Sydney Water

Distributed generation and energy efficiency

2XEP Forum on doubling Energy Productivity

Presenter: Kaia Hodge,

3 April 2014

Sydney Water

- Delivers essential, sustainable and **valued water solutions** for the benefit of the community
    - Drinking water
    - Recycled water
    - Sewerage
    - Some stormwater
- Provides services to more than **4.6 million customers** in Sydney, the Illawarra and the Blue Mountains
- Australia's largest water utility with approximately 2 500 staff and an area of operations covering 12,700 km^2

Our energy programs help us to contribute to Sydney's liveability

Our approach is to:

CONNECT
with our customers

to understand their needs, values & aspirations

COLLABORATE
with our stakeholders

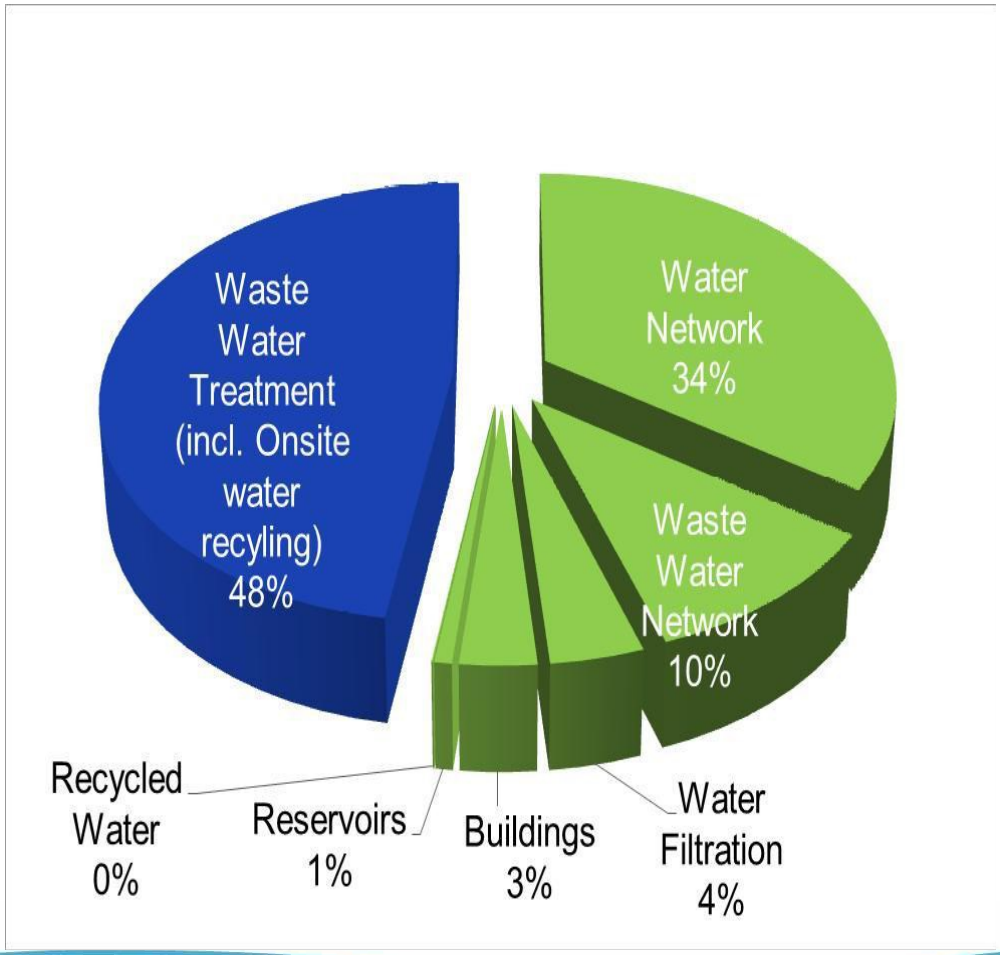
to achieve broader outcomes

INNOVATE
finding find new ways of providing our products and services

helping to future-proof our cities and reduce the energy intensity of our services

Energy Statistics

- Last year we consumed 404 GWh
  - Of this **59 GWh (15%)** was produced by renewables
- A further 6 GWh was exported to the grid
- Our target is to maintain imported power below 1998 levels
  - target **<365 GWh**



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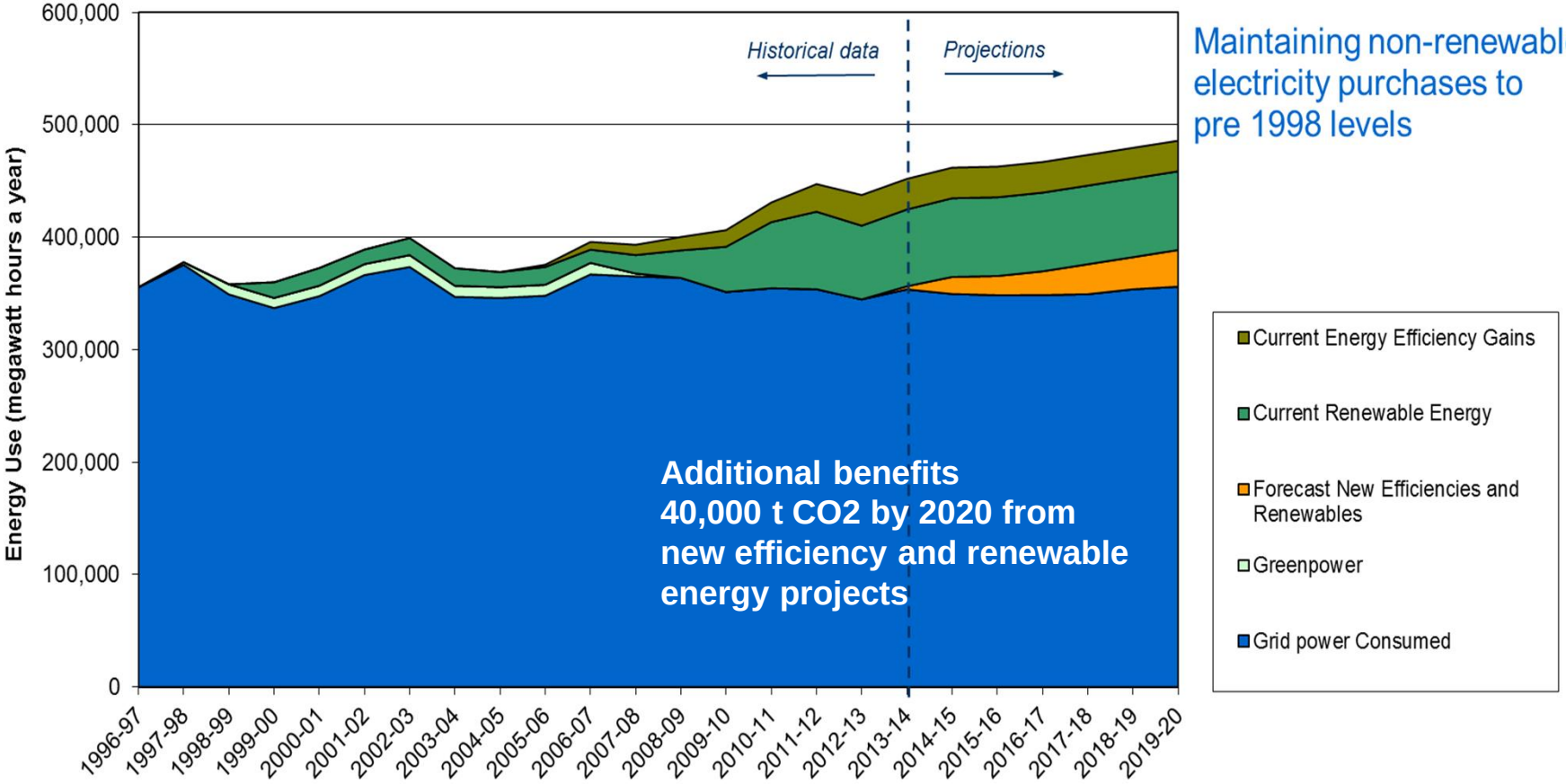
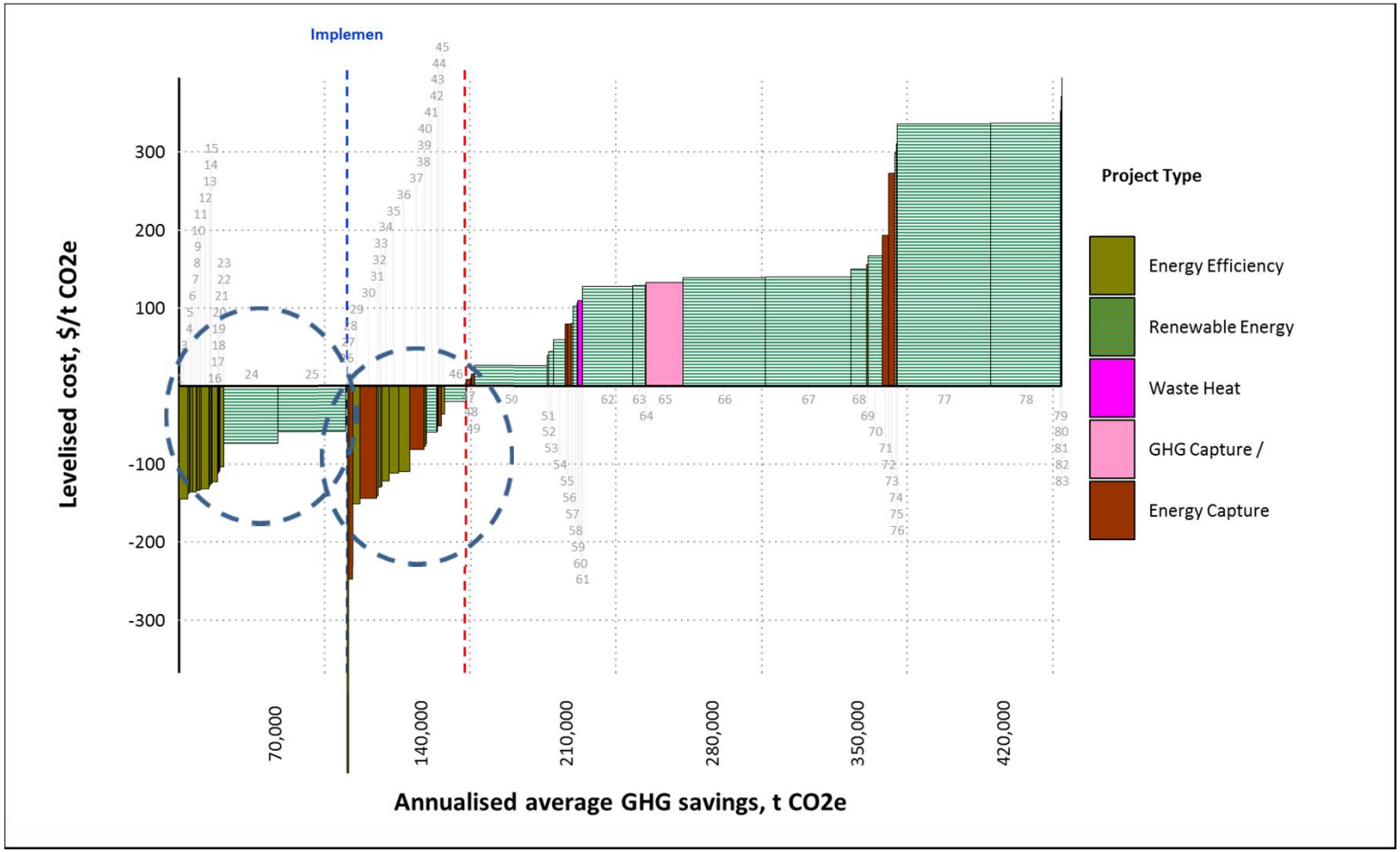
How?
Through efficiency and generation



Maintaining non-renewable electricity purchases to pre 1998 levels

Additional benefits
40,000 t CO2 by 2020 from new efficiency and renewable energy projects

Improving our operations



Cost of Carbon Abatement Curve

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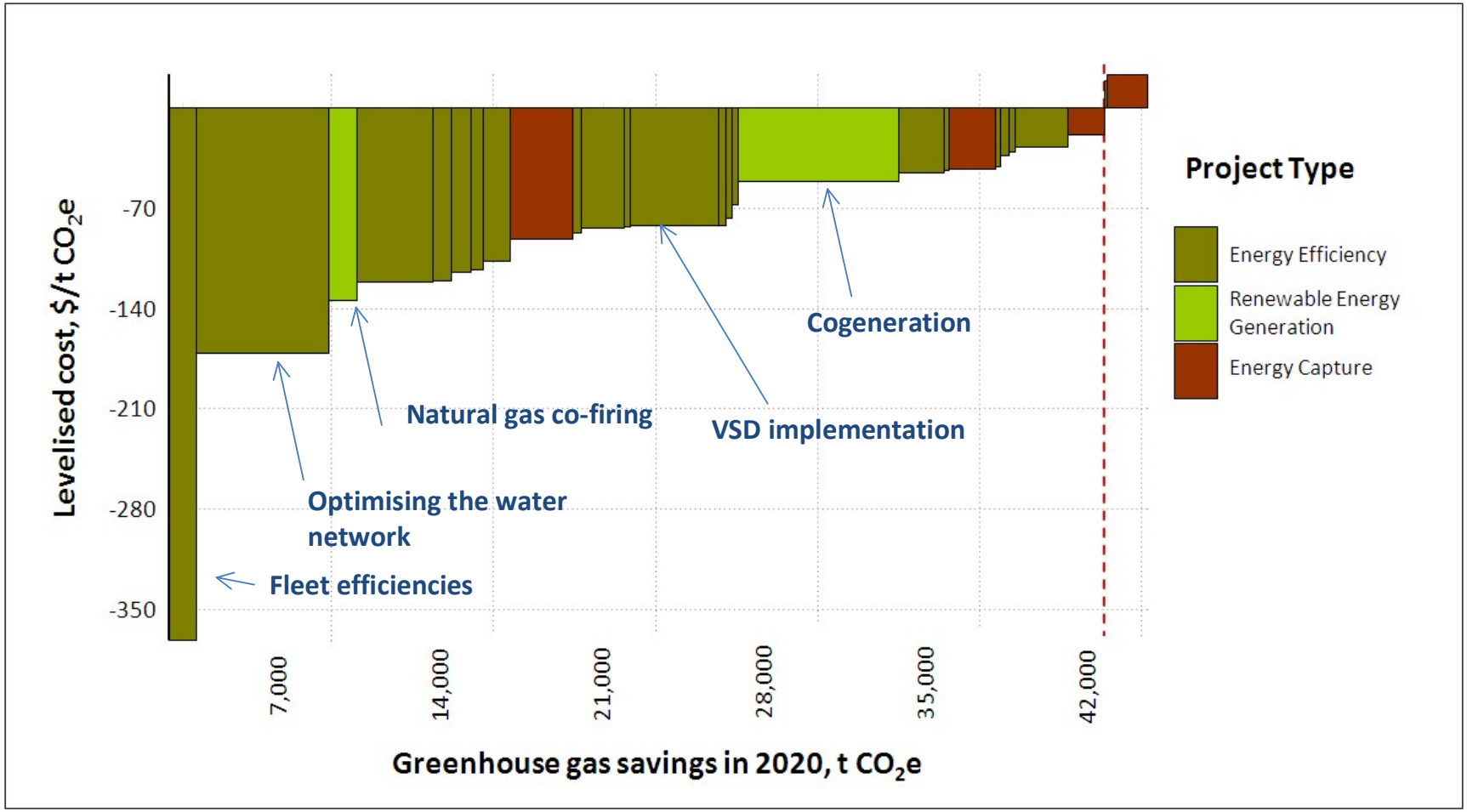
Improving our operations



Cost effective projects remaining

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Energy Efficiency Program

- $1million/year investment
- Energy Saving Certificates (ESCs) assist business cases
- Program incorporates EEO Act requirements

Replacement of blowers

Lighting Upgrade – St Marys Blower House

Renewable energy generation

Biogas

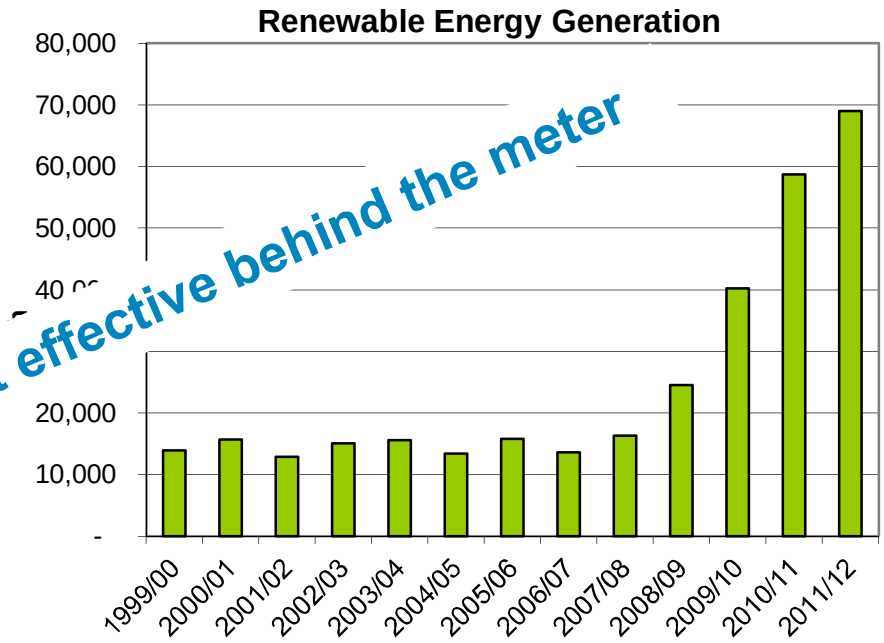
- Cogeneration using biogas from digesters
  - 8 wastewater treatment plants
  - 8.2MW installed capacity - 63 GWh pa

Hydro

- Pressure reductions and gravity flows
  - water and wastewater syste
  - Installed capacity 4 8 GWh pa

Solar

- Solar PV
  - 60 kW – 63 MWh/pa



Renewables are only cost effective behind the meter

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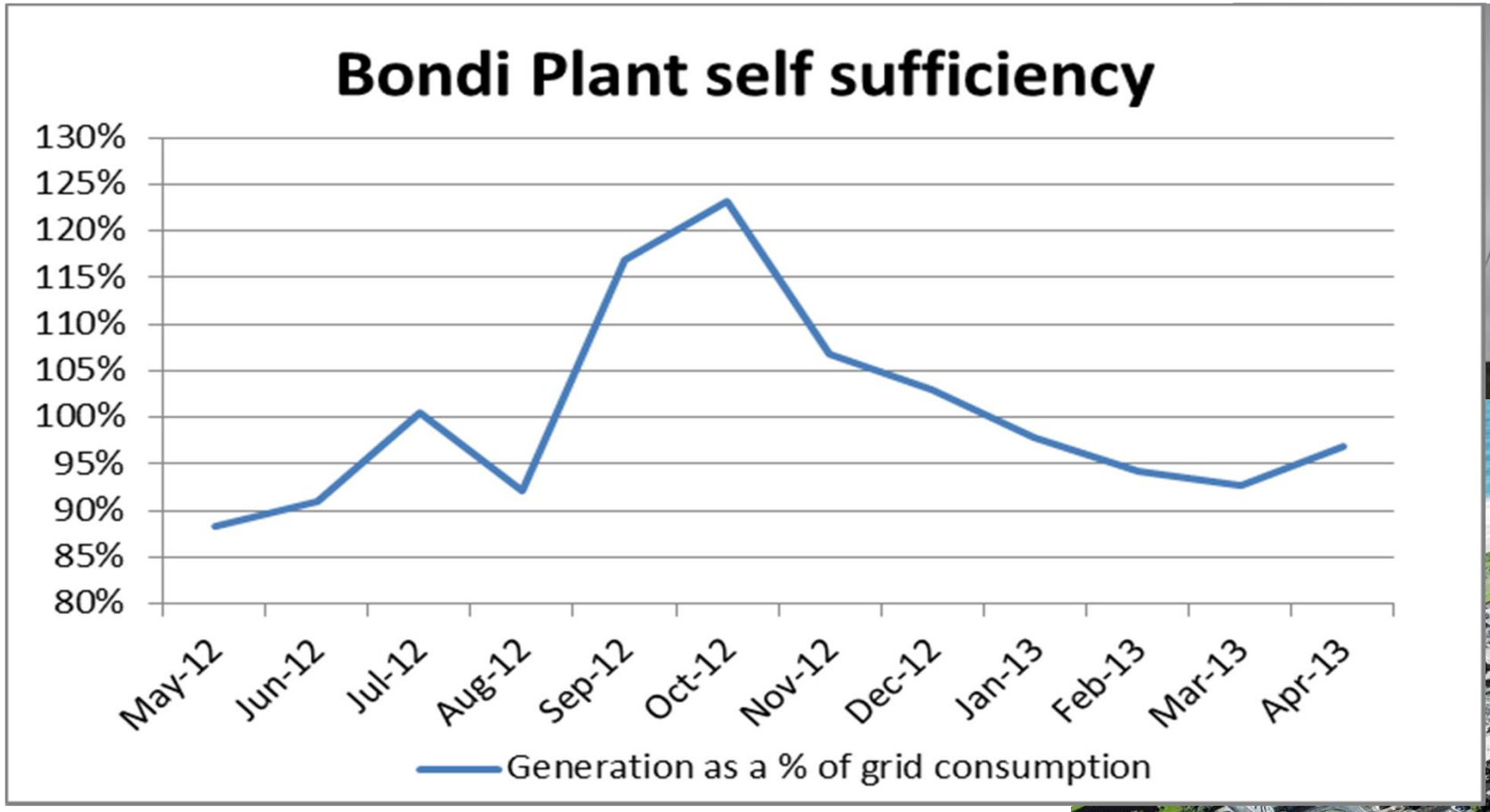
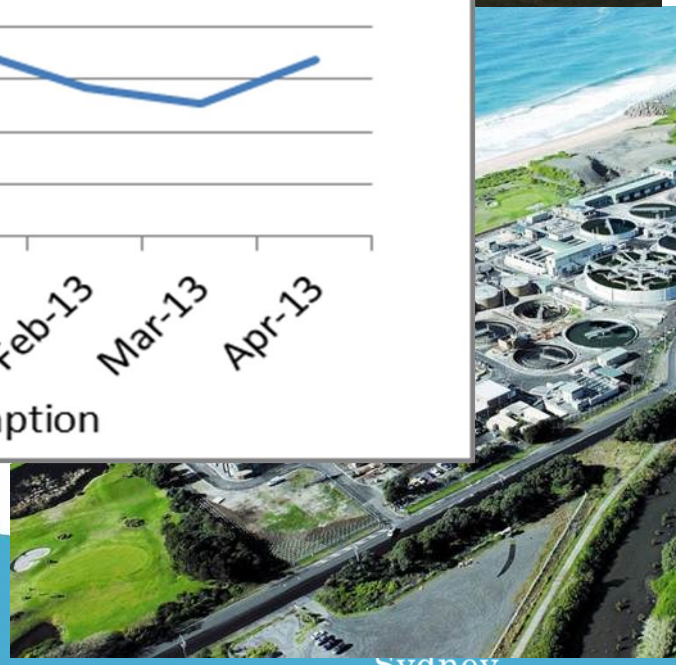
A vision of the future….





– Self-sufficient wastewater treatment plants

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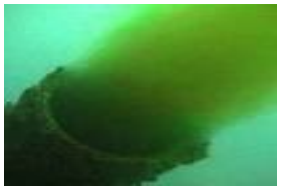
Potential to be an energy generator

Flared biogas

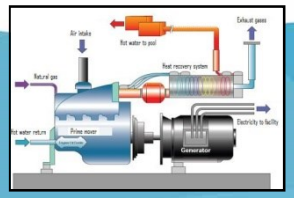
Potential energy discharged

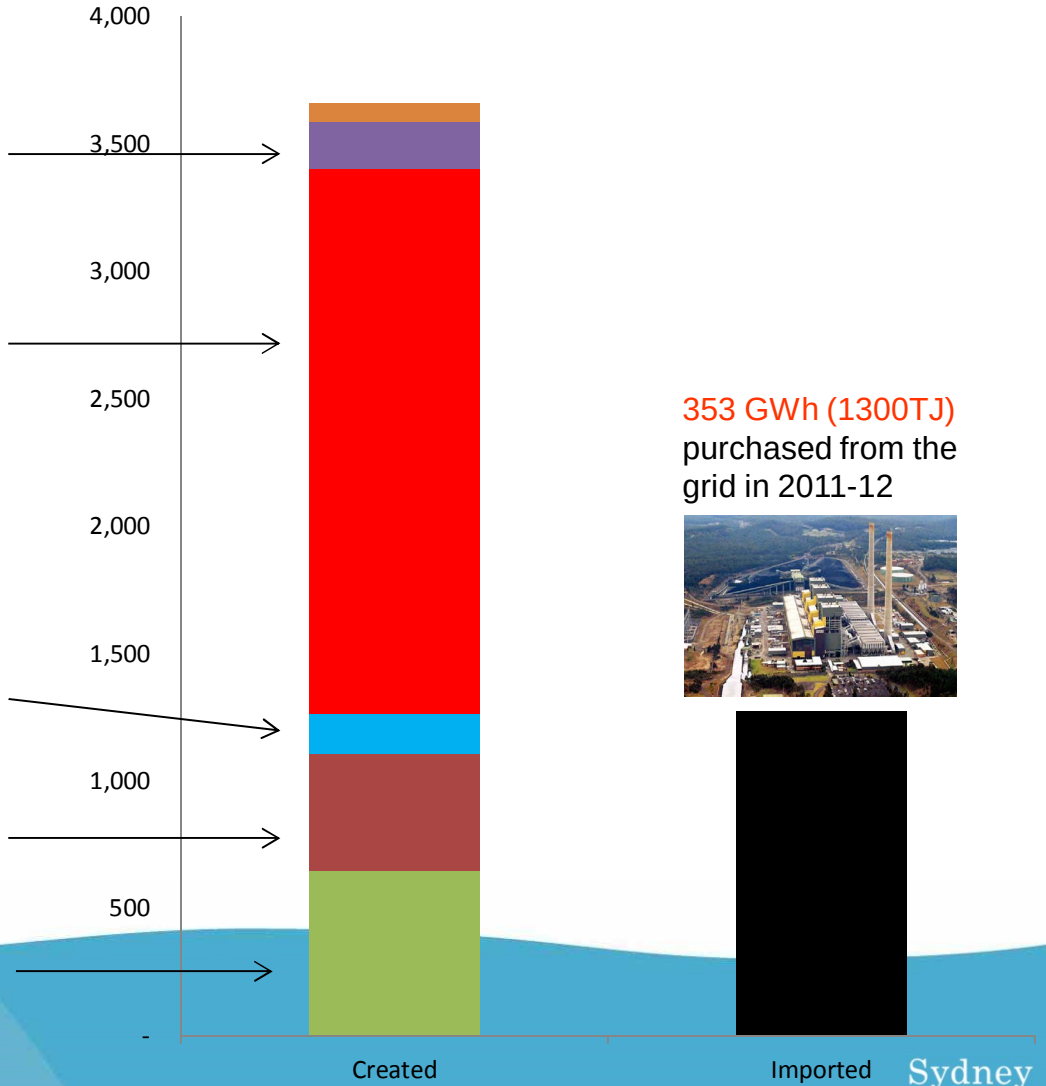


Potential energy digested during treatment

Potential energy in biosolids transported (reused as fertiliser)

Energy for cogeneration engines & water heaters





353 GWh (1300TJ) purchased from the grid in 2011-12

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Co-digestion

Potential for substantial increase in biogas generation

- eg fats, oils and grease from restaurants, food waste, wineries, farm waste

Energy efficient community solution

- Reduces waste transport
- Increased energy recovered from waste

Example : East Bay (Oakland, USA)

- blend food waste with wastewater sludge
- produce 55GWh of electricity and send excess to the local grid

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Bio-methane injection to grid

- **Small scale units in Europe**
- **Potentially a more efficient use of biogas however**
  - Requires purifying biogas from 60% to 90% methane
  - High capital cost
  - No export tariff structure
  - Biogas currently used on site
- **Demand for renewable biogas**
  - eg. City of Sydney Energy Masterplan

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Summary

- Sydney Water's energy strategy uses a combination of
  - efficiency
  - distributed generation and
  - information systems

  to keep our grid electricity purchase below 1998 levels
- The CCA tool helps us to target cost effective solutions
  - There is potential for much more energy efficiency
  - Sydney Water is already generating significant amounts of decentralised renewable energy
- Wastewater could be a more significant decentralised renewable energy source of the future

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Questions?

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