

For Danish biomass gasification and pyrolysis solutions provider Dall Energy, 2023 has already seen the signing of two new contracts for the delivery of its proprietary combustion technology – in France and Denmark respectively.

# A double deal for Dall Energy



At the contract signing were Jens Dall Bentzen (left), Director, Dall Energy; Jens Bastrup, Director, Silkeborg Forsyning; Søren Kristensen, Chairman, Silkeborg Forsyning; René Mulvad, Director Exodraft Energy; and Anders Haugaard, CEO, Exodraft Group.

**IN LATE JANUARY, THE COMPANY SIGNED A CONTRACT** with French papermaker group Clairefontaine for a boiler replacement project at a paper mill in France, while in early February, it signed a contract with compatriot municipal energy provider Silkeborg Forsyning for a new biomass-fired heating plant in Silkeborg, Denmark.

## A high-end solution for a high-end company

Founded in 1858, Papeteries de Clairefontaine is a French family-held bespoke papermaker specializing in school, fine arts, handicrafts, and office stationery.

Now part of the Exacompta-Clairefontaine group that comprises some fifty companies and employs over 3 200 people in Europe and Africa, including 580 at Papeteries de Clairefontaine paper mill in Etival-Clairefontaine, France.

All the papers used by the group are manufactured at Clairefontaine's four production sites – Etival-Clairefontaine, Everbal, and Mandeur in France, and Schut, the Netherlands.

In France, companies are looking to transition all energy consumption in manufacturing away from fossil gas. This means that large companies like Clairefontaine need technology to help them. Fast and efficient.

The company is recognized in its home country as a high-end paper product manufacturer – and as a pioneering company when it comes to sustainable operations through its focus on the preservation of forests and watercourses.

Clairefontaine has embarked on a project to replace an aging fossil gas-fired boiler unit at its Etival-Clairefontaine production site with a bio-

mass-fired boiler unit. This new unit will be linked to an existing cogeneration unit to cover the high energy requirements of paper production at the paper mill.

To this end, Dall Energy's high-end biomass gasification technology is seen as a perfect fit for the high-end Clairefontaine brand – both in terms of the financial business case and in terms of its quest for an even greener future.

In a statement, a spokesperson for Clairefontaine said that “the choice of the Dall Energy gasification and combustion system was made primarily due to two reasons. Firstly - the Dall Energy gasification technology permits the use of a very large range of fuels and means a better business case, and secondly also very importantly: the flexibility of operation as the Dall technology allows for quite fast changes in load, between 10 percent and 100 percent, which is less possible with a grate-fired plant.”

## Biomass gasification with CCU

Using around 60 000 tonnes per annum of residual biomass from forestry operations, the 22 MW biomass steam boiler plant will reduce the plant's annual gas consumption by 45 percent and, with a production of 25 tonnes of steam per hour, will provide 50 percent of the paper mill's steam requirements.

Furthermore, the plant will include carbon capture and utilization (CCU) capabilities whereby carbon dioxide (CO<sub>2</sub>) from the flue gas will be captured and used in the manufacturing process.

According to Clairefontaine, the investment for the boiler replacement project amounts to

around EUR 37 million and will be partly financed by the Government through the “France Relance” plan administrated by the Agency for Environment and Energy Management (ADEME) and Energy Savings Certificates.

## International breakthrough

For Dall Energy, the agreement with Clairefontaine represents the largest single contract for the company to date and its second project in France.

– We are beyond satisfied to have made an agreement with such an iconic French company. This proves that our patented, scalable, and unique gasification technology is able to provide something that no one else in our industry is able to – yet which many, especially, manufacturing companies need in their quest for sustainable energy sources. Not least in France, where we expect more deals in the coming years, as its companies seek to secure a sustainable green transition, said Ann Bouisset, Sales Manager at Dall Energy.

Notable too is that according to Ann Bouisset, the initial contact with Clairefontaine was made during the 2022 edition of Bio360 Expo in Nantes. Having Dalkia's La Petite Bouverie plant in Rouen as a French reference (see *Bioenergy International* no. 5/2022) was no doubt a major influencing factor.

## District heat expansion and gas phase out

For Danish municipal energy provider Silkeborg Forsyning, the agreement with Dall Energy for the supply of a 20 MW biomass heat plant is >>

>> part of major expansion and fuel switch initiative. Located in central Jutland, Silkeborg Forsyning has, in parallel, also signed a contract with Exodraft Energy, part of the heat recovery specialist Exodraft Group, for the supply of a 22 MW heat pump.

The heat pump plant, which is an air/water pump, will extract the heat from the air and use it also for district heating.

– We are super happy to enter into a collaboration with Silkeborg Forsyning. We have a stated goal of contributing to the green transition by making the heat supply CO<sub>2</sub> neutral. It is exactly the same goal as Silkeborg Forsyning, and that makes the collaboration obvious. It is the largest heat pump project we have ever been involved in and the largest contract in Exodraft Energy's history. So, we are naturally very proud to have been chosen, and we are happy to collaborate with professional partners such as Silkeborg Forsyning and their advisers, commented René Mulvad, Director of Exodraft Energy.

## Integrated hybrid heating

Together with Silkeborg Forsyning's existing 30 MW electric boiler and a new 50 MW electric boiler, along with the large solar heating plant that was built in 2016 and the flue gas condensation plant from 2019, these two new units will ensure climate-friendly district heating with high security of supply for many years to come.

Like at Sorø Fjernvarme (see *Bioenergy International* No. 6/2022), the biomass heat plant to be supplied by Dall Energy will use garden and park waste from private gardens and public areas as fuel for district heating.

– Our biomass plant converts local organic material into district heating. At the same time, a synergy effect is achieved by thinking of heat production from biomass and electric heat pump respectively together. Normally the two plants are separate, but thinking of the plants together has a positive effect on the total heat production. Demonstration of this new solution is supported by the Danish Energy Agency's EUDP program, and the project in Silkeborg is the first of its kind in Denmark, said Jens Dall Bentzen, Director of Dall Energy.

Both new plants will come into operation according to plan and begin to produce district heating at the end of 2024.

– We are very happy about the collaboration with Silkeborg Forsyning, which has arisen through a thorough and constructive dialogue. We must work together to find solutions, and the project with Silkeborg Forsyning is clear evidence of how the technologies behind the various energy solutions are not in conflict with each other, but on the contrary, can lift each other up, Jens Dall Bentzen said.

The new 50 MW electric boiler is being tested this winter season and will subsequently be put into use and included in the district heating production.

– It is more important than ever that we at Silkeborg Forsyning are not dependent on a few energy sources for our heat production. With the

agreements on the biomass plant and the new heat pump, we are assured of a multi-string district heating supply where we can deliver efficient and competitive heat. The two new plants cooperate with our other plants so that we have very high security of supply for consumers today and in the future, said Søren Kristensen, Chairman of the Board of Silkeborg Forsyning.

## A good deal for district heating customers

Currently, around 56 000 heat consumers in Silkeborg are supplied with district heating from Silkeborg Forsyning, and that number will increase in the coming years.

With the expansion of the district heating plant, Silkeborg Forsyning has taken a very big step towards its stated goal of becoming independent of natural gas as an energy source and also delivering CO<sub>2</sub> neutral district heating by 2030 at the latest.

That objective was presented in 2016. When the new heat pump and the new biomass plant are put into use at the end of 2024, together with the electric boiler, they will be able to produce district heating with a fossil CO<sub>2</sub> reduction of approximately 83 percent compared to 2016.

The various sources of district heating production will also mean that Silkeborg Forsyning is better prepared against volatile price increases on individual energy sources. District heating production becomes more flexible, as one can switch to energy sources that make the most sense.

– With several energy sources, we have a very flexible heat production, where the different energy sources can be used when they make the most sense for consumers. We have a clear goal of delivering CO<sub>2</sub>-neutral district heating in 2030, and the contracts entered into are a

very important step on the way forward in the green transition in Silkeborg Forsyning, Søren Kristensen said.

The investment is also good news for district heating customers. The new technologies are estimated to save Silkeborg Forsyning an expenditure of just over DKK 500 million (≈ EUR 67 million) over a period of 20 years.

Seen in relation to a situation where the production of district heating continues at the current facilities, the district heating consumer saves an average of around DKK 1 500 (≈ EUR 201) per year on district heating with the new, climate-friendly technologies.

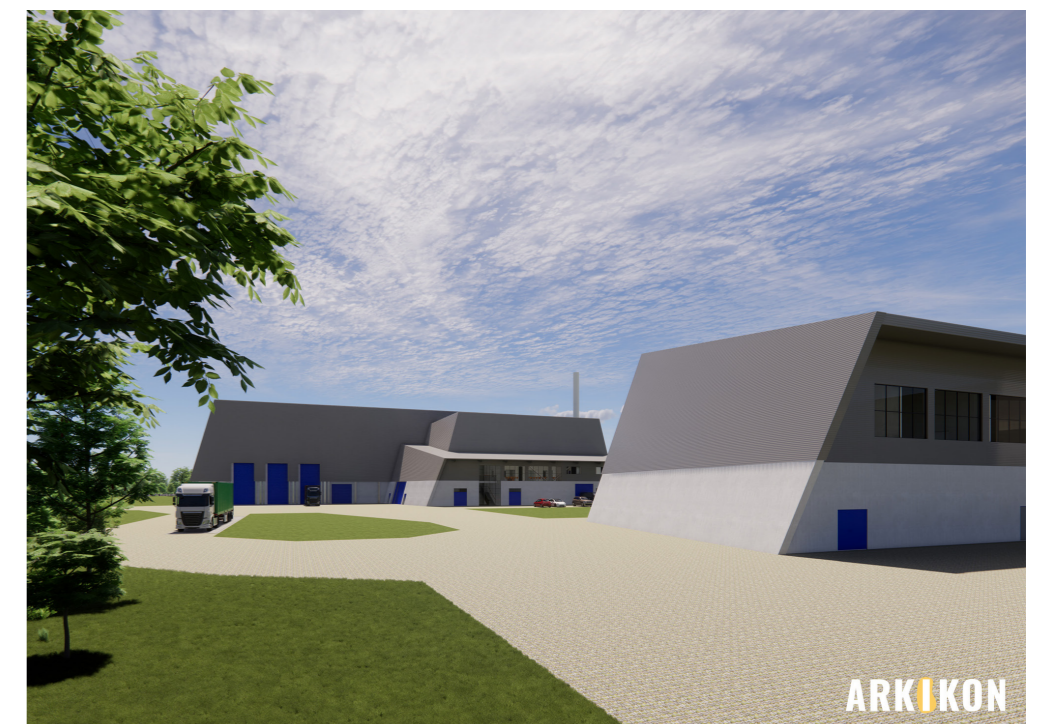
– With the projects with Dall Energy and Exodraft Energy, we have assembled a strong team to help us take a very big step forward towards climate-friendly district heating from Silkeborg Forsyning. Looking ahead to 2028, we are also looking forward - if possible - to welcoming around 12 000 new district heating consumers, this requires greater heat production. With the new systems, new and existing customers will look forward to continuing to receive future-proof, comfortable, and competitive district heating. The project group has done a great job, which has thus created a good understanding and good cooperation on the projects. It provides a good basis for achieving safe project implementation when we have to build - as well as a good implementation of the new solutions in our operations, ended Jens Bastrup, Managing Director of Silkeborg Forsyning.

Text: Alan Sherrard

Photo: Silkeborg Forsyning

Image: Arkikon

B1127/7048/AS



An artist's rendering of the new heat production units. To the left, is the biomass plant. on the right is the heat pump building.