Lesson Learnt Report

Education (Schools) Living Laboratories: Sector-wide engagement and impact

Project LLS1

23 April, 2020

ORGANISATION NAME

About i-Hub

The Innovation Hub for Affordable Heating and Cooling (i-Hub) is an initiative led by the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) in conjunction with CSIRO, Queensland University of Technology (QUT), the University of Melbourne and the University of Wollongong and supported by Australian Renewable Energy Agency (ARENA) to facilitate the heating, ventilation, air conditioning and refrigeration (HVAC&R) industry's transition to a low emissions future, stimulate jobs growth, and showcase HVAC&R innovation in buildings.

The objective of i-Hub is to support the broader HVAC&R industry with knowledge dissemination, skills-development and capacity-building. By facilitating a collaborative approach to innovation, i-Hub brings together leading universities, researchers, consultants, building owners and equipment manufacturers to create a connected research and development community in Australia.

i-Hub Lessons Learnt Report

Guidance notes for completion of the Lessons Learnt Report:

- This report is intended to be made public.
- Please use plain English, minimise jargon or unnecessary technical terms.
- Please use your organisation's branding for the report.
- The report should meet your organisation's publishing standards.
- Please use one template per each major lesson learnt and include as many as are relevant for your sub-Project. If what you learnt is more technical, this is the section to include technical information.
- The content of these Lessons Learnt Reports can be compiled (and updated, where necessary) for inclusion in the (public) Project Knowledge Sharing Report, for submission at the completion of your sub-Project.

Lead organisation	Queensland University of Technology; University of Wollongong
Sub-Project number	LLS1
Sub-Project commencement date	01/07/2019	Completion date	30/06/2022
Report date	17/04/2020
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Lessons learnt

Lesson learnt #1	Energy Consumption in Educational Facilities

Category	Technical					
Choose from:	*Technical*	*Commercial*	*Social*	*Regulatory*	*Logistical*	*Other (specify)*

Describe what you learnt about this aspect of the Project.

Education facilities in general and schools in particular typically have high levels of energy consumption, representing a large percentage of the facilities running cost. In the US, for example, schools constitute 8% of the total commercial buildings energy use and its energy bills are the second-highest operating expense, following the salaries. Due to the major social importance of school buildings, the energy performance of these facilities has been subject of interest around the world. To assess and improve the energy performance of schools benchmarking is key. Effective energy benchmarking identifies and employs key performance indicators (KPIs). The most widely employed KPI is the energy use intensity (EUI, in terms of the energy consumption normalised by floor area). The schools EUI varies across countries mostly depending on climate, heating/air conditioning systems and the school density. In Australia, previous studies have shown an average EUI of 50 kWh/m², which was the lowest of all Australian commercial buildings studied. This top energy performance of schools was attributed to the lack of data from the coldest states (TAS and VIC) and the majority of schools in the dataset for one particular state (NSW). Due to the inexistence of specific studies on the literature on KPIs targeting to assess the value of renewable energy, an avenue for future research is to link the value of renewable energy to the education sector. As a result, the Living Labs projects (LLS1 and LLS2) will focus on developing these purpose-oriented KPIs.

Please describe what you would do differently next time and how this would help. What are the implications for future Projects?

N/A

If your Project learnings have identified any knowledge gaps that need to be filled, please state it below.

There is insufficient energy performance data for educational facilities in the cooler climates of Australia. In addition, the current literature also lacks KPIs that assess the value of renewable energy in the educational sector.

Please include any other information you feel is relevant or helpful in sharing the knowledge you learnt through this stage of the Project. This may be qualitative or quantitative and may include a graph, chart, infographic or table as appropriate.