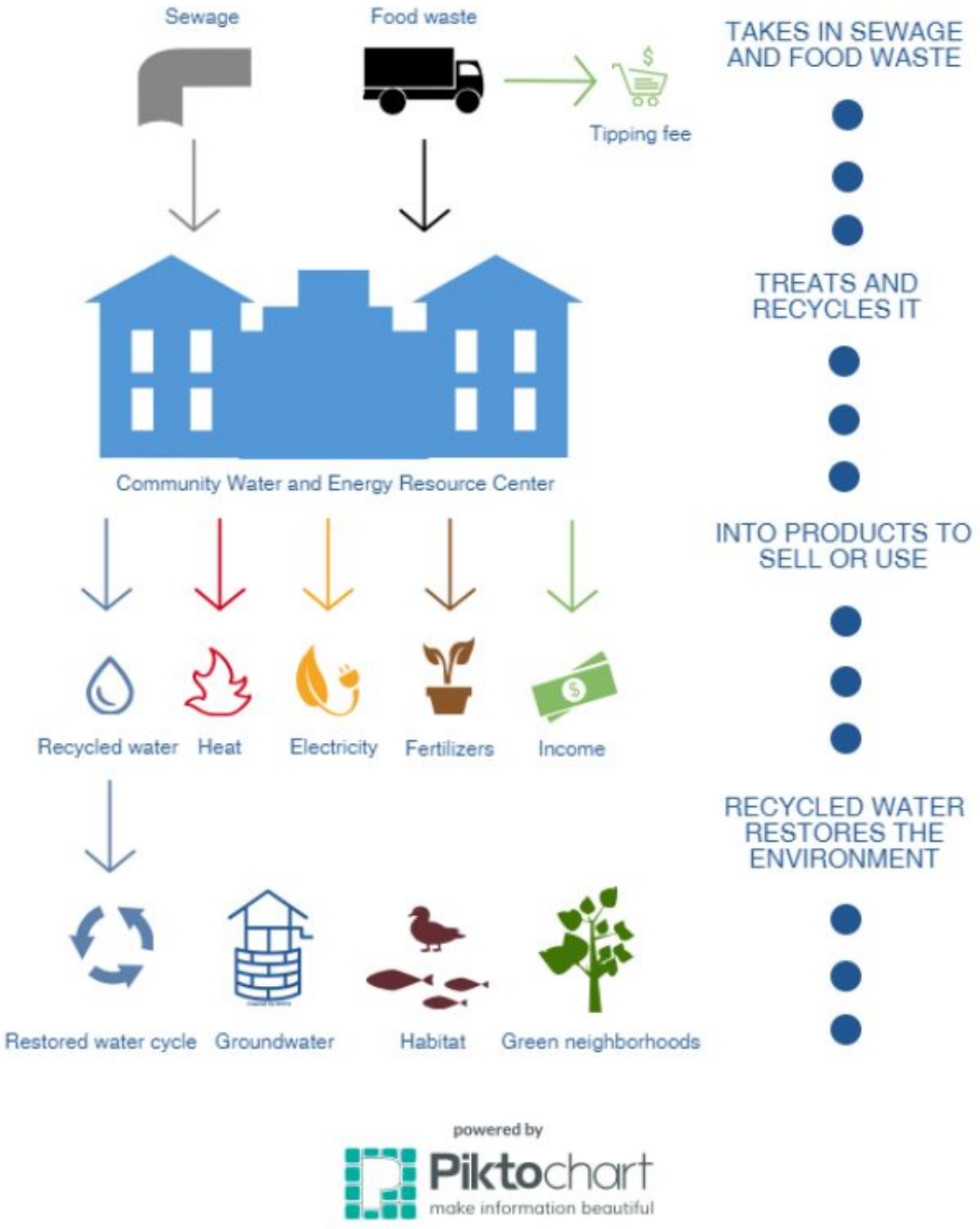
Charles River Watershed Association: Community Water and Energy Resource Centers (CWERCs)

https://www.crwa.org/smart-sewering



Charles River Watershed Association: Frequently Asked Questions about CWERCs

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Q: How does a CWERC work?

A: A CWERC, or Community Water and Energy Resource Center, is a critical node for taking in locally-generated waste and transforming it into usable products. CRWA developed conceptual designs for two CWERCs that accept wastewater from existing sewer pipes and food waste from nearby restaurants, schools, hospitals and other institutions, transforming the waste into renewable energy (both thermal and electric), reclaimed water, nutrients, and compost. Depending on local demand, CNG fuel could also be produced to power vehicles or transit systems.

Q: What are the technologies CWERCs use?

A: CWERCs are not a one size fits all solution. They are flexible, plug and play nodes where every opportunity to reuse and recycle locally produced "waste" are maximized and exploited. CRWA's conceptual designs include a membrane bioreactor for wastewater treatment, a thermal heat pump, anaerobic digester(s), a combined heat and power (CHP) system, and nutrient recovery and composting facilities.

The wastewater enters a membrane bioreactor wastewater treatment node, where it is cleaned to state reuse standards. The heat from the treated water is captured by a heat pump. This thermal energy is used internally as well as to heat and cool buildings in the CWERC district. Some of the treated water is sold for irrigation, industrial and other uses while some of it is returned to the environment to restore the natural water cycle in the district. The wastewater solids and organic food waste are "digested" to create biogas, primarily methane. The biogas from each of these sources is burned to create electricity and thermal energy in a combined heat and power system.

Q: How much will a CWERC cost?

A: A CWERC that treats about 2 million gallons daily of wastewater would cost approximately $47 million to build and $5 million annually to operate and maintain.

Q: How will CWERCs pay for themselves?

A: A CWERC produces reclaimed water, electricity, thermal energy, fertilizers and other products. The CWERC would sell these products and would charge a "tipping fee" for the disposal of food waste at the CWERC. This income would pay for operation and maintenance and capital investment.

Q: How and when will the first CWERC go on line? Who will build/own/run a CWERC?

A: CRWA is actively seeking partnerships to design and build pilot CWERCs. A CWERC could be built and operated by a wastewater utility, a municipality, a community organization or non-profit, a developer or a combination of entities. The Town of Littleton in Massachusetts is currently siting and designing a CWERC to serve its business district.

Q: Are CWERCs a new concept?

A: Many of the elements included in our conceptual CWERC design are in operation today around the U.S. and Canada. CWERCs are primarily unique in three major ways. First they combine a variety of waste to resource techniques into a single facility to maximize resource recovery. This combination of resource recovery technologies makes CWERCs financially viable in initial modeling, making them attractive investment options.

Second, CWERCs are an important element in CRWA's larger objective of restoring and sustaining local water resources (streams, rivers, groundwater). CWERCs reduce potable water demand (and energy use) by providing reuse water in densely developed areas. This helps reduce demand on and protect surface waters and aquifers that serve as our potable water supply sources. CWERCs are also surrounded by green districts where CWERC effluent is used to restore natural water features and enhance aquatic habitats.

Finally, CRWA has modeled introducing CWERCs into existing urban centralized wastewater treatment systems as a way of moving away, over time, from centralized systems. Using CWERCs to break up centralized treatment for financial, environmental, and equity reasons is a new concept.

CRWA has long sought to build infrastructure that is more compatible with and adaptable to a changing natural world. CWERCs are an important element in this transformation.