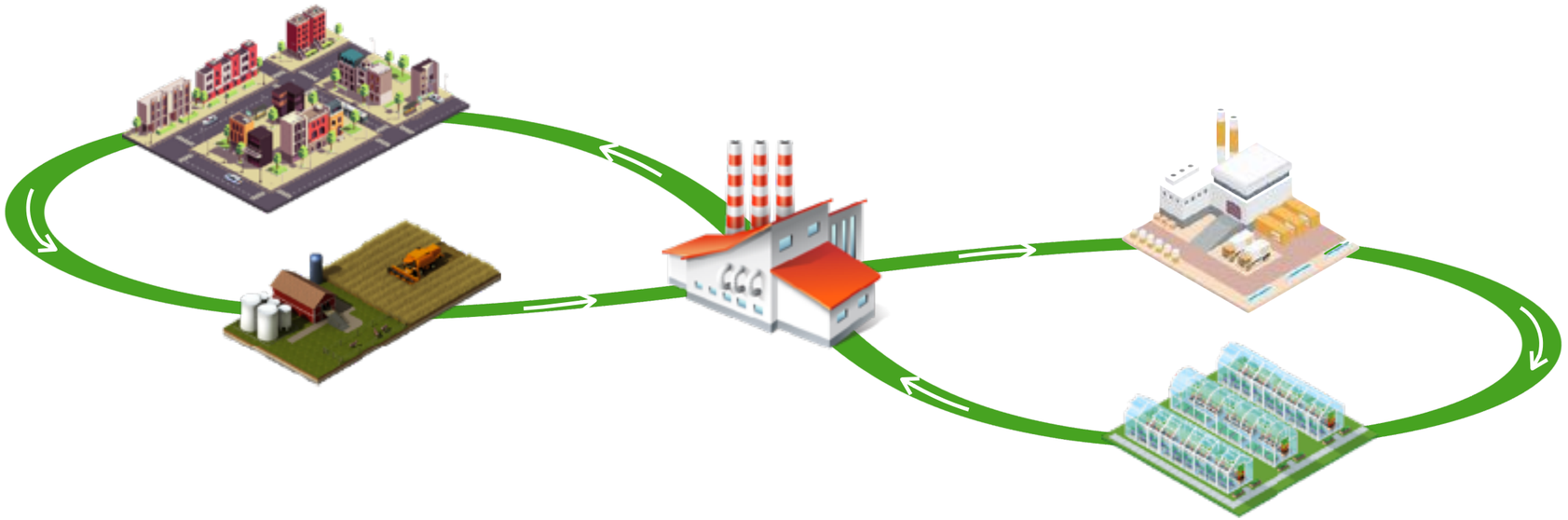
Industrial Symbiosis Practitioner Training



Part 4: Facilitation approaches and tools.

by

Murat Mirata

Environmental Technology & Management

LINKÖPING UNIVERSITY

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BALTIC INDUSTRIAL SYMBIOSIS

Interreg Baltic Sea Region

EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND

Self-organised

Facilitated

Industrial and Urban Symbiosis

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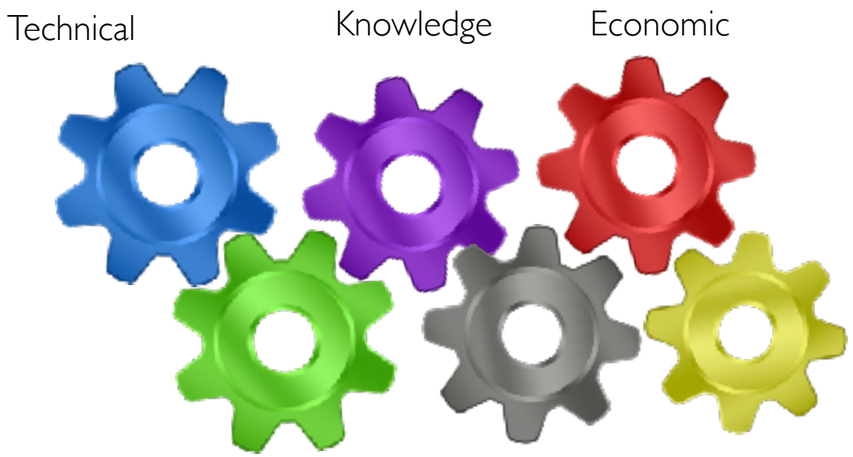
Facilitation

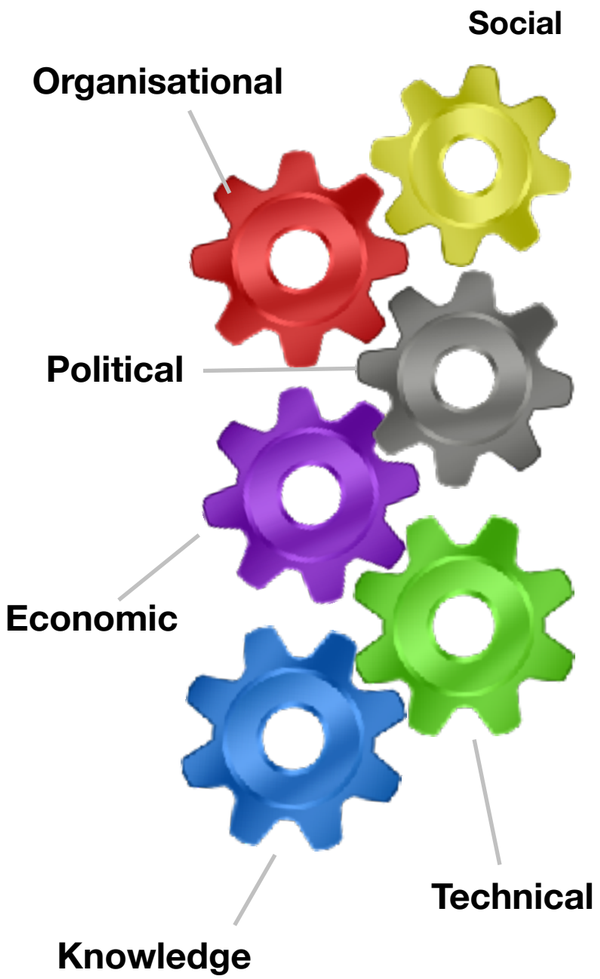
Focused actions to create supportive conditions

Image source: Pixabay

Barriers & enablers



Complex determinants & facilitation



Stakeholder demands

Market conditions

Policies

Prices

Industry mix

Location

Coordination

Intermediation

Communication

Environmental & resource pressures

Innovation

Risk

Learning

Permits

Familiarity

Laws & regulations

Transparency

Culture

Strategy

Contracts

Trust

Environmental & resource pressures

Learning

Resources

Power

Finance

Plans

Business models

Engagement

Knowledge

Feasibility

Policies

Organisations

Shared vision

Resource compatibility

Transaction costs

Compliance processes

Projects

Joint problem definition

Opportunity knowledge

R&D infrastructure

Regional Industrial System

Technology

Business culture

Broader context

Facilitation to create better conditions

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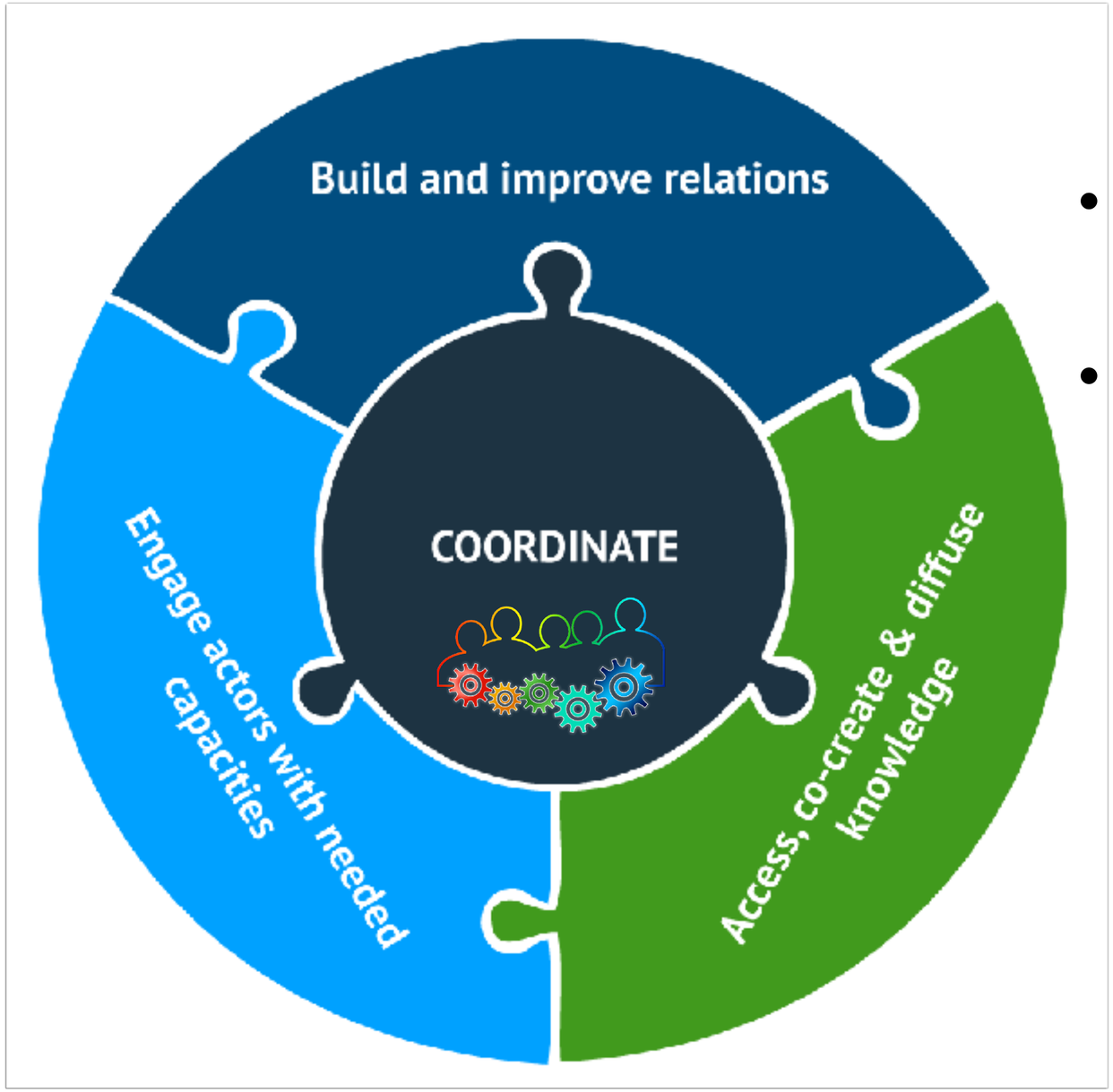
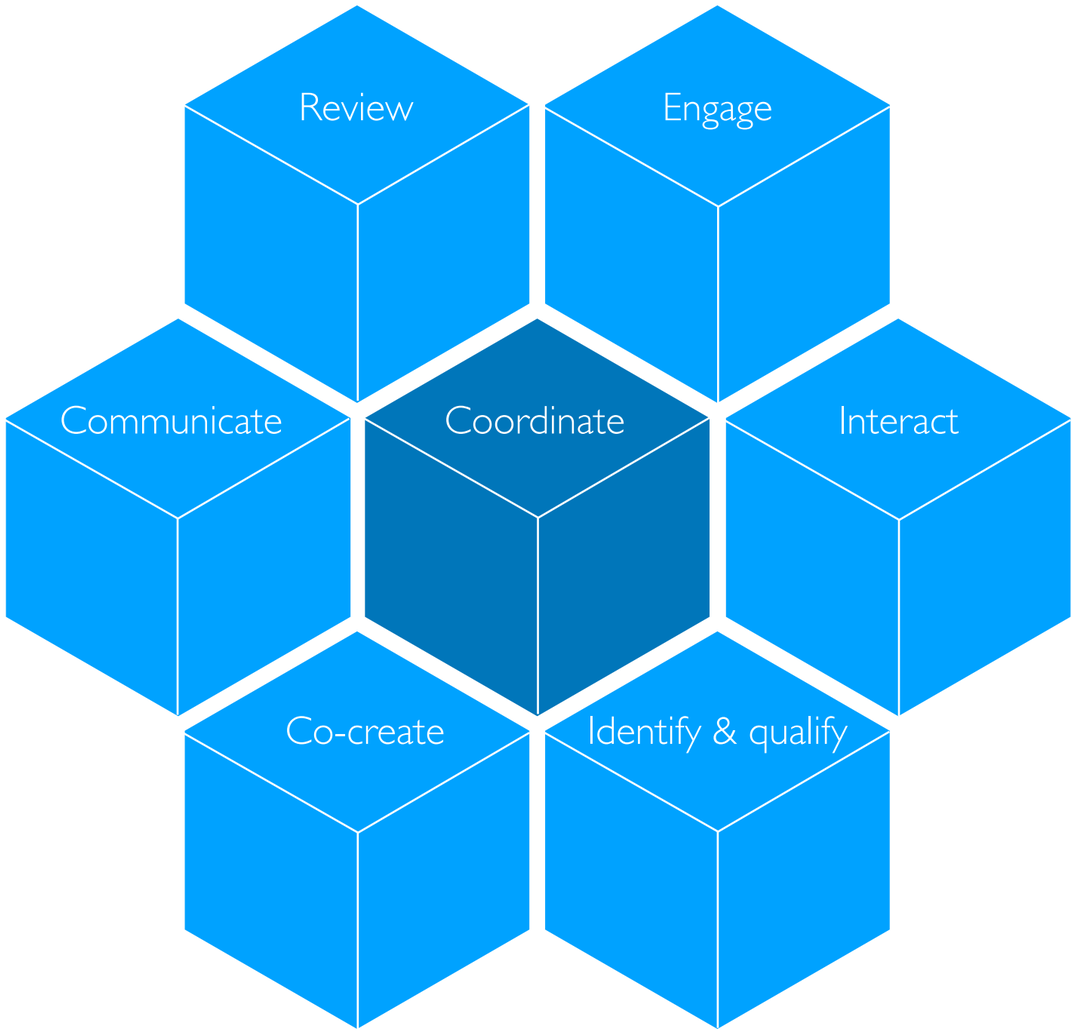
Facilitation - foundation



- It needs to be a process, not a project
- The process will, however, be assisted by dedicated projects.

Systemic facilitation - building blocks



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Organise a dedicated support structure/function

For effective and continual coordination and support

Key features

Neutral
Credible
Broad mandate
Locally embedded
Long-term

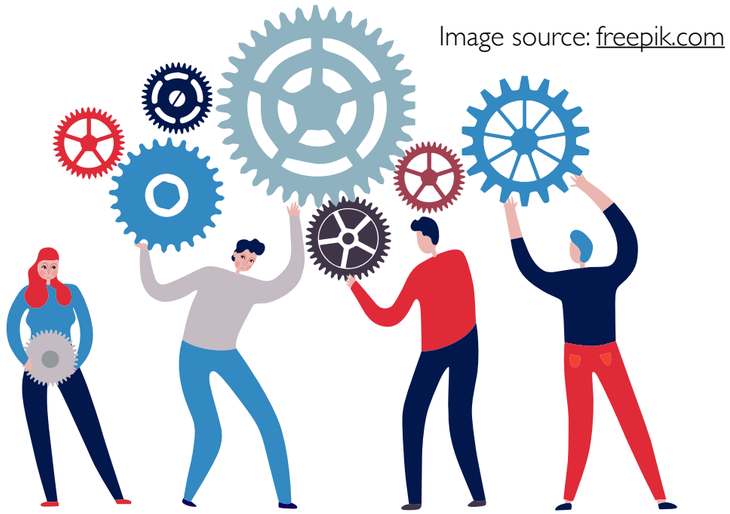

Image source: freepik.com

Knowledge institutions

Public bodies

Businesses or business organisations

Image source: freepik.com

Review

Image source: Pixabay

Review to focus/prioritise (and later on to monitor)

CONDITIONS
To build upon/change/improve

- Strengths and weaknesses

ACTIVITIES
To perform

ACTORS
To engage

Image source: freepik.com

Examples of relevant facilitation activities

Transforming	Informing/educating	Moderating	Acquiring permits
Transferring	Assessing	Visioning	Negotiating
Connecting	Engaging	Researching	Governing
Integrating	Advising	Developing	Monitoring
Identifying	Financing	Acquiring land	Mandating
Communicating	Coordinating	Planning	Governing

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Community of support

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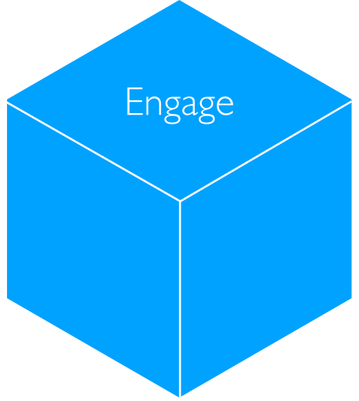
Stakeholder mapping and assessment

INDUSTRIAL SYMBIOSIS FACILITAION STAKEHOLDER ASSESSMENT MATRIX

Activities needed	Local/regional actors	Engagement status	National actors	Engagement status
Awareness and interest from actors raised				
Relations need to built/improved				
Applicable opportunities identified				
Technical investigations/assessments made				
Multiple impacts of opportunities identified				
Opportunities catalogued and followed up Development barriers identified Supportive business models developed				
Resources collected, processed, transferred				
Land availability secured				
Suitable finance secured				
Permit processes lubricated				
Legal advice provided				
Fertile markets created The process monitored, assessed, legitimized				
All of the above coordinated.				
Coordination of all of the above financed.				



Motivate by creating understanding on:

What can IS do for them?

What can they do for IS?

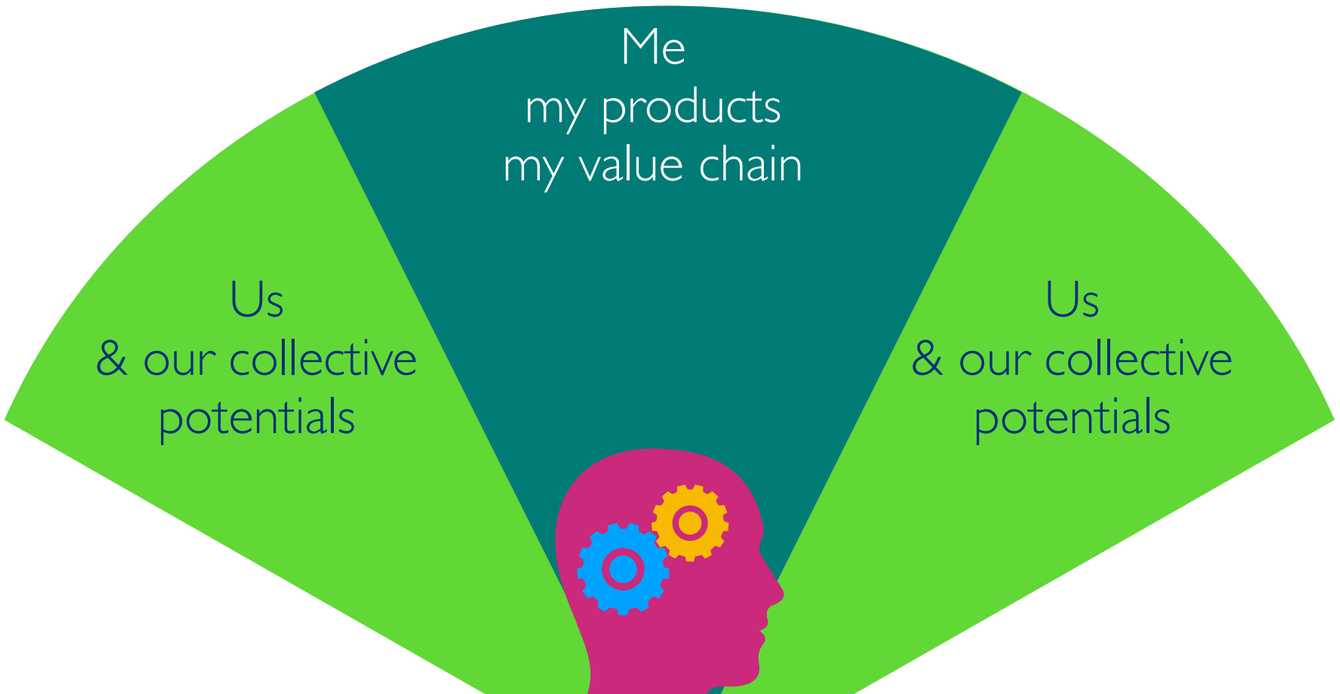
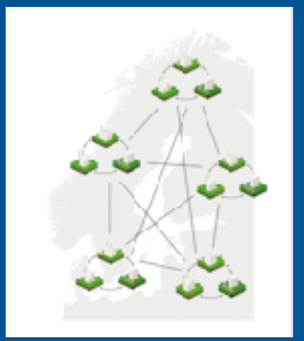


Image source: Freepik.com

Identify & share local experiences

Image source: Freepik.com

Relevant examples from elsewhere



Go to good examples (Organise study trips)

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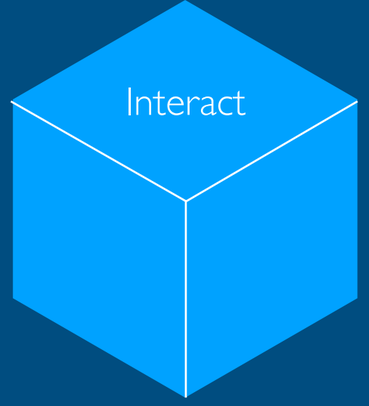

Build/improve relations & communities

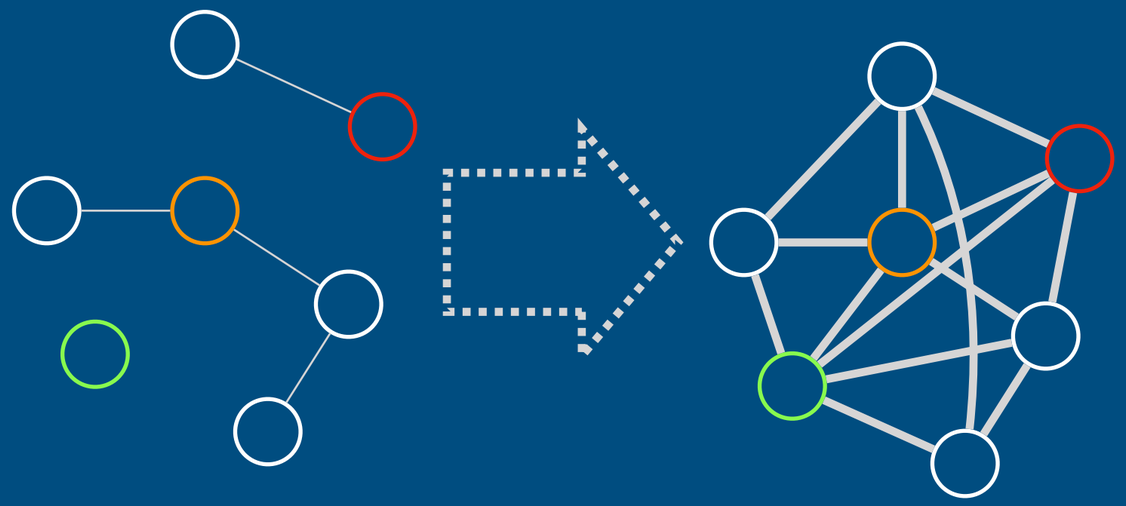

Image from Freepik.com

Innovation communities

Image from Freepik.com

(Physical) platforms for (informal) interaction

Image from Freepik.com

Thematic workshops & meetings.

Breakfast meetings

Example

Malmö stad

DELAD ENERGI

An innovation community

Breakfast meeting

Actors learn about each others' operations, plans, challenges and competencies.

(and get a kanelbulle) 😊

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Assist shared visions and goals

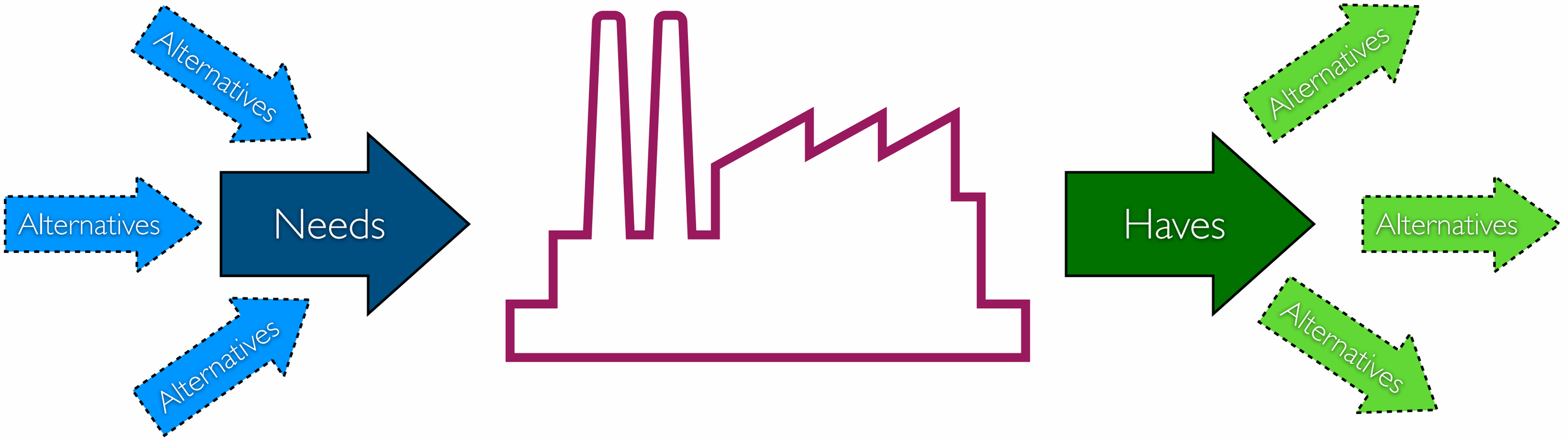
Image: Freepik.com

Create knowledge on:

Image from Freepik.com

- Possibilities
- Performance implications
- Challenges

Knowledge on opportunities



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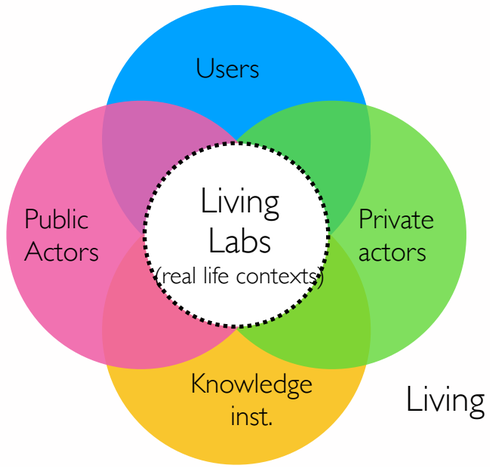
Knowledge on opportunities

Collective

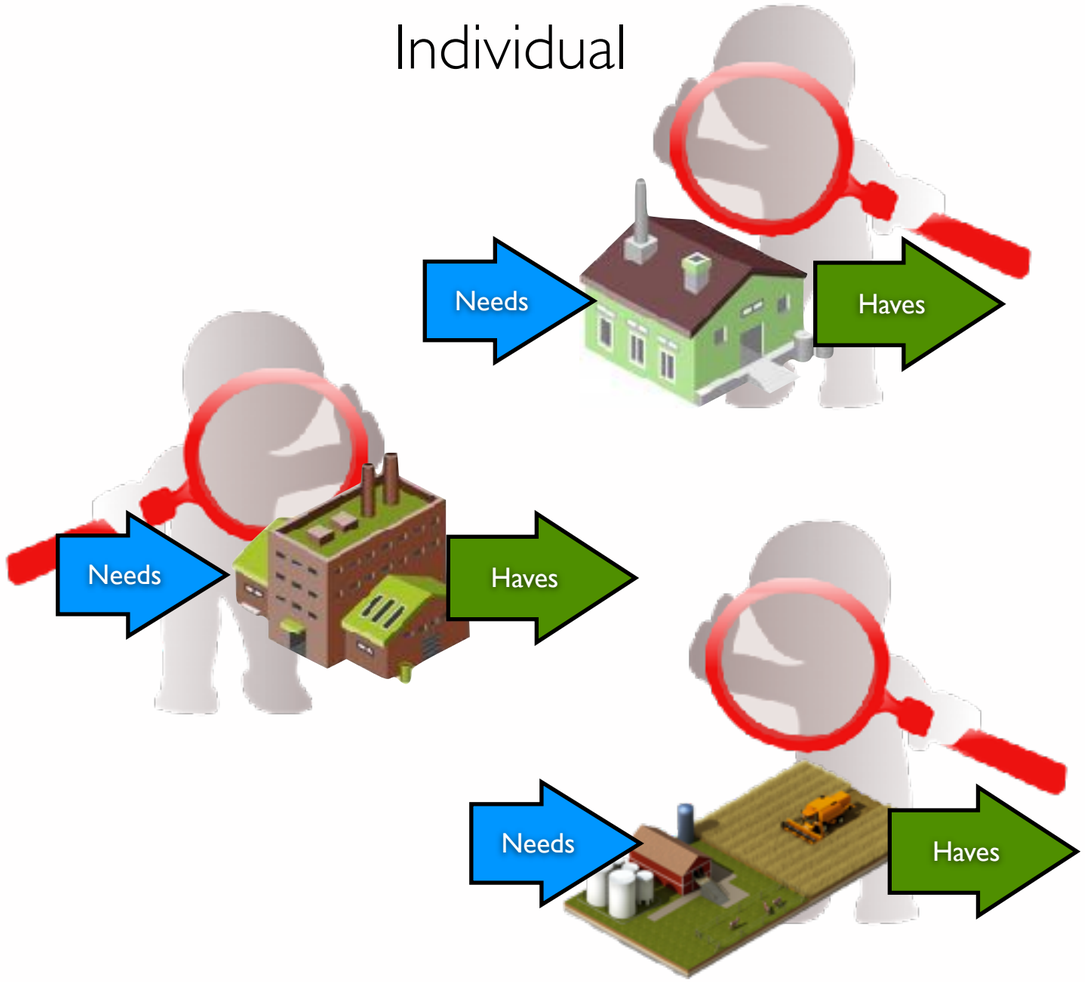
Image Freepik.com

Synergy identification workshops



Living labs

Individual



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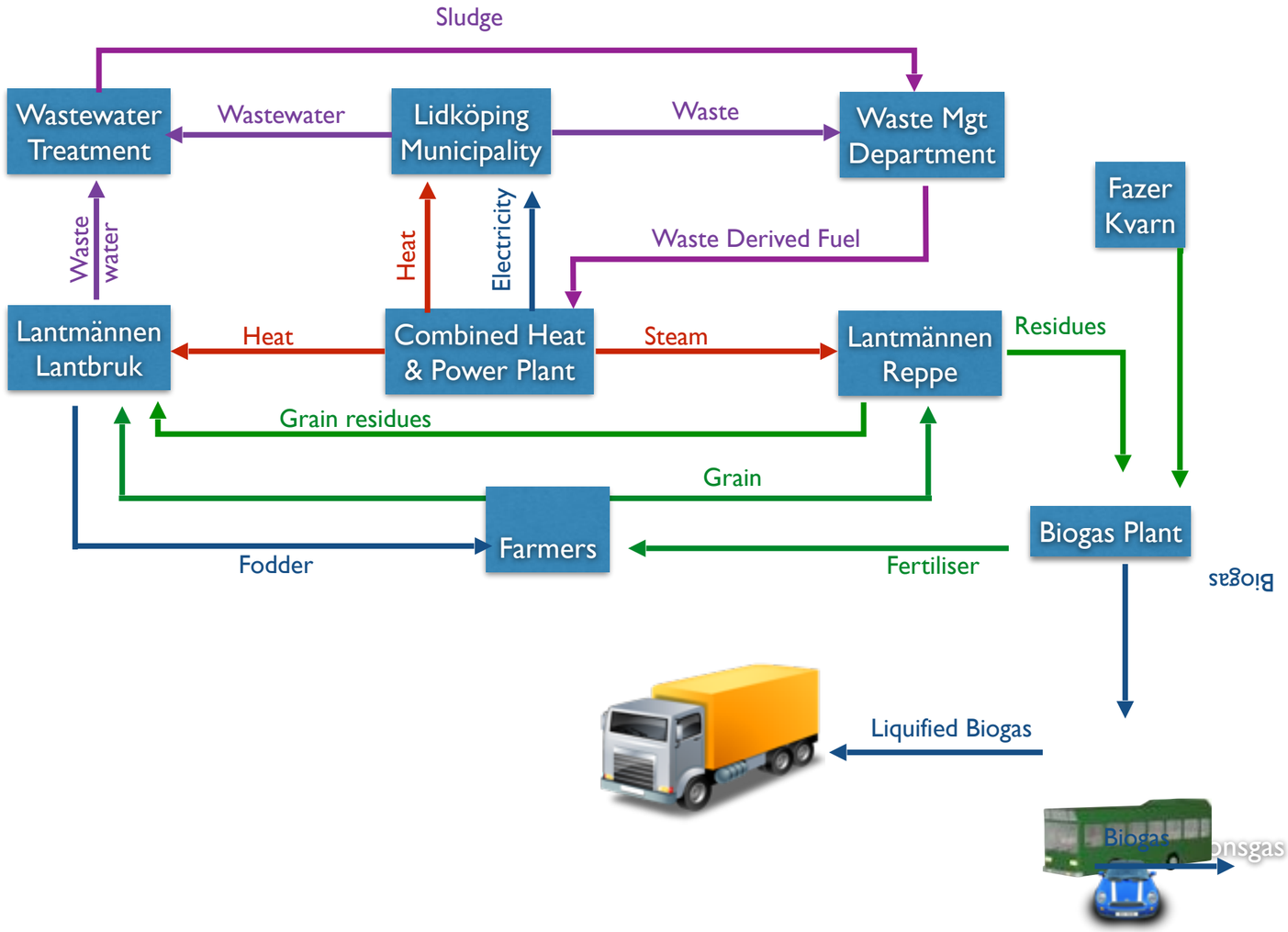
Synergy identification workshops - a magical recipe

What do you need?

What do you have?

Example - Linköping, Sweden



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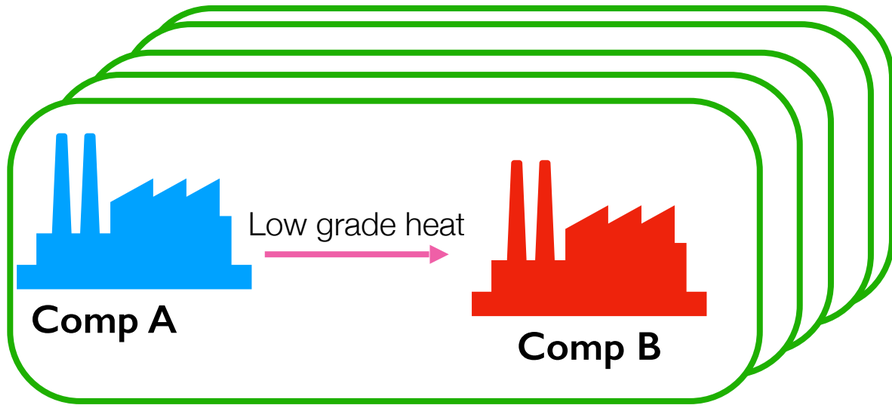
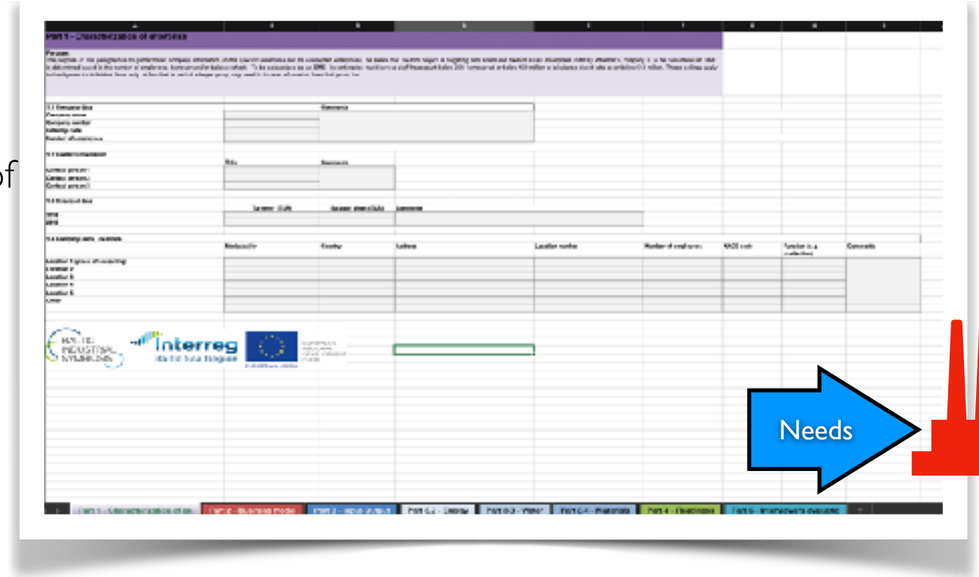
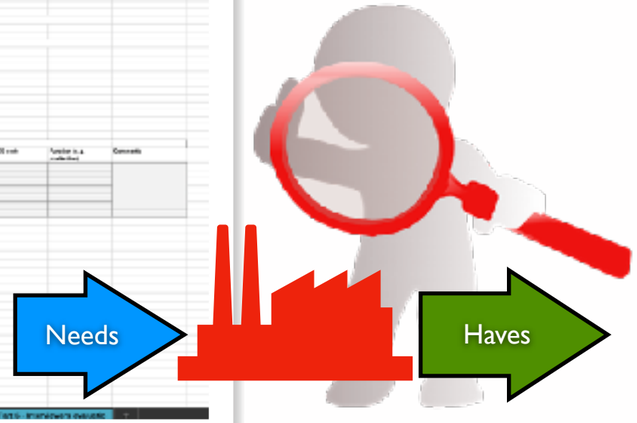


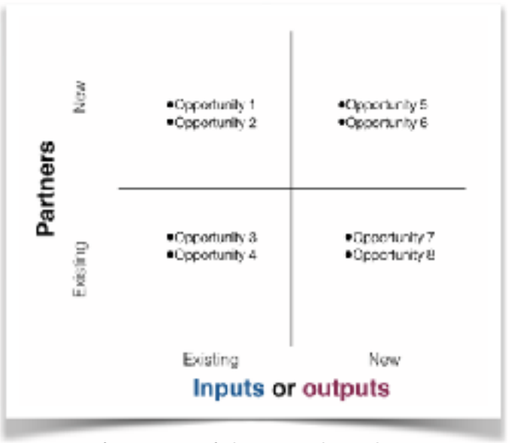
26 new ideas

Individual assessments

Screenings with help of BIS screening tool.

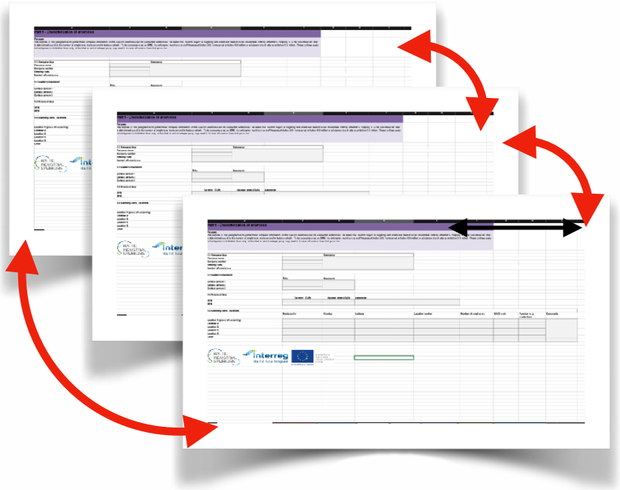






Internal investigations

Screening comparisons



Existing examples?
https://maestri-spire.eu/symbiosis-space/

Technology applications
https://epos.userecho.com

Image Freepik.com

Dedicated research

Murat Mirata

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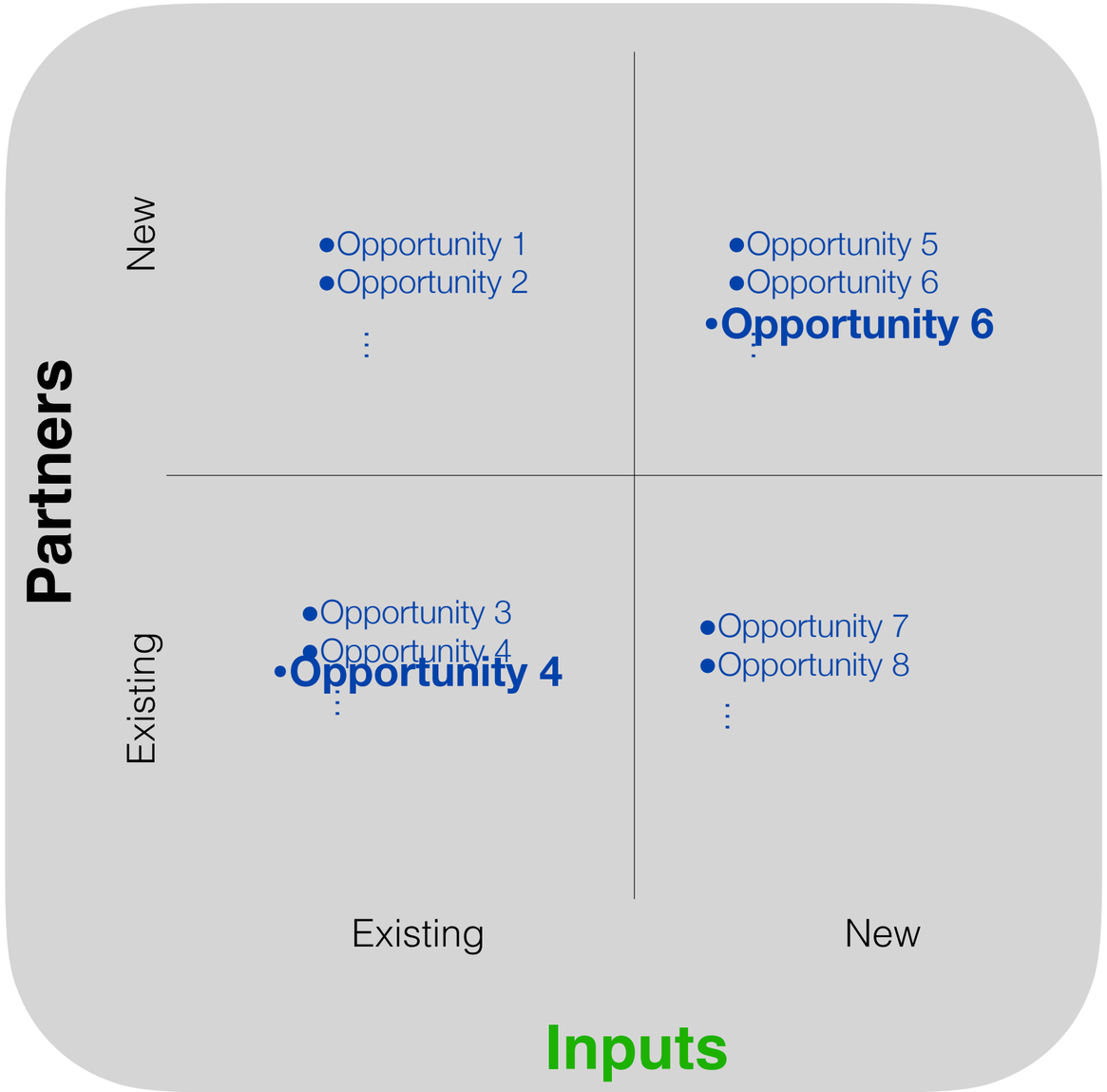
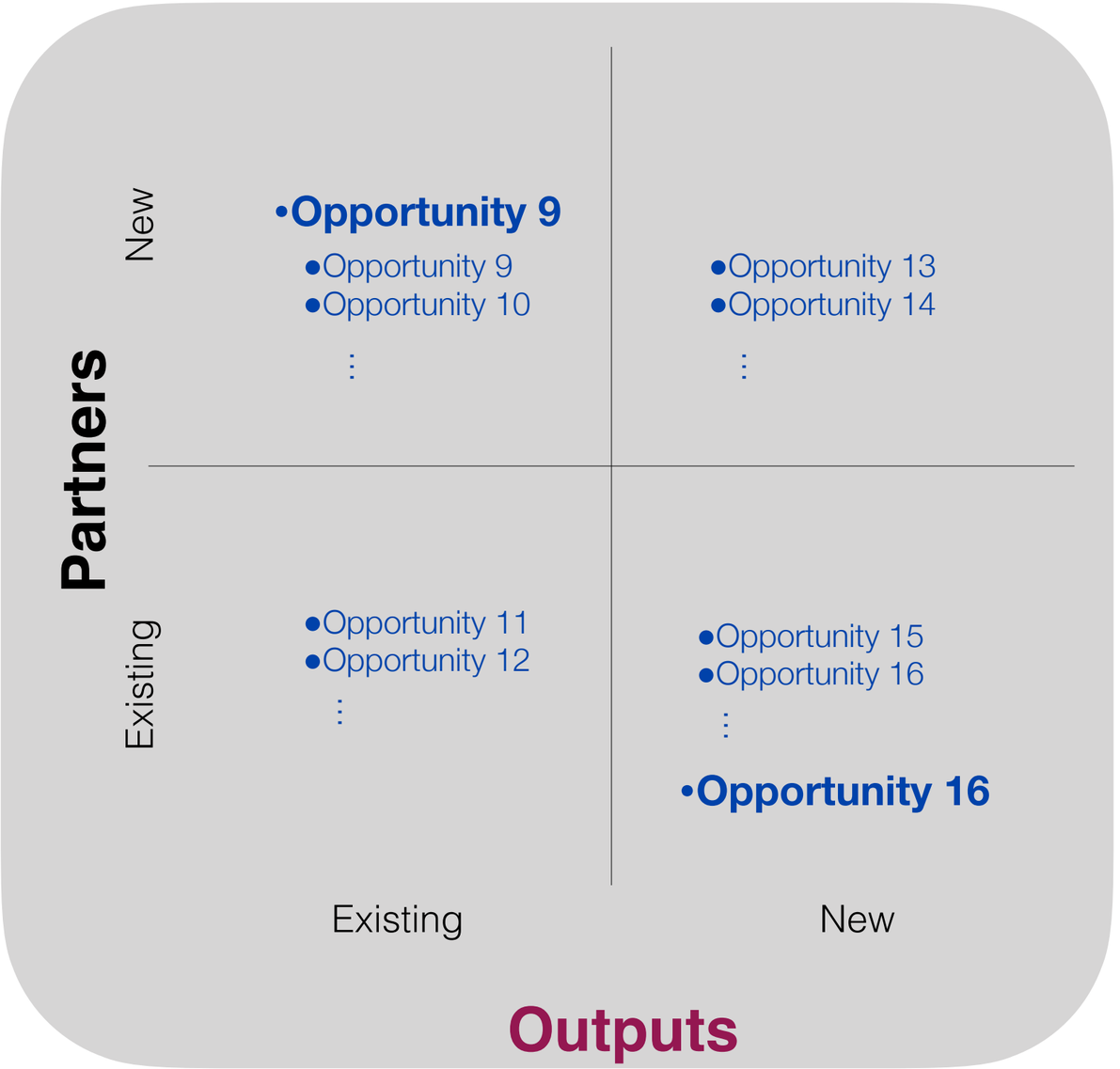
Internal assessment matrix





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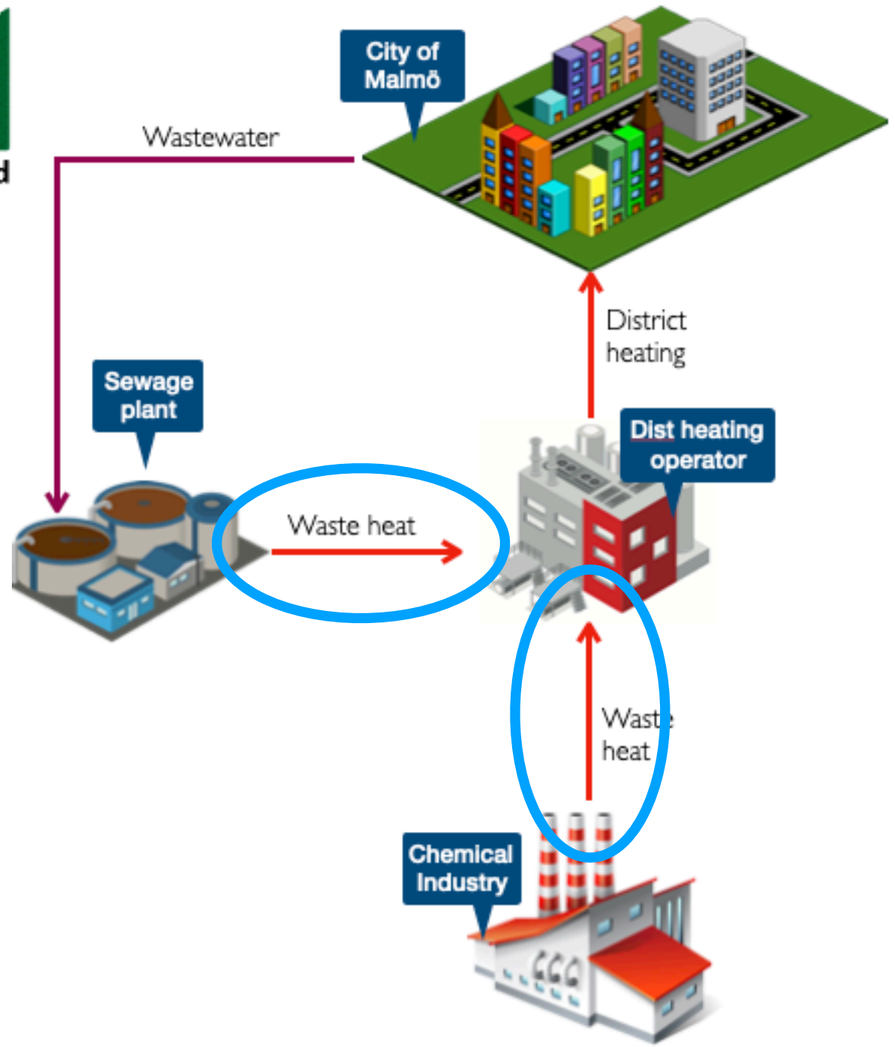
Example - Internal assessment matrix



New operational synergies

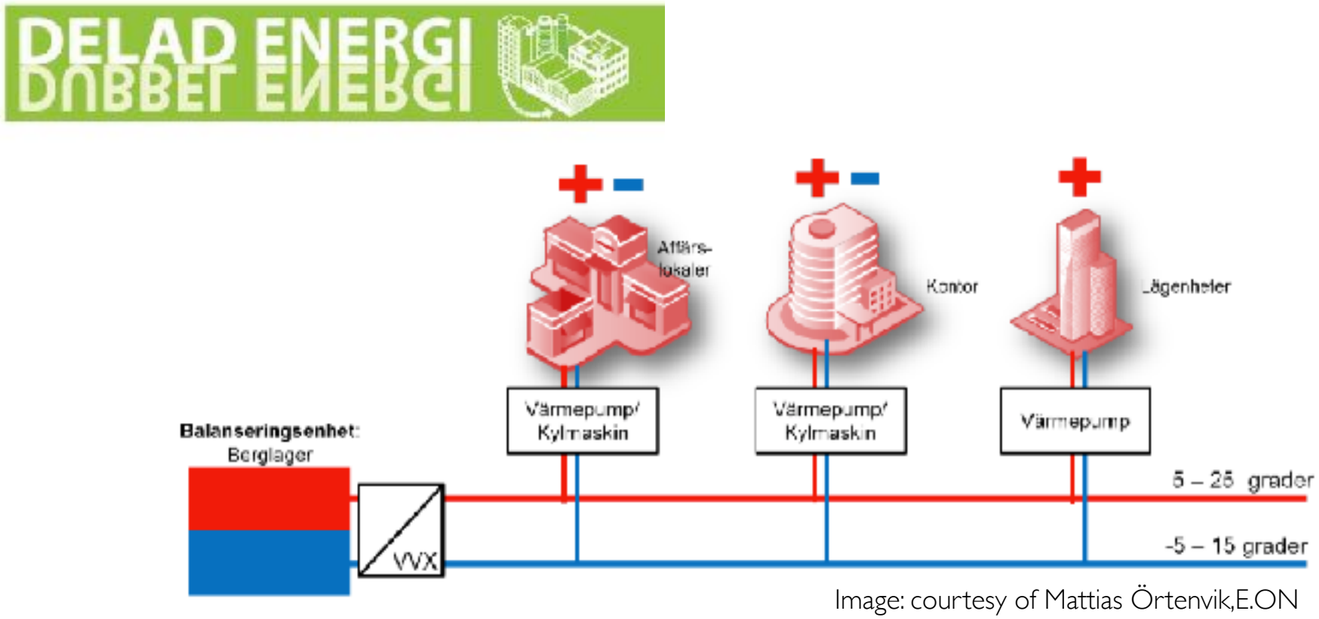
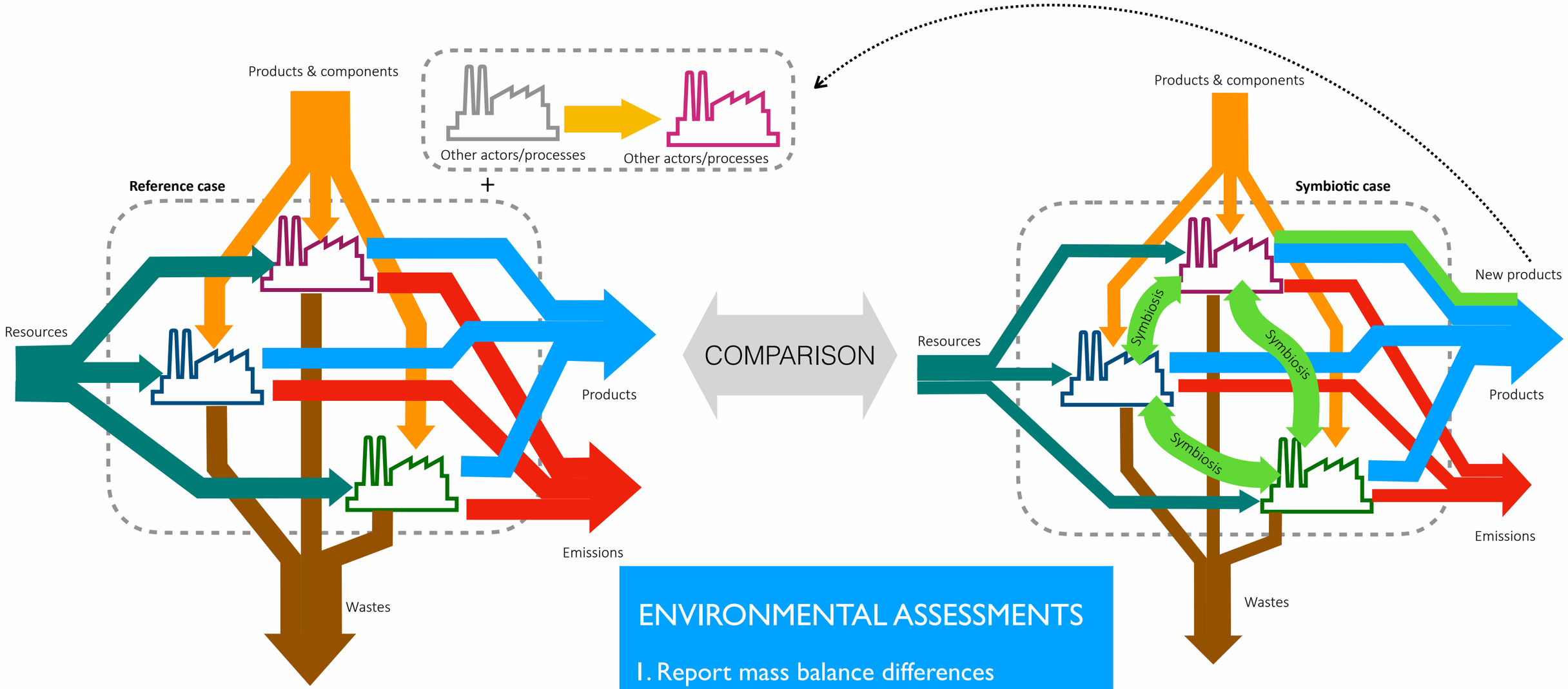


Image: courtesy of Mattias Örtenvik,E.ON

Disruptive innovations

Opportunities identified with the help "internal assessment matrix" has lead to the development of new synergies and new "residual resource utilsation" technologies.

Knowledge on impact - Environmental



ENVIRONMENTAL ASSESSMENTS

1. Report mass balance differences
2. Conduct a life-cycle-assessment

Make representative comparisons

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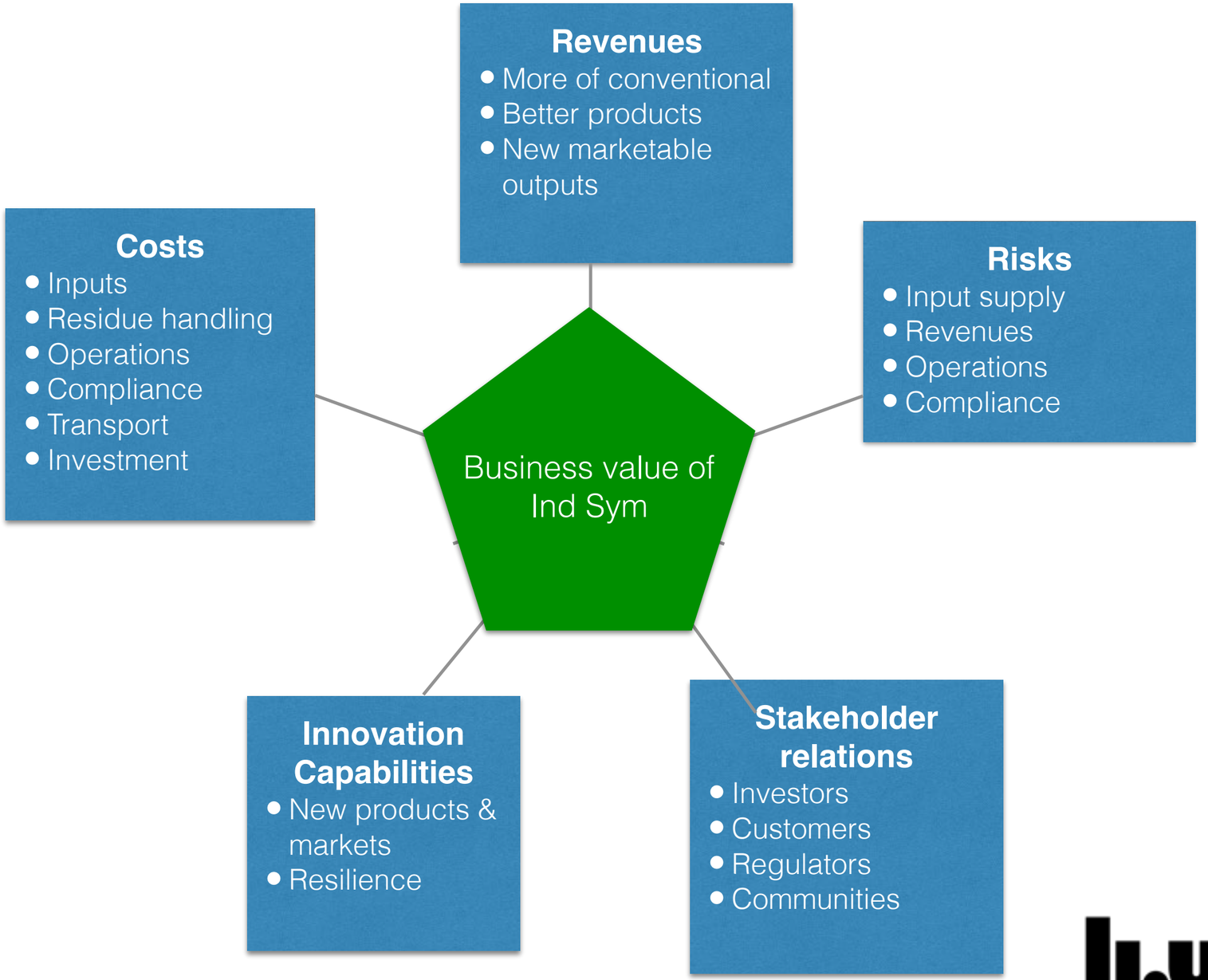
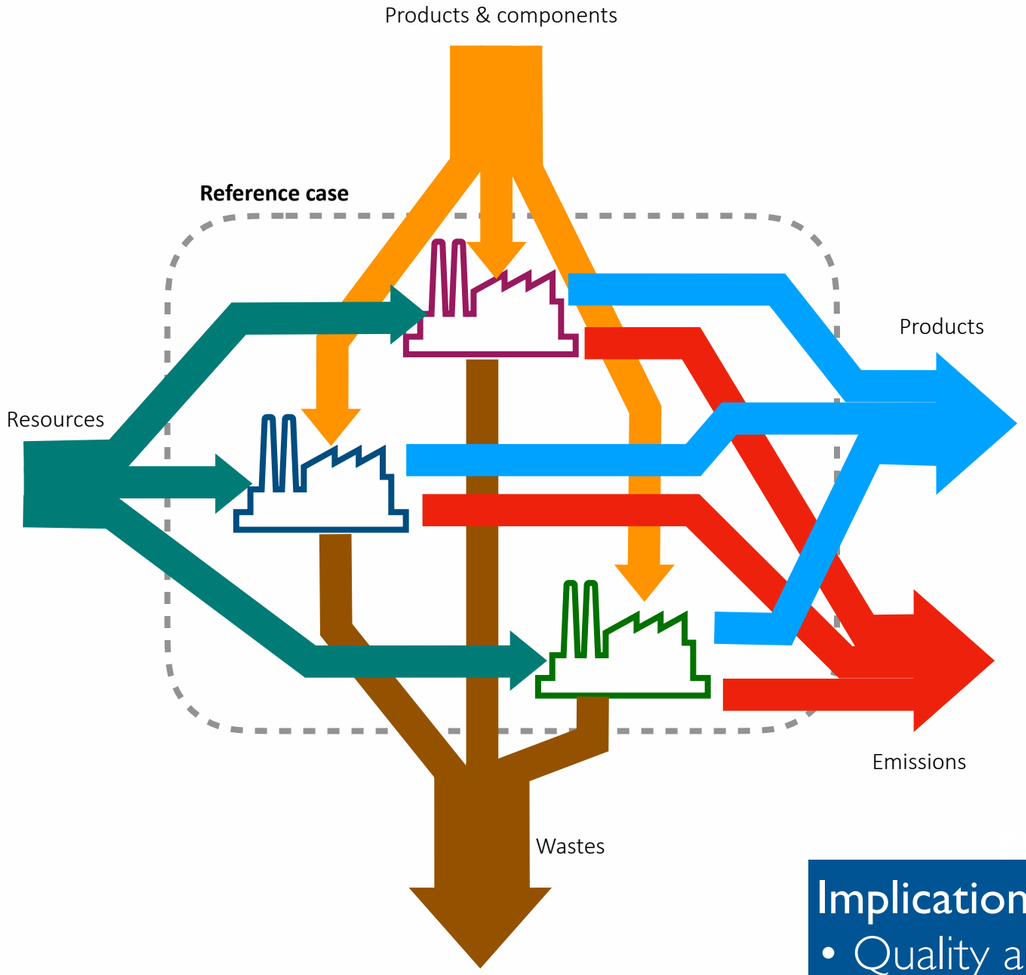
Knowledge on business performance

Needs to be comprehensive and go beyond input/waste mgt costs and additional revenues.

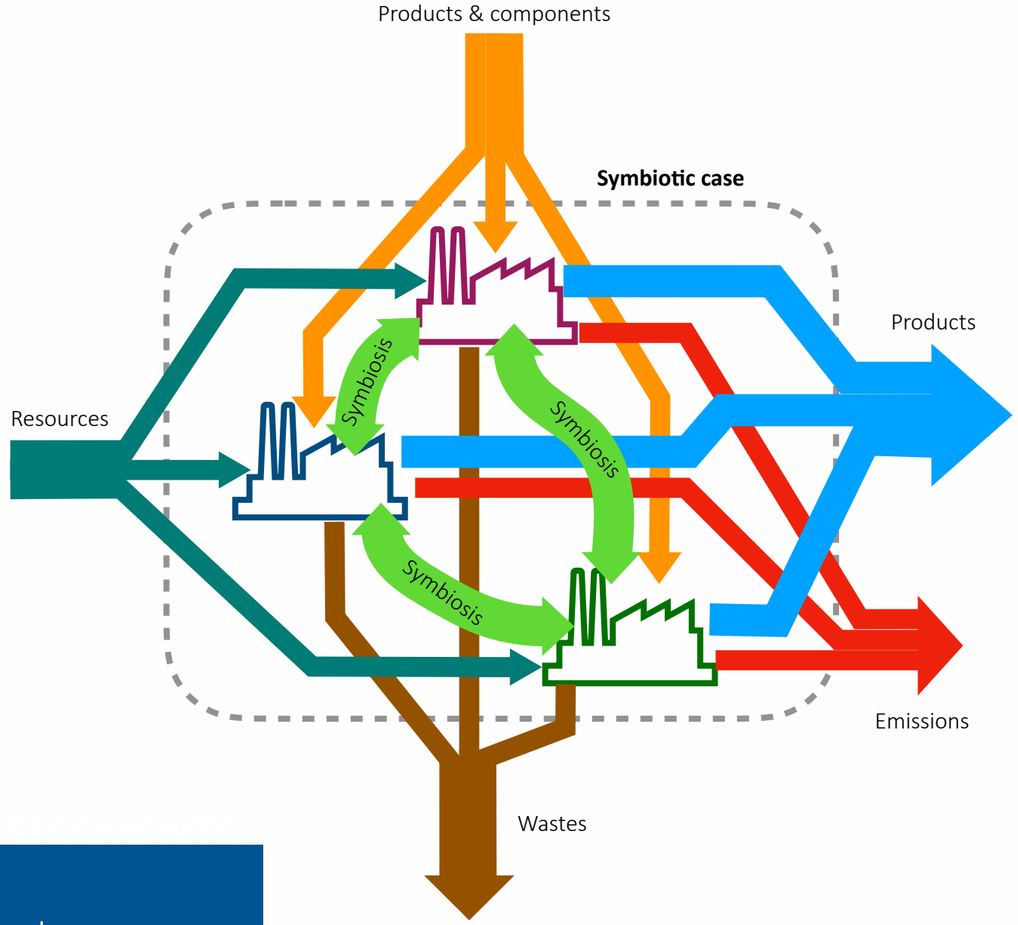
Comprehensive value and risk assessment helps with both building the business case and business agreements.



Knowledge on socio-economic performance



COMPARISON



Implications for:

- Quality and costs of public services;
- Number and quality of jobs
- Investments and new businesses
- Changes in economic value created
- Changes in tax revenues
- Image of the context

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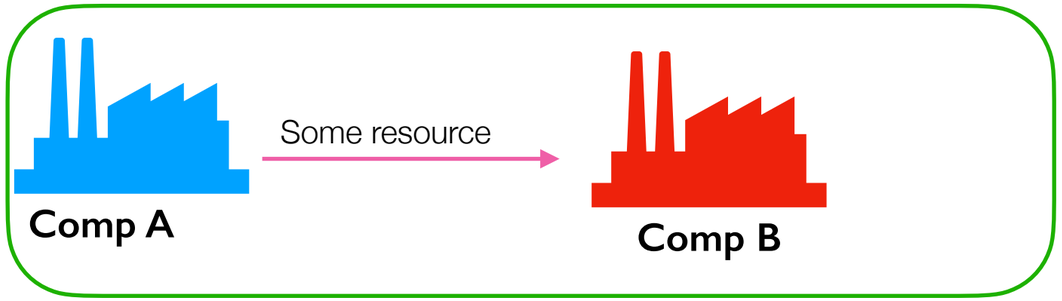
Knowledge on challenges

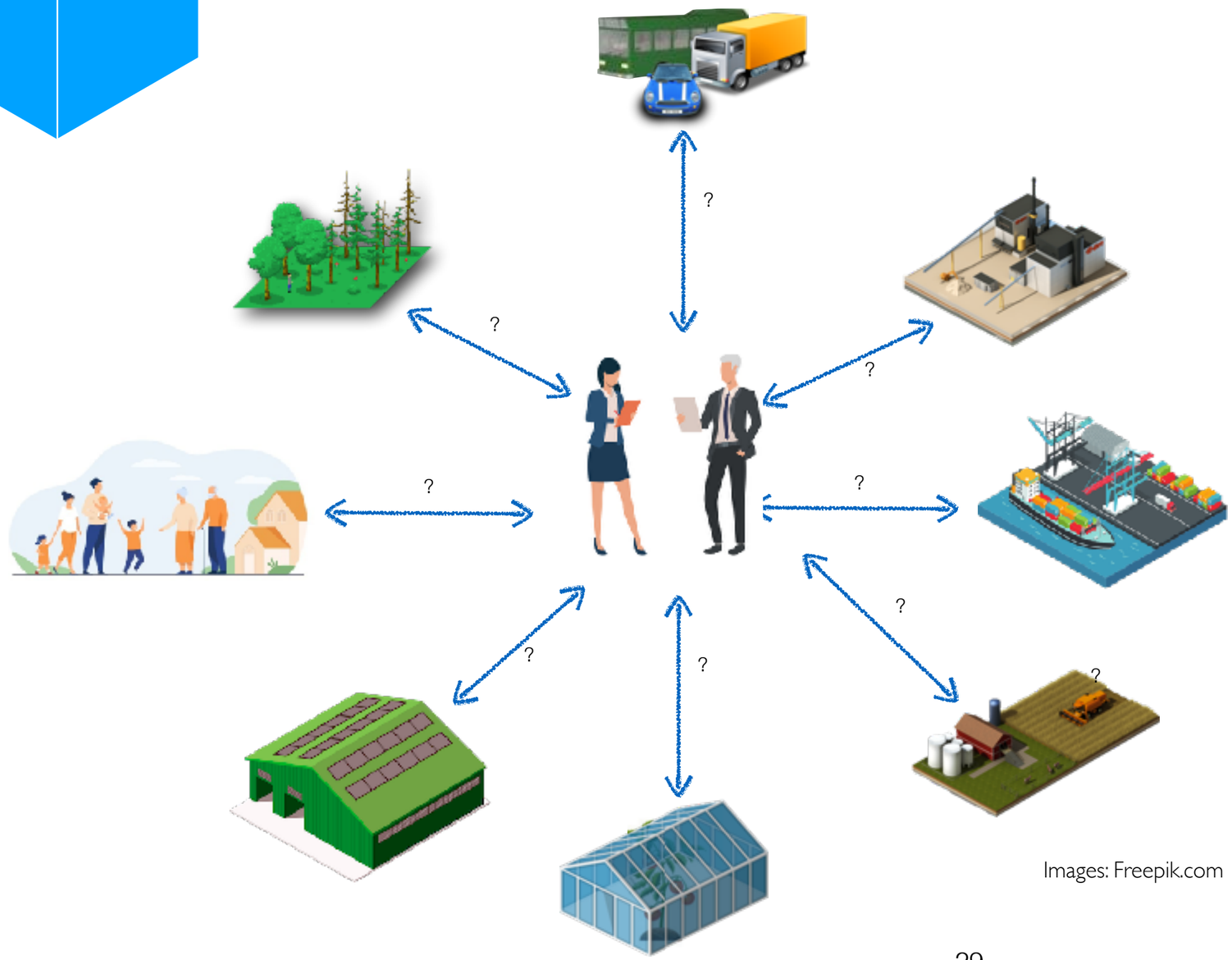
CASE X:



Quantity	6 GWh/y
Quality	60 °C
Availability	8000 h/y
Stability	Seasonal fluctuations in temp
Distance	300 m
Current cost/	Unknown
Alt cost/revenue	Unknown
Investment	None
Envl impact	
Socioeconomic	

	Technology	Organisation	Economy/market	Knowledge	Social	Policy
	• Short distance • Simple technology	• Strong top-mgt commitment; • Comp B is expanding and needs a new energy solution.				• City's climate goals are suppotive
	• Too low temperature to be useful directly	• Price of heat needs to be set • Terms of engagement not clear	• There is large competition from heat pumps.	• Not clear how much resources can. Be valorised • Environmental, business and socio-economic benefits not known.	• Dialogue and communication between parties are limited.	• There is no policy that promotes residual heat. •
Actions	• Investigate temperature profiles • Investigate heat-pump solutions.				• Organise meetings where people from different levels can meet.	• Explore possibilities to promote residual heat use in local energy plans • Set requirements for new residential areas.

Business mobilisation - renewed relationships



Images: Freepik.com

Commitment

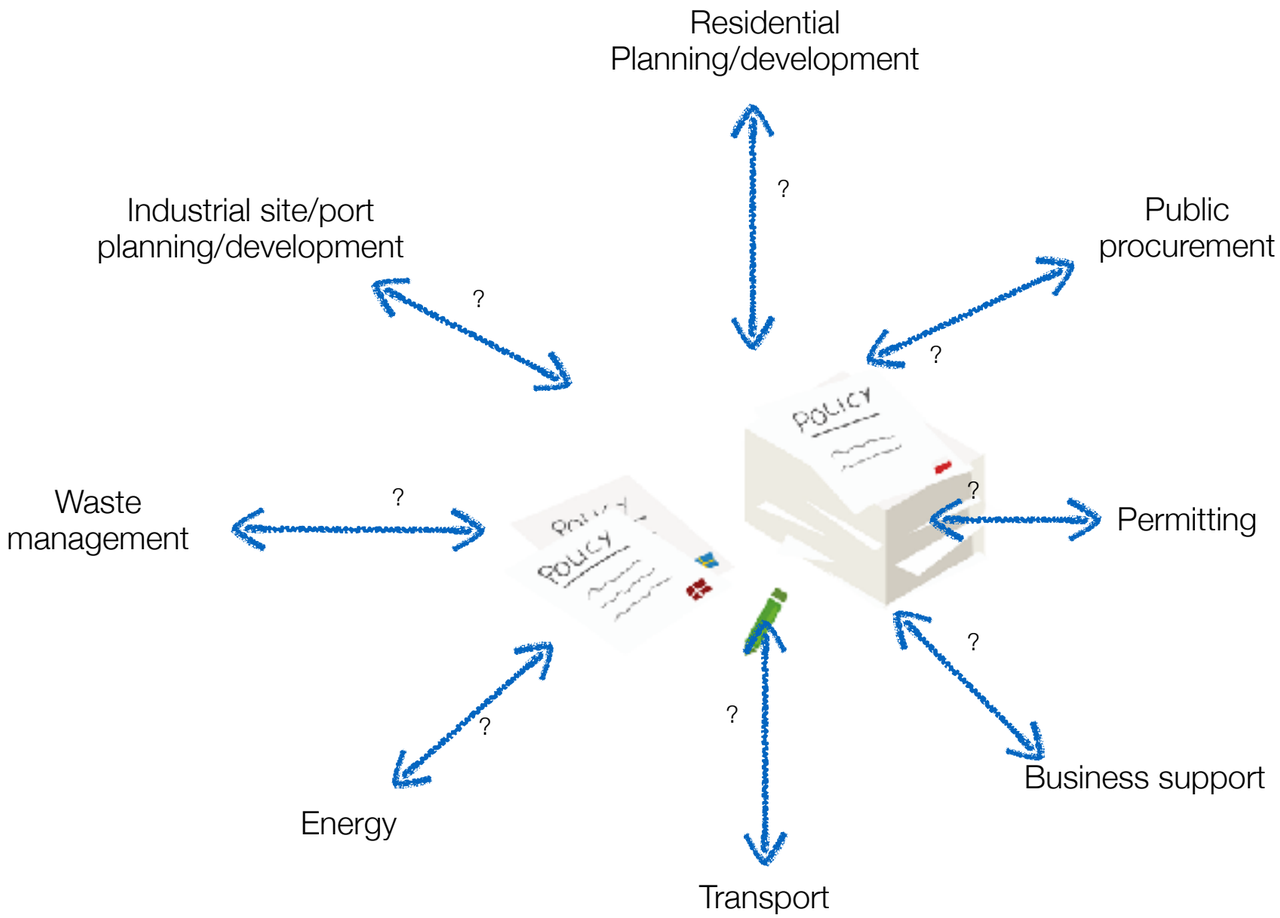
Open & transparent dialogue

Formulation of equitable and effective business models

Allocation/securing of resources for mobilisation

Co-create

Policy mobilisation



Policy innovations that can

Create incentives

Remove barriers

Create support systems

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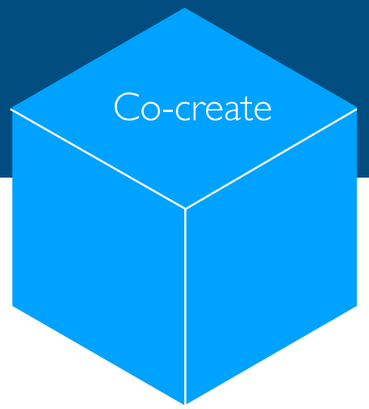


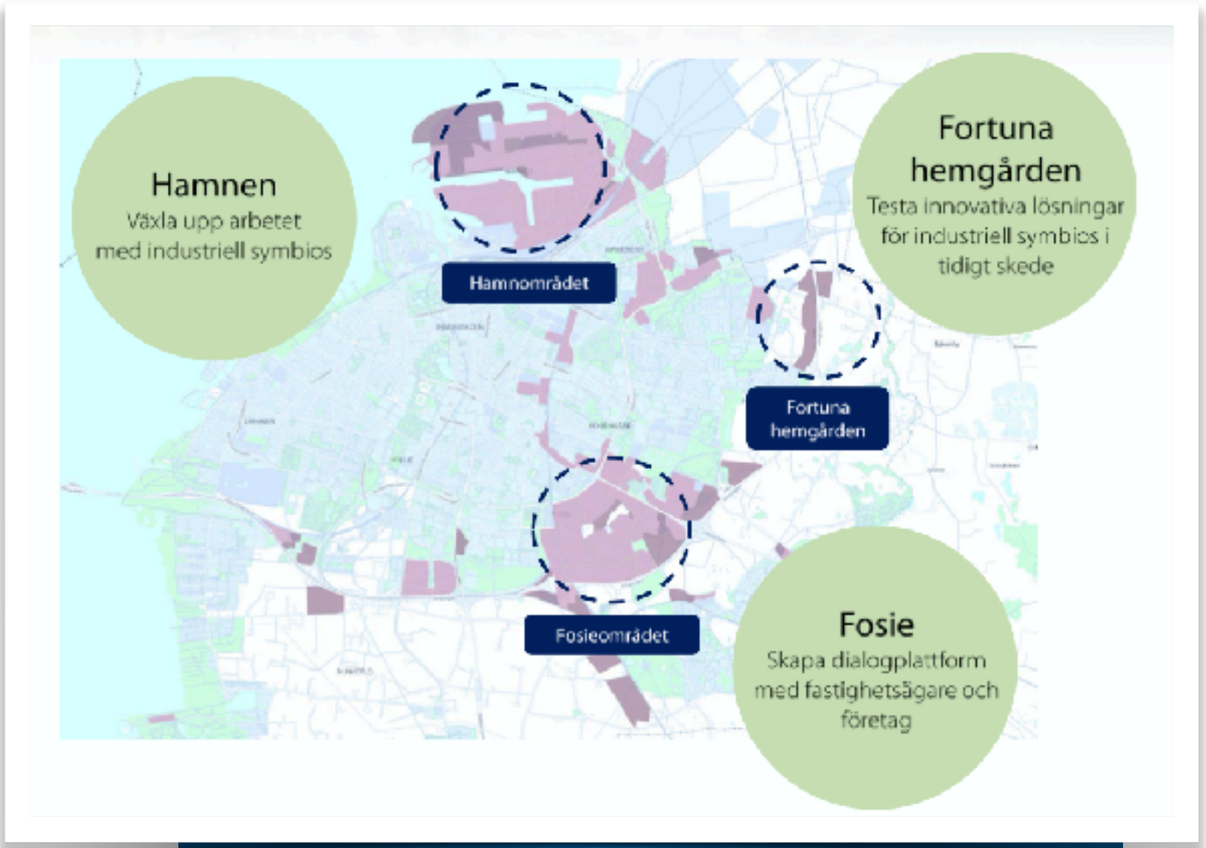
Shared, guiding visions

Image: Freepik.com

Example - New visions and policies in Malmö

Malmö stad

A new development vision



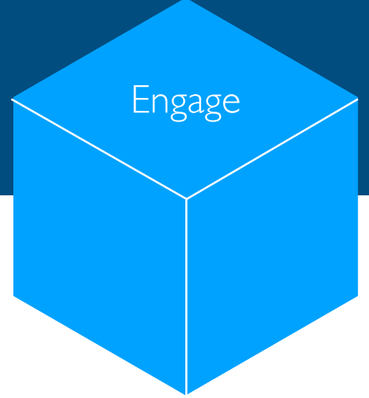
New development plans anchored in IUS

City’s Symbiosis Function

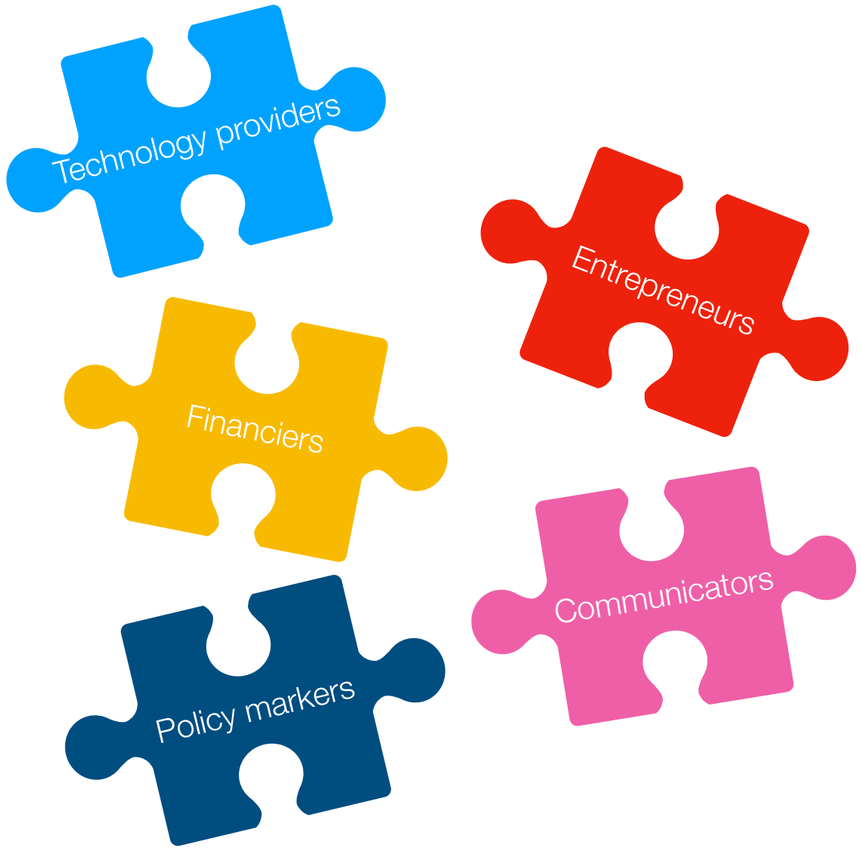
VINNOVA

Malmö stad

www.deladenergi.se

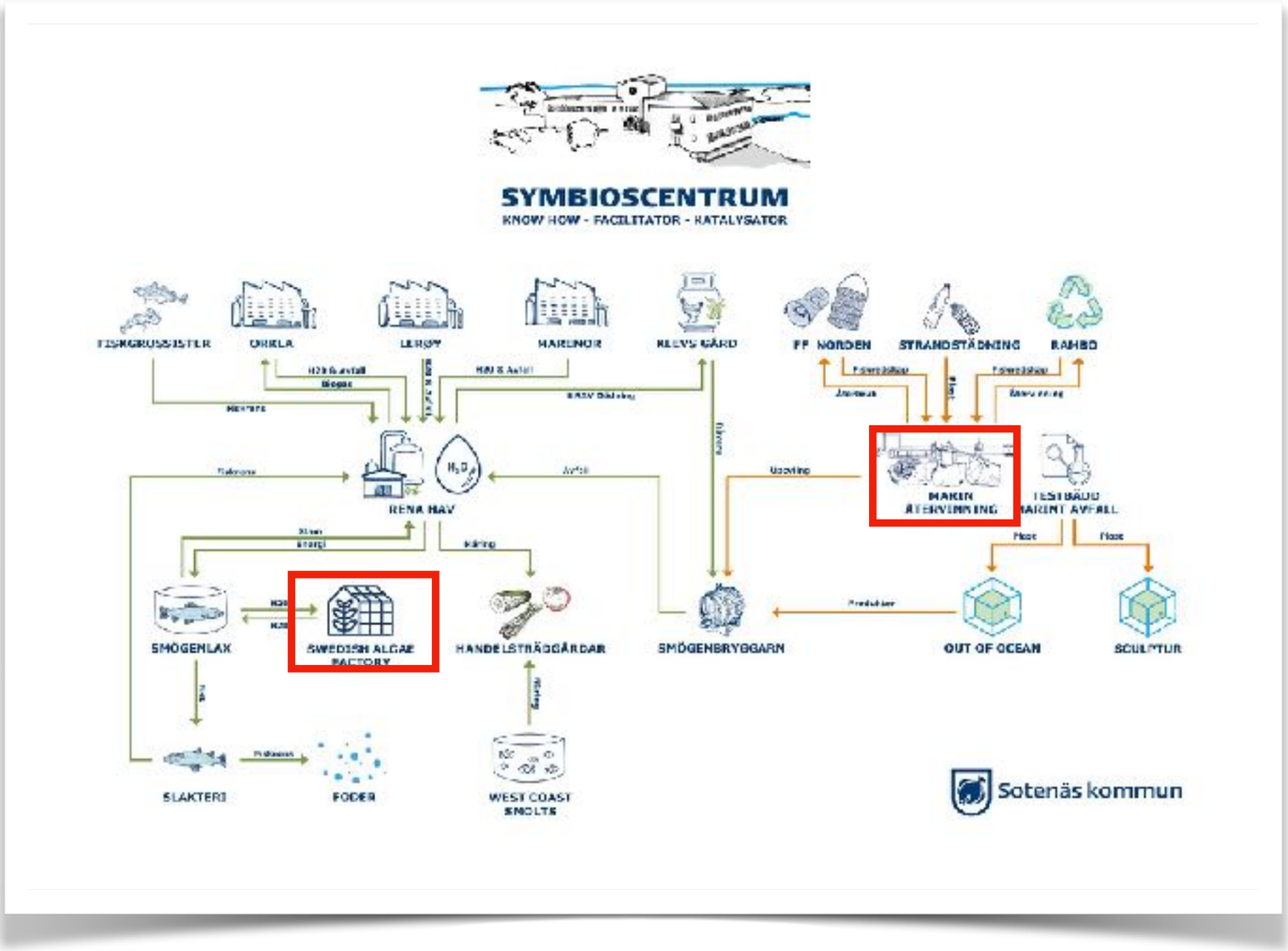


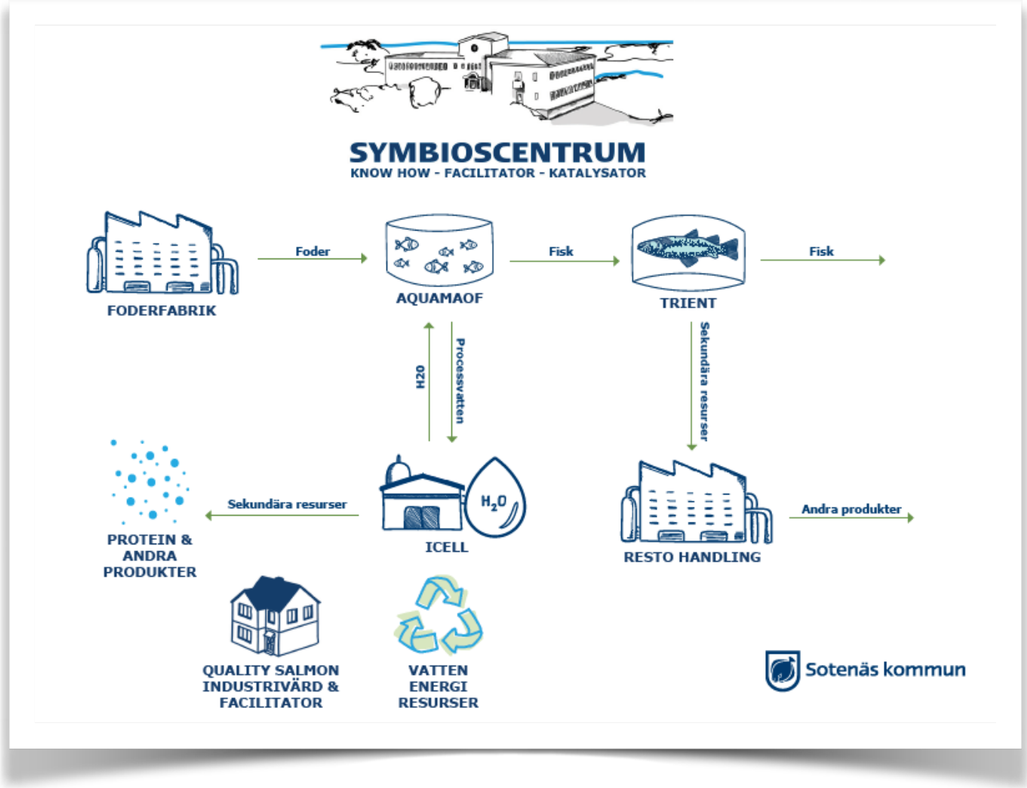
Those with mobilisation resources - also external



Images: Freepik.com

Example - Sotenäs





Sotenäs symbioscentrum continuously monitors mobilisation needs and tries to engage relevant actors.

Communicate

Measure and communicate

- **Tangible developments**
  - Resource saving
  - Economic gains
  - Employment
  - etc.

- **Intangible progress**
  - Improved relations
  - Improved knowledge
  - Visions, plans, policies
  - Extent of interest & engagement from enabling actors;

Particularly important, specially when no tangible synergy are in place.

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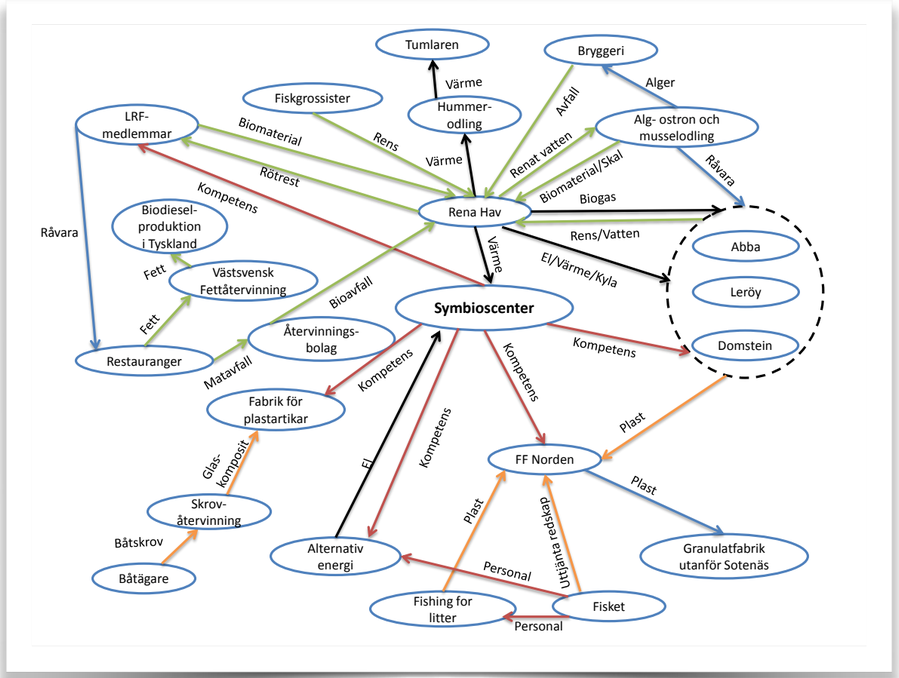
Power of visual communication

Image: Pexels.

The good vision

How it may look like!



Sotenäs kommun
Symbioscentrum

Ekonomi

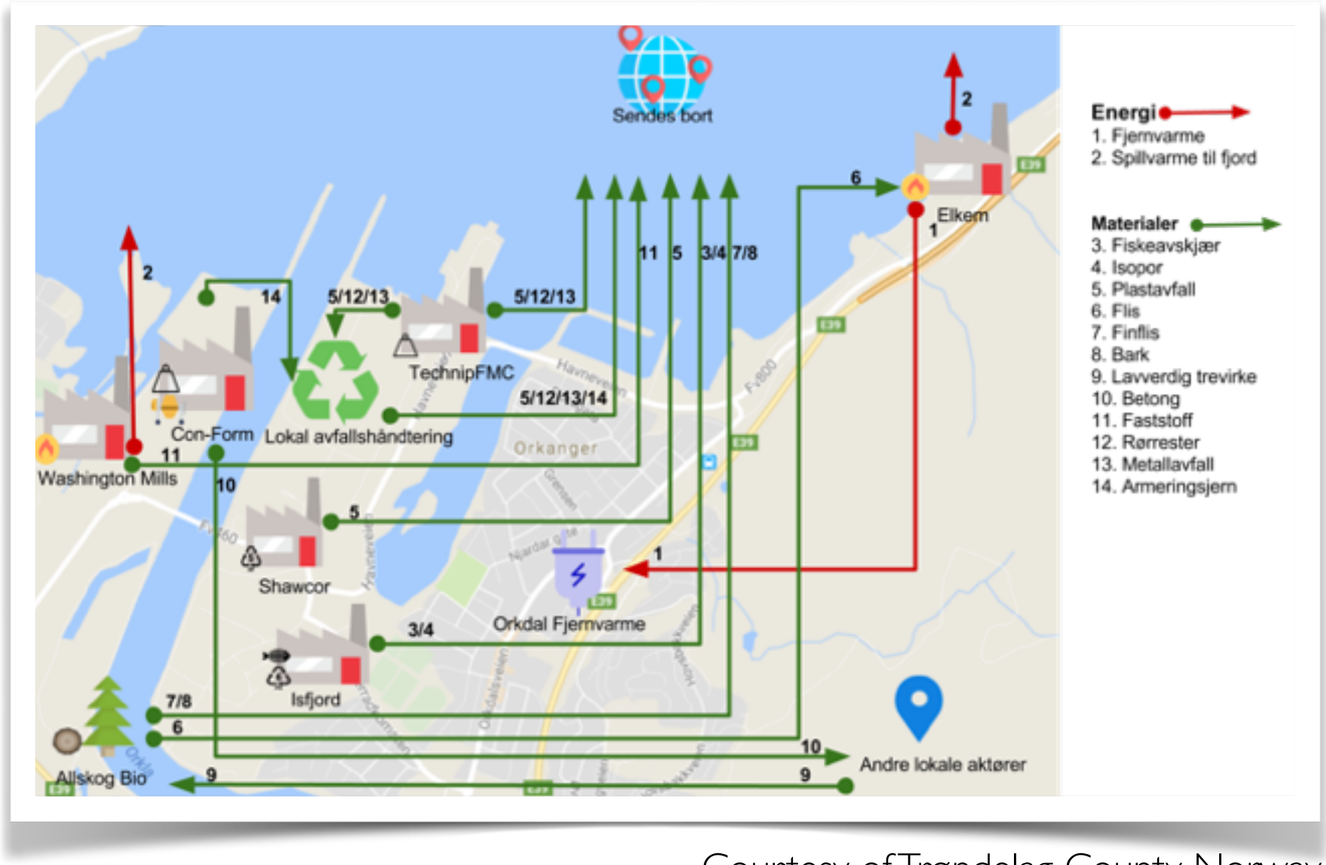
Laxodling värd miljarder ska byggas i Sotenäs

UPPDATERAD 2020-03-19 PUBLICERAD 2020-03-19

Sommarparadiset Smögen ligger längst ut i havshandet i Sotenäs kommun. Foto: Henrik Jansson/Expressen

Europas största laxodling på land ska byggas i Sotenäs kommun. Det handlar om en investering på 17-20 miljarder kronor från norska företaget Lighthouse Finance.

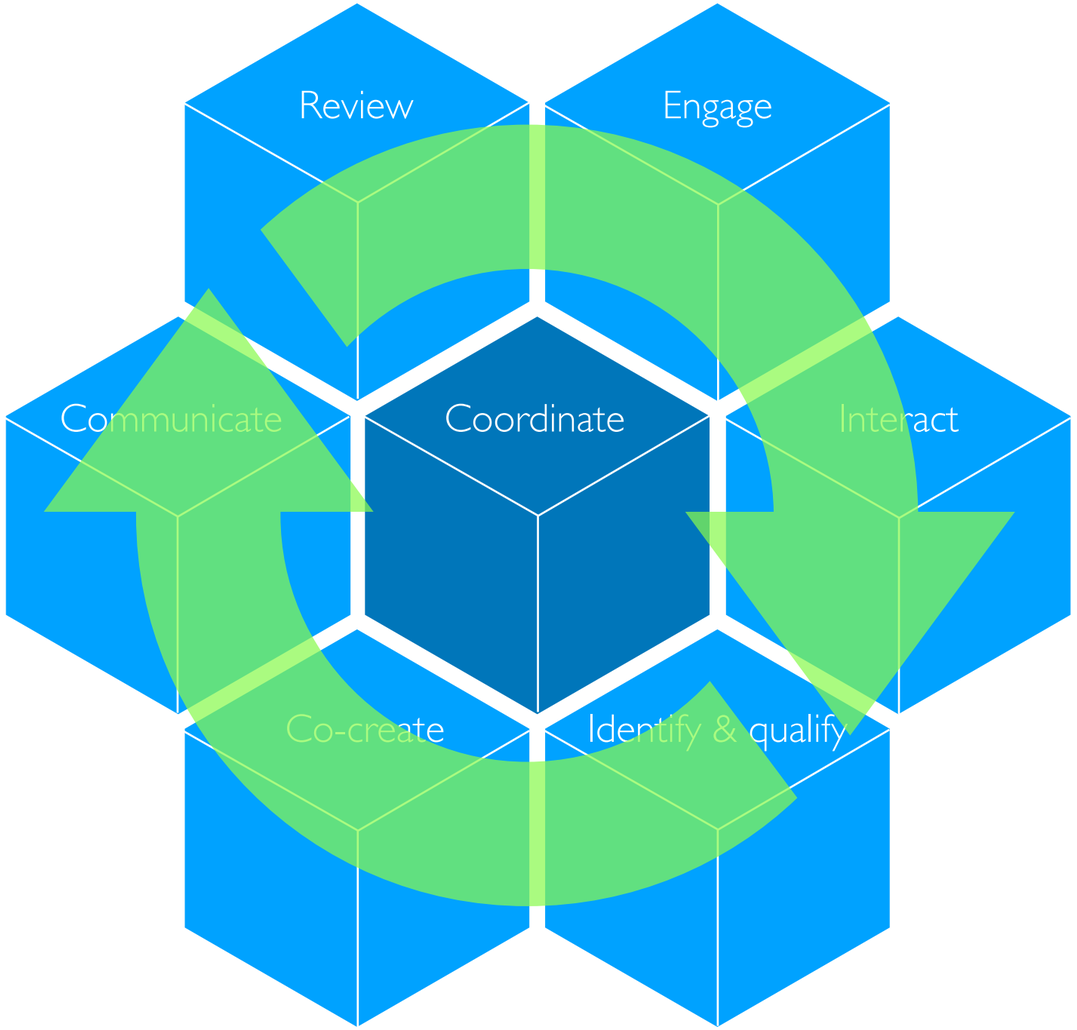
The "not so goo" outlook



Courtesy of Trøndelag County, Norway

Visual communication of discarded resources by students had a key mobilisation impact on the actors in Orkanger.

Maintain continuity



Progressively repeat!

LINKÖPING UNIVERSITY

BALTIC INDUSTRIAL SYMBIOSIS

QUESTIONS & INQUIRIES

Murat Mirata (PhD)

murat.mirata@liu.se

Interreg Baltic Sea Region

EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND

LINKÖPING UNIVERSITY