

Introducing the:

Muscatine WRRF



Water & Resource Recovery Facility

The Muscatine Water Pollution Control Plant (WPCP) is changing its name...again!

1965: Sewage Treatment Plant

1976: Wastewater Treatment Plant

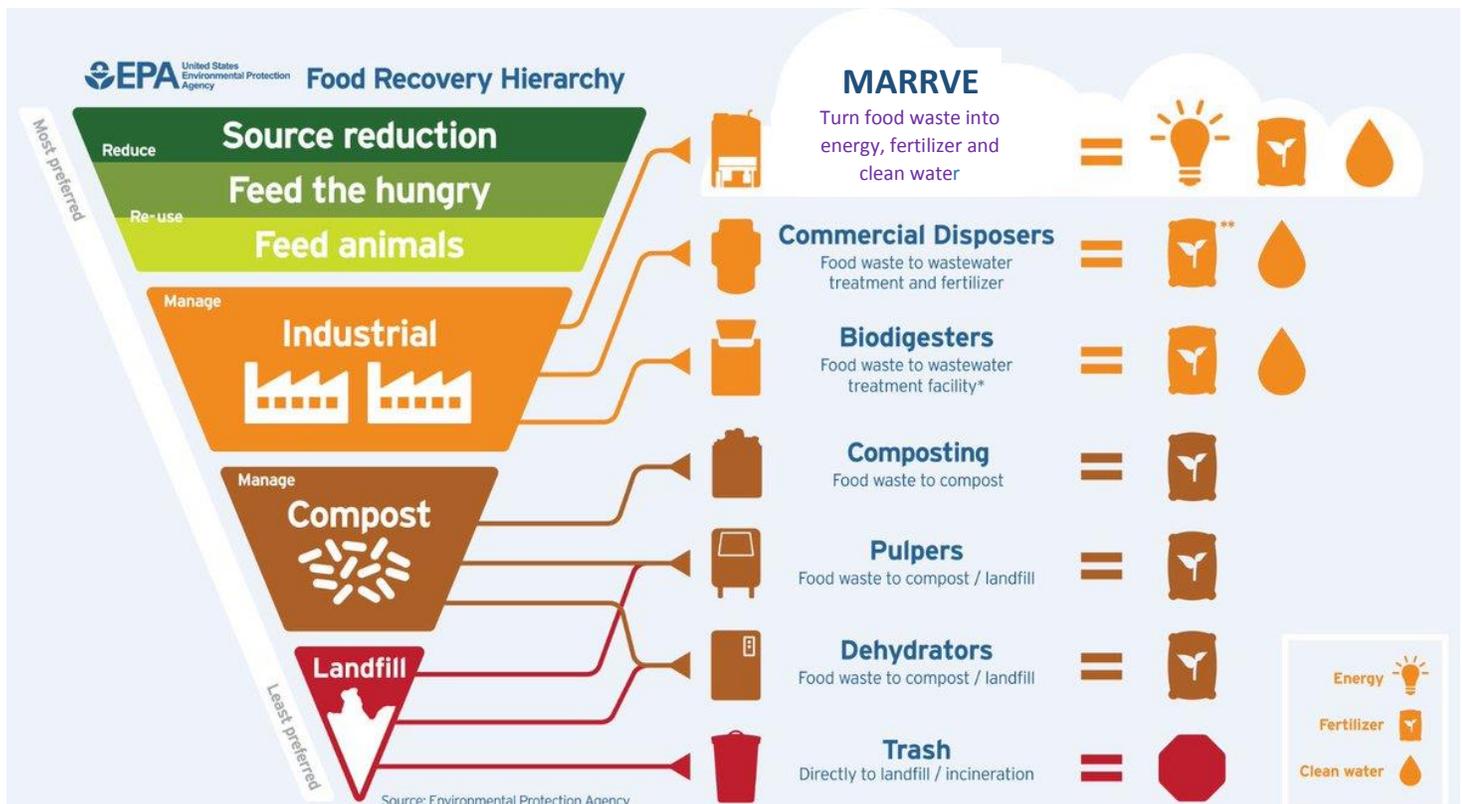
1995: Water Pollution Control Plant

2018: Water & Resource Recovery Facility



It is so much more than just a name change this time:

- People, Profit and Planet Sustainability efforts are driving innovation in your local utility.
- With the introduction of the MARRVE Program (Muscatine Area Resource Recovery for Vehicles & Energy), the name must evolve with the mission of resource recovery, not just wastewater treatment.
- Pollution control alone doesn't fit with the Utility of the Future concept and the N-E-W paradigm which focuses on Nutrients, Energy and Water.
- Organic waste will be drastically reduced in Muscatine and the region to save landfill space, curb damaging methane production and generate new revenue.
- Food waste education can increase food donations and reduce local business costs while generating renewable clean energy and natural fertilizers.



Food Recovery Efforts

There are programs that focus on food recovery from high waste locations. A link to find more information is at:

biocycle.net/2018/03/12/k-12-school-food-recovery-roadmap/ (California model)

epa.gov/sustainable-management-food/food-recovery-challenge-frc.

What is needed are local champions to start us on the path. The WRRF is just one portion of a larger solution.

Fact #1

“ America wastes nearly 40% of all food produced or 24 pounds of food per person every month.”

Fact #2

“Young consumers and families with children are the biggest wasters of food.”

Fact #3

“The annual value of food wasted globally is \$1 trillion and weighs 1.3 billion tons.”

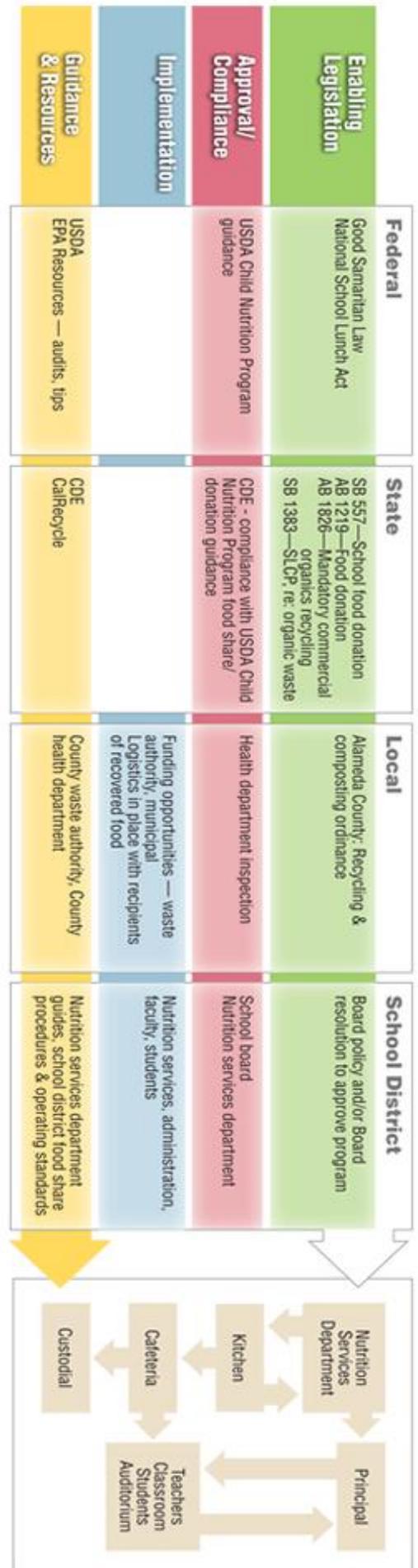
Fact #4

“In the USA, organic waste is the second highest component of landfills (30%), which are the largest sources of methane emissions.”

Fact #5

“Half of all produce is thrown away in the US because it is too ‘ugly’. This amounts to 60 million tons of fruit and vegetables. ‘Ugly’ fruits and vegetables make up a third of all wasted food in the US.”

To continue the conversation and create a path to sustainable food recovery in our community contact Jon Koch at the WRRF at 563-263-2752 or jkoch@muscatineiowa.gov.



MARRVE

Muscatine Area Resource Recovery for Vehicles & Energy

Regional recovery up to

90 Tons

A Day!

Industrial, Commercial and Residential food waste diverted from landfills to be converted into **Compressed Natural Gas** vehicle fuel.

"Fueling our future with local organic waste..."

"The only Carbon Negative vehicle fuel..."

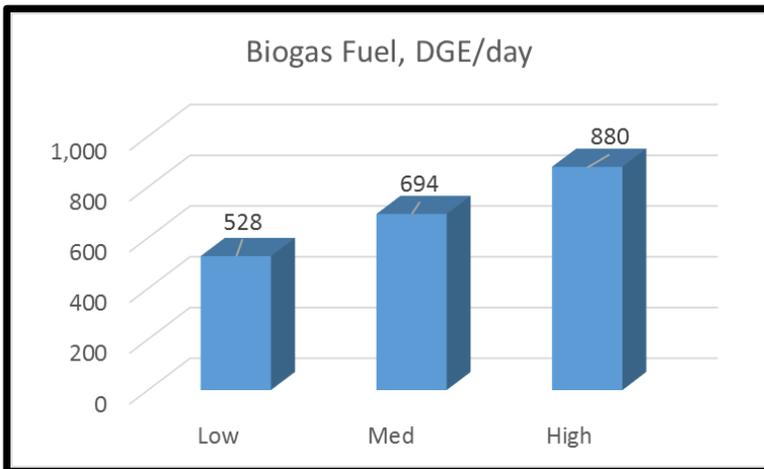
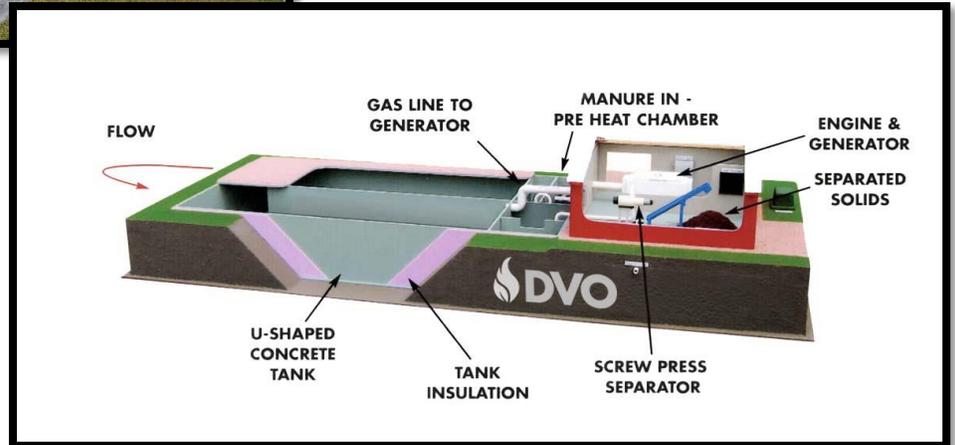
For more information visit muscatineiowa.gov/MARRVE or call 563-263-2752





The trick to turning waste food into fuel is **anaerobic digestion**. Just like in your gut, digesters turn food into methane gas and natural liquid fertilizer. We will use our existing digesters but will soon run out of capacity as so much waste food is expected.

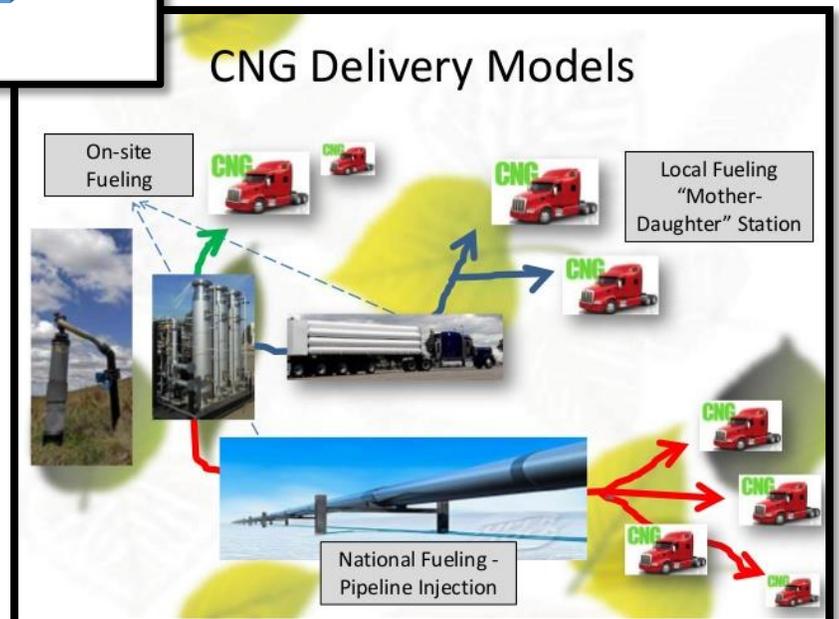
New digesters built for the **agricultural industry** are being built at the WRRF to take the extra loads for food waste expected. We will convert old digesters still on site to utilize this high strength waste technology.



Just how many gallons a day is this? DGE stands for Diesel Gallons Equivalent. So at a high production level we could see almost **900 gallons** of fuel created in Muscatine every day!

Muscatine hopes to inject the cleaned up gas into the Alliant gas pipeline. Muscatine can recognize three revenue streams from the same particle of gas going into the pipeline. The sale of the gas itself, the sale of RINs or renewable energy credits and a California energy credit. That's right, put the gas in the pipeline in Iowa and companies in **California will pay us** to fulfill their California renewable energy requirements!

CNG Delivery Models





MARRVE is your solution to mixed waste recycling!

Muscatine Area Resource Recovery for Vehicles & Energy

Save Time

Save Money

Save the Environment

Mixed Grocery Waste - Before



Organics- After



Waste Packaging - After



The world of recycling has evolved and now includes organics for beneficial re-use. The technology used at MARRVE will take **packaged** or **raw** food and process them at 20 tons per hour. It is a fast and simple process that removes the labor cost of depackaging for compost or the environmental damage of sending organics to the landfill.

“**Zero Waste**” programs are quickly becoming the norm for businesses large and small. The mandate to reduce what goes into the landfill is often hampered by the distance to a processing facility and the cost of transportation. Muscatine is set to become the **regional hub** for organics recycling and renewable energy production in the Midwest. If you are looking for a partner to expand or start your zero waste program, MARRVE is the answer.



The T42 Turbo Separator receives the mixed organic wastes **including packaging**. It processes the material by breaking open the packaging allowing the organic waste inside to exit through the bottom of the machine. The packaging continues through to be removed and either recycled or discarded as a clean waste.

The removed organic material is then sent to anaerobic digesters on site that convert the material to **natural fertilizer** and **renewable biogas**. The fertilizer is applied to local farm ground as a replacement for manufactured nitrogen and phosphorus. The biogas is used to fire boilers at the City treatment facility and fuel vehicles with clean renewable natural gas.

Contact Jon Koch at the

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