AMITY UNIVERSITY
RAJASTHAN

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Upgradation of existing and future buildings to increase energy efficiency

(Aligned with NBC 2016 and BEE Guidelines for Institutional Buildings)

Date: 09/12/2024

Amity University Rajasthan (AUR) is committed to enhancing the energy performance of all existing buildings through structured retrofitting and sustainable operational strategies. The University's plan emphasizes compliance with the National Building Code (NBC) 2016, Energy Conservation Building Code (ECBC), and Bureau of Energy Efficiency (BEE) standards, ensuring that institutional infrastructure operates with minimal energy wastage and optimal performance efficiency.

1. Energy Audit and Baseline Assessment

- Conduct comprehensive energy audits for all existing academic, administrative, and residential buildings to assess current energy consumption levels and identify inefficiencies.
- Utilize BEE-certified energy auditors to evaluate thermal performance, lighting efficiency, HVAC operations, and electrical load management.
- Establish baseline energy performance indices (EPI) for each building as per ECBC norms to monitor future improvements.

2. Data Collection and Performance Benchmarking

- Compile and analyze historical energy consumption data, utility bills, and equipment performance records.
- Benchmark buildings using BEE's Star Rating for Buildings and compare against best-performing campuses to identify improvement targets.

3. Objective Setting and Policy Alignment

- Set measurable energy-saving targets in alignment with AUR's Sustainability and Green Campus Policy.
- Objectives include:
  - Achieving minimum 15–20% reduction in overall energy consumption.
  - Ensuring compliance with ECBC 2017/ECBC+ standards for all major retrofits.
  - Reducing greenhouse gas emissions and carbon footprint per square meter.

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4. Financial Planning and Resource Mobilization

- Prepare a dedicated **Energy Efficiency Investment Plan** within the annual budget framework.
- Explore financial support through:
  - BEE institutional building energy conservation programs.
  - MNRE solar rooftop subsidies.
  - State Designated Agency (SDA) schemes for retrofit projects.
- Undertake life-cycle cost analysis (LCCA) for each retrofit measure to ensure cost-effectiveness.

5. Prioritization of Energy Efficiency Measures

Retrofit measures will be identified and prioritized based on their energy-saving potential, payback period, and alignment with ECBC recommendations:

- **Lighting Systems:** Replace conventional luminaires with LED lighting and daylight sensors to maximize natural illumination.
- **HVAC Systems:** Upgrade to high-efficiency HVAC units (BEE 4- or 5-star rated), introduce variable frequency drives (VFDs), and install programmable thermostats for zoned control.
- **Building Envelope:** Improve **insulation** of roofs and walls, seal air leaks, and use reflective paint or cool roofing materials.
- **Fenestration:** Replace outdated windows and doors with double-glazed, low-emissivity (Low-E) glass systems to enhance thermal comfort.
- **Renewable Energy Integration:** Deploy solar PV systems on rooftops, solar water heaters, and hybrid energy systems where feasible.
- **Water and Waste Systems:** Incorporate low-flow fixtures, rainwater harvesting, and wastewater recycling systems to reduce energy load on water utilities.
- **Appliances and Equipment:** Replace existing appliances with ENERGY STAR/BEE-rated equipment for laboratories, hostel, and office areas.
- **Energy Management Systems:** Implement Building Energy Management Systems (BEMS) for real-time energy monitoring and control.

6. Implementation and Compliance

- Engage certified architects, engineers, and ECBC-accredited professionals (ECBC-APs) for project design and execution.
- Ensure that all retrofits adhere to:

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  - NBC 2016, Part 8, Section 1 – Energy Efficiency.
  - Energy Conservation Building Code (ECBC 2017/ECBC+).
  - State and local building bye-laws.
- Conduct commissioning and post-installation testing to verify compliance and performance outcomes.

7. Monitoring, Verification, and Reporting

- Install sub-metering and smart meters to track energy consumption at building and system levels.
- Develop a real-time dashboard for internal monitoring and monthly reporting to the University's Energy Management Committee (EMC).
- Conduct annual performance verification and submit reports to management, highlighting savings achieved and areas for further optimization.

8. Capacity Building and Awareness Programs

- Conduct regular training and orientation sessions for maintenance teams, faculty, and students on energy-efficient practices.
- Display energy-saving awareness materials across buildings and laboratories.
- Encourage active participation through Green Ambassador Programs and energy conservation campaigns.

9. Continuous Improvement and Future Upgradation

- Periodically review all retrofit measures to incorporate emerging technologies such as IoT-based monitoring, AI-driven energy analytics, and smart grid integration.
- Explore carbon neutrality initiatives through energy offsets, green certifications (IGBC, GRIHA), and sustainability partnerships.
- Maintain alignment with future revisions of ECBC, NBC, and BEE guidelines to ensure long-term compliance and excellence in sustainable infrastructure.

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