Evaluation of a new pulping technology for pre-treating source-separated organic household waste prior to anaerobic digestion - DTU Orbit (08/11/2017)

Evaluation of a new pulping technology for pre-treating source-separated organic household waste prior to anaerobic digestion

A new technology for pre-treating source-separated organic household waste prior to anaerobic digestion was assessed, and its performance was compared to existing alternative pre-treatment technologies. This pre-treatment technology is based on waste pulping with water, using a specially developed screw mechanism. The pre-treatment technology rejects more than 95% (wet weight) of non-biodegradable impurities in waste collected from households and generates biopulp ready for anaerobic digestion. Overall, 84-99% of biodegradable material (on a dry weight basis) in the waste was recovered in the biopulp. The biochemical methane potential for the biopulp was 469±7mL CH4/g ash-free mass. Moreover, all Danish and European Union requirements regarding the content of hazardous substances in biomass intended for land application were fulfilled. Compared to other pre-treatment alternatives, the screw-pulping technology showed higher biodegradable material recovery, lower electricity consumption and comparable water consumption. The higher material recovery achieved with the technology was associated with greater transfer of nutrients (N and P), carbon (total and biogenic) but also heavy metals (except Pb) to the produced biomass. The data generated in this study could be used for the environmental assessment of the technology and thus help in selecting the best pre-treatment technology for source separated organic household waste.

General information

State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, KomTek Miljø
Authors: Naroznova, I. (Intern), Møller, J. (Intern), Larsen, B. (Ekstern), Scheutz, C. (Intern)
Number of pages: 10
Pages: 65-74
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information

Journal: Waste Management
Volume: 50
ISSN (Print): 0956-053X
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4 SJR 1.354 SNIP 2.044
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.739 SNIP 2.256 CiteScore 4.33
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.777 SNIP 2.482 CiteScore 3.43
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.822 SNIP 2.435 CiteScore 3.39
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.611 SNIP 2.184 CiteScore 2.91
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.698 SNIP 2.085 CiteScore 2.99
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.555 SNIP 1.78
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1

Scopus rating (2009): SJR 1.502 SNIP 1.899
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.378 SNIP 2.13
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.035 SNIP 1.767
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.046 SNIP 1.749
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.059 SNIP 1.65
Scopus rating (2004): SJR 1.289 SNIP 1.939
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.847 SNIP 1.269
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.561 SNIP 0.874
Scopus rating (2001): SJR 0.456 SNIP 0.696
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.271 SNIP 0.451
Scopus rating (1999): SJR 0.262 SNIP 0.479
Original language: English
Waste Management and Disposal, Biochemical methane potential, Hazardous substances, Mass balance, Pre-treatment, Source-separated organic household waste, Biohazards, Carbon, Environmental technology, Hazards, Heavy metals, Lead, Metal recovery, Methane, Recovery, Screws, Separation, Waste treatment, Organic household wastes, Pre-Treatment, Anaerobic digestion
DOIs:
10.1016/j.wasman.2016.01.042
Source: FindIt
Source-ID: 2291895414
Publication: Research - peer-review › Journal article – Annual report year: 2016