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## Best practices for energy management in buildings

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Building owners have a growing number of options for supplying and managing energy. On the supply side, options like solar energy, geothermal energy, on-site combined heat and power (CHP) assets, and district energy may be viable. On the demand side, building management systems and sub-metering can enable the analysis of consumption patterns and drive reductions in energy usage. The bottom line can be significantly impacted by the combination of capital investments and the adoption of superior operations and maintenance techniques.

To better understand this, it's helpful to look at some of the challenges involved in operations and maintenance (O&M) for energy infrastructure within buildings. The ideal method for enhancing the economic and technical performance of complex equipment is a life-cycle approach: a systematic program of diagnostic testing, inspections, overhauls, repairs, and upgrades. When equipment is maintained with a life-cycle analysis perspective, energy usage is optimized and both operating and capital costs are ultimately minimized. A diligent approach to on-site O&M also maximizes energy efficiency (i.e., high percentage of fuel is converted to useful energy), minimizes the risk of equipment failure, and ensures operation within a very tight control range.

The optimization of energy management within a building entails a broad range of services to enhance the economic, technical and environmental performance of thermal, electrical and mechanical equipment. Below are some tenets that are employed in developing a life cycle maintenance program:

### Preventive Maintenance Tasks:

- \* Develop maintenance procedures for every piece of equipment.
- \* Outline the specific maintenance tasks and frequencies, which are customized to your building and environment.
- \* Customize final plans based on a combination of the manufacturer's recommendations and previous operation of similar equipment.

Achieving maximum availability and optimal energy efficiency of building infrastructure involves:

- \* Reliability-centered maintenance
- \* Periodic inspection
- \* Diagnostic testing
- \* Statistical process control
- \* Upgrades
- \* Repairs and overhauls

Building owners who apply only basic maintenance practices to their buildings will fail to maximize the value of their investments. Continuous improvement should be the objective. Where building owners lack the personnel and tools to optimize energy management, it often makes sense to engage energy management experts to maximize the ROI on their energy and infrastructure

systems. Effective energy management can generate material savings, extend the useful life of energy assets, increase the value of a property, and also reduce the environmental impact of the building, thereby allowing building owners to focus on their core business.

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