Commonwealth of Massachusetts

EXECUTIVE OFFICE OF HOUSING & ECONOMIC DEVELOPMENT

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OFFICE OF PERFORMANCE MANAGEMENT AND OVERSIGHT

Massachusetts Clean Energy Center

Annual Report for 2017 Fiscal Year

The Massachusetts Clean Energy Center 2017 Annual Report complies with the requirements of the Office of Performance Management Oversight created by Chapter 240 of the Acts of 2010 – An Act Relative to Economic Development Reorganization. It includes goals set for the year and the performance metrics to evaluate goals, programs, and initiatives.

AGENCY OVERVIEW

The Massachusetts Clean Energy Center (MassCEC) is dedicated to accelerating the success of clean energy technologies, companies and projects in the Commonwealth—while creating high-quality jobs and long-term economic growth for the people of Massachusetts. Since it began operating in 2009, MassCEC has helped clean energy companies grow, supported municipal clean energy projects, funded university research and development, and invested in residential and commercial renewable energy installations, creating a robust marketplace for innovative clean technology companies and service providers.

MassCEC's objective is to increase the statewide adoption of renewable energy, while driving down the costs of renewable energy and delivering financial and environmental benefits to ratepayers. To do so, MassCEC works closely with residents, businesses and municipalities to develop programs that provide renewable energy solutions for their energy needs. MassCEC's programs also connect communities with the most viable clean energy and water technologies and reduce the energy burden on low- and moderate-income residents, with the hope of fostering the success of the Commonwealth's dynamic clean energy sector.

Annual Budget

MassCEC's annual awards budget for FY17 was $51.5 million and actual awards were $48.1 million.

FY2017 REPORT DETAILS

Goal: Increase renewable energy adoption while driving down the costs of renewable energy.

Strategy	Measurement(s)	Outcome(s)
Increase residential and commercial adoption and leverage private investment in renewable heating and cooling technologies, including air-source heat pumps, ground-source heat pumps and central biomass heating systems	• Number of systems awarded[1] • Installed capacity enabled • Private investment leveraged[2]	• 4,034 systems awarded • 119,453 kBtu/hr of installed capacity enabled • $35,671,060 in private investment leveraged
Continue to manage a low-interest loan program to connect homeowners who want to install solar electric systems with lenders to help finance the projects, expanding borrowing options through encouraging lower interest rate loans, and supporting loans to borrowers with moderate income or lower credit scores	• Number of loans enabled • Megawatts (MW) of installed capacity enabled • Installed capacity at moderate income households as a percentage of overall MW enabled • Private capital leveraged	• 2,052 loans enabled • 17 MW of installed capacity enabled • 40% of all capacity installed is at low or moderate income households • $68.5 million in private capital leveraged
Increase residential and commercial adoption and leverage private investment in solar hot water systems	• Number of systems awarded[3] • Square footage of collectors installed • Private investment leveraged[4]	• 94 systems awarded • 13,399 square feet of collectors installed • $1,049,550 in private investment leveraged
Increase the generation of energy from facilities using organic feedstocks -- primarily via anaerobic digestion	• Number of construction awards • Megawatts (MW) of installed capacity enabled • Number of awards for studies or technical services	• 3 construction awards • 1.77 MW of installed capacity enabled • 2 awards for studies or technical services
Cost-effectively increase the generation of electricity by Massachusetts RPS-qualified hydroelectric facilities as mandated by statute	• Number of construction awards • Annual generation (kWh/year) associated with construction awards • Cost-effectiveness of hydropower awards (cents/kWh)	• 0 construction awards, but 1 feasibility study award During FY17, staff were in communication with a number of facility owners or developers who were preparing to submit applications for construction grants, although submission is not expected until FY18.
Inform, create a better climate for, and advance the development of land-based wind projects in a manner that the projects will be	• Number of active projects in the pipeline • Number of siting/impact studies started or advanced	• 2 projects in the pipeline • 0 siting/impact studies started or advanced • 1 analysis/information project

[1] Measurement changed from “Number of systems installed” to “Number of systems awarded”, since this is a more appropriate metric for the program.
[2] Measurement changed from “Private investment leveraged per dollar awarded by MassCEC” to “Private investment leveraged”.
[3] Measurement changed from “Number of systems installed” to “Number of systems awarded”, since this is a more appropriate metric for the program.
[4] Measurement changed from “Private investment leveraged per dollar awarded by MassCEC” to “Private investment leveraged”.

appropriately sited in terms of performance, benefits, impacts and community support	• Number of analysis/information projects supported	supported
Reduce the energy burden of low-income residents by increasing access to cost-saving renewable technologies, and build on the successes of existing community-based organizations, state agencies and public assistance programs through coordination and collaboration	• External dollars leveraged • Number of housing units served[5] • Savings in energy (kWh/lifetime)	• $320,150 in leveraged funds reported to date. There are additional leveraged funds for 3,390 housing units that have not yet been reported, which will increase this number. • 6,797 housing units served • 22,282 MMBTU and 7,584,418 kWh of expected lifetime energy savings reported to date. There are additional energy savings for 3,390 housing units that have not yet been reported, which will increase these numbers.
Goal: Massachusetts continuing to lead in clean energy.		
Strategy	**Measurement(s)**	**Outcome(s)**
Provide MA-based incubators that serve clean energy start-up companies with financial assistance for operations and management expenses to enable them to provide support to cleantech start-up companies, promoting investment and job growth	• Number of cleantech companies served by incubators[6] • Number of employees at these cleantech companies • Total funding raised by these companies	• 58 companies served by incubators through FY17 • 454 employees at these companies through FY17 • $257 million raised by these companies through FY17
Assist Massachusetts cleantech companies in advancing their technologies to the commercialization stage and beyond through direct equity and venture debt investments, generating both job growth and a financial return	• Number of employees at supported companies • Total funding raised by these companies in current and future financing rounds • Valuation and returns ($) as multiple of investment cost • Total revenues generated by supported companies	• 517 employees supported at companies through FY17 • $648,490,411 leveraged funds through FY17 • 1.03x return on investment cost through FY17 • $56,248,711 in revenue generated by supported companies through FY17
Provide federally-mandated cost share to MA-based ARPA-E awardees to advance cutting-edge technology, enhance the	• External dollars leveraged • Total awarded ARPA-E dollars to MA entities[8]	• $11,745,047 leveraged • $17,348,384 in ARPA-E dollars awarded to MA entities

[5] Measurement changed from “Savings in energy costs ($/lifetime)” to “Number of Housting Units Served”, since this is a more appropriate metric for the program.

[6] Measurement changed from "Number of cleantech companies served by incubators, including graduates" to "Number of cleantech companies served by incubators", since this is a more appropriate metric for the program. It was determined the number of graduates would not be measured.

competitiveness of MA-based ARPA-E applications and leverage the deep technical expertise of ARPA-E[7]	• Number of applications sourced • Number of projects funded	• 8 applications sourced • 6 projects funded
Provide wind industry with efficient facility/technology to test utility scale wind turbine blades to validate and improve reliability and support introduction of new technology into production, while maintaining positive operating income	• Testing revenues generated by Wind Technology Testing Center (WTTC) • Number of industry blades tested • Maintain operational excellence through internationally-recognized assessment and accreditation certification	• Generated $1,544,360 for FY17 testing revenue • Tested 3 new blades and 1 special handling test • Completed the annual A2LA (lab accreditation and quality system) audit without any issues
Improve the rate of success of cleantech companies graduating from accelerators by providing support to accelerators as well as additional funding for early stage companies	• Number of applications received • External capital leveraged[9] • Annual revenues generated • Number of new jobs created[10] • Number of awardees raising a qualified financing • Number of commercial engagements per awardee • Percent of awardees that progress from Phase 1 to Phase 2 awards[11]	• 12 applications received • $1,551,583 in annual revenue generated • 0 awardees are raising qualified financing at this time • The number of commercial engagements per awardee will be collected in the future, but no data is available for FY17 • 42.9% of Phase 1 awardees progressed to receive Phase 2 awards
Address market barriers in emerging technology markets and catalyze the growth of those markets	• Projects in technologies that have limited current markets (e.g., storage, alternative transportation) • Number of strategic partners	• 2 projects supported • 5 strategic partners
Lead in the development and growth of a water innovation cluster by supporting relevant water innovation organizations and activities; create relevant and impactful water technology piloting programs, and support the growth of a strong and robust network of water technology demonstration sites	• Number of water technology pilots and demonstration projects funded • External funding leveraged • Energy savings achieved	• 5 pilots and demonstration projects funded • $952,643 in external funding leveraged • Data on energy savings achieved is not yet available, since these projects can take 12-18 months to complete

[8] Measurement changed from "Percentage of total awarded ARPA-E dollars to MA entities" to "Total awarded ARPA-E dollars to MA entities", since this is a more appropriate metric for the program.

[7] Strategy changed from "Provide federally-mandated cost share to MA-based ARPA-E awardees to advance cutting-edge technology, enhance the competitiveness of MA-based ARPA-E applications to increase capture of federal funding, and leverage the deep technical expertise of ARPA-E". Reference to increasing federal funding was removed, since this is a more appropriate strategy for the program.

[9] Measurement is no longer collected, since it is not an appropriate measure of program success.

[10] Measurement is no longer collected, since it is not an appropriate measure of program success.

[11] This measurement is new, and was not included in the initial FY17 report.

Pilot innovative, broadly replicable energy storage use cases/business models with DOER that have multiple value streams in order to prime Massachusetts for increased commercialization and deployment of storage technologies	• Number of projects with different business models • Kilowatts of new storage capacity installed • Benefits (in dollars) from storage projects	• No data is available at this time, since the awards process has been delayed. It is anticipated that the awards will be made soon, which will allow for measurements to be reported for FY18.
Support the development and growth of small companies through funding for structural innovation resources including accelerators and applied research centers	• External funding leveraged • Number of engagements with clean energy research centers/teams/projects[12] • Number of start-ups supported[13]	• $2,588,809 in external funding leveraged • 108 engagements with clean energy research centers and ecosystem partners • 91 start-ups supported
Goal: Develop a trained workforce for a rapidly growing industry.		
Strategy	**Measurement(s)**	**Outcome(s)**
Provide Massachusetts clean energy businesses with a talented pool of young professionals and introduce clean energy career experiences to people entering the workforce, through on-the-job training programs	• Number of students placed at host employers • Number of companies who host student interns • Number of internships that convert to full-time or part-time jobs • Number of women and minorities who receive internships • Number of community college students who receive internships • Number of businesses who participate from western and southern Massachusetts	• 559 students placed at host employers • 198 companies who hosted student interns • 45 internships converted in fall 2016 and 23 internships converted in spring 2017 (the number for summer 2017 internship conversions is not yet known) • 348 women and minorities who received internships • 37 community college students who received internships • 48 businesses who participated from western and southern Massachusetts
Build a robust talent pipeline for cleantech companies by engaging students across Massachusetts about Clean Energy & STEM careers	• Number of businesses who participate from western and southern Massachusetts • Number of students per grantee exposed to Clean Energy & STEM Careers • Number of participating students from Gateway Cities	• 0 businesses were from western or southern Massachusetts • 42 students were exposed to clean energy and STEM careers • 42 students were from Gateway Cities • 0 companies were supported

[12] Measurement changed from "Number of engagements with clean energy research centers/teams/projects" to "Number of engagements with clean energy research centers and ecosystem partners", since this is a more appropriate metric for the program.
13 Measurement changed from “Resources deployed for clean energy companies and entrepreneurs across the Commonwealth” to “Number of start-ups supported”, since this is a more appropriate metric for the program.

	• Number of companies supported[14]	
Goal: Advance innovative solutions that will lead to energy security and a safe, reliable and resilient energy infrastructure.		
Strategy	**Measurement(s)**	**Outcome(s)**
Provide grants for demonstration projects to promote the commercialization of new technologies and the creation of business partnerships while leveraging private funding	• Number of jobs supported[15] • Private funding leveraged[16] • Number of strategic partners engaged	• 14 jobs supported • $743,248 in leveraged funds • 9 strategic partners engaged
Provide grants for university teams and early stage start-up companies to fund targeted proof-of-concept projects	• External capital leveraged • Number of applications received • Number of awards disbursed • Number of inventions disclosed, patents awarded or patents filed	• $57,076,648 in external capital leveraged in FY17 for all grantees that have received awards during the life of the program • 97 applications received in FY17 • 14 awards disbursed in FY17 • 43 inventions disclosed, patents awarded, or patents filed through FY17
Provide grant support to university research programs in order to accelerate the development of clean technologies	• Number of university awards made • Number of students supported • External capital leveraged	• 2 awards made to universities • 8 students supported • $2,184,274 leveraged funds
In order to support the responsible and expedited development of offshore wind in the federal waters south of Martha's Vineyard, conduct initiatives including transmission survey work, met-ocean data collection, supply chain and workforce development planning, grants to academic institutions to advance offshore research and development, and continue marine wildlife surveys	• Number of new or expanded projects supported • Number of awards for research projects	• 9 new or expanded projects supported • 4 awards for research projects
Goal: Maintain public confidence in the use of ratepayer dollars.		
Strategy	**Measurement(s)**	**Outcome(s)**
Annual Independent Fiscal Audit –	• Independent fiscal audit	• The MassCEC Board of Directors

[14] Measurement is no longer collected, since it is not an appropriate measure of program success.
[15] Measurement changed from "Number of jobs created" to "Number of jobs supported", since this is a more appropriate metric for the program.
[16] Measurement changed from “Private funding leveraged per dollar awarded by MassCEC” to “Private funding leveraged”.

MassCEC engages in an independent audit of its financial statements every year, which is conducted by an independent accounting firm. The results and audited financial statements are reported to the MassCEC Audit Committee and full Board of Directors each year	presented annually to the MassCEC Board of Directors and Audit Committee at public meetings • Independent fiscal audit submitted annually to the MA State Legislature per its enabling statute	will review the FY17 fiscal year audit at the November 2017 board meeting. • Once approved at the November 2017 Board of Directors meeting, the audited financials will be posted at http://www.masscec.com/financial-information, with copies sumitted to the State Legislature
Continued partnership with A&F on Open Checkbook	• Data submitted monthly: www.mass.gov/opencheckbook	• MassCEC provides updated information to the Massachusetts Open Checkbook for Quasi Public Agencies, now called CTRHU, which can be accessed at: https://www.mass.gov/cthru-transparency
Budget and Program Performance Online – MassCEC has posted extensive financial information on its own website, including the audited financial statements and FY17 budget	• Audited financial statements and budget information included on MassCEC website • Enhanced details on program performance	• MassCEC posts its budget and financials on its website: http://www.masscec.com/financial-information
Verification of Renewable Energy Production – Tracking and Verification of Renewable Energy Production – MassCEC's Production Tracking System (PTS), (1) tracks renewable energy generation supported through MassCEC grants and rebate programs, (2) is the Independent Third Party Verifier for eligible renewable energy production that qualifies for Renewable Energy Certificates (RECs). The PTS provides data quality assurance by ensuring that renewable energy generations are appropriately registered, reported, verified and audited. MassCEC reports quarterly solar energy production to the NEPOOL (New England Power Pool), who then produces Solar-RECs (SRECs and others). NEPOOL is a voluntary association of market participants doing	• Quarterly production data reported to New England Power Pool (NEPOOL) • Annual independent audit of Solar Renewable Energy Credit (SREC) systems completed	• MassCEC's posts the Production Tracking System "Solar PV System in MA Report" and the "SREC Capacity Factor Report" at http://www.masscec.com/production-tracking-system-0

business in the six-state New England region		

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OFFICE OF PERFORMANCE MANAGEMENT AND OVERSIGHT

Massachusetts Clean Energy Center

Annual Report for 2017 Fiscal Year

Additional Information Request

Agency receipts and expenditures during the fiscal year.:

Receipts	$45,350,532
Expenditures	$53,956,593

Agency assets and liabilities at the end of the fiscal year:

Assets	$333,530,007
Liabilities	$8,993,128

Audited financial reports of the agency:

Audited financial statements can be found at the following link:
http://files.masscec.com/Massachusetts%20Clean%20Energy%20Center%20-%20Financial%20Statements.pdf

The number, nature and amounts of investments made and grants awarded by the agency:

See Exhibit A. Please note that investments are included in this schedule. Actual cash payments for investments are detailed in Exhibit B.

Information detailing debt or equity investment of the agency:

See Exhibit B. Please note that these amounts represent cash disbursements and/or the cost to MassCEC. These totals may differ from amounts presented in Exhibit A due to timing of disbursements and other minor program support amounts.

The number, nature and amounts of any loans, real estate loans, working capital loans and guarantees approved by the agency.

MassCEC is the guarantor for a $300,000 loan between Avidbank and SolarOne Solutions, Inc. The guarantee expires on May 31, 2018.

In FY17, MassCEC also entered into a venture debt loan agreement with Hydration Labs, Inc. ("Bevi"), which matures in 2020. In FY16, MassCEC awarded a construction loan to Greentown Labs, Inc.. Although the $1.5M loan was awarded in FY16, drawdowns or cash payments of $653,432 were made to Greentown in FY17. The loan matures in 2026. Amounts paid to Bevi and Greentown are presented in Exhibit B.

Other forms of financing or financial assistance that the agency provided.

In coordination with DOER, MassCEC launched the Mass Solar Loan Program in December of 2015. The Program provides incentives to Massachusetts residents in the form of subsidized loans provided through a network of local banks and credit unions.

Under the FY17 structure, the three incentives provided by the program were:

1. An Interest Rate Buydown, which reduces a participating resident's loan interest rate by 1.5%
2. Income Based Loan Support, which provides a direct principal payment between 20 and 30 percent of a loan's value for income-qualified residents, and
3. Loan Loss Reserve under which MassCEC reserves funds in a dedicated account for the purpose of compensating lenders in the event a homeowner with a qualifying credit score defaults on their loan.

The total amount awarded under the Mass Solar Loan Program in FY17 for all three categories is shown in Exhibit A.

A report of patents or products resulting from agency-funded activities.

For the Investments Program, there were 188 patents filed or granted in FY17.
For the Catalyst Program, there were 43 inventions disclosed, patents awarded, or patents filed in FY17.

A description of technical assistance that the agency provided.

MassCEC provides numerous forms of technical assistance through different programs. Exhibit C summarizes the categories of technical assistance that are provide, and the programs or efforts associated with the assistance.

Exhibit A

Program	Net Funds Awarded in FY17	Award Count*	Program Description
MassChallenge	$ 75,000.00	1	MassCEC's support of cleantech and water companies through MassChallenge's scholarship program.
Advanced Commonwealth Energy Storage (ACES)	$ 5,000.00	1	An initiative that aims to advance the energy storage segment of the state's clean energy industry by attracting and supporting local energy storage companies, expanding storage technology markets and demonstrating the value of storage benefits for the state's power grid and customers.
Clean Energy Innovation Network	$ 1,840,000.00	4	MassCEC support for many organizations and events that make Massachusetts a global leader in clean energy innovation including technology incubators and accelerators, centers for applied research that leverage federal and foreign funding, and regional entrepreneurship programs.
Incubate Mass	$ 223,940.00	5	Program provides funding to incubators that are catalyzing and supporting startup companies to create jobs and promote the commercialization of new clean energy technologies.
Manufacturing Initiative	$ 390,525.00	7	Program to provide technical assistance and leveraged financial support to help small to medium sized manufacturers to deploy cost effective energy efficiency, storage, and appropriate renewables.
Market Development	$ 186,000.00	1	Support the development and commercialization of emerging clean energy technologies that have the potential to greatly benefit the infrastructure and ratepayers in the Commonwealth and/or transform its energy landscape.
Market Research	$ 86,142.00	2	To conduct timely research and study into specific topics that will inform clean energy industry of markets and barriers, inform MassCEC's program development, identify clean energy economic opportunities and/or increase public understanding of the clean energy economy.
Microgrid Challenge	$ 35,872.96	2	To accelerate the development of innovative utility-supported multi-user or community microgrids that achieve a broad range of performance objectives including energy cost and greenhouse gas emissions reductions, improved reliability and clean energy integration, and meaningful and strategic interaction with the macrogrid.
International Collaboration	$ 15,000.00	2	Host international policy/government delegations, start-ups, companies, consulates, regulators etc. to provide an overview of MassCEC and the cleantech andwater ecosystem in Massachusetts. Includes a pilot start-up exchange program between MA and Switzerland that begins in June 2017 - called MAtCH.
Leveraging Federal Opportunities	$ 663,990.14	7	Provides conditional funding to companies seeking federal grants to attract federal research and design dollars to Massachusetts.
University Research Funds	$ 318,885.00	3	Grants and funding for universities for various research projects.
AmplifyMass	$ 646,585.25	4	Provides grants to Massachusetts-based companies and university teams receiving federal and other sources of funding for clean energy related efforts.
Catalyst Program	$ 1,029,907.50	2	Support for university teams and early stage start-ups to fund targeted proof-of-concept projects.
DeployMass	$ 125,883.50	7	DeployMass provides networking and funding support to Massachusetts clean energy and water innovation technology companies in order to facilitate the adoption of innovative technologies at public agencies, public academic institutions and municipalities to save taxpayer dollars and support the growth and development of Massachusetts-based companies.
Innovate Mass	$ 1,053,241.47	10	A competitive program that provides awards to applicant teams that offer the most innovative, effective and impactful clean energy solutions, helping companies and their technologies move closer to commercialization.
Capacity Building	$ 1,176,538.97	26	Programs designed to develop replicable models that address systemic deficiencies and enhance working models in clean energy training and education programs of the Commonwealth’s education, non-profit and workforce community.
On-the-Job-Training	$ 2,342,938.11	344	Helps prepare the next generation of clean energy workers by connecting students and recent graduates with Massachusetts companies in need of interns and providing stipends for internships.
Pathways Out of Poverty	$ 517,848.00	19	Program provides grant funding for job training programs that help low- and moderate-income earners build careers in the clean energy sector and attain financial self-sufficiency.
Workforce Programming & CleanWeb	$ 7,689.20	3	Supports symposiums, networking nights and other events to promote clean energy careers and MassCEC’s programs. MassCEC hosts an annual Cleanweb Hackathon where teams create an app or web based platform to address energy efficiency and resource managment needs, followed by an eight week mini accelerator. MassCEC also hosts an annual Women in Cleanweb Panel to address diversity in the industry and highlight successful women.
AccelerateMass	$ 500,000.00	7	Provides convertible grant funding to extend runway for early stage start-ups graduating from qualified accelerator programs.
Equity Investments	$ 850,289.95	5	Support early stage and growth companies in development and commercialization stages via convertible debt and equity investments.
Follow-On Investments	$ 990,000.00	10	Provide follow-on investments in existing portfolio companies through transition to later funding stages on way to commercialization.
Venture Debt	$ 1,000,000.00	1	Support commercialization stage companies via senior and subordinated debt investments.
Commercial Solar Financing Pilot	$ 225,000.00	1	Award for consultant services to build upon some of the opportunities identified a barriers analysis specific to onsite commercial solar, further explore some of the market obstacles, refine potential solutions, and provide resources and guidance to facilitate projects.
Commonwealth Hydro	$ 45,459.75	2	Funding to communities and businesses for studies and construction of upgrades to increase energy generation at MA RPS-eligible hydropower facilities; also support new "conduit" hydropower facilities.

Commonwealth Organics-to-Energy	$ 1,650,000.00	5	Funding to communities and businesses to evaluate anaerobic digestion projects that use sewage sludge, food waste, and other organics, and supports construction of facilities as appropriate.
Commonwealth Solar Hot Water	$ 1,160,925.20	106	Funding to support installations of residential solar thermal projects to provide hot water and/or heating.
Commonwealth Wind	$ 114,843.00	3	Funding for feasibility studies and development of appropriately sited, cost-effective land based wind projects.
Mass Solar Loan	$ 15,482,935.61	2,052 (loans enabled)	Program to support affordable financing to promote lending to residential owned solar electricity projects including projects for people with lower incomes and credit scores.
Massachusetts Solar Connect	$ 30,000.00	2	Program increases the adoption of small-scale solar electricity systems for members of participating Massachusetts-based non-profit groups through an outreach and education campaign coupled with competitive pricing via an online installer bidding platform.
Offshore Energy	$ 2,429,546.39	13	Funding, analysis, and engagement to advance planning, permitting, and supply chain development for offshore energy.
Partnership: EEA	$ 2,000,000.00	3	Support to EEA for clean energy activities.
RE Production Management Support	$ 876,000.00	14	MassCEC tracking and verification of energy production to ensure state incentives (RECs) are accessed appropriately, and the sole Independent Verifier for the SREC Programs.
Renewable Thermal & Renewable Termal Change-Outs	$ 7,826,052.14	4,034	Funding to support installation of residential and commercial ground-source heat pumps, air-source heat pumps, and efficient biomass heating systems; funding for replacement of older, inefficient woodstoves with cleaner, more efficient models.
Solar Adoption Initiatives	$ 150,840.85	2	Resources targeted at helping Massachusetts residents and business owners make decisions related to choosing solar electricity including financial benefits, siting requirements, ownership models, and installer selection. Additional efforts to improve system installation quality through education of installers and local inspectors.
SolarICE	$ 478,350.00	3	Collaboration with Department of Conservation & Recreation to conduct feasibility studies for solar installations on DCR ice rink rooftops.
Solarize Massachusetts	$ 144,100.00	8	Grassroots outreach and education initiatives that allow members of participating communities and non-profits partner with solar installers to access reduce rates for solar installation through volume based discounts.
State Facilities	$ 480,000.00	1	Collaboration with Department of Energy Resources for expanded Heat Loan programming.
Wastewater Treatment Pilot Program	$ 895,402.00	6	Funded through the Water Innovation Trust, provides targeted grants for demonstrating innovative water technologies at waste water treatment facilities.

***For the Mass Solar Loan Program a different metric than award count has been used to more accurately represent work completed under the program.**

Exhibit B

Company Name	Security Description	MassCEC Investment
CoolChip Technologies	Convertible Note	$ 30,625.00
WeSpire	Series A-1 Preferred Shares	$ 600,000.00
SolarOne Solutions	Convertible Note - Tranche 1	$ 50,000.00
CoolChip Technologies	Convertible Note	$ 25,000.00
CoolChip Technologies	Convertible Note	$ 13,750.00
Powerhouse Dynamics	Series B-2 Preferred	$ 15,000.00
Essess	Convertible Bridge Note	$ 100,000.00
EnergySage	Series A-3 Preferred	$ 80,000.00
Loci Controls	Series A Preferred	$ 100,000.00
eCurv	Series A-1 Preferred	$ 60,000.00
Powerhouse Dynamics	Series B-1 Preferred	$ 85,000.00
SolarOne Solutions	Convertible Note - Tranche 2	$ 50,000.00
Great Point Energy	Series C Preferred	$ 2,541.00
XL Hybrids	Series A Preferred	$ 816.00
Acumentrics	Class A Common	$ 123.00
Big Belly	Common	$ 5,464.00
SLIPS Technologies	Series A-1 Preferred	$ 300,000.00
CoolChip Technologies	Convertible Note	$ 30,625.00
WeSpire	Convertible Note	$ 100,000.00
CIMCON Lighting	Redeemable Bridge Note	$ 250,000.00
CIMCON Lighting	Common Shares	$ 7.50
CoolChip Technologies	Convertible Note	$ 27,250.00
XL Hybrids	Convertible Note	$ 100,000.00
Great Point Energy	Warrant Shares	$ -
Bevi	Venture Debt Loan (amount of drawdown in FY17)	$ 1,000,000.00
Greentown Labs	Contruction Loan (amount of drawdown in FY17)	$ 653,432.00

Exhibit C

Types of Technical Assistance	List of Programs or Efforts that Apply
Directly develop technical reports to support the clean energy industry	State of Charge Energy Storage Report, Ports and Infrastructure Assessment
Provide assistance to projects	Project inspections in Clean Heating and Cooling Programs and Solar PV Programs; Feasibility Studies in Water Tech Demonstration Program, Commonwealth Organics to Energy Program, Commonwealth Hydro Program, Commonwealth Wind Program; Ground Source Heath Pump Design Reviews
Fund consultants to provide technical support to industry stakeholders	Offshore Energy Program, Low-Income Challenge Energy Audits
Provide assistance to municipalities and other public entities	SolarizeMass Program, Commonwealth Organics to Energy Program, Commonwealth Wind Program, Wastewater Pilot Program, Offshore Energy Program
Provide assistance to companies	Catalyst Program, AccelerateMass Program, Investments Program, InnovateMass Program, Commonwealth Hydro Program, Wastewater Pilot Program, Offshore Energy Program
Provide assistance to manufacturers	Wind Technology Testing Center
Serve as a technical judge or reviewer	Cleantech Open Northeast, Mass Challenge, NSF SBIR, ARPA-E, MIT Water Innovation Prize, MassChallenge, Hack-a-thon
Provide assistance to local universities/research consortiums	Wind Technology Testing Center, Catalyst Program
Provide assistance to schools, colleges, or workforce	Learn and Earn Program

Commonwealth of Massachusetts

EXECUTIVE OFFICE OF HOUSING & ECONOMIC DEVELOPMENT

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OFFICE OF PERFORMANCE MANAGEMENT AND OVERSIGHT

Massachusetts Clean Energy Center

Annual Plan for 2017 Fiscal Year

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AGENCY OVERVIEW

The Massachusetts Clean Energy Center (MassCEC) is dedicated to accelerating the success of clean energy technologies, companies and projects in the Commonwealth—while creating high-quality jobs and long-term economic growth for the people of Massachusetts. Since it began operating in 2009, MassCEC has helped clean energy companies grow, supported municipal clean energy projects, funded university research and development, and invested in residential and commercial renewable energy installations, creating a robust marketplace for innovative clean technology companies and service providers.

MassCEC's objective is to increase the statewide adoption of renewable energy, while driving down the costs of renewable energy and delivering financial and environmental benefits to ratepayers. To do so, MassCEC works closely with residents, businesses and municipalities to develop programs that provide renewable energy solutions for their energy needs. MassCEC's programs also connect communities with the most viable clean energy and water technologies and reduce the energy burden on low- and moderate-income residents, with the hope of fostering the success of the Commonwealth's dynamic clean energy sector.

FISCAL YEAR 2017 ANNUAL PLAN

GOAL: Increase renewable energy adoption while driving down the costs of renewable energy.

MassCEC's programs are structured to leverage the maximum amount of private investment per ratepayer dollar spent, to reduce and eliminate state-funded incentives over time and to work closely with the industry to achieve adoption, economies of scale, and cost reductions of renewable energy.

Strategy	Measurements
Increase residential and commercial adoption and leverage private investment in renewable heating and cooling technologies, including air-source heat pumps, ground-source heat pumps and central biomass heating systems	• Number of systems installed • Installed capacity • Private investment leveraged per dollar awarded by MassCEC
Continue to manage a low-interest loan program to connect homeowners who want to install solar electric systems with lenders to help finance the projects, expanding borrowing options through encouraging lower interest rate loans, and supporting loans to borrowers with moderate income or lower credit scores	• Number of loans enabled • Megawatts (MW) of installed capacity enabled • Installed capacity at moderate income households as a percentage of overall MW enabled • Private capital leveraged
Increase residential and commercial adoption and leverage private investment in solar hot water systems	• Number of systems installed • Square footage of collectors installed • Private investment leveraged per dollar awarded by MassCEC
Increase the generation of energy from facilities using organic feedstocks – primarily via anaerobic digestion	• Number of construction awards • Megawatts (MW) associated with construction awards • Number of awards for studies or technical services
Cost-effectively increase the generation of electricity by Massachusetts RPS-qualified hydroelectric facilities as mandated by statute	• Number of construction awards • Annual generation (kWh/year) associated with construction awards • Cost-effectiveness of hydropower awards (cents/kWh)
Inform, create a better climate for, and advance the development of land-based wind projects in a manner that the projects will be appropriately sited in terms of performance, benefits, impacts and community support	• Number of active projects in the pipeline • Number of siting/impact studies started or advanced • Number of analysis/information projects supported

GOAL: Massachusetts continuing to lead in clean energy.

Massachusetts is a global cleantech sector hub and significant local industry that is launching some of the world's top clean energy companies and innovations. Massachusetts' unique concentration of research and development, universities, innovation, and start-up company excellence has become a magnet for outside investment in the Commonwealth.

Strategy	Measurements
Provide MA-based incubators that serve clean energy start-up companies with financial assistance for operations and management expenses to enable them to provide support to cleantech start-up companies, promoting investment and job growth	• Number of cleantech companies served by incubators, including graduates • Number of employees at these cleantech companies • Total funding raised by these companies
Assist Massachusetts cleantech companies in advancing their technologies to the commercialization stage and beyond through direct equity and venture debt investments, generating both job growth and a financial return	• Number of employees at supported companies • Total funding raised by these companies in current and future financing rounds • Valuation and returns ($) as multiple of investment cost • Total revenues generated by supported companies
Provide federally-mandated cost share to MA-based ARPA-E awardees to advance cutting-edge technology, enhance the competitiveness of MA-based ARPA-E applications to increase capture of federal funding, and leverage the deep technical expertise of ARPA-E	• External dollars leveraged • Percentage of total awarded ARPA-E dollars to MA entities • Number of applications sourced • Number of projects funded
Provide wind industry with efficient facility/technology to test utility scale wind turbine blades to validate and improve reliability and support introduction of new technology into production, while maintaining positive operating income	• Testing revenues generated by Wind Technology Testing Center (WTTC) • Number of industry blades tested • Maintain operational excellence through internationally-recognized assessment and accreditation certification
Improve the rate of success of cleantech companies graduating from accelerators by providing support to	• Number of applications received • External capital leveraged • Annual revenues generated

GOAL: Develop a trained workforce for a rapidly growing industry.

In coordination with the Governor's Workforce Skills Cabinet, MassCEC delivers workforce training programs that are tailored to meet the needs of clean energy employers across the entire state, while improving workforce skills, job readiness and vocational and educational opportunities for Massachusetts residents.

Strategy	Measurements
Provide Massachusetts clean energy businesses with a talented pool of young professionals and introduce clean energy career experiences to people entering the workforce, through on-the-job training programs	• Number of students placed at host employers • Number of companies who host student interns

	• Number of internships that convert to full-time jobs
	• Number of women and minorities who receive internships
	• Number of community college students who receive internships

GOAL: Advance innovative solutions that will lead to energy security and a safe, reliable and resilient energy infrastructure.

MassCEC supports market development for emerging technologies and business models. MassCEC will build on its work with DOER to nurture the local energy storage industry and to develop clean energy microgrids. This support will complement the Commonwealth's efforts to modernize the electric grid, deliver energy more efficiently, and accommodate increasingly distributed generation. Additionally, MassCEC will coordinate with relevant agencies to conduct planning and permitting activities in the federal wind energy areas south of Martha's Vineyard to support the responsible development of offshore wind.

Strategy	Measurements
Provide grants for demonstration projects to promote the commercialization of new technologies and the creation of business partnerships while leveraging private funding	• Number of jobs created • Private funding leveraged per dollar awarded by MassCEC • Number of strategic partners engaged
Provide grants for university teams and early stage start- up companies to fund targeted proof-of-concept projects	• External capital leveraged • Number of applications received • Number of awards disbursed • Number of inventions disclosed, patents awarded or patents filed
Provide grant support to university research programs in order to accelerate the development of clean technologies	• Number of university awards made • Number of students supported • External capital leveraged
In order to support the responsible and expedited development of offshore wind in the federal waters south of Martha's Vineyard, conduct initiatives including transmission survey work, met-ocean data collection, supply chain and workforce development planning, grants to academic institutions to advance	• Number of new or expanded projects supported • Number of awards for research projects

GOAL: Maintain public confidence in the use of ratepayer dollars.

MassCEC will continue to enhance its transparency and accountability regarding how it invests ratepayer funds.

Strategy	Measurements
Annual Independent Fiscal Audit – MassCEC engages in an independent audit of its financial statements every year, which is conducted by an independent accounting firm. The results and audited financial statements are reported to the MassCEC Audit Committee and full Board of Directors each year	• Independent fiscal audit presented annually to the MassCEC Board of Directors and Audit Committee at public meetings • Independent fiscal audit submitted annually to the MA State Legislature per its enabling statute
Continued partnership with A&F on Open Checkbook	• Data submitted monthly: www.mass.gov/opencheckbook
Budget and Program Performance Online – MassCEC has posted extensive financial information on its own website, including the audited financial statements and FY17 budget	• Audited financial statements and budget information included on MassCEC website • Enhanced details on program performance
Verification of Renewable Energy Production – Tracking and Verification of Renewable Energy Production – MassCEC's Production Tracking System (PTS), (1) tracks renewable energy generation supported through MassCEC grants and rebate programs, (2) is the Independent Third Party Verifier for eligible renewable energy production that qualifies for Renewable Energy Certificates (RECs). The PTS provides data quality assurance by ensuring that renewable energy generations are appropriately registered, reported, verified and audited. MassCEC reports quarterly solar energy production to the NEPOOL (New England Power Pool), who then produces Solar-RECs (SRECs and others). NEPOOL is a voluntary association of market participants doing business in the six-state New England region	• Quarterly production data reported to New England Power Pool (NEPOOL) • Annual independent audit of Solar Renewable Energy Credit (SREC) systems completed

Contact

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