

# Schneider Electric Digital Energy - Sustainable Healthcare

Smart maintenance powered by Analytics  
Presented by Per Klokset

January 29th 2019

Life Is On

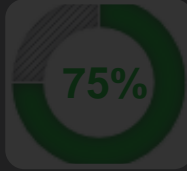
**Schneider**  
Electric

# Schneider Electric Global

- French company founded in 1836
- HQ in Paris
- 144 000 employees across 100+ countries
- 24,7 billion Euro turnover
- 5 % of turnover invested in research and development

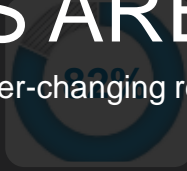
# HOSPITALS ARE DYNAMIC

and need to react to ever-changing real world requirements



## Hospital lifecycle cost

75 % of a hospitals lifecycle cost is spent on Opex. Although only about 10 % of this percentage accounts for operational costs, the amount is still huge



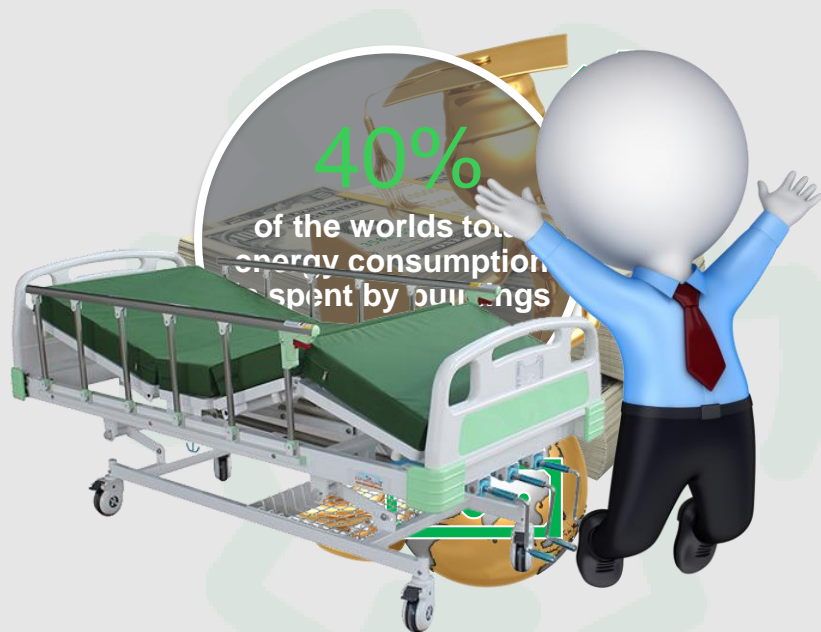
## Random deviations

82 % of a hospitals operational deviations are random by a preventive approach alone



## Energy waste

20 % of a hospitals energy consumption is wasted due to badly commissioned systems. This problem accelerates throughout the hospitals lifetime



### Finance

- Investments, ROI
- non-planned reactive maintenance costs
- Waste of energy
- Capex investments affects Opex



### Infrastructure

- Accelerating maintenance costs
- Energy efficiency
- Sustainability



### Patients and hospital staff

- Patient comfort (swift restitution)
- Work environment (high productivity, minimal sick leave)
- Technology (apps etc.)



### Resources

- Descending access to qualified technical staff
- Increased workflow

# Schneider Electric Digital Energy – Added value to hospitals

Maximize  
Building Efficiency



Optimize  
Comfort & employee productivity



Increase  
Technical visibility



## Analytics



### Energy

Continuously system diagnostics uncovers your hospital's energy waste in prioritized order. By implementing equipment variables such as fan & pump power while simultaneously feeding the system with electricity or gas costs, Analytics will be able to visualize unnecessary spendings - empowering you to make smart and environmental friendly choices!



### Comfort

Optimal indoor comfort contributes significantly to patient recovery. Moreover, top indoor quality allows medical teams to produce more while at the same time minimizing costs. A continuous comfort diagnostics uncovers indoor climate challenges in a prioritized order, enabling maintenance to react quickly on the challenges that really matter - even before the patient notices any discomfort!



### Maintenance

By ensuring optimal levels of maintenance in hospitals we'll prevent property value from falling over time. Even more importantly, a well maintained hospital is far more secure and reliable. By enabling constant analytics of all technical systems, Hospital analytics makes sure to give you the insight needed in order to keep your systems up and running!

# Analytic solutions





Your Hospital talks...  
Do you get the message?

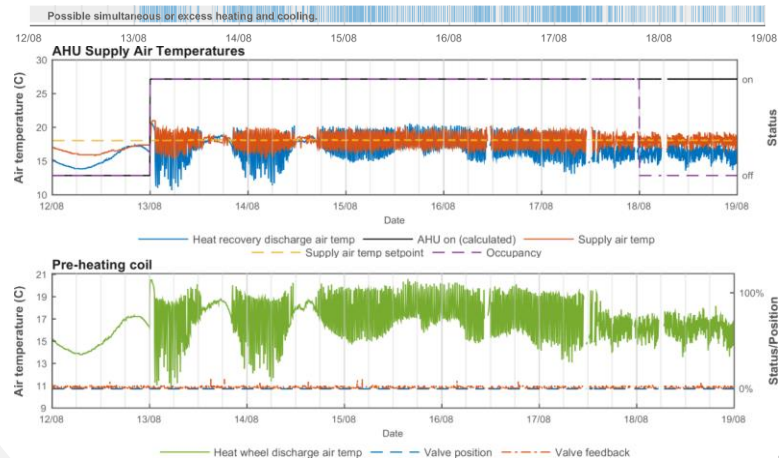


### 360.03: POSSIBLE SIMULTANEOUS OR EXCESS HEATING AND COOLING

- There was a temperature rise over the coils while heating was off for 30.5 hours over the diagnostic period
- There was a temperature drop over the coils while cooling was off for 41.8 hours over the diagnostic period
- This may have wasted around kr 898 over 7 day(s)

#### Possible Causes:

- Valve is not seating properly and is leaking
- Stuck or broken valve
- Temperature sensor error or sensor installation error is causing improper control of the valves or other coils
- PID needs tuning



Equipment	Analysis	Start Date	Notes Summary	Tests	Cost	E	C	M
Play 2 320.01 Varmesen... (Heating System)	HW Loop	05.08.2018	Minimal load across loop.	1	kr 7 205	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	27.05.2018	Minimal load across loop.	1	kr 5 963	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	03.09.2018	Minimal load across loop.	1	kr 0 797	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	29.07.2018	Minimal load across loop.	1	kr 5 811	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	10.08.2018	Minimal load across loop.	1	kr 5 647	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	22.07.2018	Minimal load across loop.	1	kr 5 342	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	06.05.2018	Minimal load across loop.	1	kr 4 338	10		
Play 2 320.01 Varmesen... (Heating System)	HW Loop	20.05.2018	Minimal load across loop.	1	kr 4 067	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	05.08.2018	Minimal load across loop.	1	kr 3 316	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	12.08.2018	Minimal load across loop.	1	kr 3 317	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	10.08.2018	Minimal load across loop.	1	kr 3 280	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	29.04.2018	Minimal load across loop.	1	kr 3 224	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	24.06.2018	Minimal load across loop.	1	kr 3 204	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	01.07.2018	Minimal load across loop.	1	kr 3 197	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	17.06.2018	Minimal load across loop.	1	kr 3 109	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	03.06.2018	Minimal load across loop.	1	kr 3 093	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	06.05.2018	Minimal load across loop.	1	kr 2 785	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	13.05.2018	Minimal load across loop.	1	kr 2 829	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	27.05.2018	Minimal load across loop.	1	kr 2 496	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	29.07.2018	Minimal load across loop.	1	kr 2 390	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	20.05.2018	Minimal load across loop.	1	kr 2 270	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	22.07.2018	Minimal load across loop.	1	kr 2 047	10		
Play 2 370.01 Hovedkje... (Cooling System)	CHW Loop	19.08.2018	Minimal load across loop. Data quality flag.	1	kr 1 462	10		
Play 3 360.03 Ventilias... (Air Handler)	AHU Coils	10.08.2018	Possible simultaneous or excess heating and cooling.	1	kr 1 234	10		
Play 3 360.03 Ventilias... (Air Handler)	AHU Coils	01.07.2018	Possible simultaneous or excess heating and cooling.	1	kr 1 020	10		
Play 3 360.03 Ventilias... (Air Handler)	AHU Coils	17.06.2018	Possible simultaneous or excess heating and cooling.	1	kr 960	10		
Play 3 360.03 Ventilias... (Air Handler)	AHU Coils	24.06.2018	Possible simultaneous or excess heating and cooling.	1	kr 923	10		
Play 3 360.03 Ventilias... (Air Handler)	AHU Coils	12.08.2018	Possible simultaneous or excess heating and cooling.	1	kr 898	10		

Building  
Enabling

Temp  
sensor  
etc.

Controllars

BS-server

LAN

BA Analytics /  
MS Azure



## Oversikt

Home

Diagnostics

Analysis  
BuilderPerformance  
IndicatorsCommissioning  
Dashboard

Alarms

Tasks

Reporting

Building  
ProfilesEquipment  
Profiles

Documents

Operations

## Welcome to Building Analytics

Please use the Quick Links or Navigation bar to begin.

[switch to provider view](#)

## Building Map



## Last Month's Top Portfolio Diagnostic Summaries

Total Faults = 388

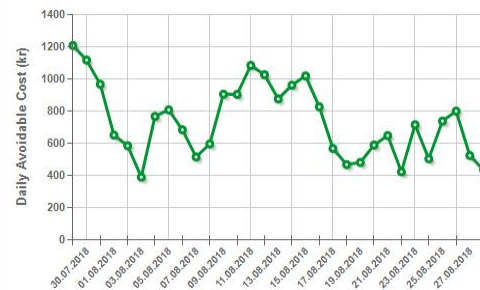
Total Avoidable Costs (NOK) = kr 68 043

Building	Faults	Avoidable Costs	
337 Byggeteknisk	32	kr 17 820	<a href="#">view</a>
341 ELA	16	kr 9 689	<a href="#">view</a>
312 Kjem 2	35	kr 5 897	<a href="#">view</a>
335 Idrettsbygget	17	kr 5 190	<a href="#">view</a>
322 Sentralbygg 2	45	kr 5 004	<a href="#">view</a>
311 Kjem 1	18	kr 4 905	<a href="#">view</a>
316 Kjemihallen	23	kr 4 353	<a href="#">view</a>
325 Gamle Elektro	18	kr 3 079	<a href="#">view</a>
327 Elektro Bygg B	7	kr 2 624	<a href="#">view</a>
354 Kjelhuset	23	kr 2 158	<a href="#">view</a>

## Last Month's Top Portfolio Diagnostic Results

Building	Equipment	Notes Summary	Avoidable Costs	E	C	M	
337 Byggeteknisk	VE03 Plan 1/0/-1/Middel	Exhaust fan speed constant. Data quality flag.	kr 5 666	10	0	4	<a href="#">view</a>
341 ELA	VE01 Kontorer E/F	Supply fan speed constant.	kr 5 136	10	0	4	<a href="#">view</a>
341 ELA	KJ01 Kondensat	Install VFDs on pumps.	kr 4 042	10	0	0	<a href="#">view</a>
337 Byggeteknisk	VE27 NBI Forsøkshall	Supply and return fan speed constant.	kr 3 911	10	0	4	<a href="#">view</a>
337 Byggeteknisk	VE05 Plan 1/0/-1 Syd	Simultaneous heating and cooling. Supply temp not tracking setpoint. Data quality flag.	kr 3 163	10	1	4	<a href="#">view</a>
335 Idrettsbygget	VA01 Fjernvarme	Minimal load across loop. Data quality flag.	kr 2 950	10	0	0	<a href="#">view</a>

## Past 30 Days Portfolio Avoidable Costs

[commissioning\\_dashboard](#)

## Yesterday's Top Portfolio Diagnostic Summaries

Total Faults = 194

Total Avoidable Costs (NOK) = kr 486

Building	Faults	Avoidable Costs	
327 Elektro Bygg B	2	kr 169	<a href="#">view</a>
312 Kjem 2	21	kr 78	<a href="#">view</a>
337 Byggeteknisk	13	kr 51	<a href="#">view</a>
319 Gamle Fysikk	12	kr 41	<a href="#">view</a>

 **Operations**

Building	Equipment	Analysis	Start Date	Notes Summary	Tasks	Cost	E	C	M	Actions
337 Byggtেকনিক	VE03 Plan 1/0/-1/Middel (Air Handler)	AHU Exhaust	01.07.2018	Exhaust fan speed constant. Data quality flag.	1	kr 5 666	💡	👤	🔧	▼
341 ELA	VE01 Kontorer E/F (Air Handler)	AHU Fan	01.07.2018	Supply fan speed constant.	1	kr 5 136	💡	👤	🔧	▼
341 ELA	KJ01 Kondensat (Cooling System)	CW Loop	01.07.2018	Install VFDs on pumps.	0	kr 4 042	💡	👤	🔧	▼
337 Byggtেকনিক	VE27 NBI Forsøkshall (Air Handler)	AHU Fan	01.07.2018	Supply and return fan speed constant.	1	kr 3 911	💡	👤	🔧	▼
337 Byggtেকনিক	VE05 Plan 1/0/-1 Syd (Air Handler)	AHU Coils	01.07.2018	Simultaneous heating and cooling. Supply temp not tracking setpoint. Data quality flag.	1	kr 3 163	💡	👤	🔧	▼
335 Idrettsbygget	VA01 Fjernvarme (Heating System)	HW Loop	01.07.2018	Minimal load across loop. Data quality flag.	0	kr 2 950	💡	👤	🔧	▼
312 Kjem 2	VE04 Laboratorier I kj... (Air Handler)	AHU Exhaust	01.07.2018	Exhaust fan speed constant. Fan status data mismatch.	0	kr 2 790	💡	👤	🔧	▼
325 Gamle Elektro	VE10 Grunnventilasjon (Air Handler)	AHU Fan	01.07.2018	Supply fan speed constant.	1	kr 2 748	💡	👤	🔧	▼
316 Kjemihallen	VE01 Kontorer 3. etg (Air Handler)	AHU Fan	01.07.2018	Supply fan speed constant.	1	kr 2 652	💡	👤	🔧	▼
327 Elektro Bygg B	VA01 Fjernvarme (Heating System)	HW Loop	01.07.2018	Install VFDs on pumps. Minimal load across loop.	0	kr 2 624	💡	👤	🔧	▼
322 Sentralbygg 2	VE03 Vest 6-13 etg (Air Handler)	AHU Exhaust	01.07.2018	Exhaust fan speed constant.	0	kr 2 321	💡	👤	🔧	▼
335 Idrettsbygget	VE01 Idrettshall (Air Handler)	AHU Fan	01.07.2018	Supply fan speed constant. Fan on while unoccupied.	1	kr 2 240	💡	👤	🔧	▼
337 Byggtেকনিক	VE28 NBI Lab (Air Handler)	AHU Exhaust	01.07.2018	Exhaust fan speed constant.	0	kr 1 533	💡	👤	🔧	▼
317 IT-bygget	KJ01 Kjøleanlegg_Kond... (Cooling System)	CW Loop	01.07.2018	Install VFDs on pumps. Data quality flag.	0	kr 1 505	💡	👤	🔧	▼

# Building Advisor Analytics - Benefits

\* Calculation based on an average of real-time customer data over a 12 to 18 month period in 900+ buildings and 8 countries



Typically 29% decrease in unscheduled maintenance

- Building Tenant
- Facility Manager



Typically 33% fewer occupant complaints

- Building Tenant
- Facility Manager
- Developer / Owner



Up to 20% energy cost reduction

- Building Tenant
- Facility Manager
- Developer / Owner

Life Is On



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Electric