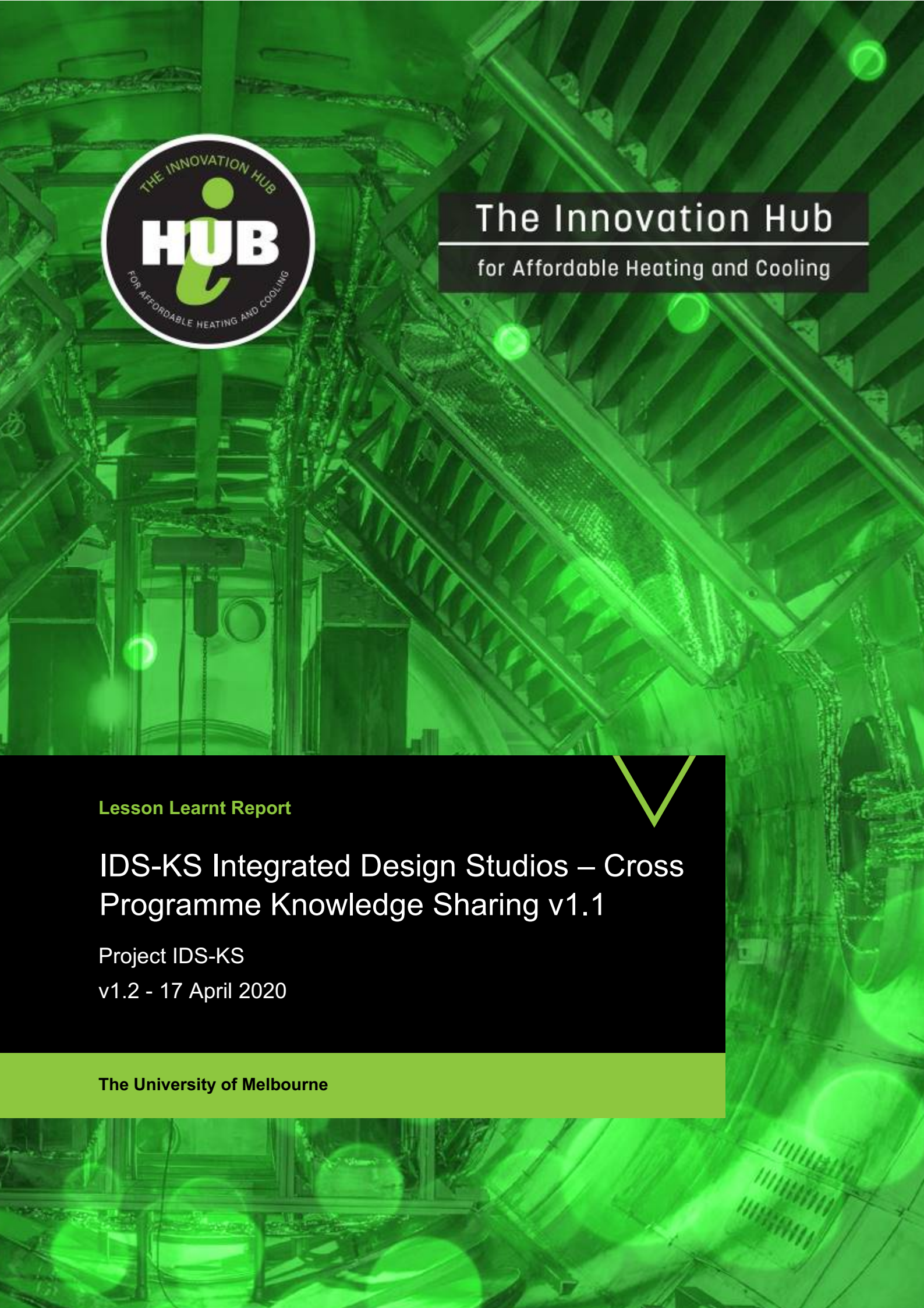


Lesson Learnt Report

IDS-KS Integrated Design Studios – Cross Programme Knowledge Sharing v1.1

Project IDS-KS

v1.2 - 17 April 2020

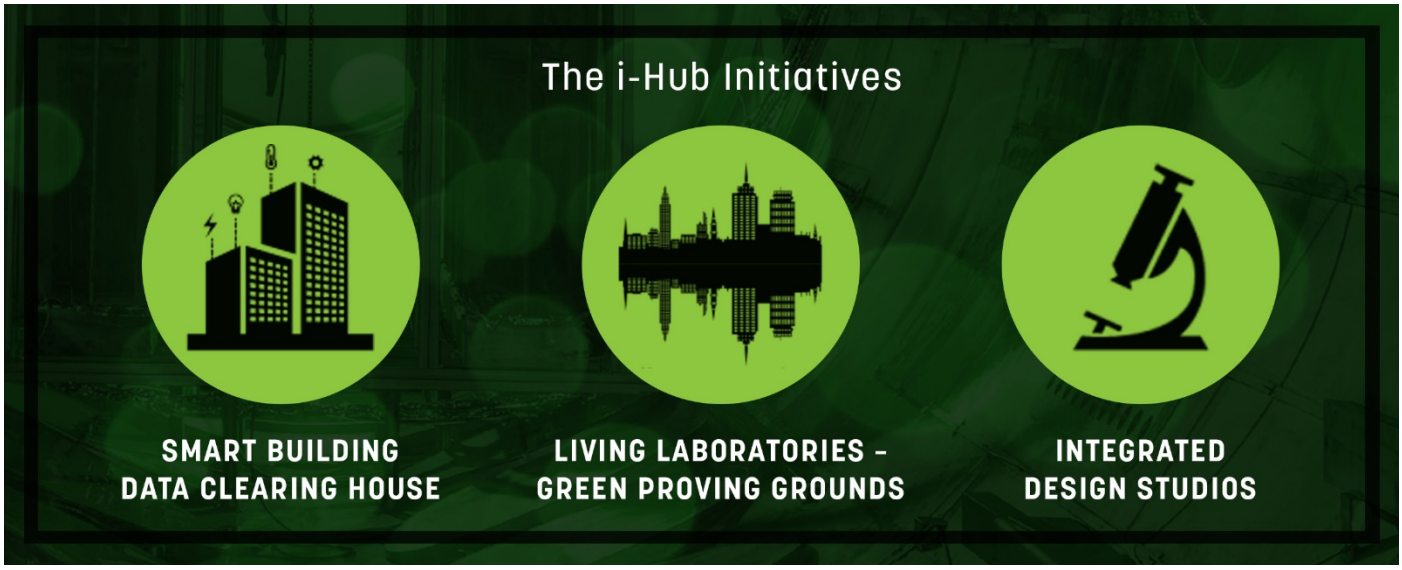
The University of Melbourne

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.

This Project received funding from ARENA as part of ARENA's Advancing Renewables Program.
The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.



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	The University of Melbourne		
Sub-Project number	IDS-KS		
Sub-Project commencement date	20 January 2020	Completion date	30th May 2022
Report date	9 April 2020		
Contact name	Brendon McNiven		
Position in organisation	Enterprise Professor (Architectural Engineering)		
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Lessons learnt

Lesson learnt #1	Integrated Design Process - one size does not fit all					
Category	Technical.					
Choose from:	*Technical*	*Commercial*	*Social*	*Regulatory*	*Logistical*	*Other (specify)*

Describe what you learnt about this aspect of the Project.

In taking the integrated design process consolidated from the literature search and applying it to the first two integrated design studios (IDS's), it was clear that the process needed a high degree of customisation. Variations between the studios included tailoring for:

- Studio Leaders style/preferences. While the studio leader is an IDS specific role and will not exist per se in practice, the individual styles and preferences of the players involved in leading design will. We felt it important to let the leaders dictate aspects related to their style of working to get buy in and maximise chances of success. We expect this will be an element that needs to be considered in implementing in practice.
- Technical content. The high level of technical content involved in data centre design and achieving cost and operational efficiencies meant that additional measures had to be taken to ensure architecture received adequate air time.
- Willingness and available time to be involved. All parties were keen however subject to various constraints. It was important to consider this in the input (frequency and duration).

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

Be more cognisant of this going into the integrated design process planning.

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

Remains to be seen how the IDS's pan out. Learnings in this respect will be consolidated through additional studios.

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.
Reference should be made to the journal article produced on best practice integrated design to provide context.

Lesson learnt #2	The process should provide inherent wayfinding.					
Category	Technical					
Choose from:	*Technical*	*Commercial*	*Social*	*Regulatory*	*Logistical*	*Other (specify)*

Describe what you learnt about this aspect of the Project.

One of the preliminary observations in relation to process was that the curation of balance between architecture and engineering looks like it will be more successful when there is an element of inherent way finding. One of the studios asked designers to produce two designs, one from an architect's view ignoring engineering, and vice versa.

This appears to have offered some benefits in assisting the designers to set the goal posts – i.e. what might pure architecture look like, and what might pure engineering look like and how do we balance and achieve the best outcomes from there. Designers who did not do this tended to be taken along a narrower path following their noses in design development rather than knowing the possible bounds.

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

Include exercises asking designs to consider from the extremes of both disciplines.

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

Learnings to be consolidated over future design studios.

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.
Reference should be made to the journal article produced on best practice integrated design to provide context.