GreenAudit

of

NARAYANA ENGINEERING COLLEGE::NELLORE

AUTONOMOUS

NARAYANA ENGINEERING COLLEGE::NELLORE

(AUTONOMOUS)

Permanently affiliated to JNTUA, Ananthapuramu ,
(Accredited by NAAC with "A+" Grade)

2021-22

By

SRI GAYATRI ENERGY SERVICES

we support you conserve

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Contents

ACKNOWLEDGEMENT

The Green audit conducted is an external audit that aims towards creating awareness healthy and sustainable environment. Though nascent, the initiative is taken up to foster the concept of environmental sustainability.

M/s **Sri Gayatri Energy Services**, Hyderabad places on record its sincere thanks toprogressive management of M/s**Narayana Engineering College , Nellore, AP** for entrusting the Green Audit work of their College.

The study team is appreciative of the keen interest and encouragement shown by

Shri **R.Samba Siva Rao**,Registrar,

Shri Dr.**A.V.S.Prasad**,Director,

Shri Dr.**G.Srinivasulu**,Principal

Shri,**K.V.Kishore ,**Associate Dean Academics

Disclaimer

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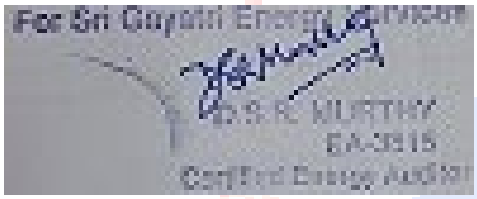
We trust the data provided by the M/s **Narayana Engineering College** , Nellore , AP personnel is true to their best of knowledge and we didn't verify the correctness of it.

Audit Study team

Shri D.S.R.Murthy	Senior Energy Auditor

CERTIFICATE

We here by certify that we carried out Green Auditin M/s **NARAYANA ENGINEERING COLLEGE**, NARAYANA AVENUE, MUTHUKUR ROAD, NELLORE, AP during March 2022 and following Observations were presented below. The Management is pro active towards Green Initiative by Harvesting, Solar Energy, Planting Trees, Better water conservation, Waste Management,Carbon Foot Print;A continual improvement in Green Initiative is appreciated. We appreciate the efforts of the M/s **Narayana Engineering College** , Nellore AP in this regard.



Executive Summary of Observations

1. A Detailed Green Audit is carried out at the Campus with following observations.
2. The plantation of Trees is a continual process which is under implementation the total green area coverage is 1.8912 Acres out of 5.03 Acres which is mandatory for mitigating the Global warming.(Photos enclosed)
3. The Grid Connected Solar PV is installed as part of Renewable energy initiative to the tune of 160 KWin the campus It is proposed to enhance the capacity of the existing Solar PV plant in near future.There by reducing the energy dependence on the Grid .
4. The Water conservation measures are already in place and further advancements are going on like Water harvesting pits are operational at individual buildings Interconnecting the rain water harvesting pits and recharge the ground water so that the water table can be enhanced .
5. Water Wastage – Leaky taps are repaired/replaced, close monitoring of the Water usage closely by maintaining.
6. Waste Management is segregated in to three categories like

   i) Bio Degradable Waste (Food Waste)It is proposed to install a Biogas plantin the campus to generate Bio gas and can be used for cooking in the campus itself . The Procurement is in process, shortly it will be installed.(Enclose Bio gas plant details)

   ii) Non Bio Degradable Waste (Plastic/Papers and Other) are collected in the dust bins located at various locations in the campus. It is proposed to Ban/ discourage the usage of plastic water bottles inside the campus (Enclose Photos of Dust bins)

   iii) E Waste Management MOU is signed with an agency for picking up the E waste generated annually and dispose the E waste in eco- friendly way .
7. The Carbon Foot print is calculated and the details are in following pages.
8. It can be concluded that the Green Audit initiatives are started and College Management recognized the importance and taking proactive steps towards sustainable environment.

Green Audit scope of work

The Green Audit is carried out in view of assessing all necessary environmental components and their impact on the campus physically by visiting the premises with reference to following.

1. Identifying the Green Area in total area of the campus and process of planting tress so that Heat /Global warming are mitigated. Creating awareness among staff/Students for planting more tress in the campus. A continual drive is created.
2. Water Conservation/ Efficient Usage / Eliminate the water misuse or wastage , Rain Water Harvesting etc
3. Renewable Energy usage to reduce the fossil fuel dependency, Harvest the Solar Power
4. Waste Management which includes Bio Waste/ Non Bio Waste/ E Waste etc
5. Carbon Foot Print – Transportation of Teaching Staff / Non Teaching Staff/ Students

METHODOLOGY

The Green Audit taken up by the college had been divided into two stages:

The Audit Stage: The Audit Stage encompasses of the team selection and the field works to be performed. The Green Audit Team focused on various Issues pertaining to college which have the highest influence on the Green Attributes of the College. The Audit stage also focused on the Methodology adopted. Checklist approach is adopted for transparent evaluation of the topics and increase readability for independent reader.

The Post Audit Stage: The post-audit stage ensures formulation of Draft findings and sent to management response. After getting draft approval, the audit team went for final report formulation.

Project Schedule:

1. Audit : 1-2 days
2. Report generation : 1 Week

Introduction of the Institution

Narayana Educational Institutions are one of the best education providers in India from the Pre-primary to professional post graduation. Narayana Educational Group was established by renowned educationalist Dr P Narayana, 44 years ago. Today, the Narayana Educational Institutions stand tall and proud for setting path breaking benchmarks in academic excellence. Four decades of experience in fulfilling the aspirations of India's students has given us conviction and confidence to aim higher and bigger always. In promoting professional colleges from this group, Narayana Engineering College Nellore (NECN) was established in 1998. Now, ours is one of the premier Engineering Colleges in the self-financing category in Andhra Pradesh. College is locating in Nellore city, which is famous for Paddy crop and is also called city of Education. Institution has well equipped built up area with impressive infrastructure like state of art Laboratories, class rooms, tutorial rooms, library, drawing halls, seminar halls etc are available to provide conducive environment for academic activities.

College is ranked by Grade 'A' by Government of Andhra Pradesh, permanently affiliated to JNTUA, Ananthapuramu, recognized by UGC 2(f) and 12(B), Accredited by 'A+' grade with 3.41 CGPA by NAAC and certified by ISO 9001:2015. NECN, over the past 21 years has become a shrine of knowledge and shaped thousands of famous and adroit graduates and post graduates, who are successful in their careers, serving all over the world. Since the inception, NECN is intended to provide quality education through value-based teaching-learning process via Outcome Based Education, providing fruitful industry –institute interaction, excelling support in research initiatives among students and faculty members, encouraging to involve in innovation and incubation cell to drive towards entrepreneurship and motivating to participate in community service activities. The institute is always focusing on overall development of the students through participation in co-curricular and extra-curricular activities. NECN is committed to bringing out the best in every student by imparting a strong educational foundation. Given the dynamic and global nature of education in the 21st century, we are constantly working hard and reinventing ourselves with the ultimate goal of creating exceptional and enriching student experiences.

STATEMENT OF ASSURANCE

The Green Audit conducted for the Third time in the college. The Management had taken initiative to carryout the Green Audit externally. As mentioned above it is in the process of improving the awareness towards the renewable energy and sustainable development .The conclusions are based on a comparison of the situations as they existed at the time of the audit. The evidences presented are in support of the conclusions.

Goals of the College

In the effort to Enhancing an environmentally literate campus where students can learn the idea of protection of environment and stay healthy. The college Management is proactively working on the several facets of "Green Campus" including Plantation of more trees,Water Conservation, Efficient water usage by eliminating leaking water taps, Installation of ETP, Water Harvesting Pits and interconnecting them to Recharge the Ground Water table . Effective Waste Management which includes Food Waste, Plastic, Paper, Metal Work, Renewable Energy, carbon footprints etc.

1. To create a green campus with focus on above concepts
2. To Harness Solar Power
3. To Conserve Water by eliminating the water leakages , wastage, Rain Water Harvesting
4. To Reduce Waste management through reduction of Food waste generation, Plastic/Paper/Metal waste generation and effective disposal
5. To Reduce the Carbon Foot print
6. Enhancement of college profile

ENVIRONMENT – Plantation of Trees

1. **Plantation of Trees**: The college management made it a practice to plant trees across the campus to improve greenery. This is a continual ongoing process and every year a target is taken to plant trees and increase theGreen cover inside the campus. The Following are the objectives kept in mind for increasing the Green Area coverage inside the campus and internal in the buildings too.

Reducing Climate Change

If people are good at something, then it is building up excess carbon dioxide in the atmosphere. Harmful CO_2 contributes to climate change, the biggest current problem the world has to deal with. Trees, however, help fight it. They absorb CO_2 removing it from the air and storing it while releasing oxygen. Annually, an acre of trees absorbs the amount of carbon dioxide equal to driving your car 26 000 miles. Trees are our main survival tools; only one tree can produce enough oxygen for four people.

Purifying Air

Trees do purify the air. They absorb pollutant gases such as nitrogen oxides, ozone, ammonia, sulfur dioxide. Trees also absorb odors and act as a filter as little particulates get trapped in leaves. A mature acre of trees can yearly provide oxygen for 18 people.

Cooling Down the Streets

The average global temperature grew by 1.4 F. This happens as tree coverage declines. Removing trees and replacing them with heat absorbing asphalt roads and buildings makes cities much warmer. Trees are cooling cities by up to 10 F by providing shade and releasing water.

Natural Air Conditioning

Architects and environmentalists came up with the great solution – green roofs. Green roofs are an amazing way to incorporate vegetation to our Premises and provide environmental benefits .Indoor trees do not only have a calming effect, they also act as natural air conditioning.

Saving Water

Except for cooling, trees also help to save water. Because of the shade they provide,water will evaporate slowly from low vegetation. Trees need about 15 water gallons a week to survive, and they release about 200-450 gallons of water per day.

Our Case: Almost 1.8912 acres of Tree plantation out of 5.03 Acres of the campus is having tree plantation and heading for area of Greenery

Water Conservation, Harvesting and Management

Per capita water availability of many river basins in India is declining over the years due to sustained population pressure, agriculture and industrial expansion, besides changing climate scenarios. This is particularly evident from the fact that the per capita availability has decreased from 1816 m3/year in 2001 to 1545m3/year in 2011.

Rainwater harvesting is a technique used for collecting, storing and using rainwater for domestic, agricultural or any other uses. The rainwater is collected from various hard surfaces such as rooftops, runoff from catchments, from streams and water conservation through watershed management or other manmade aboveground hard surfaces. It is an age-old system of collection of rainwater for future use. The harvested water can be stored on surface through ponds and tanks or can be recharged to groundwater.

Protection of Water from Pollution;

If the total fresh water available on the earth remains pollution free, it is sufficient to meet the drinking water needs of the existing population of the world, unfortunately a large portion of fresh water does not remain fit for use of the living world due to increasing economic activities, urbanization etc.

Rational Use of Groundwater:

Groundwater meets 25 per cent of total supply of water in the world, remaining 75 per cent supply is met by surface water sources of rivers, lakes etc. Demand for groundwater goes on increasing in proportion to its available quantity due to which quantity of groundwater goes on decreasing. After exploitation of groundwater, its re-infiltration takes a very long time to complete. Hence, groundwater exploitation should be only in proportion to its recharging capacity.

Increasing Forest Cover:

According to hydrological movements, water is received through rainfall every year different quantities on the surface of the earth. This water flows on the surface and reaches the seas. Some part of rainwater is stored in stable water reservoirs (lakes and tanks), whereas some quantity of water infiltrates into the land and takes the form of groundwater.

Our Case: Constructed Water harvesting Pits across the campus and in the process of constructing water drains and interconnecting the same to water harvesting pits to recharge the ground water

Renewable Energy: Solar Power

A 160 KW Grid Connected Solar PV and there is an available areafor further addition of Solar PV plant.

Among all the benefits of solar energy the most important thing is that solar energy is a truly renewable energy source. It can be harnessed in all areas of the world and is available every day. We cannot run out of solar energy source.

Solar System has generated energy, the energy bills will drop. How much you save on bill will be dependent on the size of the solar system and electricity usage. Moreover, not only will you be saving on the electricity bill, there is also a possibility to receive payments for the surplus energy that you export back to the grid. If you generate more electricity than you use (considering that your solar panel system is connected to the grid).

Some of the key benefits of solar energy on the environment include:

- Using less water. Water is one of our most precious natural resources. ...
- Reducing air pollution. ...
- Help to slow climate change. ...
- Reducing your household's carbon footprint. ...
- Reducing our reliance on fossil fuels.

Our Case : Presently installed 160 KW Grid Connected Solar PV to Harness the Solar Power and further enhancement of solar PV is under active consideration.

Waste Management:

1. **Bio Waste** – Mostly Food Waste is generated from the cooked food at the campus in the canteen. It is observed that a minimum number of 450 + will have food at the canteen and its estimated to have a wastage of 12-15 Kg/ day .It is recommended to install Bio Gas plant in the campus to generate Bio Gas from the food waste, which can be used again in the Food Cooking.
2. **Non Bio Waste** – Plastic Bottles / Waste Paper / Cardboards/ Batteries etc

   Non- biodegradable waste, which cannot be decomposed by biological processes, is called non-biodegradable waste. These are of two types - Recyclable: waste having economic values but destined for disposal can be recovered and reused along with their energy value. e g. Plastic, paper, old cloth etc. Non-recyclable: waste which do not have economic value of recovery. e.g. Carbon paper, thermo coal, tetra packs etc. Disposal of non-biodegradable waste is a major concern, not just plastic, a variety of waste being accumulated. There are a few ways to help non-biodegradable waste management. The impact of non biodegradable waste on the environment and also focus on its safe disposal for sustainable environment.

   Present Status :The College is taking active initiative and is really appreciated in reducing the paper waste / Plastic waste across the campus and in the city of Nellore also . Lot of road shows were conducted to increase awareness not only in students but also in the public of City of Nellore .

   E Waste Management

Waste Electrical and Electronic Equipment (WEEE) or E-waste is one of the fastestgrowing waste
streams in the world. In developed countries, it equals 1% of total solidwaste on an average. In developing countries, it ranges from 0.01% to 1% of the total municipal solid waste generation. In countries like China and India, though annual generation per capita is less than 1 kg, it is growing at an exponential pace.

Present Status : The College is having an MOU with an agency to dispose the E Waste. Every year the agency will come and pick up the E waste and dispose it in environmental friendly way.

Audit Framework and detailed findings of the Audit

Objective	Observation/ Present status	Remarks / Recommendation
Green Cover - Plantation of Trees	Plantation of trees is started in the campus and the green cover is extended every year in the campus. At Present 1.8912 Acres campus is having the Green cover.	A Continual plantation of trees is going on . It is recommended to increase the Green Cover further.
Renewable Energy – Harness Solar Power , Wind Power etc	A Grid Connected Solar plant is installed with capacity of 160 KW	The Solar PV plant is functional and exporting clean energy to the grid . It is recommended to explore the vacant areas to increase the solar roof top plants to harness more solar energy.
Water Conservation – i) Rain Water harvesting	i) Rain water Harvesting pits in place	They are functional
ii) Eliminating Leaking Taps	ii) A Dedicated Team working on the repairing the leaking taps across the campus	Most of the taps are repaired,It is recommended to install taps with reduced water flow like shower / Mist.
iii) Interconnection of Water Soaking pits to Rain harvesting Pits	iii) Interconnection process is initiated	Reward the personnel informing Leaky taps, Paste Labels where ever water is expected to be wasted.
iv) Avoid Misuse/wastage of water	iv) RO Plant is installed for providing safe drinking water, which generates RO reject water, this water is used for Gardening.	Process initiated
	v) Encourage to reduce the water usage	It is recommended to Install a Aqua Conditioner to reduce the RO Reject.
	vi) Water Sprinkler system installation is initiated to	Recommended to install Bio Toilets/Water Less Toilets like

	save water	ECO Loo which reduces water usage and generates fertilizer from human waste and Natural liquid from the Urine which can be reused for gardening. Under process
Waste Management i) Bio Waste	i) The Bio Waste – Food Waste generated in the canteen is proposed to be feed stock for Bio Gas plant	i) Recommended to install Bio Gas Plant and generate gas which can be used in cooking.
ii) Non Bio Waste	ii) Non Bio Waste – Plastic Bottles / Paper Waste Metals waste is being collected in the dust bins placed across the campus iii) A NMC team is visiting the campus on weekly basis and collecting the same.	ii) It is recommended to install plastic bottle crusher, which can be sold as a feed stock for the Plastic industry. iii) Installed Sandy (Sanitary napkin crusher at ladies Toilet) to avoid choking of toilets and wastage to water.
iii) E Waste	iv) E Waste – All Electronic Junk is generated in the campus in the form of Used Computer key boards/ Mouses/ CPU's/ Damaged Printers etc	iv) An agreement is in place withan agency to pick up the E waste every month

Carbon Foot Print

Total students: 2393/ Faculty: 149 / Staff- 96 / College Buses: 9
Individual Cars -15 No's , Two Wheelers – 500 No's , Public Transport –1138

Carbon Foot Print i) Transportation	i) Staff/Students commute in the College Transport - Buses from City ii) Students commute in the Public transport – Buses iii) Students / Staff Commute on individual Two Wheelers iv) Management / Faculty come by Individual cars by car pooling	i) College Transport - Around 450 members by college buses ii) Public Transport – Around 1150 members . iii) Individual Two Wheelers – Around 500+ members iv) Individual Cars – Around 30 – 45 members

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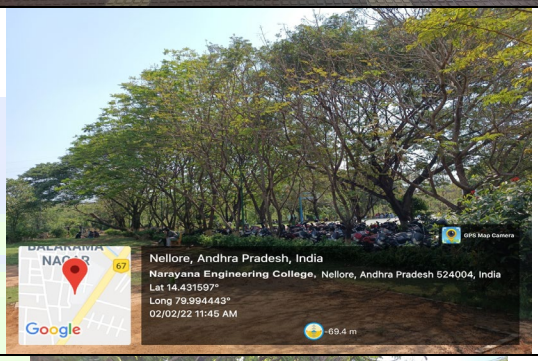
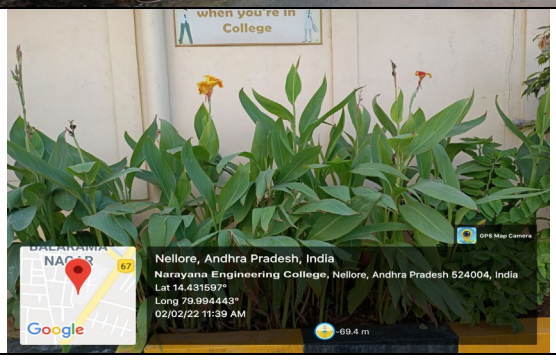
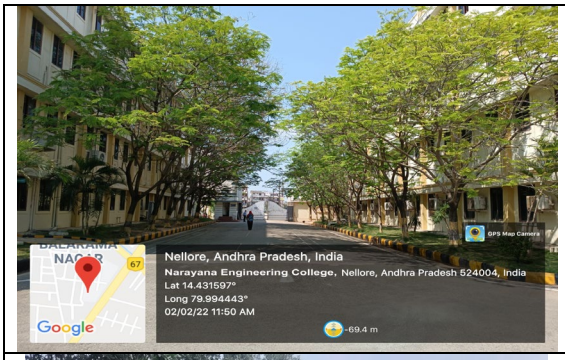
Plantation of Trees – Green Area





 Nellore, Andhra Pradesh, India Narayana Engineering College, Nellore, Andhra Pradesh 524004, India Lat 14.431597° Long 79.994443° 02/02/22 11:50 AM Google	 Nellore, Andhra Pradesh, India Narayana Engineering College, Nellore, Andhra Pradesh 524004, India Lat 14.431597° Long 79.994443° 02/02/22 11:48 AM Google
	

Water Harvesting – Conservation of Water

Liquid waste:

- All the liquid waste from washroom, bathroom is given to a biomedical wash agency having regular pickup service.
- Waste water generated is managed through the Municipal drain system.
- Zero percent leakage of waste water is ensured.

For better Rain Water Harvesting

Renewable Energy - Grid Connected Solar PV installed at the Campus

Roof Top Solar Power Plant at Faraday's Block

Solar PV Panels on roof top

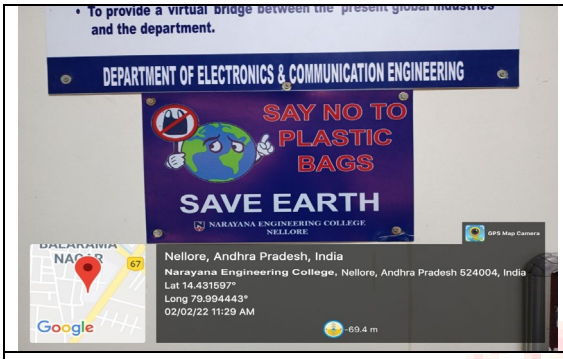
Roof Top Solar Power Plant at Charles Babbage Block

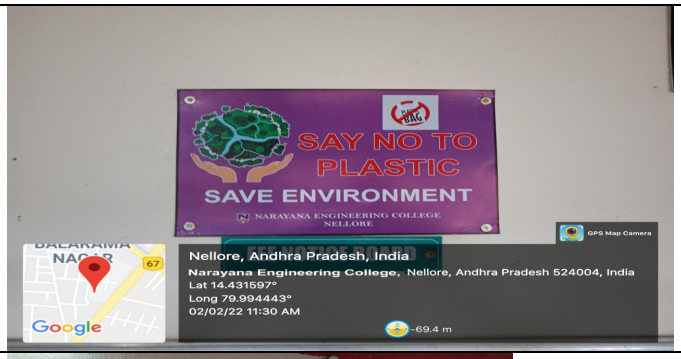
Roof Top Solar Power Plant at Charles Babbage Block

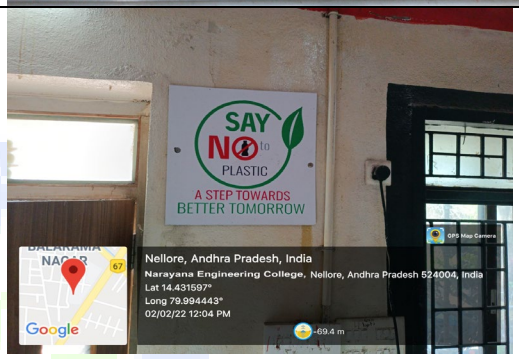
Solar PV Inverters Solar PV Inverters/

Roof Top Solar Power Plant at Charles Babbage connected to the grid

Non BioDegradable - **Plastic Waste – Discouragement**







Road shows to Create awareness among public using Plastic and its impact on environment

Tree Leaves / Paper Waste -Bio Degradable

- For collecting the solid waste from nook and corner of the campus, substantial numbers of dustbins are installed.
- Most of the waste collected is biodegradable. The minimal amount ofnon biodegradable is mostly burnt in pits.
- During the autumn season a large quantity of fallen dry leaves are collected and dumped to decompose in a pit which is used as manure for trees and plants.
- Paper waste , scrap and garbage generated are collected separately and are given to the external agencies for recycling

Waste Management – Bio Degradable

It is recommended to install a Bio Gas plant to produce Methane gas from the food waste generated in cooking the food in the canteen which will help in reducing the gas consumption (Details Enclosed)
It is also recommended to install Agnisumukh for improving the efficiency of the LPG gas burners so that the LPG gas consumption can be reduced.

Waste Management – Non Biodegradable

E Waste management :

An agreement has been made with an agency for disposal of the E Waste which are mentioned below

1. Electronic Waste (E-Waste) -The Term E-Waste will refer to the below mentioned electrical and electronic waste for the purpose of this Agreement which includes;

a) Computers & Peripherals (CPU, Keyboard, Mouse& Monitor)

b) Laptops

c) Servers

d) PCBs

e) Mobiles or Communication devices

f) Mother Boards (Computers &Laptops)

g) Security Devices

h) Telecom Equipment

i) Printers & Scanners

j) Military Electronic

k) Control Systems

l) Data Cables and wires

m) Batteries

n) CD/DVD

o) Tube lights and CFL

Benefit of recycling of E-waste:

1. E-waste contains many valuable, recoverable materials such as aluminium, copper, gold, silver, plastics, and ferrous metals. In order to conserve natural resources and the energy needed to produce new electronic equipment from virgin resources, electronic equipment can be refurbished, reused, and recycled instead of being land filled.
2. E-waste also contains toxic and hazardous materials including mercury, lead, cadmium, beryllium, chromium, and chemical flame retardants, which have the potential to leach into our soil and water.
3. Protects your surroundings- Safe recycling of outdated electronics promotes sound management of toxic chemicals such as lead and mercury.
4. Conserves natural resources- Recycling recovers valuable materials from old electronics that can be used to make new products. As a result, we save energy, reduce pollution, reduce greenhouse gas emissions, and save resources by extracting fewer raw materials from the earth.
5. Helps others -Donating your used electronics, benefits your community by passing on ready-to-use or refurbished equipment to those who need it.
6. Saves landfill space -E-waste is a growing waste stream. By recycling these items, landfill space can be conserved.

How to solve the E-waste problem?

Solving the e-waste problem starts with education, and habit changes as a result of knowledge. Most people are trained to recycle a newspaper, bottles, and cans. Almost anything electronic in nature can be recycled properly with effort. It is important that any e-waste processor is fully certified in safe destruction and follow certified documented procedures to safely dispose of electronic waste. Ask questions before you recycle! Some unscrupulous recyclers ship e-waste overseas where it is disposed of improperly, posing a threat to the environment and its' people.

Do's & Don'ts of End of life Products/E-waste

Do's:

- Always look for information on the catalogue with your product for end-of-life equipment handling.
- Ensure that only Authorized Recyclers/Dismantler handle your electronic products.
- Always call at our toll-free No's to dispose of our products that have reached end-of life
- Always drop your used electronic products, batteries or any accessories when they reach the end of their life at your nearest Authorized E-Waste Collection Points.
- Always disconnect the battery from product, and ensure any glass surface is protected against breakage.

Don'ts:

- Do not dismantle your electronic Products on your own
- Do not throw electronics in bins having "Do not Dispose" sign.
- Do not give e-waste to informal and unorganized sectors like Local Scrap Dealer/ Rag Pickers.
- Do not dispose your product in garbage bins along with municipal waste that ultimately reaches landfills.

Carbon Foot Print

The NEC has total staff(Teaching + Non Teaching) of 2638 members, the Co2 emission is 895.52 Kg/day

Members by TwoWheeler – 500 members – Co2 emission is 582.5 Kg /day

Members by College Bus – 450members - Co2 emission is 45.45 Kg/day

Members by Car Pooling – 35members – Co2 emission is 135.5 Kg/day

Members by Individual Car - 5members– Co2 emission is 67.75 Kg/day

Students by Public Transport Bus –1150 - Co2 emission is 64.32 Kg/day

Note: Assume each member travel a distance of 25 kms to college and 25 kms return to home .

Mode of Transit	**CO_2 released (per km driven per person)**	**CO_2 released during production of vehicle**
Car	271 g	313 g
Bus	101 g	---
Bicycle	16 g (This is from the fuel of the rider – food)	16 g

	Pounds CO2	**Kilograms CO2**	**Pounds CO2**	**Kilograms CO2**
Carbon Dioxide (CO_2) Factors:	**Per Unit of Volume or Mass**	**Volume or Mass**	**Million Btu**	**Million Btu**
FOR HOMES AND BUSINESSES				
Propane	12.70/gallon	5.76/gallon	139.05	63.07
Butane	14.80/gallon	6.71/gallon	143.2	64.95
Butane/Propane Mix	13.70/gallon	6.21/gallon	141.12	64.01
Home Heating and Diesel Fuel (Distillate)	22.40/gallon	10.16/gallon	161.3	73.16
Kerosene	21.50/gallon	9.75/gallon	159.4	72.3
Coal (All types)	4,631.50/short ton	2,100.82/short ton	210.2	95.35
Natural Gas	117.10/thousand cubic feet	53.12/thousand cubic feet	117	53.07
Gasoline	19.60/gallon	8.89/gallon	157.2	71.3
Residual Heating Fuel (Businesses only)	26.00/gallon	11.79/gallon	173.7	78.79
OTHER TRANSPORTATION FUELS				
Jet Fuel	21.10/gallon	9.57/gallon	156.3	70.9
Aviation Gas	18.40/gallon	8.35/gallon	152.6	69.2

INDUSTRIAL FUELS AND OTHERS NOT LISTED ABOVE				
Flared natural gas	120.70/thousand cubic feet	54.75/thousand cubic feet	120.6	54.7
Petroleum coke	32.40/gallon	14.70/gallon	225.1	102.1
Other petroleum & miscellaneous	22.09/gallon	10.02/gallon	160.1	72.62
NONFUEL USES				
Asphalt and Road Oil	26.34/gallon	11.95/gallon	166.7	75.61
Lubricants	23.62/gallon	10.72/gallon	163.6	74.21
Petrochemical Feedstocks	24.74/gallon	11.22/gallon	156.6	71.03
Special Naphthas (solvents)	20.05/gallon	9.10/gallon	160.5	72.8
Waxes	21.11/gallon	9.57/gallon	160.1	72.62
COAL BY TYPE				
Anthracite	5,685.00/short ton	2,578.68/short ton	228.6	103.7
Bituminous	4,931.30/short ton	2,236.80/short ton	205.7	93.3
Subbituminous	3,715.90/short ton	1,685.51/short ton	214.3	97.2
Lignite	2,791.60/short ton	1,266.25/short ton	215.4	97.7
Coke	6,239.68/short ton	2,830.27/short ton	251.6	114.12
OTHER FUELS				
Geothermal (average all generation)	NA	NA	16.99	7.71
Municipal Solid Waste	5,771.00/short ton	2,617.68/short ton	91.9	41.69
Tire-derived fuel	6,160.00/short ton	2,794.13/short ton	189.54	85.97
Waste oil	924.0/barrel	419.12/barrel	210	95.25
Source: U.S. Energy Information Administration estimates. Note: To convert to carbon equivalents multiply by 12/44. Coefficients may vary slightly with estimation method and across time.				
Carbon Dioxide Emissions Coefficients by Fuel				
Detailed factors (discontinued)				

Annexure

Annexures - Vendors for Water harvesting

Vendors for E Waste Recycling

Telangana	-	Hyderabad	Plot No: 21, Bhavana Colony, Opp.More Mega Super Market, Center Point, New Bowenpally, Hyderabad -500011	Chill Airconditioners	1800 266 2955