Setting the bar on sustainability



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Commercial and in Confidence

Setting the bar

- The uniquely developed enzymes break down the waste in <24 hours leaving a nutrient rich "stable" fertilizer to replenish depleted soils or direct fed to connected biomass boilers to generate hot water
- The enzymes regenerate themselves during the 15-year life span of the system, eliminating costly enzyme restorishment
- The Digester chamber is kept at a constant 160°F killing all pathogens & bacteria; can be left dormant for up to two months, restarting when waste is inserted
- Topically applied, the fertilizer, if re-hydrated, will not rot or mold or attract vermin. Composters landscapers will pick up, repackage & sell as valuable commodity





AR4 Units come in 6-convient sizes with capacities ranging from 1-ton to over 40-tons/week:

- Modular & scalable in design
- Clients can easily meet existing demand, with the ability to scale up for future growth
- Systems are stand-alone, or outfitted with larger capacity hoppers, shredders, & extruders for pelletized fuel

The future of sustainability

- The first fully automated "Plug & Play"
 <u>continuous feed</u>, waterless digester process
- NO GRAY WATER discharge ever
 - No drain lines to sewer required
- Steam is sterilized & vented to atmosphere
 - No VOC's, CO2 emissions, & PH neutral



- Reduces mass & volume of organic waste by 70% (minimum)
- Options: remote monitoring, stand-alone hopper, shredder w/screw or conveyor feed
- Load Scale, & cloud connectivity available, with background monitoring

What do you need?

AR4 Digester	Normal range without shredding, achieving + 70% reduction in volume (Kg / Tons)							;)		
Model	Kg/Day	Kg / Week	Tons / Week	Tons / Month	Tons / Year	Height (ft)	Width (ft)	Length (ft)	Cost/Day *	Power
ARC-1	100	700	0.7	2.8	33.6	3.2	2.4	4	\$2.93	3ph - 16amp
ARC-2	200	1,501	1.5	6.5	78	3.2	2.6	5.5	\$4.61	3ph - 16amp
ARC-5	500	3,740	3.7	16.2	194	4.9	3.1	12	\$6.72	3ph - 16amp
ARC-10	1,000	7,482	7.4	32.3	389	5	3.8	17	\$12.03	3ph - 63amp
ARC-20	2,000	14,969	14.9	64.8	778	8	4.6	18	\$17.54	3ph - 63amp
ARC-50	5,000	37,420	37.3	162.1	1,945	6.8	5.5	33	\$51.86	3ph - 160/inverter

*Operating Cost Per/Day was calculated at \$0.12 /kwh

What goes in

- Vegetable waste
- Commercial kitchen waste
- Sewage sludge
- Manure (dairy farming, feedlot, fodder)
- Equine stable & other animal wastes
- Crop residual
- Fish & animal offal
- Abattoir waste
- Chicken waste & chicken bedding waste

High-value nutrient rich soil fertilizer



Empty your Food Waste into the AR4 Digester Close the lid & go about your day The food waste is transformed into a Nutrient Rich Soil Additive in just 24 Hours Add directly to your soil

What comes out

Parameter	Normal Range (variation)	Garden Compost	AR4 Sample Range*
Organic Matter	40 – 70 %	68.5%	76%
pH Balance	7.0 - 8.0	7.7	6.3
Nitrogen (N)	0.6 – 3.3 %	0.96%	0.8%
Phosphorous (P)	0.2 – 0.6 %	0.15%	0.6%
Potassium (K)	0.4 – 1.8 %	0.56%	0.41%
Calcium (Ca)	2.0 – 3.5 %	1.90%	0.35%
Magnesium (Mg)	0.2 – 1.1 %	0.94%	0.14%
Sodium (Na)	0.3 – 0.7 %	0.35%	1.27%

*Marchwood Scientific Services – Certificate: 116/7385 12th August 16

What comes out

- Equine Sanctuary processes an average of 2-tons of manure a day
- AR4 system sits outside, completely weather protected & stand-alone
- AR4 system manages fluctuating animal numbers throughout the year
- Manure & fodder is loaded daily into the hopper (up to 5-tons/day)
- Hopper delivers manure to Digester
- Digestate is then used "as is" in our bio-mass boiler providing heat to the animal living spaces



Converting waste into value

AR4 unique Digesters have flexibility to convert waste into value:

- nutrient rich soil fertilizer
- high BTU value, clean burning fuel
 - When integrated with our biomass boiler system you create a full waste to energy option "closed loop"

High BTU-value bio-fuel





Step 3



The food waste is converted into a high BTU Bio-Fuel in just 24-hrs The fuel may be used on its own or co-fuelled with wood in an integrated biomass boiler The resulting heat is delivered to your existing heating system

Quick facts

- Sending 1-ton of waste landfill creates 2.5 to 4 tons of Greehouse Gases (GHG)
- Composting in traditional way requires tremendous amounts of fossil fuels; creates methane (the most dangerous type of GHG);
 & takes months to create a viable product, which contains a ¼ of the nutrient value found in our product
- Having an AR4 Bio-Digester at your site allows you to take control over your costs; lock in your overhead; & create a viable income stream
- Making a positive & sustainable impact on carbon emissions

Where will it work – the short list

- Corporate campuses
- Hospitals
- Commercial kitchens
- Restaurants
- Hotels
- Universities / Colleges
- Farms
- Resorts
- Military bases
- Airports

- Civic centers
- Senior centers
- Grow operations
- Green houses
- Abattoir's
- Sewage plants
- Aquaculture
- Processing plants
- Produce distribution centers
- Supermarkets

Who we are

- We are technology owners, focused on providing off-grid holistic infrastructure solutions, that:
 - Deploy logical, proven, economical, modular/scalable, technology platforms
 - Employ the latest environmental safeguards
- We are competent & excel in the Design, Engineering, Manufacturing, Project Delivery, & Support of our client base; Managed Services (O&M),
- We have deployed in excess of \$200m in project infrastructure & management services into the most demanding environments on four continents

Who we are

- Our treatment technologies include: AD, Potable Water, Black Water, MSW & Biomass, from 1-ton to 400-tons/day
- Clients include: Governments, Industry, First Nations, NGO's, Military, Schools
- We are focused on imparting our knowledge base, creating opportunities, which will prosper in our absence
- We ensure the communities we work with, are supported, trained & incentivized
- We are focused on community independence, security, home, family, & particularly the next generation



Case Studies

Further Case Studies are available

Mermaid Quay

- 30+ outlets feeding one C5 digester
- Shredder attached to aid in breakdown of larger food items
- 8,000 lbs of food processed per week
- Digestate used as part of soil enrichment process
- Used in greenhouse onsite

Mermaid Quay



Best Western Hotel







- 5,000 liters of food waste per week
- AR4-C5 installed within the existing Plant room
- End product used as a biofuel to produce heating & hot water
- Facilitated under a Managed Services Agreement

Nailcote Hall Country House Hotel









- 2,000 liters of food & organic waste per week
- AR4-C5 waste to heat system installed with integral shredder
- 15kW produced, lifting pool circuit temp by 36°F
- Facilitated under a Managed Services Agreement

Beneden School







- 2,000 liters of food waste per week
- AR4-C5 installed within estate's equipment shed
- End product used as soil improver by grounds staff
- Facilitated under a Managed Services Agreement

Thank you

For further assistance, and a personalized assessment of your needs.

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