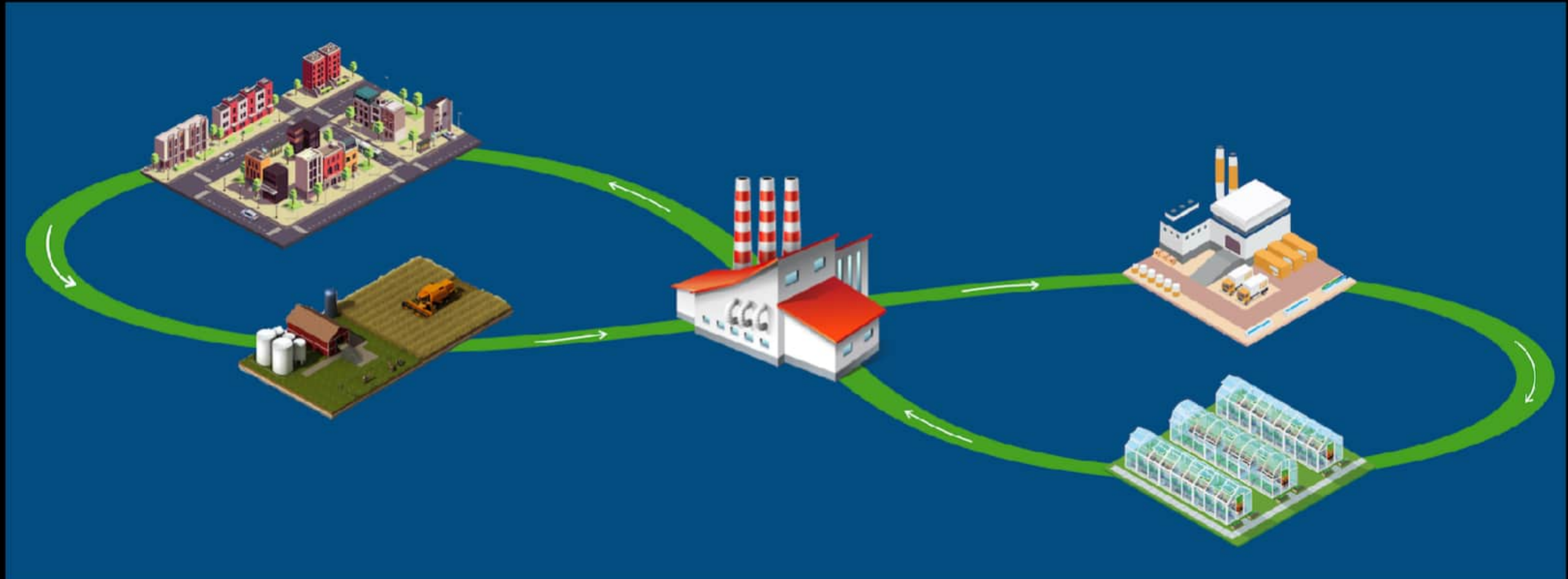


# Industrial & Urban Symbiosis

*An under-exploited Circularity hero?*



Murat Mirata

*Environmental Technology and Management*

"A must-read." —Bill and Melinda Gates

The Power of Knowing What You Don't Know

# THINK AGAIN



# ADAM GRANT

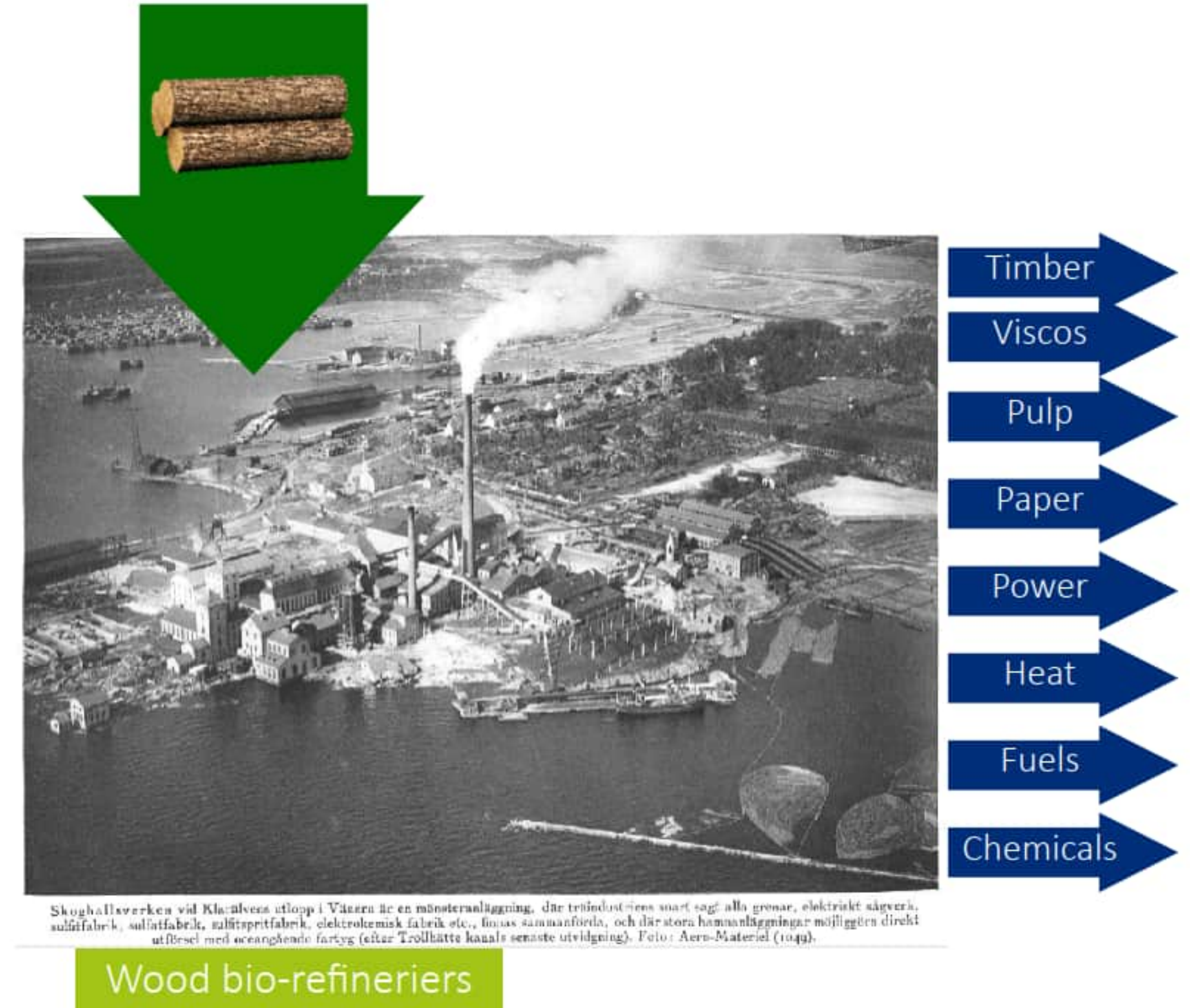
#1 *New York Times* bestselling author of  
**ORIGINALS**

# CONFIDENCE

VS

# COMPETENCE

# Industries in the past

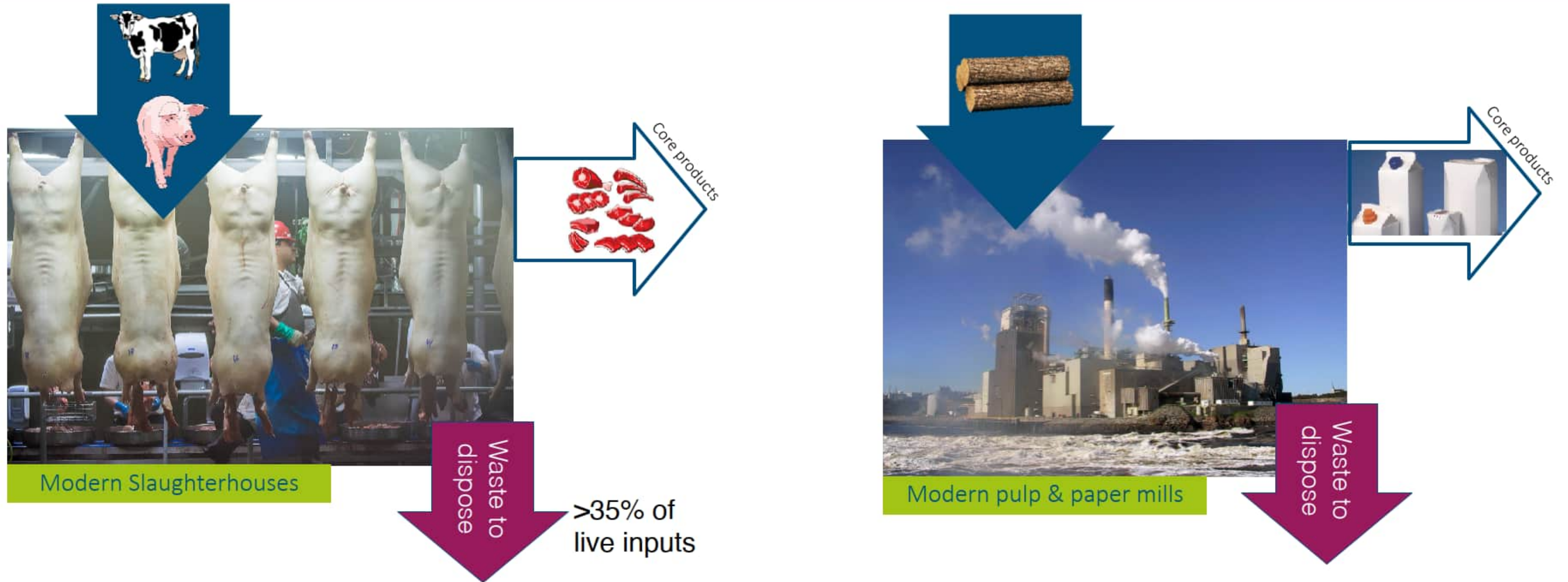


100% Product

Diversity

Integration

# Modern industry



Modern Slaughterhouses

Modern pulp & paper mills

Product & market specialisation

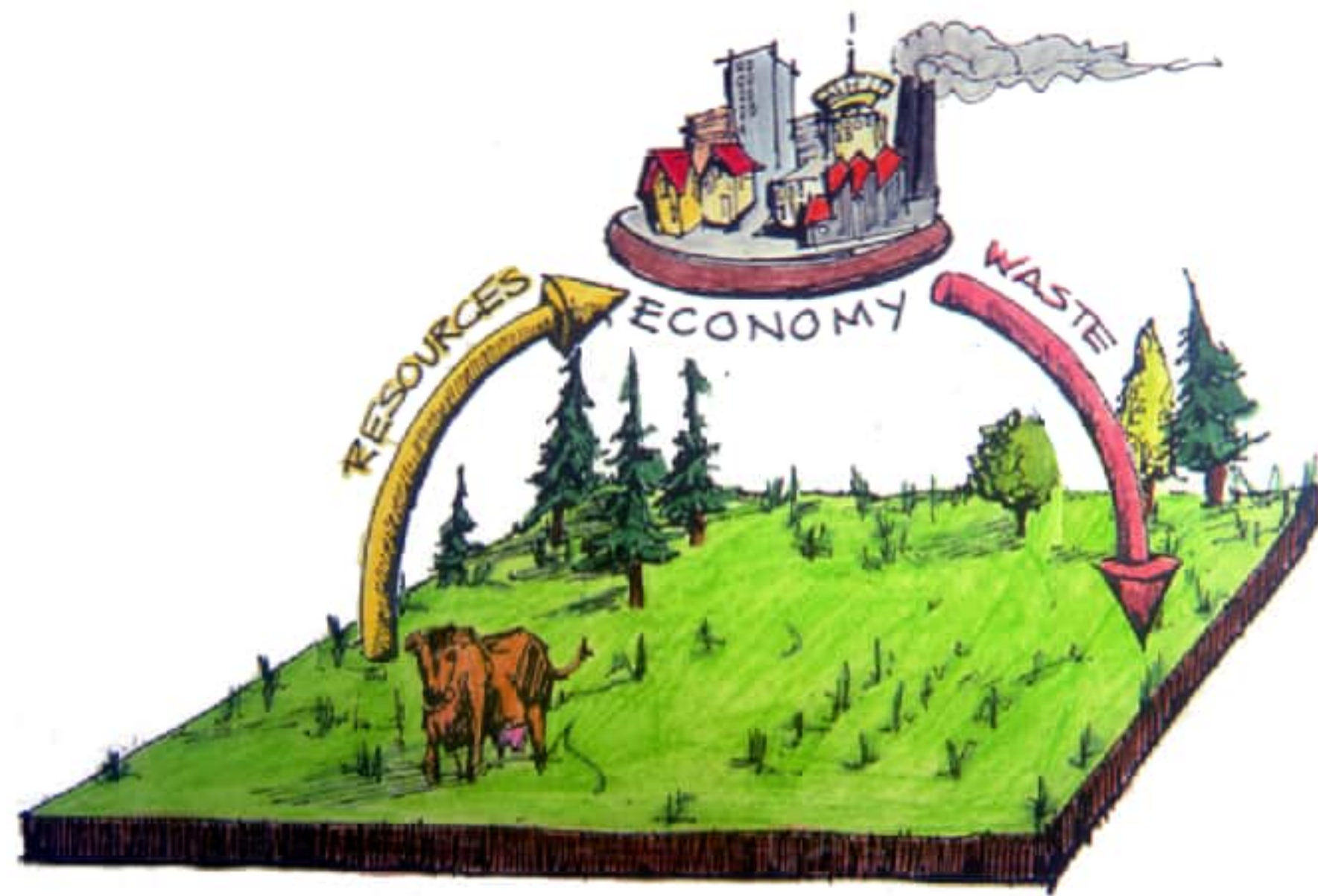
Globalisation & scale economies

Labor & machinery optimised

**Primary inputs**

**Poor “left over”  
handling**

**Sector & supply chain  
separation**



**COSTS &  
RISKS**

Resource access &  
residue management

Regulatory  
compliance

Stakeholder  
demands

# Silo approach dominates



Important and necessary – but is insufficient and misses significant opportunities.

USE  
BETTER  
RESOURCES  
USE  
BETTER

**Need to think and act in new ways**

*Going beyond individual products, organisations and sectors.*



# Industrial & urban symbiosis

## Managing resources collectively



Better inputs

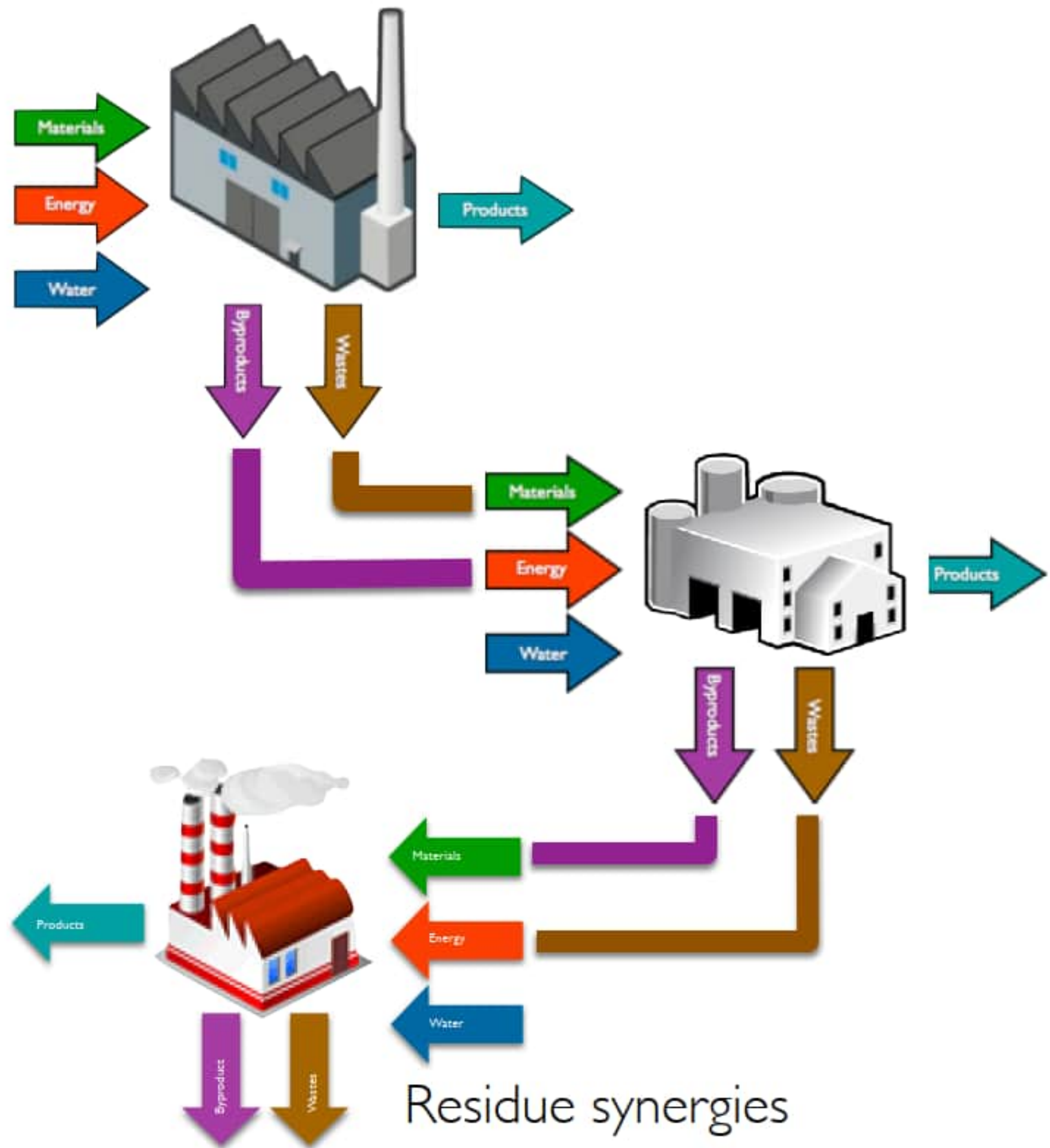
Better value from outputs

Better product & services

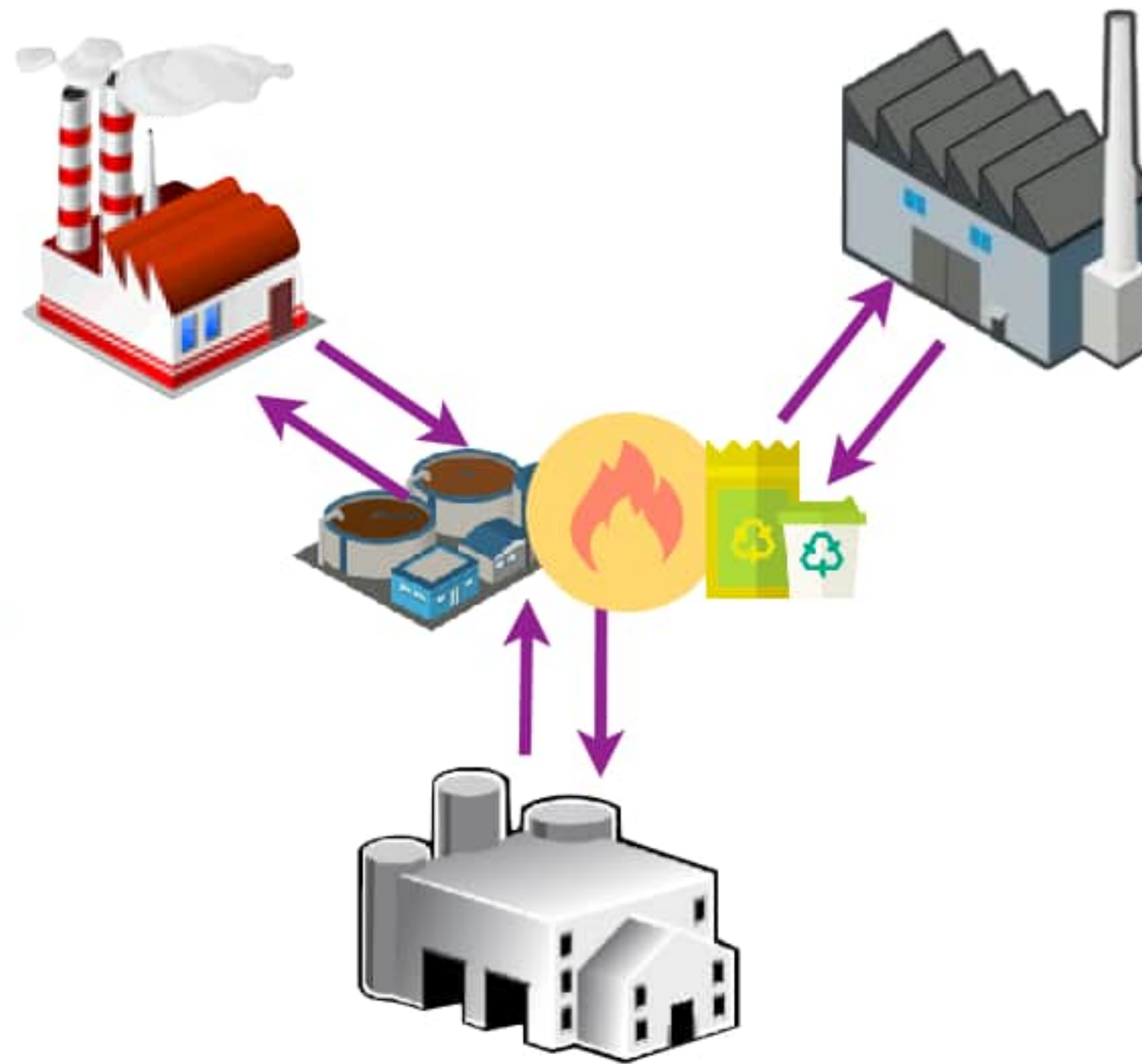


Cross-sectoral partnerships

# Mechanisms



Residue synergies



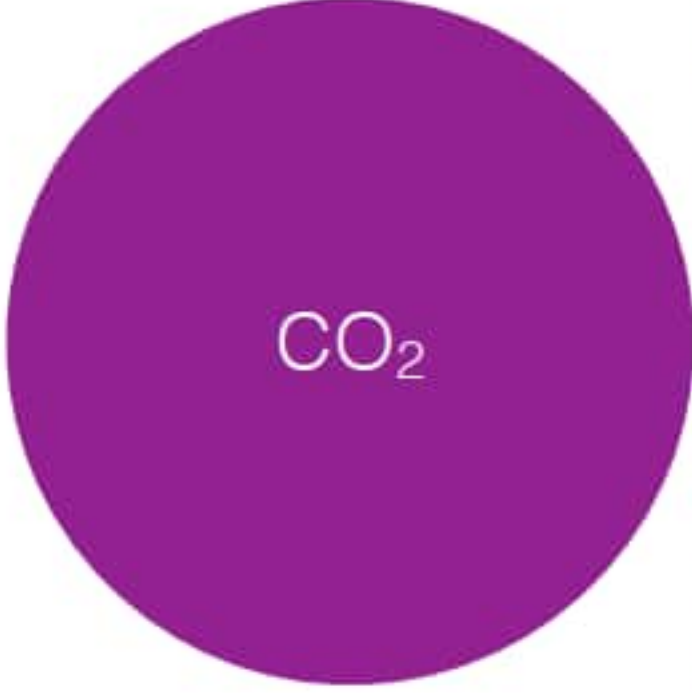
Utility/service synergies



Knowledge/competence synergies

Some inspiration





Comparable price & quality AND superior environmental performance

- x 20 CO<sub>2</sub> reduction over Swedish average
- x 50 CO<sub>2</sub> reduction over fossil-based production

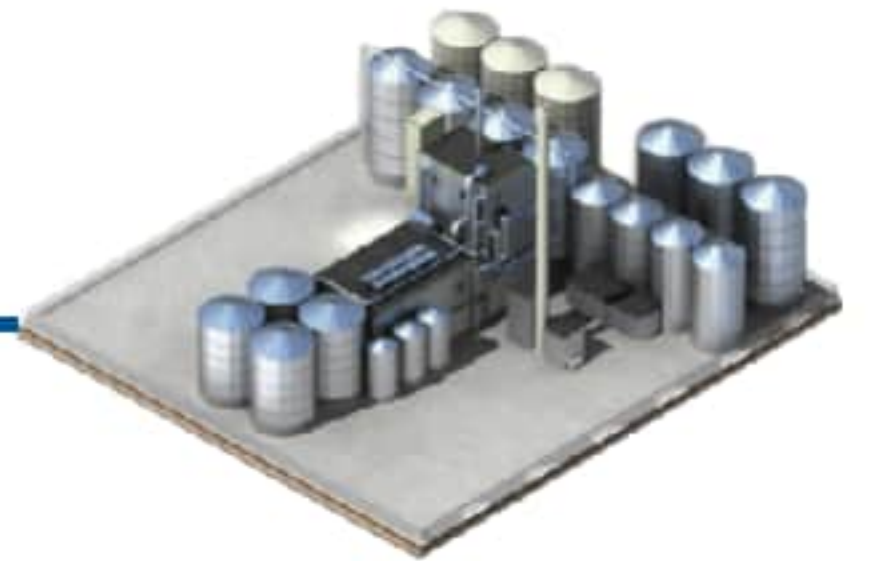


Södra Cell Pulp Mill

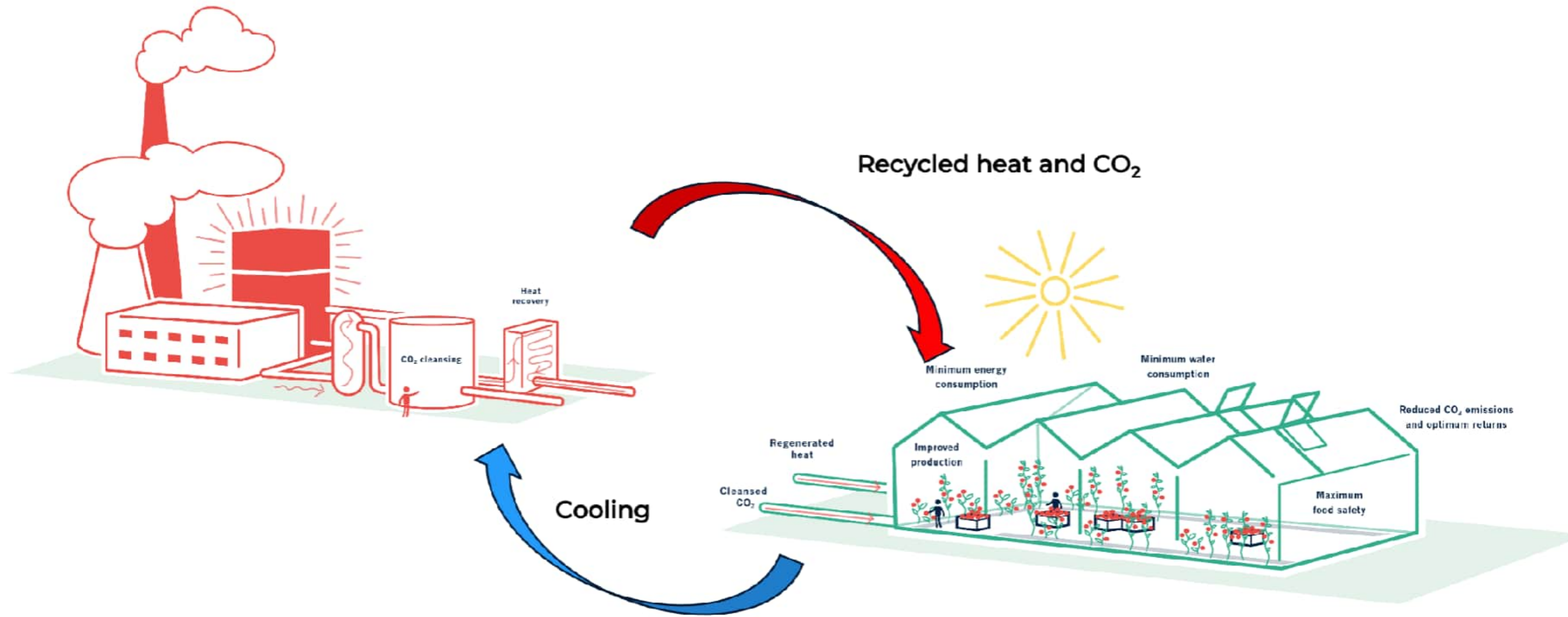
Heat →



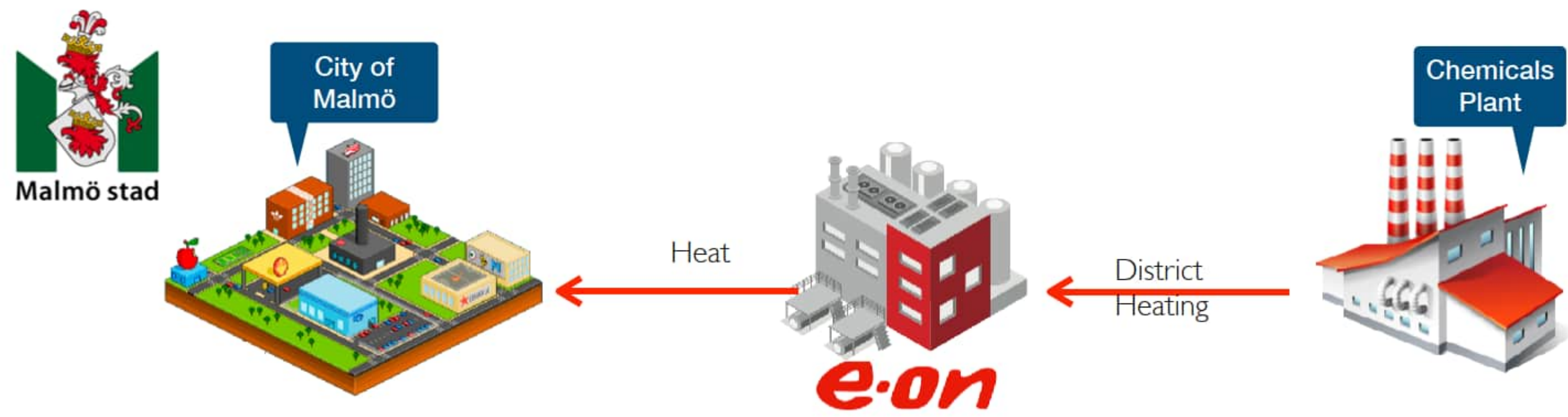
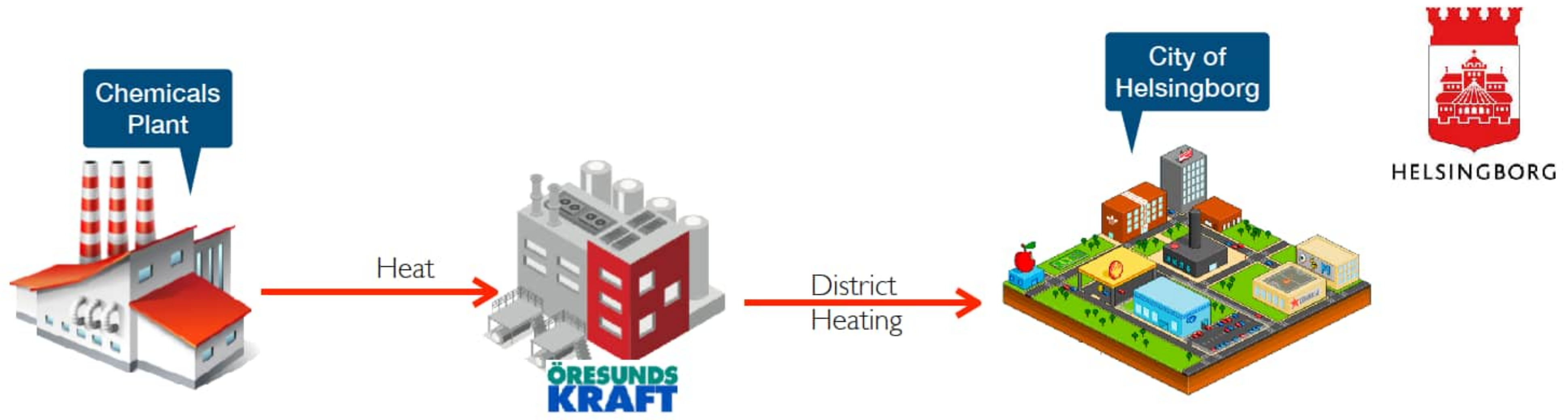
← CO<sub>2</sub>



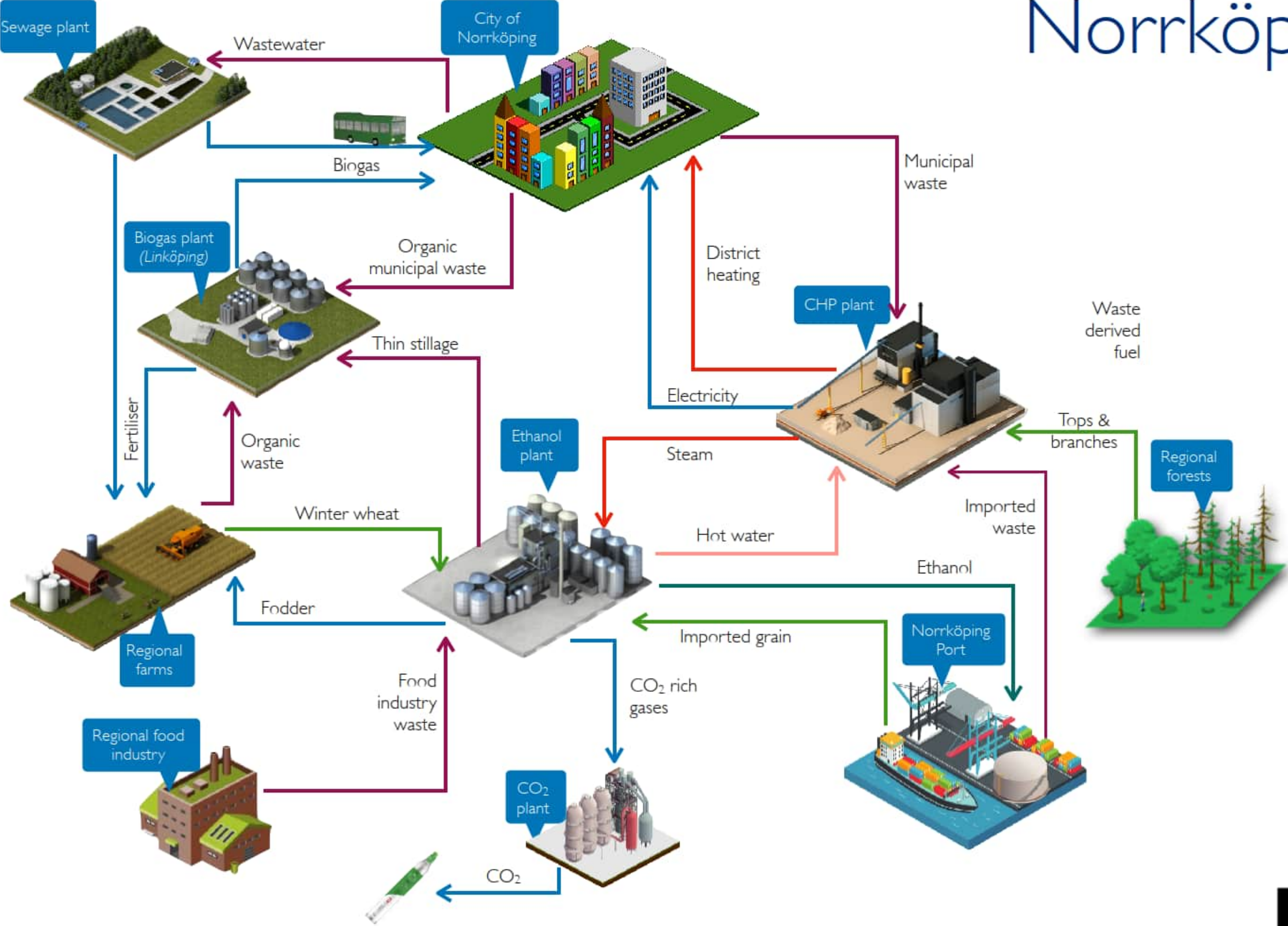
Vodka/Ethanol Production



Courtesy of **WARM**



# Norrköping



# New product/service solutions



Suitable fuel with 90% CO<sub>2</sub> reduction



Customised distribution solutions

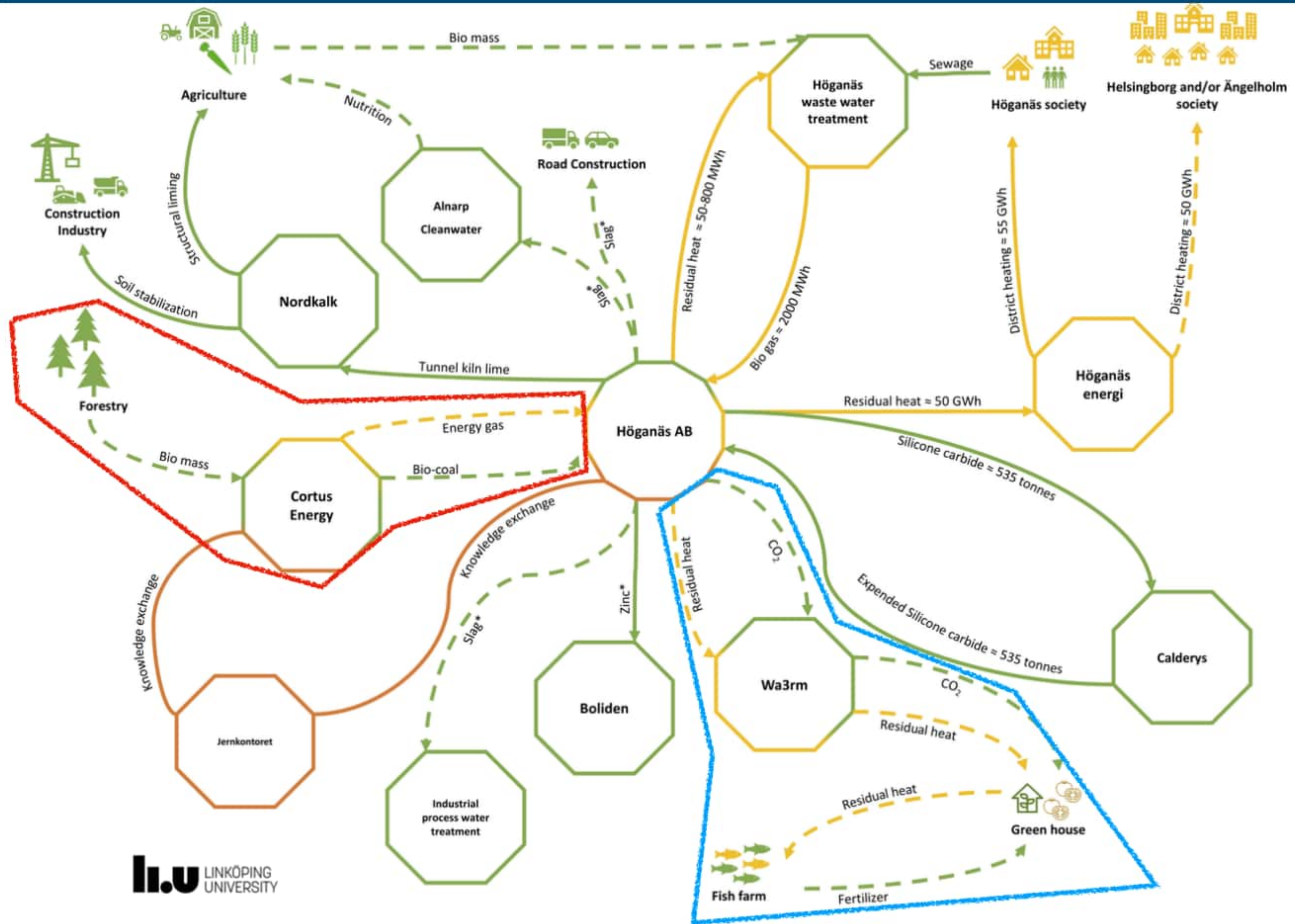


Latest generation ethanol vehicles with diesel principle





# Höganäs, Sweden





 Orkla

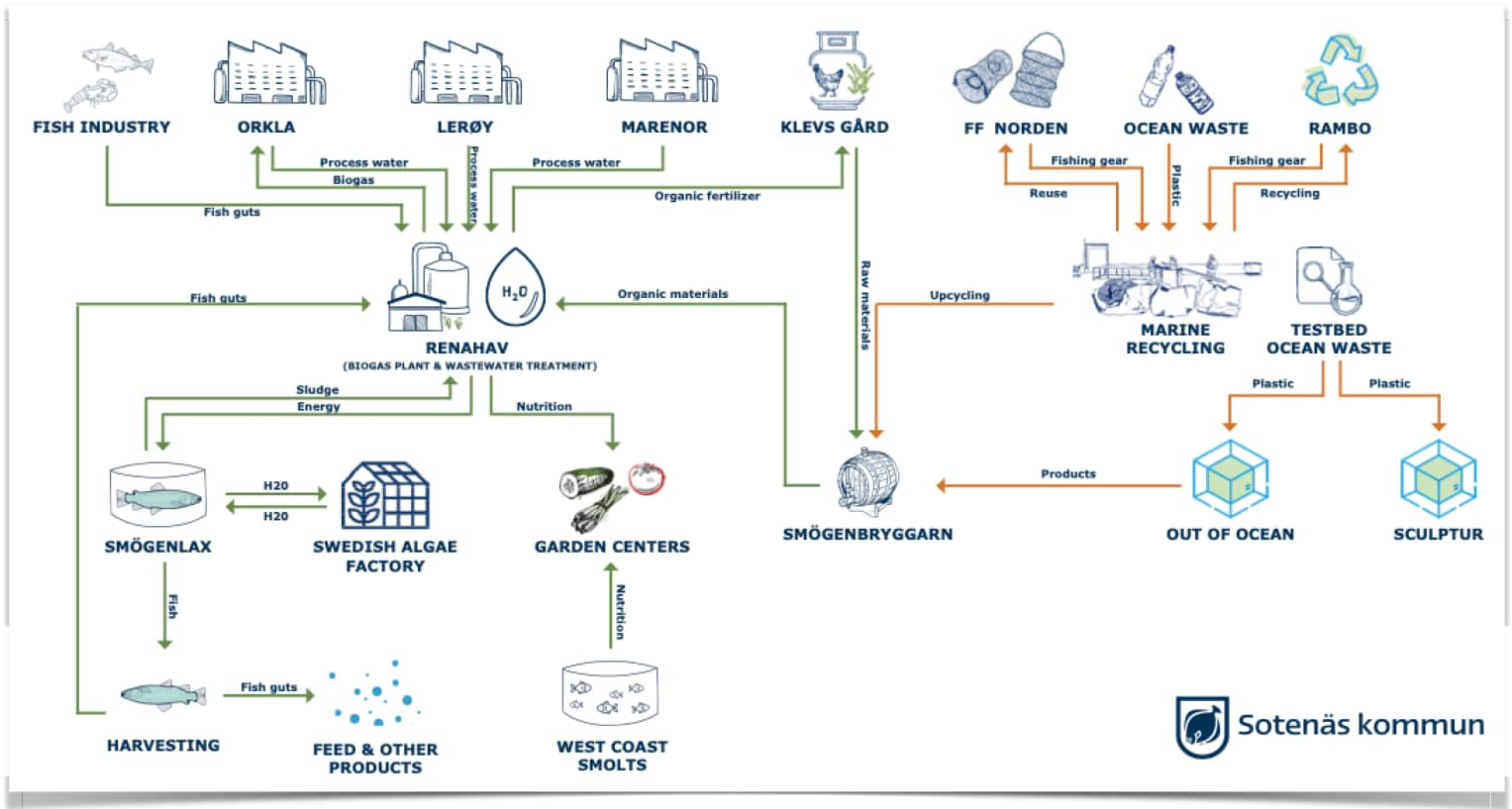


 LERØY



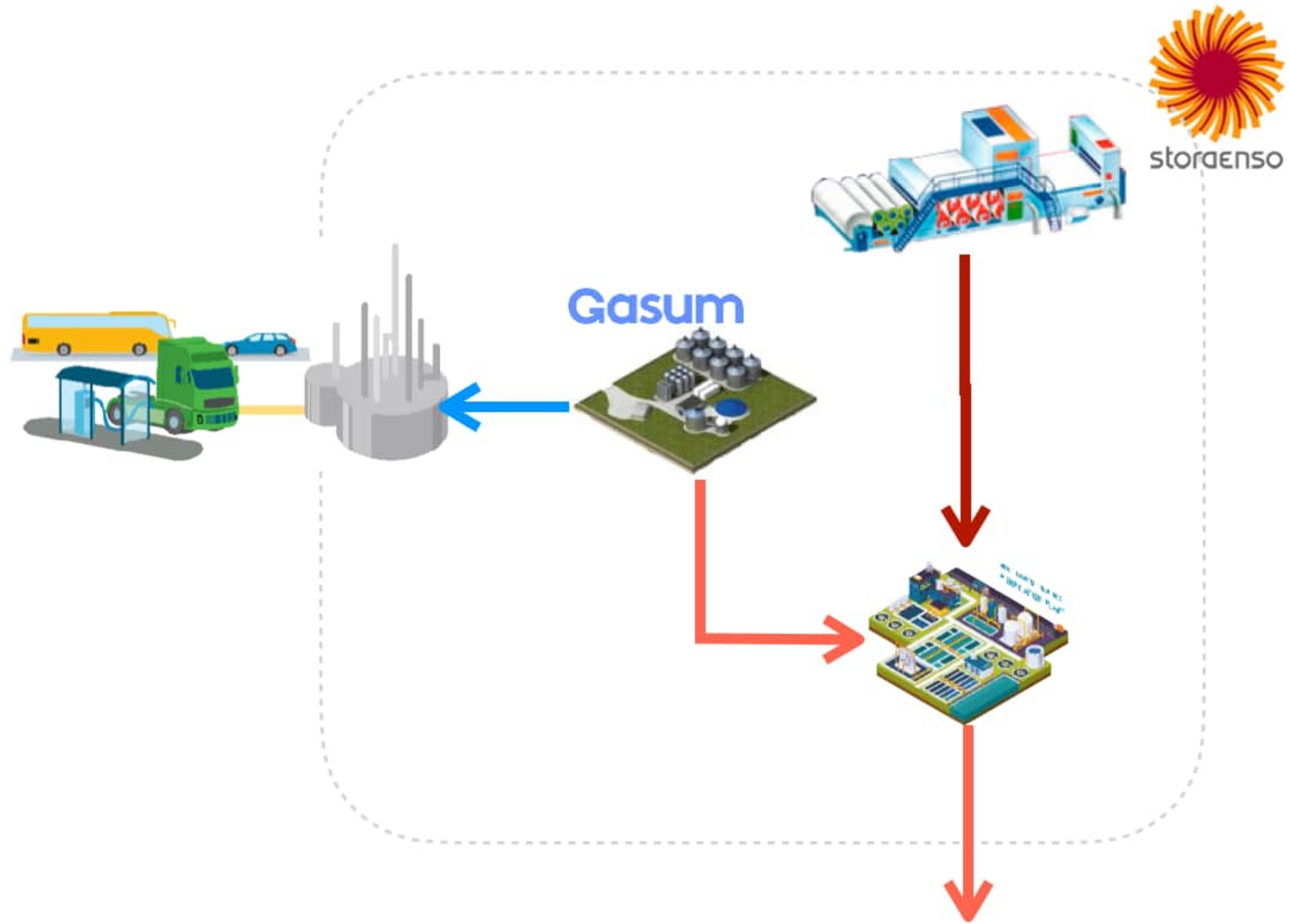
 MARENØR  
SEAFOOD







# Nymölla

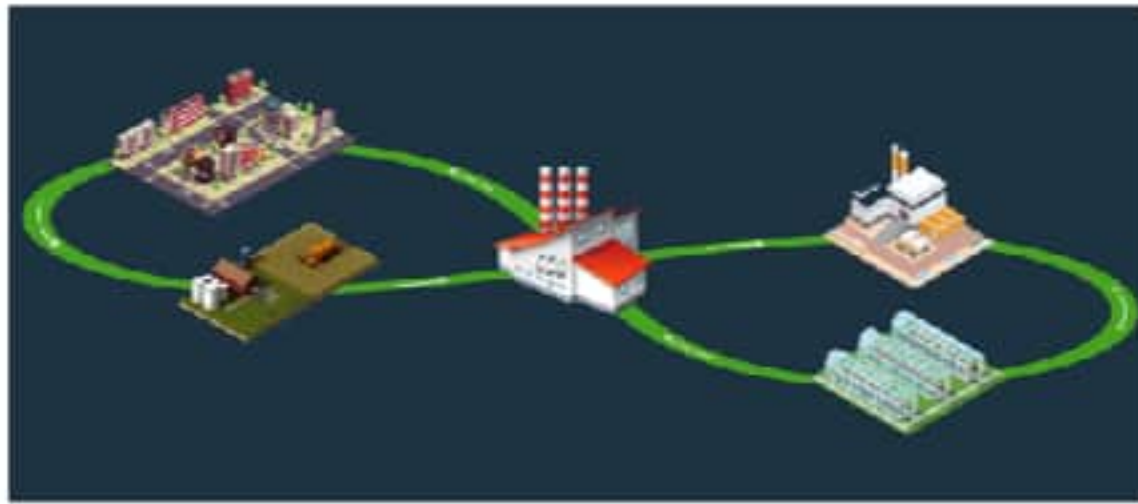


# Skogn, Norway



# For more information

## Industriell och Urban Symbios



Industriell och Urban Symbios (IUS) är ett strategiskt arbetssätt för att öka resursproduktiviteten genom samverkan. Strategin bygger på långsiktiga samarbeten mellan aktörer och sektorer som ökar värdet av underutnyttjade resurser och bidrar till innovation. IUS förbättrar företagens konkurrenskraft, minskar utsläpp och användning av primära och fossila resurser samtidigt som regional utveckling och resurssäkerhet stärks.

## Varför ska du engagera dig i IUS?



Problemet



(Del av) Lösningen



Målbilden

[www.industriellekologi.se](http://www.industriellekologi.se)

[www.industrialsymbiosis.se](http://www.industrialsymbiosis.se)

# ENABLERS



DRIVEN



WILLING

CAPABLE

INTIMATE COMMUNICATION



TRUST



ENABLING  
POLICY

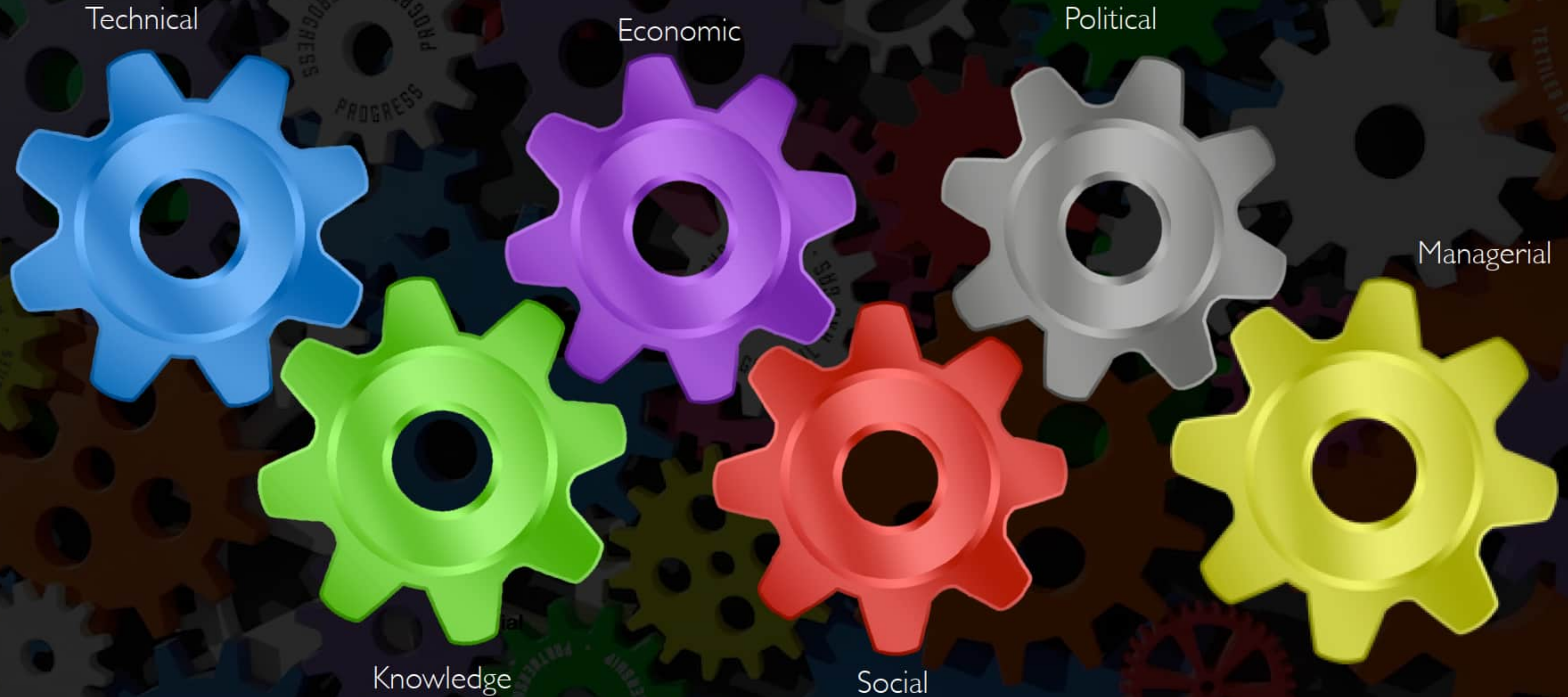
BUSINESS  
CASE



Murat Mirata



# Challenges



WHAT CAN  
BUSINESS DO?

EXPAND THE MINDSET



ALLOCATE RESOURCES



TALK & VISIT



ENGAGE  
REGENERATIVE ENTREPRENEURS

TRANSPARENT  
WIN-WIN AGREEMENTS

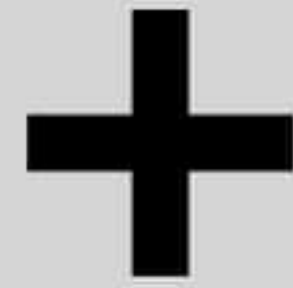
COMMUNICATE

# Regenerative industries

Waste



Biology/technology



Business model & money



Regeneration



**WARMM**

värmevärden



**ECONOVA**

**againity**

**biototal**



**Rena hav**  
ENERGI OCH VÄXTKRAFT



SWEDISH  
ALGAE  
FACTORY

**Gasum**



Scandinavian **biogas**



**ectogrid™**

POWERED BY *e-on*

**RAGN SELLS**

THANK YOU



[murat.mirata@liu.se](mailto:murat.mirata@liu.se)