

Energy Consumption Analysis and Energy Conservation Plan

Shiv Nadar Institution of Eminence (SNIOE) is committed to judicious energy usage and energy optimization through the use of energy-efficient equipment and practices in its operations. Energy conservation targets are agreed upon with the university management each year and the performance against the agreed targets are tracked throughout the year and performance is reported to the management at periodic reports.

Cross-functional teams across various functions including representation from Teaching, non-teaching, Faculty, Staff, and Students are formed and they are encouraged to identify the opportunities for energy optimization.

Multiple projects, including Zero Cost Improvements (ZCI), are identified and teams are encouraged to execute the same to drive tangible gains.

Technological and Process interventions are undertaken including, a transition to low energy-consuming types of equipment across functions to help achieve the agreed targets.

Further, strategic initiatives are also undertaken with the approval and support of the management to transition to “Clean Power” and reduce the dependence on “fossil fuel” to create energy on campus.

Data is available to reflect the transition in the desired direction.

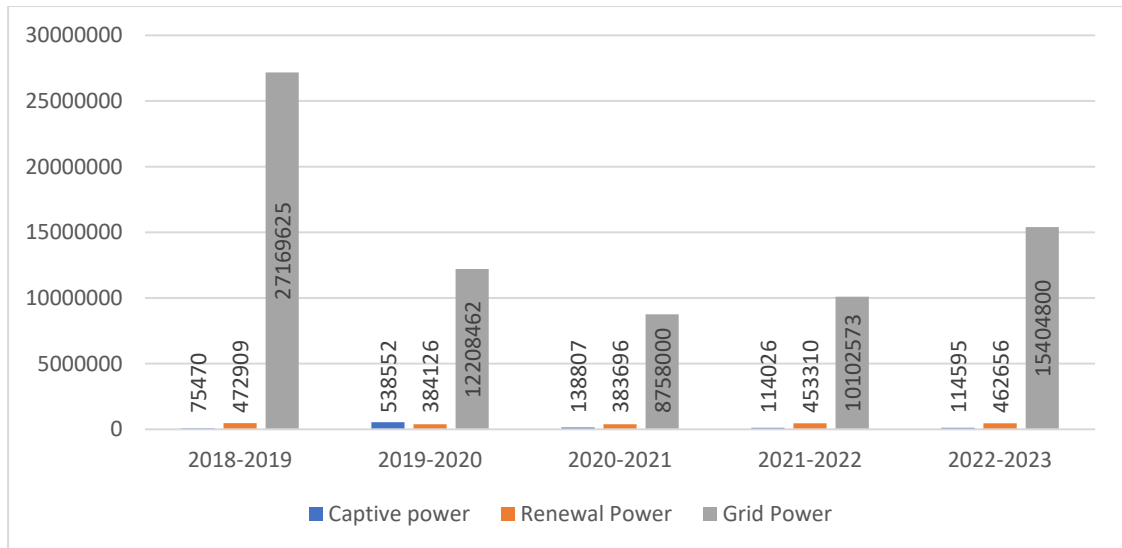
Energy consumption data analysis:

1. SNIOE is committed to transition to Clean and Green Energy. In line with the stated intent of the leadership team, the energy lifecycle is tracked from sourcing to consumption to identify the contribution from various sources of energy and undertake structured initiatives to:
 - a. Reduce Energy consumption overall
 - b. Transition from Fossil fuel-based energy sources to Green / Clean Energy sources.
2. Basis the overall energy consumption analysis from the base year 2018-19, the overall energy consumption and the contribution from the three sources of energy can be seen in Table 2.1

Financial Year	Captive generation using HSD (Kwh)	Electricity (Renewable) Solar (Kwh)	Electricity (Non-Renewable) from PVVNL (Pashchimanchal Vidyut Vitaran Nigam Limited) (Kwh)
2018-2019	75470	472909.7	27169625
2019-2020	538552	384126	12208462
2020-2021	138807	383696	8758000
2021-2022	114026	453310	10102573
2022-2023	114595	462656	15404800

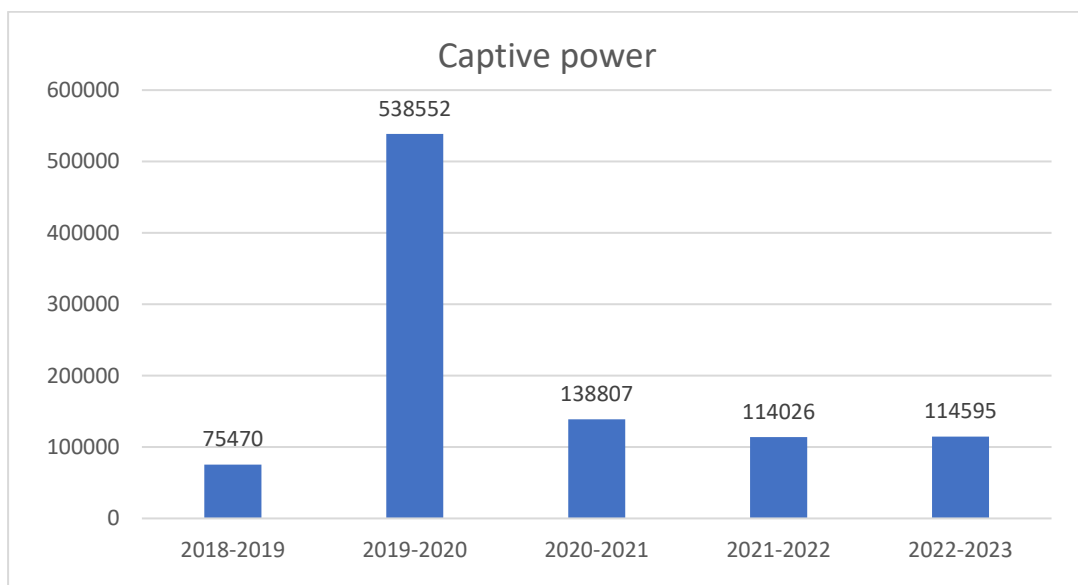
Table 2.1: Representation of the energy consumption per year from the base-line year from the different energy generation sources

- From the verified data available for the overall energy consumption at the campus, a significant outcome of the various energy conservation initiatives undertaken at the university with the involvement of various stakeholders, including Teaching Faculty, Non-Teaching Staff, and students

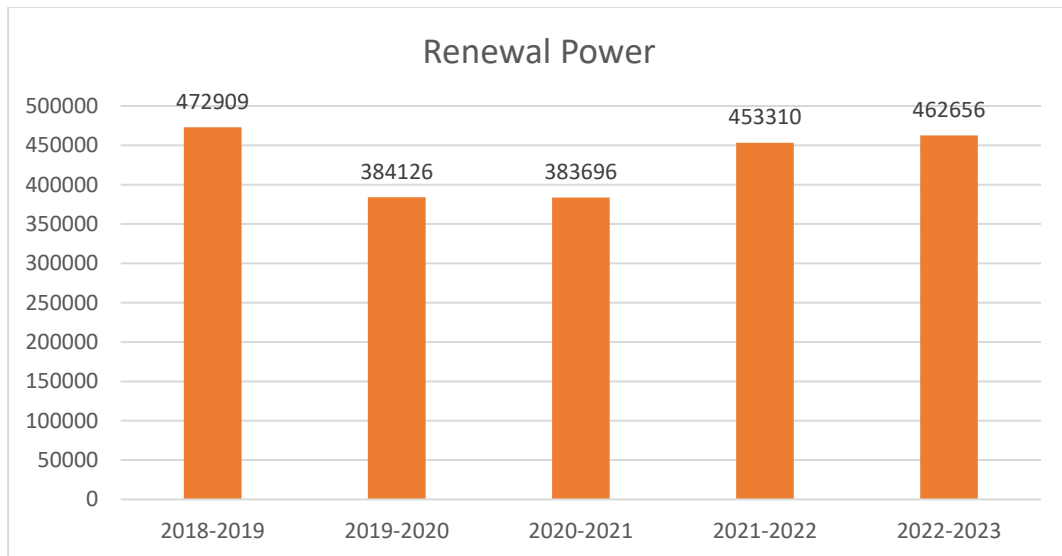


Graph 3.1: Overall Energy Consumption at SNIOE

- Further, Efforts to divestment from fossil-based power and transition to cleaner Energy sources can be seen in the Graph 4.1 which indicates the overall reduction in the energy created at the university using Fossil Fuel and Graph 4.2, which indicates an increase in the clean energy generation at the campus through the captive solar power plant installed.

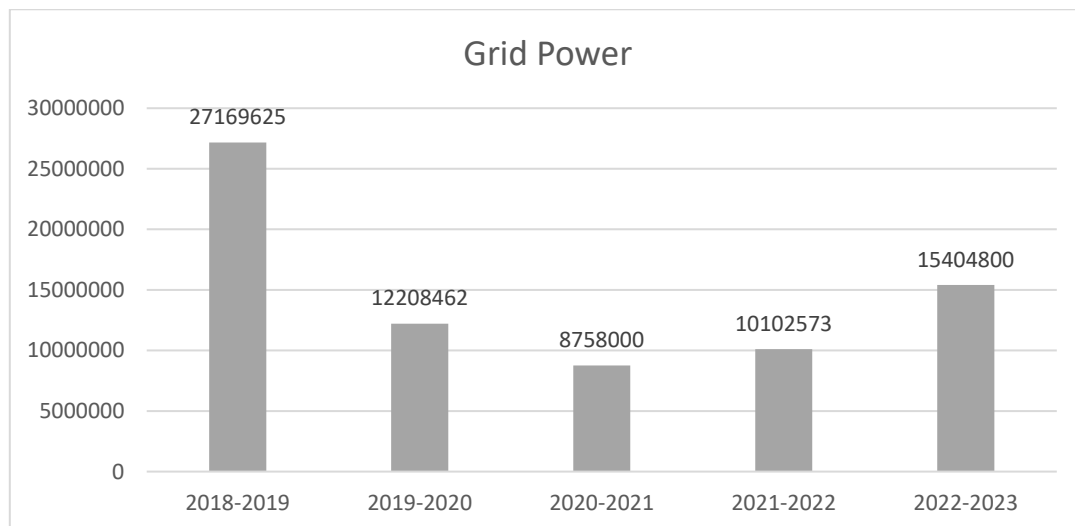


Graph 4.1: Energy created using Fossil-Fuel at Campus



Graph 4.2: Solar Power Generation at Campus

- The reduction trend in the use of Grid power also confirms the effective outcome of the overall energy Optimization initiatives taken at SNIoE, as evidenced from the Graph 5.1 below.

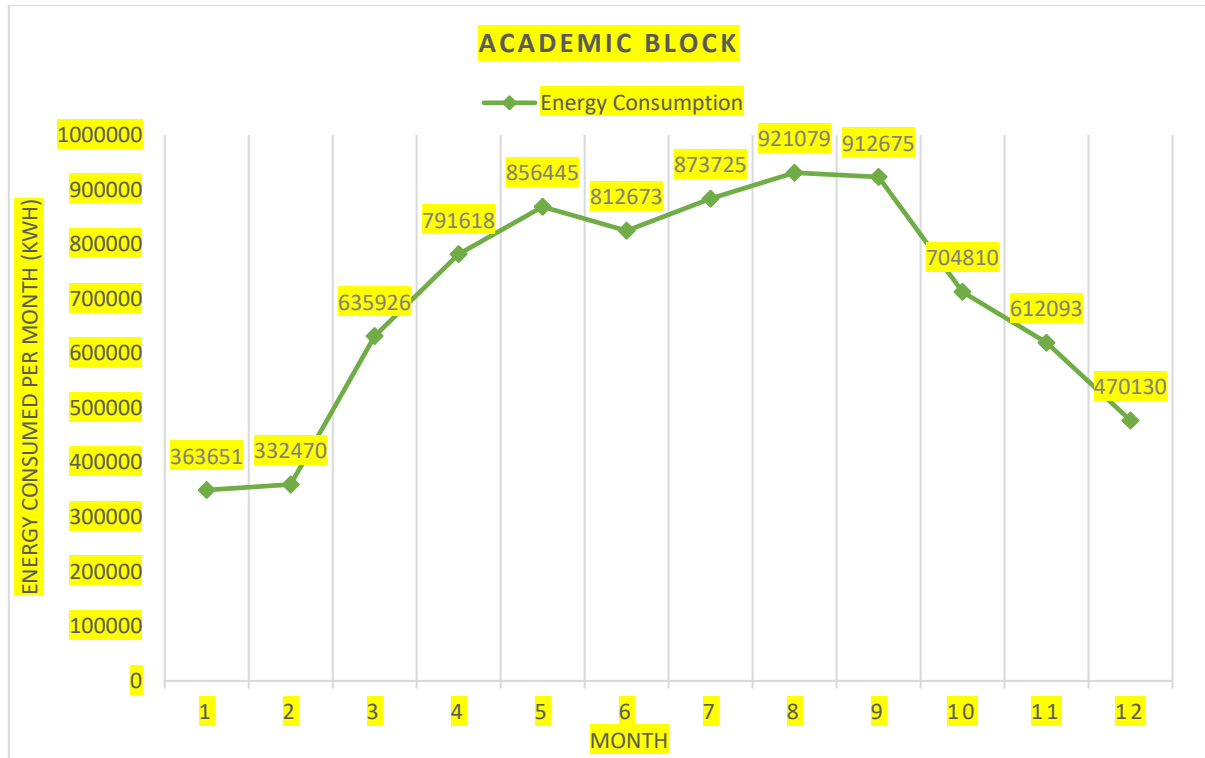


Graph 5.1 Grid Power Consumption at SNIoE

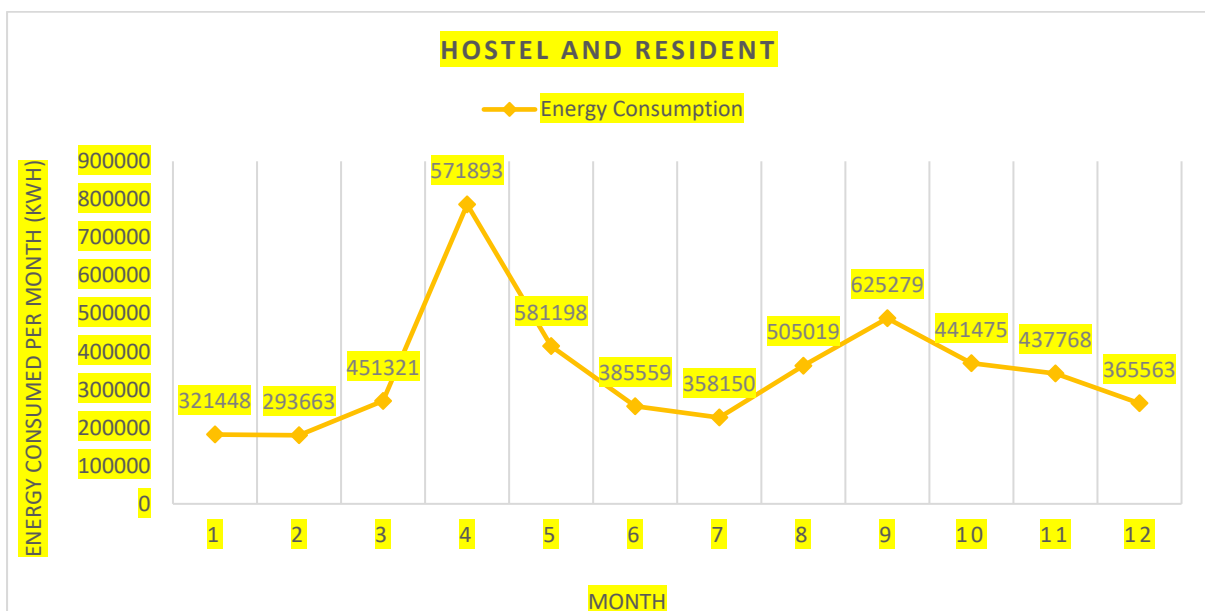
- To effectively continue the energy optimization initiatives at the SNIoE, the consumption of Energy in specific areas of the campus is also being tracked. Basis the available data on energy consumption undertaken by the maintenance team at the site, three main areas of energy consumption are identified:
 - Academic Block
 - Utility Blocks, and
 - Hostel & Residential Block
- Monthly tracking of the energy consumption in each of these areas is undertaken and a trend of overall reduction is evidenced through the various energy optimization initiatives undertaken in the respective areas with the involvement of the stakeholders. “Energy

Performance Index Report” generated monthly provides a brief analysis of the energy utilisation within the campus

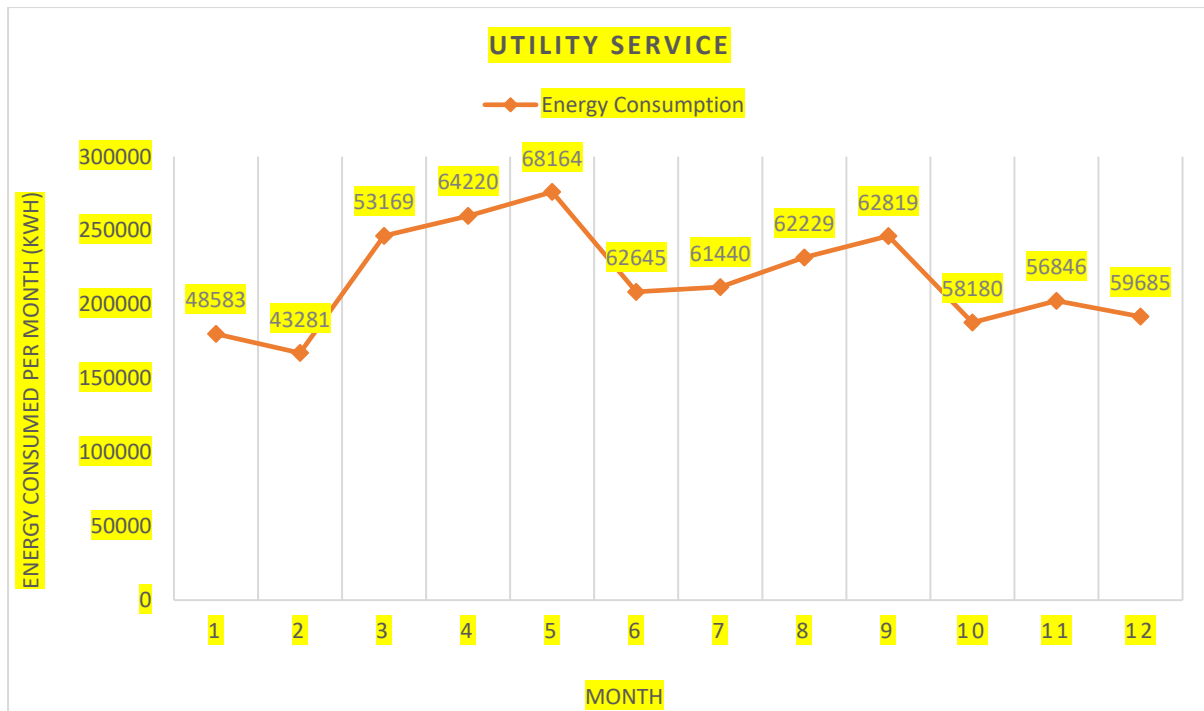
Below Graphs 7.1, 7.2, and 7.3 are evidence of the same



Graph 7.1: Representation of Energy Consumption in Academic Blocks during Year 2022



Graph 7.2: Representation of Energy Consumption in Hostel and Residential Blocks during Year 2022



Graph 7.3: Representation of Energy Consumption in Utility Services Area during Year 2022

Current achievements for increasing energy efficiency

1. The university undergoes energy consumption reviews to identify further opportunities for improvement to conserve energy.
2. Replace old fluorescent lights of 36 watts and 12 watts with Retrofit lights of 250 no's approx.
3. Replacement of the BLDC (Brass Less Direct Current) Ceiling fan is ongoing. The wattage of this fan is 30W W.R.T 70Watt of the conventional fan.
4. Installation of ATCS in HVAC plants and reduce the cost of Descaling cost with less plant Approach.
5. We have reduced energy wastage by the use of Chemicals in cooling towers in terms of less operation of HVAC pumps in maintaining the water level in the cooling tower.
6. Testing and Maintenance of Capacitor banks for Power factor improvement which impacts our Apparent power (KVAH) and more power consumption.
7. Replace the 58 no's (Approx) high wattage street lights of 56 watts into 45 watts with the same lux level
8. Installed the IR sensors in Residential washrooms, and ISC corridors to control the unnecessary operation of lights.
9. Currently we are paying approx. Rs 16 Cr. Per annum as electricity. To reduce the cost, we were taking the following initiative and the drive is still its ongoing.
10. 33kV substation installed in Sept 2017. As the power uptime is above 99%, this initiative saves approx. Rs 2.5 Cr per annum from procurement of HSD.

11. Installed Motion sensors in all the toilets in Academic and Hostel.
12. Conversation of conventional CFL/T5 light fixture to LED fixture. The hostel area is almost completed.
13. Battery-operated Urinal sensor is converted into an electrical-operated sensor. Which saves the consumption of Battery.
14. In the hostel, solar water heaters are installed in selective hostels.
15. Timer/ daylight photo sensor is used in external lighting operation.
16. The university buildings are IGBC LEED Certified and measures have been taken to:
 - 11.1 Increase energy efficiency
 - 11.2 Install solar power plants
 - 11.3 Ensure appropriate natural lighting and ventilation

Plans for energy efficiency in new buildings and renovations in buildings:

1. Addition of energy-efficient lighting in new buildings
2. Installation of lean occupancy sensors in washrooms is planned.
3. PNG connections for all Residents, Dining Halls, Club, etc. is in progress. Completion by this year's end.
4. Solar Power enhancement. The current capacity is only 430 KW. It can be enhanced to 2000 KW. Huge savings on electricity and a huge reduction in Carbon Footprint.
5. Review, analysis and refurbishment of Labs for safety of operations and environmental conservation.
6. Carbon Neutral efforts and computation.