

Concept and technologies of integrated waste management for regions or major cities

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Presentation overview

Waste management strategy and stages

1. Reduce at source
2. Reuse
3. Recycle
4. Energy recovery
5. Disposal

Regional waste management concept

Waste management concept must be based on:

- available/affordable technology
- special local environmental demands
- logistics (specific conditions)
- economic criteria

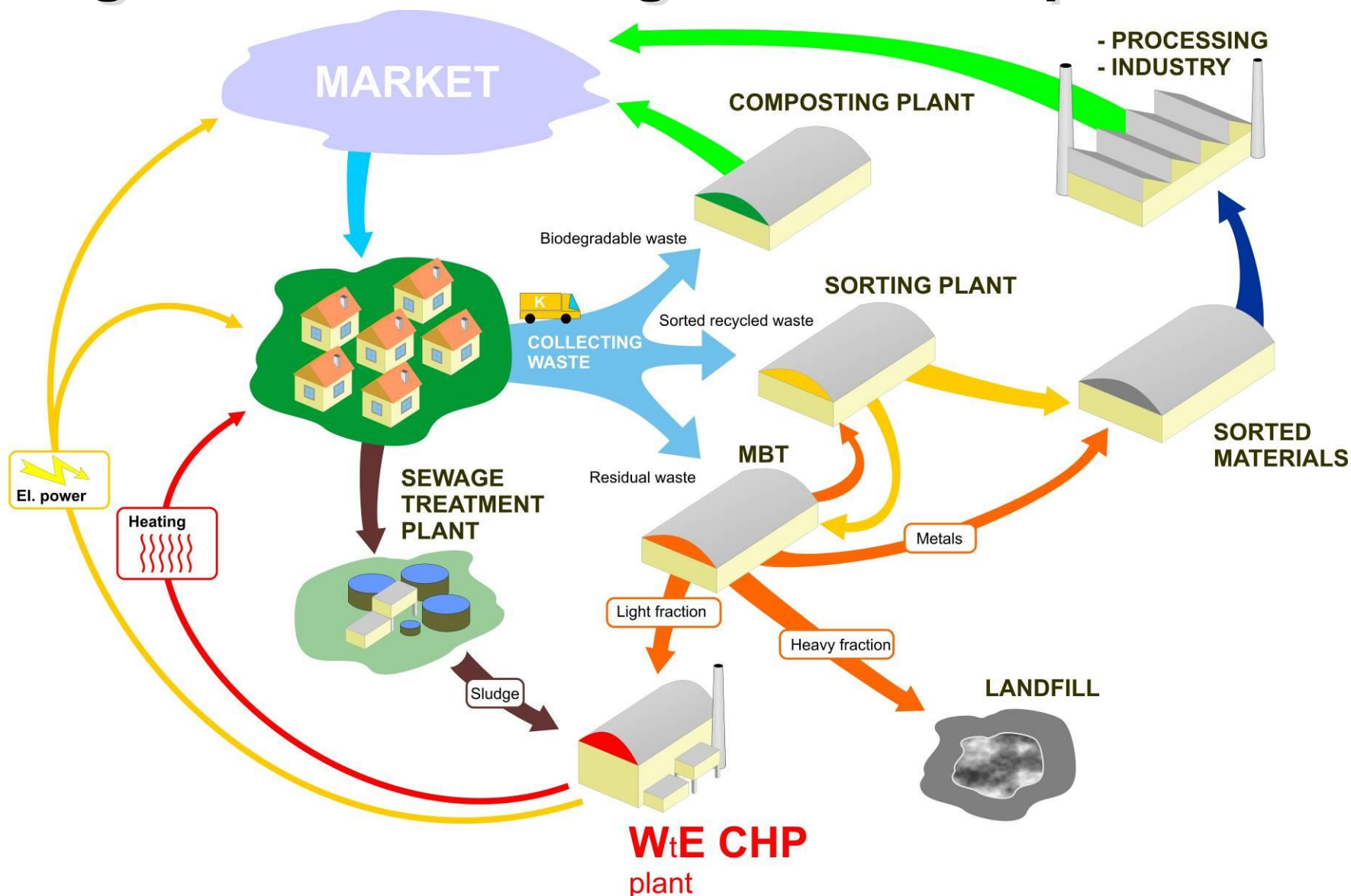
It is therefore necessary to form Integrated Waste Management based on various interconnected technologies that supplement each other.

Integrated waste management concept must always take into account the local specifics.

Regional waste management concept



Regional waste management concept



Enviromental impact of waste management technologies

1. Logiscs of waste is MSW collecting and transpotration
2. Depends very much on the waste quantity and composition, volume and size of the waste collection region
3. Separate collection of fraction has great influence on logistics
4. In case of separate collection the BRING and TAKE systems are possible

Waste logistics

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Recycling materials – sorting and preparations

Sorting of separately collected fractions
must be done completely by machines.

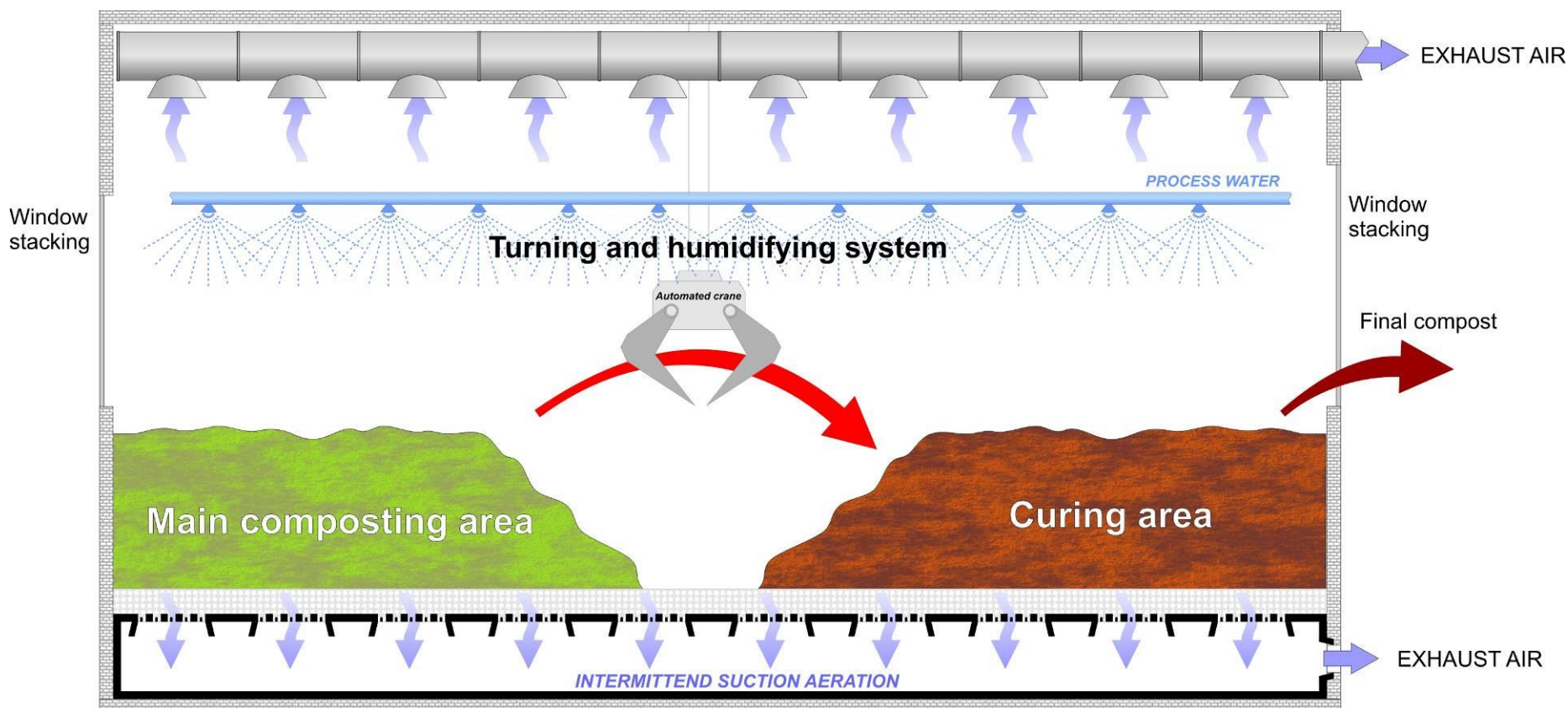


**RECYCLE
MATERIALS**

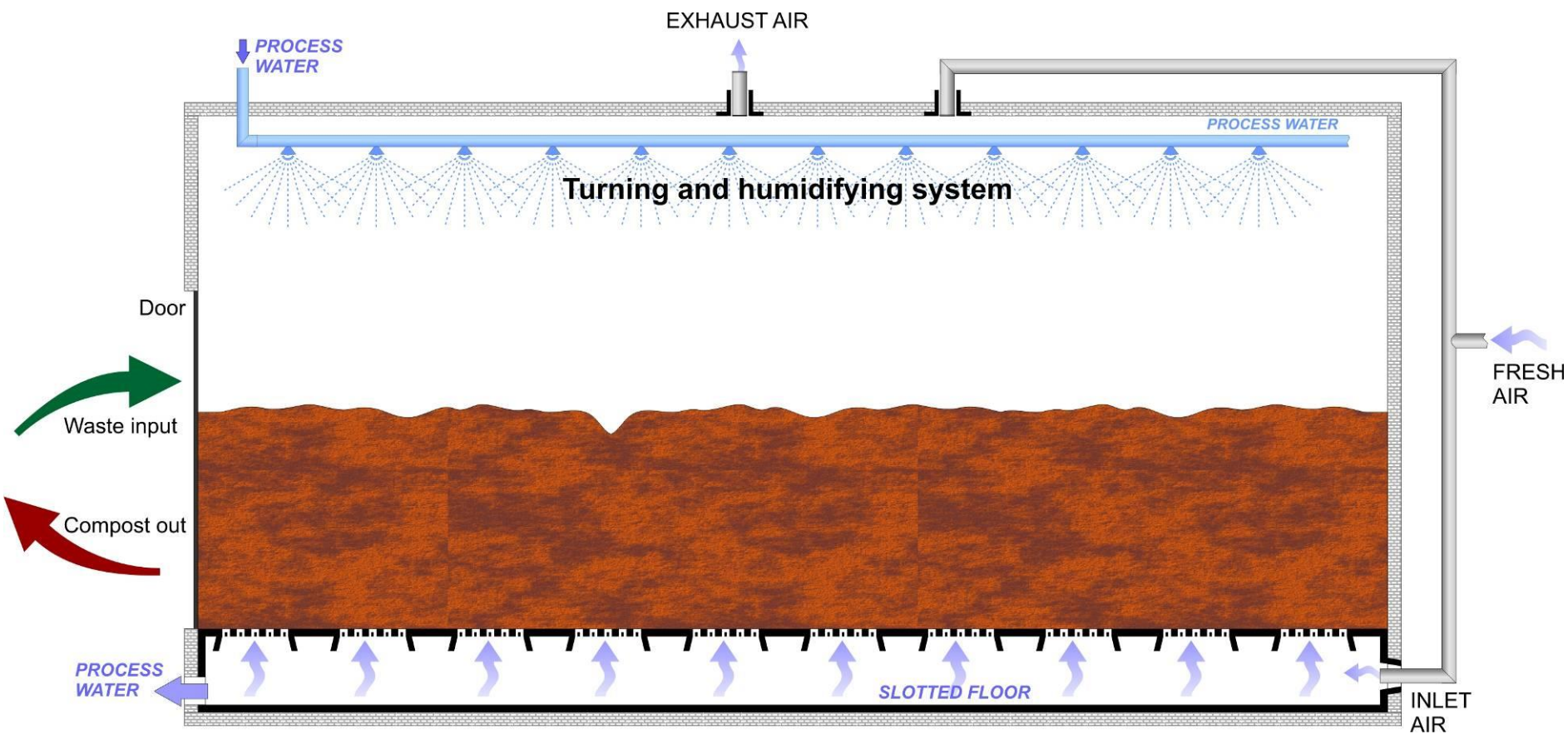
(plastics, paper, cardboard...)



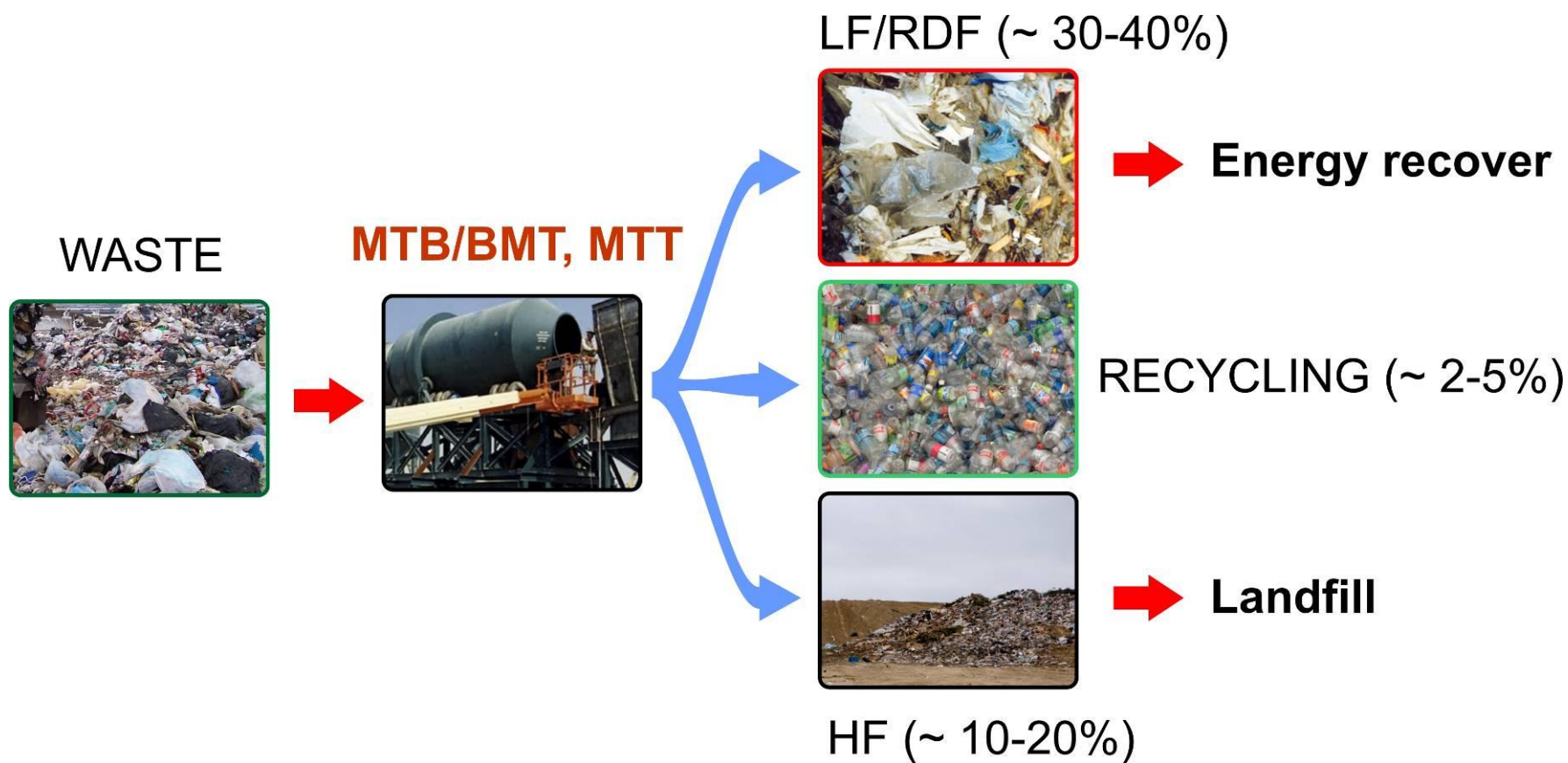
Biological treatment



Biological treatment



Separation of light and heavy fraction



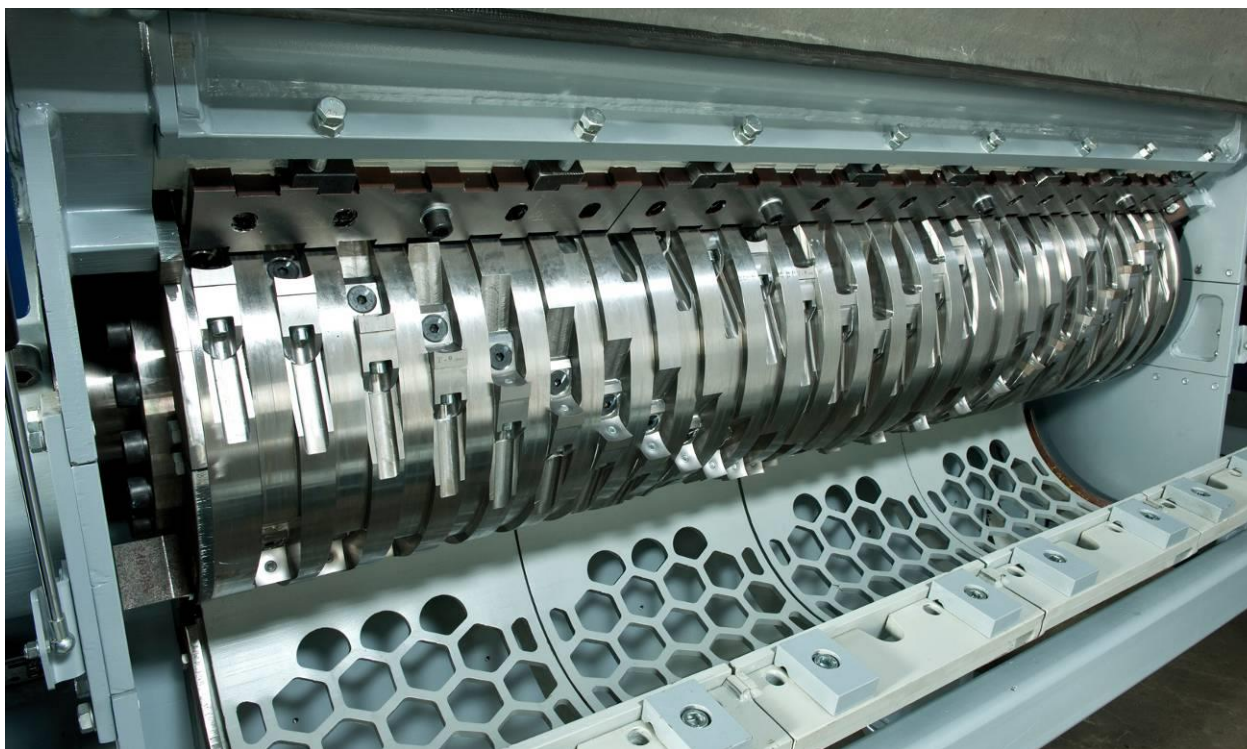
Main mechanical parts of separation process

Drums with knives



Main mechanical parts of separation process

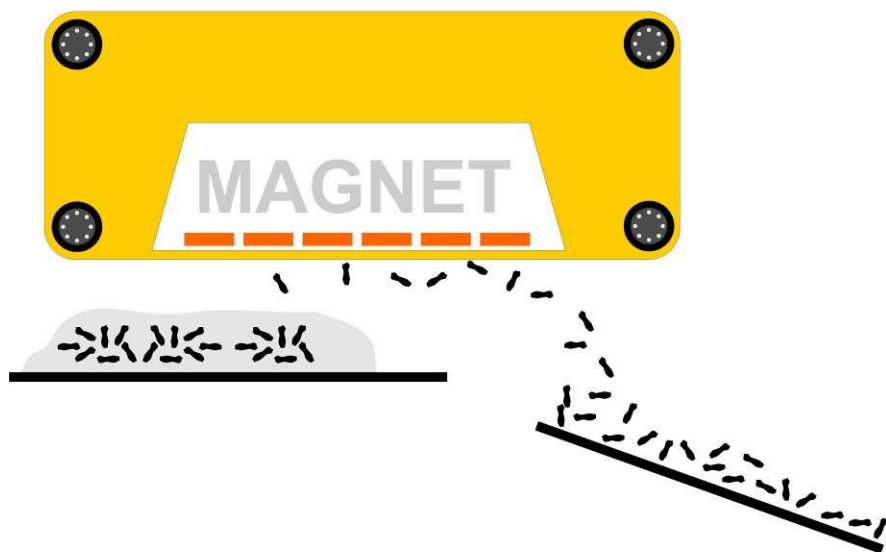
Schredder



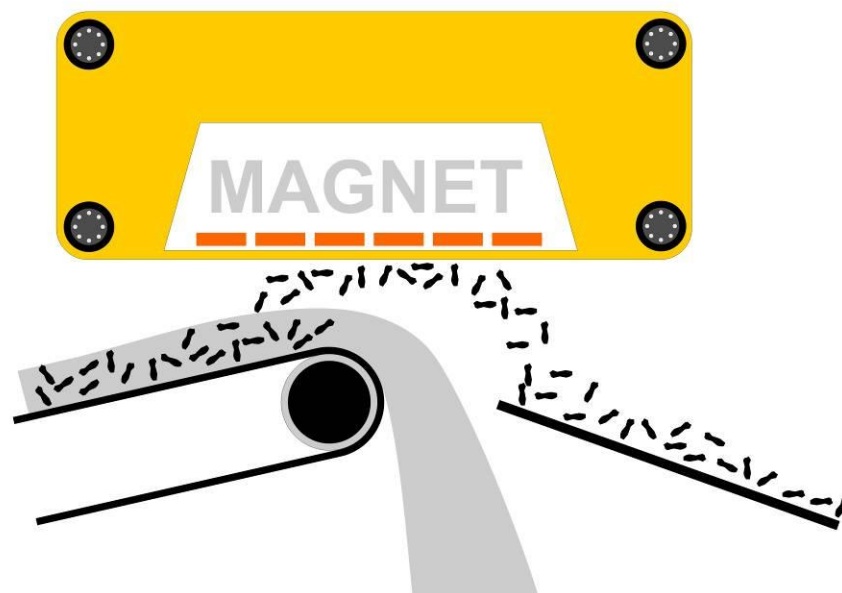
Main mechanical parts of separation process

Metal recycling

Eddy current magnetic separators
– non ferrous metals

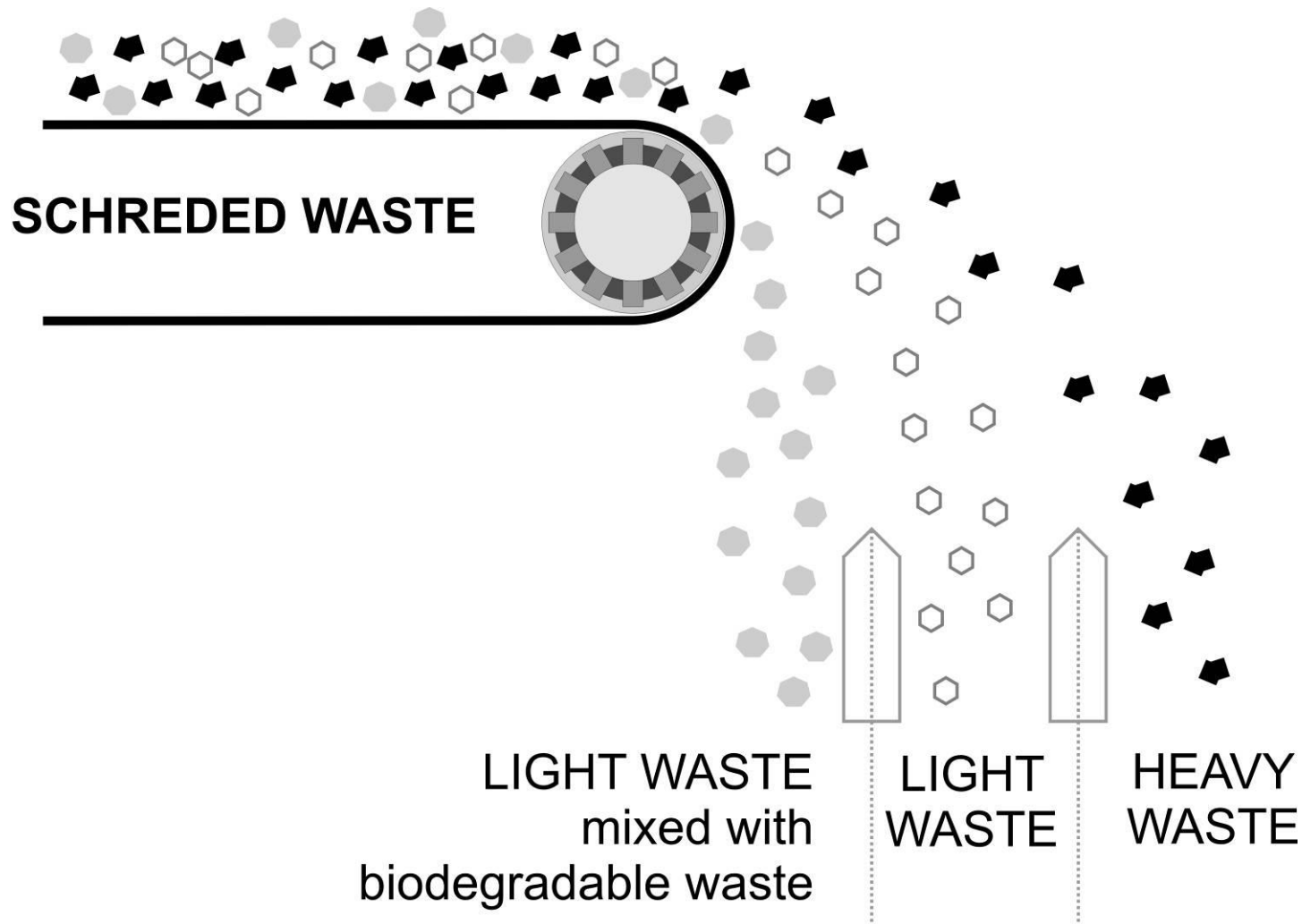


Magnet separators
– ferrous metals



Main mechanical parts of separation process

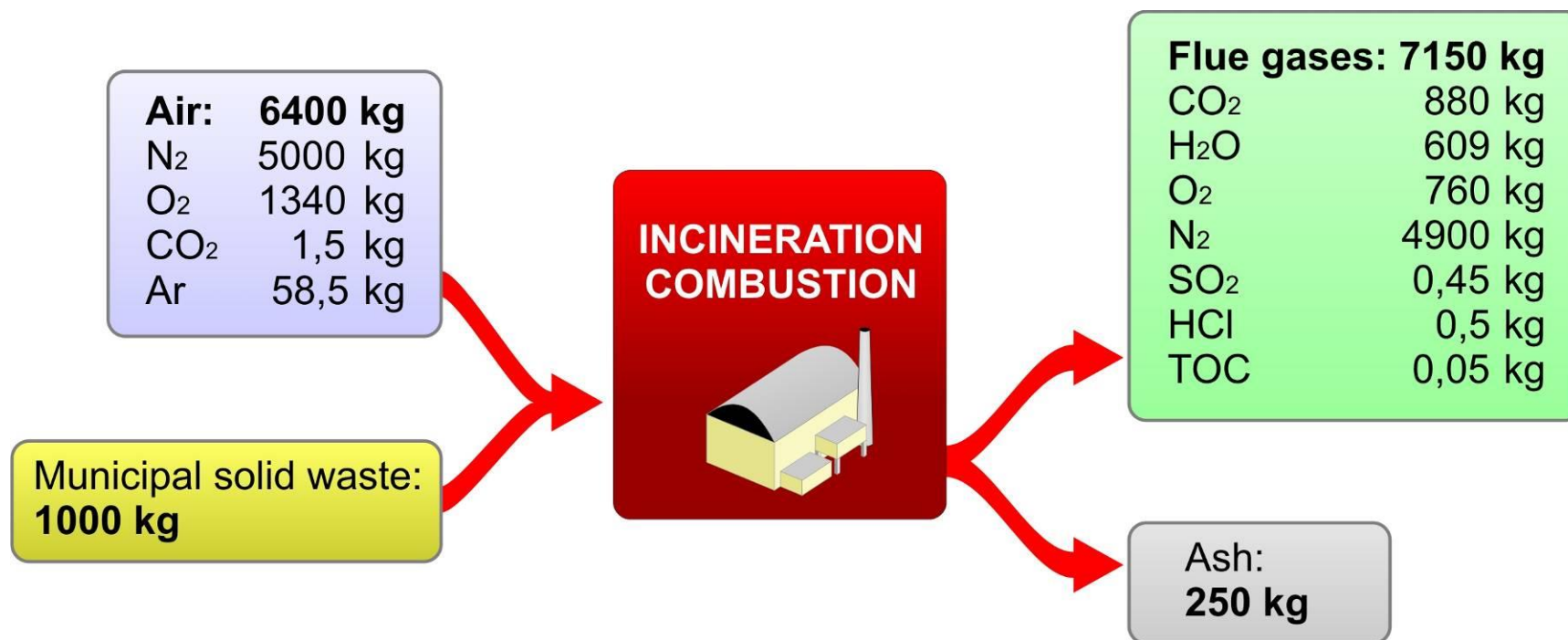
Balistic separator



Energy recovery processes

- **Incineration**
 - on grate
 - fluidized bed
 - rotation drum
- **Gasification** (oxidizing, plasma)
- **Pirolysis**
- **Combined processes**
- **Co-incineration**

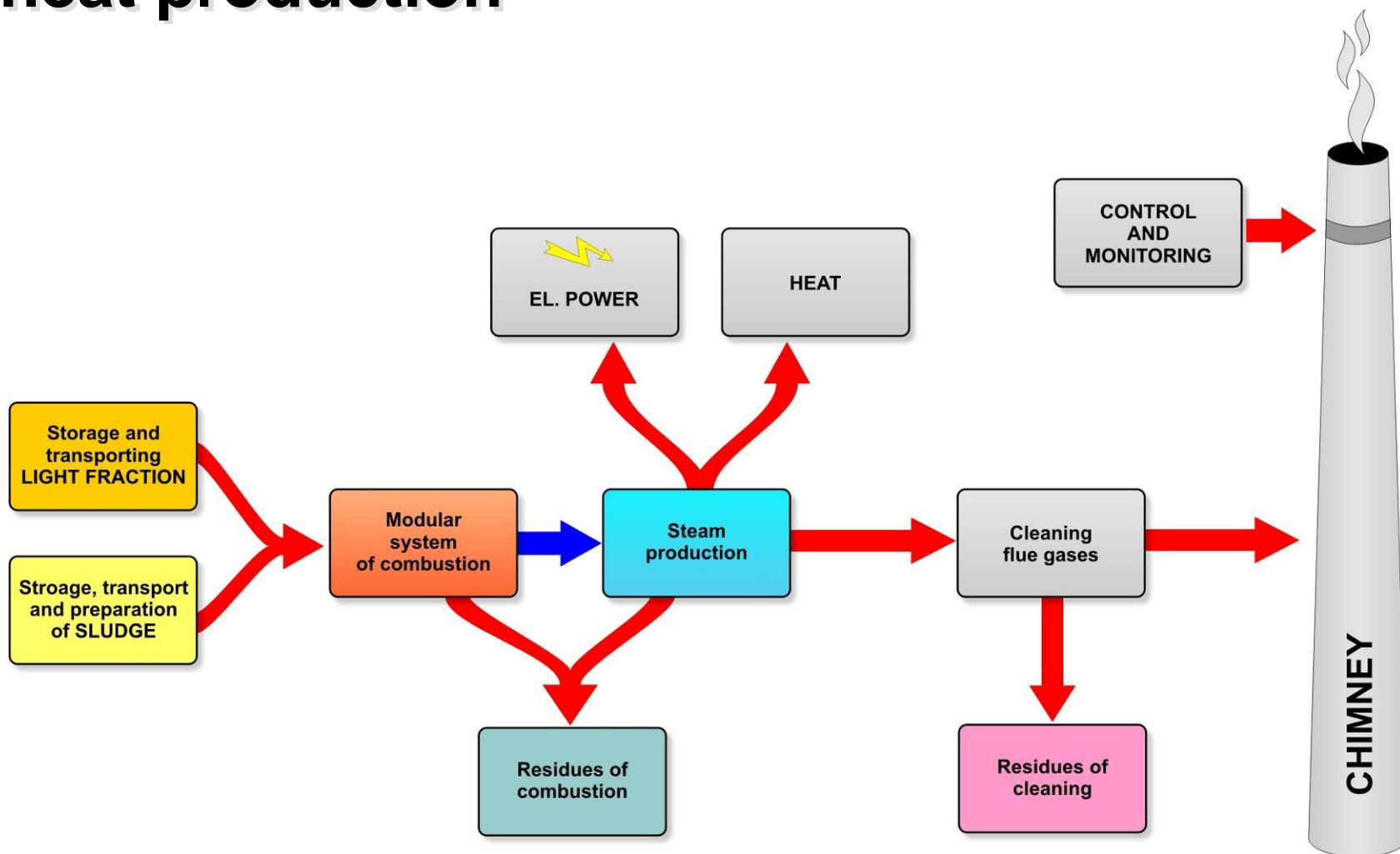
Incineration mass – 1 t of municipal waste



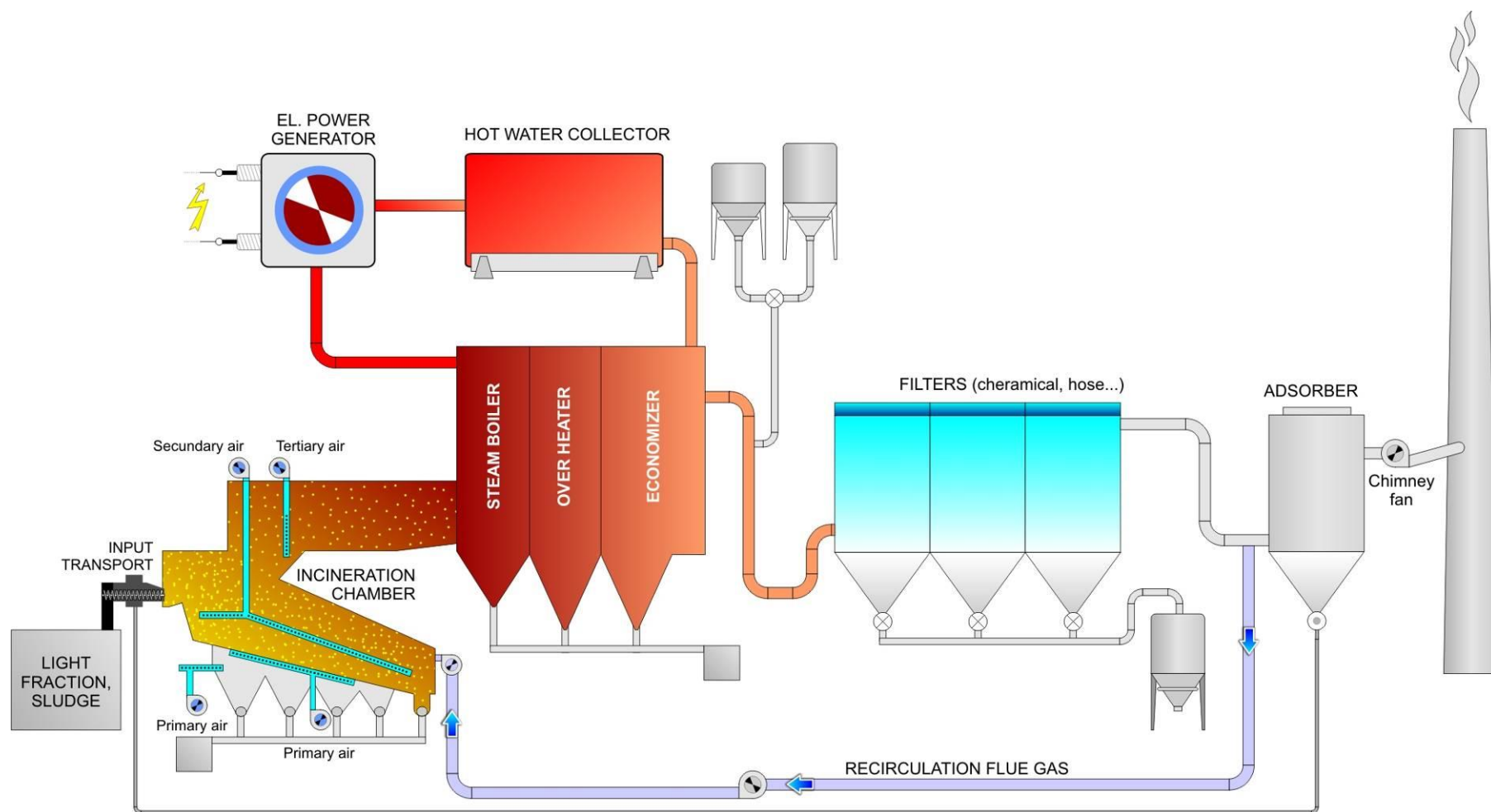
CO₂ emission: 0,880 kg/kg

CO₂ emission with respect to 85% biodiverzibility : 0,132 kg/kg

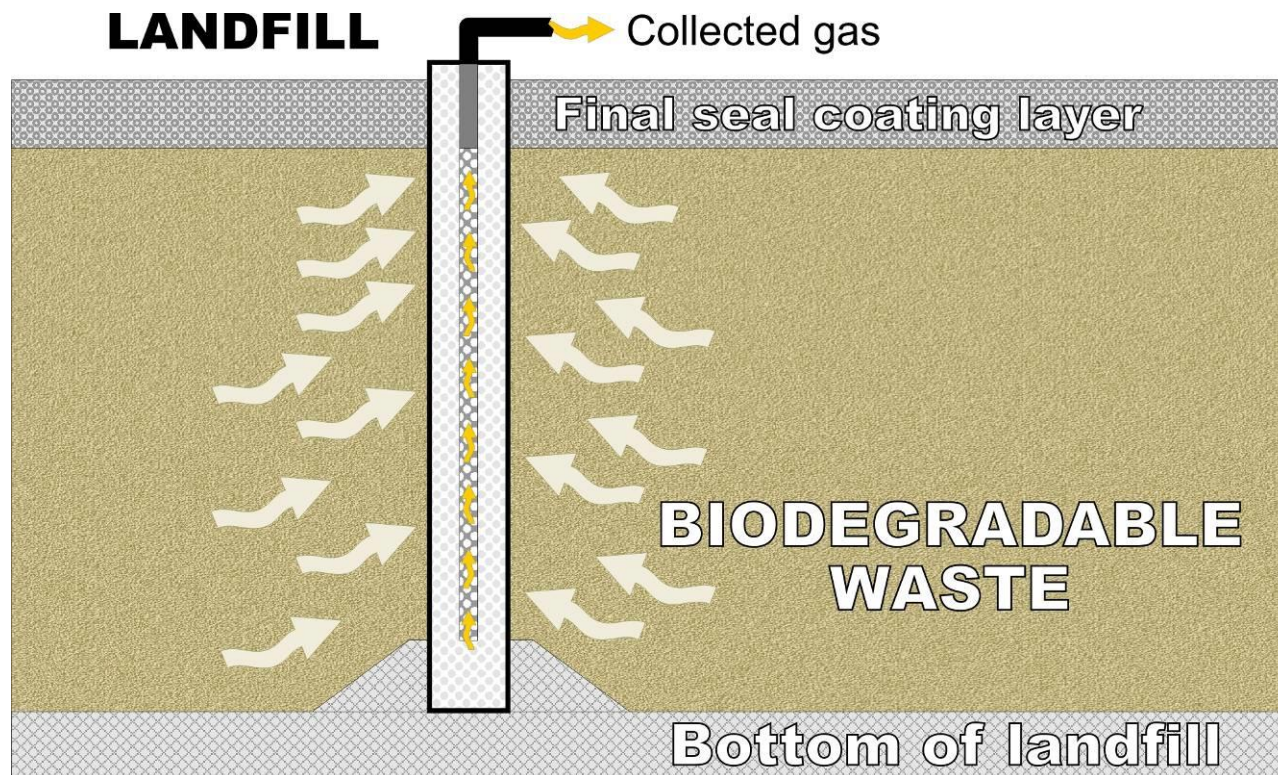
Incineration, flue gas treatment, power and heat production



Incineration, flue gas treatment, power and heat production



Landfill gas production



Overall timetable of the complete project:

2,5 years

Include:

Feasibility study (technical and investment part)

Building and start of test operation

Final operating of all technologies and objects

Land require for all stages:

1. For Landfill is requires approximately 3 hectare of land
2. For Separation and Sorting center requires approximately 2 hectare for building
3. For Powerplant requires approximately 1,5 hectare of land

Building construction costs

Investment

Sorting center:	12.827.460 €
MBO:	19.926.360 €
Compost center:	9.672.074 €
Power plant:	36.354.297 €

All described figures above are datas from one of the operational plant in Celje, Slovenia EU.

For the project to start properly in Port Harcourt, Rivers State, Nigeria, Feasibility study is needed to be done by Etra d.o.o. technical officials for the new plant, to determine the capacity suitable for your region.

Conclusion

- main technological elements of every waste management concept are waste pretreatment (MBT/BMT, MBS, MTT) and WtE plant
- the decision for the technology has to be made on local analyses of waste, recycle materials, energy and power streams in the selected
- single technology can not fulfill all demands or directives!
- all waste treatment technologies have an environmental impact
- waste treatment plans have to be designed, build and operated according to the Nigeria and local standard and legislation
- for the efficient operation of the technology secured input/output streams have to be agreed
- the technological processes have to be fully automated
- technology has to assure low labor and maintenance cost
- utilize only verified and reliable technology

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