



## Retrofitting Institutions: Feeding Job Growth with Energy Hogs



January 2012

**Jere Boyle:** Welcome to the Federal Reserve Bank of Atlanta's Economic Development podcast series. I'm Jere Boyle with the Federal Reserve Bank of Chicago.

Retrofitting public and institutional buildings like universities, hospitals, and government buildings can create jobs in the real estate sector while reducing energy costs for building owners. The Center on Wisconsin Strategy proposed this idea on retrofitting institutions as part of the "Big Ideas for Job Creation" project. The project, sponsored by the Institute for Research on Labor and Employment at the University of California at Berkeley, and supported by the Annie E. Casey Foundation, was a call to academics and economic development practitioners to design job programs for cities and states that would lead to net new job creation in one to three years. The center's idea, entitled "Retrofitting Institutions," is one of five winning ideas we are featuring in this podcast series.

Today I'm speaking with Satya Rhodes-Conway and James Irwin, both senior associates at the Center on Wisconsin Strategy. Satya and James, thank you for speaking with us today.



**Satya Rhodes-Conway:** Thank you for the opportunity.

**James Irwin:** We're glad to be here.

**Boyle:** The need to retrofit buildings for sustainability purposes has certainly been an important topic of the last decade, as well as ideas around "green jobs." Tell us about your big idea regarding "Retrofitting Institutions" and what issues you address with it?

**Rhodes-Conway:** Nearly all of our buildings waste energy through heating, cooling, and possibly inefficient management. This costs us all a lot of money, and the concept that we're working with here is that, instead of wasting that money on energy bills, we should take that money, use it to improve our buildings, and avoid the extra costs on our energy bills in the future. When you do that you create jobs, you reduce greenhouse gas emissions, and you save money. So, in this paper we focused on municipalities, universities, schools, and hospitals, or what's known as the MUSH sector. Basically, it's institutional buildings.



**Irwin:** So, this isn't a new idea, retrofitting buildings and paying for the costs with the savings. And many municipalities have done some work in this space, but very few governmental institutions have comprehensively addressed their building stock by tracking exactly where energy is being wasted, addressing the building as a system, and then fixing everything from the drafts and leaks around windows to replacing old boilers and adding smart thermostats, and doing this for all of the buildings that the municipality or university, school, or hospital controls.

There is a tremendous potential for scale here, and that's why we're really excited about this idea. There are at least 140,000 institutional and governmental building owners in the United States. Each of these entities presumably controls at least one building, and many big cities control multiple, in some instances hundreds of buildings, and that's not including any of the almost 10,000 buildings the federal government controls. Municipalities spend up to 10 percent of their budget on energy costs, though many are entirely unaware of this as they don't actually calculate energy costs separately. Total municipal energy bills countrywide add up to over \$12 billion every year.

The [U.S.] Department of Energy estimates that governments control 24 percent of total commercial floor space in this country and this square footage uses about 3.87 quadrillion BTUs, which is a British thermal unit per year, at a cost of about \$40.7 billion. Savings from energy-efficiency upgrades are historically around 20 percent of the utility bill baseline. So, while higher savings are certainly possible if strategies for deepening retrofit work are implemented, but even if the 20 percent was achieved in the MUSH sector by conducting retrofits of the entire building stock, that savings would mean \$8.1 billion per year additionally saved. The other nice thing about this sector is that you can move fairly quickly: There are established companies to do the energy assessments and retrofit work, there are multiple ways to finance these projects, and the workforce is there, and, for the most part, trained and ready to go.

**Boyle:** How does this idea of retrofitting institutions create jobs? And, if you can, could you please tell us how many and what types of jobs you believe it could create and what would be the cost?

**Rhodes-Conway:** Essentially, this is construction work. So, what we're recommending is that a municipality, a government, a hospital, a school look at the buildings they own, do an assessment of their energy use and where energy is being wasted, and then hire people to fix that. All of the money spent on that is going into the construction sector and creating jobs there. We estimate that between 4.3 and seven full-time-equivalent jobs are created for every \$1 million spent on energy-efficiency projects in this sector. This includes the salary for the people doing the work, the overhead, and it also includes materials.

We also estimate that this sector spent between \$12 [billion] and \$16 billion on energy-efficiency improvements between 1990 and 2003, and that the MUSH market activity in any given year (the numbers we have are for 2002) was between \$0.8 [billion] and \$1 billion. So, even if this sector only kept investing that much money each year, it should create somewhere between 3,000 and 7,000 full-time-equivalent jobs per year. If we look at the entire

potential here, based on the total square footage, we could expect it to cost somewhere between \$38.3 billion and \$61.2 billion to upgrade the entire sector. That investment would have the potential to create somewhere between 164,000 and 428,000 full-time-equivalent jobs.

**Irwin:** Another good thing is that these tend to be "high-road" jobs—good jobs with benefits that pay decent wages—and the deeper you go into a building retrofit, the greater the savings you're going to have financially, and the higher the skill of the work to do that retrofit. This creates jobs for skilled workers in the construction sector—workers who have some of the highest unemployment rates in the country—and it also can create opportunities for newly trained apprentices.

**Rhodes-Conway:** The other type of job creation that we haven't estimated is what happens when you spend money on materials, which is clearly needed in work like this, that money creates jobs in the companies that provide those materials. We haven't estimated that indirect job creation, but it does exist.

**Boyle:** *What are the main barriers to this type of a program, and how can those barriers be overcome?*

**Rhodes-Conway:** There're actually a number of barriers, but luckily we have ideas about how to overcome all of them. We'll each go through a few here.

One obvious barrier is the up-front capital cost. While it's absolutely true that once you retrofit a building for energy efficiency you will be saving money, some governments, institutions, hospitals might have trouble making the initial investment—they may not have that available in their budget. We think that can be overcome with smart planning and proper budgeting. There are a number of ways that, particularly government entities, can use to cover that up-front cost, whether that's through regular budgeting, or through bonding, or other mechanisms.

Some places may either not be able to borrow money or may have limits on how much money they can borrow to pay that up-front cost. So that's another barrier. There are ways around that. One option is to structure the payment as a municipal lease. Like many, the government entities pay for equipment—photocopiers, school buses—the municipal lease is a common structure in local government.

Another issue is the diffuse control of the buildings and the often poor knowledge of how much energy they use. So, you may have multiple people who are responsible for various buildings and the management and upkeep of them. And there may not be any one person who knows what it is costing the city or state or hospital to use energy in all of their buildings. So, organizing that—sembling the building managers, getting clear lines of communications, putting one person in charge—can be very helpful to just know how much you're spending on energy in your buildings and what is needed in them. The other thing that we recommend that folks do is to enter the information about their buildings into a software program, like the Energy Star Portfolio Manager that's available through the EPA, so that you can actually track on a computer all of your energy use and how much you could be saving.

**Irwin:** Another barrier faced in this work is simply a lack of knowledge about how this work is done, lack of confidence that it's a good investment, lack of time to do all of the work necessary to make this happen, and little knowledge of how to work with the companies and contractors in this field. This can be overcome through education, working with the elected leaders or decision makers who are in charge of these buildings to make sure that they know how everything works, what the financing options are, and that they have some hard data about savings and job creation numbers. It's also a very good idea to hire an owner's agent who will work with the building owners to negotiate these contracts so that you're getting what you want out of these deals.

A very major final barrier we'll discuss here is the lack of political will and leadership. The benefits of comprehensive retrofits extend well beyond the average political life span, and so it can be sort of tricky to get people to pay attention to this. This can be overcome through going about how you get anything done in government, assembling coalitions and educating the elected leaders. We've found coalitions between labor unions, community groups, local business, contractors' associations, and some of the energy services companies. You get those folks in a room and they're a very powerful coalition to help make this work happen.

**Boyle:** *In your paper, you mention a successful real-world application of this idea in Reno, Nevada. Can you describe that program and the results to date?*

**Rhodes-Conway:** Sure. Starting in 2008, the city of Reno, Nevada, launched their Energy Efficiency & Renewable Energy Initiative. They were looking to reduce their carbon footprint and lower their energy bills, so the city contracted with what's known as an energy services company to audit the electric and natural gas and water use in all of the city facilities. Based on that audit the city approved a series of projects, which included energy-efficiency measures such as lighting retrofits and heating, ventilation, and air-conditioning upgrades, as well as some investments in renewable energy. The energy services company hired local contractors to do the work, and the contract was subject to Reno's prevailing wage law, so the jobs created through the work were good paying jobs. And, even though the project isn't yet complete, it's expected to save the city half a million dollars in 2011, which is a 12 percent cost reduction in just one year. At the end of the project they expect that the energy-efficiency portion of the project alone will save the city \$1.1 million a year, and that's a reduction in energy costs of more than 25 percent.

The project was financed primarily through bonds, as well as some grants and rebates, and the total project cost was \$16 million. As of early last year it had created or retained 191 jobs, and we expect that number will go up at full build-out.

**Irwin:** There are a lot of other cities also considering similar projects. We've encouraged them to work to maximize job creation in addition to the financial savings from this work. It's easy to get the low hanging fruit changing the lights, and you'll save a lot of money by doing that, but a more ambitious approach to reducing energy use, really taking a systems-wide approach, can pay much bigger dividends, both financially and in terms of rapid job creation.

**Boyle:** *Satya and James, thank you for joining us today.*

**Rhodes-Conway:** It's been a pleasure, thank you.

**Irwin:** Thanks a lot.

**Boyle:** *This concludes our podcast. We've been speaking with Satya Rhodes-Conway and James Irwin, at the Center for Wisconsin Strategy. For more podcasts on this topic and others, please visit the Atlanta Fed's website at [www.frbatlanta.org](http://www.frbatlanta.org). If you have comments or questions, please e-mail [podcast@frbatlanta.org](mailto:podcast@frbatlanta.org). Thanks for listening.*

**RELATED LINKS**

- [Play \(MP3\)](#)
- [Economic Development](#)
- [Podcasts](#)

**RELATED LINKS ON OTHER SITES**

- [Big Ideas for Jobs](#)