



Fiskarhedenvillan



Mätplan

Renson



Behovsstyrd ventilation med sensorer

-juli 2020

Luvian



Luftrening och kylning med borrhål

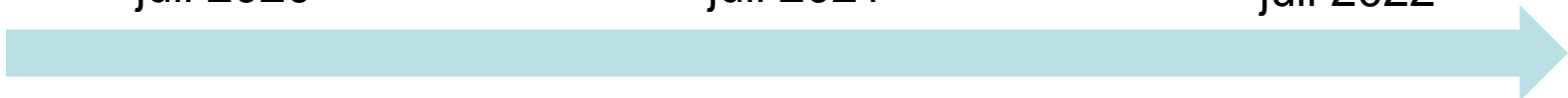
-juli 2021

Östbergs



Fukthalt i luften med olika rotormaterial i värmeväxlare

-juli 2022



Demand-controlled ventilation, findings from Dalarnas Villa

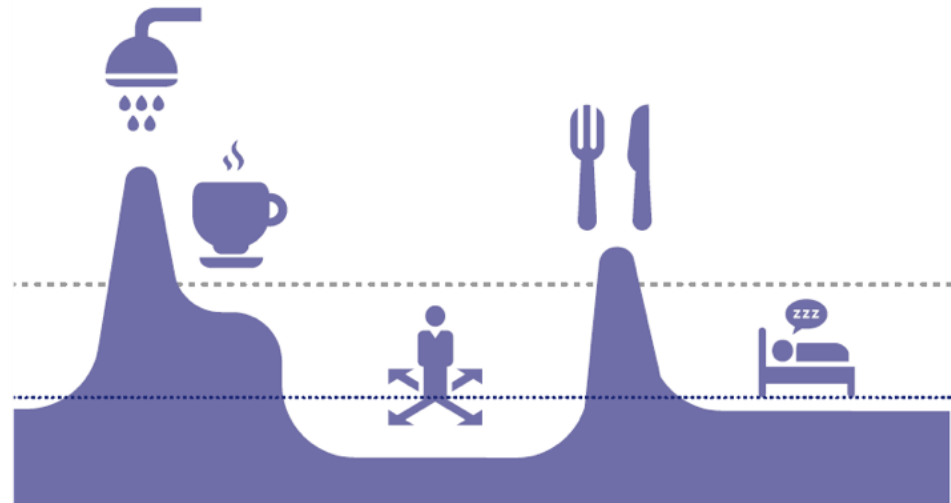
Ian Garman

Doktorand, Byggteknik, Högskolan Dalarna

Home ventilation

Demand-controlled

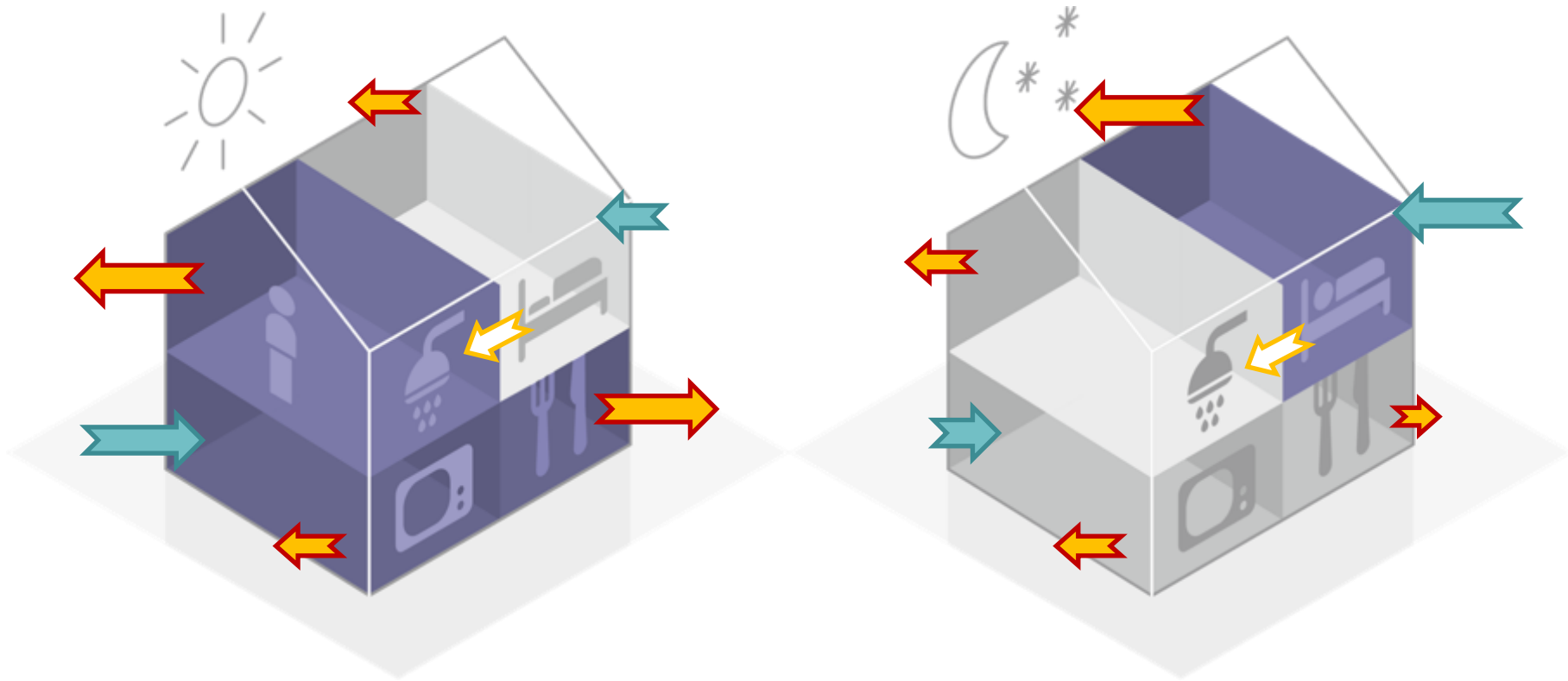
Schedule air flow levels by what is *likely to happen*
...or by what we can detect *actually happening*



Demand controlled ventilation

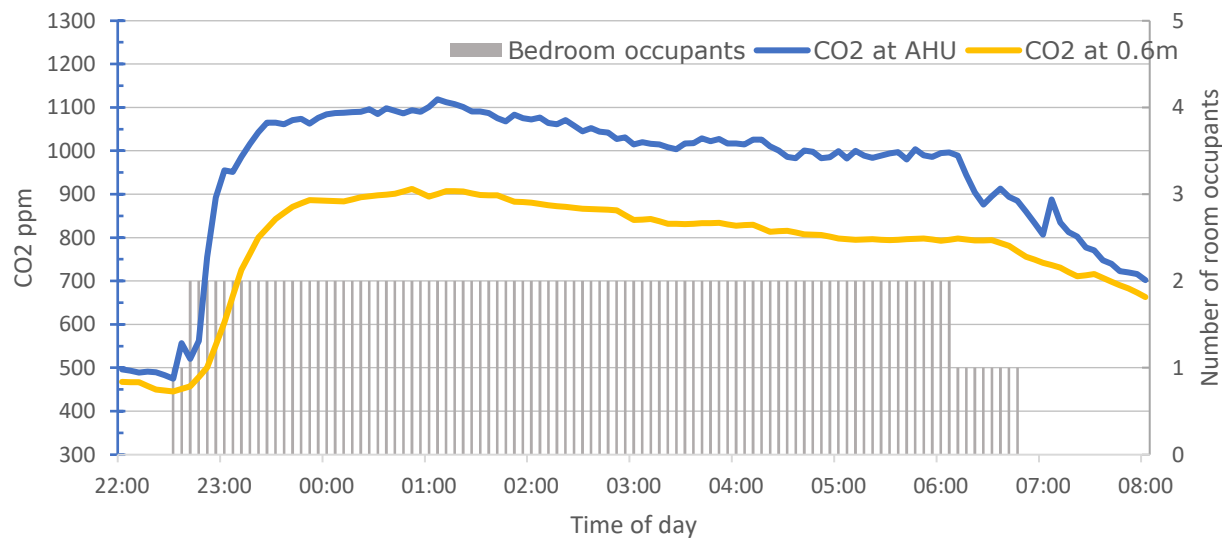
Exhaust ventilation

Demand-controlled



Findings

Ideal occupancy

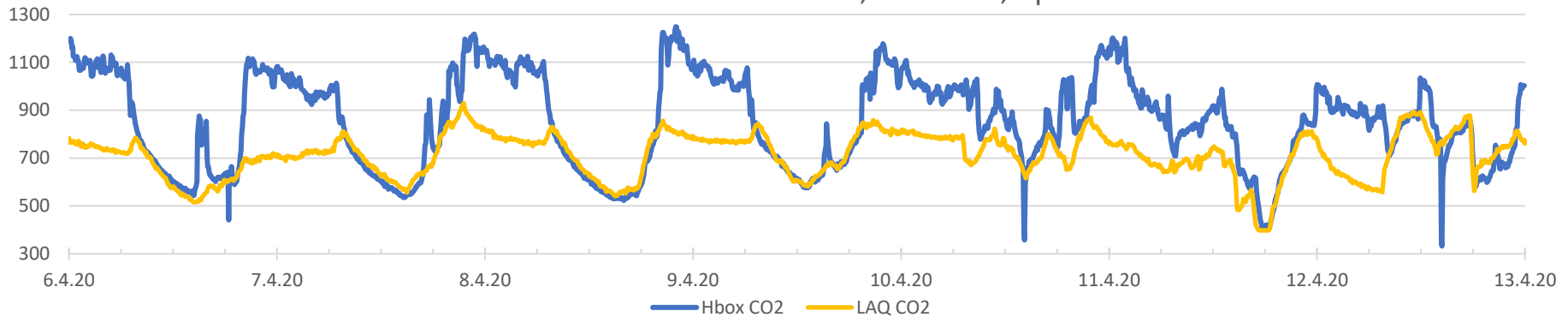


- Controlled conditions, door shut, uniform occupancy
- Two stable CO₂ levels, one at ceiling, one at breathing level
- Under 'svensk norm' ventilation, slower rise but the stable CO₂ level approached 2000 ppm

Findings

Actual occupancy

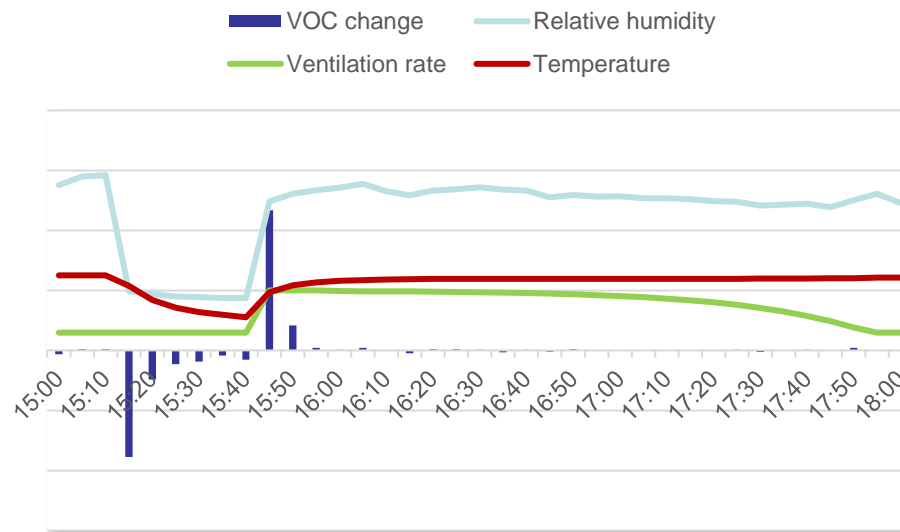
Bedroom CO2 vs time under Standard DCV, Mon–Sun, April 2020 week 15



- Same room, almost identical monitoring setup
- Flexible room use in evening. Doors open?
- No clear overnight baseline

Findings

Sensors may interpret wrongly



- System based on rate of change can be fooled by very clean air
 - Air is clean after airing, but 'dirtier' than it was
 - AHU runs hard
- How to help customers 'trust' the system?

Looking ahead

Corona, homeworking and DCV

Advantages

- A system based on responding to occupants' behaviour will work to maintain indoor environmental quality
- No need to re-program
- Ability to zone homes may help limit transmission within families

Drawback

- DCV aims for energy savings by focussing air supply where and when needed. Harder to save money if average occupancy rate increases

Demand-controlled ventilation, findings from Dalarnas Villa

Thank you for your attention

Jonn Are Myhren

Docent, Byggteknik, Högskolan Dalarna
jam@du.se

Ian Garman

Doktorand, Byggteknik, Högskolan Dalarna
iga@du.se