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Global impact of friction and wear on energy consumption, costs and emissions in transportation and industry

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Energy is a key resource for our society today and will be crucial for our sustainability in the future. Much of our energy needs comes from non-renewable fossil fuels; however, there are limitations in the availability of these fuels in the long run. Burning of oil and other non-renewable products produces large volumes of greenhouse gases that give rise to climate change. Energy is also a major cost issue for many industries. Calculations on the impact of friction and wear on energy consumption, emissions and costs are presented. The calculations are based on component level data which is upscaled to system, industrial sector and global level. About 100 million terajoule is used annually worldwide to overcome friction and that is one fifth of all energy produced. The largest quantities of energy are used by industry (29%) and in the transportation field (27%). Based on our recent studies on energy use in passenger cars, trucks and buses; we concluded that it is possible to save as much as 17.5% of the energy use in road transports in the short term (5-9 years) by effective implementation of new tribological solutions. A comprehensive overview of the total energy saving potential by improved tribology in transportation and industry is presented.

Keywords

energy

friction

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cost

emission