Säätötuli CANADA®

Biomass heating solutions

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Some applications of biomass heating

Municipal heating

Säätötuli boilers can easily be connected to heat networks, making them a convenient and ecological energy source for municipal buildings and all kinds of residential, commercial and industrial areas. Our containerized solutions offer an easy way to build up a heat network covering a whole city step-by-step. Picture: residential complex with biomass containers in Norway.

Commercial heating

Warehouses, shops, factories... Many commercial buildings require to maintain a constant temperature throughout the cold winter months. Säätötuli biomass heating solutions offer a wide range of different possibilities to heat almost all buildings with green and socially responsible energy. Picture: warehouse of a world known make-up brand in France heated with a Säätötuli pellet container.

Greenhouse heating

Greenhouses, especially in cold countries, have huge energy needs for heating. In most cases, governmental incentives are available to convert greenhouses from fossil fuels to biomass. The greenhouse owner is even able to produce some of his own fuel by using the residues of his production as fuel. Picture: greenhouse heated with a Säätötuli hot air container in Finland.

Dryers & process heat

Industrial and agricultural dryers need huge amounts of hot air to evacuate moisture. Säätötuli's hot air generator was designed originally for grain dryers. Having successfully mastered the grain dryers, it has since been used for numerous other applications like biomass dryers and underground mine shaft heating. Picture: grain dryer with hot air container in Finland.

Solutions for heat entrepreneurs

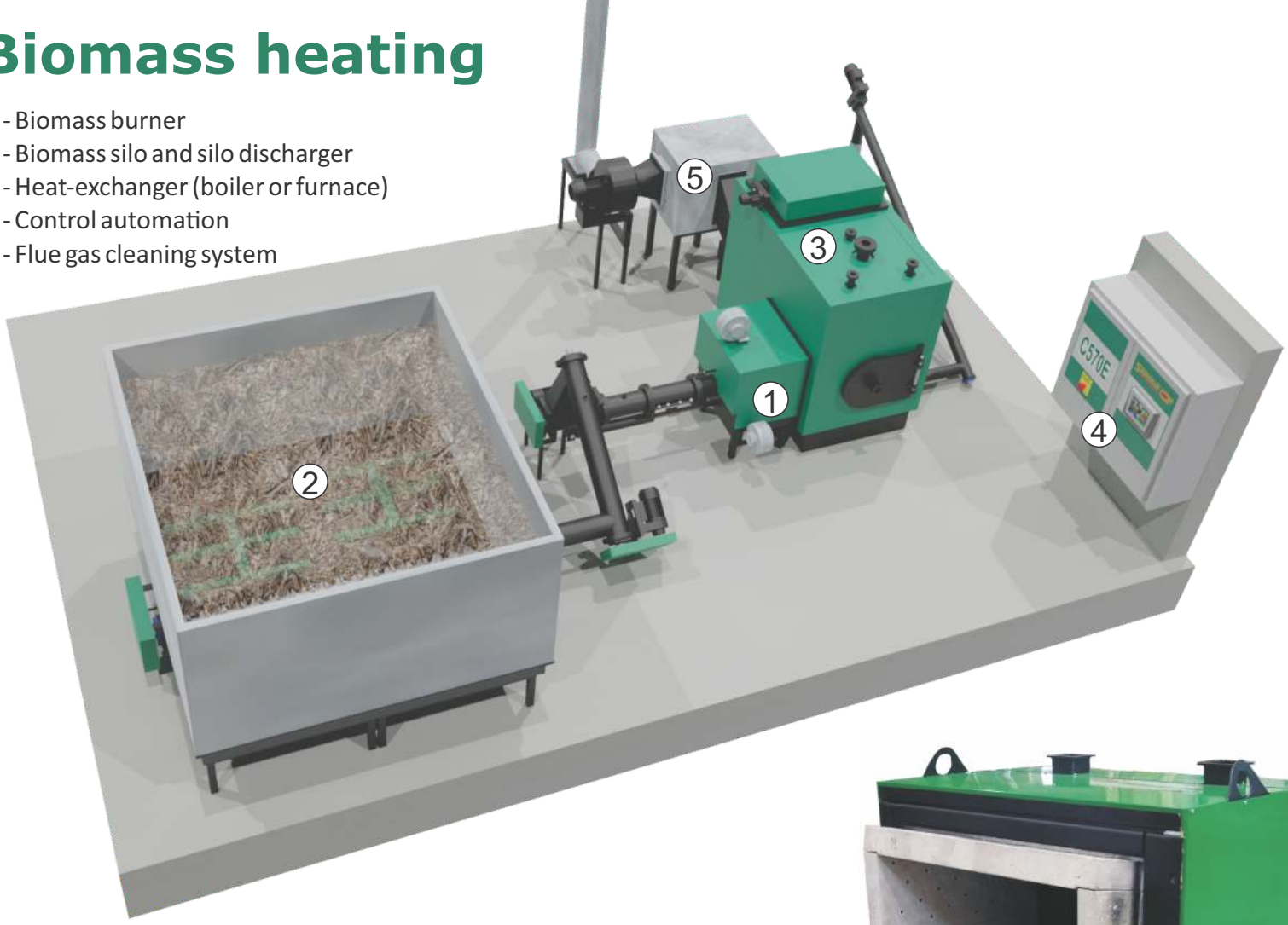
The concept of heat entrepreneurship has developed a lot in Northern Europe in the past years. Finland alone has more than 500 companies selling heat-energy. Biomass is a natural choice of fuel for the heat entrepreneurs. The relatively stable price of biomass compared to fossil fuels is a big plus for those companies. Picture: biomass plant operated by a heat entrepreneur in Finland.

Special projects and OEM

Säätötuli's efficient burning technology makes it easy to respect emission levels and allows for high temperature burning of the fuel. Combined to the versatility in the choice of fuel makes it a good fit for many special projects and OEM. It has been used in many applications as exotic as small-scale electricity production from camel manure in Africa. Picture: biomass-fired Cognac still in France.

Biomass heating

1 - Biomass burner
2 - Biomass silo and silo discharger
3 - Heat-exchanger (boiler or furnace)
4 - Control automation
5 - Flue gas cleaning system



1 - Säätötuli biomass burner

The burner is the key component in any biomass heating system. The efficiency and the ability to use different fuels will depend mostly on the burner. Säätötuli burners are horizontal stoker burners with a huge thermal inertia and a moving grate. This **allows the use of fuels with high ash contents**. Check our YouTube channel for a video describing the burner: www.youtube.com/saatotulicanada/

From 545,942 BTU/hr (160kW) and above, the burner is equipped with a removable top and easily changeable ceramics. This sturdy conception leads to a **long lifetime and reduced maintenance costs**.

Säätötuli burners can use a wide range of different solid fuels. Some examples of fuels used in Säätötuli burners: **wood-energy chips** (see back cover), woodchips, woodpellets, peat, wood industry leftovers, fruit cores, nut shells, corn cobs, recycled wood... Please note that the use of some fuels may be restricted by local regulations.

Nominal output of all burners is guaranteed for wood-based fuels up to 35% moisture

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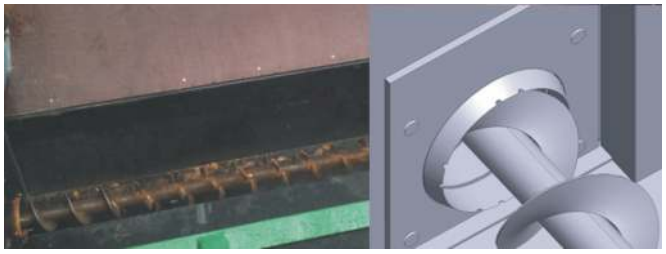
2 - Biomass silo solutions

Säätötuli Hydrobar, Metri2 and Kaks2

Säätötuli silo discharge systems are designed to provide professional grade biomass silo solutions for small and medium sized boilers and furnaces. They are equipped with mechanically (Kaks2 and Metri2) or hydraulically (Hydrobar) operated scrapers which move the fuel to a feeding auger. This feature allows to process many different biomass fuels and reduces their tendency to form vaults in the silo. Unlike a rotary silo system, all the mechanical parts are located under the discharge system, allowing for easy maintenance even when the silo is full.

Säätötuli Hydrobar

Mechanical dischargers can handle up to 8 feet (2.5m) of fuel. Hydrobar can accommodate a height of biomass up to 16 feet (5 meter).

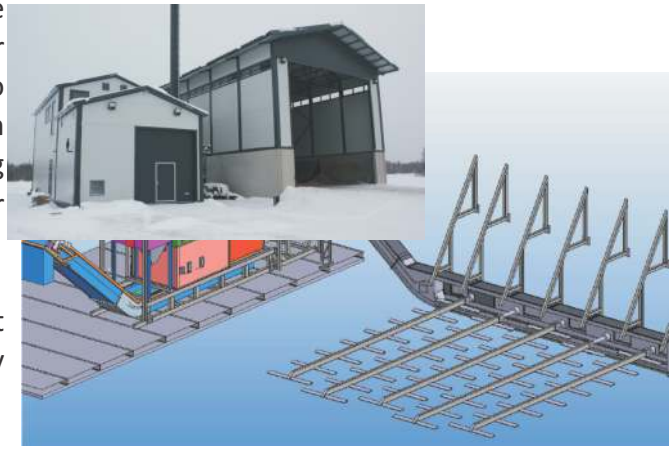


The feeding auger design is optimal for processing lowly screened fuels

Hydraulic scraper stations

For projects requiring huge silo capacity with easy loading access, the best solution is the hydraulic scraper station. Säätötuli can deliver stations with any number of scrapers. Scraper size can be customized to fit the installation site. Depending on the project, the scraper station can be connected to the boiler or furnace with a combination of feeding augers or conveyors. Säätötuli scraper stations can be easily built for several hundred cubic meters of fuel.

The scraper design is sturdy and has been made to withstand the weight of a full-sized truck. Therefore, the delivery truck can back up directly into the silo to dump the fuel on the scrapers.



Hydraulic scraper station

Pellet silos and CityStoker burner

When a heating system is designed to burn only pellets, the cost-effective solution is to equip the system with a standard pellet silo. Säätötuli has several options for different sizes of pellet silos. Pellet deliveries can be made by blower trucks or the silo can be equipped with a convenient loading system with a dumping station.

When a system is sold for pellet use only, Säätötuli recommends Säätötuli CityStoker pellet burners that are equipped with a rotating lock for increased security.

Pellet silo and CityStoker burner

Säätötuli Strong burner and silo

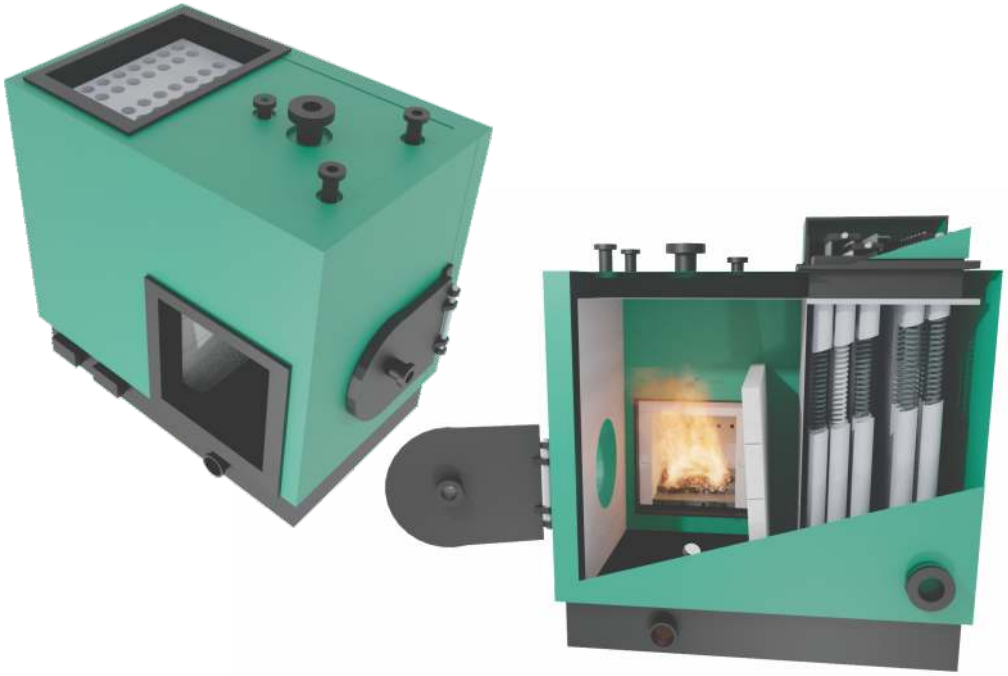
Säätötuli Strong burners are the best solutions for applications that need a small biomass burner. It includes a small silo. Säätötuli Strong burners are commonly used for retrofit and OEM purposes.

Säätötuli Strong

3 - Hot water boilers

Säätötuli biomass hot-water boilers are manufactured in Canada to **ASME Section IV** and as pressure vessels have a **Canadian Registration Number (CRN)**. They are easy to service and can be fitted with handy options like the pneumatic cleaning of the heat-exchanger and automatic ash conveyors to move the ashes directly into a container.

The boilers are built to have a long lifespan and Säätötuli is eager to help designing the plumbing work around the boiler to optimize the durability of your equipment.



Available outputs for single-boilers:

546,000 BTU/h (160kW)
682,000 BTU/h (200kW)
1,024,000 BTU/h (300kW)
1,365,000 BTU/h (400kW)
1,706,000 BTU/h (500kW)
2,560,000 BTU/h (750kW)
3,412,000 BTU/h (1000kW)
5,118,000 BTU/h (1500kW)

Boilers can be combined to increase output. It may even make sense in some cases to have two boilers. For example, in hospitals, the need for heat will be present all year long and having two boilers will guarantee to have one running during the annual maintenance of the second unit.

Hot air furnace

The Säätötuli biomass hot air generator was jointly developed with a Finnish expert in grain drying technologies. First unit was fired in 1994 and is still working in Finland. During the years, many improvements have been made. Säätötuli's hot air generator is recognized in Northern Europe for having the lowest maintenance costs and longest life-expectancy.

Designed at first for agricultural use, the Säätötuli hot air generator has since been used in many different applications such as heating of industrial and agricultural buildings, heating for underground mines, wood-chip drying and waste treatment.

The biomass hot air generator is equipped with lamellar **air-to-air convection** made with stainless and acid-proof steel. This ensures that the hot air is never in contact with the combustion smoke which is sent to the chimney. Available output: 1706MBtu/h (500kW) generating roughly **17500 CFM with 85° delta T**. Like the hot-water boilers, the hot air systems can be combined to increase output.

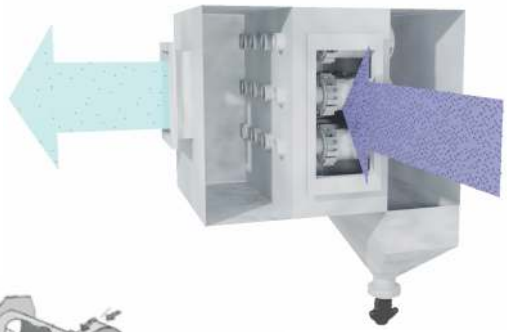
4 - Automation

Säätötuli proposes different kinds of automation solutions to fit every need of the customers. All our electrical boxes for North America are manufactured in Canada by a **CSA/UL certified** manufacturer. All Säätötuli's automations can be fitted with a GSM modem that will send text alerts on mobile phones. Automations from C570E and above have an integrated GSM modem and are able to communicate in Modbus.

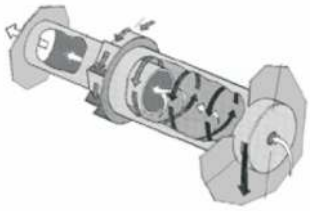
Säätötuli is among the few manufacturers using **only standard electrical components** (relays, contactors...). Not a single motherboard is specially designed for Säätötuli's products. Therefore, any electrical problem can be easily solved with the help of a local electrician and his standard components. You will never have to wait for expensive components from the factory.

5 - Exhaust gas cleaning

Even if Säätötuli's efficient burning technology has naturally low emissions and complies with many standards even without any emission control system, Säätötuli considers that the equipment should comply with the requirements not only when it's clean and new, but also during the whole life-cycle of the product. Therefore, Säätötuli uses emission control systems like **multi-cyclones** in some of its equipment.



Säätötuli has a wide knowledge of different flue-gas cleaning systems and is able to advise on the best type of system to meet the requirements with optimized cost.



Lambda sensor

The residual O2 sensor, commonly known as Lambda, relays information on the unburnt gases in the exhaust. The boiler automation then modifies input of secondary burning air to optimize the combustion. It is widely marketed as a must-have on modern wood fired boilers.

However, with Säätötuli's efficient combustion technology, the rate of unburnt gases in exhaust are often limited around 0.3%, with few if any difference between different wood types. Therefore, the gain for installing a sensor on smaller outputs can be quite reduced and the Lambda sensor is proposed as an option for those boilers.

Containerized biomass heating plants

A containerized biomass heating plant is a fully functional biomass heating system built inside a prefabricated building. The **bioheat containers** are easy to move, easy to install and easy to relocate.

Säätötuli was one of the pioneers of containerized biomass heating solutions with the first unit commissioned in 2003. The reference-list for bioheat containers at the end of 2017 contains no less than **318 installation sites**, with some of the sites having multiple containers. It is quite safe to say that manufacturing state of the art containerized heating systems is not something new for us.

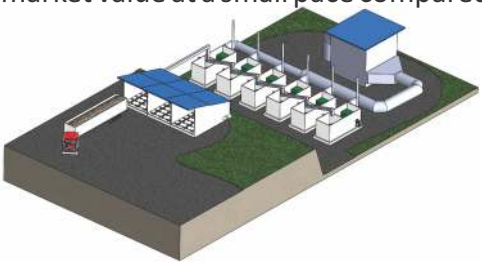
Bioheat containers come in many shape and can be manufactured with different boilers inside. When needed, the container can even integrate a fossil-fuel backup boiler. The basic structure of Säätötuli's bioheat containers is a **steel frame with fire-proof sandwich-panel roof and walls**.

Before manufacturing a new type of container, the design of the container is always checked by a local engineering company to ensure it **meets local building standards and practices**.

The bioheat containers are **versatile heating solutions**. They can be used for example to be the first steps of a biomass-fired municipal heat network. As the network grows, new containers can be added until the combined heat demand justifies the investment in a big boiler plant. Growing the biomass powered heating capacity step-by-step can be done with a quite small initial investment and will allow the supply chain to grow with the project.

Unlike a fixed boiler, a containerized boiler plant can be **easily relocated**. Especially hot-air containers are often rented off-season, as they can be, for example, used on grain dryers on autumn and heat a building on the winter time.

This ease of movement means also that there is a market for second-hand containers. In Finland, containers that have been taken care of will loose their market value at a small pace compared to consumer products like cars.



Bioheat containers are **ideal solutions for heat entrepreneurs**. When a contract ends, it is easy to move from one place to another. The container is also often accepted as a collateral, making it easier to get the necessary financing for heat selling operations.

You will find more information about our products and services on our website:

www.saatotuli.ca

Please visit also our other websites:

www.wood-chippers.ca

Chippers able to produce biomass-fuel grade wood-energy chips even with branches, hog piles and leftovers

www.firewoodprocessors.ca

Modern wood heating is made with woodchips, but you will always need firewood for your grill, BBQ and camping needs

www.big-bags.ca

A convenient way to improve firewood and woodchip logistics

Woodchips vs. wood-energy chips – what is the difference?

The word woodchip is commonly used for the pulp and paper woodchips that are made with only the best parts of the wood and screened to have a constant particle size. Säätötuli's biomass boilers do not need such a high-quality woodchip and it makes no sense to start competing with the pulp & paper industry for the same supply. Wood-energy chips are the best possible fuel to feed your boiler. Wood-energy chips are woodchips made from hog, branches, treetops, sawmill leftovers, etc. When made with a good chipper, no screening process is necessary as it would eliminate a part of the biomass.

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