ECHONET Lite enables Demand Side Energy Management
-IP based and IEC's open standardized interface for home appliances-

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In Oct 2013, Smart Meter Committee in Japanese government announced the specification of Japan's power meter, talking ECHONET Lite over IPv6, certified by IEC TC100.

This new power meter interface will start installation process in Sep 2014 and will reach Japan's all power meters by Mar 2025. In case of Tokyo Electric Power Company [TEPCO], the world biggest utility company, installation starts in Sep 2014 and will complete it in Mar 2021. Japan's power meter system is very unique so that there are two communication interfaces: one is for utility business [supply side] and the other is for empowering big data innovation such as Internet of Things [IOT] in demand side. We engineers call it Demand Side Oriented Approach.

The important is that Japan's power meter is placed as same as other home appliances: air conditioner, refrigerator, heat pomp, electric vehicle [EV], and solar panel [PV]. In censoring power consumption situation, e.g. watt hour, ampere, voltage, ECHONET Lite power meter provides consumer with real-time power consumption data via demand side energy control system, e.g. Home Energy Management System [HEMS], who is enabler for optimizing energy consumption. This HEMS service scheme is making new business opportunities. For example, Japan's showcase has reported visibility of power consumption data has caused 10-30 % power usage reduction. Empowered by this kind of empirical study's data, HEMS has become Smart House business by housing makers and utility companies in Japan.

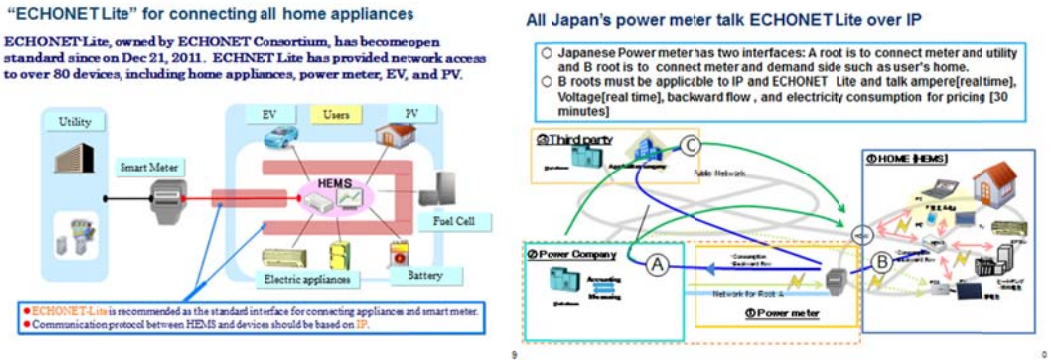

Exhibit1: smart meter adoption with ECHONET Lite

In 1997, 17 years prior to ECHONET Lite power meter adoption in Japan, ECHONET Consortium was founded with the aim of creating a rich 21st-century society by designing home network, enabled remote observation and control to home appliances. Japanese home appliance manufacturers, e.g. Toshiba, Panasonic, Mitsubishi, Hitachi, have taken a central role to apply this language to all appliances, included a power meter. Now, approximate 100 different typed home appliances are ready to talk ECHONET Lite.

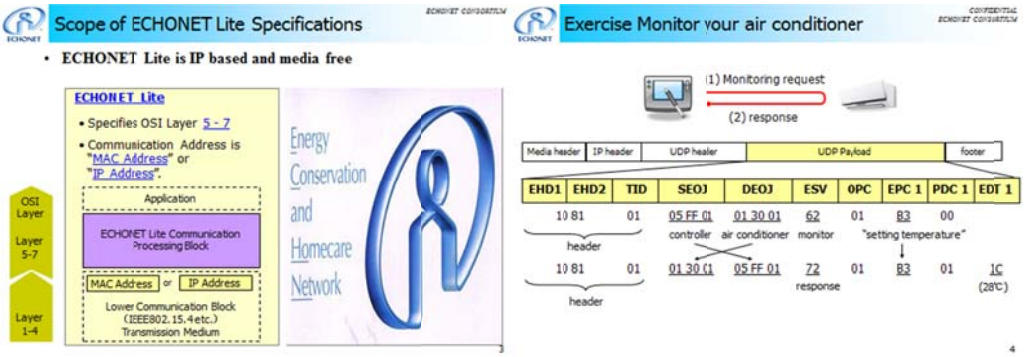

Exhibit2: ECHONET Lite Specification

In 2011, ECHONET Consortium changed policy, and ECHONET Lite has become open standard, whose all technical specifications can be freely accessible at the ECHONET Consortium web, http://www.echonet.gr.jp/english/spec/index.htm.

In addition, an interoperability test centers were launched. Continuing to the first center in Japan in 2012, oversea service started operation in Malaysia in 2013. That ideal environment, where all appliances have network access and talk to anybody, has inspired worldwide engineers and caused new projects in Asia. As one of those assumed services, there is Web based appliance control application.

In 2012, with aiming at promoting the above industrial initiative, Japanese government and Japan Smart Community Alliance [JSCA], government-industry liaison, teamed up by 350 companies and government, started to address demand side energy management with making Internet Protocol [IP] and ECHONET Lite mandatory interface for HEMS in Japan. Before announcing this recommendation, ECHONET device did not support IP. That has caused that Web engineers cannot be familiar with ECHONET Lite. Now Interoperability between IP and ECHONET Lite is ensured. To be recognized as an international standard, ECHONET Consortium removed closed Japan's architecture in retaining Japan's good. That is ECHONET Lite, which is standardized at IEC.

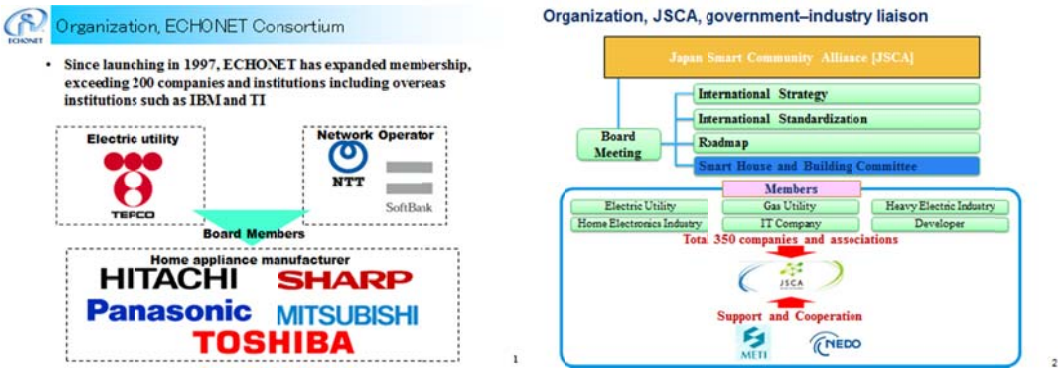

Exhibit3: Organizational Structure in ECHONET and JSCA

Discussion for standardization has been in process in some international bodies such as IEC. However, it is assumed that web becomes major human interface for controlling and observing energy consumption. That has caused strong expectation that ECHONET Lite and Web becomes interoperable.

Our authors have addressed HEMS and ECHONET Lite interface as open standard in Asia. From our ongoing implementation, we suggest the following agendas to be discussed with Web engineers for making progress Internet of things in home network system:

- Interoperability between Web based application and device based approach such as ECHONET Lite
- Network Security for delivering network access to a device, whose CPU capacity is low. Study about home network design, adjusted different regulation in every region and country, is needed.

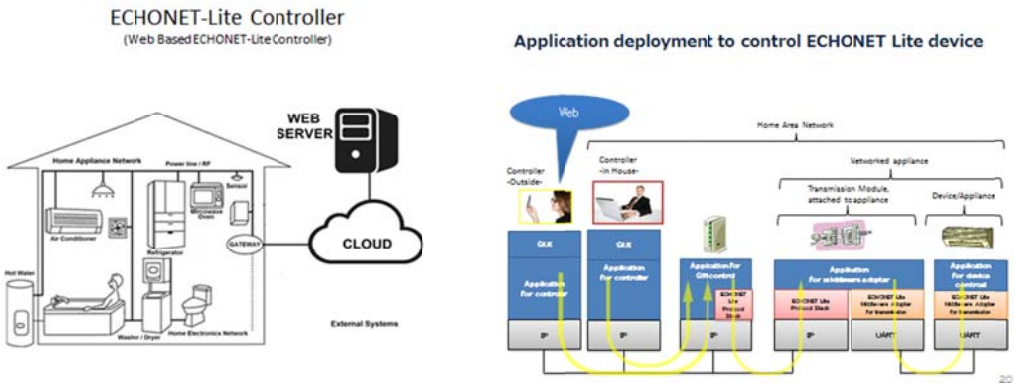

Exhibit4: ECHONET Lite ongoing studies