STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

MEETING MINUTES

Thursday, January 9, 2014
3:30 - 5:30 PM
Conference Room B
Department of Administration
One Capitol Hill, Providence, RI

Members Present:	Abigail Anthony, Joe Cirillo, Marsha Garcia, Julie Gill, Marion Gold, Jennifer Hutchinson, Michael McAteer, Joe Newsome, Chris Powell, Paul Ryan
Members Absent:	Dan Justynski
Consultants Present:	Shawn Enterline, Mike Guerard, Scudder Parker
OER Staff Present:	Chris Kearns, Rachel Sholly, Nick Ucci
Others Present:	Karen Bradbury, Jeff Broadhead, Grayson Bryant, Nick Corsetti, Josh Craft, Courtney Lane, Angela Li, Sean Murphy, Jeremy Newberger, Sam Nutter, Belinda Wong, Chon Meng Wong, George Woodbury

1. Call to Order

Chairman Ryan called the meeting to order at 3:29 PM

2. Approval of December Meeting Minutes

Mr. Powell made a motion to accept the December meeting minutes as submitted. Mr. Cirillo seconded and the motion passed unanimously. This vote was made with a four-member quorum.

3. Executive Director Report

Commissioner Gold announced that the Public Utilities Commission (PUC) has approved the 2014 Energy Efficiency Program Plan and 2014 System Reliability Plan. The Office of Energy Resources (OER) has reached out to the PUC to set up a technical session on the Total Resource

Cost test. There is already a session scheduled on February 12th on the 3-year targets, so perhaps the two could be done on the same day.

OER and National Grid have contracted with Peregrine Energy Group to work on the OER system reliability procurement solar distributed generation project. The goal is to explore the use of solar generation can be used in conjunction with current demand response efforts to mitigate load constraints in Tiverton and Little Compton. Danny Musher of OER is serving as the lead on this effort. Ms. Sholly will schedule a subcommittee call to discuss this work in more depth.

The RI Public Energy Partnership (RIPEP) has been making good headway. The RI State Bond Counsel has determined that state agencies do not need legislative approval to participate in National Grid's on-bill repayment program. This will allow state agencies to implement energy efficiency projects with no upfront capital. As a result, the Davies Vocational School project is now moving forward, with a projected 60% electric reduction. This will be the first RIPEP project and will showcase the benefits of RIPEP efforts, including the use of the on-bill repayment program. Discussions around barriers to implementing efficiency have been happening at monthly sector working group meetings. A RIPEP panel will be presenting at the RI League of Cities and Towns Annual Conference on January 30th. Vin Murray (South Kingstown) and Wayne Pimental (East Greenwich) will share recent successes in reducing municipal energy consumption. Ms. Sholly and Mike Skinner of National Grid will give an overview of RIPEP and how municipalities can get involved. Emerald Cities Providence is looking to expand their work to all municipalities. We are also working with them to figure out how to access and best utilize the City's portion of RI's Qualified Energy Conservation Bond (QECB) allocation ($1 million).

The Energy Expo planning team has drafted a schedule of activities including a VIP kickoff event, energy seminars and a keynote speech. The kickoff event will ideally feature Secretary Moniz, members of the congressional delegation and Governor Chaffee. Ms. Sholly will give a more detailed update at the February EERMC meeting.

Commissioner Gold reported that Governor Chaffee has tasked the OER and the PUC to work closely with their counterparts throughout the New England states to explore and implement solutions to energy infrastructure challenges with the goal of providing more affordable, clean and reliable energy for the region. Mr. Ucci presented on the New England Governors Energy Infrastructure Initiative (presentation available upon request). He referenced the "New England Governors' Commitment to Regional Cooperation on Energy Infrastructure Issues", a statement released by the governors in December 2013 (see attached).

Mr. Powell asked if increased use of Liquified Natural Gas (LNG) would help mitigate these price spikes. Mr. Ucci explained that LNG shipments are moving away from the U.S. and towards other global market locations where commodity prices are higher. He added that LNG is an important peaking resource and there are small LNG storage facilities within the state utilized by the local gas distribution utility to peak shave.

Mr. Powell noted that Rhode Island does not control the pipelines and asked if there was a plan for addressing this. Mr. Ucci explained that OER and the New England Governors group are exploring how the states can help facilitate pipeline capacity expansion. Commissioner Gold added that OER would be happy to brief others on this in a more detailed way.

Commissioner Gold introduced Chris Kearns of the OER to report on the streetlights tariff. Mr. Kearns reported that the parties, including the OER with support from the EERMC consultant team, the Washington County Regional Planning Council (WCRPC) and the RI League of Cities and Towns have requested a 45-day extension from the PUC. They are currently looking at a smaller scale pilot program. The deadline is mid-February, at which time the PUC can expect to see a compromise among the parties. Jeff Broadhead of the WCRPC clarified that any municipality will be able to purchase lights, but the pilot program refers to the metering controls which will allow municipalities to track actual electric consumption on each light. Mr. Broadhead introduced George Woodbury, who has analyzed potential savings of converting to LED lights in addition to the savings from private maintenance. Mr. Woodbury was the author of similar legislation in MA. To date, 83 communities have taken advantage of this opportunity, saving about $20,000 per year from simply owning their lights. RI has approximately 110,000 streetlights at a cost of about $16.9 million per year. Streetlights are usually the largest utility bill in a municipality. If all RI municipalities purchased their streetlights, the total cost would be about $9 million. If they were all converted to LED lights, the cost would be about $45 million. Maintenance would be cut by more than 50%. Initial savings in first 10 years would be about $7 million with LEDs. Energy savings would be reduced from about 65 million kW to 27 million kW.

4. National Grid 2013 Results Snapshot

Mr. Newberger gave a brief overview of 2013 energy efficiency program results. He noted that Grid is still processing the paperwork to be able to count results, but should they have a more complete report at the February meeting. Overall, Grid achieved 105% of its electric and gas goals. In the electric sector, commercial and industrial (C&I) sector reached 103%, income eligible (IE) achieved 93%, non-IE achieved 108%, with overall spending for electric measures at 107%. On the gas side, IE achieved 106%, non-IE achieved 116%, with overall spending for gas measures at 93%.

Mr. McAteer explained some key points regarding these results. The industrial side retrofit spending on the gas side was lower than expected. Grid's consultant, ClearResult, came through for the IE sector, focusing on the Department of Health and Human Services and Community Action Program agencies, and providing consulting services. The Home Energy Report initiative underperformed and Grid is looking into why this happened and how to mitigate it for 2014. They will provide more explanation for this at February meeting. Fortunately, Grid had a good cushion to offset this, for example, in the EnergyWise program. Ms. Anthony asked if OPOWER, the consultant which administers the Home Energy Reports initiative, insures their savings estimate. Mr. McAteer explained that OPOWER will in fact refund National Grid about $100,000 because they did not meet their goal. C&I gas direct install measures were only 50% of the goal. We need to figure out what to do to shore up gas opportunities in C&I sector.

Mr. Newberger introduced Grayson Bryant, National Grid's new C&I electric program manager, who started in November 2013.

5. Vote on EERMC Budget & Consultant Team Work Plan

The Council reviewed the draft 2014 budget and proposed consultant team work plan. Mr. Newsome brought up the idea of changing the name of the "reserve fund" so it does not appear that the funds are not being used. Ms. Anthony suggested that Ms. Sholly revise the budget to list possible uses for projects or activities under the reserve fund. Chairman Ryan asked if the Council pays some funds to the state. Ms. Anthony explained that the EERMC no longer pays the state because System Benefit Charge (SBC) funds go directly to OER and OER also provides in-kind services to the EERMC.

Mr. Guerard presented on the proposed scope of work (see attached). Mr. Newberger reminded the Council that OER has close to $750,000 from the SBC fund and suggested that it might be better if the OER paid for the consulting services that it uses for training and support. Mr. Powell added that the budget committee discussed whether there were services that could be shifted from the consultant team to the OER and concluded that it may be a longer term goal to work toward. Mr. Guerard reported that the consultants have budgeted 248 hours or 4 hours per week for a total of $45,900 to train and support OER staff. Mr. Newberger also asked the Council if it wants to distinguish between services to the Council versus services to the OER. Mr. Parker gave the example of the consultant team working with OER to submit the RIPEP grant proposal to demonstrate how the consultant team supports OER. Ms. Anthony agreed that this is probably not a one-year activity but felt that the Council may want to think about this for the long term. She supports this element of the budget and thinks it has provided an important and valuable service. She noted that if, in the future, there is a more adversarial relationship between the Council and the OER, it may be even more important to have the Council consultants work closely with OER. Chairman Ryan said that he was not hearing serious concerns from Council members on this issue. Mr. Guerard provided another example, noting that Mr. Kearns' work on the streetlight tariff has allowed less work to be done by the consultants. He also added that Mr. Ucci's presentation during this meeting covers important work that is beyond the consultant team's scope.

Mr. Powell made a motion to approve the EERMC budget as prepared by Ms. Sholly and the budget committee, including the consultant team budget and work plan. Mr. Newsome seconded and the motion passed unanimously.

6. Technology Trends for EE Planning: Cold Climate Heat Pumps/Mini-Splits

Mr. Parker mentioned that this topic will affect many aspects of the Council's energy efficiency work, including discussions around delivered fuels, providing benefits to IE customers, counting efficiency savings and the technical potential of energy efficiency. He then introduced Shawn Enterline of VEIC to present on behalf of the consultant team (see attached).

Mr. Powell clarified that while air source heat pumps can provide heat, they still require a standard heating system to supplement. These systems make a lot of sense for homes that heat with electric. Mr. Powell added that there is a carbon footprint benefit with this technology and that this is not just a residential solution. There are plenty of opportunities in Rhode Island for a C&I version. Grid is already offering incentives for ductless mini-splits. In a related Grid pilot,

they are looking to determine whether an increased rebate for cold-climate heat pumps would be effective. However, they will need to grapple with the fuel switching issue as they try to build this into three-year planning. Mr. McAteer cautioned that there seem to be some performance and reliability issues with these systems as well as correct installation issues.

Mr. Craft announced that NEEP is hosting a webinar on this topic next week, information about which. Mr. Powell noted that the upcoming energy expo is a good forum to get this information out.

Mr. Newsome expressed appreciation for the very informative presentations at this meeting and requested that these keep happening. Mr. Guerard said these will occur at least quarterly.

7. Other Business

Chairman Ryan reported that this year is an election year and perhaps three Council members are up for re-appointment. Commissioner Gold will follow up on this with the Governor to find out what he has in mind.

8. Public Comment

There was no public comment.

9. Adjournment

Mr. Newsome made a motion to adjourn. The motion was seconded by Mr. Powell and passed unanimously.

Next Meeting: Thursday, February 6th 3:30-5:30 PM; Conference Room B

NEW ENGLAND GOVERNORS' COMMITMENT TO REGIONAL COOPERATION ON ENERGY INFRASTRUCTURE ISSUES

Securing the future of the New England economy and environment requires strategic investments in our region's energy resources and infrastructure. These investments will provide affordable, clean, and reliable energy to power our homes and businesses; make our region more competitive by reducing energy costs; attract more investment to the region; and protect our quality of life and environment.

As the region's electric and natural gas systems have become increasingly interdependent, ensuring that we are efficiently using existing resources and securing additional clean energy supplies will be critical to New England's economic future. To ensure a reliable, affordable and diverse energy system, we need investments in additional energy efficiency, renewable generation, natural gas pipelines, and electric transmission. These investments will also serve to balance intermittent generation, reduce peak demand, and displace some of the least efficient and most polluting fossil fuel generation, enabling the states to meet clean energy and greenhouse gas reduction goals while improving the economic competitiveness of our region.

New England ratepayers can benefit if the states collaborate to advance our common goals. The Governors therefore commit to continue to work together, in coordination with ISO-New England and through the New England States Committee on Electricity (NESCOE), to advance a regional energy infrastructure initiative that diversifies our energy supply portfolio while ensuring that the benefits and costs of transmission and pipeline investments are shared appropriately among the New England States. At the same time, we must respect individual state perspectives, particularly those of host states, as well as the natural resources, environment, and economy of the States, and ensure that the citizens and other stakeholders of our region, including NEPOOL, are involved in the process. The Governors are committed to achieving consensus as we move forward, consistent with laws and policies across the region.

The New England States believe that investments in local renewable generation, combined heat and power, and renewable and competitively-priced heating for buildings will support local markets and result in additional cost savings, new jobs and economic opportunities, and environmental gains. The New England States further believe that these investments must be advanced in a coordinated approach in order to maximize ratepayer savings and system integrity. We will continue to advocate at ISO-New England, NEPOOL, and elsewhere for greater integration and utilization of renewable generation; development of new natural gas pipeline infrastructure; maximizing the use of existing transmission infrastructure; investment, where appropriate, in new transmission infrastructure; and continuation of the inclusion of energy efficiency – and the addition of distributed generation – in load forecasting and transmission planning.

continued…

New England Governors' Commitment to Regional Cooperation on Energy Infrastructure Issues

We have directed our appropriate staff to work together with NESCOE to ensure that we are taking all necessary steps to meet our common needs and goals. Our commitment to work together on energy infrastructure issues will be informed by recent regional energy infrastructure studies conducted by the States, ISO-New England, and other regional organizations. We believe that by working together we can expand economic development, promote job growth, improve the competitiveness of our industries, enhance system reliability, and protect and increase the quality of life of our citizens. Expanding our existing efforts will ensure that we are on a course toward a transformed energy, environment, and economic future for our region that offers a model for the nation.

Signed,

Dannel P. Malloy
Governor of Connecticut

Paul R. LePage
Governor of Maine

Deval L. Patrick
Governor of Massachusetts

Margaret Wood Hassan
Governor of New Hampshire

Lincoln D. Chafee
Governor of Rhode Island

Peter Shumlin
Governor of Vermont

EERMC CONSULTANT TEAM

To	Energy Efficiency and Resource Management Council
From	VEIC/Optimal Energy Consultant Team
Date	January 9, 2014
Subject	2014 Scope of Work and Budget

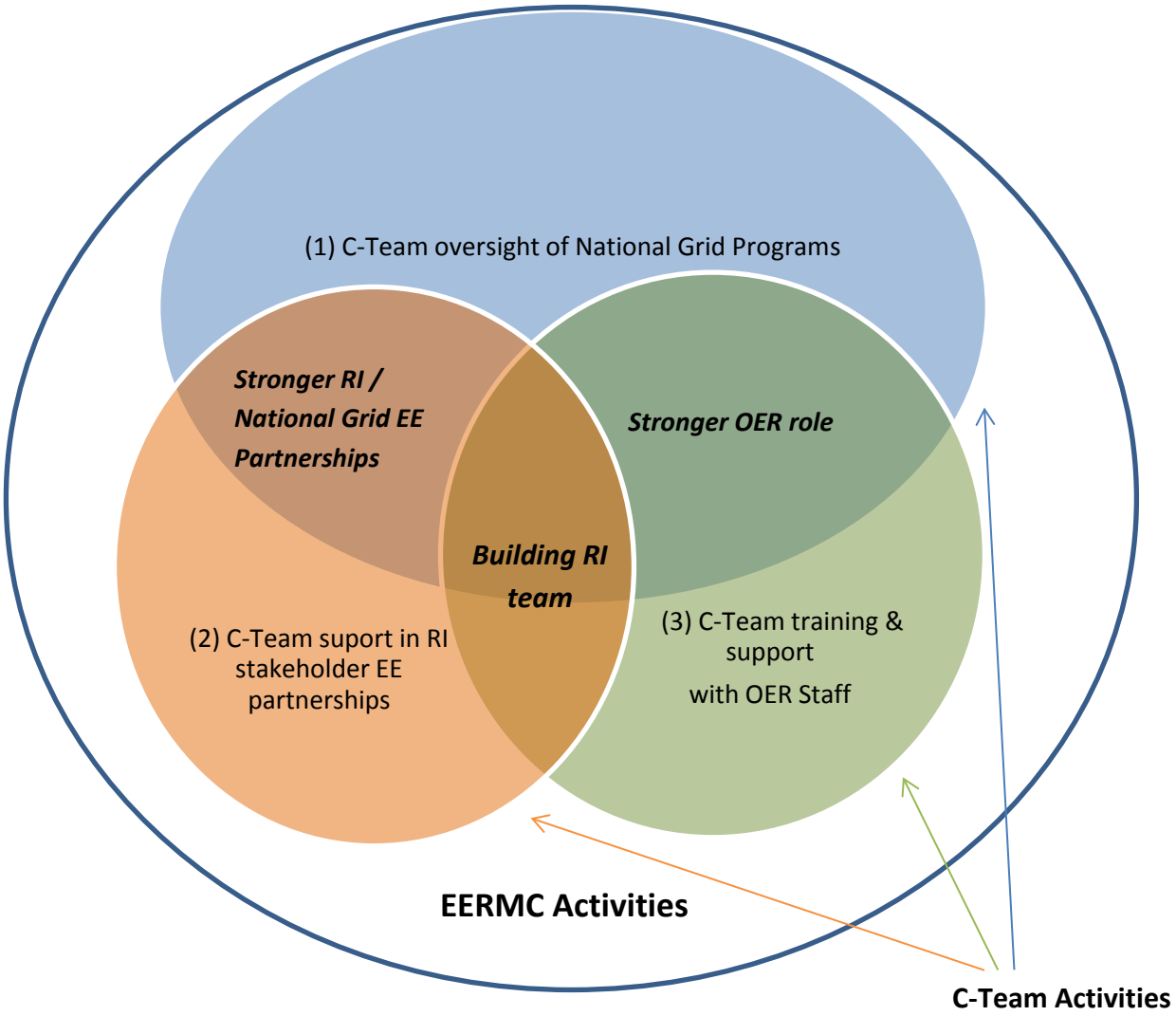
Proposed 2014 Scope of Work

The VEIC/Optimal Energy Consultant Team (Consultant Team) is pleased to present this Policy & Program Planning Consultant Scope of Work for 2014 to the Energy Efficiency and Resource Management Council (EERMC). The Consultant Team has been working with the EERMC for five years now, and deeply appreciates the opportunity to continue serving the EERMC in support of its ongoing efforts. The EERMC has helped position-- and will continue to promote-- Rhode Island as a national leader in providing benefits to its residents, its businesses and its economy through Least Cost Procurement (LCP) and innovative energy policy generally. We particularly appreciate the ability to work with the EERMC in a partnership that reflects the underlying values of the VEIC and Optimal Energy firms.

This proposed Scope of Work builds on the content of the Consultant Team's 2011 proposal in response to the EERMC's bid solicitation for the role of Policy & Program Planning Consultant, which was awarded to the Consultant Team for 2012 with the option for two subsequent annual renewals. The primary Policy & Program Planning Consultant role has been, and is expected to continue to be, as a partner and project manager to help ensure all goals are met and tasks are accomplished for the EERMC to meet its statutory objectives and duties.

The base of work will continue to be the general support of the EERMC, including representation and activity reporting at all Council meetings; input on Council meeting agendas; working with EERMC Subcommittees; as-needed meetings with individual council members on specific issues or sector-related topics; and support on the development of the Annual Energy Report to the General Assembly every April 15. Consultant Team member(s) will also represent Council concerns at related meetings such as the DSM Collaborative Subcommittee and other stakeholder events.

In its 2013 proposal, the Consultant Team presented the figure below to illustrate and guide the approach it took in providing services in 2013. The services were grouped into three categories, and we propose to continue and expand on the 2013 accomplishments that have come from using of this approach.



The representation of these three areas in Venn diagram format emphasizes the inter-relatedness of the approach. It also seeks to provide a strong framework to help effectuate the Council's mission:

> "Provide an integrated, comprehensive, public, stakeholder-driven organizational structure to secure for Rhode Island and its people the full supply, economic and environmental benefits of energy efficiency, conservation and resource management."

Specific objectives and activities related to these interrelated functions are:

1. The majority of our work will continue to be related to the design and delivery of the ratepayer-funded energy efficiency programs. This includes review and oversight of the Energy Efficiency

Procurement Plan (EEPP) implementation that National Grid conducts in Rhode Island, covering regular meetings with utility strategy staff; review of performance results and data; and research and input on actions designed to continually support savings goal achievement. Another key element is the development of the annual EEPP and System Reliability Procurement Plan (SRP), leading to the Council's approval. In 2014, additional tasks will be both the representation and defense of targets for 2015-2017 submitted on 9/1/13 by the EERMC to the RI PUC, and the ensuing development of the next Three-year Plan to achieve those targets. In addition to working closely with key National Grid staff, many of the activities above also include coordination with the DSM Collaborative Subcommittee, the OER and other key stakeholders.

2. A second area of work involves: 1) partnering with the EERMC to develop strategic relationships between the Council, National Grid and groups already working on energy efficiency in Rhode Island, and 2) identifying underserved sectors and energy efficiency opportunities in Rhode Island and proposing strategies to improve delivery of efficiency services. Examples of these successful efforts in 2013 to be built upon, and added to, in 2014 include:
    a. The Alliance for Healthy Homes, which includes representation from the EERMC, Rhode Island Housing, Green and Healthy Homes Initiative, the RI Attorney General's office, and the Departments of Housing and Community Development; Health; Energy; and Human Services.
    b. Emerald Cities, which is a coalition with the City of Providence, Brown University, Building Futures, the Rhode Island Building and Construction Trades Council, RI LISC and others.
    c. RI Public Energy Partnership, managed by the OER through a federal grant, which coordinates activities of Municipalities, Water Supply groups, State Building operations and Schools through Working Groups, and ultimately facilitating participation in National Grid programs for energy efficiency.
    d. The Farm/Agriculture sector, a traditionally underserved, "hard-to-reach" market, that began efforts to organize and better define opportunities to access energy efficiency and renewable energy upgrades with support of the Department of Environmental Management and the RI Farm Bureau.
    e. Income Eligible Services is a sector undergoing transition due to federal funding cuts and other developments, and that has been historically challenged to be fully served in RI over the last few years. The Consultant Team will review national and regional developments, and work with key RI stakeholders and National Grid to determine better solutions to insure full service to this critical population throughout Rhode Island.

3. As identified by the EERMC, the need and value for a strong Office of Energy Resources (OER) in RI was clear. Accordingly, the Consultant Team was directed to provide some direct support in the form of training, planning, and guidance for new initiatives, and relevant specialized expertise to assist the OER. The Consultant Team proposes to continue this ongoing OER support, although with less emphasis on general training and support and more toward actions to help

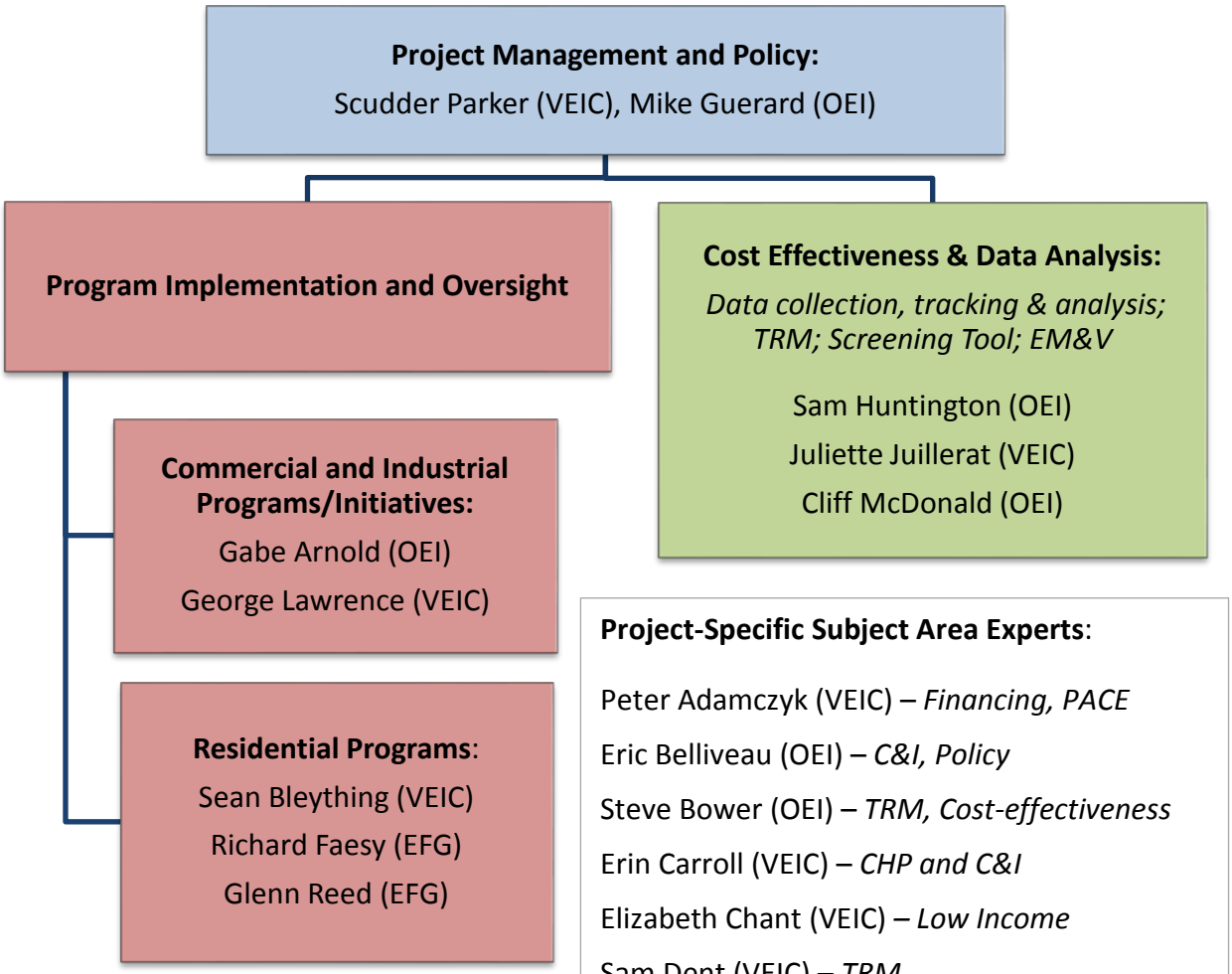
achieve one of the EERMC's assigned "Power & Duties":

> "Advise the commission of energy resources and recommend policies, standards, strategies, plans, programs, and procedures with regard to functions of the office of energy resources including but not limited to plans, strategies, and programs to:
>
> (1) Implement cost-effective energy conservation and energy efficiency programs;
> (2) Promote the development of eligible renewable energy resources for Rhode Island;
> (3) Foster distributed generation of electricity and demand response;
> (4) Assist low-income households in meeting energy needs;
> (5) Coordinate the use of funds, resources, and programs from diverse resources to achieve the purposes of the office."

The Consultant Team proposes to link these three areas again during 2014, so that National Grid's implementation strategies improve and continue to develop in partnership with the stakeholders, organizations and expertise already available in RI. We believe that this will strengthen the infrastructure for effectively implementing LCP in the state.

The organizational chart below reflects the Consultant Team's ongoing commitment to providing high quality service and resources. The project's co-management by Scudder Parker and Mike Guerard puts the team's leadership in the hands of experienced professionals with an intimate knowledge of the industry, and most critically the specific causes and conditions that make Rhode Island an industry leader. Guerard and another key staff are based in a Providence office. A core team has been assembled over the years to provide the bulk of the "hands-on" work of program implementation oversight and planning support. Collectively, the group has decades of experience in all facets of the energy efficiency industry. For specialized areas of research, analysis and input, an impressive collection of industry experts covering a wide range of topics is also queued up. These staff can be brought to bear on specific projects on an as-needed basis, and provide critical expertise to the degree needed to support any of the EERMC priorities.

Organizational Chart:



Project-Specific Subject Area Experts:

Peter Adamczyk (VEIC) – *Financing, PACE*
Eric Belliveau (OEI) – *C&I, Policy*
Steve Bower (OEI) – *TRM, Cost-effectiveness*
Erin Carroll (VEIC) – *CHP and C&I*
Elizabeth Chant (VEIC) – *Low Income*
Sam Dent (VEIC) – *TRM*
Shawn Enterline (VEIC) – *Smart Grid*
David Hill (VEIC) – *Renewable Energy*
Cheryl Jenkins (VEIC) – *ISO-NE, Renewables*
Nick Lange (VEIC) – *Behavioral Programs*
Jeff Loiter (OEI) – *Potential Studies, 3-yr Plans*
Phil Mosenthal (OEI) – *C&I*
Ralph Prahl (Prahl Consult.) – *EM&V*

The table below presents the broad subject areas and budget categories as anticipated areas of activity. The proposed core budget represents an approximately $15,000 increase from 2013 ($774,720 to $789,810), although it should be noted the 2013 budget included two supplemental budget line items to focus on PACE and Renewable energy integration, at $30,000 for each. Where appropriate, the activities related to these two areas will continue in 2014, but to a lesser degree, and as part of the core budget. While the proposed core work for 2014 continues patterns from previous years, the upcoming year presents the need for new and/or expanded services, which account for a moderate increase from the 2013 core budget.

These include:

- The legislatively required development and submittal of the next Three-year EEPP covering 2015 – 2017, due on September 1, 2014 to the RI PUC: This effort will require significant investigation of statewide, regional and national developments; data sourcing and analysis; negotiations; and reporting. The 2015 annual EEPP will then need to be completed in a compressed timeframe, adding challenges to this critical component of the EERMC's responsibilities.
- In support of the Three-year plan and ensuing annual plan for 2015, the EERMC has the opportunity to review and potentially propose modification to the "Standards for Energy Efficiency and Conservation Procurement and System Reliability." The Consultant Team is prepared to support the research and deliberations to identify enhancements to the Standards, including support of an associated Docket with the RI PUC.
- In 2013, two areas received added focus and attention. Based on the positive outcomes in both areas, it is proposed that the Consultant Team sustain and increase as needed this level of effort for:
    - support, training and coordination with the OER as it expands its role as a key player in Rhode Island's energy future
    - increased coordination and oversight of National Grid's investment of ratepayer funds, including monthly meetings with the Company's strategy groups.. It is proposed that with EERMC support, the Consultant Team will seek to further enhance this key function via agreement with National Grid on more comprehensive and timely exchanges of relevant data.
- Through RGGI funding and the initiative of stakeholder groups, a diverse range of working groups is formed or planned, including the groups Alliance for Healthy Homes, Emerald Cities, and an agriculture group coordinated by the RI Farm Bureau, and proposed RGGI-funded working groups for Delivered Fuels and Grid Modernization. The Consultant Team proposes to work actively with these groups to support their efforts that align with Council priorities. Related to these, and for other specific key aspects of the RI energy landscape, the Consultant Team would also support research and planning for integrating and leveraging broader energy issues with ratepayer funded efforts: Financing (PACE, HEAL, bonds, and other potential innovative financing concepts, as well as a close evaluation of existing vehicles, i.e. HEAT loan and C&I

On-bill Refinancing via a revolving loan fund); renewable energy linked to energy efficiency; Combined Heat & Power; solar thermal research and advanced heat pump technologies.

During discussions with the Council's Budget Subcommittee, a range of potential challenges and issues to be addressed in 2014 were flagged, including bill and rate impact analysis for natural gas, as a potential companion piece to the Division's electric analysis; CHP issues; and RI-specific energy branding/labeling. The exact scope and scale of these potential added pieces of work is not yet clear. The Consultant Team proposes that a separate budget line item for supplemental projects be created in the amount of $60,000 as a contingency to support any work required on these, or other, assignments. The work will be Council directed, and only undertaken through clear task orders defining budget, timelines and deliverables, through coordination with the Budget Subcommittee. These supplemental funds will only be used as-needed, under the clear procedures of Council approval described above.

	Total Hours	TOTAL AMOUNT
EERMC Coordination, Support and Tasks; Sub-committee Participation & Support; Research/Reporting		
Attend and support each EERMC meeting the 2nd Thursday of each month or as scheduled and general council support. -- Provide a brief verbal and written presentation of issues and work tasks from the previous month(s), and summary of upcoming issues. -- Propose and deliver relevant topic-specific presentations to support EERMC deliberations and decision-making on priority issues. -- Assume overall responsibility for managing and coordinating the work of any additional technical consultants hired by the Council.	292	$52,600
Coordinate Council member and OER staff interpretation and understanding of utility program planning, policy development and implementation, and facilitate EERMC member and OER staff participation in the planning and oversight process.	68	$12,600
Attend and support EE & SRP Collaborative Subcommittees-- Provide appropriate representation and subject-area expertise at Collaborative Subcommittee meetings.	136	$24,920
Support development and analysis of Three-year Energy Efficiency Plan for 2015 - 2017 for 9-1-14 PUC filing	586	$104,200
Provide input, review/comment, evaluate final quality and provide recommendations to EERMC on 2015 EEPP and SRP filing ; write "Cost-effectiveness memo"; provide testimony at PUC Technical session on Plans.	540	$96,960
Provide technical support and representation on relevant state and regional entities and policies, including the RI General Assembly and Executive branch, ISO-NE, RGGI & FCM, and federal entities about key energy issues and policies. Provide support on relevant PUC dockets, including direct testimony on behalf of the Council upon its request.	200	$38,040

Support development of the Annual Report to General Assembly on Council activities due on April 15 , and other energy issues as-needed,	160	$24,900
TOTAL: EERMC Coordination, Support and Tasks; Sub-committee Participation & Support; Research/Reporting	**1,982**	**$354,220**
Monitoring, Facilitating and Reporting on Progress of Savings Goals and Commitments for Specific Sector and Program Areas in the 2014 EEPP		
Monthly updates with National Grid Program staff; data collection and review; market infrastructure evaluation; internal coordination on performance results on monthly basis; prep and report -- Updates with individual council members and OER on status	1054	$182,430
Participation on steering committees/task forces, i.e. RI PEP, Codes & Standards group; Multifamily; Income Eligible Services	234	$43,820
TOTAL: Monitoring, Facilitating, Reporting	**1,288**	**$226,250**
OER support, best practices and stakeholder coordination		
Subject area expert assignments, i.e. Develop & review policies on a range of issues including cost-effectiveness, coordination of financing/funding and implementation efforts, inter-relation and leveraging of renewables and e.e., addressing market barriers through innovative delivery, and related matters.	546	$100,200
Training and support for OER staff, including topic specific areas-- PACE, renewable integration w/ ee, RIPEP	248	$45,900
Stakeholder coordination and integration -- support and align efforts of entities involved in energy efficiency operating in coordination and/or supplementing utility program efforts, including the Alliance for Healthy Homes; Emerald Cities; Farm/Ag groups; and Delivered Fuels working group.	304	$54,340
TOTAL: OER support, best practices and stakeholder coordination	**1,098**	**$200,440**
Total dollars for Core Work		**$789,810**
Supplemental funding for Council-directed special projects, as-needed	0	**$60,000**
Total Potential Budget Allocation		**$849,810**

The Consultant Team is honored to have been approved to continue this role, and will seek to maintain the highest quality of service to support the EERMC's objectives for the full benefit of all Rhode Islanders.


Vermont
Energy Investment
Corporation

Technology Trends

Cold Climate Heat Pumps / Mini Splits

EERMC
January 9th, 2014

Vermont Energy Investment Corporation

What is a Ductless Mini-Split?

Why Air Source Heat Pumps?

1. They are Very Energy Efficient
   - 3X more energy efficient than combustion.

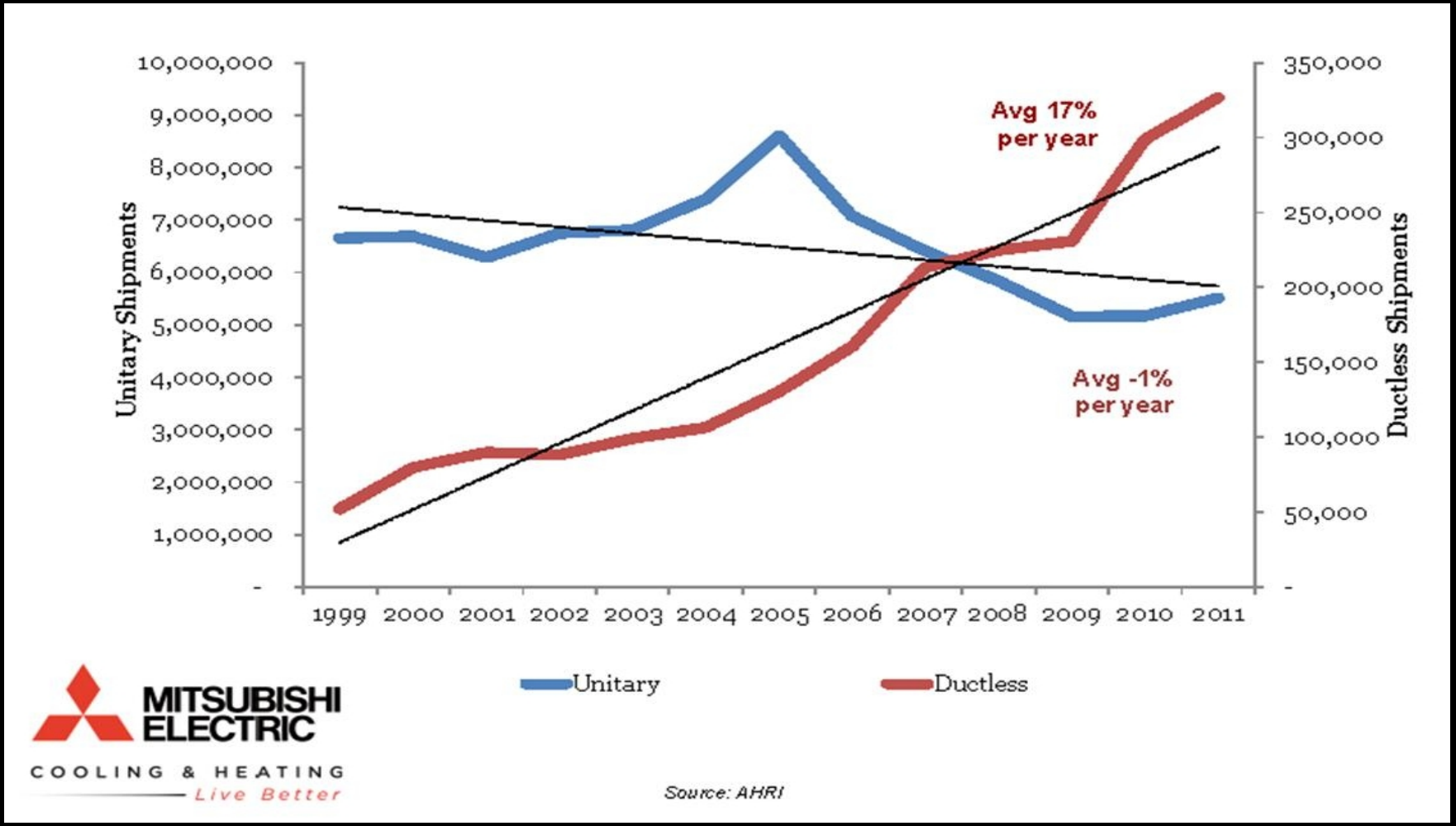
2. They Provide Substantial Cost Savings to the Customer
   - Many homeowners could reduce their heating bill by $1,000-$2,000/yr.
   - Discounted and/or TOU electric rates can further increase this savings.

3. They Offer an Array of Other Benefits
   - They can cool the home more efficiently than a window unit.
   - They are controllable by the utility.
   - They can be financed with an equipment lease.

Key Points About Ductless ASHP Technology

- An ASHP uses the same technology as your window AC unit, your car AC, and your central AC. Except:
  - It can run in reverse to provide both heat and cooling.
  - It uses R410A, a cold-climate capable refrigerant.
  - It uses a variable speed compressor and/or refrigerant flow.
- No duct work is required…flexible tubing is used.
  - Installation is flexible, and does not require difficult retrofits.
  - Ductless mini-splits are zonal , and may have multiple indoor heads per compressor.
- Key Concept = Supplemental Heat
  - Can offset 90% of existing central system.

Nationwide Shipments of Unitary & Ductless Equipment



The trend toward ductless systems is well established.

The Northeast's Heating Fuel Competition (Retail)

Energy Type	Unit	Btu/Unit	Efficiency	$/Unit	$/MMBtu
Wood	Cord	22,000,000	60%	$193.00	**$14.62**
Natural Gas	Therm	100,000	90%	$1.55	**$17.22**
Pellets	Ton	16,400,000	80%	$247.00	**$18.83**
Fuel Oil	Gallon	138,200	90%	$3.72	**$29.91**
Kerosene	Gallon	136,600	90%	$4.19	**$34.08**
Propane	Gallon	91,600	90%	$2.96	**$35.90**
Electricity	**kWh**	**3,412**	**300%**	**$0.15**	**$14.65**

- Fuel prices compete within 3 bands.
- With heat pumps, electricity falls into the 1st band.
- Is heat pump technology making combustion obsolete?

Theoretical Maximum Efficiency (COP)

	Technology	
	Combustion & Resistive	**Heat Pump**
Present Technology	0.95	2.0 - 4.0
Theoretical Maximum	1.0	6.0 - 17.0

- The efficiency gains for combustion technology have arrived.
- There is still room for improvement in heat pump technology.

Typical Residential Heating Fuel Costs (75 MMBtu/Yr)

Fuel	Volume	Unit	$/Unit	$/Yr
Wood (green)	5.7	Cords	$190	$1,080
Natural Gas	83	Therms	$1.59	$1,325
Pellets	5.7	Tons	$247	$1,412
Fuel Oil	603	Gallons	$3.85	$2,322
Kerosene	610	Gallons	$4.26	$2,599
Propane	910	Gallons	$3.24	$2,948
Electricity	21,981	kWh	$0.17	$3,737

- Without natural gas (or wood), heating costs run $2,000 - $3,000+ per year.

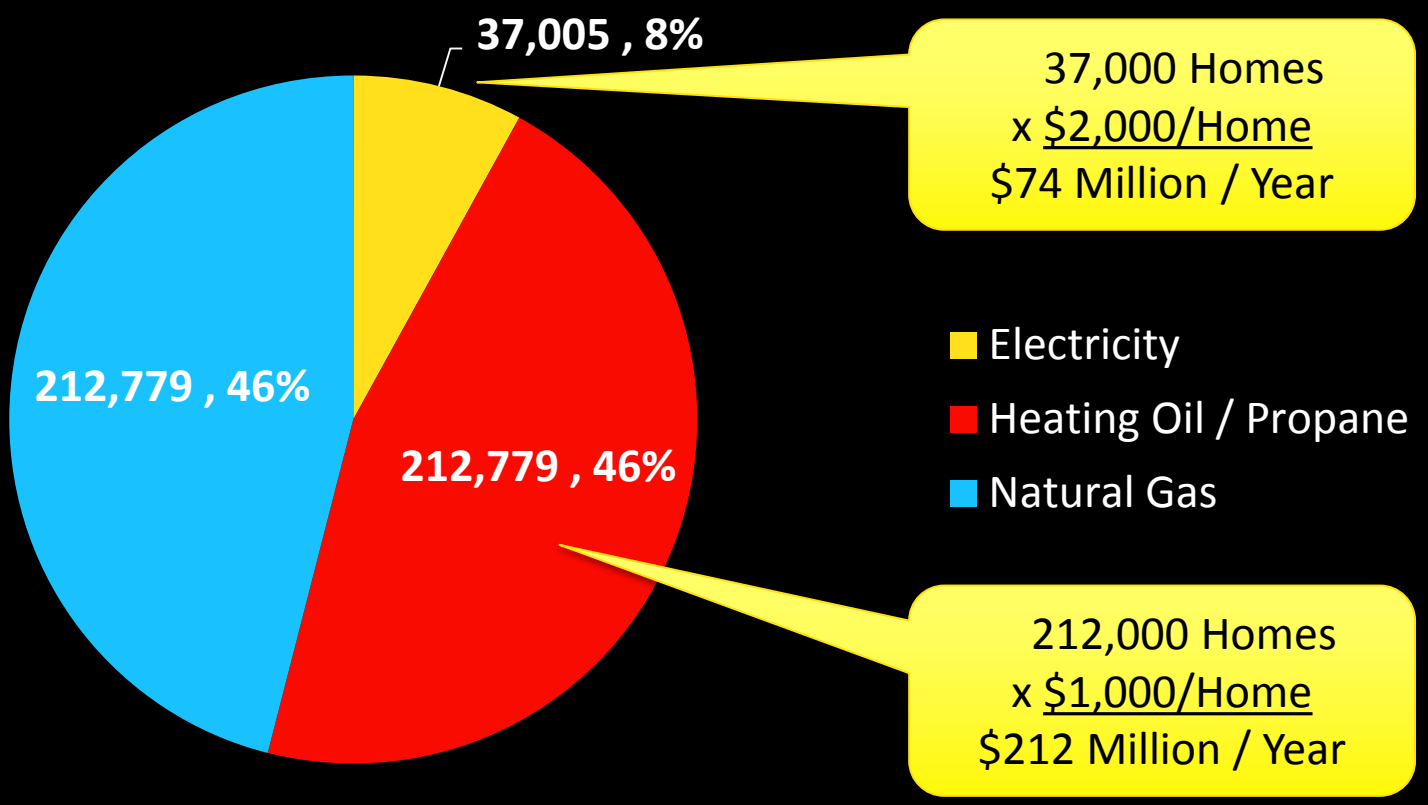
Heating Fuel Cost Savings with an ASHP (COP 3.0)

Type of Energy	Unit	50 MMBtu/Yr	75 MMBtu/Yr	100 MMBtu/Yr
Wood (green)	Cord	$28	$41	$55
Natural Gas	Therm	$(136)	$(204)	$(272)
Pellets	Ton	$(194)	$(291)	$(388)
Fuel Oil	Gallon	$(800)	$(1,200)	$(1,601)
Kerosene	Gallon	$(985)	$(1,478)	$(1,970)
Propane	Gallon	$(1,218)	$(1,827)	$(2,435)
Electricity	kWh	$(1,744)	$(2,616)	$(3,488)

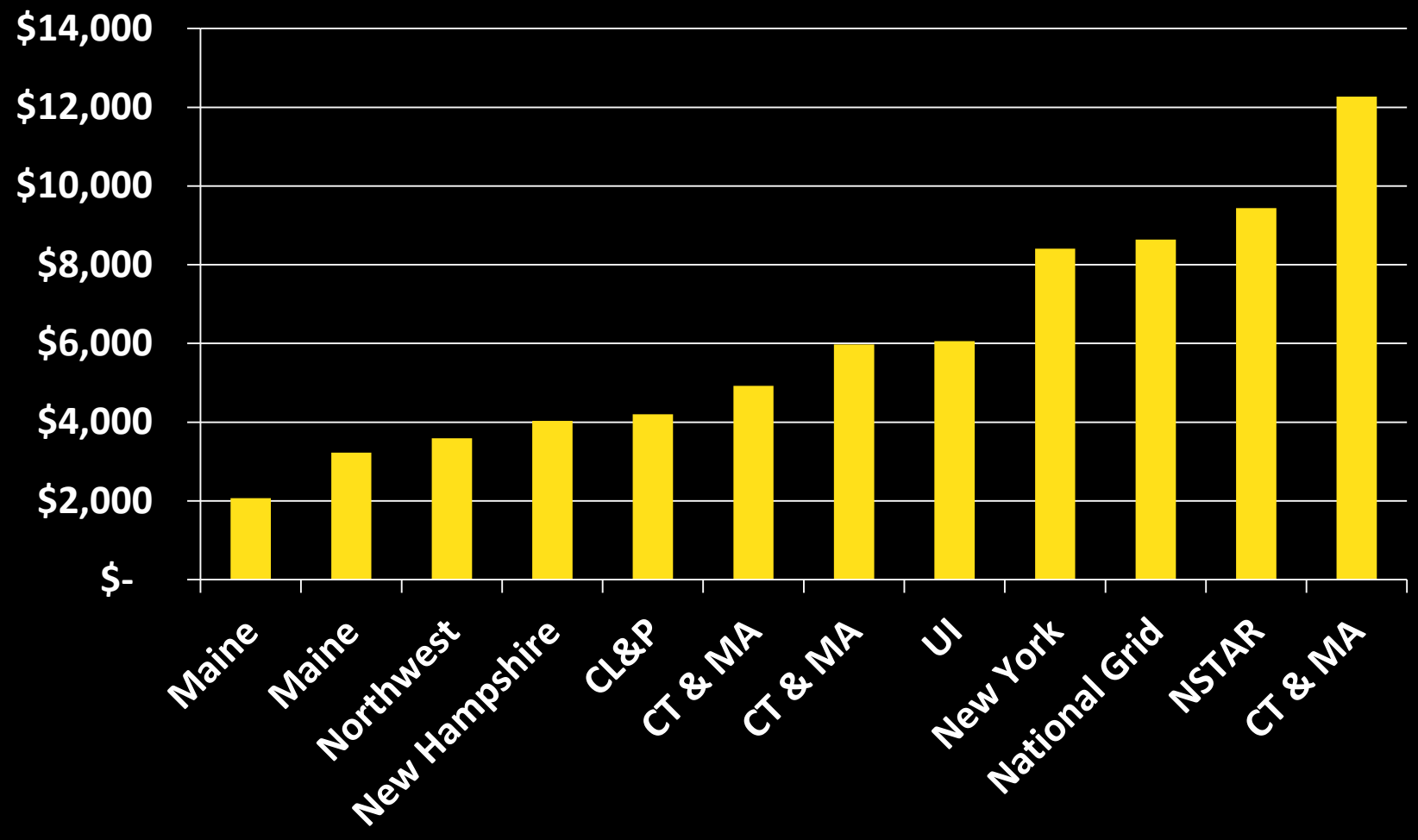
- Many residents can save $1,000 - $2,000 year.
- Assumptions:
  - Offset 90% of heating fuel costs.
  - No cooling savings in the summer.

Rhode Island Heating Fuel Mix

Total Homes = 462,564

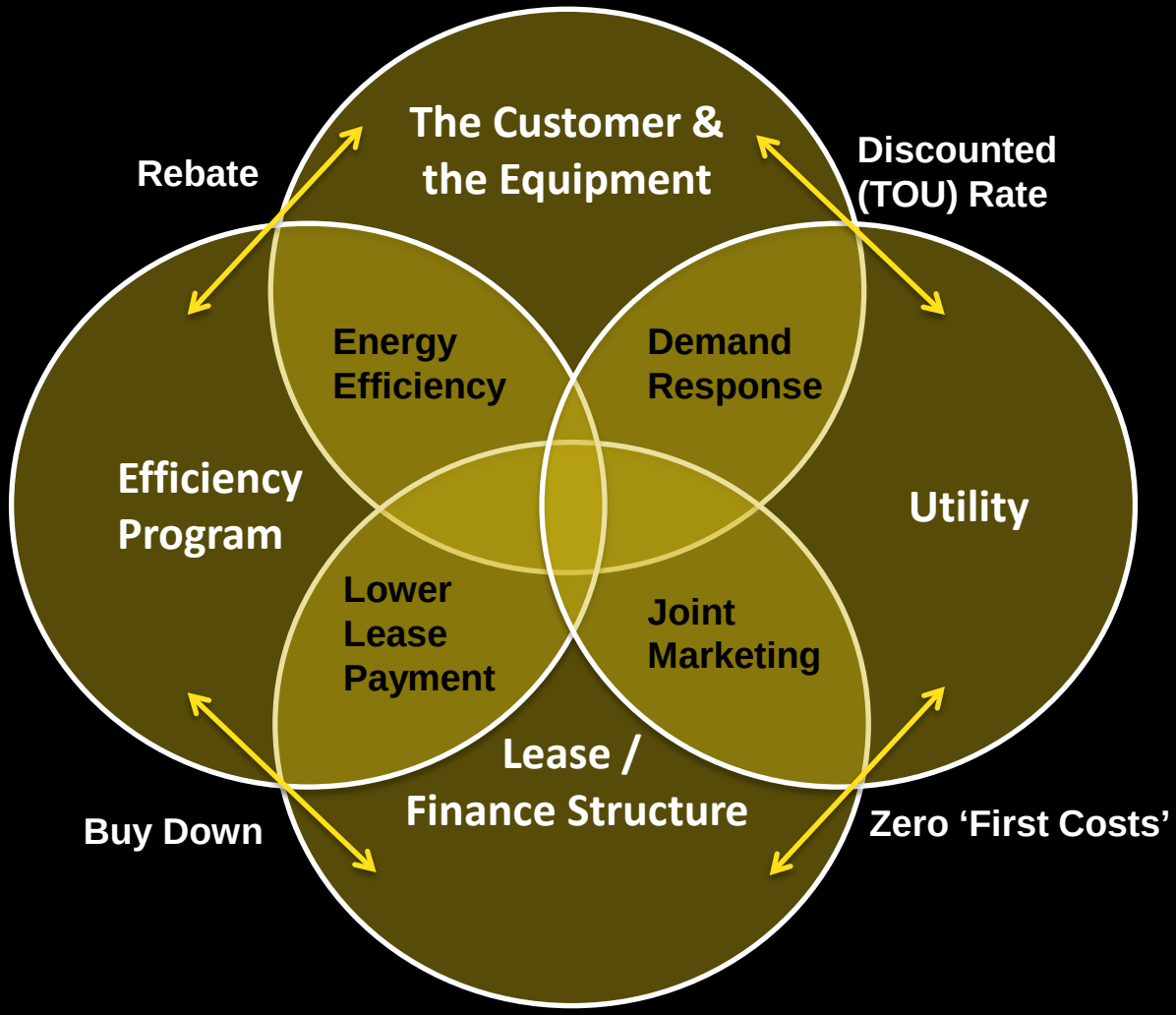


Installed Costs Per Home



Source: Northeast/Mid-Atlantic Cold Climate Air Source Heat Pump Strategy Report, NEEP, Oct 2013 Draft

Business Model for Equipment Lease Programs



A Win-Win Value Proposition at Multiple Levels

- Customer Level
  - Heating: Large energy and dollar savings on heating fuel.
  - Cooling: Efficient cooling in summer months.
  - Financial: A lease creates immediate cost savings. (No payback period)

- Utility Level
  - Control: ASHPs can be controlled to reduce peak loads if desired.
  - Loadshape: ASHPs have a long, flat loadshape, which reduces costs.
  - Additional kWh Sales: Spreads fixed costs over a larger base, putting downward pressure on overall electric rates.

- Regulatory Level
  - A Safe, Win-Win: Matching the lease and warranty terms creates a program that benefits the customer, the utility and protects nonparticipants.

Concluding Observations

- The technology is viable and continues to mature.
  - Even in a cold climate.
- The customer-level economics are compelling.
  - $1,000 - $2,000 annual savings per household.
- The macroeconomics are compelling as well.
  - $2.86 billion in potential customer cost savings over 10 yrs.
- The existing utility business models are applicable.
  - Rebate and/or Lease = Efficient, Controlled Load Growth

Regional and Rhode Island Context

- State Energy Plan (Navigant Analysis)
  - 'Energy, Economic & Climate Security Focused'
  - www.energy.ri.gov/energyplan/index.php
- Energy 2030 Report (Alliance to Save Energy)
  - 'Energy Productivity Focus'
  - www.ase.org/policy/energy2030
- Market Strategies Report (NEEP)
  - 'Technology-Specific Program & Policy Focused'
  - www.neep.org/efficient-products/emerging-technologies/Air-Source-Heat-Pumps/index
- Heat Pumps as an Alternative to Oil Heat (RMI White Paper)
  - 'Climate & Fuel Switching Focused'
  - http://www.rmi.org/Knowledge-Center/Library/2013-05_HeatPumps
- EFG Memo to CT & CSG Memo to NYSERDA
  - 'Cost Effectiveness in Neighboring States & Climate Zones'