



Plans

to upgrade existing buildings to higher energy efficiency

Creating plans to enhance the energy efficiency of existing buildings requires specific procedures that considers diverse elements of building functionality. By systematically considering these elements within a thorough strategy, building owners and managers can progressively enhance existing structures, accomplishing heightened energy efficiency and contributing to sustainability objectives. A broad framework for formulating such plans is presented below:

1. Identifying Energy Efficiency Goals:

- Define clear and achievable energy efficiency goals for each of the buildings.
- Establish targets that can be measured for reducing energy usage and energy consumption to enhance overall efficiency.

2. Conducting Energy Audit:

- Conduct a detailed energy audit for all of the existing buildings to check the current energy usage and consequently identify areas of inefficiency.
- Utilize the measurements of the data loggers and energy analyzers to analyze the performance of the building.
- Establish a monitoring system for measuring energy performance.

2. Verifying Adherence to Regulatory Requirements:

- Ensure that all upgrade measures comply with local and national building codes and regulations.
- Obtain the required permits and approvals before implementing any renovation work.

3. Implementing a maintenance plan:

- Implement a regular maintenance plan to ensure proper operation of energy-efficient systems.

4. Upgrading Lighting system:

- Replace traditional lighting bulbs with energy-efficient LED lighting.
- Install motion sensors and smart lighting systems to minimize the lighting usage as optimum as possible.

5. Upgrading Appliance and Equipment:

- Replace energy-consuming appliances and equipment with energy-efficient ones by ensuring that all new equipment meets energy efficiency standards.

6. Integrating Smart Building Technologies:

- Integrate smart building technologies, including energy management and automation systems. This includes installation of sensors and controls for lighting, HVAC, and other systems to optimize energy use.

7. Integrating Renewable Energy sources:

- Install solar PV systems as well as solar water heaters on buildings roofs. This is to achieve an on-site energy generation to supplement the building's power needs.
- Explore options for other renewable energy sources mainly biogas generation through building anaerobic digestion.

8. Upgrading HVAC System:

- Upgrade the existing heating, ventilation, and air conditioning (HVAC) system for improved efficiency.
- Implement programmable thermostats and smart HVAC controls.

9. Enhancing Insulation status:

- Enhance insulation in walls, ceilings, and floors to minimize heat transfer.
- Fill gaps and cracks to prevent air leakage in order to improve the overall building efficiency.

10. Upgrading Windows and Doors:

- Install energy-efficient windows and doors that provide proper insulation to minimize heat transfer.

11. Implementing Water Conservation Measures:

- Implement water-saving technologies to reduce water consumption.
- Consider rainwater harvesting systems.

12. Raising Awareness among the university community:

- Raise awareness among university community regarding the importance of energy efficiency and provide information on the benefits of energy saving.
- Encourage energy-saving practices.

13. Encouraging research regarding energy management systems:

- Encourage research regarding energy management systems, energy conservation procedures, renewable energy systems, and related topics.

14. Providing the required Funds and Financial Incentives:

- Provide available financial incentives and grants for energy efficiency projects.
- Investigate funding alternatives and find the return on investment for the proposed upgrades.

15. Documenting and Reporting:

- Keep detailed records of any recommended upgrades, including the technical specifications, installation dates, and the achievements.
- Prepare regular reports and share this information with stakeholders.

This implementation of this plan is directed by the university president assistant for the governance affairs. A team helps the director to assure implementing the details of this plan. The members of this team are:

- Expert from the deanship of planning and development (Eng. Heba Awartani)
- Expert from Engineering Department (Eng. Sammar Jallad).
- Expert from faculty of Engineering (Dr. Mahmoud Ismail)
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