

Grouping Retrofits to Gain Efficiency

Combining deferred maintenance items and energy upgrades leads to construction cost efficiencies and increased ROI for commercial projects.

Rather than build new facilities, many companies are finding their best bet for reducing overhead is to relocate to existing buildings or simply stay where they are and focus on maintenance and retrofitting. Either option creates the opportunity to combine needed upgrades and see just efficient their building can be.

Roof repairs needed?

A leaky roof can't be ignored, but a straight replacement may leave out a big efficiency opportunity – peeling off the old roof and adding rigid insulation. In addition, if you use a 'cool roof' combined with the added insulation, your air conditioning loads can drop 30% or more, depending on your climate.

While we're on the roof...

Replacing or retrofitting a roof is a great time to add solar photovoltaic (PV) panels. In fact, PVs generate more electricity when mounted on a cool roof versus a dark, hot roof.

Take a look at daylighting

Another upgrade that combines well with roofing is adding skylights or suntubes. Adding daylight to interior spaces reduces the amount of electric light needed and provides better quality of light for employees, which reduces operating costs and increases productivity. By planning for PVs and suntubes at the same time, the PV panels can be spaced for maximum efficiency, ensuring they don't shade each other or the suntubes.

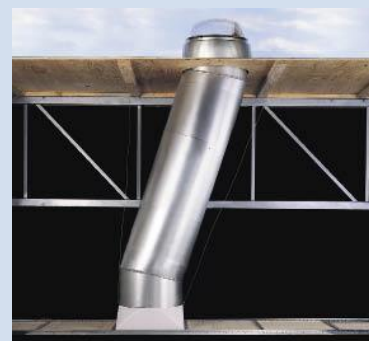
Photosensors on lighting

Once the daylighting has been added, it's important to adjust lighting controls so that the electric lights shut off automatically when there is sufficient natural light.

Grouping Retrofits at a Commercial Campus



The owners of this California business campus, a 140,000 SF facility with over 250 employees, recently combined roof replacement with added insulation and a white cool roof installation. They also determined that the payback on photovoltaic panels would be fewer than 10 years, so they installed those at the same time. Looking for an improved work environment, they visited other buildings with suntubes (pictured below) and determined that daylight would have a high impact on the indoor environment and lower their electric lighting cost. Finally, they updated their lighting controls for best efficiency.



Grouping Retrofits at the City of Santa Cruz Municipal Offices



The City of Santa Cruz remodeled an old school building to be used as their municipal offices. The renovation included a new roof, solar panels, and suntubes. This project also included increasing wall insulation, replacing windows, and adding a new mechanical system. The locations of all of the roof-top items were coordinated to optimize the electric output of the solar panels while allowing for full daylight in the suntubes.

With the added efficiencies and solar panels, the energy use is 90% lower than a standard office building.

Electric lighting

If your electric lights are more than 10 years old, an upgrade will likely pay off. Sometimes a lamp and ballast replacement is enough; sometimes new fixtures and placement are needed. Combining suntubes with a lighting upgrade at the same time will simplify the layout and reduce interruptions due to the ceiling retrofit work.

Go where the grass is greener

A whole-building energy audit will help identify other high-impact improvements that are possible for an existing building, such as mechanical equipment, insulation, windows, pumps, indoor water use, or even irrigation.

Retrofit Analysis Services

At In Balance Green Consulting, we work with engineers, suppliers, designers, and commissioning agents to develop the best balance of long-term planning and near-term implementation in grouping retrofits for commercial buildings.

- **Preliminary Energy Analysis:** We use energy modeling software, such as EnergyPro, to model the energy performance of a comparable standard building (or the existing building prior to upgrades) and compare it to the proposed energy efficient building, identifying the highest-impact improvements.
- **Daylight Modeling:** We use IES Radiance software to develop a daylight model, determining the size and spacing of skylights and/or suntubes to achieve the most appropriate light levels.
- **PV Solar Analysis:** We provide system analysis, including sizing, expected energy savings, and a payback pro forma.
- **Follow-through:** Working with the selected contractor and/or design team, we help define the total project scope and provide technical assistance and expertise throughout implementation.

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