

KALUNDBORG SYMBIOSIS

A NETWORK OF PUBLIC-PRIVATE PARTNERSHIPS

Per Møller

Head of Symbiosis Center Denmark

AWF FORUM 2018
24. MAY 2018



FN'S VERDENSMÅL
for bæredygtig udvikling



11 BÆREDYGTIGE BYER
OG LOKALSAMFUND



6 RENT VAND
OG SANITET



12 ANSVARLIGT
FORBRUG
OG PRODUKTION



7 BÆREDYGTIG
ENERGI



13 KLIMA-
INDSATS



8 ANSTÆNDIGE JOBS
OG ØKONOMISK
VÆKST



14 LIVET
I HAVET



9 INDUSTRI, INNOVATION
OG INFRASTRUKTUR



17 PARTNERSKABER
FOR HANDLING



KALUNDBORG
SYMBIOSIS

A brief presentation



Symbiosis Center Denmark is a national knowledge center working to identify and facilitate industrial symbiosis projects between industrial partners.



Our process of facilitation

- Industrial Symbiosis = effective green business model that reduce production costs and increase competitiveness and growth potential for industries.
- Takes time and resources and requires data, mutual trust and knowledge sharing between the partners as well as network relations, facilitation and support.



Potential

- Screening
- Assessment



Match

- Business case



Anchoring

- Partnership
- Network

DRAMATIC INCREASE IN COMMODITY PRICES

Sharp price increases in commodities since 2000 have erased all the real price declines of the 20th century

McKinsey Commodity Price Index (years 1999-2001 = 100)¹



¹ Based on arithmetic average of 4 commodity sub-indices: food, non-food agricultural items, metals, and energy; 2011 prices based on average of first eight months of 2011.

FROM LINEAR TO CIRCULAR ECONOMY



**DELIVERING THE
CIRCULAR ECONOMY
A TOOLKIT
FOR POLICYMAKERS**

LINEAR ECONOMY

TAKE > MAKE > DUMP



WASTE

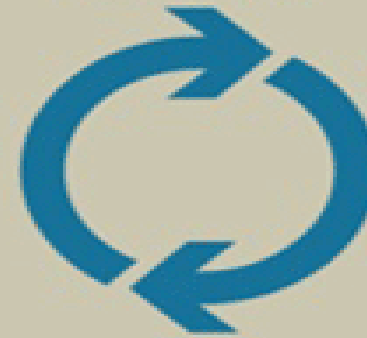
TECHNICAL & BIOLOGICAL
NUTRIENTS MIXED UP

ENERGY FROM FINITE SOURCES

CIRCULAR ECONOMY

TECHNICAL
NUTRIENTS

BIOLOGICAL
NUTRIENTS

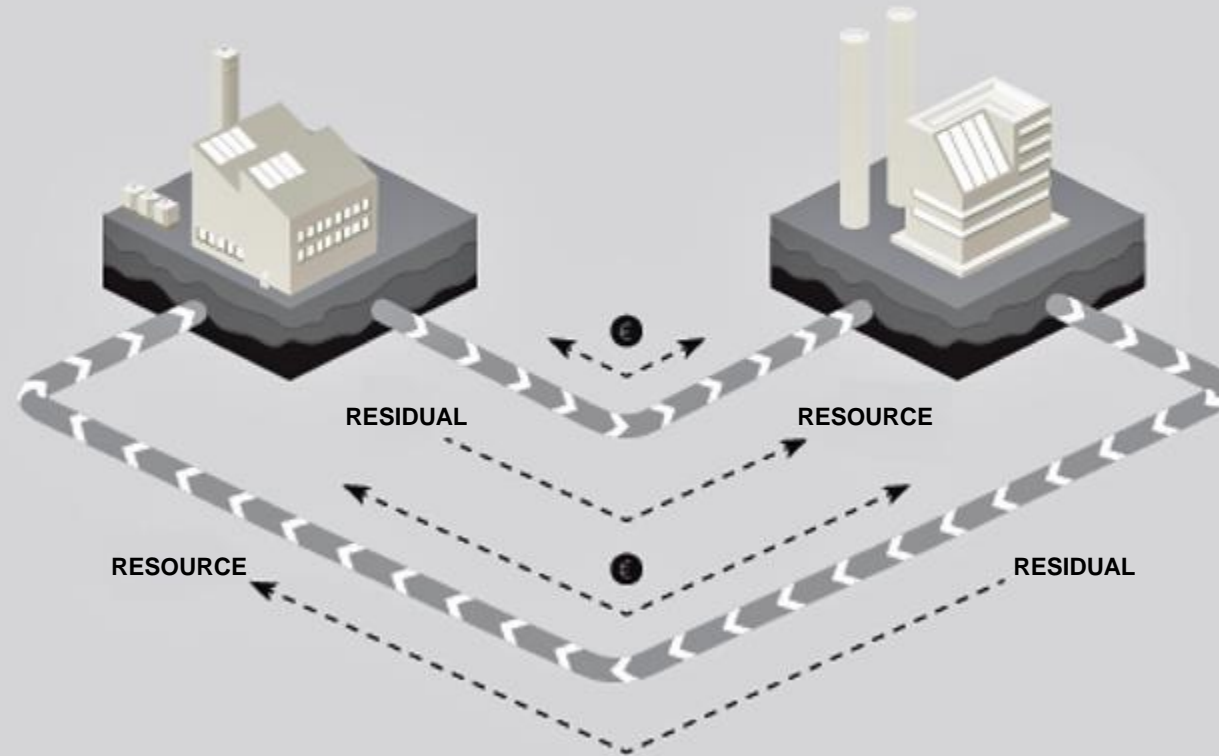


LIVING SYSTEMS

ENERGY FROM RENEWABLE SOURCES



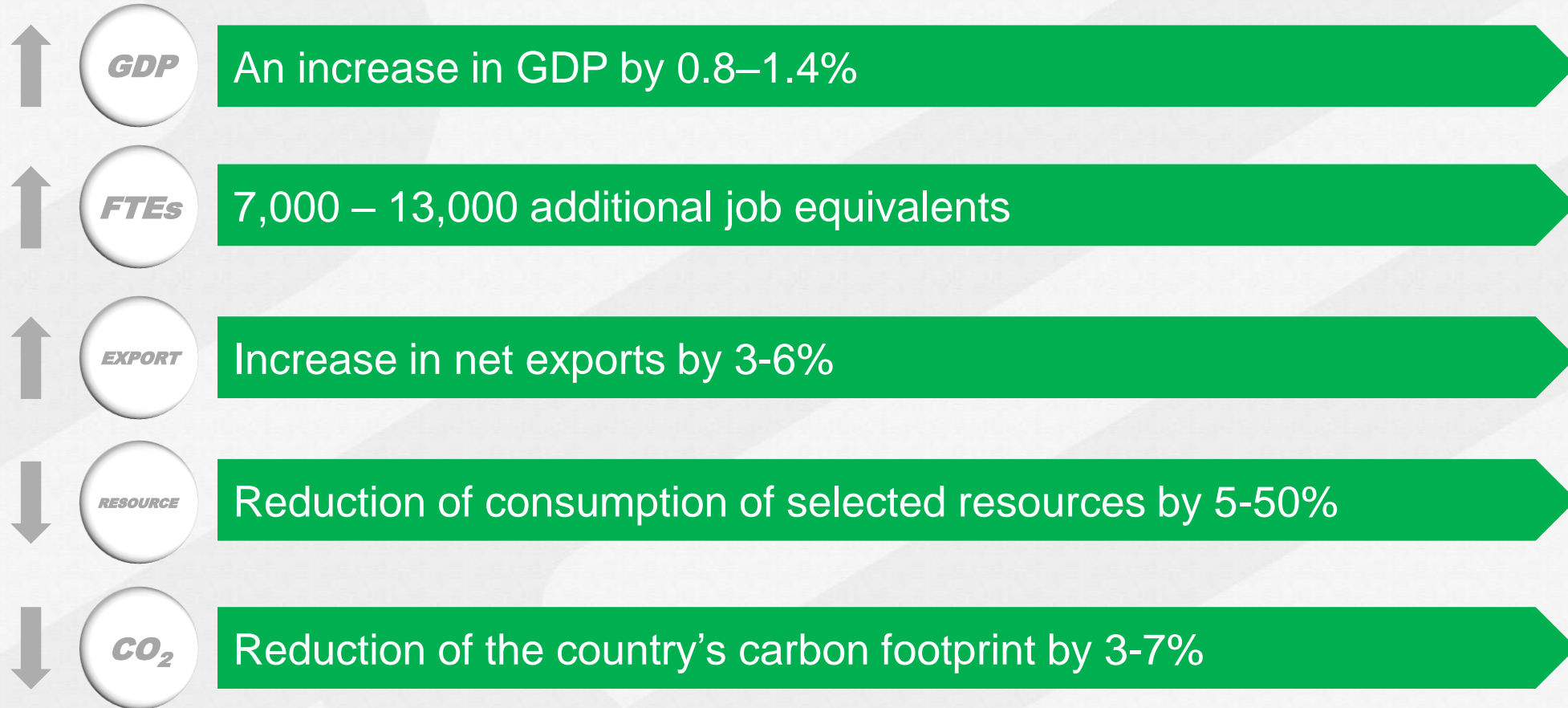
INDUSTRIAL SYMBIOSIS FOR MUTUAL BENEFIT



Redefining “waste” as a secondary resource !



CIRCULAR ECONOMY TRANSITION IN DENMARK BY 2035 COULD LEAD TO...



NEXT STEPS TOWARDS CIRCULAR ECONOMY

27 RECOMMENDATIONS TO GOVERNMENT



Advisory Board for cirkulær økonomi består af



Flemming Besenbacher
(formand)
Bestyrelsesformand,
Carlsberg Group



Aja Guldhammer
CEO, Reshopper



Anders Byriel
CEO, Kvadrat



Pernille Blach Hansen
Senior Director, LEGO



Christian B. S. Christensen
CEO, Solum Gruppen



Mik Kristensen
CEO, Nykredit Leasing



Franz Ocultza
CEO, Aage Vestergaard Larsen



Martin Petersen
CEO, EcoXpao



Matias Mel Dalsgaard
CEO, GoMore



Jais Valeur
CEO, Danish Crown



Kasper Guldager
CEO, GXN



Jeanett Vikkelsee
COO/CSO, Marius Pedersen

Den cirkulære værdikæde

- #1 Gøre cirkulær økonomi til en vækstmotor for danske virksomheder
- #2 Etablere én indgang til det offentlige for virksomheder, der oplever barrierer for cirkulær omstilling
- #3 Etablere cirkulære kommuner
- #4 Indarbejde cirkularitet i de makroøkonomiske modeller og statistikker
- #5 Udvikle standarder som understøtter cirkulær økonomi
- #6 Indarbejde cirkulær økonomi i hele uddannelsessystemet
- #7 Fremme forskning, udvikling, test, demonstration og markedsmodning af cirkulære løsninger og teknologier
- #8 Styrke finansiering til acceleration af cirkulære virksomheder
- #9 Udnytte den danske styrkeposition inden for digitalisering og ny teknologi til at understøtte den cirkulære omstilling

Design og produktion

- #10 Styrke den cirkulære produktspolitik i bl.a. eodesign-direktivet
- #11 Indarbejde cirkulær økonomi i produktionsvirksomhedernes vilkår
- #12 Udarbejde et cirkulært bygningsreglement
- #13 Udvikle standardiserede bygnings- og produktpas
- #14 Fremme rammevilkårene for bioraffinering
- #15 Etablere nye værdikæder for landbrugsafgrøder, der udnytter fotosyntesen bedre
- #16 Optimerer udnyttelsen af animalske produkter

Forbrug

- #17 Bygge og købe ind i det offentlige på baggrund af totalekonomi og livscyklusberegninger
- #18 Fremme cirkulær økonomi gennem virksomheders og det offentlige indkøb
- #19 Udvikle de cirkulære aspekter ved relevante mærkningsordninger og udbrede brugen af dem
- #20 Fremme udnyttelse af overskuds kapacitet f.eks. gennem deleøkonomiske forretningsmodeller
- #21 Forebygge madspild
- #22 Fremme reparation og genbrug

Genanvendelse

- #23 Ensætte den kommunale indsamling af husholdningsaffald for at fremme genanvendelse
- #24 Skabe klarhed om affaldssektorens rammevilkår og et bedre udbud af genanvendte råvarer
- #25 Forbedre konkurrencevilkårene på markedet for affald og genanvendte råvarer gennem ensartet klassificering og et styrket risikobaseret affaldstøyn
- #26 Udbrede selektiv nedrivning af byggen
- #27 Indføre et mere cirkulært producentansvar for elektronikaffald



BAY OF PARTNERSHIP



STATOIL REFINING DENMARK

ØRSTED

KALUNDBORG
UTILITY

AVISTA OIL

KALUNDBORG MUNICIPALITY AND BIOPRO

GYPROC SAINT GOBAIN

NOVOZYMES AND NOVO NORDISK

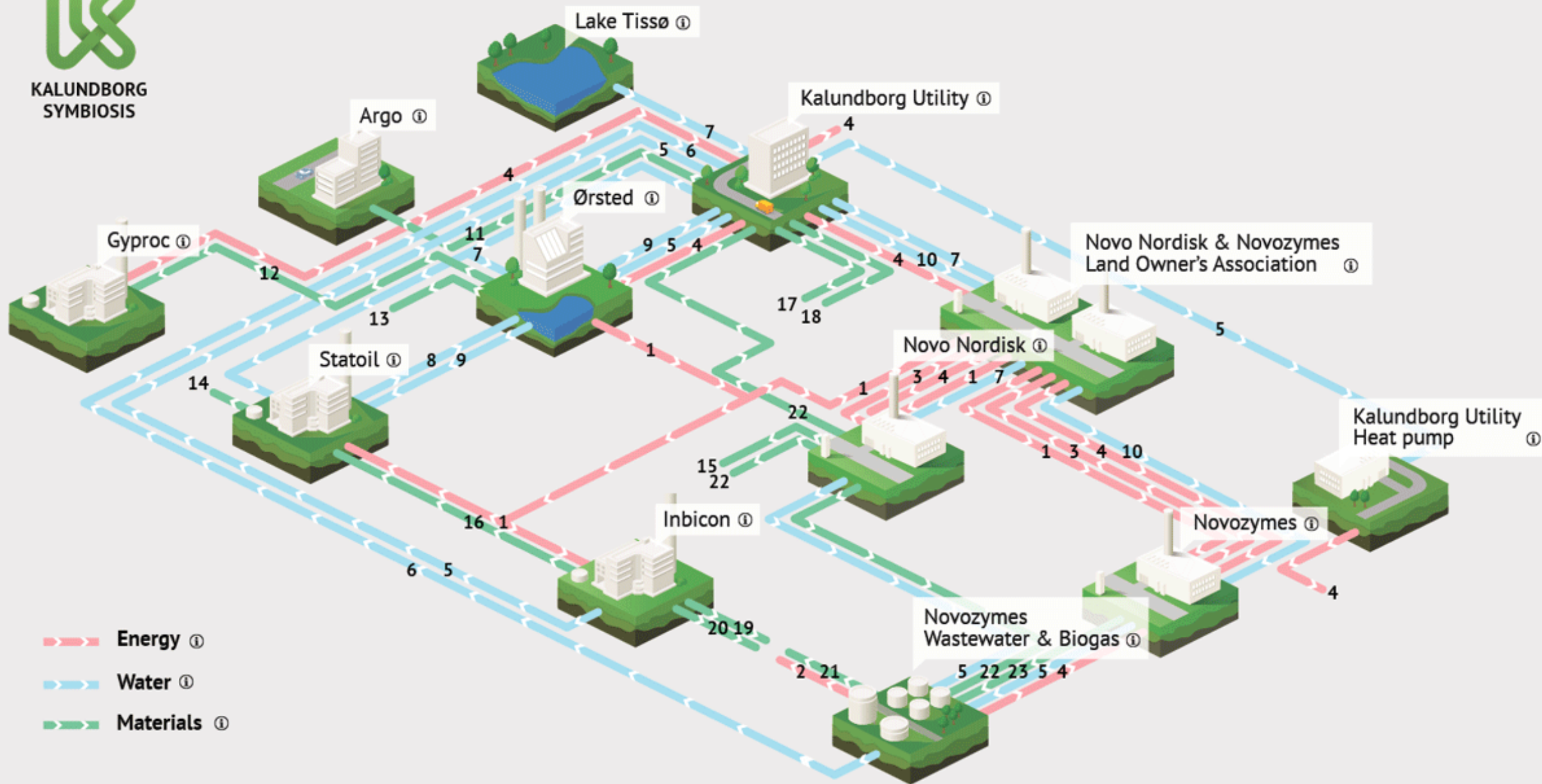
ARGO



KALUNDBORG
SYMBIOSIS



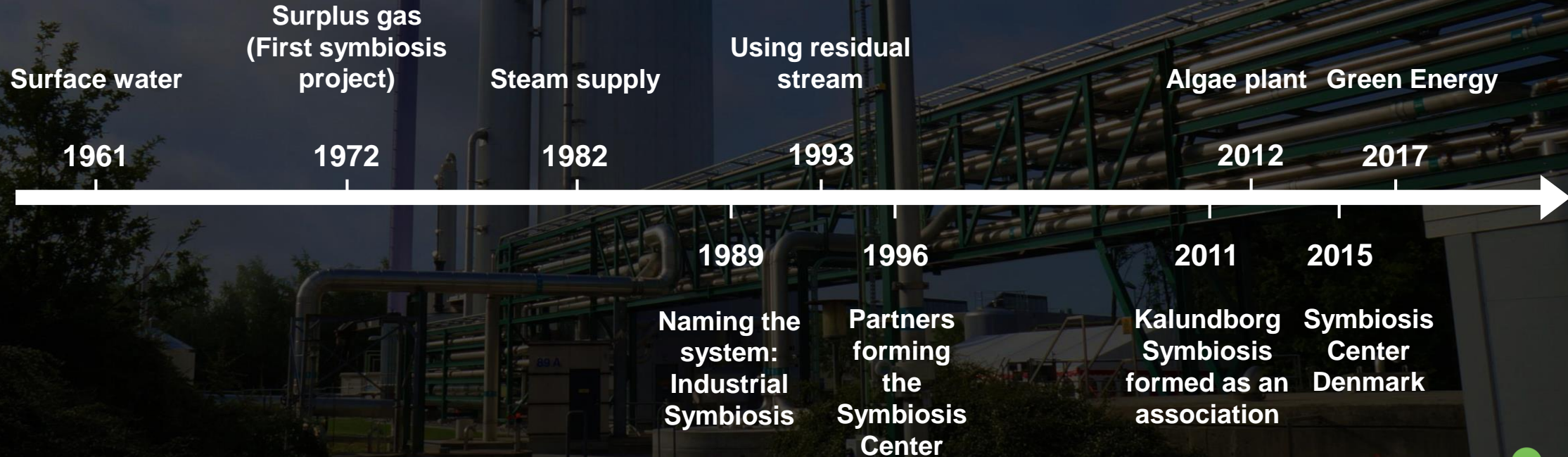
KALUNDBORG
SYMBIOSIS



MORE THAN 40 YEARS OF COOPERATION

PROJECTS

ORGANIZATION



KALUNDBORG SYMBIOSIS

ANNUAL SAVINGS

BY LIFE CYCLE ASSESSMENT (LCA)

635.000 ton

CO₂ (environmental)



The same amount of CO₂ used on average over a year by **37.352 Danes**

106 mill.

DKK (socioeconomic)



Enough to buy **354 brand new** electric powered cars

182 mill.

DKK (business economic)



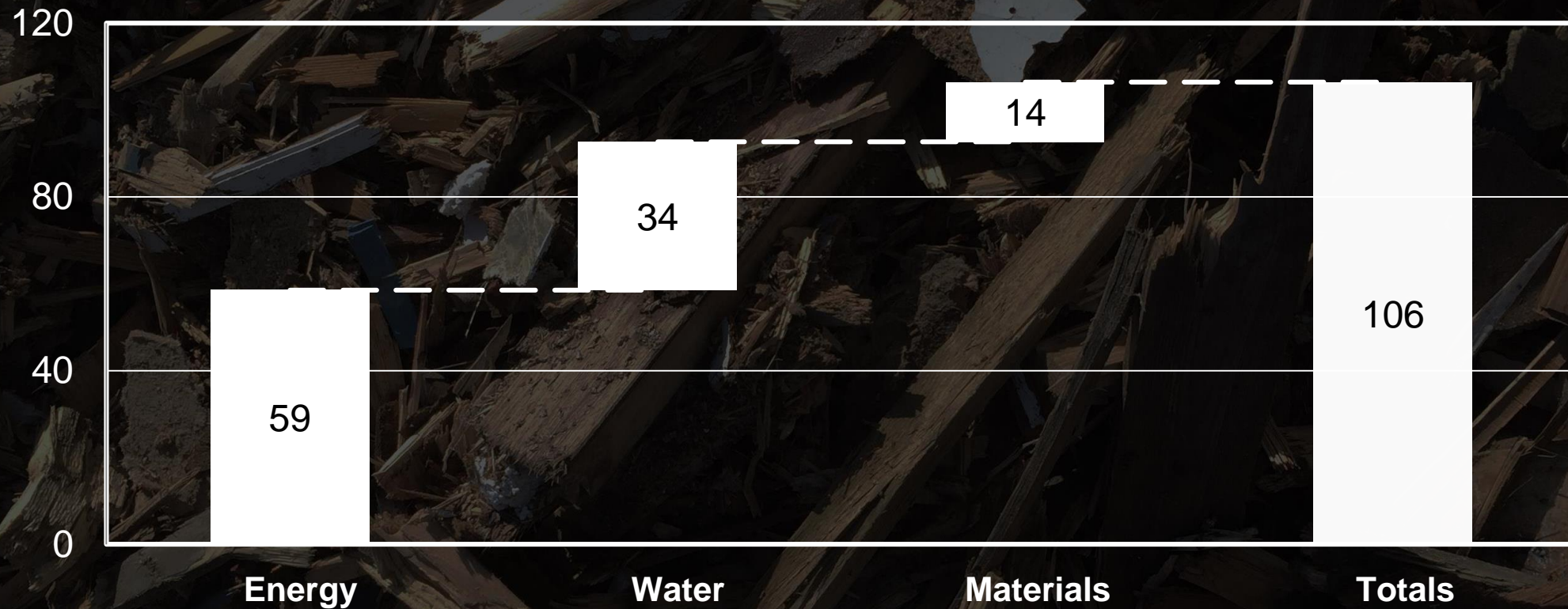
Equivalent to having **252 academics** employed for a year



KALUNDBORG
SYMBIOSIS

SOCIOECONOMIC BENEFITS

Mio. kr. / year



BENEFITS

- Increased growth and competitiveness
- Decoupling of growth and resource consumption
- Better control and adaptability
- Better innovation and business development
- Increased motivation and market value

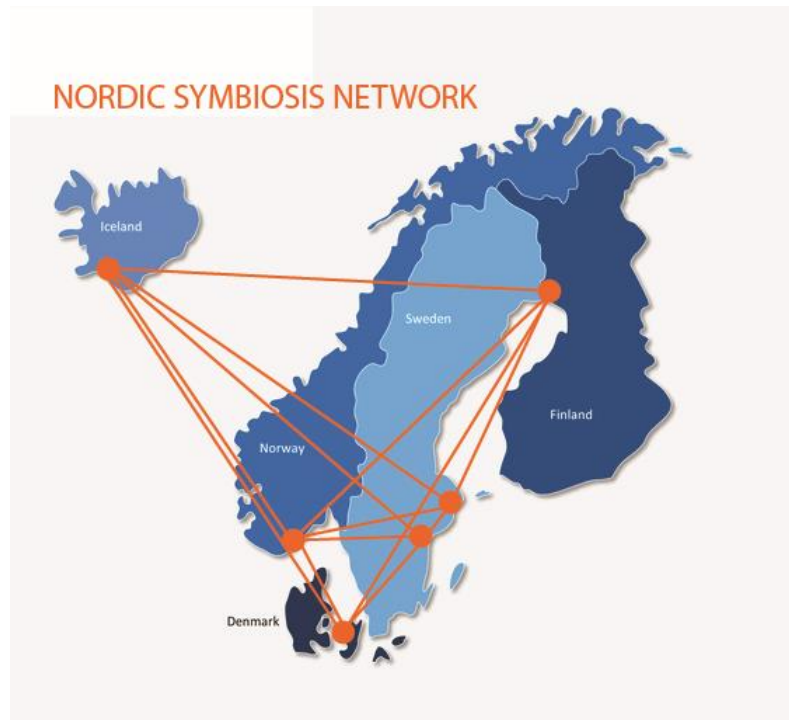
NEXT STEP

1. **Screening potentials (10 new streams by 2025)**
2. **Symbiosis from Ground Zero**
3. **GECKO – a project in Kenya**
4. **International networks**
5. **Supporting start-ups and educational initiatives**
6. **IS value proposition – attracting new industry**



NORDIC IUS NETWORK

- Current geography



- Current members:

- Linköping University, Academia (SE)
- Digipolis, Industry Cluster (FI)
- Kalundborg Symbiosis, Industrial Cluster & Symbiosis Center Denmark, Knowledge Center (DK)
- Eyde Cluster, Industry Cluster (NO)
- Alklasinn, Industry Cluster (IS)
- Nordregio, Societal research (Pan-Nordic)