Prestigious award for circular production in Kalundborg

The Board of the Kalundborg Symbiosis has greeted with pride the news that the Symbiosis has been given the prestigious WIN WIN Gothenburg Sustainability Award – a prize that has previously been won by such figures as Kofi Annan, Al Gore and Gro Harlem Brundtland. The jury's citation reads, in part, "As a pioneer within the field, the Kalundborg Symbiosis has shown the way for many other industrial clusters, inspiring businesses all around the world."

The Kalundborg Symbiosis has been in existence for more than 45 years. It is a completely unique partnership that brings industries together with public and private organisations, focusing on circular production and sustainability. The partnership has high ambitions for the continued development of the Symbiosis.

The future of the Symbiosis – shaped by history and development

"We are delighted and very proud to accept this prestigious prize," says Michael Hallgren, Chairman of the Board of the Symbiosis and Production Director at Novo Nordisk Kalundborg. "The partnership is based on common sense and cooperation, as well as comprehensive trust between the partners. The partners trust that they can share challenges with each other and find shared solutions that create value for all parties involved. There are now 25 different flows in the Symbiosis, many of which have been running for many years," explains Hallgren. He will be travelling to Gothenburg in October to accept the award on behalf of the organisations involved in the partnership.

Hallgren continues: "The partnership is continuing to develop, and the ecosystem is changing and renewing itself. Winning the award in this, of all years, is particularly significant, as only last year we developed an ambitious plan in which we decided that the partners would implement at least ten new projects by 2025. We have already started three, so that bodes well for the future of the symbiosis."

For example, recently a biogas plant was established to utilise waste products from multiple partners. In addition, the Asnæs Power Station is currently being converted from coal to biomass to provide green process steam for industrial applications from 2019.

Analysis of new opportunities

The strategy is implemented by means of a systematic screening of all existing flows in order to identify the greatest potentials for new projects. Analysis of the opportunities to collectively reuse, optimise and invest is permeated by circular access to the enterprises' production. Residual is a resource that can create value for the community.

"The more enterprises, the greater the volume, the more flows, the more opportunities there are. The Kalundborg Symbiosis is actively seeking to increase the number of flows by inviting more partners into the association. Company visits, dialogue about the challenges facing today's manufacturing industry, and inspiration from elsewhere are some of the elements that stimulate new initiatives," reports Hallgren.

New partners

The symbiosis project of the future may start in a completely different place from before, and with excellent support from well-established networks. The Board has recently invited the Biopro project to participate in the work to develop more sustainable production. This is creating links to leading universities and start-up enterprises, enabling potential to be utilised, not just by existing partners but also by newly established technology enterprises or as part of a study project.

Collaboration is worthwhile
The Kalundborg Symbiosis has carried out a life cycle analysis of all existing flows based on data from 2015, broken down into water, energy and materials[i]. The analysis, which provides an overview of financial and environmental savings, compares two scenarios: production with and without the Symbiosis. It shows that the enterprises saved DKK 182 million on the bottom line annually by cooperating, while the socio-economic benefit amounted to DKK 106 million. In other words, the enterprises can leverage competitive power as a result of the Symbiosis, while the public sector can save money, e.g. on investments in waste management. Once conversion of the Asnæs Power Station has been completed in 2019, there will be a reduction of 635,000 tonnes in CO_2 emissions – equivalent to the average carbon footprint of almost 40,000 Danes – so the collaboration is also worthwhile for the environment.

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For a list and contact details of other spokespeople and press officers at the partner enterprises, see http://www.symbiosis.dk/sustainabilityaward

Facts aboutWIN WIN Gothenburg Sustainability Award
The world's leading sustainability award aims to recognize and support outstanding contributions from around the world. The goal is to stimulate creativity and achieve lasting synergies as we strive to strike the right balance between ecological, environmental and social needs. The prize has been presented in Gothenburg since 2000.

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Facts about the Kalundborg Symbiosis
The Kalundborg Symbiosis is resource collaboration between a number of organisations in Kalundborg. In this industrial symbiosis, one enterprise's waste flow or by-product is used as a resource in another enterprise's production. The enterprises also cooperate by making joint investments, e.g. in new production facilities for sustainable energy. The cooperative has been in existence for over 45 years, and at present 25 different resource flows are exchanged between the six private enterprises and three public-sector organisations involved: Novo Nordisk, Novozymes, Equinor Refining Denmark, Ørsted, Gyproc Saint-Gobain, Kalundborg Municipality, Kalundborg Forsyning, Argo and Avista Oil.

The Kalundborg Symbiosis is internationally recognised as a leader in the field, and is highlighted in the technical literature as an example to follow. The Symbiosis generates considerable synergetic effects and benefits for both the enterprises concerned and the surrounding community in various ways, including reduced costs and thereby improved competitiveness for the participating enterprises, a reduction in the amount of waste from production and thereby in the consumption of natural resources, and reduced CO_2 emissions. Michael Hallgren, Production Director at Novo

Nordisk Kalundborg, is the chairman of the Symbiosis, and Kalundborg Municipality operates Symbiosis Center Denmark, which looks after project development and communications.

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Facts about the projects

- Biogas plant: Eastern Denmark's biggest biogas plant is a unique collaboration between Novo Nordisk, Novozymes, Ørsted and Biogadan that opened in June 2018. The plant utilises waste products from Novozymes and Novo Nordisk's factories in Kalundborg. These waste products are first converted into biogas, which is then upgraded to bio natural gas. After degassing, the biomass will be used as fertiliser on agricultural land, thereby doubling up on the recycling of waste products.

- Conversion of the Asnæs Power Station: Work began to convert Ørsted's combined heat and power station from coal to biomass in October 2017. The conversion is expected to be complete in 2019, and the changeover to green energy will involve both district heating for local residents and the supply of process steam to the enterprises.
- Excess gas from Equinor Refining Denmark (formerly Statoil Refining Denmark) to Gyproc Saint-Gobain: This, the first symbiosis project of all, was established in 1972: instead of Equinor Refining Denmark's excess gas being burnt off, it was sold to Gyproc for use in drying plasterboard. The excess gas was later replaced by natural gas.

- In 1993, DONG Energy established an advanced smoke-cleaning plant at the Asnæs Power Station to desulphurise the smoke from the plant. The waste product from this process is industrial gypsum, which is now sold to Gyproc, replacing imported natural gypsum.

- Heat pump to utilise waste heat from waste water: Kalundborg Forsyning has constructed a new heat pump that allows even more of the heat from the waste water from the various heavy industries in Kalundborg to be used. The heat pump meets 30 per cent of the town's heating needs on an annual basis.

- Testing and demonstration facilities: In Kalundborg there is a long tradition of the partners setting up testing and demonstration facilities for new technologies. As a consequence, Ørsted has a second-generation bioethanol plant, and Kalundborg Forsyning owns an algae plant that can produce valuable algae with the help of waste water.

- Collaboration with schools and universities: The partners offer study projects and support the establishment of a technical and engineering study environment in Kalundborg within the partnership Knowledge Hub Zealand.

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[i] The analysis's key figures are described in the report ***Danmarks Industrielle Hotspot: Kalundborg skaber vækst i Danmark*** ("Denmark's Industrial Hotspot: Kalundborg creates growth in Denmark"), prepared by Copenhagen Economics for Kalundborg Municipality, Novo Nordisk and Knowledge Hub Zealand (see https://www.copenhageneconomics.com/dyn/resources/Publication/publicationPDF/1/421/1515678923/danmarks-industrielle-hotspot-14nov17.pdf).