Empowering designers to Build a Greener & more Sustainable Data Center





Reducing operational cost

Rising energy costs and a premium on real-estate and floor space means that every DTC facility is **now focused on higher efficiency and an optimised power usage.**

Electrical parameters and **consumption** are now managed right **up to equipment level**, identifying potential power issues, providing **tangible cost savings** and resulting in lower billing.



Reducing operational cost

Increase efficiency without compromising power quality



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Specification Engineer
Poland



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Product Marketing Manager - UPS



Increase efficiency without compromise thanks to Smart conversion mode UPS

Quality	Efficiency
PROTECT YOUR LOAD WITHOUT COMPROMISE	DIVIDE ENERGY LOSSES BY 5

Power quality is non-negotiable, but the rising power demand of data centers requires more efficient solutions.

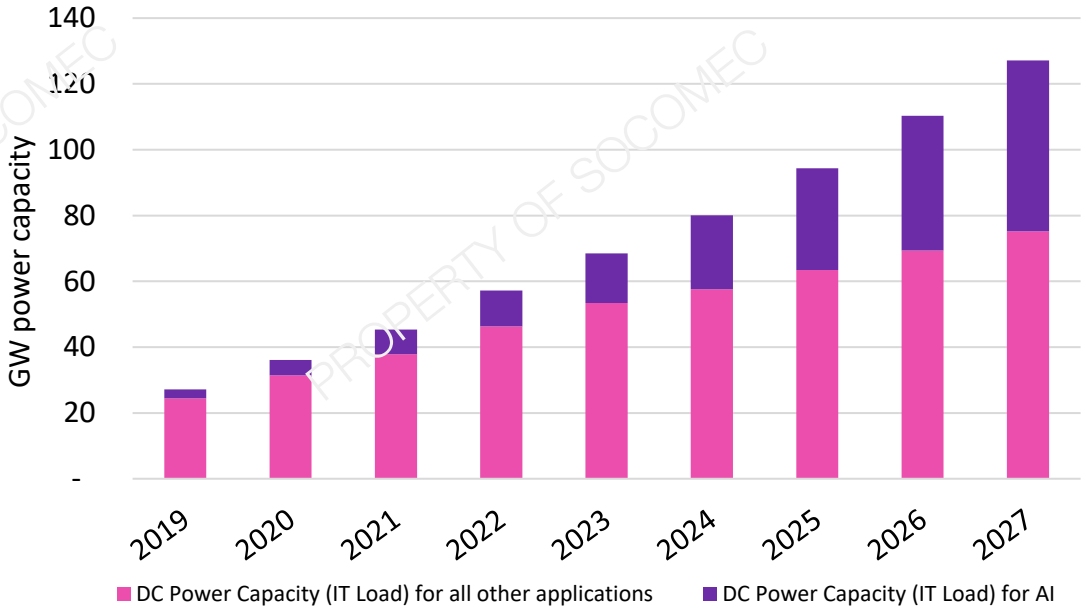
To **reduce operational costs** and **carbon emissions,** operators must adopt **innovative UPS technologies** that **maintain reliability** while **improving efficiency**

PROPERTY OF SOCOMEC

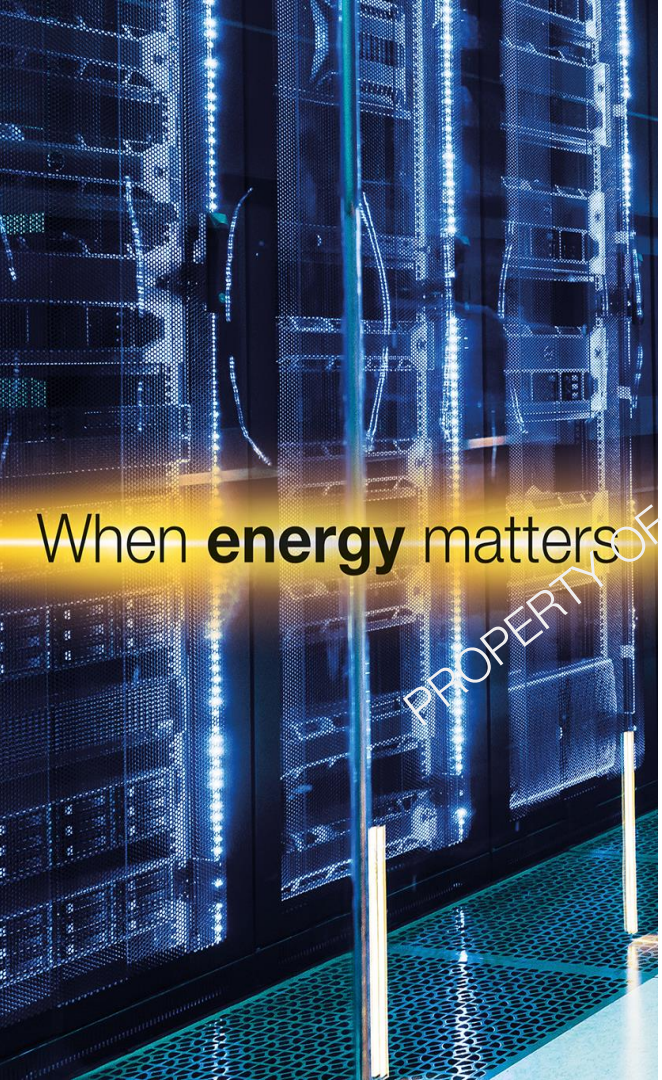


Unprecedent data center power capacity required for AI computing

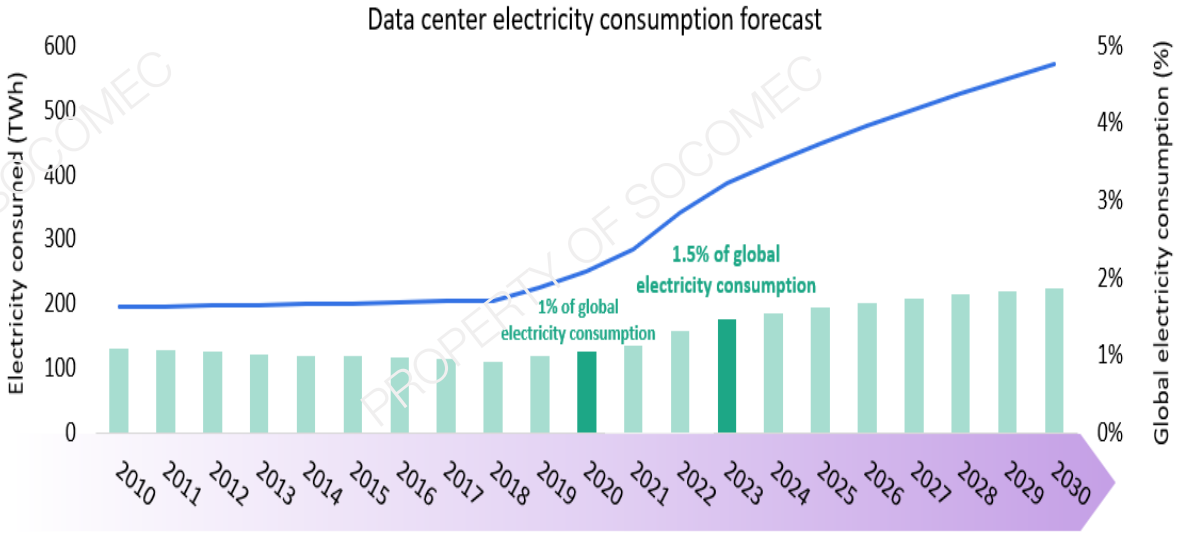
Data center power capacity (GW)



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In 2023 data centers has consumed 50% more electricity than 2020



Source: Omdia 2023

Achieve sustainable targets without compromise

Data Centers Obliged to Meet Sustainability Standards for Future Growth



Over 100 data centre operators are committed to the European Green Deal, achieving the ambitious greenhouse gas reductions of the climate law

2030 - Deadline for existing DTC to be climate neutral!

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The Pact's GOAL

- Energy Efficiency
- Water
- Circular Energy
- Clean Energy
- Circular Economy
- Monitoring & Report

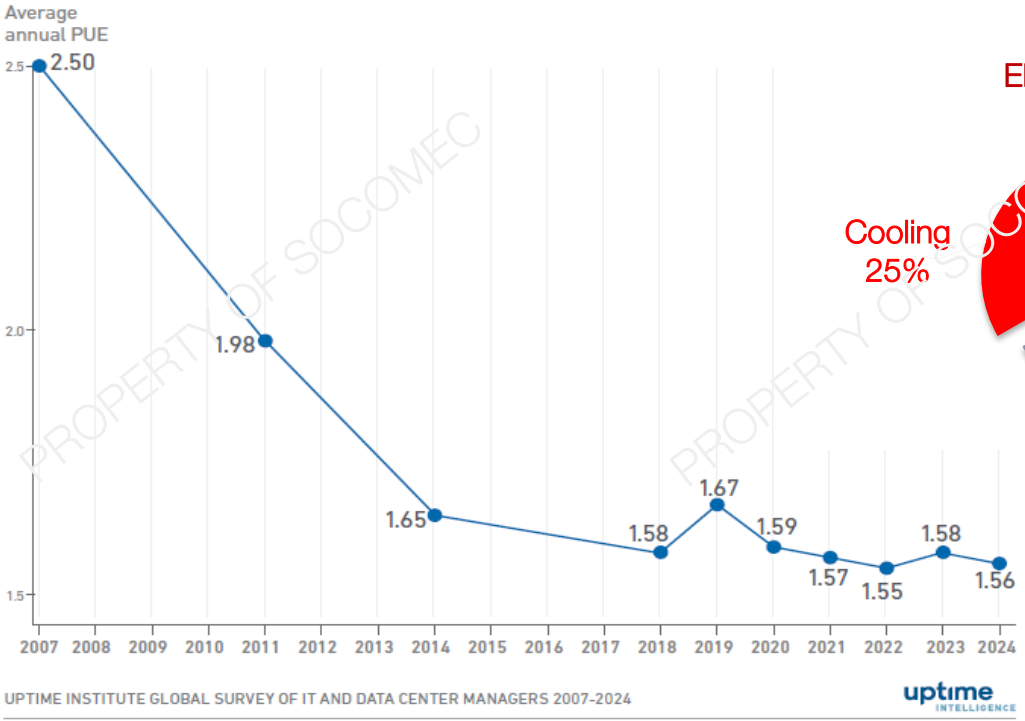
Achieve sustainable targets without compromise

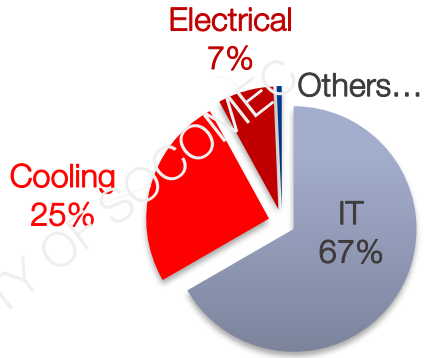
2030 - Deadline for existing DTC to be climate neutral!

CLIMATE NEUTRAL DATA CENTER

Energy Efficiency

KPI : PUE





PUE 1,5

→ (Free) Cooling system

Electrical (UPS losses)

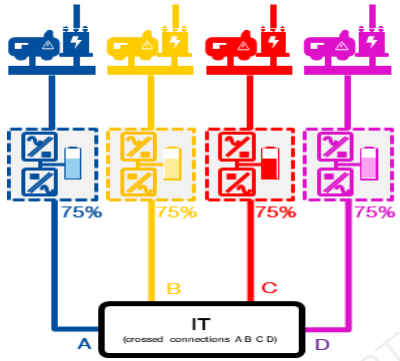
PROPERTY OF SOCOMEC

socomec Innovative Power Solutions

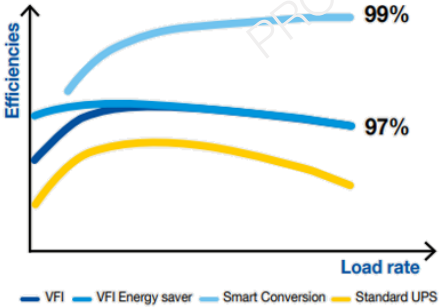
Advanced UPS Operating Modes : Smart Conversion

A Key Driver to Reduce PUE and Enhance Data Center Efficiency

Electrical Architecture



Efficiency Curves



UPS efficiency is directly influenced by the **IT load rate** and the **chosen electrical architecture.**

Increasing load rates are essential to **meet the growing demand** for power in DTC & **optimize operational efficiency.**

In VFI mode, efficiency drops at higher load rates due to increased losses.

Advanced operating modes are essential for addressing new challenges while prioritizing load protection.

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Unprecedented Efficiency!

99,1%

Uninterrupted continuity

Class 1

Output voltage tolerances
Class 1 transfer according to IEC 62040-3

Advanced UPS Operating Modes : What does Smart Conversion Really Mean?

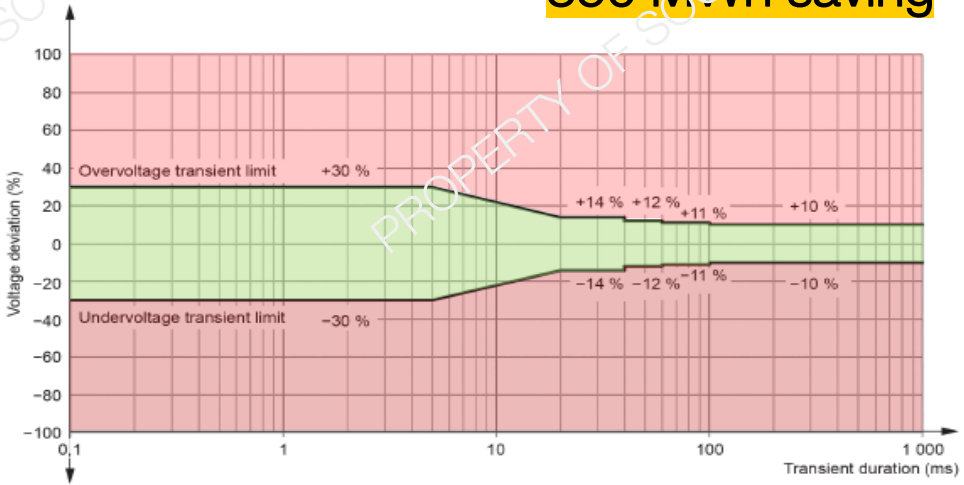
Field-proven technology – Third party certified

99.1% CERTIFIED

10kW heat at full power

5 times less losses

350 MWh saving



Critical loads are always protected!

No matter the grid condition

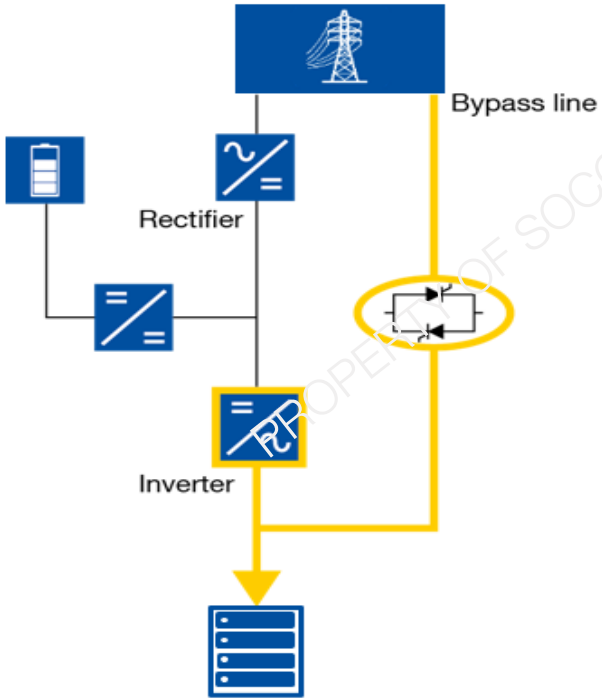
CLASS 1 CERTIFIED

PROPERTY OF SOCOMEC

socomec Innovative Power Solutions

Smart conversion mode

So how does it work ?



So MUCH MORE than a regular UPS In Eco Mode!

PROPERTY OF SOCOMEC

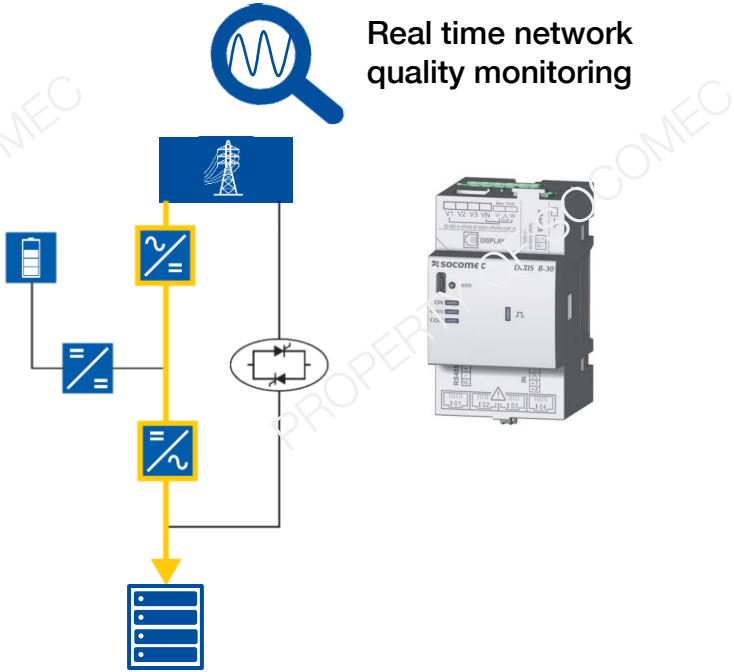
Smart conversion mode

Dedicated equipment continuously monitors network quality

Double Conversion Mode

Provides the ultimate level of protection with no impact from input disturbance…

PROPERTY OF SOCOMEC

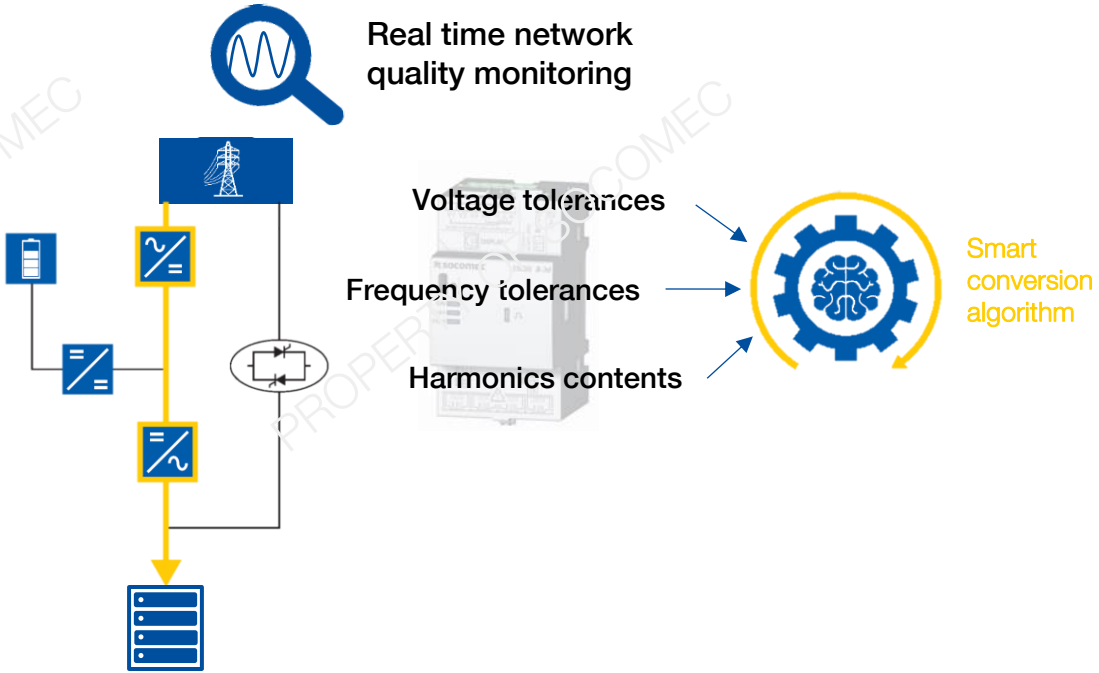


Smart conversion mode

Dedicated equipment continuously monitors network quality

Double Conversion Mode

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PROPERTY OF SOCOMEC

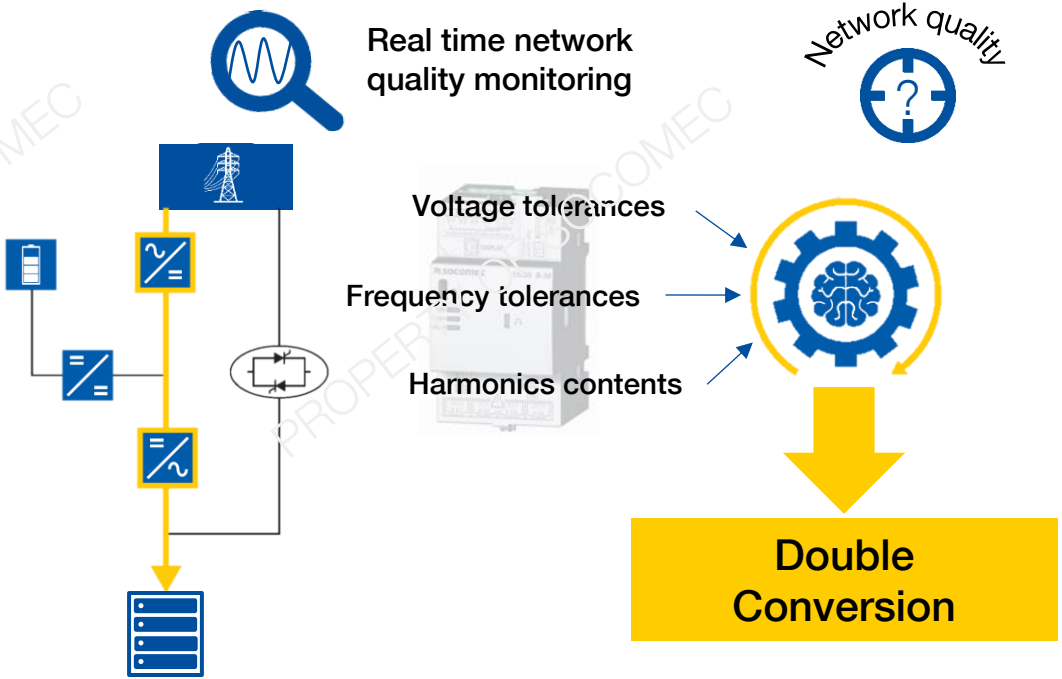
Smart conversion mode

An algorithm selects the optimum working mode

Double Conversion Mode

Provides the ultimate level of protection with no impact from input disturbance…

PROPERTY OF SOCOMEC

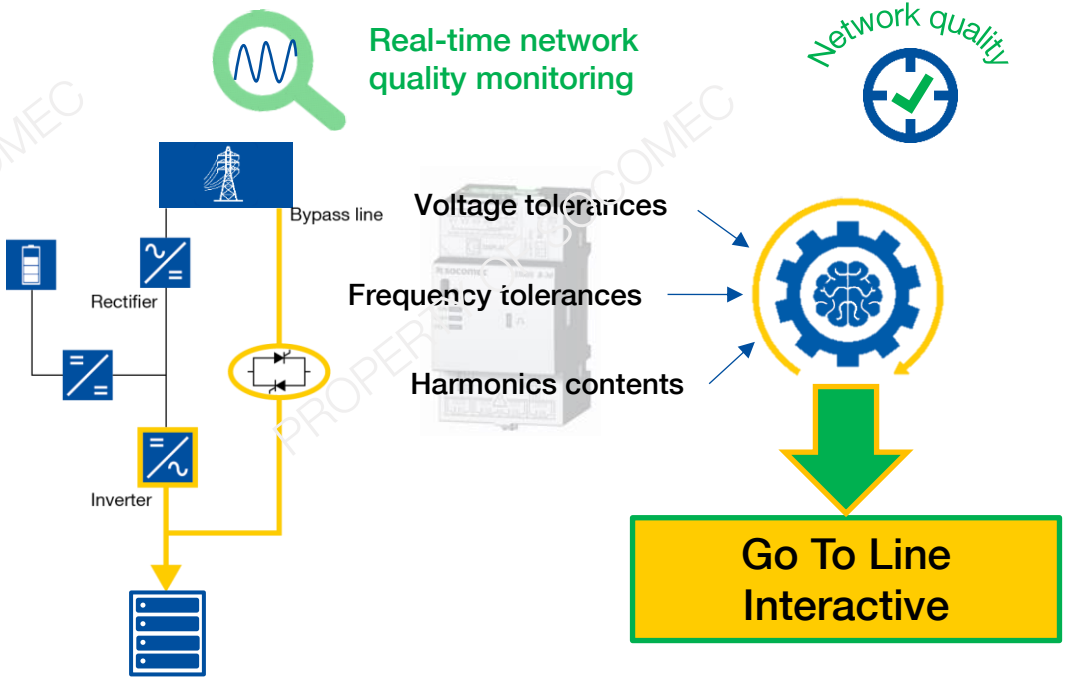


Smart conversion mode

An algorithm selects the optimum working mode

Smart : Line Interactive Mode

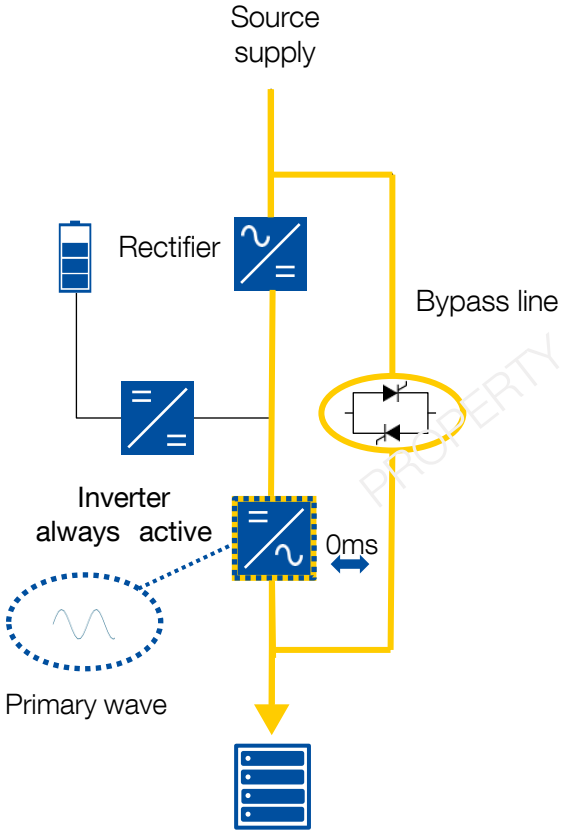
Combines the high efficiency of the static bypass and the power quality from the inverter



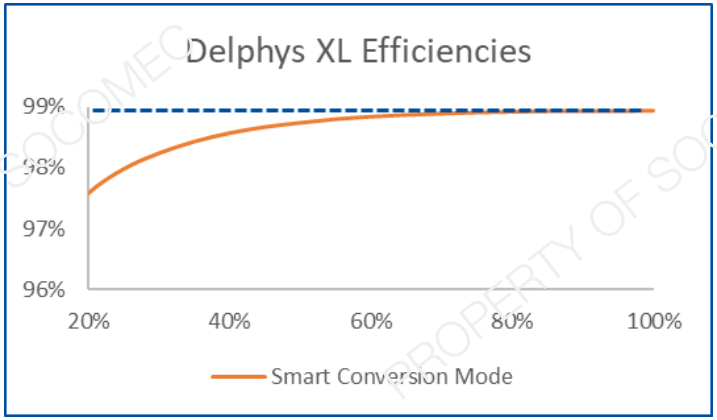
PROPERTY OF SOCOMEC

Smart conversion mode

The KEY Benefits of using the Smart conversion UPS mode



Efficiency boost **to 99,1%**





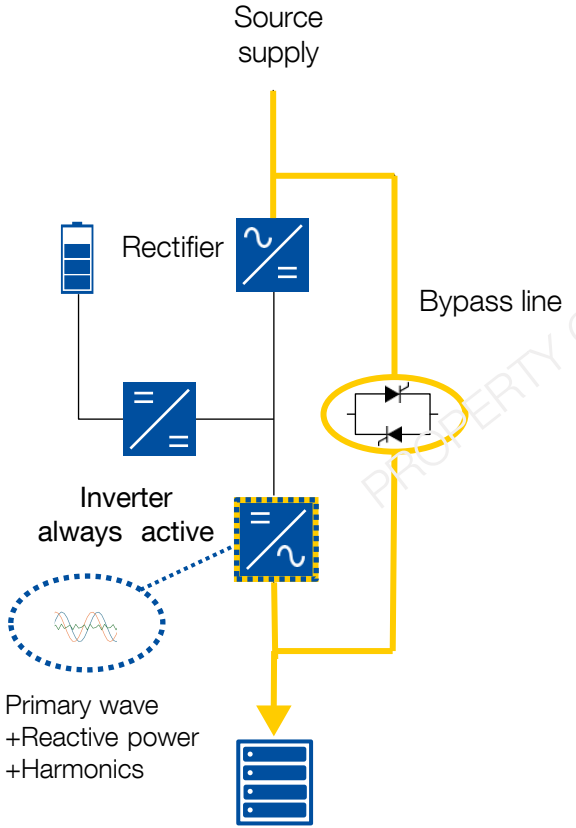
Uninterrupted power supply with **0ms transfer to VFI mode** in case of grid disturbance (Class 1 Transfer)

CLASS 1 CERTIFIED

PROPERTY OF SOCOMEC

Additional benefits of Smart conversion mode

Upstream friendly with clean consumption



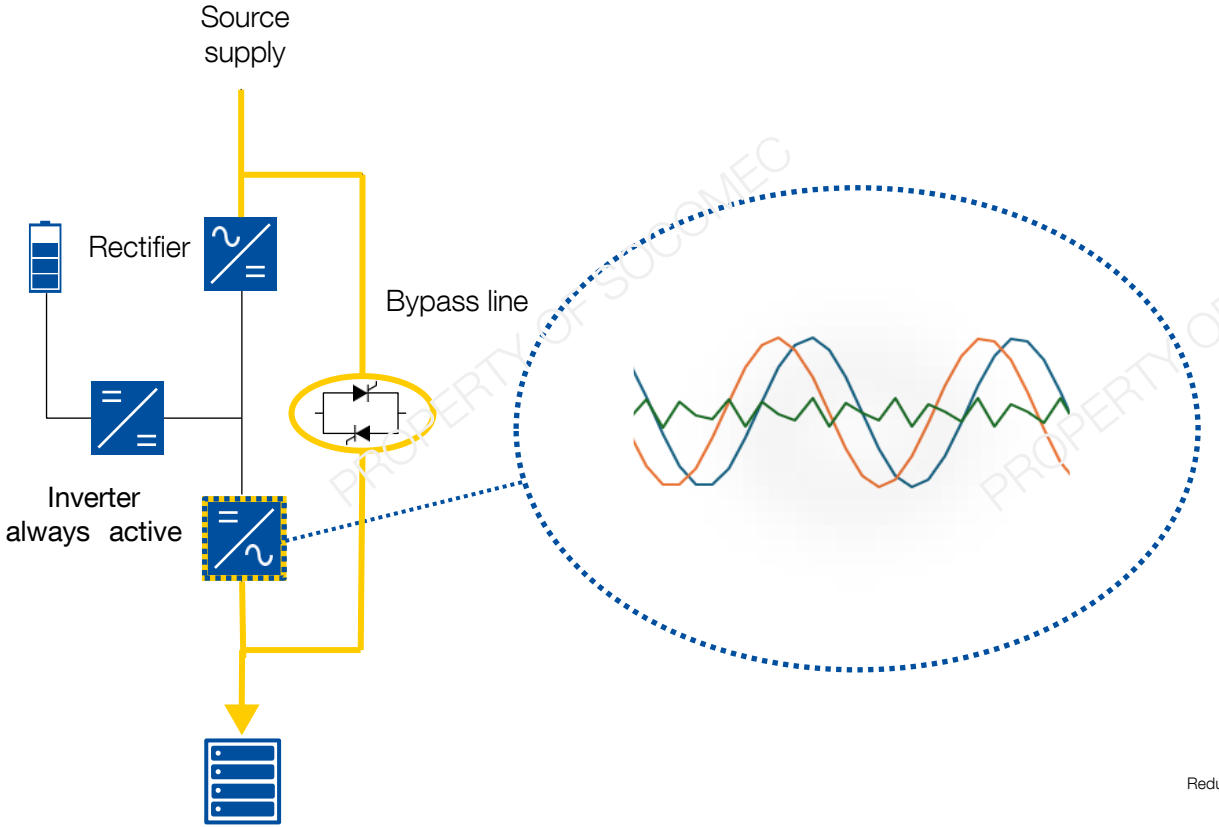
Reduce transformer load by reducing reactive power

Reduce transformer load by reducing harmonic current losses

PROPERTY OF SOCOMEC

Compensation of reactive power and harmonics

Upstream friendly with clean consumption



Primary wave

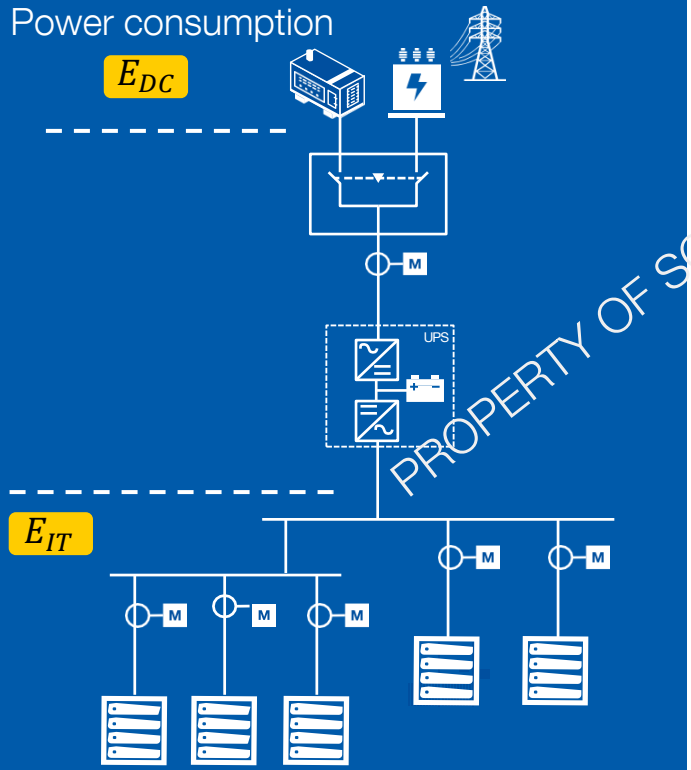
Reactive power
from 0.7 Leading to 0.7 Lagging

Harmonics compensation ≤ H7

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But what does all this mean for my installation?

Operation mode reducing Power Usage Effectiveness



E_{DC} : Total DTC Energy consumption

Power/Lighting	Cooling
• Switchgear	• Chillers
• UPS	• CRACs
• Battery backup	• Other
• Other	

E (IT) : Energy consumption of IT equipment

IT loads	
• Servers	• Network telecom eq.
• Data storage	• Other

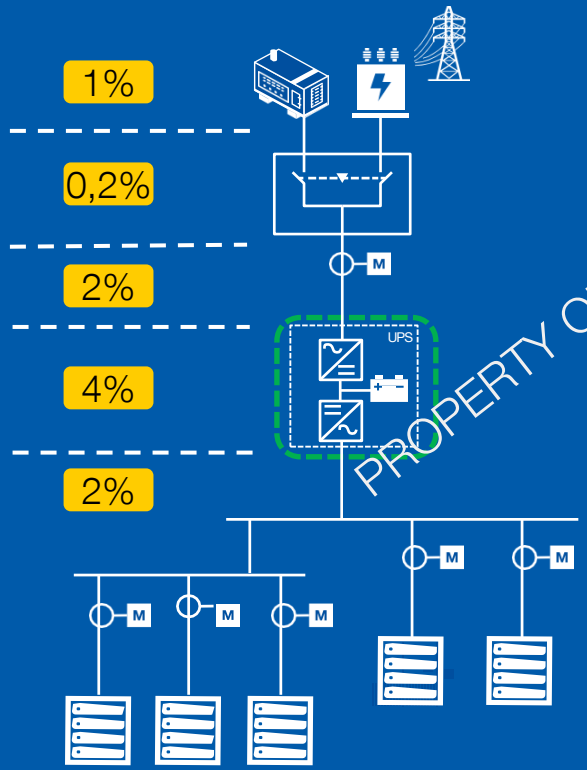
PUE is defined in:

- EN 50600-4-2,
- IEC 30134-2
- And referenced in IEC TS 22237-1

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Identifying losses inside electrical installation

Losses example for 1.6 MVA system



Transformer: 1600 kVA
IT power: 1200 kW
UPS: Delphys XL 1200kVA/kW

UPS mode: VFI

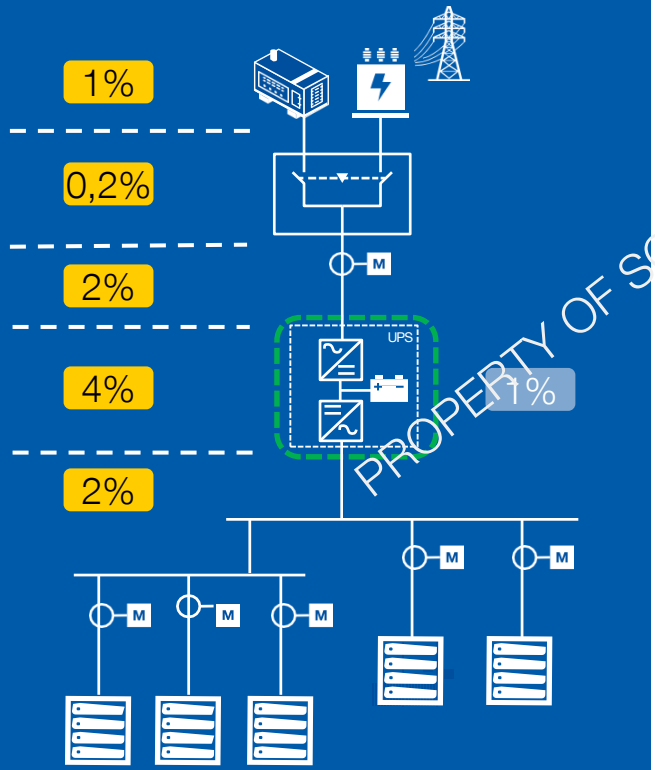
Losses	Typical	kW
Transformer	1%	10
MDB	0,2%	2,5
Main Cable	2%	25
UPS	4%	55
Distrib. Cabling	2%	24
Sys. losses		117

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MDB- Main distribution board

Identifying losses inside the electrical installation

Losses example for 1.6 MVA system



Transformer: 1600 kVA

IT power: 1200 kW

UPS: 1200kVA/kW

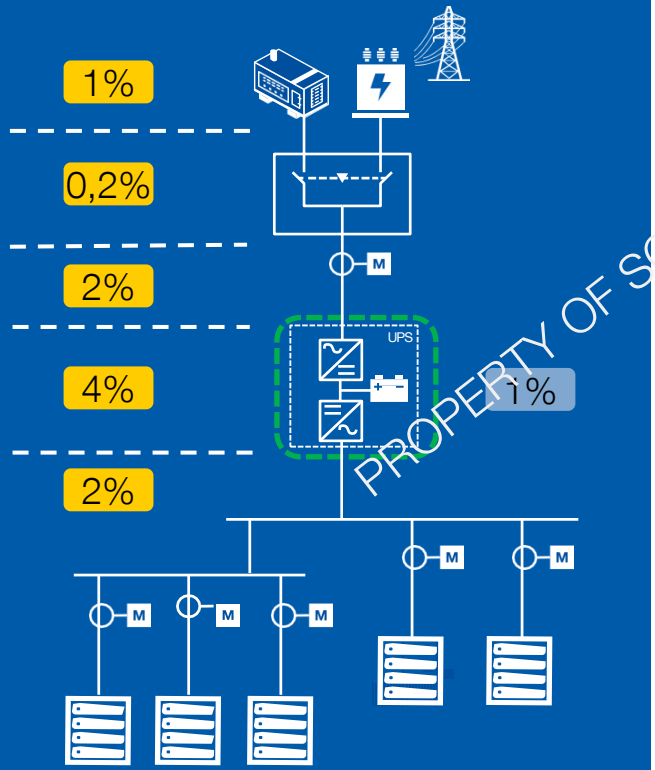
	UPS mode: VFI		UPS mode: Smart Conversion		
Losses	Typical	kW	Optimized	kW	Reduction
Transformer	1%	10	1%	9,4	6%
MDB	0,2%	2,5	0,2%	2,3	9%
Main Cable	2%	25	2%	24,3	4%
UPS	4%	55	1%	12	78%
Distrib. Cabling	2%	24	2%	24	0%
Sys. losses		117		72	38%

MDB- Main distribution board

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Identifying potential savings inside the electrical installation

Losses convert to €



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Reduction in losses 45kW

Energy saving 1080 kWh per day

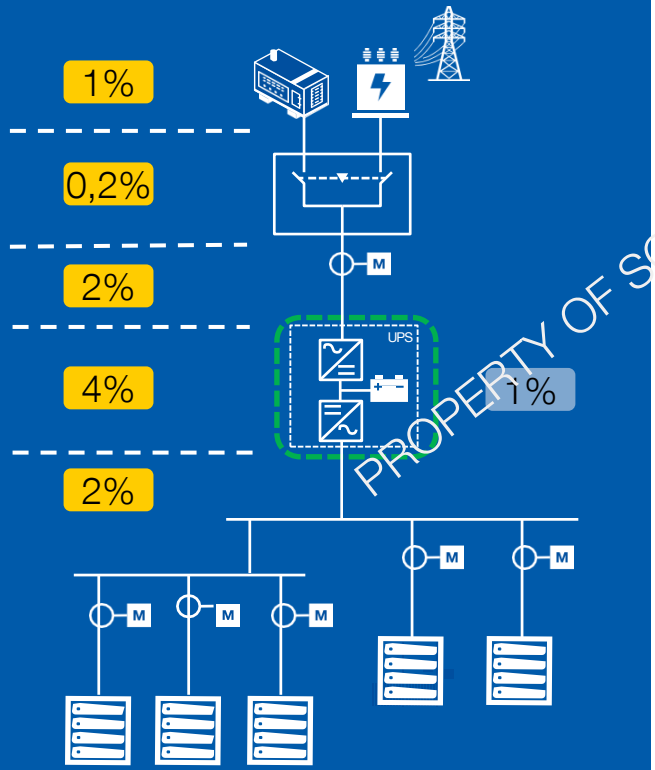
Energy saving 394 MWh per year

79 k€* Saving per year

* 0,2€ / KWh Eurostat

Identifying potential savings inside the electrical installation

Losses converted to Ton CO2 equivalent



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Europe CO2 Coefficient: 0,35 kg CO2 eq. /kWh
Analysis period : 20 years

100% VFI mode: 3410 Ton CO2 eq.

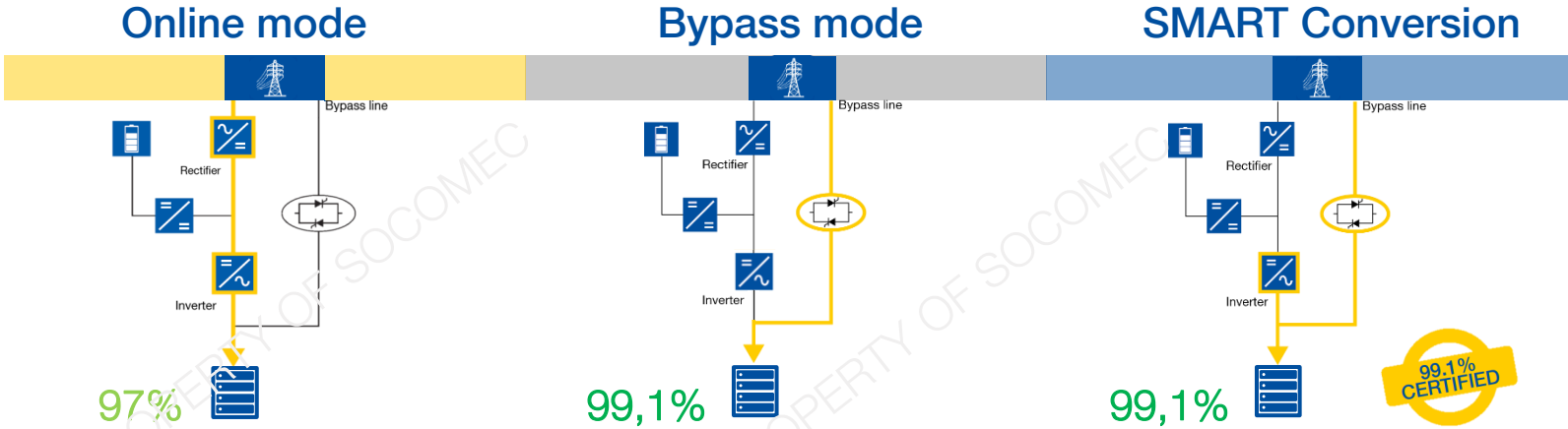
5% VFI mode: 170 Ton CO2 eq.
95% Smart Conversion: 712 Ton CO2 eq.

882 Ton

CO2 reduction of 74%

Key Takeaways on how it works

When Operating MODES become SMART…



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Less OPEX, Less Carbon Emissions &
NO Compromise to power quality!

The SOCOMEC Solution for Smart conversion

Increasing efficiency without compromising power quality



NEW

DELPHYS XM

Up to 800 kVA/kW



MODULYS XL

from 200 to 4800 kVA/kW



DELPHYS XL

from 1000 to 4800 kVA/kW

PROPERTY OF SOCOMEC

PROPERTY OF SOCOMEC

thank you **so** much!