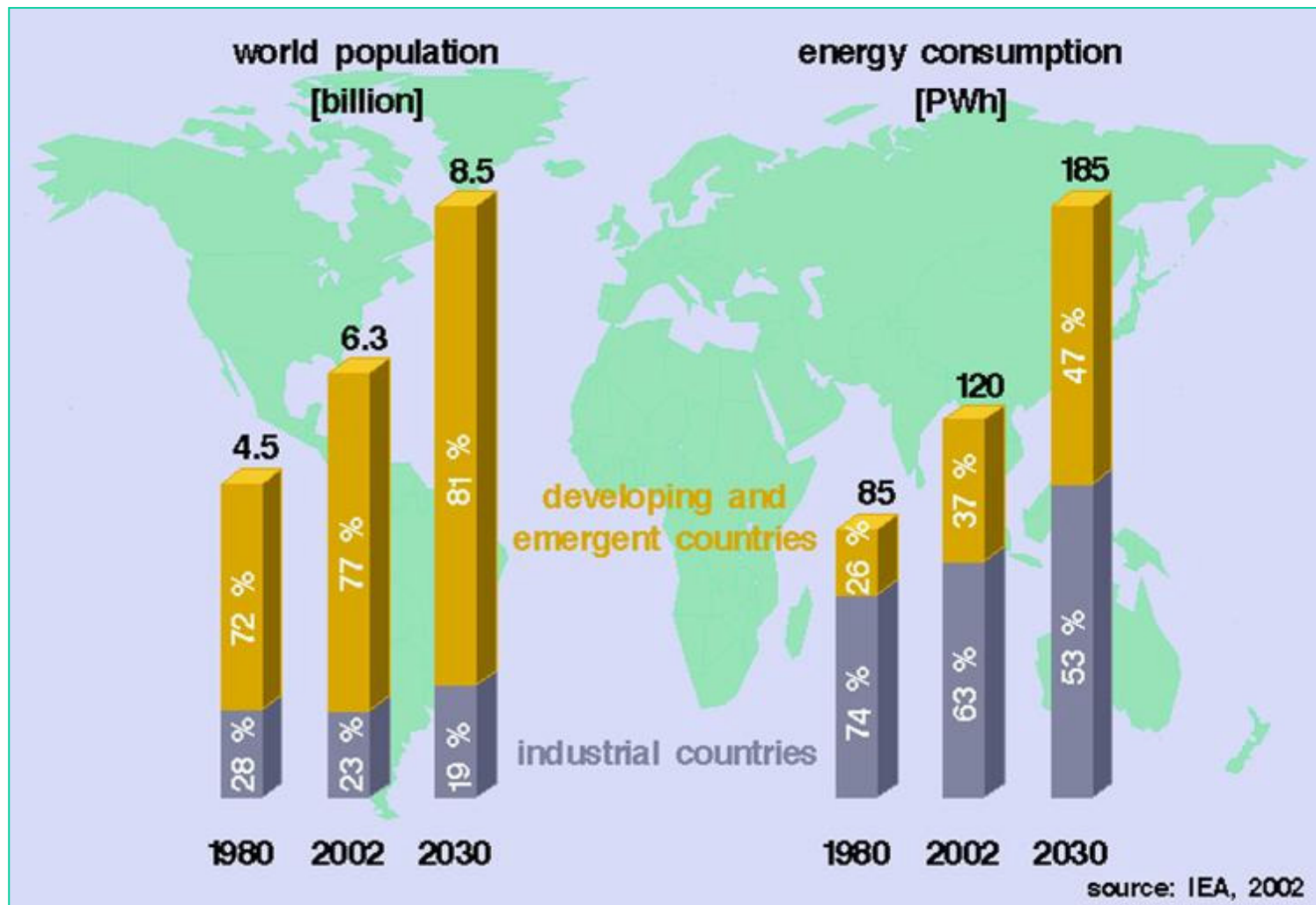


METHODS OF WASTE INCINERATION

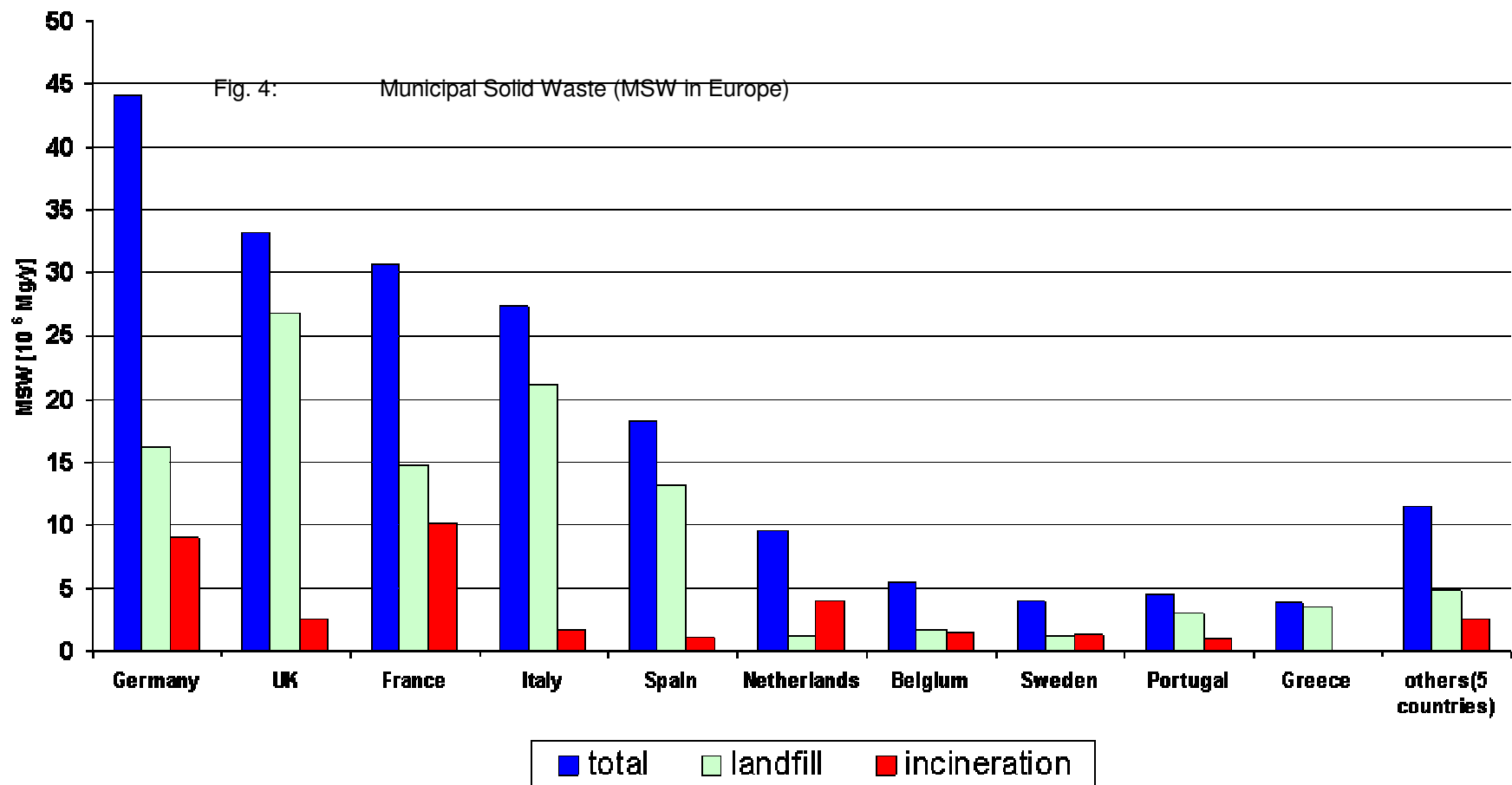
TARGETS OF WASTE INCINERATION

- I. Reduction of landfill requirement.**
- II. Recovering the energy in waste material.**
- III. Neutralisation of harmful compounds of waste.**

WORLD POPULATION AND ENERGY CONSUMPTION



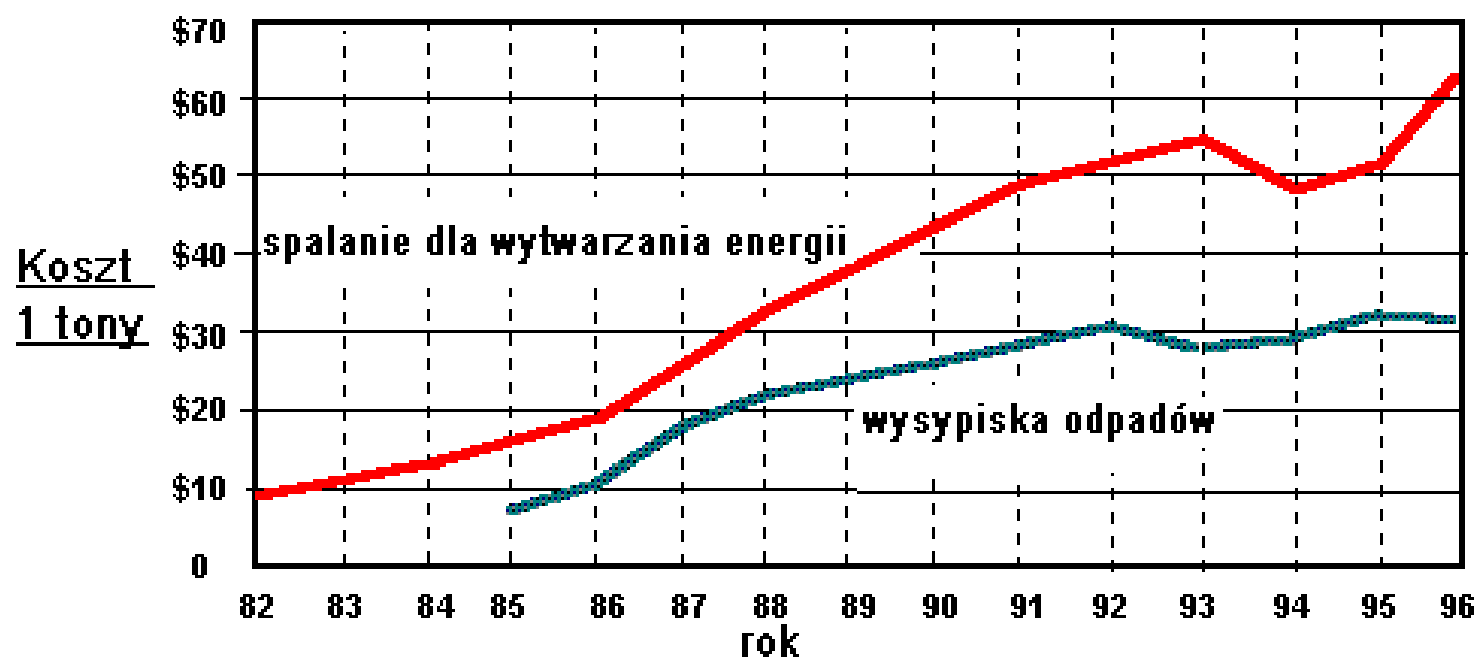
WASTE COMBUSTION AND LANDFILL IN EUROPE



Source: OECD, 2002

WASTE COMBUSTION AND LANDFILL IN USA

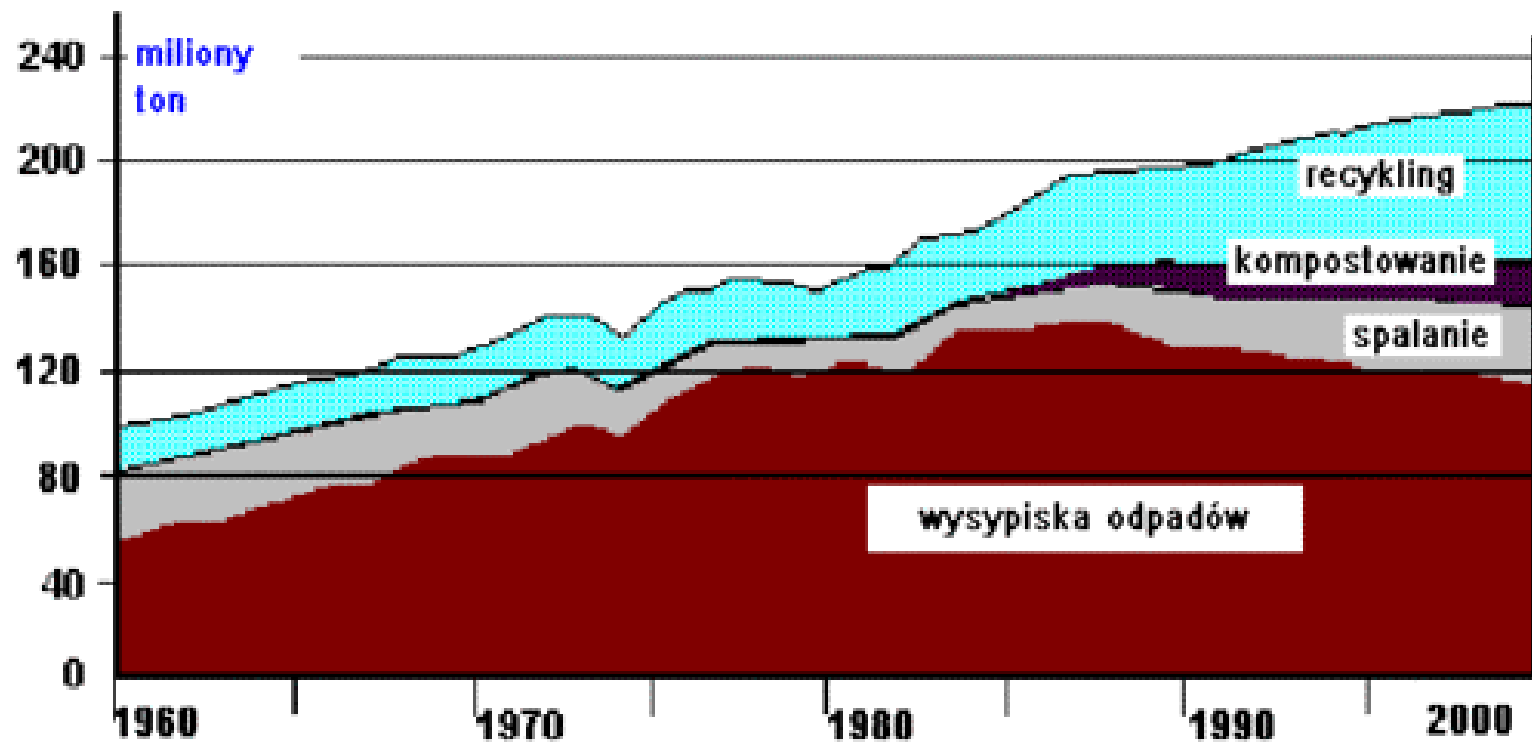
Średnie opłaty za utylizację odpadów w USA



źródło: BioCycle Magazine, Resource Recovery Yearbook, Waste Age Magazine

TENDENCIES IN WASTE MANAGEMENT

Tendencje w Wytwarzaniu Odpadów, Recyklingu i Neutralizacji w USA



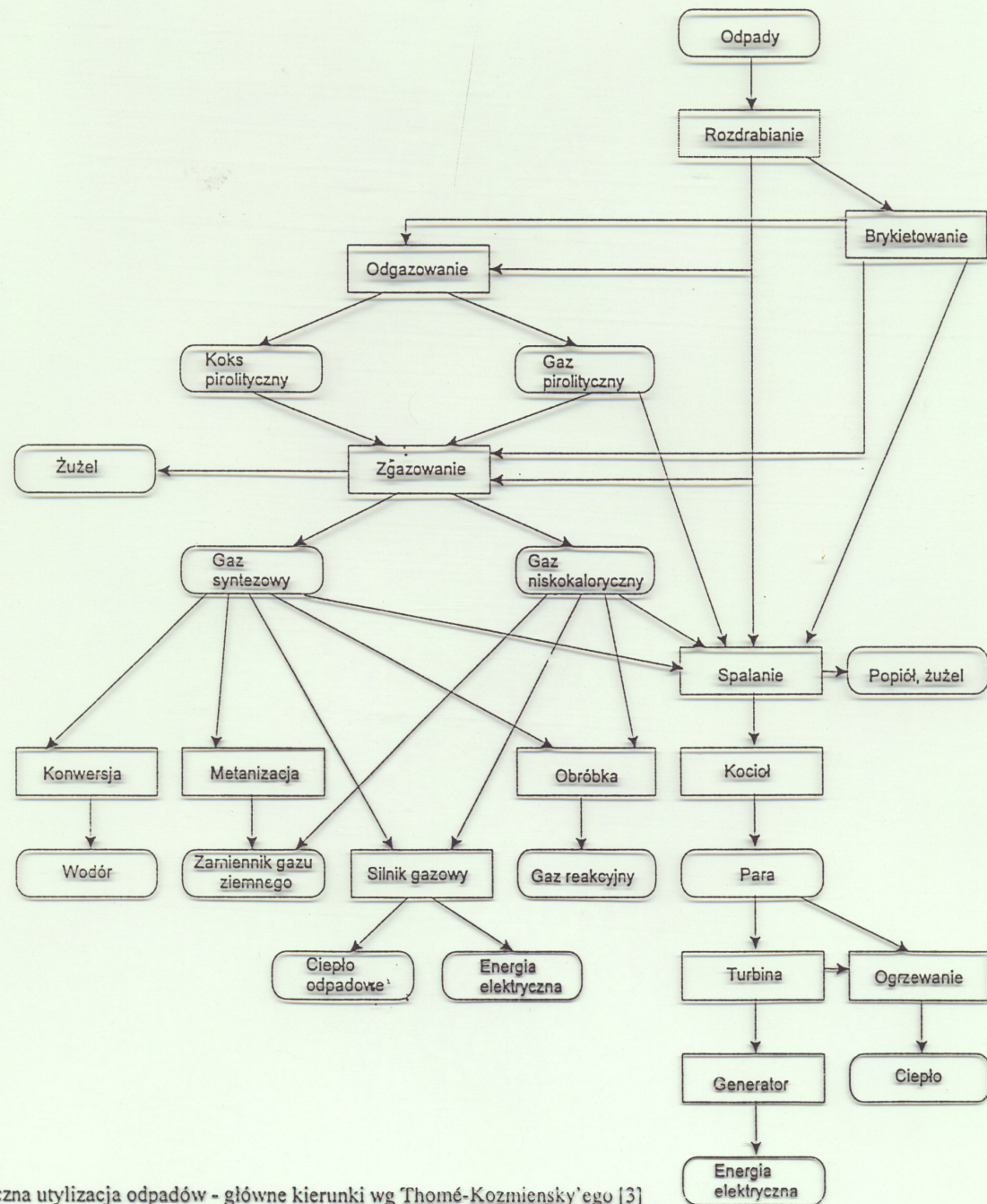
WASTE INCINERATION TECHNOLOGIES

**Basic methods of thermal incineration of
wastes:**

- I. COMBUSTION**
- II. PYROLYSIS**
- III. GASIFICATION**

**Other methods of thermal incineration of wastes:
plasma decomposition of wastes (vitrification),
incineration,
detonation.**

SCHEME OF THERMAL UTILIZATION OF WASTE



Termiczna utylizacja odpadów - główne kierunki wg Thomé-Kozmiensky'ego [3]

ADVANTAGES OF WASTE COMBUSTION

In comparison to pyrolysis and gasification combustion has three good points:

- A. Cost of waste incineration is lower (10 times).
- B. Capacity of waste incineration is greater (10 times).
- C. More efficient waste energy utilization.

DISADVANTAGES OF WASTE COMBUSTION

- **emission of pollutants typical for fossil fuels combustion (CO_2 , CO , NO_x , SO_2 , dust),**
- **considerable emission of harmful pollutants (heavy metals, PAH, PCDD/PCDFs, PCBs)**
- **fly ash and bottom ash from waste burning plants is a key problem; they are considered dangerous pollutants,**
- **control of waste combustion is not easy because wastes are „difficult” fuels.**

WASTE COMBUSTION TECHNOLOGIES

- 1. MASS BURNING SYSTEMS**
- 2. COFIRNG OF WASTE WITH COAL**
- 3. BURNING OF PRODUCTS OF WASTE
PYROLYSIS AND GASIFICATION.**

ADVANTAGES OF WASTE PYROLYSIS

Better control and optimisation of pyrolysis process:

- conditions of thermal decomposition (temperature and pressure),
- conditions of pyrolysis products burning,
- conditions of pyrolysis products conversion,
- pollutant emissions (gaseous and dust).

DISADVANTAGES OF WASTE PYROLYSIS

The waste incineration installations based on pyrolysis process has several disadvantages in comparison to the combustion processes: :

- less capacity,
- less efficiency,
- more sophisticated,
- more expensive.

APPLICATIONS OF PYROLYSIS-BASED WASTE INCINERATION TECHNOLOGIES

1. INCINERATION OF HAZARD WASTES
2. PRIMARY STAGE OF WASTE INCINERATION IN SOME TECHNOLOGIES (DUOTHERM).

ADVANTAGES OF WASTE GASIFICATION

1. CONVERSION OF WASTE INTO VALUABLE PRODUCTS.
2. POSSIBILITY OF SYNGAS PRODUCTION (H_2 AND CO).
3. SAFE LANDFILL OF ASHES.

DISADVANTAGES OF WASTE GASIFICATION

Similar like for pyrolysis:

- very sophisticated,
- small capacity,
- very expensive.