Tribology meets sustainability

Por: Shah, R (Shah, Raj)[1]; Woydt, M (Woydt, Mathias)[2]; Huq, N (Huq, Nabill)[3]; Rosenkranz, A (Rosenkranz, Andreas)[4]

INDUSTRIAL LUBRICATION AND TRIBOLOGY
Volumen: 73
Número: 3
Páginas: 430-435
DOI: 10.1108/ILT-09-2020-0356
Fecha de publicación: MAY 14 2021
Acceso anticipado: DEC 2020
Tipo de documento: Article
Ver impacto de la revista

Abstract

Purpose - This paper aims to present a comprehensive perspective on how tribology and sustainability are related and intertwined and are linked to CO2 emissions. This paper emphasizes on how tribological aspects affect everybody's life and how tribological research and progress can improve energy efficiency, sustainability and quality of life.

Design/methodology/approach - Based upon available data and predictions for the next 50 years, the potential of tribological research and development is addressed.

Findings - The effects of tribological design can significantly increase energy savings and reduce CO2 emissions. Taking advantage of tribological technologies and applying them to current infrastructure would have the largest energy savings coming from the transportation and power generation at 25% and 20%, respectively. Implementing these technologies can also cut down global CO2 emissions by about 1,460 megatons of CO2 per year in the immediate future and 3,140 megatons of CO2 per year in the long term. The extraction and processing of resources inevitably generates CO2. Doubling the lifetime of machine components and the use of circular economy reduces the material footprint with associated reductions in CO2.

Originality/value - This perspective summarizes concisely the interrelation of tribology and sustainability with CO2.

Peer review - The peer review history for this article is available at: https://publons.com/publon/10.1108/ILT-09-2020-0356/

Palabras clave

Palabras clave de autor: Sustainability; Tribology; CO2 emissions; Energy consumption; Renewable energy; Friction reduction; Material footprint; Wear protection

Información del autor

Dirección para petición de copias:
Universidad de Chile Univ Chile, FCFM, Dept Chem Engn Biotechnol & Mat, Santiago, Chile.
Dirección correspondiente: Rosenkranz, A (autor correspondiente)

+ Univ Chile, FCFM, Dept Chem Engn Biotechnol & Mat, Santiago, Chile.

Direcciones:

[1] Koehler Instrument Co, New York, NY USA

[2] MATRILUB, Berlin, Germany

+ [3] SUNY Stony Brook, Stony Brook, NY 11794 USA

+ [4] Univ Chile, FCFM, Dept Chem Engn Biotechnol & Mat, Santiago, Chile

Direcciones de correo electrónico:rshah@koehlerinstrument.com; m.woydt@matrilub.de; nabill.huq@stonybrook.edu; arosenkranz@ing.uchile.cl

Financiación

Entidad financiadora Mostrar más información	**Número de concesión**
Comision Nacional de Investigacion Cientifica y Tecnologica (CONICYT)	Fondecyt 11180121
VID of the University of Chile	U-Inicia UI013/2018

Ver texto de financiación

Editorial

EMERALD GROUP PUBLISHING LTD, HOWARD HOUSE, WAGON LANE, BINGLEY BD16 1WA, W YORKSHIRE, ENGLAND

Información de la revista

- **Impact Factor:** Journal Citation Reports

Categorías / Clasificación

Áreas de investigación: Engineering
Categorías de Web of Science: Engineering, Mechanical

Información del documento

Idioma: English
Número de acceso: WOS:000604118800001
ISSN: 0036-8792
eISSN: 1758-5775