

# WEBINAR

# **Microgrid** – få kraften til at styre grøn energiteknologi og -forbrug lokalt

# | Dagens værter

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Guenther Fleischer, Business Developer Manager, Siemens HQ



# Indhold

## Hvad er et Microgrid, og hvorfor taler vi om det?

Microgrid-definitionen, samt de globale trends, der driver anvendelsen af teknologien

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## Ok, men hvad får jeg ud af det?

Use cases, der løser konkrete udfordringer

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## Kunde case – Lempäälän Energia

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## Kunde case – Siemens Vienna Campus

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## Kunde case – Upper Blinkwater

Tekniske detaljer og hvordan man kommer i gang med sit projekt

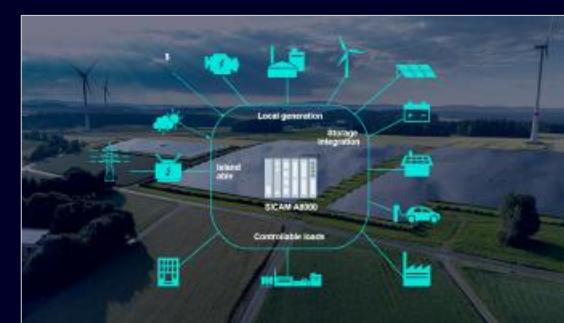
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## Teknologien bag Microgrids

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# Hvad er et Microgrid, og hvorfor taler vi om det?

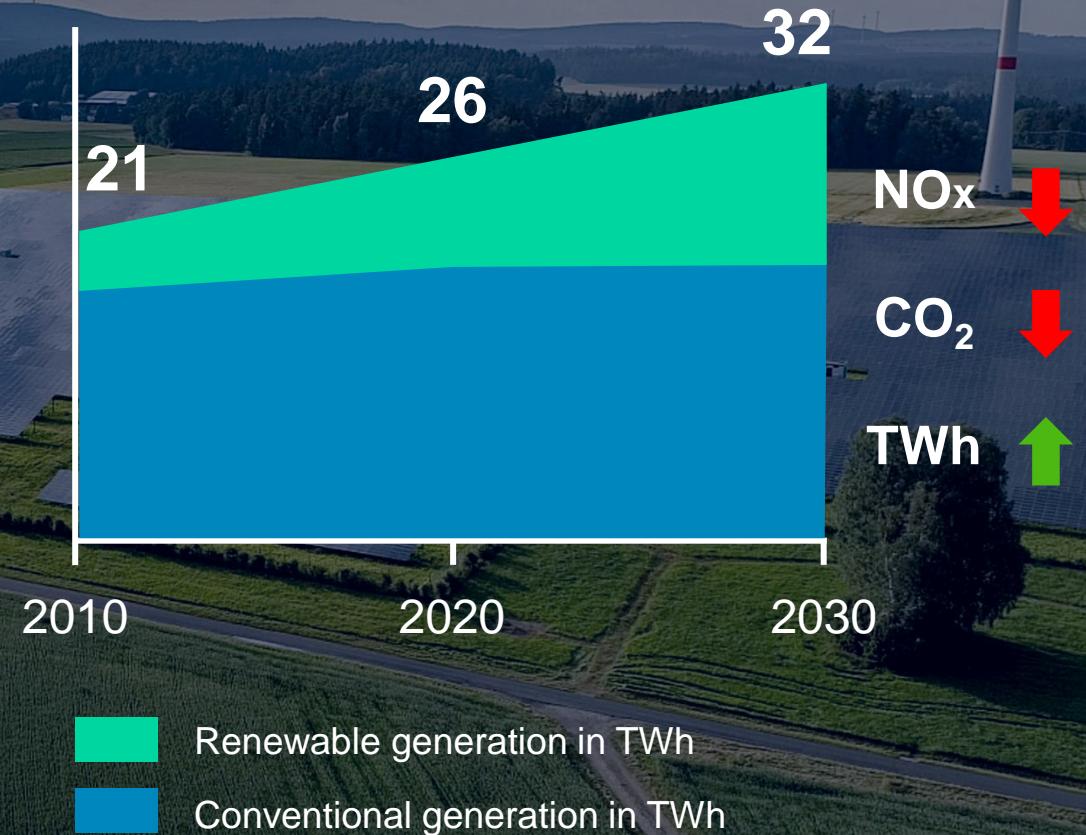
Microgrid-definitionen, samt de globale trends, der driver anvendelsen af teknologien

# Microgrid definition

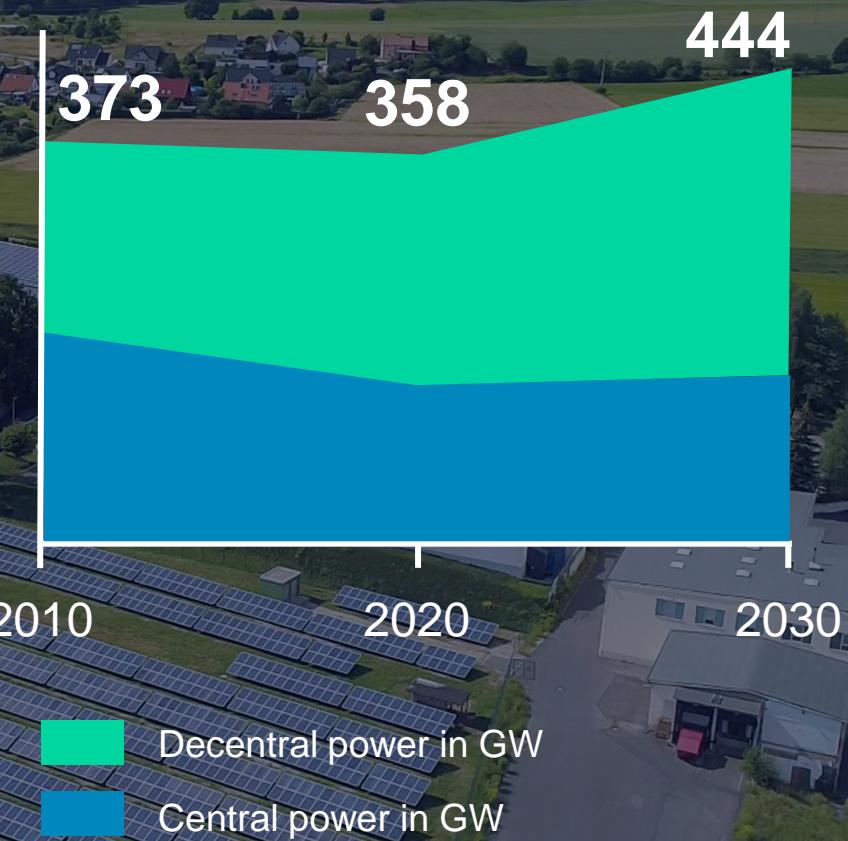


Et Microgrid er et geografisk begrænset område i elnettet, der indeholder både egen energiproduktion fra forskellige kilder, forskellige typer forbrugere og evt. energilagring. Dets primære funktion er at opretholde balancen mellem energiproduktion og forbrug, og det kan fungere med eller uden tilslutning til det øvrige elnet, dvs. i ø-drift.

# Decarbonising

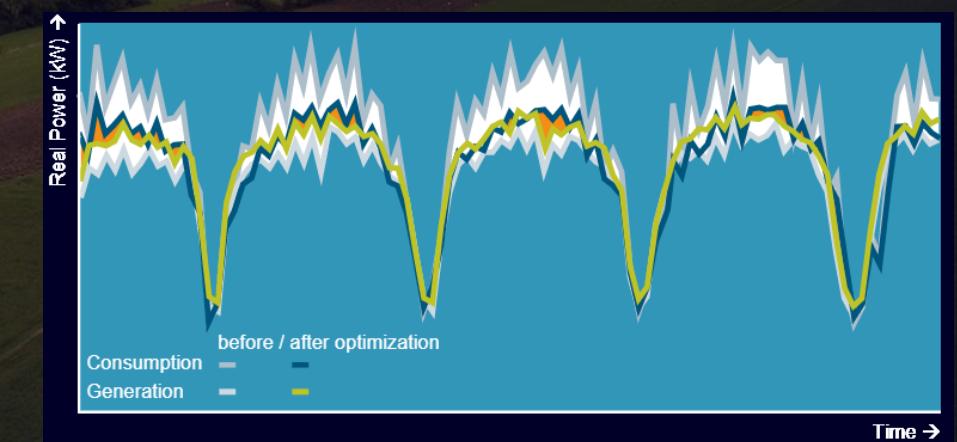


# Decentralisering



J11010110  
J0100100100100001  
J110001100000110011001  
11001101101001001101101  
0011010010010010000010101  
100100001010111101110101101  
01001001000010101111011101011  
01010111101110101101001001001  
001001001000010101111011101010  
010010000101011110111010101

# Digitalisering



# Hvem kan få gavn af teknologien?

## Campus / Communities / Higher Education



## Islands / Remote Sites



## Utilities



## Commercial / Industry



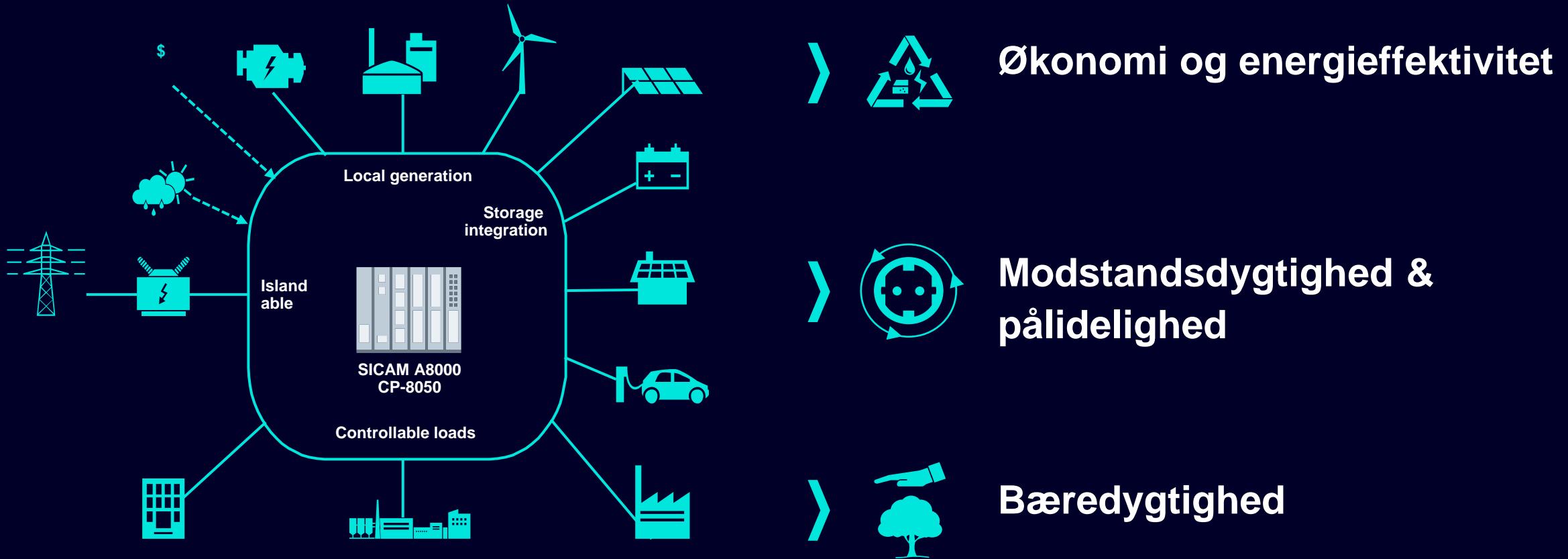
## Critical Infrastructure / Military Institutions

Ok, men hvad får jeg ud  
af det?

Use cases, der løser konkrete udfordringer

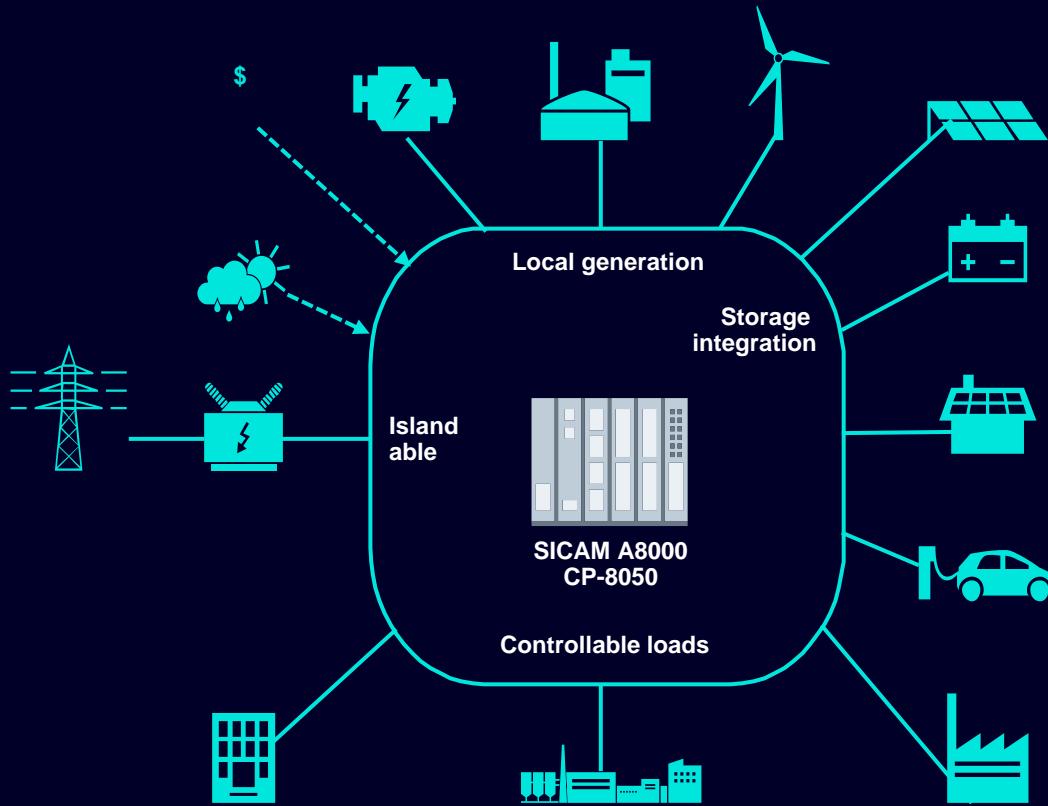
# Microgrid

## Fordele



# Microgrid

Hvad kan du opnå?



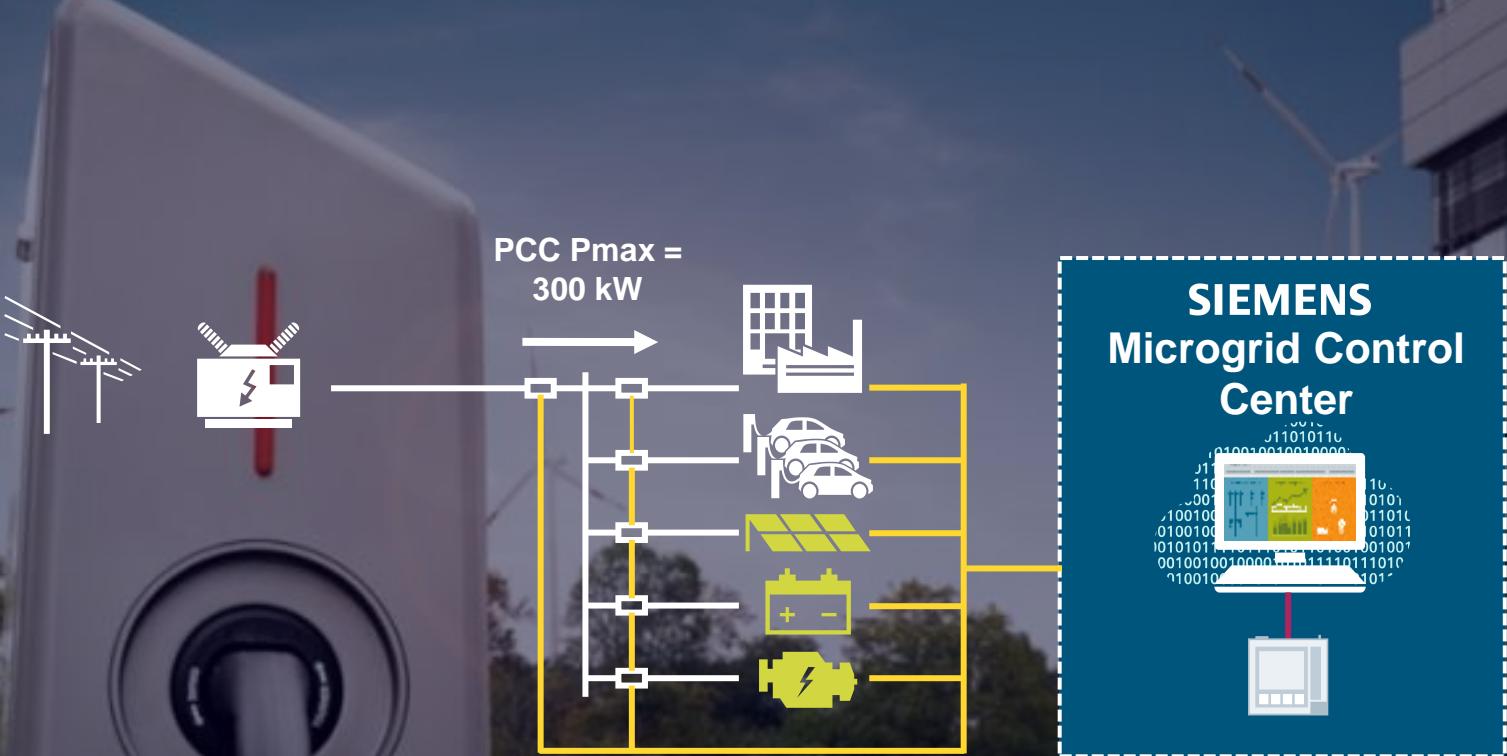
## Mål/KPI'er:

- Reduktion af CO2-udledningen
- Integration af ladeinfrastruktur til elbiler med egen, lokal generation
- Højere modstandsdygtighed ved uønsket strømafbrydelser
- Højere energi kvalitet (PQ)
- Reduktion af energiregningen (differentierede takster)
- Adgang til energimarkedet og salg af system ydelser

A photograph of a modern building's exterior featuring a massive vertical garden. The wall is covered in a grid of green plants, likely ivy or sedum, which are part of a living wall system. The building has a light-colored, possibly white or grey, facade with some structural elements visible. The sky is clear and blue.

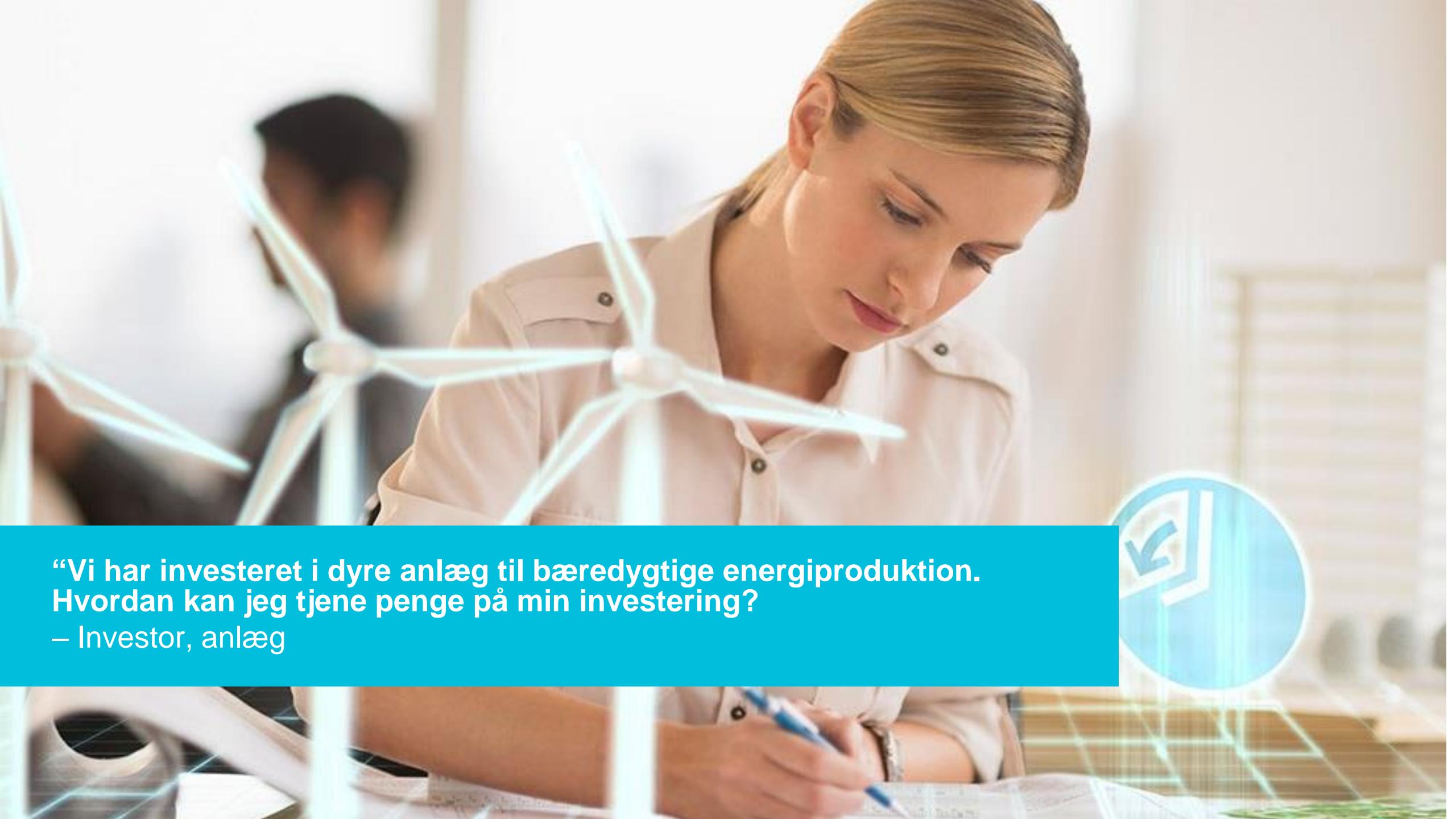
**“Jeg vil spille en aktiv rolle i klimakampen, vælge løsninger der understøtter den globale indsats omkring klimaforandringer og opfylde vores mål om at være et emissionsfrit campus.”**

– Rektor, Universitet



**“Jeg ønsker en hurtig udrulning af ladeinfrastruktur til elbiler uden opgradering af min eksisterende elnetforbindelse.”**

– Facility Manager, kontorbygning



**“Vi har investeret i dyre anlæg til bæredygtige energiproduktion.  
Hvordan kan jeg tjene penge på min investering?**

– Investor, anlæg





**“Jeg ønsker pålidelig energiforsyning 24/7 til at holde vores drift i gang og reducere omkostninger skabt af produktionsstop.”**

– Driftsvarlig, produktion



**“Jeg ønsker strøm i kontakten 24/7, samtidig ønsker jeg, at vi optimerer vores energimix.”**

– Driftsansvarlig, netvirksomhed

# Kunde case – Lempäälän Energia

# Lempäälän Energia – Commercial district

with resiliency, self supply and market participation

## Island

capability and  
resynchronization

## Self supply

using CHP, photovoltaics  
and battery storage

## Market

participation for energy  
and ancillary services

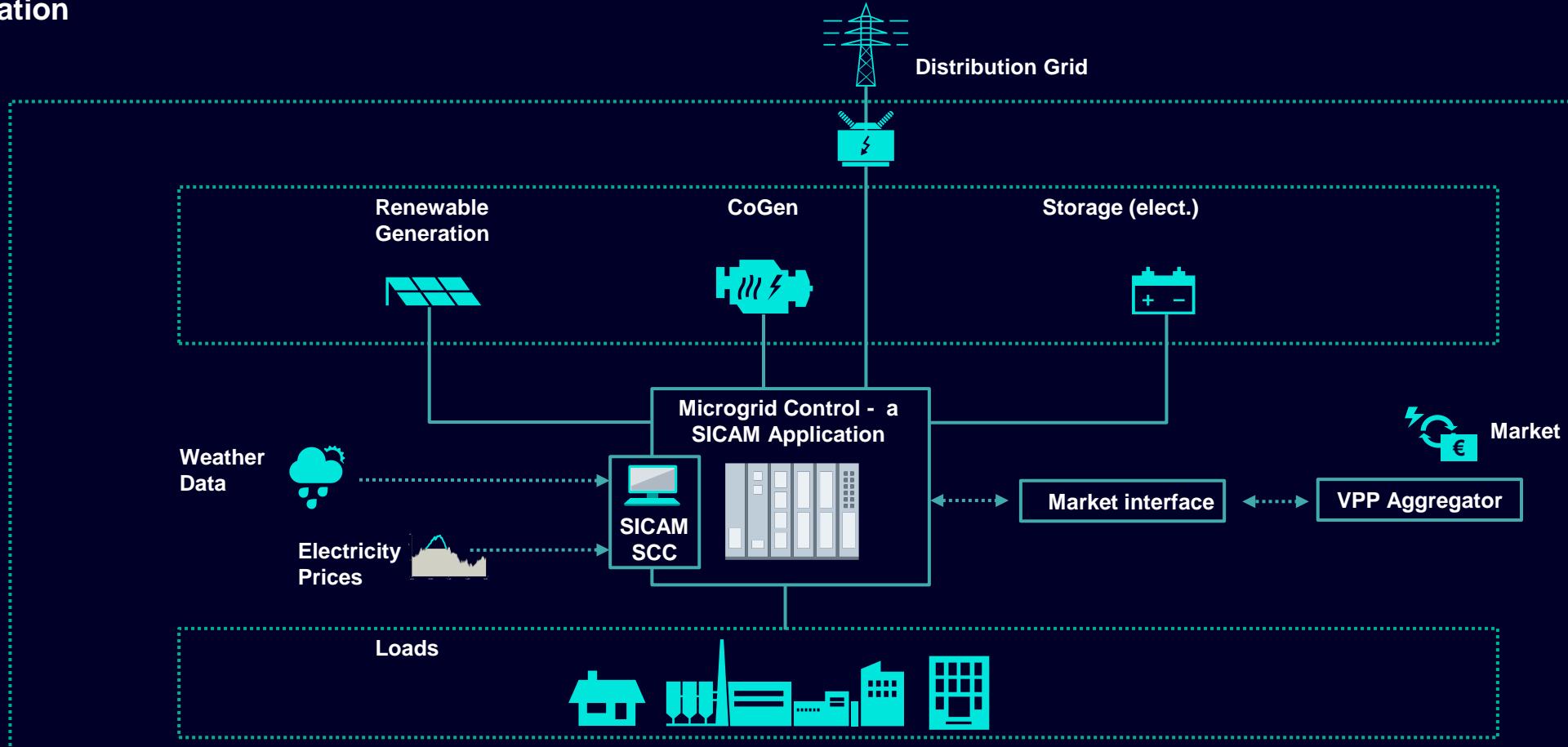
Projektiesittely  
"Energiaomavarainen Marjamäki"



# LEMENE Microgrid, Finland

Revenue generation through market participation and self sufficient electrical grid

## Configuration



# Kunde case – Siemens Vienna Campus

# Siemens Campus Microgrid Vienna

Intelligent charging infrastructure, peak shaving and CO<sub>2</sub> reduction

**~2 MW**

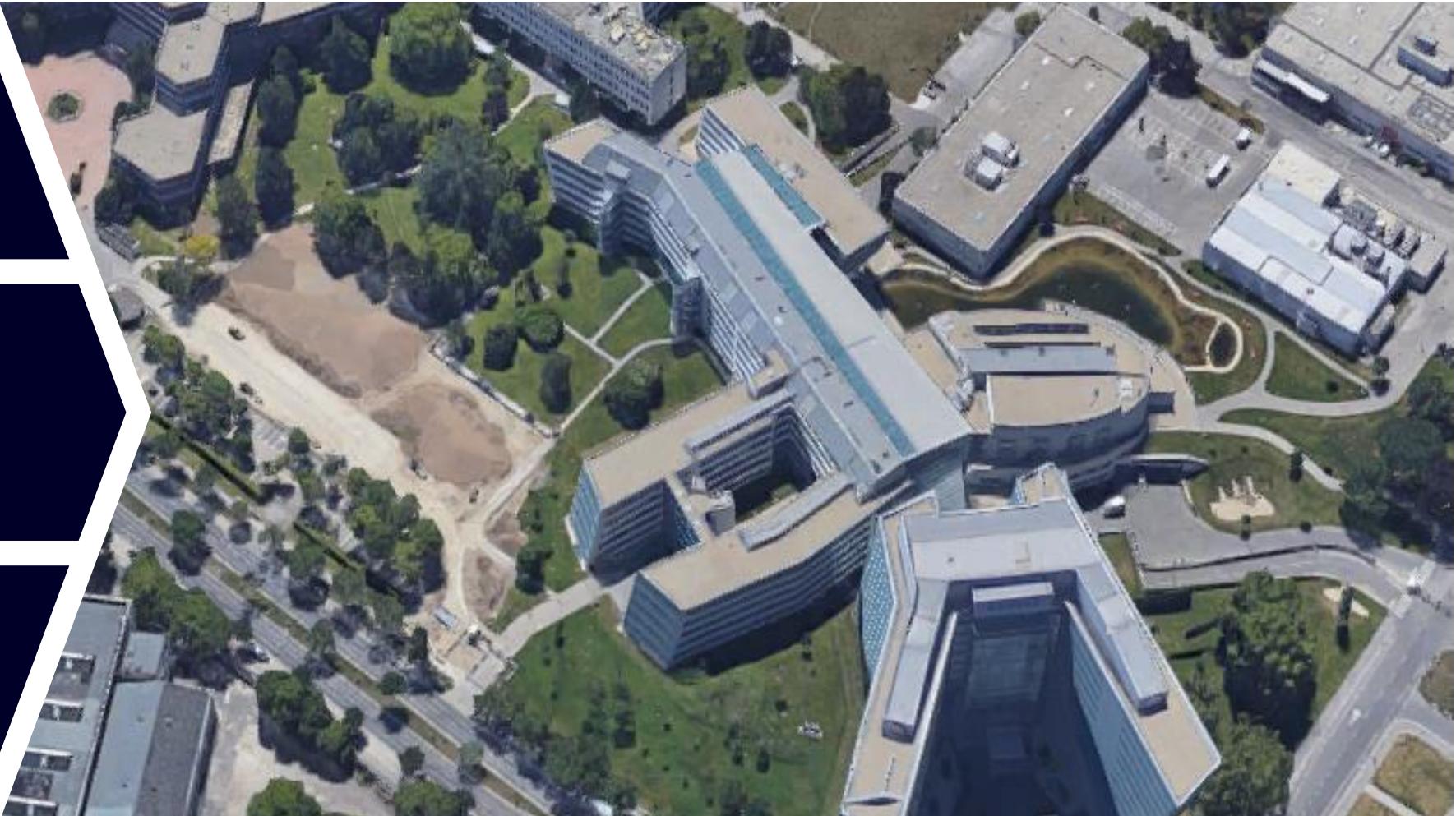
of managed power

**100 tons**

CO<sub>2</sub> saved per year

**312 kWp**

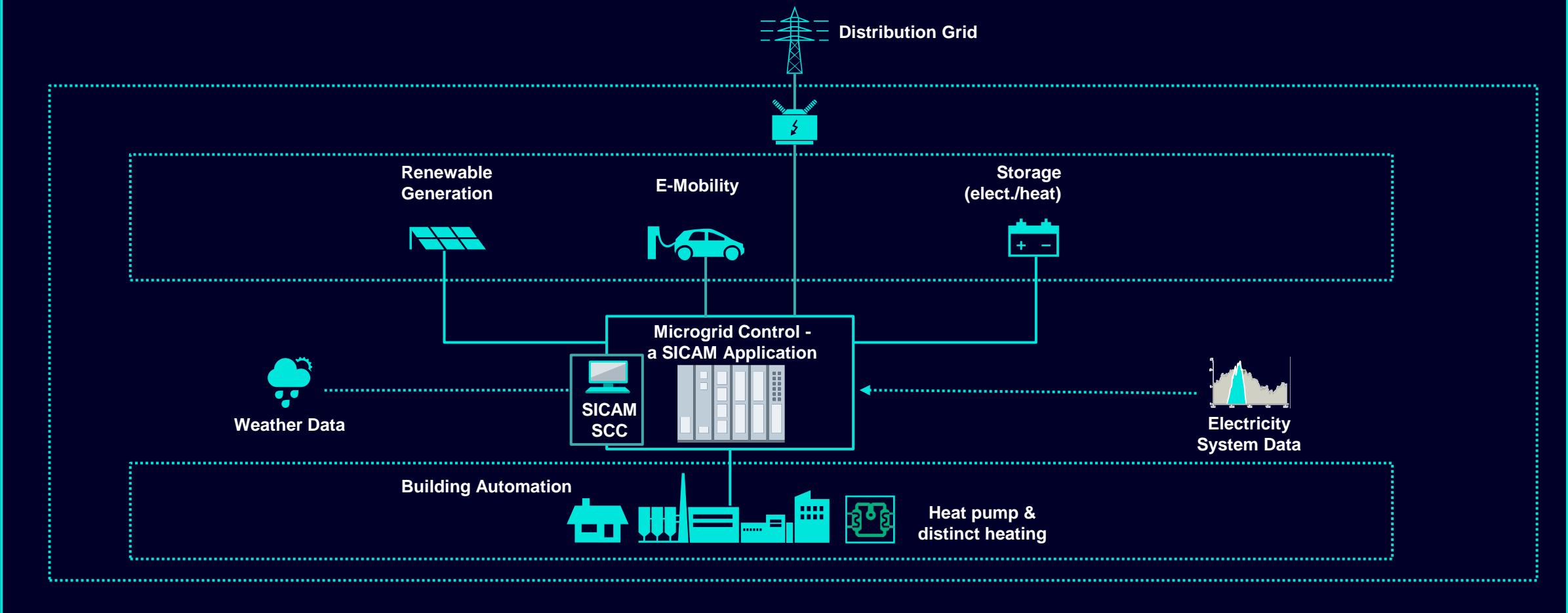
peak output from PV



# Siemens Microgrid Campus, Wien, Austria

Intelligent charging infrastructure, peak shaving and CO<sub>2</sub> reduction

## Configuration



# Kunde case – Upper Blinkwater

# Upper Blinkwater, South Africa

## Energizing remote area

**62**

House holds

**80%**

Of excess generation stored in batteries and not curtailed

**16%**

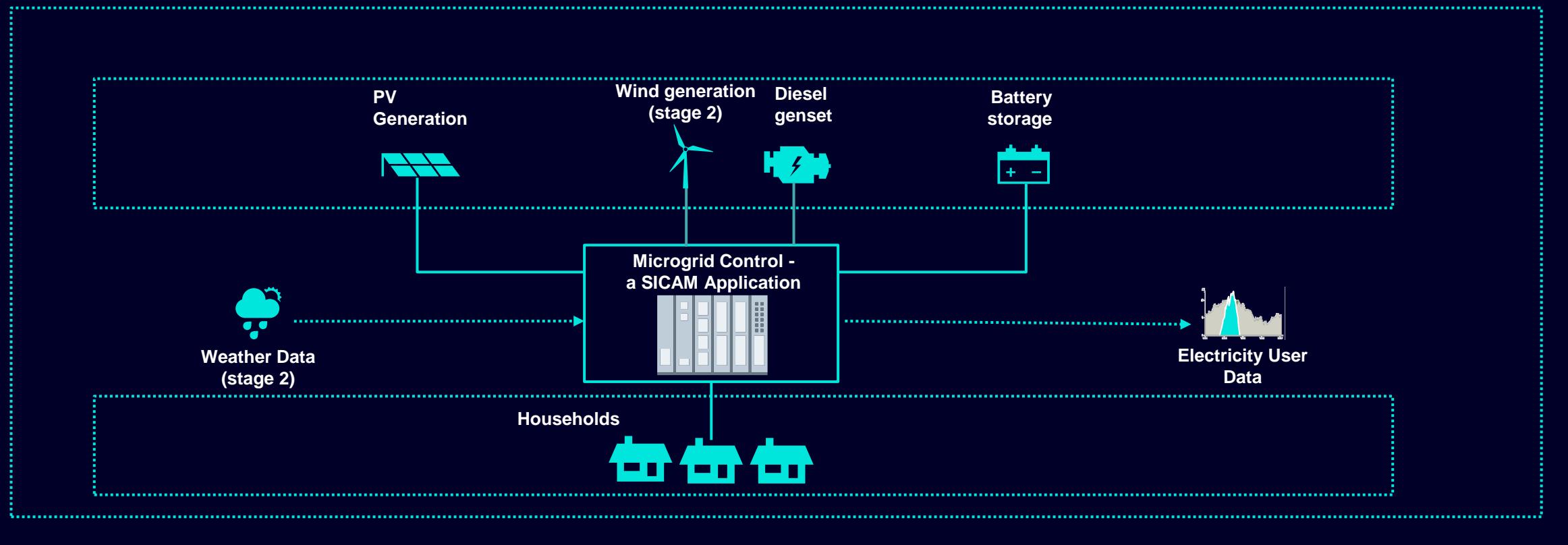
fuel savings



# Upper Blinkwater, South Africa

## Energizing remote area

### Configuration

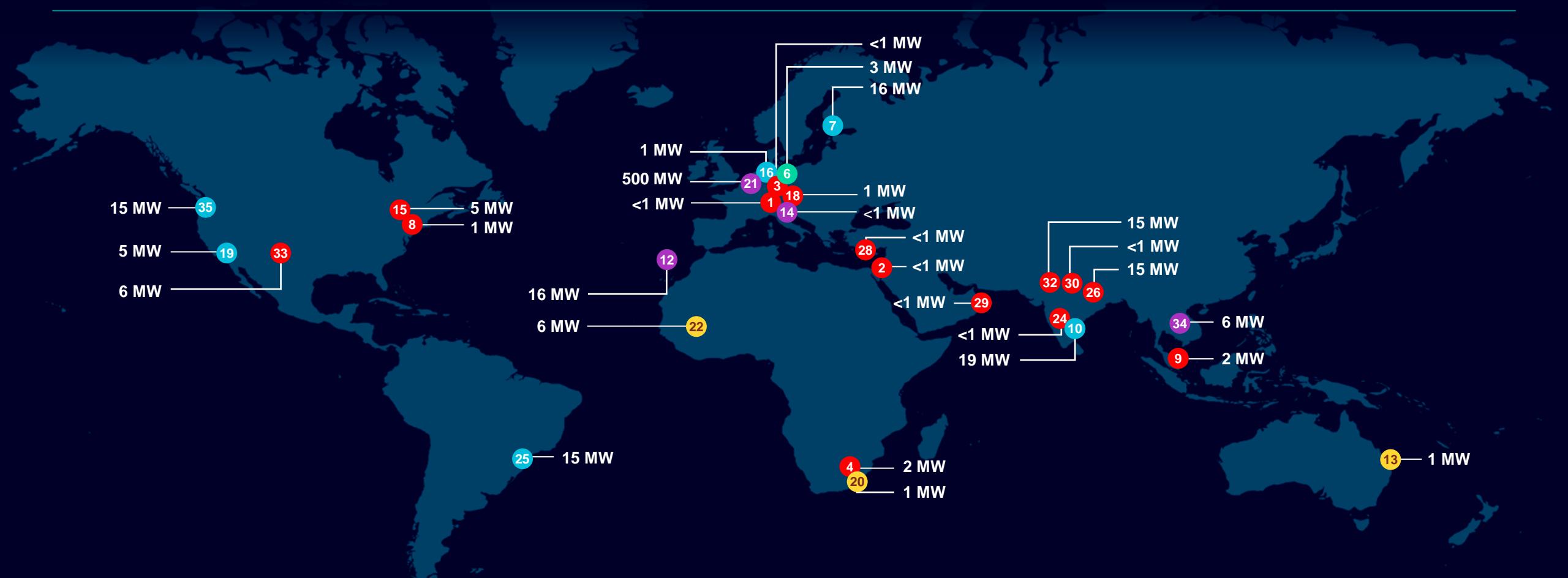


0—00 MW  
↑ Total Capacity

Project Index

- Campus/ Communities/ Higher Education
- Commercial/ Industry
- Utilities

- Islands / Remote Sites
- Critical Infrastructure/ Military Institutions



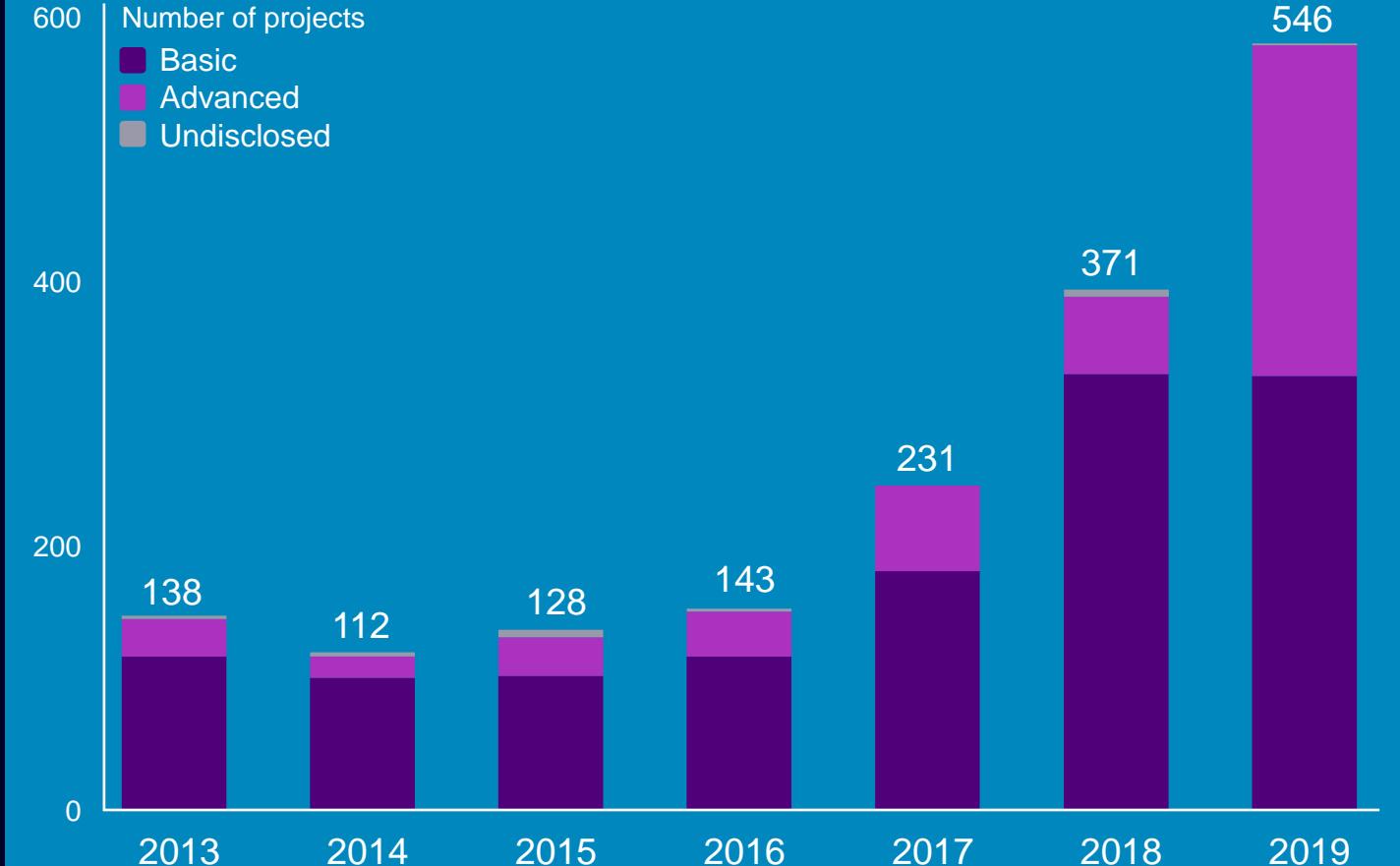
# Microgrid Control – a SICAM application worldwide



The Microgrid Solutions serving  
**76** clients and managing **2000 MW**  
worldwide

# Market trends

Microgrid projects completed annually – global figure



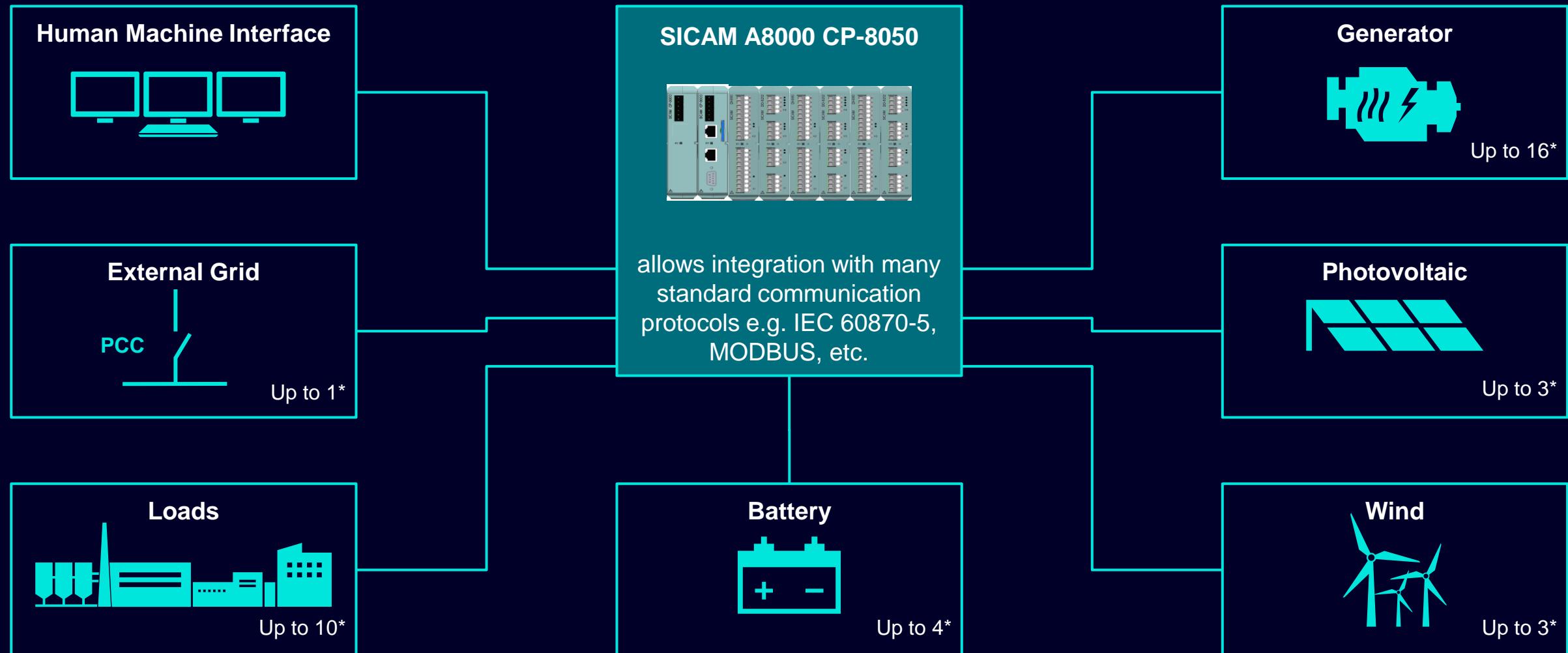
Source: Wood Mackenzie Grid Edge Service

- Microgrids are becoming increasingly common, with market estimates averaging 10-20% CAGR
- Advanced microgrids expected to surpass (multiple DERs) basic microgrids (single DERs) for most common type of deployment

# Teknologien bag Microgrids

Tekniske detaljer og hvordan man kommer i gang med sit projekt

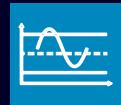
# Microgrid – SICAM Controller and proposed architecture with implemented assets



\*) standard configuration

# Microgrid – a SICAM application Standard features overview

## Basic Features



Peak  
shaving



Generation  
Control



Islanding /  
Black start



Load Control



Storage  
Control



Archiving



Monitoring/  
Reporting



**SICAM A8000 CP-8050**  
Small, robust and modular:  
Standardized Microgrid Control logic



**SICAM SCC**  
Human Machine Interface  
(pre-configured)

## Advanced Features



Load  
Management



Utilization of  
renewable  
generation  
for e-car  
charging



Demand charge  
reduction



Market access



Load  
forecasting



Generation  
forecasting

# International Standards



IEEE



Planned



1) No certification available/ planned

For Microgrid Control certain international standards are relevant depending on the region. Microgrid Control is compliant to following standards<sup>1)</sup>:

- IEEE 2030.7 Microgrid Controllers
- IEC TS 62898-2 Microgrid Operations

Following standards are applicable for projects using Microgrid Control and are supported by Microgrid Control:

- IEEE 2030.8 Testing
- IEC TS 62898-1 Microgrid Planning

For VDE-AR-N 4110 (Germany) certification is planned.

# A strong end-to-end Microgrid offering

Technical consulting & state-of-the-art simulation software solutions:

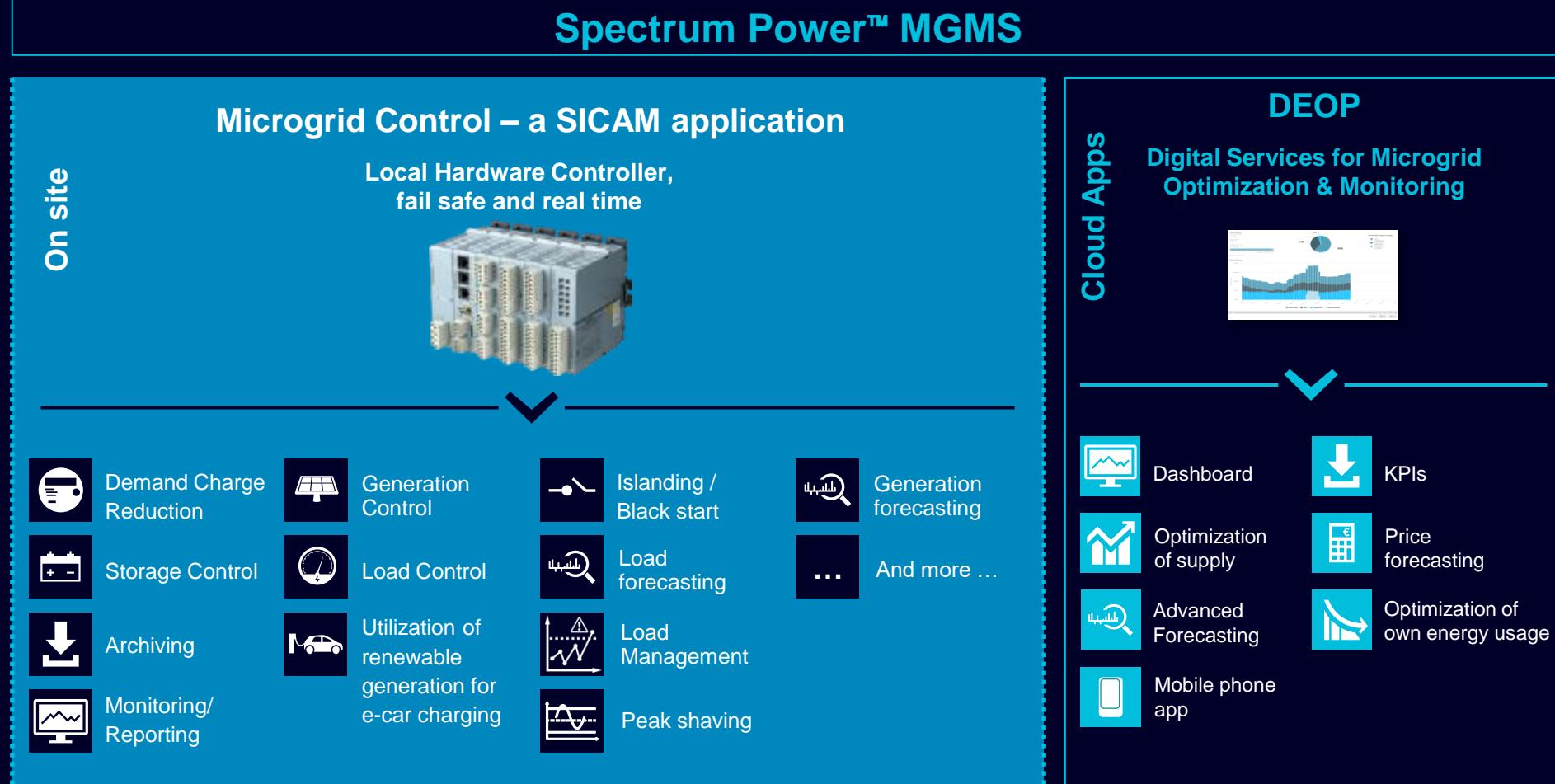
## PSS DE

Technical feasibility & economic simulation



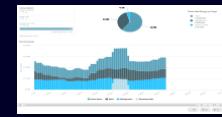
## Back office

- Determination of optimal dispatch strategy based on cost
- Determination of optimal dispatch strategy based on reliability of supply
- Determination of optimal dispatch strategy based on sustainability



## DEOP

Digital Services for Microgrid Optimization & Monitoring

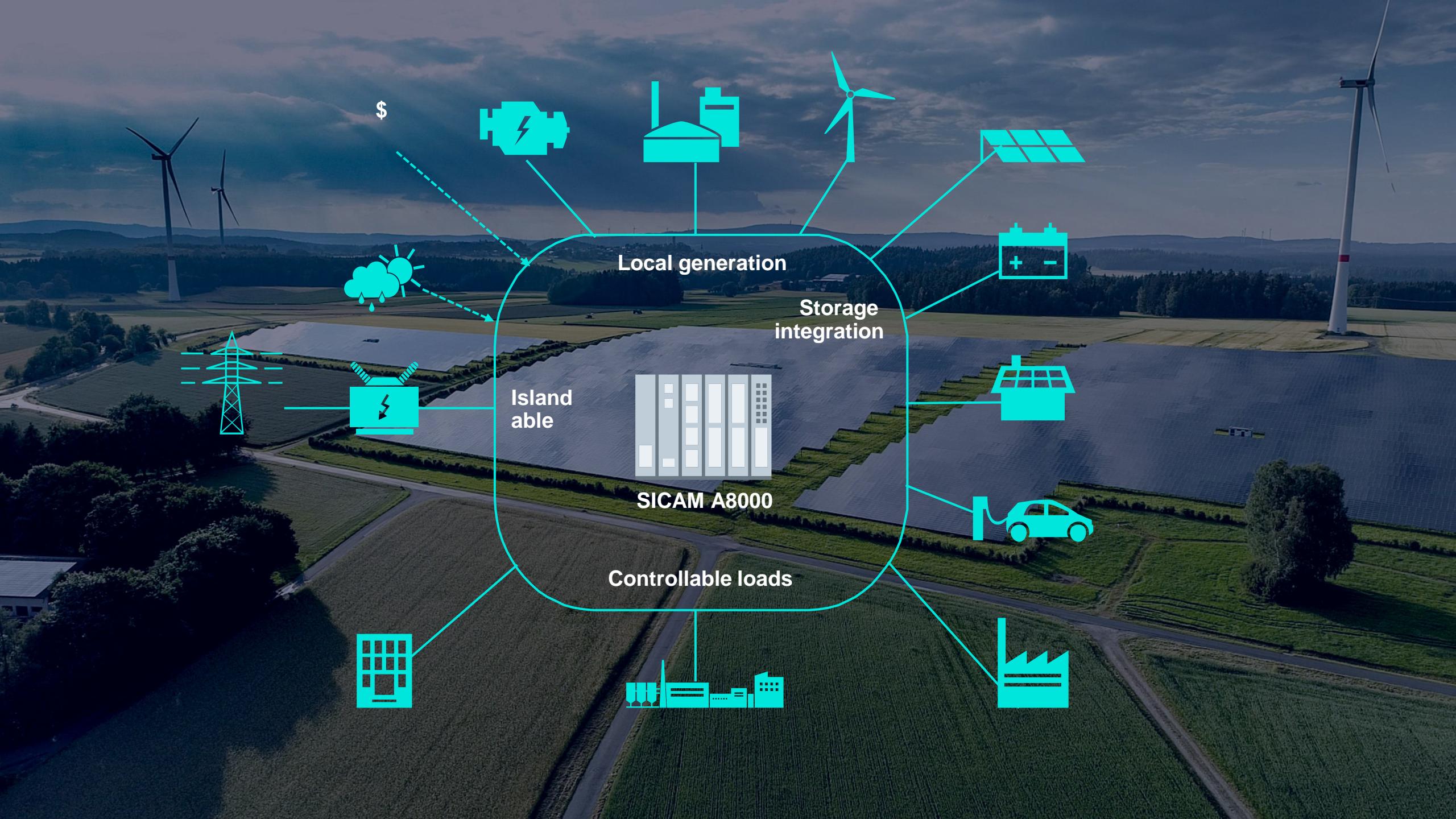


## Cloud Apps

- |  |                        |  |                                  |
|--|------------------------|--|----------------------------------|
|  | Dashboard              |  | KPIs                             |
|  | Optimization of supply |  | Price forecasting                |
|  | Advanced Forecasting   |  | Optimization of own energy usage |
|  | Mobile phone app       |  |                                  |

## Hvordan kommer du i gang?





Local generation

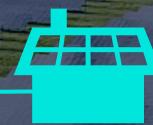
Storage  
integration

Island  
able

SICAM A8000

Controllable loads

\$



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