

INDUSTRIAL SYMBIOSIS V 2.0

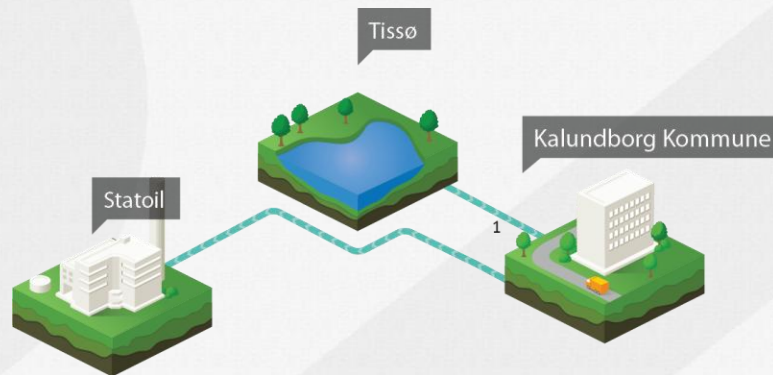


- HOW GLOBAL CHALLENGES BECOME LOCAL ADVANTAGES

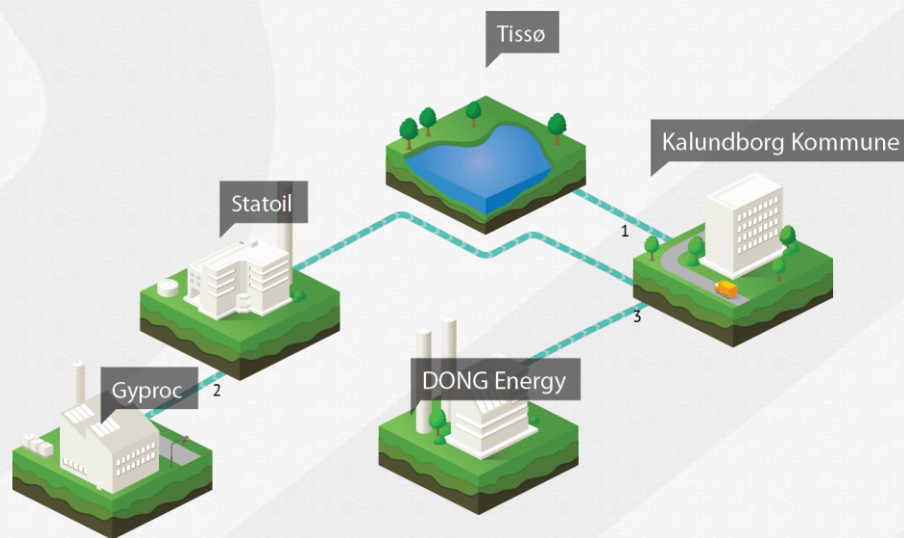
Mette Skovbjerg, Project Manager, Symbiosis Center



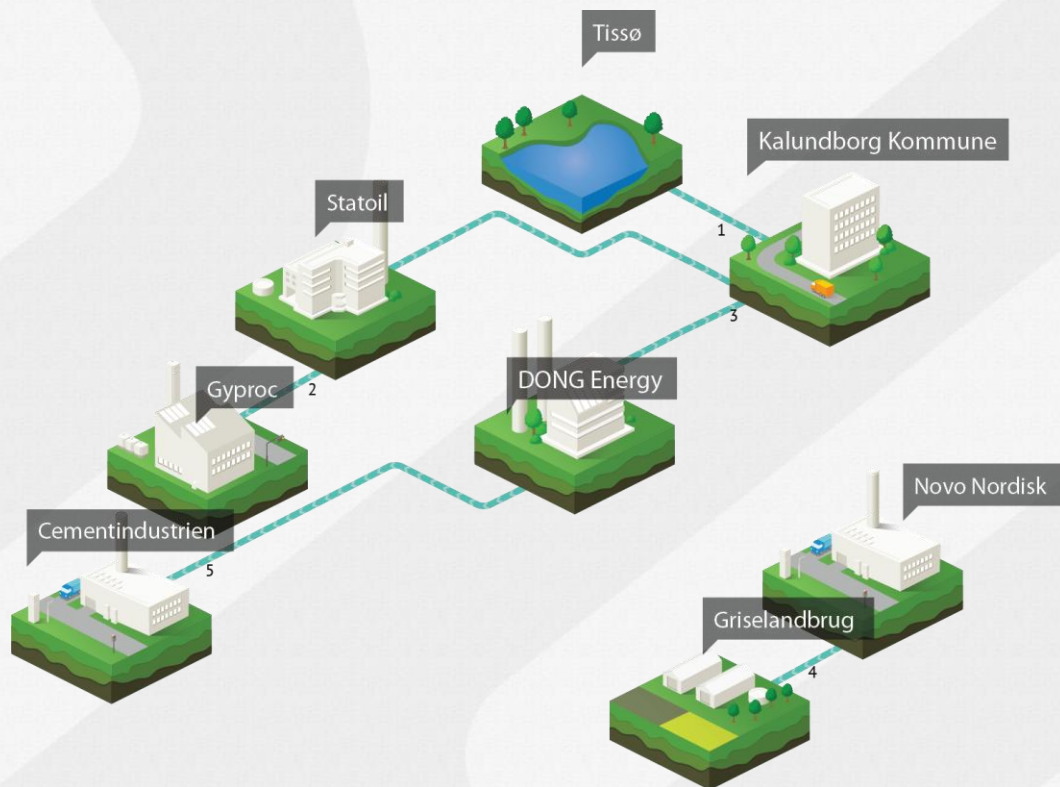
1961



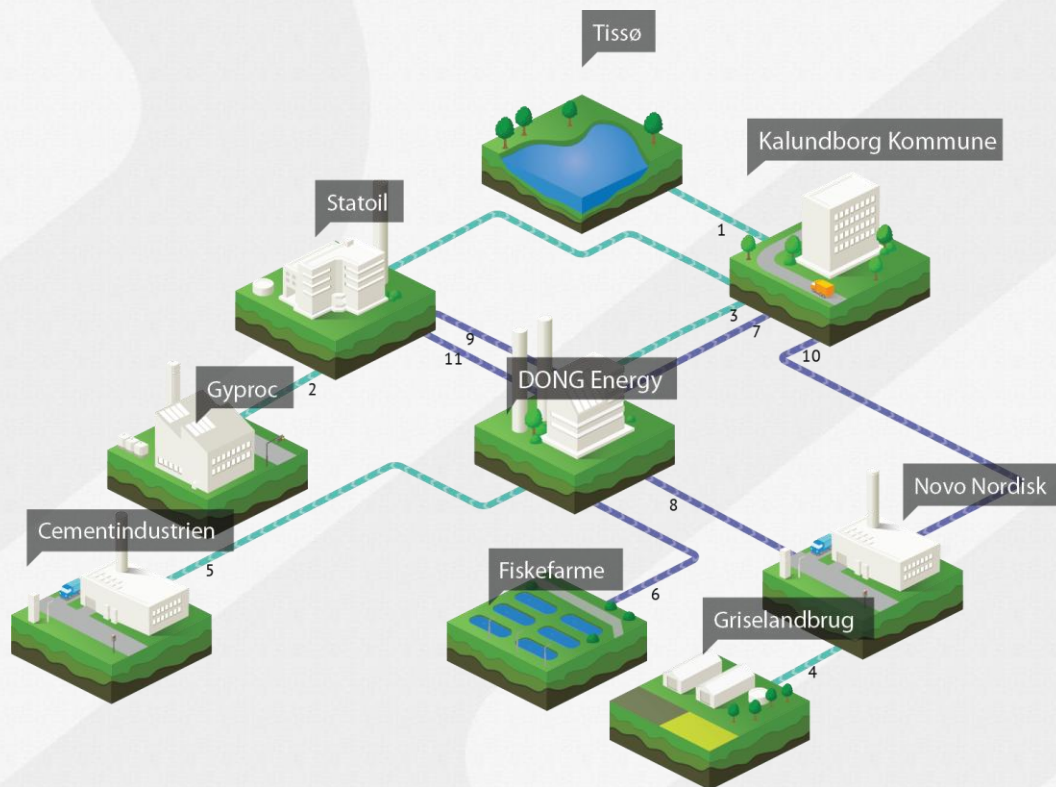
1972



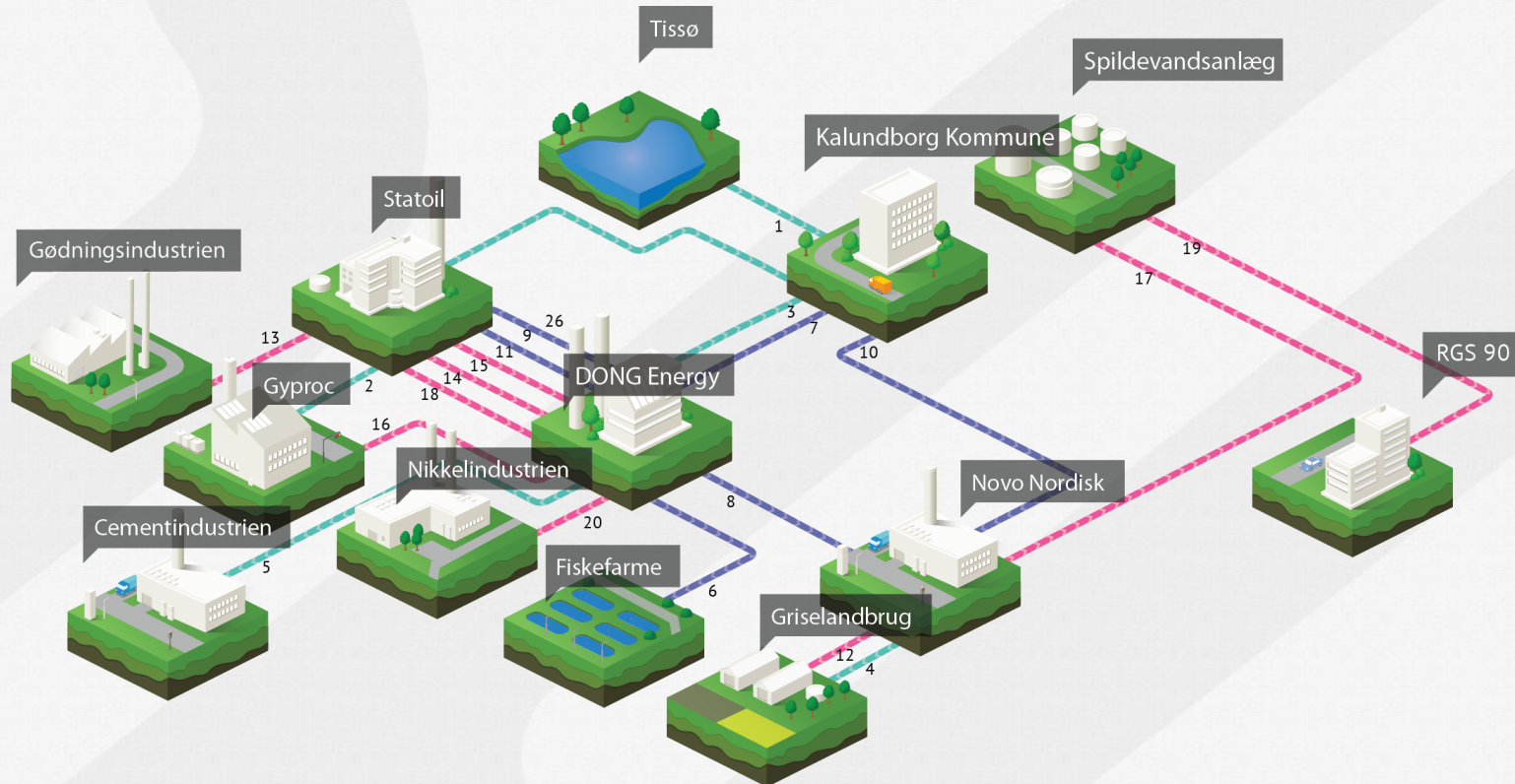
1979



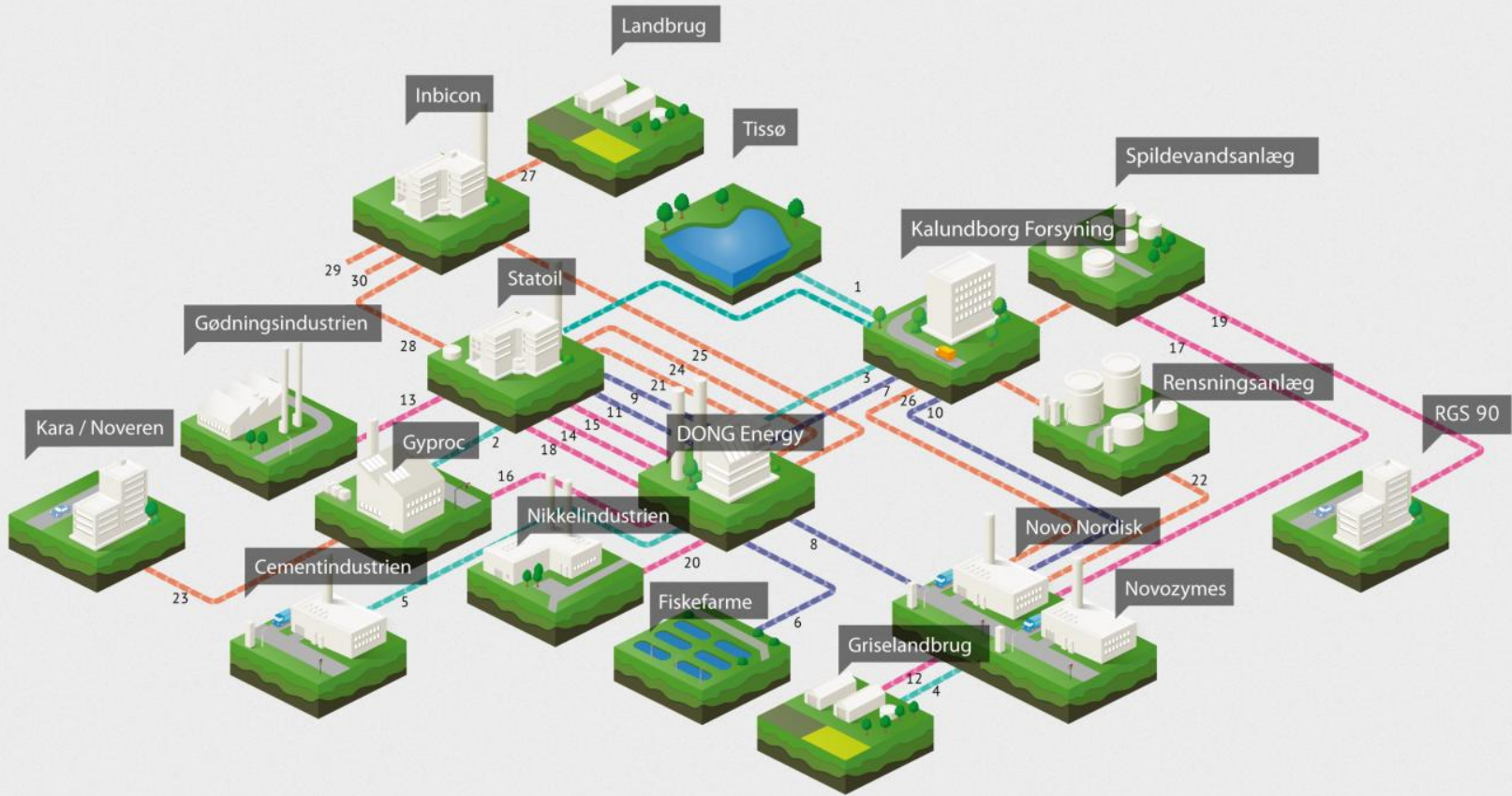
1980 - 1989



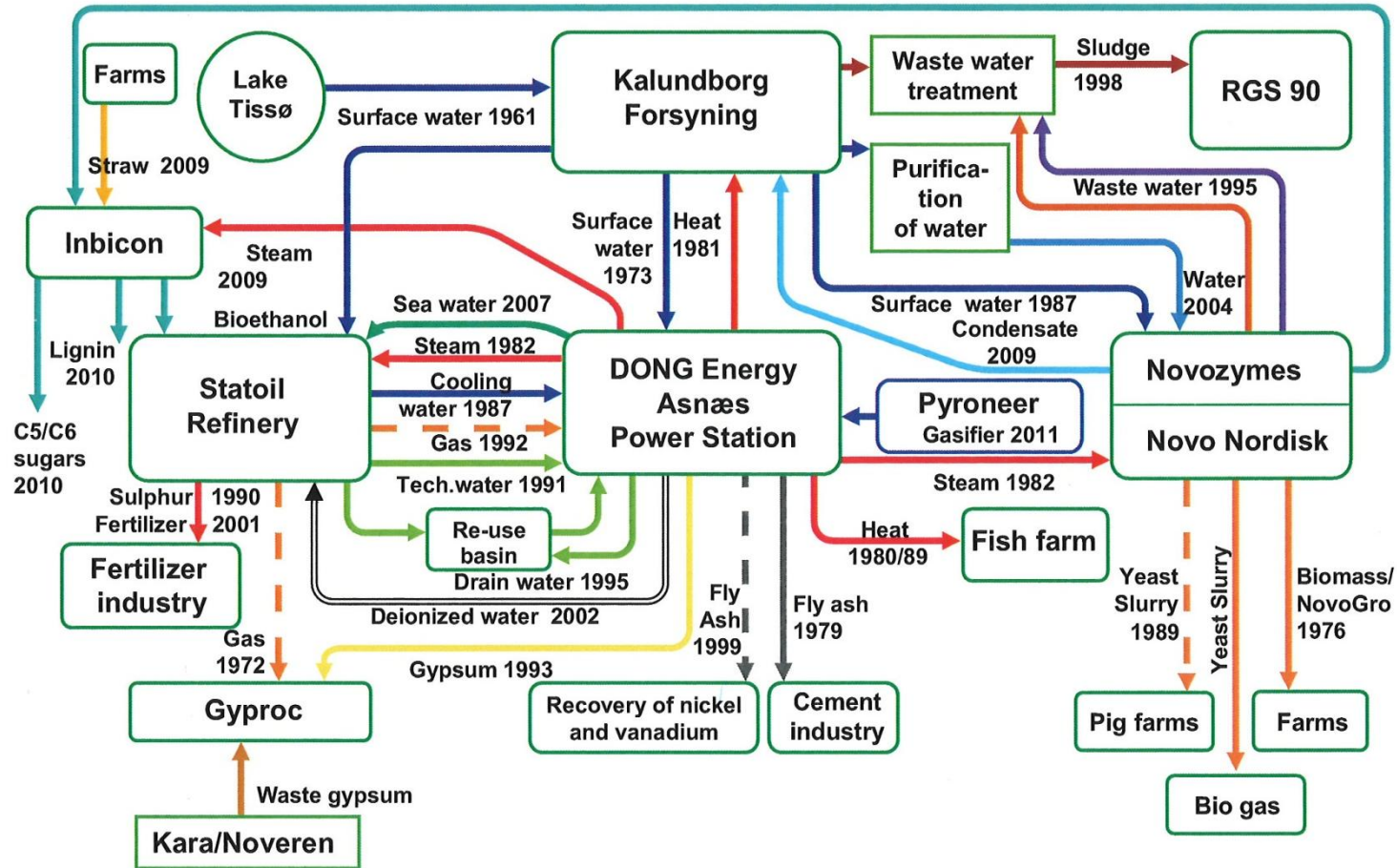
1990 - 1999



2000 - 2010



TOTAL SYMBIOSIS SYSTEM 2011



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Types of Projects

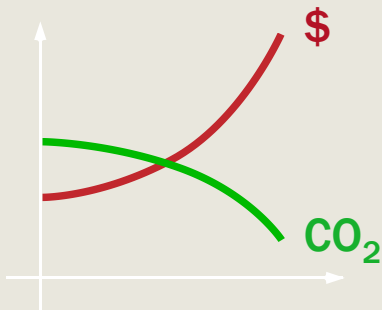
Three types of projects:

Recycling of water:	14 Projects
Exchange of energy:	7 Projects
Recycling of waste products:	12 Projects

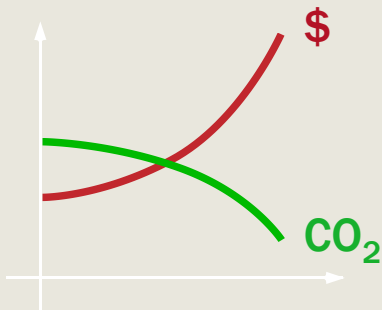


Minimizing costs on waste handling and creating revenue from new by-products

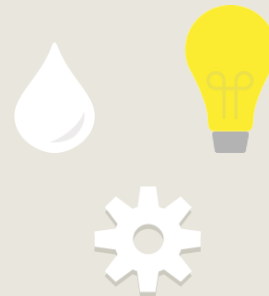
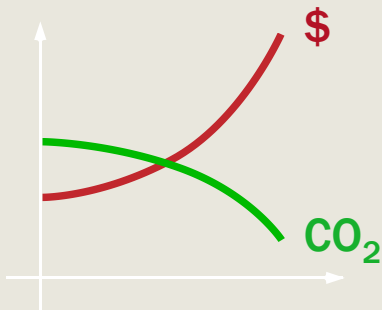
And at the same time reducing the ecological footprint by minimizing the intake of virgine resources and increasing reuse and recycling



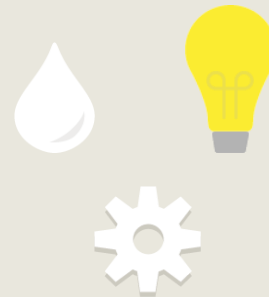
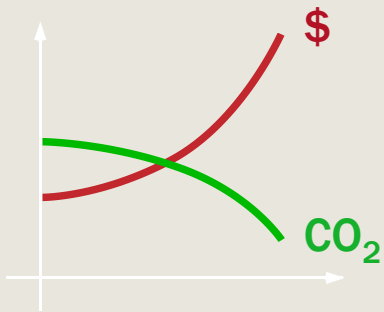
A targeted process of communicating and establishing links between diverse companies



In the process fostering a productive environment for innovation and development



Which all can be summed up as the Symbiosis Model



Economy:

- Individual agreements between companies
- Jan Hoff, Production Manager Novo Nordisk:
600 mio. DKK or app. 80 mio. Euro



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Environmental Aspects

Resource savings:

Examples:

Ground water	2,0 mill. m ³ /year
Surface water	1,0 mill. m ³ /year
Natural gypsum	200,000 tons/year
Oil	20,000 tons/year

Reduction of CO₂ emission (2008): app. **275.000 tons**

Innovation

Kalundborg Symbiosis has proven to be an environment which nurtures **innovation and the establishment of test facilities** (pitstop between laboratories and market):

- DONG Energy's demonstration plant Inbicon
- DONG Energy's Pyroneer
- E4Water micro algae test facility



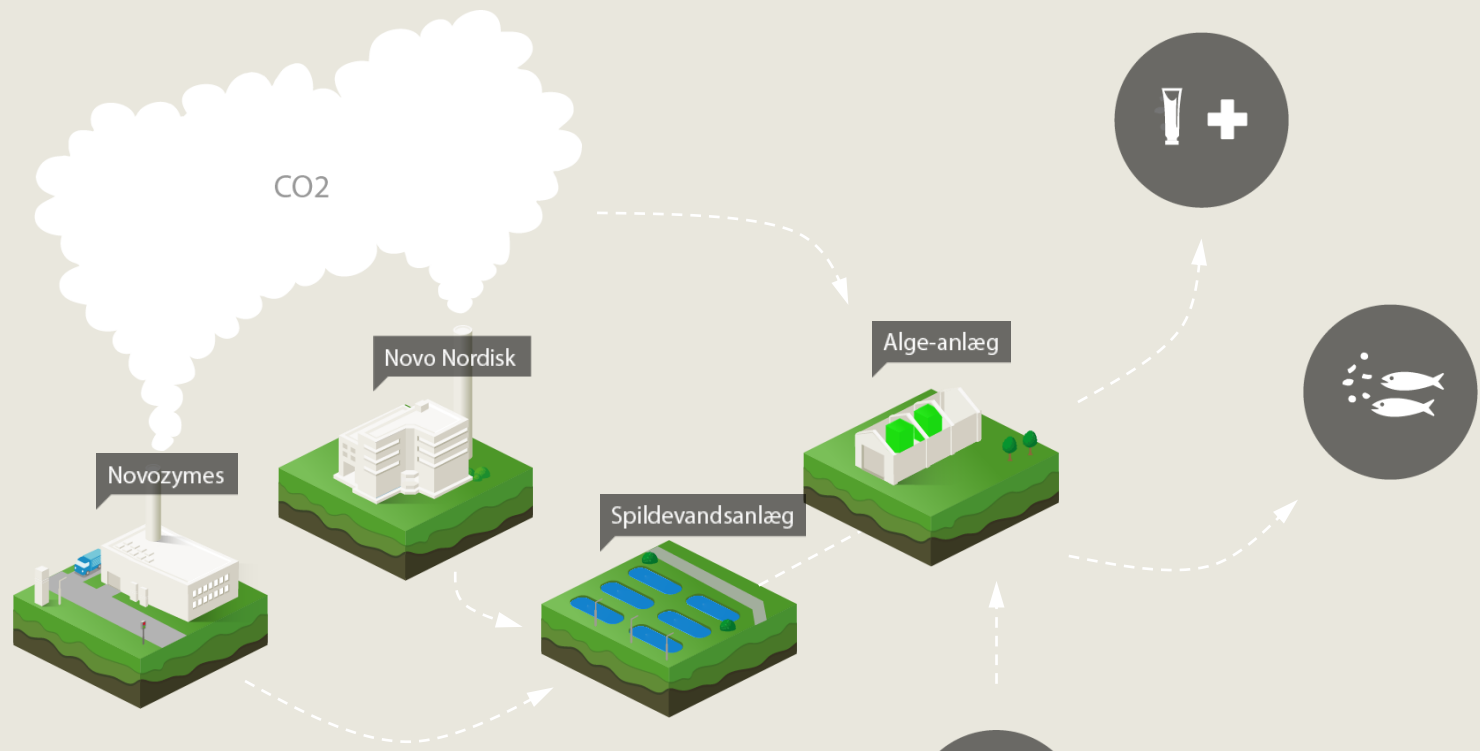
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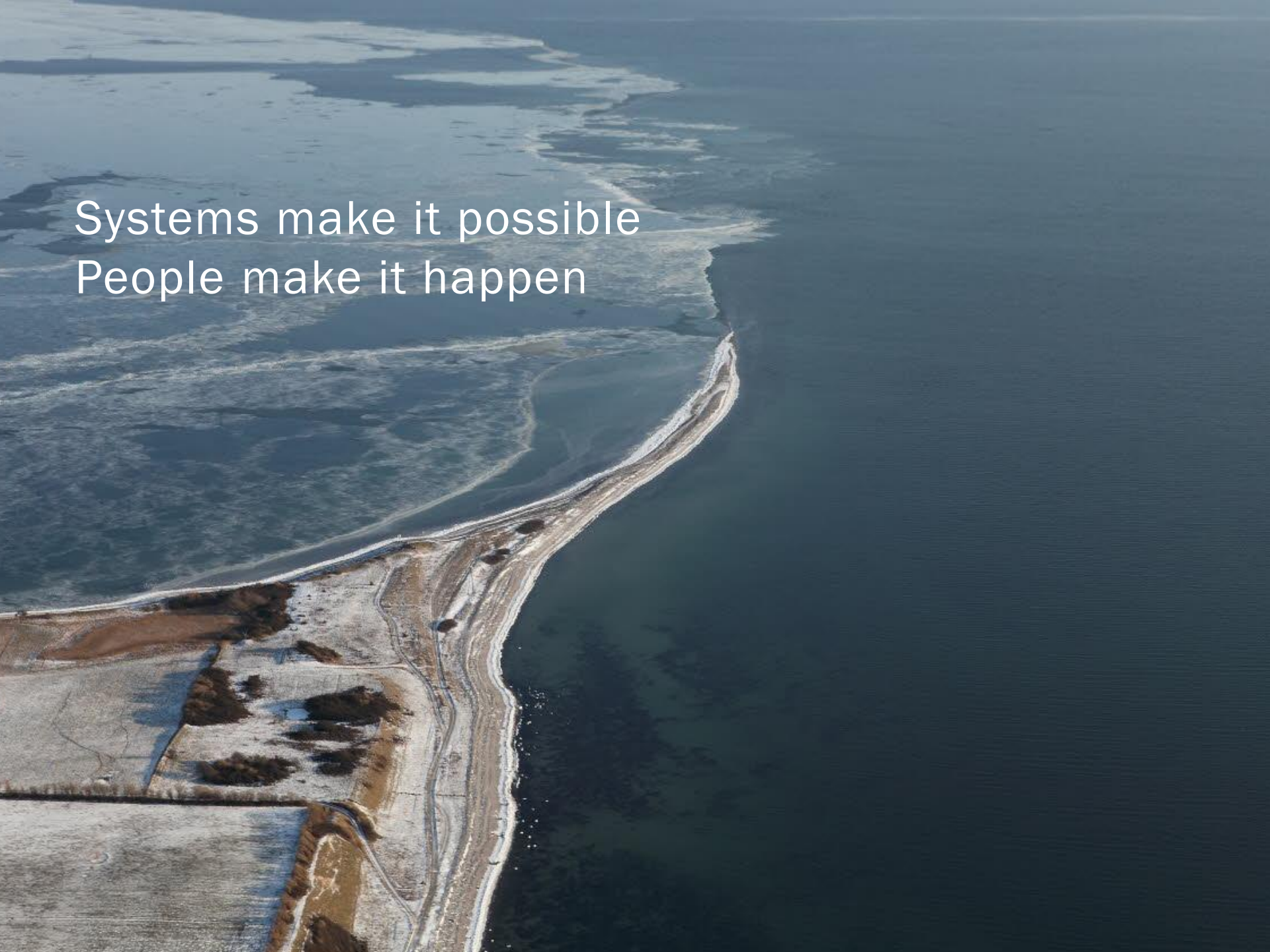
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An aerial photograph showing a narrow, light-colored strip of land, likely a dike or causeway, extending from the left side of the frame towards the right. This strip separates a shallow, light-colored bay or lagoon on the left from the deep, dark blue ocean on the right. The land strip has some vegetation and structures on it. The water in the bay shows some sediment patterns. The overall scene is a coastal landscape.

Systems make it possible
People make it happen