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Greening Up! Promising Practices in Housing Sustainability

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BC Housing

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Speakers

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With rising utility costs, less energy efficient housing is also less affordable. This session will share the details and lessons learned from two unique programs designed to improve energy efficiency and housing affordability. One utilizes a social enterprise model to undertake efficiency retrofits and increase housing affordability, while the other is a social housing provider who uses renewable energy and utility conservation to both green up and lower operating costs.

Kristin Nickel: Manager, Operations Manager, Brandon Energy Efficiency Program & Hope Switzer: Energy Efficiency Coordinator, Brandon Neighbourhood Renewal Corporation (MB)

The Brandon Neighbourhood Renewal Corporation (BNRC) is a non-profit community-based organization that seeks to establish vibrant, healthy and sustainable neighbourhoods in Brandon, Manitoba. In partnership with the City of Brandon and the Province of Manitoba, BNRC implemented the Brandon Energy Efficiency Program (BEEP) in 2007.

BEEP, which is a social enterprise, was established to improve the energy and water efficiency of existing houses, as well as to build new energy and water efficient affordable housing in Brandon and the surrounding communities.

During BEEP's first five years they completed over 600 energy and water efficiency upgrades in homes, and 494 water retrofits in apartments. These accomplishments have materialized into a 40 percent reduction in water consumption, saving 85.2 million liters of water annually, as well as a 15 percent reduction in energy consumption. To the average homeowner, these retrofits reflect an annual savings of $250 in water costs, and $300 in energy costs, making homeownership significantly more affordable.

> The Brandon Energy Efficiency Program in Manitoba is a social-enterprise utilizing an outreach model to involve the community in the retrofitting of older homes, and the construction of new energy efficient builds.

Aside from the financial savings accrued by low-income homeowners, BEEP has also had a significant impact on the environment and the local economy. To date, the retrofits have already reduced greenhouse gas emissions annually by 1,760 tons, or 3 tons per home, in addition to injecting the Brandon economy with $400,000 annually in local material sales.

BEEP is also currently doing contract work for Manitoba Hydro under the Affordable Energy Program (AEP). AEP, which emerged from the 2011 Energy Savings Act, provides upgrades for low-income homeowners to reduce energy consumption and costs. Along with a free energy review of the home, AEP provides attic insulation, basement insulation, and wall cavity insulation

to eligible homes free of cost to the homeowner. Outside of BEEP, eligible homeowners can also access the AEP program to have low-efficient natural gas furnaces replaced for $570.

BEEP crew siding housing after insulating exterior walls, helping to reduce energy consumption and costs to low-income homeoweners.

In addition to their work with Manitoba Hydro, BEEP is also completing exterior renovations to Manitoba Housing units in Brandon. This consists of insulating exterior walls, as well as installing new siding, shingles, soffit facia, eavesdrops, windows, and doors.

Most recently, BEEP is working to address the lack of affordable housing in Brandon by eliminating two of the primary financial barriers many low-income individuals face when trying to obtain housing. These financial barriers include down payment financing and high housing costs. In partnership with the Canadian Mental Health Association (CMHA) and the City of Brandon, BEEP helped establish the Solutions to End Poverty Permanently (STEPP) initiative to address these barriers by constructing energy and water efficient housing that is accessible to low-income individuals though a mortgage that is based on a reduced construction price.

The construction price of STEPP houses is reduced in part by a by-law that requires the city of Brandon to donate vacant land to non-profit organizations, such as CMHA, for affordable housing construction. CMHA then becomes the owner of the house, paying for the materials and a portion of the labour costs. These houses are then sold to successful low-income applicants in need of housing with a mortgage that is reflected by these reduced labour, material, and land costs.

Although these reduced mortgages may vary, the first STEPP home, which was appraised at $220,000, was sold to a successful low-income applicant for $150,000. As a part of the STEPP model, the CMHA then takes out a second mortgage that is the difference between the appraised value and the selling price, which in this case was $70,000.

If in the future the homeowner decides to sell, they then pay back the CMHA at the full value of the second mortgage, plus a portion of any profits made above the initial market appraisal equal to the percentage of what they purchased the house at in relation to the original appraisal value. For the first STEPP home this would mean paying back $70,000 (second CMHA mortgage) to CMHA as well as 32 percent ($150,000/$200,000) of the profits beyond the original appraised

value. These profits are then used to build more STEPP homes. To date, BEEP has constructed 4 STEPP homes in Brandon that are all occupied by first time homeowners.

Central to BEEPs intended housing and environmental outcomes is the social-enterprise model they utilize to engage with the community and to deliver its services. BEEP crews consist of individuals who were previously unemployed and on Employment and Income Assistance (EIA) or Employment Insurance (EI). BEEP provides these community members with training in carpentry, working with them to acquire the experience and capacity required to be competitive employees. Once an individual becomes a BEEP employee they enter a three-tier system that allows them to strengthen their skills and ultimately equips them to be competitive in the private market.

The first tier is for entry-level employees, and pays minimum wage. Once they show job ready skills, employees can advance to the second tier, which has an increased set of responsibilities, alongside an increase in pay. These responsibilities include on site leadership and training of tier one employees. Tier three is an apprenticeship level where upon completion BEEP employees become journeyman carpenters.

Trainees constructing energy efficient affordable housing through BEEP's skills based apprenticeship and journeyman program.

Since the program's inception, 127 previously unemployed trainees have benefited from BEEP, 45 of whom have since gained full-time employment in the labour force. Currently, BEEP has the financial capacity to directly support 24 positions in the program, and this payroll alone annually injects $700,000 into the Brandon community.

Beyond providing skills based training, BEEP also works with their trainees to reduce other significant barriers to employment. Many prospective trainees come to BEEP without a bank account and essential identification documents. BEEP helps trainees navigate these processes and obtain the essential documents by connecting them with the appropriate service providers. BEEP also works with trainees to obtain or regain their driver's license by helping them access and complete driver's education courses as well as helping them manage and pay off any impeding fines. Furthermore, BEEP provides the opportunity for program participants to enroll in education upgrading classes to obtain their GED.

By utilizing a social enterprise model, BEEP is not only helping to ensure that housing is sustainable and affordable, but it is also transforming Brandon by improving access to first time homeownership for low-income individuals, as well as providing employment and training to previously unemployed community members.

Daniel Dicaire: Energy & Sustainability Officer, Ottawa Community Housing (ON)

Ottawa Community Housing (OCH) is a social housing provider formed in 2002 following the amalgamation of two organizations, City Living and Ottawa Housing Corporation. The OCH, of which the City of Ottawa is the share stakeholder, operates at an arm's length from the city under a board of directors composed of the mayor, city officials, community representatives, and tenant board members.

Providing 15,000 homes across Ottawa for nearly 32,000 children, families, seniors and persons with special needs, OCH is the largest provider of social housing in Ottawa, and the second largest in Ontario.

The 15,000 units in the OCH portfolio are situated in 100 high to mid-rise buildings, and 60 townhouse communities. Two thirds of these buildings are over forty years old and as such are increasingly less water and energy efficient. This is problematic for OCH as it is responsible for paying all the water and sewer charges for its units, as well as a proportion of the natural gas and hydro costs on a unit-by-unit basis. In 2011, OCH spent $23.2 million on utilities, the largest of which was water consumption at $10.5 million, followed by hydro at $7.2 million and natural gas at $5.5 million.

Ottawa Community Housing is a social housing provider pursuing creative and lasting ways in which to reduce utility costs through energy efficient upgrades to their aging housing portfolio.

In order to address these costs, OCH introduced the position of Energy and Sustainability Officer in 2010 to implement and oversee creative solutions to sustainability in social housing. This was followed by the development of a Green Plan providing a framework for ensuring the sustainability and energy efficiency of OCH's housing portfolio. Over the last five years, the housing provider has undertaken a series of projects to achieve these goals.

As water was the major expense for OCH, they began by identifying creative ways to reduce water costs to become more water efficient. Following a successful pilot program, OCH began by conducting retrofits to replace all of the old toilets in 1,500 units in 2012. These old toilets, which ranged from 13 to 20 liters per flush (lpf), were not only inefficient, but many also had undiagnosed leaks further inflating costs. In their place OCH installed 3.8 (lpf) toilets, among the most energy efficient toilets on the market. Along with the in-suite toilet retrofits OCH also installed aerators and 1.5 gallon per minute (gpm) showerheads. Furthermore, in order to maintain their sustainable agenda, OCH recycled the old toilets by crushing them so the material could be used for clean infill.

Replacement and recycling of 1,500 toilets by OCH to reduce water costs, generating savings of over $5 million.

In 2014 alone Ottawa Community Housing saved 1.6 million cubic meters of water annually, which translated into over $5 million in savings. With the installation of the new showerheads, they also saved approximately 800,000 cubic meters of natural gas used to heat the water.

In 2013 OCH began undertaking building envelope retrofits to further improve the quality of their housing portfolio and reduce energy costs. This process included utilizing federal and provincial finances available under the Social Housing Renovation and Retrofit Program (SHRRP). One major component of this project was the replacement of 40 year-old windows in a selection of their high-rise buildings. Although the savings accrued with window retrofits are not profitable considering the high price tag of installation, the process not only upgraded OCH's

ageing housing portfolio, but contributed to high quality and efficient housing adhering to their sustainable Green Plan. On one site alone the new windows resulted in annual savings of 83,128 cubic meters of natural gas, or $25,838.

As another part of these building envelope retrofits, OCH installed an 8,000 square foot solar wall on one of their high-rise buildings that required recladding in order to reduce heating costs. The solar wall, which is essentially metal siding, uses the heat of the sun to pre-heat the air as it is being drawn into the air make-up vent. The project, which cost approximately $100,000, has reduced natural gas consumption in the building by around 21 percent, or $10,000 annually. OCH hopes to install more solar walls as they undertake future recladding projects on their housing portfolio.

OCH installed an 8,000 square foot solar wall on one of their high-rise buildings, reducing natural gas consumption by 21 percent.

OCH's aging portfolio also creates barriers to sustainability due to the way the homes were originally constructed. Ottawa Community Housing owns over 5,000 homes built between the 1950s and 1990s and that have a series of energy efficiency problems including unfinished basements, above grade heaters, and un-insulated furnaces.

In partnership with the Enbridge Low Income Weatherization Program, OCH has installed insulation in problem areas, including exterior basement walls, air sealing stacks, and attics. They have also conducted pre and post audits to assess the impact and the result has been a 10 to 20 percent average reduction in energy consumption. It terms of savings, nearly .25 cubic meters of energy was saved for every dollar spent on insulation, and when including draft proofing, nearly 2.78 cubic meters of energy was saved per dollar spent.

Recently, Ottawa Community Housing has also begun piloting a heat management system within one of their older high-rise buildings which is extremely energy intensive, as it uses baseboard heaters, but too difficult to retrofit because of its size. In order to creatively address this problem, OCH installed smart relays in the heating loop. Although the smart relays still allow tenants to control the temperature in their units, it monitors outside temperature and creates a heating profile that determines how much heat one individual should be using. For example, if the outside temperature is below a certain threshold, tenants receive 100 percent of their heat. However, if it were a warmer day, tenants would not have access to higher levels of heat consumption.

This has reduced the effects caused by people who left their thermostats at a constant temperature, even while out of the unit, and those that left their thermostat on and used their windows to

regulate temperature. These changes have reduced heating consumption by approximately 20 percent. Equally as important to OCH is that 75 percent of tenants also saw no difference in their comfort, while 12.5 percent reported being more comfortable.

By utilizing renewable energy, and introducing creative utility conservation projects, Ottawa Community Housing is demonstrating that there is an opportunity for creative solutions to sustainability and energy efficiency in social housing. In executing these projects OCH is not only greening their portfolio, they are making housing more affordable.

Conclusion

The programs implemented by the Brandon Energy Efficiency Program and Ottawa Community Housing present two distinct approaches to improving energy efficiency and reducing housing costs. While BEEP is a social-enterprise utilizing an outreach model to involve the community in the retrofitting of old houses and the construction of new builds, OCH is a social housing provider conducting on-site upgrades to their aging housing portfolio to reduce utility costs. These two organizations demonstrate that there is no singular approach to achieving energy efficient housing, but rather that there is ample opportunity to pursue creative and meaningful ways to reduce costs for low-income individuals and increase energy and water efficiency in both public and private housing.

Sources

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