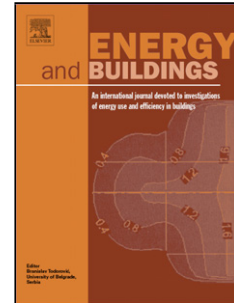


Accepted Manuscript

Title: Ecological sanitation, organic animal farm, and cogeneration: Closing the loop in achieving sustainable development-A concept study with on-site biogas fueled trigeneration retrofit in a 900-bed university hospital

Author: Basak K. Taseli Birol Kilkis



PII: S0378-7788(16)30626-0
DOI: <http://dx.doi.org/doi:10.1016/j.enbuild.2016.07.030>
Reference: ENB 6861

To appear in: *ENB*

Received date: 23-2-2016
Revised date: 9-5-2016
Accepted date: 12-7-2016

Please cite this article as: Basak K. Taseli, Birol Kilkis, Ecological sanitation, organic animal farm, and cogeneration: Closing the loop in achieving sustainable development-A concept study with on-site biogas fueled trigeneration retrofit in a 900-bed university hospital, Energy and Buildings <http://dx.doi.org/10.1016/j.enbuild.2016.07.030>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Ecological sanitation, organic animal farm, and cogeneration: Closing the loop in achieving sustainable development-A concept study with on-site biogas fueled trigeneration retrofit in a 900-bed university hospital

Basak K. Taseli^a and Birol Kilkis^{b*}

^aGiresun University Environmental Engineering Department, Giresun, Turkey

basak.taseli@giresun.edu.tr

^bBaşkent University Energy Engineering Graduate Program Chair, Ankara, Turkey

bkilkis@baskent.edu.tr

* Corresponding Author

HIGHLIGHTS

- In this paper the overall environmental and economic problems that may be associated especially with large university hospitals are addressed.
- The aim was to show a rational methodology to convert their energy and environmental disadvantages by applying ecological sanitation and developing an energy, water, food, and education nexus
- For this purpose on-site biogas possibilities and potential were investigated for a 900-bed existing hospital to be retrofitted by a trigeneration system.
- Optimum fuel share and optimum trigeneration system cascading and optimum sizing methodology shown.
- The concept study comprised two scenarios and three stages. These were namely the base scenario, which utilizes three trigeneration engines 1,25 MW_e, and two 2,2 MW_e capacity each, all running on natural gas with a total capacity of 5,65 MW_e.
- The first stage of the second scenario mixes biogas produced on-site with natural gas for driving the 1,25 MW_e engine, which satisfies the constant base load of the hospital for 24 hours a day.
- The second stage of this scenario produces biogas on the large surrounding free premises in a new eco-farm and replaces the fuel input of the 2,2 MW_e engine, which operates 16 hours per day.

Download English Version:

<https://daneshyari.com/en/article/6729552>

Download Persian Version:

<https://daneshyari.com/article/6729552>

[Daneshyari.com](https://daneshyari.com)