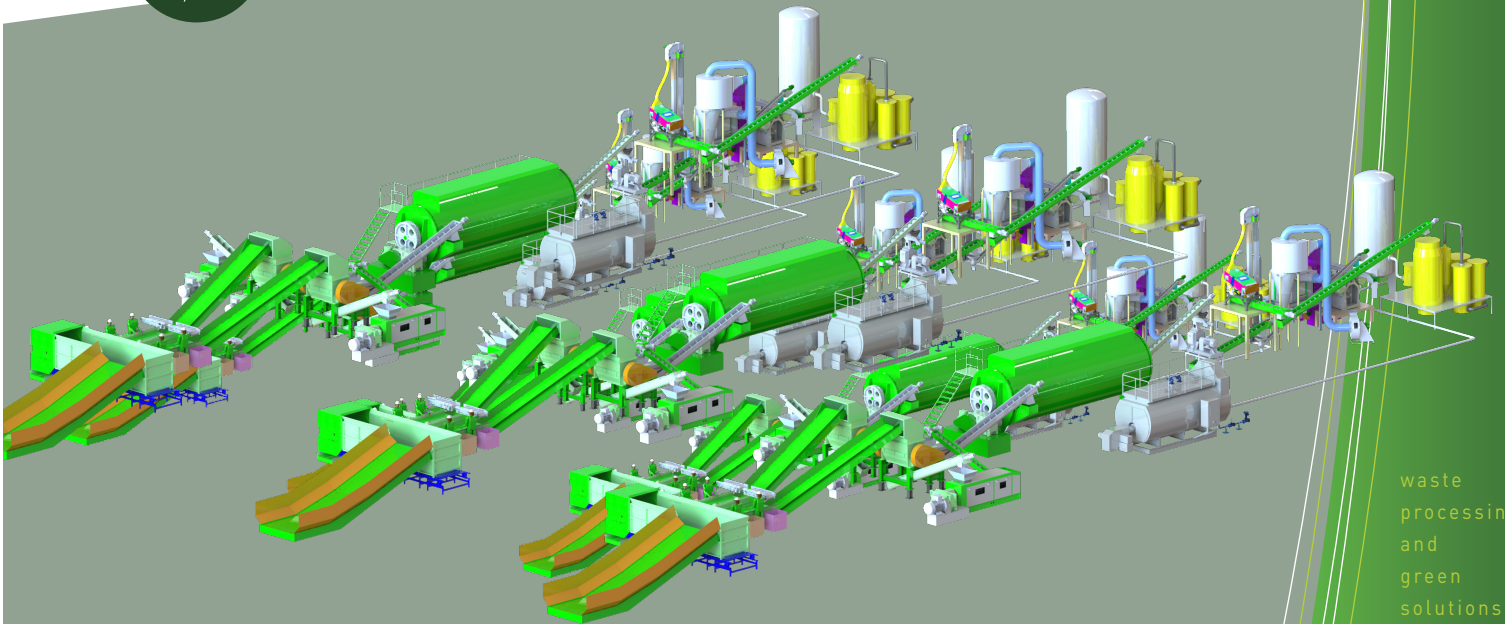


# green FUTURES

SUMMER 2017



true ZERO EMISSIONS



waste  
processing  
and  
green  
solutions

# about the INVENTOR



## ALBERT MARDIKIAN

### IT STARTED WITH A DREAM

Albert Mardikian has dedicated his life to improving the world through inventive technologies. He holds nearly 100 patents and pending patents on leading innovations and designs in the environmental, marine, and automotive industries. He has received numerous awards, including the American Medal of Honor for engineering and design innovation. He was selected as one of the 2000 greatest minds of the 20th Century by the Smithsonian Institute.

In the mid-2000s he started his quest to accomplish what many said could not be done. That is the elimination of landfills and the achievement of true zero waste. He purchased a trash hauling company and began his "hands on" process to create the technology and equipment required to achieve this dream. Regreen International Solutions is the result of over a decade of effort. It is truly a company whose technology and processing systems can truly eliminate landfills and achieve zero waste. Just as Mr. Mardikian imagined over 10 years ago.

### A MESSAGE FROM OUR FOUNDER

*"I have been an inventor my entire life, securing nearly 100 patents for technology and design. I have dedicated over 10 years of my life and a considerable amount of my personal fortune to develop the Regreen technology. It started with the simple goal of eliminating landfills and has grown into so much more.*

*I am honored and humbled by the dedicated support I have received in this mission to change the world for the better. The goal is met. Now let's spread the word and make that change happen."*



ReGreen International Solutions, Inc. (ReGreen) started 10 years ago with a simple goal. Eliminate the need for landfills by developing a system that efficiently produces marketable products from all types of solid waste. The result is our Total Waste System and our Organic Waste Processor.

Both systems start with shredders featuring a proprietary design, created from the ground up. No shredder on the market can produce uniformly sized material quicker or more consistently than ReGreen. Tested on the toughest materials (palm fronds and plastic sheeting), our shredders can process up to 15 tons-per-hour



to uniform sizes of 50 millimeters or less. This is vital to the process as a small uniform size allows our system to quickly kill bacteria, viruses, and odors.

We then use a proprietary press to remove liquids for treatment to irrigation water standards. The remaining solids then travel to the processing unit. If you have organic waste, our Organic Waste Processors can turn this material into animal feed, fertilizers, or clean-burning energy pellets in under 30 minutes at rates up to 42-tons per-hour. If you have trash, the same bacteria/virus/odor killing process creates energy pellets of 8,000+ BTU in our Total Waste System. Pellets from both systems create electricity at a rate of 1 megawatt per-ton or more.

# TURNING TRASH INTO TREASURE™

## EMERGING TECHNOLOGY TRANSFORMING TRASH INTO RENEWABLE ENERGY

All nations must deal with concentrated urban populations and isolated rural communities. ReGreen has the only technology that works well on both ends of the population spectrum. Our systems fit into a surprisingly small footprint (100 ton-per-day systems require less than 300 square meters), which allows deployment of this technology in crowded urban areas. With system-sizes ranging from 1 to 42 tons-per-hour, these systems can also be strategically placed where trash is generated. The ability to effectively size systems would also facilitate placement of closed-loop systems to create electricity from trash generated in rural areas with small populations.

In urban, rural, or suburban utilization ReGreen systems eliminate the costs and environmental issues associated with landfills. In addition, our systems provide the following benefits:

## customizable solutions for global waste management

- Reclamation of 50 gallons of irrigation water per ton processed.
- The creation of clean/renewable electricity through use of our pellets and SynGas systems (up to 1.2 megawatts per ton).
- Dedication of organic wastes to produce animal feed and soil amendments/fertilizer to support growing agricultural needs.
- Ability to turn all current waste material into useful and sustainable products.
- Elimination of long-distance transportation costs and deter illegal dumping.

Placement in population centers is safe since our process has zero harmful emissions. We don't burn waste in our process. We rapidly heat it using a proprietary radiant-heat process. The only emission is water vapor. Similarly, SynGas units create fuel through a zero-emission process. The only emission is in the ultimate cre-



Press  
Cooker  
Dryer

ation of electricity, through the use of an internal combustion engine.

ReGreen systems are designed for ease of use so no specialized training is required for efficient operation. We also utilize various remote sensors that allow us to help local operators keep their systems running at peak efficiency. Our systems are designed to run 12 to 20 hours per day, thus capital costs are only a fraction of comparably sized anaerobic digestion or incineration sys-



Processing  
System  
Overview

Under  
30  
minutes  
at rates  
up to 42  
tons per  
hour

tems. Our process is also more efficient as there is no wasted or unusable material left after processing.



# PATENTED TECHNOLOGY

SECURED PATENTED TECHNOLOGY FOR WASTE MANAGEMENT SOLUTIONS



USA Patent #9,423,178 B2 with filed 4 PCT applications for international protection.

PCT / US2016 / 051185  
 PCT / US2016 / 049311  
 PCT / US2016 / 047221  
 PCT / US2017 / 018513

Additional  
 Patents  
 Pending

## Comparison of different fuel types

Item	Coal	Diesel	Natural Gas	Pellet
1 Heat Value	5000 (Kcal/kg)	10200 (Kcal/kg)	8700 (Kcal/m3)	4500 (Kcal/kg)
2 Boiler Efficiency	74%	88%	88%	80%
3 Density (kg/m <sup>3</sup> )	1100-1400 (kg/m <sup>3</sup> )	830 - 860 (kg/m3)	0.74 (kg/m <sup>3</sup> )	980 (kg/m <sup>3</sup> )
4 CO <sub>2</sub> (.kg/kg)	1.78	3.06	1.96	0
5 SO <sub>2</sub> (g/kg)	0.5%	0.25%	-	0.07%
6 NO <sub>x</sub> (g/kg)	2.94	3.67	1.87 (g/m3)	1.02



ReGreen  
 Pellets:

Stable  
 Dry  
 Transportable  
 Energy



## Qualitative Comparison : ReGreen vs.

	Technology	By Product	Capacity	Processing Time	Pathogen Free End Product
1	ReGreen organic waste processing	Feed, Fertilizer, Syngas, BioChar, and Water	Up to 42 TPH	21minutes	Yes
2	In vessel composting system	Compost	75 Tons	4 - 7 days	No
3	Tunnel composting	Compost	Various	7 - 30 days	No
4	Dry fermentation digester	Bio-Gas	Various	21 - 28 days	No
5	Tunnel Composting	Compost	Various	7 - 30 days	No
6	In vessel composting system	Compost	40 - 50 Yds	14 - 21 days	No
7	Biomass pyrolysis	BioChar, SynGas	2 - 4 TPH	2 - 4 TPH	Yes
8	Plasma Waste Disposal	SynGas	10 - 500TPD	?	Yes
9	Dehydration System	Dehydrated Food Waste	110 - 220 lbs./Day	12 - 18 hours	No



Patented technology combined with customized solutions

## Traditional Waste Management Systems

Odor Free and Product	Humidity Control	Indirect Heat Controlled Cooker	Indirect Heat Controlled Drying	Pelletizing Option	High KCal Output	Liquid Separation / Filtration	Heat Source
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Indirect dry steam
Yes	No	No	No	No	No	No	None
No	No	No	No	No	No	No	None
No	No	No	No	No	No	No	None
No	No	No	No	No	No	No	None
No	No	No	No	No	No	No	None
Yes	No	No	No	No	Yes	No	In vessel heating
Yes	No	No	No	No	Yes	No	Plasma
Yes	Yes	No	No	No	No	No	Electric

Comparative table subject to change and may vary over time

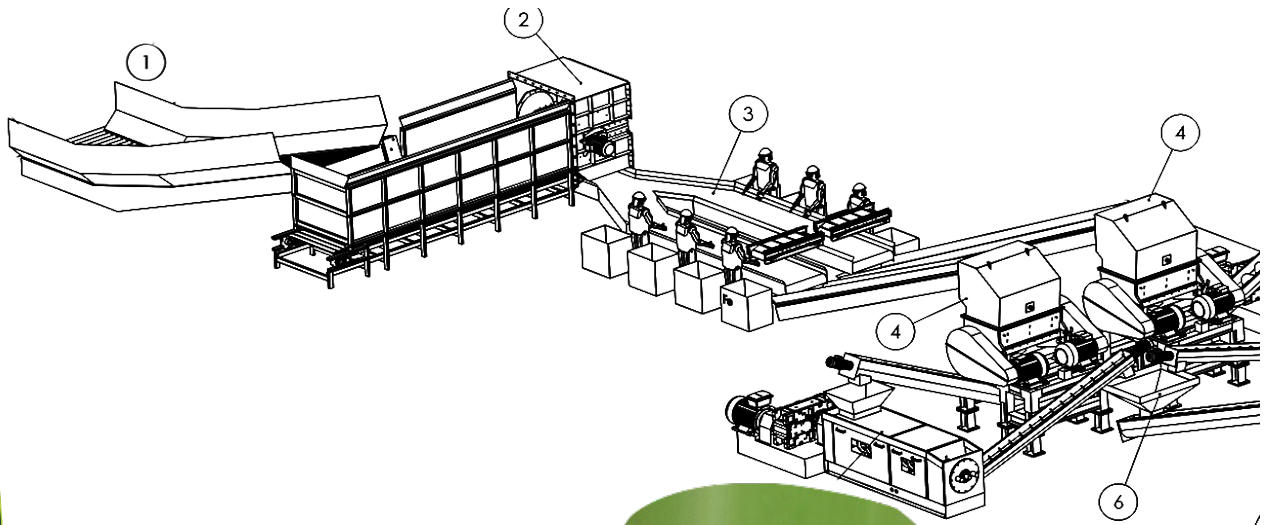


Total  
Waste  
Systems (TWS)

Available Sizes:  
3 Ton per hour  
5 Ton per hour  
10 Ton per hour  
20 Ton per hour

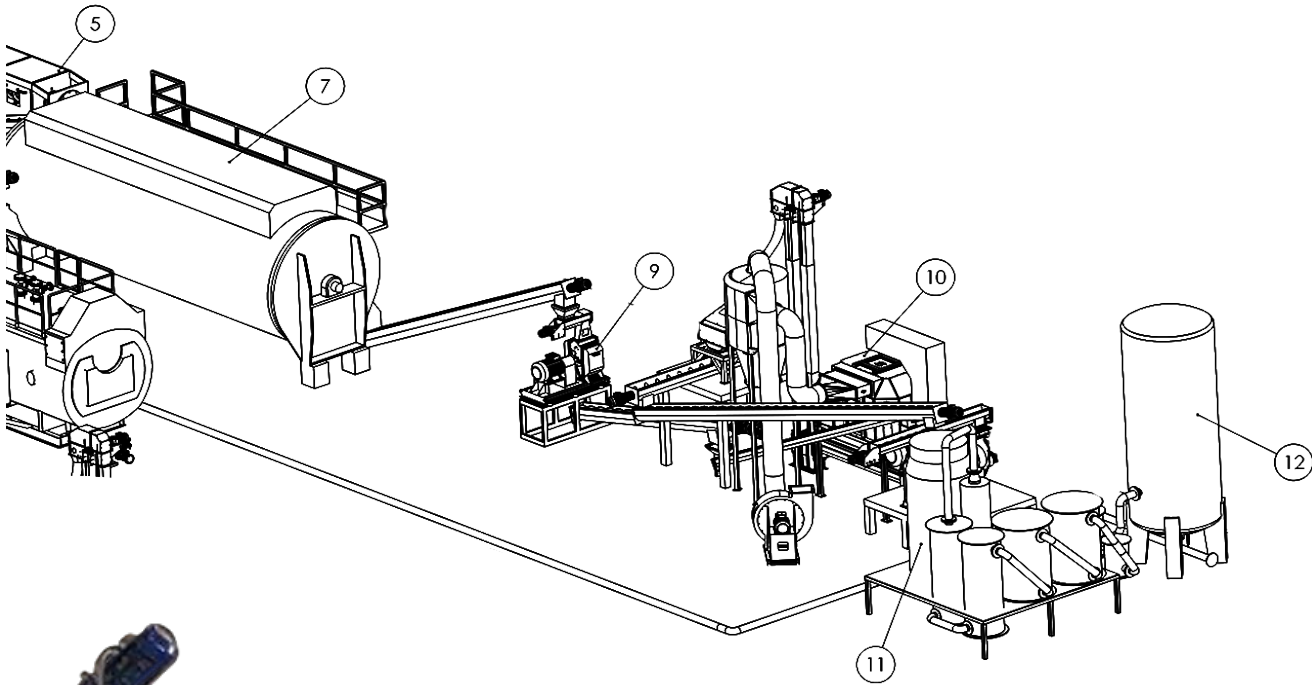
Up to 42 tons  
per hour

In less than  
30 minutes



# TOTAL WASTE SYSTEM - TWS

TRUE ZERO EMISSIONS WASTE PROCESSING CONFIGURABLE SOLUTIONS



#	Description
1	Dumping Conveyor
2	Bag Ripper
3	Sorting Unit
4	Shredder
5	Press
6	Helix Hopper
7	Cooker/Dryer
8	Steam Boiler
9	Grinder
10	Pelletizing Unit
11	Gasifier
12	SynGas Storage Tank

Featured  
15 TON  
Dual Conveyor  
Dual Shredder  
SynGas Unit

Waste to  
Pellets

Pellets to  
SynGas

SynGas to  
Electricity



# ORGANIC WASTE PROCESSOR - OWP

CONVERT ORGANIC WASTE OR YARD WASTE INTO FEED, FERTILIZER, OR GREEN ENERGY



After cooking, option to extract nutrient rich and bacteria free liquid

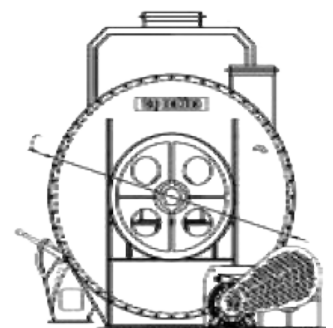
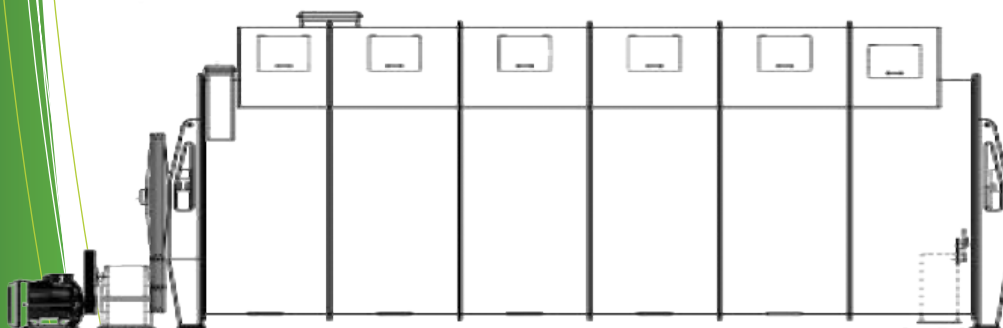
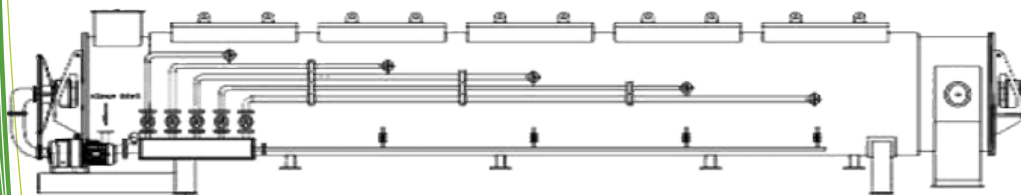
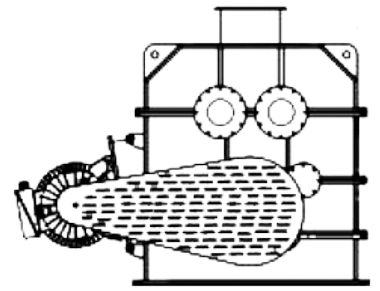
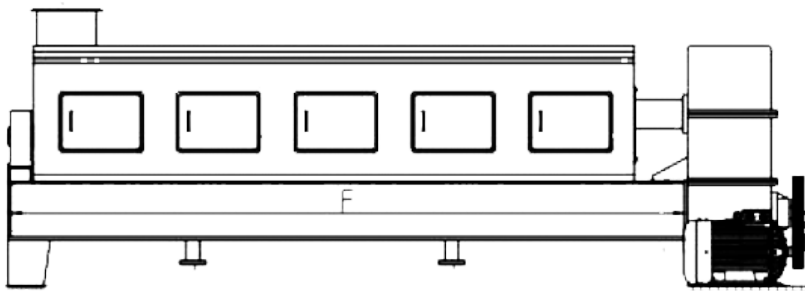
- Create an immediate organic fertilizer product
- Use as a base nutrient-packed liquid for specific fertilizer blends

Further processing options

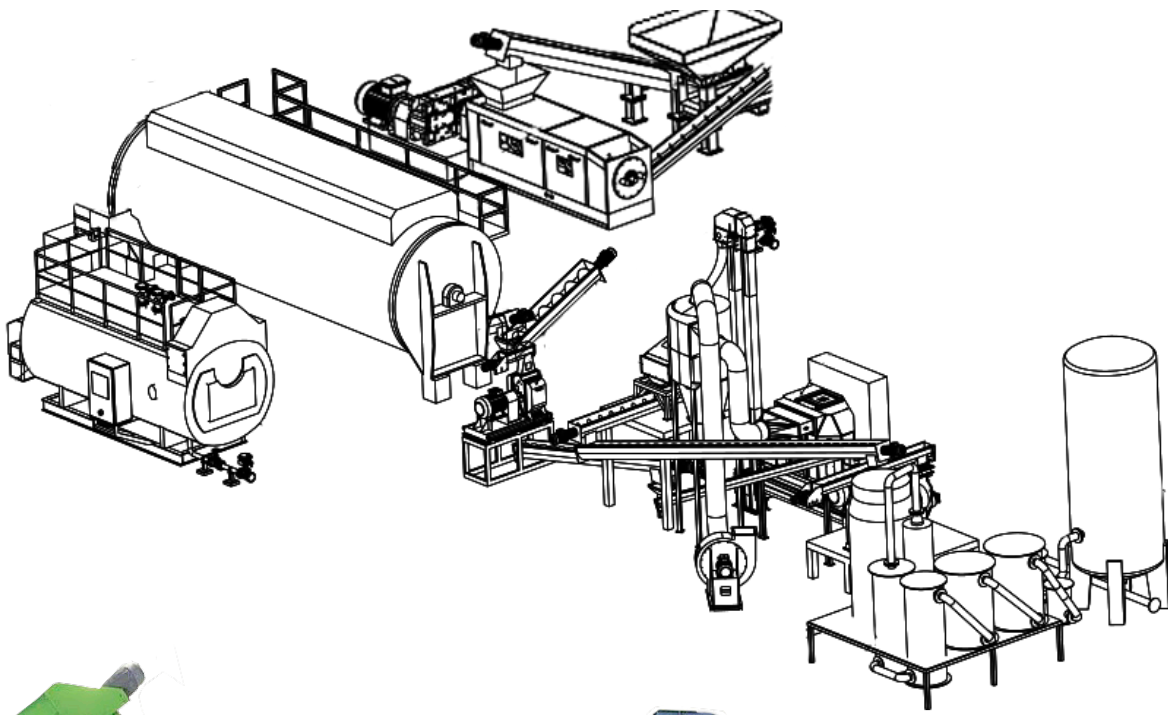
- Immediate bag feed and fertilizer product in our automated system
- Process end-product into pellets then use our coolers to ensure low moisture content and long storage life

Optional on-site SynGas System

- Immediately convert pellets to electricity at rate of 1 megawatt per-ton
- Convert SynGas into natural gas products like CNG, LNG, or pipeline gas
- Use a portion of the SynGas to operate the steam boiler and electricity to power the entire system (approximately 15% of total SynGas produced will do both)
- Sell excess to power grid or pipeline



Transform  
Organic  
Waste  
into  
Fertilizer  
Animal Feed  
and  
fuel pellets  
in less than  
30 minutes



Organic Waste Processor (OWP)

Available Sizes:  
350 TPD  
400 TPD  
800 TPD

## Organic Waste Processors

	Type	Capacity	Weight	Power
1	P 350	350 TPD	9500 kg	37 kW
2	P 400	400 TPD	10880 kg	45 kW
3	P 800	800 TPD	26600 kg	55 kW





Kitchen  
Waste  
Processor (KWP)

Available Sizes:  
KWP 300  
KWP 1000

Kitchen Scrap  
Kitchen Waste  
Table Scrapings  
Expired Food  
Yard Waste

# KITCHEN WASTE PROCESSOR - KWP

IDEAL SOLUTIONS FOR HOTELS, FOOD MANUFACTURING/PROCESSING COMPANIES, CASINOS

## System Highlights

- Fits into a very small footprint
- Handles all types of organics waste and common contaminants (paper and plastic)
- Provides full compliance with mandatory organics recycling regulations
- Eliminates disposal costs and landfill needs
- Kills all harmful bacteria and odors rapidly

## Technology

- All the innovations of our larger machines in a compact size
- Durable and simple to operate
- Easy to maintain

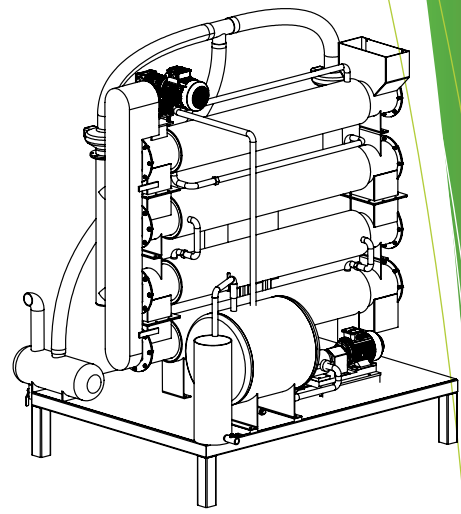
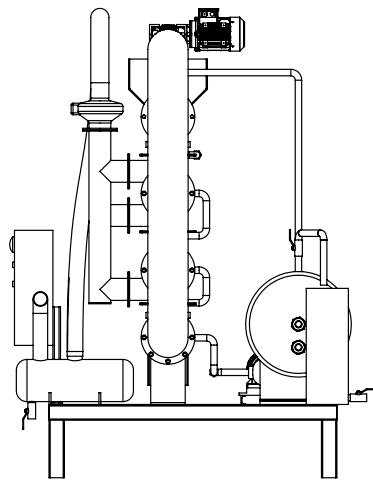
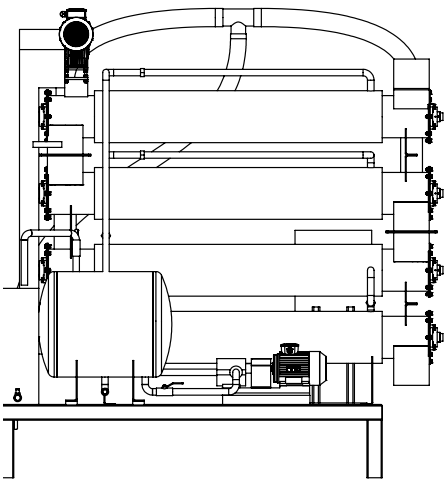
## Solutions

- Produce feed, fertilizer, or fuel pellets rapidly
- Eliminate existing waste collection costs
- Easily integrated into existing waste collection/consolidation process
- Waste collection cost savings, plus end product values provides a quick payback on your investment



## Kitchen Waste Processors

	Type	Capacity	Weight	RPM	Amerage	L	W	H
1	KWP	150 kg/h	1055 kg	1440	115.5 / 57.74	1740 mm	2326 mm	2445 mm
2	KWP Press	300 kg/h	1300 kg	2000	28.53 / 14.26	2567 mm	688 mm	930 mm



Kitchen Scrap  
Kitchen Waste  
Table Scraping  
Expired Food  
Yard Waste



eco friendly



# GASIFICATION SYSTEM WITH CHILLER

TRANSFORMING ONE TON OF FUEL PELLETS TO 1 MEGAWATTS OF ELECTRICITY

Regreen's unique and patented process is the only one that can turn municipal solid waste (MSW) into an effective fuel for syngas systems. Replicating much of the benefits of torrefaction, yet not burning the processed material, we rapidly create pellets with gross calorific values of 4,700 to over 6,000 with MSW, and 3,500 (horse manure) to 5,200 with organic waste. At 4,500 kcal/kg our pellets produce 1 megawatt of electricity per-ton.

The syngas process releases no emissions so we provide a superior and green alternative to fossil fuels, coal, or wood biomass for energy production. Our syngas or pellets can easily be used in the following common applications, with great environmental benefit:

Pellet or Coal Fired Power Plants – Industrial Steam/Heat Boilers – Pellet Heaters – Gas Stoves



## ELECTRIC GENERATOR

SYNGAS GREEN ENERGY CONVERTED TO ELECTRICITY

Regreen has overcome the most common difficulties faced in marketing of RDF which is bad or not stable quality of the product (limitations are due to odor/foul smell and variation in GCV of the RDF). Regreen has established plants that follow a stringent process to establish Fuel Pellet as a Green Alternative Fuel to Coal especially in emerging markets due to its stable quality and price advantages.



SynGas  
Generators

Available in  
multiple  
configurations

Simple  
electricity  
production

Customize  
to add  
heating and  
cooling for  
central air  
and water

Methane  
Diesel  
Petroleum  
Jef Fuel  
Fly Ash

# SYNTHESIS GAS (SynGas) BENEFITS

## TRUE ZERO EMISSIONS SYSTEM

- High BTU value pellet that generate up to 1.2 megawatts of electricity per-ton of MSW
- Eliminate processes MSW to bacteria
- SynGas unit creates a zero emission energy fuel in a process: takes minutes, not months to produce anytime of the year
- Anaerobic digestion takes one week to one month to produce a much "dirtier" gas AND leaves 95% residue (digestate) with requires further processing
- SynGas unit produces clean gas in minutes and residue is marketable fly ash or biochar at approximately 17% residual-rate

In addition, its immediate production capabilities allows you to power your entire ReGreen System on the pellets it produces

## CUSTOMIZABLE SOLUTIONS

- Electricity can be consumed on site and exported
- On-site SynGas System Boiler can eliminate need for pelletizin

SAVE MONEY FOR SYSTEM OPERATORS & THE COMMUNITIES THEY SERVE

Customizable solutions for air conditioning heating and steam solutions

## Global economy - Pellet Benefits

Benefit	Description
1 Efficient	<ul style="list-style-type: none"> <li>• Uniform shape &amp; size for best consistency and efficiency</li> <li>• Fuel pellets have stable low moisture content and produces reusable fly ash residue or biochar</li> </ul>
2 Safe	<ul style="list-style-type: none"> <li>• Easy to use and store for future uses or global shipping</li> <li>• Low risk of fire hazards or immediate combustion</li> </ul>
3 Smokeless operations	<ul style="list-style-type: none"> <li>• Zero Emissions during low heat burning process</li> <li>• SynGas is produced in an encapsulated process</li> </ul>
4 Cost effective	<ul style="list-style-type: none"> <li>• Significant lower enery cost than comparative fuel sources</li> </ul>
5 Sustainable Eco-Friendly	<ul style="list-style-type: none"> <li>• Fuel pellet consumption produces lower emissions</li> <li>• Biomass residue is a green replacement for fossil fuels</li> <li>• Ultra low-emissions to produce electricity and no emission to produce CNG, LNG, or pipeline gas</li> </ul>

