Integrated Urban Water Management
Challenges with Implementation

Chris Hertle | Market Leader GHD, Adjunct Professor AWMC, UQ
Outline

- IWM concept
- What were the drivers?
- What has been implemented?
- Where are these at now?
- Ways to improve
Drivers

- Drought / flood mitigation
- Reduced discharge
- Political support
- Corporate drivers
- Funding
- Community support
Some Australian Examples

- Manly Eco Village
- Pimpama - Coomera
- Rouse Hill
- Homebush
- Mawson Lakes
- Parramatta Civic Centre
- The Gap
- XXXX, Fosters, Smiths
- Manly Eco Village
- Pimpama - Coomera
- Rouse Hill
- Homebush
- Aurora
- Kalkallo
- Docklands
- Tasmania
- Western Australia
- Northern Territory
- South Australia
- Queensland
- NSW
- Victoria

Many agricultural reuse application
What has happened to these?

Rouse Hill
- Greenfield development utilising dual water reticulation
- Advanced BNR treatment with membrane filtration
- Cross connections
- Changed to filtration and super chlorination

Pimpama Coomera
- Used dual water, rainwater tanks, smart sewers
- Reduced potable water demand, discharges by >70%
- Some cross connections
- Closing due to high O&M and slower development uptake

City of Sydney
- Integrated water management for Sydney CBD
- Stormwater, greywater and sewer mining systems
- Highly brownfield
- Costs of systems too high to justify

Industrial water Recycling
- About 6 plants implemented in drought
- >50% water reduction
- >70% recycle
- Low energy, small footprint WWTP (Anaerobic / aerobic) and membranes / disinfection
- Still operational
Decentralised Systems

- Reduced potable water use by 60%
- Zero wastewater discharge
- Inefficient pumps and blowers
- High CAPEX & O&M costs
- Wet weather discharge

Potable Water Supply

Kitchen (8%)
Bathroom (15%)
Laundry (10%)
Toilets (12%)
Hot water (15%)

20kL Roof water Tank

External use
Landscaping & lawn (40%)

On-site STP

Tank Overflow

Fire Hydrants
## Opportunities for Decentralised Systems

<table>
<thead>
<tr>
<th>Positives</th>
<th>Negatives</th>
<th>Gaps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced network costs</td>
<td>Inefficient pumps &amp; blowers</td>
<td>Alternative treatment</td>
</tr>
<tr>
<td>Reduced water use and wastewater discharge</td>
<td>Need to produce high quality to allow for occasional discharge</td>
<td>Physical / Chemical treatment for wet weather?</td>
</tr>
<tr>
<td>Potable water replacement</td>
<td>Cross Connections</td>
<td>Low cost sensors</td>
</tr>
<tr>
<td>Delayed linear infrastructure</td>
<td>Slower than expected development</td>
<td>Flexible treatment and reuse options</td>
</tr>
<tr>
<td>Reduced localised flooding</td>
<td>Storages need to be empty</td>
<td>Automation</td>
</tr>
</tbody>
</table>
## Interactions GHD - AWMC

<table>
<thead>
<tr>
<th>Area</th>
<th>GHD</th>
<th>AWMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWRCöE</td>
<td>RAC member</td>
<td>RAC member</td>
</tr>
<tr>
<td></td>
<td>Concept development, Engineering, cost benefit</td>
<td>R&amp;D, laboratory and pilots</td>
</tr>
<tr>
<td>Anaerobic digestion</td>
<td>Concept design and implementation</td>
<td>Literature review, BMPs, reviews</td>
</tr>
<tr>
<td>MLA/ AWMC</td>
<td>Links to clients, engineering / CBA</td>
<td>Literature review, BMPs, reviews</td>
</tr>
<tr>
<td>Knowledge transfer</td>
<td>AWMC seminars</td>
<td>Disseminate information, teaming</td>
</tr>
<tr>
<td></td>
<td>Occasional lectures</td>
<td></td>
</tr>
</tbody>
</table>