FACILITIES AND FINANCE, I AM IN CONTROL

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Each year facility managers are forced to achieve greater results with ever decreasing capital funds and resources. This paper will first provide facility managers with an understanding of the key financial metrics that can be applied to infrastructure improvement projects. Next, through field examples, facility managers will know how to identify, quantify, and qualify their infrastructure improvement projects. Finally, this paper will demonstrate how facility managers will utilize the financial metrics and planning process to obtain project funding from hospital administration.

Introduction

The healthcare industry is under increasing pressure to reduce costs, provide excellent patient care, and provide state of the art technology. In fact, CMS reported the average profit margin for US hospitals in 2008 was 5.7%, leaving no room for error. Typically, there is no department in the hospital more pressured to reduce cost, and that receives less funding than plant operations. Why is this?

Let's first look at the hospitals executive team. According to the 2008 American College of Healthcare Executives' (ACHE) annual survey of top issues confronting hospital CEOs, the number four concern of hospitals is physician relations, number three is care for the uninsured, number two concern is quality and patient safety, and the number one concern was financial challenges.

Although the number one concern of a Hospital's CEO is financial, how often do facility managers present their projects utilizing the financial metrics that the administration uses to make critical financial decisions as a part of their business case for infrastructure improvements? From a recent survey of facility managers across the nation, approximately 65% of those surveyed indicated that they did not know how to equate cost savings to patient revenue and approximately 70% wanted further education on analyzing key metrics within their hospitals financial statements.

Key Financial Metrics

Todd Smith, Tremco, Inc. is a Certified Energy Manager and Certified Sustainable Design Professional through the Association of Energy Engineers. He recommends and utilizes several key metrics for any infrastructure improvement plan: simple payback, average age of plant, equivalent patient revenues, and NPV (Net Present Value). Smith recommends facility managers incorporate these metrics into their annual capital budget planning and justification process.

Smith has extensive experience identifying operational improvements throughout the physical plant and incorporating those projects into a Proforma analysis for approval of funds by the CFO. Smith's process begins with a visual inspection of the plant, evaluation of utility spend, interview with infection control practitioners, and review of patient satisfaction surveys. Smith notes that including infection control and patient satisfaction surveys provides you with information that can tie your infrastructure improvement projects to the hospital administration's number four concern for physician satisfaction and the number two concern patient satisfaction/safety respectively.

By following this process, not only does Smith look to identify a reduction in capital spend, but he also identifies ways to extend the life of facility assets while meeting Environment of Care standards, identifies opportunities to reduce risk in surgical suites while improving operating conditions for physicians and nurses, and provides information that links the physical environment to patient satisfaction.

Simple Payback

The first metric that Smith utilizes to determine the financial feasibility for your infrastructure improvement projects is simple payback. *Simple payback is the cost of the project, divided by the annual anticipated cost savings.* For example, if you are replacing a boiler at a cost of $100,000 that is anticipated to reduce your utility costs by $20,000 per year, this project has a payback of 5 years.

$$\$100,000 \div \$20,000 = 5 \text{ years}$$

Smith creates a rolling master list of all infrastructure improvement projects that includes the anticipated replacement date, project name, budget estimate, and payback. This list can be kept in Excel or other spreadsheet database enabling you to sort or group the projects to meet capital restrictions or to group projects to achieve your hospitals target average payback. Smith recommends that you find out from your hospital administration the target payback and use it in conjunction with the other metrics outlined below because financial requirements vary from hospital to hospital.

Payback is often used in conjunction with Return on Investment, which is equal to the *Annual Savings divided by the Investment Cost.* Because both of these metrics do not take into account the time value of money, they should be used in conjunction with the below metrics.

Equivalent Patient Revenue

The second metric Smith recommends is equivalent patient revenue. To calculate equivalent patient revenue you need to know your operating margin which can be found on your financial statements or calculated as the difference between operating revenue and total expenses divided by operating revenue. According to an AHA 2009 Trendwatch Report the average hospital operating margin in 2007 was 2.6%. Facility managers can locate their operating margin on current financial statements or find this out from a colleague in your finance department.

Equivalent patient revenue is calculated by dividing every dollar a project saves by your operating margin. For example, if your operating margin is 2%, every dollar you save is equivalent to $50 in patient revenue. The above boiler replacement project represents $1,000,000 in equivalent patient revenues. Yes, facilities management does have a profound impact on the bottom line!

$$\$20,000 \div .02 = \$1,000,000$$

Average Age of Plant

The third metric Smith recommends is *average age of plant, which is calculated by dividing your accumulated depreciation, by your depreciation expense.* According do the 2009 AHA Trendwatch report, the 2007 average age of plant was 9.8 years, so if your average age of plant is

below the national average your goal is to decrease that number incrementally through infrastructure improvement projects. Why is this metric important? Hospitals bond ratings, which impact the interest rate at which your hospital can borrow money, is being impacted by average age of plant that is longer than 7-9 years. Smith recommends you find out your average age of plant from a finance department colleague. He also made the following recommendations:

First, Smith advises facility managers to be aware that each asset carries a depreciation expense and that as you retire an asset, you lose that assets remaining depreciation expense, increasing your average age of plant. Second, a $1 investment in equipment can impact the financial statements beyond the $1 investment in the physical plant because it effects depreciation expense, which effects investment income. So if you are wondering why you can't get that façade project approved, which you feel is needed more then your HVAC upgrades, depreciation and average age of plant may be an contributing factor.

Net Present Value

The fourth metric, Net Present Value, is probably the most important metric a facility manager can utilize. Net Present Value (NPV) is more relevant than simple payback and ROI because it takes into account the time value of money. Since facility improvement projects can generate savings over long periods of time, it is imperative to capture those savings and present the results to the administration that truly reflect the financial value to the hospital. NPV gives the facility manager the vehicle to compete with clinical projects for capital dollars.

As an example, suppose you have a project with a first cost of $1 million dollars that generates an annual savings of $200,000. Given a discount rate of 5% for a tax exempt system and a useful life of 20 years for the facility improvement project, the present value of the annual savings is worth roughly $2.5 million in today's dollars. After subtracting the $1 million dollar investment the "NET" present value of the project is $1.5 million. So this project, with a simple payback of 5 years and a ROI of 20%, is worth $1.5 million dollars to the hospital today.

From the Field Recommendations, Catholic Healthcare West

Catholic Healthcare West (CHW) is a California-based, non-profit, public benefit corporation comprised of 41 acute care hospitals located in Arizona, California and Nevada. David A. Jones, Manager of Utility Services is a certified energy manager and building commissioning agent. With 25 years experience in all aspects of hospital facility operations and management, his current focus is on supply and demand side management, administering a system-wide infrastructure program, managing an operational energy efficiency program, and administering CHW's participation with the California Climate Action Registry.

Jones has extensive experience in financing alternatives specific to demand side programs, commodity contracting, supply and demand energy auditing including measurement and verification, and energy efficiency from operational improvements. He received a BS in Biological Science with an emphasis in molecular genetics and a BS in Business Administration with a minor in finance. In addition, he continually strives to stay abreast of current industry trends through self-directed study, professional memberships such as AEE, ASHE, ASHRAE, ASTM International, and various development programs.

Jones started his career in healthcare as a utility man, working with trade specific journeyman. From there he went through a 4-year apprenticeship/trade program where he had the opportunity to work with and learn from some skilled journeymen/engineers and retained contractors while attending technical/trade classes. Jones saw first hand the money being spent on utilities and the fact that no one was monitoring or managing energy consumption. “People took small steps to make improvements during repairs or preventive maintenance, but little was being done to impact energy consumption from a campus perspective,” says Jones.

So when Jones relocated to a new hospital that was focused on the reliability of their roof top mechanical systems, he got his first chance to link infrastructure improvements with finance. Jones worked directly with the CEO on this project, monitored the equipment to find deficiencies, and found cost savings of approximately $30k per month. According to Jones, “You only look as good as your worst employee. Technologies change rapidly and everyone needs training, training, and more training.”

Jones has come along way since then, and with CHW’s leadership team is leading a comprehensive infrastructure improvement and operational energy efficiency program. CHW’s facility management team recognizes the cost of deferred maintenance, and attributes the need for deferred maintenance to three primary causes:

1. There are rarely adequate budgeted dollars to do the required preventative maintenance

2. Staff technical knowledge is being lost due to a retiring work force and a lack of mentoring programs

3. Number of staff is either the same or decreasing while the workload increases through acquisitions, and/or the increasing average age of plant

With these factors in mind, CHW established an infrastructure improvement program that was developed by and is administered at the system level. This infrastructure conservation program is a three step process.

Step 1 is rating the condition of existing equipment. CHW staff evaluates the existing condition of mechanical, electrical and plumbing systems to determine if they are operating the way they were designed to operate and notes existing condition based on five tiers: Excellent, Good, Fair, Poor, and Unsatisfactory. This assessment also documents how well the central plant is being maintained, and whether equipment can be repaired, rebuilt, or replaced.

This process begins with the assumption that any piece of equipment can be repaired or rebuilt rather than the equipment must be replaced. Through cost analysis of repair/rebuild versus replacement, factoring in critical nature of equipment, existing equipment load, and project timelines, decisions are made as to repair/rebuild or replace. According to Jones, the key to this effort is focused on understanding the existing load of the equipment, ensuring it is operating optimally, and linking this to master plan efforts for potential growth or consolidation. Optimization is determined through the following:

- What is our current MEP capacity and are we operating as initially designed?
- What are our master plans for the next 5 to 7 years and specifically how do these plans tie to our existing central plant and mechanical spaces?
- Lastly, what is the best system to meet all of those identified needs?

CHW has found that acute care campuses constructed over multiple phases typically have over-redundancy built into the design of the MEP system. Once those systems are "fine tuned," energy savings between 5-10% can be realized, with paybacks ranging between 1-12 months.

In addition to the cost savings, some utility companies currently offer rebates and incentives for such improvements. One example of this is an operational energy program with repairs/improvements amounting to $82,000 which were paid in full by the local utilities.

Step 2 is to identify and list the equipment within the central plant, to determine what is near the end of its useful life. Once all equipment is "rolled up" for all campuses, CHW prioritizes and budgets each piece of equipment based on the highest priority needs; essentially creating an MEP master plan.

TABLE 1 – EXPECTED LIFE OF BUILDING COMPONENTS

Roofs	20 Years
Finishes	10 Years
Windows	30 Years
Mechanical Systems	30 Years
Electrical Systems	30 Years
Paving	10 Years
Structure	50 Years

Step 3 is to evaluate whether or not the hospital can improve the economics of their energy consumption through infrastructure improvements, operational energy efficiency program, and/or large capital intensive energy plant improvements; calculating the economics for each of these options. Are there renewable energy sources available and what are our options for funding? Are they being good stewards of the areas limited resources?

So what are the key financial metrics that Jones and CHW use for their infrastructure improvement program? First, Jones separates projects into two buckets to assist with the prioritization and to ensure adequate and meaningful financial metrics are applied. The first bucket consists of items that have to be replaced since they have reached the end of their useful life, equipment breakdowns that are occurring on a regular basis, and equipment downtime that is impacting patient care or is a life safety issue. Financial metrics used for these include:

- Project Cost – Rebates/Incentives = Project $Cost_{(net)}$
- Project $Cost_{(net)}$ – Annual Repair Costs = Adjusted Project Cost
- Adjusted Project Cost ÷ Energy Savings = Simple Payback

The second bucket consists of items that are approaching the end of their useful life and should be replaced on a planned schedule as opposed to after the equipment has failed. While these projects receive careful consideration from leadership, it is imperative to provide an accurate

assessment of equipment, potential impact of equipment failure, options for financial vehicles (rebates and incentives), and a thorough Proforma including added project expense for temporary equipment.

- Project Cost – Rebates/Incentives = Project $Cost_{(net)}$
- Project $Cost_{(net)}$ – (Annual Repair Costs + Rental Equipment Costs) = Adjusted Project Cost
- Adjusted Project Cost ÷ Energy Savings = Simple Payback

CHW also uses equivalent patient revenue to gain leadership approval. For example, consider a project with the following parameters:

Project Cost: $800,000
Rebates/Incentives: $80,000
Energy Savings: $125,000
Simple Payback: 5.8 years
Operating Margin: 2.8%

Equivalent Revenue from Operations:

Year 1: ($125,000 + $80,000)/0.028 = $7.32M
Year 2 and beyond: $125,000/0.028 = $4.46M

Utility rebates and incentives can have a significant impact to the project economics and should be considered in every project. Simply making a call to the local utility company or checking their Web site is the first step.

For CHW's deferred maintenance program the key metrics used are cost avoidance and internal rate of return if using CHW dollars, and the net present value if financing (using someone else's dollars). If using a lender, typically the lender keeps the asset on their balance sheet.

In addition to the key financial metrics, Jones recommends that you include with your capital request one to two paragraphs outlining the key environmental benefits of each project. Including statements regarding the projects reduction in carbon dioxide, equivalency facts tied to reduced cars on road, residential homes, etc. can add benefit to a project and could potentially gain some valuable PR. Information on how your project effects the environment can be found at www.practicegreenhealth.org/tools/eic.

So who does Jones recommend you partner with to help you balance facilities with finance? Jones has established strong friends, colleagues, and mentors over the years and recommends that facility personnel look to do the same. One of Jones key mentors during the late 90's was a corporate CFO. Today he works closely with colleagues within CHW's treasury department, that help him evaluate the different ways that things can be paid for, and how the financial benefits or metrics can be accurately articulated to hospital administration.

From the Field Recommendations, Geisinger Health System

Alan Neuner, is Associate Vice President Facility Operations, Geisinger Health System. Geisinger Health System is an integrated health system with facilities dispersed across a 42-county service area in central and northeastern Pennsylvania. As Associate Vice President for Facilities Operations, Neuner is responsible for 200 employees servicing a physical plant of four million square feet. He links all facilities projects with a multi-year plan that includes the ROI per project and an average ROI, which can then be linked to equivalent patient revenues.

Neuner's program began with a beta of Geisinger's main campus in Danville, PA. Neuner and his staff devised a creative strategy to manage energy resources, which resulted in a reduction in overall energy utilization, while the physical plant expanded by more than 50 percent. He applied his initial success at Danville across the system, and will present a number of alternate ways of funding infrastructure needs and setting measurable goals that will ultimately reduce your operating cost, extend the life of your facility assets, and establish your credibility with the hospital administration.

Neuner didn't have the support of a financial liaison when he began his program in the mid-90's. So how did he begin? He did a lot of reading, mostly financial periodicals. His first project that used financial metrics was a 69,000 volt substation. Their utilities at that time were over $250,000 per year, and this project represented a straight payback with no financial risk. The project also brought Geisinger a new rate structure, from 6 cents to 5 cents.

The catalyst to Neuner's comprehensive rolling master plan came one fiscal year, when the facilities department was completely forgotten during the capital budgeting process. Neuner wanted to break the trend of constantly competing for capital from other departments. He started by partnering with a financial liaison to guide him on how average age of plant was calculated. He also looked into how other departments' asset bases were measured, and compared that to his own department. For example, although the radiology department, a previous competitor for capital had an asset base of $30B, the facilities management department was responsible for managing approximately $400B in assets. No one had ever taken a look at the facilities maintenance department from this type of financial perspective, bringing the facilities management department to the hospital administration table within Geisinger.

From here, Neuner developed a rolling master plan for facilities capital projects. This is accomplished by listing each asset, assigning a grade or state of conditions marker, and estimating the asset replacement date. From here Neuner developed a 5 year plan with estimated costs. This master plan was presented to the CFO, along with the track record of projects. Neuner recommends leveling the capital requirements over the 5 year plan and using that target number as your annual capital request. In Neuner's case, this was $1M per year. With this fixed capital budget, the facilities management department can utilize any savings generated to fund additional infrastructure improvement projects and ongoing maintenance, improving the performance of the facility assets, while reducing average age of plant.

Neuner also has some key tips for facility managers following this model:

1. Remember to apply a square footage metric to your program costs. This way as your facilities grow through expansion or acquisitions, you have a justification to increase your annual capital allotment
2. The hospital administration does not care about the inclusion of technical data for capital justification. They don't care about BTU's, so keep your data limited to the financial metrics. Speak their language
3. Plan for assets to fail out of plan. Never ask for more money during the fiscal year. It's important that you demonstrate that you not only have a plan, but that you are capable of managing it and sticking to it
4. Measure your results. Neuner recommends the Energy Impact Calculator on Practice Green Health, www.practicegreenhealth.org/tools/eic. Here you can put in energy usage, before and after, and can calculate amount of pollutants reduced and calculates the health impacts
5. Keep track of your manpower. Over time, as your hospital square footage grows, typically your manpower does not. This is further justification to increase your capital spend

So how has this changed Neuner's career? Says Neuner, "It has made my life wonderful. I know their language and I have gained their respect."

Summary

Facility managers are in a position to significantly impact the bottom line of their healthcare organizations. This begins with a basic understanding of the financial metrics that the hospital administration uses to measure their performance, creating a master plan for all facility assets, and applying those financial metrics to all capital improvement projects. By understanding and articulating the significant positive impact that facilities management can bring to the organization through infrastructure improvement projects, you align yourself with the number one concern of the C-Suite: **Financial Challenges**.

Glossary of Formulas

Average Age of Plant: Accumulated depreciation/depreciation expense

Cash on Hand (days): ((Cash on hand + securities + investments)/ (operating expense – depreciation expense))/365

Equivalent patient revenue: Calculated by dividing every dollar a project saves by your operating margin

Net Present Value (NPV):

$$NPV = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \ldots + \frac{CF_n}{(1+k)^n} - ICO$$

CF: Cash Flow = Annual savings – Annual cost
k: discount rate
ICO: Initial Cash Outflow

Operating Margin: (Net Revenue – Operating Expenses)/ Net Revenue

Return on Investment (ROI): Annual Savings/ Investment Cost

Simple Payback: Investment/annual savings

Recommended Resources

Web Resources

- Alter Systems: www.altersystems.com/catalog/index.php
- California Climate Action Registry (CCAR): www.climateregistry.org/
- California Commercial End-Use Survey (CEUS) www.energy.ca.gov/ceus/index.html
- California Energy Commission (CEC): www.energy.ca.gov/
- California Solar Initiative (CSI): www.gosolarcalifornia.ca.gov/csi/index.html
- Commercial Building Energy Consumption Survey (CBEC's): www.eia.doe.gov/emeu/cbecs/
- Practice Greenhealth Energy Impact Calculator: www.practicegreenhealth.org/tools/eic
- Premier GreenHealthy Web site: http://www.premierinc.com/quality-safety/tools-services/safety/GreenHealthy/index.jsp

Publications

Crucial Conversations: Tools For Talking When Stakes Are High, by Kerry Patterson, Joseph Grenny, Ron McMillan, Al Switzler and Stephen R. Covey