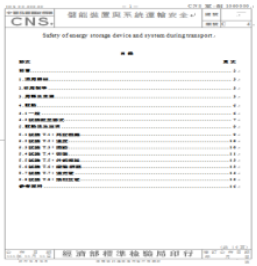
社區型智慧家庭節電系統標準檢測驗證計畫

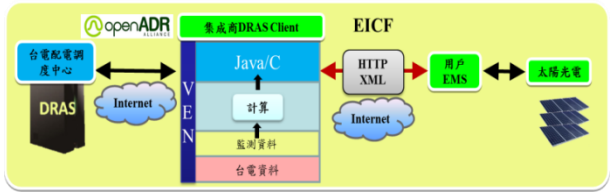
執行單位	經濟部標準檢驗局	計畫主持人	謝翰璋 主任秘書

為達成政府將電力資訊傳送至家庭端政策，AMI至HEMS通訊技術遴選測試，及AMI與HEMS網路層互通性檢測技術研究，能完備所需檢測技術與能量；研究UN 38.3有關儲能電池系統之運輸防護安全之驗證技術，可提升國內自主化驗證技術，協助業者就近測試，大幅減輕產品送到國外之運送困難及人員差旅等成本支出；106年完成用戶群代表執行自動需量反應及限制分散式風/光發電之逆送電量(至配電饋線)時，與上游(電業)及下游(用戶)之間所需互通性介面標準。107年進一步考量儲能系統與配電饋線主變分接頭之饋線電壓協調，且進而完成互通性測試案例與測試標準。

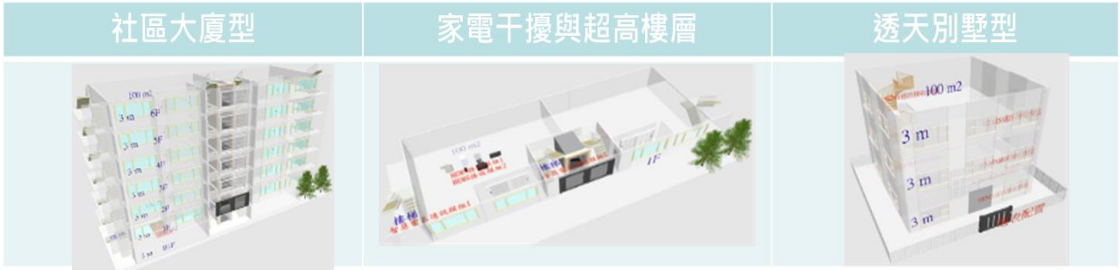
- 國際需量反應OpenADR標準檢測技術研究
- 國內第一套TaiSEIA智慧家電協定第三方檢測工具
- AMI至HEMS通訊模組試驗場域，與檢測規範
- AMI至HEMS通訊模組網路層互通性測試案例



標準草案



運用OpenADR調度PV之軟體系統架構



AMI至HEMS通訊模組試驗場域

技術介紹

以研究國際儲能系統運輸安全防護規範標準UN38.3為目標，相關的檢測技術，評估對儲能系統之性能、可靠度等產生之影響，藉此提供儲能系統驗證上有更完善之失效評估方法及判定準則，尤其國內以外銷導向，此類產品在空運或海運方面，需要進行有關運輸配送之環境失效與安全性能驗證，若無法完成此最後一哩路，將嚴重影響外銷產值，故本計畫研究成果，將可確保產品運送之公共交通安全並促進產業蓬勃發展。所提出的用戶群代表與上、下游之間執行空調卸載與發散式電源發電所需之互通性Use case及所需資料介面，有助於擴大:(a)自動需量反應、(b)分散式風/光發電之併網、(c) 用戶群代表之發展及(a)～(c)相關微電網產業之發展。

目前發展情形

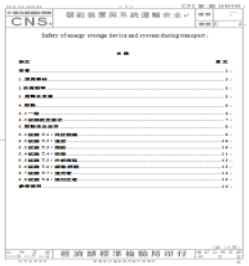
近十年國際車廠爭相推出環保節能電動車，其主要動力來源為鋰電池，鋰電池儲能系統成本下降，國際車廠也乘勢發展定置型儲能系統並有量產產品問市，但是為了提高電池性能效率與降低線路傳輸成本，需要將電池芯(Cell)串並聯組合成為高電壓輸出方式以滿足高效率性能的要求，可能在使用過程中發生過度充電、過度放電等誤用情況或遭受各式環境因子的影響，造成系統失效甚至起火爆炸等意外，故儲能系統產品性能與安全驗證技術為世界各國重視及持續發展的指標。提出用戶群代表與上游電業以及與下游同一饋線用戶執行空調ADR、PV發電RPL、用戶儲能系統、配電饋線主變分接頭(TC)等電壓協調調度所需之互通性測試標準。，並已研擬六個Use Case。107年度擬對適用於我國用戶群代表的ADR及RPL適用之軟體系統架構與互通性介面規格，發展測試樣本(Device Under Test，DUT)。據之研擬用戶群代表對上游電業的DRAS，以及對下游HEMS、商業大樓EMS等，執行空調卸載及太陽能逆送電量限制所需的互通性測試標準。並研擬(1)與上游電業執行社區及商業大樓空調卸載與分散式太陽能逆送電量限制所需的互通性Test Case與互通性測試標準；(2)進一步考量饋線電壓協調之互通性Test Case與互通性測試標準。

Smart home energy-saving system’ s test specification and certification program

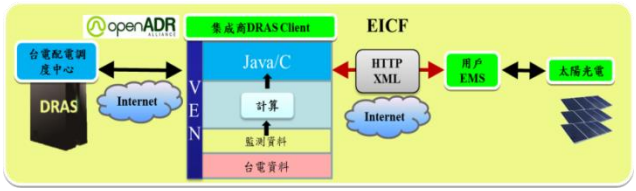
Execution Unit	Bureau of Standards, Metrology and Inspection
Project Director	Secretary General Han-Chang Hsieh

Due to government policy about power energy information, we are going to evaluation AMI to HEMS communication tech, research Network layer interoperability test method, setting test tech and capacity completely；UN 38.3 The testing technology for the safety of transport protection of Energy Storage System can enhance domestic self-testing technologies, near-field testing, and greatly reduce the cost of shipping such products to overseas destinations as well as personnel travel expenses；106 years Completion of the required interoperability standards between upstream (electrical) and downstream (users) when the user group representative performs automated demand response and limits the amount of reverse power delivered to the distributed wind / solar power generation (to the distribution feeder). 107 years Further consider the energy storage system and distribution feeder main transformer tap feeder voltage coordination, and then complete the interoperability test cases and test standards.

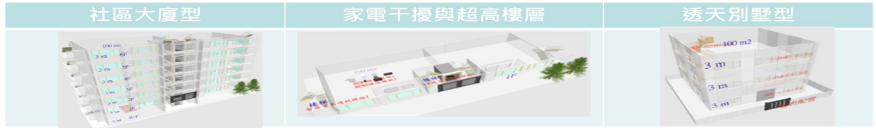
- The research of OpenADR test specification.
- The third party testing tool of TaiSEIA Smart Appliances.
- The test field and testing specification of AMI to HEMS communication module.
- The test case about Network layer interoperability of AMI to HEMS communication module.



Standards draft



Software system architecture for scheduling PV on OpenADR



AMI to HEMS Communication Test Field

- Energy storage system has been used in residential, business and power grids and other fields, but such products are manufactured, it must go through the transport and distribution processes before they can reach the hands of customers, transport and distribution process needs to face a variety of environmental factors Test, resulting in failure or accidental energy storage components, affecting public transport and related personnel around the security, so the plan to research the international energy storage system transport safety standards UN38.3 as the goal, the relevant testing technology, evaluation of the Energy storage system performance, reliability, etc., Therefore, the research results of this project will ensure the public transport safety of products and promote the industrial.
- To conduct the Automatic Demand Response(ADR) and to limit the PV reverse power (RPL) to the utility network ,aggregators have to communicate with the utility and electricity customers, based on which we propose a set of interoperability standards covering : 6 use cases and related data interfaces、test cases on the aggregator's EMS software and the so derived test standards.
- The proposed are interoperability standards which include the use cases、data interfaces and the test standards on aggregator's energy management system(EMS) for with the utility and the electricity customers on both customers' automated demand response(ADR) load shedding and their limitations of photovoltaic(PV) reverse power to the utility network.

  The proposed can assist the development of : (a)ADR、(b)distributed wind and PV access with utility network、(c)aggregators and the related (a)~(c) microgrid industries.