AK CENTRALEN

"Creating Value"

Subsidiaries

Denmark: AK-Centralen A/S

Holkebjergvej 73
5250 Odense SV
Tlf. +45 6617 4203
Mail: akc@ak-centralen.dk
CVR: 27611877

Åbningstid: 24/7 – 365

Sweden: AK-Centralen AB

Datavägen 14.B
Göteborg – 436 32 Askim
Tlf. +46 31 3108 800
Mail: akc@ak-centralen.se
Org. Nr. 5569408122

www.ak-centralen.dk

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by the numbers

• Total supermarkets:	2.000
• Evaporators	100.000
• Sensors and pressure transmitters	600.000
• Alarms	300.000
• To Service	<5%
• Data points	40.000.000

AK-Products

AK ALARMS®

Intelligent monitoring – Core Service

(New) MA-Alarms via alarm robot
- Quality alarms
- Extended set point validation
- Extended alarm monitoring

(New) Defrost robot

(New) AK QUALITYTIME®

AK CONNECT®

AK BASELINE® Phase 1 & Phase 2

AK ASSETS®

Core service

- **Temperature quality at lowest possible cost of maintenance and energy.**
- How:
  - Intelligent monitoring
  - Responsibility for the process
  - Solving problems not reporting on them
  - Make decisions based on fact not belief.

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Cost / Benefit

	Yearly
Saved services 5 to 9 (7 a kr. 3.000)	21.000 kr.
*Energy savings 15-25%	32.000 kr.
Savings in damaged goods (estimation)	10.000 kr.
	63.000 kr.

*Consumption per year kw/h 200.000

Subscription	13.800 kr.

Level of savings per store 49.200 kr. yearly.

For 500 stores = 24.600.000 kr. = 3,3 mio. Euro

Energy potential

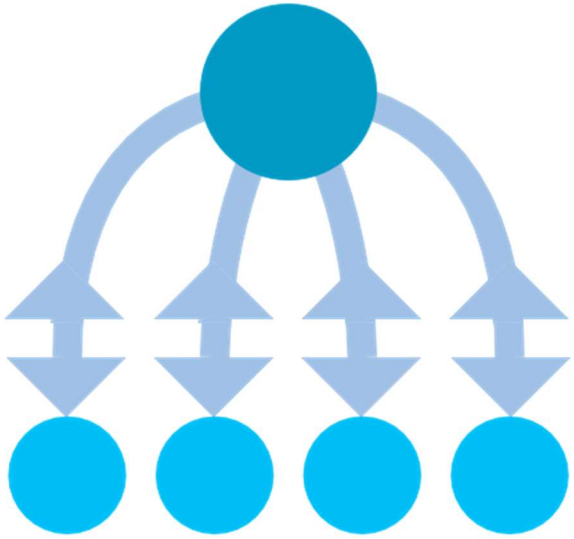
2000 stores =	**350 Gwh for cooling**
Or (Danish pricing)	**DKK 245 mio.**
	EUR 33 mio.
10 % savings	**DKK 24,5 mio. (3,3 mio. EUR)**
20 % savings	**DKK 49,0 mio. (6,6 mio. EUR)**

49.000.000 DKK

Prerequisite

Electronic controllers + Connection

AK CONNECT®



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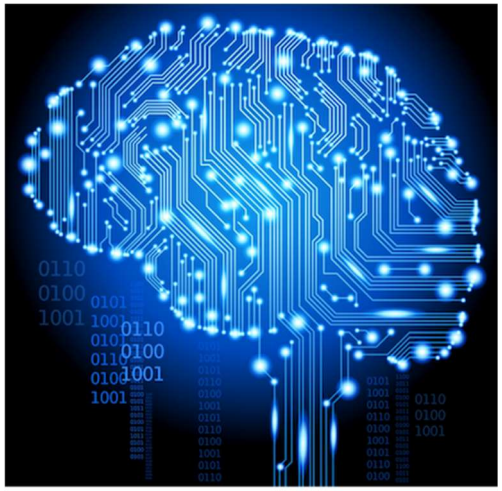
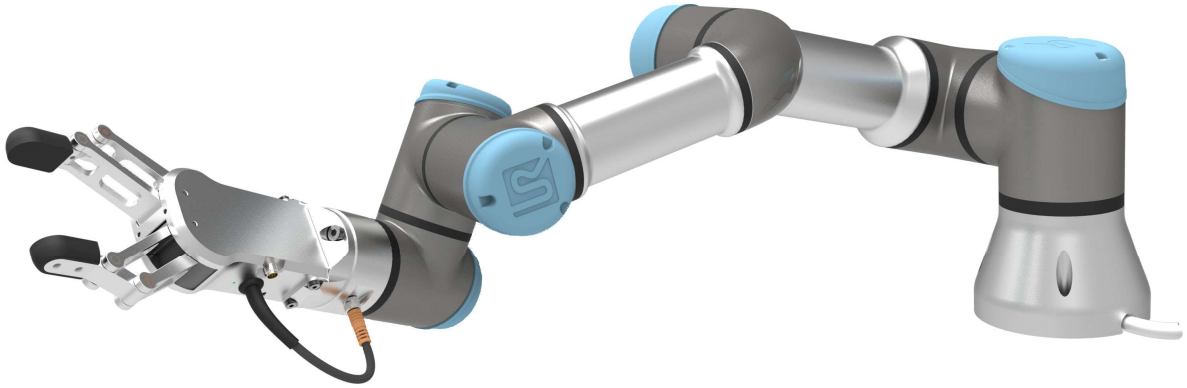
IoT – Internet of things

Big Data

AI / Deep learning

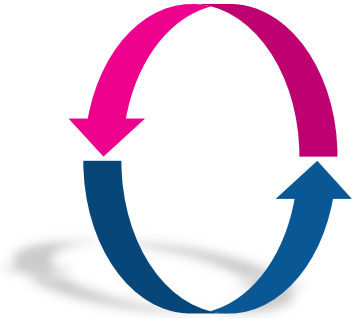
Robot technology





Management

- Management needs data collection
- Savings are not possible without any measurements!
- Take power over parameters / management
  - Overcooling?



- Optimize installed base (Don’t miss optimizing on bad/poor installations)

90% of installations are compromises and not ideal

- Make an environment that can keep the optimizations and continuously make improvements

AK-Products

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AK BASELINE® Phase 1 & Phase 2

AK-Products

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”Artificial intelligence is the new electricity” Andrew Ng; 2017

Optimization phases

Large scale optimization

Phase 1 **8-12%**

Phase 2 **9-13%**

Controller
keys

Temperature measurement – pr. unit

License plate

Bar code

Temp. profile	+5°C
Asset type	MUL
ID per attribute	Glass
ID per attribute	Electric defrost

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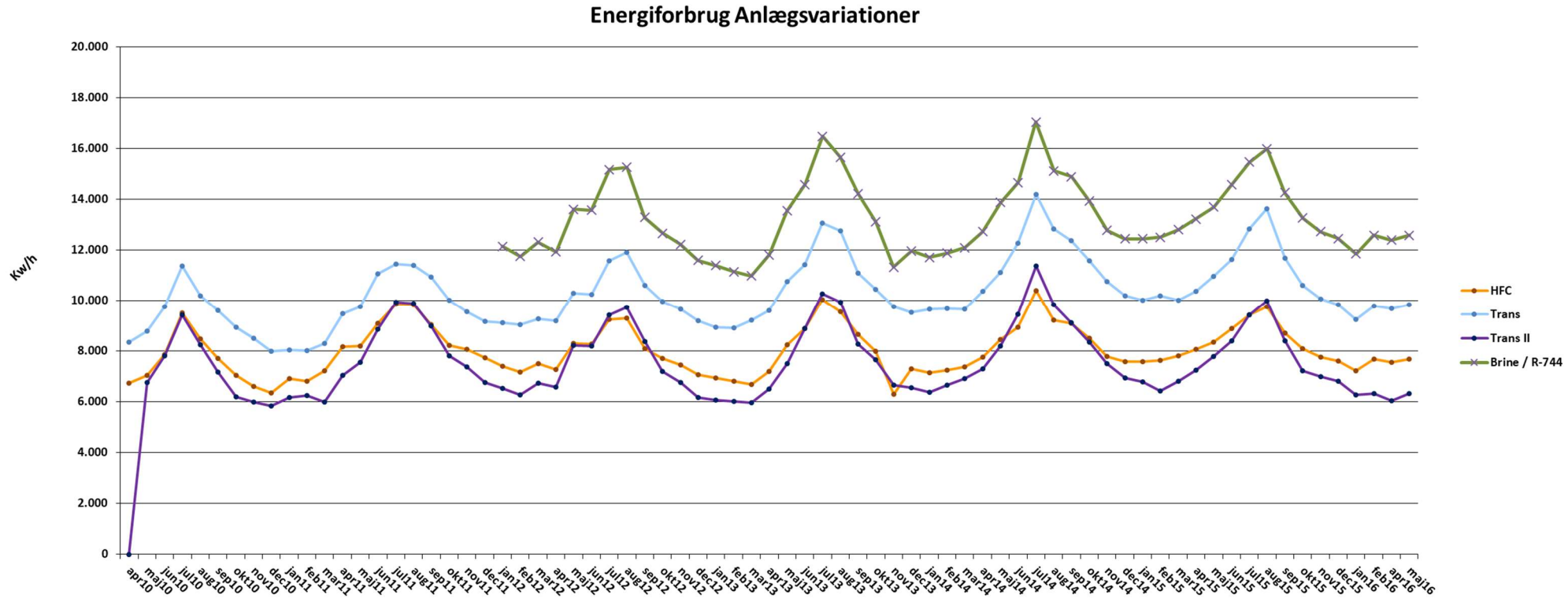
Phase 1

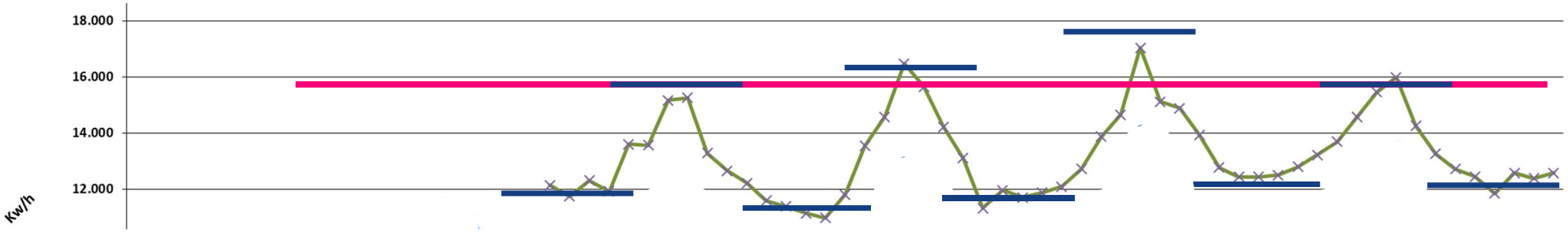
Low hanging fruit

- Profile groups
- Turn on available settings

Energy usage year by year



Energy usage year by year



Example suction pressure

Random sample of test stores.

Variance in parameters: Freezing -39 to -32
Cooling -18 to -9

Who is in control?

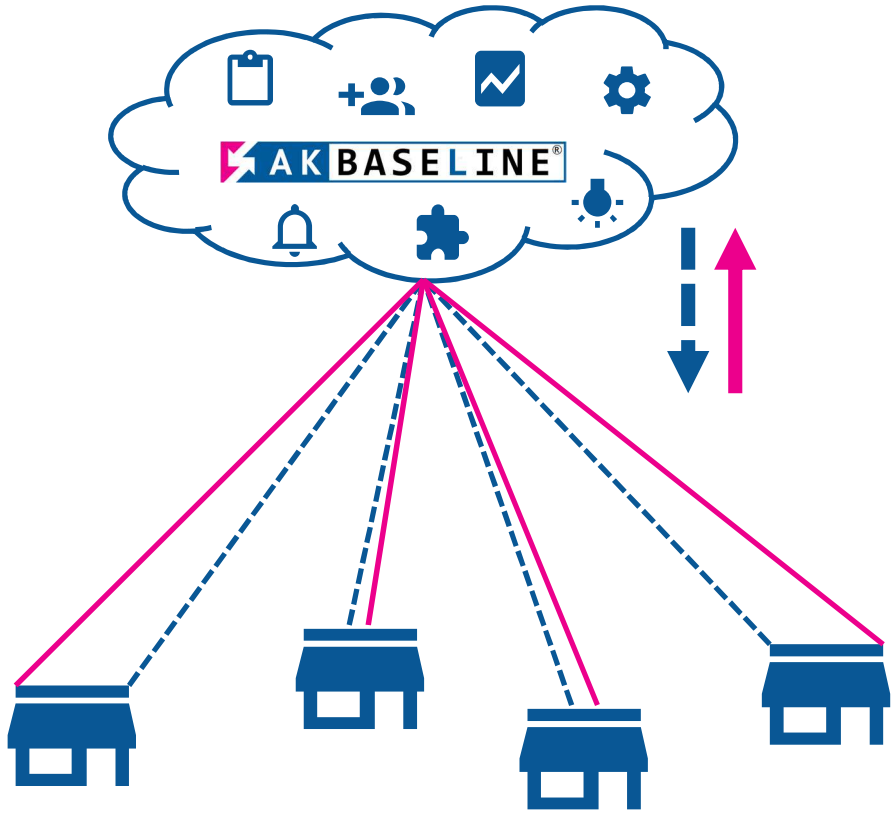
-32/12	-32/-11
-35/-12	-33/-14
-35/-12	-32/-20
-30/-9	-32/-11
-32/-9	-32/-9
-32/-10	-35/-12
-33/-10	-35/-14
-38/-12	-32/-10
-34/-12	-35/-14
-32/-10	-32/-11
-39/-15	-32/-12
-32/-9	-32/-10
-32/-10	-32/-13
-32/-10	-36/-18
-32/-10	-32/-11
-35/-13	-32/-12
-32/-13	-32/-12
-35/-12	-32/-10
-35/-12	-32/-16
-37/-12	-33/-14
-32/-11	-35/-9
-34/-13	-32/-15
-33/-11	-32/-12

Phase 2

Parameters

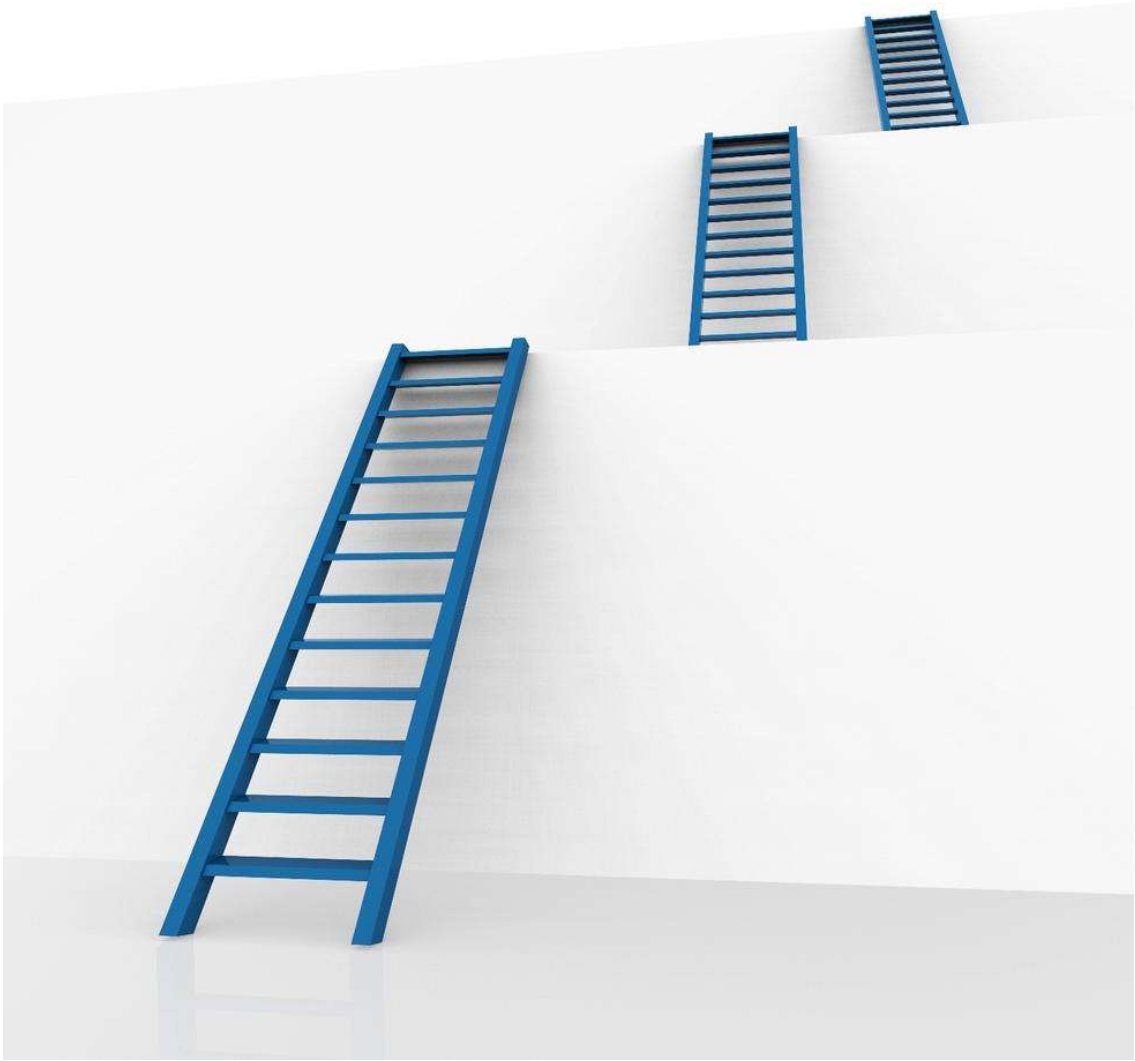
Connect

Continuous proces



Obstacles

- Measure the savings?
- Customer equipment
- Customer data



Proven facts

- Test store case 10 stores: 21% of overall savings
- Test store case 21 stores: 24%
- Test store case 4 stores: 22%
- Test store case existing customer 45 stores: 13% phase 1 savings

Rolling this service out to one of our largest customers in 650 stores for phase 1.

Begin the optimization process!
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