



GETTING TO “YES” FOR ENERGY EFFICIENCY



CASE STUDY:

HARFORD COUNTY PUBLIC SCHOOLS



A Maryland Public School System Invests in Energy Efficiency and Renewable Energy to Improve Facilities, Manage Costs, and Set an Example for the Next Generation

November 1, 2013 – Rev. 1.0

A Report on Accelerating Commercial Building Energy Retrofits



INTRODUCTION

When Andrew Cassilly was hired by Harford County Public Schools (HCPS) in 2008, his chief priority was to reduce costs enough to offset his annual salary. His results after five years have far exceeded that modest goal: many millions saved from lower energy bills, prevented maintenance, and more efficient operations. Today, as HCPS's Resource Conservation Manager and bona fide energy efficiency champion, Mr. Cassilly manages a wide range of energy projects in dozens of buildings across a county home to 250,000 residents in northeastern Maryland. But before, in 2008, he faced challenges that included a recessionary economy, looming local government budget cuts, and prospects of staff reductions. "You have to care enough to ask, 'Where do we Start?'" said Mr. Cassilly.

By 2010, with the economy still in the doldrums, his attention turned to energy efficiency as a way to reduce operations and maintenance costs and conserve resources. Mr. Cassilly started by using internal maintenance resources to carry out limited lighting upgrades. But he became frustrated by his lack of personnel and budget resources to complete the retrofit he knew HCPS needed. As a former teacher, Mr. Cassilly wanted to share HCPS's cost-reduction strategy with other teachers and facilitate the integration of sustainability into the curriculum for the students' benefit. With an impressive list of successful projects completed and pending, Mr. Cassilly's work makes HCPS a model for other local governments interested in energy efficiency and a role model of sustainability for its students.

PREPARING FOR SUCCESS

Build a Team

A champion's support team benefits from members external to the organization as well as internal. With personnel resources already stretched, Mr. Cassilly looked to find as much assistance from contractors and vendors as possible. "I want the guy who'll help me out," said Mr. Cassilly. "Not just a salesman." The external support team members expanded to include engineering, assessment, and contracting resources. Electric utility Baltimore Gas and Electric Company (BGE) coordinated with Mr. Cassilly and contributed rebates and incentives as well.

Mr. Cassilly reached out to a wide network of HCPS staff: teachers, custodians, security officers, cooks and nutritionists, and information technology (IT) specialists. By understanding their needs and explaining to them the benefits of energy efficiency, he was able to build a broad base of support from allies who stood to gain. Mr. Cassilly cultivated support from stakeholders who stood to benefit from better classroom project reliability or more efficient hood exhaust fans in cafeteria kitchens. A cycle developed, as savings enabled more measures that won support from more stakeholders, which then made the project more compelling financially and in terms of making HCPS facilities better places to teach and learn.

He also found support among an especially important internal source: students. Mr. Cassilly found students to be interested in sustainability and receptive to the idea of HCPS "practicing what we teach." Some students have been inspired to suggest additional projects and ways to incorporate the energy improvements into the curriculum.

Language of Audience

From the outset, Mr. Cassilly was worried that his initiative would generate negative reactions and his colleagues would see him as the "energy police"—a deputized enforcer with the authority to mandate unreasonable changes

to the routines of teachers, maintenance workers, and other staff. So he emphasized how energy efficiency could affect the learning environment. He focused on improvements to capital equipment and measures that would eliminate waste and increase resources for educational purposes. Mr. Cassilly put energy efficiency in perspective so every stakeholder could understand how operational savings would benefit students and have positive effects on the core mission of HCPS.

Cost of Delay

No organization with scarce resources intends to waste energy. And in times of tight budgets, reducing waste becomes imperative. To start, Mr. Cassilly identified lighting as a major opportunity in nearly every HCPS facility. He argued that if HCPS continued to postpone lighting upgrades and wait for new technology to become cheaper, rebates might disappear. He took the initiative and did what he could with the resources at his disposal and immediately generated savings.

Based on his experience as a teacher, Mr. Cassilly also identified a cost of delay that affected dozens of students on a daily basis: IT upgrades. In many HCPS classrooms, teachers rely on projectors to display lessons instead of old-fashioned transparencies. If a projector goes down, it is a major disruption: the class has to adapt to inferior back-up technology or a teacher finds a spare room (with a working projector). Mr. Cassilly calculated how much instruction time was lost to IT failures: on average, four projectors are down at any given time, and each requires three days to repair. Upgrades to the projectors and IT network delivered extended bulb life and gave teachers advance warning to forestall failures.

Project-Process Alignment

Champions working in the public sector discover how decision-making is frequently more regimented and time-consuming than in business. Mr. Cassilly had experience with bureaucracy and approached HCPS with a formal request to form a committee charged with exploring energy efficiency and specifically energy performance contracts (EPCs). He selected committee members from his support team and included his direct supervisor. As the committee's work shifted from evaluating options to soliciting bids, Mr. Cassilly was already engaged in the necessary formal process. The overall process lasted more than one year but it returned multiple EPC proposals and culminated in an award to Johnson Controls, Inc. (JCI), a large and respected energy services company.

CLEARING THE HURDLES

From the start, Mr. Cassilly understood how much support he would need to successfully implement a project of the size and scope he knew HCPS needed. He would lead as the energy efficiency project's champion, but he needed technical, organizational, political, and financial assistance from the start. To deal with all the day-to-day work required of a champion during implementation, he looked externally for contractors and vendors to contribute manpower and handle paperwork. Mr. Cassilly did not wait to begin until his support team to be fully forged. He understood that early success could help bring stakeholders along and increase the depth and breadth of internal support.



“Who’s Going to Do This?”

A champion with a strong support team is an organization’s best bet for saving energy and reducing costs .

UNDERSTANDING THE HURDLE

From the start, Mr. Cassilly understood how much support he would need to successfully implement a project of the size and scope he knew HCPS needed. He would lead as the energy efficiency project’s champion, but he needed technical, organizational, political, and financial assistance from the start. To deal with all the day-to-day work required of a champion during implementation, he looked externally for contractors and vendors to contribute manpower and handle paperwork. Mr. Cassilly did not wait to begin until his support team to be fully forged. He understood that early success could help bring stakeholders along and increase the depth and breadth of internal support.

PREPARING FOR THE RACE

The internal support team assembled for the HCPS project also had personal stakes in successful implementation. Mr. Cassilly led the HCPS sustainability committee and invited teachers to join. He ensured that every supporter would gain something from the project. This contributed to the project’s overall momentum because everyone became invested for their own reasons.

Mr. Cassilly’s attention then turned to identifying external personnel resources to carry out project implementation. With an EPC, Mr. Cassilly grew his staff with the project managers, engineers, electricians, and technicians JCI could muster. This boost allowed Mr. Cassilly to overcome his greatest hurdle: hours in the day. “I didn’t have the time or resources to put into this,” said Mr. Cassilly. JCI arranged for utility rebates, used the cost savings to lower the capital outlay, and staged the project to ensure that energy savings would be greater in a given year than the cost of financing.

STRATEGIES AND TOOLS

Challenge: No Extra Staff Capacity

- Contact your state energy office and utility
- Contact an energy service company

Common Strategies and Tools

- Collaborate with colleagues who want to reduce costs and operate more efficiently



“This Isn’t a Core Competency”

Tightened budgets make energy efficiency a must-have for every organization.

UNDERSTANDING THE HURDLE

Energy efficiency can certainly help lower utility bills, but it does not generate revenue to pay for up-front infrastructure improvements. An organization typically considers its core competency some number of activities that create revenue, drive profits, or further progress toward a mission or meeting goals. A school system like HCPS would consider education, instruction, athletics, and safety as core competencies long before energy

efficiency. Champions are critical to help their organizations consider the benefits of energy efficiency and reconsider the real dividends of managing its energy costs through wise investments.

PREPARING FOR THE RACE

Mr. Cassilly looked to other school systems to find examples of energy efficiency projects that HCPS could use as models to emulate. He identified similar projects implemented by similar organizations to show what success could look like from the outset. Being able to show stakeholders and decision-makers a relatable case study can overcome a significant amount of hesitation and discomfort.

It is fairly obvious that cost-effective energy efficiency projects lead to lower electricity and natural gas bills. Mr. Cassilly looked more broadly around HCPS facilities and identified time and operational savings in less-than-obvious places. The more savings he could generate from improvements related to conservation measures, the stronger he could make arguments in favor of a comprehensive retrofit. He calculated maintenance and operational savings from every measure.

Mr. Cassilly was concerned from the outset that energy efficiency could be perceived as burdensome to teachers, annoying and inconvenient for custodians, or conducive to “suffering” from dark hallways and unconditioned rooms. He worked to make sure his communications resonated with stakeholders by stressing that his main goal was to improve the learning environment and “making school a nicer place to be.” For example, he emphasized the benefits of IT upgrades that allowed classroom projectors to be controlled remotely and powered-down when not in use. More reliable technology would help teachers be more effective. Fewer service requests would save the maintenance department time from constantly ordering replacement bulbs and scheduling repetitive change-outs. And of course, lower energy bills (and a small fraction of replacement bulb bills) would make administrators happy.

STRATEGIES AND TOOLS

Challenge: Not Important to Occupants

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| <input checked="" type="checkbox"/> Quantify decreased operations and maintenance costs | <input checked="" type="checkbox"/> Tell potential tenants about efficiency measures |
| <input checked="" type="checkbox"/> Use terminology associated with your tenant’s mission and daily operations | |

Common Strategies and Tools

- | | |
|---|---|
| <input checked="" type="checkbox"/> Prepare a proof-of-concept argument with case studies | <input checked="" type="checkbox"/> Frame the savings in a way that boosts your bottom line |
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“We Can’t Afford It.”

Can an organization afford to not make wise investments that will generate savings?

UNDERSTANDING THE HURDLE

The “We Can’t Afford It” hurdle manifests itself in many ways—shortage of capital for up-front costs, inability to borrow, bad credit, or no access to financing. Champions have to determine which underlying challenges actually compose the hurdle. A champion also must ensure that stakeholders and decision-makers understand that the choice implicit in energy efficiency is not between “spending money” and “not spending money.” Organizations

pay one way or the other: either through bills for wasted energy to a utility, or in investments that lower costs and improve facilities.

PREPARING FOR THE RACE

Fortuitously for HCPS, Mr. Cassilly's initiative began at a time when several sources of grant and other external funding were coming online. The availability of Energy Efficiency and Conservation Block Grant (EECBG) funding attracted attention from local leaders. Mr. Cassilly took advantage of the Federal Section 179D tax deduction for additional energy efficient upgrades. HCPS also obtained a grant for \$750,000 from the Maryland Energy Administration (MEA) for a large-scale solar photovoltaic (PV) project that spread across six schools.

Mr. Cassilly researched ratepayer-funded rebates available from BGE and Delmarva Power and Light, the two electric utilities serving HCPS facilities. "You've just got to get started," he advised. "Actively look at how to take advantage of these resources." Mr. Cassilly worked with JCI to consider rebates at the outset, which increased the size of the project HCPS could afford by using those savings to offset up-front costs.

Mr. Cassilly's main strategy to address the affordability of the HCPS project was the EPC with JCI. Organizations using EPCs avoid upfront costs because improvements are paid for by revenue generated from savings. The EPC structure maximized the investment by HCPC by leveraging savings to secure financing. The EPC structure maximized the investment by HCPC, leveraged savings to secure financing, and protected the project from budget shortfalls by keeping savings in accounts designated for facility improvements. Per the terms of the EPC, JCI staged the project to ensure that energy savings would be greater in a given year than the cost of financing

STRATEGIES AND TOOLS

Challenge: "It Costs Too Much"

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| <input checked="" type="checkbox"/> For larger projects, work with an energy service company, possibly using an energy services agreement or energy performance contract | <input checked="" type="checkbox"/> Finance and structure the project so finance costs are less than savings |
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Common Strategies and Tools

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| <input checked="" type="checkbox"/> Apply for state or local government grant funding | <input checked="" type="checkbox"/> Identify potential rebates and subsidies |
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" Other Projects Offer Better Returns."

Incorporating energy efficiency into normal operations and investment cycles—and vice-versa—can stretch budgets while generating savings.

UNDERSTANDING THE HURDLE

HCPS leaders have to manage many competing priorities for scarce resources across a large district in order to provide quality public education. Energy efficiency could seem trivial when compared against investments in teachers and support professionals, technology, or athletics. A champion must learn to see energy efficiency from the perspective of the organization's chief financial officer (CFO) and chief operations officer (COO) in order to make a compelling argument in favor of a project.

PREPARING FOR THE RACE

Mr. Cassilly's first picked the proverbial "low-hanging fruit"—lighting upgrades. HCPS took advantage of generous rebates and quickly generated positive cash flow that could be used to inform future arguments for more comprehensive energy efficiency. He started by using internal maintenance resources to replace outdated metal halide, mercury vapor, and T-12 bulbs and fixtures and exterior security lights that were an attractive target for vandals. New light-emitting diode (LED) fixtures saved money and Mr. Cassilly kept track of how those measures affected HCPS staff. Teachers, administrators, and students noted the improved aesthetics of the exterior of the school as well as interior spaces. Maintenance workers were relieved from having to constantly replace antiquated bulbs and fixtures in hard-to-reach places like stairwells.

Higher morale, improved productivity, increased attendance, and more attractive and inviting facilities were benefits that Mr. Cassilly was always sure to count when he presented to budget managers and decision-makers. "A better environment makes for better people," said Mr. Cassilly. He developed his case for a comprehensive project by demonstrating that better efficiency led to an improved learning environment as opposed to hardships, sacrifices, or "suffering." Projects that made school "a nicer and healthier place to be" should be considered alongside other capital investments. These benefits still count despite being harder to monetize and convey quantitatively.

STRATEGIES AND TOOLS

Challenge: Evaluating Returns

- Frame energy efficiency and improved cash flow as a competitive advantage

Challenge: Capital Budget Constraints

- Bundle with other capital improvement projects

Common Strategies and Tools

- Identify potential rebates and subsidies [F3]
- Finance and structure the project so finance costs are less than savings
- Focus project on short-term measures with immediate or near-term positive cash flow

ENERGY AND COST BENEFITS FROM IMPROVEMENTS

The first phase of the HCPS project, facilitated by Mr. Cassilly with internal resources only and focused largely on lighting improvements, generated annual energy savings of 1.9 kilowatt-hours (kWh) and cost savings of \$198,678. The larger project facilitated by the EPC with JCI, guaranteed for 15 years, will save over 7.2 million kWh, 109,000 gallons of heating oil, and 3.4 million gallons of water. In total, BGE contributed over \$1 million in rebates against a project cost of \$16 million. These savings are inclusive of energy and non-energy projects implemented as part of the project, however not all maintenance and operational savings have been quantified to date.

LESSONS FOR OTHER CHAMPIONS

With assistance from his support team, internal and external stakeholders, and the community-at-large, Mr. Cassilly was able to lead a comprehensive energy efficiency retrofit to implementation. The project is on-going and he continues to hear more ideas for projects from HCPS staff and students. HCPS is a model that other energy efficiency champions—in the public school sector and beyond, in Maryland and across the county—can learn from and follow to achieve their own success.

Some specific lessons from Mr. Cassilly's experience for other aspiring energy efficiency champions:

- Get started— initial success with smaller projects will foster support for larger comprehensive projects.
- Involve the whole school community; gather input from all departments.
- Think outside the box to justify energy improvements beyond their obvious cost savings.
- Fight back against the notion that efficiency presumes suffering or making people change against their will.
- Utilize outside resources to maximize your personnel and budget resources.
- Talk openly with vendors about leveraging savings for everyone's benefit.
- Advertise success and keep up the good work.

This case study was prepared by the Maryland Energy Administration and Clean Energy Solutions, Inc., based on an original design and methodology developed by the Maryland Energy Administration and Catalyst Financial Group, Inc., in "Getting to 'Yes' for Energy Efficiency: A Guide to Developing a Persuasive Business Case for Energy Efficiency in Commercial and Corporate Properties," with funding provided by the U.S. Department of Energy (DE-EE0005460, "Accelerating Commercial Building Retrofits: Policy, Best Practice Compilation, Pilot Implementation.")

