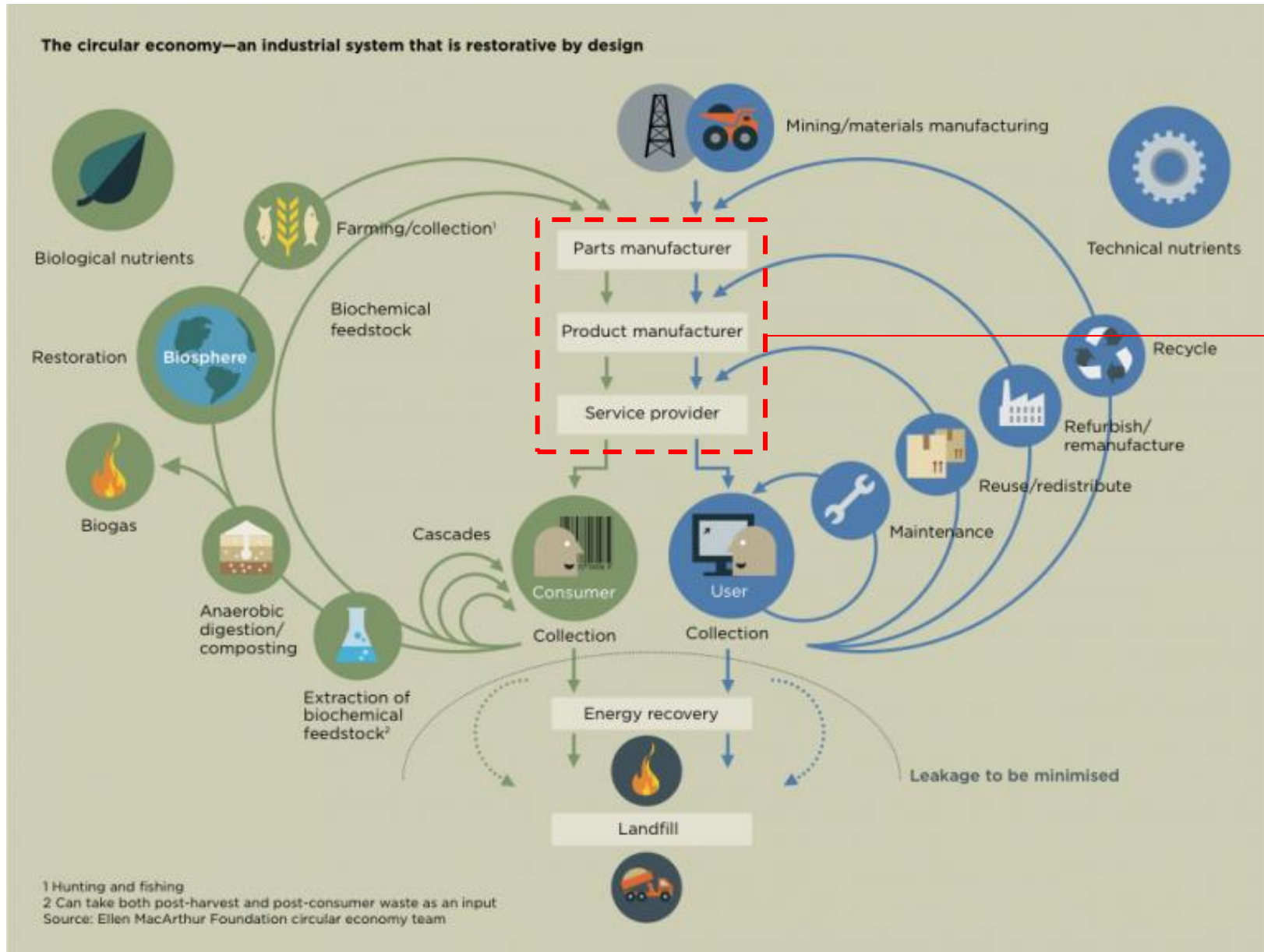


KALUNDBORG SYMBIOSIS

A UNIQUE PRIVATE – PUBLIC PARTNERSHIP

Maggie Lund
Senior project manager
Dansk SymbioseCenter, Kalundborg municipality





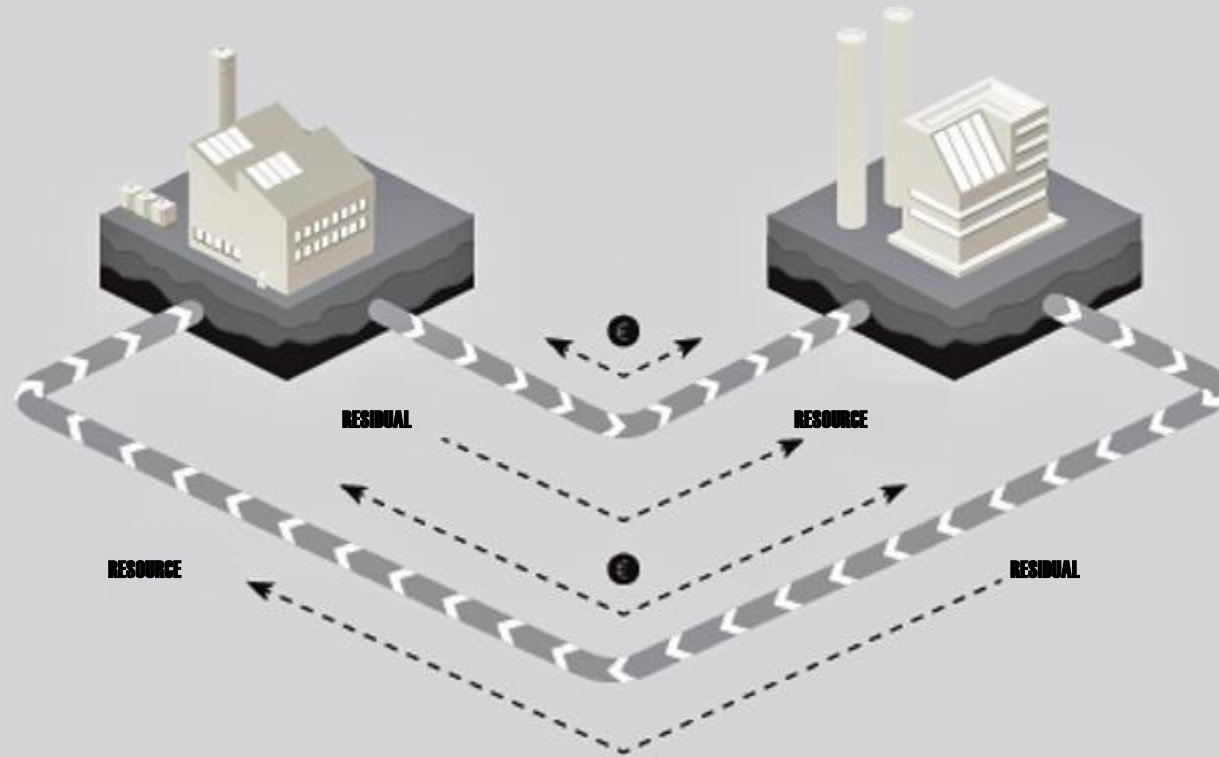
Industrial Symbiosis is part of circular economy: Companies that already in the production phase saved or regenerated value of residual in terms of water, material and energy.

Kalunborg Symbiosis used as case studies for Ellen MacArthur Foundation:
<https://www.ellenmacarthurfoundation.org/case-studies/effective-industrial-symbiosis>

”A circular economy is restorative and regenerative by design , and aims to keep products, components, and materials at their highest utility and value at all times.” Ellen MacArthur Foundation, 2010.



MUTUAL BENEFIT



BAY OF PARTNERSHIP



STATOI REFINING DENMARK

ØRSTED

KALUNDBORG
UTILITY

GYPROC SAINT GOBAIN

ARGO

KALUNDBORG MUNICIPALITY

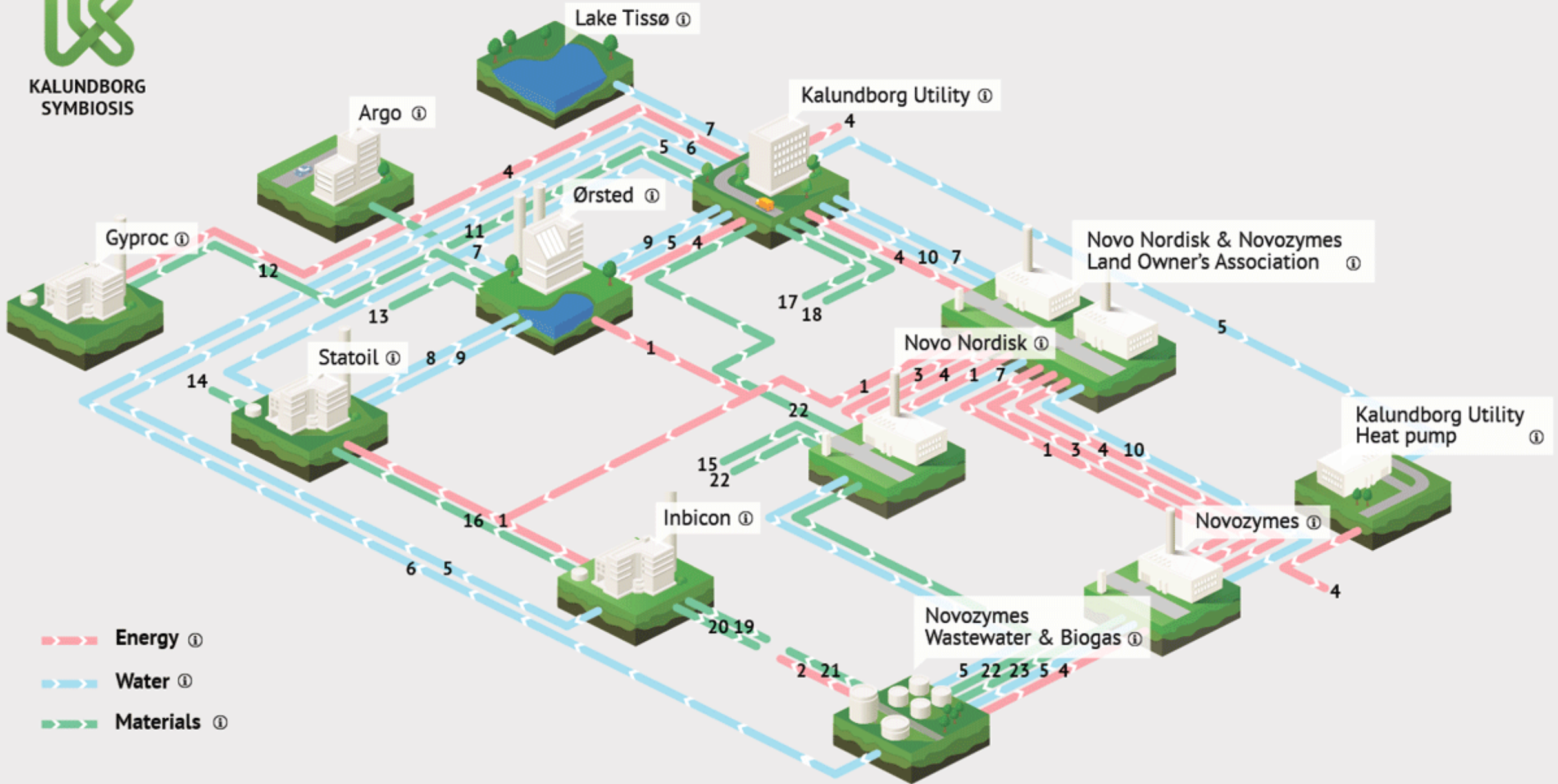
NOVOZYMES AND NOVO NORDISK



KALUNDBORG
SYMBIOSIS

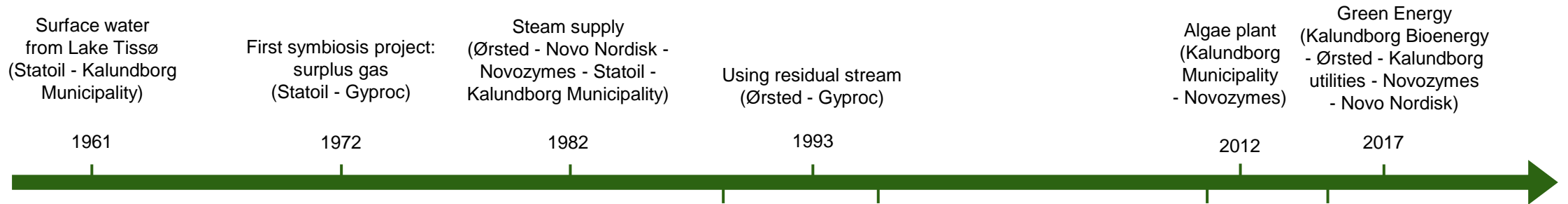


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SYMBIOSIS

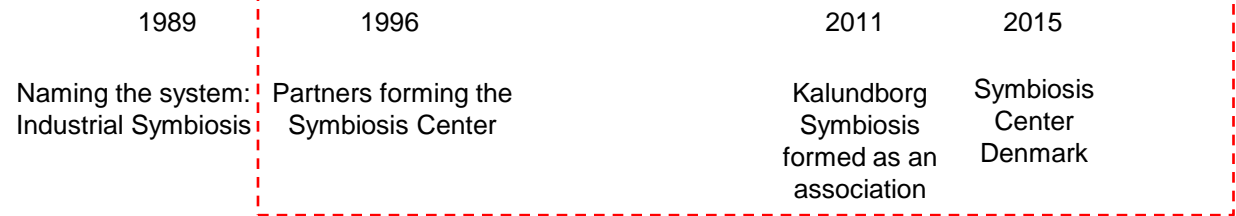


MORE THAN 40 YEARS OF COOPERATION

PROJECTS



ORGANIZATION



A facility unit that has long term strategy.



KALUNDBORG SYMBIOSIS

WORKING TOGETHER: SURFACE WATER SPRINGS IN 1961

Surface water
from Lake Tissø
(Statoil - Kalundborg
Municipality)

1961

1972

1982

1993

2012

2017

1989

1996

2011

2015



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SYMBIOSIS

GOOD BUSINESS CASE: FROM FIRST STREAM IN 1972

First symbiosis project:
surplus gas
(Statoil - Gyproc)

1961

1972

1982

1993

2012

2017

1989

1996

2011

2015



KALUNDBORG
SYMBIOSIS

ADAPTABLE: NEW BUSINESS MODEL GAINING STEAM FROM 1982

Steam supply
(Ørsted- Novo Nordisk -
Novozymes - Statoil -
Kalundborg
Municipality)

1961

1972

1982

1993

2012

2017

1989

1996

2011

2015



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MINDSET: MATERIALIZED IN GYPSUM FROM 1993

Using residual stream
(Ørsted - Gyproc)

1961

1972

1982

1993

2012

2017

1989

1996

2011

2015



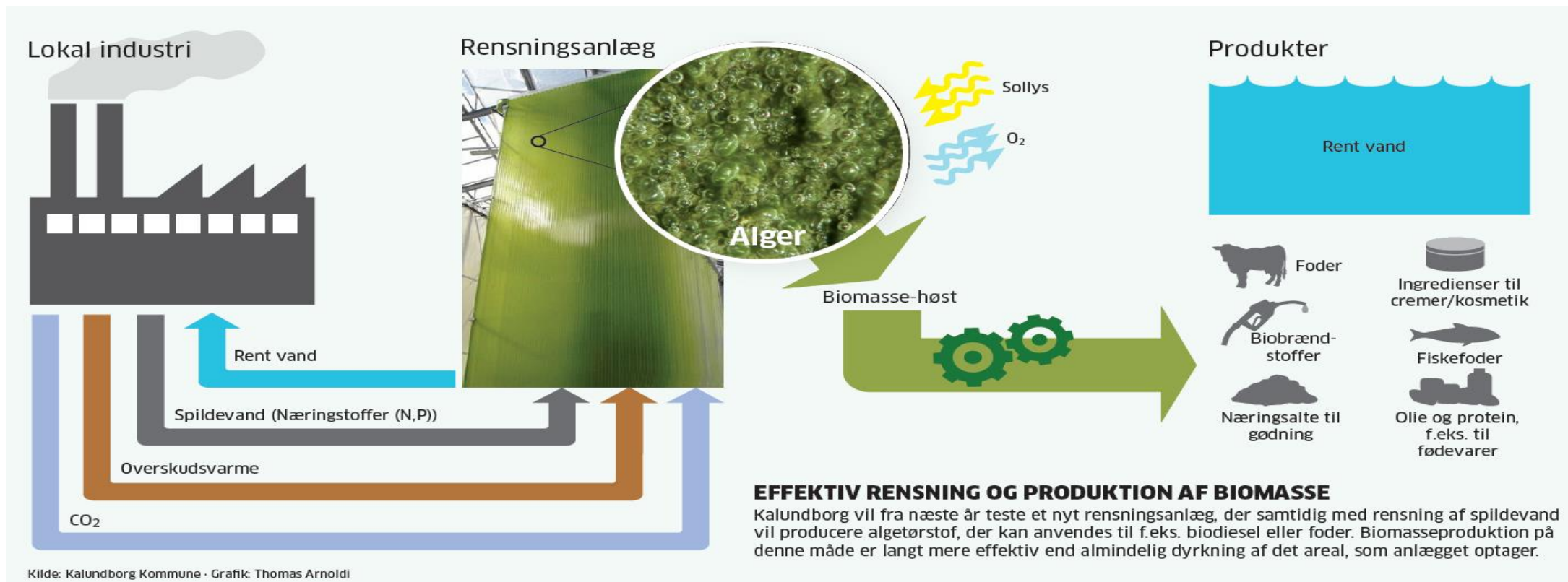
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SYMBIOSIS

TEST & DEMONSTRATION: ALGAE PLANT 2012



MICROALGAE CONCEPT

- Ressource efficiency and added value



GREEN ENERGY FROM 2017



Green Energy
(Kalundborg Bioenergy
- DONG - Kalundborg
utilities - Novozymes
- Novo Nordisk)



KALUNDBORG
SYMBIOSIS

Vision

Kalundborg Symbiosis wants to be the world's leading industrial symbiosis with a circular approach to production.

By symbiosis we understand a local partnership where you provide, share and reuse resources to create a shared value.

RENEW

Strengthening of the partnership
Develop and anchor the local symbiotic mindset

CONNECT

Full resource utilization
The water, energy and material flows from the partners are all included in the symbiosis

PROMOTE

Spreading of the symbiotic mindset
Inspire others to be part of a symbiosis

Mission

Kalundborg Symbiosis creates a sustainable development in our companies through joint projects.

By sustainability, we understand the long-term responsible use of resources, in balance with economic, environmental and social considerations.



**KALUNDBORG
SYMBIOSIS**



**SYSTEMS MAKE IT POSSIBLE
PEOPLE MAKE IT HAPPEN**

For more information please contact:
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