

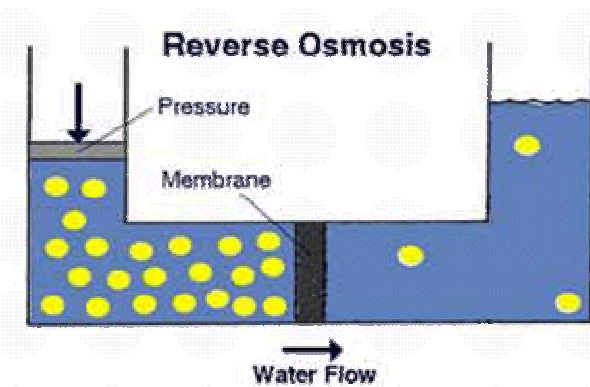


Energy and greenhouse impacts of water options for Sydney

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Recycling: The Sustainable Alternative to
Desalination
Parliament House, Sydney

Desalination



- Why does it need so much energy?
 - Large pumps
 - ✓ Pump seawater from ocean to plant
 - ✓ Force seawater through membranes under high pressure
 - ✓ Pump drinking water into the distribution system
- Electricity cost can be 50-75% of total operating cost

Desalinated water is “bottled electricity”

Sydney's desalination proposal

Size of plant (ML/day)	125	500	
Electricity consumption (GWh/yr) (Almost all sourced from coal power)	225	906	↑↑NSW electricity consumption by 1.2% = Enough electricity to run 120,000 homes
Greenhouse gas emissions (kilotonnes CO ₂ /year)	240	950	↑↑NSW emissions by 0.6% = 220,000 additional cars
Greenhouse intensity (tonnes CO ₂ per ML)	5.3		= Burning > 2L of petrol for each 1000L of water



NSW Greenhouse Strategy

- Reduce emissions to 2000 levels by 2025
- A 500 ML desalination plant would cancel out savings from
 - Energy efficiency improvements in existing homes over the next ten years OR
 - Reductions in automobile usage over the next ten years

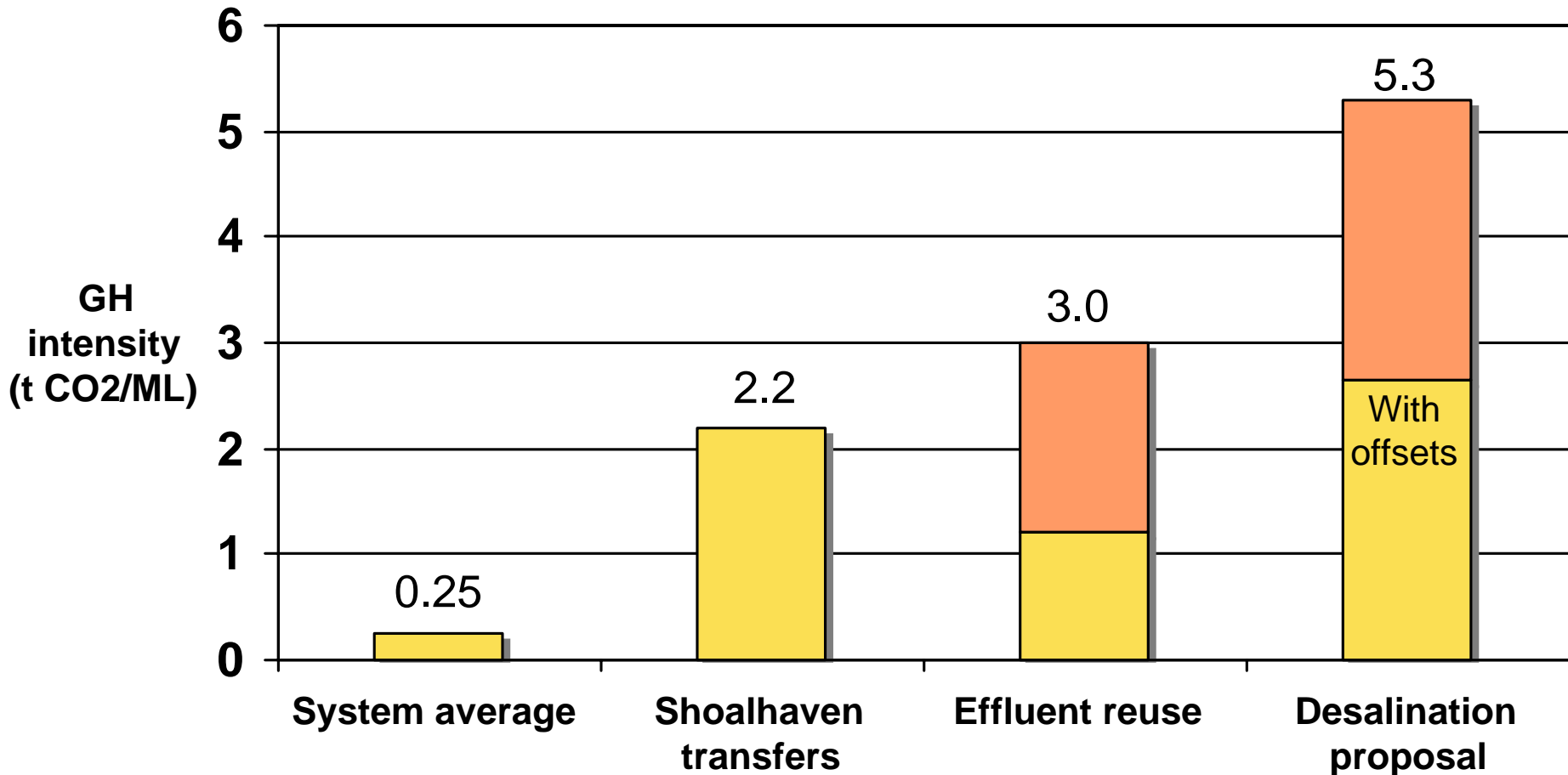
A desalination plant makes it harder to meet greenhouse gas reduction commitments



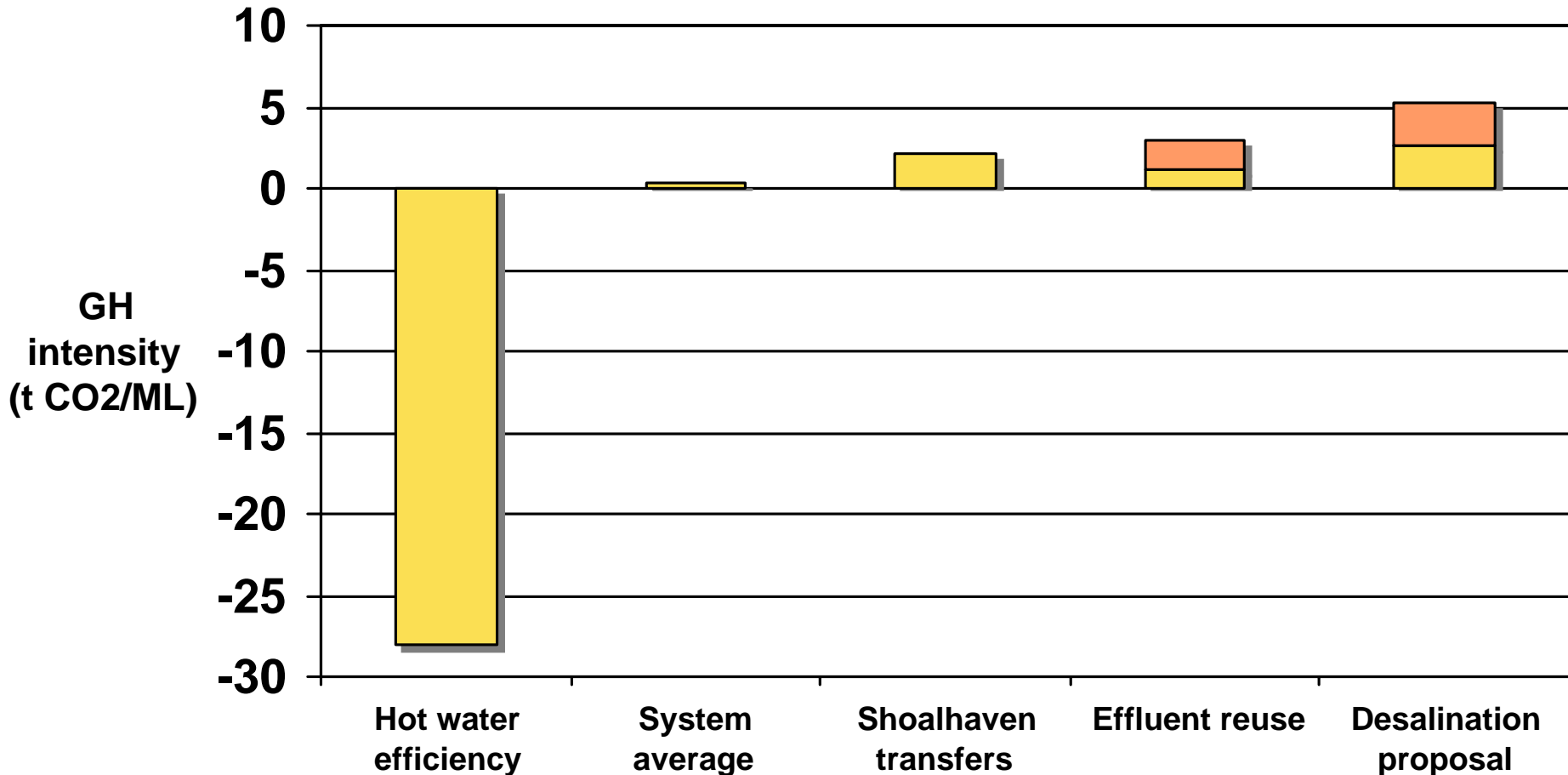
Offsetting emissions

- Sydney Water has committed to reduce greenhouse gas emissions from the plant by 50%
- Purchase renewable energy certificates (RECs)
 - Cost up to \$16m per year at current prices
 - 5% increase in demand for RE would likely increase price
 - Expires in 2020
- Purchase NSW Greenhouse Abatement Certificates (NGACs)
 - Cost up to \$6m per year at current prices
 - None available until at least 2007
- Plant trees
 - Cost up to \$8m per year
 - Would need to plant at least 14,000 hectares (almost the size of the Royal National Park)
 - 5 year lead time

Greenhouse intensity of different water sources (1)



Greenhouse intensity of different water sources (2)





Conclusions

- Desalination is energy intensive and offsetting options are expensive (and may not be feasible)
- Even with expensive offsets for 50% of greenhouse gas emissions, desalination still produces as much or more greenhouse gas than a comparable effluent recycling scheme
- Water efficiency is most attractive from an energy and greenhouse perspective
- NSW Government has not provided sufficient justification for why it is adopting such a greenhouse-intensive option
- Need for greater transparency and public involvement in the decision-making process