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Micro-cogeneration versus conventional technologies: Considering model uncertainties in assessing the energy benefits

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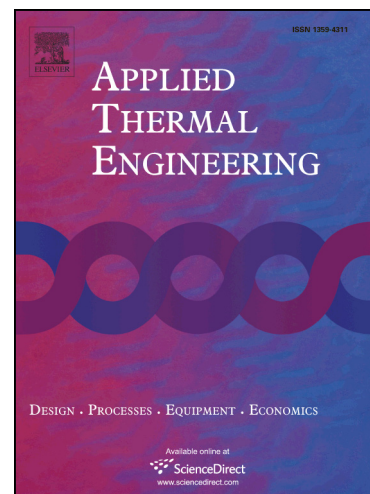
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1 **Micro-cogeneration versus conventional technologies:**
2 **considering model uncertainties in assessing the energy**
3 **benefits**

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11 **Abstract**

12 Fuel cells with nominal outputs of approximately 1 kW_{AC} are emerging as a
13 prime-mover of a micro-cogeneration system potentially well-suited to compete,
14 on an energy basis, with conventional methods for satisfying occupant electrical
15 and thermal demands in a residential application. As the energy benefits of these
16 systems can be incremental when compared to efficient conventional methods,
17 it is especially important to consider the uncertainties of the models on which
18 simulation results are based. However, researchers have yet to take this aspect
19 into account.

20 This article makes a contribution by demonstrating how these model uncer-
21 tainties may be propagated to the simulation results of a micro-cogeneration sys-
22 tem for comparison to a reference scenario using a case study. This case study
23 compares the energy performance of a fuel-cell based micro-cogeneration system
24 serving only domestic hot water demands to an efficient reference scenario where
25 the conventional methods for providing electrical and thermal demands are con-

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