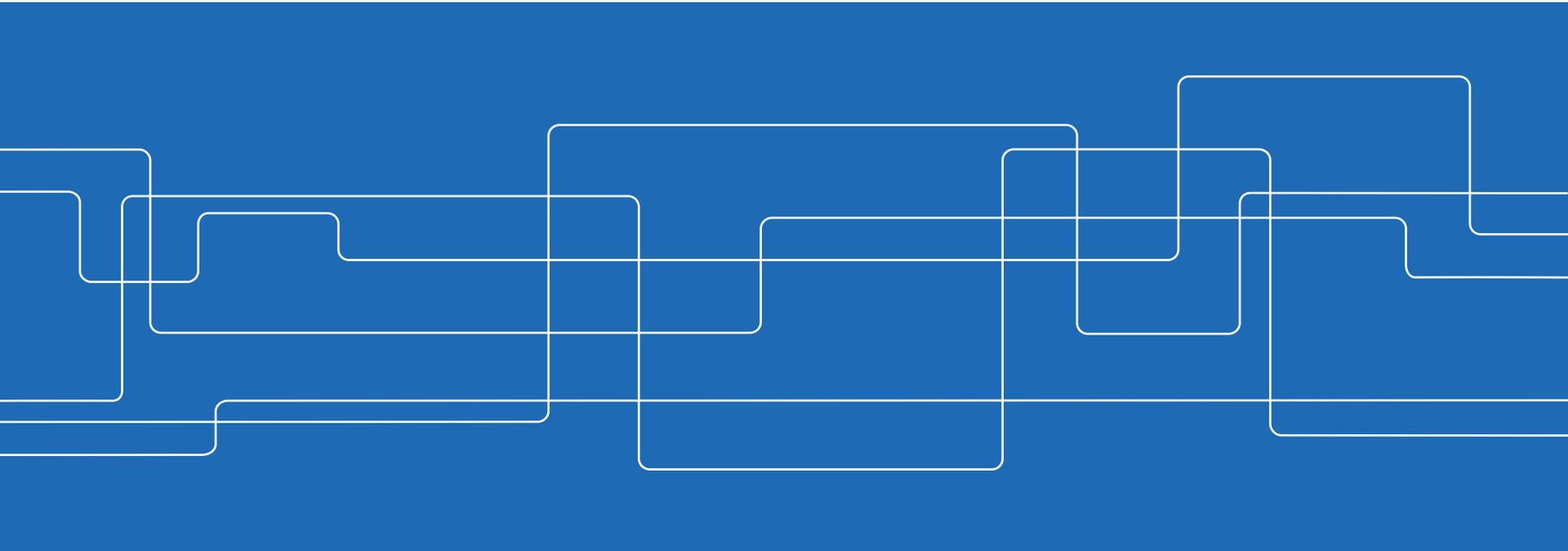




K T H LIVE-IN LAB

EXPECT INNOVATION



Background

40% energy is used in the built environment

20-20-20 EU Target

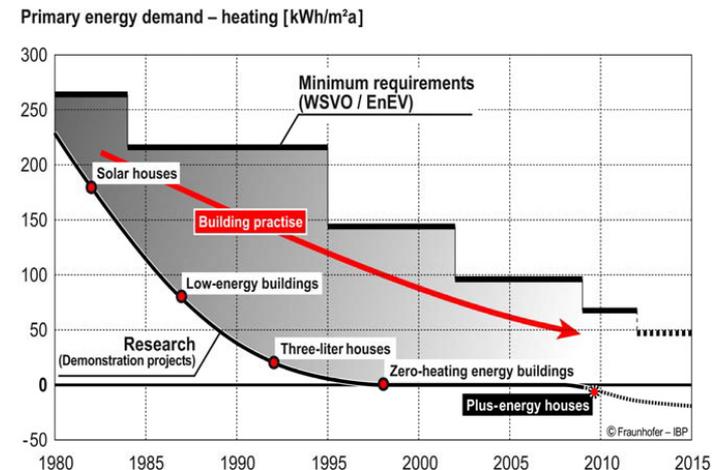
- -20% GHG (1990)
- +20% RW
- +20% Energy efficiency

EPBD recast (2010): future buildings will be:

- Low-Energy Buildings
- Zero-Net Energy Buildings (ZEB)

Extensive efforts to reduce energy use in new buildings

Older buildings consume more and still constitute the major share of the building stock





ICT and the built environment

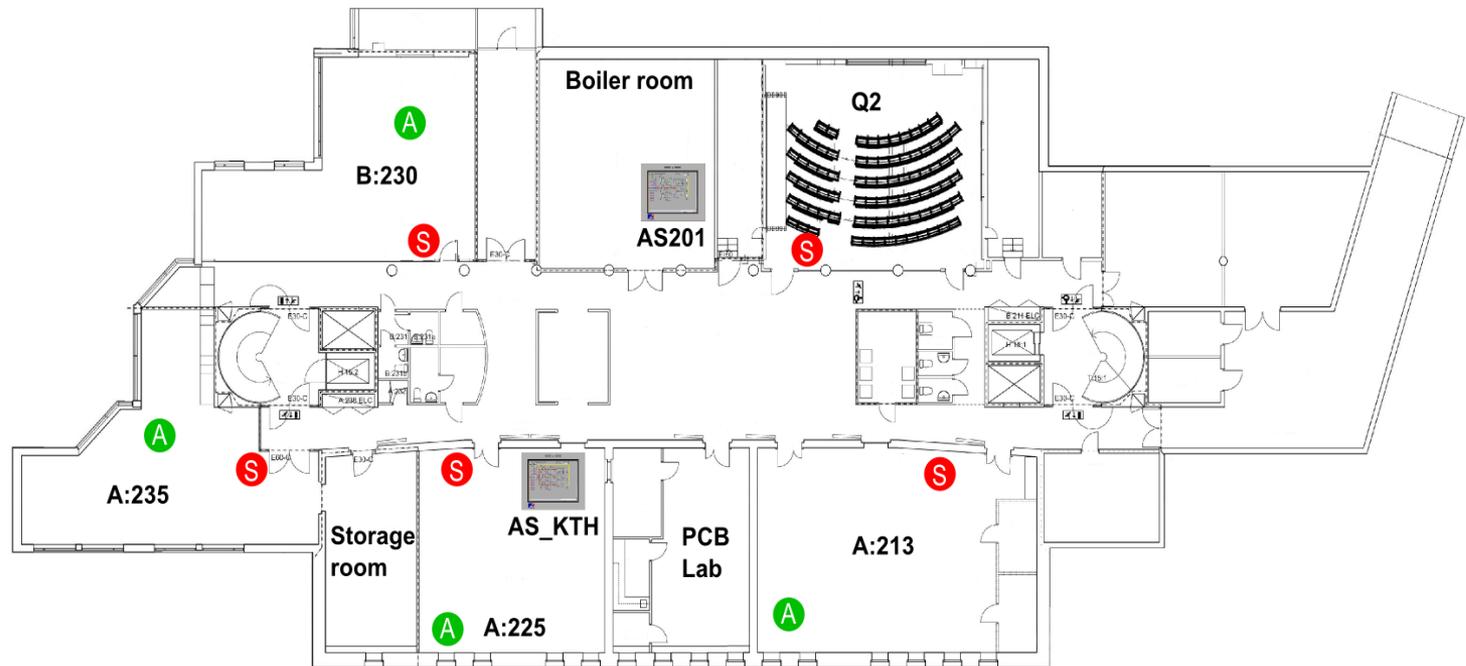
Previous work has shown that there are inefficiencies due to, among others:

- Human behavior
- Faulty systems
- Design and construction standard
- Heating and ventilation system performance degradation

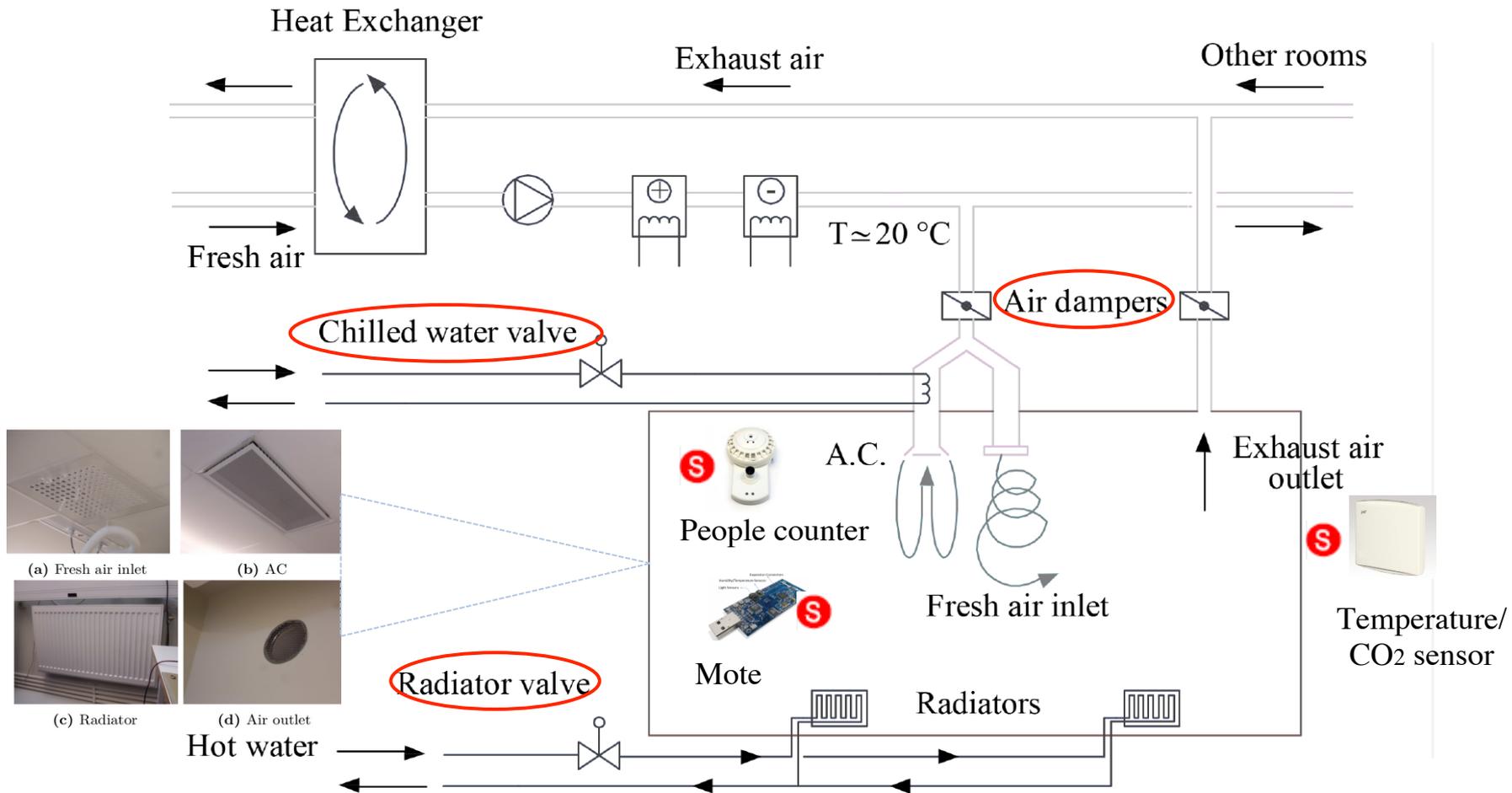
Growing importance of how ICT can improve the energy management in our society

- Improved buildings monitoring
- Understand complex phenomena like human behavior
- Better building systems control
- Improve the services systems

Previous work: KTH EES Smart Building Testbed

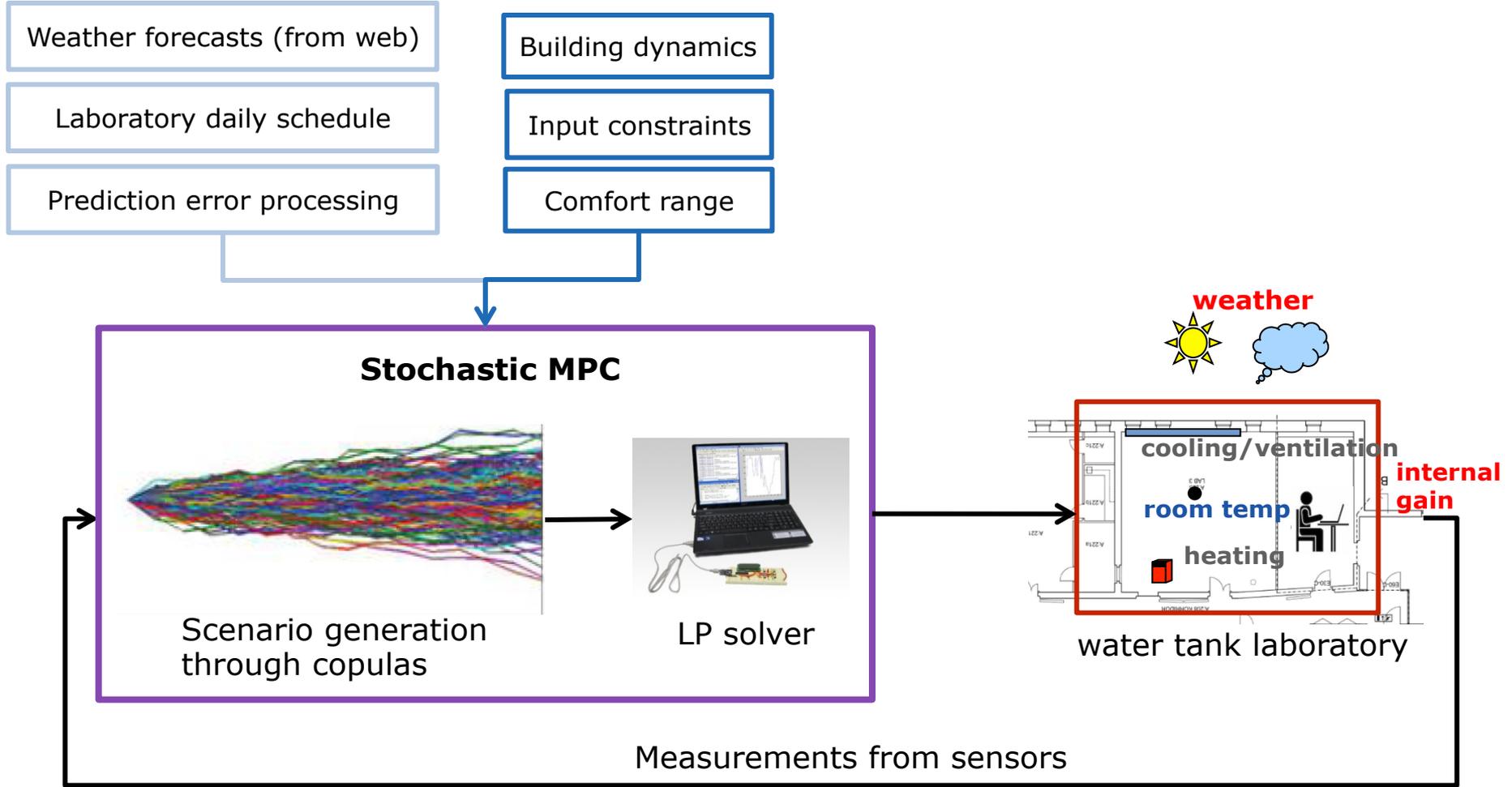


Smart buildings in practice: ~~WiFi~~ ^{Access} ~~network~~ ^{network}



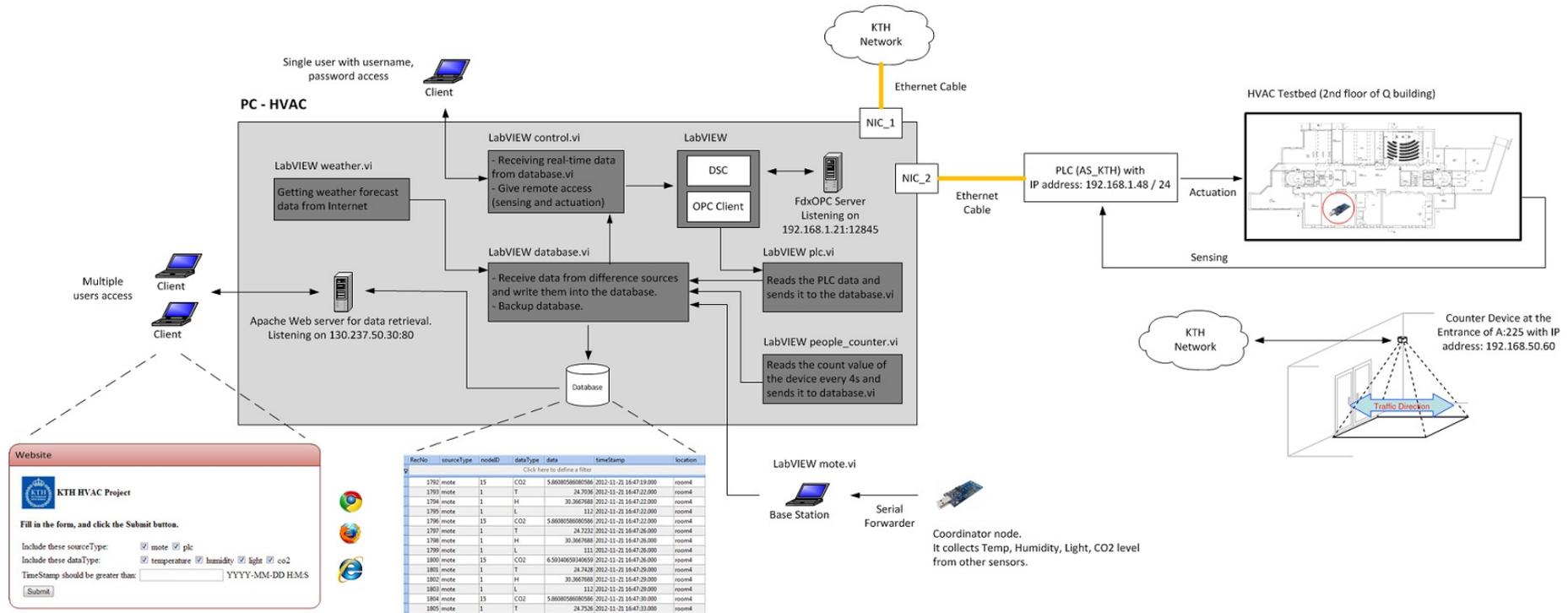


HVAC Control Scheme





Architecture





Lessons learned

Positive experiences

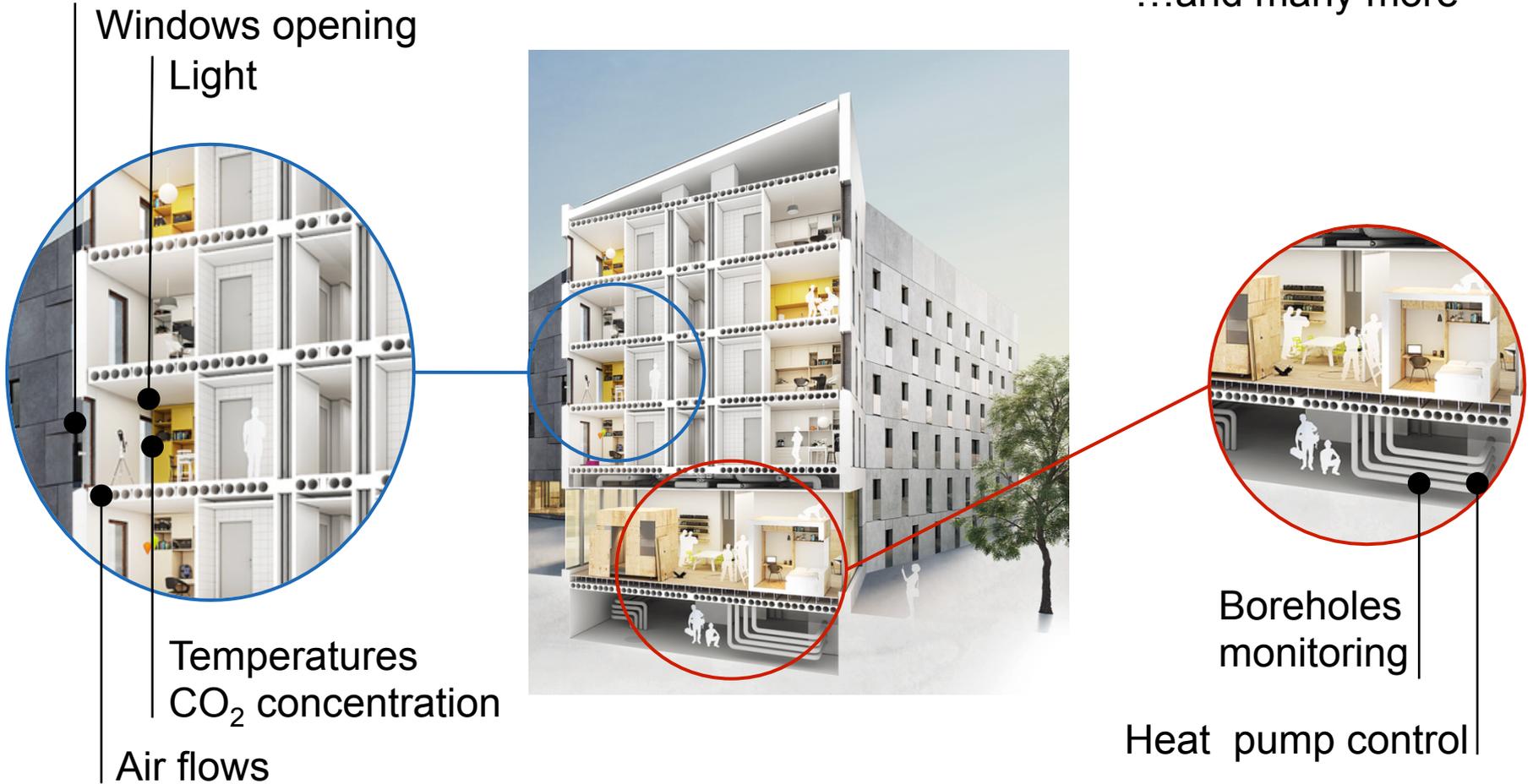
- Flexible system and architecture
- Reproducibility
- Encouraging results (10-30% energy savings)
- Reliable control system

Challenges

- Implementation labor
- Standardization
 - Software & programming languages
 - Hardware
 - Communication protocols
- Proprietary systems
 - Welcome open source approach!

Example of sensors

...and many more



Wireless sensors for flexibility

Adaptive Controllers: pilot projects

AKADEMISKA HUS

Residential buildings: Live-In Lab



Office buildings: Undervisning Hus





Live-In Lab IoT workshop

Venue: Dome of Vision,
Valhallavägen 79

Date: 26th November

Link for registration: [https://
www.liveinlab.kth.se/kalender](https://www.liveinlab.kth.se/kalender)

The screenshot shows the KTH Live-In Lab website. At the top right, it says "KTH LIVE-IN LAB | KTH Live-In Lab in English". The navigation menu includes: HEM, UTVECKLING OCH FORSKNING, OM KTH LIVE-IN LAB, UTBILDNING, KALENDER, and KONTAKT. The left sidebar has "KTH LIVE-IN LAB" and "KALENDER HÄNDELSER". The main content area is titled "KTH LIVE-IN LAB / KALENDER" and "Kalender". It highlights the event on "TI 1 NOVEMBER - ON 30 NOVEMBER". The specific event is on "25 november", "Fredag, 16:00 - 18:00", titled "HÄNDELSER KTH Live-In Labs Digital Platform", with speakers "Marco Molinari & Elena Malakhatka" and location "Dome of Visions". A "Läs mer" link is provided. To the right is a calendar grid for "November 2016" with days of the week (Mån, Tis, Ona, Tor, Fre, Lör, Sön) and dates 1-30. Below the calendar are links: "Lista resten av året", "Skriv ut denna lista", "Exportera kalender", "Nuvarande tidsintervall", and "Exportera resten av året". The footer contains "KTH", "Intresserad av KTH Live-In Lab", and "Kontakt".