

4 CONGRESO
NACIONAL
DE DEMOLICIÓN
Y RECICLAJE



15 INTERFORUM
RECYCLING
DE LA F.I.R.



4 Congreso Nacional de Demolición y Reciclaje 15 Interforum Recycling de la F.I.R.

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Competitivity of recycled aggregates

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Overall view

1. Special and distinguishing marks of recycled aggregates
2. Factors determining the competitiveness of recycled aggregates
3. Amount and fractions of construction and demolition waste (cd-waste)
4. Prices of primary and artificial aggregates
5. Stationary versus mobile recycling-plants
6. Summary and conclusions

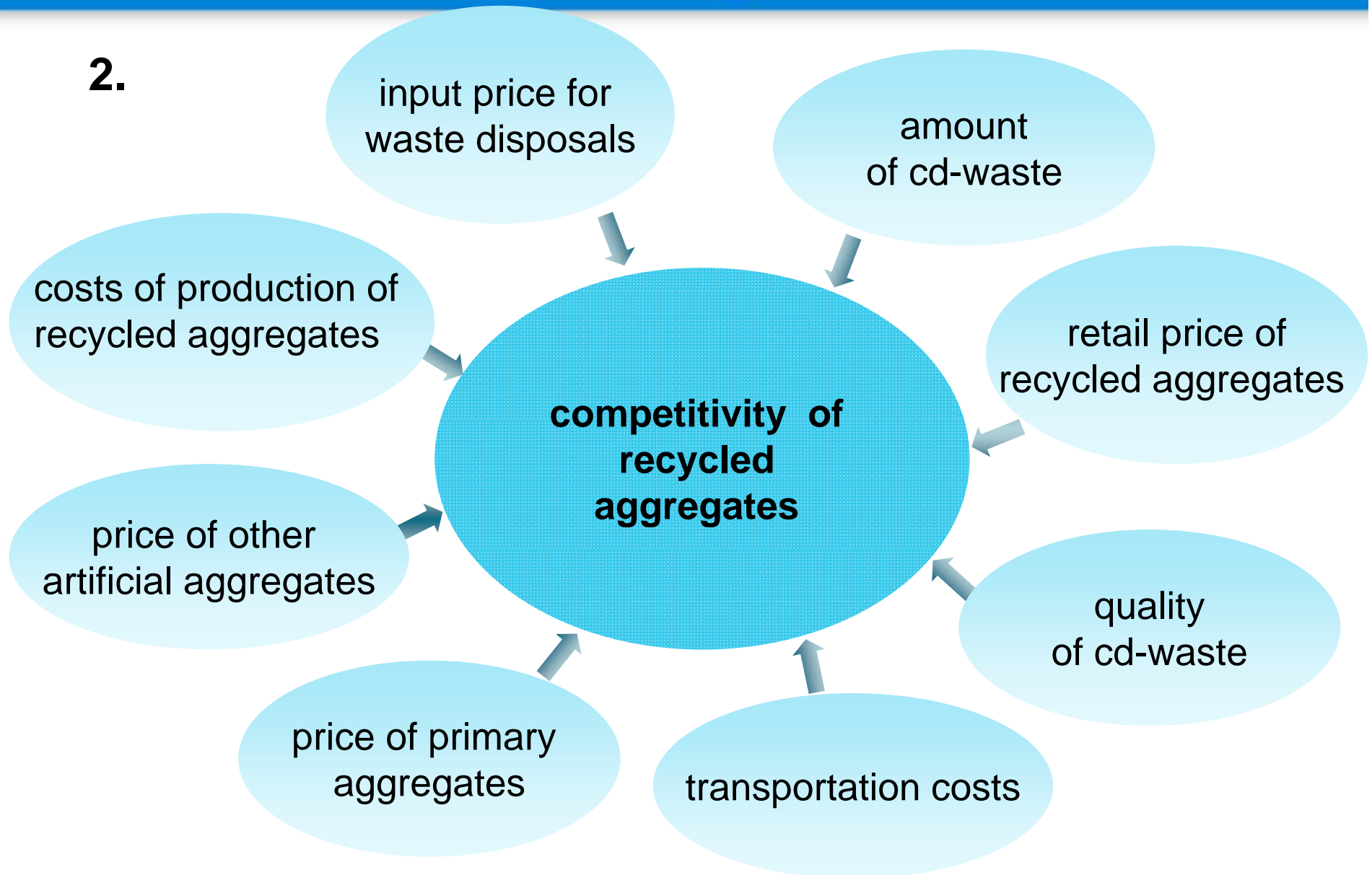


1. Special and distinguishing marks of recycled aggregates

- supply of raw material depends on amount of regional cd-waste
- raw materials have a negative price
- no influence on quality of raw materials
- high impact of environmental regulations according air, soil and ground water



2.

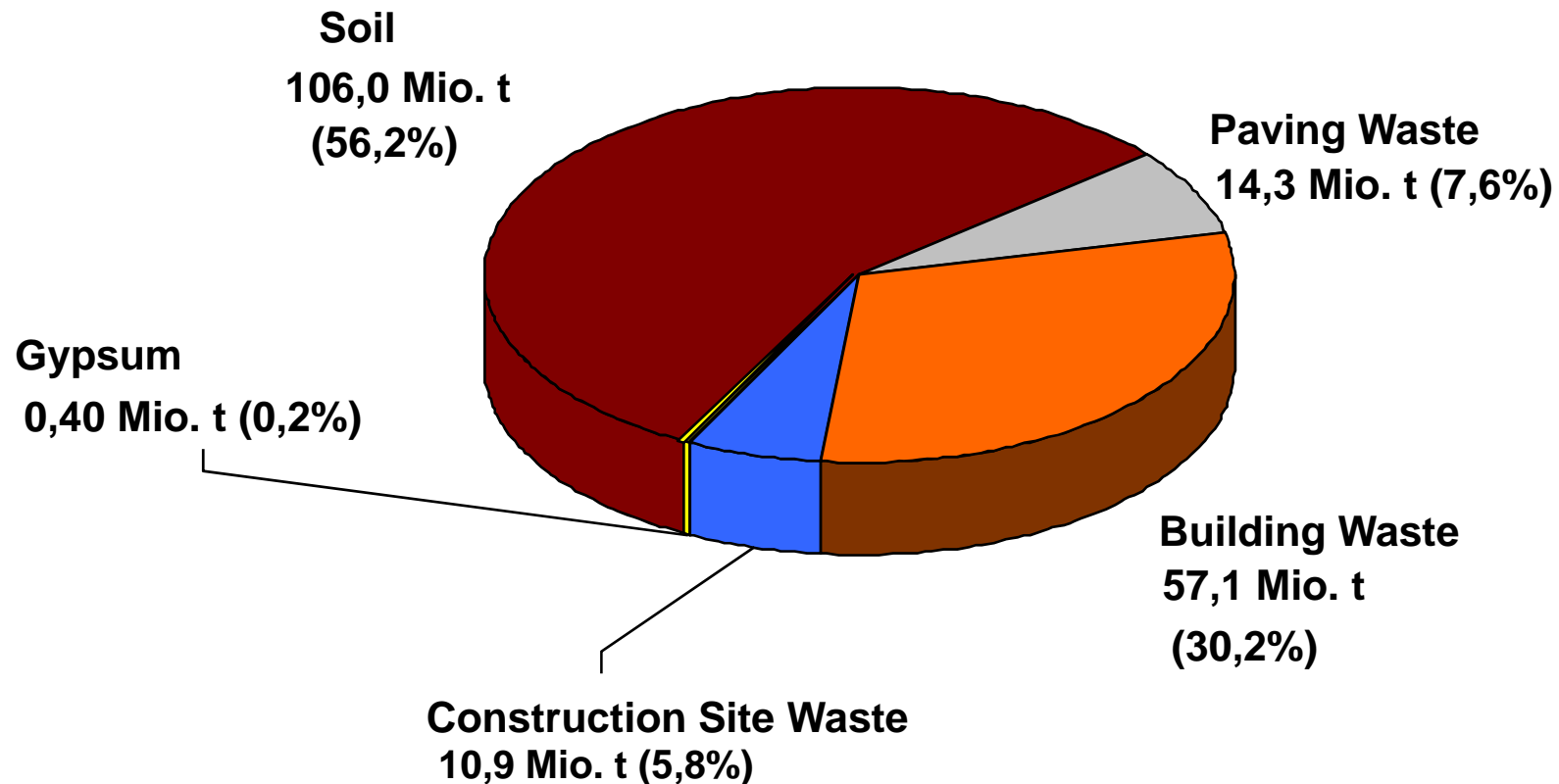




3.1. Amount of construction and demolition waste (Germany 2006)

(6th Monitoring Report, Consortium for recycling management in the construction sector)

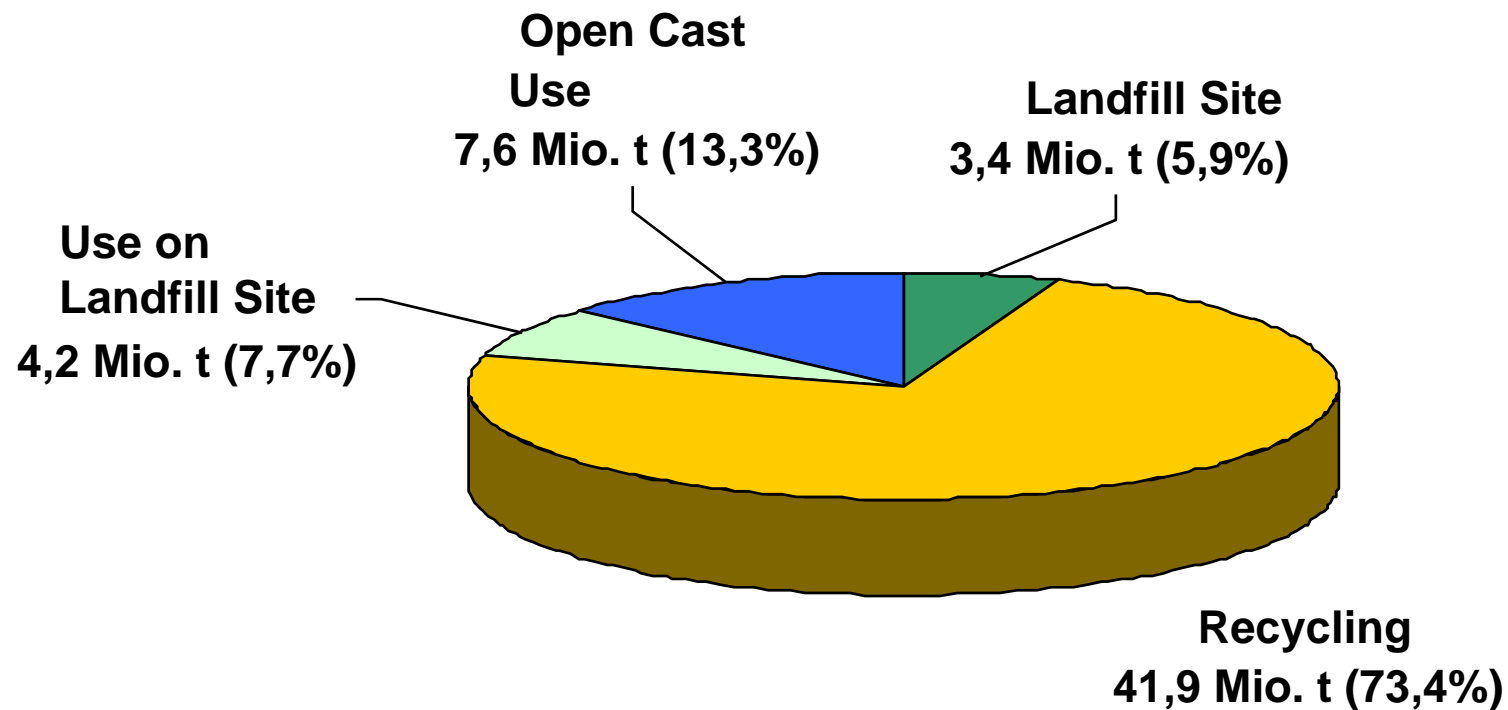
188,70 Mio. t (100 %)





3.2. Recycling and disposal of building waste (2006)

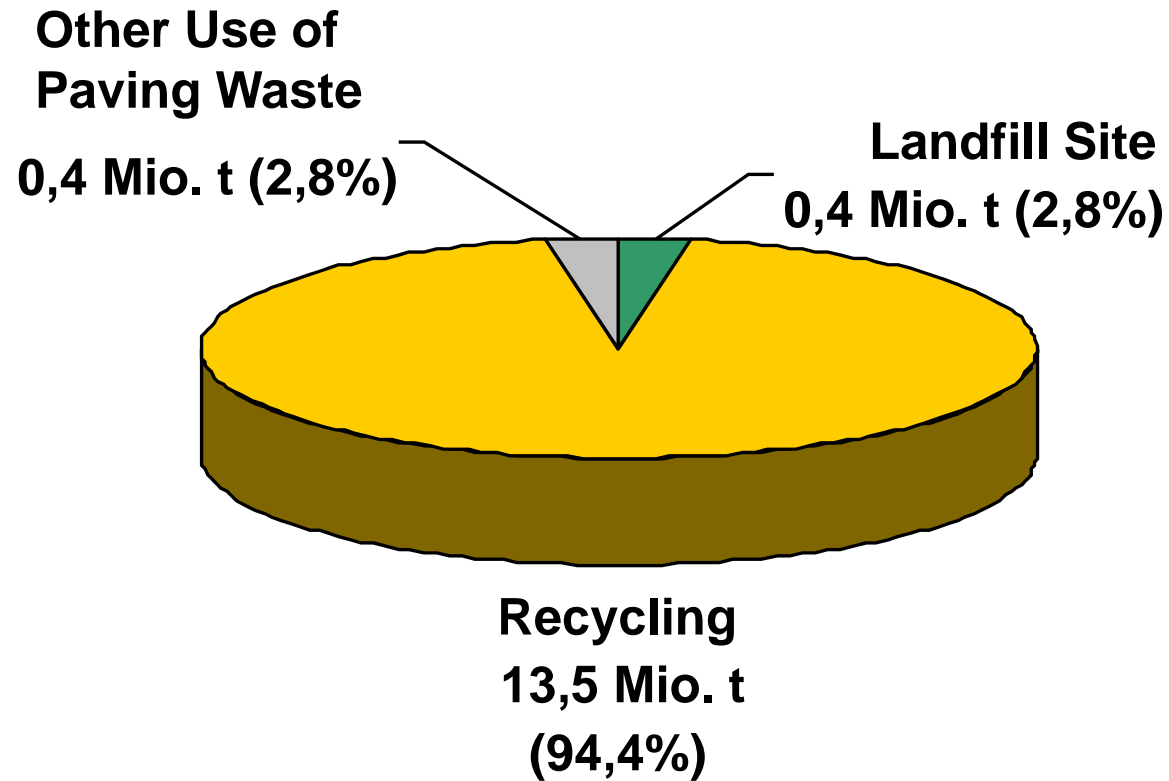
57,1 Mio. t (100%)





3.3. Disposal and recycling of paving waste (2006)

14,3 Mio. t (100%)

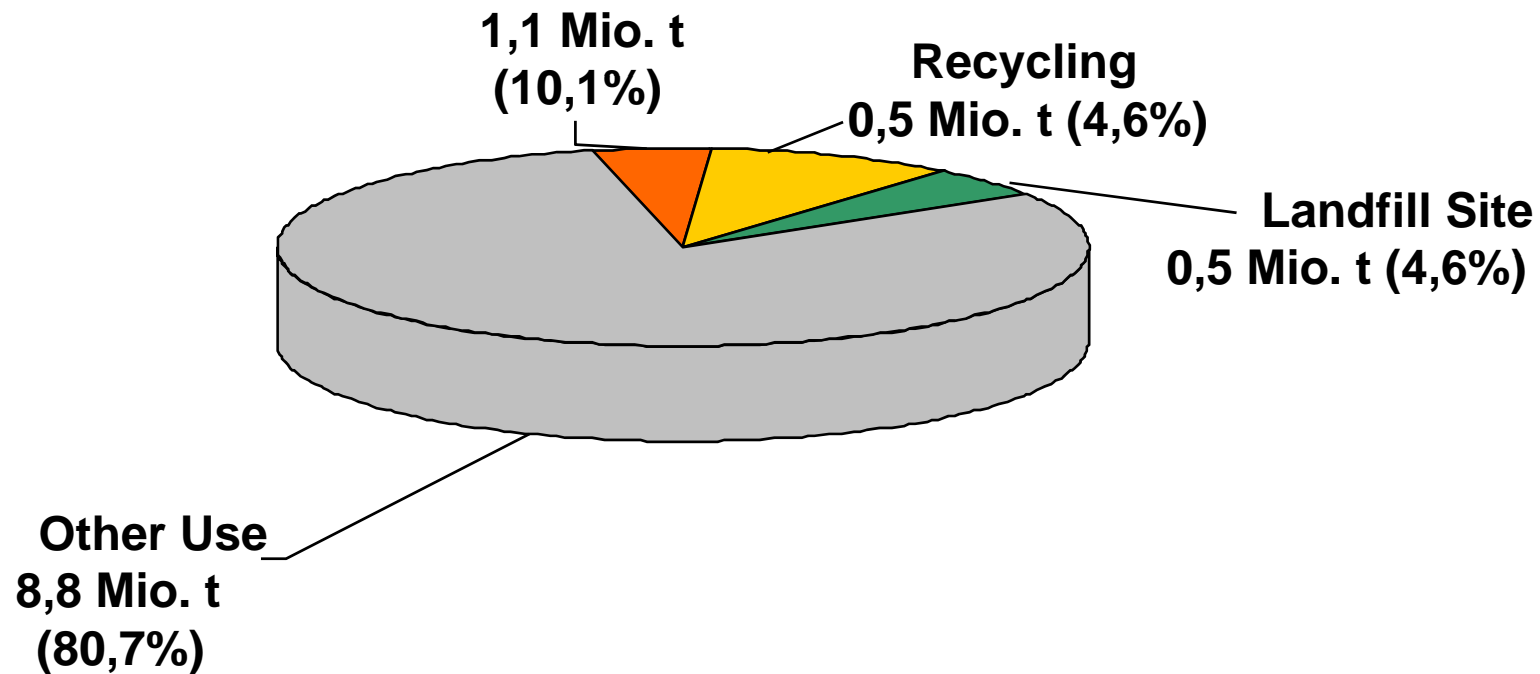




3.4. Recycling and disposal of construction site waste (2006)

10,9 Mio. t (100%)

Energetic Use





3.5. Quality of recycled aggregates

criteria for technical use (incomplete)

- unit weight
- resistance to freezing
- grading curve
- proctor density
- content of fines
- bulk density

criteria for environmental protection (incomplete)

- vanadium
- sulphate
- ph-value
- PAK



4.1. Input prices for cd-waste disposal into recycling plants

	NRW 2008
• building waste	4 – 8,00 €/t
• concrete	4 – 9,00 €/t
• paving waste	5 – 8,00 €/t
• autoclaved aerated concrete	12 – 18,00 €/t
• construction site waste	110 – 180,00 €/t



4.2. Prices of primary aggregates (ex works)

	NRW 2008
sand	4 – 5,00 €/t
unprepared gravel	4 – 5,00 €/t
gravel	6 – 8,00 €/t
lime stone	6 – 8,00 €/t
basalt	10,00 €/t



4.3. Retail prices of artificial aggregates (ex work)

	NRW 2008
blast furnace slag	5,00 €/t
foundry slag	- 8,00 – - 12,00 €/t
household waste ash	- 5,00 €/t



4.4. Retail prices for recycled aggregates in North Rhine-Westphalia (2008)

products	price
screening materials 0 – 45 mm	1 – 2,50 €/t
screened sand	0 – 0,50 €/t
oversize particles (> 50 mm)	2 – 3,00 €/t



5.1. Stationary versus mobile plants

stationary plants

- guaranteed quality of products (third party control)
- high output results in cost-degression
- better health and safety
- more store room
- input from small sites
- no costs of transposition

mobile plants

- lower investment
- lower transport costs for the site
- reuse of material at the place
- for bigger sites suitable
- more flexibility



5.2. Costs of production of recycled aggregates

variable costs

about 30 %

- electricity
- fuel / oil
- repair

fixed costs

about 70 %

- staff
- depreciation
- interest
- rent for leasehold property
- insurance
- overheads
- administrative expenses



6.1. Summary and conclusions

recycled aggregates promote a sustainable economy by

- saving natural resources
- reducing landfill sites
- reducing negative effects of transport (shorter ways)
- saving energy compared to primary materials



6.2. Summary and conclusions

we need:

- European legal framework for more acceptance of recycled aggregates by local deciders
- better control and punishment of illegal disposal
- fair competition with primary materials (public procurement)
- steering of our business according to regional supply and demand (avoiding surplus-capacities)
- selective demolition of ruins
- design of buildings fit for recycling

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