Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs

Department of Environmental Protection

CLEANENERGYRESULTS

Massachusetts' Wastewater Energy Recovery (WWER) Pilot Program[1]

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MassDEP is pleased to announce this Pilot Project grant program to support the installation of Wastewater Energy Recovery (WWER) technologies in Massachusetts. The pilot project grants (WWER Grants) are being offered by the Clean Energy Results Program (CERP), a collaborative program in partnership with MA DOER and the Mass Clean Energy Center. This initiative will provide critical phased state grant funding for the assessment, design, and construction of wastewater energy recovery pilot projects in Massachusetts. The objectives of this pilot program are to: (1) assess, design, install, or construct this energy recovery technology; (2) evaluate the resultant energy and cost savings and greenhouse gas emission reductions; and (3) develop a replicable WWER partnership model for cost-effective and scaled project development in Massachusetts.

MassDEP is making five million dollars ($5,000,000) in grant funds available from the agency's Climate Protection and Mitigation Expendable Trust to support this program. This core state funding will be combined and leveraged with other sources of existing technical or financial assistance from Massachusetts' energy utilities (Mass Save®, MLPs), WWER technology providers who can provide preliminary assessments for interested customers, and other state and potential federal partners.

Background – About Wastewater Energy Recovery

In December 2023, MassDEP's CERP program convened a Wastewater Energy Recovery Summit to share information about WWER technologies and existing projects with municipal wastewater facilities, municipal policymakers, MassSave® Program Administrators (National Grid, Eversource, and others), Municipal Light Plants (MLPs), consultants, and other related professionals. Materials from the Summit can be found on the MassDEP CERP website. Since the Summit was held, MassDEP's CERP program has collaborated with the MassSave® energy efficiency Program Administrators to bring their technical and financial assistance program resources into this pilot and provided targeted outreach to interested municipal wastewater facilities, hospitals, community projects, and other facilities.

Wastewater is a valuable and abundant source of un-tapped thermal energy that is recoverable.[2] WWER is a proven decarbonization technology, with approximately 500 installations worldwide. Many of the

[1] Authors: Michael DiBara, Danah Tench, Sharon K. Lee, Brian Postale, Ann Lowery
[2] Reference: "ScienceDirect Energy Reports 9 (2023) 16-33" Science Direct Waste Water Heat Recovery
[3] Reference: Uhrig Therm Liner Energy Systems 3-31-2023; Sharc Energy Systems; Noventa - Huber: Toronto Western Hospital project

WWER installations are in Europe and Canada and have been providing cost-effective renewable heating and cooling of commercial buildings for over 15 years[3]. WWER can be thought of as a technology that operates like Ground Source Heat Pumps (GSHPs). Whereas GSHPs reject or absorb heat from groundwater, WWER rejects or absorbs heat from wastewater. One of the more attractive and economically beneficial differences between the two technologies is that WWER does not require subsurface ground loops or boreholes, which can account for about 30% of the cost for GSHP technology.

WWER systems generally consist of a heat exchange process combined with pumping loop for wastewater or sewage. The technologies commonly available can be classified according to the location of the main heat exchanger used to extract waste heat from the sewage. These categories include:

- In-Sewer Pipe Heat Exchangers (inserted inside the pipe)
- External Heat Exchangers
- Integral Sewer Pipe Heat Exchangers (integral to the pipe wall)

Pilot Project Goals

The WWER pilot program has three main goals:

1. Support construction and activation of pilot projects using WWER technologies. Encourage project locations across regions, of varying size and scale (i.e., serving an individual building, multiple buildings, district, or campus), and prioritizing benefits to underserved and disadvantaged populations.
2. Evaluate the cost, energy, and environmental effectiveness of the completed pilot installations.
3. Develop a replicable WWER partnership model for cost-effective and scaled project development in Massachusetts and elsewhere, through data collection and assessment, development of guidance, and integration into existing design standards for wastewater treatment facilities.

Eligible Entities

This pilot program is seeking proposals for WWER installations across all regions of the Commonwealth with a focus on maximizing benefits with most of the projects in underserved and disadvantaged areas. Eligible Applicants include the following high-energy users.

- Publicly owned wastewater facilities (state, municipal, district, or authority)
- Privately owned wastewater facilities
- Municipal or state-owned facilities other than wastewater utilities
- Public and privately owned schools, colleges and universities
- Nonprofit or privately owned facilities (e.g. housing, hospitals, commercial, industrial)

Program Structure & Funding Assistance

MassDEP's WWER grants will provide funding assistance for project development in three phases. A project may apply at any phase for funding but must provide documentation that demonstrates technical and financial viability for executing the phase for which they are applying. Facilities can leverage funding based on need at their appropriate project phase. MassDEP will evaluate the final report and deliverables

from each completed phase to determine successive funding eligibility for the next application phase based on the viability and likelihood that the WWER project will be successfully implemented.

Energy Assessment (Phase 1)

Assessment Scope: Conduct a focused Technical Assistance Study performed by a (energy utility, consultant, wastewater energy recovery technology provider, or applicant's engineering team) that provides building owners with a draft plan for wastewater energy recovery, including initial project costs, estimates for energy-savings, greenhouse gas emission (GHG) reductions, and a basic site diagram showing how wastewater energy sources will be assessed for space heating, cooling, hot water etc. in the building or buildings. Determine the existing heating and cooling loads of the building(s) under consideration and evaluate the potential options for wastewater energy recovery via an onsite sanitary line, municipal sewer line, pump station, effluent channel etc. Please (see sample).

Financial / Technical Support: MassDEP, MassSave® and Technology Providers

- MassSave® and Technology providers can provide funding or in-kind technical assistance for energy and technology assessments.
- WWER Grants: MassDEP may provide funding for up to $15,000 for energy and technology assessment work.
- Funding assistance may vary for projects in municipal light plant territories.

Project Design (Phase 2)

Project Design Scope: Develop a final design and signed schematic drawings for technically and economically viable WWER projects. The pilot project design grants will fund: (1) the production of 100% design and bid ready drawings of the proposed project that consist of fully developed construction plans, profiles, sections and details depicting, at minimum, the following final design elements: Site - General, Architectural Structural, HVAC, Process, Electrical, Instrumentation; (2) the preparation of 100% and bid ready technical specifications; and (3) the preparation of an opinion of probable construction costs.

Design elements should include: system size (tons, kW, etc.) for space heating and cooling loads, refined project analysis that includes estimated project costs, energy savings, avoided GHG's etc., schematics for the wastewater tie-in infrastructure; pumping and heat exchanger equipment sizes and control instrumentation, expected daily flow of wastewater diversion rate, operation; and maintenance plan (solids removal, odor control management plan, safety and isolation procedures if needed).

Financial / Technical Support: MassDEP, MA DOER, Grant Applicant, Design and Engineering Team.

- The Design Phase is a challenging and costly phase to fully finance and may need funding from one or more potential sources to achieve full design phase completion. A WWER Grant applicant may need to commit some of its own funds (matching funds are not required but encouraged to fill any potential project funding gap) to complete this design phase.
- WWER Grants: MassDEP may provide funding through pilot grants of up to $100,000 for project design.

Project Construction (Phase 3)

Construction Scope: Grants for pilot projects at the construction phase will build on and integrate capital funding project plans that leverage state, federal, energy utility, and technology provider funding options, and other incentives, to construct technically and economically viable wastewater energy recovery projects.

Projects that have reached this phase are expected to have secured capital funding from multiple sources and incentives for construction. Through MassSave®, energy utility Program Administrators provide incentives for the installation of eligible water source heat pump equipment in custom amounts determined by the utility depending on the equipment being installed and / or the efficiency measure. For projects within a Municipal Light Plant Companies territory, please check what specific incentives may be available for eligible water source heat pump installations.

Financial / Technical Support: MassDEP, MassSave®, State Revolving Loan Fund (SRF), MA DOER.

- A pilot project grant applicant may need to commit some of its own funds (matching not required but encouraged to fill the potential project funding gap) to complete the construction phase.
- MassDEP State Revolving Funding (SRF) may be available for municipal drinking water and wastewater facilities when a project is proposed in the Project Evaluation Form. For more information, please see: https://www.mass.gov/info-details/clean-water-state-revolving-fund-srf-program
- WWER Grants: MassDEP may award funding for project construction up to $750,000.
- DOER/EOEEA: Projects may be eligible for Green Community grants or Climate Leader grants.

Pilot Procurement (Request for Response-RFR): The WWER pilot grant program will be executed through a competitive grant solicitation posted on COMMBUYS and open to municipal, private, and nonprofit sectors. The grant solicitation will be open, and applications will be reviewed on a rolling basis for a two to three year period or until all initial funds are awarded. Successful pilot applicants will be expected to leverage all available funding in addition to MassDEP funding. To be eligible to advance to the next phase of funding, a project proponent must demonstrate both technical and financing feasibility and likelihood that the project will be implemented in order for a subsequent phase application to be competitive.

MassDEP reserves the right to award funding of greater or lesser amounts than specified in this section depending upon the quantity and the quality of the applications received; however, the current total WWER Pilot Grant Program available funding is $5 million. Additional details regarding how to apply and this grant opportunity will be available in the RFR in COMMBUYS and the new EEA Grants Management System (GMS) for eligibility requirements, project categories, and evaluation criteria.

New Grants Management System: The Pilot Project Grants will be part of EEA's new Grants Management System. To access the GMS, grant applicants must create a username and password and have their profile validated, which could take several days to complete. MassDEP recommends that potential applicants create an account and become familiar with the system as soon as possible. See EEA's Grants Management System web page for details.

WWER Pilot Project Tasks and Target Timelines

Tasks	2025 Jun	To	2026 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2027 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Project Partners Coordination / Kickoff Meetings																							
Implement Targeted Outreach and Communication Plan																							
MassDEP Releases COMMBUYS/GMS RFR for Pilot Projects																							
Ongoing Review of Proposals and Selection of Grant Pilot Sites																							
Initial Grant Awards (Rolling Application)																							
Assessment Phase*																							
Design Phase*																							
Construction Phase*																							
DEP Project Management, Oversight, Reporting, and Deliverables																							
Phased Draft Reports & Deliverables[3]																							
Phased Final Reports																							
Evaluation of Pilots																							

*Each pilot project may use grant funding in one, two, or all three of these noted project phases. Applications are reviewed on a rolling basis, and the opportunity is dependent on funding availability. The project phases are expected to be completed within the timeframe listed and upon execution of a grant award contract unless prior arrangement is made and written approval granted by MassDEP: Energy Assessment Phase within six (6) months, Design Phase within nine (9) months, and Construction Phase within two (2) years).

[3] Grantees will need to submit both draft and final reports for MassDEP review during the project's implementation. Timing of the reports will depend on the phased project start date.