

The Role of the Circular Economy in Decarbonisation of Industry

Decarbonisation of Czech industry will not be possible without the circular economy. Use of circular measures can reduce CO2 emissions in key industry sectors in the EU by up to 65% while saving up to 30% of investment and energy costs by 2050. The circular economy should therefore receive similar attention and active support as other decarbonisation pathways related to energy efficiency, transition to renewable energy or breakthrough process technologies.

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The Czech Republic is the second most industrialised country in the EU.

At the same time, it is the third most carbon intensive EU economy per capita.

95%

CEMENT AND CONCRETE

... of concrete's carbon footprint comes from cement, making up about 40% of CO2 emissions embodied in buildings.

Key decarbonisation measures are reducing the clinker-to-cement ratio, replacing clinker with low-carbon substitutes, or reducing cement-to-concrete ratios.

15%

PLASTICS

... of waste plastics in the EU today are ultimately recycled.

Circular measures could eliminate up to 80% of CO2 emissions from primary plastics and their later incineration. These include reuse and material efficiency, mechanical and chemical recycling and use of sustainable bio-based plastics.

65%

... of total industrial CO2 emissions in the EU are from production of steel, cement, plastics, and aluminium.

And 60% of these materials are used in three main sectors: buildings construction, automotive industry, and packaging.

90%

STEEL

... of steel output from Czech steelworks is currently primary production using blast furnaces.

Shifting to electric arc furnaces (EAF) or hybrid furnaces using steel scrap is a key decarbonisation strategy.

50%

ALUMINIUM

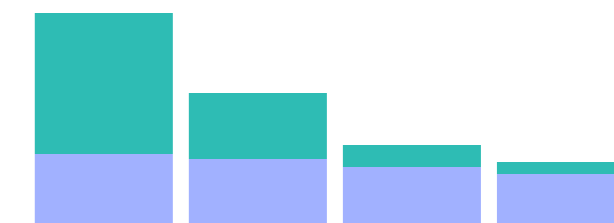
... of CO2 emissions embodied in aluminium consumed in the EU could be eliminated by maximising the share of recycled aluminium.

Emissions from aluminium recycling can be over 95% lower than those from primary aluminium production.

Buildings construction

In the coming decades most CO2 emissions related to buildings will be embodied in materials. Key circular measures to reduce emissions include extending building lifespans by modular design and renovation, or reducing demand for new buildings by higher utilisation of existing ones.

WBCSD: Increase in share of embodied carbon from materials over time



Over time, the operational energy decarbonizes

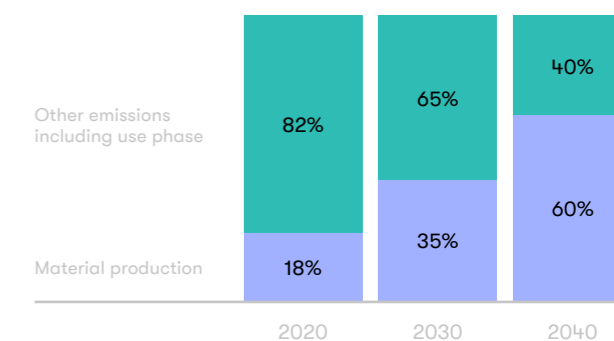
Operational carbon (energy)
Embodied carbon (materials)

Source: Decarbonizing construction – Guidance for investors and developers to reduce embodied carbon (WBCSD, July 2021), p. 9

Automotive industry

The automotive industry accounts for 25% of aluminium, 12% of steel and 9% of plastics consumption in the EU. Similarly to buildings, exhaust emissions currently account for over 80% of vehicle life cycle CO2 emissions. With a shift to electromobility and other alternative fuels, embodied carbon in materials could account for 60% of life cycle emissions by 2040. Key circular measures include higher utilisation of the existing fleet (sharing), vehicle lightweighting or downsizing, and vehicle lifetime extension.

WEF: Emissions from material production will have higher share than other life-cycle emissions in percentage share (based on required sales volumes)



Source: Forging Ahead – A materials roadmap for the zero-carbon car (World Economic Forum, December 2020), p. 8