Interdependent Multi-Issue Negotiation for Energy Exchange in Remote Communities

[Abstract Only] *

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ABSTRACT
We present a novel negotiation protocol to facilitate energy exchange between off-grid homes that are equipped with renewable energy generation and electricity storage. Our protocol imposes restrictions over negotiation such that it reduces the complex interdependent multi-issue negotiation to one where agents have a strategy profile in subgame perfect Nash equilibrium. We show that our negotiation protocol is tractable, concurrent, scalable and leads to Pareto-optimal outcomes in a decentralised manner. We empirically evaluate our protocol and show that, in this instance, a society of agents can (i) improve the overall utilities by 14% and (ii) reduce their overall use of the batteries by 37%.

Categories and Subject Descriptors
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General Terms
Agents, Multi-Agent Systems.

Keywords
Energy exchange, storage, battery, interdependent, multi-issue, complex, negotiation, protocol.

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