

Technology-focused Needs and Opportunities Workshop

28 January 2016, 11am - 4pm

Melbourne Water, 990 Latrobe Street, Docklands, Melbourne

Objective: To capture particular needs and opportunities relating to technology developments and implementation required to transition to Water Sensitive Cities, and to identify possible research ideas in relation to these needs

Attendees

No.	Name	Surname	Organisation
1.	Barry	Ball	CRCWSC
2.	Bronwen	Butterfield	Icon Water
3.	Cintia	Dotto	Water Technology
4.	Damien	Batstone	CRCWSC/UQ
5.	Damien	Connell	Smart Water Fund
6.	David	Horn	GHD Pty Ltd
7.	Carolynne	Van Der Cingel	CRCWSC
8.	Eloise	Larsen	CRCWSC
9.	Giles	Pickard	City of Subiaco
10.	Jurg	Keller	CRCWSC
11.	Lisa	Ehrenfried	Water Services Association of Australia
12.	Matt	Hipsey	UWA
13.	Owen	Gould	Icon Water
14.	Pam	Kerry	South East Water
15.	Rachel	Cardell-Oliver	UWA
16.	Rowan	Barling	Jacobs
17.	Thomas	Kuen	Melbourne Water
18.	Warwick	Bishop	Water Technology
19.	Zhiguo	Yuan	UQ

Discussion items - Supporting the transition of cities into water sensitive cities

Session 1:

What on-ground technological innovations and validation processes are required?

Needs cluster 1: Analysis, interpretation & utilisation of complex & real-time data

Smart, integrated water systems <ul style="list-style-type: none"> • Cheap sensors • Model-data integration workflows • Model integration • Data analytics – machine learning • System optimisation – local & macro scale • Good modelling practise 	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
	Promote/design model integration workflows Coordinate “smart” model library Optimisation of metrics (balance water cycle) – development & testing
Model application/development <ul style="list-style-type: none"> • Fill gaps in capability • Don’t reinvent the wheel • Could be additional functionality on existing systems – plug-ins/add-ons 	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Identify model inadequacy/GAPS	Model capability reviews Model comparative studies Initiate model library New algorithm development
Smarter use of data for system management	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Use the technology Articulate needs & uses/applications Training for industry use	Knowledge/audit of what technology has been developed & available
Tools/algorithms to interpret data for planning & business cases e.g. pipe infrastructure planning, stormwater quality, wetland water quality	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
As above	

Needs cluster 2: Innovative water supply options through diversified and integrated technology solutions

<p>Need technologies that challenge the order of current water supply systems: treat water – distribute centrally – use – run off centrally – treat sewage Treat water at tap Treat waste in toilet (when concentrated especially from hospitals & industry)</p>	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
<p>Trials Community engagement Push for more outcome based regulation</p>	<p>Develop technology</p>

<p>Cheap local recycling to support green infrastructure Greywater/wastewater Building/precinct scale</p>	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
<p>Regulations issues to be sorted with structure Pilot opportunities Cost benefit analysis</p>	<p>Advise industry/regulator on risk assessment Solution to avoid public exposure to hazards Different level of treatment for different levels of exposure Cost benefit analysis</p>

<p>Integrate on-ground technologies for cost-effectiveness e.g. stormwater, greywater, treated effluent used seasonally</p>	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
<p>Influence regulators Funding arrangements Trial integration Better communications across industry</p>	<p>Validation & assurance e.g. water quality concerns, processes Identify proxies for monitoring to drive validation costs down</p>

Needs cluster 3: Smart monitoring and sensing

<p>Driver – water quality, nutrient discharge into environment Monitor – develop new equipment, improve existing equipment Continuous monitoring – online, control No lab required – on-site equipment Cheaper surrogates</p>	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
<p>Test the new technology What, why, purpose & expected outcome</p>	<p>Data analysis technology To inform what to monitor Advise on equipment-testing protocols</p>

<p>Sensing</p> <ul style="list-style-type: none"> • Cheap, distributed • Pipe network • Chemicals (DOM, NO₃...) • Surrogates • Consider cost, battery requirement, heavy customisation of network is a barrier 	
<ul style="list-style-type: none"> • Remote sensing • Groundwater bore network • Soil moisture for irrigation • Microbial 	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
<p>Advocate – routine, identify opportunities Sensor packages Data warehousing/ greensense Business models</p>	<p>Review & trial Communicate findings Sensor package, data acquisition Specify measuring criteria</p>

Session 2:

What structural changes (policy, regulatory, organisational or economic frameworks) would enable more rapid technology innovation and uptake?

Needs cluster 4: Outcome-based regulation

Outcome-based regulation	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Survey community/customers Pressure/lobby regulators to consider “whole” outcomes	Evidence/case studies Best solutions/outcomes

Outcome-based regulation	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Case studies Early engagement of community & regulators	Evidence-based risk assessment

Needs cluster 5: Holistic valuation and decision making to achieve optimal outcomes

Holistic validation frameworks for technology implementation Shared funding models Incentive/subsidies Risk/reward e.g. integrated model to share cost & risk for aquifer recharge	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Provide case studies	Influence policy making with evidence

Best value for whole community Transparency of total costs & benefits	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Transparency – consideration of community benefit	Research priced & underpriced benefits Promote unpriced benefits

Business cases & multiple decision makers brought together to enable projects and build cases for change Potential surcharge on projects as funding source for long term technology trials & implementation	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Willing industry members to be engaged in order to test & implement technology. Value & benefits to be quantified and these results communicated to industry & community	CRCWSC to bring industry together Help facilitate adoption of technology through knowledge sharing/transfer By providing support & research build confidence in industry Development of promotional material

Needs cluster 6: Industry-leading technology innovation

Manage operational impacts/changes & perceptions of risk	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Include operational requirements, costs & risks in initial business cases Share experiences Include operational staff as key stakeholders for decisions	Facilitate access to lessons learned from failures & successes

Industry uptake of new technology Risk aversion amongst practitioners/utilities/regulators Previous failures (technology & implementation)	
What can the industry/RAP do to lead/support?	What can the CRCWSC do to lead/support?
Be brave!	Promote case studies – successes & failures Brand pilots to manage utility/regulator reputation Support pilots