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An aerial photograph of a winding asphalt road through a dense green forest. The road curves in a figure-eight pattern. A white car is visible on the road. The surrounding area is lush with trees and some yellow flowers.

# HIGH-QUALITY ASPHALT RECYCLING

**Swedish Asphalt Days conference Malmö/Stockholm.  
23/24 November 2022**

*Martin Diekmann, Wirtgen GmbH*

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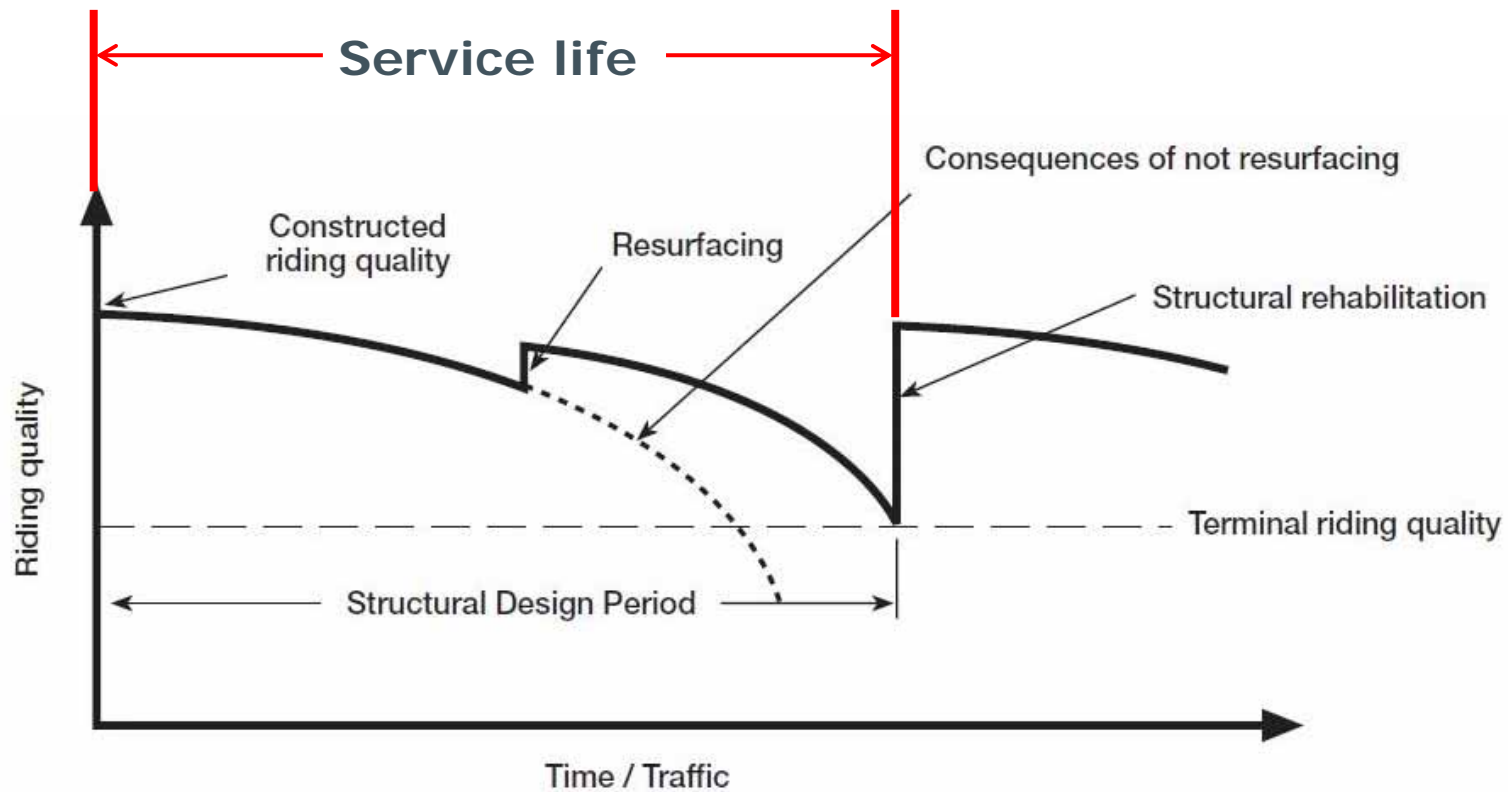
# CHALLENGES IN ROAD CONSTRUCTION

In General

# Challenges in road construction



# Challenges in road construction



2018/10/09

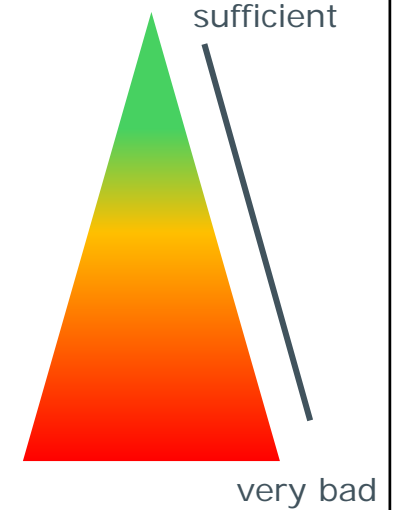
Advanced Cold Recycling : Part 2 – Traffic and Applied Loads

## Challenges in road construction



<b>Roads in Germany as a whole</b>	<b>~ 830.000 km</b>
Federal roads	51.033 km
State and state roads	86.924 km
County roads	91.826 km
other roads (estimated)	~ 600.000 km

Road condition report



## Challenges in road construction



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# THE CONVENTIONAL WAY

Hot Recycling

# Conventional Asphalt Recycling

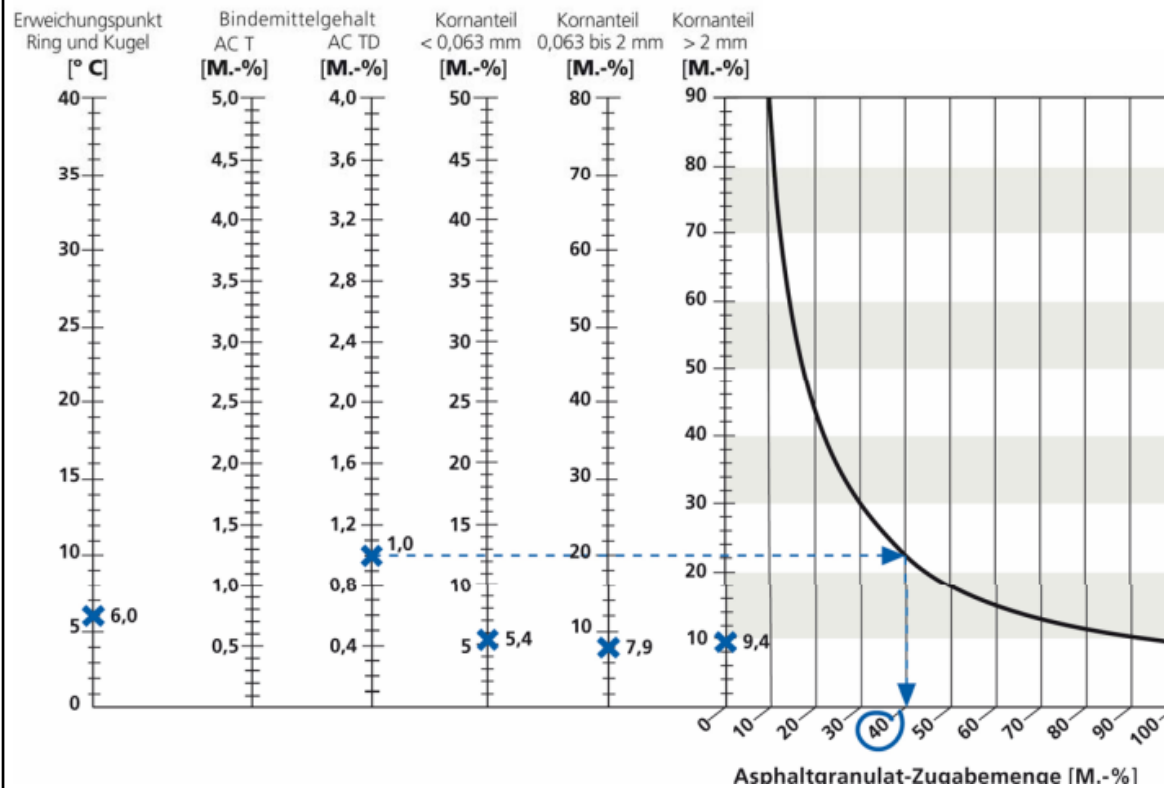




# Conventional Asphalt Recycling



Vorhandene Spannweite von Merkmalsgrößen des Asphaltgranulates



## Conventional asphalt recycling



### Technical requirements

- ▶ heated by the hot rock grains, when batches are added  
**(Direct addition to the mixer): 30M.-%**
- ▶ heated by the hot rock grains, with continuous addition  
**(Elevator addition): 40% M.-%**
- ▶ heated together with the rock grains  
**(Middle encore): 40 M.-%**
- ▶ heated in a separate device  
**(Parallel drum): 100 M.-%**
- ▶ **Higher addition rates** are possible with corresponding positive experiences.

## Conventional asphalt recycling



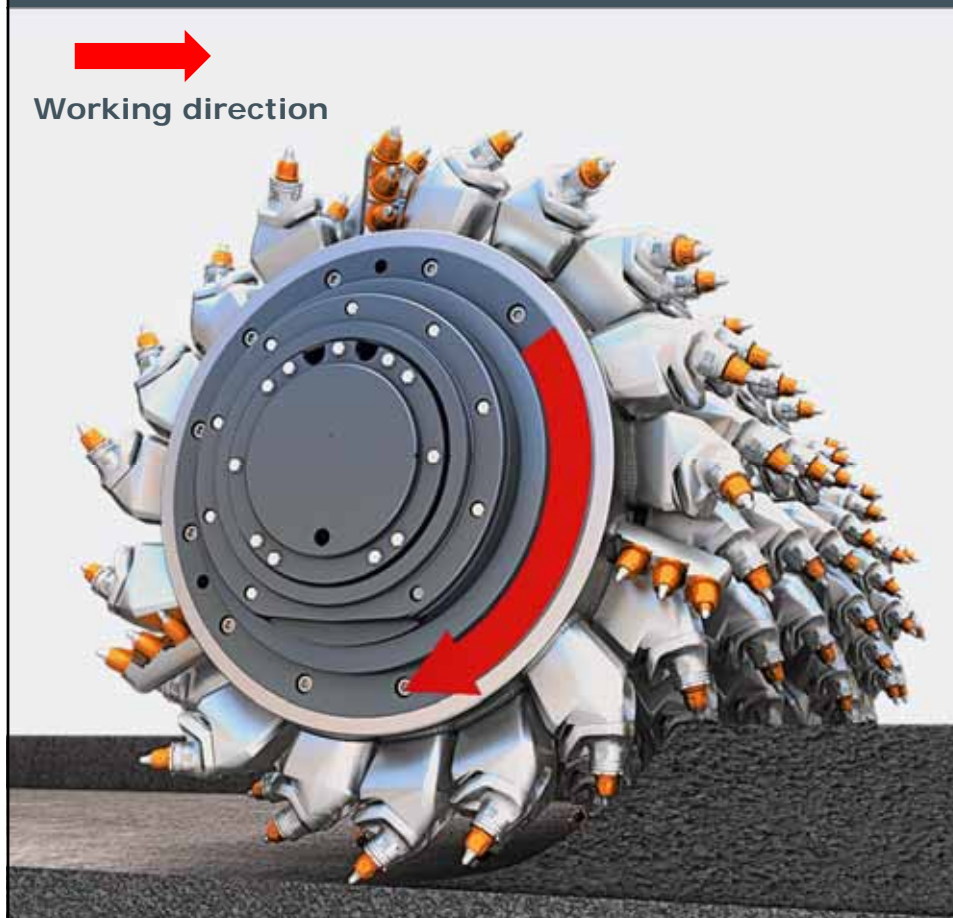
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# THE PRODUCTION SYSTEM

Cold-Recycling

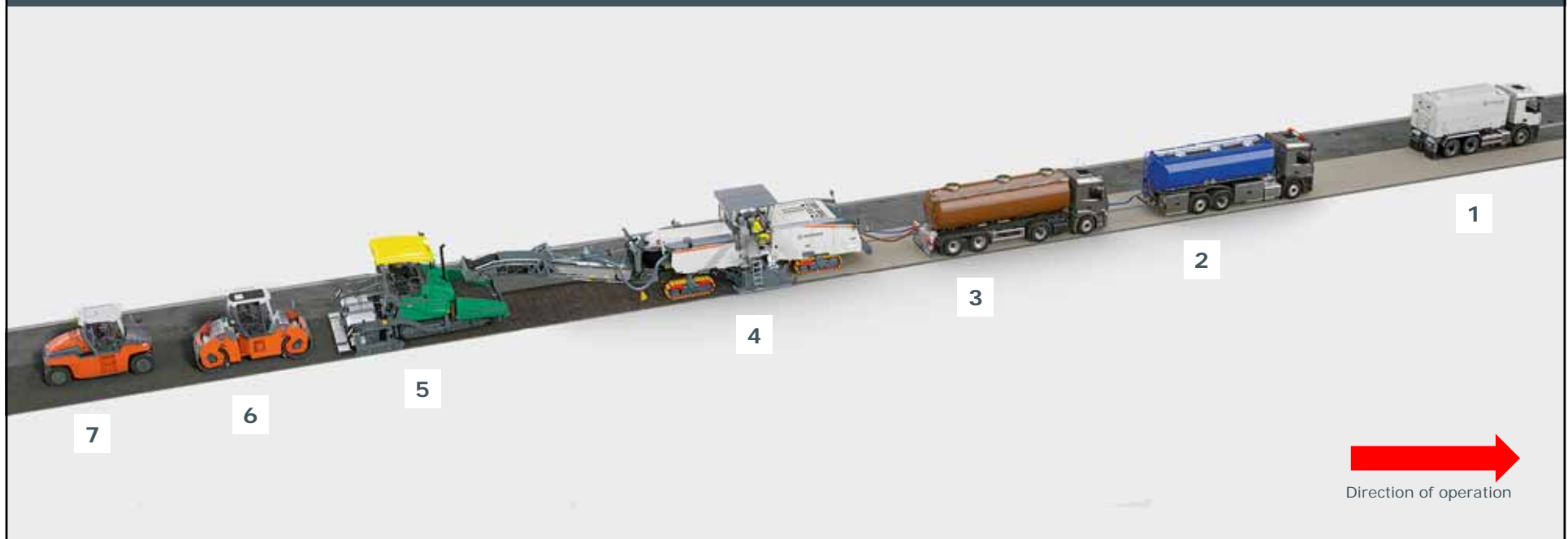
## Down-cut mode in "Rear Load" design



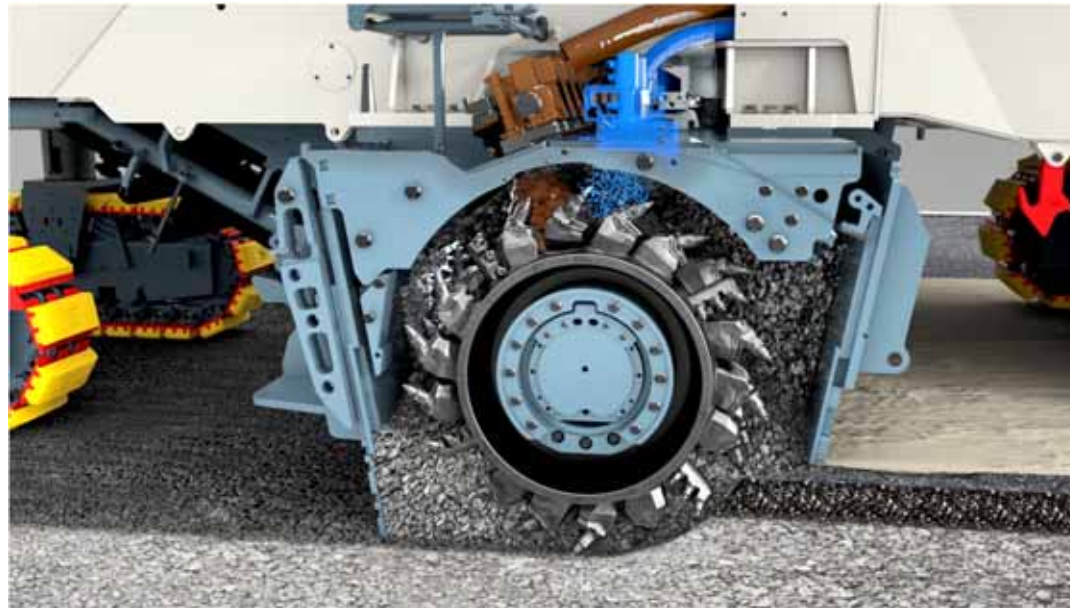
- ▶ In "Rear Load" design, the recycler uses the down-cut process developed by WIRTGEN in which the milling and mixing rotor operates in the direction of travel
- ▶ The process optimizes gradation control and prevents the material from breaking into larger chunks

# Cold recycling with integrated rear loading

Recycling train including the W 380 CR / W 380 CRi



- |   |  |   |                             |
|---|--|---|-----------------------------|
| 1 | STREUMASTER binder spreader                | 5 | VÖGELE asphalt paver        |
| 2 | Water tanker truck                         | 6 | HAMM tandem roller          |
| 3 | Binder tanker truck                        | 7 | HAMM pneumatic-tyred roller |
| 4 | WIRTGEN cold recycler W 380 CR / W 380 CRi |   |                             |



## W 240 CR – W 380 CRi with lateral premilling



Working width variable  
from 2,35m – > 3,80m

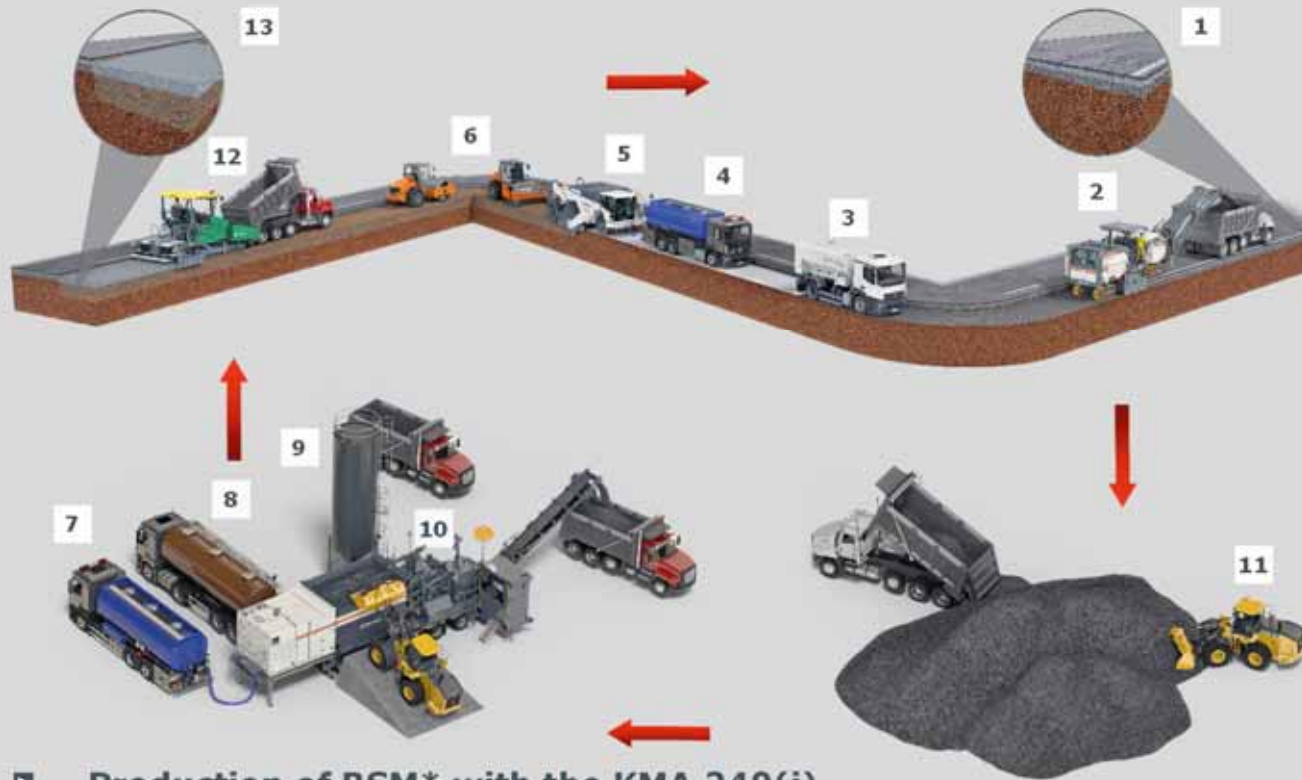
Full lane Recycling in  
just 2 passes.

Recycling depth up to  
30cm.

Performance up to  
600t/h.



# Cold In-Plant Recycling with Bitumen and Cement



- 1 Damaged asphalt surface
- 2 WIRTGEN cold milling machine
- 3 STREUMASTER binding agent spreader
- 4 Water tank truck
- 5 WIRTGEN WR 240(i) cold recycler
- 6 HAMM compactor
- 7 Water tank truck
- 8 Bitumen tank truck
- 9 Cement silo
- 10 WIRTGEN KMA 240(i) cold recycling mixing plant
- 11 JOHN DEERE wheel loader
- 12 VÖGELE paver
- 13 Recycled asphalt layer

▶ **Production of BSM\* with the KMA 240(i)**  
 \*BSM: asphalt milled material with foamed bitumen / emulsion



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# ADVANTAGES

Cold-Recycling

## Cold recycling - Advantages



**up to 100 %**  
less material disposal costs

**up to 90 %**  
less transport volume

**up to 90 %**  
less use of resources

**up to 60%**  
less CO<sub>2</sub> emission

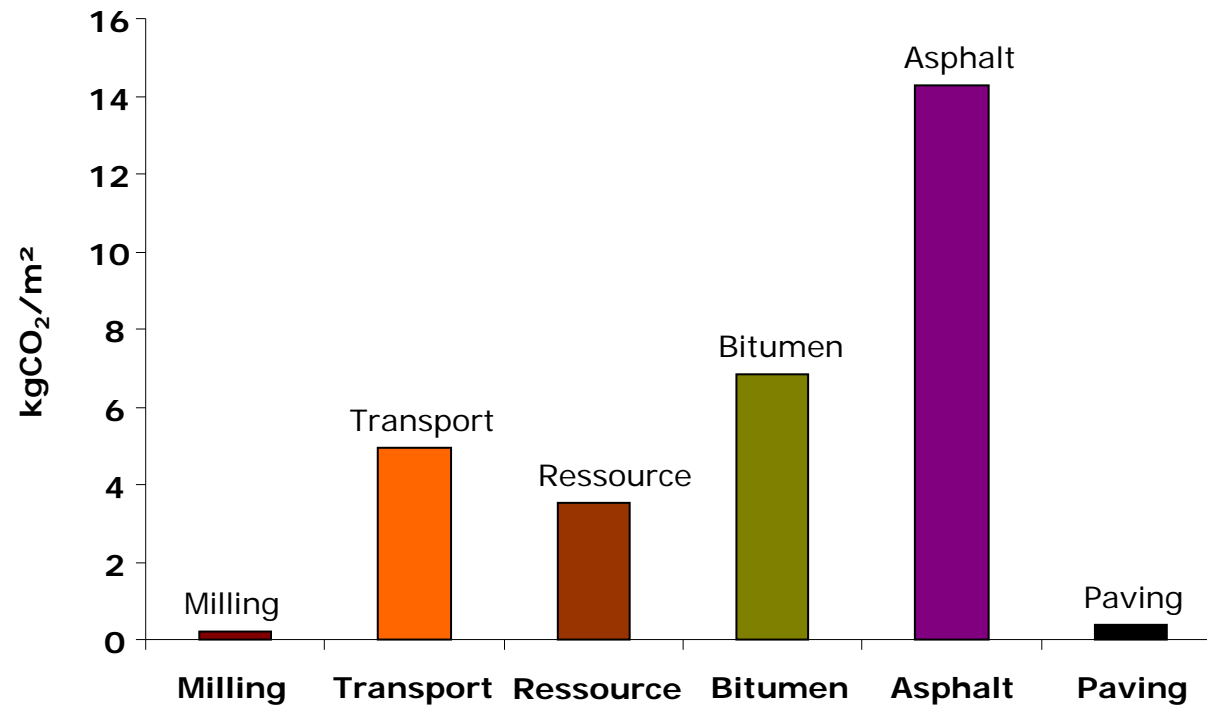
**up to 50 %**  
less use of binders

**up to 50 %**  
lower overall cost

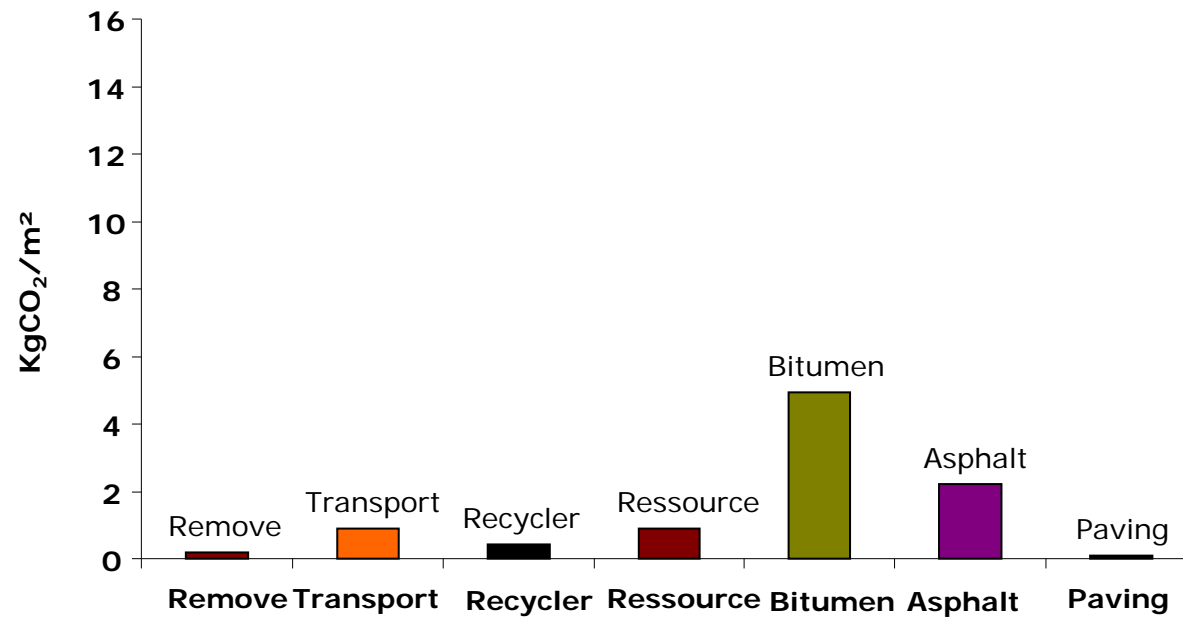
**up to 50 %**  
shorter construction time



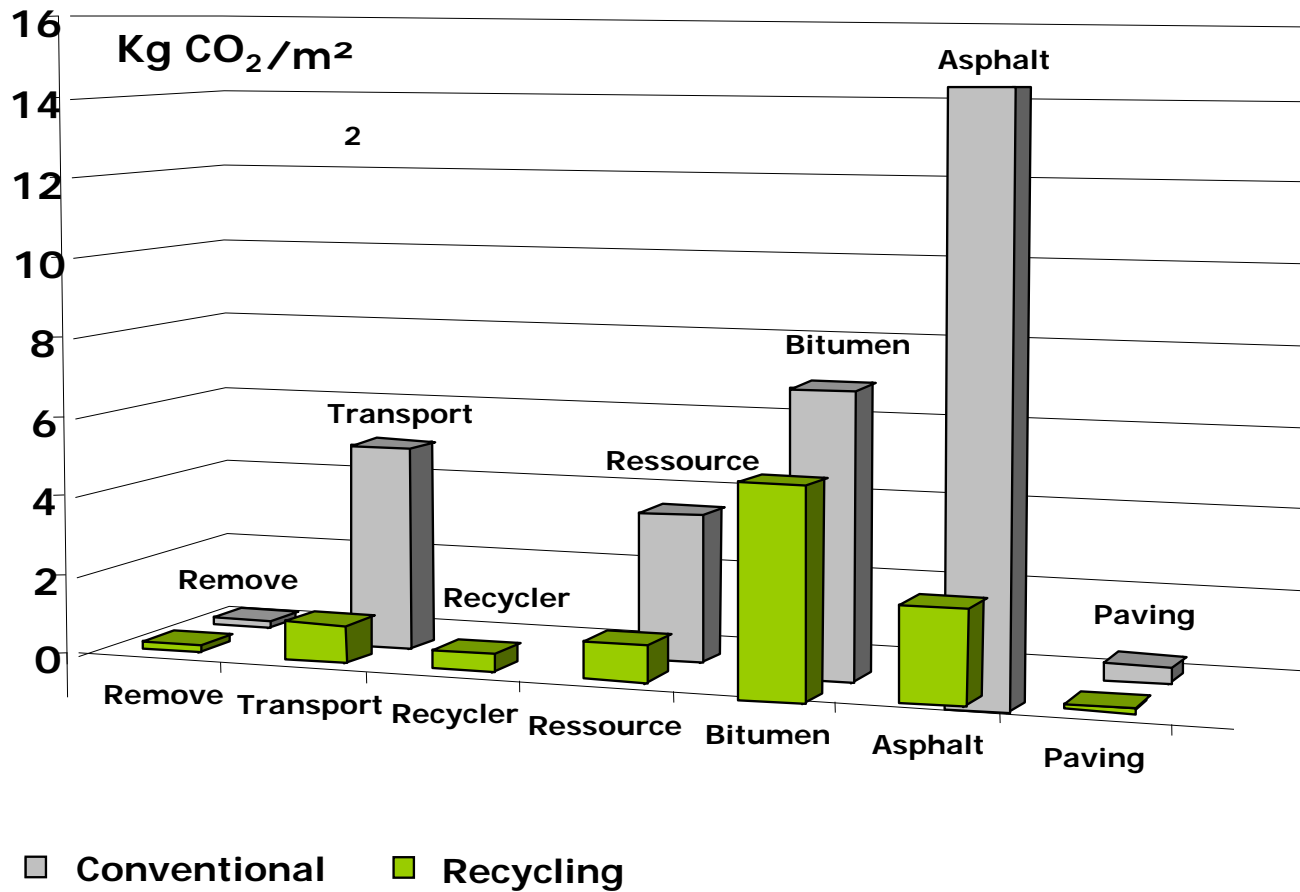
# CO<sub>2</sub> - Emissions from conventional renewal



# CO<sub>2</sub> - Emissions from Cold Recycling



# CO<sub>2</sub> - Balance Comparison of both methods



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# SAVINGS AT A GLANCE

Cold-Recycling

Savings at a glance per km



*Width 7,5m / Depth 0,15m*



## Savings at a glance per km

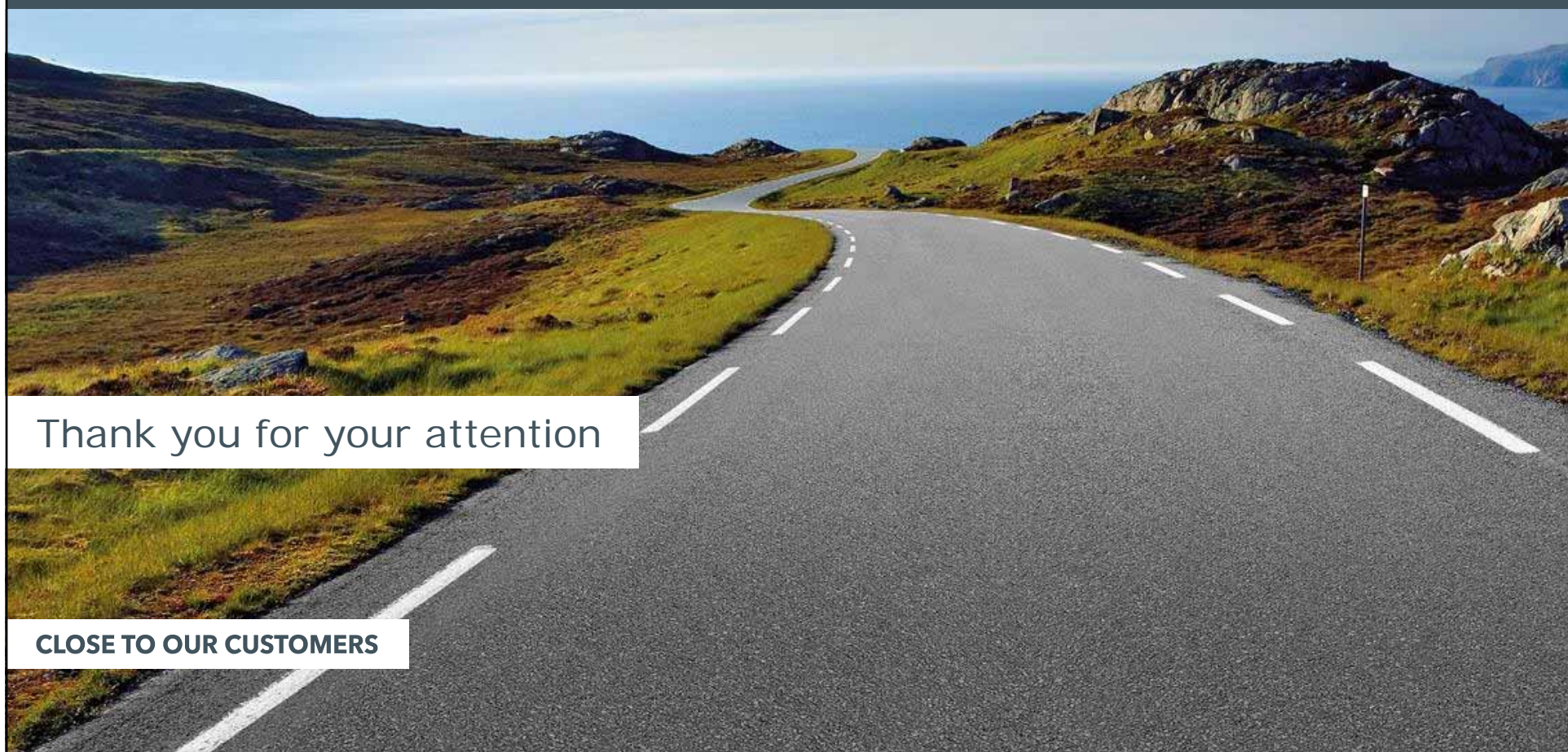


*Width 7,5m / depth 0,15m*

- |  |   |
|--|---|
| ▶ Save up to <b>90% resources</b>                | ▶ <b>2700 ton</b> (Virgin material)                     |
| ▶ Save up to <b>90% transport</b>                | ▶ <b>280 Truck Charges</b>                              |
| ▶ Save up to <b>100% Disposal costs</b>          | ▶ <b>2700 ton</b> (Disposal)                            |
| ▶ Save up to <b>60% CO<sub>2</sub> Emissions</b> | ▶ <b>7500 PKW</b> (Emissions) on 100km driving distance |

/km

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Thank you for your attention

**CLOSE TO OUR CUSTOMERS**