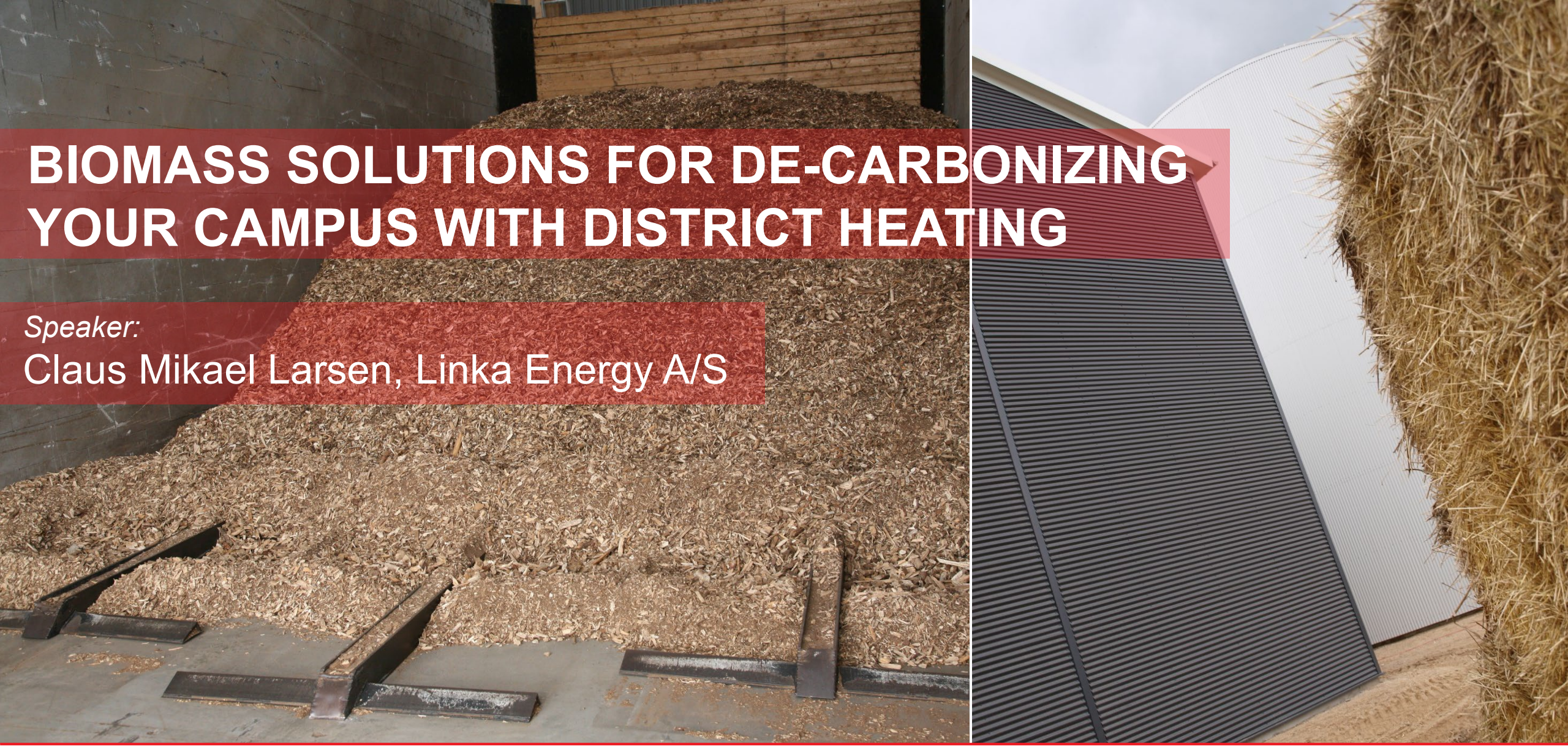

BIOMASS SOLUTIONS FOR DE-CARBONIZING YOUR CAMPUS WITH DISTRICT HEATING

Speaker:
Claus Mikael Larsen, Linka Energy A/S

CampusEnergy2020
THE POWER TO CHANGE
FEBRUARY 10-14 ▲ SHERATON DENVER DOWNTOWN ▲ DENVER, CO

LIN-KA ENERGY

THE PROBLEM

Climate changes are affecting our way of life, and we all need to reduce our carbon footprint to stop this.

Many North American campuses are looking to implement new energy systems, but face challenges when choosing the right energy source.

It's a jungle out there… How does one decide?

There are many solutions, all with their own benefits and disadvantages.

Investing in renewable energy systems is too expensive, too unreliable or just too impractical - **or is it?**

SOLUTION

Biomass provides more cost-efficient and sustainable energy than any other renewable energy source.

+ Already here and available
  - regardless of how we use it

+ Reduces the amount of waste in our society
  - the entire crop is used

+ Local supply = stronger local economy
  - can sustain or even create new jobs

SOLUTION

+ Can often be installed in existing boiler room
  - no changes to the infrastructure or surrounding environment

+ None, or very little, nuisance to the local community
  - other energy sources can cause noise interference or visual nuisance

+ Higher flexibility
  - combination of different biofuels, e.g. combined straw and pellet combustion, with easy switch depending on price and availability

+ Can be combined with other energy sources
  - such as solar panels and heating pumps

IS BIOMASS REALLY CO_2 NEUTRAL?

Local farmer grows crops

Heating plant burns biomass

Campus is heated and powered

Farmer spreads ash onto field

IS BIOMASS REALLY CO_2 NEUTRAL?

Local farmer grows crops

Residue products from harvesting would otherwise emit CO_2 while rotting in the field

Heating plant burns biomass

The CO_2 emitted during combustion is absorbed by the new biomass growth

Campus is heated and powered

Heat and power is provided even if the sun doesn't shine and the wind doesn't blow

Farmer spreads ash onto field

Ash from the combustion acts as a natural fertilizer for the new growth

CASE STUDY: CAMP RUSTA-HEGGELIA

Camp Rusta-Heggelia (military base)

Bardufoss, Norway

The wood chip plant supplies heating for barracks and office buildings, all dependent on heat, as temperatures in the area can drop below -40°F.

Plant specifications:

Installation year: 2017

Fuel: Wood chips

Energy: Heating

Boiler size: 14.7 Mbtu

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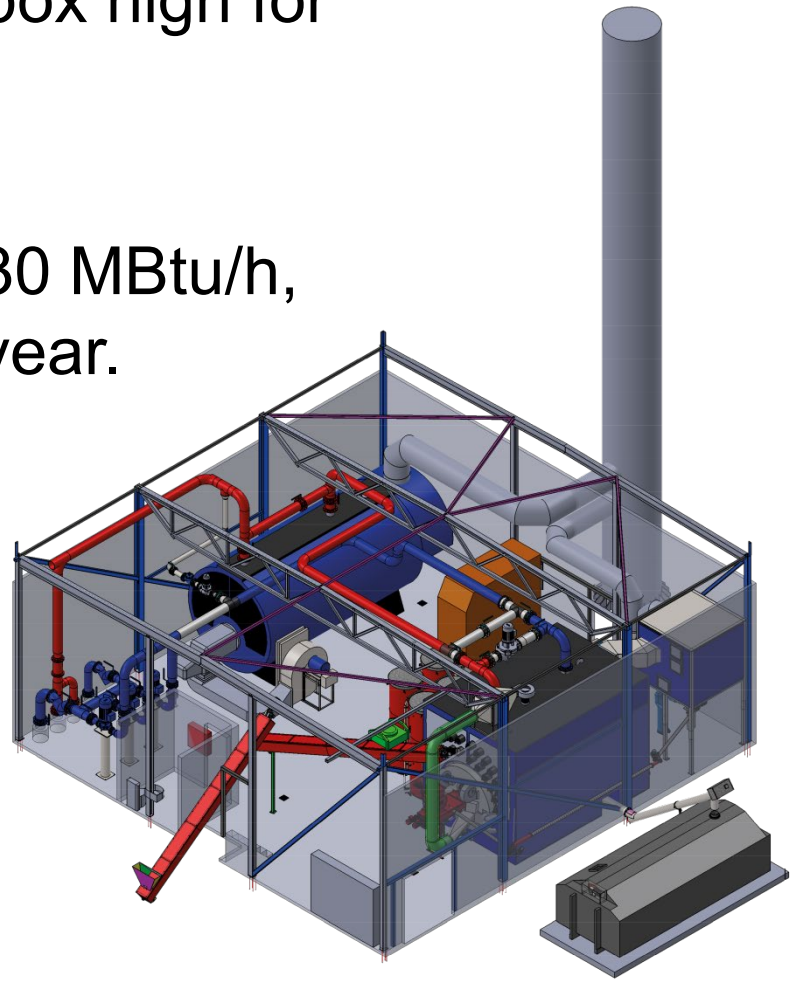
CASE STUDY: CAMP RUSTA-HEGGELIA

Designed for burning wood chips with up to 40 % water

- → Tiles are mounted inside to keep temperature in firebox high for evaporation of water in fuel

The camp has an annual heating consumption of 64,830 MBtu/h, and the plant will burn 21.860 m^3 of wood chips every year.

Storage with a scraper unit is built next to the boiler room. The automatic feeding system ensures a constant, steady fuel feed.



CASE STUDY: CAMP RUSTA-HEGGELIA

Before

→ Electric boiler

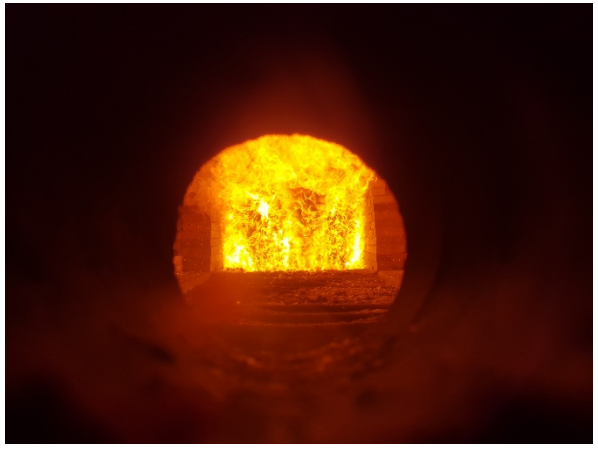
→ Oil boiler

CO_2 reduction

→ About 4.400 ton

Financial savings for the customer

→ About 30 %



Q&A SESSION

Questions for the speaker?

THANK YOU!

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