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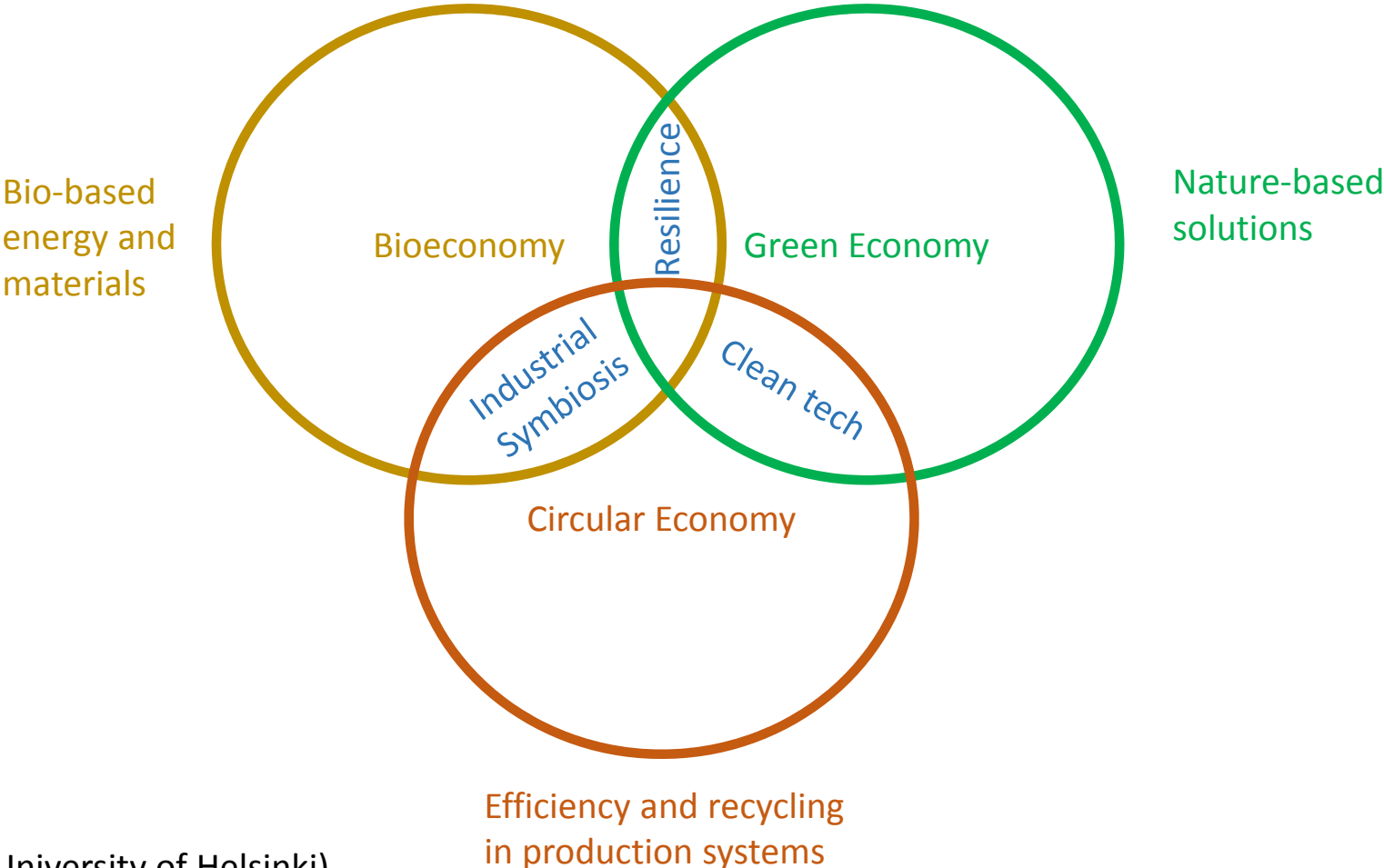
# The value chain for valorisation of organic waste in promotion of a circular bioeconomy: A literature review

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# Why?



Bio-based energy and materials

Bioeconomy

Green Economy

Nature-based solutions

Resilience

Industrial Symbiosis

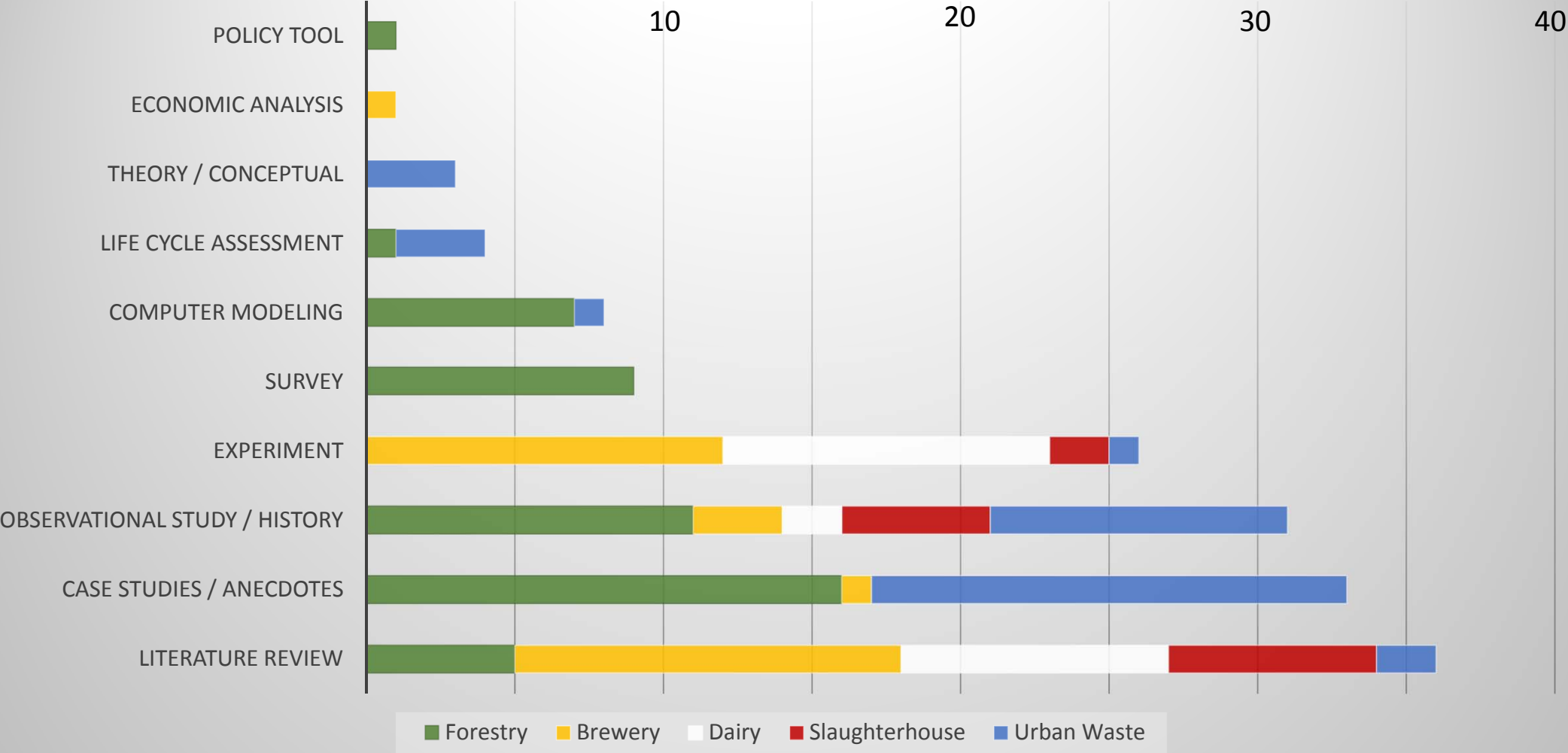
Clean tech

Circular Economy

Efficiency and recycling in production systems

(Figure adapted from University of Helsinki)

# Distribution of Methods by Sector



# Preliminary Results

| Value Chain    | Resource Procurement | Transport and Handling | Transformation and Processing | Valorization and Market | End Use |
|----------------|----------------------|------------------------|-------------------------------|-------------------------|---------|
| Forestry       | 23                   | 12                     | 12                            | 27                      | 10      |
| Slaughterhouse | 0                    | 6                      | 2                             | 4                       | 4       |
| Dairy          | 2                    | 0                      | 6                             | 2                       | 2       |
| Brewery        | 3                    | 3                      | 8                             | 11                      | 11      |

| Drivers        | Policy and Governance | Business Strategies | Economics and Costs | Demand Sectors | Innovation and R&D | Actors and Networks |
|----------------|-----------------------|---------------------|---------------------|----------------|--------------------|---------------------|
| Forestry       | 24                    | 32                  | 11                  | 7              | 14                 | 8                   |
| Slaughterhouse | 0                     | 0                   | 6                   | 0              | 0                  | 0                   |
| Dairy          | 4                     | 0                   | 1                   | 4              | 1                  | 0                   |
| Brewery        | 1                     | 3                   | 11                  | 9              | 17                 | 1                   |

Experimentation



**Brewers' Grains**

Drivers

-Innovation

Value Chain

-Market, End use

Method

-Experiment



**Dairy Whey**

Drivers

-Demand Sectors

Value Chain

-Transformation & Processing

Method

-Experiment

Market, Resource, Policy

Value Chain

Processing, Handling

Methods



**Forestry Sawdust**

Drivers

-Policy, Business

Value Chain

-Resource, Market

Method

-Case Studies



**Slaughterhouse By-products**

Drivers

-Economics & Cost

Value Chain

-Transport & Handling

Method

-Observational Study

Observation, Case Studies

Push-Pull: complex

# Conclusions



- Roughly 25% of literature on value chains for organic waste valorization are reviews
- Opportunities for sectors to learn from each other (though some resource specific attributes)
- Correlations create unexpected, complex push-pull relationships
  - Innovation as a driver: end use and valorization (e.g. Brewery)
  - Demand as a driver: transformation technology (e.g. Dairy)
  - Economics and cost drivers: transport and handling (e.g. Slaughterhouse)
  - Policy and business strategies: resource procurement (e.g. Forestry)