

# MAXIMISING RECOVERY MINIMISING IMPACT

The Eastern Creek UR-3R is Sydney's  
first Alternative Waste Technology Facility  
for household waste



Sydney needs waste solutions that are sustainable, sensitive to the environment, and deal with waste locally.



Through the use of new Alternative Waste Technologies, what used to be seen as garbage, we now treat as materials for recycling and resources for renewal.

# WHAT IS ALTERNATIVE WASTE TECHNOLOGY?

Alternative Waste Technology (AWT) describes a technology that:

- Diverts waste away from landfill;
- Recovers more resources from the waste stream; and
- Minimises the impact on the environment.

AWT is described as “alternative” because it offers a more sustainable solution than waste disposal methods such as conventional landfills, bioreactor landfills and incineration. AWT can include mechanical separation methods, biological processes, thermal technologies and mechanical biological treatment.

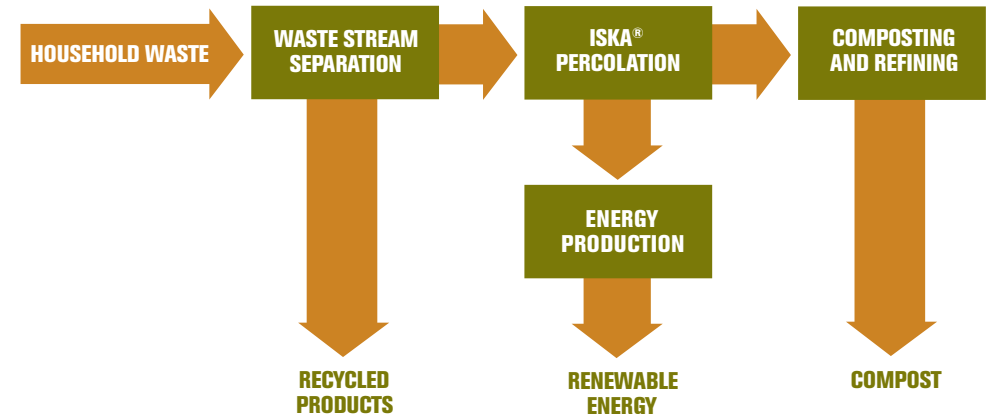
# ARE THERE ANY AWT FACILITIES FOR HOUSEHOLD WASTE IN SYDNEY?

Sydney’s first AWT facility for household waste, the Eastern Creek UR-3R Facility, was launched in September, 2004. The Facility is a partnership between WSN Environmental Solutions and Global Renewables and represents an investment of \$71 million in Western Sydney.

# WHAT HAPPENS AT THE EASTERN CREEK UR-3R FACILITY?

The Eastern Creek UR-3R Facility is a world first that uses a number of different proven technologies to provide better environmental outcomes for Sydney’s waste.

It uses a four-stage Mechanical Biological Treatment (MBT) process that mechanically sorts the waste to remove recyclables and inert materials. It then biologically treats the organic materials such as food scraps and garden clippings. Waste is transformed into valued resources, including metals, glass, paper, green electricity and compost.



**Design benefits of the facility include:**

- It is self sufficient in energy and water.
- Reduction of noise, dust and odour due to waste being dealt with locally and in an enclosed system; and
- Safer roads and cleaner air because waste is not transported over long distances and greenhouse gases are captured.

# WHAT IS THE UR-3R FACILITY DESIGNED TO DO?

# 11%

Initially process up to 175,000 tonnes or 11% of Sydney's household waste, and up to 16% on expansion

# 80%

Divert up to 80% of waste away from landfill

# 50,000

Reduce greenhouse gas emissions equivalent to taking up to 50,000 cars off the road

# 23,500

Produce up to 23,500 tonnes of compost each year – enough to fill around 13 Olympic swimming pools

# 2,250

Produce green electricity equivalent to providing up to 2,250 homes with year-round green power

# 100%

Capture up to 100% of biogas produced

# 23,000

Recover an extra 23,000 tonnes of recyclable materials each year – equivalent to the amount normally recycled by 160,000 people

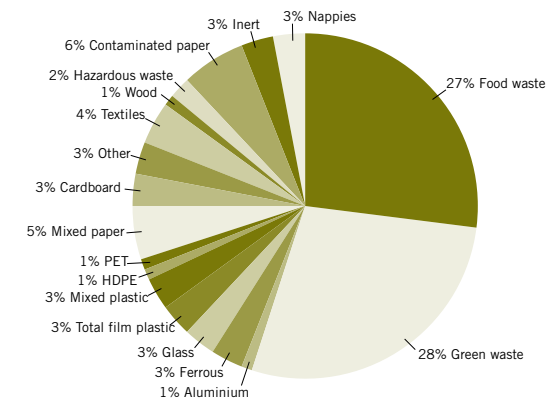
# WHAT GOES IN AND WHAT COMES OUT?

These two pie charts show:

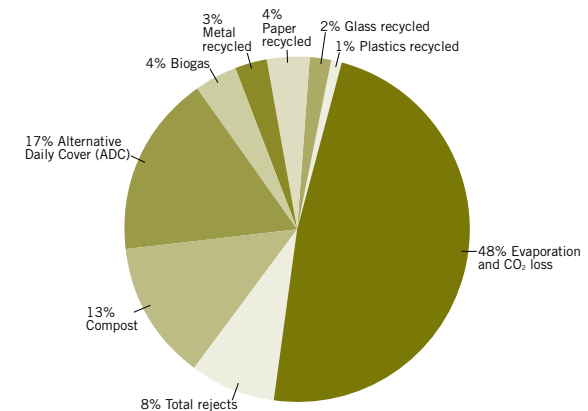
**Resource in** – what is generally in the garbage (putrescible waste) that goes into the facility; and

**Resource out** – the types of resources such as plastics, metals, glass, paper, cardboard, compost and green energy that are recycled or recovered from the waste.

### RESOURCE IN



### RESOURCE OUT



(Note: These charts are estimates based on design specifications)

# HOW DOES IT WORK?

## Delivery

Waste delivery trucks and transfer trailers deliver waste to the facility and tip it onto the floor of the receivals hall.

## Pre-sorting

Bulky or hazardous items, such as car batteries and large pieces of cardboard, are manually removed and recycled where possible. The waste is loaded into a bag opener or “splitter”, which has sharp blades that open the garbage bags and release the waste without damaging the contents. The garbage bags and other plastic films are blown away from the heavier items into a collection bin, and then taken away for recycling.

It is very important that certain items are kept out of the garbage bin as they can be dangerous, contaminate the waste, or damage the sorting equipment.

### What can't go in the bin:

- Car batteries
- Car parts
- Engine oil
- Gas cylinders
- Paint and paint products
- Household chemicals
- Medicines

These items should be properly disposed of through one of WSN Environmental Solutions' Resource Recovery Centres or through one of the Department of Environment and Conservation's CleanOut days for household chemicals.

## Trommel separation

Two trommel screens separate the organic portion of the waste (kitchen and garden scraps) from the recyclables. A trommel is shaped like a giant cylinder. It has lot of holes that let small pieces fall through to separate them from the larger pieces.

## Sorting of recyclables

Machines are used to sort the recyclables into different types of materials including metals, plastics, paper and cardboard, glass. One type of machine uses giant magnets to separate steel from the other materials. Another machine called a wind sifter separates light items such as plastic bags by blowing air to make the plastic float. Some of the sorting is done by hand. The sorted recyclables are then squashed into big cubes called bales, and sent to manufacturers to be made into recycled products.

## ISKA® Percolation

The organic part of the waste (such as fruit and vegetable scraps, leaves and grass clippings) is fed into a machine called a percolator where it stays for two days. The ISKA® Percolator is like a giant washing machine that turns the waste constantly and washes it using recycled water. Tiny bugs called aerobic bacteria, that need oxygen to survive, help to break down the organics. This process cleans and deodorises the organics.

## Digestion

The liquid in the percolator now has organic material dissolved in it. It is pumped into a big tank called a digester that contains millions of tiny bugs called anaerobic bacteria. These bugs, which are different to the ones in the percolator because they don't like oxygen, break down the organic material that is dissolved in the liquid, and produce a biogas that contains methane. The leftover liquid is treated and then recycled into the percolator. The methane produced by the bugs is fed to the onsite power plant where it is burned to produce green electricity.

## Composting

After the organics have been percolated and the excess moisture removed, the material is fed into the 230 metre long composting hall where it is continuously turned for four weeks using SCT technology from Italy to produce compost. The material is then transferred to an outdoor area where it matures for eight more weeks. The compost is refined and any plastic and glass fragments are removed.

# WHAT WILL HAPPEN IN THE FUTURE?

With support from local councils and their communities, more AWT facilities will be developed to help transform waste into a valuable resource.

WSN Environmental Solutions plans to build AWT facilities across its network in the future to ensure that Sydney can manage its waste in a more sustainable way.

## GLOSSARY

### **Aerobic**

In the presence of oxygen.

### **Alternative Waste Technology (AWT)**

A waste treatment technology that focuses on diverting waste away from landfill, maximising the recovery of resources and minimising the impact on the environment.

### **Anaerobic**

In the absence of oxygen.

### **Biogas**

A combustible gas created by the decomposition of organic material. It is composed mainly of methane, carbon dioxide and hydrogen sulphide.

### **Bioreactor landfill**

Bioreactor landfills differ from conventional landfills in that leachate (the liquid that is produced as waste breaks down, or any water that comes into contact with the waste) is recirculated through the landfill to accelerate decomposition of the waste and the rate of gas production.

### **Compost**

Decayed organic matter that can be used to improve soil and provide nutrients.

### **Conventional landfill**

In a conventional landfill wastes are placed in the ground, compacted and then covered. A liner placed beneath the waste prevents liquid being released to groundwater. As the waste degrades, methane and carbon dioxide are released – the methane can be captured and used to generate green electricity.

### **Digestion**

The process of bacteria breaking down organic material.

### **Ferrous metal**

A metal that contains iron.

### **Green electricity**

Electricity that is generated from a renewable source such as biogas, wind, sun or water.

### **Greenhouse gas emissions**

Gases, such as methane and carbon dioxide, that contribute to the greenhouse effect and global warming.

### **Inert**

Not chemically reactive, stable.

### **Mechanical Biological**

A method of treating waste using both mechanical separation and biological treatment.

### **Methane**

An odourless, inflammable gas created by the decomposition of organic matter. It has 21 times the greenhouse effect of carbon dioxide.

### **Organics**

Materials that originate from living organisms, such as plants and trees.

### **Percolator**

A vessel that forces liquid through something, often repetitively.

### **Putrescible waste**

The part of the waste stream that will spoil or decay. Putrescible waste usually breaks down in a landfill to create landfill gases and a liquid by-product called leachate.

### **Sustainability**

Meeting the needs of the present without compromising the ability of future generations to meet their needs.

### **Trommel**

A cylindrical sieve that revolves. It is used for screening material or separating different sized objects.

### **Wind sifter**

A machine that separates light items such as plastic bags by blowing air to make the items float.

# HOW CAN I GET MORE INFORMATION?

For more information on any of WSN Environmental Solutions' services:

**[www.wsn.com.au](http://www.wsn.com.au)**

Customer Service Centre: 1300 651 116

[info@wsn.com.au](mailto:info@wsn.com.au)

Locked Bag 7699, Chatswood DC, NSW 2067