

# ENERGY AUDIT

FOR SALCON THE VERANDAS  
SECTOR 54, GOLF COURSE ROAD,  
GURUGRAM

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**An audit focused on electrical energy, which included evaluation of electrical equipment, research on electrical saving technologies, and recommendations of ways to cut energy consumption, thereby saving on cost.**

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# COMPREHENSIVE ENERGY AUDIT

## FOR SALCON THE VERANDAS, GURUGRAM

### Executive Summary

Salcon The Verandas, located in Sector 54 of Gurugram, is a premium residential complex comprising 192 luxury apartments across six towers on a 9-acre site. This comprehensive energy audit reveals critical insights into the property's energy performance and significant optimization opportunities.

- The analyzed 6 BHK unit (6,425 sq ft) consumed 54,608 kWh annually at a cost of Rs. 3.7 Lakh/annum.
- Energy intensity of 91.47 kWh/m<sup>2</sup>/year classifies this as High Consumption - exceeding Indian residential benchmarks by 83%
- Summer consumption peaks at 7,365 kWh/month (August 2025), nearly 265% higher than the Spring/Winter transition low of 2,016 kWh (March 2024)
- Complex-wide extrapolation suggests annual consumption of 8.46 million kWh costing Rs. 5.84 crore

With targeted energy efficiency measures, this property can achieve annual savings of Rs. 3.15 crore across the complex, with individual 6 BHK units saving up to Rs. 2.00 lakh per year (54% reduction).

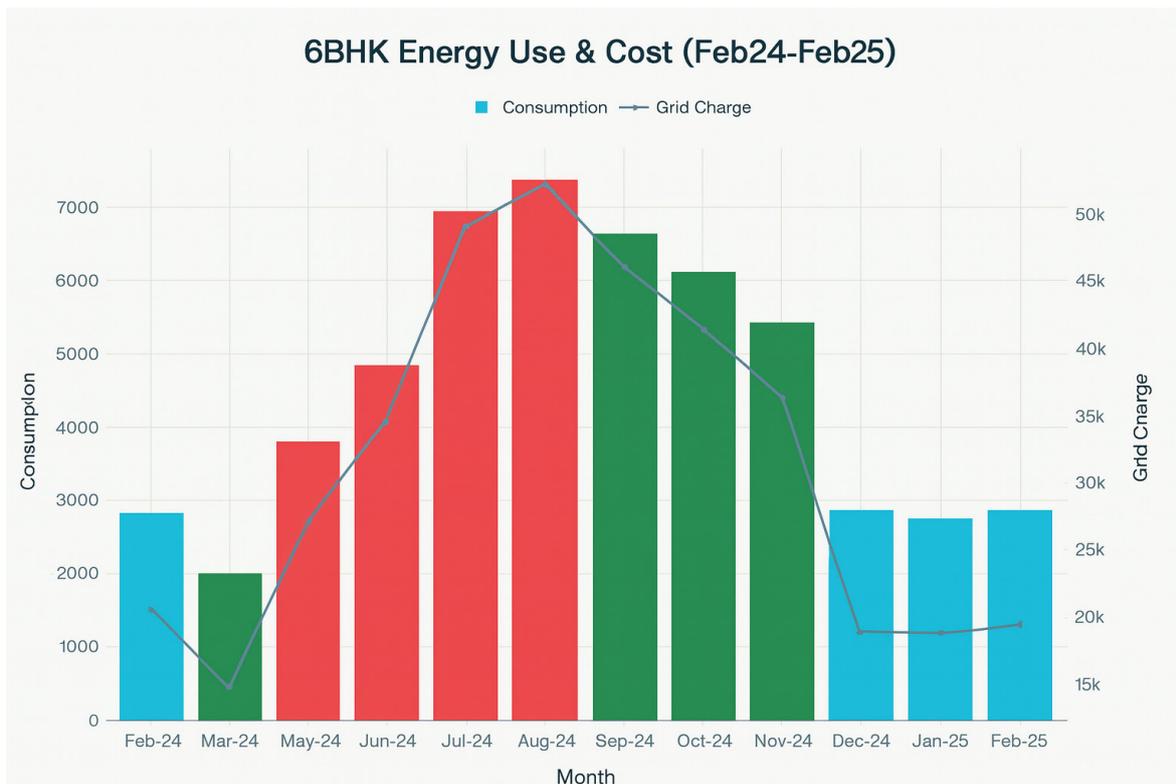
### Property Overview

- **Location:** Sector 54, Golf Course Road, Gurugram
- **Total Area:** 9 acres
- **Total Units:** 192 units (across 6 towers)
- **Unit Configuration:** 4 BHK (4,495 sq ft) 96 Units, 5 BHK (5,330 sq ft) 48 Units, 6 BHK (6,425 sq ft) 48 Units.
- **HVAC System:** Daikin split air conditioning units in all apartments
- **Power Backup:** 100% diesel generator backup
- **Green Features:** Rainwater harvesting, landscaped gardens, energy-efficient lighting provisions

### Energy Performance Analysis of a 6 BHK Unit (Feb 2024 - Feb 2025)

The electricity billing data from a representative 6 BHK apartment reveals consumption patterns significantly above industry benchmarks.

The overall trend in the energy consumption is shown in figure 1 below:



As shown in the graph, the energy consumption varies greatly over the year. The summary of the consumption however, is easier to compare with industry benchmarks as shown below

**Summary of consumption:**

- Total Consumption: 54,608 kWh/year
- Energy Intensity: 91.47 kWh/m<sup>2</sup>/year (597 sq m unit)

**Industry Benchmarks:**

- Indian Residential Average: 45-50 kWh/m<sup>2</sup>/year
- Efficient Buildings: 12-36 kWh/m<sup>2</sup>/year

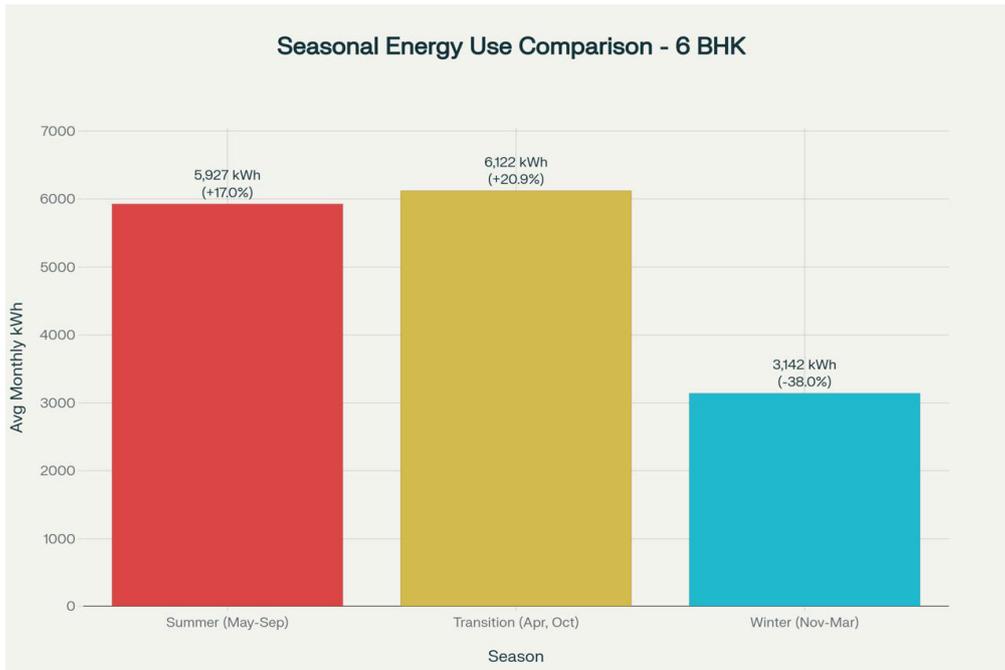
**Performance Gap:**

83% above typical consumption, 154% above efficient standards

**Root Cause analysis of higher than normal usage:**

The billing data in figure 1 reveals dramatic seasonal variations.

We can visualize that a bit more clearly with a bar graph chunked by season:



Seasonal comparison showing 89% higher energy consumption during summer/transition periods compared to winter months. This indicates that HVAC systems, which is largely dormant during the winter months is a potential root cause of the problem. The primary contributions to the inefficiency in the HVAC system could stem from:

- Individual split AC systems without centralized efficiency controls
- Large unit sizes (6,425 sq ft) with high cooling loads
- No smart thermostats or occupancy-based controls being used
- Inadequate insulation (wall insulation is very uncommon in Haryana as our winters are not that cold)

The Building design also has an undesirable thermal performance. They have a large window-to-wall ratio that allows excessive heat gain, particularly affecting top-floor units. This forces HVAC systems to work harder, especially during 7-month hot season (April-October in Gurugram).

The property also lacks any extensive smart controls to optimize consumption across common areas and individual units. The Diesel based Backup Power incurs a cost of Rs 27-28/unit versus grid power at Rs 6.90/unit, represents significant cost escalation during power outages.

## **Complex-Wide Energy Profile Projection**

Since the data for my analysis was from one apartment unit, we can extrapolate our results to understand the overall scale of this inefficiency on both usage and cost.

- Total Energy: 8.46 million kWh (assuming proportional consumption across unit types)
- Total Annual Cost: Rs. 5.84 crore at average Rs. 6.90/kWh
- Monthly Average: 705,000 kWh complex-wide
- Peak Summer Months: 953152 kWh/month (August equivalent)

This positions Salcon The Verandas at the higher end of energy consumption among luxury residential complexes in India, with significant room for optimization.

### **Plan of Action:**

#### **Priority 1:**

#### **HVAC System Optimization (Highest Impact)**

HVAC represents approximately 70-75% of total energy consumption based on seasonal variation patterns.

#### **Recommended Interventions:**

- Replace aging AC units with BEE 5-star rated inverter systems (EER 3.5+)
- Install smart thermostats with scheduling and occupancy detection
- Implement zoned cooling based on actual occupancy
- Enhanced insulation for walls and ceilings (R-19 minimum)
- Preventive maintenance contracts ensuring optimal refrigerant levels and coil cleanliness

#### **For Individual 6 BHK Unit:**

- Potential Savings: 15,000-18,000 kWh/year (Rs. 1.03-1.24 lakh annually)
- Investment: Rs. 3.5-4.5 lakh per unit
- Payback Period: 3-4 years

#### **Complex-Wide (192 Units):**

- Annual Savings: 2.88-3.46 million kWh (Rs. 1.99-2.38 crore)
- Investment: Rs. 6.7 - 8.6 crore
- Payback Period: 3-4 years

## **Priority 2:**

### **Building Design Improvements**

#### **Target:**

Reduce thermal heat gain by 30-40% without compromising on aesthetics of the building.

#### **Specific Measures:**

- Cool Roof Coatings: Reflective coatings on top-floor units (SRI 78+)
- Window Films/Double Glazing: Low-E window treatments (SHGC 0.25-0.30)
- External Shading: Retractable awnings for west-facing facades
- Terrace Gardens: Green roofs for additional insulation

#### **For Individual 6 BHK Unit:**

- Potential Savings: 8,000-11,000 kWh/year (Rs. 55,000-76,000 annually)
- Investment: Rs. 2.5-3.5 lakh
- Payback Period: 3.5-5 years

#### **Complex-Wide:**

- Annual Savings: 1.54-2.11 million kWh (Rs. 1.06-1.46 crore)
- Investment: Rs. 4.8-6.7 crore
- Payback Period: 4.5 years

## **Priority 3:**

### **Solar Power Backup Installation**

The Extensive rooftop area across 6 towers with excellent solar irradiance (5.2 kWh/m<sup>2</sup>/day in Gurugram) would be an excellent source of energy during grid downtime. Removing the reliance on generators would help reduce both the cost and carbon footprint of the society. Since we don't have clear data on what percentage of the spending was from backup power, it's difficult to estimate the benefit of this change.

## **Conclusion and Strategic Recommendations**

The comprehensive energy audit of Salcon The Verandas, validated with actual 6 BHK consumption data showing 91.47 kWh/m<sup>2</sup>/year (83% above industry benchmarks), demonstrates exceptional potential for energy and cost optimization. The current annual complex-wide energy expenditure of approximately Rs. 5.84 crore can be reduced by 40-60%, generating about Rs. 3.15 crore in annual savings. However, the success of this venture leans heavily on a few factors:

1. **Prioritize HVAC Optimization:** With 70-75% of consumption attributed to cooling, this represents the single largest opportunity. The 265% consumption spike from winter to summer in the analyzed unit confirms air conditioning as the primary target.
2. **Phased Implementation Approach:** Splitting tasks by priority and moving in phases will offer a more structured approach to addressing this issue.
3. **Resident Engagement:** Individual unit savings provide compelling financial motivation for resident participation. Capitalizing on this can be useful in gaining help from the society to solve this problem.
4. **Data-Driven Management:** Measuring processes and affects of improvements can help gauge and improve overall energy efficiency of the society.

By implementing this comprehensive energy efficiency program, Salcon The Verandas can transform from a high-consumption property (91.47 kWh/m<sup>2</sup>/year) to an industry benchmark for sustainable luxury living (36 kWh/m<sup>2</sup>/year), delivering substantial financial returns while positioning the complex as a leader in environmental stewardship within the Gurugram real estate market.

## References

Salcon Developers. The Verandas Brochure. MagicBricks, 2014, <https://img.staticmb.com/mbimages/project/1391595460421Verandas-brochure.pdf>.

Global Buildings Performance Network (GBPN). India Baseline: Residential Building Energy Performance & Policy Roadmap. June 2021, [https://www.gbpn.org/wp-content/uploads/2021/06/08.-INDIA-Baseline\\_TR\\_low-2.pdf](https://www.gbpn.org/wp-content/uploads/2021/06/08.-INDIA-Baseline_TR_low-2.pdf).

Sharma, Nivedita. High-Rise Apartment Buildings as a Sustainable Building Typology in the Indian Subcontinent. Academia.edu, 2017, [https://www.academia.edu/35629767/HIGH\\_RISE\\_APARTMENT\\_BUILDINGS\\_AS\\_A\\_SUSTAINABLE\\_BUILDING\\_TYOLOGY\\_IN\\_THE\\_INDIAN\\_SUBCONTINENT](https://www.academia.edu/35629767/HIGH_RISE_APARTMENT_BUILDINGS_AS_A_SUSTAINABLE_BUILDING_TYOLOGY_IN_THE_INDIAN_SUBCONTINENT).

Salcon The Verandas Gurgaon. CommonFloor, <https://www.commonfloor.com/salcon-the-verandas-gurgaon/povp-cucdhv>.

Salcon and Saluja Constructions: The Verandas. PropTiger, <https://www.proptiger.com/gurgaon/sector-54/salcon-and-saluja-constructions-the-verandas-507477>.

Salcon The Verandas, Sector 54 Gurgaon. Jaguar Landbase, <https://jaguarlandbase.com/salcon-the-verandas-sector-54-gurgaon>.

“Electricity Bill.” Reddit: r/gurgaon, Sept. 2023, [https://www.reddit.com/r/gurgaon/comments/16hg7i6/electricity\\_bill/](https://www.reddit.com/r/gurgaon/comments/16hg7i6/electricity_bill/).

The Rise of Green Sustainable Luxury Homes in Gurugram. Investors Clinic, Sept. 2023, <https://investorsclinic.in/blog/the-rise-of-green-sustainable-luxury-homes-in-gurugram>.

Top Sustainable Projects in Gurgaon. D.C. Jain Real Estate, 2024, <https://dcjain.com/top-sustainable-projects-in-gurgaon/>.

Green Sustainable Real Estate Gurgaon. Ganga Realty, 2024,