

Scientists call for industry intervention to reduce toxicological footprint

December 22 2016, by Heather Crookes



A composite image of the Western hemisphere of the Earth. Credit: NASA

Scientists are calling for an increase in sustainable and less toxic material in global manufacturing as one way of firms reducing their toxicological footprint and combating climate change.

Research led by Professor Lenny Koh at the University of Sheffield's Management School and published in *Nature Scientific Reports* today (Wednesday 21 December 2016) highlights toxicity and its impact on [climate change](#).

By analysing data from the Toxic Release Inventory of the United States (US), Prof Koh's team identified some key interventions to mitigate toxic chemical release's impact on climate change – the analysis quantifies the contribution of population growth, changes in consumption volume, consumption structure, production structure and changes in emissions intensity on toxicology footprint. The findings will be helpful for decision makers to understand toxic chemical release and formulate effective mitigation standards and management protocols.

They found that there are many external influences on the US's toxicological footprint, including economic recession and recovery patterns, [population growth](#), change in consumption volume, production structure and emission intensity, all of which provide a narrative in explaining why and how toxicological footprint fluctuates in the data – for example, between 1999 and 2006 the toxicological footprint of the US decreased by 42 per cent, mainly driven by improvement in emissions intensity in the mining and quarrying sector.

Prof Koh, Director of Advanced Resource Efficiency Centre at the University of Sheffield, said: "We often see carbon dioxide levels and emissions measured, but toxicity also affects the environment and is rarely reported.

"In addition to understanding the drivers of the US's toxicological

footprint dynamics, our analysis assesses the efficacy of different drivers to reduce it in the future. Our results show the prominence the mining and quarrying sector in emissions, so I propose that a sectorial-focused approach should be designed to address reduction."

Prof Ian Reaney, co-author from the Department of Materials Science and Engineering, said: "This study has highlighted the strategic importance of understanding [toxic chemical](#) release, emphasising the need for more sustainable and less toxic materials and materials extraction in global manufacturing."

Prof Klaus Hubacek, co-author from the University of Maryland, said: "This international collaboration provides an excellent base to advance our understanding of efficiency and structural aspects of an economy and their impact on the toxicological footprint."

More information: S. C. L. Koh et al. Drivers of U.S. toxicological footprints trajectory 1998–2013, *Scientific Reports* (2016). [DOI: 10.1038/srep39514](#)

Provided by University of Sheffield

Citation: Scientists call for industry intervention to reduce toxicological footprint (2016, December 22) retrieved 17 July 2024 from <https://phys.org/news/2016-12-scientists-industry-intervention-toxicological-footprint.html>

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