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Solid Waste Management:


Have you imagined a world without landfill?


Global warming


Leachate leakage


Air pollution

Environment

Our inspiration

Hazards


Landfill on fire


Methane Gas Leak

Operations

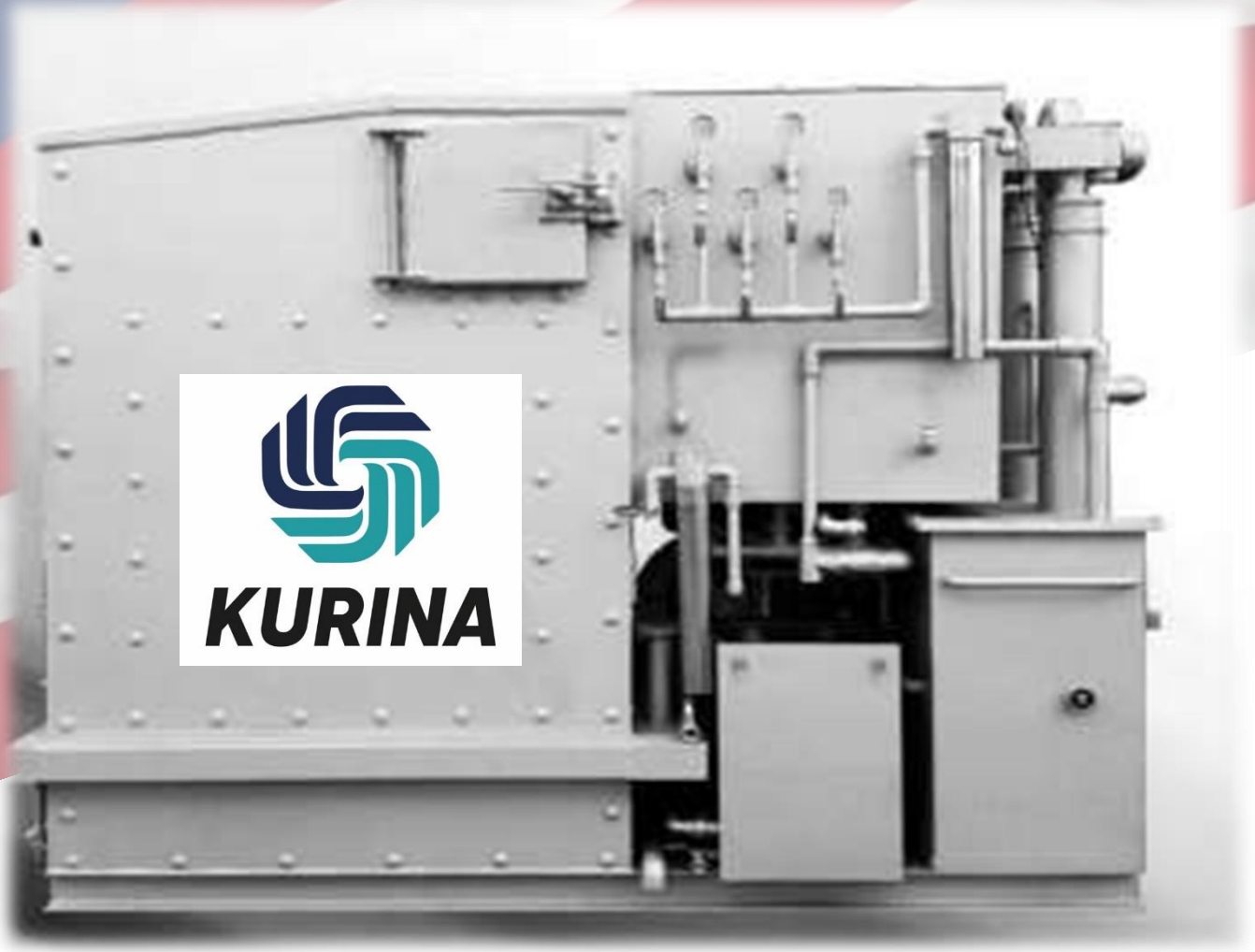

High Capex

Land Scarcity


Logistics & Pollution


Burying the problem

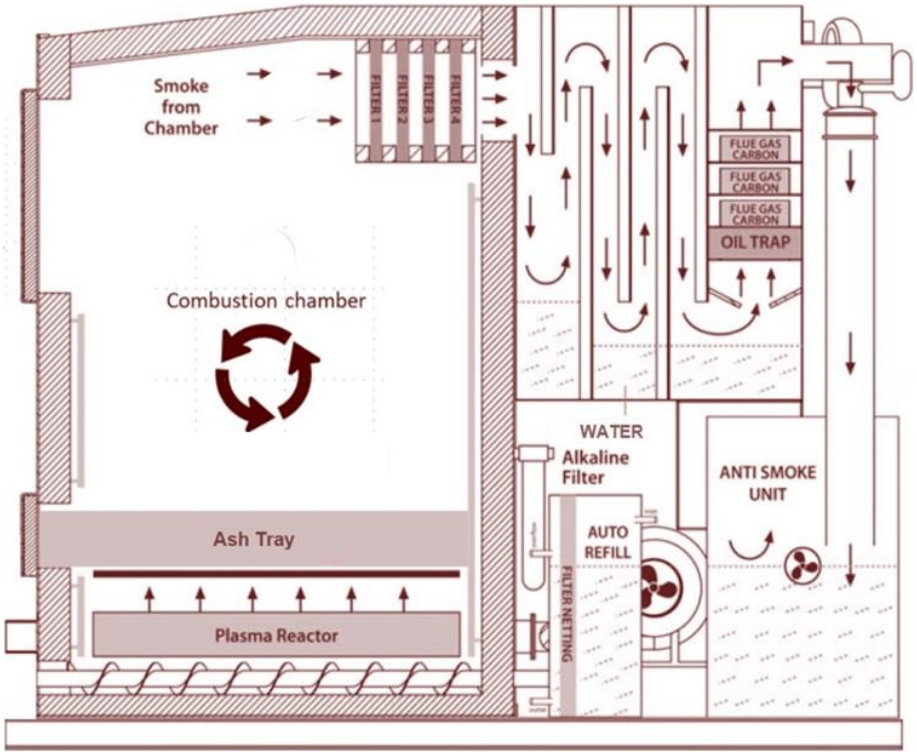
We have a solution that is 100% innovated, patented and manufactured in Malaysia



KURINA: *processes waste to ash*

- Reduces mass by 96%
- Utilises plasma technology that allows heat to go up to 1,000 Celsius (°C)
- Able to process all types of residential waste up to 80% moisture level except glass, metals and ceramic
- Emission is smokeless and odorless

What is the technology?



- Pyrolysis is the thermal decomposition of waste occurring in the absence or little oxygen.
- The unit requires heat initiation to start thermal decomposition and the reactor is designed to hold up heat up to 1,600 degrees Celsius.
- The unit does not use any fuel-stock i.e. gas or diesel. Instead, heat is generated based on an initiation point and is further built using ionized air that is channeled into the chamber.

Kurina functions across

4

Operational steps

1 **Load waste into the unit**

- Open the door of the unit
- Load waste into the unit
- Close the door

2 **Processing of the waste**

- Waste is processed between 30 minutes to 45 minutes depending on moisture level
- Step 1 is repeated until waste is cleared

3 **Collection of the ash**

- The ash as a by-product is collected from the ash tray and can be used as fertilizers and construction material i.e. bricks.

4 **Maintenance**

- There is a daily, weekly and quarterly maintenance that the operator themselves can conduct

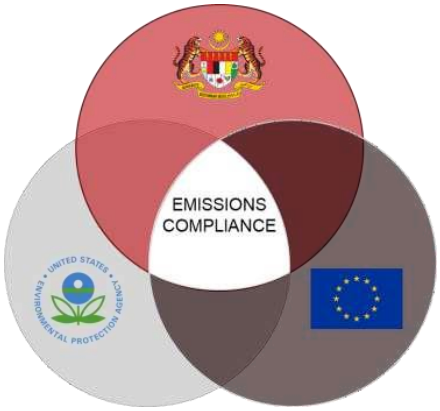
Daily Requirements: 1 litre/hour of water 5.25KW per hour of electricity

1 Compliance to environmental standards

Kurina Emission and Ash Testing

90%

below the EU, US EPA and DOE standards



Lab test:

Eco-friendly

- Options with solar power
- Zero noise pollution
- Zero vibration
- Low carbon footprint
- No smoke
- No odor/smell

Kurina's emission is ~ 92% lower than the threshold set by the US EPA, EU as well as Malaysia's Environmental Quality (Clean Air) Regulation 2014.

	US EPA Threshold (mg/m^3)	EU Threshold (mg/m^3)	Malaysia Threshold (mg/m^3)	KURINA Independent Party Test Results (mg/m^3)	KURINA Manufacturer Test Results (mg/m^3)
Particulate matter	34.00	10.00	50.00	3.00	9.98
Sulphur Dioxide	250.00	250.00	100.00	3.00	68.00
Nitrogen Oxide	300.00	300.00	700.00	ND (<0.03)	ND(<0.5)
Lead	0.07	NA	1.00	ND (<0.01)	0.32
Cadmium	0.04	0.05	0.20	ND (<0.1)	ND (<0.02)
Mercury	0.55	NA	0.05	ND (<0.03)	0.02
Carbon Monoxide	50	114.56	NA	0.2	0.2
Dioxin/ Furan	0.025	NA	NA	0.00001	0.00001
	94%	91%	90%	>	KURINA's emission results are lower than the threshold by 90%

2 Non-toxic ash as byproduct

Construction materials i.e. bricks

Fertilizer

3 No secondary contamination

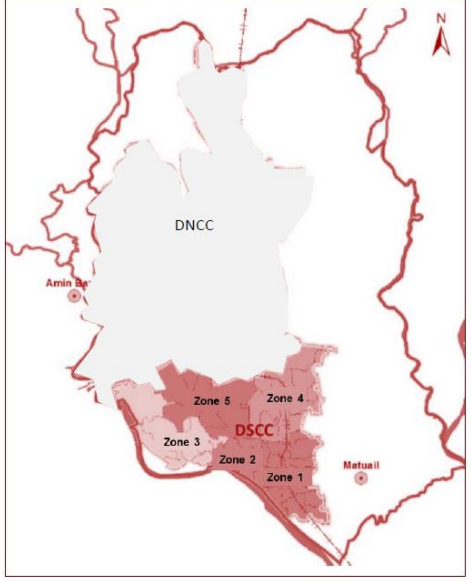
- **Built-in treatment design** i.e. filter mechanism and maintenance schedule
- **No discharge**
- **Processes its own waste** i.e. filters or used consumables

4 Cost and space efficient

- **Tonne for tonne:** Capital expenditure is up to **80% cheaper** than a complete sanitary landfill, incinerator or a WTE plant
- **Tonne for tonne:** Operational expenditure is up to **70% cheaper** than an incinerator or a WTE plant
- **KURINA** is at the **size of a single car park bay**

5 Decentralised and scalable approach

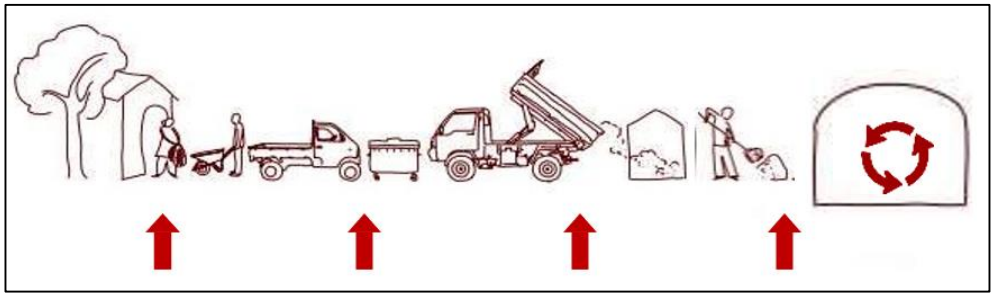
Administrative areas in DSCC



Recommended # Kurina in each administrative area* of DSCC

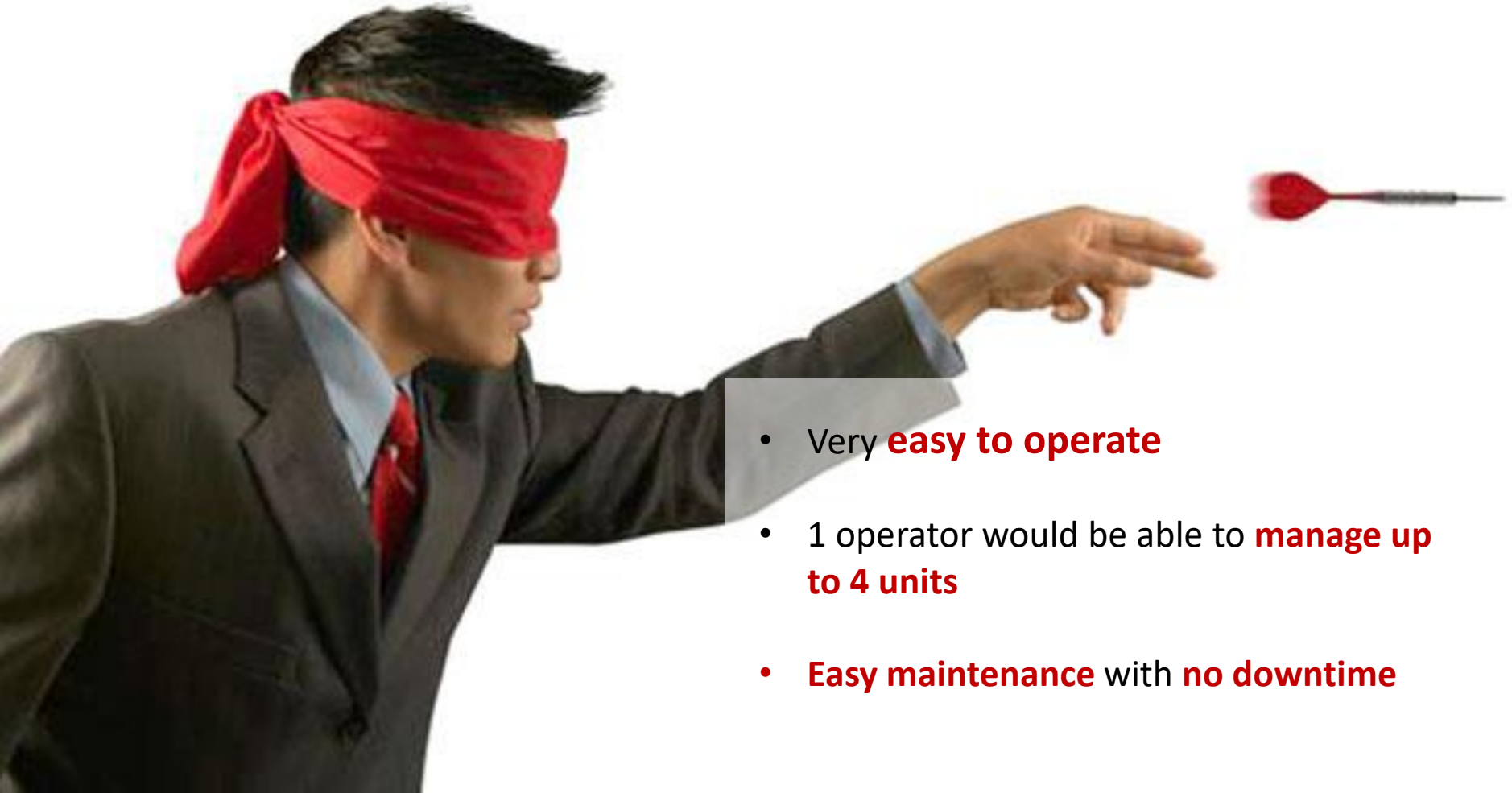
Zones	Tonnes / Day	# Kurina
Zone 1	502	167
Zone 2	512	170
Zone 3	330	110
Zone 4	584	195
Zone 5	401	134
TOTAL	**2329**	**777**

- As landfills are close to capacity, DSCC will need to **either replace their existing facilities with new Sanitary Landfills** or **consider new solutions**
- The **777 Kurina*** will allow for the DSCC to **tailor** their **waste management strategy** as they see fit by choosing to either place the Kurina
  - **Centrally :** manage waste from the city at a central location for processing (i.e. at landfill site)
  - **Decentralised :** to place Kurina at **transfer stations** where they can now **start accepting household waste** for disposal as well
- ***Based on 3-Tonne Smokeless model**



- Allows **collection closer to source** that saves logistics cost
- Decentralized approach **eliminates the need for landfill** or secondary collection sites
- Promotes increased efficiency by **allowing for intervention at various points** of the waste value chain, thus allowing to integrate with existing solutions

6 User friendly



- Very **easy to operate**
- 1 operator would be able to **manage up to 4 units**
- **Easy maintenance** with **no downtime**

Kurina has been successfully implemented in 10 different locations

Locations:

1. Marikina, Philippines
2. Jakarta, Indonesia
3. Semporna, Malaysia
4. Bangkok, Thailand
5. Dubai, UAE
6. Shi Yang, China
7. Sydney, Australia
8. Singapore
9. Peninsular Malaysia
10. Phnom Penh

Kurina transforms Semporna, Malaysia within 3 months of operations

Before (26 March 2019)

After (27 July 2019)

Project Details

Details
The location was once a dumpsite has been cleaned up and is currently operating as a waste management centre

Location
Sempol Kurina Centre, Semporna, Malaysia

Year in Operations
2019

Size of Kurina Centre
500 square feet

Type of Unit
1 K3000ES – 3 Tonne Smokeless

Type of Waste
Residential Waste

Use of By-Product
- Sold as fertiliser
- Used as cover to level the surroundings of Kurina Centre

Source: Kampung Sempol waste management facility

Kurina transforms Apalit, Philippines from a dumpsite to a community car park

BEFORE (August 2018)

AFTER (March 2019)

Project Details

Details
The location was once a dumpsite has been cleaned up and is currently operating as a waste management centre

Location
Apalit Landfill, Philippines

Year in Operations
2018

Size of Kurina Centre
500 square feet

Type of Unit
1 K2000R– 2 tonne solar powered

Type of Waste
Residential Waste

Use of By-Product
- Used as cover to level the surroundings to be turned into car park

Source: Apalit Landfill Operations

Ash produced by Kurina in Soung City, Cambodia is used as fertilisers

BEFORE (February 2019)

AFTER (July 2019)

Project Details

Details
The unit has been utilised to manage and process municipal solid waste

Location
Soung City, Cambodia

Year in Operations
2019

Type of Unit
1 K2000R – 2 tonne solar powered

Type of Waste
Municipal Solid Waste

Use of By-Product

- The ash is used as fertilisers by small farmers in the city

Source: Soung City Landfill Operations

Kurina operations in Shi Yang, China treats 100% plastic waste

Processed Items

Project Details

Details
The unit has been utilised to treat synthetic waste such as shoes, rubber material, plastic bottles

Location
Shi Yang, China

Year in Operations
2018

Type of Unit
1 K4000ES – 4 tonne smokeless

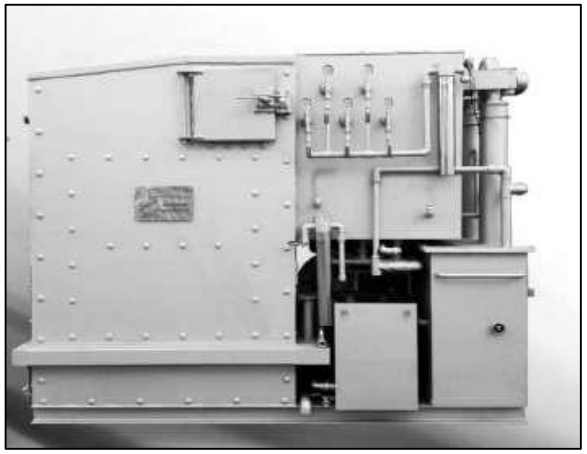
Type of Waste
Synthetic rubber and plastic

Use of By-Product

- The ash is transported and disposed of to the landfill

Source: Shi Yang Waste Operations

Kurina comes in 3 models, each with different capacities and smokeless options



Specifications	K2000R	K3000ES	K4000ES
Model Type	Regular	Smokeless	Smokeless
Power Source	Solar and battery	AC Power	AC Power
Power Requirements*	1.3 KW p/hr	4.75 KW p/hr	5.25 KW p/hr
Water Requirements (per day)*	24L	24L	24L
Processing Capacity (per day)	2 tonnes	2.5-3 tonnes	4 tonnes
Waste Burn Rate (per hour)	83 Kg	125 Kg	166 Kg
HS Code	8417.80.0000	8417.80.0000	8417.80.0000

*Note: Power requirements are similar across models as power is only required for initial ignition of the plasma reactor. Water requirements are similar across models as the filtration device and corresponding capacity is similar across all devices.

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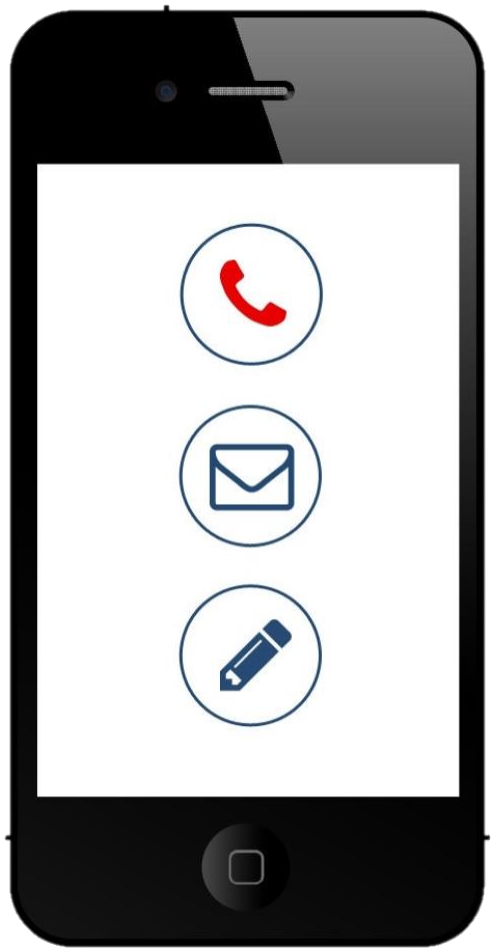
Contact us for more details



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Thank You

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KURINA solutions for Covid-19 and hospital waste

COVID-19 is producing a spike in hospital waste that could potentially further pose a health risk

KURINA

Facts of Matter:

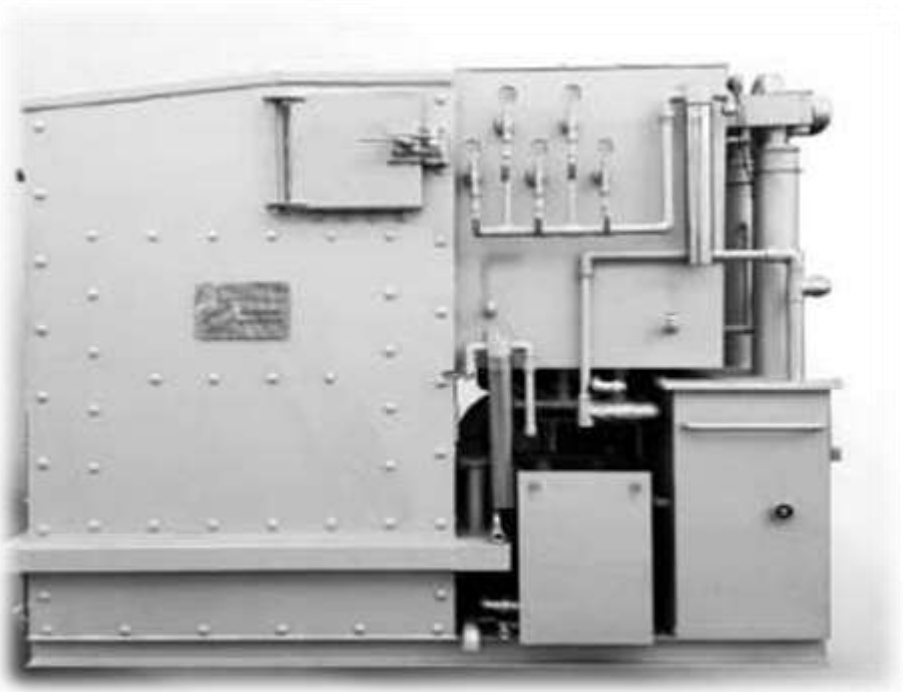
- **26 hospitals are treating** COVID-19 patients (15 – P. Malaysia, 4 - Sarawak, 6 - Sabah and 1 - Labuan);
- Each bed is estimated to **produce additional 0.8kg waste**;
- **57 hospitals are conducting screening** amounting to **3,500 PPEs used/disposed a day** (~5,250kg per day);
- Hospital Sg Buloh is estimated to produce **additional 192kg of waste a day** due to the COVID-19 situation;
- CNBC* has reported WHO considers the **virus could be airborne** and extreme measures must be taken to safe guard medical staff and patients.

Our proposal:

- We propose to **deploy KURINA units** at the hospitals to immediately process the non-hazardous medical waste;
- As the unit is at the size of **a single car park bay**, it can be placed within the hospital area;
- Operational cost for the unit without staff **is ~RM49 per day per unit**. This is an extremely significant saving and the waste is not required to be transported out of the hospital; and
- This solution would enable **hospitals to immediately process COVID-19 related waste and any other non-hazardous waste from the hospital on the same day** reducing risk of being contagious while being stored or transported.

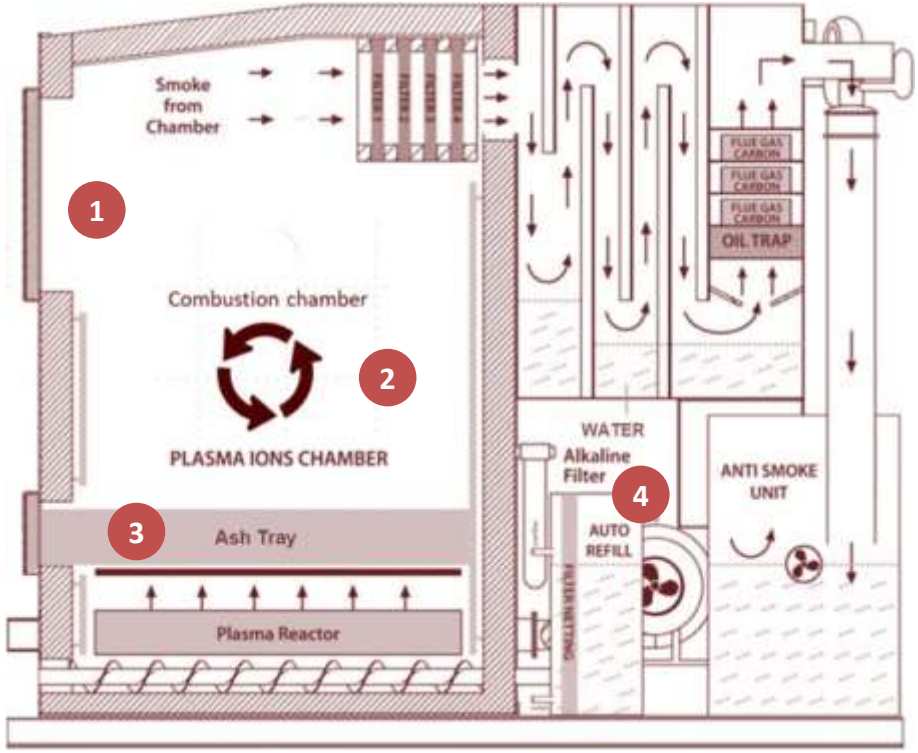
*https://www.cnbc.com/2020/03/16/who-considers-airborne-precautions-for-medical-staff-after-study-shows-coronavirus-can-survive-in-air.html

KURINA is technology patented and manufactured in Malaysia



- Processes waste into ash by reducing mass by 96%;
- Utilises pyrolysis technology that allows heat to go up to 1,000 Celsius (°C);
- No usage of diesel, gas or any fuel stock;
- Able to process all types of waste up to 80% moisture level except glass, metals and ceramic;
- Emission is smokeless and odorless and is 90% better than US EPA and EU environmental standards;
- Zero vibration and noise;
- Non toxic ash and no secondary contamination;
- Cost and space efficient;
- Decentralised deployment and scalable; and
- User friendly

4 operational steps



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Thank You