Recycle Food Waste, Drive Long-term Sustainability

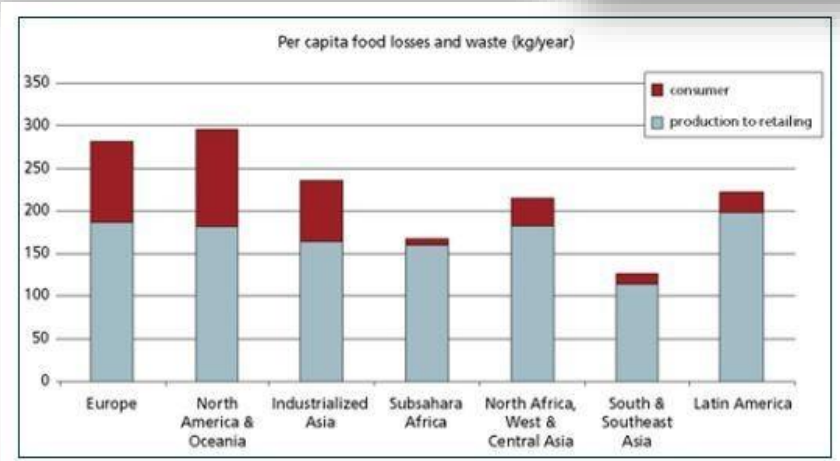
- Promote Zero-waste with Oklin Composters

ArtiZen

Bringing Zero-Waste Solution to Singapore Food Waste Generators

ArtiZen

Food Waste: Today's Issue



- Global:
  - **30%** of food produced,
  - **1.38 Billion Tones/yr**.
  - **~USD 1 Trillion/yr**
  - **+ 3.3 Billion Tones/yr** Greenhouse Gases.
- Singapore:
  - Grown **by ~30%** (over last 10-yr).
  - **763 K Ton** (2018).
  - Each household **~0.75kg/day**.
- NEA: Recycle/Treat food waste.

ArtiZen

NEA's Directives

When	Who	What
Fr 2021	Large public-sector building developers	Take the lead in segregating the waste.
Fr 2021	Large food-waste generators	Set aside space for food-waste treatment systems
Fr 2024	Large food-waste generators	Treat food waste on-site
Fr 2024	All food-waste generators	Segregate waste for treatment on- or off-site

Singapore Government Fund Applicable

Parliament: New zero-waste law to compel big firms to take greater action

It will put in place approach mandating key responsibilities to enable recycling

REPUBLIC OF SINGAPORE
GOVERNMENT GAZETTE
ACTS SUPPLEMENT

Published by Authority

NO. 36] FRIDAY, OCTOBER 4 [2019

ArtiZen

Solution: Recycle Food Waste

Food Waste + Microbes → Compost

- Bio-conversion.
  - Continuous.
  - Accelerated.
- Compost.
  - Nutrient-rich.
  - Horticulture use.
- Natural.

ArtiZen

Values

Convenience

- ✓~90% reduction
- ✓~ 24hr conversion
- ✓Disposal frequency reduction

Comfort/Health

- ✓Odorless
- ✓Pest deterrent
- ✓Pathogen free (EU Reg. #142/2011)

Economics

- ✓Disposal cost saving/avoidance
- ✓ Avoid High Water Consumption
- ✓ Avoid Grey Water treatment

Sustainability

- ✓Greenhouse Gas reduction
- ✓Reusable Compost

ArtiZen

Technology Differentiation

Dehydrator

Digester

Natural Composter

ArtiZen

Technology Differentiation

	Oklin's Composter	Other 's Composter	Dehydrator	Digester	Natural Composting
Bacteria	√	√	x	x	√
Enzyme	x	√	x	√	x
Temperature	55~75°C	35~70°C	90~100°C	20~50°C	40~75°C
O_2	√	√	x	x	√
Cycle Time	24hr	24~72hr	8~11hr	12~24hr	3~8 months
Input	Continuous	Continuous, Batch	Batch	Continuous	Continuous
Output	Compost	Compost	Biomass	Sludge, Grey Water	Compost
Reduction Rate	80~90%		Up to 90%	~60%	
Offload Frequency	Once a week		Every Batch		

Microbiological Degrading

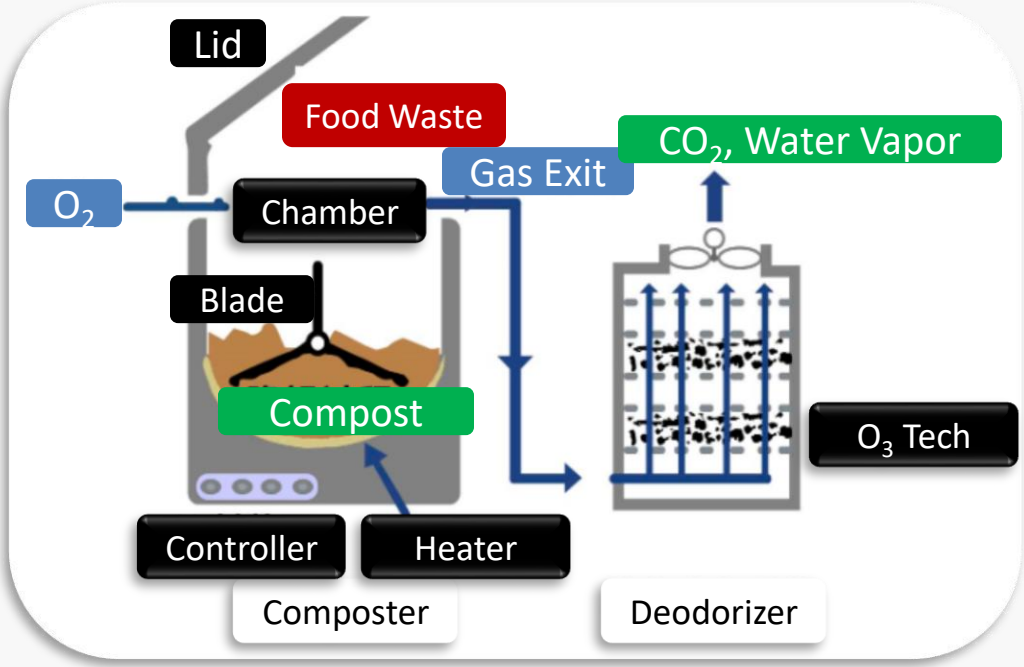
“Micro-babies”: Acidulo™

- Aerobic metabolism:
  - ~ 90% → water vapor and gases,
  - ~ 10% → **Compost** (offload once a week).
- Active @ > 50ºC.
- Non hazardous, nor threat to humans or animals.
- Replenish annually.

ArtiZen

Equipment

- Composter:
  - “In”: Food waste.
  - “Out”: Compost.
  - “Stay”: Microbes.
  - Equipped with
    - Energy efficient heater
    - Mixing blade.
- Deodorizer



ArtiZen

Equipment

GG-02

4~5.5 kg/day
2 T/yr
240W, Single Phase

GG-10s

25~30 kg/day
10 T/yr
2.1 kW, Single Phase

GG-30s

80~90 kg/day
30 T/yr
4 kW, 3-Phase

ArtiZen

Capacity Options

Oklin
www.oklininternational.com

Machine Model		GG10s	GG30s	GG50s	GG100s	GG200s	GG300s	GG500s	GG600s
Input Capacity	Daily (kg)	25	75	125	250	500	800	1,350	1,500
	Daily (lbs)	55	165	275	550	1,100	1,750	3,000	3,300
	Yearly (tons)	10	30	50	100	200	300	500	600
Machine Dimensions (W x D x H)	(mm)	1,160 x 620 x 1,005	1,960 x 890 x 1,250	2,155 x 1,055 x 1,330	3,040 x 1,220 x 1,575	3,190 x 1,550 x 1,880	4,050 x 1,820 x 2,165	4,958 x 1,955 x 2,995	6,988 x 1,955 x 2,995
	(in)	45.67 x 24.4 x 39.56	77.17 x 35.04 x 49.21	84.84 x 41.54 x 52.36	119.69 x 48.03 x 62.0	125.60 x 61.02 x 74.02	159.45 x 71.65 x 85.24	195.20 x 76.97 x 117.91	275.12 x 76.97 x 117.91
Stairs (W x D x H)	(mm)			990 x 800 x 1,300	1,300 x 800 x 1,475				
	(in)			38.98 x 31.50 x 51.18	51.18 x 31.50 x 58.07				
Machine Dimensions (incl. safety rails) (W x D x H)	(mm)						4,715 x 1,820 x 3,005	5,628 x 1,955 x 3,238	7,655 x 1,955 x 3,328
	(in)						185.63 x 71.66 x 118.31	221.57 x 76.97 x 127.48	301.38 x 76.97 x 131.02
Machine Weight	(kg)	240	450	650	1,150	2,500	3,500	5,500	7,000
	(lbs)	528	993	1,430	2,530	5,510	7,716	12,125	15,400
Power Draw	kW	2.1	4	6	13	25	25	45	50.75
Power Consumption*	kWh/month	310 - 944	694 - 1,787	987 - 2,664	1,949 - 5,297	3,088 - 8,575	3,953 - 10,885	7,796 - 19,732	8,796 - 23,177
Voltage	V; Hz	Single Phase 110-240V; 50/60 Hz	Three-phase 200-480V 50/60Hz						
Standard Deodorizer Dimension	(mm)	410 x 580 x 980	510 x 800 x 1,300	510 x 800 x 1,300	510 x 800 x 1,300 (x 2 units)				
	(in)	16.14 x 22.83 x 38.58	20.08 x 31.5 x 51.18	20.08 x 31.5 x 51.18	20.08 x 31.5 x 51.18 (x 2 units)				
Standard Deodorizer Weight	(kg)	45	130	130	130 (x 2 units)	130 (x 2 units)	130 (x 2 units)	130 (x 2 units)	130 (x 2 units)
	(lbs)	100	287	287	287 (x 2 units)	287 (x 2 units)	287 (x 2 units)	287 (x 2 units)	287 (x 2 units)
UV Deodorizer Dimension	(mm)	520 x 900 x 755			520 x 1,200 x 755	520 x 1,200 x 755 (x 2 units)			
	(in)	20.47 x 35.43 x 29.72			20.47 x 47.24 x 29.72	20.47 x 47.24 x 29.72 (x2 units)			
UV Deodorizer Weight	(kg)	70	70	70	120	120	120	120	120
	(lbs)	154	154	154	264	264	264	264	264
Bin Lifter Dimensions (without safety doors)	(mm)				1,150 x 1,030 x 1,680	1,150 x 1,080 x 1,920	1,150 x 1,080 x 2,195	1,150 x 1,080 x 2,435	1,150 x 1,080 x 2,435
	(in)				45.28 x 40.55 x 66.14	45.28 x 42.52 x 75.59	45.28 x 42.52 x 86.42	45.28 x 42.52 x 95.87	45.28 x 42.52 x 95.87
Bin Lifter Dimensions (with safety doors)	(mm)				1,150 x 1,300 x 1,680	1,150 x 1,350 x 1,920	1,150 x 1,350 x 2,195	1,150 x 1,350 x 2,435	1,150 x 1,350 x 2,435
	(in)				45.28 x 51.18 x 66.14	45.28 x 53.15 x 75.59	45.28 x 53.15 x 86.42	45.28 x 53.15 x 95.87	45.28 x 53.15 x 95.87

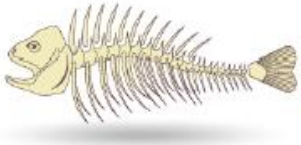
*Actual power consumption may vary depending on use

ArtiZen

“Bon Appétit”

Fruit and Vegetables

Meat Products i.e. Chicken, Pork, Fish



Fish Bones, Soft Bones

Soft Shells i.e. Egg Shells, Shrimp Shells

Liquid Food i.e. Soup, Stew

Bread, Noodles, Tacos etc.

Grains i.e. Rice, Cereal

Dairy Products, Confectionary

Coffee Grounds

Bagasse/Compostable Products

ArtiZen

“~~Rubbish Bin~~”

Metal or Plastic Chopsticks, Toothpicks

Plastic Products i.e. Bags, Bottles

Medicine, Chemicals

Metal, glass, kitchen utensils

Coated Paper

Fruit Pits or Stems

Tea bags, cloth, tape, and doggie bags

Cigarettes

Batteries

Cooking Oils

ArtiZen

Drive Sustainability: Cases

- **GG10s** installed at **BERAU am Wolfgangsee, the Hotel and Camping in Salzkammergut**, a famous tourist area near **Salzburg City, Austria**. (2016)

➢ Installed in the wood and tool shed, close in proximity to the kitchen where food scraps are collected.

➢- Equipped to handle the kitchen food waste, and with the abundance of greenland around the resort area, the compost generated is used to fertilize their grounds.

ArtiZen

Case Reference

- https://www.idnes.cz/karlovy-vary/zpravy/elektricky-komposter-obedy-svaciny-zbytky-jidlo-jidelna-skola-kuchyne.A170316_2312537_vary-zpravy_ba

“The remnants of lunches and snacks are converted into fertilizer in the new composter in school” – GG-30s

- ❑Primary School of Languages in Libušina Street in Karlovy Vary, Czech, launched a pilot unit in canteen.
- ❑Other schools in the city launched afterwards then.
- ❑Jiří Burian, the school principal appreciated the values of the compact size.
- ❑The Spa Parks Administration used the compost for fertilization. “
- ❑Everything is fast and hygienic and easy operation.
- ❑Emptying the composter is only a matter of minutes.

ArtiZen

Drive Sustainability: Cases

- **GG30s** installed at **Silo, an award-winning zero waste restaurant, bakery and coffee house in Brighton, UK. opened in 2014 and pioneered zero waste dining in the UK**.

➢Food waste and leftovers are composted by this aerobic GG-30s, lovingly named Bertha.

➢ In 24 hours it can turn up to 60 kilos depending on density, into compost.

➢Restaurant also offer composting service to surrounding restaurants and neighbors. Compost is then delivered to their growers directly or to other local restaurants in order to cut out the middlemen.

ArtiZen

Drive Sustainability: Cases

Site: Ahold Supermarket
Location: Tabor, Czech Republic
Machine: GG30s
Install Year: 2016

Site: Macau International Airport
Location: Macau SAR
Machine: GG50
Install Year: 2013

Site: Volvo Penta
Location: Penta, Sweden
Machine: GG50s
Install Year: 2017

Site: Fazer Food Services
Location: Stockholm, Sweden
Machine: GG50s
Install Year: 2017

Site: Unilever Lipton Jebel Ali Factory
Location: Dubai UAE
Machine: GG100s
Install Year: 2013
Publications: Unilever Press Release 2013

Site: Barwon Health Hospital
Location: Geelong, Australia
Machine: GG100s
Install Year: 2013
Publications: The Fifth Estate June 2014

Site: Jiangle Composting Facility
Location: Fujian Province, China
Machine: GG500s
Install Year: 2016

ArtiZen

Drive Sustainability: Cases

Oklin Profile

Year	Milestone
1980s	Founded by a group of Japanese and Korean scientists when they discovered Acidulo® .
1997	Developed the equipment .
2010	Int'l distribution and marketing hub founded in Hong Kong.
Early 2000s ~Now	Worked with distributors in North and South America, Europe, Middle East, South Africa, China, Southeast Asia and Australia and New Zealand.
Early 2020	Singapore office established.

Late 2019, **ArtiZen** was granted as the preferred distributor in Singapore.

www.oklinsingapore.com

ArtiZen

“Close-loop”, totality of Solution

❑We may provide extra-mile services, together with our partners, to drive this sustainability initiative with close loop execution.

Quantitative and Qualitative Measurement

Government Fund Application Assistance

Compost collection

Government Grant

- ❑ Food Waste Fund (NEA)
- ❑ PSG (Productivity Solution Grant)
- ❑ 3R Fund (NEA)
- ❑ EDG (ESG)
- ❑ …

3R Fund

Project eligibility

- Projects must result in an increase in the quantity of solid waste (this excludes toxic and chemical wastes) recycled or a reduction in the quantity of solid waste generated. The minimum tonnage eligibility is 100 tonnes reduced, reused or recycled over the whole project duration. (The maximum project duration is 3.5 years.)
- Projects must not have commenced at the time of application (i.e. issuing of purchase orders for equipment, conducting collection and recycling of recyclables, etc. (whichever is earliest))
- Projects with new and innovative processes and concepts, and which target waste streams with low recycling rates such as food, plastic and glass will be given higher priority.

Applicant eligibility

- Any organization in Singapore, including companies, non-profit organizations, non-government organizations, town councils, schools, institutions and managing bodies such as MCSTs can apply for the 3R Fund.

Grant quantum

- The 3R Fund will co-fund up to 80 % of qualifying costs, subject to a cap of $1 million per project or per applicant. The funding level will depend on the quantity and type of waste reduced or recycled. The grant will be calculated based on key outcomes such as the actual quantity of waste reduced or recycled.

NEA 3R Fund Website：
https://www.nea.gov.sg/programmes-grants/grants-and-awards/3r-fund

Thank you

ArtiZen Pte Ltd
Foodservice Equipment Specialist

T: +65 6749 6880
E: sales.dept@artizen.com.sg
www.artizen.com.sg