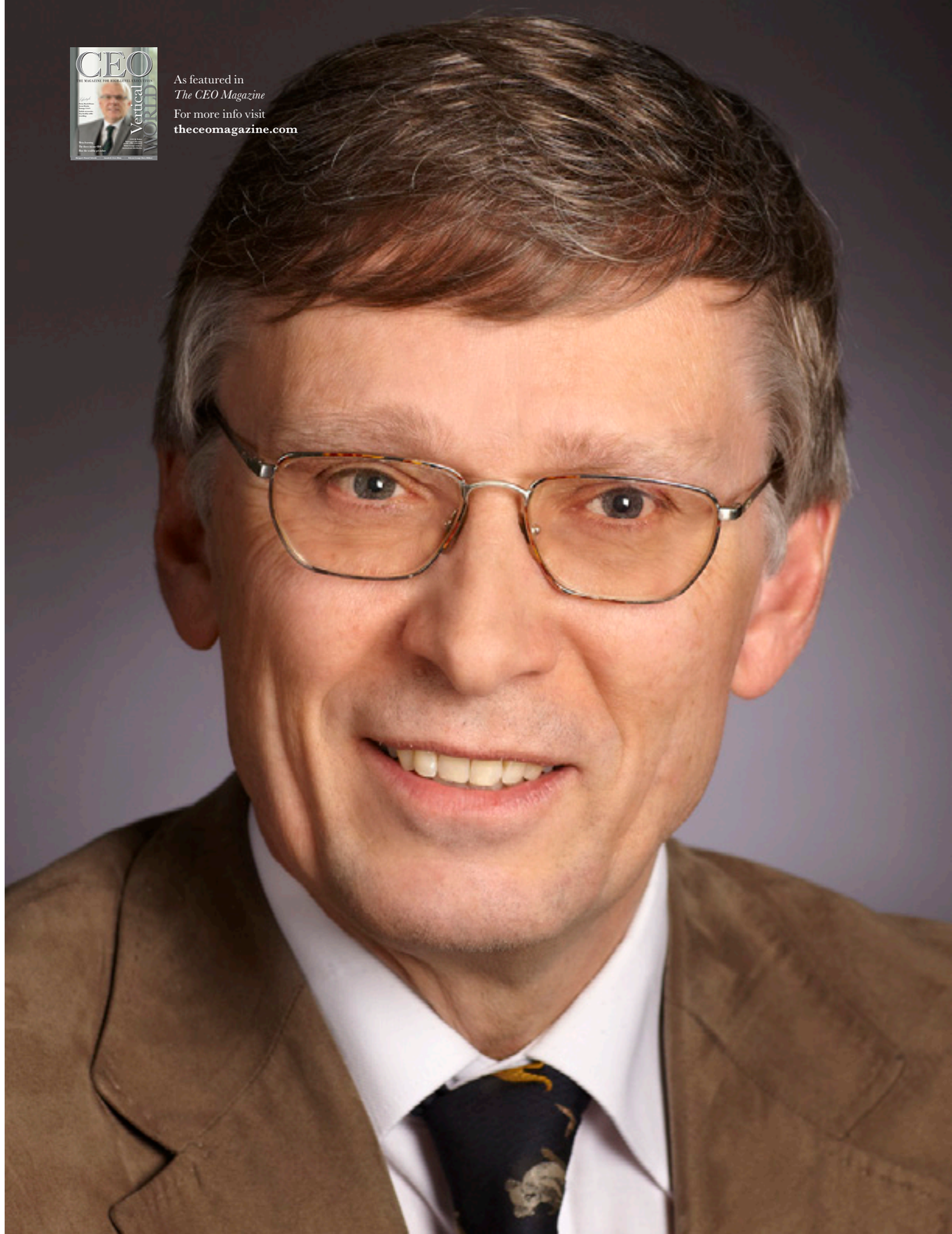
VEKS

Energy Efficiency

After years of discussion and planning, district heating company VEKS is excited to see the Solrød Biogas Plant—a collaborative project between the local municipality, energy, agriculture, and industry sectors—come into fruition.

Images courtesy of VEKS



Since its establishment in 1984, VEKS has been utilising and distributing surplus heat from combined heat and power (CHP) plants and waste incineration plants. The not-for-profit regional district heating transmission company is owned by 12 municipalities and serves the needs of approximately 350,000 taxpayers in the Copenhagen and wider Denmark region.

VEKS has a strong focus on sustainability and is proud to have significantly reduced carbon dioxide (CO2), sulphur and nitrogen emissions in the community through its work. The majority of energy it is supplied with comes from the Avedøre CHP Plant and other CHP plants in Copenhagen, as well as the waste incineration plants KARA/NOVEREN and Vestforbrænding. In recent years, VEKS has expanded its operations from being strictly a district heating transmission company to include production of power, and heat and distribution heat activities.

CEO Lars Gullev has been in the energy sector for more than 30 years and has been leading VEKS since the late 90s. He has seen the industry change and evolve over time to become ever more focused on sustainable energy production.

VEKS is working with the industrial and agricultural sectors to establish a biogas plant using 100-per-cent renewable energy. Located in the Solrød municipality of Denmark, the facility—named Solrød Biogas Plant and owned by the municipality of Solrød—will be powered by raw materials—seaweed from beach cleaning, residues from the production of pectin courtesy of the company CP Kelco, industrial biomass, and animal manure.

The plant is designed to hold a raw-material capacity of 200,000 tonnes and the produced biogas will be used in a large gas engine—owned by VEKS—to produce power and heat. The power will then be sold to the electricity grid and the heat will be used by VEKS in the comprehensive district heating system.

"The Solrød Biogas Plant will go into operation at the end of this year," Lars says. "It has been a project which has received support from the European Union because they see this concept as one that can be copied and used in other countries where there is surplus product from industries. It's a great thing that this waste can be upgraded and utilised in energy production."

The facility is in line with VEKS' commitment to sustainability and will have many positive repercussions for the wider ›

"The primary focus for the Solrød Biogas Plant is in fact to solve some environmental challenges."
- Lars Gullev

community. It will solve the problem of odours wafting away from the washed-up seaweed and algae on Køge Bay and it will help to combat marine pollution. Furthermore, by using the seaweed and organic industrial waste, it will reduce the need to use fossil fuels for energy consumption, creating a greener environment which takes action on climate change.

VEKS predicts that as a result of the project there will be an annual reduction of around 40,500 tonnes of CO2 emissions, which is approximately 60 per cent of Solrød's climate target, as well as a 62-tonne reduction of nitrogen and a 9-tonne reduction of phosphorous in Køge Bay.

"The primary focus for the Solrød Biogas Plant is in fact to solve some environmental challenges," Lars explains, "to reduce the phosphorous and nitrogen emissions going out to sea, and the out washing of phosphorous and nitrogen from the farmers. It's a recycling system which reduces surplus waste to create electricity and heat production.

"We're using four raw materials. The first is the seaweed, which just sits on the beach to rot. Next is the by-product from a factory producing pectin, a product used in the food industry to make marmalades and jams smooth. Pectin is originally from oranges produced in Brazil. In Brazil, these oranges are juiced and you take out the oil from the peels and then the peels are dried and shipped to Denmark and brought to this factory where they take the pectin out of the peels. Until now, they have used this surplus product, this waste product, for feeding calves. But the farmers in Denmark producing calves have moved to the western part of the country and it's not possible to motivate the pigs [local to the area] to eat these dried peels because their stomach is not designed for that kind of food. So the farmers now have between 60 and 70,000 tonnes per year of this waste, which we are able to utilise in the biogas plant. Then we have industrial biomass, and lastly up to 40,000 tonnes of manure from pigs and cows."

As well as its involvement with the Solrød Biogas Plant, VEKS is also focused on achieving its aim of supplying its customers with a CO2-neutral district heating system by the year 2025. "We are on track with that," Lars notes. "We are more optimistic than we were two years ago."

Lars adds that having supply-chain excellence will be key in achieving this future aim. "We are always looking for mutually beneficial contracts. From where we buy the primary part of our district heating we now have one contract which will be going until 2027 and another one until 2033. Those are both long-term and stable contracts which are of benefit for both parties. The key benefit from this is that it's possible to make long-term investments, which is absolutely necessary when you are in the business of taking care of infrastructure duties. It's normal that we have a payback time of our investments of between 20 and up to 30 years. We have patient money."

VEKS has several supply partners which are crucial to its operations, one being the engineering company Ramboll. "Ramboll is one of our partners we are involved with in expanding the district heating system. We see Ramboll as a professional partner who understand our targets and this common understanding makes the daily work easier. They are really key to us," Lars says. "At VEKS, it is not relevant to have simply a supplier-to-customer relationship; we need long-term partners who understand our goals and help us to ensure that we achieve these. Respect, openness, energy, and responsibility—those are the values that are the foundation of VEKS."

Lars says it is a great thing to be able to supply customers with renewable energy, or green district heating. However, he notes that it can't be too expensive in order to be an attractive choice. "For us, it's very important that we are competitive with individual heating. We are engaged in projects where we convert larger, natural-gas-supplied consumers from individual natural gas to district heating. To make this attractive for them we have decided on a special district heating tariff where we give a guarantee for the district heating price in the future.

"Basically, we have linked the district heating price directly to the cost they would have if they continued with natural gas. That means that we take the cost they have today by using natural gas, the cost they have for interest and depreciation, investment in natural gas installation, and then the annual maintenance costs. We add the three elements together and then we multiply that with a factor of 0.9, and that means that they are guaranteed a discount of 10 per cent.

"The background for going into this activity—converting individual natural gas consumers to district heating—is split up into two parts. One is to reduce our CO2 emission: by going from natural gas to our green district heating there will be a dramatic reduction of these emissions. Furthermore, we will transfer the emissions from these small, individual consumers into the regime regulated by the European emissions system.

"At VEKS, it is not relevant to have simply a supplier-to-customer relationship; we need long-term partners who understand our goals and help us to ensure that we achieve these."
- Lars Gullev

"The other thing, or background, for going into these activities is that it's an obligation for district heating companies in Denmark to reduce or to be deeply involved in the reduction of the heat demand. That means that when we look into our future of a reduced heat demand we will get space free in our pipe system to connect new consumers relatively cheaply.

"This connection of new consumers will then ensure that we have more hits to split our fixed costs on. If we just sit down and accept the future where our heat demand or the amount of heat we sell will decrease, the fixed costs per unit we sell will increase. So for us it is necessary to expand the areas with district heating to ensure that we can keep the district heating price at a reasonable level.

"It's not only about passion; it's also about business—even if we are not allowed to make a profit. That is special because the framework of Denmark's district heating sector is that it is non-profit. The target for us is not to make a profit for the owners. If we make a profit we have to reduce the price. For us, the target is to supply the consumers with green district heating and do it in a good business manner, too."

The past 12 months have been an exciting time for Lars and the team at VEKS. With its involvement in the Solrød Biogas Project, and its commitment to creating a greener future, the business is on track to making a difference for the betterment of the Danish community.