

Collaborative Industry Research to Develop Regional Synergies

Experiences and Lessons from Kwinana (Western Australia)

Dick van Beers
Centre of Excellence in Cleaner Production
Curtin University of Technology

Rene van Berkel
Eco-Innovation



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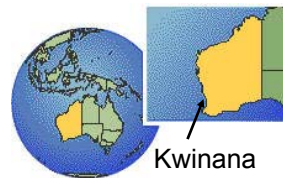
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Overview



- Kwinana Industrial Area
- Kwinana Synergies Project
- Development of regional synergies (industrial symbiosis)
 - Inorganic by-products
 - Water
 - Energy
- Conclusions



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Kwinana Industrial Area

- **Heavy industrial area**
 - 40 km south of Perth, Western Australia
- **Kwinana is a leading edge example of regional synergy implementation**
 - 47 diverse and matured existing synergies
- **Favourable features**
 - Industry diversity, non-competitive, proximity, Kwinana Industries Council, industry champions
- **Potential for further synergy development**
 - Move beyond low-hanging fruit
 - Industry commitment

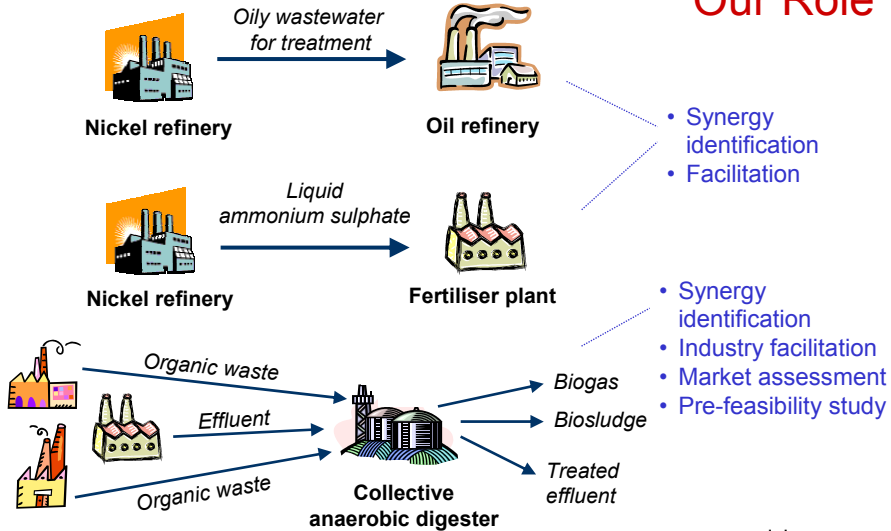


CSRP Kwinana Synergies Project

- **Aim**
 - Provide practical support to industries for the identification and evaluation of synergy opportunities
- **Partners**
 - Centre for Sustainable Resource Processing
 - Kwinana Industries Council
 - Kwinana industries
- **Current focus areas**
 - By-products, water, energy
 - Progressing 15 promising synergies
 - Short/medium term
 - Collective Kwinana strategies
 - Medium/long term



Some Promising Synergies Our Role



- Synergy identification
- Facilitation
- Synergy identification
- Industry facilitation
- Market assessment
- Pre-feasibility study

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Inorganic By-Products



- **Approach**
 - Focus on bauxite residue and gypsum
 - Find practical short-term and high volume reuses
 - Link into local construction developments
- **Lessons learnt**
 - Start with a market assessment
 - Transportation cost is a critical factor
 - Current regulatory barriers
 - Community perception / misunderstanding
 - Benefits from collaborative approach
 - Absence of methods to measure sustainability benefits

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Water



- **Approach**
 - Mapping of company water inputs and outputs
 - Water synergy scoping study + workshop
- **Lessons learnt**
 - Currently low water prices, but increasing
 - Changing business drivers for water conservation
 - Promising water synergies exist
 - One-on-one company and collective for Kwinana
 - Apply direct reuse or low cost technologies
 - Sustainability through diversity of water supply

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Energy



- **Approach**
 - Industry energy survey (uses and losses)
 - Energy synergy scoping study + workshop
- **Lessons learnt**
 - Changing business drivers for energy conservation
 - Focus on energy recovery from flue gases
 - Highest energy contents (TJ) and temperatures
 - Proven simple technologies seem most attractive
 - Significant energy losses over larger distances
 - Feasibility depends on energy needs of user

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Conclusions



- **Progressing new synergies**
 - Move beyond low hanging fruit
 - Significant progress made to date
 - Synergy development does not happen overnight
 - Assistance to meet industry research needs
- **Collective Kwinana strategies**
 - Framework to support development of synergies
 - Close collaboration with Kwinana Industries Council
 - Realisation that 'whole > sum of parts'

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Suggestions for Further Reading

- Van Beers D. (forthcoming). Capturing Regional Synergies in the Kwinana Industrial Area - 2007 Status Report. Centre for Sustainable Resource Processing, Perth, Australia.
- Van Beers D., Corder G.D., Bossilkov A., van Berkel R., (2007). Industrial Symbiosis in the Australian Minerals Industry: The Cases of Kwinana and Gladstone. Journal of Industrial Ecology, Vol. 11, no.1.

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Questions and Comments



Dick van Beers
Centre of Excellence in Cleaner Production
Curtin University of Technology
www.csrp.com.au
Phone +61 (0)8 9266 3268
Email: d.vanbeers@curtin.edu.au



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