ENEL 674 Industrial and Commercial Power Systems

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Project Milestone 2

Consideration of Future Technologies

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Consideration of future technologies that may impact design over 10-20 years:

As technology advances, there are several developments that may impact building design over the next 10-20 years. Here are some major examples:

1. Smart Buildings:

The use of smart technologies to manage and optimize building operations is already becoming more common and is likely to become even more widespread in the coming years. This may include the use of sensors to monitor energy usage, occupancy levels, and air quality, as well as the use of automation to control lighting, heating, and cooling systems.

2. Energy Storage:

The development of new battery technologies is making it easier and more cost-effective to store energy generated by solar panels or other renewable sources. This could lead to greater use of on-site energy storage systems in buildings, which could help to reduce reliance on the grid and increase the use of renewable energy.

3. Electric Vehicles:

As the use of electric vehicles becomes more widespread, building owners and designers may need to consider the provision of EV charging infrastructure. This could include the installation of charging points in car parks, as well as the provision of charging facilities for electric bikes and scooters.

4. Smart Grid:

A smart grid is an electricity network that uses digital communications technology to monitor and control power flows in real-time. Smart grids can enable buildings to more effectively manage their energy consumption and incorporate more renewable energy sources. Building managers can modify energy use in response to changes in energy supply and demand by utilising demand response programmes, which are made possible by smart grids. By doing so, the grid may experience less stress during times of high demand and fewer fossil fuel power units may be required.

5. Green roofs and Walls:

Green roofs and walls can help reduce a building's energy consumption by providing insulation and shade, and also absorb carbon dioxide and pollutants from the air. Green roofs and walls can help filter out pollutants and enhance air quality, giving visitors a healthier and more comfortable atmosphere. This can lower the chance of developing respiratory conditions and enhance general health. For occupants, green walls and roofs can provide an aesthetically pleasant environment that improves their welfare and way of life in general. This can lessen stress, increase productivity, and improve the overall experience of the occupants.

6. Building automation systems (BAS):

Commercial buildings may have a bright future thanks to building automation systems (BAS), which allow for the seamless integration of various building technologies and systems for improved economy, sustainability, and occupant comfort. Many building systems, including HVAC, lighting, security, and fire safety, can be integrated via BAS to enable centralised control and monitoring. This could improve occupant comfort, cut down on energy waste, and maximise building efficiency.

7. Internet of Things (IoT):

IoT devices can be used to monitor and control building systems, including lighting, HVAC, and security, to optimize energy usage and enhance occupant comfort. Real-time monitoring of equipment performance with IoT devices can help identify problems early on. This can save time and money by reducing downtime and optimising maintenance plans. By identifying and warning occupants of potential hazards or unauthorised access, IoT devices can be used to monitor and improve building safety and security. By doing so, the risk can be decreased and the assets' security and safety can be increased.

8. 5G and wireless Technologies:

The rollout of 5G networks is likely to have a major impact on the way buildings are designed and operated. This could include the use of wireless sensors to monitor building systems, the deployment of autonomous vehicles for deliveries and waste management, and the use of augmented and virtual reality to enhance the building design process.

9. Building Materials:

The development of new building materials, such as ultra-strong concrete and self-healing coatings, could change the way buildings are constructed and maintained. These materials may offer greater durability, better energy efficiency, and reduced maintenance requirements, leading to lower costs and a reduced environmental footprint.

These are just a few examples of the technologies that may impact building design in the coming years. It is important for building owners and designers to stay up to date with these developments in order to ensure that their buildings are equipped to meet the challenges of the future.