Synergy parks
inter-organisational collaborations
by sharing bio-based resources

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OUTLINE

1) Introduction
2) Synergy park examples, the Netherlands
3) Synergy park examples, Belgium
4) Conclusions
5) Policy recommendations
1. INTRODUCTION

Synergy park definition

A synergy park is a collaboration among heterogeneous partners (mainly agricultural and industrial), aiming at enhanced economic and environmental performance, sustainable agri-food production, and biomass utilization through sharing utilities and exchanging waste and by-products.

Characteristics of synergy parks

- Geographical proximity
- Technological proximity
- Complementarity
- Cultural proximity
- Heterogeneity
- Innovation
- Large investments
- Long term
- Large scale
- Involvement of many external actors
1. INTRODUCTION

Impact of bio-based businesses

+ • Substitute fossil fuel • Energy security • Reduced use of mineral fertilizer • Waste reduction • Employment

− • Land use conflict • Acidification • Risk for biogas leaks • Bad smells • Soil erosion • More CO2 • Reduced biodiversity • Deforestation

2. SYNERGY PARK EXAMPLES, THE NETHERLANDS

Can the negative impacts be reduced via collaborations in synergy parks?
2. SYNERGY PARK EXAMPLES, THE NETHERLANDS

Bergerden, Gelderland

Organizations involved – 17
- Micro – 9
- Small – 7
- Medium – 1

Aim
Clustering horticultural companies to enable synergies via joint heat, electricity, water, and carbon dioxide exchange systems, use of rest heat and electricity created by bio-energy production technologies, recycle and reuse of bio-waste to produce energy and fertilizer.

Achievements
Co-location of 12 horticultural growers by 2013 that share energy and water use systems.

Challenges
- several horticultural companies went bankrupt
- energy cooperation went bankrupt
- start collaboration with Bio-based Bergerden delayed.
2. SYNERGY PARK EXAMPLES, THE NETHERLANDS

**Agriport A7, North Holland**

Organizations involved – 24
- Micro – 9
- Small – 4
- Medium – 6
- Large – 5

**Aim**
Clustering large scale horticultural, livestock, logistic, energy companies to create sustainability benefits through synergies. The spatial concentration of agricultural companies enables the sharing of resources and bio-mass waste use.

**Achievements**
The joint logistics system and joint ownership of an energy company that produces energy via geothermal heat and power system and supplies heat, gas and electricity to the glasshouses. Local biogas plant uses the local green waste and provides green energy and CO2 to local glasshouses.

**Challenges**
Installation of large scale biomass digester at location, co-location of intensive animal husbandries and fish farms, etc.
# 2. SYNERGY PARK EXAMPLES, THE NETHERLANDS

## InnoFaseEnergy, Gelderland

Organizations involved – 11 (at the development)

**Aim**
Green energy production through new technologies, speed up the transition via renewable Sources: from TRASH to TREASURE

### Achievements

<table>
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<tr>
<th>Workgroups</th>
<th>Concept</th>
<th>Smart, because</th>
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<tbody>
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<td>1. Resource Synergy</td>
<td>Energy &amp; resource synergy AVR-WRIJ Lokal symbiosis</td>
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<tr>
<td>2. Power-2-Fuel</td>
<td>Energy from biomass: conversion to transportfuel (H2 production) Flexible electricity</td>
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<td>3. Power-2-Gas</td>
<td>Energy from biomass and Co2 recovery (CH4 production) Flexible Energy-mix</td>
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<td>4. Carbon Resourcing</td>
<td>Convert CO2 from biomass into resource CO2-Positieve Industry</td>
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**Challenges**
biomass incineration has the disadvantage of substantial CO2 emissions; biomass digesting (WRIJ Waterboard) + CHP unit has a low energy efficiency.
1. INTRODUCTION

Impact of synergy parks

- Reduced CO2
- Shorter transportations
- More waste use
- More waste reduction
- Economies of scale
- Clean energy production
- Efficient use of resources
- Reputation

- Increased costs
- Large scale land use
- Traffic congestions
- Visual appearance
- Increasing density of population

2. SYNERGY PARK EXAMPLES, THE NETHERLANDS

Can the negative impacts be reduced via collaborations in synergy parks?

YES, Partially
Can the energetic valorization of biomass be accelerated via collaborations in synergy parks?

Synergy park ‘Roeselare’
3. SYNERGY PARK EXAMPLES, BELGIUM

Synergies for biogas

**Aim**
Increase energetic valorization of biogas from food sector

**Action**
Feasibility analysis of joint biogas station
Challenges

- Not profitable without financial support
- Share of responsibility and costs
- Spatial planning

Synergies for biogene residual heat

Aim
Increase valorisation of residual heat from biomass installations

Action
Feasibility analysis of green district heating network
3. SYNERGY PARK EXAMPLES, BELGIUM

Biogene residual heat

Challenges
- Inventarisation is very intensive
- Coordination
- Economic profitability

Next steps
- Optimisation of coupling scenarios
- Short term: 1-1 or 1-N coupling
- Long term: heat network
3. SYNERGY PARK EXAMPLES, BELGIUM

Can the energetic valorization of biomass be accelerated via collaborations in synergy parks?

YES, there is a large potential, BUT practical problems and low profitability

4. CONCLUSIONS

The benefits of inter-organizational collaborations in bio-based businesses mostly overweight the negative outcomes and is therefore preferable than fossil fuel.

HOWEVER, the practical implementation of synergies is not easy!

1. Biomass should be used carefully and thoughtfully.

2. Synergy park is a system innovation that requires engagement and commitment of various stakeholders over a long term.

3. Synergy park requires high investment costs especially at the establishment phase. Easier to establish for future industrial parks.
5. POLICY RECOMMENDATIONS

- Strengthen support to SME’s that are involved in activities for sustainable production.
- Promote industries and productions at location that can provide opportunities for sufficient biomass supply and use. Secure biomass supply.
- Support start-up companies to establish long-term relations with other local companies.
- Support building new infrastructure, such as roads, pipelines.
- Need for a matchmaker/network broker, e.g. public officer.
- Need for a networking platform.
- Need for labelling system to warrant the content, quality and the potential application of the exchanged products.

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Questions?