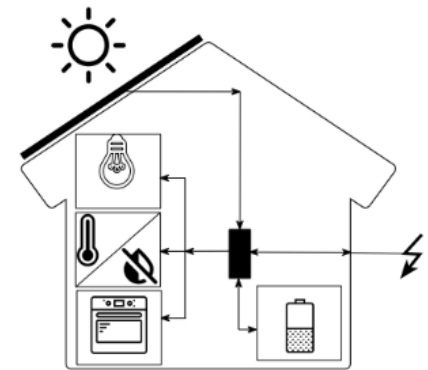


# **EBC Annex 74, 2018 - 2021**

## **Competition & Living Lab Platform**



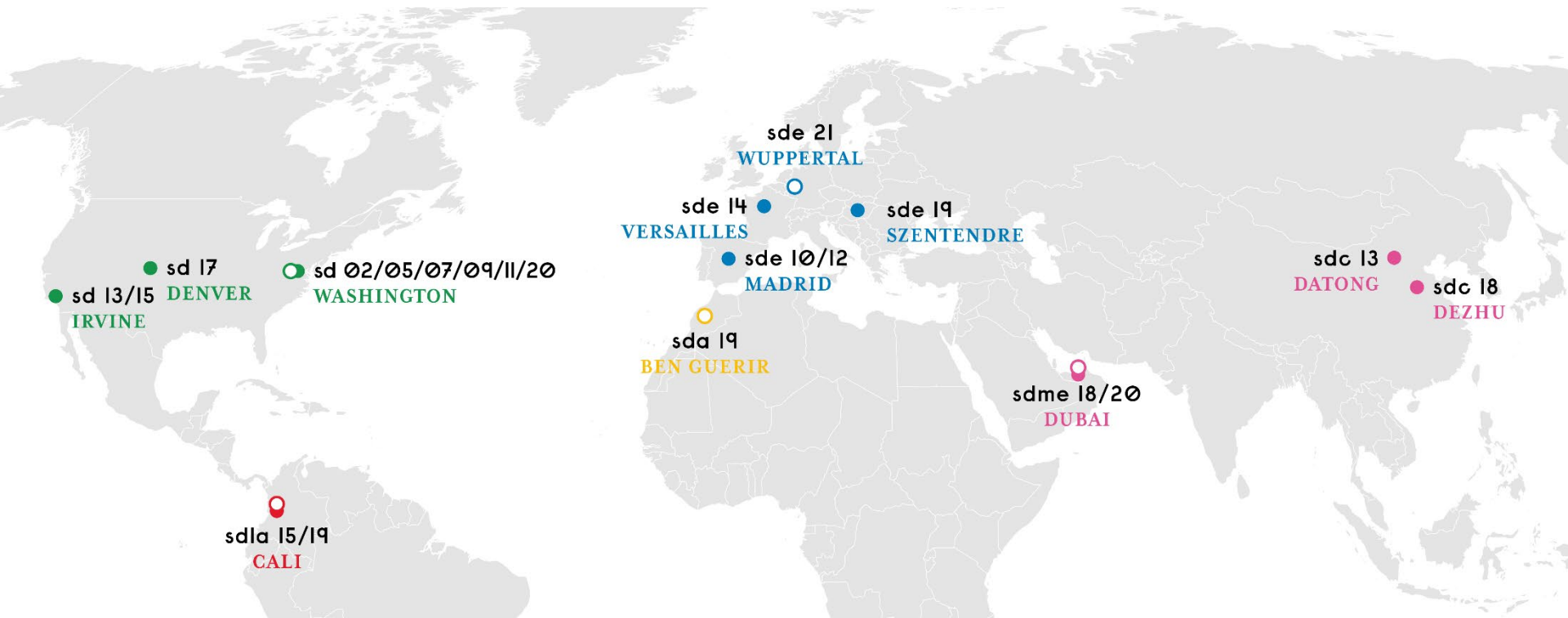
**EBC Webinar: The Science and Communication of Energy-Efficient Indoor Environments**

10<sup>th</sup> November 2020

Karsten Voss, Sergio Vega

## Background – Solar Decathlon

University teams **design, build and operate** 20 full-scale, **all-electric** experimental solar homes within each **competition** edition.

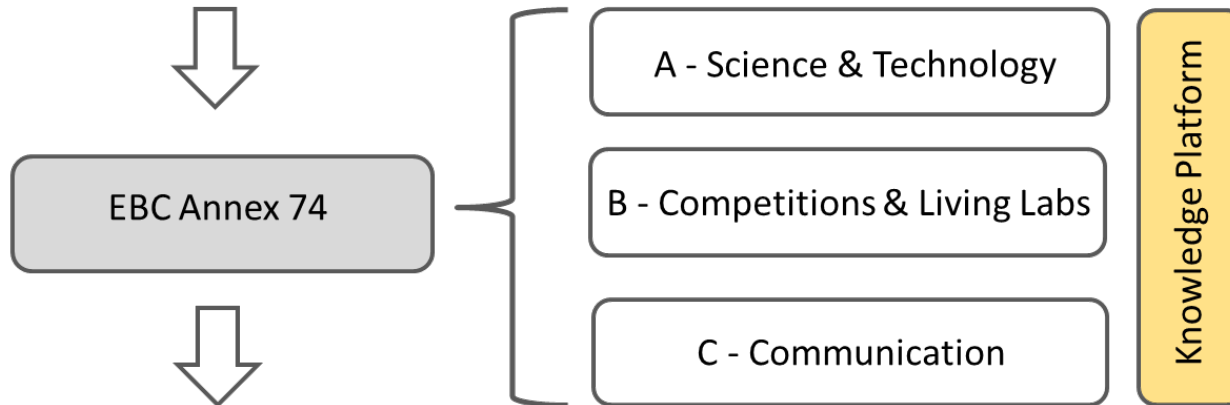




## Working Environment

### Resources

- EC project: Solar Decathlon Europe – Analysis of Results
- Impact from building related IEA Annexes / Tasks
- International Solar Decathlon Community



### Improving & Stimulating Events

- Science & Technology Report (A)
- Impact & Performance Report (B1)
- After Competition & Living Labs Scenario Report (B2)
- Linking Competition & Science
- Living Labs Networking

### Audience

- Educational Institutions
- Public Bodies
- Industry & Professionals
- Scientific Community
- Energy Policy Makers

### Participating Countries

Belgium, China, Germany, The Netherlands, Spain, Switzerland, United States

### Observers

Hungary, Morocco, United Arab Emirates, Colombia

# Building Competition & Living Labs Knowledge Platform - Documentation

**Building Energy Competition & Living Lab Knowledge Platform**
<https://building-competition.org/> **Login**

**Solar Decathlon**

Africa

China

Europe

- EU2010
- EU2012
- EU2014
- EU2019
- EU2021

Latin America

Middle East

United States


- US2002

Q Search...


organization contest/scoring teams

ATL	Atlantic Challenge
BAR	Team Resso
BUC	Team EFdeN
CUJ	Chiba University
DEL	Prêt-à-Loger
DTU	Team-DTU
FNX	Team Fenix
INS	Team Inside Out
KMU	KMUTT-Team
LUC	Team Lucerne
MEX	Team Mexico Unam
OTP	Team On Top
PAR	Team Paris
PLT	Plateau Team Universidad de Alealá

Map
Satellite




Map data ©2020 Terms of Use



Energy in Buildings and  
Communities Programme

Supported by:



Federal Ministry  
for Economic Affairs  
and Energy

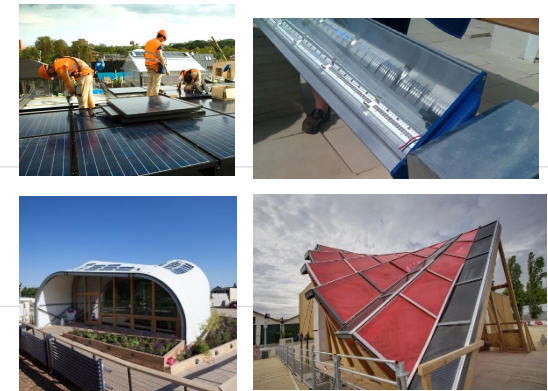
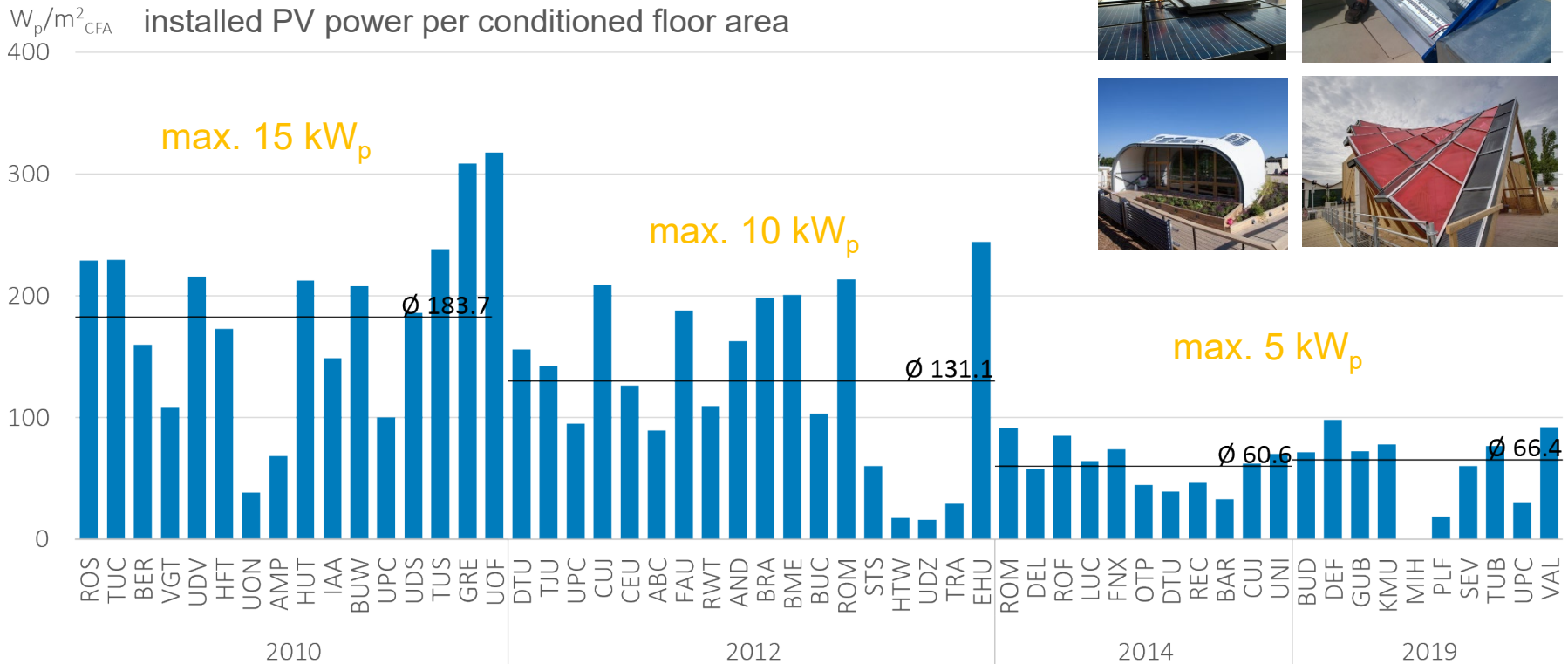
on the basis of a decision  
by the German Bundestag

# SDE Cross Analysis – Example

Energy in Buildings and Communities Programme

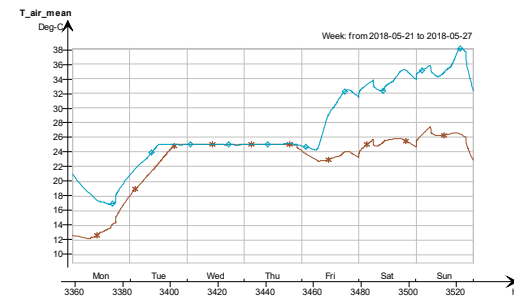
The PV system sizing reflects the boundaries set by each competition rules with the latest competition in Europe more reflecting market realistic conditions. **No monitoring on the system, but on then hose level.**

$W_p/m^2_{CFA}$  installed PV power per conditioned floor area



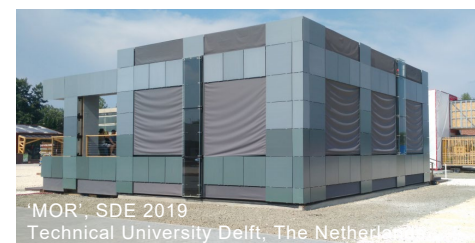
## Linking SDE & Building Science

- Collecting monitoring data and information including key strategies identified
- Create a set of “topical papers” linking the major topics of the competitions to research and IEA Annexes/Tasks
- Create a set of templates to more consequently collect building information and generate KPIs
- Providing tools for teams: circularity index, comfort
- Design performance research contests to investigate real system operation versus simulations
  - Building Grid Interaction / Energy Flexibility
  - PV Performance Ratio
  - Thermal Performance testing (co-heating test)
  - etc.

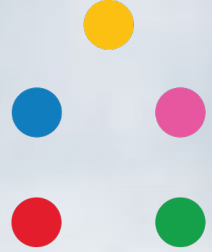


## Lessons Learned

- While SD projects are relevant showcases, they can create more impact in architectural practice when **addressing real a site context**.
- **Space economy and space sharing** demonstrate major messages to achieve affordable, climate neutral housing.
- The construction sector profits from examples of **circular design** to reduce waste and increase resource efficiency.
- Showcases are good but **more performance research** is needed to address the operation phase and reduce the performance gap.
- Connected research work may follow a competition through a **network of living labs**.







# solar decathlon europe 21

WUPPERTAL GERMANY *... goes urban!*

Solar Decathlon Europe 21 will be the first event stimulated by the work of Annex 74. It will be held in June 22 in Wuppertal, Germany: [www.sde21.eu](http://www.sde21.eu)



## Impact & Performance

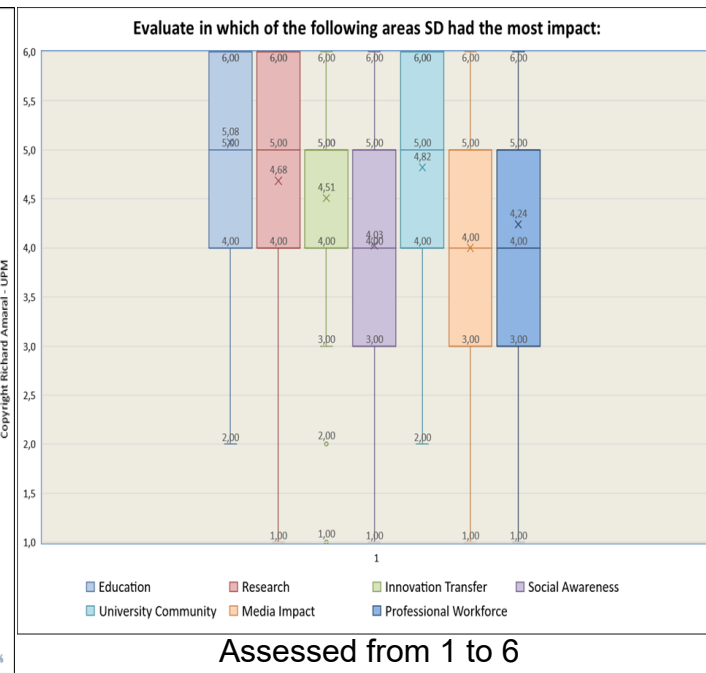
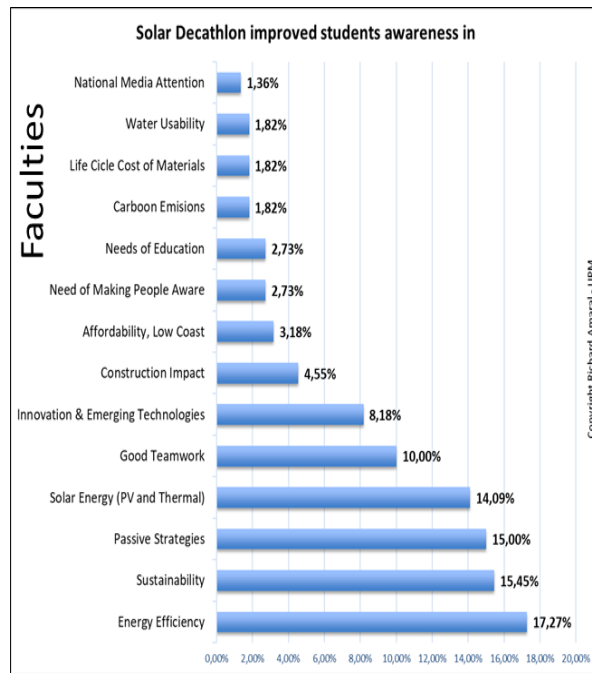
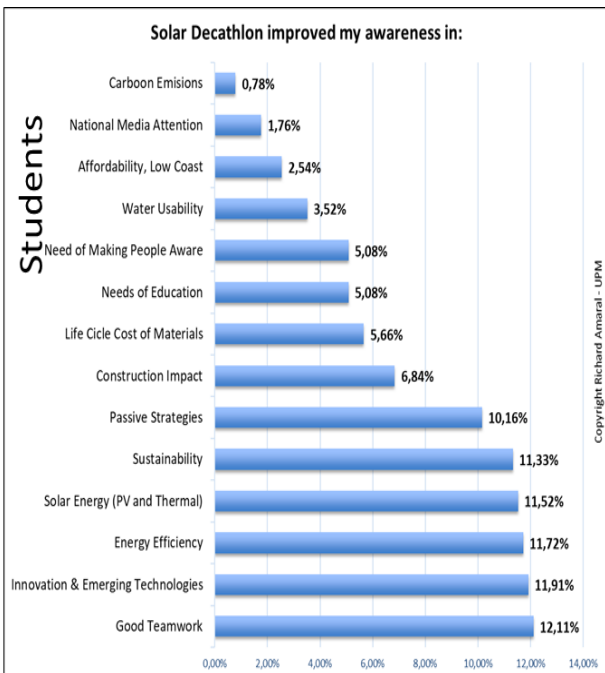
- There have been 18 editions of SD so far, with **its general and particular objectives** (education, professional training, social awareness, innovation, sustainability, energy efficiency,...)
- What has been the **real impact of SD**?
- To what extent have the objectives pursued with SD been met?
- In order to improve **the performance of SD** in different areas, we must be able to measure them.
- How do we **assess** them?
- How do we **improve** them?

### The methodology:



# Impact & Performance

**The worldwide survey** (15-30' long survey to different stakeholders – 391 Answers) plus analysis of another 3 more surveys in US, Europe, and worldwide



- 100% of students believe that they have **enhance their employability**, and 100% of Sponsors **would hire SD Decathletes**

## Impact & Performance

### The interviews

- 15 open in depth interviews to Sponsors (professionals & industry)
- 10 in depth interviews to SD Organizers worldwide (in progress)
- 60 semi-structured interviews to students and faculties

To identify **key drivers for successful competitions** and linked events

To assess **subjective SD impacts** and **how to improve SD and linked events**

### The factsheets

- 195 factsheets and info about Post Competition and Living Labs
- 15 (from 18) factsheets about Organization of SD competitions and linked events and about their outreach.

To identify **impacts and outreach from competitions** and linked events

To learn about the **objectives, strategies, and management** and how they impacted in the **outreach and SD performance**

### The variables, performance indicators, and KPIs

To assess real **impacts & performance** of SD competitions and linked events

## Lessons Learned

- SD has a **very high potential to promote both research & innovative education** strategies for students through comprehensive and transversal education fostered by universities, the competition itself, and opportunities offered by the post-competition usage of houses.
- SD **improve technical and professional skills** for the next generation of energy efficient and sustainable committed architects and engineers **and their employability**.
- SD and linked events demonstrate a **very high outreach with adequate strategies**, and it became a **key driver to foster education and awareness** of children, citizens, professionals, students, in more sustainable and energy efficient buildings and cities



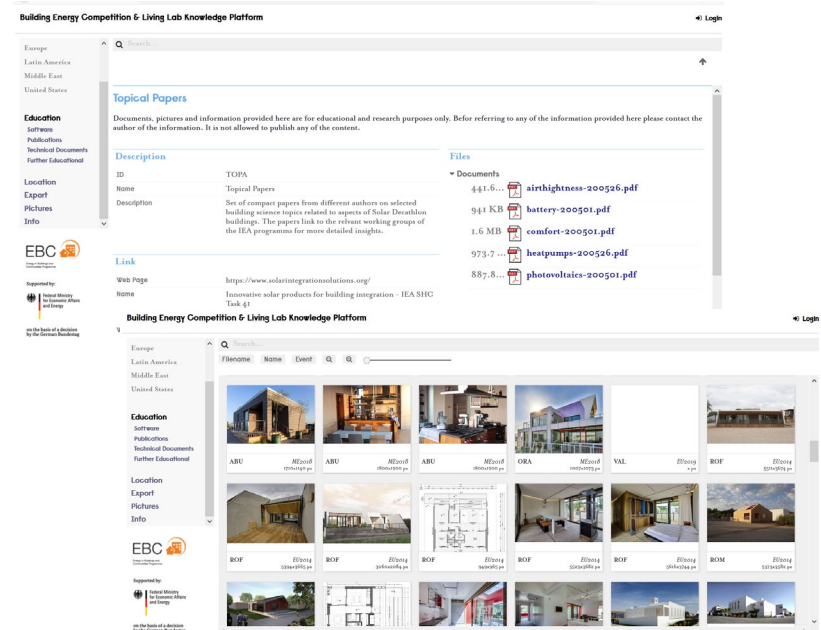
## More Information

The **knowledge platform** provides a series of information on

- Competition organization
- Competition results
- Competition houses
- Monitoring data
- Educational Material:  
Tools, Topical Papers, etc.
- Living Lab Facts

It adds to the portal [www.solardecathlon.gov](http://www.solardecathlon.gov)

**Annex 74 reports** will be made available in 2021 via the EBC portal.



The screenshot displays the 'Building Energy Competition & Living Lab Knowledge Platform' interface. The top section, titled 'Topical Papers', provides a list of documents for educational and research purposes. The table below summarizes the listed documents:

ID	Name	Files
441.6...	airtightness-200526.pdf	441.6 KB
941.1 KB	battery-200501.pdf	941.1 KB
1.6 MB	comfort-200501.pdf	1.6 MB
973.7...	heatpumps-200526.pdf	973.7 KB
887.8...	photovoltaics-200501.pdf	887.8 KB

The bottom section of the screenshot shows a grid of images representing various building projects, with labels such as 'ABU', 'BOF', 'OREA', and 'VAL'.

The public visibility of material is limited to respect copyrights. Please contact us via email for more details on login conditions: [annex74@uni-wuppertal.de](mailto:annex74@uni-wuppertal.de)