# PECC: Environmental Sustainability in Urban Centres

## New policies, public incentives, new technologies to promote the development of “eco cities” and “eco districts”

Simon Gardner Lee, General Manager – Marketing & Strategy

12 March 2011


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# The Role of Local Government

To be a responsible and accountable sphere of democratic governance

To be a focus for community identity and civic spirit

To provide appropriate services to meet community needs in an effective and efficient manner

To facilitate and coordinate local efforts and resources in pursuit of community goals

*"As the closest sphere of government to the community, Local Government is in the best position to identify and address the needs of the people living, working and visiting the area it serves."*

# But…

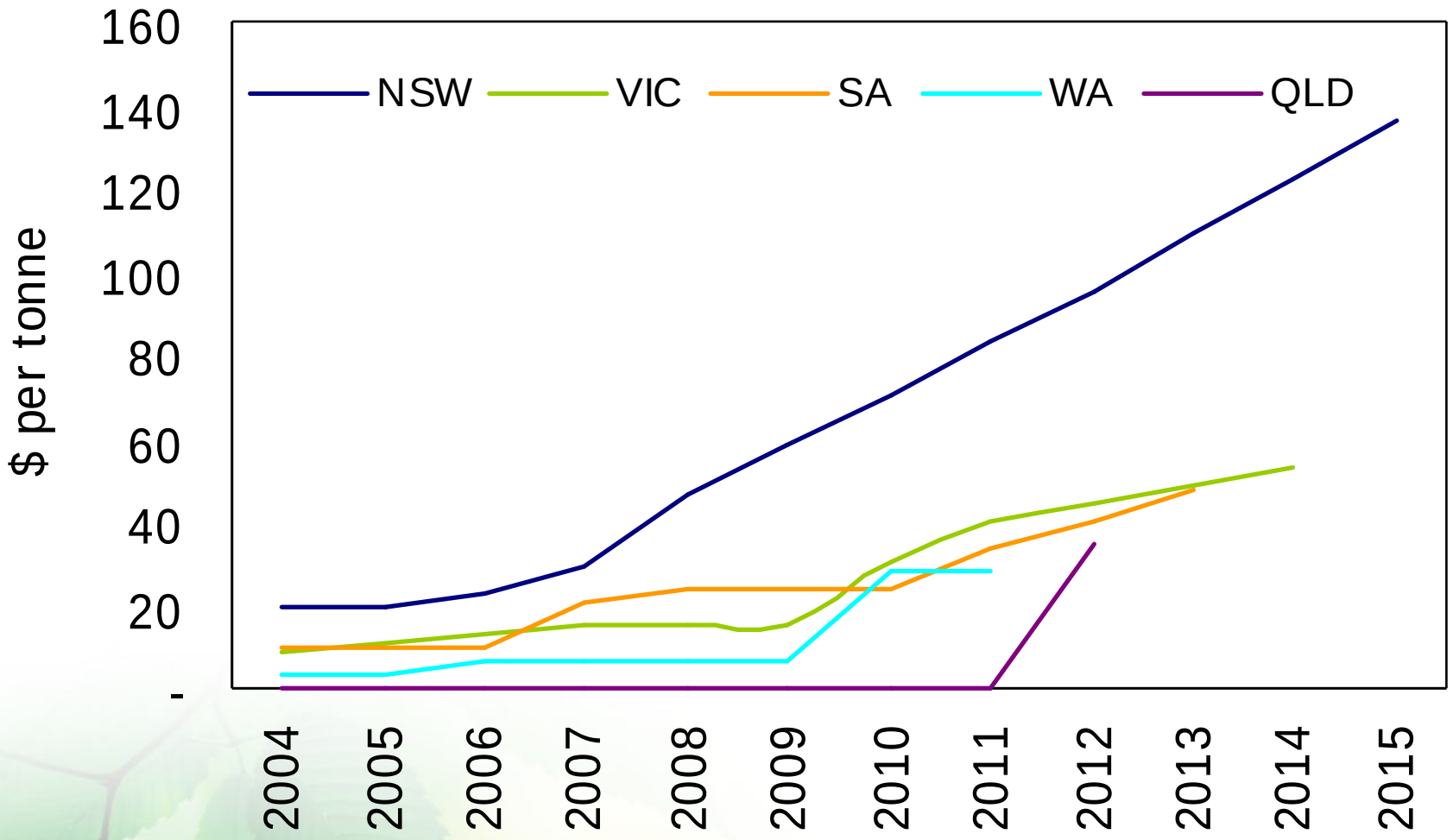
What happens when the consequences of Local Government decision-making have ramifications beyond the boundary of its constituents?

Local government is a necessary participating partner in the Australian system of democratically elected, representative government in accordance with the view expressed without dissent at the Australian Constitution Convention in Hobart, 1996

***Councillor John Campbell***
***President, Australian Local Government Association***
***Chair, 1997 National General Assembly***

However, when the demarcation of authority is shared or blurred across government jurisdictions, who is left with the final decision?

# Each State Government has different drivers and priorities but all are using the landfill levy (tax) as their primary waste lever



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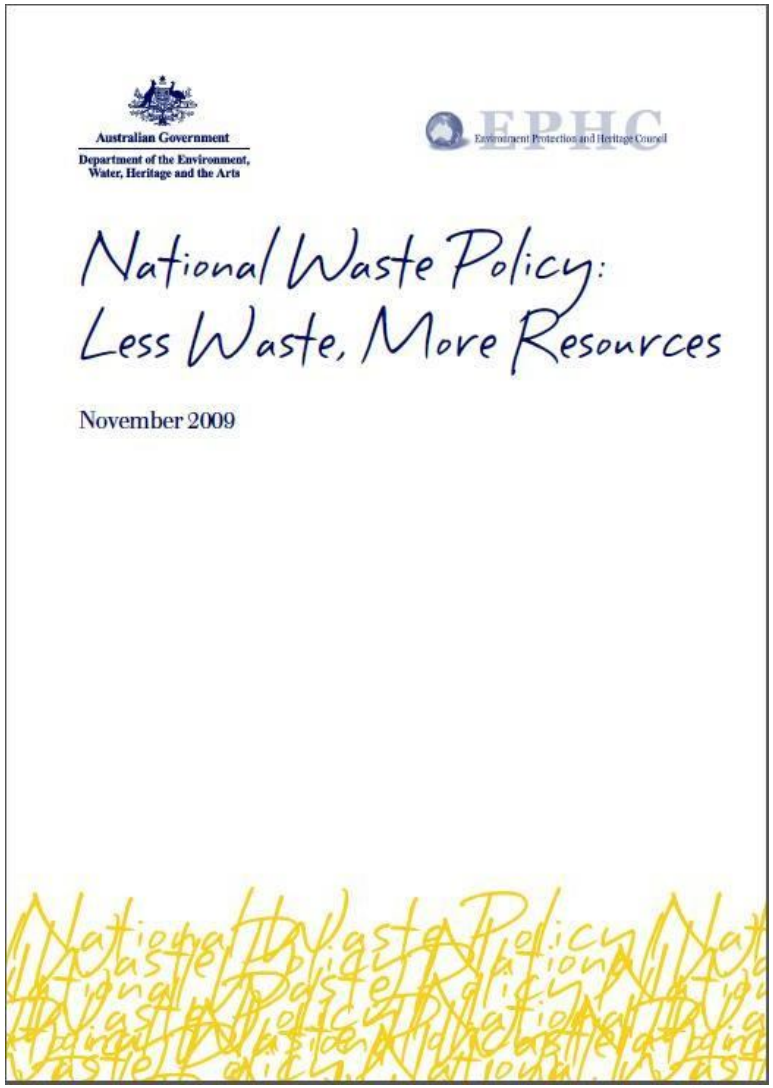
# Then there is the largely ineffectual but important stance of the Federal Government towards waste and sustainability

- NWP developed to support national approaches for the recovery of resources from waste
- 16 strategies
- 7 working groups to develop working plans for the 16 strategies
- Stakeholder implementation and references groups to be established as required
- Effective project management through use of approved templates


Australian Government
Department of the Environment, Water, Heritage and the Arts

EPHC
Environment Protection and Heritage Council

National Waste Policy:
Less Waste, More Resources

November 2009

# The ‘waste’ industry has embarked upon a journey that is constantly evolving along a sustainable pathway

**Open Air Composting**

**Engineered Landfills**

**MRFs (Sorting & Recycling)**

# But what about the non-low hanging fruit?

Local government will cooperate at a regional scale to address issues affecting adjoining communities, and to provide a basis for effective intergovernment relations. This will include appropriate resource sharing and joint activities amongst councils


**Then there is the conflicting signals from politicians, consultants and technology providers**

Composting

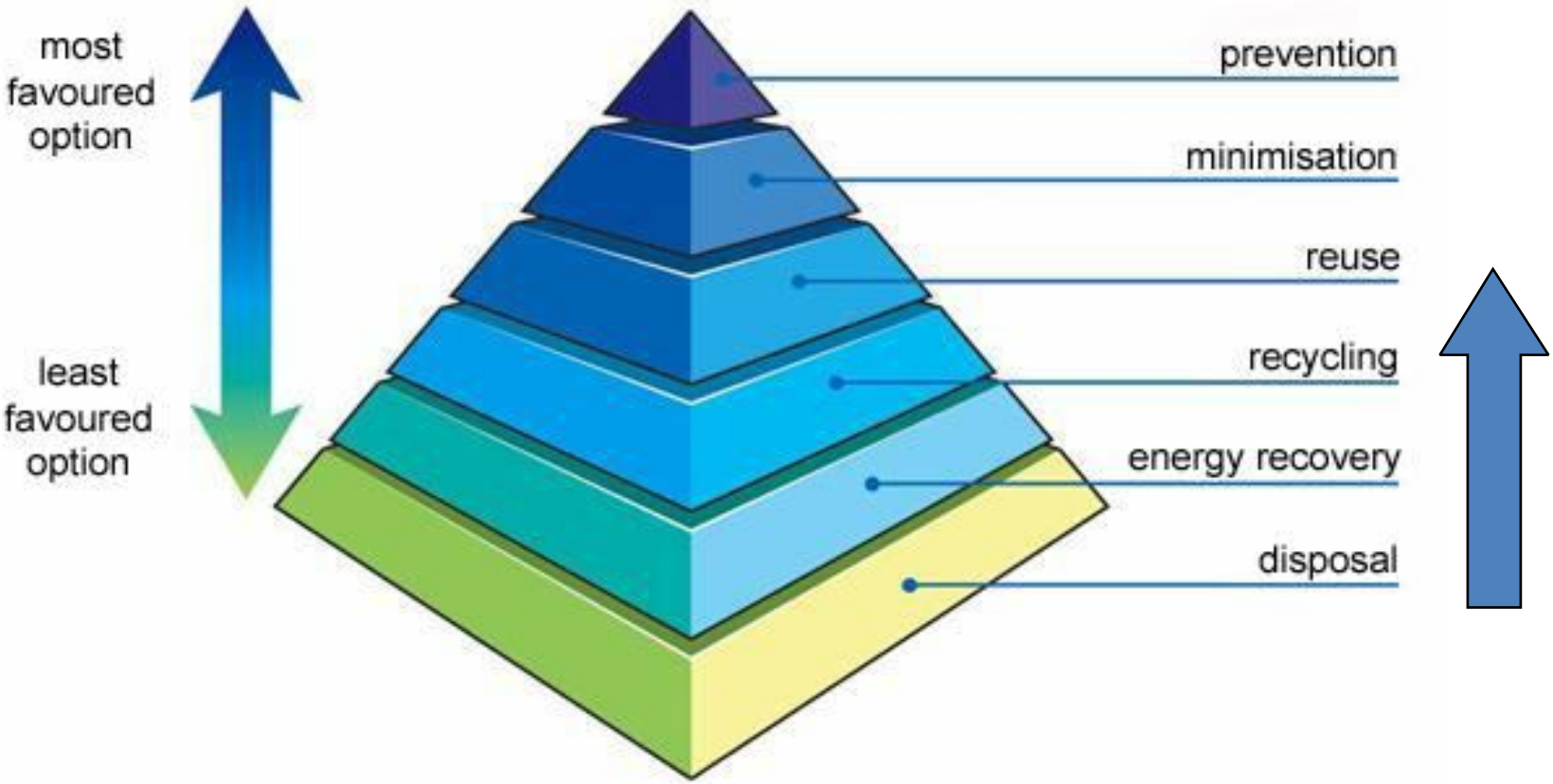
Landfilling with Best Practice Gas Capture & Electricity Production

Anaerobic Digestion with Electricity Production

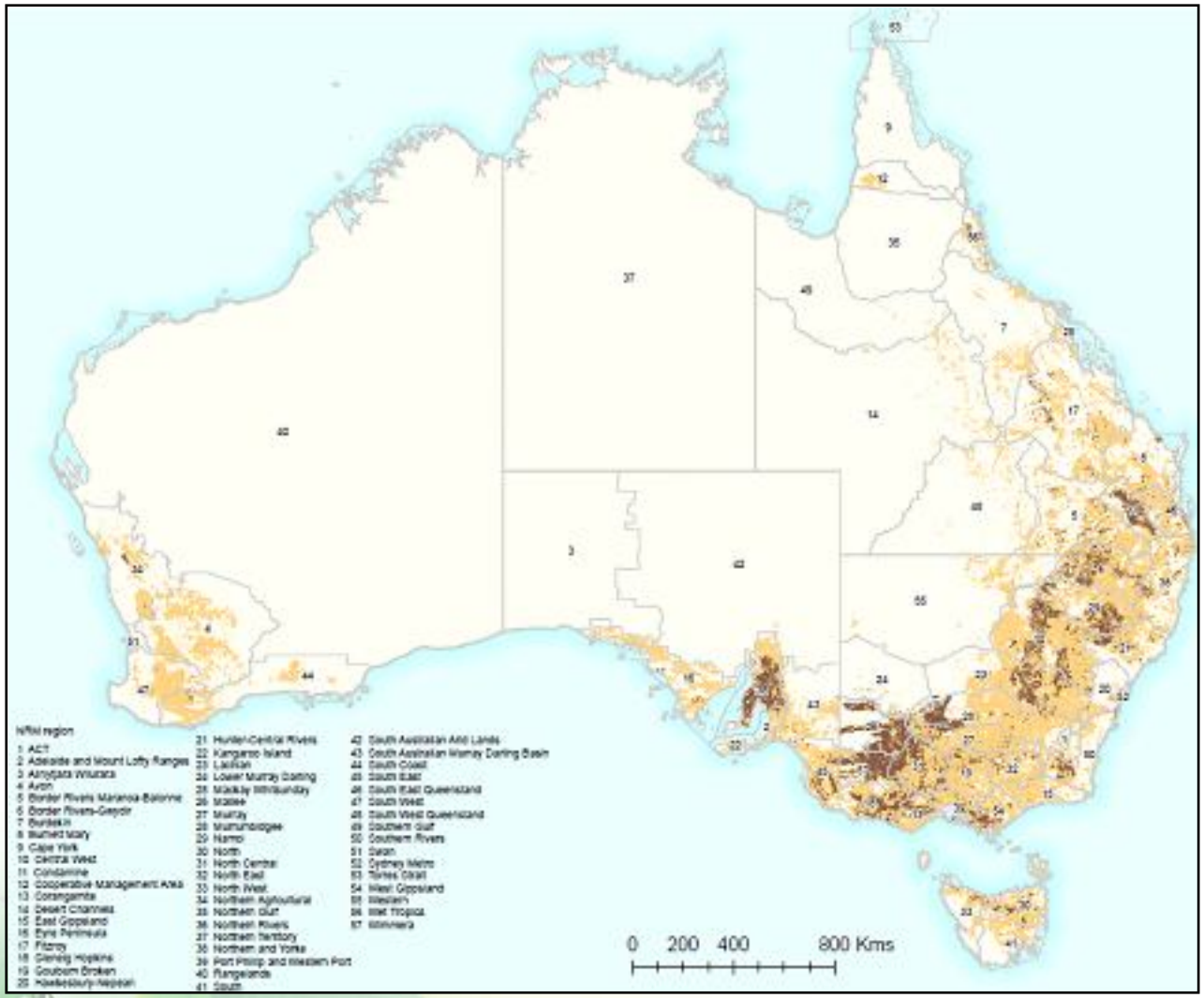
Biochar

Collection Bin Configurations

# In keeping with the Waste Hierarchy, and the principles of sustainable development, SITA decided to push the envelope



# Using the ecological and food security issues associated with agricultural production in Australia as our primary driver




Map 2.4.3

Indicative locations where improving soil and land management practices to increase soil organic matter will provide the biggest benefits

- Low
- Moderate
- High
- NRM Regions

Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

# The ARRT of Organics® allows us to turn this…

ARRT – Advanced Resource Recovery Technologies

## …into this

# …which allows us to do this!

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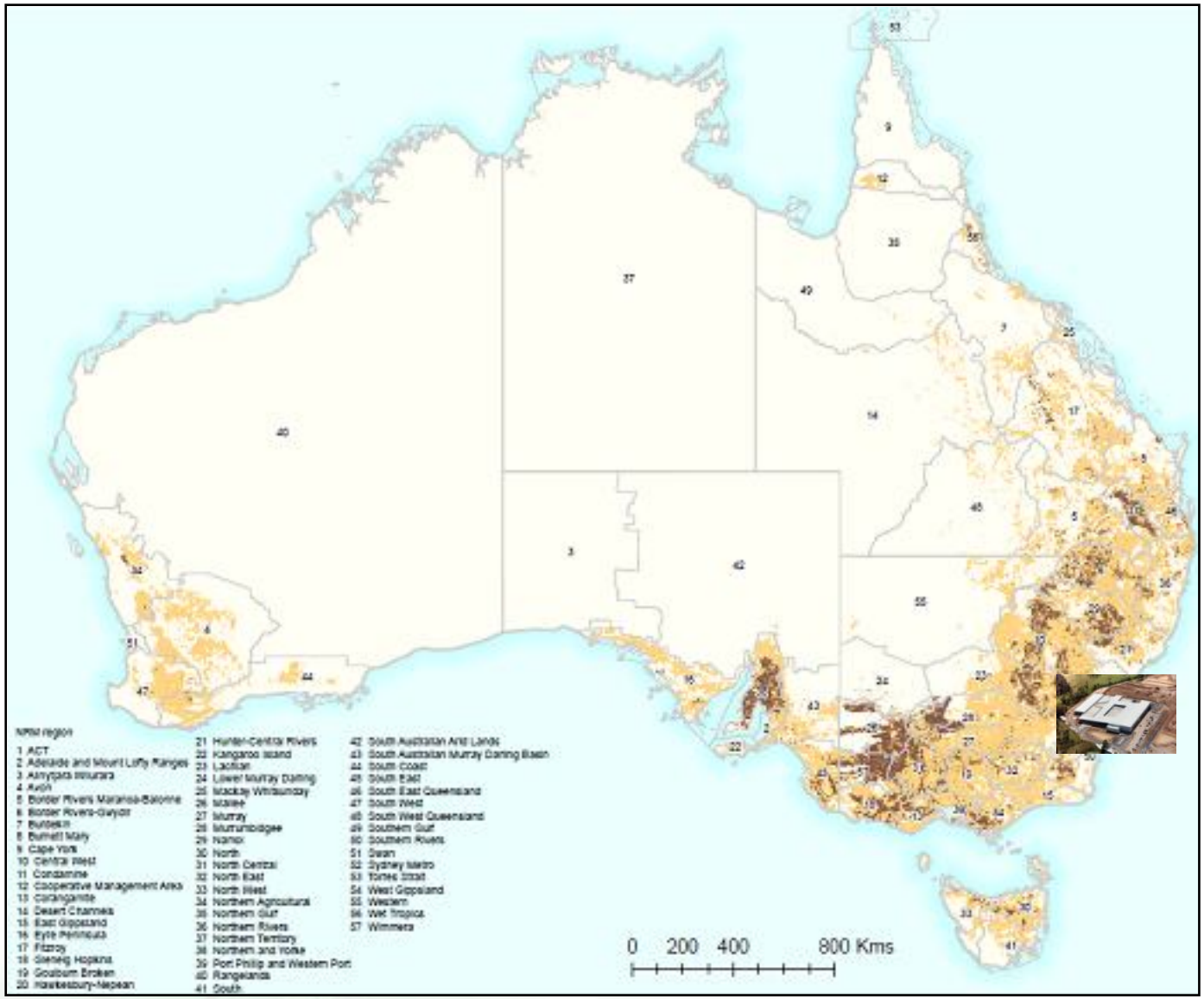
# Kemps Creek SAWT Advanced Resource Recovery Facility: capacity 125,000 tpa

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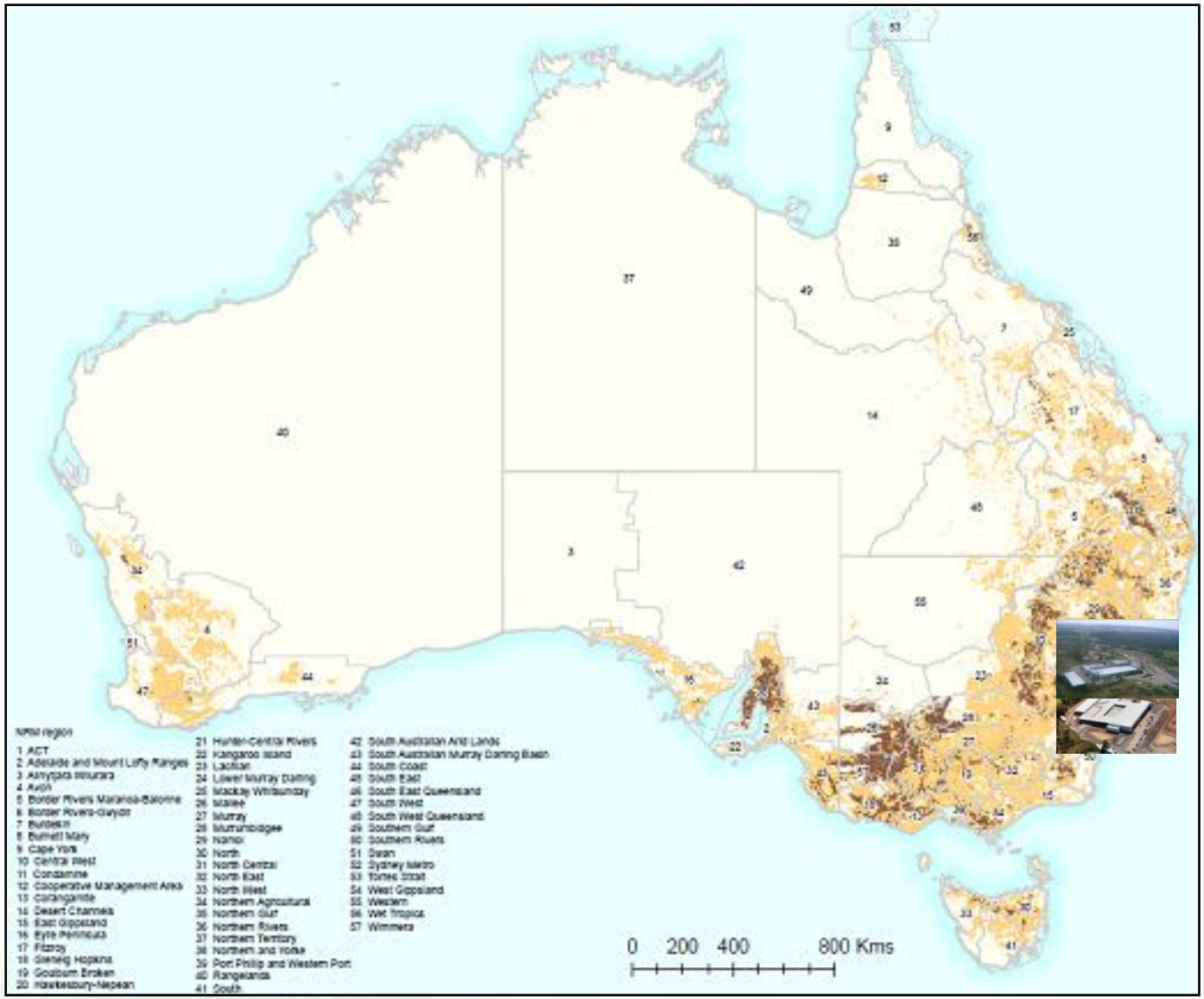
# Raymond Terrace Advanced Resource Recovery Facility: capacity 45,000 tpa

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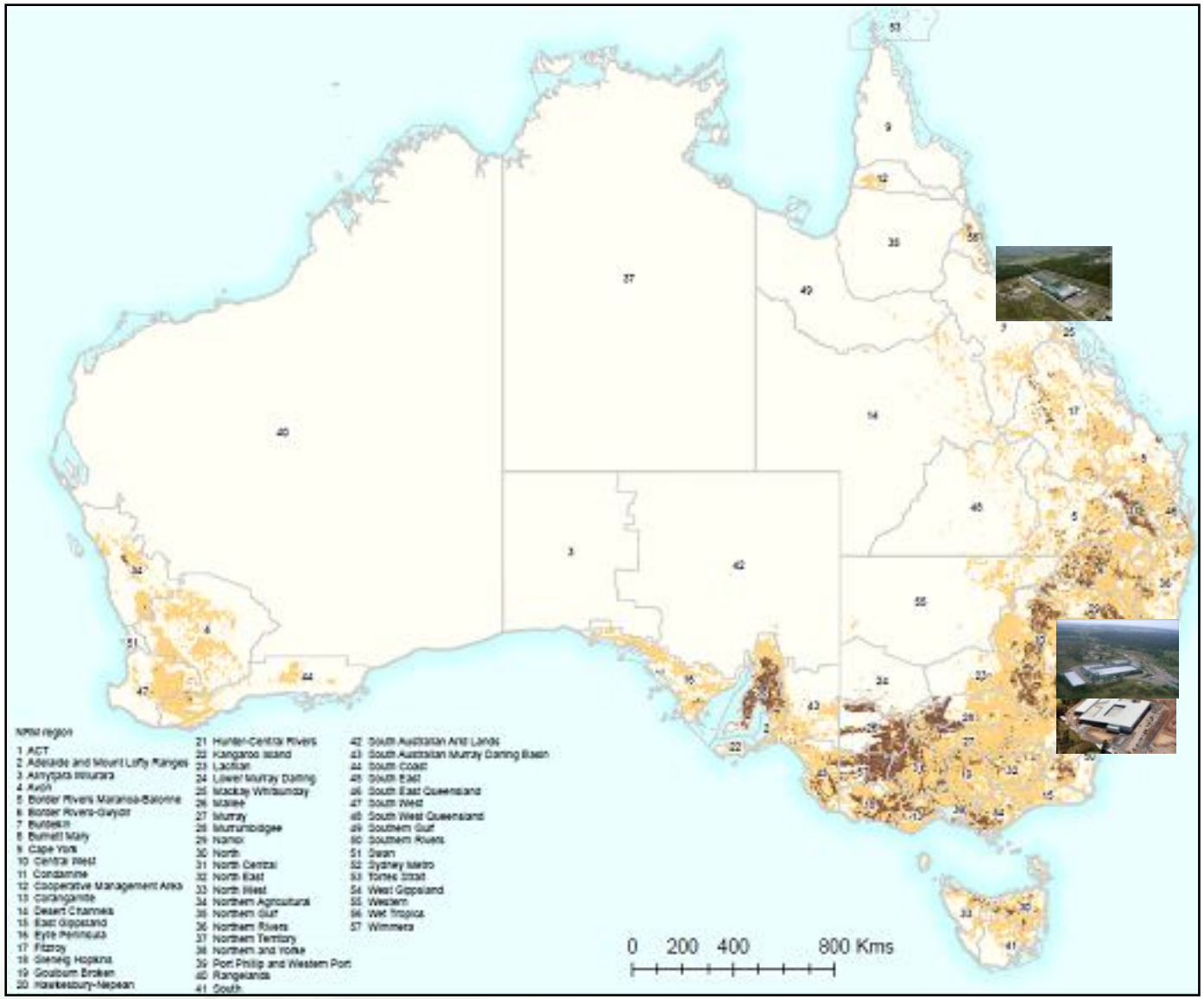
Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

# Cairns Advanced Resource Recovery Facility: capacity 110,000 tpa

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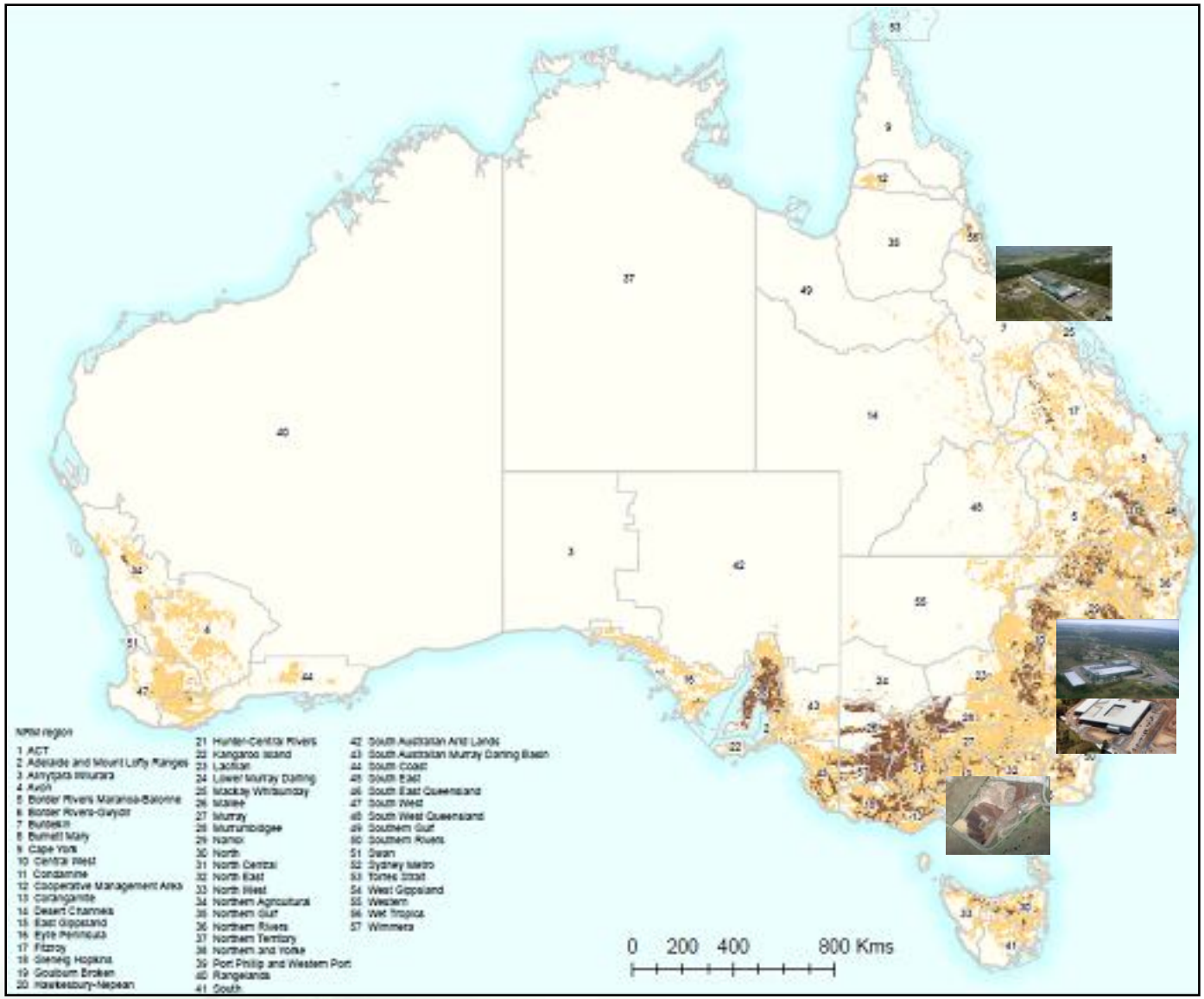
# Epping Organic Resource Recovery Facility: capacity 70,000 tpa

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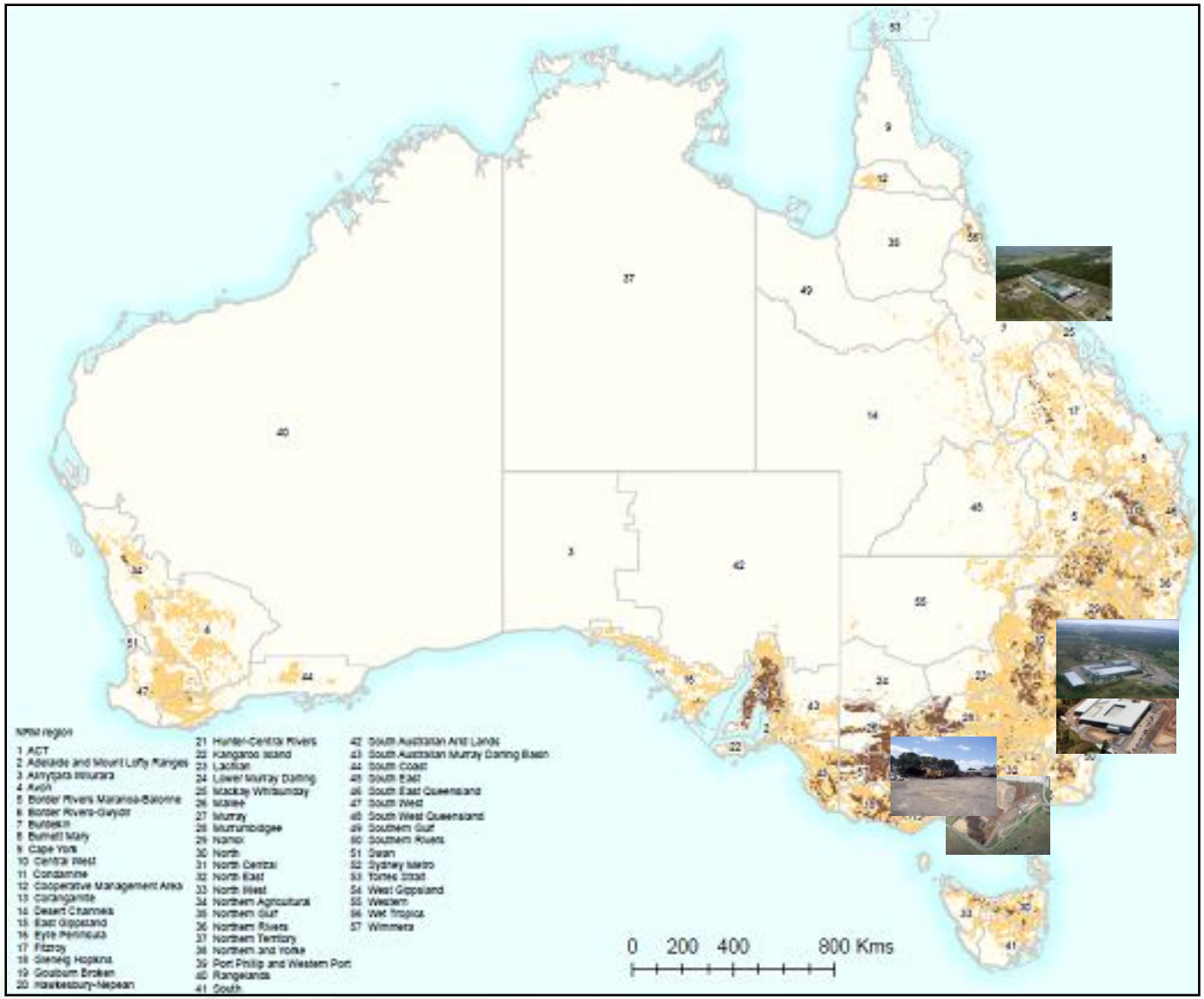
# Ballan Organic Resource Recovery Facility: capacity 5,000 tpa




SITA Organics

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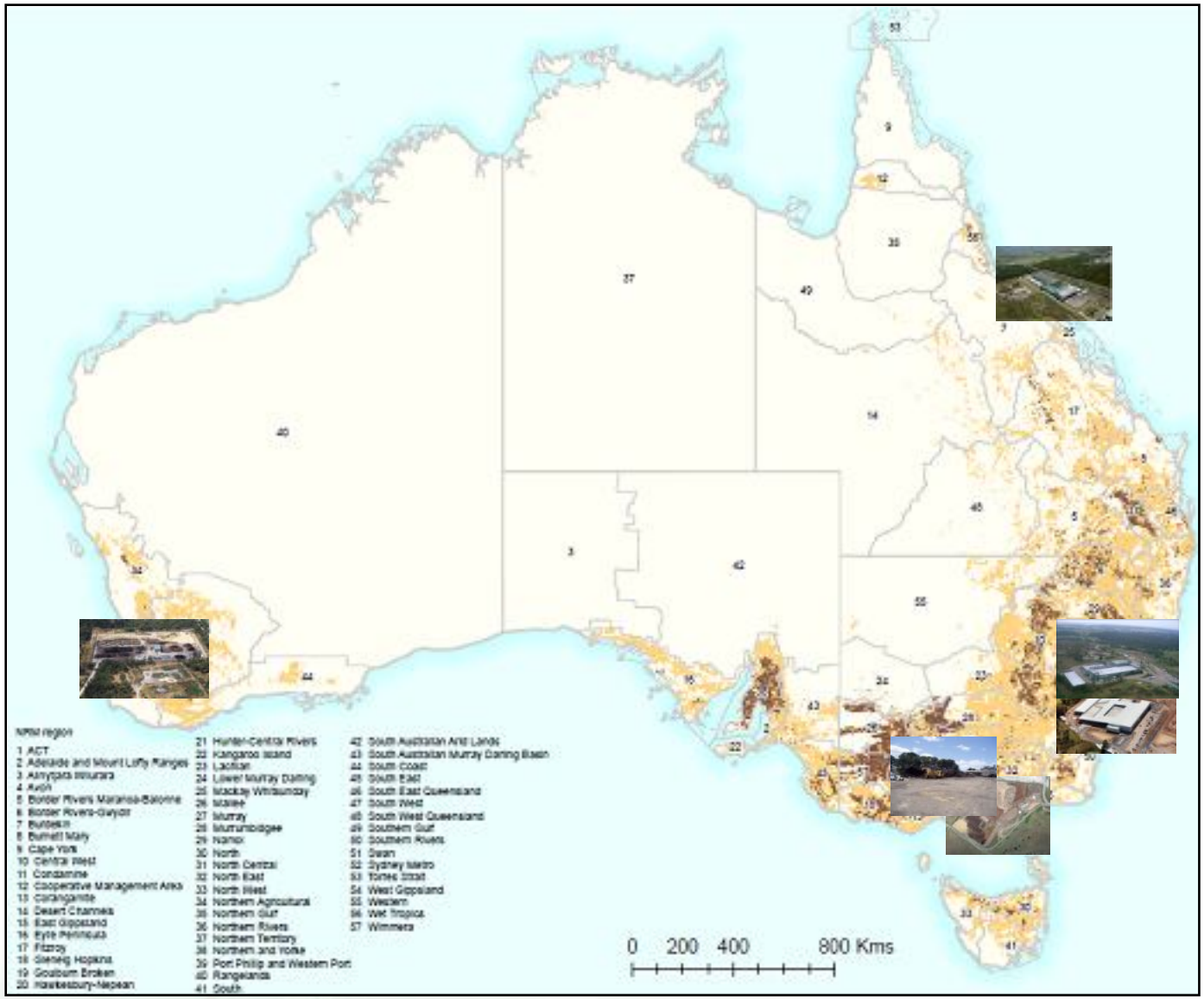
# Kwinana BioWise Advanced Resource Recovery Facility: capacity 35,000 tpa

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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

# Neerabup BioVision Advanced Resource Recovery Facility: capacity 100,000 tpa



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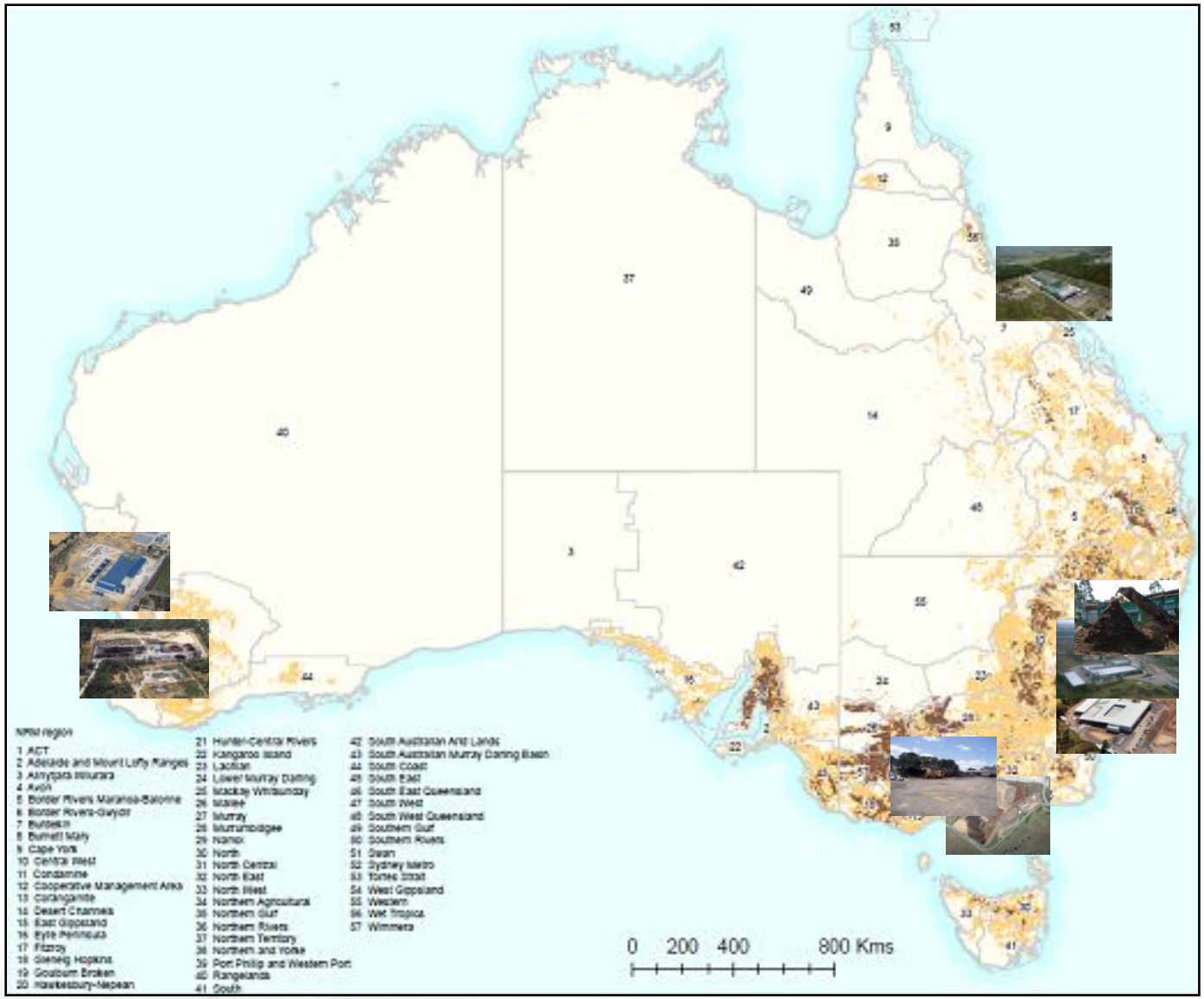
# Ryde Organic Resource Recovery Facility: capacity 20,000 tpa

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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*



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# Chullora Organic Resource Recovery Facility: capacity 30,000 tpa


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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

# Spring Farm Advanced Resource Resource Recovery Facility: capacity 90,000 tpa


SITA Organics

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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*



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# Camden Soil Mix Organic Resource Recovery Facility: capacity 50,000 tpa


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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

# Lucas Heights Organic Resource Recovery Facility: capacity 50,000 tpa


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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

# Eastern Creek Organic Resource Recovery Facility: capacity 80,000 tpa


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Source: *Australian Government Department of the Environment, Water, Heritage and the Arts*

SITA is the largest processor of urban-generated organics in Australia



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# As our processing capacity has grown, so have our product sales

- In 2005, SITA produced ~17,000 tonnes of organic product
- In 2007, SITA produced ~52,000 tonnes of organic product
- In 2009, SITA produced ~108,000 tonnes of organic product
- In 2011, SITA will produce ~500,000+ tonnes of organic product

  or nearly 800,000 cubic metres

# Summary of the drivers for the new target markets

Agricultural Productivity

- NPK levels
- Availability of fertilisers
- Cost of fertilisers
- Soil organic matter levels
- Retention of moisture
- Erosion control

Reduction in Environmental Degradation

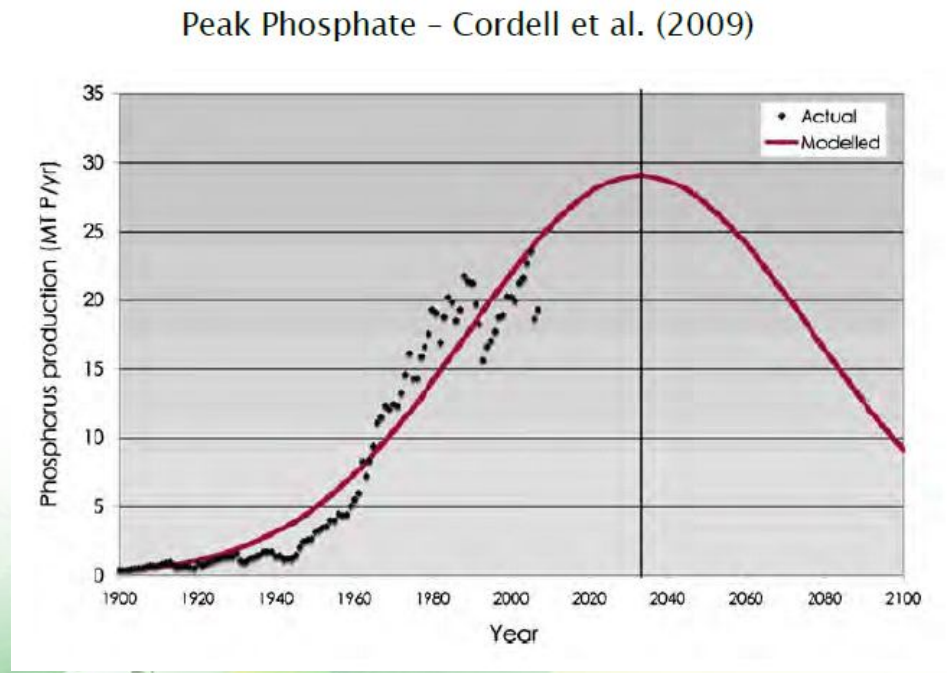
- Nutrient run-off → eutrophication of waterways
- Greenhouse gas emissions

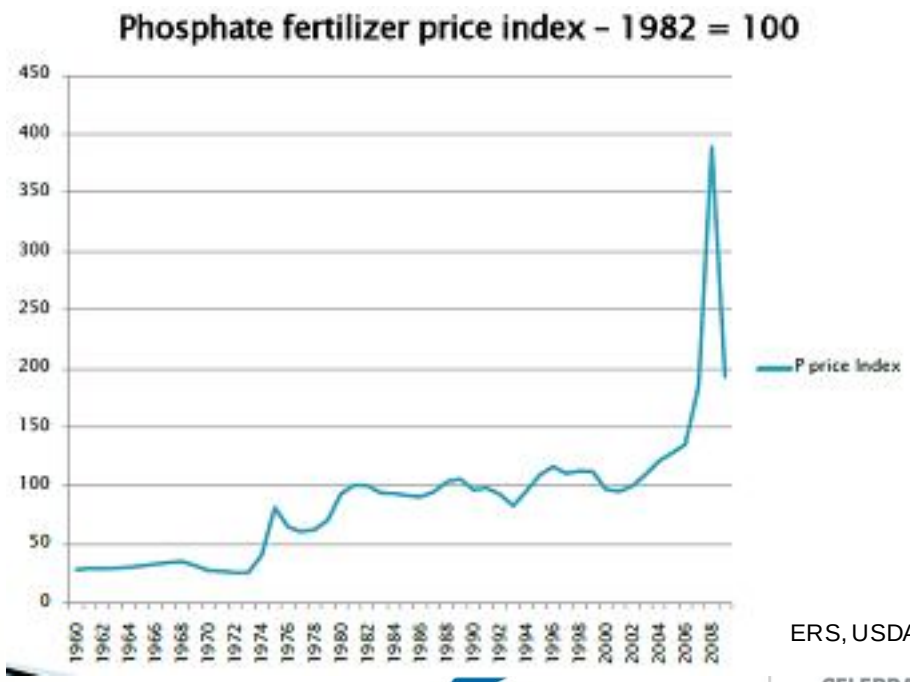
# ‘Peak Phosphorus’ is the elephant in the agricultural room

Movement of phosphorus from rural production areas to urban centres:

- With subsequent loss of significant amounts of P from urban centres
- Plus: the high degree of P chelation in the Australian soils

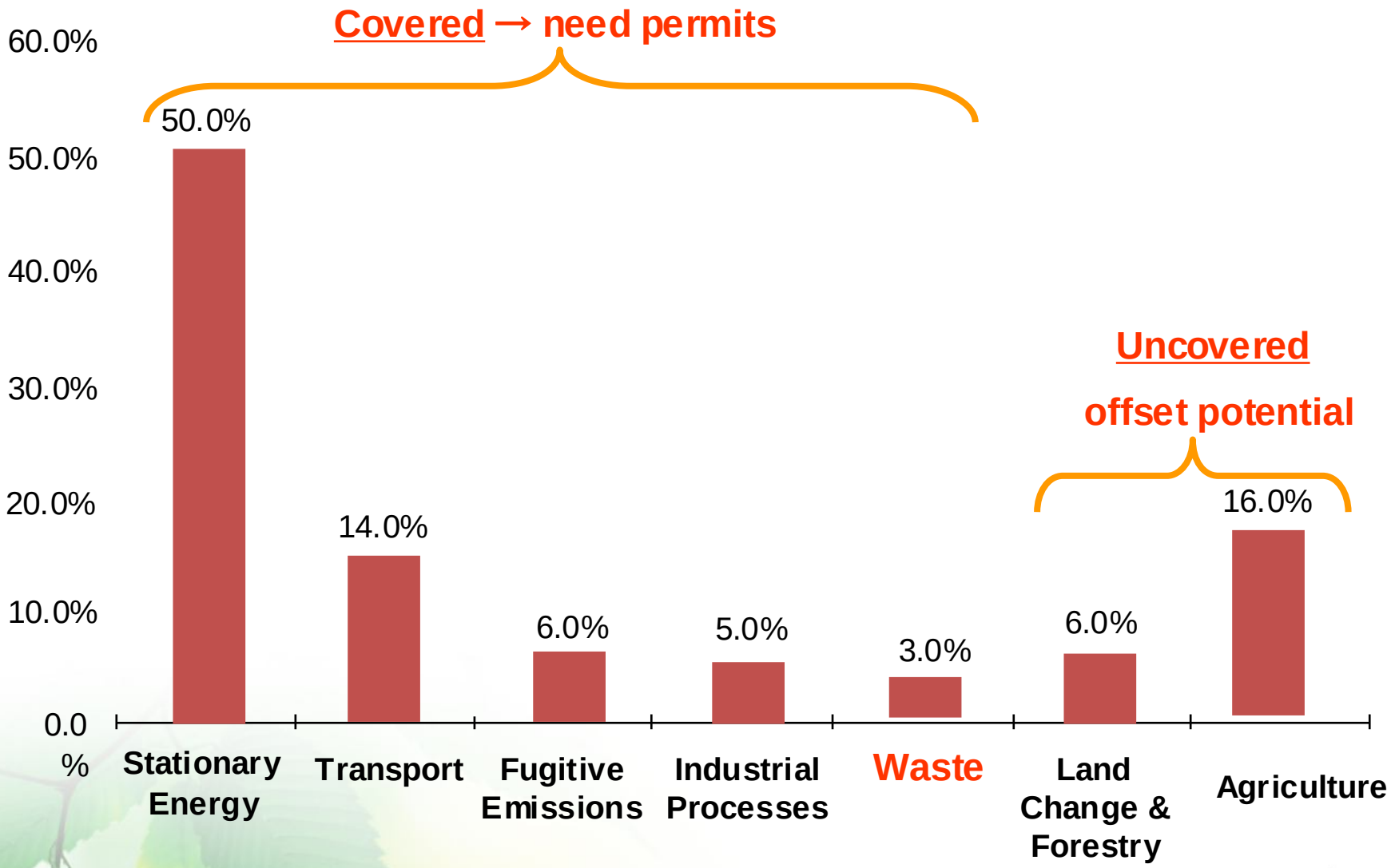
Compost is the best option available for achieving a ‘circular economy’ for phosphorous




ERS, USDA 2010

# Mechanisms are being devised globally to deal with the issue of GHGs – in Australia, the following sectors are covered



# In Australia the primary mechanism to generate offset credits for subsequent trading will be the Carbon Farming Initiative

1. Legislation
   - The Accrediting Mechanism
   - To be passed in H1 2011
2. Domestic Offset Integrity Committee
   - Determination of the methodologies that will be accredited and validated
   - Initial methodologies to be accepted
     - Legacy waste
     - Manure management
     - Savanna burning
     - Forestry
   - Several sub-committee's have already been established for other methodologies
     - Soil Carbon

**SITA Organics has one other advantage compared to other processors – we have national coverage across all major soil types and plant production systems**

# Consider where SITA Organics products are sold:

- Cairns: tropical agriculture
- Raymond Terrace: sub-tropical agriculture and mining (Hunter)
- Sydney: urban amenity
  temperate agriculture/ horticulture (clay/ loam soils)
- Melbourne: urban amenity
  temperate agriculture/ horticulture (clay/ loam soils)
- Perth: urban amenity
  temperate agriculture/ horticulture (sandy soils)

**For the first time in Australia, an organisation is able to establish trials nationally, and over the long-term, that can simultaneously manage soil nutrition and provide the data for the creation of soil carbon sequestration methodologies**

**However, scientific 'common sense' will not work in the market-place unless supported by a market savvy brand development program that helps deliver the circular economy**

Fruit-ARRT™

Garden-ARRT™

Veggie-ARRT™

Crop-ARRT™

Vine-ARRT™

Lawn-ARRT™

Rehab-ARRT™

Flower-ARRT™

Pasture-ARRT™

# Garden-ARRT™

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# Lawn-ARRT™



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# Pasture ARRT™



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# Crop-ARRT™

# Rehab-ARRT™



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# FruitARRT™



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# Veggie-ARRT™




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# Vine-ARRT™

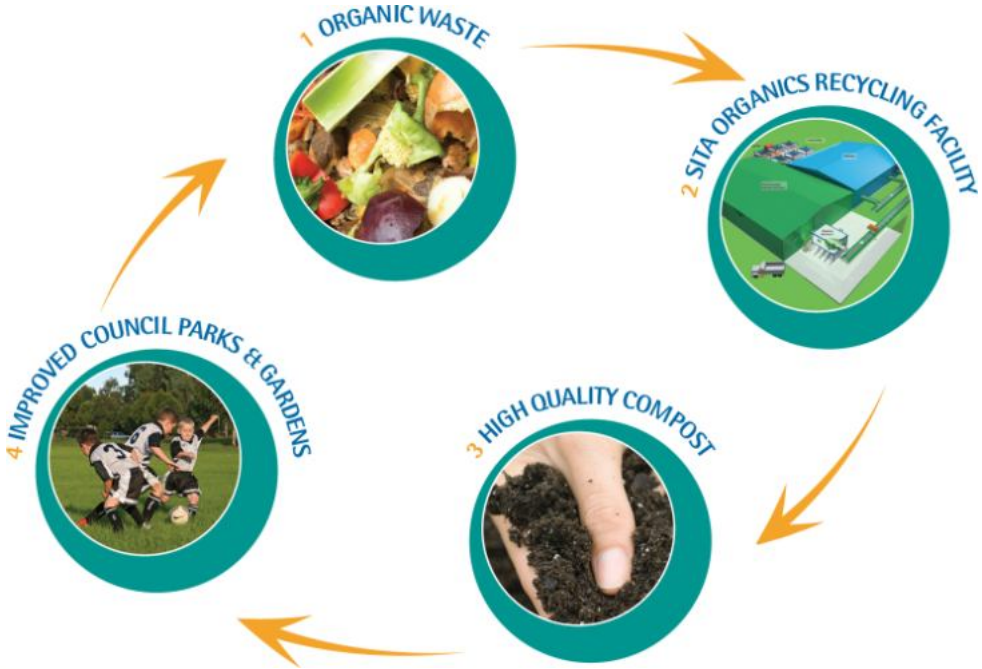
# Flower-ARRT™

## Engagement of local and regional communities in the circular economy is crucial to its successful implementation – visual representation is critical as people 'buy with their eyes'

- One of the fastest growing markets in the urban amenity sector, albeit from a low base, is roof-top gardens.
- Through our distribution channels we are developing a range of ROOF-ARRT™ products
- NABERS – National Built Environment Rating System
  - Aims to reduce an Office block's environmental footprint by encouraging the avoidance of disposal and maximising resource recovery
- The promotional opportunities are staggering – imagine sitting in an office looking down at a living garden on an office tower roof and seeing "ROOF-ARRT" being advertised in a flower and shrub arrangement

**Education is also vital in supporting the establishment of circular economies – as actions must be tied into relevant outcomes that are visible to the 'enactor'**

- SITA strongly advocates for co-mingled Food and Garden Organics Kerbside Collections
  - Allows Councils to purchase (buy-back) the product derived from their constituents actions
- Acts as an Engagement Tool
  - Social benefits are manifest in better public amenities
    - especially during prolonged periods of drought
  - Residents are able to see the results of their actions
  - Positive feedback loops



Cranbrook Oval, Penrith, Sydney

Edinburgh Gardens Oval, Fitzroy, Melbourne

# Broader engagement circular economies exist where local horticultural produce can be linked directly back to the residents

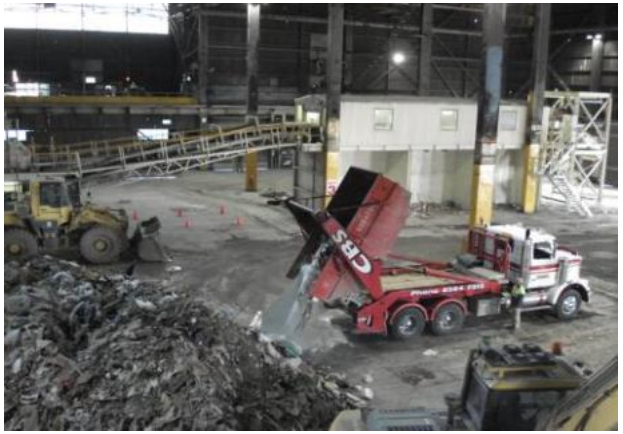
- City to Soil Program
  - Managed by DECCW around the Canberra region
  - Incentive-based with hampers of fresh produce given away as prizes for participation
- Market to Market Program
  - Managed by SITA in the south western peri-urban area of Sydney

# But there's more!

**Combining organics recovery with alternative fuel production can recover 85+% from MSW**

- Composting ARRT facilities processing MSW can only achieve maximum 55+% diversion from landfill
- But in the process of separating out the raw organics from the non-putresible fraction, this residual fraction is ideal as a raw feedstock for SITA's alternative fuel ARRT facilities
- The business model is the same as for the organic product manufacturing system we have examined
  - Recover the desired fraction through separation technologies
  - Produce specified products to target markets

# SITA's alternative fuel ARRT in Adelaide – SITA-ResourceCo – is the first of its kind that produces a Process Engineered Fuel (PEF) that is used as a substitute for fossil fuels

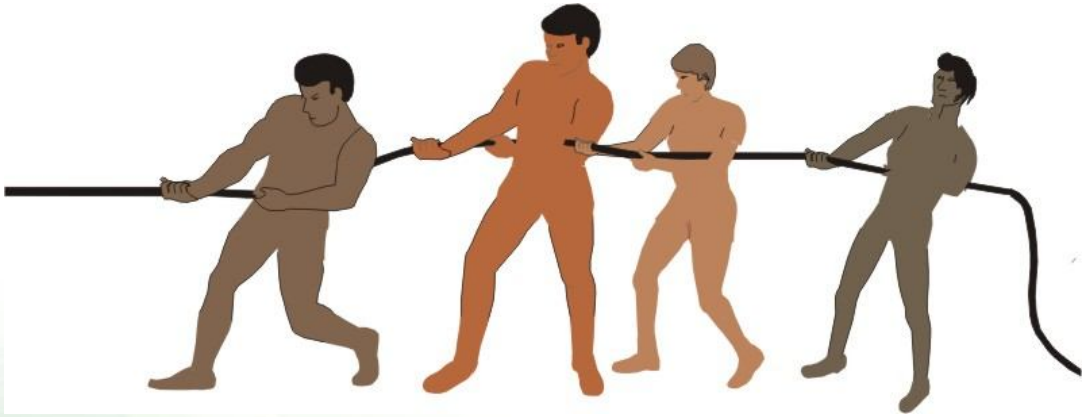


- PEF is not RDF – PEF is specifically made to the specifications of the client
  - Cement kilns
  - Brown coal power stations
- RDF is associated with mass-burn incineration
  - Unlikely to become available in Australia for 10+ years (if at all)

SITA-RESOURCECO ALTERNATIVE FUELS

# Conclusion

With policy settings directed at resource recovery (through levies) being enacted upon by Local Governments, and public incentives through marketing platforms set, new technologies are generating the circular economies at a local and regional level, and helping to create the “eco-cities” and “eco-districts” of today and tomorrow



Thank You

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