

Energy Audit Report (2021-22)



VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS)

Velan Nagar, P.V. Vaithiyalingam Road, Pallavaram, Chennai-600 117,
Tamil Nadu, India

Audit Date: 5th April 2022

Pragnaa

Pragnaa Shree Venture India Pvt. Ltd
Door No. 4 & 5, Flat No. F-2, Daya Garden, First Floor, 2nd Cross
Street, New Colony, Chrompet, Chennai – 600 044

INDEX

S. No	Contents	Page No
1	Executive Summary	3
2	Introduction to VISTAS	5
3	General Information of VISTAS	11
4	Facilities	12
5	VISTAS Layout	14
6	Vision, Mission and Core Values	15
7	Management Commitment	17
8	Scope and Goals of Green Audit	18
9	Benefits of Green Audit	19
10	Target Areas of Green Audit	20
11	Methodology	21
12	Auditing Energy Management	23
13	Participation and Consultation	34
14	Best Practices / Initiatives	38
15	Conclusion	44
16	List of Recommendations	45
17	Disclaimer	46

Section 1: Executive Summary

Educational institutions now a day are becoming more sensitive to environmental factors and more concepts are being introduced to make them eco-friendly. To preserve the environment within the campus, various viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of energy savings, recycling of waste, water reduction, water harvesting etc... The activities pursued by the university can also create a variety of adverse environmental impacts. Environmental auditing is a process whereby an organization's environmental performance is tested against its environmental policies and objectives. The green audit is defined as an official examination of the effects a University has on the environment. As a part of such practice, an internal audit (Green Audit) is conducted to evaluate the actual scenario at the campus.

The green audit can be a useful tool for a University to determine how and where they are using the most energy or water or resources; the University can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve the waste minimization plan. Green auditing and the implementation of mitigation measures is a win-win situation for all the University, the learners and the planet. It can also create health consciousness and promote environmental awareness, values and ethics. It provides staff and students with a better understanding of Green impact on campus. Green auditing promotes financial savings through the reduction of resource use. It allows the development of ownership and personal and social responsibility for the students and teachers.

The audit process involved Initial Data Collection at, Site walkthrough with the team of VISTAS with the views management including the policies, activities, documents and records.

This was followed by staff and student interviews, collection of data, review of records, observation of practices and observable outcomes.

The baseline data collected from Vels University, VISTAS, Pallavaram, and Chennai are analyzed and conclusions made.

We thank the Management of VISTAS, Dr. Kalaivani and Dr. Sathish and other team members for supporting the complete audit process.

We are happy to submit this green audit report to the **VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS).**

Mr. S.K. Srinivasan
Mr. R. Murali
Mr. S. Babu

Pragnaa Shree Venture India Pvt. Ltd

Section 2: Introduction to VISTAS

Vels Group of Institutions run by the Vael's Educational Trust, a charitable, non-profitable organization was established in 1992 by Dr Ishari K.Ganesh to commemorate the fond memory of his father Shri. Isari Velan, the Former Deputy Minister in the popular Govt. of Dr M.G.R was also associated with the film industry. Taking education to the humble thresholds of first-generation learners and weaker sections of society has ever been the objective of Vael's Trust. The vision of Vael's is to inculcate self-reliance and discipline among the youth and also to improve the quality of higher education.

The multifaceted, need-based, magnificent Vels Group of Institutions under Vaels Educational Trust highlight the commitment and dedication toward the noble cause of higher education. Lighting the lamp of education on countless thresholds hidden in the folds and crevices of India, Vael's holds high the blazing beacon of quality Education

Indeed this institution of higher learning and excellence is a leviathan in the ever-expansive ocean of education. The moving spirit behind Vels success story is the founder Chairman and Managing Trustee Dr.Ishari K.Ganesh. Believing staunchly in the philosophy of work, placed on the pedestal of worship, he is a visionary and inspiring academician, who breathed into generations and generations of students, the unsullied breath of quality education, tempered by discipline and enlivened by dedication.

Vels College of Pharmacy was started in 1992. Subsequently, Vels College of Physiotherapy (1993) and Vels College of Science (1993) were started. The Deemed to be University status was conferred, to the above different colleges, after fulfilling all the procedures on 04.06.2008 by the MHRD, Govt. of India with the registered name **VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS)**. The Head Office of the VISTAS has located at Pallavaram around 2 km. south of Pallavaram railway station and nearly 4 km away from Chennai Airport. The Deemed University status has been conferred by UGC after taking into account the

rich experience accumulated by the Management and the Quality maintained in the field of Higher education.

VISTAS has blossomed into a multi-disciplinary Institute offering more than 100 UG & PG programs, besides Doctoral programs, through 16 Schools and 45 Departments. Programs have the approval of the relevant Statutory Regulating Agencies such as UGC, AICTE, PCI, BCI, NCTE, DGS etc. VISTAS have a student strength of close to 14500 and a faculty strength of close to 709 with 348 of them having a doctorate. The School of Maritime Studies was awarded an “A1” grade by the Indian Register of Shipping (IRS) in Nov-2019. **VISTAS has been accredited by NAAC with a CGPA of 3.01 / 4 (A) grade in March 2019. B.E., Mechanical Engineering, B.E., Computer Science & Engineering, Master of Business Administration, B. Pharmacy, B.E., Marine Engineering, B.E. Electronics and Communication Engineering, B.E., Electrical & Electronics Engineering, B.E., Biomedical Engineering & B. Tech IT (Cloud and Mobile based Application Development) programs have been accredited by the NBA.**

VISTAS is also recognized as a Scientific and Industrial Research Organization (SIRO) by the Ministry of Science and Technology, Government of India. VISTAS has improved infrastructure, modernized laboratories, increased hostel accommodation and improved sports facilities. Since becoming a deemed university, syllabi have been revamped periodically in all disciplines. There has been a significant increase in the enrolment of students and more so among women students. The Deemed University is well equipped with ICT facilities such as Smart classrooms, Video Conferencing, Online courses and Vels Knowledge Resource Centre. VISTAS has a Centre for Fish Immunology, Incubation Centre, Central Instrumentation Laboratory, Centre for Energy and Alternative Fuels, Centre for Artificial Intelligence, Centre for Automation and Power Conservation, Centre for Material Research, Centre for Excellence in Pharmaceutical Research & Drug Testing, Centre for Elephant Research, Centre for Bioengineering, Centre of Excellence in Cloud Computing with IBM, Centre of Excellence in Business Analytics with IBM, Centre for Intellectual Property Rights (IPR), Centre for Advanced Research & Development (CARD), Centre for Multimedia Research, Centre for Transfer of Technology, Centre of Excellence in Constitutional Law and Centre of Excellence in MAT Lab.

OUR VISION

To make the Institute an epitome of excellence in higher education by providing high-quality education and rigorous training in multiple streams of choice with ample scope for all-round development for the betterment of society.

OUR MISSION

- Effectively **imparting knowledge and** inculcating innovative **thinking**
- Facilitating **skill enhancement** through add-on courses and **hands-on training.**
- Doing original, socially relevant, **high-quality research.**
- Facilitating appropriate co-curricular, extracurricular and extension activities
- Instilling the spirit of **integrity, equity,** professional **ethics** and social **harmony.**

The structure of Governance in VISTAS facilitates Autonomy, Transparency and Accountability through the participation of various stakeholders. It provides the differentiation and integration of various activities in VISTAS. The Organizational structure has been designed as per UGC Regulation. The Regulatory bodies of VISTAS include the Board of Management, Academic Council, Planning and Monitoring Board, Board of Studies and Finance committee. They have been functioning as per guidelines of UGC and Memorandum of Association and they meet periodically. The various key stakeholders of VISTAS, which include faculty, students, parents, industry experts, academic peers and alumni, are involved in decision making at every level. For smooth functioning of VISTAS, several sub-committees comprising the faculty and student representatives have been constituted. In order to decentralize administrative/academic machinery, the authority has been delegated by setting up of Deans for various Schools, Admissions, Academics, Research, Student Affairs, Faculty, IQAC, etc., For transparent functioning, the Admission, Academics, Administration, Accounts and Examination processes are automated by using ERP.

An enriched teaching, learning and evaluation process is carried out in VISTAS catering to the diversity of students and faculty. Students entering VISTAS enjoy a multivariate learning process. Bridge Courses are conducted to prepare the students

for their respective study environments. The entire Teaching-Learning process is student-centric focusing on LMS, KMS, and E-Learning resources. Interactive and instructional lectures, focused discussions, classroom deliberations, practical classes, hands-on training, projects, presentations, workshops and guest lectures help students to hone their technical skills. Comprehensive lesson plans are prepared regularly by faculties for effective teaching. Independent, Interactive, Collaborative and Participatory learning is encouraged and the required facilities are available for students in terms of SMART Classrooms, Wi-Fi-enabled Campus, Industrial Interactions, Projects and visits. Video lectures of VISTAS were recorded using EduTech, NPTEL, EDX and other MOOCs to enhance student learning. Virtual learning through the AVIEW and Moodle programs of IIT are available. VISTAS employ an effective Mentor-Mentee system for guidance and counselling students on regular basis. Class committee meetings are conducted regularly for all types of learners. Remedial and tutorial classes are conducted for slow learners to enhance their learning. Fast learners are involved in NPTEL courses, industrial problems and projects. All the programs offered by VISTAS have clearly defined POs, PSOs and COs and the outcomes are assessed through direct and indirect methods. VISTAS adopt a Continuous Assessment System, where both formative and summative assessments are ensured to measure the attainment of course outcomes.

VISTAS core values are aligned with its vision and mission and are reflected in the curricular and professional growth of the VISTAS community. With Equity as its premier value and a Women's Forum as its mouthpiece, VISTAS promote gender sensitivity among all stakeholders. Girls are given special counselling to overcome depression, abnormal behaviour etc. VISTAS have a well-defined Environment policy. The campus is green, serene and pleasant. Steps have also been taken to conserve energy and reduce carbon footprint by installing three windmills and solar street lamps. VISTAS has been adhering to the best practices such as Herbal Garden, Tobacco-Free Campus, Green Campus, Bio-gas plant, Rain Water Harvesting, Renewable energy and carbon neutrality. The E-waste is again sold back to the contractors for disposal. Recently a modern waste processing machine has been installed on the campus, for converting biodegradable waste into manure. Being situated in the heart of the city, VISTAS enjoys the privilege of creating direct and indirect employment opportunities for the local unemployed youth. Good connectivity and the presence of

industries in the vicinity are major advantages. The core values and the developments stated above are displayed on the Institute's website. Promoting a cosmopolitan culture, VISTAS observes National festivals and birth/death anniversaries of great Indian personalities.

VISTAS follows the Best practices such as Outcome Based Education, Student Mentoring, External Academic and Administration Audit, ERP in all the activities, NSS Unit-Swachh Bharat Abhiyan, Student's Feedback about Teachers, MHRD Digital Initiatives, Research culture, Institution-Industry Interaction, Use of Renewable Energy, Internship for Students, Parent Corner in the Website etc. The Industry-Institution relationship is very strong at VISTAS. Industries are busy developing products at the Incubation Centre. Some academic programs such as B. Tech and MBA are run in collaboration with M/s IBM. Experienced Professors are active in solving industrial problems as part of consultancy projects. Our vision is to provide quality education. Hence, as part of ensuring quality, an External Academic and Administrative Audit is performed in all the departments every year.

A centre, named, "Centre for Advanced Research and Development (CARD)" has been established to promote research. Besides 12 advanced dedicated research labs in various schools, a Central Instrumentation lab is set up housing advanced instruments such as BET Surface Area Analyzer, Field Emission Scanning Electron Microscope, High-Performance Thin-Layer Chromatography, X-Ray Diffractometer, Particle Size and Zeta Potential Analyzer, Raman Spectrometer, etc. Research scholars from nearby universities also use the VISTAS lab for research. Due to strong Industry – Institutional tie-up, senior faculty are busy solving industrial problems as consultancy projects. Ten industries are active at Incubation Centre in developing products useful to the society. Staff members are given incentives to publish papers and attend seminars. During the last three years, 1374 research papers have been published in the UGC listed journals. *Turnitin* software is available to eliminate plagiarism.

Under the Unnat Bharath Abhiyan program, VISTAS has initiated the promotion of institutional social responsibility through activities undertaken in the neighbourhood

rural community. Generic Medicines are made available to the Society through Pradhan Mantri Jan-Aushadhi Yojana Scheme.

The road map of VISTAS is well-drawn. Our vision is to make this an International Institute wherein students from all the countries will assemble to enrich themselves in terms of knowledge. We want to provide physical and academic infrastructure including lab facilities which will create a “reverse flow” of students. Our ambition is to have at least 100 crores worth of research projects by 2030.

Several are the paths and avenues to be explored and exploited. Countless are the feathers to be added to the Vels cap of success. The endeavours continue with determination, “to strive, to seek, to find and not to yield”. On the whole, the Institute is committed to excellence in every activity, intelligent planning of each activity and ensuring focused effect on each of them for attaining excellence. **WE HAVE ACHIEVED A LOT, STILL, WE FEEL WE HAVE MILES TO GO AND OUR JOURNEY IN HIGHER EDUCATION CONTINUES...**

Section 3: General Information

S. No	Description (2021-22)	Male	Female
1	Students	10184	4389
2	Teaching Staff	360	384
3	Non-Teaching Staff	251	227
4	Total	10795	5000

Students & Staff School Wise			
S. No	Description	Male	Female
1	School of Management Studies & Commerce	2493	777
2	School of Computing Sciences	1596	350
3	School of Life Sciences	257	352
4	School of Mass Communication	521	64
5	School of Maritime Studies	575	12
6	School of Engineering	1805	282
7	School of Basic Sciences	130	110
8	School of Hotel & Catering Mgmt.	150	24
9	School of Pharmaceutical Sciences	381	244
10	School of Physiotherapy	189	320
11	School of Ocean Engineering	107	11
12	School of Law	1011	473
13	School of Languages	69	70
14	School of Education	26	268
15	School of Music & Fine Arts	34	18
16	Dept. of Aviation	193	58
17	School of Ancient Indian Studies	26	39
18	Ph.D	621	917
19	M.Phil	-	-

Section 4: Facilities Available

- Boys Hostels
- Girls Hostels
- Staff Quarters
- Three air-conditioned auditoria with a capacity of 1200, 250 & 120
- Three air-conditioned seminar halls with a seating capacity of 150
- Main Canteen is available which can cater to 200 persons at a time and Three smaller canteens are also available
- Bank with ATM
- Pharmacy
- RO Plant
- Transport facilities
- Nine Diesel Generators
- Three Wind Mills
- Waste Management
- Solar Plant
- Insurance for all students and staff members

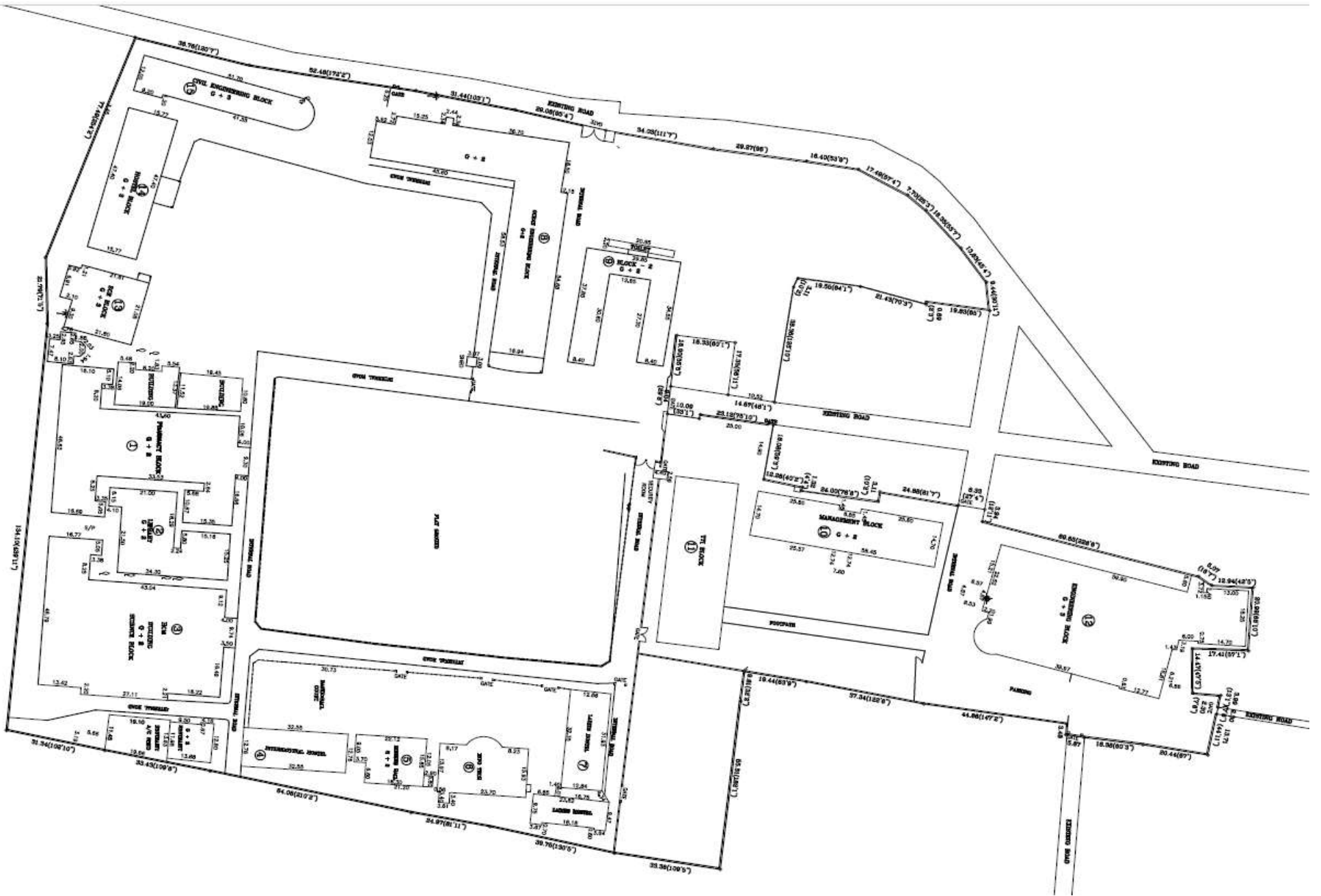
VISTAS have three playgrounds and other facilities such as:

- Football Field
- Volleyball Court
- Basketball Court
- Ball Badminton Court
- Badminton Courts (Outdoor)
- Throwball Court
- Tennikoit Court
- Taekwondo
- Cricket Practice Pitch (nets)
- Kabaddi Court
- Swimming Pool (25mtsX14 mts)

Facilities Available

- 200 Mtrs Track
- Fitness Centre (gymnasium)
- Indoor hall to play Table Tennis, Carrom and Chess
- All the Fire Safety Equipment are provided on the premises
- Having necessary Wheel Chairs and Ramps in all the buildings on the campus.
- The institution is having adequate toilet facilities for physically challenged persons.
- Lift facilities are available
- All members of staff (Teaching, Non-teaching & Students) are covered through accident cum hospitalization insurance.
- Two separate Health Clinics are available - One for Boys and One for Girls.
- One Male Medical Officer and One lady Medical Officer are available.
- Tie-up with nearby hospitals namely Kamatchi Hospital, and Parvathy Hospital.
- Apollo Shine Clinic is located within the campus.
- 24 Hrs Ambulance facility
- Nursing Assistants

Section 5: Layout



Section 6: Vision, Mission and Core Values

Vision

- To make the Institute an epitome of excellence in higher education by providing high-quality education and rigorous training in multiple streams of choice with ample scope for all-round development for the betterment of society.

Mission

- Effectively **imparting knowledge** and inculcating **innovative thinking**.
- Facilitating **skill enhancement** through add on courses and **hands-on training**.
- Doing original, socially relevant, **high-quality research**.
- Facilitating appropriate **co-curricular, extracurricular and extension activities**.
- Instilling the **spirit of integrity, equity, professional ethics and social harmony**.

Core Values

VISTAS believe that:

- VISTAS students and scholars should be well-founded on the pursuit of knowledge through, teaching and learning research, with fellowships required based on intellectual merit, ability and the potential for excellence.
- Perspectives, arising from diverse knowledge backgrounds, that redefine our identities, deepen scholarly inquiry and enrich path-breaking newer knowledge horizons.

- Cherish the key values of academic freedom, creative and innovative thought, ethical standards and integrity, accountability and social justice, and nurturing an open mind and open society.
- Foster inquiry-led and evidence-based approach to creative knowledge; facilitate a vibrant academic ambience to nurture the intellectual climate.

Section 7: Management's Commitment

The Management of the VISTAS has shown a commitment to green auditing during the audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environmentally friendly such as awareness programs on the environment, campus farming, planting more trees on the campus etc., after the green auditing. The management of the University was willing to formulate policies based on the green auditing report.

Section 8: Scope and Goals of Green Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care that is the responsibility of each individual who is part of economic, financial, social, and environmental factors. It is necessary to conduct the green audit on the University campus because students become aware of the green audit, its advantages to saving the planet and they become good citizens of our country. Hence, a Green audit becomes necessary at the university level.

Section 9: Benefits of the Green Auditing

- More efficient resource management
- To provide a basis for improved sustainability
- To create a green campus
- To enable waste management through reduction of waste generation, solid-waste and water recycling
- To create a plastic-free campus and evolve health consciousness among the stakeholders
- Recognize the cost-saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Enhance the alertness to environmental guidelines and duties
- Impart environmental education through a systematic environmental management approach and Improve environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the University and its environment
- Enhancement of University profile
- Developing an environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.

Section 10: Target Areas of Green Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Eco-campus concept mainly focuses on the efficient use of energy and water; minimising waste generation or pollution and also economic efficiency. All these indicators are assessed in process of “Green Auditing of the educational institute”. Eco-campus focuses on the reduction of contribution to emissions, procuring a cost-effective and secure supply of energy, encouraging and enhancing energy use conservation, promoting personal action, reducing the institute’s energy and water consumption, reducing wastes to landfill, and integrating environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, and Environment.

Section 11: Methodology of Green Auditing

The purpose of the audit was to ensure that the practices followed on the campus are by the Green Policy adopted by the institution. The criteria, methods and recommendations used in the audit were based on the identified risks. The methodology includes: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the document, interviewing responsible persons and data analysis, measurements and recommendations. The methodology adopted for this audit was a three-step process comprising of:

1. Data Collection – In the preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, surveys communicating with responsible persons and measurements.

The following steps were taken for data collection:

- Site Visit
 - Data about the general information was collected by observation and interview.
 - The power consumption of appliances was recorded by taking an average value in some cases.
2. Data Analysis - Detailed analysis of data collected includes calculation of energy consumption, analysis of latest electricity bill of the campus, Water consumption, Waste Generation and Greenery Management.
 3. Recommendation – Based on the results of data analysis and observations, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. The use of fossil fuels has to be reduced for the sake of community health.

The above target areas particular to the University were evaluated through a questionnaire circulated among the students for data collection.

The following data was collected for the following areas during the assessment.

1. Environment & Waste Management
2. Energy Management
3. Water Management

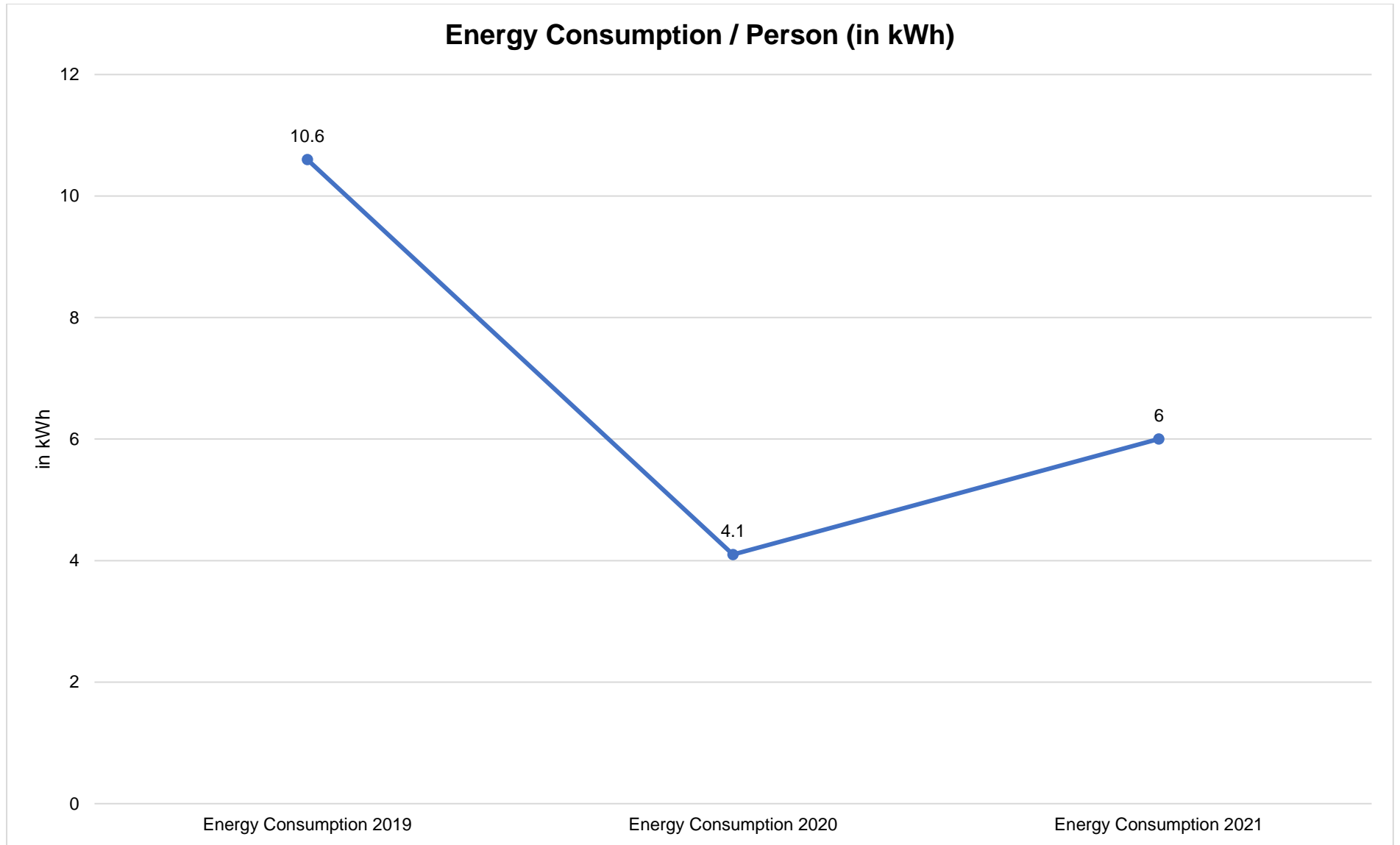
Section 12: Auditing for Energy Management

Energy cannot be seen, but we know it is there because we can see its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60W to 100W while an energy-efficient light-emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

Energy Consumption Data

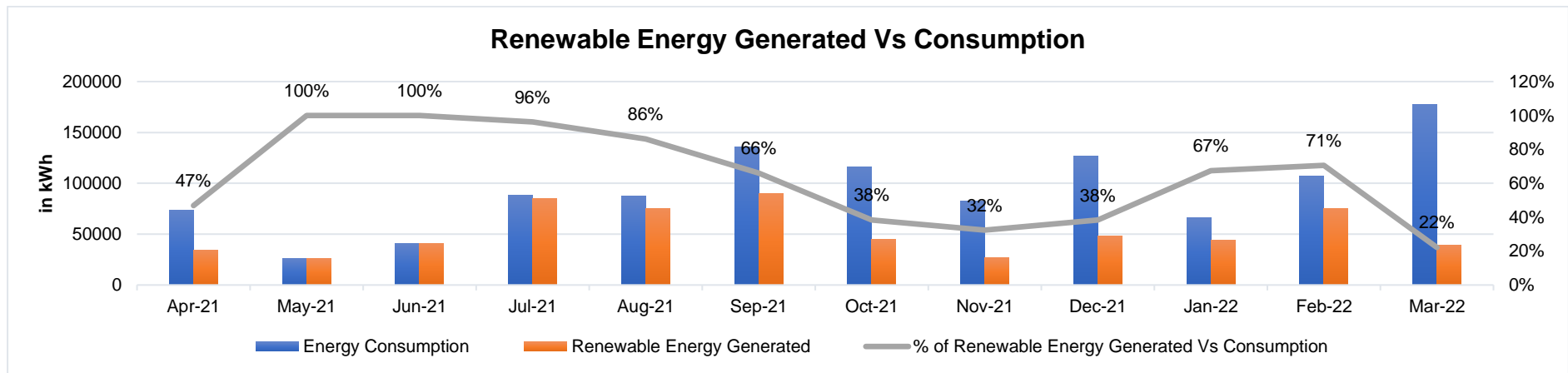
S. No	Description	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22
1	Electricity Consumption (in kWh) – Service 588	36192	13542	17970	40605	42339	72993	69477	53730	81708	32898	63693	92964
2	Electricity Consumption (in kWh) Service 797	37423	12740	23160	47862	45127	62990	46702	28540	44830	32980	43345	84167
	Total Energy Consumption (in kWh)	73615	26282	41130	88467	87466	135983	116179	82270	126538	65878	107038	177131
	Energy Consumption per Person (in kWh)	4.7	1.7	2.6	5.6	5.5	8.6	7.4	5.2	8.0	4.2	.8	11.2

Energy Consumption / Person (in kWh)



Renewable Energy Generated

S. No	Description	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22
1	Energy Generated from Windmill (588)	26029	13542	17970	40265	37315	56306	28842	15422	37185	32057	63693	30904
2	Energy Generated from Windmill (797)	8494	12740	23160	44825	38026	33416	15689	11199	11255	12364	11839	8325
3	% Renewable Energy Generated vs Energy Consumed	47%	100%	100%	96%	86%	66%	38%	32%	38%	67%	71%	22%



Electrical Equipment in the University and its Energy Consumption (Average Operation 6 hrs/day)

Vistas (Average Operation 6 hrs/Day)						
S. No	Equipments	Quantity	Unit/Watts	Whr	kWh	Kwh/Month
1	Tube Light	1210	40	240	0.24	7.2
2	2X2 LED	313	35	210	0.21	6.3
3	1X1 LED	150	25	150	0.15	4.5
4	48" Ceiling Fan	897	80	480	0.48	14.4
5	Chandelier light	4	800	4800	4.8	144
6	Projector	57	100	600	0.6	18
7	Printer	34	100	600	0.6	18
8	Xerox	4	1200	7200	7.2	216
9	Exhaust fan	37	100	600	0.6	18
10	Focus light	32	300	1800	1.8	54
11	Speaker	43	25	150	0.15	4.5
12	Air conditioner(2kw)	134	3000	18000	18	540
13	Spot light	39	30	180	0.18	5.4
14	Water cooler(1.5KW)	8	1500	9000	9	270
15	TV	8	230	1380	1.38	41.4
16	Fridge	2	1800	10800	10.8	324
17	Induction stove	1	800	4800	4.8	144
18	coffee maker	1	200	1200	1.2	36
19	Water heater	2	1200	7200	7.2	216
20	cash counting machine	3	400	2400	2.4	72
21	VIBA submersible motor(2.23KW)	1	2238	13428	13.428	402.84
22	Foundation motor(5.6KW)	1	5600	33600	33.6	1008
23	Filter motor(1.5KW)	2	1500	9000	9	270
24	RO plant(0.75KW)	1	750	4500	4.5	135
25	Battery Tester	2	750	4500	4.5	135
26	PL Lamp	64	35	210	0.21	6.3
27	Sump Motor	2	1700	10200	10.2	306
28	Wall Mounting Fan	25	80	480	0.48	14.4
29	High Beam Light	6	150	900	0.9	27
30	Open Well Motors	3	3347	20082	20.082	602.46
31	0.75KW Motors	130	746	4476	4.476	134.28
32	Heater	8	1000	6000	6	180
33	Pedestal Fan	5	100	600	0.6	18
34	Automatic Machine	1	500	3000	3	90
35	Weight Balance	2	500	3000	3	90

Vistas (Average Operation 6 hrs/Day)						
S. No	Equipments	Quantity	Unit/Watts	Whr	kWh	Kwh/Month
36	Gallantry	1	1250	7500	7.5	225
37	Fume Hood	1	2000	12000	12	360
38	Muffle Furnace	1	1500	9000	9	270
39	Hot Air Oven(3KW)	2	3000	18000	18	540
40	Glove box	1	1200	7200	7.2	216
41	Motor	1	1480	8880	8.88	266.4
42	Street Light	23	95	570	0.57	17.1
43	UPS	127 kVa				101.6

Electrical Equipment in the University and its Energy Consumption

Vaels Educational Trust (Service 2) (Average Operation 6 hrs/Day)						
S. No	Equipments	Quantity	Unit/Watts	Whr	kWh	Kwh/Month
1	Tube Light	4218	40	240	0.24	7.2
2	48" Ceiling Fan	2321	75	450	0.45	13.5
3	12" Exhaust Fan	110	70	420	0.42	12.6
4	Copier	3	800	4800	4.8	144
5	Printer	15	100	600	0.6	18
6	Air conditioner(1.55KW)	44	1550	9300	9.3	279
7	Air conditioner(2KW)	198	2400	14400	14.4	432
8	Projector	417	200	1200	1.2	36
9	Water cooler(1.5KW)	41	1500	9000	9	270
10	Incubator	3	200	1200	1.2	36
11	Fume cup board	3	200	1200	1.2	36
12	Double cone blender	2	746	4476	4.476	134.28
13	Dry granulator	1	1200	7200	7.2	216
14	Hot air oven(1.5KW)	4	1500	9000	9	270
15	Air Compressor(1.2KW)	2	1200	7200	7.2	216
16	Angle Polishing pen	1	800	4800	4.8	144
17	Stability chamber	4	1000	6000	6	180
18	Cooling Centrifuge	7	100	600	0.6	18
19	Tableting machine (Single punch)	1	2250	13500	13.5	405
20	Rotary Tablet punching machine	1	2250	13500	13.5	405
21	Orbital incubator shaker	2	160	960	0.96	28.8
22	Tray dryer	2	900	5400	5.4	162
23	Filter press(7.85KW)	1	7850	47100	47.1	1413
24	TV	4	130	780	0.78	23.4
25	Speaker	40	20	120	0.12	3.6
26	Air flow chamber	1	250	1500	1.5	45
27	Auto try box	1	50	300	0.3	9
28	Cassette AC(2.25KW)	3	2250	13500	13.5	405
29	photo calorimeter digital	1	400	2400	2.4	72
30	PH meter digital	2	150	900	0.9	27
31	magnetic stirrer	1	250	1500	1.5	45
32	Lab digital balance	15	100	600	0.6	18
33	motorized analytical balancer	1	70	420	0.42	12.6
34	GC purification panel	3	450	2700	2.7	81
35	UV VIS Spectro photometer	4	250	1500	1.5	45
36	Electronic weighing scale	5	800	4800	4.8	144

Vaels Educational Trust (Service 2) (Average Operation 6 hrs/Day)

S. No	Equipments	Quantity	Unit/Watts	Whr	kWh	Kwh/Month
37	vacuum pump(1.8KW)	2	1800	10800	10.8	324
38	Overhead projector	4	100	600	0.6	18
39	LC-2010 CHT IND	2	150	900	0.9	27
40	Gas purification panel	1	750	4500	4.5	135
41	Digital calorimeter	1	100	600	0.6	18
42	centrifuge	6	100	600	0.6	18
43	Digital photo calorimeter	1	100	600	0.6	18
44	Micro plate reader	1	100	600	0.6	18
45	melting point apparatus	4	850	5100	5.1	153
46	orbital shaker	1	750	4500	4.5	135
47	water bath shaker	1	750	4500	4.5	135
48	micro centrifuge	1	100	600	0.6	18
49	FTIR system	1	250	1500	1.5	45
50	Alpha T spectrometer	1	500	3000	3	90
51	Auto clave	1	200	1200	1.2	36
52	Freeze dryer(1.8KW)	1	1800	10800	10.8	324
53	Ampoule washing machine	1	1200	7200	7.2	216
54	filling and sealing machine	1	1200	7200	7.2	216
55	bottle sealing machine	1	550	3300	3.3	99
56	Liquid filling machine	1	275	1650	1.65	49.5
57	electronic weighing balancer	1	250	1500	1.5	45
58	limit test apparatus	1	1250	7500	7.5	225
59	suction pump(1.5KW)	1	1500	9000	9	270
60	plate auto enclave	1	750	4500	4.5	135
61	Elisa reader	1	200	1200	1.2	36
62	GPS imaging system	1	1250	7500	7.5	225
63	Refrigerator	13	800	4800	4.8	144
64	Xerox	2	1000	6000	6	180
65	Autoclave	1	1000	6000	6	180
66	camera lucifer	3	7500	45000	45	1350
67	calorie counter	1	500	3000	3	90
68	Dissection microscope	5	250	1500	1.5	45
69	electronic double well water bath	2	750	4500	4.5	135
70	Hair dryer	2	1000	6000	6	180
71	Heating mantle(2KW)	18	2000	12000	12	360
72	Hot plate	2	1000	6000	6	180
73	Mixer	1	350	2100	2.1	63
74	Muffle furnace	1	1000	6000	6	180
75	PH meter digital	2	200	1200	1.2	36
76	Refractometer	2	300	1800	1.8	54

Vaels Educational Trust (Service 2) (Average Operation 6 hrs/Day)

S. No	Equipments	Quantity	Unit/Watts	Whr	kWh	Kwh/Month
77	Extractor mantle	2	1250	7500	7.5	225
78	LCD projector model	1	750	4500	4.5	135
79	UV chamber	1	1000	6000	6	180
80	Orbital shaker incubator(1KW)	2	1000	6000	6	180
81	Digital electronic balancer	2	500	3000	3	90
82	Water Heater(2.7KW)	5	2700	16200	16.2	486
83	Water cooler(1.2KW)	3	1200	7200	7.2	216
84	Submersible motor(2.2KW)	6	2238	13428	13.428	402.84
85	sump motor(2.2KW)	7	2238	13428	13.428	402.84
86	2X2 LED Light	140	35	210	0.21	6.3
87	Amplifier	3	20	120	0.12	3.6
88	lift(5.6KW)	2	5600	33600	33.6	1008
89	Grinder	4	200	1200	1.2	36
90	deep freezer	3	800	4800	4.8	144
91	Water Motor(3KW)	4	3000	18000	18	540
92	Hot air oven(2KW)	2	2000	12000	12	360
93	Insect killer machine	1	40	240	0.24	7.2
94	Mixie (0.75KW)	2	750	4500	4.5	135
95	self priming motor(0.75KW)	1	750	4500	4.5	135
96	open well motor(2.23KW)	4	2238	13428	13.428	402.84
97	Deck bakery oven(2.5KW)	6	2500	15000	15	450
98	Spot Light	52	35	210	0.21	6.3
99	Heavy duty Grinder	3	1200	7200	7.2	216
100	Refrigerator	3	800	4800	4.8	144
101	Micro oven	8	1800	10800	10.8	324
102	Sewage motor(2.42KW)	6	2424	14544	14.544	436.32
103	Analog calorimeter	5	500	3000	3	90
104	Auto analyser	1	500	3000	3	90
105	Auto clave	4	500	3000	3	90
106	microscope	4	50	300	0.3	9
107	Digital calorimeter	16	750	4500	4.5	135
108	balance weighing machine	6	100	600	0.6	18
109	Homogeniser	3	250	1500	1.5	45
110	Heating mantle	7	500	3000	3	90
111	Hemo cyclometer	5	100	600	0.6	18
112	Laminar air flow machine(1KW)	4	1000	6000	6	180
113	magnetic stirrer	4	150	900	0.9	27
114	PH meter	12	350	2100	2.1	63
115	Rotary shaker	4	750	4500	4.5	135

Vaels Educational Trust (Service 2) (Average Operation 6 hrs/Day)

S. No	Equipments	Quantity	Unit/Watts	Whr	kWh	Kwh/Month
116	UV Spectro photometer	1	750	4500	4.5	135
117	Vacuum pump(2KW)	6	2000	12000	12	360
118	vortex mixer	6	450	2700	2.7	81
119	water bath	3	200	1200	1.2	36
120	cooling incubator(1.5KW)	2	1500	9000	9	270
121	shaker incubator(1.5KW)	1	1500	9000	9	270
122	Micro wave oven	4	800	4800	4.8	144
123	rotor vapour	2	250	1500	1.5	45
124	RO plant	1	750	4500	4.5	135
125	Elisa reader	1	150	900	0.9	27
126	PCR	1	200	1200	1.2	36
127	UV Transilluminator	1	550	3300	3.3	99
128	UV-VIS_ Transilluminator	1	200	1200	1.2	36
129	Bunsen burner	4	150	900	0.9	27
130	cyclic voltameter	1	150	900	0.9	27
131	single pan analytical balance	1	120	720	0.72	21.6
132	electronic analytical balancer	5	40	240	0.24	7.2
133	Fume exhaust hood	2	200	1200	1.2	36
134	Hot plate	1	400	2400	2.4	72
135	overhead projector	1	80	480	0.48	14.4
136	polarimeter	3	200	1200	1.2	36
137	Refractometer	2	400	2400	2.4	72
138	Thermostat digital control stirrer	1	400	2400	2.4	72
139	western cadmium coil	1	250	1500	1.5	45
140	1X1 LED	110	18	108	0.108	3.24
141	coundangel meter	1	950	5700	5.7	171
142	electro chemical workspace	1	500	3000	3	90
143	RTPCR	1	900	5400	5.4	162
144	DSE`	1	750	4500	4.5	135
145	TGA	1	1000	6000	6	180
146	semi micro balance	1	150	900	0.9	27
147	HPTLC	1	1500	9000	9	270
148	FTART	1	1200	7200	7.2	216
149	UV-visual spectro meter	1	1500	9000	9	270
150	PH meter	3	250	1500	1.5	45
151	sonic reactor	1	1500	9000	9	270
152	hot air oven	1	1750	10500	10.5	315
153	double distillation water unit	1	950	5700	5.7	171
154	XRD	1	1150	6900	6.9	207

Vaels Educational Trust (Service 2) (Average Operation 6 hrs/Day)

S. No	Equipments	Quantity	Unit/Watts	W/hr	kWh	Kwh/Month
155	Deep freezer 1	1	1500	9000	9	270
156	FESEM	1	1750	10500	10.5	315
157	confocal roman spectrum	1	1200	7200	7.2	216
158	BET surface area analysis	1	1500	9000	9	270
159	DFS	1	1000	6000	6	180
160	AFM	1	1200	7200	7.2	216
161	dossing pump(1.15KW)	1	1150	6900	6.9	207
162	Bio safety calorimeter	1	750	4500	4.5	135
163	Street Light	41	95	570	0.57	17.1
164	UPS					281.6

Section 13: Participation of Teams

In VISTAS the green auditing was done with the help of Pragnaa Shree Venture India Pvt. Ltd involves different student groups, teaching and non-teaching staff. The green audit began with the teams walking through all the different facilities at the college, determining the different types of appliances and utilities (lights, taps, toilets, fridges, etc.) as well as measuring the usage per item (Watts indicated on the appliance or measuring water from a tap) and identifying the relevant consumption patterns (such as how often an appliance is used) and their impacts. The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and water use. College records and documents were verified several times to clarify the data received through surveys and discussions.

Hostel Advisory Committee

S.No.	Name	Designation
CHAIRMAN		
1	Dr. A.Subramanian	Dean Student Affairs
MEMBERS		
2	Capt.N.Kumar	Director, School of Maritime Studies
3	Dr. Kathireshan A. K	Professor & Head, Dept of Microbiology School of Life Science
4	Dr. Satheeshkumar.S	Professor & Head, School of Pharmaceutical Sciences,
5	Dr. Sivasankar.V	Associate Professor and HOD School of Languages (Tamil)
6	Dr. Vennila Shree.S	Professor Dept. of Commerce (A&F) School of Management Studies & Commerce
7	Dr.P.Sri Jothi	Assistant Prof.& Head School of Mass Communication
8	Dr. Sivaganesan.S	Asst. Professor Department of Mechanical Engg. School of Engineering
9	Dr. Perumal.S	Asst. Professor Dept. of Computer Science School of Computing Sciences
10	Mr. Rohan Kumar.D	Assistant Professor and Head (IC) School of Law
11	Ms. Ulaga Priya.K	Asst. Professor Dept. of CSE School of Engineering
12	Dr. S. Vilochanan Thampi	Librarian Dept. of Library
13	Mr.A.Arangannal	Physical Director Dept. of Physical Education

TRANSPORT COMMITTEE

S. No	Name	Designation
CHAIRPERSON		
1	Dr. S. Vasantha	Professor, MBA School of Management Studies and Commerce
MEMBERS		
2	Mr.Anandh. V	Personal Secretary to Chancellor
3	Dr.K.Kamala	Professor, Department of Tamil School of Languages
4	Dr.P.Vijayalakshmi	Assistant Professor Dept of ECE School of Engineering
5	Dr. R.Sudha	Assistant Professor Dept of Chemistry School of Basic Science
6	Mr.S. Venkatesh	Transport Incharge Dept of Transport

Energy Committee

S. No	Name	Function	Designation
1	Dr. Shanmuga Sundaram.N	Chairman	Associate Professor Dept. of EEE School of Engineering.
2	Dr. Muthuraman.V	Member	Professor Dept. of Mechanical School of Engineering.
3	Dr. Karunakaran.K	Member	Assistant Professor Dept. of Mechanical School of Engineering.
4	Dr. Vijayaraj.S	Member	Assistant Professor Dept. of EEE School of Engineering.
5	Mr. Rajasekar.M	Member	Maintenance Head Dept. of Maintenance
6	Mr. Karthik. K	Student	Electrical and Electronics Engineering, 3 rd Year
7	Mr. Govind Vishnu Ganesh	Student	Electrical and Electronics Engineering, 3 rd Year
8	Ms. S. Saghithya	Student	Electrical and Electronics Engineering, 3 rd Year

Section 14: Best Practices / Initiatives done by the University;
Solar System



Wind Solar Hybrid System



Terrace Organic Farming



Rain Water Harvesting



Bio Composter



- The waste is segregated at each level and source.
- The Maintenance workers on each floor collect, clean, segregate and compile the waste in the dustbins (Green and Blue) provided on each floor.
- The institution has contacted an authorized vendor who collects the waste from the designated place, segregates them, recycles them and disposes them at the landfills authorized by the government.
- Normal conversion of biodegradable solid waste into manure takes 20 days

Solid Waste Management – Bio Gas Plant



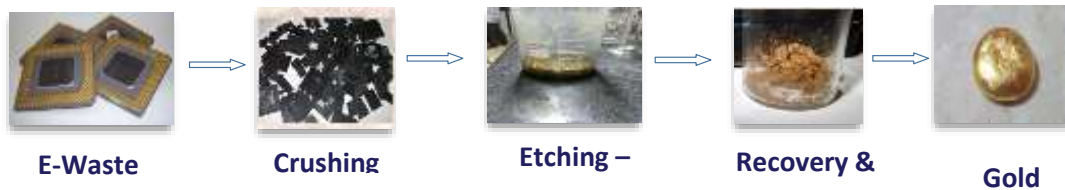
The BioGas Collected from the plant is used for Cooking



Liquid Waste Management – Portable Sewage Treatment (Laboratory)



E-Waste Management Plant - Hydrometallurgy Plant Precious Metal Recovery



- Biogas plant erected
- Machinery is installed for the conversion of biodegradable solid waste into manure.
- Solar lighting systems in VISTAS's campus.
- Wind Energy is used through our 3 Windmills under the agreements with TANGEDCO.
- Water harvesting and effective waste management.
- Extensive green covering of campus
- Energy Audit, Safety Audit, and Green Audit are being conducted regularly.
- The Institution has initiated an eco-club consisting of students and faculty to identify places for planting trees and to take care of soil fertility. Plantation and maintenance of saplings have become the rudimentary activities towards realizing the “go green” vision of the Institution.
- VISTAS is selected as one of the HEIs to actively take part in Unnath Bharath Abhiyam Program.

- Pradhan Mantri Bhartiya Janaushadhi Kendra (PMBJK) is an initiative to ensure the availability of quality medicines at affordable prices to all. Based on the vision of the Prime Minister, PMBJK was inaugurated by Dr S Manivanan, Deputy Drugs Controller, CDSCO on 19th March 2018. This generic medical store provides quality medicines at an affordable cost to the public.
- Green areas and lung spaces are well maintained and the university has conducted a green audit of its campus
- The University identified areas of environmental pollution and initiated steps toward reducing the same.
- Sprinkles are used for watering lawns.
- Green generators are installed to overcome the energy crises.
- A dedicated Medicinal plants garden is maintained.
- Smoking is prohibited on the campus and the campus is a non-smoking campus.
- Only non-toxic paints and eco-friendly cleaning materials are used.
- An effective waste management system is in practice.
- The use of recyclable materials for construction and interiors reduces waste.
- Tree plantation is done periodically and the greenery is maintained on the campus.
- Our green cover is around 30% of the total surface area.
- Only Bharath3 fuel-efficient vehicles are used and vehicles are allowed to park only in the selected area and not within the campus.
- Genset usage is restricted and is used only sparingly.
- Minimization of paper usage by adopting online communications and ERP systems.
- The Herbal Garden is maintained by the School of Pharmaceutical Sciences.
- Campus cleaning day is observed periodically with the help of NSS.
- Emphasize is on paperless governance.
- Adequate measures have been taken to protect the trees in and around the campus.
- The campus is well maintained with trees and ornamental plants.
- Tree planting is the popular scheme adopted by our NSS students and “Go Green” is another slogan to motivate our students to go for tree planting.

- New trees are planted regularly as and when required.
- The inverter is used when there is power shut down for a short duration instead of operating generators.
- The LED lamps are progressively used in the place of other lamps.
- Partitioning the big halls into small size/falls roofing is carried out to minimize the power consumption.
- Renovation of wiring and replacement of transformers are done regularly.
- All the rooms have instruction boards to switch-off fans, lights, and AC and Computer terminals when not in use.
- The University has installed three windmills with a capacity of 250 KW H.T. (Each) and the Annual Wind Power Generation on average is around 85,028 units. Three Wind Mills are supplying power to the Tamil Nadu Power Grid and withdrawing the power from the grid to the university`s requirements.
- Solar lights are used on the main roads of the university.
- The Biogas Plant is in operation and the Biogas produced from food waste, decomposable organic materials and kitchen wastes is used in Hostel.

Section 15: Conclusion

The green audit assists in the process of monitoring and verifying the performance in the environmental arena and is fast becoming an indispensable aid to decision making in VISTAS.

The green audit reports assist in the process of attaining an eco-friendly approach to the sustainable development of the University. Hope that the results presented in the green auditing report will serve as an opportunity to improve the environment-related practices and resource usage at the university as well as new activities and innovative practices. A few recommendations are added to waste management using eco-friendly and scientific techniques. This may lead to a prosperous future in the context of Green Campus and thus sustainable environment and community development.

It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organization. An outside view, perspective and opinion often help staff who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and that systems and procedures are coping with natural changes and modifications that occur.

Section 16. List of Recommendations

Common Recommendations

- Establishing environmental policy for the overall University
- Establish water, waste and energy management systems

Criteria Wise Recommendations

Energy

- Conduct more save energy awareness programs for students and staff.
- Proper maintenance of Electrical system and Diesel Generator Sets

Section 17: Disclaimer

Pragnaa Shree Venture India Pvt. Ltd has prepared this report for Vels University based on input data submitted by the representatives of the University.

It is further informed that the conclusions are arrived at following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

If you wish to distribute copies of this report external to your organisation, then all pages must be included.

Pragnaa Shree Venture India Pvt. Ltd, its staff and agents shall keep confidential all information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.