

SET

CleanTech

ECO-SUSTAINABLE
TECHNOLOGIES

—
XXI CENTURY

Profit
from waste
recycling



Turning waste to profit?

* Solid recovered fuel (SRF) based on mandate of European Commission CEN / TC343.

Calorific value of standard SRF is the same as of coal (15–25 MJ/kg) whereas CO₂ emissions of SRF are just 1/5 of relevant emissions of coal. SRF has low content of chlorine and sulphur. Furthermore, SRF manufactured using Tyrannosaurus® –technology, is local, environmentally friendly, standardized high-calorific fuel to be used in different power boilers, cement mills as well as in other industrial processes.

Finnish eco-sustainable Tyrannosaurus® — technology is advanced technical solution to turn waste recycling process into profitable business.

Solid Environmental Technologies (SETCleanTech), Finland, delivers Tyrannosaurus® — technology to Russia and CIS-countries.

Tyrannosaurus® is the most powerful and intelligent system for processing household waste into high-quality SRF. One production line can process up to 1200 tons of municipal solid waste (MSW) or 600 tons of industrial waste / tyres per day.

Tyrannosaurus® is an automatic system having high reliability and low operational costs.

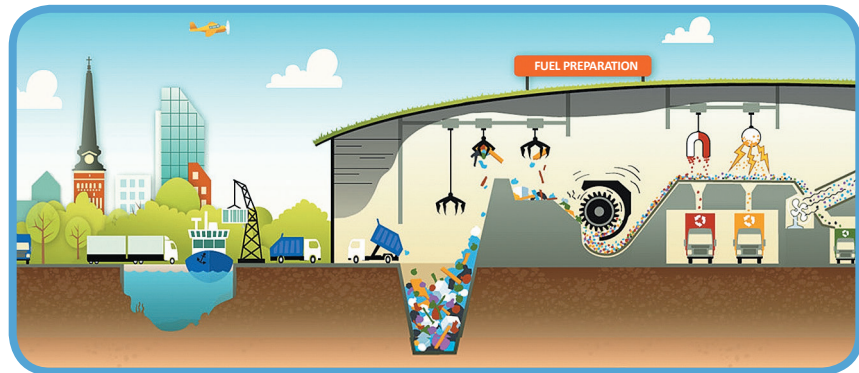


Some see a problem,
others see
an opportunity.

Turning waste to high-quality SRF to produce heat and electricity

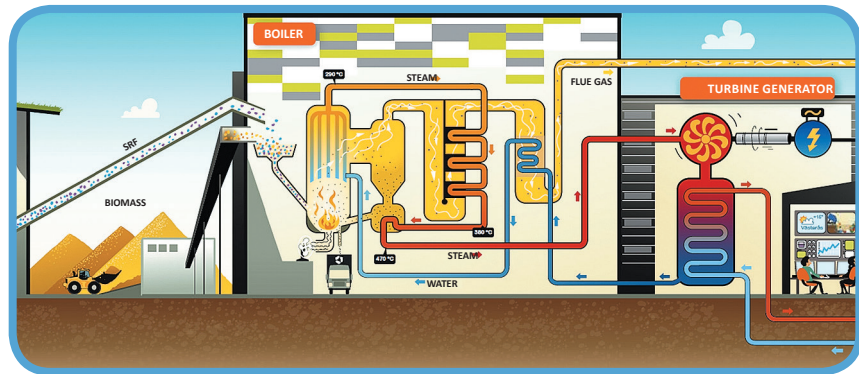
Processing of MSW and industrial waste

- shredding, sorting and getting refuse derived fuel;
- fuel silo storage;
- boiler feeding;
- SRF indoor storage option.



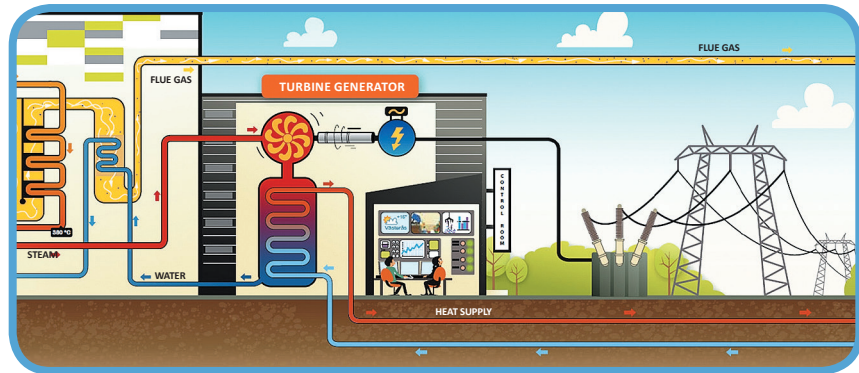
Energy production from SRF

- supreme efficiency;
- CFB boiler;
- steam production.



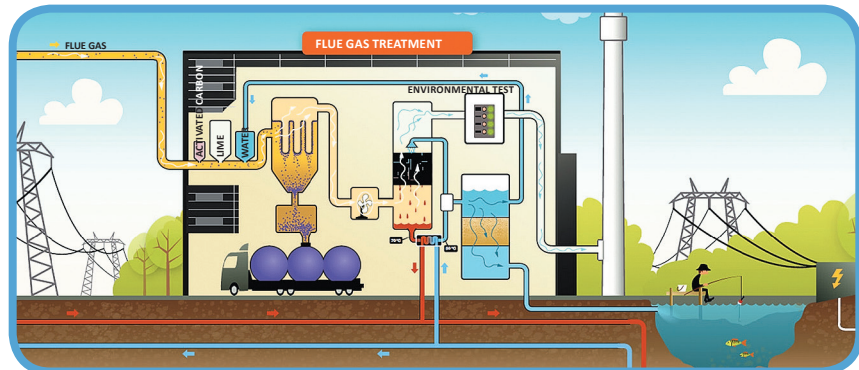
Power production

- boilers heat is used to produce electricity and district heating.



Flue gas scrubbing

- additional energy production due to flue gas condensing;
- emissions are considerably lower than requirements of European standards.





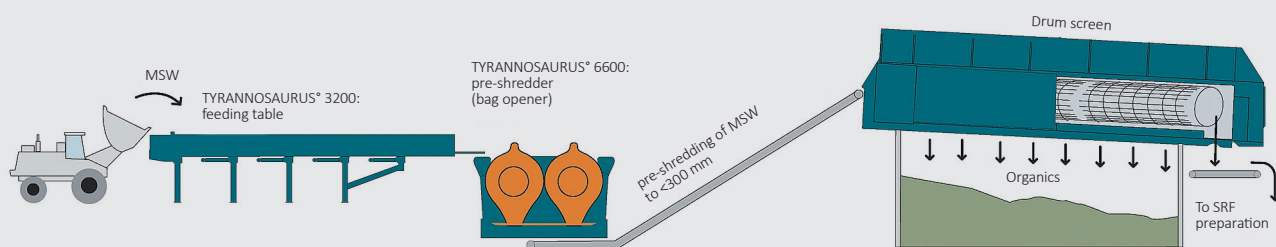
TYRANNOSAURUS® – system

MSW pretreatment process

Waste pretreatment process starts from feeding of MSW to Tyrannosaurus® pre-shredder which is specially designed to open plastic bags and to reduce MSW to abt. 300 mm size.

After Tyrannosaurus® pre-shredder wet organics as well as some inert and other materials are separated with high capacity drum screen. After screen we have an option for manual sorting line to remove recyclable materials (plastics, metals, cardboard, glass etc.). Fractions having higher calorific value and some types of recyclable materials are fed further to automatic sorting and SRF production process. Combustible material of 300 mm size is acceptable for burning in grate-fired boiler. In such case pre-shredder can be basic shredder of the system.

TYRANNOSAURUS® Waste pretreatment line®



In Tyrannosaurus® shredder particles size and quality will remain the same due to ZeroGap – technology even when blades are worn.

SRF production process

SRF production process starts from feeding pretreated material. Feeding device is adjusted for optimal automatic operation with Tyrannosaurus® shredder. If too much material will be fed into Tyrannosaurus® shredder, the feeder will slow down automatically providing optimal capacity of the production line at all times. Tyrannosaurus® shredder having weight up to 90 tons is made of solid steel frame (60 mm) and can work continuously.

Massive Impact Protection system (MIPS) ensures process continuity even when large parts of material will be fed into shredder. In such case Tyrannosaurus® shredder will automatically throw out large non-shreddable parts of material (metal, stones, car motors etc.) into separate silo and continue shredding process without any interruptions. At maximum capacity Tyrannosaurus® shredder can shred material to 75 mm parts during one shredding phase.

Ferrous metals are separated by automatic suspended magnet separators. After that the material is dropped onto belt-type conveyor and guided to fines screen to separate fine fraction (sand, pebble, organics, small pieces of glass, ceramics, etc.).

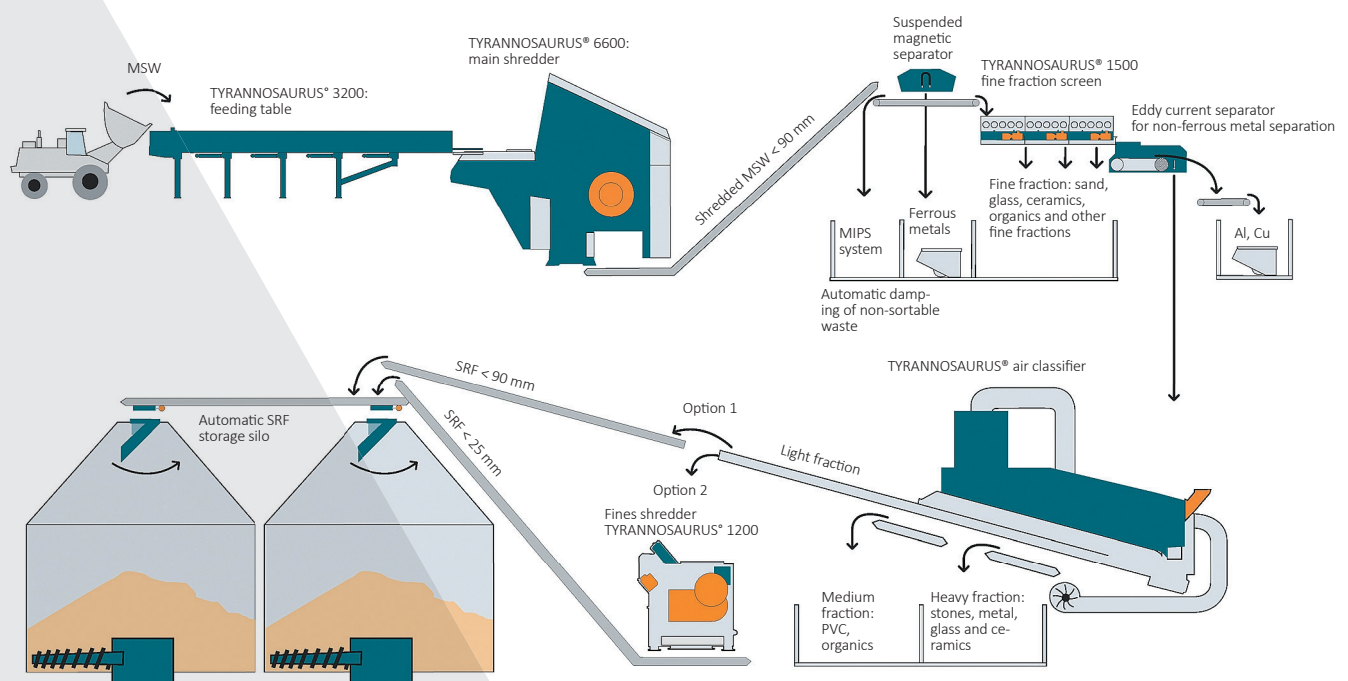
Furthermore material is led to eddy current separator where non-magnetic conducting materials such as aluminium, copper etc. are to be removed.

At the final stage of SRF preparation process air classifier divides material flow into two parts:

- light fuel fraction (paper, cardboard, textiles and plastic films);
- heavy fraction (possible organic waste remains, heavy plastic (PVC etc.), glass, metals, stones, ceramics etc.).

The whole SRF preparation process is controlled on-line providing optimal fuel production for the end user.

SRF production line TYRANNOSAURUS®



Tyrannosaurus®-system — the best of its kind

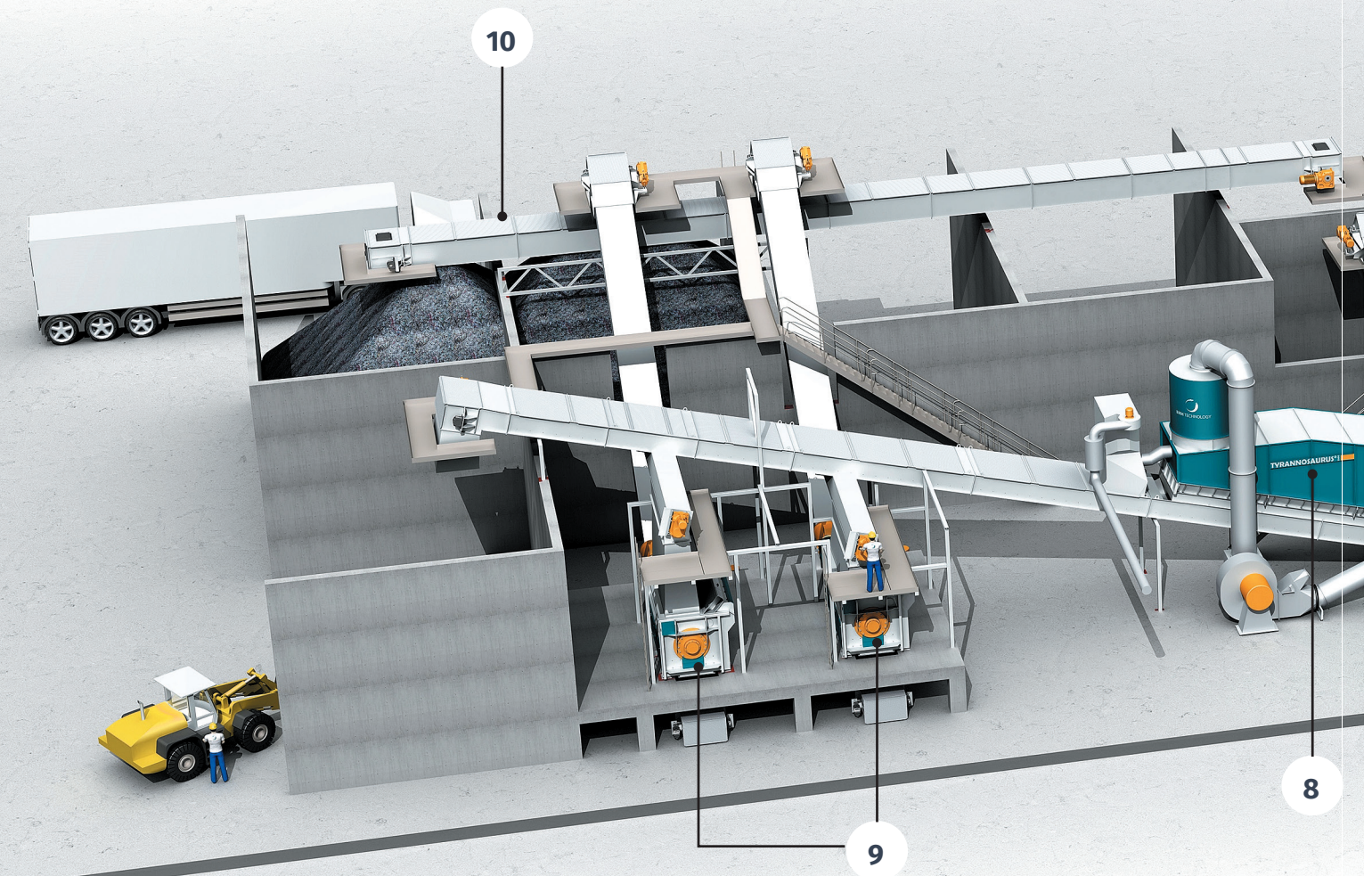
Experts from Solid Environmental Technologies take care of regular monitoring and preventive maintenance of the equipment. Quality of SRF remains at highest possible level, harmful contaminants are minimal and processing is fully controlled by the client.

Benefits of Tyrannosaurus®-system:

- turn-key project;
- high operational availability;
- high performance;
- minimum maintenance;
- no need for constant surveillance;
- automatic process;
- low production costs;
- best quality fuel.



Tyrannosaurus®-concept has set up new standard for high-quality SRF production.

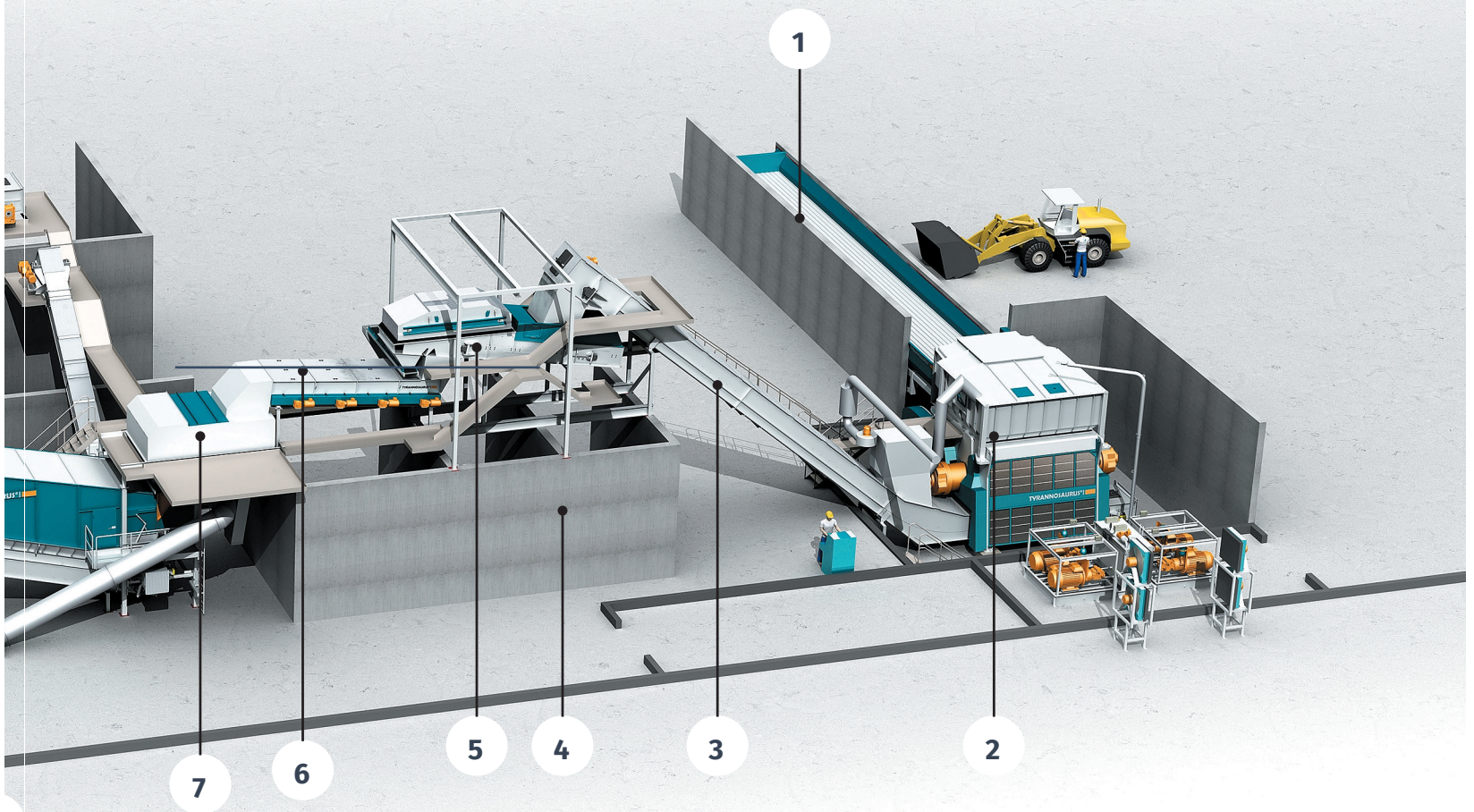


Tyrannosaurus® — SRF production plant

1. Feeder Tyrannosaurus® 3200.
2. Shredder Tyrannosaurus® 9900.
3. Discharging conveyor.
4. Massive Impact Protection System (MIPS) for automatic removal of big size metal objects.
5. Suspended magnet separator for ferrous metal removal.
6. Fine fraction screen — Tyrannosaurus® 1500 Fines.
7. Eddy current separator for non-ferrous metal removal.
8. Air classifier.
9. Tyrannosaurus 1200 Fine Shredder for production of SRF fuel for cement kilns.
10. Fuel storage system.



Taking care of your investments.

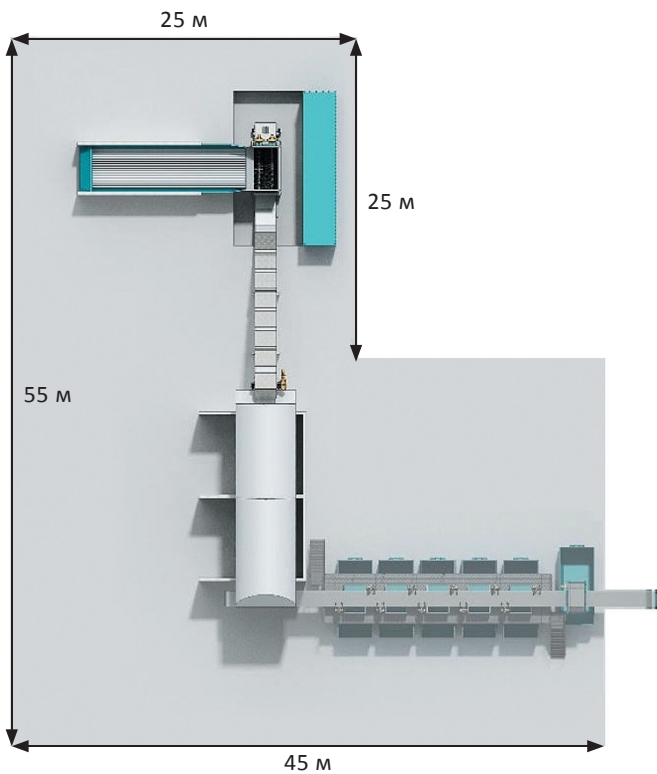


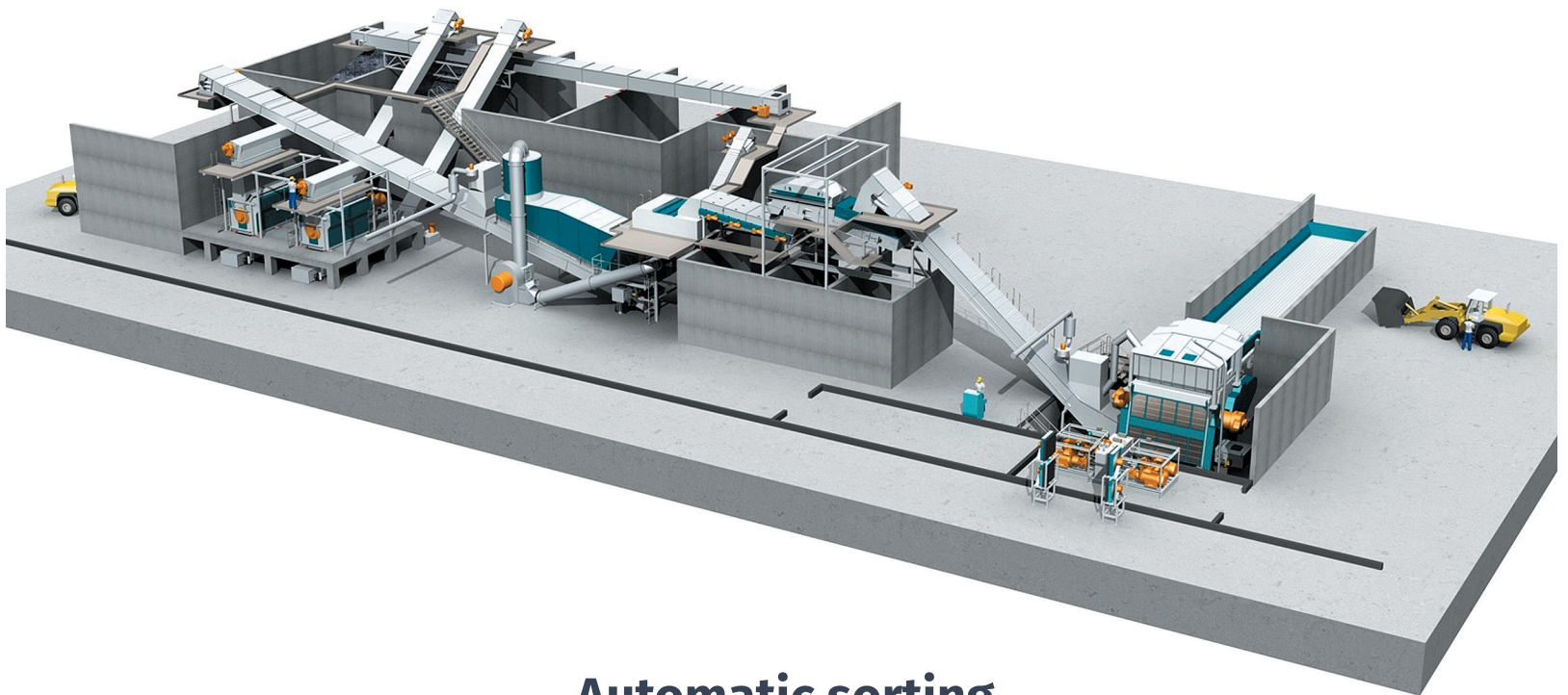
Process line options

Unsorted MSW pretreatment line

Drum screen, manual sorting line and magnet separator are used to separate organic matter, different types of valuable recyclables and fractions for SRF production. Can be used as main processing line of small amounts especially for the fuel to be burned in grate-fired boilers.

Production capacity: up to 400 t/d.





Automatic sorting and high-quality SRF production line

In this line ferrous and non-ferrous metals, plastics, glass as well as inert and other materials not usable for fuel production are automatically removed from presorted MSW.

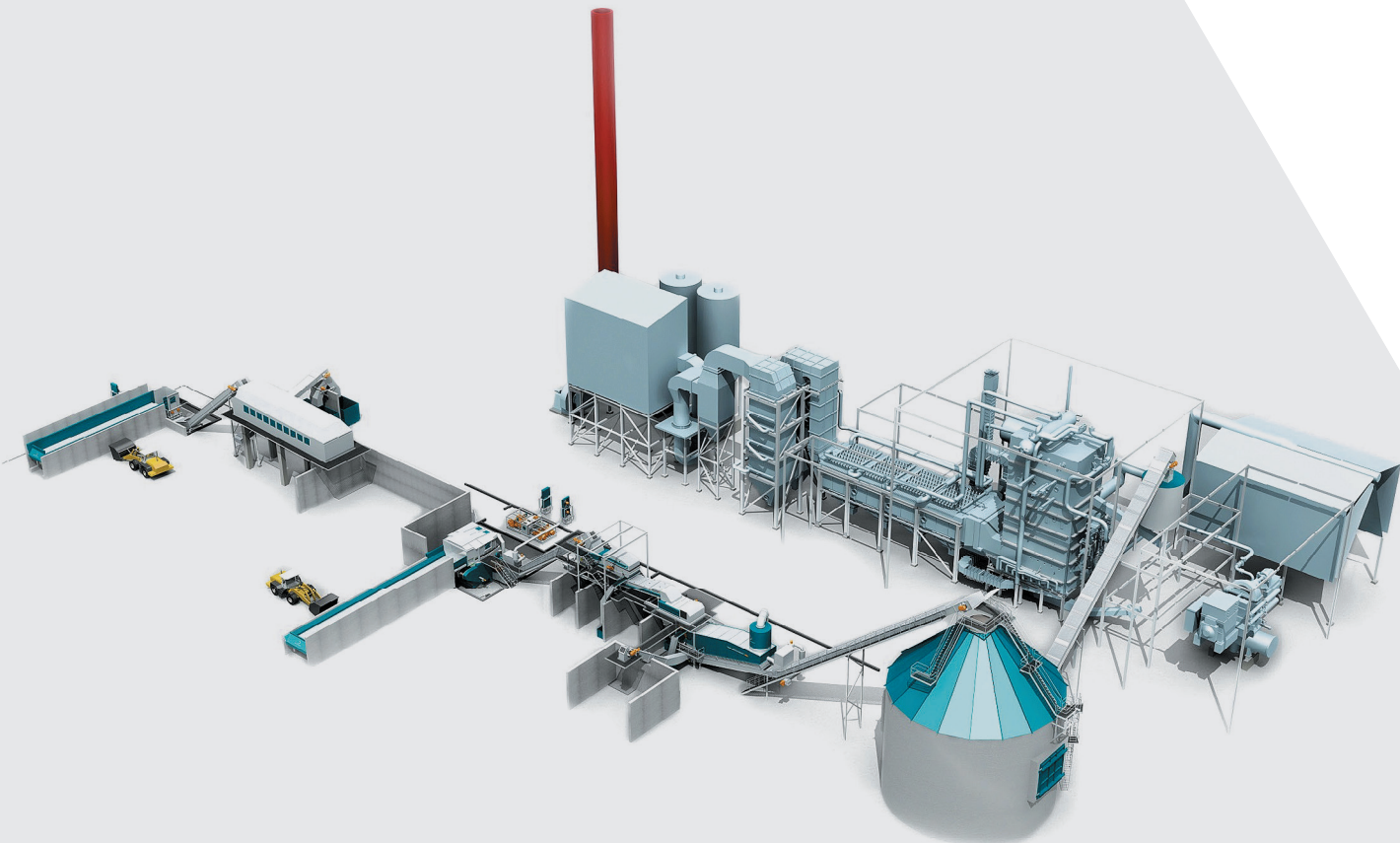
Where SRF can be used?

- in heat-only boiler houses;
- in power plants for power and heat production;
- in cement mills.

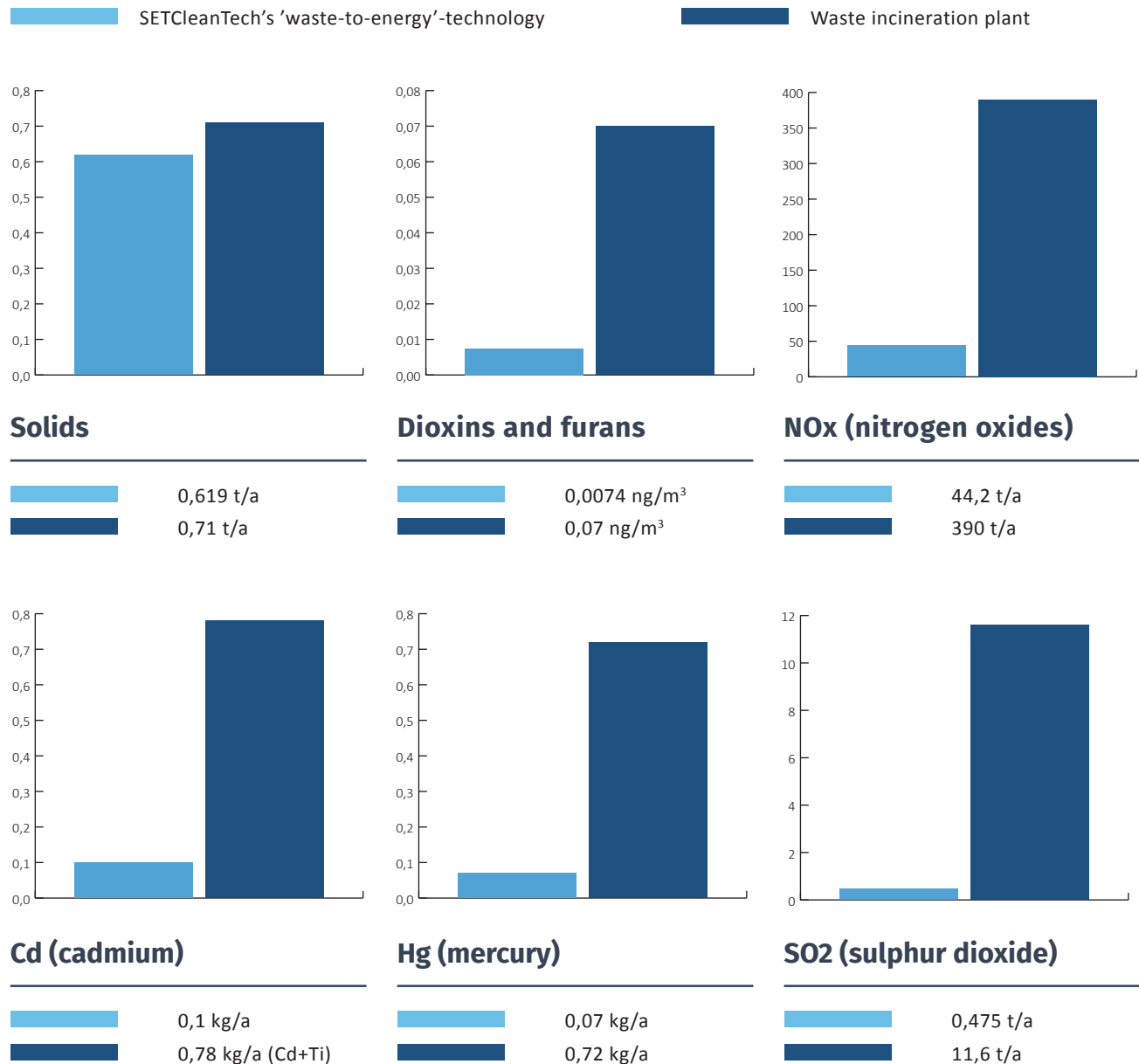
Production capacity: 400–1000 t/d.

SRF produced at Tyrannosaurus° automatic sorting line is environmentally friendly, low-cost certified fuel of high calorific value. Specifications of this fuel are comparable with coal whereas it has considerably lower chlorine and sulphur content and CO₂ emissions level. Thus use of SRF for heat and power production

as well as in cement kilns ensures low atmospheric emissions complying with all European requirements. Boiler houses and cogeneration plants based on CFB technology ensure eco-friendly production with high efficiency and profitability.



Advantages of eco-sustainable SETCleanTech concept over waste incineration



- SETCleanTech's 'waste-to-energy' — concept ensures low atmospheric emissions.
- SETCleanTech's 'waste-to-energy' — concept does not require use of natural gas as additional fuel thus providing for considerably lower emission level caused by MSW.
- CFB boilers (SETCleanTech's 'waste-to-energy' — concept) operate with oxygen (O₂) content of 6%. Grate-fired boilers (Waste incineration plant) operate with oxygen (O₂) content of 11%. This means that dioxin emissions of CFB boilers are significantly lower than that of Grate fired Waste incineration plants.

Finnish company Solid Environmental Technologies Oy (SETCleanTech) focuses on ecology and environmental protection. Companies' experts have 40 years of experience in eco-sustainable technology markets.

One of the main activities of the company is implementation of comprehensive waste management projects including advanced sorting and processing of municipal solid waste, industrial and forestry wastes as well as production of SRF, heat and power.

Conversion of waste to power is high-profitable process and can solve whole range of problems connected to waste recycling in big cities and improve energy security of sparsely populated regions. Besides, advanced waste sorting provides for recovery of valuable recyclables such as plastics, metals, paper, glass, cardboard etc.

Due to advanced sorting and processing of wastes to power/heat at most 10% of total amount of municipal solid waste will remain for landfill disposal. This will improve environmental situation drastically, decrease harmful emissions level and save natural energy resources (gas and oil) for future generations.

Solid Environmental Technologies Oy

Exclusive distributor
of BMH Technologies Oy in Russia

There is no room for landfills in future cities

Solid Environmental Technologies Oy is exclusive distributor of Finnish BMH Technologies Oy, which produces Tyrannosaurus® -equipment, in Russia and CIS -countries. Due to Tyrannosaurus® -technology You will get valuable recyclables and high-quality solid recovered fuel (SRF). Use of the fuel for heat and power production will ensure high profitability of waste management and improve environment and life quality!

Ruukinkuja 2, 02330 Espoo, Finland

+7 921 397 0130 +358 40 5799 560

info@setcleantech.com

www.setcleantech.com

