Economic viability of recycled water schemes: Assessment Framework & Tool

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Water recycling

Centre mission

• National R&D program to enhance and expand water recycling
• $40m investment through industry, research and government partnerships

Economic challenges

• Recycled water schemes difficult for one beneficiary/investor to justify
• Economic and commercial benefits often poorly estimated
• Ability to assess viability differs widely with private & public schemes
• Significant gaps in quantifying costs, values, risks & benefits
Economic viability

• Better understanding and methods to address commercial and institutional impediments, risks & opportunities
• Industry supported framework for assessment and pricing
• Research to fill knowledge gaps
• Consistent CBA-style approach
• New tool to apply nationally accepted assessment framework
Assessment products

- Technical report and CBA assessment tool
- Economic framework with community benefits
- Commercial assessment framework
- New research:
  - Value to recycled water users through a hedonic pricing study: Rouse Hill property values premium with recycled water >$5k (>3/kL)
  - Value to community through a choice modelling study: Western Sydney residents “willingness to pay” varied ($0.45-$3.80/kL)
Users

• Water service providers
• Private developers
• Regional councils
• State planning agencies
• Property developers
• Economic regulators
• Consultants

Adoption

• WSAA hosted briefings
• Workshops - Syd, Melb, Bris, Perth
• Recycled water economic forum – Sydney 2013
• Water Corporation & WA Dept Water adopt methodology
• NSW DPI Water and Water Directorate supported
Assessment Framework

Costs

- Recycled water direct costs
- Indirect service delivery costs
- Reticulation costs
- Other environment/community costs

Benefits

- Wider community willingness to pay
- Avoided potable water costs
- Avoided wastewater costs
- Value to customer (net of potable value)
- Other environment/community benefits

Economic viability threshold

NOTE: Size of bars does not reflect relative size of costs/benefits.
Recycled Water
ECONOMIC ASSESSMENT TOOL

community benefit
reticulation cost
water savings
avoided wastewater cost
recycled water cost
Recycled Water Assessment Tool

- Industry wanted a simple tool to apply framework
- Developed by AWRCOE and MJA, extra funding by Victorian R&D business grant
- Easy to use Excel-based CBA
- Tool tested by 6 regional councils and water utilities
- Positive feedback by industry
- GHD reviewed tool with market assessment
- Next stage – use by industry
Market testing

• Council feedback:
  – Mt Isa – recycled wastewater for irrigation
  – Parkes – recycled wastewater for irrigation
  – Coffs Harbour – recycled wastewater for irrigation
  – Alice Springs – managed aquifer recharge scheme
  – Perth – groundwater replenishment scheme

• “Easy to use” - “Good in Excel” - “Widen scope to include existing schemes” - “Complements other CBA software”
Input, variables & assumptions

Water volumes supplied
Analysis period (eg 10-50 yr)
Discount rate (eg 7%)
Capital and operating costs
Willingness to pay for recycled water
Avoided water and sewerage costs
Reduces costs to a single present value (NPV)
Costs are levelised eg $ per kL

<table>
<thead>
<tr>
<th>Cost description</th>
<th>Estimate</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long run marginal cost of potable water (bulk)</td>
<td>3.00</td>
<td>$/kL</td>
</tr>
<tr>
<td>Long run marginal cost of wastewater disposal (bulk)</td>
<td>0.50</td>
<td>$/kL</td>
</tr>
<tr>
<td>Potable water volumetric charges</td>
<td>2.50</td>
<td>$/kL</td>
</tr>
<tr>
<td>Recycled water volumetric charges</td>
<td>1.50</td>
<td>$/kL</td>
</tr>
<tr>
<td>Developer charges for recycled water</td>
<td>500</td>
<td>$/lot</td>
</tr>
<tr>
<td>Avoided rainwater tank uptake</td>
<td>10%</td>
<td>% of new properties</td>
</tr>
<tr>
<td>Cost of installing a rainwater tank</td>
<td>3,000</td>
<td>$/household</td>
</tr>
<tr>
<td>Rainwater tank annual costs</td>
<td>30</td>
<td>$/household/year</td>
</tr>
</tbody>
</table>
Download Tool

- Free download
- Register your name, organisation, project
- Receive program and ‘worked’ example

Parkes case study

- Outline of existing reuse schemes to golf course and racecourse
- Use of Tool to assess existing schemes – pros & cons
- Use of Tool for business case on new treatment facility
- Benefits of Tool to rural and regional utilities
Links to case studies – UTS

- 8 recycling schemes reviewed - economic, operational, regulatory, risk and environmental perspective
- Complex web - lessons, guides, stories
  - Darling Quarter – commercial building
  - Roseville – stormwater recycling
  - Wide Bay – farm irrigation
  - Aurora – greenfield residential
  - Rosehill – large industrial users
  - Wagga Wagga – farm and ovals irrigation
  - Yatala – commercial brewery
  - Willunga Basin – wine region irrigation