



Dear Ms. Taylor Jantz-Sell and Ms. Abigail Daken,

I am writing to represent the [Open Connectivity Foundation](https://openconnectivity.org/)<sup>1</sup> (OCF) and submit an informational response to your request for comments regarding the Energy Star program and Smart Home Energy Management Systems (SHEMS).

OCF is a non-profit, industry standards organisation<sup>2</sup> dedicated to ensuring secure interoperability for consumers, businesses and industries by delivering a standard communications platform, a bridging specification, and a certification program allowing devices and services to communicate regardless of form factor, operating system, service provider, transport technology or ecosystem. OCF also enables fast adoption of its communications platform in real products by sponsoring the [IoTivity](https://iotivity.org/)<sup>3</sup> project, run by the Linux Foundation, which provides an open source reference implementation of the OCF specifications.

Over 400 companies, non-profit organizations, and educational institutions are members of OCF, including a wide range of technology companies, device manufacturers and service providers. They cover a variety of geographies and vertical markets. Many supply residential customers and count both the Smart Home and Energy Management as areas of interest. These members have already worked on SHEMS within OCF over the last several years, and the organisation is thus well placed to contribute to the EPA's discussion. A full membership list can be found on [OCF's website](https://openconnectivity.org/foundation/membership-list)<sup>4</sup>.

### **The Interoperability Challenge**

OCF's members chose to include SHEMS as part of OCF's work because one of the main challenges to delivering an effective system is interoperability.

The devices, appliances and underlying infrastructure in every home today come from a wide variety of suppliers; the smart home of the future will be no different. Typical SHEMS use cases rely on the ability for decision making systems to access a multiplicity of data and control points. For example: simple presence detectors triggering HVAC and lighting; more complex forecasting of whole home energy generation from solar panels, and use across all consuming devices, based on past behaviour. Thus there needs to be – at some level – a common language.

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<sup>1</sup> Open Connectivity Foundation main website: <https://openconnectivity.org/>

<sup>2</sup> The Open Connectivity Foundation is a 501(c)(6) non-profit, incorporated as a non-stock corporation in the State of Delaware.

<sup>3</sup> IoTivity project website: <https://iotivity.org/>

<sup>4</sup> OCF membership list: <https://openconnectivity.org/foundation/membership-list>

Historically, this sort of broad interoperability has been best developed by companies collaborating in open standards organisations.

Enabling the smart home brings risks as well as rewards. A connected device may expose private information. Even something as simple as “no one is home” can be useful to those with malicious intent. Insecure devices may be hacked and hijacked, repurposed or “bricked”. History has shown it is therefore essential that communications protocols are designed with security baked-in – not added in after the fact – and that open standards organisations, and open source code, are the best ways to ensure that such security is appropriate and robust.

### **OCF & Secure Interoperability**

OCF's communications framework provides the secure interoperability necessary for a SHERMS ecosystem. The architectural approach is scalable from relatively light weight devices with constrained capabilities all the way to Cloud services. The security model provides granular access control to individual resources on a device, so only those with the necessary permissions can reach them.

An attractive technology isn't useful if it isn't accessible. OCF makes its specification [available publicly](#)<sup>5</sup> and employs a wiki-like online database called [oneloTa.org](#) to manage data models. It also uses the proven combination of a certification test program to ensure compliance with the specification and interoperability with other devices, and trademarked branding to communicate compatibility. There are fees for OCF membership and certification, but both are open, i.e. there is no mechanism for any member to block another company, provided the latter signs the membership agreement and pays the necessary fees.

OCF supports royalty free licensing of patents essential to implementing the technology, between member companies, under RAND-Z terms<sup>6</sup>. The IoTivity code is distributed under the Apache 2.0 license, which is highly flexible and offers patent protection based on contributions and use. It is possible to use IoTivity code without being an OCF members, but if a company wishes to benefit from OCF's branding and patent protection, or participate in the development of future versions of the specification, then membership is required.

This ability to deliver secure interoperability in this accessible way is the major reason that [EEBus](#)<sup>7</sup> signed a liaison agreement with OCF in February 2015. EEBus is a European-based industry consortium focused on developing “the language of choice when devices speak about energy”, especially in the SHERMS context. OCF has been working over the last three years to

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<sup>5</sup> OCF specification are available here: <https://openconnectivity.org/developer/specifications>

<sup>6</sup> RAND-Z stands for Reasonable and Non-Discriminatory – Zero Royalty. This is the default for OCF. There is the potential for a member to declare – during an IPR review – that certain patents they deem to be critical will only be licenced under RAND terms, but this has not happened to date and it is OCF's stated position that it will prefer to work round any such declarations rather than risk members being subject to future royalty costs.

<sup>7</sup> EEBus main website: <https://www.eebus.org/en/>

ensure that the two efforts are aligned in order to maximise reuse and learning across the two organisations, and minimise duplication of effort.

In a global market place, conflicting regional requirements are likely to add costs. It is therefore worth noting that the European Union is also considering SHEMS issues<sup>8</sup>; is developing a reference "interoperability language" called SAREF<sup>9</sup>; and that SAREF is mapped to EEBus<sup>10</sup>.

In general OCF places a high value on collaboration with other organisations and standards to avoid and address ecosystem fragmentation. OCF has over 20 liaison agreements and ongoing collaborations, including with relevant organisations such as: [IETF](#)<sup>11</sup>; [Thread Group](#)<sup>12</sup>; [oneM2M](#)<sup>13</sup>; [W3C](#)<sup>14</sup>; and the [Zigbee Alliance](#)<sup>15</sup>.

## Summary

One of the major challenges of delivery Smart Home Energy Management Systems is the requirement for secure interoperability between devices and systems from a wide variety of different manufactures. OCF has been focused on secure interoperability for the Internet of Things for over 4 years, including Smart Home and Energy Management, and has a robust, scalable, easily adopted solution that is supported by over 400 members including many companies that are key to the SHEMS market.

Best regards,



John Park

Executive Director  
Open Connectivity Foundation

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<sup>8</sup> EU policy & scenario analysis of SHEMS:

[http://www.eco-smartappliances.eu/Documents/Task\\_7\\_draft\\_20170914.pdf](http://www.eco-smartappliances.eu/Documents/Task_7_draft_20170914.pdf)

<sup>9</sup> SAREF roadmap: [http://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=51530](http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=51530)

<sup>10</sup> SAREF mapping to EEBus & OCF:

[https://docbox.etsi.org/Workshop/2016/201611\\_M2MIoTWS/00\\_WORKSHOP/S05\\_SAREF/EEBUS\\_BAUMEISTER.pdf](https://docbox.etsi.org/Workshop/2016/201611_M2MIoTWS/00_WORKSHOP/S05_SAREF/EEBUS_BAUMEISTER.pdf)

<sup>11</sup> Internet Engineering Task Force (IETF) homepage: <https://www.ietf.org/>

<sup>12</sup> Thread Group homepage: <https://www.threadgroup.org/>

<sup>13</sup> oneM2M homepage: <http://www.onem2m.org/>

<sup>14</sup> World Wide Web Consortium (W3C) homepage: <https://www.w3.org/>

<sup>15</sup> Zigbee Alliance homepage: <https://www.zigbee.org/>

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