



The way of waste handling



Recycling



PRIORITY
of energetical use
of waste – WTEP
Malešice



Waste disposal



The system of waste collection

Mixed waste



Sorted waste



Hazardous waste



Paper

Plastic

Glass

Drink cartons

Bio waste

Gastro waste

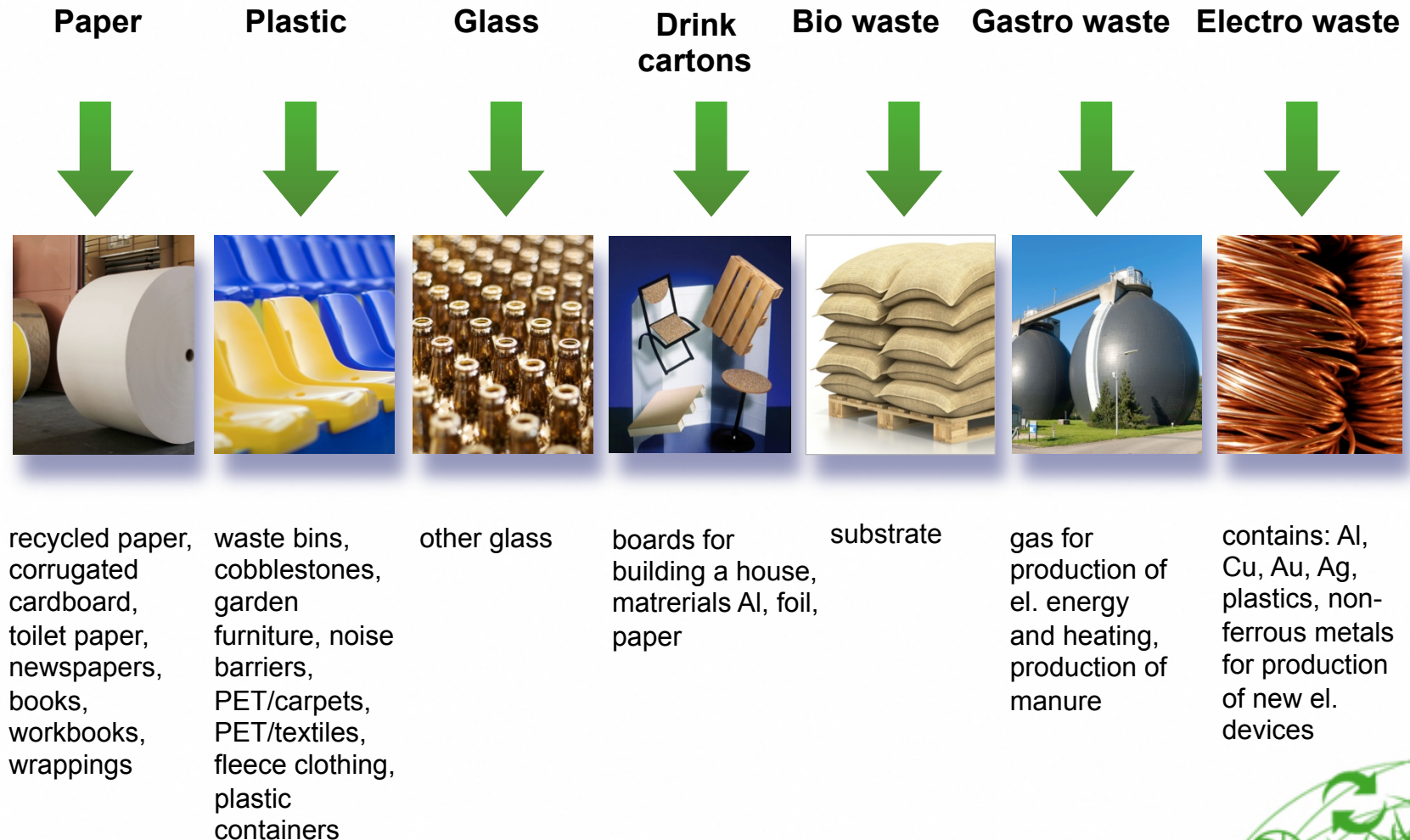
Electro waste

2/3 of the inhabitants of the Czech Republic have been sorting waste and have about **213 thousand** containers for sorted waste in an average distance of **106 m** from their home. Residents of the capital Prague have about **17 thousand** containers for sorted waste and on average they sort **41,5 kg** of waste per year each (paper, glass, plastic, drink cartons).



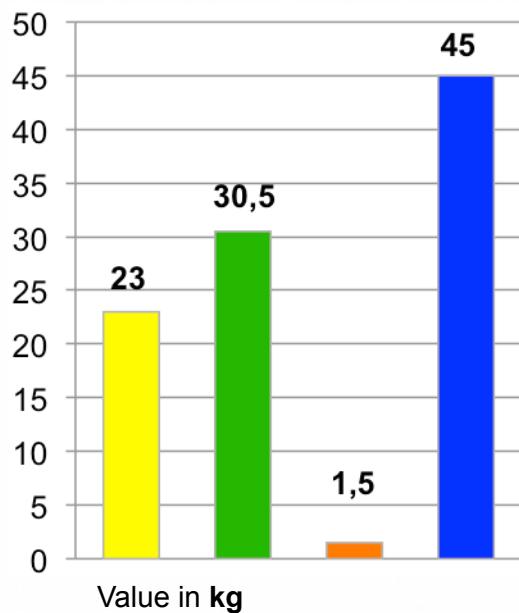
Recycling

Further usage of commonly used products

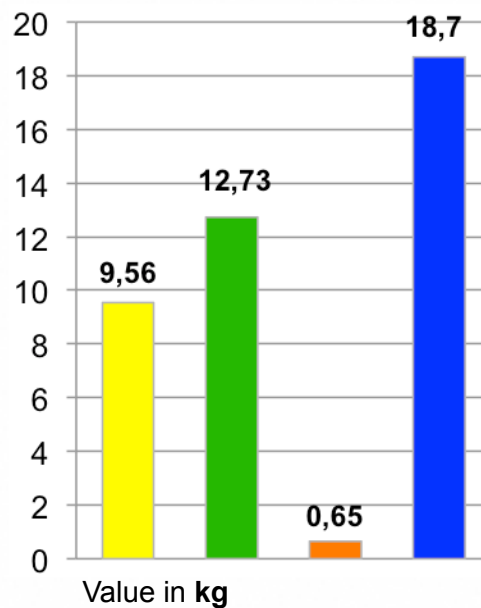


The way of communal waste in the Czech Republic

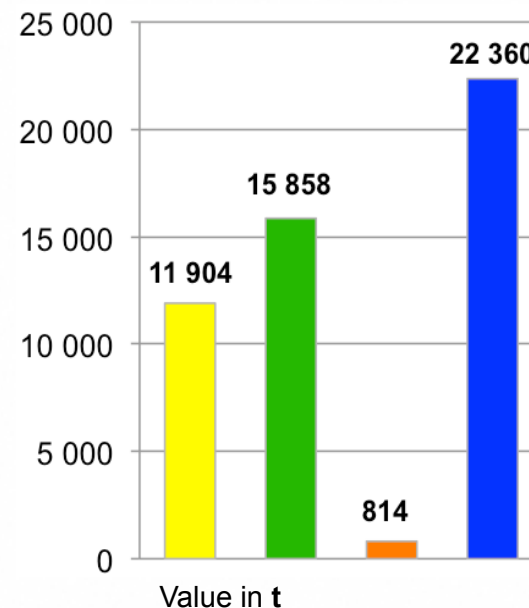
Average values of sorted waste in Czech households for year 2012



Average values of sorted waste per person in Prague for year 2012



Total amount of sorted waste in Prague for year 2012



■ PLASTIC ■ GLASS ■ DRINK CARTONS ■ PAPER

Source: ČSU (Czech office for statistics)



Sorted waste - paper

Sorting of waste is a collection and operations of single kinds of waste separated from each other. That means properly sorted communal waste according to its material substance which can be later recycled and once again integrated to the production. Collection of waste is operated by means of special containers that are properly marked with signs indicating specific scrap materials.

Pražské služby, a.s. focuses on paper from the segment of sorted waste because it owns 2 paper sorting centres and has a long-time experience in this field (paper sorting has been in operation since 1998).



Sorted waste – the way of paper



About **36 000 t** of sorted and collected waste for the year 2012 in Prague



There are **8 850** collections and operations per year in Prague.



- 1. line** – Pod Šancemi - operating since 2000
 - processes **25 000** tn/year, 38 employees
- 2. line** – Chrášťany – operating since 2008,
 - processes **25 000** t/year, 38 employees



PS sells paper to purchasers in the Czech Republic and neighbouring countries: A, DE, SK.



Pražské služby saves by recycling paper **612 thousand** high-grown trees, that is about **815 ha** of a forest.



Waste to Energy Plant Malešice (WTEP)

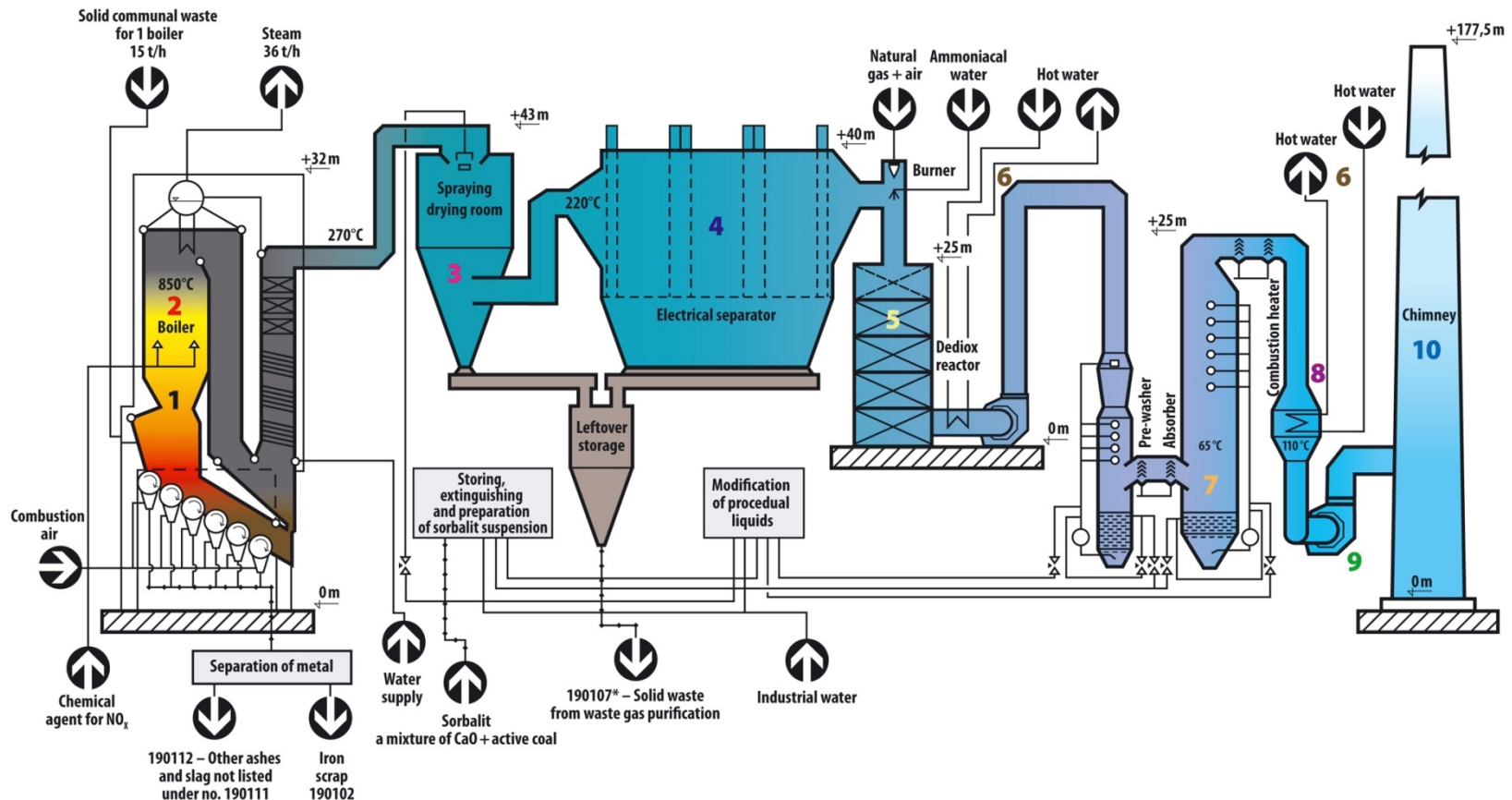


Topics

- Legislative conditions for WTEP
 - 17. BImSchV was driving force for WTEP conditions on the european level
 - Regulations 75/442/EEC, 1999/31/EC and 2000/76/EC for EU
- MSW is a renewable energy source with permanent availability
 - Every EU citizen produces 350 kg MSW/a, i.e. 3,5 GJ energy hidden in waste
 - Recovered MSW could substitute 7% of heat and electricity demand
- Support of heat and electricity recovery from MSW
 - Bonuses for renewable energy – MSW contains over 50% „green carbon“
- There is no technology without environmental impact!
 - Question of „sustainable development“
 - Principle of „the smaller evil“ (landfilling vs. energy recovery)
- MSW is contributor to the energetic state self-sufficiency
 - Less dependence on foreign import of energy (gas, oil)
 - Politically and economically safe source (smart grids, smart cities)
- Barriers for MSW recovery
 - About 400 WTE plants in Europe, 3 in Czech Republic
 - Influence of „green“ activists on state policy - without their personal responsibility!
 - Lack of financial resources by government – occasion for private investors?!



Technological schema of WTEP Malešice



1. Incineration
2. SNCR DeNOx
3. Semi-dry absorption
4. ESP
5. SCR DeDiox/DeNOx
6. Heat recuperation
7. Wet flue gas washing
8. FG reheating
9. Flue gas fan
10. Chimney



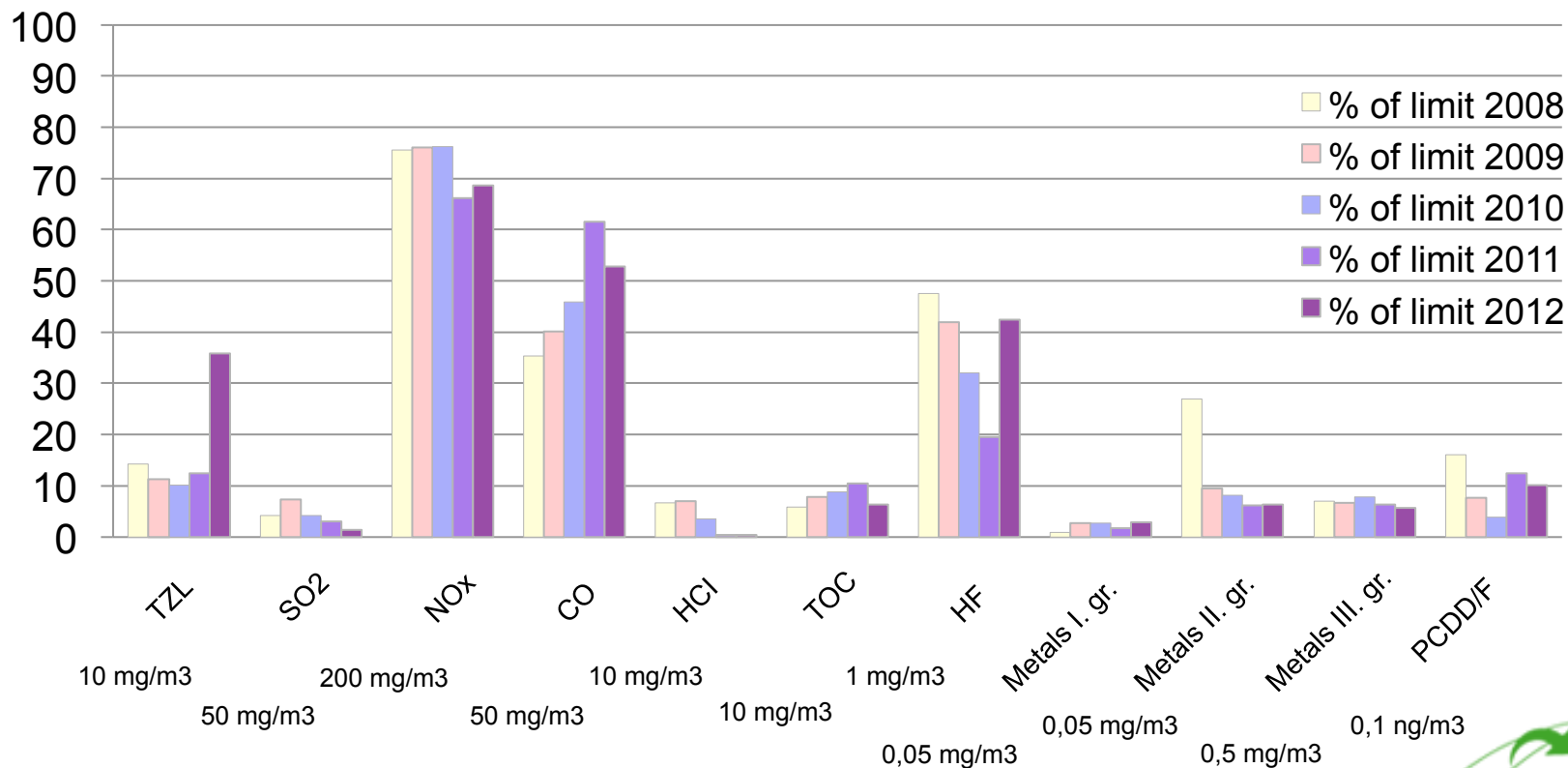
Material and energy balances



WTEP emissions 2008 - 2012

Average daily values compared with EU law 86/2002 (graphic)

% WTEP - percentage adherence to emission standards



Balances and benefits of WTEP Prague

- WTEP capacity of 300.000 t/a minimalizes waste disposal in Prague
- Incineration reduces the waste volume by 90%, the weight by 70%
- MSW contains more than 50% of organic carbon (renewable energy)
- Separated iron scrap usable as raw material for 30 km railway
- Inert slag (similar to basalt) usable to construct 18 km of road
- Electricity and heat from waste to 18.000 households
- Polutants are concentrated in less than 1% of origin MSW volume
- WTEP generates energy with less emissions than coal power plants
- 8/11 of controlled emissions are bellow 10% of limits
- 3/11 of controlled emissions are in average lower than half of limits
- Depreciation and operation costs amount to 70 % of expenditures
- Depreciation and operation cost are „connected vessels“
- Gate fee for waste is the main part of take (75%)
- Operating WTEP with positive economical balance (5% of turn over)
- No external demand of electricity from public net
- Clean technology due to very strict legislative requirements

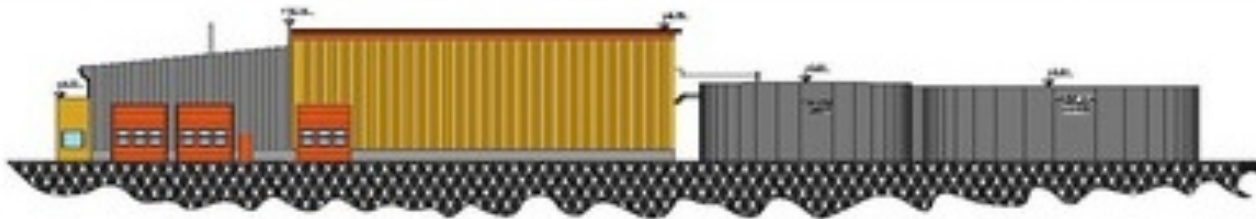


Bioreaktor planned project of Pražské služby

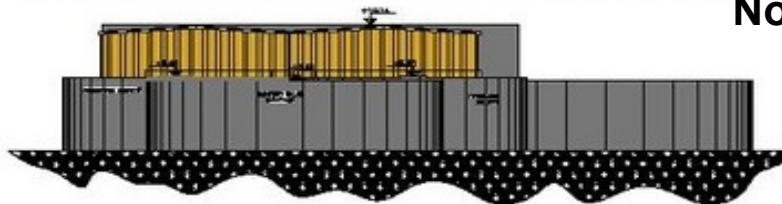
Instalation of a special device for processing food leftovers, expired goods and urban green

- Target capacity of drafted device is **14 - 16 thousand** tons/year of biologically decomposable communal waste (BRKO).
- There is **2,9 GWh** of electric current produced from biogas (coverage of consumption of about 1000 households). Further there is produced **4,2 GWh** of heating – that will be used for own consumption. Another final product is a quality substrate.

Eastern view



Northern view



One of the essential principles of ecology: Ecosystem which cannot balance its waste is sentenced to change – or extinction.

Man, is the only organism on the planet Earth, who is consistently and systematically creating waste when satisfying his needs. Several tens of thousand kinds of waste are strongly toxic or radioactive. With its quality and amount, waste became a new synthetic component of the environment - beside the air, water, soil, rock, plants and animal beings.

The amount of waste on the planet is still growing exponentially.

All this we could describe as a human waste cynicism. It is very short-sighted, do we want our own environment to be convicted to extinction?

The basic strategy of handling waste is expressed with 3 R concept: Reduce (prevent creation), Reuse, Recycle. The worst way of handling waste is waste disposal: it takes the space which we need for the nature and for ourselves, and it considerable burden for future generations.

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