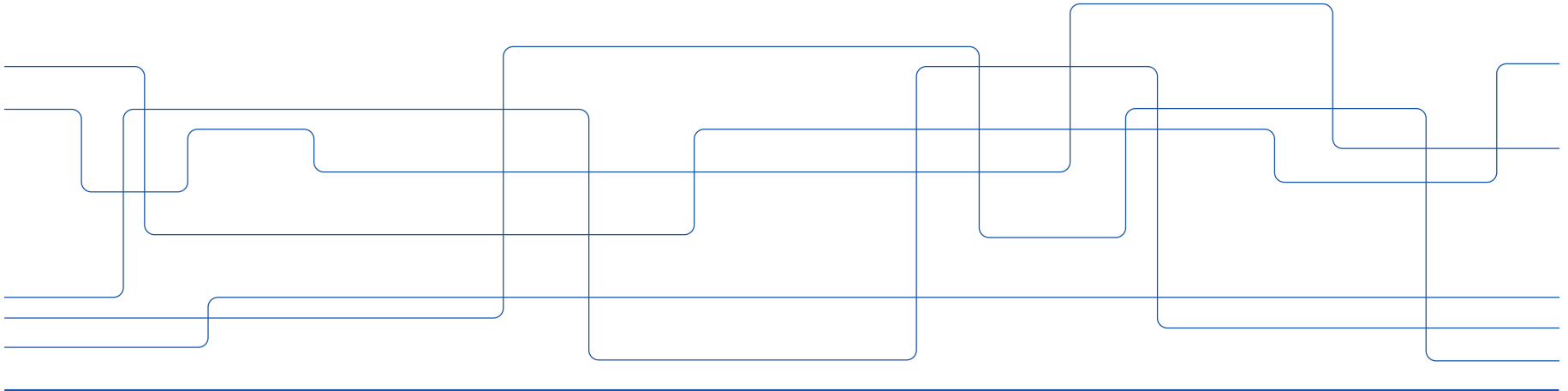




KTH Live-In Lab – Live Sessions

Testbeds for Accelerated Innovation

Jonas Anund Vogel



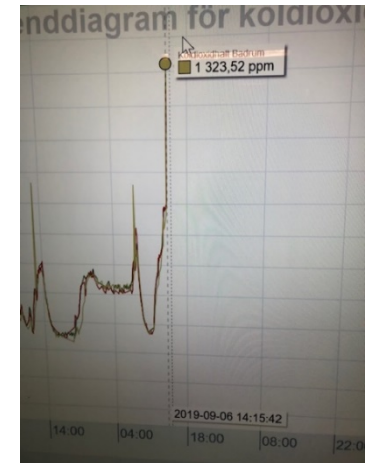
Agenda – Building ventilation post corona

10:00 – 10:50 – Public event

- Jonas Anund Vogel – KTH Live-In Lab
- Sasan Sadrizadeh (KTH)
- Jakob Löndahl (LTH)
- Aneta Wierzbicka (LTH)
- Birgitta Nordqvist (LTH)
- Jimmy Åström (Tovenco)
- Tomas Engdahl (Bengt Dahlgren)

11:00 – 12:00 For future R&D-partners

- Join the discussion **if you want to participate/fund** future R&D related to ventilation and corona/indoor air
- Also, join if you are interested in listening to discussions.





Information – Live Sessions

- **Write questions to the speakers in the chat**
- If you want to be part of/fund research, tests, demonstrations then please **type contact details in the chat.**
- **Please mute yourselves**
- Do not interrupt while the presenters are speaking.
- Questions will be discussed after presentations.

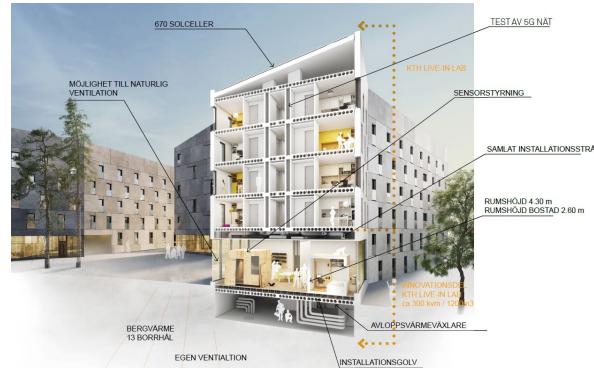
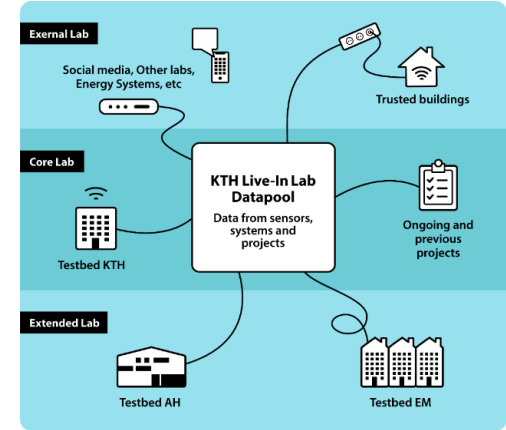




Research Centre to Accelerate innovation

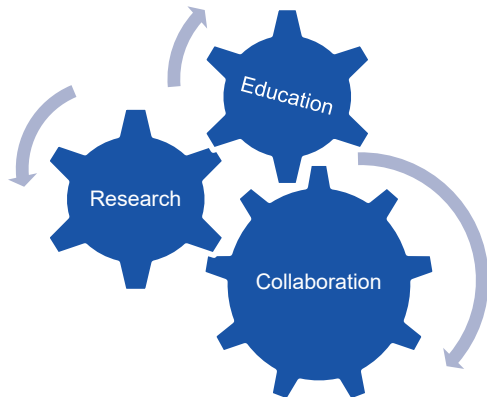


- **Test infrastructure** – Physical platform for collaboration
- **Datapool** – Storing and sharing data
- **Collaboration platform** – The interface between individuals creating value



Platform for collaboration – Enabling projects

- 18 ongoing
- 1.1 M euro In-kind
- 3.6 MEuro funding
- 71 partners



Projekt på KTH Live-In Lab

Forsknings- och utvecklingsprojekt på KTH Live-In Lab kan pågå allt från ett par veckor till år beroende på utformning. Kontakta oss gärna om du är intresserad av ett specifikt projekt.



Förbättrad borrhåsteknologi för utveckling av bergvärmesystem

Borrhål med fiberoptisk mätutrustning gör det möjligt att utvärdera termisk prestanda för borrhål av olika längder inom samma borrhållfält.

[Läs mer om projektet](#)



USB-C för energismarta byggnader

Ochno utvecklar en plattform för föresklad integrering av USB-C uttag i fastigheter, mätning av eldistribution och styrning av anslutna enheter.

[Läs mer om projektet](#)



Effektiv köksventilation med energiåtervinning

KTH och Tovenco tar fram effektivare ventilation i lägenheter genom en spiskåpa som ökar energiåtervinningen.

[Läs mer om projektet](#)



LIL - multipla testbäddar

KTH Live-In Labs plattform av multipla testbäddar kan hantera många olika produkter och tjänster - var för sig eller i ett verkligt system.

[Läs mer om projektet](#)



Occupant pro-environmental choice and behaviour



Service Design for the Sustainable Behaviour Modelling: Smart Schedule



Allergenfria inomhusmiljöer genom innovativa ventilationsstrategier

Ett projekt initierat av Karolinska Institutet avsett att testa hur luftburna allergen från pälsdjur kan minimeras i inomhusmiljöer.

[Läs mer om projektet](#)



Comparative Spill-Over And Degradation Effects Of Nudges And Boos

I ett långsiktigt randomiserat fältförsök jämförs två metoder som syftar till att förändra hushållens energi- och konsumtionsbeteende.

[Läs mer om projektet](#)



Altered – samma kran, 98% mindre vatten

Installation av extremsparande munstycken från Altered i befintliga badrums- och kökskranar.

[Läs mer om projektet](#)

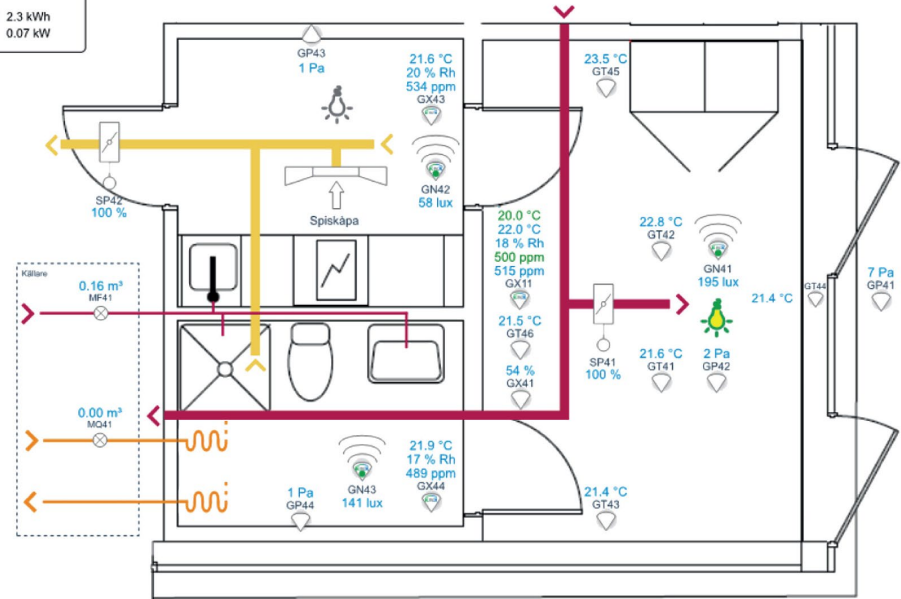


Pilotstudie för minskad vattenkonsumtion genom icke-invasiv ultraljudsteknik

Installation av Labros vattenmätningsteknik ger förbättrad kunskap om hur mätning av vattenförbrukning på individuellt kan stänga överförbrukning av vatten och energi i flerfamiljshus.

[Läs mer om projektet](#)

- Temperature
- RH
- CO₂
- Ventilation airflows
- Ventilation T_{in}, T_{out}
- Window opening
- Pressure
- Noise level
- Sensors for fire detection
- DHW
- Tap water
- Electricity metering for light and outlets
- Occupancy detection
- Tablet
- Allergenes





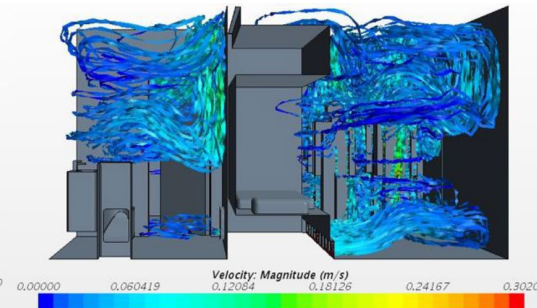
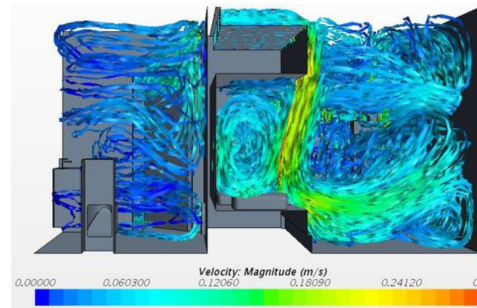
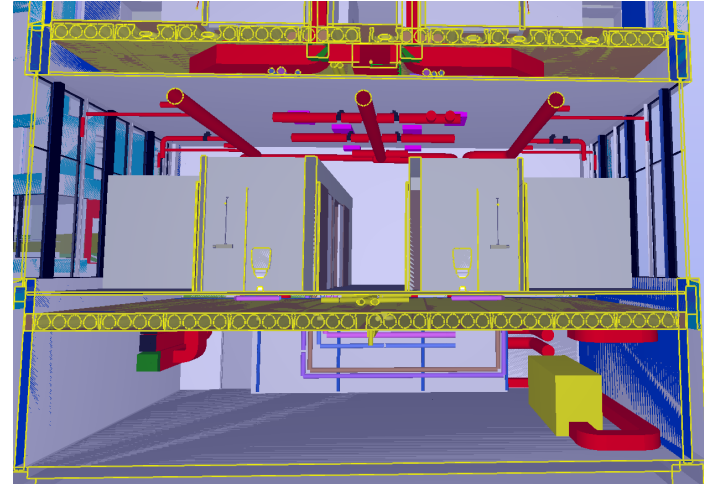
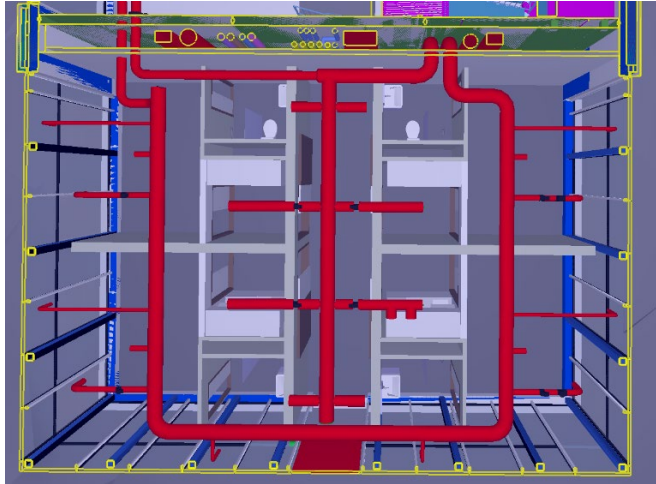
3D-virtual tour of Testbed KTH

K T H
LIVE-IN LAB

<https://my.matterport.com/show/?m=ikckmvpKH5F>



Flexible testinfrastruktur

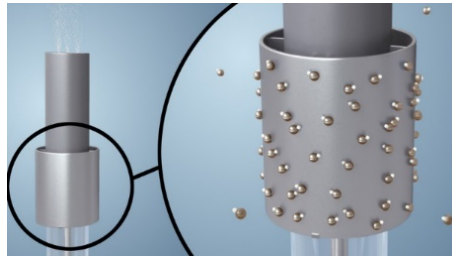
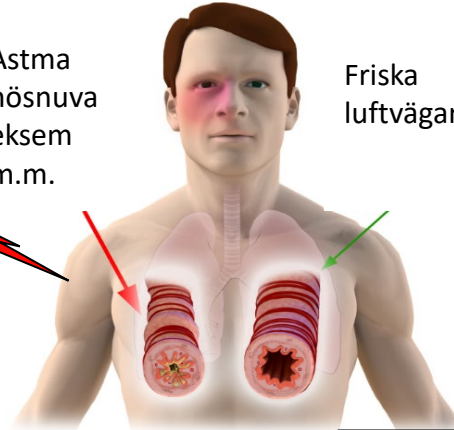


Allergen free indoor environments with innovative ventilation strategies



Astma
hösnuva
eksem
m.m.

Friska
luftvägar



Abstract

Background: Allergy to dogs is frequent and exposure to allergens often inevitable. How different dog allergen particles spread in the environment is therefore of almost importance in order to link allergy challenge with allergen composition, allergenicity and asthma.

Objective: The aim was to determine the composition of five dog allergens in airborne particles of different sizes under controlled conditions.

Methods: Four dogs were sampled for 2 hours each in a 22m³ chamber. Fur and saliva samples were collected and three different methods of collecting aerosol particles applied. The gathered material was analyzed using ELISA for the five dog allergens Can f 1-4 and 6.

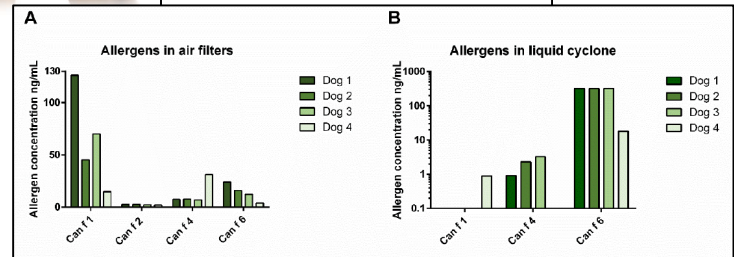
Results: Can f 4 and Can f 6 was both associated to particles of 0.34 – 38.3 µm size compared to Can f 1 which was only detected on particles >2.8 µm. Can f 6 was the most abundant allergen in liquid cyclone samples, while Can f 1 was prevalent in air filters. Can f 3 was below detection limit in all air sampling methods and Can f 2 was only found in minute amounts on air filters.

Conclusion: Four dog allergens could be detected using all three methods, however at different degree implying different aerosol abilities. The allergens being present on a wider range of aerosol particles could impact the severity of allergic reactions. Depending on the allergen characteristics, different sampling methods may be advantageous.

Clinical implications: Dog allergens are associated with aerosol particles of different sizes, which could modulate the allergenicity of the different allergens and might warrant different preventions.

Capsule summary: Dog allergens can be detected in air using several sampling methods, however to a varying degree. Single dog allergens have different aerosolization mechanisms and particle association, which may impact their allergenicity and ability to spread.

Key words: Dog allergens, aerosol particles, airborne allergens, air sampling



Ongoing Studies – Ensuring sustainability and equality of water and energy systems

- Investigates possible benefits related to gray water reuse and waste water heat exchangers.
- Two case studies: KTH Live-In Lab and HSB Living Lab

Financed by FORMAS 2019-2021.

Total budget 9MSEK

KTH (Watercentre, Energy Technology, Historical Studies and:

Akademiska Hus, SVOA, Sthlm Exergi, Einar Mattson, Familjebostäder, HSB, Uponor, Graytec, Värmdö, SKT, Svenskt Vatten, Mälardalens Högskola.

[More info at: www.water.abe.kth.se/research/decentralised/seqwens](http://www.water.abe.kth.se/research/decentralised/seqwens)



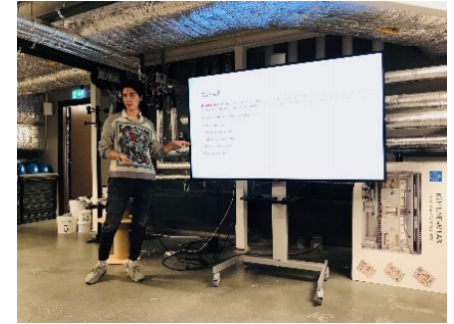
Results - Living services portfolio creation for smart and sustainable buildings

The main research questions were:

- How to implement a human-centric data-driven approach to the service design process?
- How can services be designed to save resources?

Results

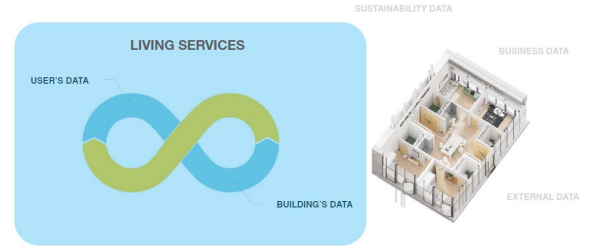
- New services related to kitchen design and appliances can lead to 7-10% electricity reduction and 5-7% water reduction
- Services related to wellbeing can lead to 5-7% electricity savings and increase user experience (UC) 10-15%
-



Example data

```

{
  "user_id": "U001",
  "device_id": "D001",
  "user_name": "John Doe",
  "device_name": "Smartwatch",
  "location": "Kitchen",
  "timestamp": "2023-10-27 10:30:00",
  "battery_level": 85,
  "heart_rate": 72,
  "social_media": "open",
  "temperature": 22.5,
  "humidity": 60,
  "ei_consumption": 150,
  "co2": 400,
  "water_consumption": 5.5
}
  
```



Positioning data Outlook schedule Heart rate Social media (open) Water consumption Humidity EI Consumption CO2

Ongoing Studies – Nudges and Boosts

How can we *effectively* help people overcoming neglect, lack of information & mistakes?

Nudges

- Harness existing heuristic and biases
- Adjust choice architecture so that biased choices yield best results



Defaults
(e.g. outlet with fixed timer)



Visually framed signals



Social norms



Information



Simple Rules



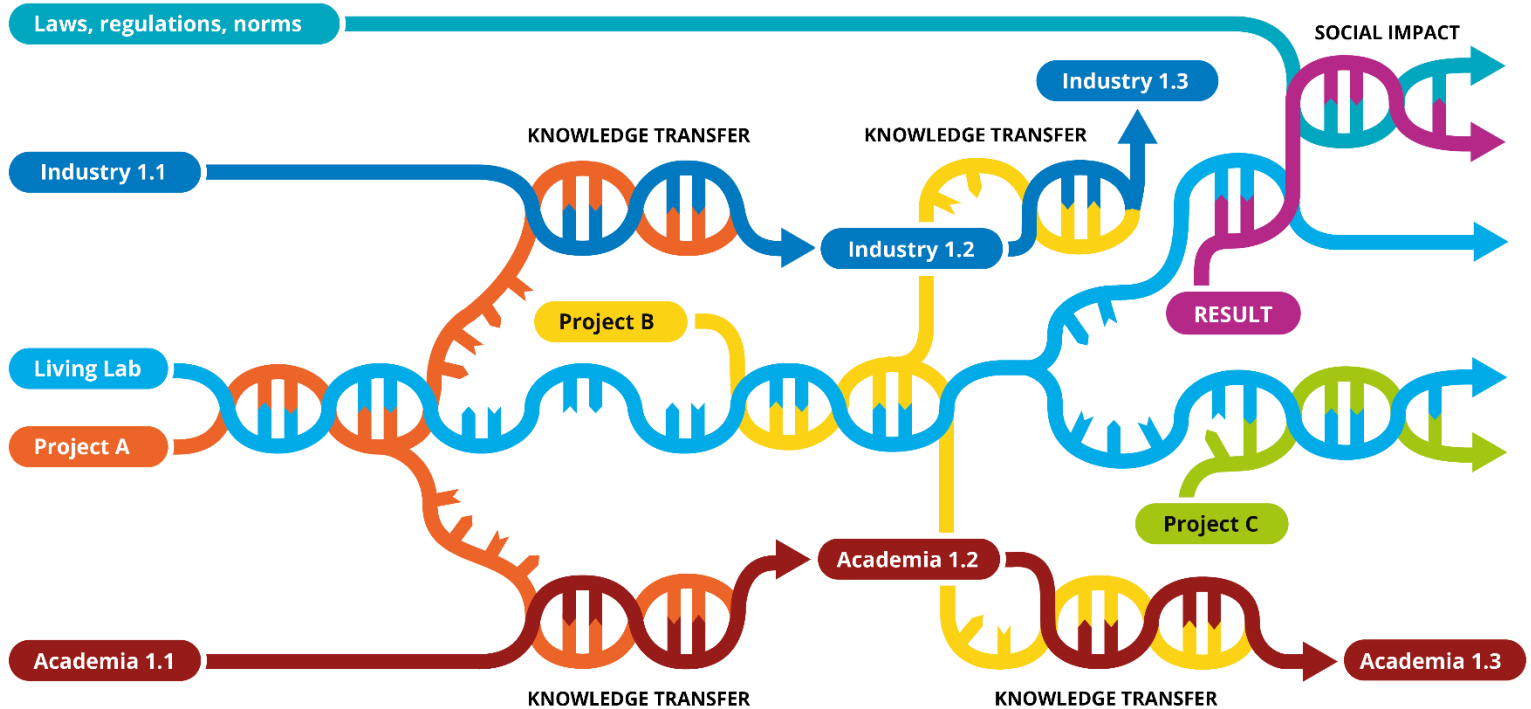
Supporting Infrastructure

Boosts

- Train heuristics to avoid biases
- Develop simple and trainable strategies so that people can overcome their shortcomings

Live-In Labs DNA and M-RNA

Impact through Co-creation and learning in teams





Centrumpartners



AKADEMISKA HUS



Finansiärer och projektfinansiärer



Samarbetspartners



Projektpartners

Asplan Viak, Avanti System Aktiebolag, Bengt Dahlgren AB, Bosch Siemens, Botrygg, Boverket, Brugg Cables, Climacheck Sweden AB, Danfoss, Equa, Ericsson, Familjebostäder, Geobatteri AB, Graytec AB, Grunditz Göransson Arkitekter, HP-borringar i Klippan AB, HSB, HSB Living Lab, Hyllteknik, IKANO Bostad, Invisense, Karolinska Institutet, Karolinska Universitetssjukhuset, Labtrino, LifeAir, MUOVITECH AB, Myrspoven, Nowab AB, Ochno AB, Silver Life, SINDEQ Borrteknik AB, Stockholm Exergi, Stockholms, Universitet, Stockholm Water and Waste Company, Stures brunnsborringar AB, Svensk Energi & Kylanalys AB, Svensk Vatten, SWECO Environment AB, Telia, Tosibox, Triopipe Geotherm AB, Uponor AB, Vasakronan, Vinden, Värmdö Kommun, WellPerform, Wessman Entreprenad AB

