

ENERGY CONSUMPTION REDUCTION, RECYCLING, NOISE MITIGATION

SESSION 4 – SOCIAL RESPONSIBILITY, SUSTAINABILITY

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Social Responsibility in the Asphalt Industry

**Environmental
Impact**

**Sustainable
Practices**

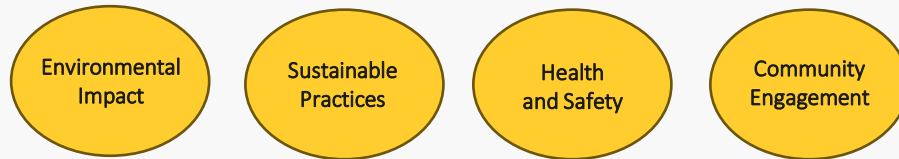
**Health and
Safety**

**Quality and
Performance**

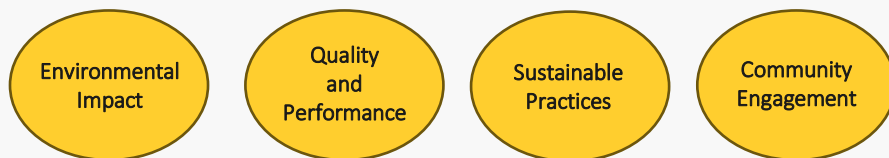
**Community
Engagement**

Social responsibility in the Asphalt Industry

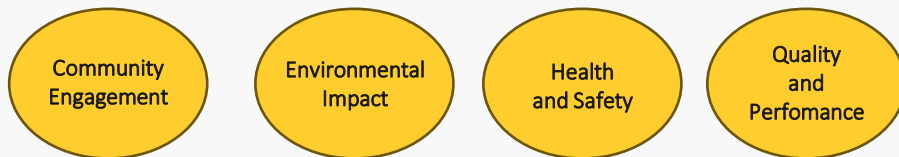
Energy consumption reduction



Recycling/Reuse



Noise mitigation

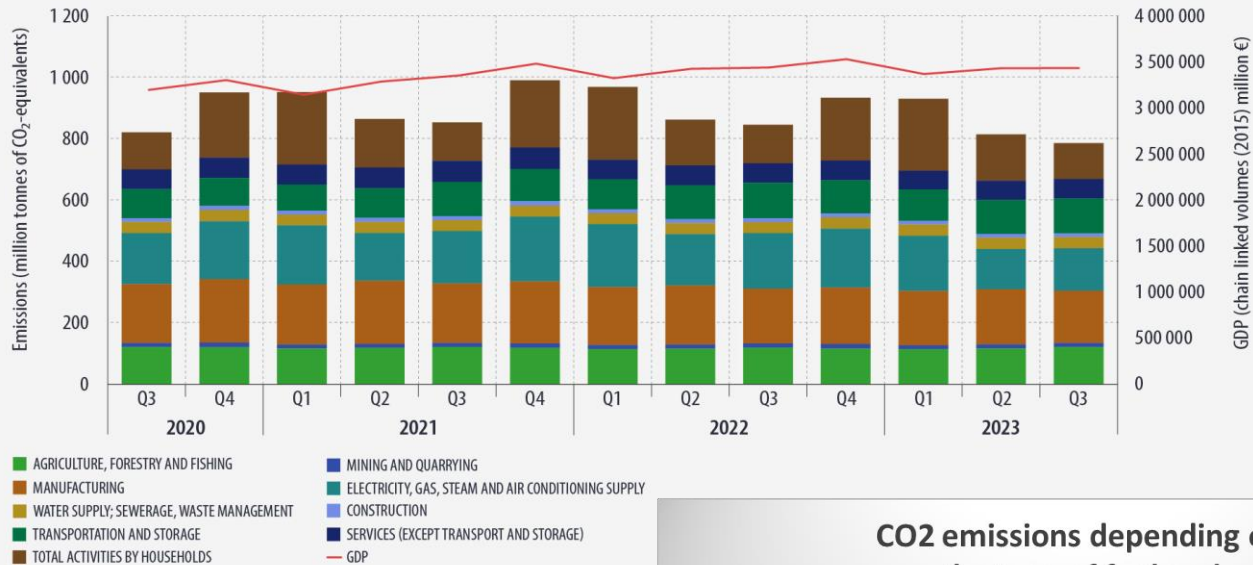


ENERGY CONSUMPTION REDUCTION

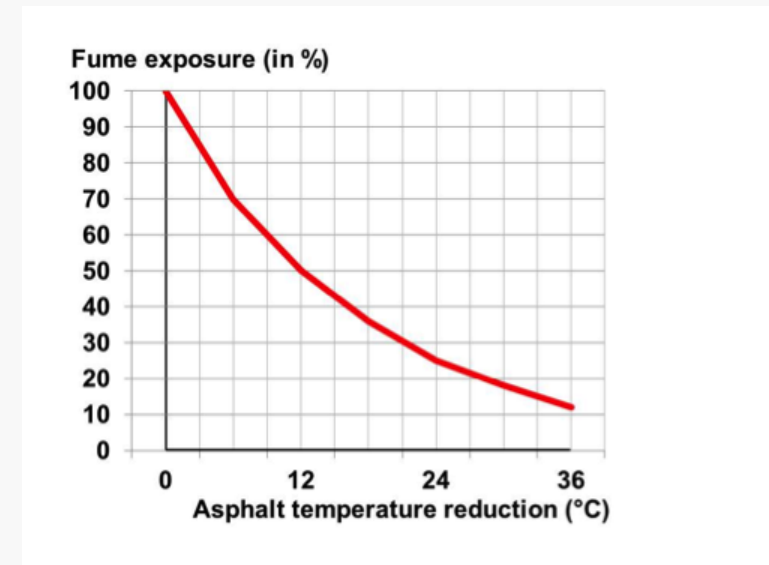
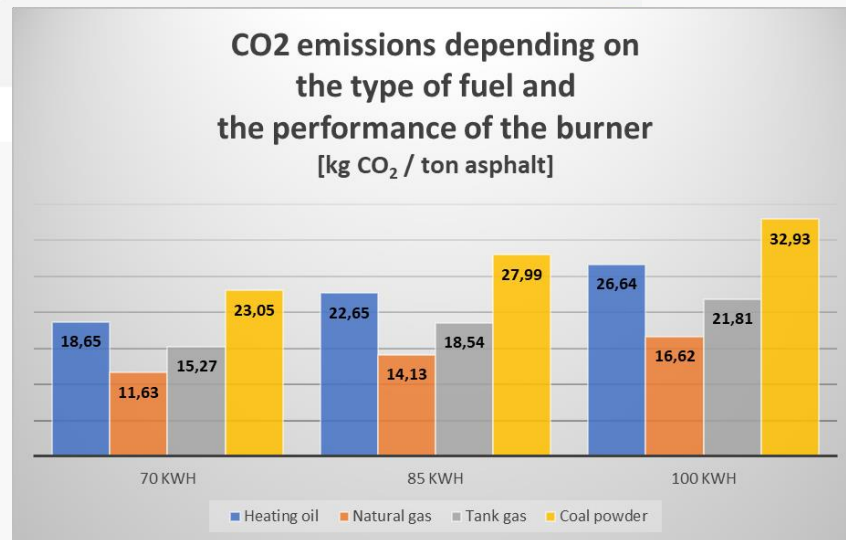
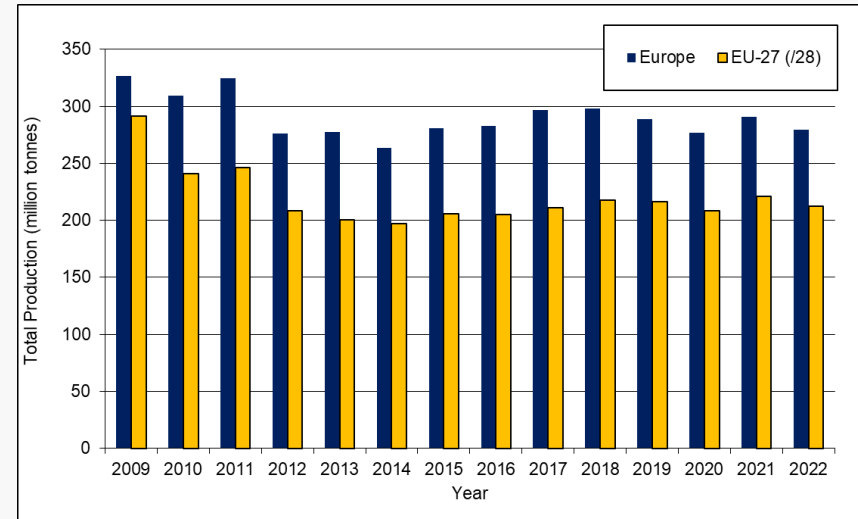
Energy consumption reduction

Greenhouse gas emissions by the economy and GDP, EU, Q3 2020 - Q3 2023

(million tonnes of CO₂-equivalents, chain linked volumes (2015) million €)



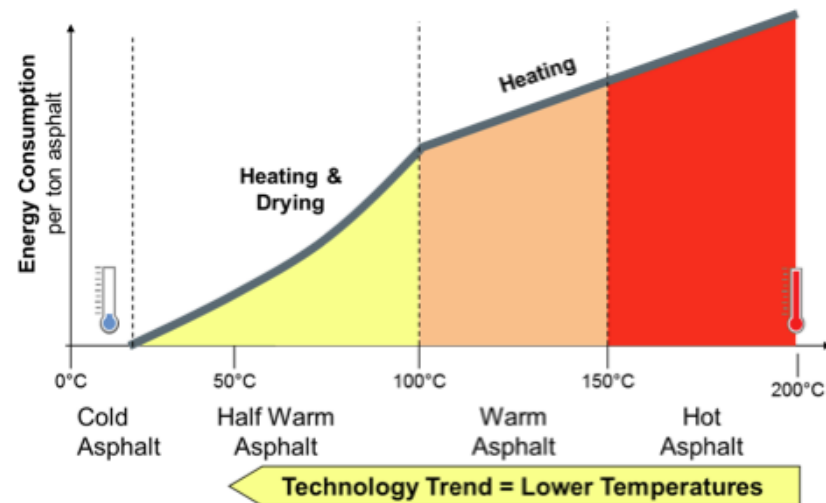
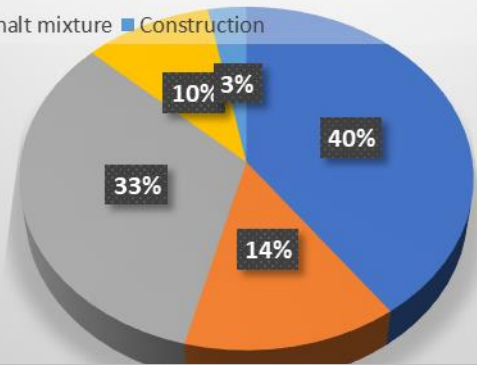
eurostat



Energy consumption reduction

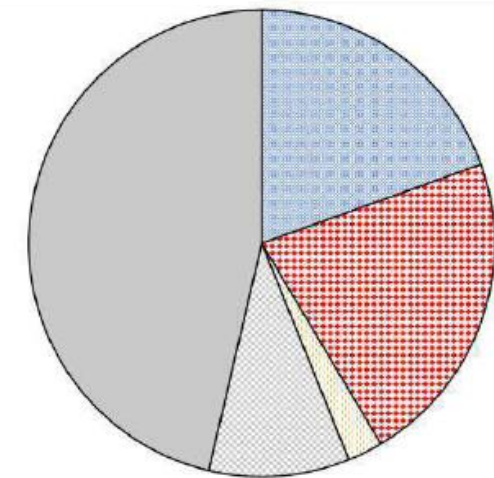
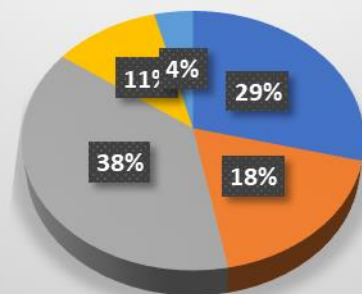
CO₂ emission at new asphalt pavement construction

- Raw material production
- Transport of raw material
- Asphalt production
- Transport of asphalt mixture
- Construction



CO₂ emission at pavement renovation works

- Raw material production
- Transport of raw material
- Asphalt production
- Transport of asphalt mixture
- Construction

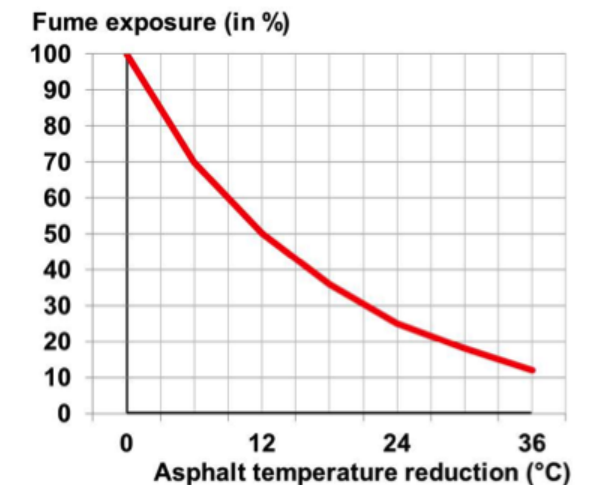
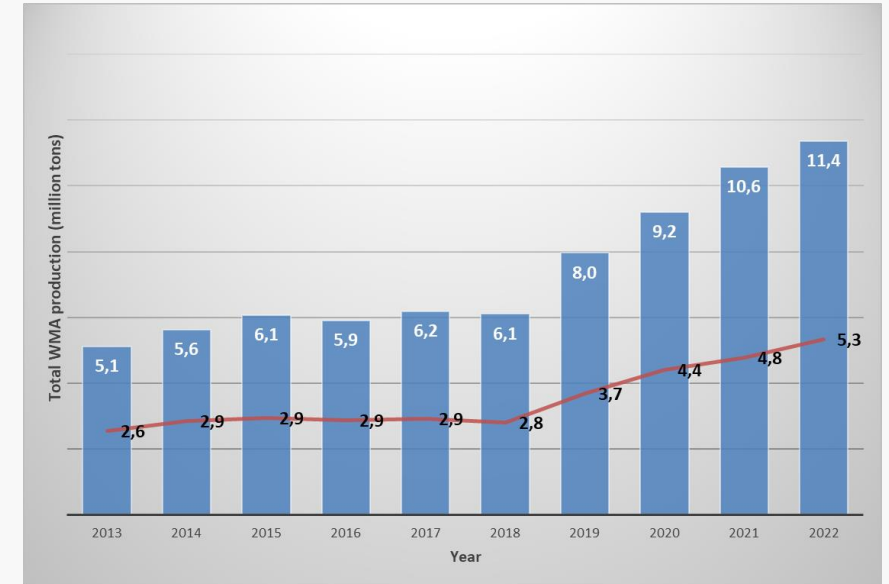


- Preventive maintenance
- Recycling asphalt
- Lower production temperature
- Asphalt plant (green gas tc.)
- Remaining

Energy consumption reduction: Tools

Production temperature reduction

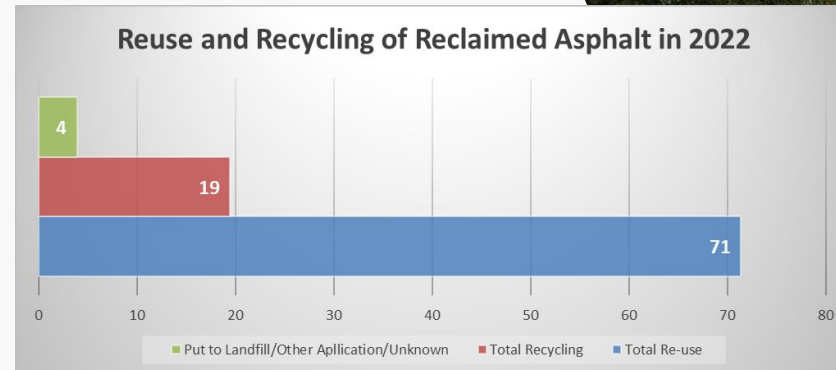
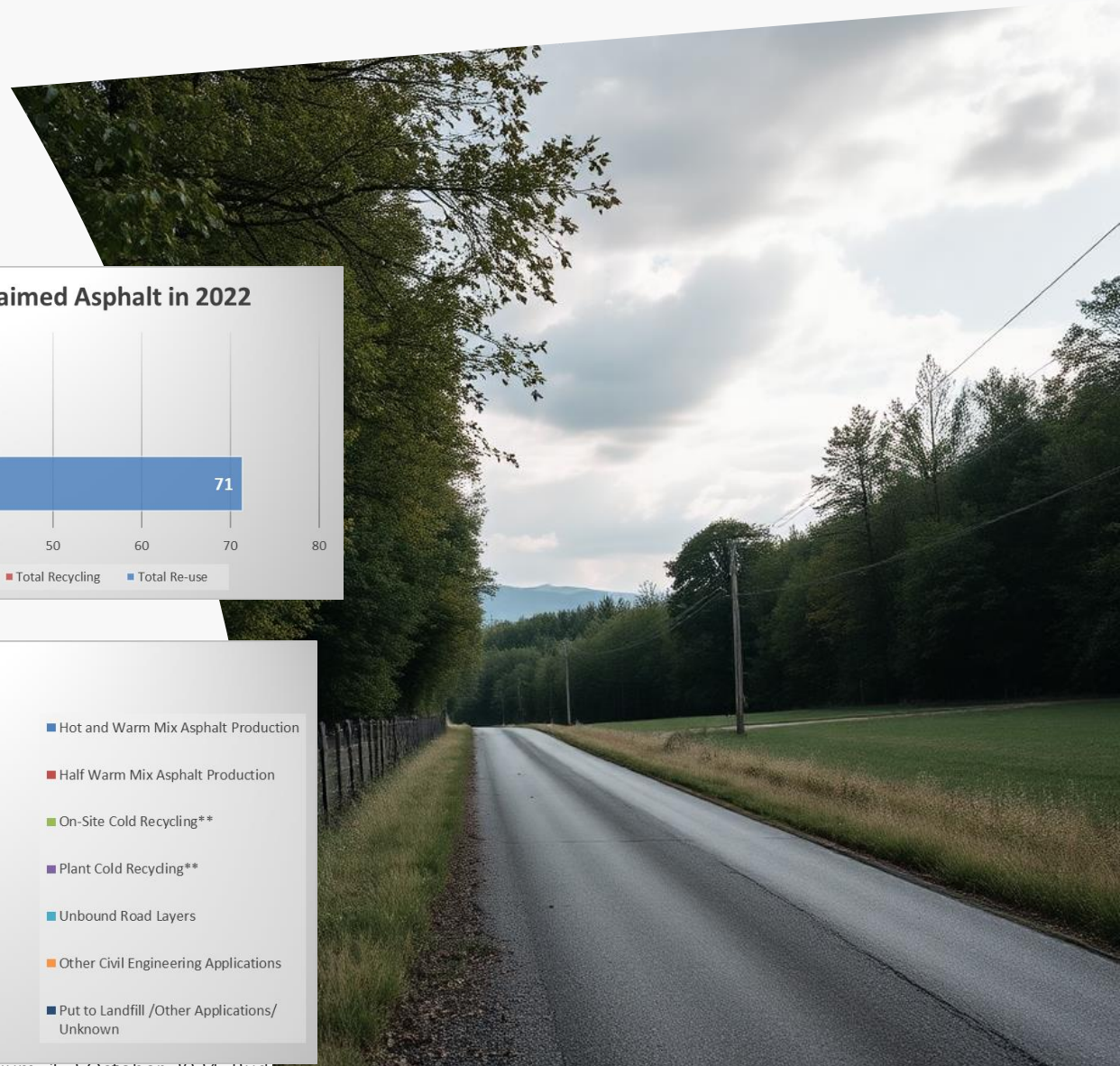
- Chemical additives,
- Natural additives,
- Foaming agents,
- Foamed bitumen,
- Low viscosity binder,
- Decreasing/eliminate moisture in the aggregates (1:14),
- (Bio based binders),
- (Green fuel (electricity or green hydrogen)),
- (Life-time extending maintenance).



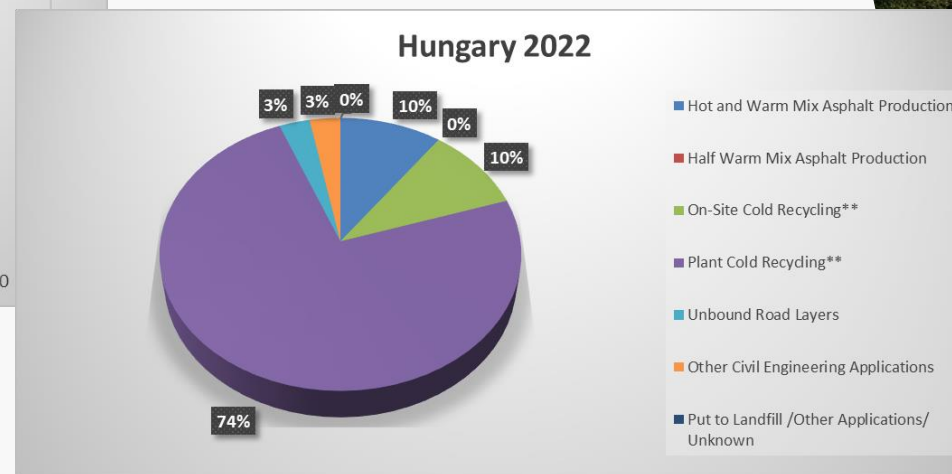
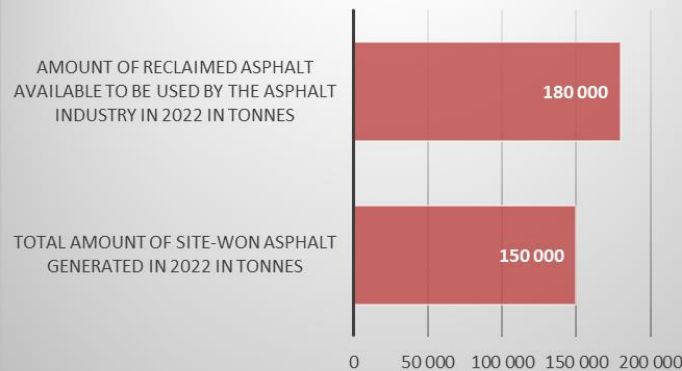
RECYCLING/REUSE

Recycling/Reuse

- Theoretically up to 100%,
- Allow to reduce using primer raw materials,
- Limited by
 - Mixing technic,
 - Regulations,
 - Characteristics of RAP.



Hungary 2022



Recycling/Reuse: Tools

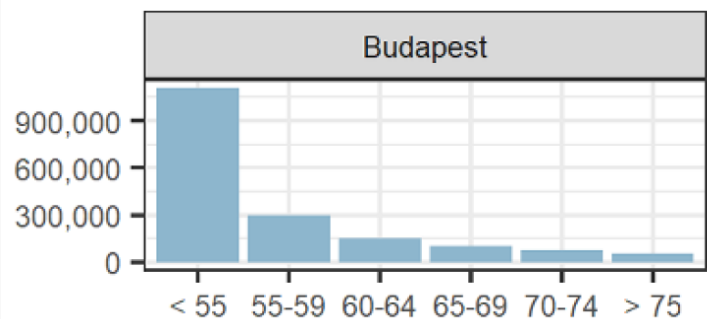
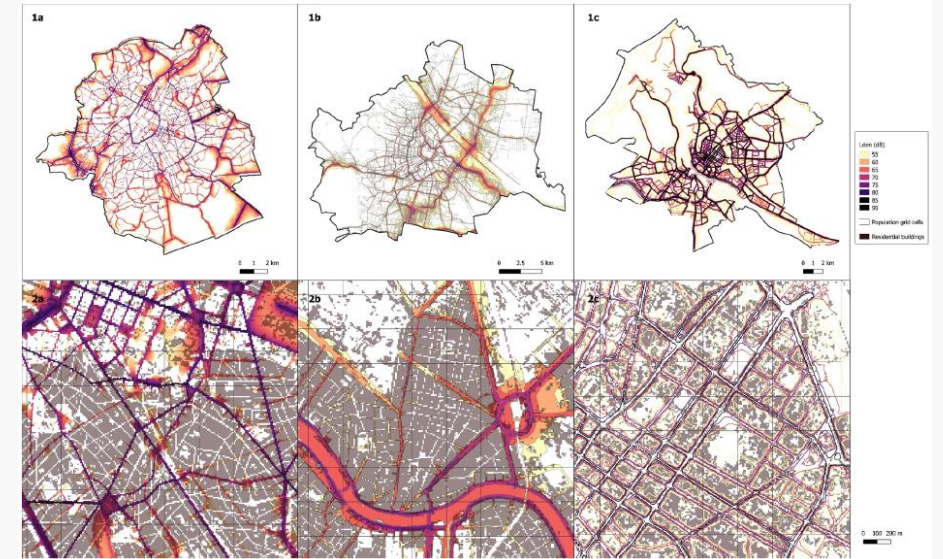
- Classification system for RAP,
- High-grade application (RAP from surface layer to surface layer asphalt),
- Over 40% RAP need of recycling agents (bio-rejuvenators),
- Technical background is needed (e.g. parallel drum although it increases energy consumption),
- Cold recycling with „non-high-grade“ RAP,
- Low-cost pavement types,
- Recycling for another purpose (e.g. embankment, etc.).



NOISE MITIGATION

Noise mitigation

- Less importance during the design phase,
- EU study mentioned 685 734 people (38,2%) exposed by traffic noise in Budapest (pop. 1 795 482)
- Therefrom 109 281 adults annoyed by the traffic noise



impact on mortality in 25 European capitals.

	Preventable deaths (n)(95% CI)	% of natural-cause mortality (95% CI)	% of IHD mortality (95% CI)	Preventable deaths per 100,000 population (95% CI)	YLL due to preventable mortality (95% CI)	YLL per 100,000 population (95% CI)
Amsterdam, the Netherlands	7 (2-12)	0.12% (0.04-0.20)	1.74% (0.58-2.91)	1.3 (0.4-2.2)	92 (41-143)	15 (7-24)
Berlin, Germany	42 (11-72)	0.13% (0.04-0.23)	0.95% (0.25-1.62)	1.5 (0.4-2.6)	488 (202-758)	18 (7-28)
Brussels, Belgium	11 (2-18)	0.12% (0.02-0.21)	1.51% (0.27-2.60)	1.3 (0.3-2.3)	123 (49-193)	17 (7-26)
Budapest, Hungary	86 (24-149)	0.41% (0.11-0.70)	1.61% (0.46-2.79)	5.7 (1.6-9.9)	803 (337-1304)	54 (23-87)
Copenhagen,	5 (1-9)	0.13% (0.02-0.24)	1.82% (0.33-3.24)	1.7 (0.3-3.0)	61 (29-95)	20 (9-31)

Noise mitigation

European Commission

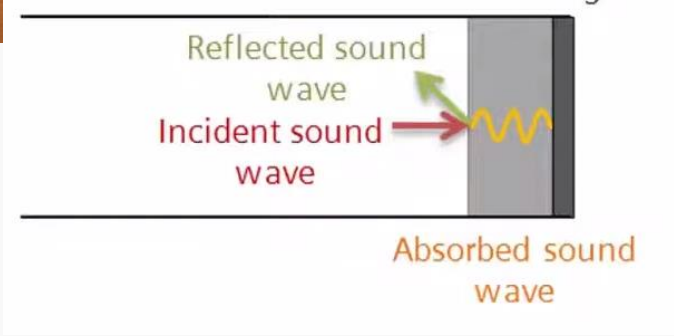
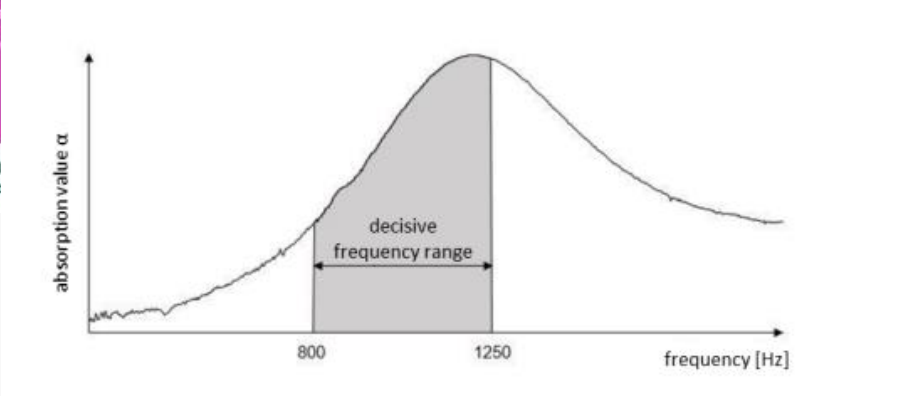
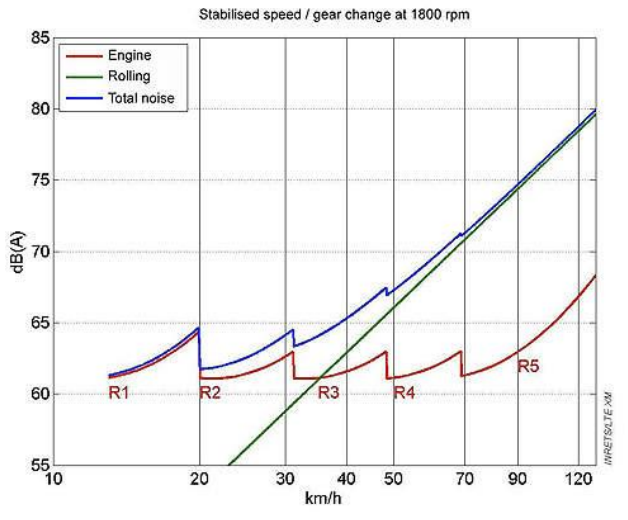
10 ways to combat NOISE POLLUTION

In the EU, more than 100 million citizens are affected by noise levels harmful to their health.

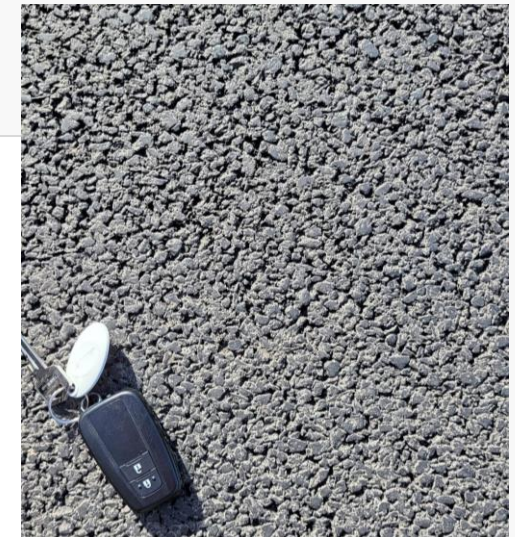
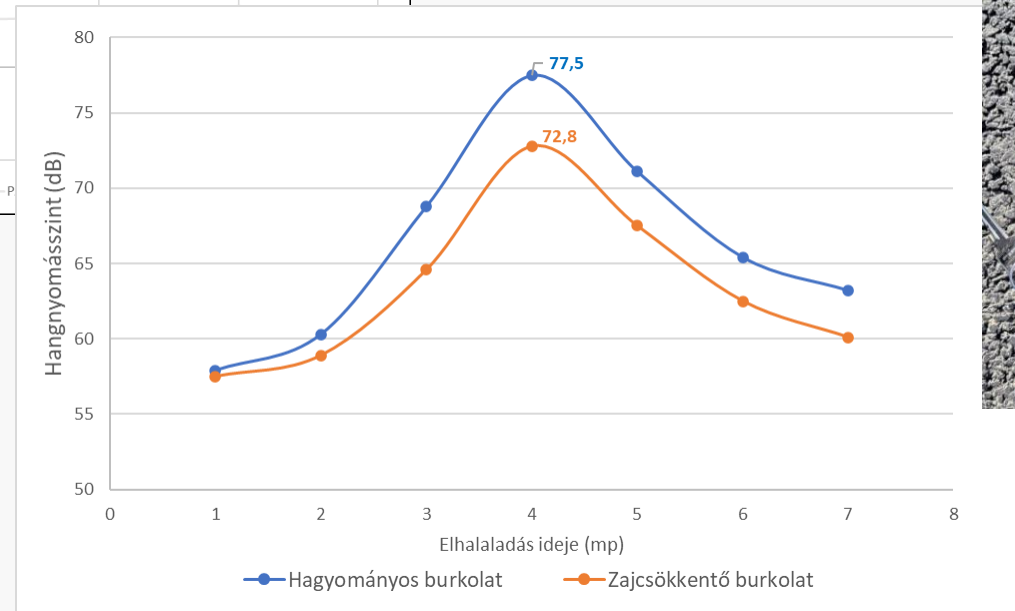
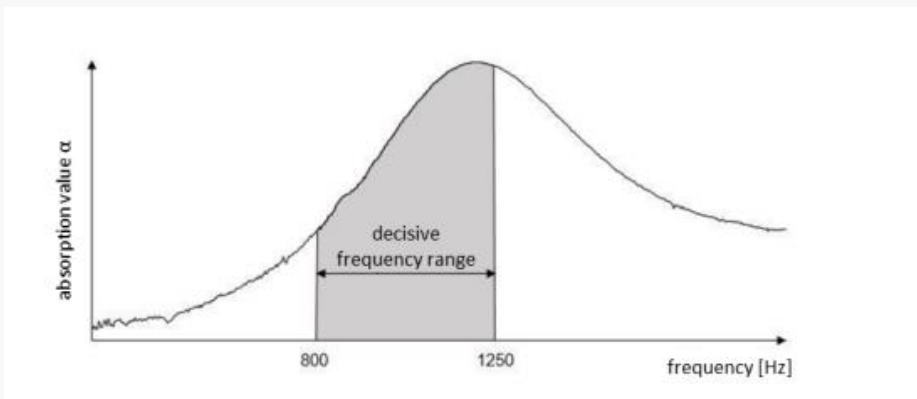
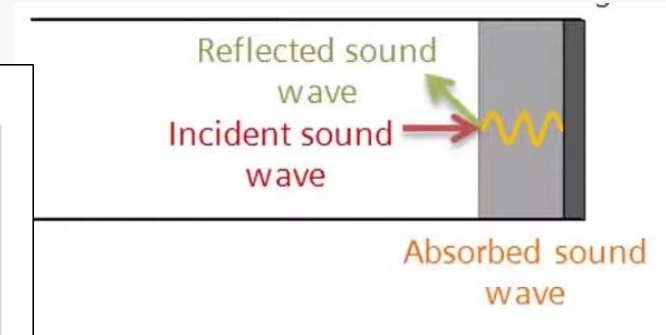
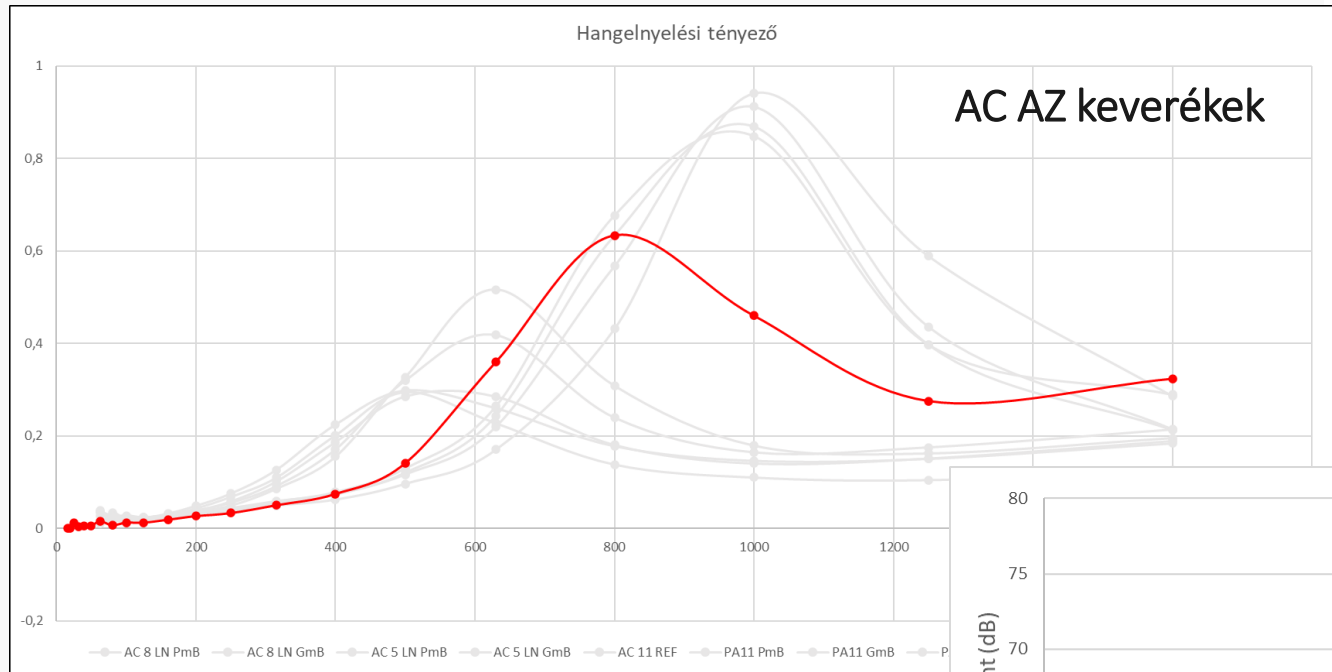
Road traffic is the major source of noise pollution, followed by railway and aircraft noise.

The infographic lists 10 methods with their respective noise reduction (dB) and cost-effectiveness scores (stars):

- Electric cars:** 1 dB reduction, 4 stars.
- Traffic management:** 1-4 dB reduction, 4 stars.
- Noise barriers:** 3-20 dB reduction, 5 stars.
- Brake blocks for trains:** 8-10 decibels (dB) reduction, 5 stars.
- Building insulation:** 5-10 dB reduction, 4 stars.
- Building design:** 2-15 dB reduction, 4 stars.
- Changing driving styles:** 2-15 dB reduction, 4 stars.
- Quiet road:** 2-15 dB reduction, 4 stars.
- Implementation of façade insulation:** 3-5 dB reduction, 4 stars.
- Implementation of low-noise brake blocks:** 3-5 dB reduction, 4 stars.

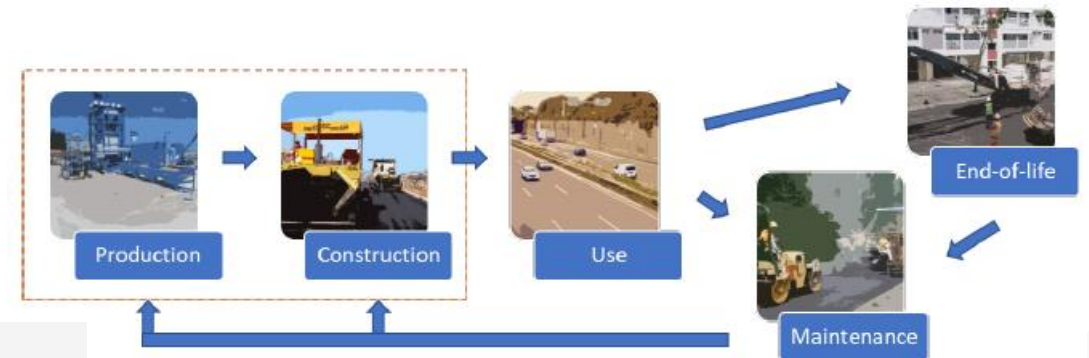


Noise mitigation



Some additional aspects for consideration

- Circular Economy System in the Asphalt Industry
- Digitalization as Tool,
- Importance of Design in Sustainability:
 - Material use design,
 - Layout design.



Conclusion

- Many issues are on the table to solve regarding Social Responsibility and Sustainability,
- Reducing the emission of greenhouse gases must be a common goal,
- Road construction is a set of energy-intensive processes (production of raw materials, production, installation),
- These goals can be reached only with cooperation between the customers and the contractor side,
- It is not enough to focus exclusively on asphalt production, but it can be seen as the first step in the process,
- Tools are available, but a concept is needed which can be supported by all participants.



AI in the presentation





Thank you for your
attention!

**Happy 30th birthday,
MAÚT!**

Dr. FÜLEKI Péter
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References

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