جامعة فلسطين التقنية - خضوري
Palestine Technical University - Kadoorie

Energy Efficiency Plan
to reduce overall energy consumption

Creating plans to reduce the energy consumption to achieve more energy efficiency 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.

This plan is part of the green building policy. The main purpose of the implementation of this policy that includes an energy efficiency plan is to systematically prepare any new building designs or any renovations to ensure following energy efficiency standards and this includes the implementation of green building code as well as ensure providing any efficient appliances. A broad framework for formulating such plan to minimize energy consumption in University buildings is presented below:

1. **Identifying Energy Efficiency Goals:**
   - Define clear and achievable energy efficiency goals for each of the building in order to reduce 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 and then to identify the possibilities and the procedures to reduce the consumption.
   - Establish a sustained monitoring system for measuring energy performance for each of the buildings.

2. **Verifying Adherence to Regulatory Requirements:**
   - Ensure that all upgrade measures regarding the energy consumption reduction comply with local and national building codes and regulations.

- Obtain the required permits and approvals before implementing any consumption reduction work.

3. **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.
    - All new buildings installed after 2020 are equipped to satisfy this by integrating these systems with the designs. Major renovation for the existing buildings to build these systems. There is a target that all buildings will include like these systems by 2025.

4. **Upgrading Appliance and Equipment:**
    - Replace energy-consuming appliances and equipment with modern energy-efficient ones by ensuring that all new equipment meets energy efficiency standards. There is a target that all appliances will be efficient by 2026.

5. **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.
    - Achieve at least five requirements regarding the smart building implementation (Automation, safety, energy, water, indoor environment, lighting). About 87% of the existing buildings satisfy this target. All buildings installed after 2019 satisfy this target. Major renovation for the existing buildings to install like these systems. There is a target that all buildings will include like these systems by 2025.

6. **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. This reduces the dependency on the grid supply (consequently reduces the bill and reduces the CO2 pollutant emissions)
    - Explore options for other renewable energy sources mainly biogas generation through building anaerobic digestion. This reduces the dependency on traditional gas bottles (consequently reduces the gas bill and reduces the CO2 pollutant emissions).

7. **Upgrading HVAC System:**

- Upgrade the existing heating, ventilation, and air conditioning (HVAC) system for improved efficiency.
- Circulate instructions among the university community to maintain temperature settings for heating and conditioning at specified ones according to standards.
- Implement programmable thermostats and smart HVAC controls.

8. **Enhancing Insulation status:**
   - Enhance insulation in walls, ceilings, and floors to minimize heat transfer and then the energy consumption.
   - Fill gaps and cracks to prevent air leakage in order to improve the overall building efficiency.

9. **Upgrading Windows and Doors:**
   - Install energy-efficient windows and doors that provide proper insulation to minimize heat transfer and then the energy consumption.

10. **Raising Awareness among the university community:**
    - Raise awareness among university community regarding the importance of energy efficiency regarding the energy consumption reduction measures and provide information on the benefits of energy saving.
    - Initiate awareness campaigns to foster energy-conscious behavior among university community, advocating practices such as turning off lights and equipment when not in use.
    - Collaborate with utility providers to explore incentives, and programs that promote energy efficiency in university buildings.
    - Encourage energy-saving practices.

11. **Encouraging research regarding energy management systems:**
    - Encourage research regarding energy management systems, energy conservation procedures, renewable energy systems, and related topics.

12. **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.

13. **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. Mervet)
- Expert from Engineering Departmnet (Eng. Sammar Jallad).
- Expert from faculty of Engineering (Dr. Shaher Ziod)
- Expert from faculty of Engineering (Dr. Mohamamd Dridi)
- Expert from faculty of Engineering (Dr. Hafez Daraghmi)
- Finance Department (Monther Zidan)
- Services Department (Mohammad Jabr)