

# 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

I.2.11 [Computing Methodologies]: Artificial Intelligence, Distributed Artificial Intelligence.

## General Terms

Agents, Multi-Agent Systems.

## Keywords

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

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