

Improving energy productivity in the water industry

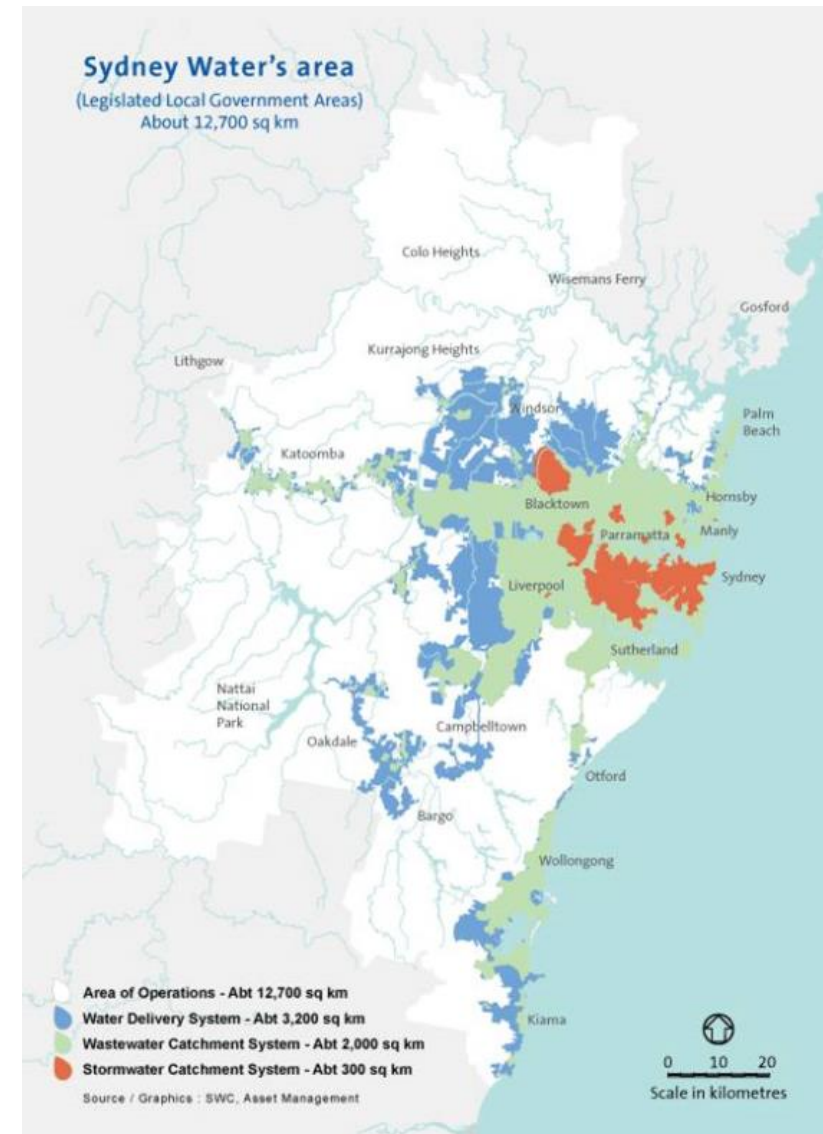
Phil Woods, Energy Manager

Australian Summer Study on Energy Productivity

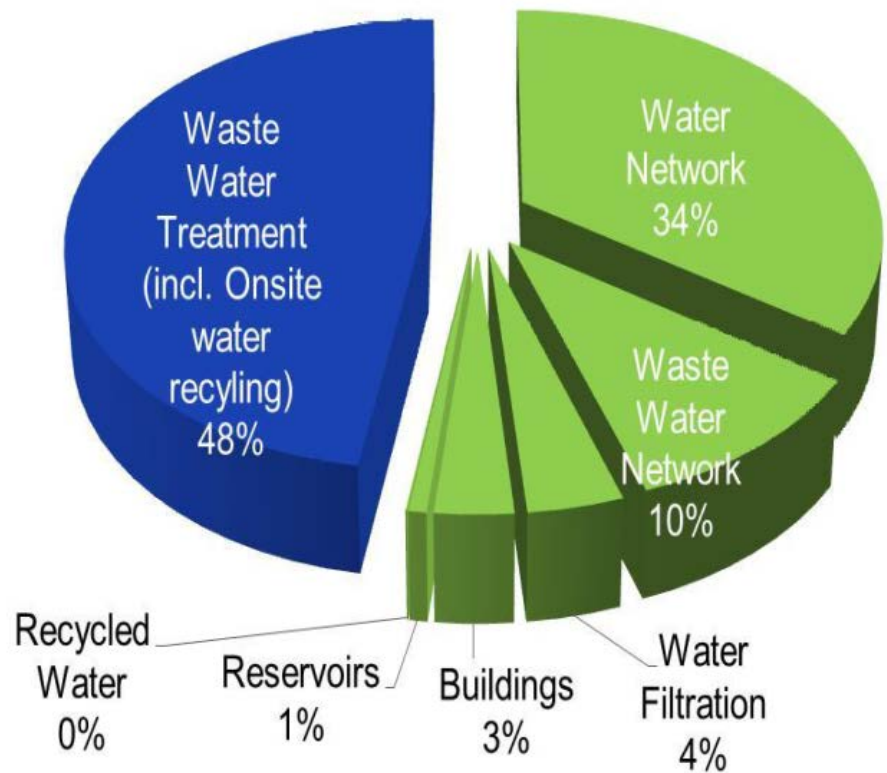
25 February 2016

Sydney Water

- 💧 4.8 million customers
- 💧 Australia's largest water utility
 - Drinking water
 - Recycled water
 - Wastewater
 - Some stormwater
- 💧 29 wastewater treatment plants
- 💧 1 billion litres of wastewater a day
- 💧 In top 100 electricity users in Australia



Water is energy intensive



2014-15 consumption: 414 GWh
73 GWh self generated



Impact of drought on water sources

- 💧 Dam water – **0.25 kWh/kL**
- 💧 Recycled water (Rouse Hill) – **1 kWh/kL** (additional)
- 💧 Tank water – **1.5kWh/kL**
(up to 4 kWh/kL for less efficient systems)
- 💧 Sydney Desalination Plant – **3.3kWh/kL**
(offset by RECs from a windfarm)

Note: excludes transfer pumping except tank water

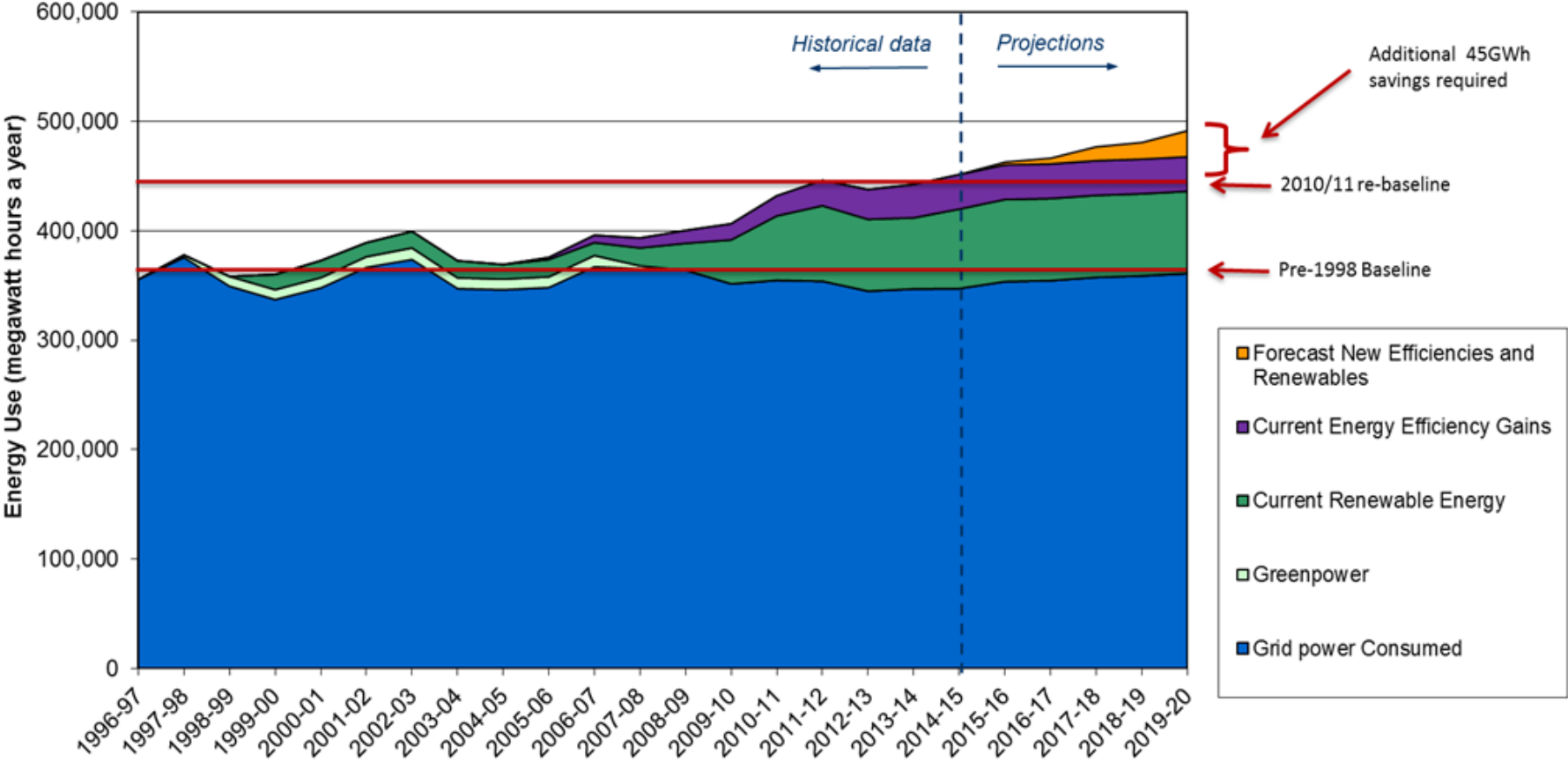
Energy Management Program

1. Energy efficiency
2. Renewable energy generation
3. Planning & design
4. Tariff management



Energy Target

Cost effectively maintain non-renewable electricity purchases to pre 1998 levels



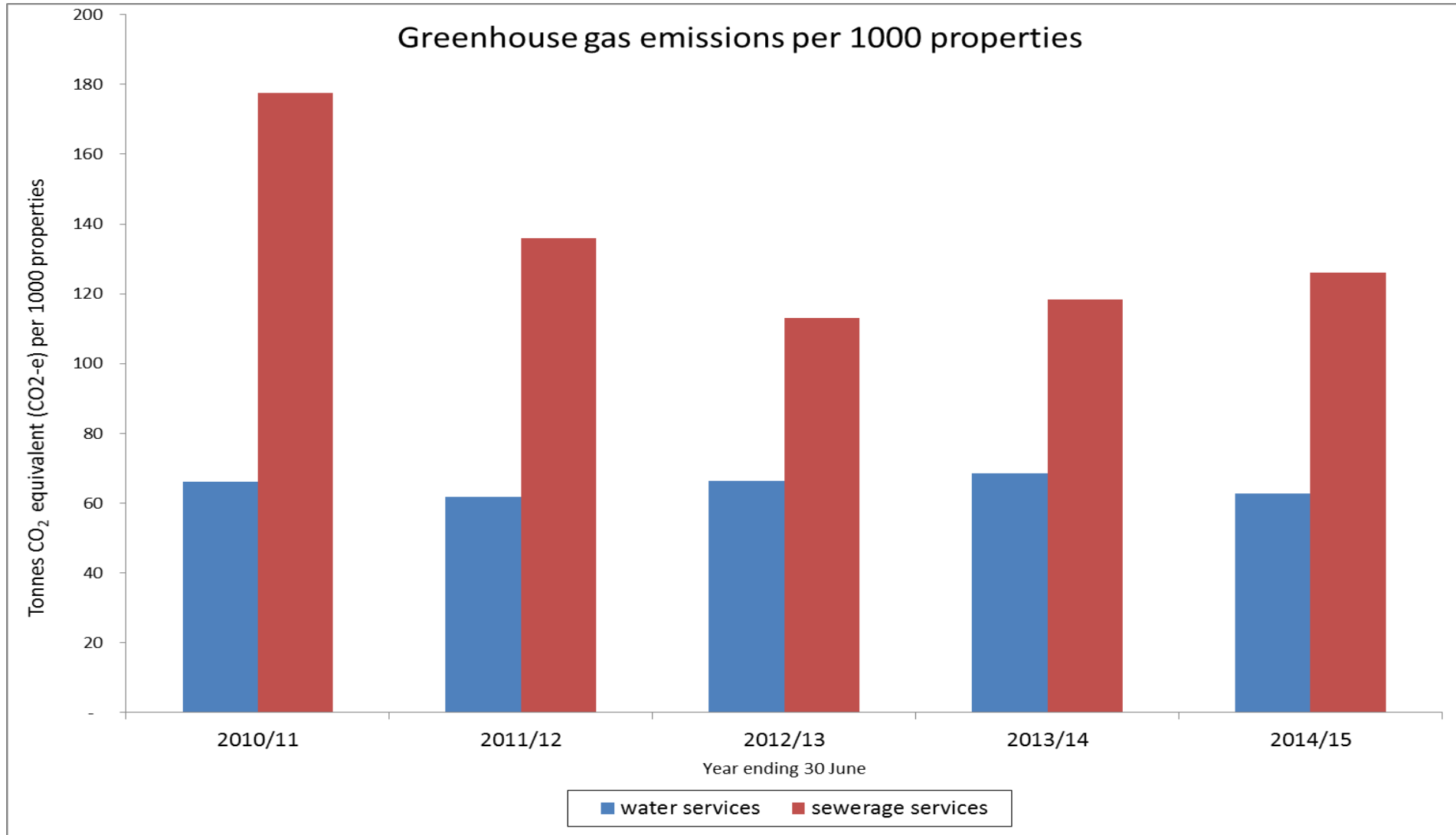
Energy productivity

What does it mean to the water industry?

Effective, holistic energy management

- 💧 Doing what we already (mostly) do now.....but with some new ways to get traction with the business
- 💧 Energy Productivity terminology helps engage
- 💧 Greater focus on the outputs, not just inputs
- 💧 Energy delivers business value and is not just a cost

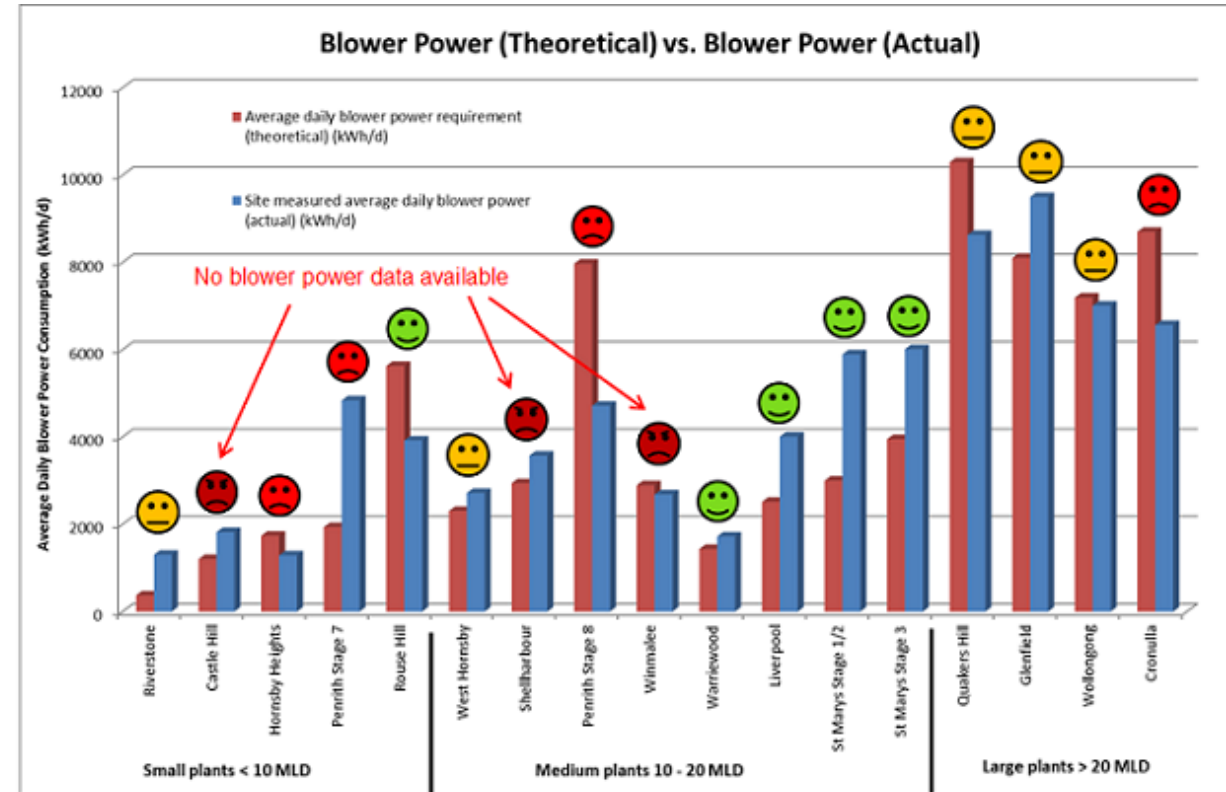
National Water Commission Indicators



Benchmarking

Knowing where we stand

- 💧 Wastewater treatment plant energy benchmarking
 - Energy consumption per equivalent population
 - Water Services Association of Australia
- 💧 Pump energy benchmarking (WSAA)
- 💧 Aeration energy benchmarking
 - Understand poor performers
 - Develop ongoing KPIs
 - Identify data limitations

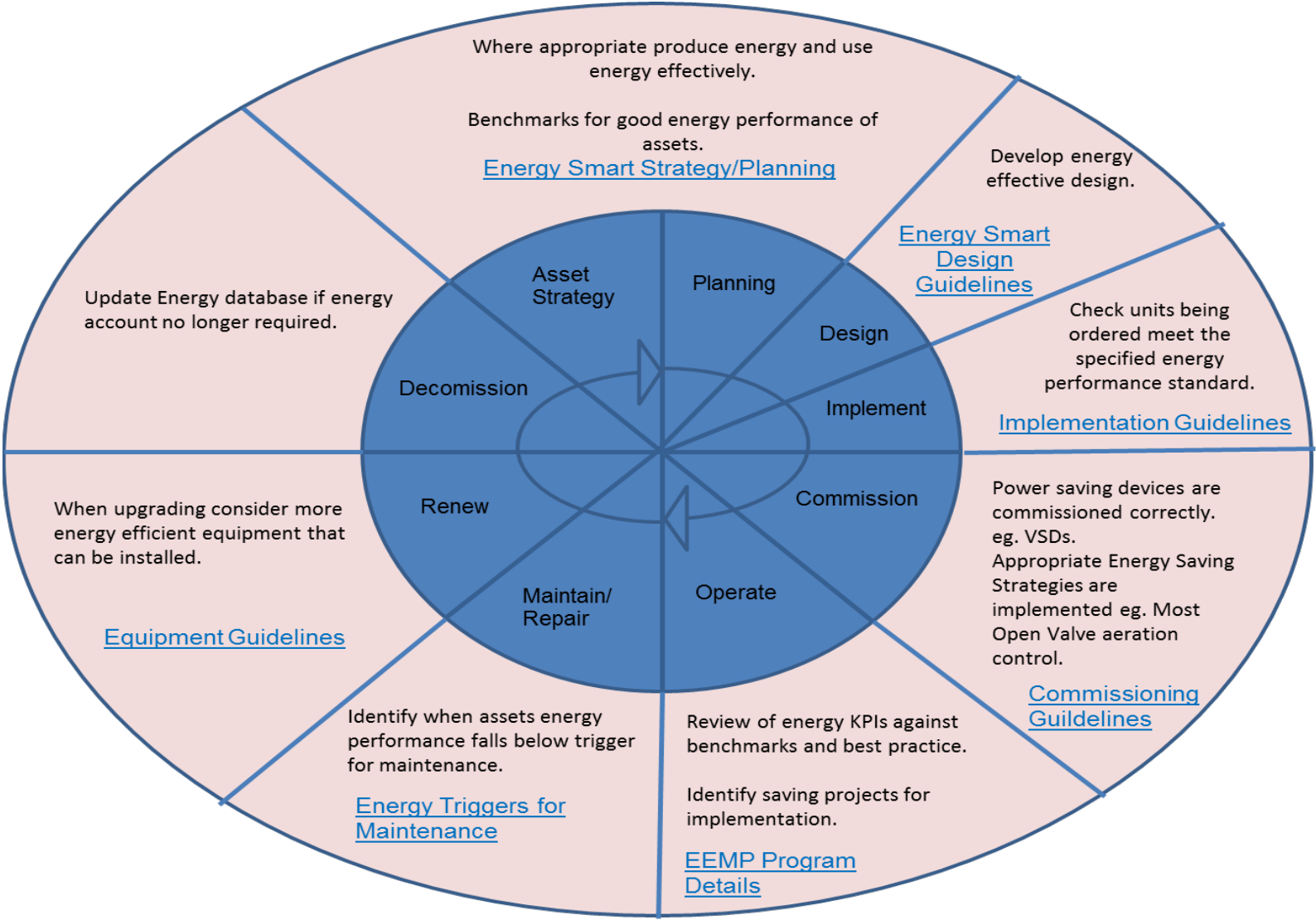


Data limitations: 🟢 None 🟡 Some 🔴 Lots 🔴 Too Many!

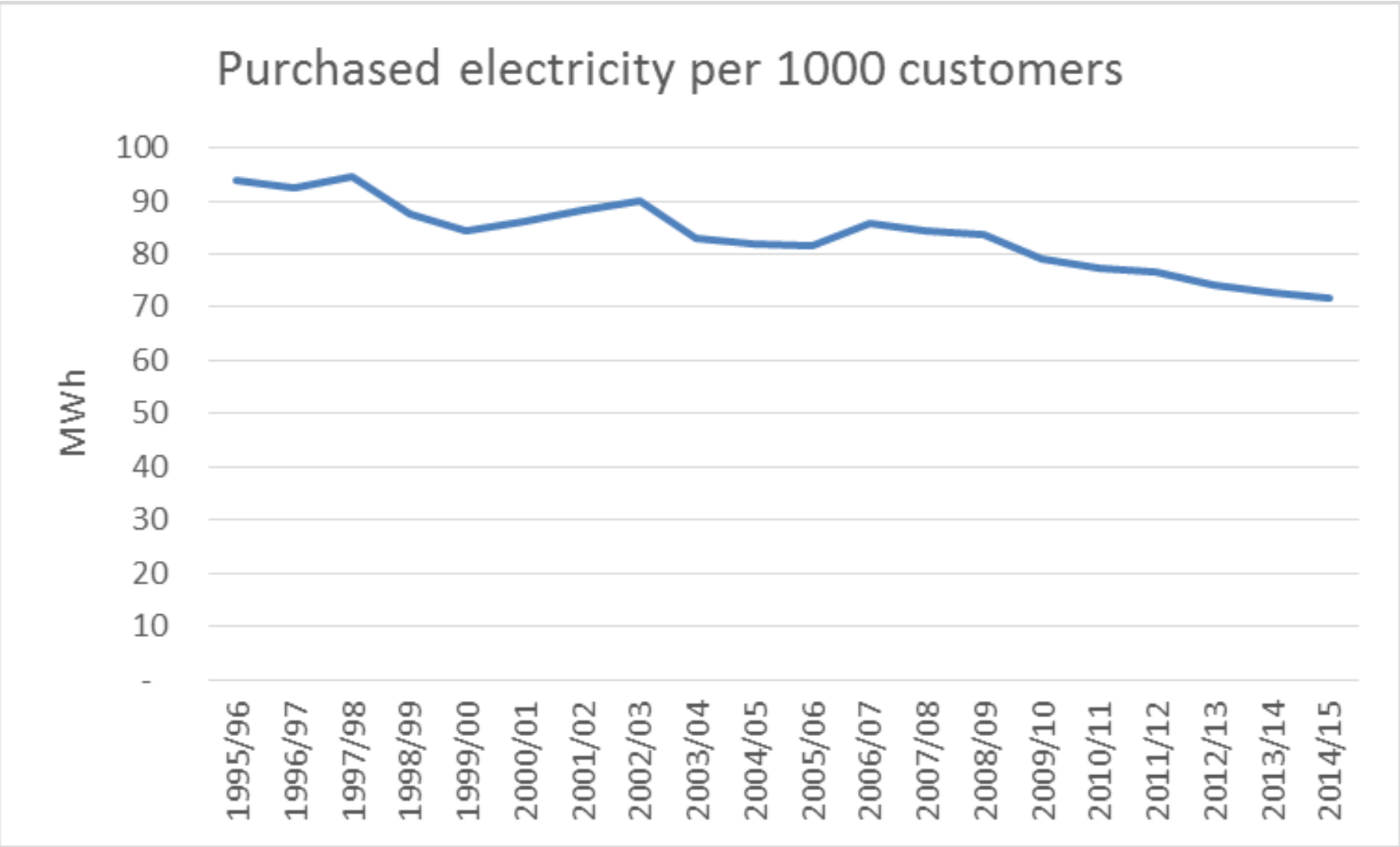
How do we improve EP in the water industry?

- 💧 Reducing the energy consumption of existing operations (energy efficiency)
 - eg upgrading a pump to a more efficient unit
- 💧 System optimisation
 - eg. assessing that a smaller pump can do the same job
- 💧 Transformation of business models
 - eg designing a system that reduces or removes the need for pumping
- 💧 Quantifying the full business value
 - eg installing a low pressure, variable speed pump saves energy but can also reduce the risk of water main breaks

Energy Smart Assets



Energy productivity has improved by 25%



Questions?