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Making food go further through waste reduction and innovation

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Americans waste about 25 percent of all food and drinks we buy, to the tune of \$130 every single month. It's a growing problem with significant [financial and environmental impacts](#). In 2017, 175,470 tons of commercially collected food waste from businesses and residents entered King County's Cedar Hills Regional Landfill.

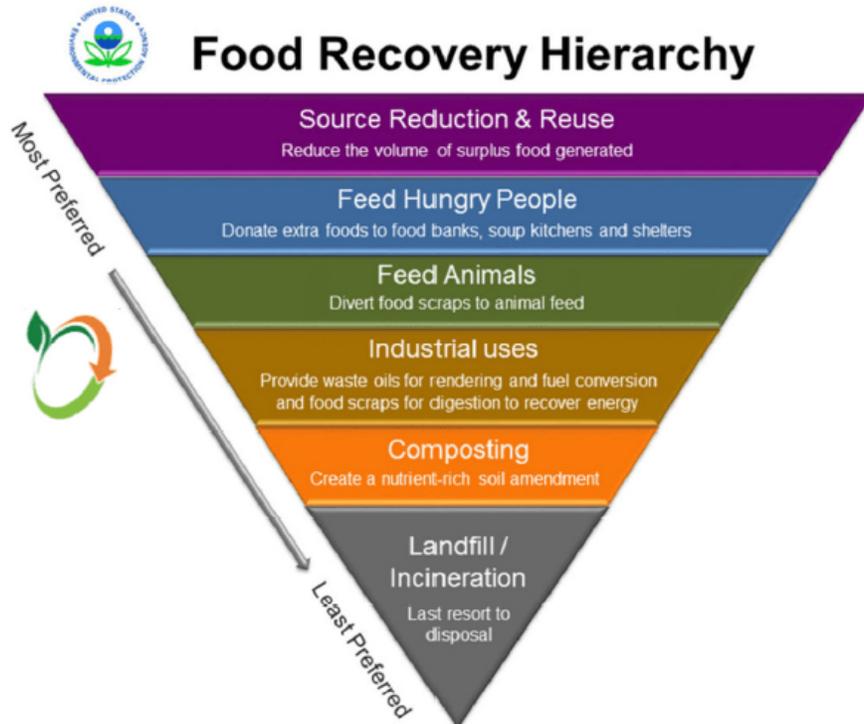
When we throw away food, we also waste all the nutrients, water, energy and fuel used to produce, package and transport food from the farm to our plates. Uneaten food accounts for 23 percent of all methane emissions in the U.S. – a potent contributor to [climate change](#). Reducing food waste is a key strategy identified by the King County [Local Food Initiative](#). The County's target is decreasing the amount of wholesome food loss by 25 percent in the next 10 years.

The targets identified in the Reduce Food Waste effort is to redirect healthy food away from disposal to consumption so the resources it took to produce, transport, and consume food are not wasted.

Organizations across King County are taking several actions to reduce food waste, including education and food recovery. Since 82 percent of food waste comes from homes and consumer-facing businesses, many projects focus on waste reduction practices to prevent waste from entering landfills in the first place.

While reducing the volume of surplus food generated is the first priority, keeping waste out of landfills is the ultimate goal. Providing alternative uses for existing waste, including fuels and fertilizers, can achieve this purpose.

¹ <https://kingcountygreen.com/2019/06/25/making-food-go-further-through-waste-reduction-and-innovation/>



One alternative use for waste being piloted in our region is using food waste to create fuel and fertilizer.

Impact Bioenergy™, a startup company that was formed in 2013 in Seattle, converts restaurant compost bin waste and spent yeast from breweries into renewable energy and organic plant food. [Impact Bioenergy](#)'s mission is to change the paradigm and get food "waste" to be recognized as a valuable renewable resource, which empowers communities by making renewable energy and organic plant food locally through organic materials recycling.

King County Solid Waste Division (SWD) has supported Impact Bioenergy through their [commercial food waste grants](#) for projects that aim to reduce food waste generated by the commercial sector (non-residential) within King County. These grants are used to increase the countywide recycling rate, extend the life of the Cedar Hills Regional Landfill, and achieve zero waste of resources by 2030.

The Local Food team spoke with Srirup Kumar, Community Engagement Officer at Impact Bioenergy, to learn more about why bioenergy is valuable to King County farmers and residents and how a circular economy is being created on Vashon Island.

Why is bioenergy important?

"On a national scale, most food "waste" ends up in a landfill," said Kumar. "However, Washington state uses composting, which is beneficial to divert our food waste but still involves dumpsters, trucks, and hauling it to someone else's community."

Impact Bioenergy is trying to minimize or eliminate trucks to be “zero waste” while generating valuable commodities within a one or two-mile radius (a.k.a. a “super local” food system).

“As the saying goes, ‘waste’ is just resource out of place,” said Kumar. “Together, we can put it in the right place.”

“Ultimately, we want to completely move away from reliance on fossil fuels and fertilizers and use local renewable energy and organic plant food instead,” said Kumar. “Renewable natural gas for vehicles, heating and cooking, from these resources allows us to more intentionally invest in local farmers, residents, and companies.”

Another benefit of converting waste into renewable energy is the production of plant and livestock food.

“We want to provide ecosystem services by providing liquid and solid probiotic plant foods for farm and family use.”

How is Impact Bioenergy creating a circular economy on Vashon Island?

Vashon Island is a 37-square-mile island with a population of roughly 11,000 people. Currently, the waste on Vashon Island is transported to Cedar Hills Regional Landfill, 45 miles away.

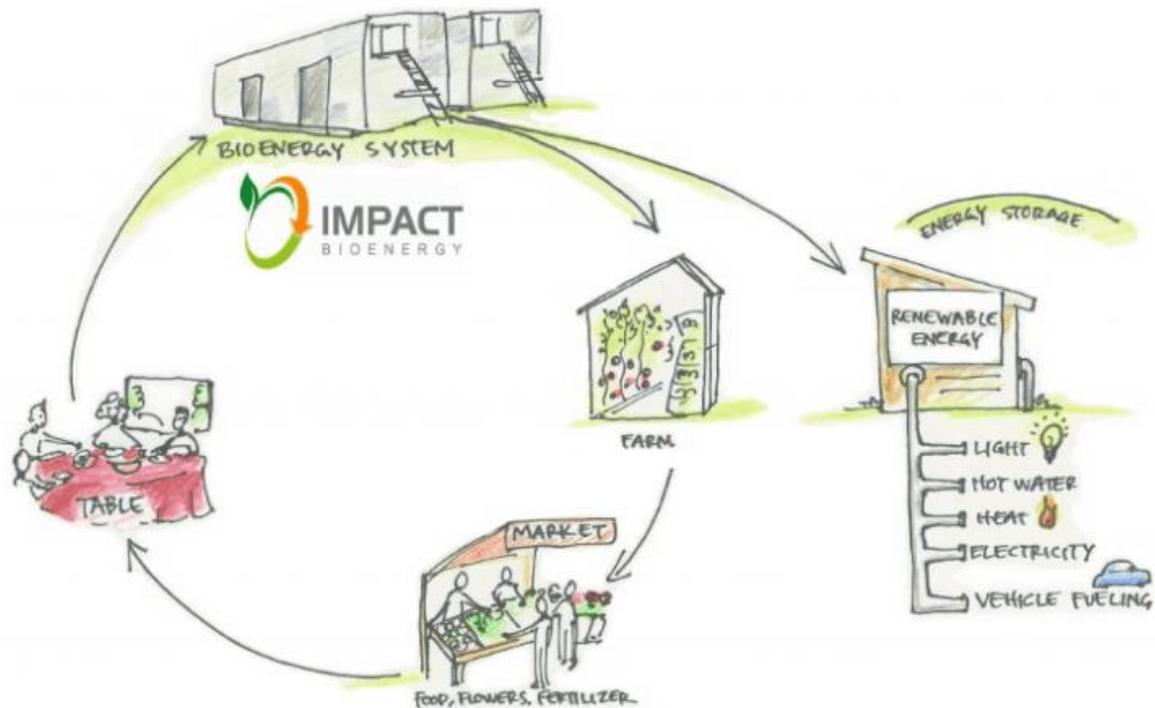
Vashon Bioenergy Farm, located at Island Spring Organics tofu factory, is a community-scale bioenergy system that is designed to convert food and beverage “waste” into the cleanest fuel commercially available and organic plant food, with zero waste. The system uses a circular process where waste is recycled into usable renewables for businesses, farmers, schools and residents alike on Vashon Island.

“Thanks to King County’s Department of Natural Resources and Parks and the Washington State Department of Commerce’s Energy Division, our team at Impact Bioenergy has designed, built, and will co-own and co-operate our first community-scale bioenergy system. Within the living bioenergy system, billions of microbes convert food scraps into products, including ReDew: Probiotic Plant Food and ORNG: Organic Renewable Natural Gas,” said Kumar.

“Vashon Bioenergy Farm can recycle around one third of the food and beverage waste on-island. With the community, we will demonstrate how to minimize long-haul trucking of materials to and from other communities. Together, we can reduce the carbon intensity of food and energy systems, and be more resilient.”

The new system entails using a large airless tank called a digester where beneficial bacteria break down food waste. Methane is a natural byproduct of the digestion process, which can be purified into natural gas. The digested food waste can be turned into a fertilizer-like compost.

This summer, the new digester will start converting tofu plant leftovers into probiotic plant food and clean energy. Other commercial food waste from the island may also be diverted to the digester in due time, which is designed to generate enough fuel to power a small fleet of trucks or provide clean energy to more than 40 homes.



Benefits of generating bioenergy and other products from digesters:

- Diverts waste from landfill and saves landfill capacity
- Generates renewable natural gas that can be used to power vehicles or heat and power homes
- Waste products can be used locally to increase soil tilth, sequester carbon, and cycle nutrients through soil and organic produce
- Decreases costs for small producers like Island Spring Organics tofu factory
- Reduces landfill, fertilizer, and vehicle source greenhouse gas emissions
- Creates local jobs producing lower emission transportation fuel and clean energy
- Provides organic plant food for farmers and residents

In addition, unlike solar or wind energy resources, the new digester can continually generate and store energy for Vashon Island when needed, which can be used for heating, cooling, electricity, and vehicle fuel. The storability is important for natural disaster response and climate change resiliency and can be used to generate electricity during power outages on Vashon Island.

The digester also reclaims over 2,000 pounds of nutrients and 300,000 gallons of water annually to make probiotic plant food, which promotes the healthy growth of Vashon

Island's own food, flowers, and landscape. This enables the replacement of chemically-based fertilizers with locally produced organic fertilizer.

Impact Bioenergy has been testing their digested food waste to grow produce. Spinach and carrots have been grown with ReDew, a fertilizer blend containing Impact's digestate. In the coming weeks, Impact Bioenergy plans to roll out products for farm and family use.



Spinach grown with ReDew

Ultimately, the Impact Bioenergy team is working to make bioenergy accessible, affordable and simple, and they believe it will promote self-reliance, allowing communities to be more food and energy independent.

Visit [*Impact Bioenergy's website*](#) for more information.

Watch [this short video](#) about how Impact Bioenergy's new digester, NAUTILUS, is converting tofu manufacturing plant leftovers into fuel and probiotic plant food.

Watch [this short video](#) about how the shipping-container-sized digester, HORSE, converts leftovers into energy.