

Overview on globally applied used engine oil recycling technologies

S. A. Ratiu, G. O. Tirian, N. L. Mihon, M. D. Armioni

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Abstract

Due to the growing importance of environmental issues in modern society, the global economy has been compelled to refocus further towards eco-friendly, low-pollution technologies based on waste recycling. Furthermore, these technologies not only offer economic value to products at the end of their life cycle, but they have the ability to address the issue of inadequate waste storage in landfills. At the same time, given the growing trends in the number of vehicles, the demand for lubricants is also increasing, which involves the generation of larger and larger amounts of used engine oil. Being included in the category of hazardous waste, it requires management based on sustainable principles, and recycling is recommended as a preferred method of treatment, as it still has a high economic value. This article aims to present some of the technologies that have been effectively implemented on a global scale for the recycling of used engine oil, as well as a series of advantages that these processes present, both ecologically and from an economic perspective.

Keywords: eco-friendly technologies, low-pollution technologies, lubricants, engine oil recycling

References

1. 1995 Technical guidelines on used oil re-refining or other re-uses of previously used oil (Geneva, Switzerland) Basel Convention on the Control of Transboundary Movements on Hazardous Wastes and Their Disposal
[Go to reference in article](#)
[Google Scholar](#)
2. <https://www.umweltbundesamt.de/en/publikationen/polycyclic-aromatic-hydrocarbons>
[Go to reference in article](#)
[Google Scholar](#)
3.]2014 Case Studies in Environmental Medicine: Polychlorinated Biphenyls (PCBs) Toxicity, Agency for Toxic Substances and Disease Registry (WB 2460)

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[Go to reference in article](#)

[Google Scholar](#)

4. <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2015/07/planning-and-waste-management-advice/documents/planning-waste-management-advice-pdf/planning-waste-management-advice-pdf/govscot%3Adocument/Planning%2Band%2Bwaste%2Bmanagement%2Badvise.pdf>

[Go to reference in article](#)

[Google Scholar](#)

5. 2016 Waste Framework Directive revision: European waste oil re-refining industry position (Brussels, Belgium)

[Go to reference in article](#)

[Google Scholar](#)

6. Regional Activity Centre for Cleaner Production (RAC/CP) Mediterranean Action Plan 2000 Possibilities for the recycling and reuse of used oils (Barcelona, Spain)

[Go to reference in article](#)

[Google Scholar](#)

7. Ahamad M T, ChadraSekhar B P, Mohan P N, Joshi K S and Sree T D R 2015 Recycling and Analysis of Spent Engine Oil, International Journal of Scientific & Engineering Research **6** 711-715

[Go to reference in article](#)

[Google Scholar](#)

8. Akilimali F C 2017 Feasibility study of recycling used lubricating oil (India: The University of Dodoma)

[Go to reference in article](#)

[Google Scholar](#)

9. 2012 Compendium of Recycling and Destruction Technologies for Waste Oils (Osaka, Japan)

[Go to reference in article](#)

[Google Scholar](#)

10. Rincon J and Canizares P 2005 Waste oil recycling using mixtures of polar solvents, Industrial & Engineering Chemistry Research **44** 7854-7859

[Go to reference in article](#)

[Google Scholar](#)

11. Osman D I, Attia S I and Taman A. R. 2018 Recycling of used engine oil by different solvent, Egyptian Journal of Petroleum **27** 221-225

[Go to reference in article](#)

[Google Scholar](#)

12. Boadu K O, Joel O F, Essumang D K and Evbuomwan B O 2019 A Review of Methods for Removal of Contaminants in Used Lubricating Oil, Chemical Science International Journal **26** 1-11

[Go to reference in article](#)

[Google Scholar](#)

13. <https://www.puraglobe.com/company/>

[Go to reference in article](#)

[Google Scholar](#)

14. Dalla Giovanna F, Khlebinskaia O, Lodolo A and Miertus S 2003 Compendium of Used Oil Regeneration Technologies (Trieste: International Centre For Science And High Technology)

[Go to reference in article](#)

[Google Scholar](#)

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Engineering
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Conference Series: Materials Science and Engineering, 2022, Vol. 1220, Nr. 1**

15. <https://www.itelyum-regeneration.com/en/revivoil/>
[Go to reference in article](#)
[Google Scholar](#)
16. <https://www.sor.com.au/what-we-do/waste-oil-refining-process/>
[Go to reference in article](#)
[Google Scholar](#)
17. <https://www.cleanharbors.com/services/technical-services/recycling-services/used-oil-and-oil-products-recycling>
[Go to reference in article](#)
[Google Scholar](#)
18. Audibert F 2011 Waste Engine Oils: Rerefining and Energy Recovery (Amsterdam, The Netherlands: Elsevier)
[Go to reference in article](#)
[Google Scholar](#)
19. <https://www.bechtel.com/services/chemicals/bhts/oil-processing/>
[Go to reference in article](#)
[Google Scholar](#)
20. <http://www.afrilub.ma/>
[Go to reference in article](#)
[Google Scholar](#)
21. <https://www.youtube.com/watch?v=bF5xDnjFcg4>
[Go to reference in article](#)[Google Scholar](#)
22. <https://www.lwart.com.br/coleta-de-oleo-lubrificante-usado/>
[Go to reference in article](#)
[Google Scholar](#)
23. Nixon H and Saphores J D 2002 Used Oil Policies to Protect the Environment: An Overview of Canadian Experiences
[Go to reference in article](#)
[Google Scholar](#)