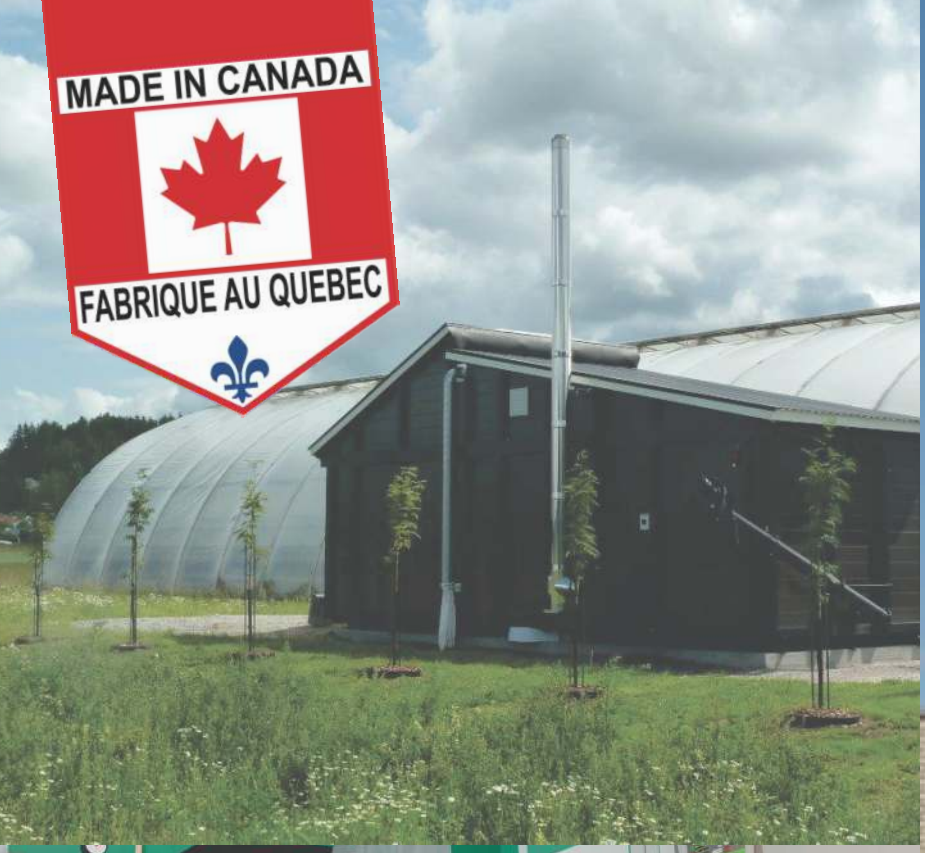



Säätötuli® CANADA

# Biomass heating for farms and greenhouses

EN Feb 2021

# What is biomass heating ?

Biomass heating uses agricultural and forestry by-products as fuel in a boiler or a furnace. The heat is then transferred to water or air that is sent to the building or equipment that needs it.

Most used biomass fuels are wood based, mainly wood pellets and woodchips. Wood pellets are a high-quality fuel that is easy to find anywhere in Canada. Woodchips are easy to make by investing in a chipper. Woodchips can also be bought from forestry cooperatives, sawmills, and other wood industries. Unlike pellets, quality and humidity of the woodchips can differ a lot depending on the source.


wood pellets


woodchips


hay pellets

A lot of alternative biomass fuels can be used also. For example, agricultural and food industry by-products (fruit stones, nutshells...) can have high energy content, as well as the by-products of the woodworking industry and even wood from recycling centers.

These alternative fuels can provide low-cost fuels, and even free fuels in some cases. Using these alternative fuels is possible with Säätötuli's boiler technology. They just need to be in a form that can be transferred in an auger and their humidity must be at a reasonable level.


corn cobs

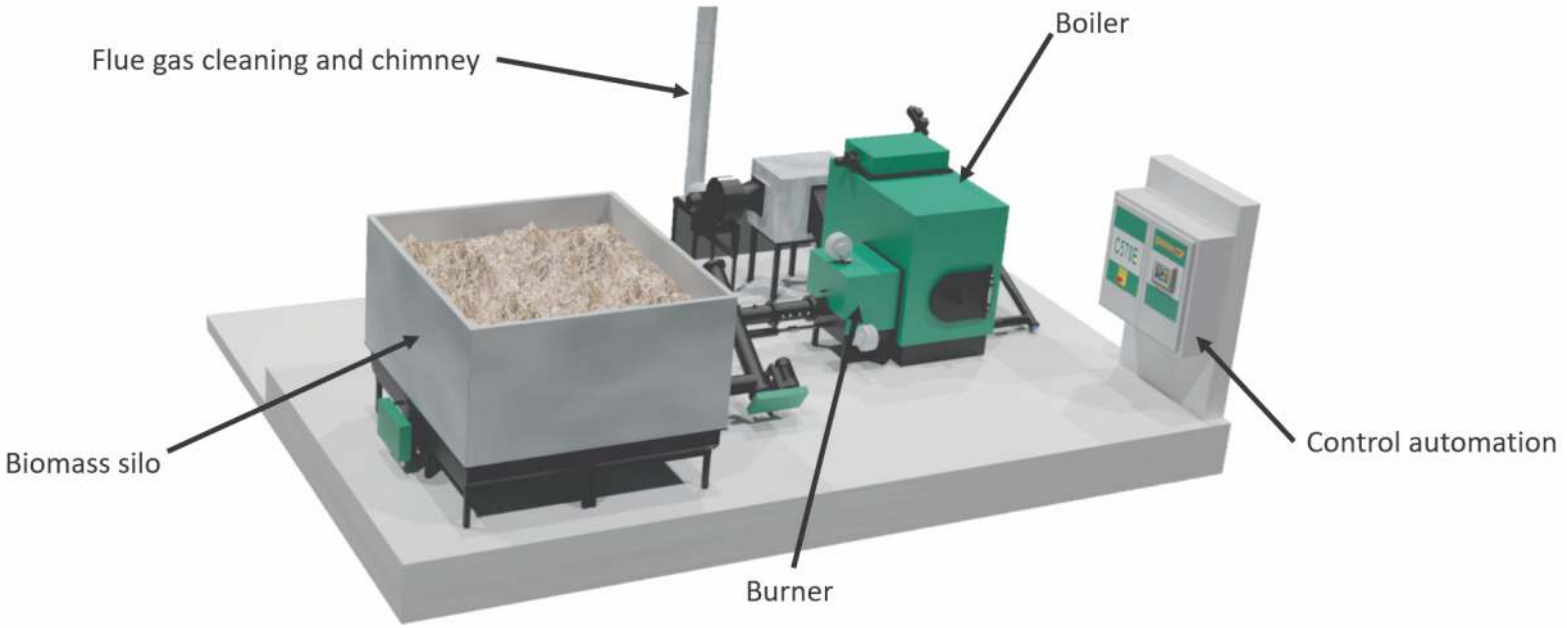

nutshells


straw briquettes

Please note that using non-wood-based fuels may require environmental permitting in some provinces or territories. Some agricultural by-products may also have high ash-content and emit acid smoke that may corrode your equipment. In all cases, solutions are available to mitigate the negative impacts. Do not hesitate to ask us or our dealers on how to optimize your fuel mix.

# Säätötuli biomass heating systems

Säätötuli's biomass heating systems are based on a Finnish combustion technology. Our equipment is now in most part **made in Canada**. Säätötuli's technology is highly versatile regarding the different biomass fuels it can handle and ensures a great efficiency and **low emissions**. Säätötuli's biomass heating systems can conform to the strictest environmental regulations anywhere in Canada.




Säätötuli's Finnish heritage has taught us what is essential for a farmer in a polar country like Canada.

Säätötuli is proud that its equipment provides among the **lowest maintenance costs of the industry**. Wear parts are thick and sturdy. Motors and gears are chosen to last the full lifetime of the heating system. All equipment is easy to service with a standard toolbox. Cherry on the top: our automation boxes do not have a single proprietary printed circuit board (PCB). All electric components are easy to find locally to reduce downtime to a minimum.

## Nominal output is guaranteed for wood-based fuels up to 35% moisture content

A low-cost biomass fuel goes most of the time hand-to-hand with high moisture-content. For forestry owners, the most cost-effective fuel is usually woodchip that is made from wood that has been seasoned for a year. Branches and treetops that have seasoned will made chips with a moisture content around 35%. It is dry enough to not freeze in the silo and to avoid fermentation. Säätötuli's boilers will output the promised energy with woodchips with a moisture content up to 35%.

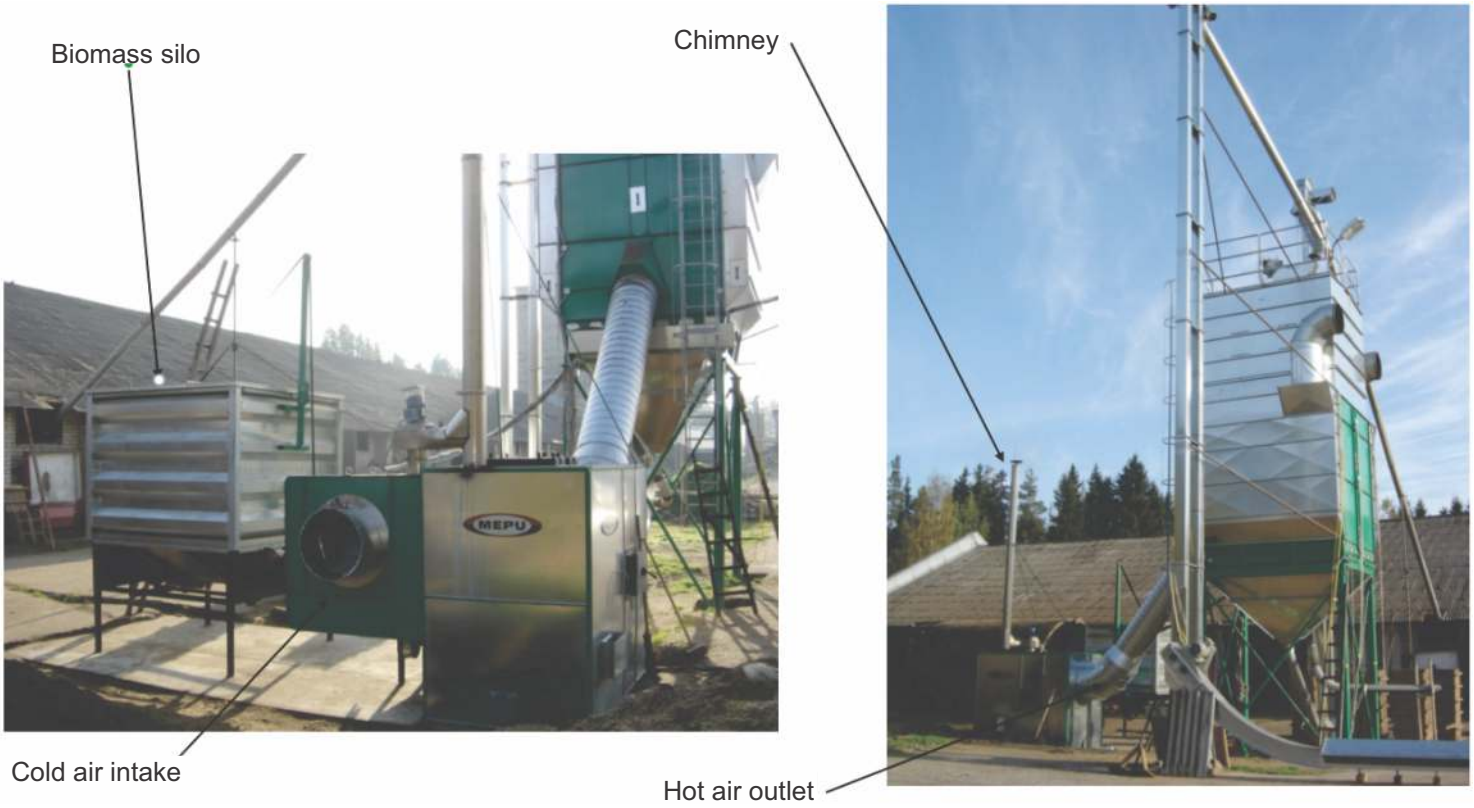
The design of our silo dischargers and augers also allows the use biomass fuels that have been produced with lower-grade screening. Forgetting to sharpen your chipper blades does not mean a cold evening anymore.

Säätötuli CANADA®

# Grain dryers

Grain dryers have huge energy needs. They are traditionally heated with direct propane heating. The problem with direct heating is that all the smoke of the combustion is sent through the grain. This means that all the moisture contained in the fuel and all the dioxins from the combustion will also be sent through the grains.

Säätötuli's hot-air furnace was developed with a grain dryer manufacturer. It is equipped with a stainless-steel lamellar air-to-air heat-exchanger that will send the smoke directly to a dedicated chimney. That ensures that only heated fresh air will be sent to the dryer. Using a hot-water biomass boiler on a grain dryer is also an option. It will just require the addition of a radiator to transfer the heat from the water to the airflow of the dryer.




Like all Säätötuli biomass combustion equipment, the hot-air furnace can burn a wide variety of different solid fuels. Even the dust collected from inside the grain dryer can be used as an energy source.

The biomass hot-air system is available for 1.7 million BTU/hr (500kW). That means that it can provide up to 17,500 CFM with a delta T of +75°C. Several units can be combined to increase the output.

The hot-air furnace can also be ordered as a containerised solution that is easy to move with a roll-off truck. You can then use it in the fall on your grain dryer and use it elsewhere during the winter. The return on investment is shorter as you can heat one of your buildings. The unit can also be rented or used to sell BTUs.

# Greenhouses

In cold countries like Canada, greenhouses have huge heating needs. Heating them with fossil fuels will generate an important carbon footprint and can be equally harmful to your wallet.

Säätötuli's biomass heating systems are a profitable solution for greenhouse heating. A greenhouse can be heated with a hot-air furnace. However, a hydronic biomass boiler will give a lot more versatility to your heating. Hot water heating can be installed in the greenhouse by heating floor, radiators, or air-heater units. A single hot-water boiler can easily heat several greenhouses, and other buildings like offices and houses nearby. With a well-designed hydronic network, it is even possible to choose the temperature that is sent to each building from the boiler room.

For greenhouses that operate all year long, investing in two biomass boilers instead of one may be a good solution. Outside of the coldest days of the winter, one of the two boilers may be enough to generate the heat, thus burning less fuel. It allows also to keep one boiler running while doing the annual maintenance on the other one in the summer.

Greenhouses with automated lights have an additional challenge in regards of heating. The moment the lights go off, the lamps do not generate light anymore, but also no more heat (this is not the case with new LED-lights). This sudden peak-demand must be considered when dimensioning the boiler. In most cases adding a buffer-tank is a good solution.

Säätötuli can provide heating equipment to be installed in existing buildings, and also containerised factory-assembled biomass heating plants.

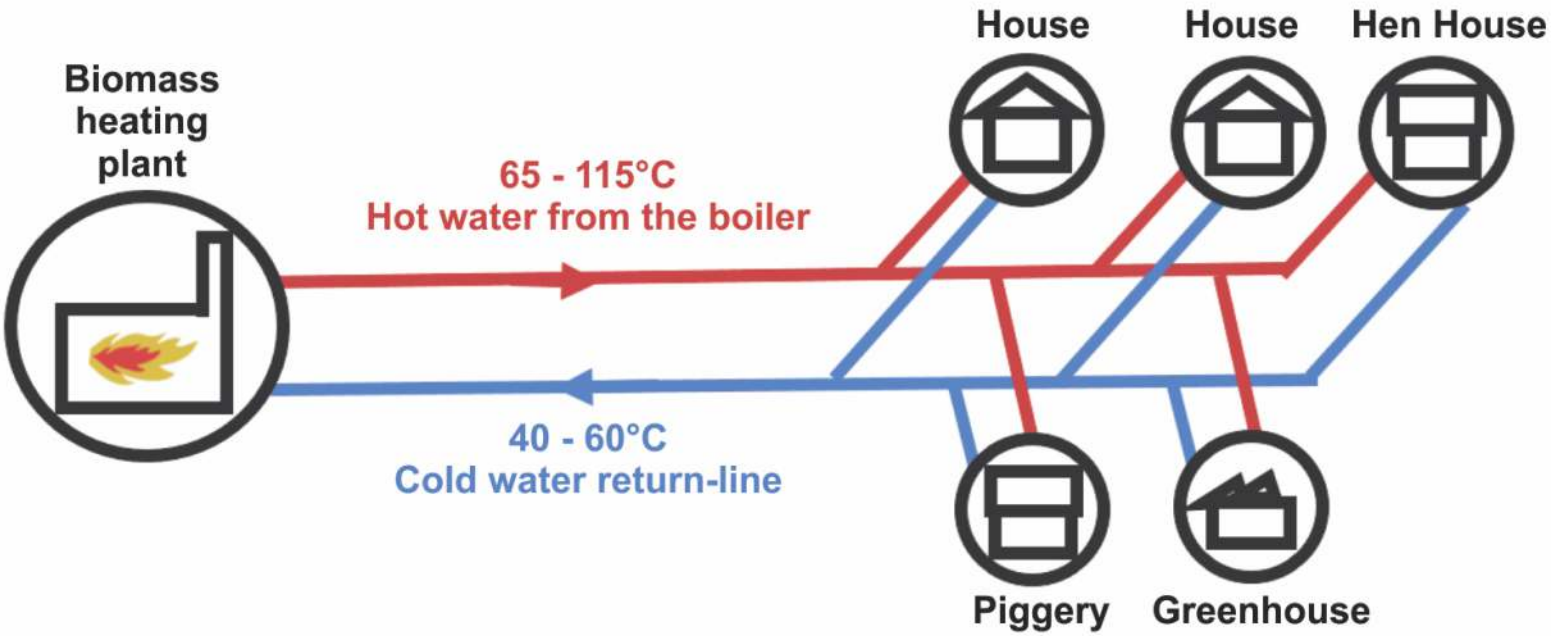
Säätötuli CANADA®

# Livestock, workshop, barn, garage, house...

Säätötuli's biomass heating systems adapt to any kind of building to be heated: livestock buildings, workshops, barns, garages, and houses. With a hot-water boiler, it is easy to also generate all the hot water needed for cleaning systems, production rooms and bathrooms.



A Säätötuli hot-water boiler can be installed to heat a single building. It can also be connected to a hydronic heating network that heats all the buildings of the farm with a single boiler. The advantage of having a heat-network is that there is only one boiler to maintain and to fuel up.




Depending on the output of the boiler and the type of fuel, the size of the biomass fuel silo must be considered to avoid having to fill it all the time.

Säätötuli has a wide range of different silo options from the 420-liter metal box (enough for a single home heated with pellets), up to the industrial floor-scraper silo that can handle several full-size truckloads of fuel.

Most of the time in agricultural applications, the solutions that are used are silos that can be filled with the loader that is already on the farm premises.

# Retrofit burners

You have a wood-fired heating equipment and would like to convert it to automatically burn woodchips or pellets? Säätötuli biomass burners are also available as retrofit burners.

The retrofit burners are sold with a silo or a silo discharger and a control automation that is to be connected to a thermostat. Retrofit biomass burners are easy to install on outdoor furnaces and maple syrup evaporators for example.


# Containerised biomass heating plants

A biomass boiler is quite big and needs room for the fuel storage silo. If you do not have an existing building where to install your biomass heating system, you do not have to build a new building just for that.

Säätötuli has a wide range of “containerised” biomass heating plants. They are modular biomass heating systems that include the silo, the boiler, the control automation, and everything else you need from a boiler room. The heating plant is plug-and-play: just put it on a solid surface, connect the electricity and the heat network, erect the chimney and you are ready to go.

These systems are easy to move and therefore you can use them in different places during the year. For example, at the grain dryer in the fall and at a greenhouse or a livestock building during the winter.

Säätötuli® CANADA

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.

Säätötuli CANADA®

Säätötuli Canada Enterprises inc.
5720 rue Barré
St. Hyacinthe, QC
CANADA, J2R 1E4

Phone: 1 450-253-1567
www.saatotuli.ca