooja Kalita, the resource person from **South Asian University (SAU)** opened up intense discussion on the **need for gender sensitization** and gender mainstreaming in a development scenario of a society vis-à-vis economy.

### **17.4.3**

- The School of Planning, Architecture & Design Excellence conducted a webinar on “Women in Architecture and Design – Choose to Challenge” on the occasion of International Women’s Day on 8 Mar. 2021 in online mode through MS Teams. The guest for the webinar was Dr. Ponni Concessao, Principal Architect, OCI Architects Ponni & Oscar. Architect Dr. Ponni M. Concessao did her B.Arch. from NIT, Trichy (1987), later did her M.Arch., Cornell University (1989) and Advanced Professional Studies at Harvard University in 1992. She was conferred an Honorary Doctorate in Modern Architecture in 2008 in Malaysia, and University of Milano for Modern Architecture and Architectural Science, 2014. She worked with internationally renowned architectural firm Edward Larrabee Barnes in New York City. She has won over 138 International, National and State awards for architecture, interior designs and has been widely published in design magazines and newspapers.. Ponni was recently awarded the Women Icons of Asia 2019 in Singapore along with 11 women from Asian nations. Architect Ponni is involved in the Prime Minister’s Pradhan Mantri Awas Yojana project and also built noon-meal centers, toilets for underprivileged girl students as well as schools for leprosy afflicted patients’ children. Ar. Ponni also has annual exhibitions of her paintings to raise funds for Leprosy Eradication. Ar. Ponni’s session started by sharing her views on how challenging the world was for a woman herself to achieve a position she is now today. Facing gender inequality at very beginning, she managed to pursue her dreams and became the first woman candidate to study at NIT Trichy. She also shared her experience in USA at Cornell and Harvard

Universities where she broke more gender and national barriers; and how was she able to turn challenges to a problem-solving scenario to achieve a goal. Ar. Ponni Concesso also shared the architectural and interior projects, from residential to institutional, commercial and hospitality which she had led and designed. Students were more interested in asking about Ar. Ponni's aspiring stories in life as a woman..

### **17.2.1**

- The Office of Student Affairs & Google Developer **Student Club** of the Department of Information Technology organised an exclusive Women's Day **Ideathon with a theme** "Gender Equality Today for Sustainable Tomorrow" on 8 March 2022. Ms. Dhivya Krishna, Writer, Public Speaker, Tedexer & Prominent Social Entrepreneur spoke passionately about the bright days ahead for women. She narrated her hardships and efforts to overcome the gender bias in the society. Speaking about her study of technology and psychology to understand society, Ms. Dhivya opined, "It is important to know the in and out of social values in steering myself as a woman. Without this basic understanding, it is not possible to become a tech leader. As a social worker, I mingle with the downtrodden sections of the society. I go to the remote villages and mix with the children there. Girls who have not seen touch phones will brighten their faces once they see our touch phones. Such a joy of life I would like to see in the innocent faces of interior areas of our country". Best young brains gathered to hammer out ideas towards gender equality. More than 100 participants took part actively. Ms. Afra Banan, GDSC Lead and Women's Secretary proposed the vote of thanks

### **17.2.2**

Fempower, HITS organized a Webinar on "Awareness Session on POSH" on 26 August 2021 commemorating "Women Equality Day". Dr. Sherine Joy, Head, Fempower Centre, HITS welcomed the Speaker, Ms. Raghavi Senthilkumar, Director and Founder, **The Headway Academy & Foundation** POSH & POSCO certified, Alumna (MBA 2007). Dr. Sherine briefed on the objectives of Fempower and also the importance to know about Prevention of Sexual Harassment (POSH). She also introduced the resource person to the audience that constituted staff and students of HITS and guests. Speaking on gender equality,

Ms. Raghavi quoted the law by the Constitution on “Right to Equality”. She recollected the Criminal Law Amendment Act which was established as an outcome of Mathura rape case and it was further amended after Nirbhaya case. Unfortunate cases lead to implementation of Laws. Women is considered as weaker section till date and there are several laws to protect, the gravity of the offences are still prevalent and law has to fall into action. Ms. Raghavi elaborated on the law to protect the women in society and the law to protect women being harassed. She emphasized on Gender sensitization, it is a method of understanding the individuals of both the genders, the physical and psychological aspects. She explained briefly on the difference between harassment and sexual harassment. She also expressed the fact that there are inhibitions of victims not opening up when they are harassed, whether it is an institution, workplace, organization or homes.

### 17.2.3

Centre for Women and Girls Welfare and Development, (CWGWD) Fempower, HITS organized a webinar on “Economic Empowerment of Women and Strategies” on 19 August 2021. Ms. Chief Guest Ms. Jessy Mathew, International Trainer and Speaker, and Director at **Al Amal Watnia, Oman, Founder Director at Jj2 Consultancy UK Ltd.;** and Alumna MBA’96, HITS. Dr. Sherine briefed about the aims of Fempower that includes economic empowerment of women and girls. She mentioned that Dr. Mrs Elizabeth Verghese, Chancellor of HITS, who is an inspiration for Hindustan fraternity and an iconic personality released the Fempower during the Women’s Day Celebration during March 2020. Dr. Elizabeth emphasized, “there is a need for women to rise above all challenges and odds like inequality, gender bias and economic disparity”. Keeping in view of the Fempower aims, the Centre for Women and Girls Welfare and Development has chartered out several programmes and events that would empower women and girls. Ms. Jessy Mathews gave an insightful presentation empowering women in all aspects: economical, social, political, fundamental & financial. Her key thoughts are highlighted. Ms. Jessy, Emphasized that Women need to reshape their own perception of how they view themselves. They have to step up as women and take the lead.

## **GOAL 6: Clean Water and Sanitation**

The Centre of Excellence in Underwater Robotics and Communication (CoE URC) at Hindustan Institute of Technology and Science (HITS) was inaugurated by Dr. M. Ravichandran, Secretary, Ministry of Earth Sciences (MoES) on 30 September 2022 in presence of Dr. S. Somanath, Chairman, Indian Space Research Organisation (ISRO). The CoE URC aims to establish advanced research and development in various areas of ocean engineering. The CoE URC will offer unique research opportunities for students and industry partners to uplift their skills in the areas of (1) Design and Development of Bio-mimetic Underwater Vehicles, (2) Smart Nanomaterials for Underwater Devices, (3) Optical, Acoustical, and RF-Communication, (4) Artificial Intelligence and Machine Learning Assisted IOT Signal Processing. The Centre will offer under graduate and post graduate level advanced research projects along with regular PhD research work. Dr. M. Ravichandran appreciated the efforts to establish the Centre with a major focus on the selected research thrust areas which are well aligned with the deep ocean mission of our Nation. He further extended his confidence in the CoE to excel in National and International collaborative research projects. He wished the CoE URC to possess a technologically potential roadmap in the proposed thrust areas to excel among the pioneer international research community.



## **GOAL 7: AFFORDABLE AND CLEAN ENERGY**

### **17.4.3**

Organised “Hindustan Cyclothon 2021” along with the School of Physical Education and Sports Science on 2 Oct. 2021. Over 150 **alumni** and students participated.

### **17.2.3**

The Office of International Affairs in collaboration with **Western Sydney University, Australia** organized an interactive Webinar on theme “Racing with Sun – Creating a Solar Car” on 31 March 2021. Resource persons included Prof. Gu Fang, Prof. Ming Zhao, Dr. Dharmappa Hagare and Dr. Ali Hellany from the School of Engineering, Western Sydney University, Australia. More than 380 students from Automobile, Mechanical, Mechatronics, Electrical and Electronics Engineering participated.

### **17.2.3**

Dr. Puspamitra, Head, CENCON; Dr. Indrajit Shawn, School of Computer Science; and Dr. Preethi, School of Building Sciences, HITS, participated in the 6th Congress of World **Technology Universities Network, USA** from 18 to 20 Oct. 2021.

## **GOAL 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE**

### **17.4.4**

HITS and Trier University have signed an MOU in late 2018, following which the partnership got a joint Project titled “German – Indian R&D Study on **Innovative Concepts for Traffic Infrastructure, Driver Assistance and Vehicle Safety**” funded by DAAD (German Academic Exchange Programme) in 2020. As a part of the Project, Students and Faculty from Trier University of Applied Sciences visited HITS and spent more than a week carrying out studies on road safety. Similarly, students and faculty from HITS went to

Germany and spent almost a month carrying out studies on various aspects of driver assistance, road infrastructure and vehicle safety.

### **17.4.3**

The Department of Electrical and Electronics Engineering organized a Webinar on “Dreams and **Social Entrepreneurship**” on 19 Mar. 2021. Mr. Jayakumar Anthony, Head – HR, Eaton Power Quality Pvt. Ltd., Pondicherry delivered an inspirational lecture on “Dreams and Social Entrepreneurship” through MS Teams. He introduced the different aspects of entrepreneurship and emphasized the importance of zeal and great ideas as ingredients for business start-up. His motivational lecture emphasized the need for basic awareness of entrepreneurial concepts to take up entrepreneurship as a challenging career. Mr. Anthony explained in detail about the various attributes of successful entrepreneurs and employees such as drive, communication skills and technical skills. The webinar was attended by 162 students across departments.

### **17.2.1**

Obtained a Consultancy Funded Project, “Development of **Automatic Tea Leaf Cutter** for Inclined Terrain Harvesting” worth Rs. 12,86,000/- from PABS Tea Pvt Ltd., Kerala

### **17.4.3**

Dr. D. Dinakaran, Professor & Head, Centre for Automation and Robotics, School of Mechanical Sciences, HITS, delivered Keynote Lecture in the 71st Annual General Membership Meeting and Convention (e-AGM \* 2.0), on “Transformation in Robotics Research and **Development: After COVID19 Scenario**” organized by the Mechatronics and Robotics Society of Philippines on 27 Dec. 2021.

### **17.4.2**

The Department of Electronics and Communication Engineering conducted an Online Workshop on “Do It Yourself - Automatic Hand Sanitizer Dispenser” Series on 29 May, 5 and 9 June 2021 from 4 to 5 p.m. Under the guidance of Dr. AL. Vallikannu, Head, ECE, the programme was conducted by Mr. S. Srinivasan, Asst. Professor; and Mr. John Jacob, Lab Superintendent as resource persons. A total of 75 students participated from various schools in Tamil Nadu and other states. Mr. John Jacob introduced all electronics components used in making of hand sanitizer like resistor, Capacitor, diode and Transistor etc. and discussed the different ways of making this dispenser. A PPT explaining the circuit diagram of making automatic sanitizer dispenser was presented.

## **GOAL 10: REDUCED INEQUALITY**

### **17.4.3**

**Alumni** Ms. Premila Josephine Manager - Product Development Engineering, Advanced Micro Devices, Singapore states “ Rendering services to the community is not an option but a responsibility of every human. The experiences as a member of the KCC Community Center Singapore, OLPS Church L&C Committee, and AMD CSC Committee led me to institute a community services program in HEAAC with 2 targets - to serve the underprivileged, and to instill the spirit of service in our alumni members. We successfully launched this program on 29 May 2022 with ‘**Willing Hearts**’ a **charity organization** that provides food for 11,000 people daily to over 70 locations island-wide. HEAAC plans to share its time in various organizations on a quarterly/ monthly basis and grow this initiative to benefit the needy.

Workshop on “Effective Communication Skills at Workplace” for Non-teaching Faculty was held from 1 to 3 Feb. 2022 .

## **GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES**

### **17.4.2**

On the occasion of world landscape architecture month (April), SPADE organized a webinar on “Happy Cities Through Streets” by Ar. Aswathy Dlip, Senior Programme Manager, ITDP, India on 21 April 2021. Students and faculty members of SPADE participated. Ar. Aswathy spoke about the Organization in which she is currently working on, ITDP **Institute of transportation and development policy**, their goals and promotions on sustainable transportation around the world, and about the work the organization does in Chennai for the past 10 years. Further, she discussed about how ITDP created public spaces along the streets with the survey that ITDP has taken on the different mode of mobility people use for different needs and also mentioned how world’s best cities design the streets by allocating spaces to all users. The talk continued with the process of the work they initiate in reforming the streets, setting non-motorized transport policy guidelines and promoting it with guidance of the government and expanding the transformation through capacity building and institutional frame work. Ar. Aswathy highlighted various opportunities that exist in developing Happy cities like India cycle 4 change and street for people challenge.

## 17.4.2



**Dr. Panagiotis Karamanos**  
*IURC, Country Coordinator in India, Expert IURC, Europe.*

“The European Union (EU) funded International Urban and Regional Cooperation programme (IURC), encourages EU and Indian city pairings on topics of sustainable urbanization. It also seeks the direct involvement of key stakeholders, such as academia and civil society. We are very fortunate that HITS is a committed partner in the Chennai-Trier (Germany) pairing by giving valuable advice and most importantly by providing the framework for creating a sustainable campus concept. This concept will look into sustainability from a comprehensive perspective, including mobility, water, waste, and other key issues. Therefore, it will be beneficial

not only for HITS but for other large institutions and city neighbourhoods that can take advantage of the best practices learned from this cooperation. HITS is noted for its important contribution and commitment.”

## GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES

### 17.4.4



US INDIA Partnership Free Job Oriented Training on “Installation of Solar Water Pump” was conducted by HITS between 28 July and 4 August 2021 **under the Grant support of 11,360 \$ from University of Nebraska, USA** through Alamo Colleges District, USA. The objective of the training programme was to deliver workforce training to the HITS adopted village residents to build skills that will result in their employment and improved economic conditions. Initially, Alamo Colleges District provided a 60-hour “train-the-trainer” video instruction on “Installation Solar Water Pumping Systems” to the faculty of HITS.

## **GOAL 12: RESPONSIBLE CONSUMPTION AND PRODUCTION**

### **17.4.5**

- Delegates Mr. Ashok Verghese, Director, HITS & Dr. M. Jaikumar, Professor & Head, Automobile Department from Hindustan University welcomed by Mayor of Trier (IURC Asia & Australia) to exchange the ideas on Sustainable – waste management – recycle with Stadtwerke Trier and visited their Energy and Technology Park on 10<sup>th</sup> November, 2022.





- The NSS Cell of HITS in association with **Urbaser Sumeet**, one of the leading Facility Management Service providers in India; and the Greater Chennai Corporation conducted a **Beach Cleaning Campaign** on 12 December 2021 at Broken Bridge, Besant Nagar. The objective of the Clean Beach Campaign is to clean up the beaches by scanning the sand for any debris before being drawn into the sea by high tides. More than 100 students actively participated in the event and created awareness.

### 17.2.1

World Environment Day is being observed on 5 June engaging governments, businesses and citizens in an effort to address pressing environmental issues. School of Planning, Architecture and Design Excellence (SPADE) commemorated World Environment Day in association with **Institute of Town Planners India (TNRC)** on 5 June 2021 on the theme Ecosystem Restoration. For too long, we have been exploiting and destroying our planet's ecosystems. Every three seconds, the world loses enough forest to cover a football pitch and over the last century we have destroyed half of our wetlands. Ecosystem restoration refers to preventing, halting and reversing this damage – to go from exploiting nature to healing it. The virtual event started with a welcome address by Mr. S. R. Rajendhiran, Chairman, TN Regional Chapter, ITPI. He highlighted over 20 environmental problems which the world is facing today, and emphasized on the need for World Environment Day, where only 12% of cities in the world have air quality measures in place that meet the World Health Organization standards. Dr. S. N. Sridhara, Vice Chancellor, HITS delivered the presidential

address and briefed on the history of World Environment Day, and the role of United Nations in making it a global event through its conventions. He also emphasised on the healing quality of the nature and its rejuvenation with the example of recent lockdowns due to COVID 19 all over the world and the cost which one spends on oxygen cylinder, which nature gives us at free of cost throughout our living.

## **GOAL 13: CLIMATE ACTION**

### **17.4.4**

- A team of 6 students from the Department of Aeronautical Engineering won Rs. 1.5 lakh Prize money in **Hackathon on Climate Action-21** organised by **WTUN, UK**.

### **17.4.4**

- Dr. RM. Kuppan Chetty, Principal Investigator; Dr. M. M. Ramya, and Ms. N. Seenu, Co-Investigators; are resuming a research project, Development of Autonomous Heterogeneous Robotic Swarm Simulator for **Faster Disaster Reconnaissance and Mitigation**” worth Rs. 52,51,271/- funded by **Royal Academic of Engineering, UK**.

### **17.2.4**

Talk was held on 18 March 2022 Socio-Political **Aspects of Climate Change** delivered by Ms Joan Shilpa Kiran from the **National Institute of Advanced Studies (NIAS)**, Bangalore.

Dr. Badri Narayanan, Head, School of Management Studies; and Dr. David Easow, Head, School of Liberal Arts and Applied Sciences, HITS, participated in WTUN Innovation **Hackathon on “Climate Action”** organised by **WTUN, USA** on 29 June 2021.

### **17.2.4**

Dr. Kavitha, Assistant Professor; G., Mr. Manish, Desai, B.Tech. Aerospace Engg., and Ms. Krithika, S., Research Scholar obtained **an International Patent** for A Method and System for Performing **Weather Forecast**” on 26 June 2021.

## **GOAL 14: LIFE BELOW WATER**

### **17.2.1**

- Carried out research activities on the ongoing project “Coupled fluid-structure interaction studies due to underwater explosion on submerged composite pressure hull” worth Rs. 41.1 lakhs sanctioned by NRB, **DRDO**.

### **17.2.1**

Completed “Estimation of shock levels and its impact on the underwater axi-symmetric bodies” project worth Rs.6.65 lakhs sanctioned by NSTL, **DRDO** during Nov. 2019 - Mar. 2021