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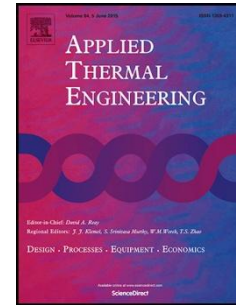
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1 **EXPERIMENTAL EVALUATION OF A DIESEL-BIOGAS DUAL FUEL ENGINE OPERATED ON**
2 **MICRO-TRIGENERATION SYSTEM FOR POWER, DRYING AND COOLING**

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8 **Highlights:**

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10 A micro-trigeneration system based in a diesel-biogas dual fuel engine was obtained
11
12 Heat from engine exhaust gases was used for drying and refrigeration applications
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14 Energy efficiency of the microtrigeneration system in dual mode was 40%
15
16 Peppermint was dried in the microtrigeneration system

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19
20 **Abstract**

21 A micro-trigeneration system based on a diesel-biogas dual fuel engine was evaluated
22 experimentally. In this system, waste heat from the engine exhaust was used for heating air
23 using a heat pipe exchanger and for driving an absorption unit freezer. The air heated was
24 used in a convective trays dryer designed to dry peppermint. The global energy efficiency of
25 this system at the engine full load was 40% and 31% in diesel and dual mode, respectively,
26 while the same efficiencies of the engine at the original single generation were 23% and 18%,
27 respectively. On the other hand, a maximum diesel substitution level of 50% was achieved in
28 dual mode.

29 **Keywords:** micro-trigeneration, dual fuel engine, biogas, peppermint drying, absorption cooling

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