

Il ruolo della simbiosi industriale per la Prevenzione della produzione di rifiuti: a che punto siamo?

Designing Regional Industrial Symbiosis Networks *Application to the Apulia Region*

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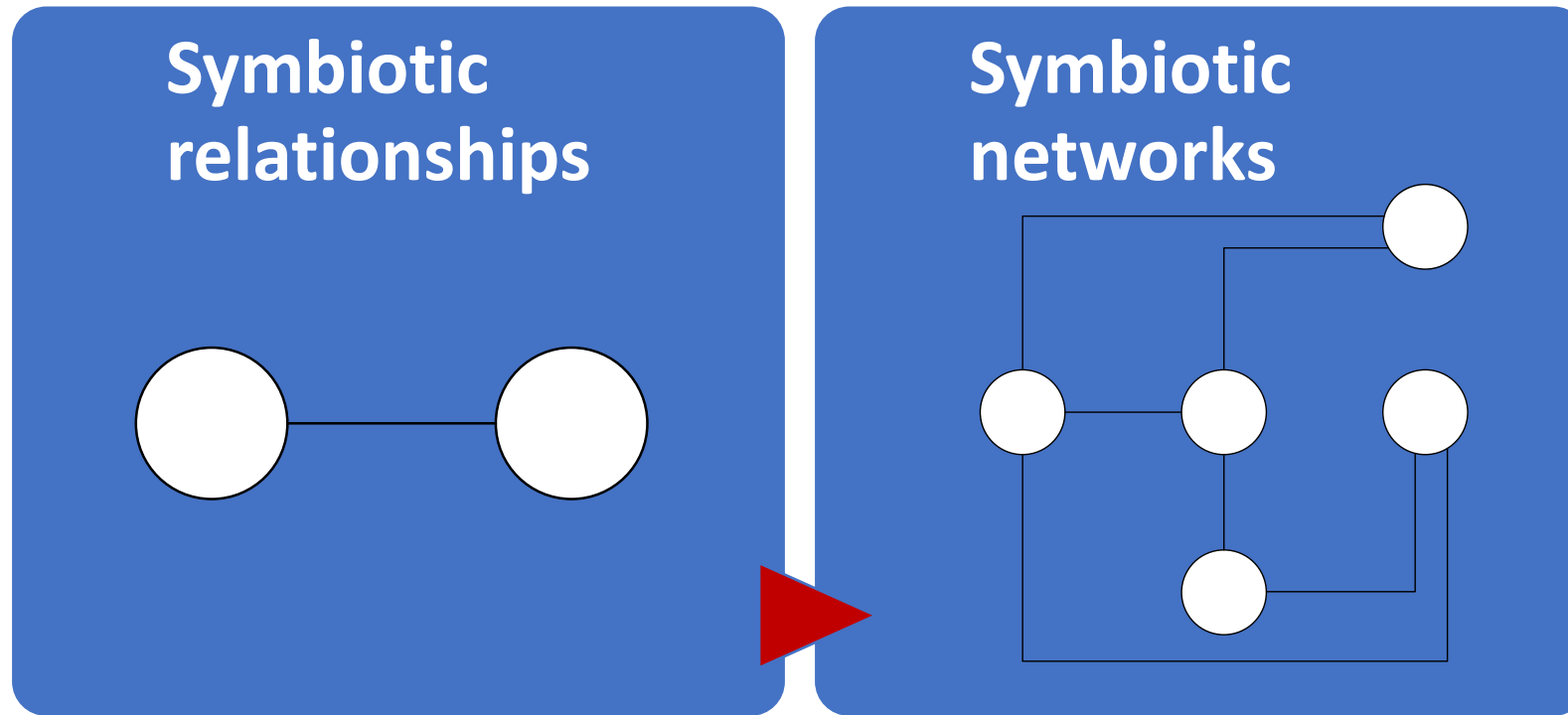
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Agenda

- Introduction
- Research Aim and Contribution
- Developed tools and methodologies
- Application to the Apulia region
- Conclusions

Moving towards industrial symbiosis networks



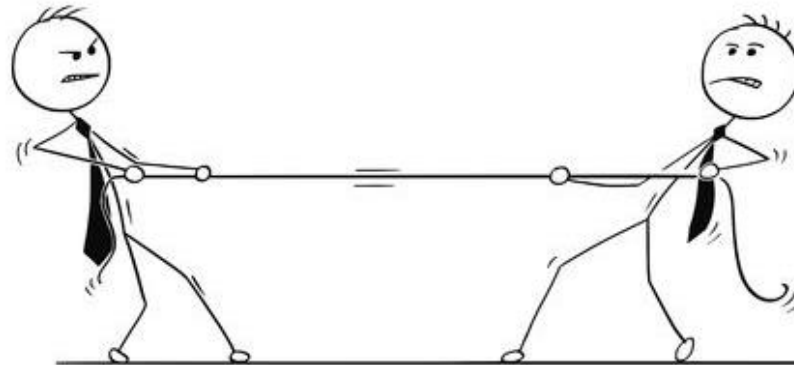
- + opportunities
- + redundancy
- + resilience

The spatial scale of industrial symbiosis networks



Social relationships

Transportation costs



Number of potential partners

Amounts of wastes

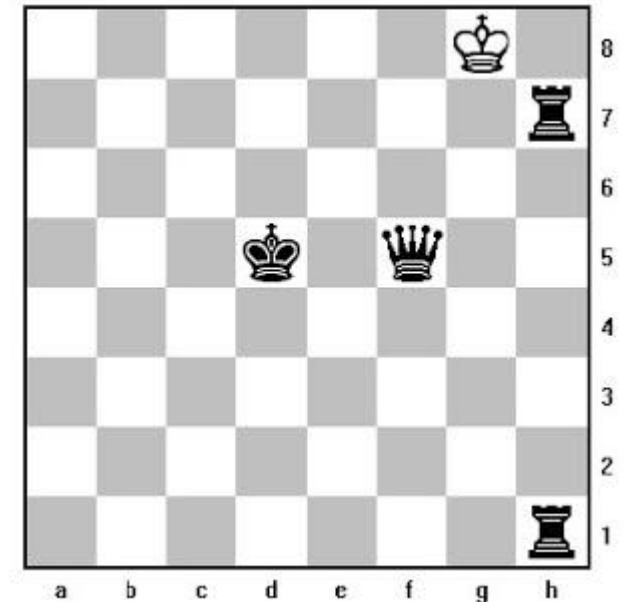
Industrial symbiosis at regional level



- Several attempts to design regional industrial symbiosis networks...
- ... but with the same remark

The role of information on potential partners!

- Companies might not have enough information
- Companies are reluctant to share information



Aim and contribution of our research

- Proposing a method to design regional industrial symbiosis networks overcoming the information barriers
- Two contributions
 1. Building a dictionary of all the potential symbiotic synergies implementable among couples of companies → “waste-input relationship table”
 2. Designing a procedure to identify and select all the potential symbiotic synergies that can be implemented among the companies belonging to a given region
- Test on the Apulia Region

(1)

The waste-input relationship table

- Based on symbiotic relationships described in the literature

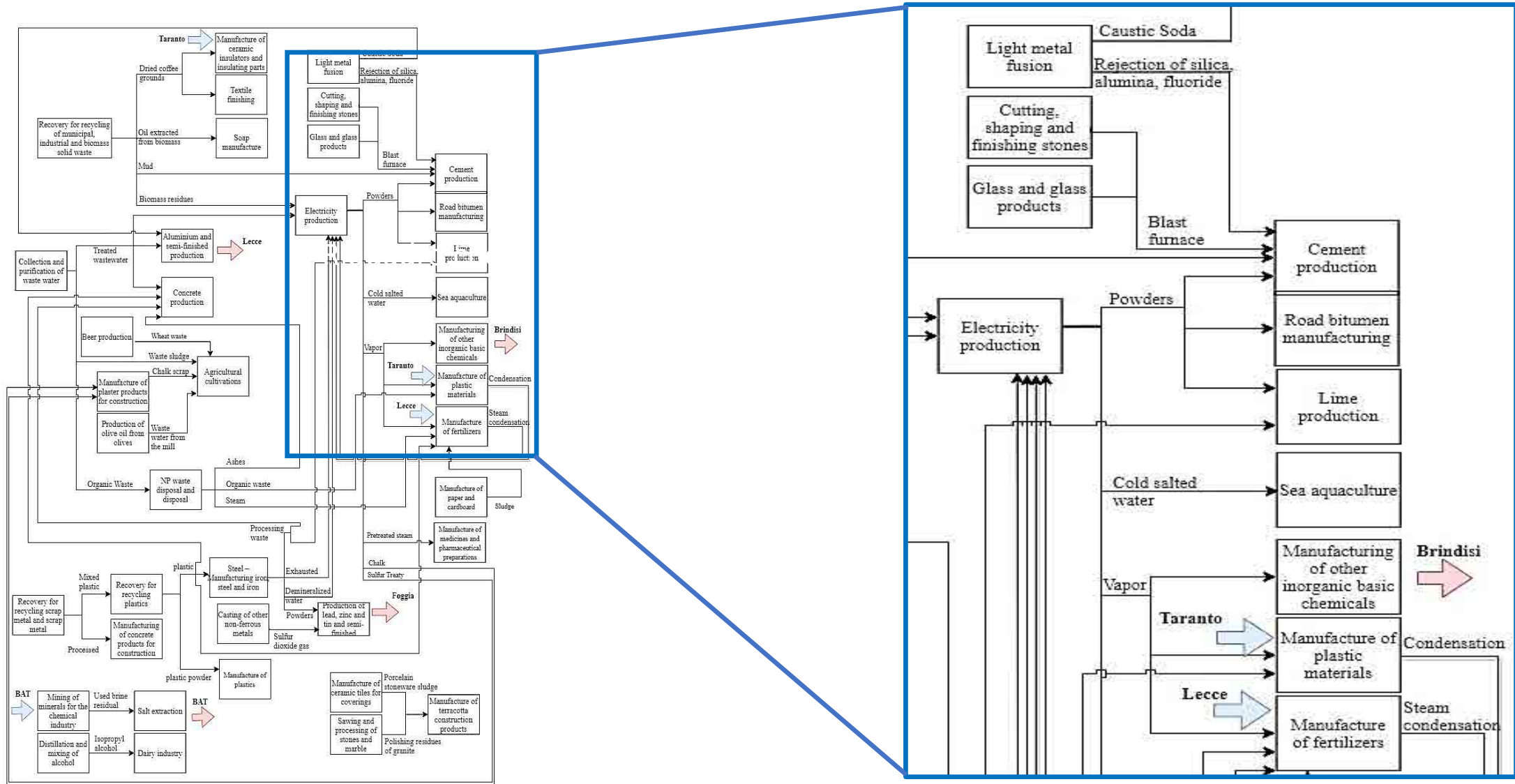
| Waste producer | | Waste exchanged | | | Waste user | | Use | Reference | |
|---------------------|---|---|--------------------|----------|------------------------|------------------------------------|------------|---|--|
| NACE waste producer | Description waste producer | Waste | Subcategory wastes | EWC | Description waste user | NACE waste user | | | |
| A | 01.11.10 | cultivation of cereals (excluding rice) | Corn residues | organic | 02 01 03 | Biogas production plants | E 38.21.09 | Input | (Waste, contaminated sites. (S.D.). ER Ambiente: s.d.) |
| | | | | organic | 02 04 99 | | | | |
| | 01.14.00 | Farms: Cultivation of sugar cane | Wheat straw | organic | 02.04.99 | Power plants | D 35.11.00 | Biofuel | (Herczeg et al., 2018) |
| | 01.2 | Farms | Wheat straw | organic | 02 01 03 | Power plants | D 35.11.00 | Biofuel | (Herczeg et al., 2018) |
| | 01.23.00 | Citrus cultivation | Citrus waste | organic | 02 01 03 | Plant for making yarns and fabrics | C 13.20.00 | Input to extract cellulose | (Santanocito & Vismara, 2013) |
| | 01.28.00 | Growing of spices, aromatic and pharmaceutical plants (eucalyptus plantation) | Shrub scraps | organic | 02 01 03 | Power plant | D 35.11.00 | Vegetable charcoal as a substitute for black coal | (Chertow, 2007) |
| | | | | organic | 02 01 07 | | | | |
| 01.50.00 | Farms: Agricultural crops associated with animal breeding: mixed activity | Wheat straw | organic | 02 01 03 | Power plants | D 35.11.00 | Biofuel | (Herczeg et al., 2018) | |
| 01.65.00 | Farms: Activities following the harvest | wheat straw | organic | 02 01 03 | Power plants | D 35.11.00 | Biofuel | (Herczeg et al., 2018) | |

(2)

Designing regional industrial symbiosis networks

1. Assessing the number of economic activities within the region → [Censimento Imprese ISTAT](#)
2. Classifying these activities by the NACE code
3. Collecting/assessing the amounts of wastes produced by each firm
 - Collecting → [Camere di Commercio](#)
 - Assessing → [Rapporto Rifiuti Speciali ISPRA + Censimento Imprese ISTAT](#)
4. Selecting the rows of the waste-input relationships table
5. Mapping the potential symbiotic relationships

Potential relationships in the province of Bari



Conclusions

- Practical implications
 - Disclosing information among companies
 - Assisting policymakers in identifying opportunities to support
 - Tool for regional development
 - A first assessment of potential environmental benefits
- First attempt
 - Waste-input relationship table might be not exhaustive
 - Assessment of potential benefits to be developed

Thank you for your attention!

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