



COMMONWEALTH OF MASSACHUSETTS

*Charles Baker, Governor
Matthew Beaton, Secretary
Judith Judson, Commissioner*

*Green Communities Division
Webinar*

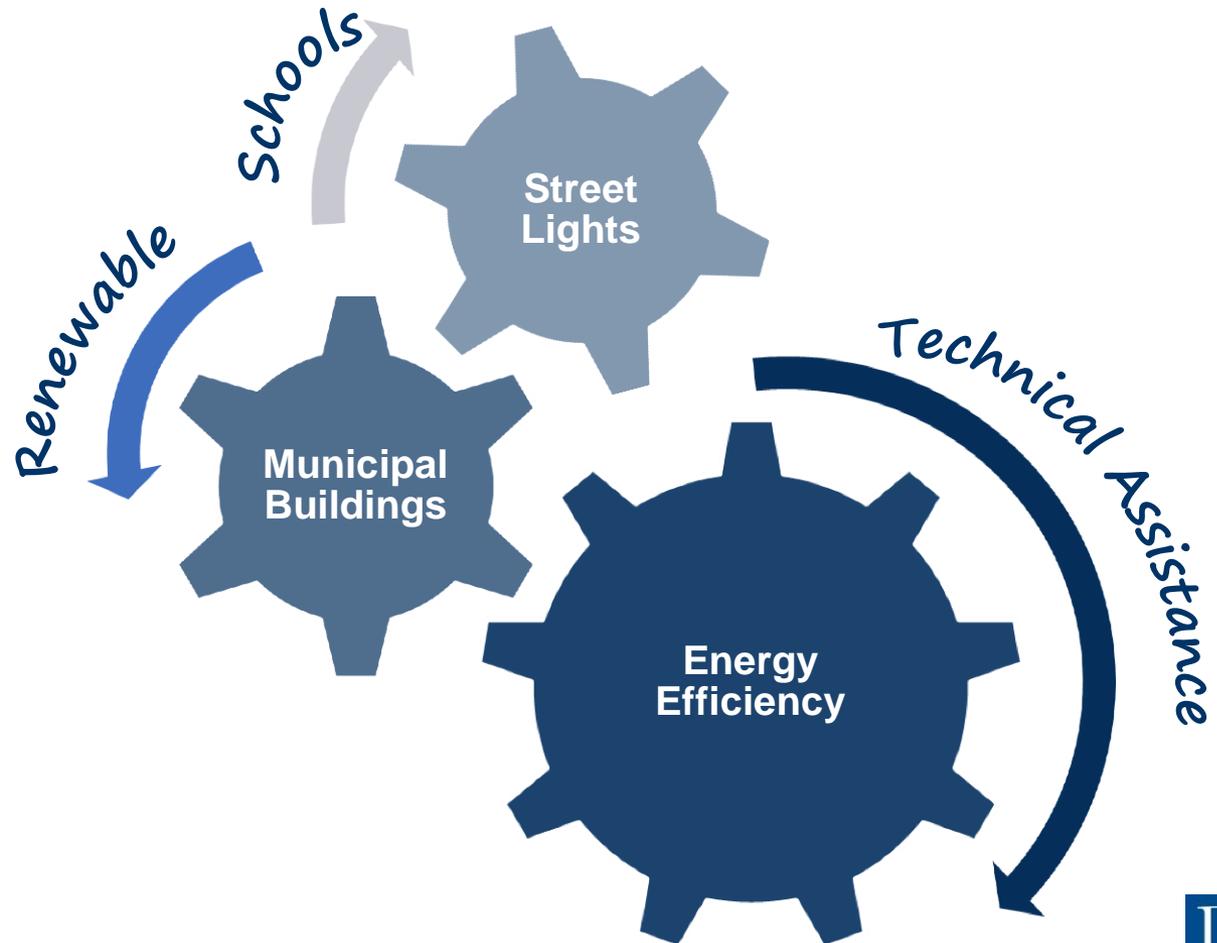
November 17, 2017

What's New at MassCEC

Programs and Initiatives for Municipalities

Green Communities Division

The energy hub for **all** Massachusetts cities and towns, not just designated “Green Communities.”



Green Communities Division - Programs & Resources for Municipalities

- Green Communities Designation and Grant Program
- MassEnergyInsight energy tracking and analysis tool
- Municipal Energy Technical Assistance
- Energy Management Services Procurement Oversight
- Website filled with tools & resources:
- www.mass.gov/orgs/green-communities-division-massdoer

Email updates via e-blasts – Sign up by sending an email to:
join-ene-greencommunities@listserv.state.ma.us



*Helping Massachusetts Municipalities Create a Clean,
Affordable, and Resilient Energy Future*



Outreach - Regional Coordinators

- Regional Coordinators act as direct liaisons with cities and towns on energy efficiency and renewable energy activities
- Located at each of the DEP Regional Offices:



WERO – SPRINGFIELD: Jim Barry
Jim.Barry@state.ma.us



NERO – WILMINGTON: Neal Duffy
Neal.Duffy@state.ma.us



CERO – WORCESTER: Kelly Brown
Kelly.Brown@state.ma.us



SERO – LAKEVILLE: Seth Pickering
Seth.Pickering@state.ma.us



Helping Massachusetts Municipalities Create A Greener Energy Future



Recording & Presentation

- The webinar is being recorded and will be available on our website in approximately 48 hours at: www.mass.gov/orgs/green-communities-division-massdoer
- Click on the camera icon top right of your screen to save any slides for future reference
- Use the Q & A icon on your screen to type in questions



Helping Massachusetts Municipalities Create A Greener Energy Future



What's New at the Massachusetts Clean Energy Center

Programs and Initiatives for Municipalities

Katie Dobbins, Project Manager, Innovation and Industry Support

Elizabeth Youngblood, Senior Project Manager, Solar Programs

Amy Barad, Director, Commercial Programs

November 17, 2017

Agenda

- Introduction
- Current MassCEC RFPs
 - Clean Energy Activity Day
 - Waste Water Treatment Plant Innovative Technology
- Clean Heating and Cooling incentives for municipalities
- Updates to 2018 Solarize Mass, Solarize Mass Plus, and HeatSmart Mass programs
- Updates to Deploy Mass
- Questions

MassCEC Mission

MassCEC is a quasi-public state agency whose mission is to support the growth of the clean energy economy in Massachusetts.

ADOPT

Spur deployment of renewable energy technologies

CONNECT

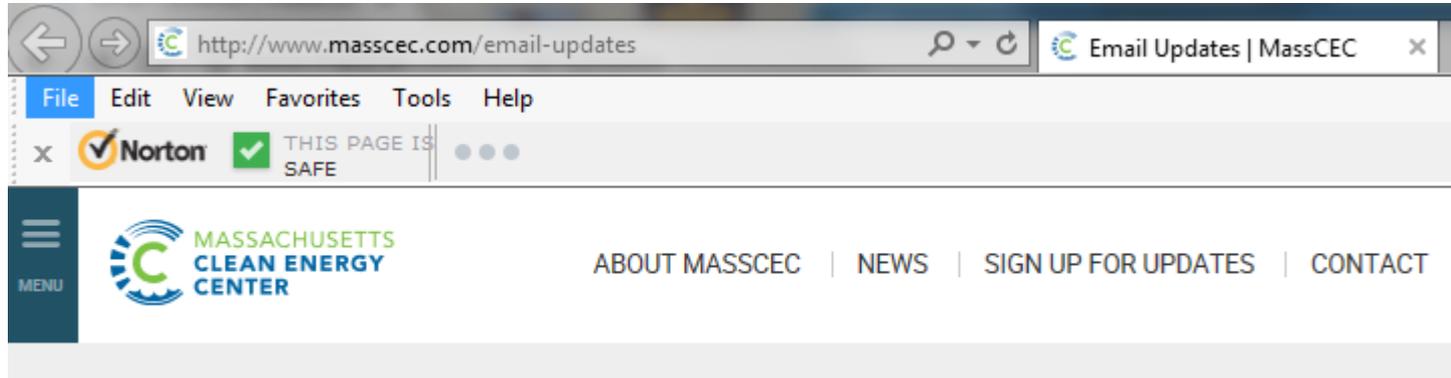
Connect employers, job seekers, students, communities, and investors to the clean energy industry.

INNOVATE

Promote innovation through infrastructure, funding, and other support.

Funded primarily by a system benefit charge on electricity bills (separate from MassSave).

Sign Up for MassCEC Email Updates



Email Updates

To receive email updates from Massachusetts Clean Energy Center, please enter your email address below:

**Required*

Please select the type of updates you would like to receive:

- Massachusetts Daily Clean Energy News Digest**
A daily newsletter of local, national and international clean energy news.
- Events Calendar and Announcements**
Receive occasional major MassCEC announcements and a newsletter of local and regional clean energy events highlighted twice monthly.

Receive periodic updates on these program areas:

- Careers, Workforce and Internships**

Request for Proposals

2018 Clean Energy Activity Day

Clean Energy Activity Day

- **Purpose:** *K-8 MA schools plan and host a clean energy activity day in the spring for their students!*
- **Proposals Due By:** December 8, 2017
- **Anticipated Award Amount:**
\$8-10,000/school for up to 10 awardees
- **Anticipated Award/Project Start Date:**
Awards will be announced at the end of January 2018 with events occurring between February – June 2018.
- **Other:** *In 2017 we awarded 6 schools and reached ~1,100 students – we aim to beat this number in 2018.*
- *Go to the below link for extended webinar on the RFP: <http://bit.ly/2ihMcr1>*



Clean Energy Activity Day

<http://www.masscec.com/clean-energy-activity-day>

 MENU  ABOUT MASSCEC | NEWS | SIGN UP FOR UPDATES | CONTACT      

Clean Energy Activity Day EDUCATOR / TRAINER 

[Home](#) > [Clean Energy Activity Day](#)

MassCEC partners with Massachusetts elementary and middle schools to provide students with a day dedicated to clean energy and STEM education and hands-on activities.

▶ [Who's Eligible?](#)

▶ [How Do I Apply?](#)

▶ [Frequently Asked Questions](#)

▶ [Program Background](#)

▶ [Program Contact](#)



Tamika Jacques, tjacques@masscec.com

Request for Proposals

Wastewater Treatment Plant (WWT)

Innovative Technology Pilots

Goal of WWT Innovative Technology Pilots

The **primary goal** of the program is to:

Assist Massachusetts WWT utilities by funding the piloting of innovative water technologies that (1) **increase facility energy efficiency**

Secondary goals include:

- (2) **recover reusable resources** (i.e., heat, clean water, nutrients, or electricity) and/or;
- (3) **remove/remediate nutrients** (i.e. nitrogen, phosphorus)

General RFP Information

Total Funding Available	\$ 800,000
Maximum Award	\$150,000
Duration of Pilots	Not to exceed 12 months
Required Cost Share	At least 50% (combination of in-kind and cash)
Anticipated Total Awards	5-8 awards

Eligibility & Minimum Qualifications



Two or more entities comprised of at least one publicly owned WWT facility and at least one innovative water technology provider



“Water innovation” includes technologies related to wastewater as well as innovative applications in the municipal WWT market, and *does not include (for this RFP) innovative policy, business plan, or regulation*



Applicants must indicate baseline energy use metrics and goals in terms of a potential percentage increase for one or more of the technology areas that is proposed for piloting (*measured in kWh/MG treated or kBTU/gpd*)

Proposal Requirements



- ❖ Attachment A: Project Proposal Cover Sheet

- ❖ Attachment B: Application Form

- ❖ Attachment C: Project Work Plan and Budget Template



- ❖ Copy of Completed NYSERDA TRL Calculator Spreadsheet



- ❖ Staff Resumes

- ❖ Attachment D: Authorized Applicant Team's Signature and Acceptance Form

FY17 WWT Successes



1 Project Complete

Amherst and Clean Membranes: Treated 4.5m gallons of water from Amherst's WWT Plant to Class A reuse standard to irrigate UMass Amherst's athletic fields.



4 Projects Underway

Upper Blackstone and Clearas: Resource recovery to produce algae for wastewater treatment.

Montague and The Water Plant Company: Solids Destruction Via Anaerobic digestion.

Tisbury and CSE Clean Water LLC: Removal of Nitrogen from residential Title 5 septic systems.

Barnstable and Geomatrix, LLC: Removal of nitrogen and selected contaminants from residential Title 5 septic systems.

Application Timeline and Process

Release of RFP	September 26 th , 2017
Final Date for Written Questions	December 1 st , 2017
Final Date for Submittal of Applications	December 8 th , 2017 by 4:00 PM EST
Projects Selected*	March 9 th , 2018
Pilot Projects Begin By*	No more than one month from execution of contract with MassCEC
Pilot Projects Complete By*	No more than 12 months after pilot project begins



Questions should be emailed to kdobbins@masscec.com

**Dates after RFP Response Due Date are anticipated dates. All dates are subject to change. Please refer to the MassCEC website for any changes at:*

<http://www.masscec.com/water-innovation>

Clean Heating and Cooling Commercial-Scale Incentives

Clean Heating & Cooling Agenda

- Why clean heating & cooling?
- Technology overviews
- Example projects
- Ways your community can take advantage
- Appendix: MassCEC incentive formulas

Poll Question #1

- **Are you constructing any new buildings in the near future?**
 - **Yes**
 - **No**

Poll Question #2

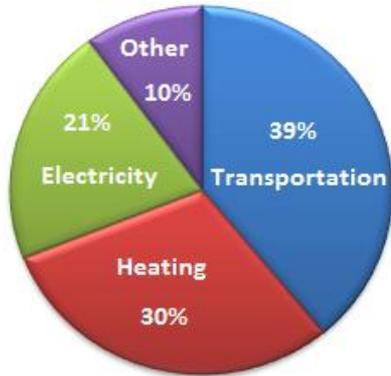
- **Do you have any municipal buildings that heat with any of the following?**
 - **electric resistance heating**
 - **oil**
 - **propane**

Poll Question #3

- **Do you have any municipal buildings that need new heating systems?**
 - **Yes**
 - **No**

Case for Clean Heating

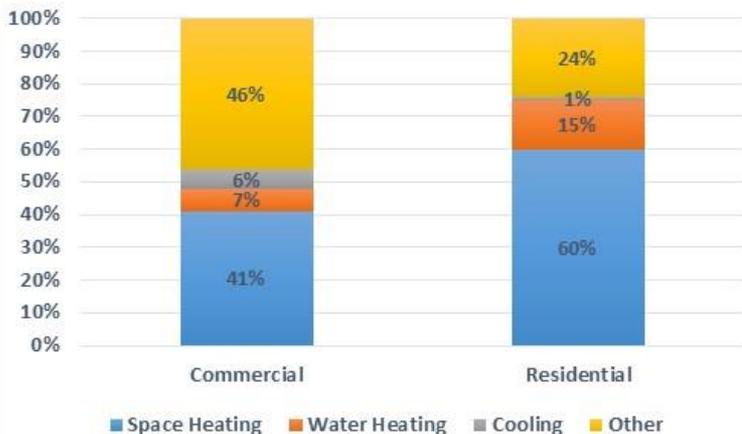
GHG Emissions (MA)



MA GWSA reduction targets:

- 25% by 2020
- 80% by 2050
- Does not specify how to do it

Building Energy Use (New England)



Clean Heating & Cooling: a multi-benefit solution

- Much lower GHG emissions
- Superior quality and comfort
- Decreased operational costs

Technologies Supported



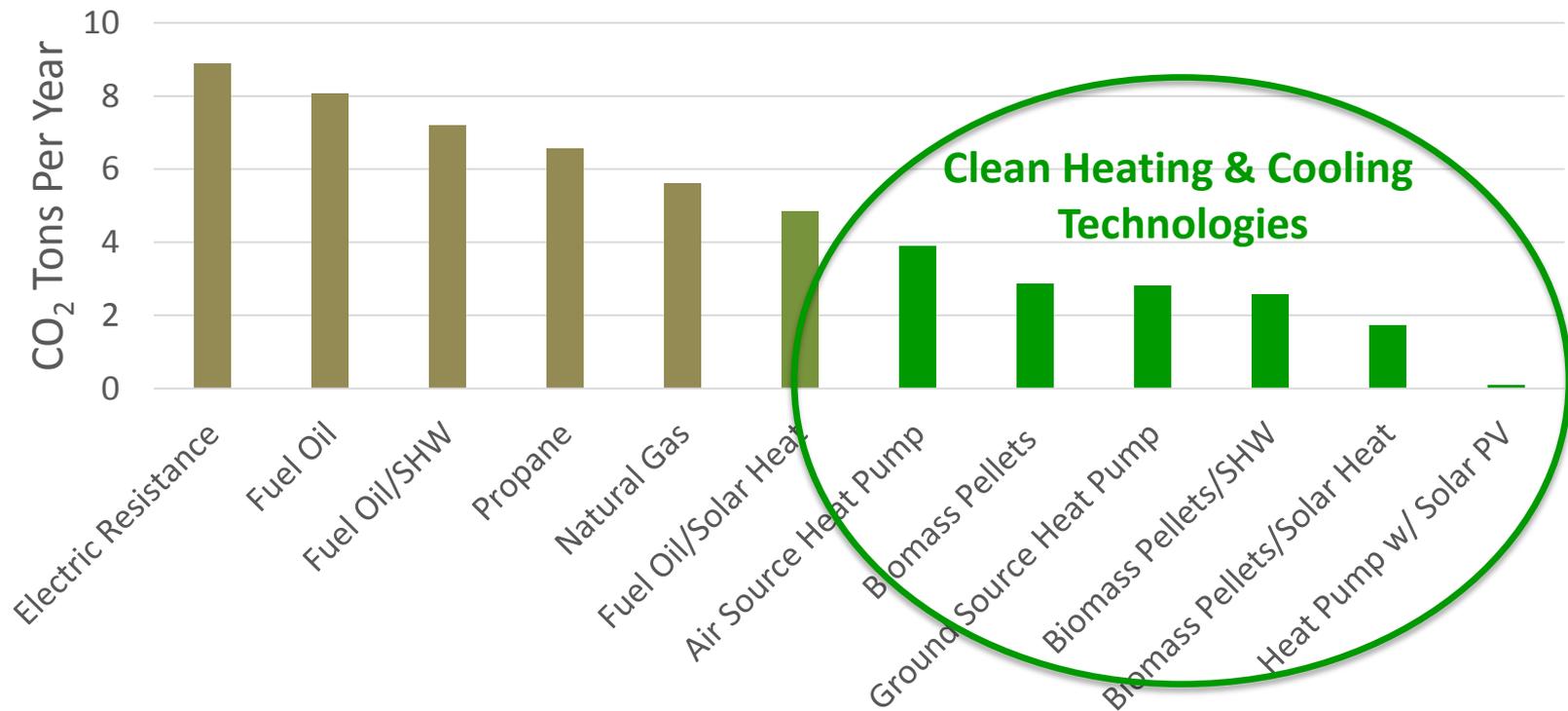
- **Cold-Climate Air Source Heat Pumps**
- **Ground Source Heat Pumps**



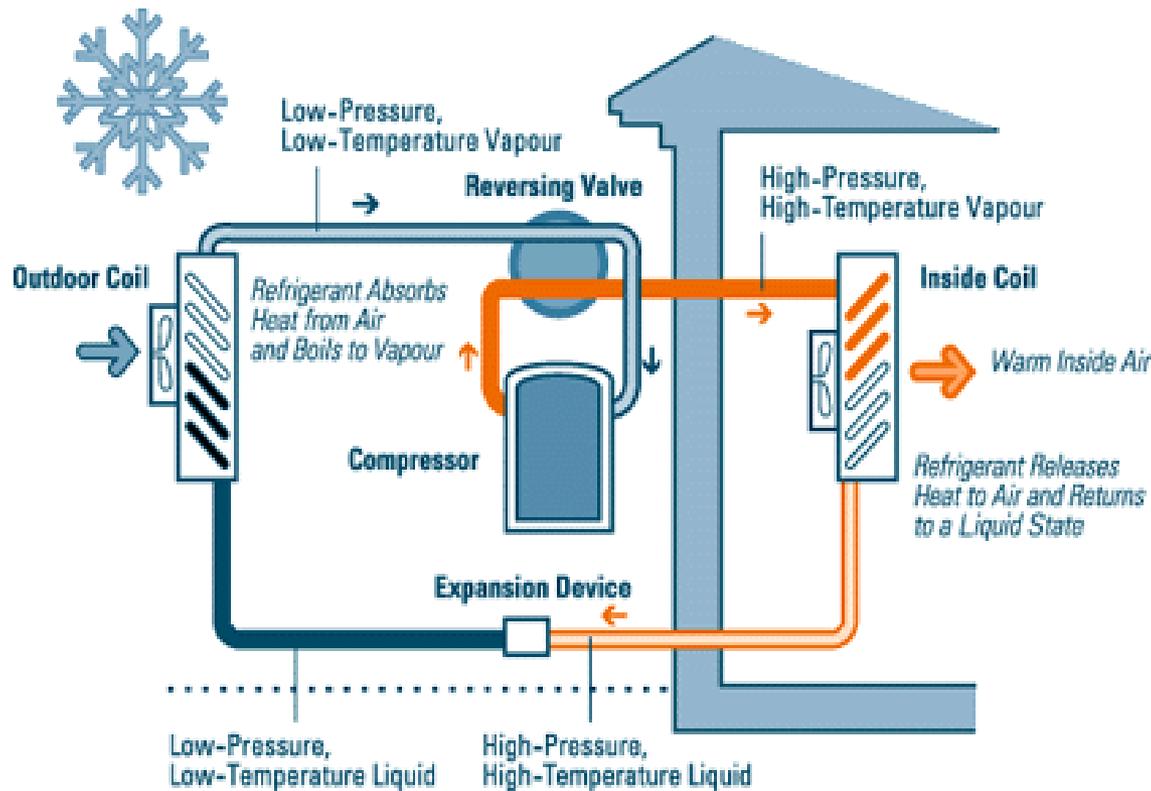
- **Solar Hot Water**
- **Modern Wood Heating**

Renewable Heating & GHG

Estimated Annual GHG Emissions – Example Small Building



How Does it Work?



ASHPs use a refrigerant loop to extract and move heat between spaces. Systems can provide both heating AND cooling.

Variable Refrigerant Flow (VRF) vs. Mini-Splits: What's the difference?



CHARACTERISTIC	MINI-SPLIT	VRF
LEVEL OF CUSTOMIZATION	Low	High; flexible options
UNIT CAPACITY (BTU/HR)	Up to 65,000	65,001 – 500,000
# INDOOR HEADS PER OUTDOOR COMPRESSOR	Up to 8	Up to 60
SIMULTANEOUS HEATING & COOLING	Not available	Available

Clark University Alumni Center

- 35,000 sf building (event spaces, offices)
- 100% heated and cooled by air-source VRF
- Advanced controls optimize energy savings



Ground-Source Heat Pumps

- Highest efficiency clean heating technology
- Vertical or horizontal wells
 - 50+ year heating asset
- Distribution typically by forced air or low-temperature hydronic
- Best applications:
 - Space heating & cooling
 - Lower temperature process loads



Alden Court Nursing Care & Rehab Center

- 11 ground-source heat pumps
- 58 tons of capacity
- 35 separately controllable zones
- Greatly improved occupant comfort
- ~70% savings on heating and cooling bills
- ~65% reduction in CO₂ emissions



Central Wood Heating

- Supported technologies are high-efficiency and clean burning
- Pellet and wood chip boilers
- Fully automated systems
- Bulk fuel delivery
- Best applications:
 - Replacement for fossil fuel-fired boilers
 - Schools and campuses
 - Process heat (food processing, brewing, etc.)
 - Agricultural heating, including greenhouses



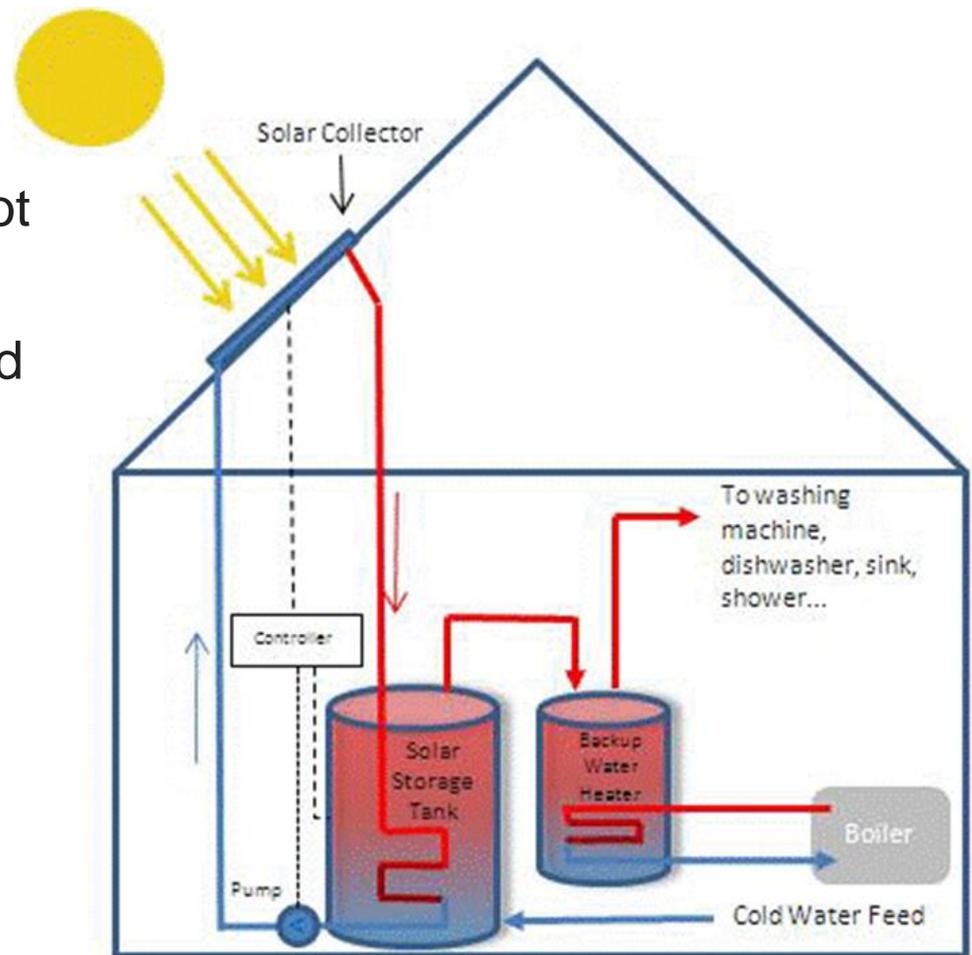
Narragansett Regional School District (Templeton)



- Wood chip-fired boiler (replaced #2 fuel oil)
- Saves ~\$250,000/year on fuel expense
- Emissions control system includes electrostatic precipitator

Solar Hot Water

- Ties in with most domestic hot water systems
- Roof or ground space needed
- Excellent applications:
 - Housing
 - Indoor swimming pools
 - Washing processes
 - Food production

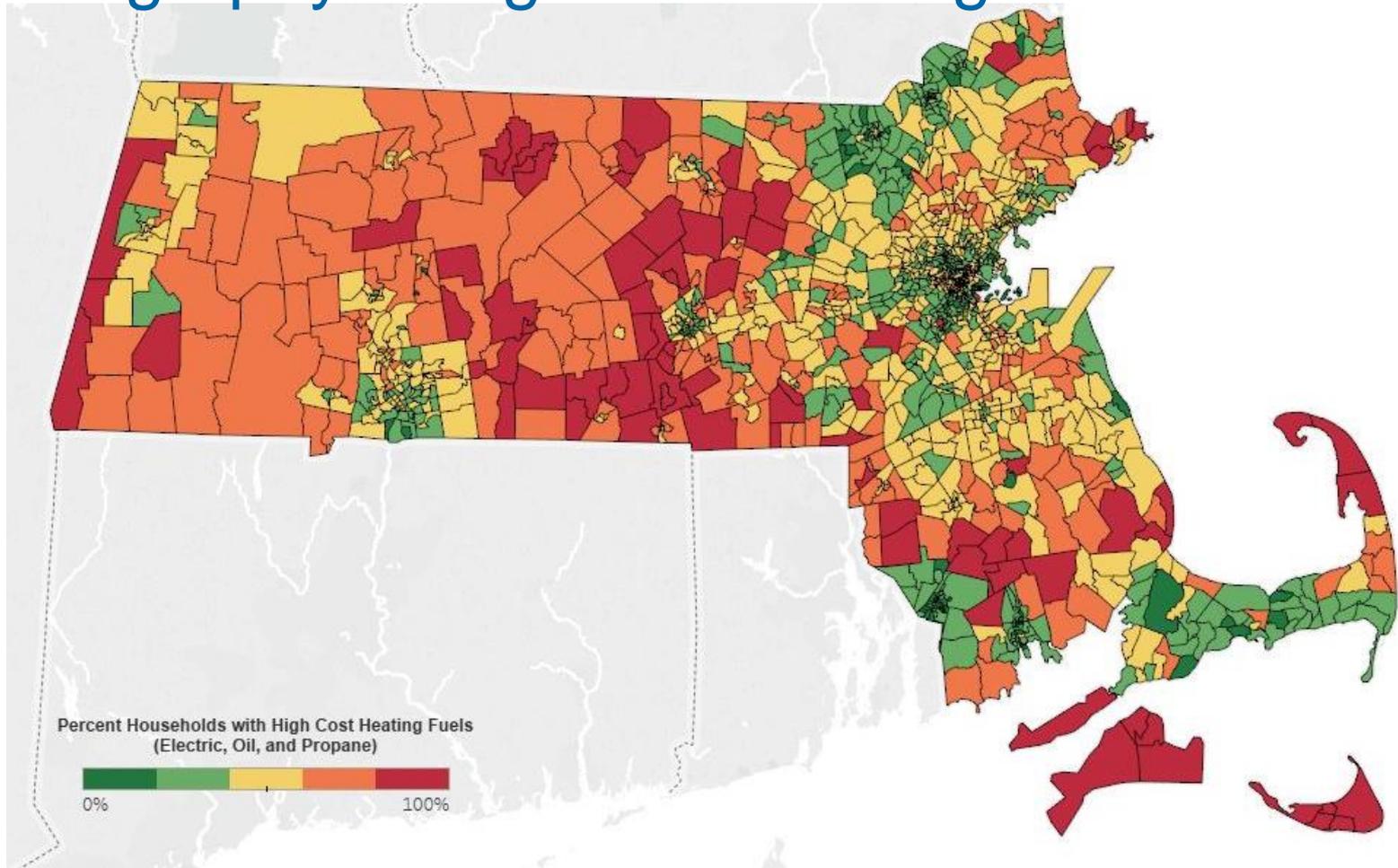


Wheaton College



- Flat-plate solar collectors on Haas Athletic Building roof
- Heats water for pool and locker rooms
- Saves over 3,900 therms/yr, or 40% of facility's demand for water heating

Geography of high cost heating fuels



MassCEC Clean Heating & Cooling Incentives

Technology	Maximum Incentive
VRF Air-Source Heat Pumps	\$250,000
Other Air-Source Heat Pumps	\$225,000
Ground-Source Heat Pumps	\$250,000
Central Wood Heating	\$250,000
Solar Hot Water	\$101,500

Details in Appendix and at:

<http://www.masscec.com/business/clean-heating-and-cooling>

How your community can take advantage

1. Employ at new or retrofitted municipal facilities
 - Increase comfort, save money, reduce GHG footprint
 - Combine with MassSave and/or other incentives for additional savings
2. Spread the word to businesses in your community
3. Advise project developers of clean heating & cooling options

MassCEC Clean Heating & Cooling: 617-315-9357

2018 Solarize Mass, Solarize Mass Plus, and HeatSmart Mass Programs

Solarize Mass and Solarize Mass Plus

- **Background:** *Communities collaborate with DOER and MassCEC to conduct an outreach and education campaign, coupled with a competitive installer selection process that offers reduced pricing to community members*

Over 18% of Massachusetts communities have participated to date

Over 3,200 contracts signed representing over 21MW of capacity

Participants see 20% average savings

- **Proposals:** *Seeking communities and community groupings to participate in 2018 program. Rolling solicitation, deadline for 2018 round is May 31, 2018, or when funds are reserved.*
- **Anticipated Award Amount:** *up to \$5,000 per community.*
- **Solarize Mass Plus:** *Pairs solar PV with complementary technologies*
- See www.solarizemass.com for program results, community best practices and how your municipality can apply

2018 and 2019 HeatSmart Mass

- *Pilot based off of successful Solarize Mass program seeking to increase the adoption of small-scale clean heating and cooling technologies through competitive installer selection and reduced pricing for participants*
- *Technologies include solar hot water, air source heat pump, ground source heat pump, and high efficiency wood pellet boilers*
- *2018 program closed, intending to launch a second round in Spring/Summer 2018*
- *See <http://www.masscec.com/heatsmart-mass> for more information, and sign up for email updates*

Program Differences

	Solarize Mass	Solarize Mass Plus	HeatSmart Mass
Technologies	Solar PV	Solar PV, and one or more complementary technologies (solar hot water, air source heat pump, ground source heat pump, electric vehicles, etc.)	Solar hot water, air source heat pump, ground source heat pump, high efficiency wood pellet boiler
Community Application Process	Rolling		Limited application timeline per program round
Who can apply	Municipalities in investor owned utilities (Eversource, National Grid, Unitil), or Municipal Lighting Plant communities (MLP's): Ashburnham, Holden, Holyoke, Russell, Templeton		All municipalities in Massachusetts*

*HeatSmart Mass is funded through Alternative Compliance Payment (ACP) funds

Poll Question #4

- **Choose all that apply: My community has:**
 - **Participated in the Solarize Mass program in the past**
 - **Considered applying to the Solarize Mass program**
 - **Heard of the Solarize Mass program**

DeployMass Program

DeployMass Program Goals

- (1) Support the growth and development of Massachusetts-based clean energy and water technology companies
- (2) Cut operating costs, reducing greenhouse gas emissions and/or provide other energy benefits for public entities via the deployment of de-risked, commercially-ready clean energy technologies

CoolGreenPower

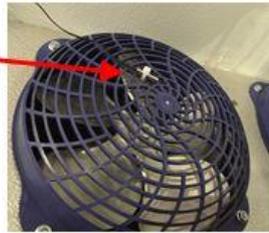
Product: COOLNOMIX
AC/Refrigeration energy
efficiency device

Project: Medford
Vocational Technical High
School

Support: \$10,000 grant
with \$3,750 cost share
from CoolGreenPower



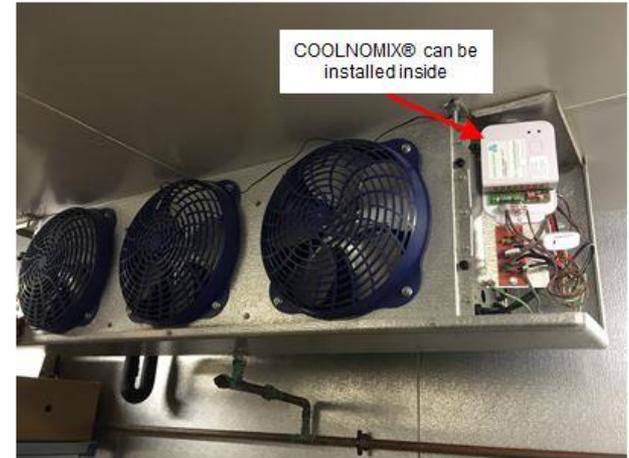
Supply air sensor



Return air sensor



COOLNOMIX® can be
installed inside



DeployMass

<http://www.masscec.com/deploymass>

MASSACHUSETTS CLEAN ENERGY CENTER

ABOUT MASSCEC | NEWS | SIGN UP FOR UPDATES | CONTACT

f t in You Tube

DeployMass

INNOVATOR 

[Home](#) > [DeployMass](#)

DeployMass (formerly known as the Massachusetts as a First Customer Program) facilitates the adoption of clean energy or water innovation technologies at public agencies, public academic institutions and municipalities to support the growth and development of Massachusetts-based companies while saving taxpayer dollars.

▶ [Who's Eligible?](#)

▶ [How Do I Apply?](#)

▶ [FAQ](#)

▶ [Program Background](#)

▶ [Program Contact](#)



Maeghan Lefebvre, MLefebvre@masscec.com

Questions?

Elizabeth Youngblood, Senior Project Manager
eyoungblood@masscec.com 617-315-9335

Amy Barad, Program Director
abarad@masscec.com 617-315-9310

Katie Dobbins, Project manager
kdobbins@masscec.com 617 315 9317

Visit us at www.MassCEC.com

Follow Us on
Social Media



Join our email lists

www.masscec.com/email-updates

Appendix: Clean Heating & Cooling Incentives

Air-Source Heat Pump Incentives

VRF Incentive Calculation

(\$ per 12,000 BTU/hr of rated heating capacity @ 17°F)

Owner Type	No Heat Recovery	Heat Recovery	Max. Grant (HR / no HR)
Private	\$800	\$1,200	\$120,000 / \$180,000
Public/Non-Profit	\$1,000	\$1,400	\$150,000 / \$210,000
Affordable Housing	\$1,600	\$2,000	\$240,000 / \$250,000

Mini-Split Incentive Calculation

(\$ per 12,000 BTU/hr of rated heating capacity @ 5°F)

Owner Type	\$ per unit <u>or</u> per 12 kBTU/hr	Max. Grant
Private	\$625	\$93,750
Public/Non-Profit	\$800	\$120,000
Affordable Housing	\$1,500	\$225,000

Other Incentives

- Mass Save
- Alternative energy credits

Ground-Source Heat Pump Incentives

- Maximum incentive: \$250,000
- Incentive based on system capacity, with adders for
 - Higher efficiency
 - Publicly owned buildings
 - Affordable housing

Other incentives: Alternative energy credits

Modern Biomass (Wood) Heating Incentive

Incentive Calculation Based on % of eligible project costs

Incentive Component	% of Project Costs	Max. Value
Base	35%	\$175,000
Thermal Storage Adder	5%	\$25,000
Cascading Systems Adder	2.5%	\$12,500
Distribution System Efficiency Adder	2.5%	\$12,500
Public/Non-Profit/Affordable Housing Adder	5%	\$25,000
Maximum Incentive	50%	\$250,000

MassCEC Solar Hot Water Incentives

Incentive Calculation

Incentive based on SRCC OG-100 efficiency rating, # of collectors, and adders

Component	Standard	Non-Profit/ Public	Affordable Housing
Base Incentive = Rating * # of Collectors * Constant	Constant = \$100	Constant = \$150	Constant = \$200
PV Co-Location Adder	\$500		
Maximum Incentive before Metering	40% of cost, up to \$100,000	65% of cost, up to \$100,000	80% of cost, up to \$100,000
Metering Adder	100% of metering equipment cost, up to \$1,500		
Maximum Total Incentive	\$101,500		

Other Incentives

- 30% federal tax credit
- Alternative energy credits