LINKA ENERGY GROUP

LIN-KA ENERGY : Jernforsen bioenergy solutions

CORPORATE PRESENTATION

- Group
- Expertise
- Segments
- Fuel range
- Technology
- References

LINKA ENERGY GROUP

EXPERTS IN BIOMASS BOILER SYSTEMS

Linka Energy

Est. 1978 - 41 years of experience in biomass combustion

+3,500 biomass plants installed worldwide

50+ employees

→ Engineering, Sales, Project Management, Construction, Production, Installation, Service and Administration

Jernforsen Energy

Est. 1984 - 35 years of experience in biomass combustion

+1,000 biomass plants installed worldwide

35+ employees

→ Engineering, Sales, Project Management, Installation, Service and Administration

→ In-house experts in control systems (automation)

+ 60% export

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EXPERTISE

Linka Energy

Supply of fully automated quality biomass boiler systems – built on modular, scalable and patented unique technology

Product range btw. 100 kW - 15 MW^{th}

Hot water to steam, CHP

Supply of machinery to turnkey solutions

Speciality: dry and complex biomass waste fuels

Jernforsen Energy

Supply of fully automated quality biomass boiler systems – designed uniquely to the customer requirements

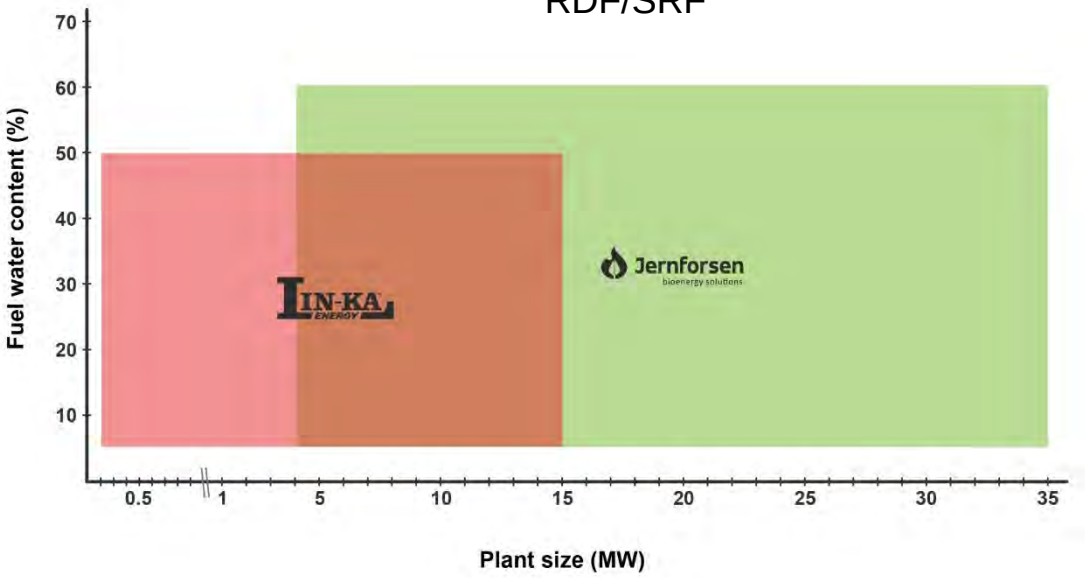
High performance standards, strong devotion and knowhow ensures high quality delivery in all plants

Product range btw. 2 MW – 35 MW^{th}

Hot water to steam, CHP

Supply of machinery to turnkey solutions

Speciality: wet and complex fuels, waste wood, RDF/SRF



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SEGMENTS

District heating

Central heating supply for residential areas.

Industry

Dairies, coffee industry, military camps, etc.

Wood industries

Saw mills, pellet production, paper industry, kitchen manufacturers, etc.

Agriculture

Poultry farms, pig farms, estates, nurseries, etc.

Institutions

Schools, dormitories, campsites, etc.

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FUEL RANGE

A broad range of waste products can be used for fuel in a Linka Group boiler system

Pellets | Briquetts | Saw dust | MBM | Waste-wood | Straw | RDF | SRF | Wood chips | Peat | GROT | Bark

5% — From dry to wet — 65%

Turn your biowaste into a heat and power ressource through our systems

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LINKA BOILERS

Linka’s boilers are developed from our own design, based on 40 years of experience

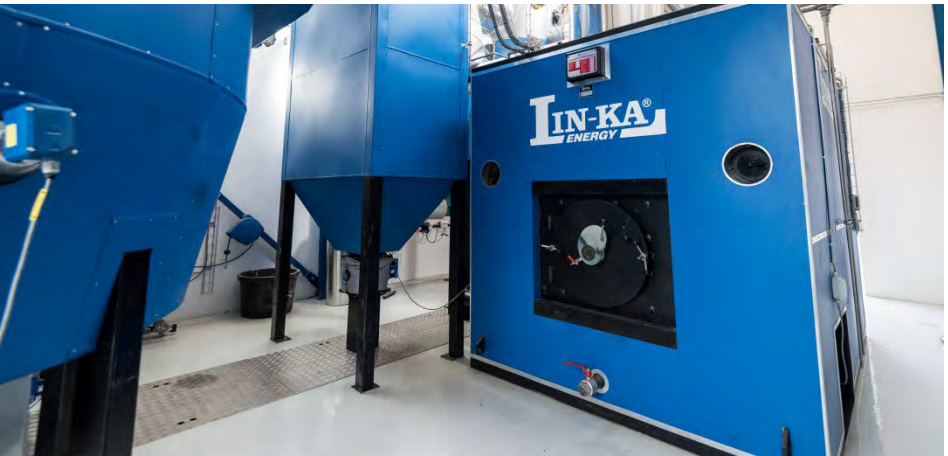
→In close collaboration with our Danish boiler supplier

→Efficient and reliable fire extinguishing system to prevent backfire

→Boilers are prepared for installation of SNCR system, to reduce NOx emissions by adding chemicals during the combustion process.

World patented combustion technology

→Ensures total combustion of the fuel and minimal development of clinker



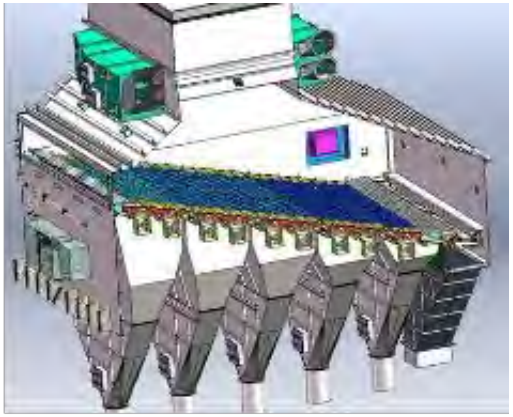
JERNFORSEN BOILERS

Combustion system with low emissions

→Due to sizeable grates, the development of our air system combined with a long combustion time

Moving grate system - grates are controlled by a forward movement

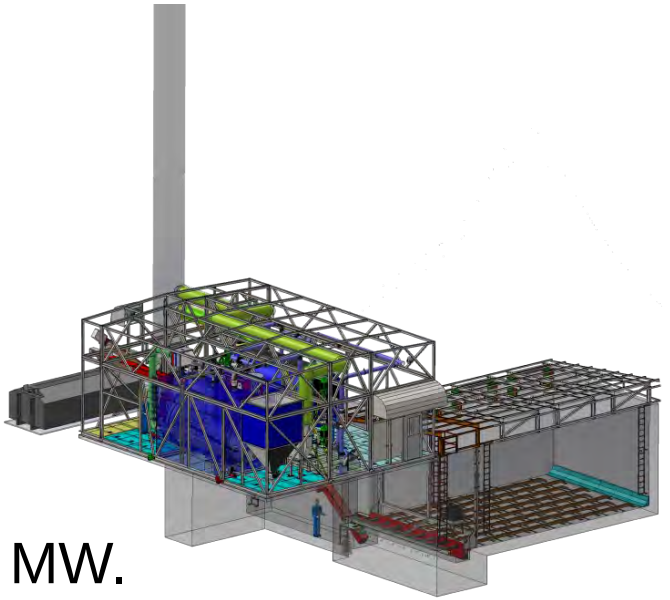
Final combustion of the ash prior to being transported to the ash container



MOBILE SOLUTIONS

Pre-manufactured boiler plant

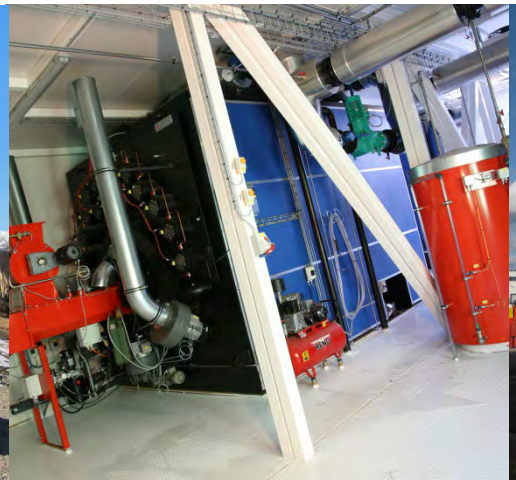
→ The boiler system is delivered as ”plug and play” including feeding- and de-ashing systems.



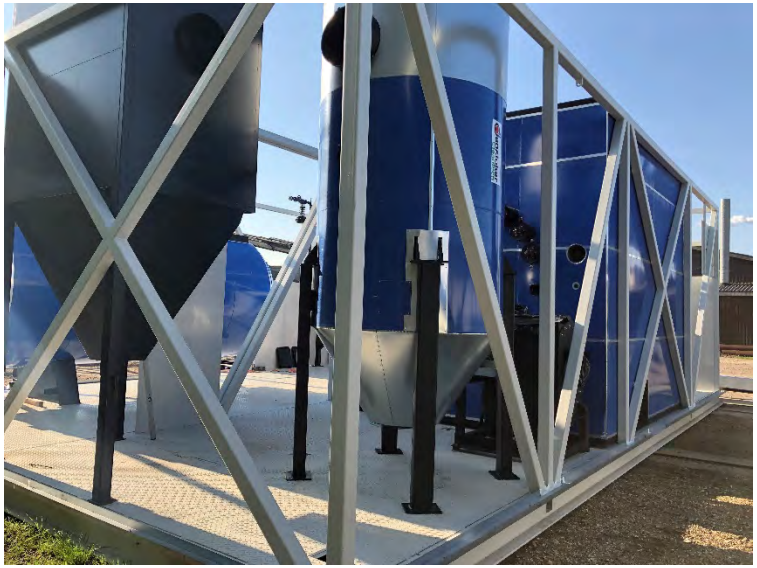
Turnkey solution - delivered directly on site

→ Operational soon hereafter

Mobile plants are built from 250 kW - 5,000 MW.



2MW STEAM - SWEDEN



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WASTE COMBUSTION

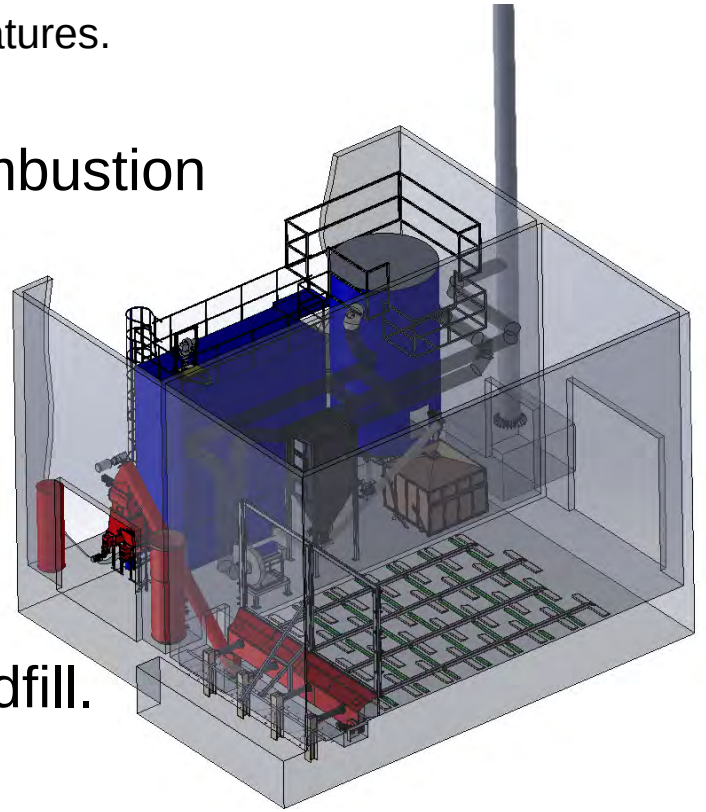
Designed to handle the stringent requirements and extreme fuel qualities that may occur

→ When burning waste materials the boiler and economizer is combined. Tiles are mounted inside the boiler to maintain the high temperatures.

The flue gas' retention time inside the combustion chamber is min. 2 seconds at 850°C.

→ Ensures burnout of toxic content

→ Complies with IED directive (EU reg.)



By burning waste materials like RDF, SRF and waste wood we exploit our resources SUSTAINABLY and reduce landfill.

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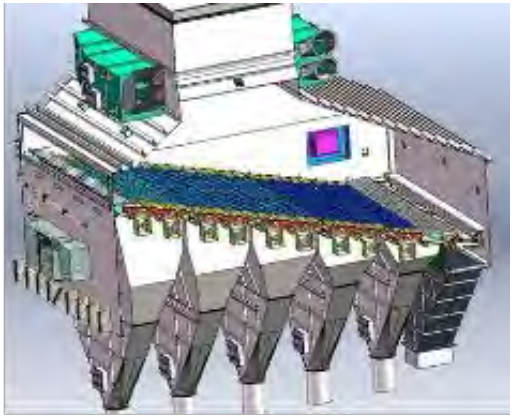
LINKA SOLUTIONS

Combustion system with low emissions

→Due to sizeable grates, the development of our air system combined with a prolonged combustion time (+2 sec. @ 850° C)

→Supporting burner to ensure temperature level

→Water tube boiler to ensure durability



Moving grate system – each grate bar row moves individually and is designed for waste products (waste grate system)

Final combustion of the ash prior to being transported to the ash container

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REFERENCES

A small selection of our projects.

VETLANDA, SE

Main data;

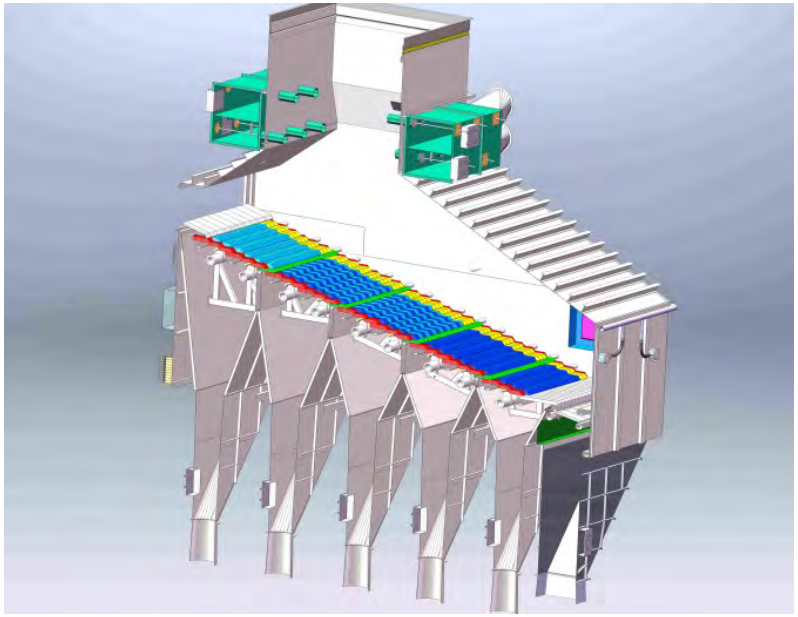
Turnkey delivery, commissioned in 2013

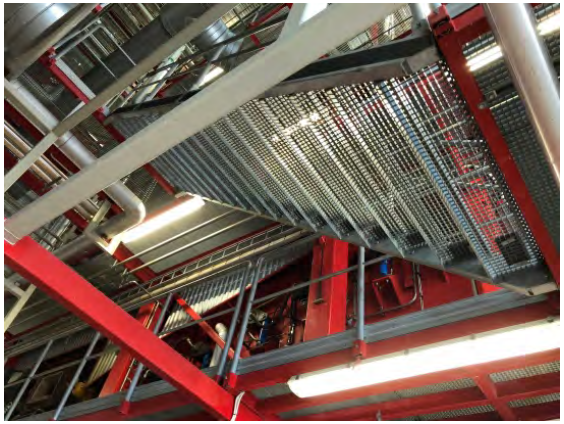
Staged combustion principle

27MWth, 79 Bar g, 500ºC

System supports

- ➔ Hot water for district heating
- ➔ Process steam
- ➔ Power production 7MWel
- ➔ Using waste wood as fuel – previously also mixed with plastics





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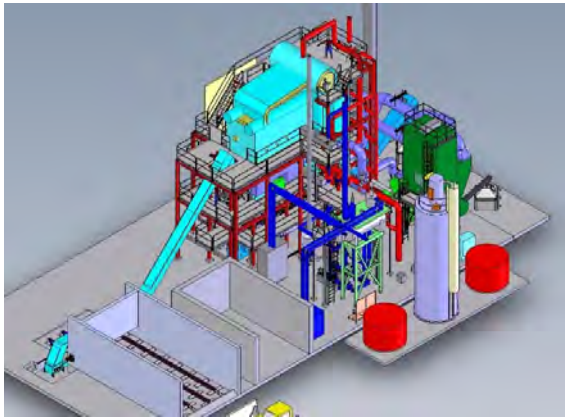
ARGENT UK – 4MW



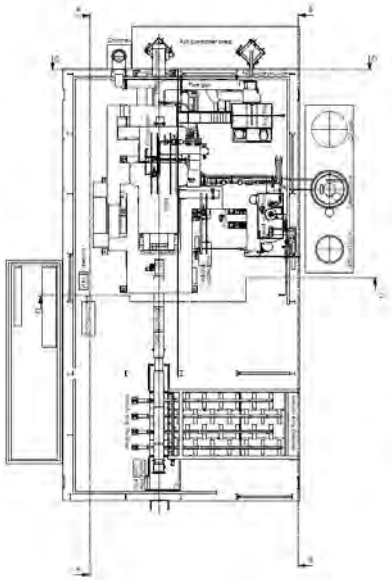
Small scale waste incineration system

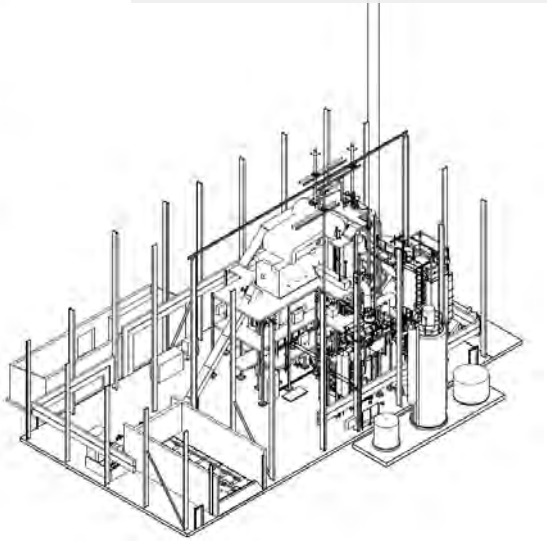
The delivery content technical equipment from fuel storage to chimney:

Steam system, 40 bar (o) – 6,5t/h

CHP ready

Fuel handling, IED-combustion, steam boiler, SNCR system for de-Nox, bag filter with additive (SO2 control), steam system and control system





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ANEBY AMAQ

- Aneby, Sweden

Mobile boiler system with 4 x 3 MW boilers as containerized solutions. Feeding system includes 2 silos and 2 wood chip pits.

- Estimated payback time: **4 years**
- Savings on district heating: **8%**
- Efficiency: Up to **91.9%**

CAMP BARDUFOSS

- Bardufoss, Norway

4.3 MW wood chips system for Norwegian military base, installed in 2016. Fuel is fed from a walking floor system.

- Fifth Linka system for the Norwegian Defence
- Designed for burning wood chips with up to 40% water
- Burns wood chips every year

ST. MERLØSE HEATING

- Holbæk, Denmark

4.5 MW turn-key straw system, built in 2013. Scope of supply included a straw cutter, filter and storage tank.

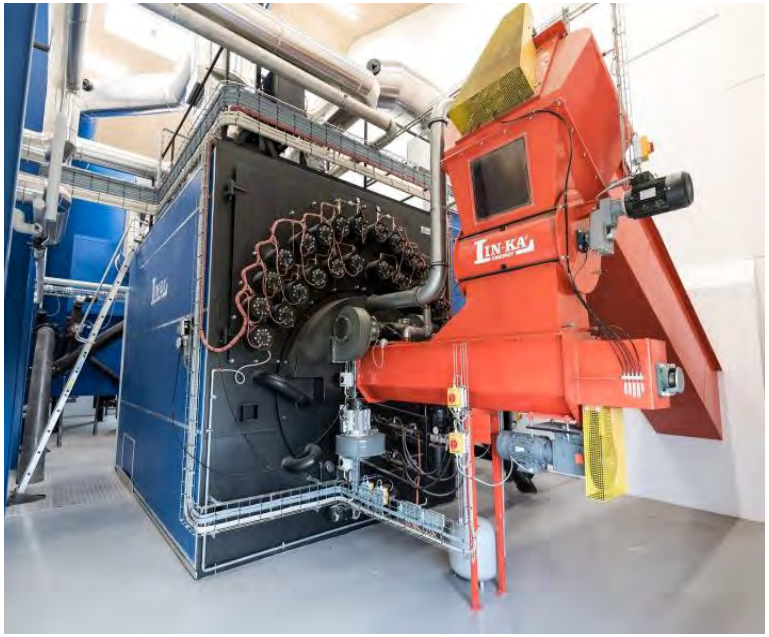
- **5-pass boiler** for more efficient use of the heat
- Efficiency: **93.4%**
- Savings on straw: **10%**

HJALLERUP HEATING

- Hjallerup, Denmark

3 MW turn-key straw system with an automated crane system and TWIN shredder.

- String remover is installed for higher automation
- Efficiency: **93.17%**
- Customer savings on heat: **30 DKK/MWh**



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References on demand

LINKA Energy A/S
Referenceliste
Biomasse > 2 MW

Opført	MW	Kunde	Brændsel	Land	Projektnr.
2019	2,0	Danish Agro - Skamby	Kornafrens	Danmark	32231
2019	3,2	Banak - Lakselv	Flis	Norge	32226
2019	2,0	Porsangmoen	Flis	Norge	32225
2018	4,0	Graphite Resources	RDF	UK	32219
2018	4,0	S J Sleath - rebuild	Affaldstræ	UK	32210
2018	2,0	Ward	Affaldstræ	UK	32206
2018	2,0	Gjerlev Fjernvarme	Halm/flis	Danmark	32214
2017	2,0	Grønhøj Biogas	Flis	Danmark	32158
2016	5,0	Danspin - Sindi Lanka (damp)	Pellets	Estland	32057
2015	3,0	Bioenergy - Tine Mejeri (damp)	Flis	Norge	32010
2014	4,0	Bioenergy - Skioll (norsk militærlejr)	Flis	Norge	31955
2014	5,0	KLm Energi - Arvidsjaur	Pellets	Sverige	31938
2014	4 x 3,0	KLm Energi - AMAQ	Pellets	Sverige	31919
2014	3,0	Jordberga Gård AB	Halm	Sverige	31912
2014	3,0	KLm Energi - Västerbotten	Pellets	Sverige	31909
2013	5,0	Aabenraa-Rødekro Fjernvarme - Gl. Stubbæk	Pellets	Danmark	31903
2013	5,0	Aabenraa-Rødekro Fjernvarme - Rådsmandsløkken	Pellets	Danmark	31902
2013	6,5	Lollands Forsyning - Drammenvej	Halm	Danmark	31889
2017	3,0	Ølgod Fjernvarme	Flis	Danmark	31877
2013	3,0	Bioenergy - Høybuktmoen (norsk militærlejr)	Pellets	Norge	31870
2013	3,0	Danstoker	Pellets	Norge	31860
2013	3,0	KLm Energi - Norrsjö	Pellets	Sverige	31858
2013	4,0	Bioenergy A/S - Avantor	Pellets	Norge	31849
2013	4,5	St. Merløse Halmvarmeværk	Halm	Danmark	31829

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References on demand

Jernforsen referencelist

Client	City	Country	Year	Capacity (kW)	Type of plant	Delivery scoop	Other information
Moelven Sokna AS	Sokna	Norway	2019	2x12.000	Pellet plant	Machine delivery	
Hållanders Sågverk AB	Dalstorp	Sweden	2018	4.000	Sawmill	Machine delivery	
Derome Timber AB	Derome	Sweden	2018		Sawmill	Flue gas cleaning	ESP, *14 MW*
E.On Lokala Energilösningar AB	Hasselfors	Sweden	2018		Sawmill	Fuel handling System	New silo
VIDA Hästveda	Hästveda	Sweden	2018		Sawmill	Flue gas cleaning	ESP, *5 MW*
Trelleborgs Fjärrvärme AB	Trelleborg	Sweden	2018		District Heating	Flue gas cleaning	2x ESP, *4+ 8 MW*
Mariehamn Bioenergi AB	Mariehamn	Finland	2018		District Heating	Flue gas cleaning	ESP + RGK, *5 MW*
Ronneby Energi AB	Ronneby	Sweden	2017	6.000	District Heating	Machine delivery	Changing combustion chamber
ATA Timber AB	Sandsjöfors	Sweden	2017	6.000	Sawmill	Machine delivery	
Bergs Timber AB	Mörlunda	Sweden	2017	6.000	Sawmill	Process delivery	
Gislaved Energi AB	Gislaved	Sweden	2017	7.000	District Heating	Turn-key	
Alingsås Energi AB	Alingsås	Sweden	2017	14.000	District Heating	Process delivery	
Argent Energy	Ellesmare Port	UK	2017	4.000	Process Industry	Process delivery	WID complient
Solör Bioenergi AB	Strömsnäsbruk	Sweden	2016	4.000	District Heating	Machine delivery	
Raisio OY	Åbo	Finland	2016	9.500	Process Industry	Machine delivery	
Eidsiva Bioenergi AS	Elverum	Norway	2015	10.000	District Heating	Process delivery	WID complient
University of St Andrews	St Andrews	UK	2015	6.500	District Heating	Machine delivery	
Höglands Såg och Hyvleri AB	Domsjö	Sweden	2015	5.000	Sawmill	Machine delivery	
VIDA Borgstena AB	Borgstena	Sweden	2015	12.000	Sawmill	Process delivery	
ATA Timber AB	Moheda	Sweden	2015	6.000	Sawmill	Machine delivery	
E.On Värme Sverige AB	Arninge	Sweden	2015	16.000	District Heating	Process delivery	

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Thank you for your attention!

IN-KA® ENERGY

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