Analysis of the Green Communities Act

An Interactive qualifying Project

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Abstract:

Our IQP tracks the progress and implementation of the Green Communities Act at city, town, and state levels. We worked with city officials from Worcester, the DOER, and the Town of Douglas Massachusetts to examine the obstacles communities must overcome to achieve Green Communities status. This project is a guide to the feasibility of Green Communities adoption on a town level. We examined financial, political and economic issues that affect the perceptions of the Act among Massachusetts residents.

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Introduction

To combat the ever rising carbon emissions of the world the action of governments is necessary. Global warming is known to the world now. It is hardly a theory anymore. Whatever the degree of effect man has had on it, and what the consequences may be are varied, but it is not wise to be presumptuous. Action is required at this stage. The question now is more one of, who will act and how, rather than if. Several efforts have been made historically, the first significant one being the Montreal Protocol of 1987. After the discovery in the 80's of the enormous ozone hole over the Antarctic, an international effort was made to stop the depletion. This resulted in the Montreal protocol, which placed large bans on the production and use of Chlorofluorocarbons, and Hydrofluorocarbons. Unlike later efforts this has been enormously successful; the ozone has been stabilized and is regenerating. The Kyoto Protocol of 1997 attempted to get nations to reduce emissions below the 1990 level by 5.2% by 2012. Most of the world has joined it, the U.S. being a notable exception. Many industrialized nations have made efforts under Kyoto, the overall success will not be known for two more years. However, Kyoto failed to bring the major industrialized nations of the world together under one act. An attempt to create a unified successor to Kyoto was made at the Copenhagen climate talks in 2009. Here was an excellent example of the necessity of international community participation. A significant resolution was not reached there, as the international community could not agree. There was argument and disagreement between east and west, and developed and undeveloped countries. As of this date, no firm resolution has been reached. The state of Massachusetts' has taken action however, and is independently of international or federal agreements pursuing its own energy reduction plan.

Our project is on the Green Communities act of 2008, as signed into law by Deval Patrick on July 2nd, 2008. The main purpose of the act is simply to reduce Greenhouse gas emissions in the state of

Massachusetts. A secondary objective is to try to develop a green energy industry and infrastructure in the state of Massachusetts. The main goals of the act are as follows:[1]

- To have 20% of the Commonwealth's electrical load powered by renewable or alternative sources by 2020.
- To have 25% of the Commonwealths electrical load on the demand side, as in electrical supply to homes including all devices behind the meter, achieving an annual efficiency of 80% or greater by 2020.
- To reduce fossil fuel use in buildings by 10% from 2007 levels by 2020.
- To develop a plan to reduce Commonwealth energy consumption by 10% by 2017.
- To increase solar energy usage on the order of 400% by 2020.

To help facilitate this process, the act also created a Green Communities division of the Department of Energy Resources (DOER). This division is allocated 10 million a year to carry out its task.[2] Their task is identify communities that show willingness to, "go green," and assist them in doing so with grants out of the 10 million dollars allocated. To become a Green community a town's government must fulfill five criteria. These are:[3]

1. Adopting local zoning bylaw or ordinance that allows "as-of-right-siting" of renewable energy projects.
2. Adopting an expedited permitting process to the as-of-right facilities.
3. Establishing a municipal energy use baseline and a program designed to reduce use by 20% in five years.
4. Purchasing only fuel efficient vehicles for municipal use whenever available and practicable.

[1] From Department of Energy and Resources website, found on http://www.mass.gov
[2] From DOER website, found on: http://www.mass.gov
[3] Page on guidance documents on DOER website: http://www.mass.gov/?pageID=eoeeaterminal&L=3&L0=Home&L1=Energy%2c+Utilities+%26+Clean+Technologies&L2=Green+Communities&sid=Eoeea&b=terminalcontent&f=doer_green_communities_gc-grant-program&csid=Eoeea

5. Requiring all new residential construction over 3000 square feet and all new commercial and industrial real estate construction to reduce lifecycle energy costs by adoption of the Stretch code, which is an appendix to the standard base building code.

If a town's government meets these requirements,itmay apply to become a green community. Once accepted, it is eligible for a grant to be used for renewable energy projects. There are of course many finer details to the bill, as well as additional sections, but this encompasses the major points and objectives.

The act may be small in finance and notoriety, but it is nevertheless ambitious and progressive. The goals are incredibly high. In a time of new household technologies and growing population, to reduce energy usage by such an amount is to be fighting the trends of society as a whole. Unlike the international agreements of Copenhagen and Kyoto, the Green Communities Act does not bind towns into energy reduction. One of the more intelligent aspects of the acts design is that it places emphasis on incentive and cooperation in a society as a whole to act. By a more universal effort, greater goals can be achieved. This effort is spread throughout the layers of a society. It involves the participation of the government from the state to the local level, the utility companies, renewable energy technology manufacturers, and town's citizens who ultimately have a say in a town's decisions. All of these groups must collaborate if there is any chance of completing the act's goals.

All of the above groups comprised the potential range of focus of our IQP. The previous projects focused primarily on tracking the acts notoriety and progress to date through surveys and interviews. Ultimately we decided to examine the act from a different angle. As said before the act is very ambitious and progressive, and as with many actions of government, it is well intentioned. But however well-intentioned it may be, whether or not the act is functioning effectively to achieve its goalsis another question. We ultimately decided to focus on the act's functioning at the local level, where it is

intended to assist. We decided to work with a community that was considering becoming a Green Community, and to encourage them to apply while analyzing what factors encouraged or deterred them from doing it. Through the analysis portion we intended to examine the finer points of the act's operation at the local level to get some idea how effective it has been. Our attempts to fulfill these objectives first broughtus into contact with a regional representative of the Green Communities Division. From there we began researching the five criteria extensively to be able to better assist a town. Sometime later we got in touch with the town engineer of Douglas. We discussed assisting Douglas in its efforts to meet Criteria Three. As a way to learn more detail about the local level of the act, we attended a stretch code meeting on the town of Sutton. At the meeting, we cameinto contact with a HERS rater (HERS will be discussed later) and the Douglas town engineer. Several weeks later we attended a town meeting of the Douglas Energy Committee to introduce ourselves and discuss how we could assist them.

A single town will have little effect on the world's net carbon dioxide output. But we are a long way from achieving success against global warming. Right now the world is in the stage that requires simply beginning. The relevant question today is: who will act? That should be the current measure of progress and success. A single town can achieve a degree of progress in society by simply starting the process, and that, by today's standards is a success.

Criteria Summary and Explanations

The Five Green Communities Criteria:

Below is a synopsis and background of the five strictly enforced criteria which must be met by townships and cities in order to become eligible as a green community. After each description we lay out potential problems that towns may have with each individual criterion. A community can only achieve the 'green' status upon completion of all five of these criteria listed below. Some of the criteria differ greatly from one another, while others are very similar to each other. Each town must adopt a detailed plan of action, and fully immerse themselves in the available information in order to be effective. Planning assistants were also provided by the DOER, as aids to town representatives to not only help create an action plan, but also to educate and help town representatives better understand the Acts requirements and regulations. Towns who fully adopt all five criteria are making an important step to *"reduce energy consumption, pursue clean renewable and alternative energy projects, and provide for economic development in the clean energy sector."*[4]

Criteria 1 – As of Right Sighting

According to Section 22 of the Green Communities Act text:

"To qualify as a green community, a municipality or other local governmental body shall: . . . provide for the as-of-right siting of renewable or alternative energy generating facilities, renewable or alternative energy research and development facilities, or renewable or alternative energy manufacturing facilities in designated locations."[5]

The description above can sound complicated but it is in fact quite simple. First off, it is important to look at what the term "As of right sighting" actually means. A writer for the Hamilton-Wenham Chronicle, a local Massachusetts paper, recently wrote an article on how Hamilton and

[4]http://www.mass.gov/?pageID=eoeeaterminal&L=3&L0=Home&L1=Energy%2C+Utilities+%26+Clean+Technologies&L2=Green+Communities&sid=Eoeea&b=terminalcontent&f=doer_green_communities_gc-grant-program&csid=Eoeea

[5]http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter25a/Section10

Wenham were on the way to becoming a green community and she highlighted what "As of right sighting" meant for the community by saying:

"As-of-right siting means that specific site or sites chosen may be developed for the intended purpose described in the bylaw without the need for a special permit, variance, amendment, waiver, or other discretionary approval. However, the development is subject to site plan review to determine conformance with local, state and federal laws.[6]" –Sue Patrolia – Hamilton Wenham Chronicle

Some of the key questions and issues which towns get stuck on in criteria one include determining whether or not development is permitted "as of right", determining whether construction of an alternative energy manufacturing facility is allowed within the specific zoning guidelines of the town, (i.e. commercial, light commercial, industrial, residential, mixed use, etc.) and whether any additional development is feasible for the town within the zoning regulations. Smaller towns may have trouble due to sheer lack of size in general with not much to spare. However, larger towns may have already used up their available space for these sites. Fortunately, many towns already qualify for this criterion.

Criteria number two shares many similarities with that of the first, in that its mandatory implementation involves the adoption of an expedited application and permitting process with regards to the "as of right sighting" of proposed energy facilities.

Criteria 2 – Expedited Application and Permitting Process for "as of right" Energy Facilities

The expedited application and permit process applies within the municipality and helps ensure that projects involving "as of right" siting do not take longer than one year to receive final approval. The criteria only applies to "as of right" proposed energy facilities, assuming all permits for the facility can be approved and issued within the one year timeline.

[6]http://www.wickedlocal.com/hamilton/newsnow/x2034412333/As-of-right-siting-in-Green-Communities-program

It is also important to note that towns can also meet this requirement by adopting a stricter, 180 day timeline for the expedited permit process. This is referred to as Chapter 43D of the green communities Act.

Criteria 2: Expedited permitting process

One of the hardest things is the political opposition in this case. There may be members of the town who don't see the need to expedite permits for facilities like this that will initially cost the town money to erect.Most towns have few problems fulfilling the first two criteria.

Criteria 3 – The Energy Reduction Plan (ERP)

Criteria three of the Massachusetts Green Communities Grant Program has two significant pieces relating to energy usage throughout a municipality. The first of these is that the municipality must create some type of database of the energy usage for all municipal buildings, vehicles, and street and traffic lighting. This compilation of energy usage data for a municipality is referred to as the baseline, and should be created for the most recent year of complete data. The second part of this criteria mandates that any municipality seeking Green Community Grant funds must enact a comprehensive baseline reduction program. This program has to be developed to lower the baseline energy usage by twenty percent of the total within a five year period after the decided baseline year. This Energy Reduction Plan (ERP) is one of the most important pieces of the entire Green Communities Grant initiative, also requiring annual reports of a town's energy reductions. This criterion is among the most forward thinking of the entire set, and represents recognition of the need to more strictly control energy consumption.

The compiling of a list of all energy using items in a municipality is a monumental task by itself. Criteria three suggests several different software tools to assist in completing the energy inventory, including an EnergyStar portfolio manager and of particular note, the Department of Energy Resources' MassEnergyInsight program. Naturally there are several guidelines in criteria three that towns must follow to be eligible. One such guideline is that both public and regional must adopt the ERP, and additionally that the regional school district is required to create their own baseline which is assigned a particular percentage of the municipality's total baseline. A brief summary or description of the town including the town's population should also be included.

The municipality's baseline contains a summary of every known energy usage within the municipality. This means that all municipal buildings, vehicles, and municipally owned street and traffic light must be accounted for. The list of buildings is broken down further by the type of fuel used to heat them between oil, propane, natural gas, and any other fuels used. This separation is done in order to more easily identify the level of energy consumption by individual building or heating types. The vehicles section of the list should include those used for public school transit. This list may be broken down based on categories of vehicles which are exempt or non-exempt for consideration in the baseline based on another Green Communities criteria. The criteria referenced (criteria 4), applies to a town's number of vehicles along with their fuel usage rating and emissions quality. The list of lights in a municipality should be broken down into those owned by the town and those owned by the utility providing the energy to the lights. All those lights owned by the utility do not have to be included in the baseline. As a part of the guidelines for calculating the buildings' energy usage in each of the years, there are specific guidelines for any changes in the building stock of a town. The rules mandate that the building's addition to the list be included in the annual report in the year which the building was made operational, among a multitude of other considerations.

It is important for a town that is creating a baseline for any particular year to identify the Department of Energy Resources approved tool(s) used in doing so. The town must also clearly identify the applicable baseline year and the total municipal energy usage for that year, which is typically done through several pages of tables containing the items' type of energy consumed and the amount in a prescribed set of units. With these steps completed, it becomes much easier to identify poor efficiency and noticeable waste throughout the community. It can also greatly assist in recognizing areas of easiest improvement.

While not actually required, the summary section of criteria three also suggests that a municipality conduct energy audits. These audits will provide a town with the ability to understand the quantities of current energy usage at an even more individual level, while still creatively highlighting opportunities for energy reduction. By using audits, energy savings amounts can be easily determined by obtaining some information from equipment manufacturers regarding energy usage of current materials. If energy audits have been completed, they should be included in the summary or at the very least be noted in an attachment and cited as a resource. The second part of criteria three is a major challenge for all towns, and is typically considered among the highlights of the Green Communities Act.

While the first half of the document explains what needs to be done, the second half explains how to do it. There are several example charts that many towns can pull right from the document itself

and use themselves such as "Table 7" which is a table that shows a graphical schedule for implementation based on the quarters of a fiscal year. These provided examples help to decrease the challenge of creating the ERP.

This is definitely one of the most difficult for towns because of the time, effort and manpower required. Towns are required to use energy monitoring software to establish the energy consumption of each building in their town. They essentially inventory their energy consumption. This process is long and involved but not necessarily difficult. However, a lot of towns don't have the time or human resources to do this.

Criteria 4 – Fuel Efficient Vehicles

Criteria number 4 is put into place for the purpose of requiring adopting communities to purchase fuel efficient or zero emission vehicles in the future, for those vehicles which will be designated for municipal use. Completion of this criterion can differ from very quick and easy for some small towns that may only have a handful or less municipal vehicles, to one of the most time consuming and laborious of the five criteria for bigger cities and towns, with much more planning required regarding their municipal vehicles, according to Kelly Brown, regional coordinator of the DEP.

According to the Act:

"The purpose behind this criterion is to reduce carbon dioxide emissions by municipal vehicles, which has a positive impact on the environmental and saves the municipality money."[7]

It is important to document that according to the EPA's "Green Vehicle Guide" burning one gallon of gas contributes an estimated twenty gallons of carbon dioxide into the atmosphere[8]. It is for this reason that purchasing fuel efficient municipal vehicles with a high MPG and low emissions standards can have an enormous impact of the pollution created by municipalities themselves. In order to meet requirements for criteria number four, both the general government as well as the local school district which falls within that municipality is required to enact a fuel efficient vehicle policy.

The state has a specific MPG requirement plan for future purchases by towns according to the type of vehicle their municipality may require. (i.e. 2 wheel drive car, 4 wheel drive car, 2 wheel drive small pickup truck, full size pickup truck, etc.) The requirements are adjusted over time as new; more fuel efficient models become more commonplace in the automotive market. It requires towns to keep

[7]http://www.mass.gov/Eoeea/docs/doer/green_communities/grant_program/buying_fuel_efficient_vehicles.pdf
[8]http://www.epa.gov/greenvehicles/Aboutratings.do#aboutfueleconomy

up on their research to ensure they do not fall below acceptable standards when purchasing new vehicles for municipal use.

This criterion becomes an issue when towns look into the return on investment of the new vehicles. A lot of towns don't have the budget to replace all their town vehicles. Others just don't see the point in replacing them because they have to spend so much money to do so.

Criteria 5 – Stretch Code Adoption

The fifth and final criteria of the Green Communities Act is the adoption of document 780 CMR 115.AA, also commonly referred to as the "stretch code". Stretch code adoption is often one of the most time-consuming and detailed of the five criteria. It is also the criterion which commonly meets with the most resistance from towns and those who work in the building and contracting field. The stretch code provides a more energy efficient alternative to the base energy code for new and existing buildings.[9] The adoption of more strict building codes and energy requirements is commonly met with some resistance and negativity by those who may not understand or see the benefits from its adoption. The reason that this criterion is not easy to adopt, and meet Green Communities Act regulations, is due to the fact that the town must vote on the code via the most common forum available, which is generally through town meetings. If information and benefits are not well conveyed to townspeople of a given municipality than it increases the likelihood that the code will be voted down. Also important to add is that the stretch code may not be amended or changed by municipalities who seek to adopt it. It should be noted that, at some future date, the ASHRAE 2011 code will be adopted into the MA base code thereby making the stretch code a standard in the state.

As said before, opinions of the stretch code vary from town to town depending on its make-up. The degree to which a town is residential or commercial can affect a town's opinion. The provisions of the stretch code for **new** residential construction are as follows. New residential construction of 3 stories or less are required to meet a standard dictated by the HERS system. HERS, is the Home Energy Rating System. A zero score is a zero energy building; a 100 score a base code compliant building. The stretch code requires a score of 65 or lower for new construction over 3,000ft^2. Below 3,000ft^2 requires a score of 70. The scores are a percentage of energy as required by the 2006 International building code.

[9]http://www.mass.gov/?pageID=eoeeaterminal&L=3&L0=Home&L1=Energy%2C+Utilities+%26+Clean+Technologies&L2=Green+Communities&sid=Eoeea&b=terminalcontent&f=doer_green_communities_gc-grant-program&csid=Eoeea

For commercial construction, the stretch code has varying requirements based on size and type of building. First, commercial buildings below 5,000ft^2 are exempt. Also exempt are specialty buildings below 40,000ft^2. Buildings that could be considered "specialty" are supermarkets, laboratories, or warehouses depending on the circumstances. All commercial construction over 100,000ft^2, and specialty buildings over 40,000ft^2 are required to meet a 20% energy reduction below the base set by the 2007 ASHRAE 90.1 performance code. If these facilities should construct additions equal to or beyond 30% of the existing floor area, then these additions are subject to the 20% reduction as well. Medium commercial constructions of 5,000-100,000ft2 have two options; they can either meet the 20% ASHRAE level reduction, or take prescriptive energy saving measures based on the IECC 2009 Code Chapter 5. If they should construct additions equal to or greater than 30% of existing floor area which have their own heating systems, these additions are subject to the same energy saving measures.

For reference purposes, ASHRAE is the American Society of Heating Refrigerating and Air Conditioning Engineers. In intervals of a few years ASHRAE puts out a new standard code for building systems energy efficiency, which states, towns, or builders, may choose to adopt or not adopt.

Criterion 5 is the other challenging criteria for a lot of towns. A lot of opposition is due to the fact that people don't like change. The "stretch code" is essentially building code 3 years ahead of its time. Many people don't see the value in adopting stricter building code when the general population is willing to buy homes as is. Within the stretch code there are stricter guidelines for home effieciency. This applies to residential areas and would require builders and code officials to understand and meet these new, stricter requirements. To evaluate the thermal efficiency of the buildings, HERS raters are called in.in. they use sophisticated software to rate the house as compared to a 'perfect' house based on a home that follows code 100%. Towns have a hard time passing the stretch code because builders and code officials don't want to deal with extra hassle if they can't see a reason for it.

Application Process:

Upon feeling that it has satisfied the five criteria discussed above, a town may begin the application process to be designated a Green Community. At this point a town must begin assembling its work to meet the five criteria. This primarily involves; ensuring it has met the criteria, filling out an application for Green community designation, as well as an application for grants under the program. The Massachusetts Department of Energy Resources (DOER) provides assistance to towns in these three areas. This assistance comes in the form energy audits, planning assistance, and a series of regional coordinators to assists in the various Massachusetts regions.

Meeting the five criteria can be a time consuming process. In particular criteria three and five can be difficult. First, to assist towns with meeting the criteria the DOER provides guidance documents for each of the criteria. These documents provide an outline of what the community must achieve and walk them through how to do it. They leave the exact method of achieving it to the community, but specify the requirements of the criteria. For criteria 1-4 the DOER has provided model plans for meeting the criteria, these simply serve as guides. However, this is not always enough. Some of the criteria require a lot of time and effort for the town.

Once a community feels it has met the criteria and eligible to apply for Green community status, it has two options before doing so. A community can either fill out the application form, or before doing so apply for Planning Assistance. The Planning Assistance program provides assistance to communities in evaluating how well they have met the five criteria. This is provided by the DOER free of charge, but towns must still apply for it. For the Fiscal Year 2011, and the next round of Green Communities grants, applications for Planning assistance were due on October 1, 2010. The current round of planning assistance commences in December, and runs for 90 days until March 2011. If a community is granted Planning Assistance they are provided with up to 100 hours of consultation from the DOER. To

determine how well they have met the criteria, the DOER often relies on different departments to evaluate different criteria, such as the local DPW.

After feeling it has met the criteria, a community may now complete the application for Green Community's designation. The application itself is fairly straightforward. It has six sections. The first section is simply general town information such as: town name, demographics, govt. personnel, etc, and a certification of application form. The other five sections are details and documentation of the towns progress on the five criteria. Under the first criteria the town must provide the following:

- List of types of zoning it has granted for renewable energy generation, such as wind, solar, or photovoltaic.
- Documentation of: the town bylaw, identification of designated locations, copy of bylaw or ordinance, site plan review, and zoning map.

In addition, if the town has research and development facilities or manufacturing facilities, there is another similar set of documentation that must be provided for this. For criterion 2, the community must provide legal documentation of its expedited permitting process, and a guarantee that nothing will prevent it from taking effect within one year. Criterion 3 requires a full report on the communities plan to reduce baseline energy use by 20% across all municipally operated buildings, vehicles, streetlights, and traffic lights. Criterion 3 requires the following:

- Identification of the energy inventory tool used.
- Identification of baseline year used.
- Documentation of the results of the inventory.
- Specific energy conservation measures to be used, the reductions to be achieved, and a timetable of milestones for efficiency achievements.

- Documentation that town govt. and local school district have adopted the baseline energy reduction.

It is a requirement of criterion 3 that the local, or regional, school district adopt the energy reduction as well. Criterion 4 requires the following:

- Copy of policy of method for purchasing fuel efficient vehicles only.
- Inventory of non-exempt vehicles, including model year and mpg rating, with plans for replacements with fuel efficient vehicles.
- Documentation that both the town govt. and local, or regional, school district have adopted the fuel efficient vehicle policy.

For criterion five, the town must certify that it has adopted building code 780 CMR 115.AA. Which is the stretch code; the stretch code is appendix 155AA of the base building code. If the town has adopted some local process which is roughly equivalent to the stretch code, then it must provide documentation of this, along with details of how it will reduce life-cycle energy costs. Finally, towns have the option of requesting a waiver on a certain criteria. If the town has a reasonable reason that it cannot meet all of the requirements, then it may be waived so long as the town is dedicated to alternative measures that advance the Green Communities purpose. This is the full, but abbreviated, list of requirements for the Green Communities application. Application for the currently in progress round of Green Communities designations were due on November, 19 2010.

Upon receiving the Green Community designation, a town may now apply for a grant for renewable/alternative energy projects. Green Communities are designated in different in different rounds each year. Likewise, applications for grants are done in rounds. Towns applying for Green

Community status for the fiscal year 2011, may apply for grants beginning on December 17 and ending on January 21, 2011; this only for towns in the upcoming round of Green Community's designations. Existing towns are notified when future grant opportunities are available. In the current round of applications four million dollars in grants are available, with another expected round of grants in summer 2011.

The Application for Grants is more detail driven than the green community application, but not necessarily more difficult. The grant process has several ground rules, and guidelines that applicant towns must be aware of. First, every grant has a base size and additional funds are determined by:

- Per capita income and population allocation formula.
- Additional amount for communities that adopted as-of-right siting, or criteria one.
- An additional amount to regionally designated green communities.
- No grant will exceed 1 million dollars.

In addition, not more than 10% of the funds may be used for administrative costs. Annual reports are required on progress to maintain both Green community status and grants. The grant does not have to be for a specific project, but can be used to fund costs of studying, designing, and implementing energy efficiency activities.

For each project grant application a community must complete the entirety of the documentation required in the Grant Application guide. This documentation includes three sections:

1. Project narrative:
    - Project feasibility
    - Budget plan for the project.
2. Projected Energy and Climate impacts:

- Contribution to five year energy reduction plan, consistency with Green Community's criteria.
- Greenhouse gas reductions
- Cost/benefit ratio, amount of fossil fuel reduced by funds spent.

3. Projected economic development benefit:
   - Job creation/ Job retention
   - Other economic development benefits.

Once this is completed, along with the appendices, a town must fill out a set of tables. The tables consist of, type of project, funding requested, project annual energy savings, and a table of metric conversion for energy consumption reduction. The appendices to the Grant application contain further tables which require greater detail about expected energy savings, the exact measures taken, and in what sector or sectors of the town they will be implemented.

As final note, the DOER has designated regional coordinators for the four major section of Massachusetts, whose job it is to assist towns with all of the above. The regional coordinator for the central region is Kelly Brown, who is based in Worcester.

Progress to Date

It's impossible to deny, regardless of political motivation or influence, that the Green Communities Act has come a long way since it was signed into law in 2008. Since that time the state of Massachusetts has seen the program generate momentum through the help of agencies such as the Department of Energy Resources, the ICF International, and Massachusetts citizens alike.

The Green Communities program has garnered attention from the press and became national news soon after it was signed into law. In 2010 though, the program really showed its true potential for the first time, with the initial wave of green communities being named in late July[10]. It has been a tremendously interesting time to study and observe this Act being that it is still in its infancy as a state program and much can be gathered and learned.

We have had the privilege to evaluate and examine the Green Communities Act on a number of levels including the State level, city level, and small town level. We also had the opportunity to evaluate the impact of the Act on individual homeowners, who are both looking to remodel, as well as those who are building new construction.

When considering the current state of the Green Communities Act and what has happened to date, one must examine the political and socioeconomic impact that has walked hand and hand with it. On a town level the political element revolves around town selectmen, town managers, energy councils, and town meetings. Different elements of the Act resound with particular political influences and groups of people. For instance, Criteria Five of the Act is stretch code adoption, an element that provokes questions, uneasiness, and resistance from building contractors, code officials, and even city planners. The job of the DOER through regional coordinators such as Kelly Brown, and the ICF through planning assistants has been to educate and inform town officials as well as citizens alike. Planning assistants have been a valuable asset, especially to smaller towns which often lack the presence of a full time governing body or council. In addition to providing information and making the Act as clear as possible to citizens and town leadership, these planning assistants outline a timeframe for Green Communities Adoption within the town. Each planning assistant works with a single town for 90 days and gets them

[10]http://www.solarfeeds.com/brightstar-solar/15491-18-green-communities-approved-in-massachusetts

on the path towards criteria completion.[11] Often times though the most crucial piece of the equation for Green Communities adoption in a town is to have someone willing to take on the role in local government who feels strongly about it. "The best way to become a green community isto have someone willing to take the lead in that particular town."[12]

The funding of the Green Communities Act is generated through the auction and sale of carbon dioxide permits which are distributed by the RGGI, or Regional Greenhouse Gas Initiative. The RGGI is a non-profit corporation cooperative effort among ten states – Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont[13]. The permits are purchased by power generating facilities that create carbon dioxide emissions at their facilities. What it comes down to is these power generators are paying to pollute. The money from the sale of the permits is directly contributed to the available annual grant money for the Green Communities Act. Sometimes, but not always, permit money is allocated through MassCEC, or the Massachusetts Clean Energy Center which also provides grants, exemptions, and rebates to individuals and towns alike.[14] In 2010, the total dollar amount of available grant money distributed amongst the newly named green communities was 8.1 million dollars.[15]

To date, there have been 53 named green communities in the state, all of which reached certification in 2010, with 30 being named in the initial round and the remainder being named in the

[11]Interview with Kelly Brown, Regional Coordinator.DOER.
[12]Interview with John Odell – City of Worcester Energy Efficiency and Conservation Manager
[13]http://www.rggi.org/rggi. November, 2010
[14] Kate Ploud, Communications Manager - MassCEC
[15]http://www.wickedlocal.com/chelmsford/news/x1814120220/Chelmsford-to-recieve-state-grant-money-for-solar-panels-at-Parker-Middle-School#axzz1Ew2vXl9N

second round of certifications this past fall. The current green communities vary in size from 990 to 620,535 residents[16].

One of the core theories of this project revolved around our group's feeling that if we could provide clear concise examples of how the Green Communities Act affected different size communities, we could avoid creating any bias as well as provide the most insightful observations for those who might read this.

Worcester was named in the initial round of green communities in July of 2010. We found this interesting that a city the size of Worcester, population 175,454[17] (2006) was able to complete all five of the Green Communities criteria within the first round of certification. What we later learned through meeting with John O'Dell, Worcester's energy efficiency and conservation manager was that it is not necessarily a more daunting task to achieve Green Communities status as a major city as opposed to a small town. In fact, one of the benefits of larger cities who are trying to become Green Communities is that they generally have full time government officials who can dedicate their work to the process. On the other hand, small towns often rely on part time governments and have less manpower to dedicate to the Act.

One of the advantages that helped Worcester meet the first round of certification was that they already had a good jump start on some of the criteria due to energy conservation planning in the past. "When Green Communities came along, Worcester had already had an energy efficiency plan in effect. They had been doing an ESCO project with HoneyWell. Worcester had already planned for 18% reduction under the ESCO project; they only had to find two more percent to meet Criteria Three."[18]

[16]http://www.mass.gov/?pageID=eoeeasubtopic&L=3&L0=Home&L1=Energy%2C+Utilities+%26+Clean+Technologies&L2=Green+Communities&sid=Eoeea
[17]http://quickfacts.census.gov/qfd/states/25/2582000.html
[18] Interview with John Odell – City of Worcester Energy Efficiency and Conservation Manager

As is the case in many towns, stretch code adoption was the trickiest step for Worcester. City government officials were met with opposition from builders and contractors as well as many residents who simply did not have a fundamental understanding of the stretch code and anticipated it would affect them in a much more drastic way than it did. John O'Dell and the Worcester city government pitched these contractors on planning for the future and being a step ahead of the curve. "Worcester initially met opposition on stretch code from builders, but managed to convince them to accept it. The reason being, it would become the standard code three years in the future anyway. And, since the economy was down and builders didn't have much work, we convinced them that this would be the best time to retrain their employees on the future code."[19]

In many ways Worcester is the example of a smooth facilitation process to becoming a green community. Their city government and energy committees had been proactive in previous years and had created town ordinances and regulations with respect to energy conservation and being greener. These steps paid off greatly for Worcester when it came to Green Communities criteria. The city had already completed or nearly completed criteria 1, criteria 3, and criteria 4 before ever truly sitting down and trying to comply with the Act's specifications.

In order to get an unbiased view of towns though we felt it would be pertinent for us to examine the process of applying for Green Communities status as a small town. We were put in contact with Bill Cundiff, city planner for the town of Douglas, Massachusetts. In relation to Worcester, Douglas is a much smaller rural town with a population of 8460 people (2009). Douglas is located in southern, Massachusetts, bordered by Oxford and Sutton on the north; Uxbridge on the east; Burrillville, Rhode Island on the South; and Webster on the west. Douglas is 18 miles south of Worcester, 40 miles

[19]Interview with John Odell – City of Worcester Energy Efficiency and Conservation Manager

southwest of Boston, and 175 miles from New York City[20]. We were put in touch with Mr. Cundiff via Kelly Brown, Regional Coordinator at the DOER.

Douglas is currently in the process of applying for Green Community status, although they do not have many of the head starts and advantages that Worcester had. To start with, their government is comprised of only five selectmen and they follow a town meeting format for issues that require a town vote or consensus.[21] We had the opportunity to sit in on a Town of Douglas Energy committee meeting which was comprised of Bill Cundiff, and four other members of the committee. At this meeting the goal was to outline the town of Douglas' timeline for Green Communities adoption. (Please see the appendix of this paper to see a copy of the Douglas adoption timeline.)It was clear to see that there was not a lot of prior knowledge of the Green Communities Act by the members of the energy committee although Bill Cundiff did a very good job of giving the background of the program, and talking about its advantages and perks.

Douglas is certainly on its way to becoming a Green Community but they are truly being hindered by a lack of available manpower to dedicate to the task. Bill Cundiff who is spearheading the Green Communities adoption in Douglas also has many other responsibilities as town planner and cannot dedicate all of his time to the Act. It is clear that the town could use more involvement from citizens and government officials alike. Douglas has been utilizing ICF planning assistants who have been a great help in getting the town to complete Criteria One, getting them the knowledge on how to pass criteria number 5, and have helped them draft an expedited permit process letter for criteria number 2. The use of planning assistants is optional and must be applied for by the towns should they choose to utilize them. In Worcester's case they opted to not use planning assistants as they felt they had a significant handle on the application process. Planning assistants can be a great asset to smaller towns

[20]http://www.douglasma.org/annual/DouglasAnnual2009.pdf
[21]http://www.douglasma.org/annual/DouglasAnnual2009.pdf

like Douglas who cannot tackle the green community's application process in a timely fashion. Given our experience in Douglas it does not appear that there is insurmountable opposition to the stretch code, but like many towns there are people who want to hear more about how it affects them. Educating the citizens is the most important task, and the town of Douglas has helped do this by coordinating information sessions with the help of the DOER and the ICF, such as the one our group sat- in on. Other information sessions have been organized in local towns to educate contractors and code officials from the area, such as the one our group sat in on in the town of Sutton, MA.

Problems and Issues with the Act

As with any government act the Green Communities program is not without flaws. Some of the issues that arise are necessary evils of such an effort. Others are created by the act itself and the people involved. Still others are unavoidable. Determining how exactly to delegate responsibility for these problems is difficult. In spite of whether anybody is to blame, these problems will be encountered by towns on the path to Green Communities status.

Before discussing specific local level issues we briefly give an overview of issues at the state level. The Green Communities division receives 10 million dollars per year to allocate in grants. These grants are given out to be used specifically for energy efficiency projects. Under the act there is a surcharge of .5¢/kwH on all non-locally provided power.[22] This surcharge is placed into a renewable energy trust fund which funds grants for projects and rebates for energy efficiency. These grants and

[22] From text of the Green Communities act: http://www.malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter169

rebates are available to any energy project that shows promise, they are not part of the 10million dollars allocated to the Green Communities division. [23] The Massachusetts Clean Energy Center(MASCEC) was designated in the act is the recipient of all the revenue from the electric surcharge. From there they fulfill the previously stated intention of the fund. In addition to this, the power companies are forced to buy permits for carbon usage at auction. The auction is called the Regional Greenhouse Gas initiative, which is currently a ten state effort which states may choose to join. By entering into RGGI a state takes on a commitment to reduce carbon usage of the electric grid providers by 10% by the year 2018. Massachusetts has a carbon allowance of 26,260204 short tons, and this is due to drop to 23,634,183, short tons. When factoring in the 20% drop planned through green communities this becomes; 21,008,000 short tons of CO_2.[24] In the last auction permits were sold at 1.86$ per short ton. Between the states electric providers, this brings the total revenue to about 50 million dollars in revenue for 2010.

The issue here is one that involves politics, and depends on who is judging it. Many argue that a Cap and Trade program is not the right way to reduce energy usage. The free market vs. regulation is the issue at hand. The argument is that it upsets the natural business balance. This is partly justified as the energy providers now have the burden of the additional costs. How significant this is to them is debatable. NSTAR for example had a revenue of 2.9 billion dollars in 2010, while paying out 17million to Massachusetts for carbon permits.[25] But, cap and trade also forces progress to be made. The utilities are then forced to engage with communities and clean energy providers to bring clean technology to the state. So a portion of the RGGI funds helps fund these efforts by the power companies. Another issue is that of dealing with bureaucracy, and how effective overall the program is. Under the program 80% of

[23] MASSCEC website, and E-mail correspondence with MASSCEC.
[24] Data on CO2 usage and percentage reductions were provided by the Regional Greenhouse Gas Initiative website.
[25] Data found from publicly available financial statements of NSTAR, specifically was found under google finance page.

RGGI funds go to energy efficiency ultimately.[26] But Massachusetts then sends this money to several different places. It goes to the state government, to MASSCEC, to the utilities and to towns under green communities. Between these different destinations the proceeds change hands many times. Each division requires planning and time to delegate funds and organize efforts. In the end it is possible that a significant amount of the proceeds goes to waste between the time of auction and usage. Some of this loss is necessity, since companies need to spend a portion on the cost of personnel and man hours spent on relegating the funds. The issue, however, is whether there is significant inefficiency in the system; by simply using an overcomplicated system we often reduce the overall efficiency of our plans. Governments and companies need time to debate how to use funds, and usually don't agree at first. The bottom line is that large government can get in its own way generally speaking; this is not always the case but is a definite possibility.

Returning to focus on the local level, most of the issues of the act are in trying to meet the five criteria. As well spelled out as they are in the DOER guidance documents, enacting them is not so simple.

Most of the issues revolve around criteria three, and five. Criteria three is particularly difficult to accomplish. As stated, criteria three requires establishing of a baseline energy usage for a town and reducing this by 20% in five years. It requires an assessment of the energy usage of all municipal buildings, vehicles, and street and traffic lights. A small town of perhaps 3-7,000 people will obviously have far fewer things to evaluate than a large town. But through our experience in the project we have found that in either case the energy evaluation is extremely time consuming. Every building must be evaluated, and every vehicle inventoried and categorized. We have gotten the impression that this usually takes 2-3 months to complete in spite of all available resources. To evaluate energy use a town

[26] Regional Greenhouse Gas Initiative requirement, found under RGGI website

must establish a baseline for usage. To do this first requires evaluating municipal buildings. Floor area, building area, and heating/insulating properties must be taken from building plans or measurements and entered into records for evaluating energy efficiency of buildings. This will take a group of people working on the issue to achieve. This is in addition to the vehicle inventory. Fuel consumption of municipal vehicles is a portion of municipal energy use. Each vehicle must be inventoried in terms of model year, and fuel efficiency. This is a portion of criteria four as well which mandates the purchasing of only fuel efficient vehicles. Finally a town must compile its billing records of energy use. A single home will have monthly bills for water, electric, and gas; a town building is no different. But, the baseline year used for evaluating energy usage is not simply the most recent year. The year chosen depends on what is considered a typical year in energy consumption. If a new building should come online in a small town, or a significant upgrade is undertaken, then we probably cannot take this year as a baseline. The bills must be used to examine all past energy usage and their costs. When adding all bills from the last several years from all departments of a town, including schools, for every month, we will have an incredibly large amount of data gathered. That being said once the data is gathered it must be processed. Many towns will use MASS Energy Insight to evaluate town energy use. MASS Energy Insight is a free program run by the state for towns to use. The program lets a town see its monthly energy usages based on the entered Gas and Electric data from billing records. The data is categorized to help a town evaluate it.[27] At this point a town may attempt to define a baseline energy usage from which they can reduce consumption by 20%. As mentioned earlier in the paper, a town may apply for an energy audit from the DOER to assist with all of this.[28]

We see from the above that an extensive amount of work is required for criteria three. During our time at the Douglas town council meeting Bill Cundiff mentioned that he was requesting assistance

[27] Information from the above paragraph is primarily from interviews with and presentations from, people working on or with the act.
[28] Department of Energy and Resources website

on entering data on municipal buildings from heads of other town buildings as it was simply too much for one person alone. The essential issue here is the amount of work required for criteria three. Establishing a baseline is particularly difficult. It is not simply a matter of picking the latest year's consumption and then identifying how to reduce it. The amount of past monthly bills for gas and electric use spanning several years from a multitude of municipal towns is enormous. Douglas is a relatively small town of 7,000 people, but towns engineer Bill Cundiff had a very thick stack of papers containing past billing information. All of this must be processed for entry into MASS energy insight, if used. The number of bills and data for a city such as Worcester was likely enormous. Worcester had John O'Dell the city efficiency planner specifically working on this for several months with the Worcester city govt. to establish a baseline. This is opposed to the small town level where the city engineer is sometimes a part time employee. For any town large or small the energy evaluation is time consuming. MASS energy insight helps but is not perfect. It categorizes energy usage and tracks it month to month. But the program only gives base data, not in depth base information about specific points of consumption.[29] In addition the person receiving the training for the town to use MASS Energy insight must go through a short training session. But, due to the enormous amounts of data, Bill Cundiff for example has been forced to request permission of town council, and school boards of Douglas to request more training time for other Douglas personnel in the program. Thus MASS Energy insight is more a tool for establishing a baseline than identifying specific points of reduction in a town. The essence of this is that criteria three is incredibly time consuming and inexact. After finding all energy use and establishing a baseline, a town has to compile a detailed report about how they plan to make the reduction. This the DOER cannot help with the reduction plan, this is entirely up to the town. The shear amount of work involved can discourage a town from making the attempt to apply at all.

[29] Information in above paragraph comes primarily from discussions with Bill Cundiff, and John O'Dell

The next significant issue in applying for Green Communities is not nearly as rigorous in work involved, but still difficult in its own way. Criteria 5, as previously stated is the stretch code. The stretch code is usually a point of some protest in towns that are considering adopting it. The resistance comes almost entirely from the home building community, rather than commercial. Most builders are reluctant at first to adopt it. The stretch code requires greater seals on all surfaces on ducts, and on doorways, and windows. In addition to these, better insulation and heating/cooling efficiency is required. This obviously drives up construction costs. In addition, builders have to retrain their employees on the stretch code which can be time consuming.

Here we are truly examining the local level of the act. This criteria usually meets the most opposition in towns. While there is no actual problem with the act itself here, it is the local community that can be the source of problems. Mainly it's because people are weary of the costs, and don't understand the code. This is a significant issue. The opposition from the townspeople more often than not is due to ignorance. They do not understand all the provisions and misconstrue them. Such as one person that presenter Michael Berry mentioned at the Sutton Stretch Code Meeting we attended on January 27th. At a presentation he gave in a town near Cape Cod some time ago, he had a person become very angry assuming that if he wanted to remodel his kitchen he had to renovate his whole house to meet the code as well. That isn't true, Mr. Berry said he told him this and then the man settled down. This is somewhat common however since information on the stretch code is lacking currently. At the local govt. level politics can come into play. Town councils are often on occasion fearful of public anger if they enact it and the population is still largely ignorant of it. This concern is amplified during local election cycles for obvious reasons.

In addition, enacting the stretch code requires the town to reeducate local code officials, this is an issue for builders as well. Because of the necessary effort to reeducate, both parties often elect to

put it off entirely. It takes time to do this. But, this is an example of an issue which is created more so by the community than the act itself. From John O'Dell in Worcester we learned how the City of Worcester had handled this. They convinced the builders on the argument that the stretch code would soon become a part of the standard base code in 2012, and that now was the time to reeducate while the economy was slow. This seems to be the most sensible counter argument to delaying the inevitable. Then again, there are towns that simply aren't interested as well.

A significant portion of stretch code opposition comes from the builders as stated. But there is more to it than just the job of reeducating employees. During our meeting of the 4th of February with Russell Cole, a certified HERS rater by RESNET, we got onto the topic of the housing industry as a whole. He mentioned that the technology for higher efficiency homes has been around for years, what's needed is new application of it. And, in addition that home builders will build whatever the industry demands. This is most certainly true in a capitalist economy. Builders will build according to what the market has demanded. If there were a universal demand for higher efficiency homes they would answer it. But as things stand at the present time the market is not demanding it. The buildings contractors will produce partly based on the industry around them. The realtor's asses the value of a property, and the mortgage industry gives loans based on their own evaluation of the property. So the contractors build a particular home based largely on the expected value of the mortgage and real estate market. This expected value will of course depend on what the realtors and banks consider important components of a home. There is some conflict over what is important however.

The mortgage industry recognizes the energy future of a home as a legitimate way of assessing its value. So, in 1995 the Residential Services Network was founded to try to develop a universal rating system for home energy.[30] RESNET developed the HERS system of auditing the energy usage of a home.

[30] From RESNET website: http://www.resnet.us/about

This is a comprehensive evaluation of energy usage, including the use of the computer program REMRATE, which is a program for modeling all the parameters of a home.[31] The certified HERS rater will load all the detail specifications of a home such as wall thickness, exposure of basement foundation, volume of conditioned space, type of heating unit, etc, into the program. The program essentially rates the home against the ideal home of the 2009 IECC building code, which is the base code in Massachusetts. The builder can then make adjustments to the home before during or after construction. The evaluation process includes on-site inspections of a checklist of items of the house of course. With the combination of the modeling programs which apply science to the energy analysis, and the on-site inspection, the final rating is very accurate. This rating is taken into account in the value of a property for the purposes of obtaining a mortgage for a home. RESNET was founded for exactly that purpose.

The real estate industry however, is less inclined to factor in the energy future of a home into its value; or at least the energy future as determined by a source outside of the realty business.[32] They prefer to have the home value under their own control. As a result there is somewhat of a lack of science in determining the value of a home, and less emphasis on it in the industry. With less home value focused on the energy rating, the builders will by the principles of economics, build less to that end. As a result builders can often be reluctant to adopt the stretch code. This is not to say that all builders are this way, many have willingly adopted it, but to merely state that the industry sometimes fights progress unknowingly. Given that currently the country is in a state of recession, progress may be difficult in the near future.

The Green Communities division can assist with many of the above issues. The division has 4 regional coordinators for the state of Massachusetts. Their jobs are to educate and guide the towns in

[31] From interviews with Russell Cole
[32] From Interviews with Russell Cole and general research on the internet

their region about the details of the act, and applications process. They Green Communities division also has consultants in-house who assist the towns in need. The Green Communities division functions in league with the DOER to help towns. The Green Communities division primarily gives guidance and clarification to towns, in addition to being the evaluators of the applications, while the DOER will handle more of the technical assistance such as MASS Energy Insight and performing energy audits. We asked John O'Dell the Worcester city planner about working with the Green Communities division during their planning phase. First he noted that they were extremely helpful and accommodating to Worcester. He said, though, that they are very overstretched. They don't have enough consultants in-house, and are forced to do the best with the number they have. While it may not make or break the success of the act, achieving greater energy efficiency would proceed much more smoothly with greater capacity at the Green communities division. As we have noted in Douglas, the process for a relatively small town council can take well over a year to complete. If they, generally speaking, had greater resources available to assist the process could be much quicker. Towns could complete the process quicker and the numbers of towns applying could potentially increase each round.

Before moving on, we should note that not all of the above are issues with the Act itself. Many of these are created at the local level. Opposition to the stretch code for example is an issue at the local level, where a lack of knowledge creates opposition and makes adoption difficult. In immediate context the state cannot control the industry at large. The industry acts as it chooses to for itself and this often opposes the purposes of Green Communities. However, this issue is not within the Green Communities Act, it is an issue of government regulation at a large economic scale. We also have the issue of simply general opposition to the act at the local level. This is no one's fault however. A town's people may simply be opposed to adoption for one reason or another. Assuming this is not due to ignorance, it is simply a part of democracy and not something that can, or should be, controlled. There are some things however that the state has made more difficult than necessary. For one, the massive amounts data that

must be processed for the 20% energy reduction can overwhelm smaller towns. This is because of the Act's strict data gathering requirements for towns to establish a baseline. It may be justified, but the state needs to provide more assistance to towns in progress on the third criteria. We reach a similar conclusion for the Green Communities division. The Act's success could be sped up considerably were the state to provide more funding for in-house consultants. New legislation with ambitious goals cannot be expected to progress without adequate resources allocated. It's a simple principle of science that you get out of something what you put in to it. However, we acknowledge that in a time of economic recession when the state's budget is very tight it would be difficult to increase funding.

Summary of Experiences

Preceding our conclusions about the act we thought we would detail our progress and experience's working on the act. The following section summarizes the course of events that led us to decide where to take the project, and where the project ended up going. We moved from purely research A-term, to directly engaging in the community C-Term.[33]

Our project began at the start of A-term 2010. We spent the majority of A-Term researching the Act. We studied the criteria, the regional greenhouse gas initiative, the state and local governments, and projects undertaken by the act. We also to some degree studied simply the field of renewable energy. After about 4-5 weeks of this we met to decide where to take the project. After some discussion we ended up on the idea of working with a town to try to convince them to become a green community. This was proposed but we soon found that it would have to be modified. Given our choices

[33] All references in this section to criteria, and different aspects of their details will be explained in the following sections.

for towns and project timetable this would most likely not have worked. We modified our project goal to working with a community and trying to convince them to become a green community, while analyzing what encouraged or deterred them from doing so. Beginning B-Term we started this process.

Not sure of what to communities to work with, we decided that we should consult with someone who could advise us on where to look. We contacted the Regional Coordinator for the Green Communities division Kelly Brown. After agreeing to meet with us, we met her at the Department of Environmental Protection offices in Worcester, on Friday the 12th of November. We discussed our project, and the green communities act as a whole. She knew exactly what we needed to know. We discussed the surrounding towns with her, and whom we should contact. At this point we still intended to try to guide a community to apply for Green Community status. We realized after our meeting however that was unrealistic. She informed us that most towns preferred the help of the DOER and Green Communities division. She suggested that we could assist a town on meeting a particular criterion. She offered to contact some towns for us after planning assistance applications were due the next Friday, as this would give a good indication of what towns were going to apply for green community status in the near future. She made the final suggestion that we study extensively the 5 criteria, so that we would be fully prepared to assist a town when the time came.

We had a follow up meeting with her on the second of December, where we discussed more of the details of the criteria. She was still contacting towns at this point, so we kept studying the criteria for the time being. This was the focus of our second report. At the end of B-term she informed us that the town of Douglas was interested and that Bill Cundiff, the town engineer, would contact us some time about working with us. He got in touch with us on the first of January. After exchanging e-mails for two weeks, we talked with him by phone and arranged to meet him at some point during the Sutton stretch code meeting on the 27th of January that Kelly Brown had informed us of. We ended up getting

much more from the meeting than anticipated. We met the presenters, Michael Berry and NSTAR representative, LeironBiton an ICF consultant, and Russell Cole a HERS rater, HERS is explained in the criteria section. We got contact information from all of them, and discussed possibly meeting with them at some point. We then met Bill Cundiff. We talked with him about where Douglas needed assistance, and what we could do for them. We arranged to talk by phone at some point to discuss it further.

Sometime later we decided to meet with the HERS rater Russell Cole. We felt that his role was most in line with our studying of the criteria. The stretch code of course being one of the most significant criteria. We contacted him, and arranged a meeting for the fourth of February. We met with him for about an hour and a half. We discussed a range of issues centered around the stretch code and the HERS system, along with discussion of the housing and mortgage industry's role. Before the end he offered to show us some of the programs used to model home energy usage. We thought it would benefit the project further and we all arranged a meeting for Wednesday the 16th of February. During that time we also arranged to attend the Town of Douglas' Energy Committee meeting for the same day. This meeting was rescheduled from two weeks prior, as it had been postponed due to snow. During the gap times we continued to study the criteria.

On the 16th we arrived at Russell Coles house for our meeting. We were running a bit late, and had the Energy Committee meeting shortly, so we had about an hour and fifteen minutes. He walked us through the use of the program REMRATE, which is designed to model as accurately as possible the energy usage of a home. We then left at about six thirty for the meeting. We met with Bill Cundiff before hand and discussed what Douglas could use assistance on. He asked our help collecting and organizing information for Douglas' energy audit for criteria three. During the course of the meeting we got a look at Douglas' timetable for Green Communities adoption, and how far along they were. He introduced us to the council, and told them what we would be doing for Douglas.

Conclusions

Given our experiences and knowledge that have been accrued over the last six months, we feel we can accurately reach several conclusions based on our findings. The Green Communities Act is still in its early stages as a legislative Act and much more research can expand upon our findings in the coming years. Our belief is that the following conclusions should be of use to anyone furthering research on the Green Communities topic.

We see the Green Communities Act as a positive piece of legislation that is fundamentally well intentioned towards Massachusetts communities and citizens alike. We acknowledge that political influence plays an important role in how people perceive the Green Communities Act. In many cases we found that politics plays a more prominent role than we initially expected, particularly in our experience working on the town level. However, the way in which the Act is perceived is partly dependent on the political affiliations of the individual. Regardless of political affiliation, we feel that the Act is a forward thinking and progressive piece of legislation. Politically, opposition often depends on the size and demographics of particular towns, making it easier to enact the program in some towns rather than others.

Many variables determine the feasibility of Green Communities adoption. Population size, town government structure, and timing play important roles in determining this feasibility. Some towns currently have priorities that lie ahead of completion of the Act's criteria. Others have additional qualifications such as municipal lighting facilities which provide cheaper electricity therefore there is less incentive to adopt the Act. One major variable is how the Act affects different sized towns and cities. From our experiences working with representatives from both a major city and small town, we have determined that it greatly affects the resources each would need in different ways. We feel that the Act

could cater more so to smaller towns that may have a more challenging time meeting the current criteria. We feel that to help move the act forward more quickly in smaller towns ICF as well as the Green communities division could provide more planning assistance and consultants.

Many towns are weary of implementing the stretch code and Criteria Four due to the costs involved. Many Massachusetts towns are operating on strict budgets which may not leave much extra financial flexibility for Green Communities implementation. In particular, Criteria Four can be a financial burden, requiring replacement of municipal vehicles with more fuel efficient ones. Towns generally prefer to recycle or replace their municipal vehicles with lower cost alternative models as opposed to purchasing higher fuel efficiency vehicles. In many small towns in particular, a lack of human capital can restrict the pace of completion of the five criteria. Criteria Three, four, and five, are especially time consuming and labor intensive and often take the longest to complete. By contrast larger towns have the flexibility to hire additional staff to work specifically on the needs of the green communities act. The town of Worcester, for example, had previously established an energy oversight and efficiency project headed by John O'Dell, the city efficiency planner. This project, begun in 2005, gave Worcester a head start on completing three of the five criteria.

The make-up of the Green Communities Act invokes many questions within the community, but few questions garner more uncertainness than those about the Stretch code. As we learned during the duration of this project, the stretch code is a volatile criterion that can often deter skeptics from becoming further involved in the Green Communities. Having sat in on two separate information sessions regarding Green Communities Criteria completion on a town and regional level, it is fair to say that people often come in with a lack of detailed knowledge on he stretch code. In the examples we witnessed, people's questions and hesitance was quelled after they simply were educated on the code. Many contractors and builders are understandably hesitant to work primarily in a town or area that is

adhering to a different building code. In many cases when contractors heard that the stretch code for 2010 will be the base building code for Massachusetts in 2013, they saw it in a more favorable light. As a group we believe the most important next step for the Green Communities education is to help townspeople better understand the stretch code and what it consists of.

Information about the Green Communities Act has been circulated throughout Massachusetts. However, many citizens haven't heard about it. Lack of information is one of several problems facing the adoption of the Act because people aren't willing to commit time and effort to something that they don't understand. To combat this, the DOER holds meetings run by ICF planning assistants and brings in people like Russell Cole to bring information to the general public and town officials alike. However, those meetings don't get out to the general public who are the people affected.

Through all of our combined research items, the group has found that despite all of the argument associated with the adoption and incorporation of the Green Communities criteria, the Act itself has effectively controlled energy usage in Massachusetts. The Act has sparked the installation of numerous rooftop solar panel arrays, and several individual wind turbines and turbine farms in over fifty fully designated Green Communities across Massachusetts. The number of communities that have attained Green designation has increased steadily with the passing qualification periods. The impact of Green Communities programs in one town frequently spreads to neighboring towns, simply because of the positive changes observed in one area. The monetary savings alone have had enough of an influence to convert a few towns to believe in the benefits of the Act. The secondary environmental preservation and quality of life elements boosted by the Act have become glaringly apparent as the Green Communities has progressed since 2008. Based on the overall purpose of the Act, our group believes that it's very tough to argue that it has not been successful.

As stated we all agreed that the Green Communities Act is essentially well intentioned and more good than bad. Whether or not the Act achieves its goals of 20% energy reduction by 2020 will take time to determine. Nevertheless, in our time the goal is taking action and beginning the process toward energy efficiency. The state has done this with the Green Communities act and deserves credit for it. Therefore we can say that at the grand level the Act is a success. At the lower levels where we examine the details of the act, we can see issues and points that need to be addressed. Some of these are the result of the way the state organizes the act, others are the fault of the towns or communities as a whole. With added emphasis by the state the act could become much more significant and effective. It could achieve its means much more quickly. However, this is not to say that overall it is flawed. We believe that the organization of the act is good, requiring only minor adjustments. In our experience dealing directly with the communities and representatives of the Act, we found that on the whole that the act is well run. The personnel working either in towns, for towns, or with towns, know their jobs to the letter and effectively assist the community. This is the major success of the act: its excellent organization and guidance. We believe that in the future the act will meet its goals only if enough towns join the act. To date 53 towns have joined the act since the first designations in May 2010. We believe that although this number will continue to increase, the rate that towns join may slow in the future. This could be due to the initial coverage of it fading, and the economic recession. Nevertheless it is progress at the very least.

Additional Research Possibilities

The topic of environmental conservation and awareness has sparked a vast amount of debate and controversy. It is only natural that with a topic of this magnitude and a timeframe of research and discussion limited to seven weeks, not every aspect can be assessed in infinite detail. While our group's research of the Green Communities Act has been somewhat limited by our timeframe and resources, groups of students after us will undoubtedly want to develop a better understanding of the Green Communities Act as well. One of our responsibilities in completing this project is to provide a basis for deeper research to future students through the most interesting, but unfinished qualities of the research our group has done. The best of these incomplete leads are the unforeseen political arguments that adoption of the Act invokes, the intentions of the act masking rapidly adjusting future needs, and the practicality of applying the Green Communities criteria, or similar practices in a considerably wider range of economic and social environments. Even though our group has made some definitive conclusions about these topics, we understand that there is much more to be gained from looking into each one with a perspective more enamored with the details.

The stated goal of the Green Communities Act is to reduce electric bills, promote the development of renewable energy, and stimulate the clean energy industry. This statement implies that these are the goals of the Green Communities Act for all participants to reach. Achieving these goals however, demands that the town and state governments are involved for needs of approval and financial analysis. We have learned that this is where many issues impeding the implementation of Green Communities practices begin. In an interview with Mr. Russell Cole, a Home Energy Ratings System, or HERS, rater, he suggested that a large part of the opposition to the Green Communities Act comes from builders and contractors who are unhappy with the need to conform to a unique set of guidelines, called stretch building codes. The unwillingness of this group to accept the understandably

intimidating changes coupled with a commonly unclear knowledge of the act at the town government level, has led to struggles in passing the Act in some cases. Whether the Green Communities designation and funding is a lesser priority or the benefits of the act are believed to be outweighed by the necessary time and resource commitment is something to be investigated further. Something else worth discussing is the reasoning for particular cases of opposition, and trying to find reasonable agreements to alleviate such concerns.

It may not be immediately agreed upon specifically that the Green Communities Act is right for a town at the current time. It can almost certainly be agreed upon however, that the Green Communities Act of Massachusetts seeks to address an increasingly relevant and deeply complicated issue. The amount of energy usage will vary between towns and even between buildings, and the Green Communities Act virtually forces those who wish to abide by it to accurately understand the sum of these uses. The Act's optional nature might imply that energy efficiency and controlled consumption is a topic of only nominal interest. It would be immensely beneficial to look at the Green Communities Act as a starting point to a future of energy and conservation awareness. The Green Communities Act is the first legitimate law devoted entirely to assessing energy, and represents the beginning of an appreciable shift in priorities. The Act may be progressive by today's standards, but its implications moving forward deserve considerable attention.

A deeper look at the words of the Green Communities Act does not explicitly limit the opportunities it affords to any one group of people. Unfortunately this does not mean that everyone benefits from the Green Communities Act. The relatively strict stipulations of the criteria prevent some towns from being able to participate. In order for towns to effectively apply the Green Communities programs, they have to devote a significant amount of financial resources and human capital. The need for resources differs from town to town based on the size and existing information and permitting processes. The comparisons between Worcester and Douglas were the most interesting thing that we

found. Worcester already had a well-defined permitting system, energy use data, town vehicle data, and the human and monetary resources available to focus on earning the Green Communities designation. Douglas on the other hand, had only completed the easiest criteria, the expedited as-of-right processes. Their smaller town government lacks the time and resources necessary. It is also likely that because of the size of the town, passing the Green Communities Act is much lower on the list of priorities when compared to day to day functions. We think that a very worthwhile study would be to compare the economic and social environments in which the Green Communities Act has been the most successful.

To Those Involved

Neither this wealth of information nor this final report could have come together without the help of several dedicated people, whom we would like to thank. First of all we want to thank Ms. Kelly Brown, the regional coordinator for the Green Communities initiative in central Massachusetts, who was able to provide tremendous information about individual towns' involvement with the Green Communities Act in the region. Kelly also connected us with Mr. John O'dell, Worcester's energy efficiency and conservation manager, who was able to come to WPI to discuss the Act and how it was successfully applied in Worcester. We would also like to thank the town councils of the towns of Sutton and Douglas Massachusetts, who allowed us to attend meetings in their towns regarding the implementation of the building stretch code and the timeline for completion of specific criteria respectively. We would also like to thank Leiran Biton, and Michael Berry, presenters at the Sutton stretch code meeting, who took time to meet with us following the meeting to speak with us. We would also very sincerely like to thank Bill Cundiff for allowing us to attend the Douglas town meeting about their plan to earn Green Communities designation, and also for allowing us to aid the town in attempting to complete criterion 3. This opportunity gave us a much more personal view of what kind of investment the Green Communities Act demands. We would also especially like to thank Home Energy Solutions president, and HERS rater Russell Cole. Russell, who was a keynote speaker at the Sutton town meeting, initially met with us at WPI for a discussion about the unseen politics that are debated when looking at the Green Communities Act. Russell also invited us to his home, and gave us a first-hand demonstration of his home energy analysis tools while explaining the role of a HERS rater in improving energy efficiency, and assisting in compliance with the building stretch code criterion of the Act. Finally we would like to thank Professor Kent Rissmiller, who oversaw the entire project from concept to product, providing incalculable amounts of guidance and support.

Bibliography of Used Sources:

Below is list of sources that provided us with bulk of our knowledge on the act. Many of them are used in the paper, some were never needed. Nevertheless, all of them played a role at some point in guiding us. All of those used in the paper were cited in the text.

- Three year Mass. Energy efficiency plan for 2010-2012:

http://www.mass.gov/?pageID=eoeeamodulechunk&L=5&L0=Home&L1=Grants+%26+Technical+Assistance&L2=Guidance+%26+Technical+Assistance&L3=Agencies+and+Divisions&L4=Department+of+Public+Utilities+(DPU)&sid=Eoeea&b=terminalcontent&f=dpu_1-28-10_dpu_ord_09-116-09-128&csid=Eoeea

- Fiscal year 2011 Massachusetts state budget: direct link to energy page. Contains full info on past and present state spending in every department.

http://www.mass.gov/bb/gaa/fy2011/app_11/dpt_11/hene.htm

- Article on awards of for energy efficiency in MA:

http://www.mass.gov/?pageID=eoeeapressrelease&L=1&L0=Home&sid=Eoeea&b=pressrelease&f=100318_pr_high_perf_buildings1&csid=Eoeea

- Webpage on the awarded stimulus dollars in MA for energy efficiency and renewable energy:

http://www.mass.gov/?pageID=eoeeaterminal&L=5&L0=Home&L1=Energy%2c+Utilities+%26+Clean+Technologies&L2=Resources+for+Current+Economic+Conditions&L3=Recovery+and+Reinvestment+-+Clean+Energy+and+Environment&L4=Energy+Recovery+Dollars+at+Work&sid=Eoeea&b=terminalcontent&f=doer_arra_stimulus-funds&csid=Eoeea

- (Direct link to MA statewide energy efficiency plan 2010-2012. Proceeds distribution is on P. 58-60.)

http://www.ma-eeac.org/docs/DPU-filing/ElectricPlanFinalOct09.pdf

- Article on home owned by Alex Cheimets, and how the state assisted him as part of Zero energy research to do massive energy saving renovations to his home.

http://www.mass.gov/Eoeea/docs/doer/Zero_Net_Energy_Buildings/Arlington%20Case%20FINAL.pdf

- Story of man who renovated his house for energy efficiency and got numerous rebates and tax credits for his renovation and solar panels for the state govt. and power company National Grid.

http://www.mass.gov/Eoeea/docs/doer/Zero_Net_Energy_Buildings/Gloucester%20Case%20FINAL.pdf

- Main page on zero energy web site on efficient home renovations in MA:

http://www.mass.gov/?pageID=eoeeaterminal&L=4&L0=Home&L1=Energy%2c+Utilities+%26+Clean+Technologies&L2=Energy+Efficiency&L3=Zero+Net+Energy+Buildings+(ZNEB)&sid=Eoeea&b=terminalcontent&f=doer_Zero_Net_Energy_Buildings_Case_Studies&csid=Eoeea

- Article from 2008, after bills passing, summarizing the bill and its benefits:

http://www.mass.gov/?pageID=gov3pressrelease&L=1&L0=Home&sid=Agov3&b=pressrelease&f=080702_bill_energy_clean&csid=Agov3

- Article on Grants to Springfield and Belchertown under Green communities division:

http://www.masslive.com/news/index.ssf/2010/05/springfield_in_line_for_900000.html

- Article on the Worcester zoning ordinance improvements, specifically laying out guidelines for private ownership of wind turbines.

http://www.env.state.ma.us/eea/green_communities/library/worcester_zoning_ordinance_wind.pdf

- Information on the Regional Greenhouse Gas initiative: Includes information on full details of the program, how many allowances there are per state, the price they are sold at, who bought them, and the long term reduction goal.

http://www.rggi.org/home

- Green communities page(not part of DOER website.). Has a full summary of the Green communities act:

http://greencommunitiesact.com/

- Link to Page on detailed MA state Budget, at bottom contains current budget for FY 2011.

http://www.malegislature.gov/Budget/BudgetBreakdown

- Link to Page on MA energy expenditures:

http://www.eia.doe.gov/states/sep_sum/html/pdf/rank_pr.pdf

- Link to U.S. energy website page on Massachusetts energy Data:

http://www.eia.gov/state/state_energy_profiles.cfm?sid=MA

- Article on cost of solar energy on average, compared to other sources:

http://greenecon.net/understanding-the-cost-of-solar-energy/energy_economics.html

- Link to page on DOER website on alternative fuel vehicles, and meetings held on them for coalition for clean cities.http://www.mass.gov/?pageID=eoeeaterminal&L=3&L0=Home&L1=Energy%2c+Utilities+

%26+Clean+Technologies&L2=Alternative+Transportation&sid=Eoeea&b=terminalcontent&f=doer_clean_cities_about-ccc&csid=Eoeea

- Link to page on Biodiesel in MA:

http://www.mass.gov/?pageID=eoeeaterminal&L=3&L0=Home&L1=Energy%2C+Utilities+%26+Clean+Technologies&L2=Alternative+Transportation&sid=Eoeea&b=terminalcontent&f=doer_alternative_fuels_biodiesel-afv&csid=Eoeea

- Text of the Green Communities act itself:

http://www.malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter169

- Link to US census data on Shrewsbury:

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=shrewsbury&_cityTown=shrewsbury&_state=04000US25&_zip=&_lang=en&_sse=on&pctxt=fph&pgsl=010

- Link to map on MASSCEC site of different electrical providers and their locations in MA:

http://masscec.com/masscec/file/ElectricUtilityMap.pdf

- Link to WPI projects page:

http://www.wpi.edu/academics/Projects/started.html

- Link to Guidance documents of the Five Green Communities Criteria:

http://www.mass.gov/?pageID=eoeeaterminal&L=3&L0=Home&L1=Energy%2c+Utilities+%26+Clean+Technologies&L2=Green+Communities&sid=Eoeea&b=terminalcontent&f=doer_green_communities_gc-grant-program&csid=Eoeea

- Link to ASHRAE Page which contains document summarizing the 90.1-2007 code, which is required for certain energy efficiency requirements under the MA stretch code.

http://www.ashrae.org/technology/page/548

- Link to specific page on the Green Communities criteria website, containing the full 8th edition MA State Base Building Code, Appendix 115AA is toward the bottom.

http://www.mass.gov/?pageID=eopsterminal&L=4&L0=Home&L1=Consumer+Protection+%26+Business+Licensing&L2=License+Type+by+Business+Area&L3=Construction+Supervisor+License&sid=Eeops&b=terminalcontent&f=dps_bbrs_code_8th_edition&csid=Eeops

- Link past IQP projects page:

http://www.wpi.edu/Pubs/E-project/browse/iqp_by_advisor/r.html

- Additional citations found in this document:

http://www.douglasma.org/annual/DouglasAnnual2009.pdf

http://www.wickedlocal.com/chelmsford/news/x1814120220/Chelmsford-to-recieve-state-grant-money-for-solar-panels-at-Parker-Middle-School#axzz1Ew2vXI9N

http://quickfacts.census.gov/qfd/states/25/2582000.html

Interview with Kelly Brown, Regional Coordinator.DOER.

Interview with John Odell – City of Worcester Energy Efficiency and Conservation Manager

Kate Plourd, Communications Manager - MassCEC

News article on latest round of Green Communities designations

http://www.solarfeeds.com/brightstar-solar/15491-18-green-communities-approved-in-massachusetts

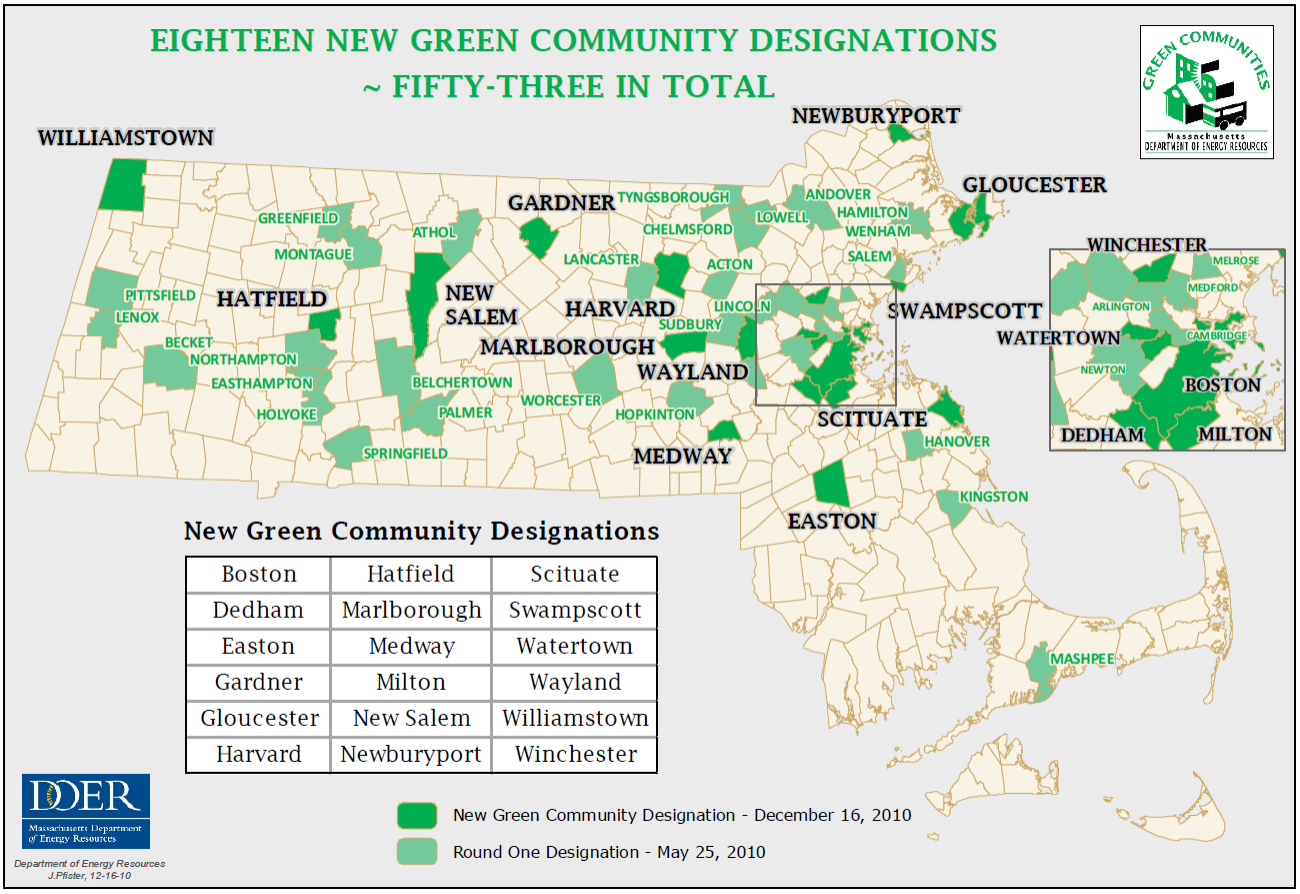
Link to RESNET website

http://www.resnet.us/about

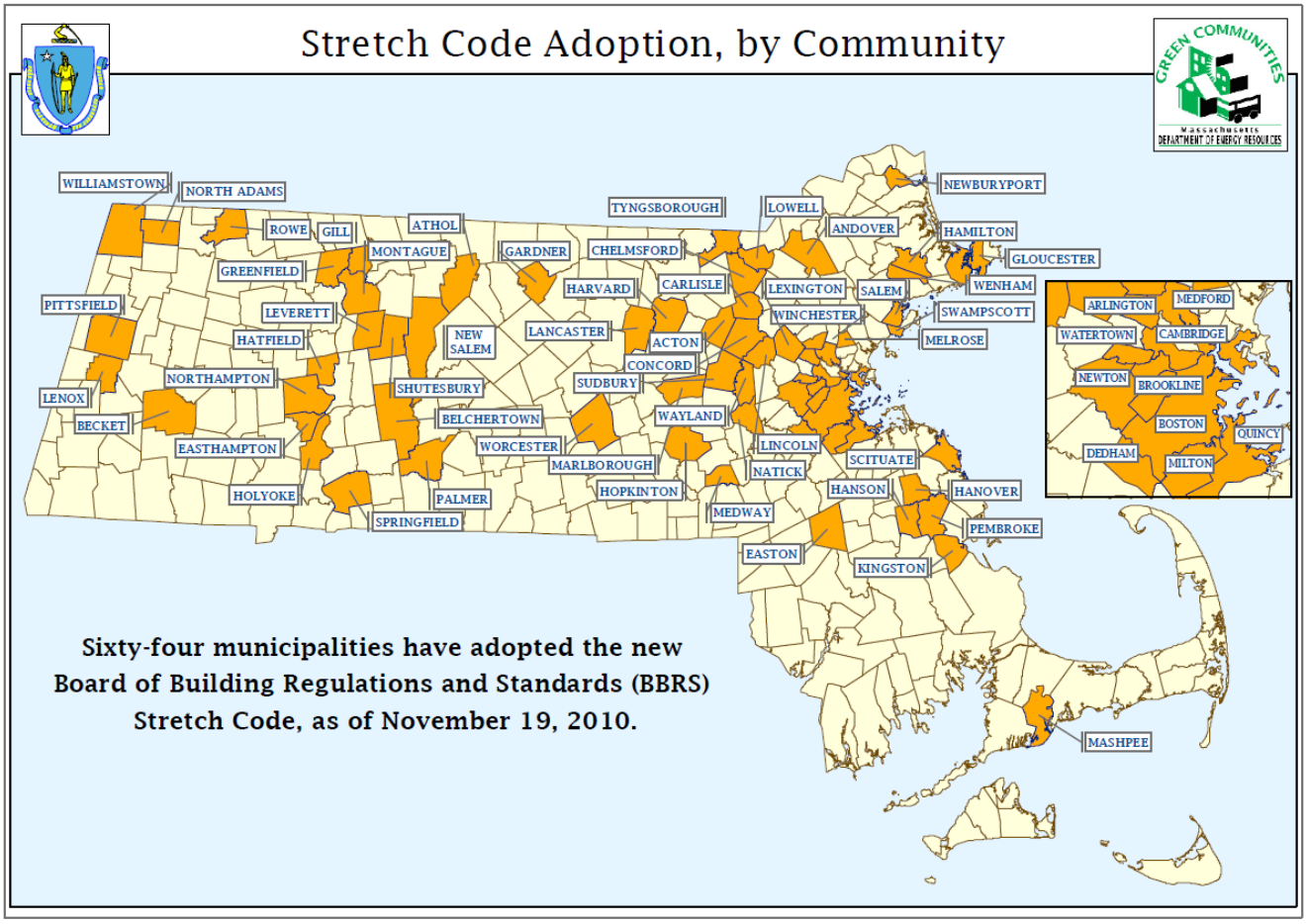
Appendices:

Below we have included various materials that are useful references. They provide a good look at some of what has been discussed in our paper.

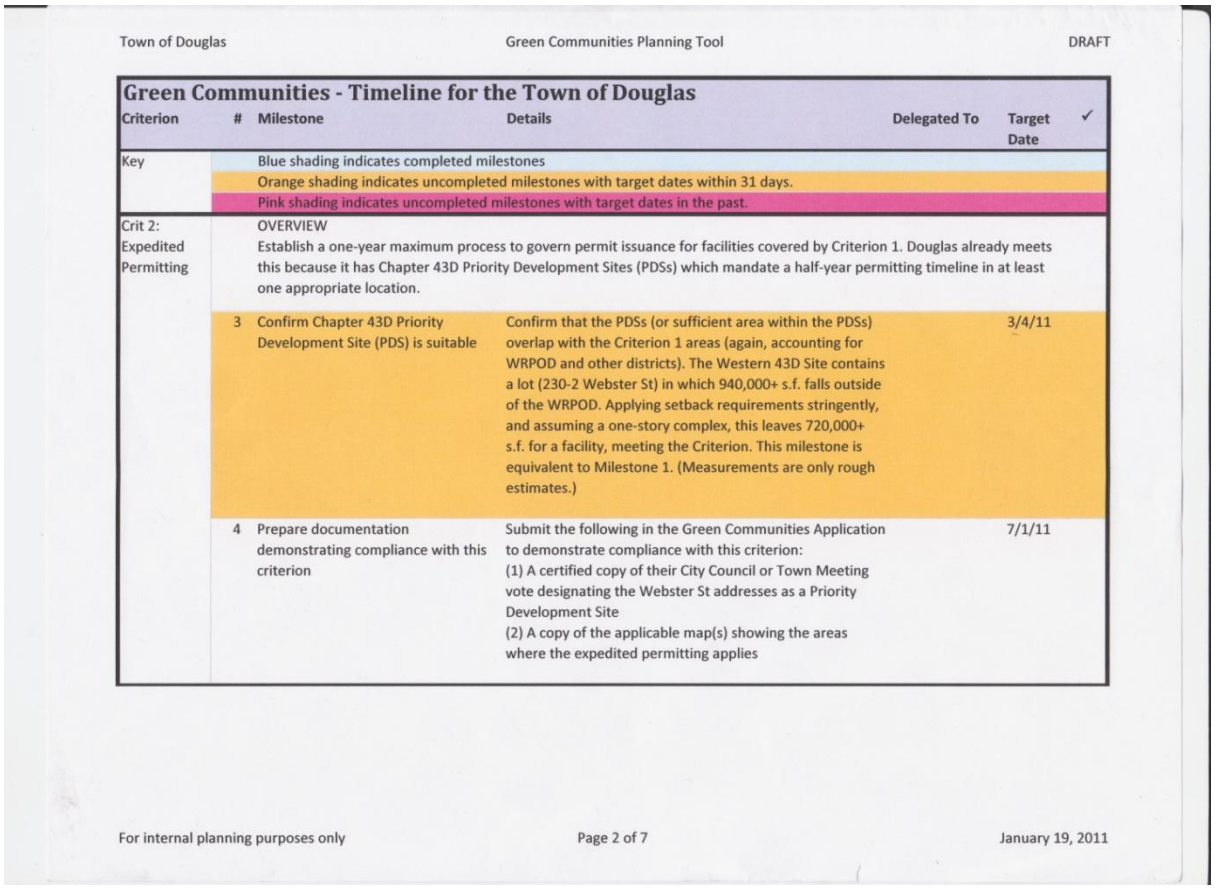
Below is the DOER provided map of the 53 Green Communities. The round of designation is shown on the map.



Below is the map of the 64 towns that have adopted the stretch code as of this date. We were informed by Kelly Brown that these maps are updated as soon as possible after new towns join.



Below we have the detailed schedule of adoption for the Town of Douglas. These documents were given to us by Bill Cundiff at the Douglas Energy Committee meeting. They outline Douglas' plan for Green Communities adoption. They include their time table, which ends in March of 2012, and the necessary tasks to accomplish as well as how they will be done. They go in the order of the criteria.



Town of Douglas | Green Communities Planning Tool | DRAFT

Green Communities - Timeline for the Town of Douglas

Criterion	#	Milestone	Details	Delegated To	Target Date	✓
Key		Blue shading indicates completed milestones				
		Orange shading indicates uncompleted milestones with target dates within 31 days.				
		Pink shading indicates uncompleted milestones with target dates in the past.				
Crit 2: Expedited Permitting		OVERVIEW Establish a one-year maximum process to govern permit issuance for facilities covered by Criterion 1. Douglas already meets this because it has Chapter 43D Priority Development Sites (PDSs) which mandate a half-year permitting timeline in at least one appropriate location.				
	3	Confirm Chapter 43D Priority Development Site (PDS) is suitable	Confirm that the PDSs (or sufficient area within the PDSs) overlap with the Criterion 1 areas (again, accounting for WRPOD and other districts). The Western 43D Site contains a lot (230-2 Webster St) in which 940,000+ s.f. falls outside of the WRPOD. Applying setback requirements stringently, and assuming a one-story complex, this leaves 720,000+ s.f. for a facility, meeting the Criterion. This milestone is equivalent to Milestone 1. (Measurements are only rough estimates.)		3/4/11	
	4	Prepare documentation demonstrating compliance with this criterion	Submit the following in the Green Communities Application to demonstrate compliance with this criterion: (1) A certified copy of their City Council or Town Meeting vote designating the Webster St addresses as a Priority Development Site (2) A copy of the applicable map(s) showing the areas where the expedited permitting applies		7/1/11	

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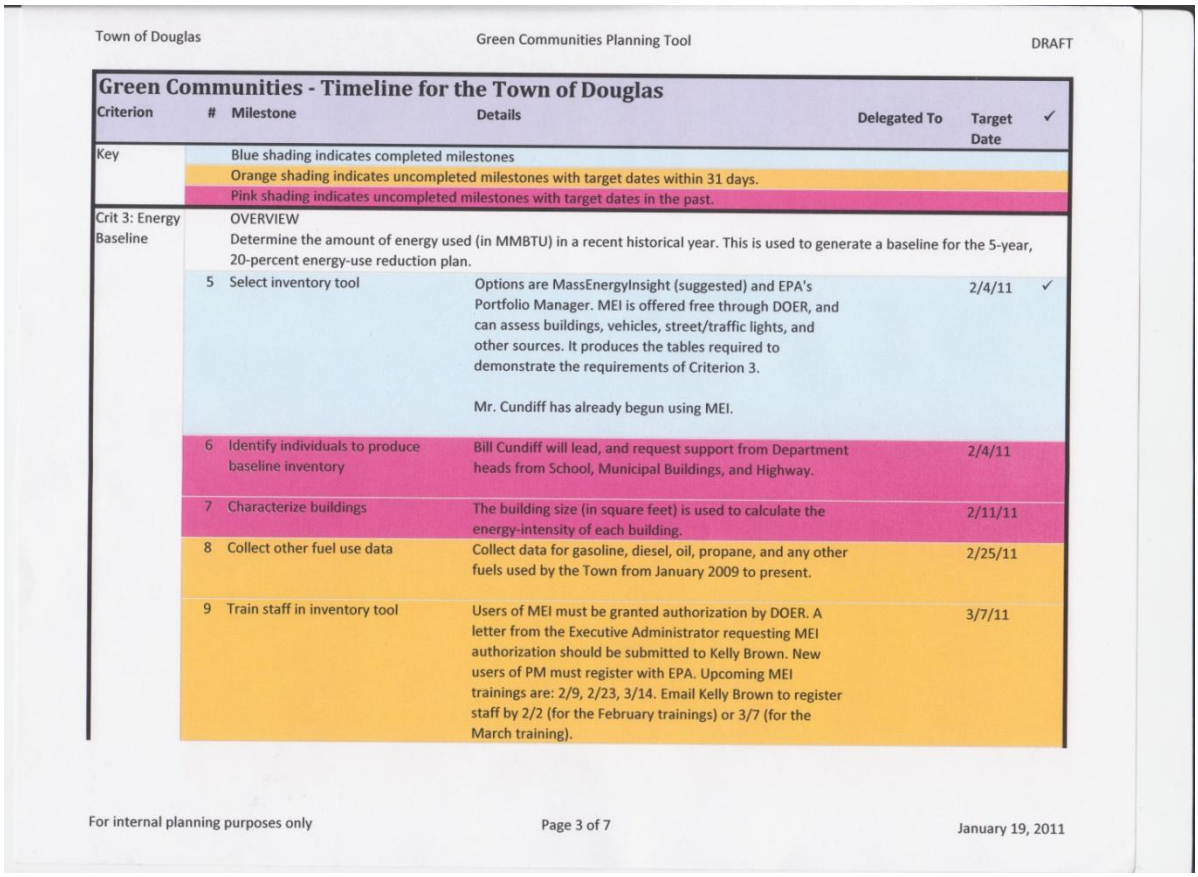

Town of Douglas | Green Communities Planning Tool | DRAFT

Green Communities - Timeline for the Town of Douglas

Criterion	#	Milestone	Details	Delegated To	Target Date	✓
Key		Blue shading indicates completed milestones				
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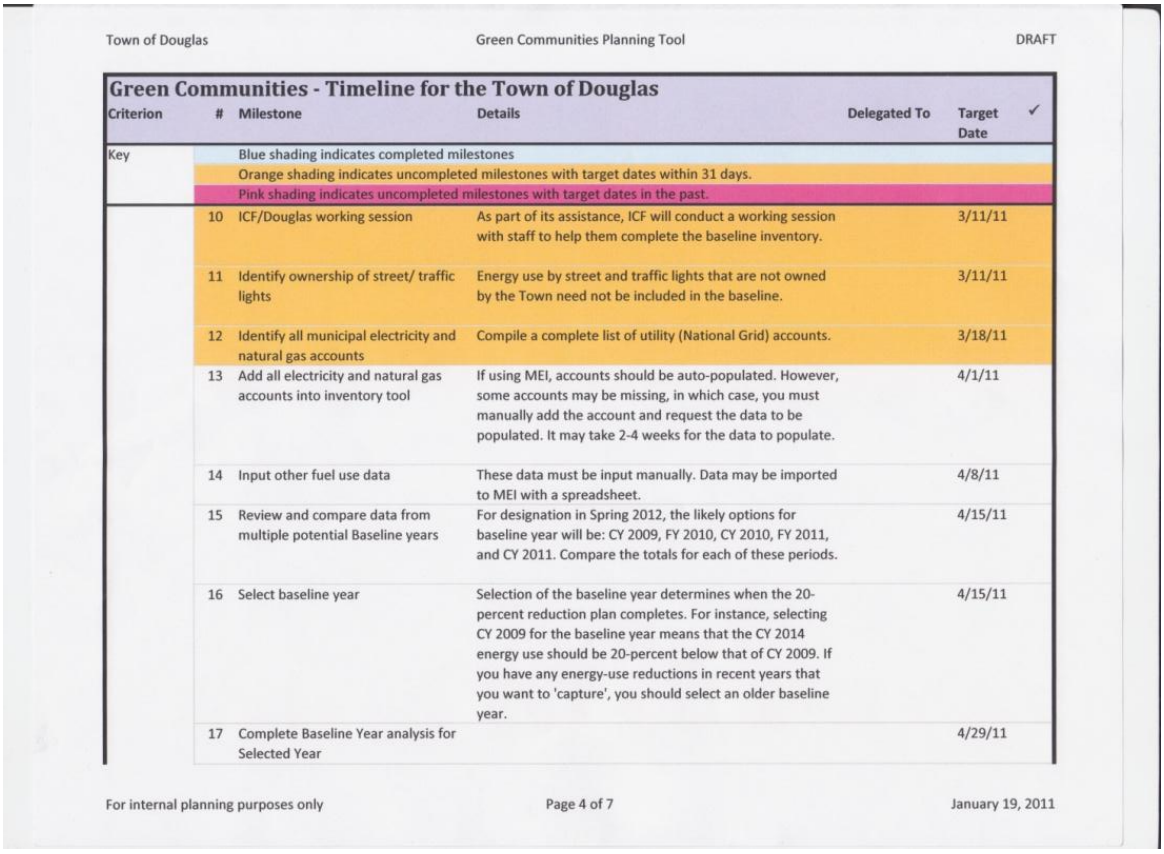
Crit 3: Energy Baseline		OVERVIEW Determine the amount of energy used (in MMBTU) in a recent historical year. This is used to generate a baseline for the 5-year, 20-percent energy-use reduction plan.				
	5	Select inventory tool	Options are MassEnergyInsight (suggested) and EPA's Portfolio Manager. MEI is offered free through DOER, and can assess buildings, vehicles, street/traffic lights, and other sources. It produces the tables required to demonstrate the requirements of Criterion 3. Mr. Cundiff has already begun using MEI.		2/4/11	✓
	6	Identify individuals to produce baseline inventory	Bill Cundiff will lead, and request support from Department heads from School, Municipal Buildings, and Highway.		2/4/11	
	7	Characterize buildings	The building size (in square feet) is used to calculate the energy-intensity of each building.		2/11/11	
	8	Collect other fuel use data	Collect data for gasoline, diesel, oil, propane, and any other fuels used by the Town from January 2009 to present.		2/25/11	
	9	Train staff in inventory tool	Users of MEI must be granted authorization by DOER. A letter from the Executive Administrator requesting MEI authorization should be submitted to Kelly Brown. New users of PM must register with EPA. Upcoming MEI trainings are: 2/9, 2/23, 3/14. Email Kelly Brown to register staff by 2/2 (for the February trainings) or 3/7 (for the March training).		3/7/11	

For internal planning purposes only | Page 3 of 7 | January 19, 2011



Green Communities - Timeline for the Town of Douglas

Criterion	#	Milestone	Details	Delegated To	Target Date	✓
Key		Blue shading indicates completed milestones				
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		Pink shading indicates uncompleted milestones with target dates in the past.				
	10	ICF/Douglas working session	As part of its assistance, ICF will conduct a working session with staff to help them complete the baseline inventory.		3/11/11	
	11	Identify ownership of street/ traffic lights	Energy use by street and traffic lights that are not owned by the Town need not be included in the baseline.		3/11/11	
	12	Identify all municipal electricity and natural gas accounts	Compile a complete list of utility (National Grid) accounts.		3/18/11	
	13	Add all electricity and natural gas accounts into inventory tool	If using MEI, accounts should be auto-populated. However, some accounts may be missing, in which case, you must manually add the account and request the data to be populated. It may take 2-4 weeks for the data to populate.		4/1/11	
	14	Input other fuel use data	These data must be input manually. Data may be imported to MEI with a spreadsheet.		4/8/11	
	15	Review and compare data from multiple potential Baseline years	For designation in Spring 2012, the likely options for baseline year will be: CY 2009, FY 2010, CY 2010, FY 2011, and CY 2011. Compare the totals for each of these periods.		4/15/11	
	16	Select baseline year	Selection of the baseline year determines when the 20-percent reduction plan completes. For instance, selecting CY 2009 for the baseline year means that the CY 2014 energy use should be 20-percent below that of CY 2009. If you have any energy-use reductions in recent years that you want to 'capture', you should select an older baseline year.		4/15/11	
	17	Complete Baseline Year analysis for Selected Year			4/29/11	

Green Communities - Timeline for the Town of Douglas

Criterion	#	Milestone	Details	Delegated To	Target Date	✓
Key		Blue shading indicates completed milestones				
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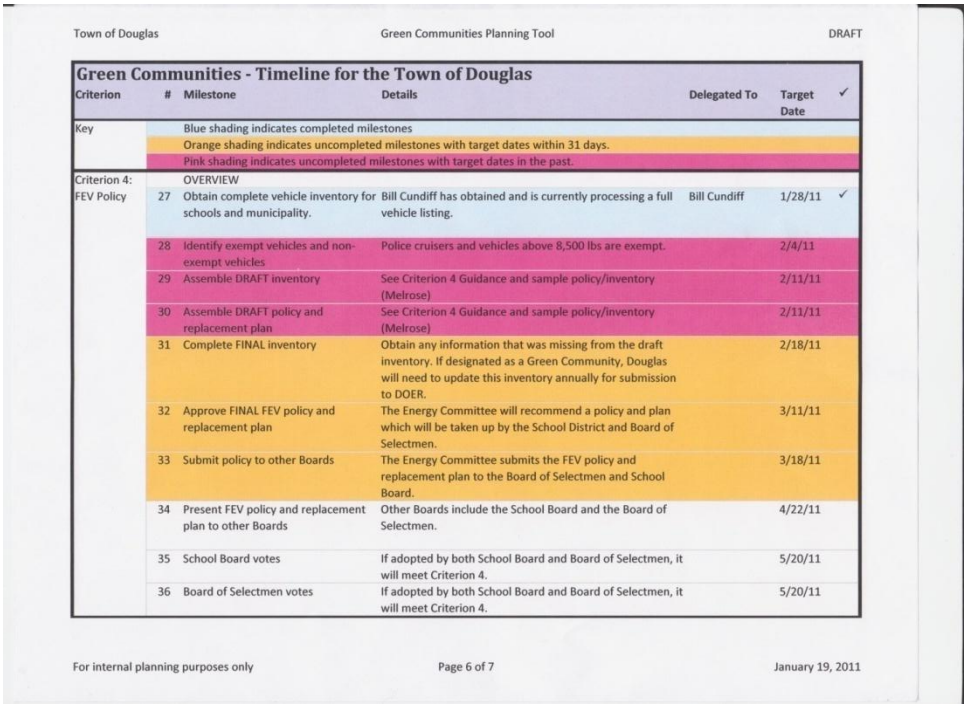
		Pink shading indicates uncompleted milestones with target dates in the past.				
Criterion 3: Energy Reduction Plan		OVERVIEW Adopt an Energy-Use Reduction Plan (ERP) that reduces municipal energy use by 20 percent over 5 years. The School District and general government (Selectmen) must both adopt the policy.				
	18	Identify low performing buildings	Using the baseline analysis, identify buildings where energy-use reduction opportunities exist. These opportunities may represent large dollar savings.		4/15/11	
	19	Conduct Building Energy Audits	Audits to identify specific opportunities for energy savings for low performing buildings. Payback periods for some improvements is commonly short (less than 2 years).		8/5/11	
	19	Identify a menu of energy use reduction measures	See "Best Practices for Energy Efficiency in Municipal Buildings" document. Also see the spreadsheet of Sample Energy Efficiency Measures provided by ICF.		8/19/11	
	20	Select energy use reduction measures	Select measures that represent a comprehensive approach and meet the 20 percent reduction requirement.		9/2/11	
	21	Draft ERP	See the template document and tables provided by ICF.		9/30/11	
	22	Finalize ERP			10/28/11	
	23	Submit ERP to Selectmen and School Board	The plan must be adopted by these two organizations to satisfy Criterion 3.		11/4/11	
	24	Present ERP to Selectmen and School Boards at their meetings			12/2/11	
	25	School Board votes	If adopted by both School Board and Board of Selectmen, it will meet Criterion 3.		1/6/12	
	26	Board of Selectmen votes			1/6/12	



Green Communities - Timeline for the Town of Douglas

Criterion	#	Milestone	Details	Delegated To	Target Date	✓
Key		Blue shading indicates completed milestones				
		Orange shading indicates uncompleted milestones with target dates within 31 days.				
		Pink shading indicates uncompleted milestones with target dates in the past.				
Criterion 4: FEV Policy		OVERVIEW				
	27	Obtain complete vehicle inventory for schools and municipality.	Bill Cundiff has obtained and is currently processing a full vehicle listing.	Bill Cundiff	1/28/11	✓
	28	Identify exempt vehicles and non-exempt vehicles	Police cruisers and vehicles above 8,500 lbs are exempt.		2/4/11	
	29	Assemble DRAFT inventory	See Criterion 4 Guidance and sample policy/inventory (Melrose)		2/11/11	
	30	Assemble DRAFT policy and replacement plan	See Criterion 4 Guidance and sample policy/inventory (Melrose)		2/11/11	
	31	Complete FINAL inventory	Obtain any information that was missing from the draft inventory. If designated as a Green Community, Douglas will need to update this inventory annually for submission to DOER.		2/18/11	
	32	Approve FINAL FEV policy and replacement plan	The Energy Committee will recommend a policy and plan which will be taken up by the School District and Board of Selectmen.		3/11/11	
	33	Submit policy to other Boards	The Energy Committee submits the FEV policy and replacement plan to the Board of Selectmen and School Board.		3/18/11	
	34	Present FEV policy and replacement plan to other Boards	Other Boards include the School Board and the Board of Selectmen.		4/22/11	
	35	School Board votes	If adopted by both School Board and Board of Selectmen, it will meet Criterion 4.		5/20/11	
	36	Board of Selectmen votes	If adopted by both School Board and Board of Selectmen, it will meet Criterion 4.		5/20/11	

Green Communities - Timeline for the Town of Douglas

Criterion	#	Milestone	Details	Delegated To	Target Date	✓
Key		Blue shading indicates completed milestones				
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		Pink shading indicates uncompleted milestones with target dates in the past.				
Crit 5: Stretch Code		OVERVIEW Adopt the Stretch Energy Code. The Stretch Code must be adopted as an Article on the Warrant at Town Meeting.				
	37	Attend Sutton Regional Stretch Code Seminar	Sutton is hosting a regional Stretch Energy Code workshop for builders and the public. Officials from the Energy Committee, Selectmen, and other Departments from the Town of Douglas should attend.		1/27/11	
	38	Follow up with elected and appointed public officials	Identify concerns held by Selectmen and other officials (including building inspector)		2/1/11	
	39	Plan additional Stretch Code event(s)	Depending on attendance from Douglas at the 1/27 event, plan events for government officials, the public, and/or builders. Consider focusing on concerns raised by officials (item 38).		2/25/11	
	39	Hold additional Stretch Code event(s)	Hold additional events in Spring 2012, as well.		3/25/11	
	40	Follow up with elected and appointed public officials	Address concerns held by Selectmen and other officials (including building inspector)		4/1/11	
	41	Submit Stretch Code Article on Warrant			2/17/12	
	42	Energy Committee votes on recommending the Stretch Code			2/24/12	
	43	Board of Selectmen votes on recommending the Stretch Code			3/30/12