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# Toolkit Application for Regional Synergy Opportunities

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A. Bossilkov, "Toolkit Application for Regional Synergy Opportunities"



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## CSRP Enabling Tools and Technologies

- Aim
  - developing a platform for the identification, evaluation and implementation of synergy projects
- Elements
  - Best practice review and promotion
    - [www.csrp.com.au/database/](http://www.csrp.com.au/database/)
  - Tools to aid implementation of regional synergies
    - Identification and screening new synergies
    - Assessment of technology needs



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## The Toolkit

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- **Less-resource intensive way to identify & evaluate synergy opportunities**
  - **Preliminary Assessment Tool**
    - No industry data required
    - Establishing the business case
  - **Inventory Tools**
    - Real industry data
    - Materials/By-products, Water & Waste Heat
  - **Screening Tool**
    - Prioritisation of synergy opportunities
    - Sustainability benefits & Ease of implementation



## Application Areas

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- **Completed**
  - Kwinana Industrial Area, WA (all)
  - Gladstone Industrial Area, QLD (all)
  - Geelong Region, VIC (preliminary)
  - Wagga Wagga, NSW (preliminary)
  - Hydrogen Energy (inventory)
- **Upcoming**
  - Rustenburg, South Africa (inventory, screening)
  - Geelong, VIC (inventory, screening) ?
  - Wagga Wagga, NSW (inventory, screening) ?
  - Hydrogen Energy (screening)





## Kwinana Industrial Area, WA

- **Comparison study**
  - Kwinana Synergies Project
    - Hands-on support on development and implementation
    - Companies' data collection
      - Data sheets, water and energy surveys
    - Synergy identification
      - By-products – 42; Water - 25; Energy - 10
      - Elaborate and time consuming
  - Toolkit application
    - Data as supplied
      - Material/By-products - >400 inputs, >500 outputs
        - » Categories & subcategories
      - Water - 10 largest users
      - Waste heat - 17 largest users



## Kwinana Industrial Area, WA (cont)

- **Materials/By-products Tool**
  - 7 synergies not captured (out of 42)
    - Suggested by companies, insufficient data
  - 10 more generated
    - Collective initiatives in purchasing and recycling
    - Streams that are not focus areas for Kwinana Synergies Project (recyclables, plastics, metals)
    - Low quantity, insufficient data
- **Water Tool**
  - Replication on one-to-one synergies
  - No results on collective synergies
- **Screening Tool**





## Gladstone Industrial Area, QLD

- Same approach

- Gladstone Synergies Project

- Lower number of industries
    - Data on materials/by-products only
    - Synergy identification - 26 short and long term



- Toolkit application

- Data for Material/By-products - >50 inputs, >120 outputs
    - 1 synergy not captured
      - Input not covered by data collection
    - 4 more suggested



## Geelong Region, VIC

- Application of Preliminary Assessment Tool

- Potential Synergy Opportunities - Geelong

- Wastewater exchanges
    - Alternative feeds for cement production
      - Boiler ash, baghouse dust, gypsum, catalysts, slag, sand
    - Alternative fuels for cement production
      - Fuel gas, Spent oils waste grain/dust, rubber, tyres, wood waste/saw dust, spent solvents and oils, used rags/fibre waste, filter bags/filters, biosludge
    - Boiler ash, cement kiln dust, slag, refractory waste and sand for road construction applications
    - Sand for abrasive blasting
    - Organic waste for agricultural applications
    - Sulphur for fertiliser manufacturing
    - Other opportunities:
      - Various spent acids/acid solutions, various spent caustic soda/alkaline solutions, filter cakes, various sludges



## Hydrogen Energy

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- **BP & Rio Tinto JV**
  - Proposed ICGCC plant
  - Scoping study for industrial synergies opportunities investigation
- **Suggested synergy opportunities**
  - Inputs
    - Number of water sources identified based on quality and distance
    - Alternative fuels to supplement coal
  - Outputs
    - Potential opportunities for: Slag, N<sub>2</sub>, H<sub>2</sub>, S, CO<sub>2</sub>, H<sub>2</sub>S
  - Further investigation and screening



## Toolkit Benefits and Issues

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- **Benefits**
  - Rapid & streamlined assessment of synergy opportunities
  - Provides user with guidance and support
  - Results extensively correspond with identified opportunities
- **Issues**
  - Data
    - Lack of detail, confidentiality, availability
    - Results for materials and by-products affected most
  - Scoping