



INDUSTRIAL ECOLOGY OPPORTUNITIES: A PORT MELBOURNE SCOPING STUDY

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Background

- > How can we think creatively about resource exchange opportunities in Melbourne?
- > How useful might an industrial ecology approach be?
 - for water and other resource exchanges
 - given its demonstrated potential locally (e.g. Kwinana) and internationally
- > What can we learn about implementing new approaches to resource management?

Objectives

- a. To **identify** opportunities for industrial ecology in Melbourne
- b. Provide guidance to underpin **adoption**

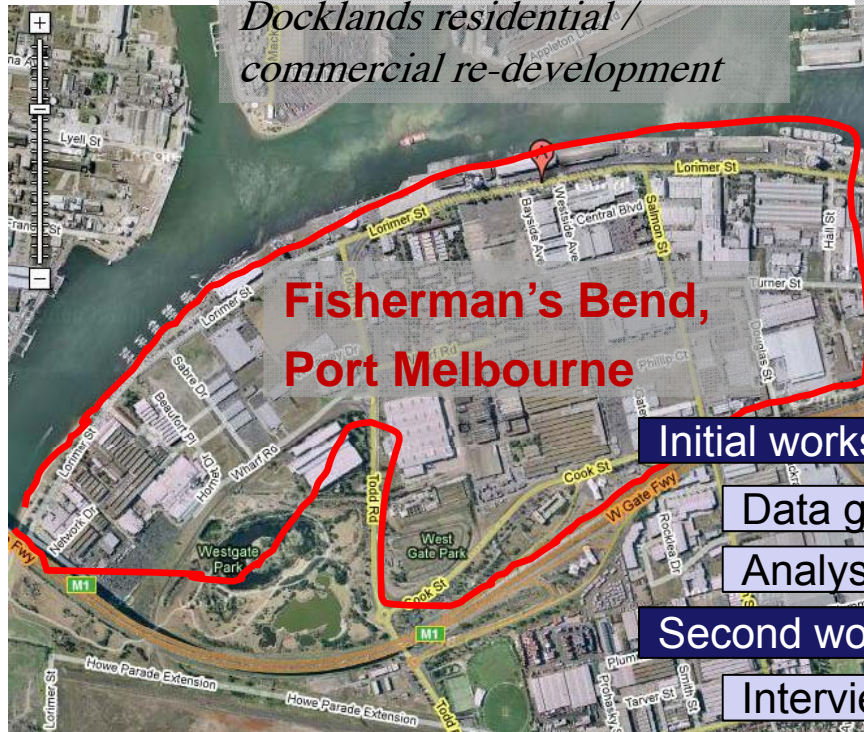
Key focus

- *identifying opportunities for water conservation*
- *reductions in TDS and metal discharges to sewer*
- *reducing energy related footprint of water cycle*

Approach

Project Stage	Planned Outcome	Actual Outcome
Initiation & Literature Review	Identify success factors	+ output to build profile
Stakeholder workshop	Engage & raise profile; present lit. review; preliminary ideas	+ identified Laverton opportunity - limited follow up post-workshop
Develop tool & map opportunities	Systematic identification process	- data availability/resolution - still need to gauge interest
Stakeholder workshop	Prioritise opportunities	++ interest from Port Melbourne
Scoping study of best opportunity	Business case for implementation	++ seeded further collaboration

Port Melbourne Site



Docklands residential / commercial re-development

*Melb City Centre
-> 2-3km*

**Fisherman's Bend,
Port Melbourne**

- Kraft food
- Indep. cement
- Boral plasterboard
- Holden
- Boeing
- Herald WklyTimes
- Symex
- West Gate Freeway All.

Initial workshop with companies

Data gathering

Analysis, options, cost effectiveness

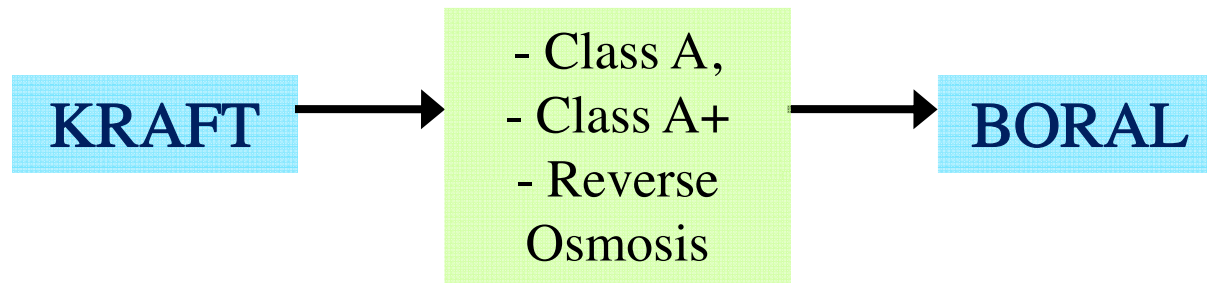
Second workshop to present/discuss

Interviews on barriers and opportunities

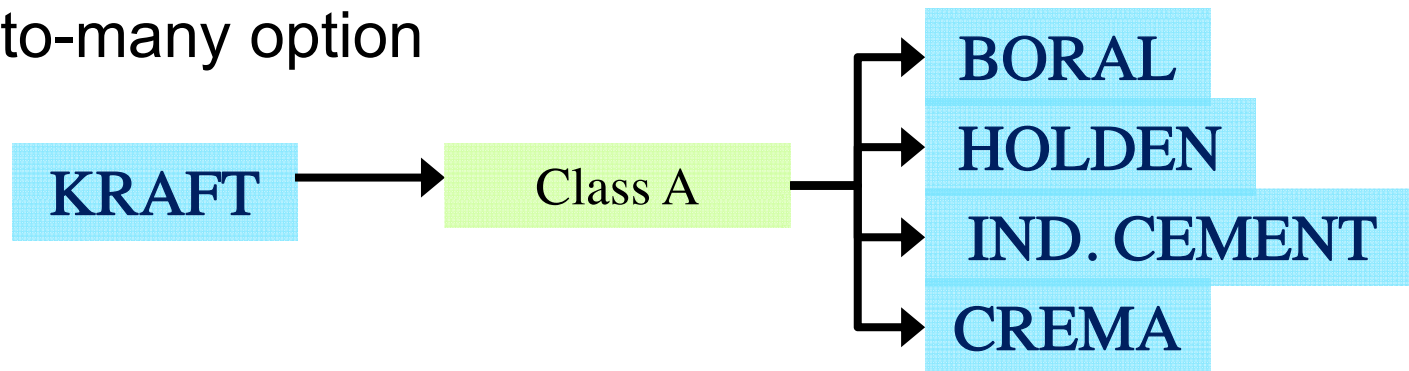
Final scoping study

Scenarios evaluated

- > Company-to-company: different water qualities evaluated



- > Single-to-many option



Economic assessment

- > Key assumptions:
 - Water and trade waste increasing @ 15% + CPI p.a. for 5 years
 - Recycled water prices \leq potable mains charges
 - 10 year project horizon with land costs excluded

	Option type	Treatment	Water quality	Capital cost (\$Million)	Operating costs (\$/annum)	Cumulative cash flow after 10 years: No interest loan on capital	Levelised Cost
A	One-to-one	MBR	Class A	\$2.5	\$450,000/a	\$250,000	\$9/kL
B	Many-to-many	MBR	Class A	\$2.7	\$500,000/a	\$(450,000)	\$8/kL
C	One-to-one	MBR ½RO	>Class A	\$2.7	\$570,000/a	\$(3,700,00)	\$14/kL
D	One-to-one	RO	RO	\$2.8	\$730,000/a	\$(5,000,000)	\$18/kL
E	One-to-one	½MBR	>Class A	\$2.7	\$490,000/a	\$(1,100,000)	\$27/kL

Comparison to other options within Melbourne

Cost effectiveness (\$/kL)

- > Port Melb options \$8-\$28/kL
- > Desalination \$2-\$5/kL
- > Rain tanks \$3-\$10/kL
- > Efficiency \$0.50-\$2/kL

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At what scale do we

- > assess options?
- > seek to close the loop?
 - for water, other resources?

On-site efficiency where possible
then industrial ecology...
seeking a lower carbon footprint...
or lower water use...

Barriers & drivers – Port Melbourne vs Kwinana, WA

	Port Melbourne	Kwinana
Economics	Secure price	Secure supply
Information sharing	Future opportunities	History of implementation; Regional industry council
Corporate responsibility	Corporate sustainability	Community engagement
Regional context	Borders city; limited land Newer light industry	New heavy industry; big area new synergy opportunities
Regulation	Only utility currently sells water	Barrier to by-product reuse

Further reflections

- > Understand **local** barriers, drivers and enablers
 - > stakeholders use different metrics
 - > Current/future costs, payback, \$/kL
 - > improved environmental performance
 - > important role for **industry council**
- > **Water-energy links** increasingly important; limitation of initial work

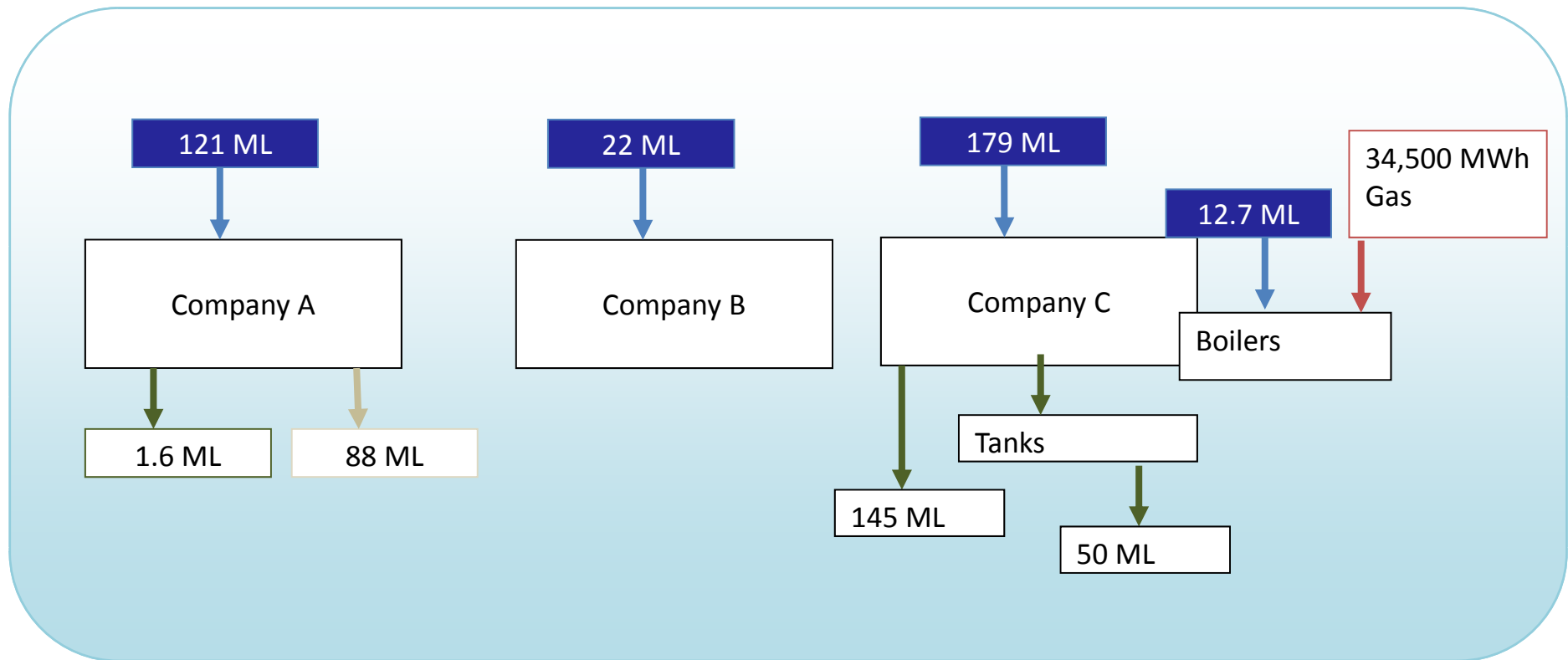
Benefits of project

- > Positioned Smart Water Fund as Industrial Ecology Leader
- > Shared learning on **potential of industrial ecology**, what works (company-led) and what doesn't
- > Demonstrates value of **creating space for innovation** through bringing stakeholders together
- > **Deepened collaboration** between companies, government, utilities, seeding further work

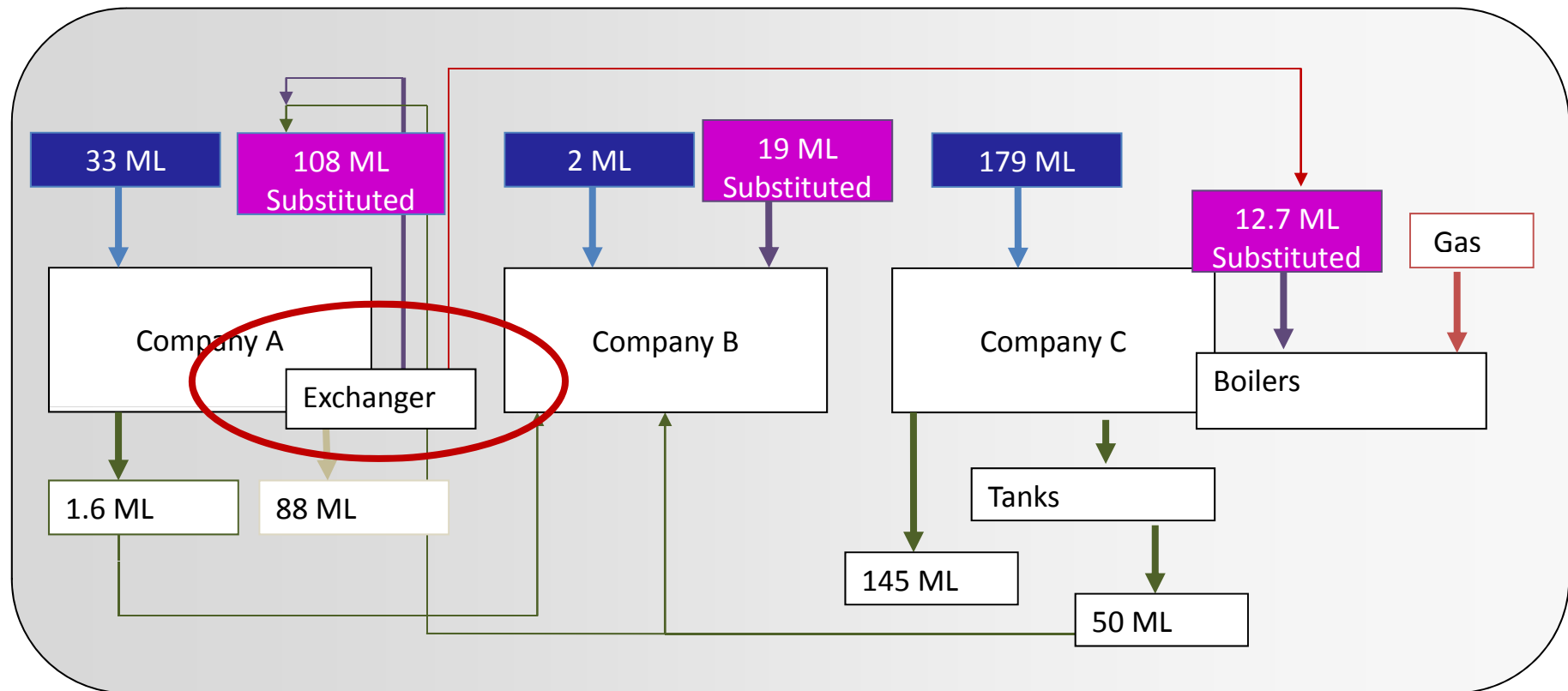
Outcomes of post-project work

- > Port Melbourne Industrial Ecology Working Group
 - > First workshop July 2009. Facilitator: Dr Paul Tebo; Key proponent: Vanessa Lenihan, South East Water
 - > EPA and Sustainability Victoria are project partners
 - > Developing a Sustainability Covenant for the group
 - > Embraces a focus beyond water resources

Current Annual Resource Flows



Potential Annual Resource Flows



Further ideas from working group

- > **These projects included a:**
 - Centralised water sharing project
 - Neighbour to neighbour water sharing project
 - Energy project
 - Salt mass balance project
 - Further development of the original Smart Water Fund Industrial Ecology Project.

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