

# ISO/IEC 15067-3-3:2019-10 (E)

## Information technology - Home Electronic System (HES) application model - Part 3-3: Model of a system of interacting Energy Management Agents (EMAs) for demand response energy management

---

### CONTENTS

- FOREWORD ..... 4
- INTRODUCTION ..... 5
- 1 Scope ..... 6
- 2 Normative references ..... 6
- 3 Terms, definitions and abbreviations ..... 6
  - 3.1 Terms and definitions ..... 6
  - 3.2 Abbreviations ..... 7
- 4 Conformance ..... 7
- 5 Energy management agent for home or residential community ..... 8
  - 5.1 Overview for home or residential community ..... 8
  - 5.2 System architecture for an energy management system with multiple EMAs ..... 8
  - 5.3 Interacting energy management agents ..... 10
- 6 Topology of energy management systems ..... 12
  - 6.1 Overview of topologies ..... 12
  - 6.2 Local EMA topology model ..... 13
  - 6.3 Hybrid EMA topology model ..... 14
- Annex A (informative) An energy management system with multiple energy management agents ..... 16
  - A.1 Use cases for energy management systems with multiple energy management agents ..... 16
  - A.2 Demand-response functionality of interacting EMAs ..... 19
  - A.3 Communication capability among EMAs ..... 21
- Annex B (informative) Service scenarios of an interacting energy management agent ..... 22
  - B.1 A service scenario of hierarchical interacting energy management agents ..... 22
  - B.2 A service scenario of mesh interacting energy management agents ..... 24
- Bibliography ..... 27
  
- Figure 1 – Example of an energy management system in a building with two homes ..... 8
- Figure 2 – System architecture of an energy management system for a home with multiple EMAs ..... 9
- Figure 3 – Example model of hierarchical interacting energy management agents ..... 11
- Figure 4 – Example model of mesh interacting energy management agents ..... 11
- Figure 5 – Example model of mixed hierarchical and mesh interacting energy management agents ..... 12
- Figure 6 – Topology models for a system of interacting EMAs ..... 13
- Figure 7 – Physical topology example of local EMA topology model ..... 14
- Figure 8 – Physical topology example of hybrid EMA topology model ..... 14
- Figure A.1 – Example of local EMA topology model for a home ..... 16
- Figure A.2 – Example of local EMA topology model for a residential community ..... 17

Figure A.3 – Hybrid EMA topology model example for a home .....	17
Figure A.4 – Hybrid EMA topology model example for a residential community .....	18
Figure A.5 – Function of hierarchical interacting energy management agents .....	20
Figure A.6 – Function of mesh interacting energy management agents .....	20
Figure B.1 – EMA to EMA interaction model in a hierarchical interacting EMA environment.....	23
Figure B.2 – EMA to EMA interactions to achieve user's energy cost budget .....	25
Table B.1 – Information flows between server EMA and client EMA .....	24
Table B.2 – Information flows among EMAs .....	26