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## Encouraging Private Investment In Energy Efficiency

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# POLICY PAPER

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## ENCOURAGING PRIVATE INVESTMENT IN ENERGY EFFICIENCY

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Sarah Schindler

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# ENCOURAGING PRIVATE INVESTMENT IN ENERGY EFFICIENCY

Sarah Schindler\*

January 2011

## I. Executive Summary

Combating the negative effects of climate change requires finding ways to increase energy production while reducing energy demand. Every New England state has programs in place to encourage home and business owners to improve the energy efficiency of their buildings. Despite the clear **financial benefits** and **environmental benefits** that result from energy efficiency upgrades, most New Englanders have not taken advantage of the programs being offered by their states.

This paper begins by addressing the structure of federal and state energy efficiency programs, as well as the existing funding for those programs. It then describes key barriers that prevent energy efficiency programs from motivating more people to retrofit their homes and businesses. These barriers can be broken down into problems with the **structure** of the energy efficiency incentive programs, and problems that result from the **behavior** of energy consumers. Structural challenges include:

- the incentive structure of the entity that is administering the energy efficiency program in the state;
- an insufficient number of well-trained workers, such as contractors and program staff; and
- uncertain project costs, due to the structure of some incentive programs.

From a behavioral perspective, barriers include:

- the belief by policy-makers that information and funding alone are sufficient motivators;
- too much information that is unmotivating, and not enough that is motivating;
- insufficient financing mechanisms; and
- insufficiently targeted and focused marketing and outreach.

This paper further provides solutions that states and localities can use to overcome some of these barriers. These solutions include:

- decoupling the revenues and energy sales of utilities that administer state energy efficiency programs;
- providing on-the-job training, certification programs, and consistent information to contractors who will be perceived as representatives of the energy efficiency program;
- providing information that encourages people to act, including:
  - specific information about energy use on utility bills;

- information about how one’s energy use compares to one’s neighbors’ use;
- information from trusted sources such as neighbors and other peers; and
- personal, concrete information instead of technical information about projected savings.
- working with banks, utility companies, and the legislature to allow for innovative financing mechanisms in the state; and
- using behavioral science research to shape marketing and outreach campaigns, including:
  - providing technical assistance in addition to information and rebates;
  - using peer-to-peer communication;
  - using competition or peer pressure to let people know how their energy use compares to that of their neighbors; and
  - using positive language.

By implementing some of these basic techniques, cities and states should see increased participation in their energy efficiency programs. Hopefully, this will result in a greater number of building owners undertaking retrofits, thus decreasing energy demand. However, in order to achieve the deep energy savings necessary to truly combat the negative effects of climate change, it may also be necessary to impose mandates in addition to, or instead of, incentives.

## **II. The Issue: How best to provide incentives for owners of small businesses and residences to retrofit their buildings and homes**

### **a. Energy Consumption and Greenhouse Gas Emissions**

Some states and municipalities are leading the charge in an effort to reduce greenhouse gas emissions and curb the negative impacts of climate change. At the same time, there has been recognition that future energy needs in the United States will require either production of additional supplies or reduction in demand.<sup>1</sup> While policy-makers should be looking at ways to increase supply and decrease demand, many, including President Obama, have noted that energy efficiency is “the cheapest, cleanest, fastest energy source.”<sup>2</sup> Indeed, existing buildings consume approximately 39 percent of primary energy used in the United States.<sup>3</sup> By implementing energy efficiency and

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<sup>1</sup> Kenneth Gillingham et al., *Energy Efficiency Policies: A Retrospective Examination*, 31 ANN. REV. ENV’T. RESOURCES 161, 162 (2006).

<sup>2</sup> Michael Grunwald, *America’s Untapped Energy Resource: Boosting Efficiency*, TIME, Dec. 31, 2008, at 2, available at <http://www.time.com/time/magazine/article/0,9171,1869224,00.html>. See also Alice Kaswan, *Climate Change, Consumption, and Cities*, 36 FORDHAM URB. L.J. 253, 267 (2009) (“Increased energy efficiency in new buildings, existing buildings, and appliances could have a significant impact on the nation’s electricity demand and its associated emissions, and is the lowest-cost mechanism available for reducing the electricity sector’s emissions.”).

<sup>3</sup> U.S. DEP’T OF ENERGY, BUILDINGS ENERGY DATA BOOK 1-3 tbl.1.1.3, (2009), available at [http://buildingsdatabook.eren.doe.gov/docs/DataBooks/2009\\_BEDB\\_Updated.pdf](http://buildingsdatabook.eren.doe.gov/docs/DataBooks/2009_BEDB_Updated.pdf). Primary

demand reduction measures, the U.S. has the ability to reduce annual non-transportation energy consumption by approximately 23 percent by 2020.<sup>4</sup> These measures are especially important in New England, which lacks its own oil refineries, has spotty natural gas coverage, and has high residential energy demand due to its cold winter climate.<sup>5</sup>

Many believe that these numerous, broad societal benefits should provide sufficient motivation for individuals to improve the energy efficiency of their homes and businesses. Further, substantial funding currently exists for energy efficiency programs due not only to ratepayer<sup>6</sup> funds, but also federal funding from the American Reinvestment and Recovery Act.<sup>7</sup> Moreover, energy efficiency upgrades actually result in financial savings over time due to reduced energy consumption. Unfortunately, although these factors would seem to offer sufficient motivation, individual homeowners and small businesses underutilize the programs and funding available for energy efficiency retrofits. This is often referred to as the “energy efficiency gap.”<sup>8</sup>

The energy efficiency gap is a well-documented and long-standing problem. Historically, building owners have chosen not to invest in more energy-efficient technology and appliances, even when funding or financing is available to make purchase of those products and services feasible.<sup>9</sup> There are many reasons for the gap. There is a standard assumption that if people had more information or were given more money to undertake upgrades, they would do so. Recent behavioral science research has revealed,

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energy is “[e]nergy in the form that it is first accounted for in a statistical energy balance, before any transformation to secondary or tertiary forms of energy. For example, coal can be converted to synthetic gas, which can be converted to electricity; in this example, coal is primary energy, synthetic gas is secondary energy, and electricity is tertiary energy.” U.S. Energy Information Administration, Glossary, at <http://www.eia.gov/glossary/index.cfm> (last visited Jan. 21, 2011).

<sup>4</sup> HANNAH CHOI GRANADE ET AL., MCKINSEY & CO., UNLOCKING ENERGY EFFICIENCY IN THE U.S. ECONOMY 7 (2009), available at [http://www.mckinsey.com/clientservice/electricpowernaturalgas/downloads/US\\_energy\\_efficiency\\_full\\_report.pdf](http://www.mckinsey.com/clientservice/electricpowernaturalgas/downloads/US_energy_efficiency_full_report.pdf). See also Kaswan, *supra* note 2, at 268 (“According to some studies, the majority of existing residences and commercial buildings are poorly insulated and retrofits could significantly increase their efficiency.”).

<sup>5</sup> Decreasing energy demand also decreases the likelihood that new utility infrastructure, such as transmission lines, will need to be constructed. See Edan Rotenberg, *Energy Efficiency in Regulated and Deregulated Markets*, 24 UCLA J. ENVTL. L. & POL’Y 259, 285 (2006).

<sup>6</sup> Ratepayer simply means a utility customer. This article will use “ratepayer” and “customer” interchangeably.

<sup>7</sup> American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, 138 (2009).

<sup>8</sup> See Charlie Wilson & Hadi Dowlatabadi, *Models of Decision Making and Residential Energy Use*, 32 ANN. REV. ENV’T. RESOURCES 169, 172 (2007) (“Explanations for the energy efficiency gap include a lack of relevant information on available technologies, limited access to capital, misaligned incentives, imperfect markets for energy efficiency, and organizational barriers.”).

<sup>9</sup> Marilyn A. Brown, *Market Failures and Barriers as a Basis for Clean Energy Policies*, 29 ENERGY POL’Y 1197, 1198 (2001) (acknowledging the gap, even when there are no hidden costs to the consumer).

however, that information and money are often not sufficient.<sup>10</sup> That being said, we are now at a point in time where the possibility of overcoming this gap may be possible, due in large part to two factors: (1) there is an unprecedented amount of federal funding being directed to state-level energy-efficiency, retrofit, and weatherization programs; and (2) concepts such as sustainability, energy efficiency, climate change, and “being green” have entered the public discourse and consciousness in new and dramatic ways. This paper will focus on ways to harness these trends, overcome existing barriers, and motivate owners of homes and businesses to upgrade their existing buildings in an effort to decrease their demand for energy.<sup>11</sup>

## **b. Funding**

Throughout New England, many state energy efficiency programs are ratepayer-funded through charges on utility bills.<sup>12</sup> New England states also have access to funds generated by the Regional Greenhouse Gas Initiative (“RGGI”), which is a market-based, cap-and-trade program for emissions of carbon dioxide.<sup>13</sup> Additionally, the American Recovery and Reinvestment Act (“ARRA”) recently directed \$16 billion in stimulus funds to federal and state programs to fund energy efficiency and renewable energy

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<sup>10</sup> MERRIAN C. FULLER ET AL., LAWRENCE BERKELEY NAT’L LAB., DRIVING DEMAND FOR HOME ENERGY IMPROVEMENTS: MOTIVATING RESIDENTIAL CUSTOMERS TO INVEST IN COMPREHENSIVE UPGRADES THAT ELIMINATE ENERGY WASTE, AVOID HIGH BILLS, AND SPUR THE ECONOMY 29 (2010), available at <http://eetd.lbl.gov/EAP/EMP/reports/lbnl-3960e-print.pdf> (reviewing the behavioral science literature and determining that “it is often not enough to provide financing and prove to people that it is in their economic interest to make home energy improvements”).

<sup>11</sup> This focus does not imply that policy-makers should not also be focusing on ways to increase the energy supply, especially through distributed renewable energy technologies such as residential solar and wind energy generation. See RYAN FIRESTONE & CHRIS MARNEY, ERNEST ORLANDO LAWRENCE BERKELEY NAT’L LAB., DISTRIBUTED ENERGY RESOURCES FOR CARBON EMISSIONS MITIGATION (2007), available at <http://eetd.lbl.gov/ea/emp/reports/62871.pdf>. This is especially important, given that approximately 80 percent of energy consumption in the U.S. in 2009 came from fossil fuel sources. U.S. ENERGY INFO. ADMIN., ENERGY CONSUMPTION BY ENERGY SOURCE tbl.1 (2010), available at [http://www.eia.doe.gov/cneaf/alternate/page/renew\\_energy\\_consump/table1.html](http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/table1.html).

<sup>12</sup> Ratepayer funds are typically mandated by state law and require that the utility sets aside a portion of the proceeds for energy efficiency initiatives. See GALEN BARBOSE ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NAT’L LAB., THE SHIFTING LANDSCAPE OF RATEPAYER-FUNDED ENERGY EFFICIENCY IN THE U.S. 3-6 (2009), available at <http://eetd.lbl.gov/ea/ems/reports/lbnl-2258e.pdf>. *E.g.*, CONN. GEN. STAT. § 7-233y (2010); MASS. GEN. LAWS ch. 25A, §11G (2010).

<sup>13</sup> Ten states participate in RGGI: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. See, *e.g.*, Control of carbon dioxides emissions, CONN. AGENCIES REGS. § 22a-174-31 (2010); CO<sub>2</sub> Budget Trading Program, 06-096 ME. CODE R. CH. 156 (2010).

programs.<sup>14</sup> This funding is meant to create new “green” jobs and reduce energy consumption and reliance on foreign oil.<sup>15</sup>

### **i. State Programs**

A description of the energy efficiency and retrofit programs available within a single state could fill volumes. Further, “[b]ecause state programs are so numerous and diverse, the literature offers little on the overall cost-effectiveness and energy savings from these programs.”<sup>16</sup> There are, however, some common themes to the New England state energy efficiency programs.

Most state programs provide funding to weatherize the homes of low-income individuals, rebates for energy efficient appliances and building retrofits, and technical assistance to businesses and/or homeowners who seek to upgrade their buildings. Some, but not all, New England states have programs designed to encourage renewable energy such as solar, geothermal, and wind power generation. Energy efficiency programs in New England are administered by a variety of entities, including the utility companies

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<sup>14</sup> American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, 138 (2009). Of that amount, \$3.2 billion was allocated for Energy Efficiency and Conservation Block Grants; \$5 billion for the Weatherization Assistance Program; and \$3.1 billion for the State Energy Program. Robert A. Reiley, *Financial Incentives and the Leadership Role Taken by Pennsylvania and Other States to Bring Green Energy to the Free Market*, 18 WIDENER L.J. 897, 919 (2009).

<sup>15</sup> Jason B. Hutt & Matthew J. Armstrong, *Development of Energy Infrastructure: Will Taxpayers' Money Stimulate Environmental Reform?*, 56 FED. LAW. 39, 39 (2009).

<sup>16</sup> Gillingham et al., *supra* note 1, at 179.

themselves<sup>17</sup>, state-run or quasi-state agencies,<sup>18</sup> and private non-profit agencies under contract with the state.<sup>19</sup>

## ii. Federal Programs

There are three federal programs funded under ARRA that address energy efficiency and weatherization: the Weatherization Assistance Program (“WAP”), the Energy Efficiency and Conservation Block Grant (“EECBG”) Program, and the State Energy Program (“SEP”).

The WAP was started in 1976 in response to the OPEC oil embargo. Its purpose was and continues to be providing aid to low-income families, the disabled and the elderly in the form of home weatherization projects. Weatherization improves the energy performance of dwellings that house these underserved groups and thus reduces their energy bills. The WAP provides funding to states, which then provide money to local community action agencies that carry out weatherization projects in communities around the state.<sup>20</sup> The EECBG program, which is modeled after the Department of Housing and Urban Development’s Community Development Block Grant program, received \$3.2 billion under the ARRA to fund formula and competitive grants.<sup>21</sup> The general purpose of the EECBG program is to improve energy efficiency and promote conservation through projects that reduce fossil fuel emissions, improve energy efficiency in the

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<sup>17</sup> In Massachusetts, programs are operated by the utility companies with substantial design and approval oversight by an appointed Energy Efficiency Advisory Council. An Act Relative To Green Communities, 2008 Mass. Acts 169; MASS. GEN. LAWS ch. 25, § 22 (2010). Similarly, in Connecticut, utility companies administer efficiency programs with guidance and assistance from the Energy Conservation Management Board, a group of appointed individuals representing both public and private interests. *See* Connecticut Clean Energy Fund, What is the EMCBC?, <http://www.ctsavesenergy.org/about/ecmb.php> (last visited Jan. 21, 2011); CONN. GEN. STAT. § 16-245m (2010). New Hampshire’s programs are also run by the utilities—with approval of and review by the state Public Utilities Commission—and are funded by a system benefit charge. N.H. REV. STAT. ANN § 374-F:3 et seq. (1996); New Hampshire Public Utilities Commission, Order No. 23,982 (May, 31 2002), *available at* <http://www.puc.nh.gov/Regulatory/Orders/2002ORDS/23982e.PDF>.

<sup>18</sup> Efficiency Maine receives some funding from a system benefits charge that is included in electricity rates. The Maine Public Utilities Commission originally managed Efficiency Maine, but its programs are now administered by the Efficiency Maine Trust, a nine-person board of directors. *See* Efficiency Maine, About Efficiency Maine, *at* <http://www.energymaine.com/about> (last visited Jan. 21, 2011). The Rhode Island Office of Energy Resources promotes energy efficiency programs in Rhode Island. Rhode Island Energy Resources Act, R.I. GEN. LAWS § 42-140-1 (2006).

<sup>19</sup> Efficiency Vermont is a ratepayer-funded energy efficiency utility, which provides efficiency services and is operated by the Vermont Energy Investment Corporation. *See* Efficiency Vermont: About Us, *at* <http://www.energymaine.com/pages/Common/AboutUs/> (last visited Jan. 21, 2011).

<sup>20</sup> U.S. Department of Energy, Weatherization Assistance Program, *at* <http://www1.eere.energy.gov/wip/wap.html> (last visited Jan. 21, 2011).

<sup>21</sup> U.S. Department of Energy: Energy Efficiency and Conservation Block Grant Program, *at* <http://www1.eere.energy.gov/wip/eeecbg.html> (last visited Jan. 21, 2011).



transportation and building sectors, and install renewable energy projects in government buildings.<sup>22</sup> Similarly, the SEP provides money to various existing state, county, and city energy efficiency programs.<sup>23</sup> Under the SEP, states are treated as decision-makers. They fund diverse programs such as those providing training and education to build a green workforce, energy audits for businesses, and energy efficiency upgrades to state-owned buildings.<sup>24</sup> Neither SEP nor EECBG funding is income-dependent.

The BetterBuildings program (formerly known as Retrofit Ramp-Up), which is part of EECBG, is in the process of providing approximately \$452 million to 35 communities in the U.S. for the implementation of pilot projects that will provide homeowners and businesses with funding for energy efficient building retrofits.<sup>25</sup> These pilot projects retrofit structures at a community-wide or block-by-block level in an effort to reach economies of scale.<sup>26</sup> The state of Maine and communities in Massachusetts, Vermont, New Hampshire, and Connecticut have received funding through the BetterBuildings program.<sup>27</sup>

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<sup>22</sup> *Id.*; see Katherine A. Trisolini, *All Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation*, 62 STAN. L. REV. 669, 733-34 (2010).

<sup>23</sup> U.S. Department of Energy, Recovery Act and State Energy Program, at [http://www1.eere.energy.gov/wip/recovery\\_act\\_sep.html](http://www1.eere.energy.gov/wip/recovery_act_sep.html) (last visited Jan. 21, 2011).

<sup>24</sup> U.S. Department of Energy, Weatherization and Intergovernmental Program, at [http://www1.eere.energy.gov/wip/project\\_map/](http://www1.eere.energy.gov/wip/project_map/) (examples provided from Maine, Massachusetts, and New Hampshire State Energy Programs) (last visited Jan. 21, 2011).

<sup>25</sup> See U.S. DEP'T OF ENERGY, RETROFIT RAMP-UP SELECTED PROJECTS (2010), at [http://www.energy.gov/news/documents/Retrofit\\_Ramp-Up\\_Project\\_List.pdf](http://www.energy.gov/news/documents/Retrofit_Ramp-Up_Project_List.pdf).

<sup>26</sup> Telephone Interview with Jen Stutsman, Deputy Press Secretary, U.S. Dep't of Energy (Oct. 13, 2010).

<sup>27</sup> The U.S. Department of Energy provides descriptions of grants made under the EECBG program. For example: "The Carbon-Neutral Lowell Park and Preservation District initiative will create a model of how energy efficiency upgrades can meet historical preservation standards;" "The Maine Home Performance Program will establish a statewide revolving loan fund;" "Neighborhood Works of Western Vermont [] plans to blanket Rutland County, Vermont, to serve 40% of eligible households with a combination of low-cost home 'Home Energy Visits,' comprehensive energy audits, financing, and substantial retrofits in a two-phased approach;" "The Beacon Communities Project, led by New Hampshire's Office of Energy and Planning, will utilize proven neighbor-to-neighbor education, technical assistance, and sustainable financing mechanisms to retrofit hundreds of residential, commercial, government, and industrial buildings;" and "[T]he Neighbor to Neighbor Energy Challenge brings together a consortium of 14 leading rural, suburban, and low-income communities throughout Connecticut with a team of nine public, private, academic, and non-profit organizations. The program will target participation of 10% of households to set specific, measurable stretch goals of 20% for energy savings and clean energy usage." U.S. DEP'T OF ENERGY, BETTERBUILDINGS (2010), available at <http://www.eere.energy.gov/betterbuildings/>.

### III. Overcoming the Challenges that Face Energy Efficiency Programs in New England

#### a. Structural Barriers to Achieving Energy Efficiency

##### i. Incentive Structure of Energy Efficiency Programs and Utility Decoupling

In some states, utility companies administer energy efficiency programs. This could result in a conflict of interest, given that utilities typically make more money when they sell more power.<sup>28</sup> When ratepayers save electricity through energy efficiency measures, the utility companies' revenues decrease. Therefore, in a standard cost-of-service ratemaking environment where a utility's revenues are linked to its sales of electricity, the utility lacks a strong incentive to promote energy efficiency or demand-reduction programs.<sup>29</sup>

The two best options for overcoming this conflict are (1) taking the responsibility for administering energy efficiency programs out of the hands of the utilities and putting it into another energy efficiency entity,<sup>30</sup> such as a governmental or non-profit entity, or (2) decoupling.<sup>31</sup> Decoupling severs the connection between a utility's revenues and its energy sales, and instead bases rate of payment on fixed costs. In New England, private utility companies run the efficiency programs in three states: Connecticut, Massachusetts, and New Hampshire. In each of those states, decoupling proposals have been introduced or are being discussed.<sup>32</sup> For example, in early 2009 the New Hampshire

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<sup>28</sup> See Eric Blank & Stephen Pomerance, *After-the-Fact Regulatory Review: Balancing Competing Concerns*, 9 YALE J. ON REG. 107, 114-115 (1992) (noting the "anomaly in the existing regulatory structure"); see also Grunwald, *supra* note 2, at 2 (addressing the conflict).

<sup>29</sup> See Peter Lehner, *Changing Markets to Address Climate Change*, 35 B.C. ENVTL. AFF. L. REV. 385, 395 (2008) (noting that customer efficiency results in loss of revenue); see also U.S. ENVTL. PROT. AGENCY, ENERGY TRENDS IN SELECTED MANUFACTURING SECTORS: OPPORTUNITIES AND CHALLENGES FOR ENVIRONMENTALLY PREFERABLE ENERGY OUTCOMES (2007), available at <http://www.epa.gov/sectors/pdf/energy/report.pdf>.

<sup>30</sup> As it is used in this paper, an "energy efficiency entity" is the governmental, non-profit, or utility company that administers a state's energy efficiency programs.

<sup>31</sup> See NAT'L ASS'N OF REGULATORY UTIL. COMM'RS, DECOUPLING FOR ELECTRIC AND GAS UTILITIES FREQUENTLY ASKED QUESTIONS 4 (2007), available at [http://www.naesb.org/pdf3/dsmee\\_naruc\\_decoupling\\_faq.pdf](http://www.naesb.org/pdf3/dsmee_naruc_decoupling_faq.pdf) ("Arguments have been made that taking utilities out of the efficiency businesses and having that function played by a State, quasi-State, or private sector entity is a preferable alternative to removing disincentives to their promoting efficiency.").

<sup>32</sup> See H.B. 7432, 2007 Gen. Assem., Reg. Sess. (Conn. 2007) (bill requiring that all utility companies incorporate decoupling proposals into their next individual rate case). In Connecticut, United Illuminating is currently in a decoupling pilot. Telephone interview with Pat McDonnell, Dir. of Conservation Load Mgmt., The United Illuminating Co. (Oct. 27, 2010). See also Massachusetts Department of Public Utilities, Order 07-6-A (Dec. 22, 2008), available at <http://www.env.state.ma.us/dpu/docs/electric/07-6/122208dpuord.pdf> (stating that all utility companies must incorporate decoupling proposals into their next individual rate case); and New Hampshire Public Utilities Commission, Order Regarding Energy Efficiency Rate Mechanisms,

Public Utilities Commission determined that “existing rate design and mechanisms, as a conceptual matter, can pose an obstacle to investment in energy efficiency,” and thus decided to look closely into decoupling.<sup>33</sup> However, to-date no New Hampshire utility has come forward with a decoupling plan.<sup>34</sup>

Decoupling, or other means that would remove disincentives for utilities to promote energy efficiency programs, are important because there are a number of benefits that can be derived from having a utility company administer a state’s energy efficiency programs.<sup>35</sup> Indeed, one commentator noted that the utility is “[b]y far the actor best suited to engage in efficiency measures.”<sup>36</sup> Most importantly, utilities have technical expertise and thus should be able to efficiently point out ways that consumers can save energy.<sup>37</sup> The utilities also have market intelligence that stems from access to and knowledge of customers’ energy usage and records.<sup>38</sup> Finally, some believe they have name recognition, which might instill a sense of security that their recommendations are sound.<sup>39</sup> Thus, so long as a state works towards decoupling its utilities, there are strong benefits to be gained from having a utility-run program.

That being said, there are also benefits to having other entities run energy efficiency programs, such as quasi-state agencies or third-party non-profits under contract to the state. As will be discussed further below, building owners often find information from governmental or community-serving non-profit sources to be more credible than

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Order No. 24,934 (Jan. 16, 2009), *available at* <http://www.puc.nh.gov/Regulatory/CaseFile/2007/07-064/ORDERS/07-064%202009-01-16%20Order%20No.%2024,934%20Order%20Resolving%20Investigation.PDF> (concluding that current energy rate structure is a barrier to energy efficiency, and ordering that future rate structures be established to meet individual utilities’ needs as well as account for changes in weather, but failing to specify parameters of the future rate structures).

<sup>33</sup> New Hampshire Public Utilities Commission, Order Regarding Energy Efficiency Rate Mechanisms, Order No. 24,934 at 19 (Jan. 16, 2009), *available at* <http://www.puc.nh.gov/Regulatory/CaseFile/2007/07-064/ORDERS/07-064%202009-01-16%20Order%20No.%2024,934%20Order%20Resolving%20Investigation.PDF>.

<sup>34</sup> Telephone interview with Eric Steltzer, Energy Policy Analyst, N.H. Office of Energy and Planning (Oct. 27, 2010).

<sup>35</sup> For example, in Massachusetts the energy efficiency program MassSave is run by a coalition of utilities. However, those utilities operate under a mandate to procure all cost effective energy efficiency measures, and are subject to oversight by the Energy Efficiency Advisory Council, a board of stakeholders that includes both industry and environmental representatives. Telephone interview with Lyn Huckabee, Residential Program Coordinator, Mass. Dep’t of Energy Resources (Oct. 20, 2010). Least cost procurement requirements such as these can lessen some of the concerns raised in this section.

<sup>36</sup> Rotenberg, *supra* note 5, at 285.

<sup>37</sup> *Id.* at 282 (describing utility expertise).

<sup>38</sup> JOSEPH ETO ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NAT’L LAB., RATEPAYER-FUNDED ENERGY-EFFICIENCY PROGRAMS IN A RESTRUCTURED ELECTRICITY INDUSTRY: ISSUES, OPTIONS, AND UNANSWERED QUESTIONS 9-10 (1996), *available at* <http://eetd.lbl.gov/ea/emp/reports/40026.pdf>.

<sup>39</sup> Telephone interview with Eric Steltzer, *supra* note 34.

that from utility companies. Notably, Maine (quasi-state agency) and Vermont (private non-profit) are ranked as states with successful energy efficiency programs.<sup>40</sup>

## ii. Lack of a Skilled Workforce

Contractors are a key element of any successful energy efficiency upgrade program. In many cases, the contractors will be the public face of the program as they meet with customers, perform home energy audits, explain the upgrades that will help reduce energy consumption, and perform installations. This is true even for programs that rely extensively on program staff or community nonprofit groups to conduct outreach and provide information to consumers.<sup>41</sup> Because consumers will view contractors as an extension of the state's energy efficiency program, it is important that those contractors are well-trained and that their work is effective.<sup>42</sup>

There have been some well-publicized problems with the quality of the energy efficiency upgrades performed by some contractors and agencies. For example, in Ohio, 20 of the 68 agencies that perform retrofits failed more than half of their inspections by the state, and five of those failed all of their inspections.<sup>43</sup> Further, in Illinois, federal monitoring of that state's Weatherization Assistance Program "revealed substandard performance in weatherization workmanship, initial home assessments, and contractor billing" so severe that "they put the integrity of the entire Program at risk."<sup>44</sup> The reasons for the poor workmanship are due in part to the lack of sufficient numbers of skilled workers, which in turn has been one of the barriers to increasing the number of energy efficiency upgrades.<sup>45</sup>

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<sup>40</sup> The American Council for an Energy-Efficient Economy's 2010 State Energy Efficiency Scorecard ranked Vermont 5<sup>th</sup> and Maine 10<sup>th</sup> in overall energy efficiency. Of note, almost all New England states, including those with utility-run programs, rank very highly on this list: Massachusetts was 2<sup>nd</sup>, Rhode Island 7<sup>th</sup>, and Connecticut 8<sup>th</sup>. New Hampshire, which has a utility-run program, was ranked 22<sup>nd</sup>. MAGGIE MOLINA ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., THE 2010 STATE ENERGY EFFICIENCY SCORECARD (2010), available at <http://www.aceee.org/sites/default/files/publications/researchreports/e107.pdf>.

<sup>41</sup> FULLER ET AL., *supra* note 10, at 62.

<sup>42</sup> *Id.* at 58 (recognizing that "customers are likely to view private contractors as extensions of the program").

<sup>43</sup> Doug Caruso, *Broken fixes: Inspectors find shoddy work in weatherization program*, THE COLUMBUS DISPATCH, March 14, 2010, available at [http://www.dispatchpolitics.com/live/content/local\\_news/stories/2010/03/14/copy/broken-fixes.html?adsec=politics&sid=101](http://www.dispatchpolitics.com/live/content/local_news/stories/2010/03/14/copy/broken-fixes.html?adsec=politics&sid=101).

<sup>44</sup> U.S. DEP'T OF ENERGY, OFFICE OF INSPECTOR GEN., AUDIT REPORT: THE STATE OF ILLINOIS WEATHERIZATION ASSISTANCE PROGRAM, in MEMORANDUM FOR THE SECRETARY 1 (2010), available at <http://www.ig.energy.gov/documents/OAS-RA-11-01.pdf>; see also FULLER ET AL., *supra* note 10, at 58 ("[C]ustomers see the contractors themselves as ambassadors of the program. When the quality of some contractors' work did not pass inspection, it produced negative attitudes about the program in those particular cases.").

<sup>45</sup> MIDDLE CLASS TASK FORCE, COUNCIL ON ENVTL. QUALITY, RECOVERY THROUGH RETROFIT at 1 (2009), available at [http://www.whitehouse.gov/assets/documents/Recovery\\_Through\\_Retrofit\\_Final\\_Report.pdf](http://www.whitehouse.gov/assets/documents/Recovery_Through_Retrofit_Final_Report.pdf).

To overcome this barrier, states should invest money in certification and job training programs for contractors. Many states require all contractors who will perform energy efficiency upgrades tied to incentives to obtain certification from private third-party certification organizations, such as the Building Performance Institute. This ensures that all contractors are receiving the same information, and thus should convey consistent messages to customers.

While certification is a good first step, states should also consider requiring an apprenticeship program for contractors who will undertake retrofits pursuant to a state energy efficiency program. One purpose of the stimulus funding was to create green jobs, and it has succeeded in creating greater demand for energy audits.<sup>46</sup> However, if the contractors conducting the upgrades do so at sub-standard levels, it gives the entire industry a bad name, and thus creates additional barriers to participation. On-the-job training programs would give certified contractors the opportunity to apply their learning, and should result in greater quality control.<sup>47</sup> States might also consider investing in stronger Measurement and Verification<sup>48</sup> programs to determine the amount of energy actually being conserved by a contractor's work, and greater numbers of random inspections.<sup>49</sup>

Finally, energy efficiency program administrators should create programs that contractors will be able to successfully manage and implement. Indeed, it has been suggested that once contractors know what the program expectations and requirements are, they can tailor their work to meet those standards.<sup>50</sup> Thus, energy efficiency program managers should be certain to communicate to contractors the details of the program and its goals.

### **iii. Structure of Consumer Incentives and Uncertainty**

The structure of many state energy efficiency programs results in uncertainty about retrofit costs and about the extent of offsetting financial incentives or rebates. This

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<sup>46</sup> Telephone interview with Diane Milliken, Partner, Horizon Residential Energy Services (Oct. 26, 2010).

<sup>47</sup> *Id.*

<sup>48</sup> Measurement and Verification, or "M&V," programs attempt to validate "the cost benefit of those [energy efficiency] programs . . . through monitoring and measuring the actual efficiencies achieved." Warren C. Kotzmann, *Flipping the Switch on Alternative Energy?*, 29 J. LAND RESOURCES & ENVTL. L. 19, 24 (2009).

<sup>49</sup> Caruso, *supra* note 43 (describing inspections that discovered problems). In Connecticut, when random quality assurance inspections reveal a contractor or vendor who is not performing well, that vendor will be retrained. Telephone interview with Pat McDonnell, *supra* note 32.

<sup>50</sup> Caruso, *supra* note 43 (quoting an energy efficiency agency director who "said that the agency's weatherization work has improved because the state inspections pointed out problems. 'Once we're clear on exactly what is expected,' he said, 'then you don't see those problems reoccurring.'").

uncertainty discourages building owners from participating in energy efficiency programs.

Uncertainty exists, in part, because there are so many different programs available even within a given state. Individuals can seek rebates and tax credits at both the federal and state level, and often through multiple programs. Specifically, many New England states currently offer energy-efficiency rebate programs. Some of these provide a consumer with money back at the register for the purchase of energy efficient appliances,<sup>51</sup> but others are more complicated. For example, in Maine, a homeowner must pay out-of-pocket for an energy audit by a “Participating Energy Advisor,” which is a contractor who has been certified and accepted into the program. These audits often cost around \$500.<sup>52</sup> There are rebates available for some costs of the work done, but the amount of those rebates is wholly dependent upon the projected percentage of energy that will be saved on heating and hot water after the upgrades are complete.

There are a few problems with this model. First, there are trust and information issues, which will be addressed in more detail below. Building owners may wonder: if my energy bill is not a large part of my monthly budget, why should I lay out \$500 for an audit, and then pay for improvements that could be upwards of \$15,000 or \$20,000 without knowing how much of that money I will get back? Even though I have been told that I will make back that money over time through lower energy bills, I do not know how long I will live in this house, and I might move before I am able to fully reap the

cost savings.<sup>53</sup> Further, even if I am a building owner who wants to undertake an energy efficiency upgrade, I might not have enough capital to pay for the initial audit or the subsequent work. Consumers faced with all of these questions and information have a tendency to become overwhelmed and stop listening, especially because energy efficiency is not a top priority for most building owners.

Financing can be helpful in addressing many of these concerns. For example, in Massachusetts, the utilities provide free energy audits and air sealing to all residential building owners.<sup>54</sup> Because there is no initial \$500 investment in the cost of the audit, the only barriers are lack of time or knowledge of the program. Thus, free audits circumvent the initial uncertainty barrier. However, if a building owner decides to move forward with additional work suggested by the audit, uncertainty remains regarding the cost of the

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<sup>51</sup> Because appliance rebates programs are certain and easy to understand, they have been very successful. In Maine and Massachusetts, the programs ran out of money quickly. For example, the Massachusetts program, which enabled customers to purchase dishwashers for as little as \$4.99, ran out of its approximately \$6 million in funding in less than two hours. *Appliance Rebates Run Out Quickly In Mass.*, WMTW.COM, Apr. 22, 2010, <http://www.wmtw.com/cash-for-appliances/23231554/detail.html>.

<sup>52</sup> Telephone interview with Diane Milliken, *supra* note 46.

<sup>53</sup> David Leonhardt, *A Stimulus That Could Save Money*, N.Y. TIMES, Nov. 18, 2009, at B1, available at <http://www.nytimes.com/2009/11/18/business/economy/18leonhardt.html> (“The whole package would probably cost \$4,500 and save us something like \$400 a year. We may not stay in the house nearly long enough to justify the investment.”).

<sup>54</sup> Telephone interview with Lyn Huckabee, *supra* note 35.

work and the amount of rebates or tax credits that will be available.<sup>55</sup> Overall, while it is important for programs to offer different types of financial incentives, they should attempt to craft those programs in such a way as to reduce uncertainty.

## **b. Behavioral Barriers to Achieving Energy Efficiency: Focusing on the Consumer**

### **i. Information**

Providing consumers with information is not the panacea that many believe it to be; information alone is not enough to motivate action.<sup>56</sup> However, it is certainly important for consumers to be aware of the programs that exist so that they can take advantage of them.<sup>57</sup> Currently, energy efficiency entities are faced with a multi-faceted information problem: there is too little information being delivered that motivates consumers to action; the information is not being delivered by a trustworthy source; and the information is too technical. All of these informational problems must be addressed in order to best encourage a person to invest time and money in retrofitting her home or business.

First, although energy efficiency administrators distribute an overwhelming amount of information about their programs and benefits, the information being disseminated does not sufficiently motivate consumers to take action. For example, many states have online tools available that let a building owner calculate the amount of energy their building uses and then compare that amount to the average home or business in the area. However, in order to use these tools, a person must know how many gallons of oil their heating system uses annually, how many kilowatt-hours of energy they use per year, and the R-level of their insulation. This is information that the average consumer lacks. Because energy costs are generally a small portion of a homeowner or small business owner's overall expenditures each month, they are not willing to invest in the "information gathering and transactions costs."<sup>58</sup>

Of those who take the time to pull out old bills and calculate these amounts, there is still key information lacking, such as differentiation on energy bills. Thus, it is difficult for a building owner to know the actual efficiency of her building. If ratepayers were able to see not just how much energy they use, but specifically where in their homes or businesses those uses were occurring, this feedback might encourage them to take

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<sup>55</sup> Well-trained contractors who have a thorough knowledge of the program could allay some of these concerns by carefully explaining these program elements to a homeowner.

<sup>56</sup> ED DELHAGEN ET AL., LIVING CITIES & INST. FOR SUSTAINABLE COMMUNITIES, SCALING UP BUILDING ENERGY RETROFITTING IN U.S. CITIES: A RESOURCE GUIDE FOR LOCAL LEADERS 14 (2009), *available at* [http://www.iscvt.org/who\\_we\\_are/publications/Green\\_Boot\\_Camp\\_Resource\\_Guide.pdf](http://www.iscvt.org/who_we_are/publications/Green_Boot_Camp_Resource_Guide.pdf) ("[D]ecades of experience with efficiency and other environmental outreach programs have shown that information does little by itself to motivate behavior change.").

<sup>57</sup> Kaswan, *supra* note 2, at 275 (addressing need for information).

<sup>58</sup> Brown, *supra* note 9, at 1202.

steps to reduce specific energy demands.<sup>59</sup> Finally, even if a consumer is armed with useful information about specific existing energy use, it is hard to know what measures will have real impacts on energy savings, and therefore costs. This ties into problems with the structure of some incentive programs. For example, in some states a customer is simply given a copy of an energy audit, which contains a number of recommended upgrades, but is not given any further information about which projects should be undertaken first or by whom.<sup>60</sup> Most building owners lack the expertise to interpret that document on their own. Thus, programs should be structured so that contractors or project staff are available to explain the audit and next steps to building owners.

Behavioral science studies have also recently shown that the person from whom the information is coming is a very important factor in determining whether the target will find that information trustworthy and persuasive. Hearing from a neighbor who has already undertaken an energy efficiency upgrade is more successful than providing a person with technical information about how much they are likely to save from a retrofit.<sup>61</sup> On the other hand, if the information is coming from the utility company or a contractor, an individual may believe that there is self-interest involved in the message.<sup>62</sup> Some studies suggest that efficiency information received from a governmental entity is viewed as more trustworthy than that received from a utility.<sup>63</sup> Finally, because energy efficiency measures are not visual measures that can be seen, and often take time to fully pay for themselves, consumers are less likely to completely trust their benefits.<sup>64</sup>

In addition to examining the source of the information and its impact on behavior, studies have also looked into the content of the information. Historically, program

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<sup>59</sup> See Wilson & Dowlatabadi, *supra* note 8, at 181 (addressing provision of feedback on utility bills); see also Brown, *supra* note 9, at 1201 (“[R]esidential consumers get a monthly electricity bill that provides no breakdown of individual end-uses. This is analogous to shopping in a supermarket that has no product prices; if you get only a total bill at the checkout counter, you have no idea what individual items cost.”). The technology to make this possible is still in its nascence, but includes smart meters, which are beginning to be installed by utility companies in some areas and buildings, and power meters or home energy monitors, which can be used in the home and are plugged in between an electric device and the socket. See, e.g., TED The Energy Detective, About TED, at <http://www.theenergydetective.com/about-ted> (last visited Jan. 21, 2011); see also Efficiency Maine, Kill-A-Watt Electricity Monitors, at <http://www.energymaine.com/at-home/kill-a-watt-electricity-monitors> (last visited Jan. 21, 2011).

<sup>60</sup> In some states, steering building owners to private contractors is seen as suspect, which might explain the lack of direction.

<sup>61</sup> Wilson & Dowlatabadi, *supra* note 8, at 180-181 (noting that social feedback aids positive attitude formation).

<sup>62</sup> But see *supra* note 39 and accompanying text (noting that some consumers may feel secure accepting efficiency information from their utility company due to name recognition).

<sup>63</sup> C.S. Craig & J.M. McCann, *Assessing Communication Effects on Energy Conservation*, 5 J. OF CONSUMER RES. 82 (1978).

<sup>64</sup> Lehner, *supra* note 29, at 390 (discussing trustworthiness and asking, “should I really pay an extra one hundred dollars for some different refrigerator because it says that it is going to save me money over three years? Is it really? I do not really trust that. I think cash in the hand is worth a lot more.”).



managers believed that if consumers knew how much energy (and money) they would save by installing energy saving technology, and how quickly that technology would pay for itself, they would invest. However, recent studies have found that “the most effective information in promoting residential energy efficiency was simple, salient, personally relevant, and easily comparable rather than technical, detailed, factual, and comprehensive.”<sup>65</sup> The focus should be on the increase in personal comfort that stems from home energy improvements, instead of solely financial or environmental savings. Thus, it makes sense that neighbors and early adopters would be the more appropriate parties to be delivering that information than the government or utility companies.

## ii. Financing: Split Incentives and Initial Investment Costs

Just as behavioral science studies have shown that information alone is not enough to motivate a homeowner or small business owner to undertake an energy efficiency retrofit, it has also been determined that giving people access to capital for improvements is not enough.<sup>66</sup> That being said, studies have shown that financing for initial costs is an important motivating factor.<sup>67</sup>

One problem facing many of the energy efficiency programs in New England is that of misplaced or split incentives. Builders and landlords are the ones making decisions about the level of insulation and the efficiency of appliances installed in homes and businesses, but they are not necessarily the ones who will be living in those structures or paying for heating and hot water during long, cold winters.<sup>68</sup> On the other hand, if a landlord does pay the bills and thus purchases energy efficient appliances, the tenants have less incentive to conserve energy, because they do not bear the costs of their use.<sup>69</sup> Thus, there currently are disincentives for builders and landlords to undertake energy efficiency upgrades.

A related problem presented by retrofitting is that the benefits of the upgrades are tied to the structure itself, but the costs of those upgrades are connected to the building owner who has to pay for them. Thus, if a building owner sells her home before the upgrades have paid for themselves in savings, she loses out, and thus is disinclined to invest in upgrades in the first instance.<sup>70</sup> Some existing efficiency programs or state housing authorities provide products to customers who undertake retrofits such as low interest loans and revolving loan funds. For years, Energy Efficient Mortgages and Energy Improvement Mortgages have been offered, but purchasers woefully underuse

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<sup>65</sup> Wilson & Dowlatabadi, *supra* note 8, at 181.

<sup>66</sup> FULLER ET AL., *supra* note 10, at 28-29 (discussing relevant literature and noting that provision of financing alone is not enough to change behavior).

<sup>67</sup> DELHAGEN ET AL., *supra* note 55, at 34.

<sup>68</sup> Lehner, *supra* note 29, at 390-91 (discussing the problem of split incentives).

<sup>69</sup> Brown, *supra* note 9, at, 1200.

<sup>70</sup> See Kaswan, *supra* note 2, at 279 (noting that energy efficiency investments may not create sufficient sales premiums to justify the investment); see also MIDDLE CLASS TASK FORCE, *supra* note 45.

them.<sup>71</sup> Some states and municipalities have attempted to implement even more innovative mechanisms, including on-bill utility financing and Property Assessed Clean Energy (PACE) financing.

On-bill financing has been in place for a number of years in Connecticut, New Hampshire, Massachusetts, and Rhode Island. The utility company pays for the costs of the upgrades, and the customer pays off that amount over time via a charge on the monthly utility bill. Pursuant to some programs, the price of the utility bill does not rise, but remains what it was prior to the efficiency upgrades. Once those upgrades are paid off, the monthly charge decreases to reflect the lower amount of energy being used. On-bill financing offers zero percent interest and is unsecured; it is thus typically only used for business, municipal, and institutional clients, not residences.<sup>72</sup>

Under a PACE program, the upfront costs of financing the retrofit are paid by a public entity, such as the municipality. The homeowner agrees to pay off this amount through a lien or tax assessment on the property.<sup>73</sup> Thus, the obligation for repayment is attached to the property, not a specific property owner. This way, if the owner sells the property before having reaped the benefits of the upgrades, the next property owner continues to pay the increased property taxes associated with the upgrades.<sup>74</sup> New Hampshire, Vermont, Massachusetts and Maine are among the 23 states whose

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<sup>71</sup> Energy Efficient Mortgages are used to purchase homes that are already energy efficient, and “enable homeowners to qualify for a larger mortgage as a result of projected energy savings.” Edna Sussman, *Green Buildings: An Overview and Recent Developments*, ABA TRENDS, May/June 2005, at 8, 9. They also tend to “offer lower interest rates [,] . . . lower closing costs,” and other benefits.” Stephen M. Johnson, *Terrorism, Security, and Environmental Protection*, 29 WM. & MARY ENVTL. L. & POL’Y REV. 107, 158 n.164 (2004) (quoting U.S. ENVTL. PROT. AGENCY, NAT’L CTR. FOR ENVTL. ECON., THE UNITED STATES EXPERIENCE WITH ECONOMIC INCENTIVES FOR PROTECTING THE ENVIRONMENT § 10.2.2.3 (2001), available at [http://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0216B-13.pdf/\\$file/EE-0216B-13.pdf](http://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0216B-13.pdf/$file/EE-0216B-13.pdf)). An Energy Improvement Mortgage is similar, but it “give[s] the buyer of an existing home the opportunity to borrow more money at the time of sale or refinancing to make their [] home more energy efficient. . . . The extra dollars borrowed to add additional insulation, replace the old heating/cooling system, or tighten the home are rolled into the new mortgage and spread over the mortgage term . . . .” Residential Energy Services Network, Energy Efficient Mortgage, <http://www.resnet.us/lenders/overview> (last viewed Jan. 21, 2011).

<sup>72</sup> New Hampshire has recently begun using RGGI funds to expand on-bill financing to the residential sector for certain energy efficiency upgrades. However, the program is currently tied to the individual, instead of to the meter, and thus it is not transferable to a new owner if the person who undertook the upgrades sells the house. Telephone interview with Eric Steltzer, *supra* note 34. In Connecticut, The United Illuminating Company has begun to offer on-bill financing for residential customers, which was approved after the utility began its decoupling pilot. Telephone interview with Pat McDonnell, *supra* note 32.

<sup>73</sup> See John C. Dernbach et al., *Making the States Full Partners in A National Climate Change Effort: A Necessary Element for Sustainable Economic Development*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10597, 10602 (2010) (describing PACE program).

<sup>74</sup> Joel B. Eisen, *Can Urban Solar Become A “Disruptive” Technology?: The Case for Solar Utilities*, 24 NOTRE DAME J.L. ETHICS & PUB. POL’Y 53 (2010) (describing PACE financing).

legislatures have adopted enabling legislation allowing municipalities to create PACE programs.<sup>75</sup> Further, over \$150 million in Recovery Act funding went to support PACE programs.<sup>76</sup> In theory, PACE would directly address many of the concerns raised in this section.

Unfortunately, the Federal Housing Finance Agency (“FHFA”) has interceded and the future of PACE is now uncertain. Those municipalities that had begun offering loans under the program have had to stop. The FHFA regulates Fannie Mae and Freddie Mac, which are government-sponsored entities that purchase mortgages. In July 2010, FHFA issued a statement that effectively froze the PACE program due to concerns that the PACE loans would take priority over existing mortgages, including in states such as California and Colorado where the program had already been implemented.<sup>77</sup>

While there are other financing mechanisms that could help to overcome the barriers caused by lack of capital, states should petition FHFA and the banks to take a closer look at the PACE program and allow it to move forward. Indeed, some states, localities, and non-profits have already filed suit against the FHFA.<sup>78</sup> Assuming PACE is allowed to move forward, Connecticut and Rhode Island would have to adopt enabling legislation to join the other New England states that have already provided for PACE.

Regardless, states in New England currently have more money than ever before to invest in energy efficiency programs. However, given the high level of participation and extent of retrofits that will be necessary to have a real impact on greenhouse gas emissions, more federal or state funding must be provided, or creative financing mechanisms must be in place to loan building owners the money needed to make retrofits on a larger scale. Because such a large level of initial investment is required, financing is a key piece of raising participation in energy efficiency programs.

### **iii. Marketing and Outreach**

In addition to providing building owners with information about retrofitting their structures and financial incentives to assist them in doing so, energy efficiency entities must focus on marketing and outreach in order to better motivate consumer action.

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<sup>75</sup> See, e.g., Act to Increase the Affordability of Clean Energy for Homeowners and Businesses, Maine Public Law 2009, ch. 591 (codified at ME. REV. STAT. ANN. tit. 35-A, § 10151 (2009)).

<sup>76</sup> Complaint, Natural Res. Def. Council, Inc. v. Fed. House. Fin. Agency (S.D.N.Y. filed Oct. 5, 2010) (No. 10 Civ. 7647), available at [http://docs.nrdc.org/energy/files/ene\\_10100601a.pdf](http://docs.nrdc.org/energy/files/ene_10100601a.pdf).

<sup>77</sup> Press Release, Natural Resources Defense Council, NRDC Sues Federal Housing Regulators for Blocking Affordable Clean Energy Projects for Homeowners (Oct. 6, 2010), available at <http://www.nrdc.org/media/2010/101006.asp>; see *Bank Regulation*, BANKING & FIN. SERVS. POL’Y REP., August 2010, at 34.

<sup>78</sup> The state of California and counties in California and Florida have filed suit, as have the Sierra Club and the National Resources Defense Council (“NRDC”). The NRDC has alleged violations of the Administrative Procedure Act and the National Environmental Policy Act. Complaint, *supra* note 75.

Because traditional “products” are physical things, marketing them is fairly straightforward; they can be easily described and understood through pictures in newspapers or ads on television. Even renewable energy generation equipment such as solar panels and wind turbines are physical and can be visualized. Energy efficiency, on the other hand, is amorphous.<sup>79</sup> Traditional forms of marketing can make building owners aware of existing programs, but more is needed to motivate them to act.<sup>80</sup>

Energy efficiency experts in Vermont have found that “technical assistance and hand-holding” are more effective motivators to action than simple financial incentives.<sup>81</sup> By providing technical assistance, including specific advice about what improvements to make and what appliances to purchase, Efficiency Vermont staff is able to overcome some of the lack of information and perceived risks addressed earlier.<sup>82</sup> These results have been especially pronounced in the business sector. An account manager is assigned to each of the largest energy consumers in the state, and is tasked with getting to know that business, its motivations, objectives, and capital investment plans. This strategy, which is based more on relationships than passive rebates, has been very successful.

Another element of marketing is using a targeted approach instead of a blanket one. By targeting early adopters or individuals who are already planning on remodeling or updating their buildings, greater gains can be made. For example, if a person is planning to replace their roof, a knowledgeable staff person or contractor could provide them with specific, tailored information about what else they could do to their roof and attic to reduce energy consumption, and direct them to specialized rebates.<sup>83</sup> Placing focus on the natural replacement and early adopter markets is also helpful, because if one of these individuals has a positive experience, they can tell their friends and neighbors about it, encouraging them to invest as well.

As was discussed in the section on information, the person delivering the message is sometimes just as important as the message itself. Behavioral studies have shown that peer-to-peer communication is an important motivating factor.<sup>84</sup> This relates to research demonstrating the importance of social norms and peer influence, which shows that “energy saving efforts were most strongly correlated with the belief that other people were conserving energy.”<sup>85</sup> Similarly, some retrofit programs have found that the best

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<sup>79</sup> Wilson & Dowlatabadi, *supra* note 8, at 179 (“Solar technologies have greater normative appeal than less visible measures such as home insulation.”).

<sup>80</sup> FULLER ET AL., *supra* note 10, at 60.

<sup>81</sup> Telephone interview with Blair Hamilton, Policy Dir., Vt. Energy Inv. Corp. (Oct. 18, 2010).

<sup>82</sup> Efficiency Vermont currently employs approximately 180 FTE staff and contractors to serve approximately 600,000 people. When they began energy efficiency work in the state, they did not realize that they would be so reliant on people, instead of money. However, as they increased their incentive budget and their staffing, and looked at the results, they realized that more savings were coming from the technical assistance they offered, as opposed to the financial incentives. *Id.*

<sup>83</sup> *Id.*

<sup>84</sup> M. Harrigan, *Moving Consumers to Choose Energy Efficiency*. Washington, DC: The Alliance to Save Energy (1991) (discussing person-to-person communication).

<sup>85</sup> FULLER ET AL., *supra* note 10, at 30. A recent study placed various signs in hotel rooms encouraging guests to reuse their towels. Some signs suggested they do so to save the environment or resources, but the sign that resulted in the greatest success was that which stated

motivator to action is competition among neighbors.<sup>86</sup> For example, some pilot programs have achieved great success by providing utility customers with information on their bills that shows their energy consumption as it compares to that of their neighbors. Specifically, a smiley face means they are conserving more than their neighbors, while a frown means they are conserving less.<sup>87</sup>

Recruiting volunteers to go door-to-door and help their neighbors start with a single action, such as replacing standard light bulbs with compact fluorescent bulbs, has been shown to get people involved and interested in retrofits.<sup>88</sup> Energy efficiency programs are well-positioned to take advantage of these tools, especially because “going green” is a concept that has entered the public discourse in many communities.

Finally, studies also suggest that people are more likely to respond positively to words that are descriptive and appealing. Thus, some research suggests that the terms audit and retrofit should be replaced with energy assessment and home energy improvements or upgrades, respectively.<sup>89</sup> Making even small changes such as these in the marketing and outreach campaigns based on social science and behavioral research costs little and can have far-reaching, positive impacts.

#### **IV. Recommendations**

This paper aims to provide decision-makers with tools to most effectively motivate owners of small business and residences to reduce their energy consumption through energy efficiency improvements. It has suggested that entities charged with achieving energy efficiency within each state consider the structure, content, and marketing of their programs.

##### **a. Specific Suggestions**

On the structural side, states should ensure that the entity or entities in charge of promoting energy efficiency have incentives to reduce energy consumption. This might include decoupling utilities that administer efficiency programs, or tasking a state, quasi-state, or non-profit agency with promoting energy efficiency. Additionally, the staff and contractors involved with undertaking energy efficiency upgrades should be well-trained and available in sufficient numbers to timely meet consumer demand for their services. Finally, incentives and rebates should be structured so as to reduce uncertainty. If any of

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that majority of other hotel guests reuse their towels. Noah Goldstein et al., *A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels*, 35 J. OF CONSUMER RES. 472 (2008).

<sup>86</sup> DELHAGEN ET AL., *supra* note 55, at 14.

<sup>87</sup> See OPOWER Home Energy Report, <http://www.opower.com/Products/HomeEnergyReport.aspx> (last visited Jan. 21, 2011). National Grid in Massachusetts has begun to use the OPOWER comparisons on its customers' bills. See also Ellen Gibson, *Energy Use: Neighbor vs. Neighbor*, BLOOMBERG BUSINESSWEEK, Nov. 9, 2009, available at [http://www.businessweek.com/innovate/content/nov2009/id2009115\\_475766.htm](http://www.businessweek.com/innovate/content/nov2009/id2009115_475766.htm).

<sup>88</sup> Telephone interview with Blair Hamilton, *supra* note 80 (discussing project porchlight).

<sup>89</sup> FULLER ET AL., *supra* note 10, at 48 (discussing importance of language).

these structural programmatic elements are lacking, consumer confidence in the overall energy efficiency program may be undermined.

Those tasked with administering energy efficiency should familiarize themselves with the recent social and behavioral psychology literature that focuses on marketing and messages. This paper suggests that it is not enough merely to provide people with information about the benefits of retrofitting their homes, nor is it enough to provide rebates or financial incentives. Instead, by providing a combination of information, rebates, financing tools, technical assistance, and targeted marketing, building owners will be best encouraged to upgrade their homes and businesses.

#### **b. Looking Ahead: Mandates**

In the end, voluntary approaches to energy efficiency probably will not be enough to reach the levels of deep cuts that are needed to reduce greenhouse gas emissions.<sup>90</sup> Therefore, states and municipalities should begin to think about using a stick, such as mandates, instead of a carrot, such as incentives. It would make the most sense for these new requirements to be imposed in the form of building codes, requiring certain levels of energy efficiency for all new construction.<sup>91</sup> Certain products, such as incandescent light bulbs, could be banned within new construction.

With respect to modifying the existing building stock, one strategy would be to require rating or labeling that disclosed the levels of building energy consumption at the time of sale or change in building occupancy. This could be paired with a requirement that the seller or buyer implement minimum energy efficiency requirements at that time as well. The timing would make sense, as people obtain new mortgages at the time of purchase, which could help pay for the costs of the upgrades. As cities, states, and the

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<sup>90</sup> Telephone interview with Blair Hamilton, *supra* note 80 (discussing mandates); *see also* Edna Sussman, *Reshaping Municipal and County Laws to Foster Green Building, Energy Efficiency, and Renewable Energy*, 16 N.Y.U. ENVTL. L.J. 1, 21 (2008) (recognizing that “garnering voluntary action is a slow process and municipalities may wish to consider opportunities to mandate energy efficiency upgrades . . .”).

<sup>91</sup> Notably, recent model building and energy codes have become more energy efficient. For example, the recently approved 2012 International Energy Conservation Code (“IECC”) will increase energy savings by 30 percent over the 2006 IECC. Progress Alerts, U.S. Dep’t of Energy, DOE Announces Historic Strides in Energy Efficiency for Residential and Commercial Building Codes (Nov. 15, 2010), *available at* [http://apps1.eere.energy.gov/news/progress\\_alerts.cfm/pa\\_id=437](http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=437). Although states and localities are not forced to immediately implement new model codes, the ARRA required states accepting SEP funding to commit to 90 percent compliance with the most recently published IECC standards by 2017. American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 410(a)(2), 123 Stat. 115, 147 (2009). At the time the ARRA was adopted, the most recent standards were the 2009 IECC, which achieved 15 percent energy savings as compared to the 2006 version.

federal government move toward more comprehensive energy efficiency policies, mandates should be examined more closely.<sup>92</sup>

In order to sufficiently reduce greenhouse gas emissions, policy-makers must think about ways to improve energy efficiency and reduce unnecessary energy demand, while at the same time increasing renewable energy generation. By incorporating some or all of the suggestions raised in this paper, states and communities can more effectively mitigate some of the negative effects of climate change.

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<sup>92</sup> There are a number of other options that governments can and should consider. Though using energy efficiently is the cheapest and fastest way to reduce greenhouse gas emissions, extremely deep cuts are needed to make a substantial impact. Thus, states and cities should seriously consider encouraging or mandating investment in renewable and distributed generation technologies. See John V. Hurd, *The Great Standby Rate Debate: Analysis of A Key Barrier to the Influx of Needed New Alternative Energy Sources*, 42 SUFFOLK U. L. REV. 939, 939-40 (2009).