

INDEKLIMA & DATA

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Carsten Rejnhold Jørgensen, Lindinvent Aps

LINDINVENT[®]
INDOOR SPACES **SMARTER**

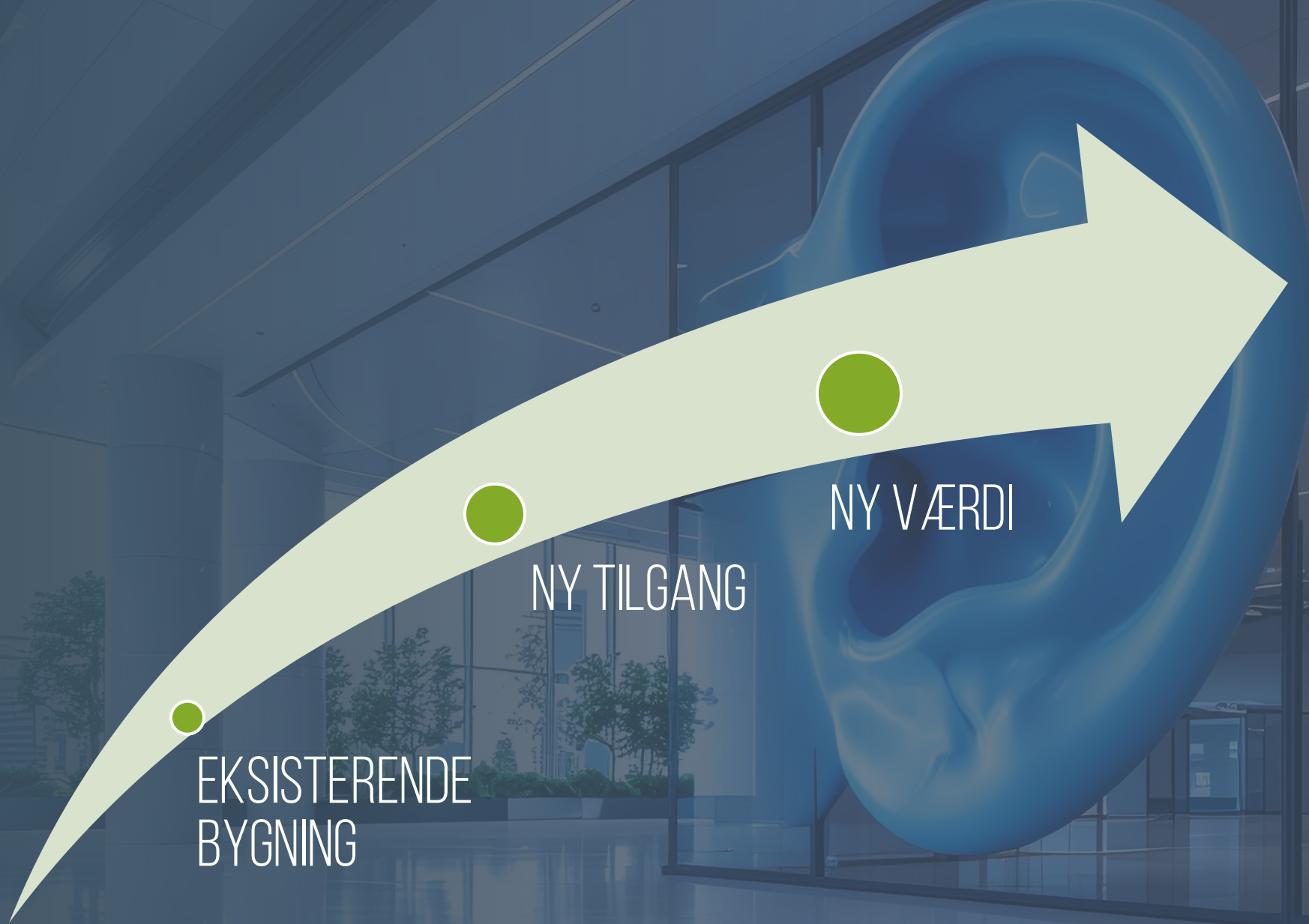
INDEKLIMA & DATA

INTRO OG UDFORDRING I DAG

CASE

ACTIONS

RESULTATER



NAVIAIR: SMART ENERGIRENOVERING I KØBENHAVN

Fra traditionel ventilation til datadrevet energieffektivitet

NAVIAIR: KRAV SPECIFIKATION

- KOMPLET INDSIGT I INDEKLIMAET PÅ RUMNIVEAU
- FORSTÅELSE AF, HVORDAN BYGNINGEN BENYTTES OVER TID
- NEM OG HURTIG FEJLFINDING
- ENERGIBESPARELSER



DATADREVET STYRING -> ENERGIEFFEKTIVITET

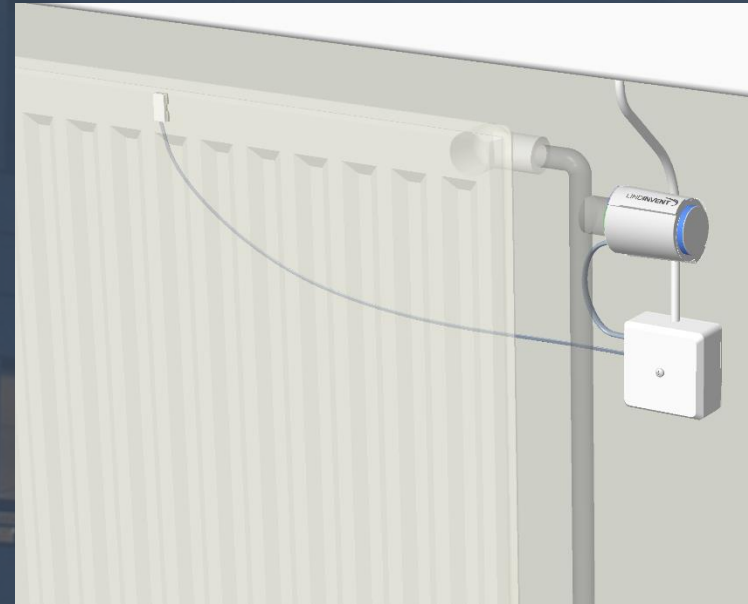
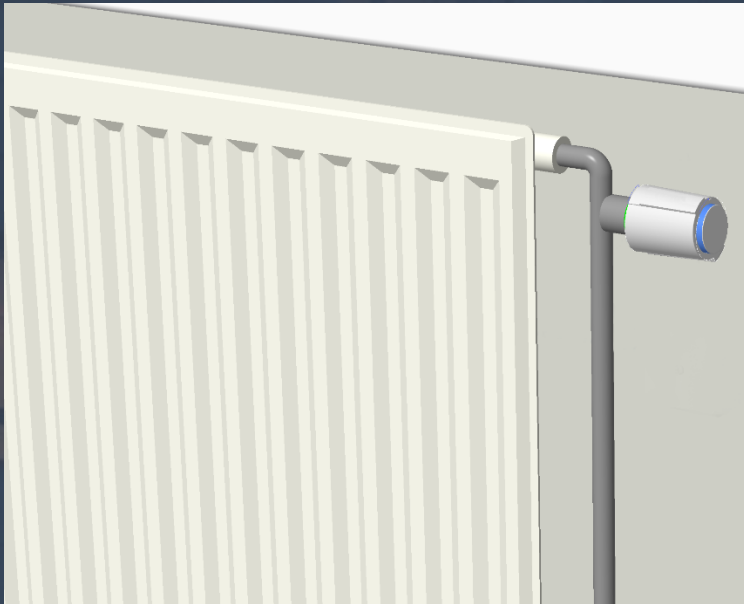


CAV



DCV

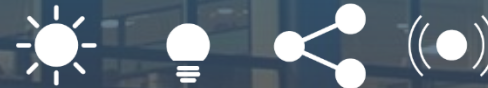
DATADREVET STYRING -> ENERGIEFFEKTIVITET



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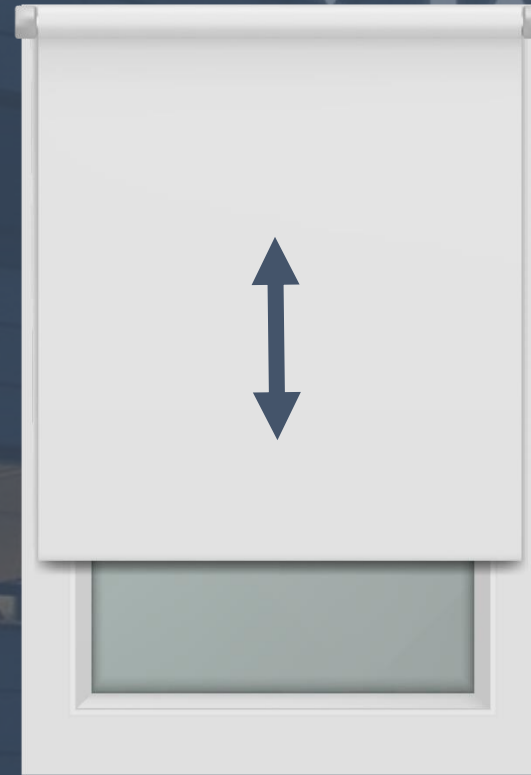
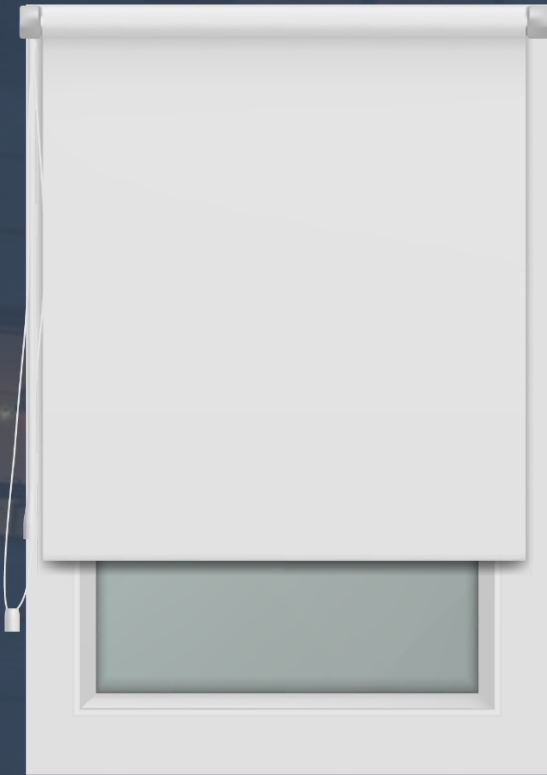


Tænd/slukbelysning



DALI-belysning

DATADREVET STYRING -> ENERGIEFFEKTIVITET



HVILKEN TYPE AF DATA HAR VI?





DASHBOARD



VEJRPROGNOSE



9°C

SKYFRIT



KVARTSITEN 2

Lindinvent AB
Skiffervägen 39
224 78 Lund

ALARM

1

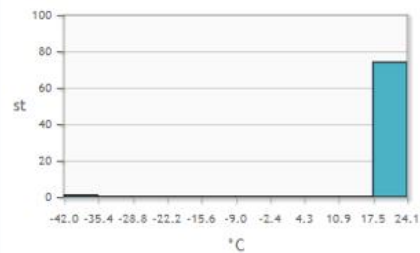
ANTAL PERSONER

34

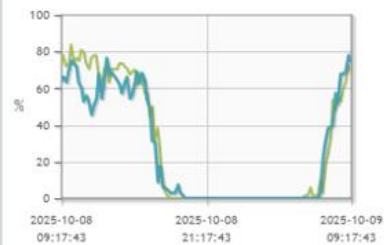
ALARMSYSTEM

Fra

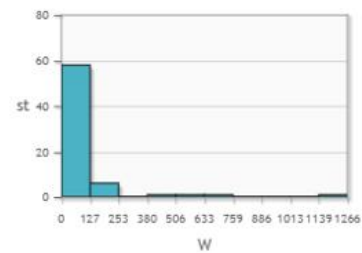
Rumtemperatur



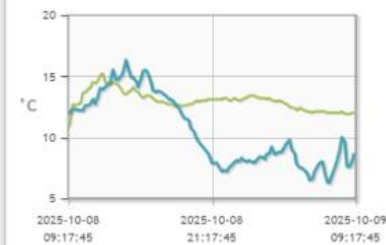
Tilstedeværelse (-1 dag)



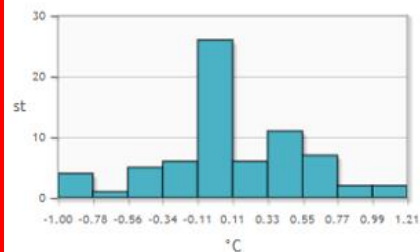
Køling



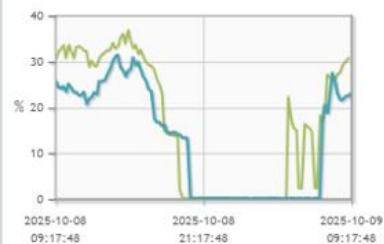
Udetemperatur (-1 dag)



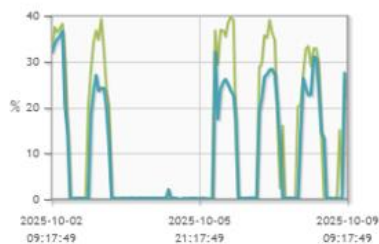
Komfortafvigelse



Luftvolume 24 h (-1 uge)



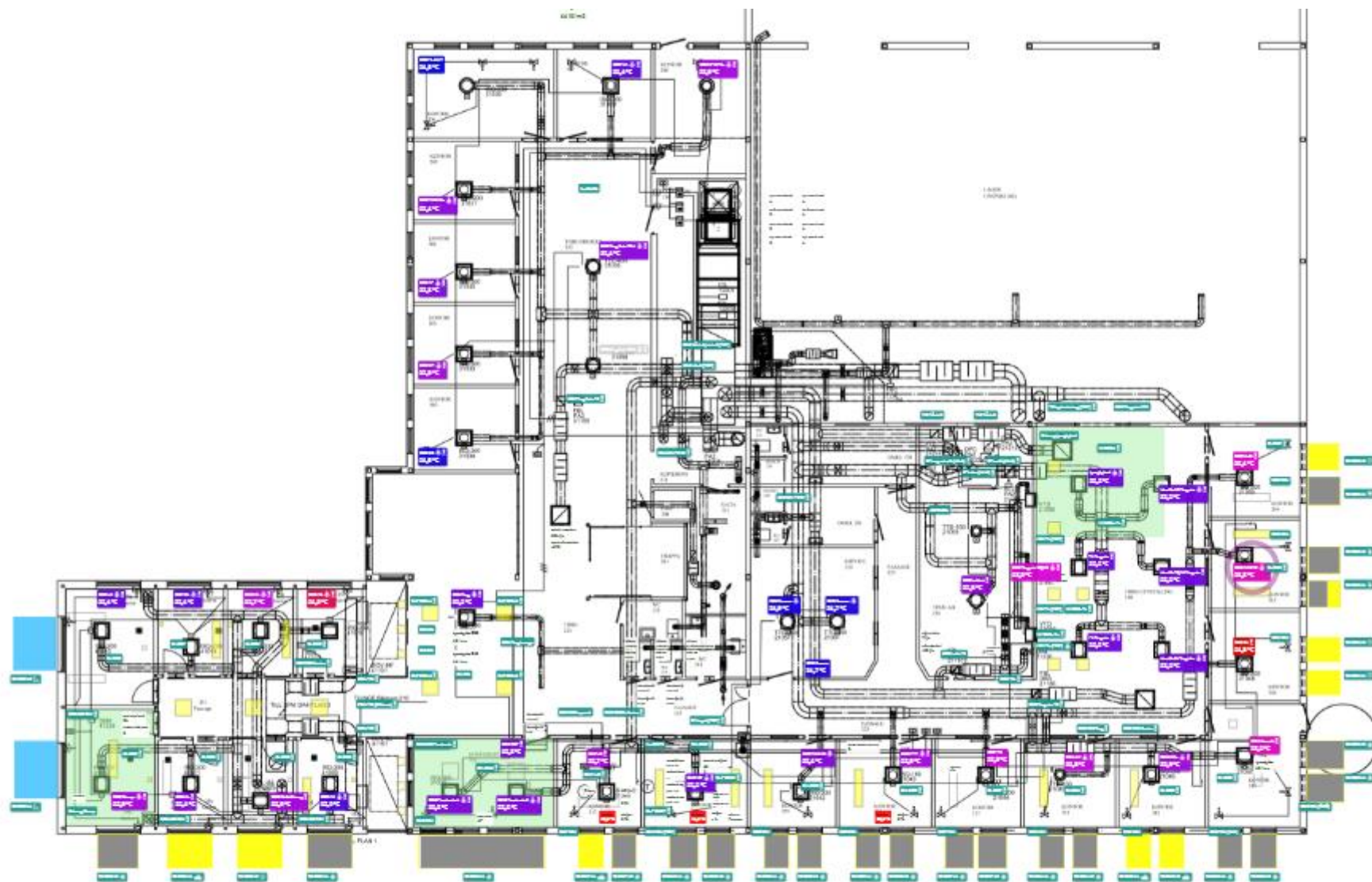
Luftvolume 7 dage (-1 uge)



SFP 5701 (-1 dag)







R242 ALBE
 24.01.2024
 27.01.2024

R242 ALBE

VÆRDIER PRODUKT INFO ALARM ÆNDRINGER NOTAT

Working mode	Normal
Rum temperatur	22,7 °C
Tilstædeværelse	Ja
CO2-koncentration	608 ppm
Kanal temperatur	17,3 °C
Indblæsnings flow	10 l/s
Lokal tilluft	10 l/s
Lokal tilluft beregnet SP	10 l/s
Enhed åbningsgrad	8 %
Varme signal	0 %
Komfortafvigelse	0,5 °C
Fravaersafvigelse	0,0 °C
Beregnet køleeffekt, luft	63 W
Beregnet varmeeffekt, el	0 W
Beregnet varmeeffekt, luft	0 W
Beregnet anlægseffekt	13 W
Lys relæ aktivt	Ja
Rum temp beregnet SP	22,2 °C
Rumtemperatur SP	22,2 °C
Rumtemperatur offset SP	0,0 °C
CO2-koncentration SP	1000 ppm
Minimum flow SP	5 l/s

DASHBOARD



VEJRPROGNOSE



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ALARM

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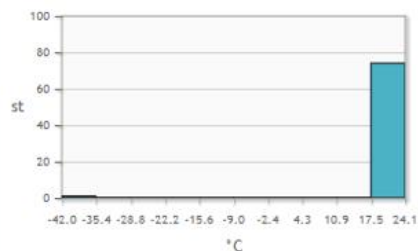
ANTAL PERSONER

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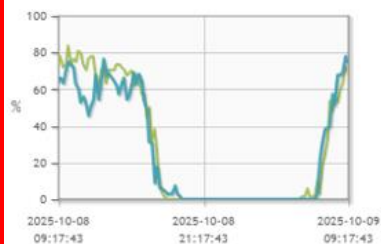
ALARMSYSTEM

Fra

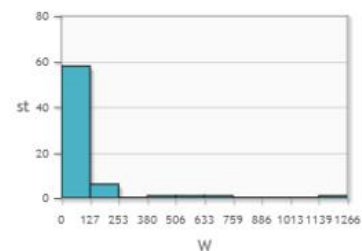
Rumtemperatur



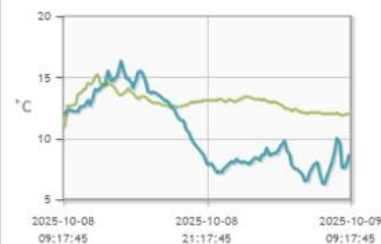
Tilstedeværelse (-1 dag)



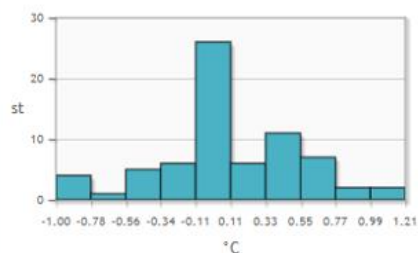
Køling



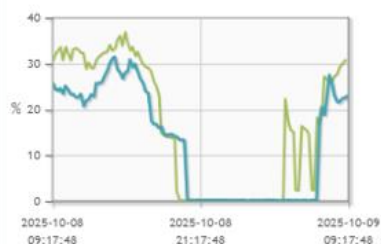
Udetemperatur (-1 dag)



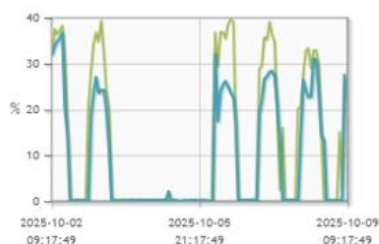
Komfortafvigelse



Luftvolume 24 h (-1 uge)



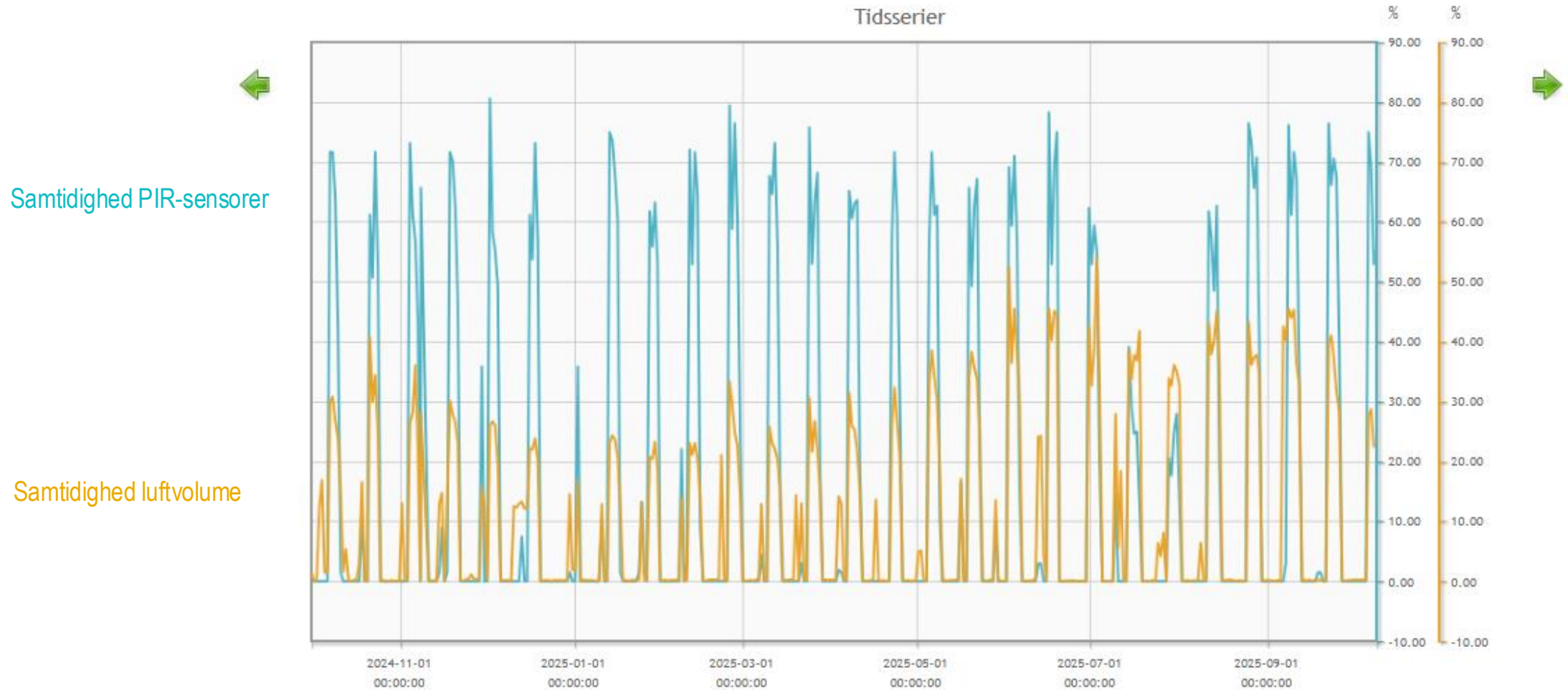
Luftvolume 7 dage (-1 uge)



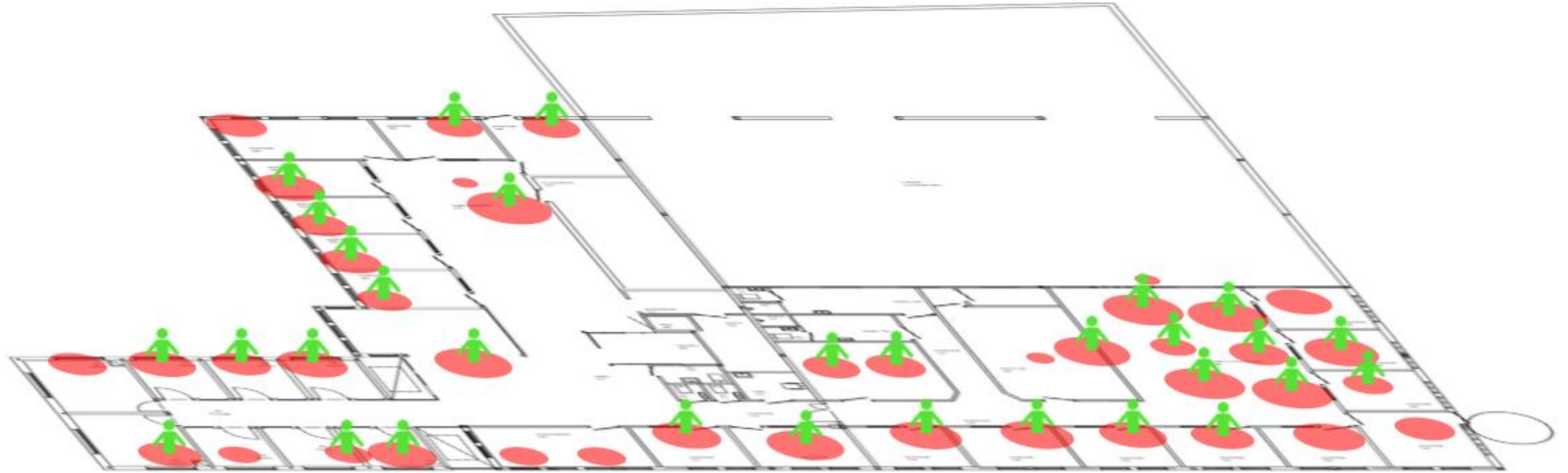
SFP 5701 (-1 dag)



SAMTIDIGHED



HEAT MAP



PRESENCE ANALYSIS (PIR)

DIVISION

From

oktober 2:a 10:51

SINGLE NODE

To

oktober 9:e 10:51

Division

5701

All time

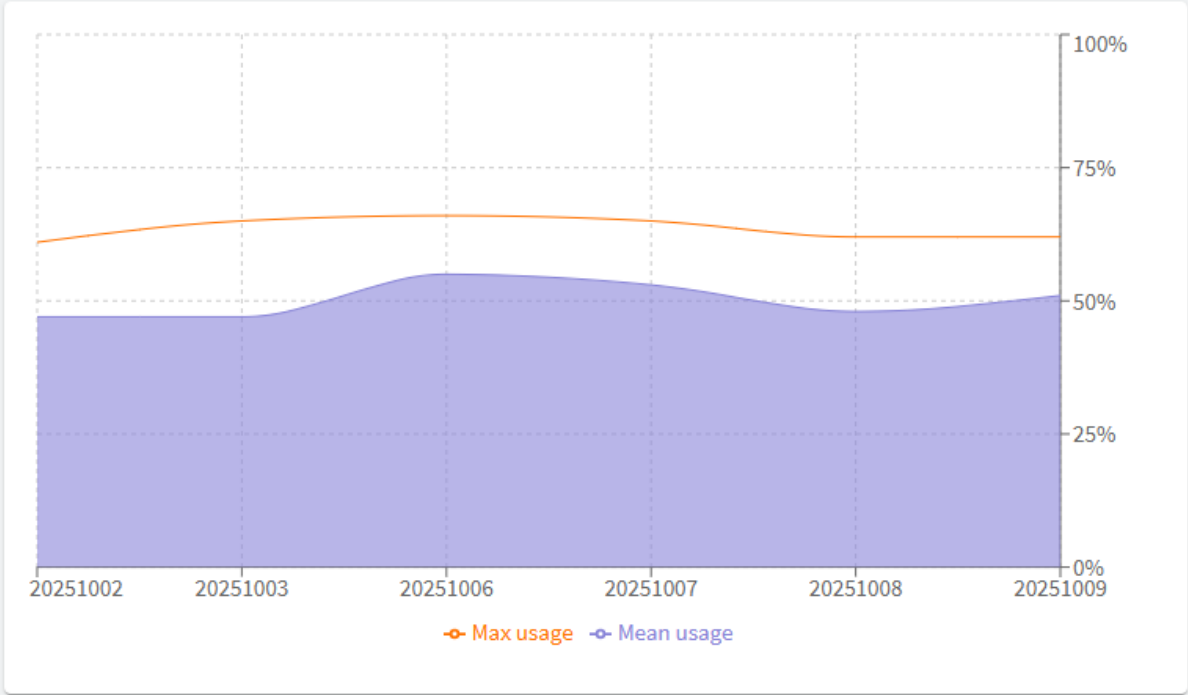
Office hours

From

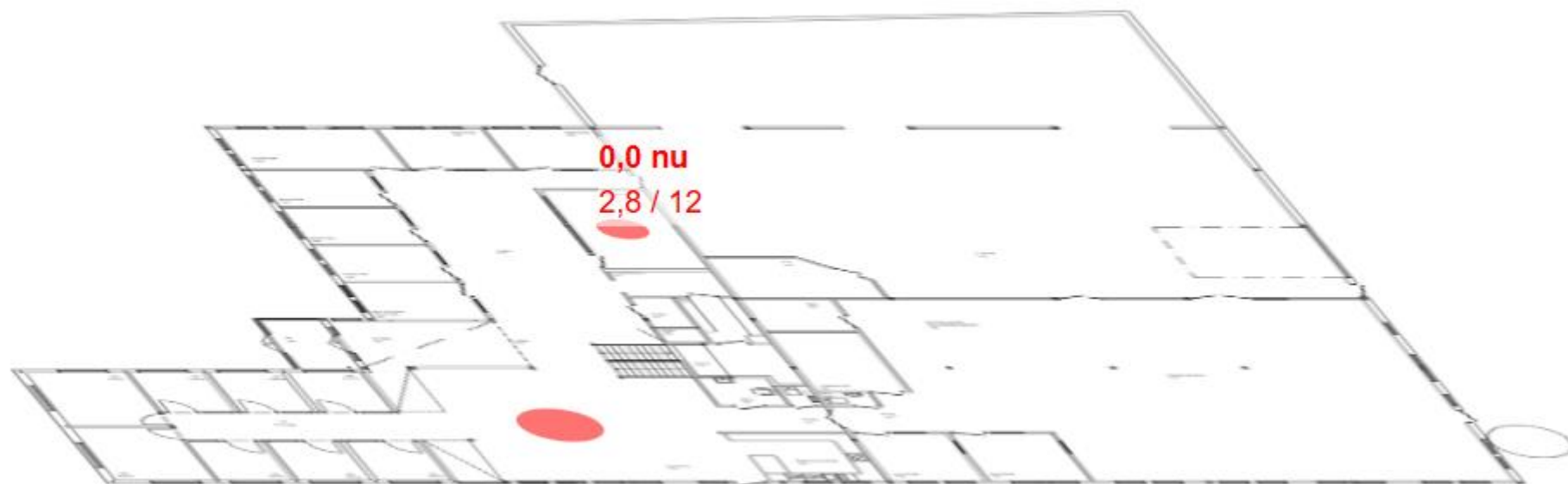
Monday

To

Friday

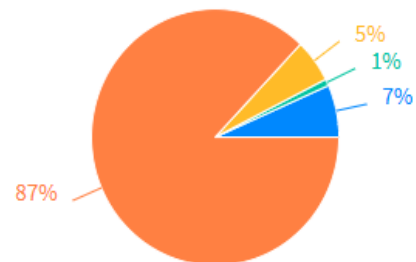


Intervals	Monday	Tuesday	Wednesday	Thursday	Friday
07:00-08:00	34%	33%	31%	31%	28%
08:00-09:00	56%	53%	49%	55%	52%
09:00-10:00	60%	62%	60%	62%	62%
10:00-11:00	65%	65%	55%	57%	65%
11:00-12:00	63%	64%	47%	56%	55%
12:00-13:00	56%	59%	56%	48%	50%
13:00-14:00	65%	59%	62%	56%	57%
14:00-15:00	62%	60%	55%	53%	61%
15:00-16:00	66%	55%	59%	50%	50%
16:00-17:00	56%	47%	48%	36%	25%
17:00-18:00	24%	20%	12%	14%	6%
Mean value	55%	52%	48%	47%	46%

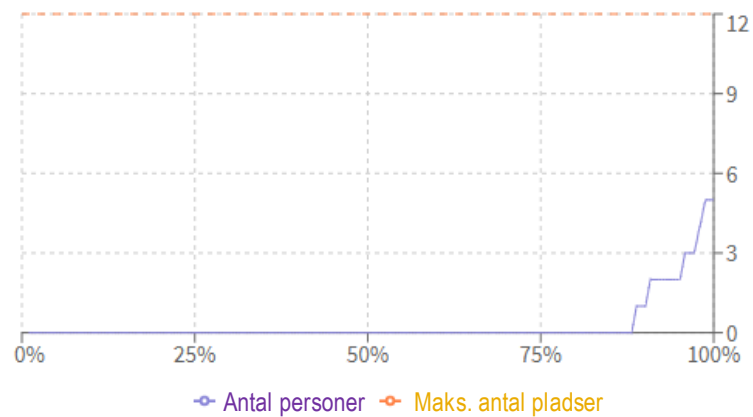


DATA FRA ACTIVE DIRECTORY OG PIR-SENSORER

Booking Kastrup



■ Booket og brugt ■ Booket men ikke brugt ■ Brugt, men ikke reserveret
■ Hverken reserveret eller brugt

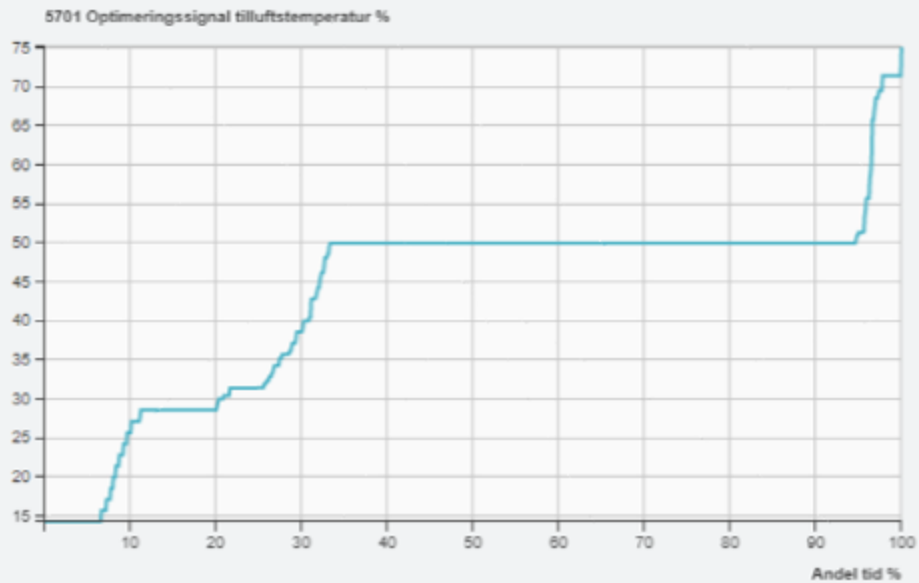


Nøgletal

Rum ubrugt: 88 %
Tilstedeværelse to personer: 5 %
Tilstedeværelse mere end halvdelen:
Tilstedeværelse over maks.: 0 %
Højeste antal tilstedeværende personer: 11
Maks. antal pladser: 12

ADAPTIV OPTIMERING AV ANLÆG

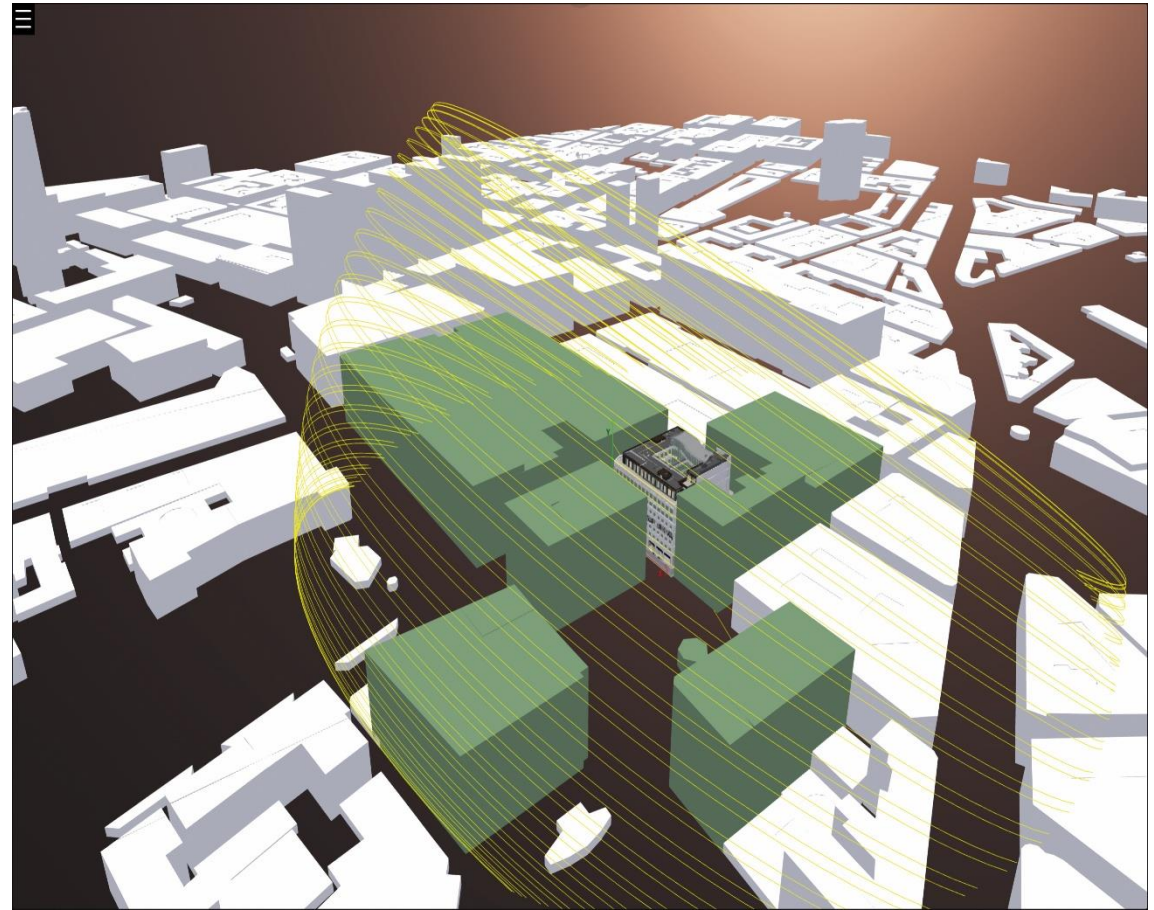
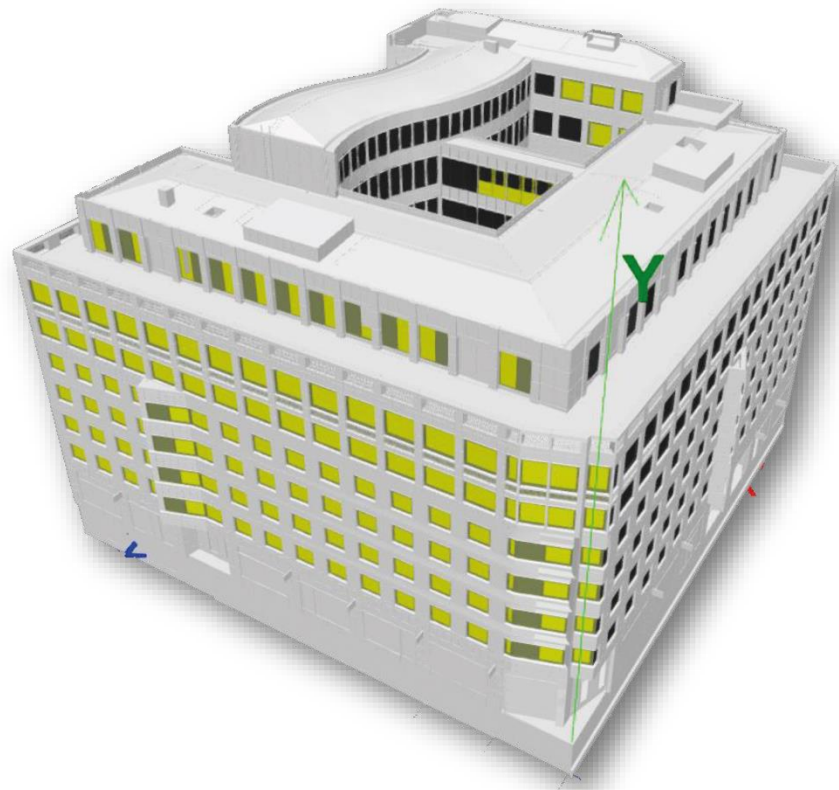
Optimeringssignal tilluftstemperatur (-1 v.)



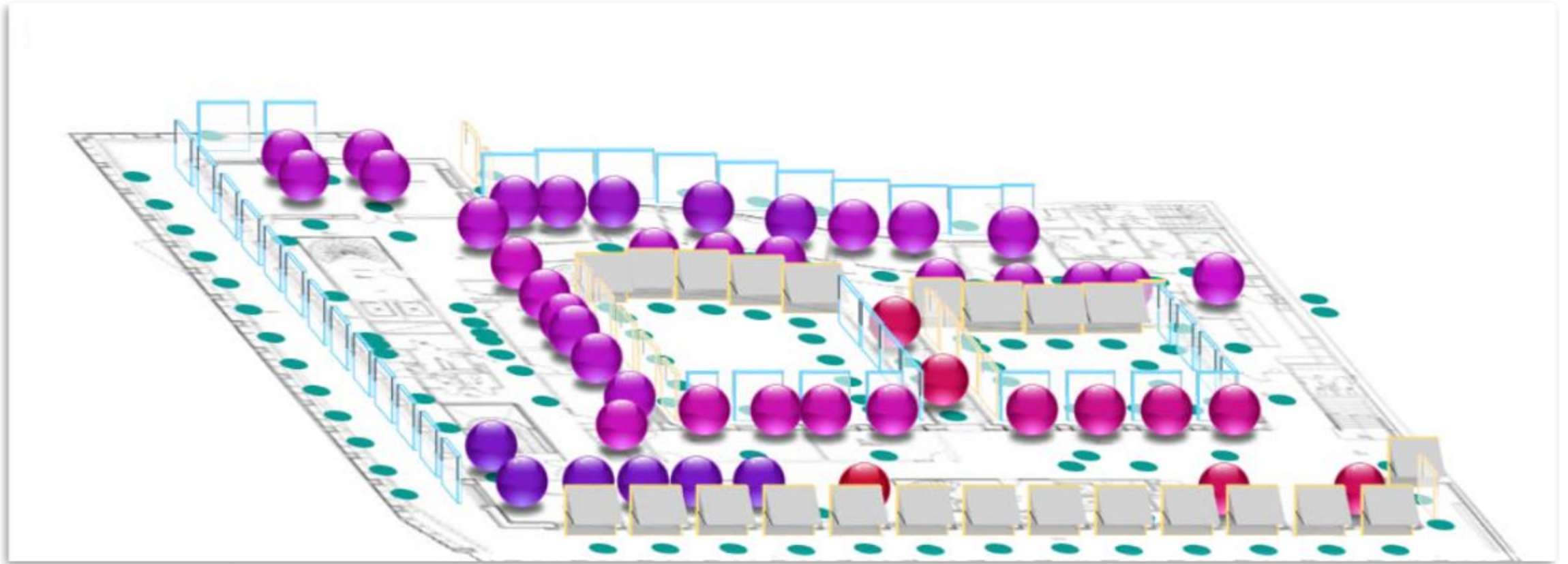
Optimeringssignal tryckoptimering (-1 v.)



SOLAFSKÆRMNING



VISUALISERING AF SOLAFSKÆRMNING

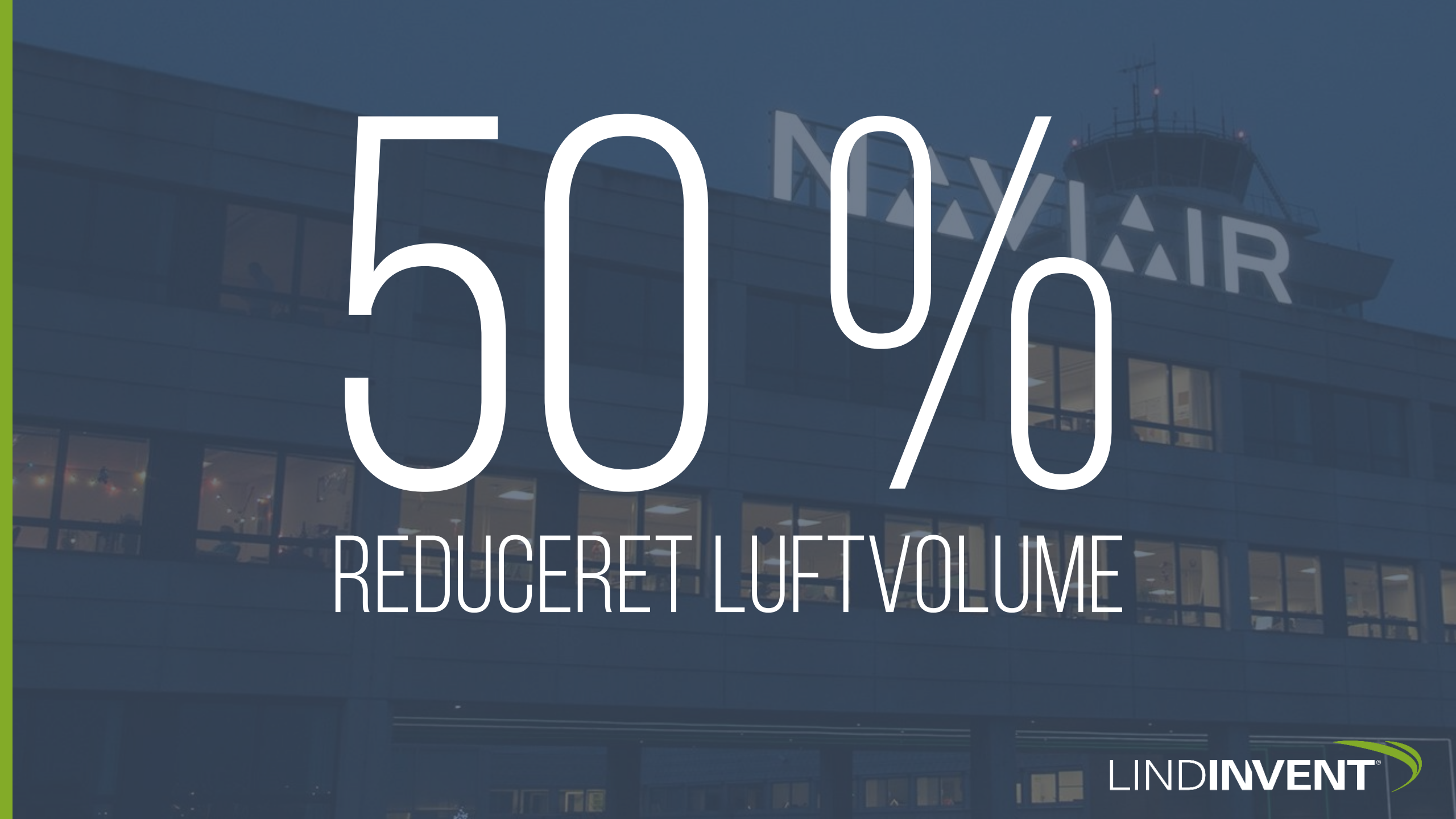


NAVIAIRS OPLEVELSE

”Hvor vi tidligere havde et traditionelt CAV-system, har vi nu behovsstyret ventilation. Det gør det muligt lokalt at regulere luftmængde, temperatur og CO₂-niveau, så indeklimaet kan tilpasses brugernes faktiske behov.



Mahmoud Jabbari, projektleder hos Naviar



50%

REDUCERET LUFTVOLUME

ØVRIGE RESULTATER

- TILFREDSE BRUGER
- HURTIGE TILPASNINGER AF DRIFTEN SELV
- UKENDT BESPARELSE PÅ VARME PÅ NUVÆRENDE TIDSPUNKT
- BYGNINGEN PRÆSTERER SIT BEDSTE – HVER ENESTE DAG.

Q&A