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Ingenuity for life

Unlock the potential – Digitalize your building

Light+Building | Frankfurt-Main, 18 – 23 March 2018

siemens.com/light-building

Individual needs of building users …

Comfort
High expectations of user-friendly offices

Quality of life
New offers for municipal housing and city quarters

Fit for purpose
Best conditions for hospital patients

Unlock the potential

Digitalize your building

… meet new market drivers
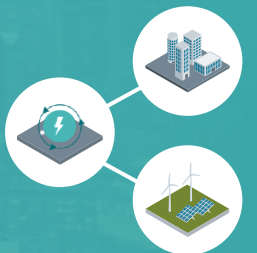
IoT technology
Sensors, Data Analytics, AI

Adaptive infrastructures
Forward-looking and flexible buildings

Convergence of infrastructures
New business models

Decarbonization
Electricity as the #1 energy source

Diverse Roles – Different Requirements

Owners
- Higher capacity through flexibility
- Greater value generation
- TCO optimization
- More transparency through KPIs and dashboards

Operators
- Operational transparency and operation
- Higher availability of equipment and facilities
- Lower maintenance costs

Commercial tenants
- Employee productivity
- Workplace safety and security
- Greater comfort

Project developers
- Greater transparency and forward-looking development: 4D-planning and simulation/BIM
- User-orientation: "Human-Centric Design"
- Integration of innovative solutions
- Risk-minimized project realization

Individual added value for building users

City/ grid operators/ utilities
- Strengthen customer relationships through added-value services
- Integrate building infrastructures in supply strategies

Architects/ planners
- Greater transparency for faster project completion and earlier conflict and error detection
- User-orientation: integration of innovative solutions

Distributors
- Modular and IoT-ready systems and devices
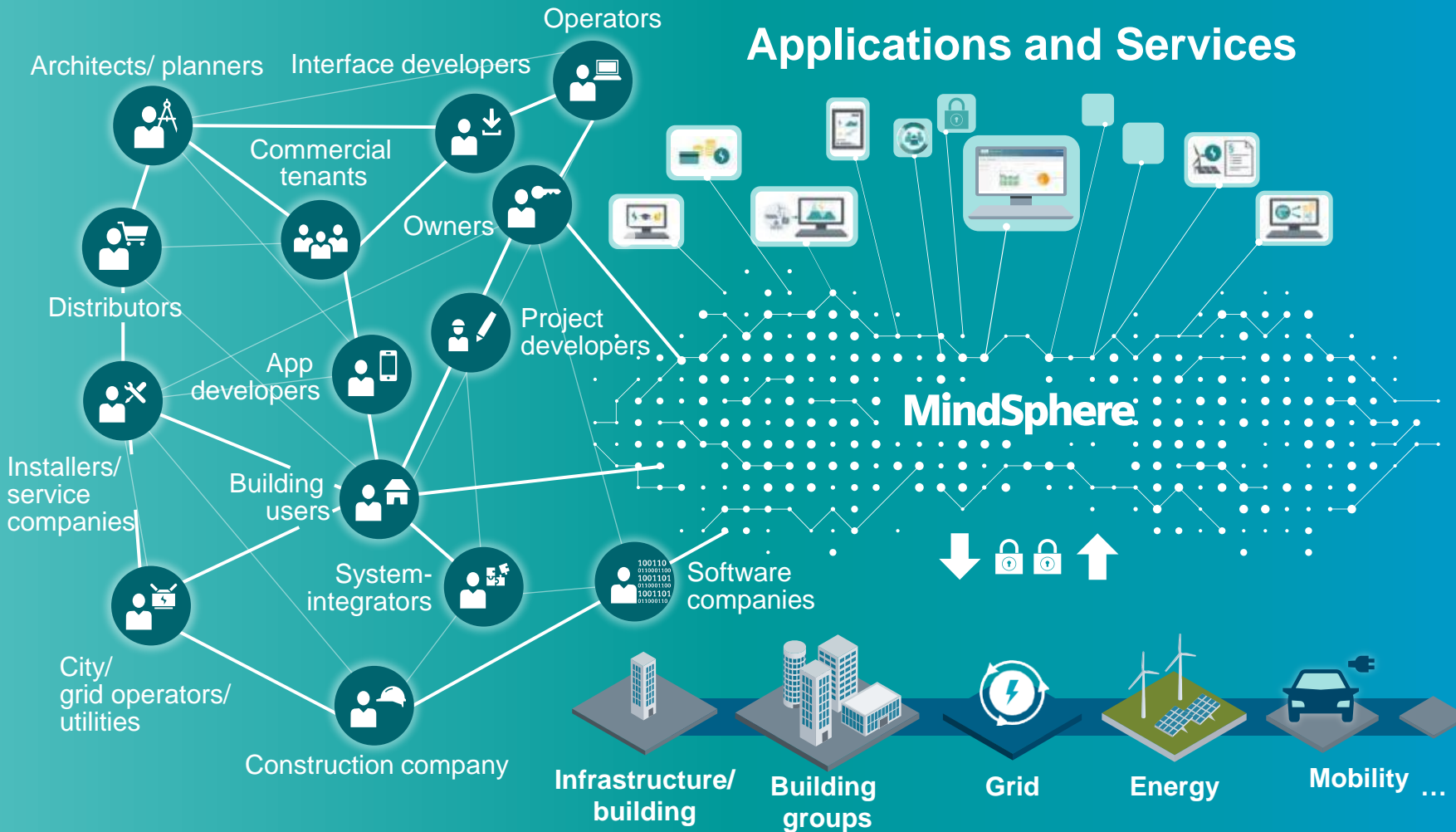- Defining new data-driven business models

Installers/ service companies
- Digital engineering
- Modular and IoT-ready systems and devices
- Adaptive maintenance and proactive service offerings

An Open and Secure Ecosystem

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Operators

Architects/ planners   Interface developers

Commercial tenants

Owners

Distributors

Project developers

App developers

Installers/ service companies

Building users

System-integrators

Software companies

City/ grid operators/ utilities

Construction company

Applications and Services

MindSphere

Infrastructure/ building   Building groups   Grid   Energy   Mobility ...

Open
Secure cloud infrastructure and ecosystem
– Open interfaces/APIs
– Open standards
– Plug and play
– Open partner network
– Cyber-Security "Charter of Trust"
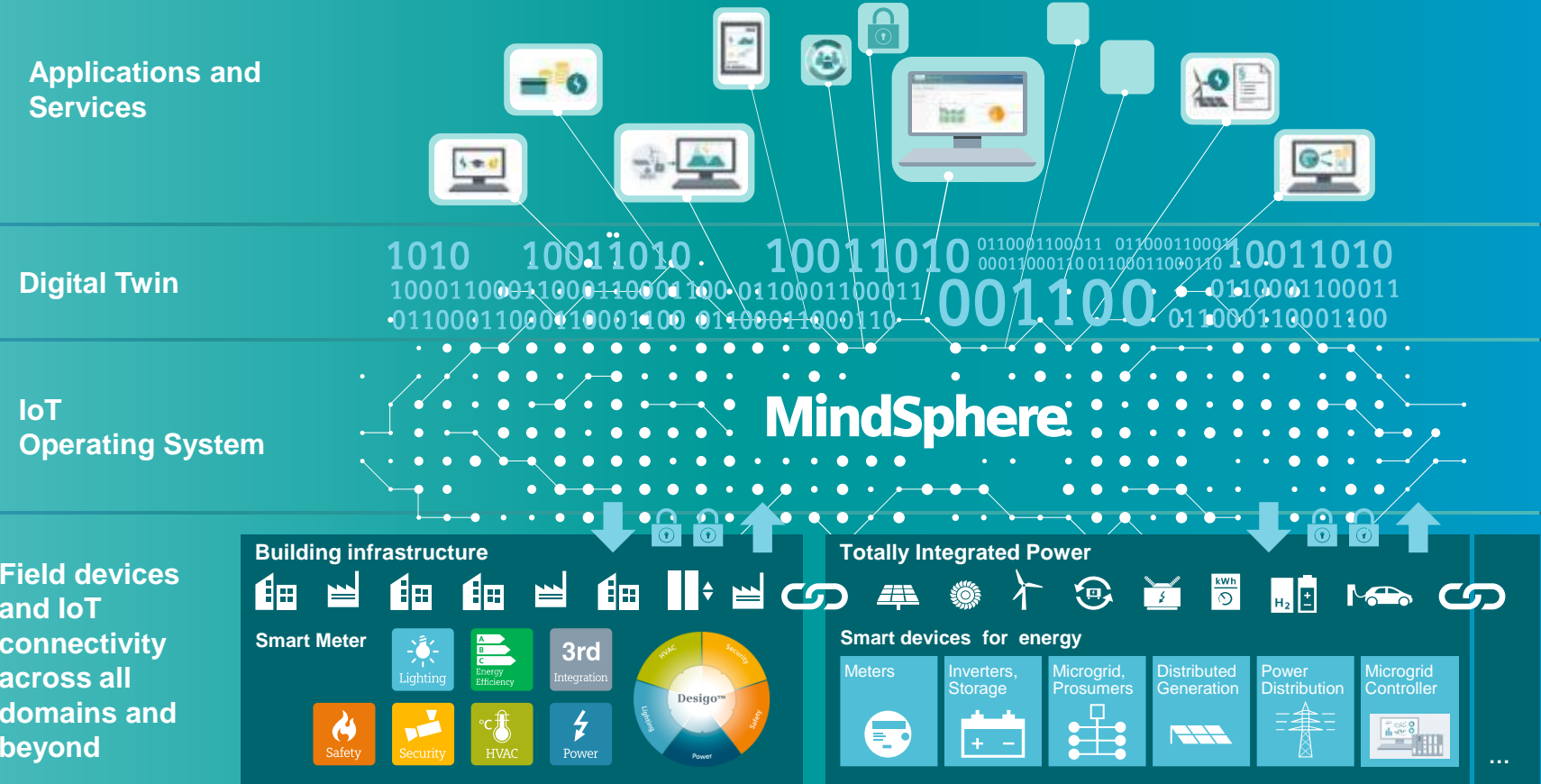
Systemic
End-to-end solutions
– Scalability
– Definition of new value chains
– New data-driven services: predictive maintenance
– Cross-sector coverage

MindSphere – The secure IoT Operating System

Sector-specific know-how combined with end-to-end solutions for optimized building performance and energy management
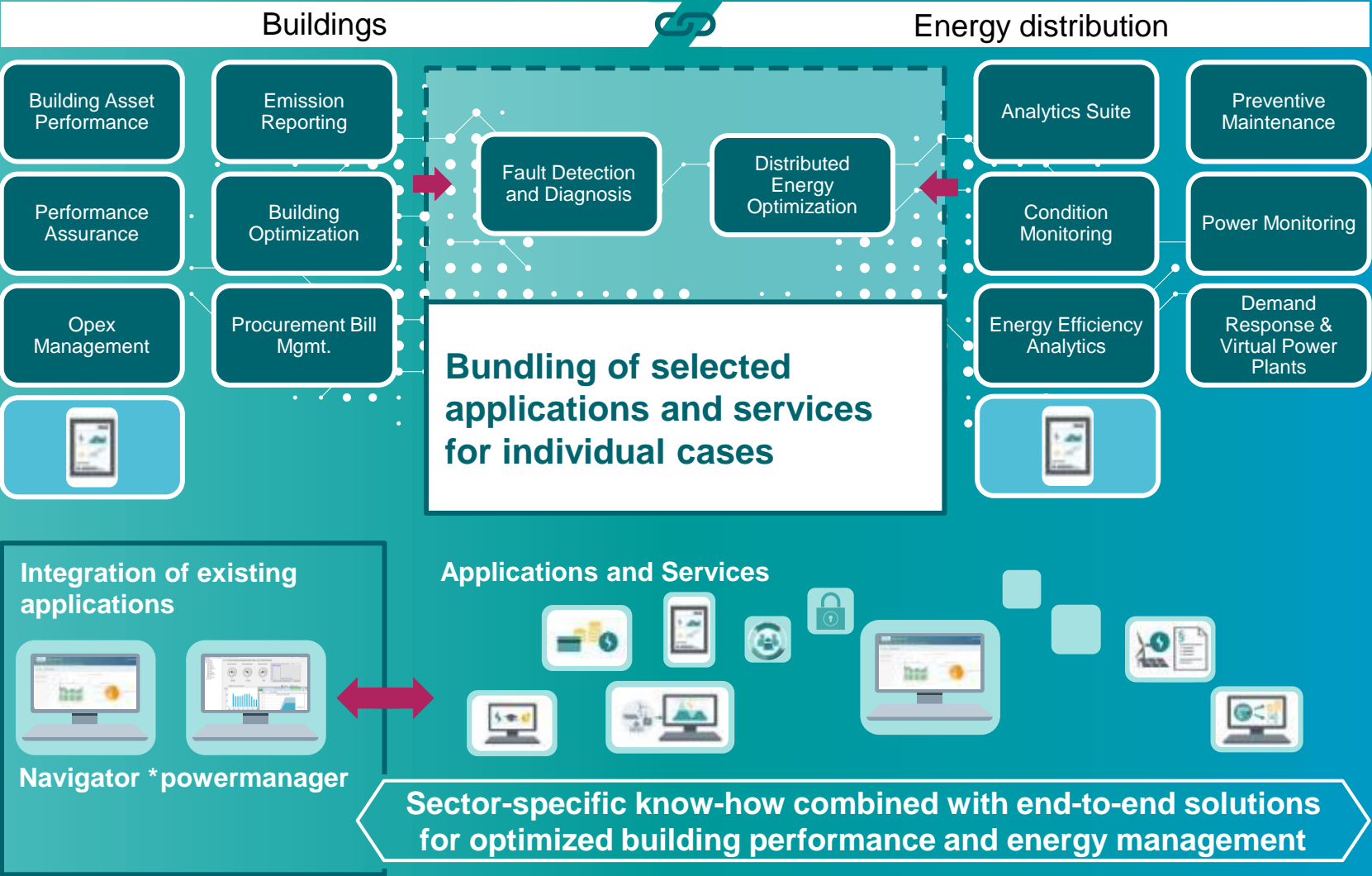
Applications and Services

Digital Twin

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10001100001100011000110001100   00110001100011000   001100
01100011000110001   0110001100011   0110001100011   001100   011000110001100

IoT Operating System

MindSphere

Field devices and IoT connectivity across all domains and beyond

Building infrastructure

Smart Meter

Lighting
Energy Efficiency
3rd Integration

Safety
Security
HVAC
Power

Desigo™

Totally Integrated Power

kWh   H₂

Smart devices for energy

Meters	Inverters, Storage	Microgrid, Prosumers	Distributed Generation	Power Distribution	Microgrid Controller

...

Powerful applications and Digital Services

101010
1101010101   1101
Closed-loop innovation with end-to-end digital twin

IoT operating system as digital service offering

Connecting real things to the digital world

Customized IoT Applications and Services

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Buildings — Energy distribution

Building Asset Performance	Emission Reporting
Performance Assurance	Building Optimization
Opex Management	Procurement Bill Mgmt.

Fault Detection and Diagnosis → **Distributed Energy Optimization**

Analytics Suite	Preventive Maintenance
Condition Monitoring	Power Monitoring
Energy Efficiency Analytics	Demand Response & Virtual Power Plants

Bundling of selected applications and services for individual cases

Easy integration with existing applications

Siemens applications

Apps

Development of own "3rd party" applications
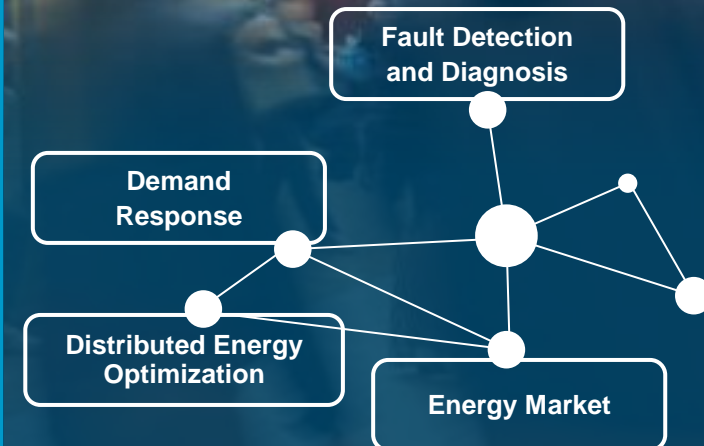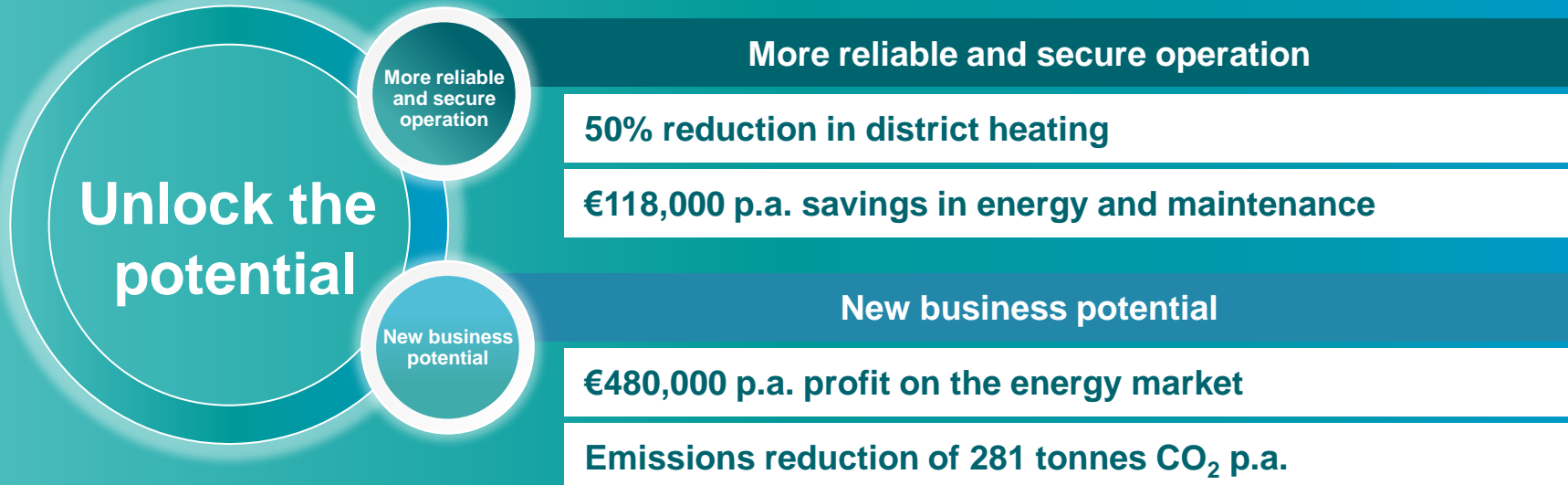
MindSphere Application Center

Integration of existing applications

Navigator *powermanager

Applications and Services

Sector-specific know-how combined with end-to-end solutions for optimized building performance and energy management

Develop New Data-Driven Services – Enhance Existing Processes

Predictive planning & construction

Digitalize your building

More secure and reliable operation

New business potential

Optimization of lifecycle costs
- Faster project realization
- Greater building quality
- Reduced design risk
- Minimized operational risk

"Perfect places"
- Intuitive operation: Space and user efficiency
- Energy and asset efficiency
- Comfort and safety
- Optimized service and maintenance process
- Critical power

New business potential
- Basis for data-driven business models
- Monetize new business insights
- Customer solution co-creation

Sello Shopping Center, Finland

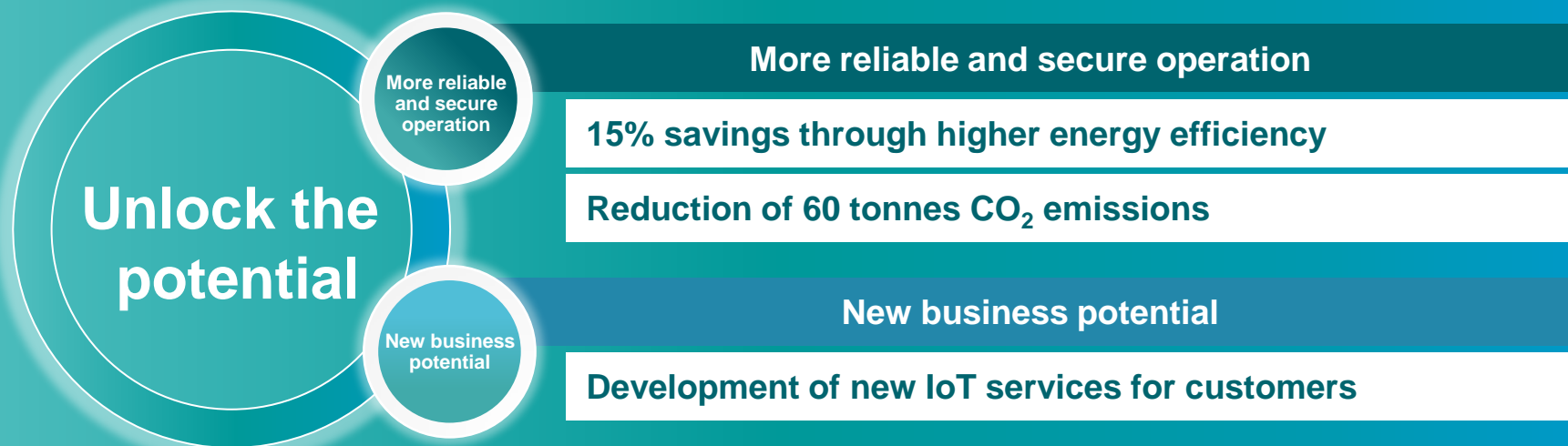## »Data-driven services transform Sello into one of the greenest shopping centers in Europe«

- Remote Analytics: connecting 1,500 energy- and heating/cooling/air conditioning data points with a cloud-based building automation system
- Micro-Grid: 0,5 MW own solar electricity, 1,68 MW energy storage
- Demand response: enabling participation on the energy market
- Dedicated operations manager

Unlock the potential

More reliable and secure operation

New business potential

More reliable and secure operation

50% reduction in district heating

€118,000 p.a. savings in energy and maintenance

New business potential

€480,000 p.a. profit on the energy market

Emissions reduction of 281 tonnes CO_2 p.a.

Fault Detection and Diagnosis

Demand Response

Distributed Energy Optimization

Energy Market

MindSphere in Action –
Electrical Wholesaler REXEL near Linz, Austria
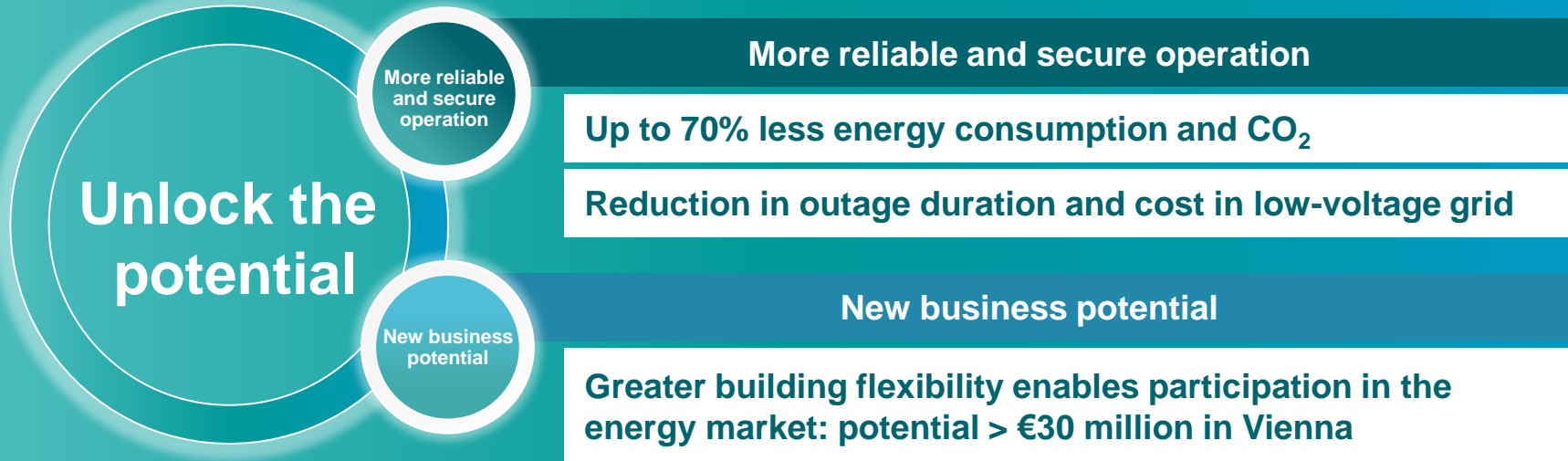
»New, data-driven business models«

– ISO 50001-compliant energy management at the Regro central depot (Austria)

– Energy monitoring system from the SENTRON portfolio connected to MindSphere

– Amortization of investment possible within two years

– Rexel offers its own customers energy consulting and implementation: development of a customized MindSphere application together with Siemens

Unlock the potential

More reliable and secure operation

More reliable and secure operation

15% savings through higher energy efficiency

Reduction of 60 tonnes CO_2 emissions

New business potential

New business potential

Development of new IoT services for customers

Rexel

New IoT service application

End-customers
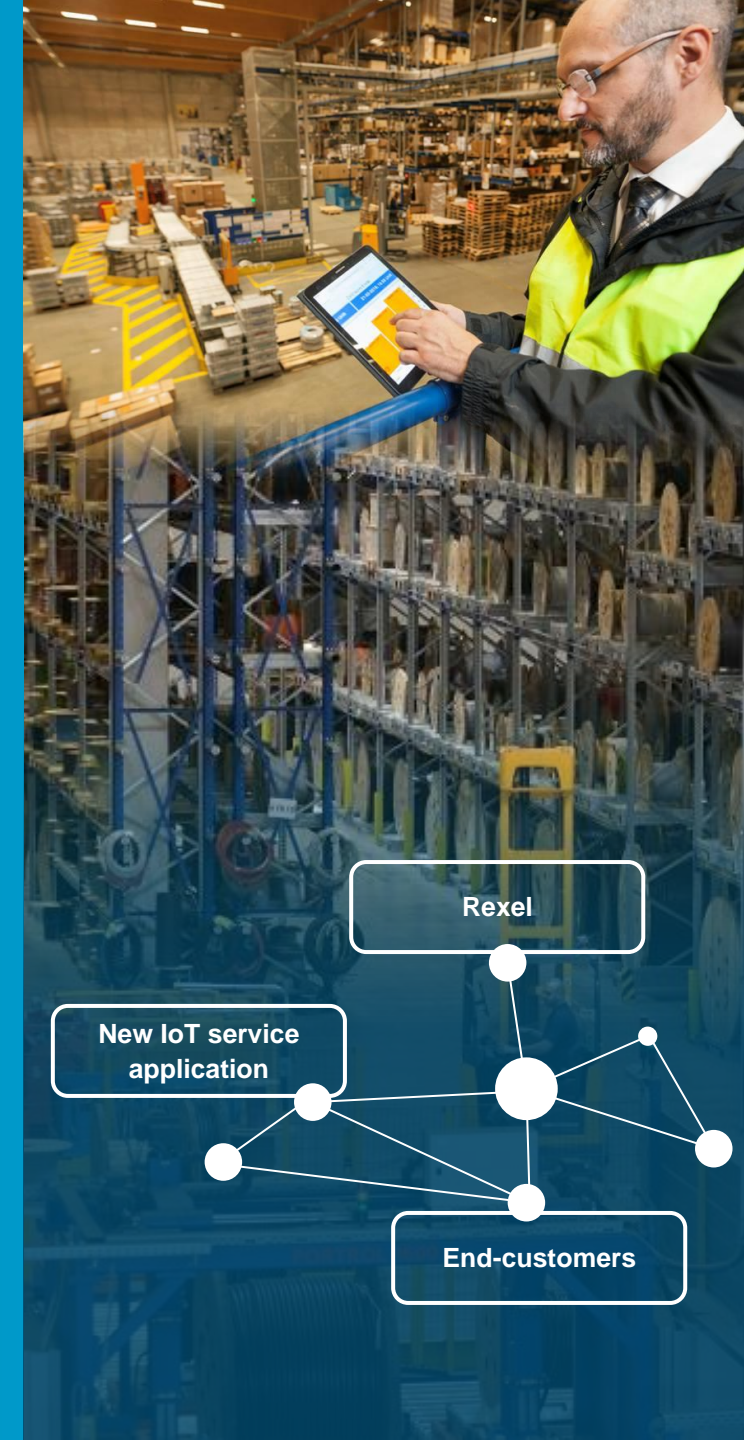
Smart City Seestadt Aspern

»Unique European project for intelligent energy consumption in a smart city quarter«

– 3 networked building complexes (housing, school campus, student home),
energy provision on the basis of alternative generation, housing und school campus independently
operable, building automation with predictive optimization

– Buildings fully integrated with the grid: 12 network stations with 24 transformers,
>500 Smart Meters, >100 Grid Monitoring Devices, 6 storage batteries (each 100kWh)

– Networking of buildings and grid, central data station captures 1.5 million daily measurements
in real-world conditions, continuous data analytics across domains

– Prototype demo-implementation (energy distribution monitoring) realized in MindSphere

Unlock the potential

More reliable and secure operation

More reliable and secure operation

Up to 70% less energy consumption and CO_2

Reduction in outage duration and cost in low-voltage grid

New business potential

New business potential

Greater building flexibility enables participation in the energy market: potential > €30 million in Vienna

Smart Grid
Smart User
Market
Smart Building
Smart ICT

Wien Energy
Vienna Business Agency
Wien Grids
Siemens
Wien 3420 project development

DB Schenker Head Office, Essen

»The Premium Office in action«

– Desigo CC building management platform: including 1,500 fire alarms,
  40 Siport readers, video surveillance systems, Dali lighting control

– Individual quality and comfort with Premium Office:
  560 Desigo automation single-room controllers

– Maximized transparency: fire alarm technology, building security, heating,
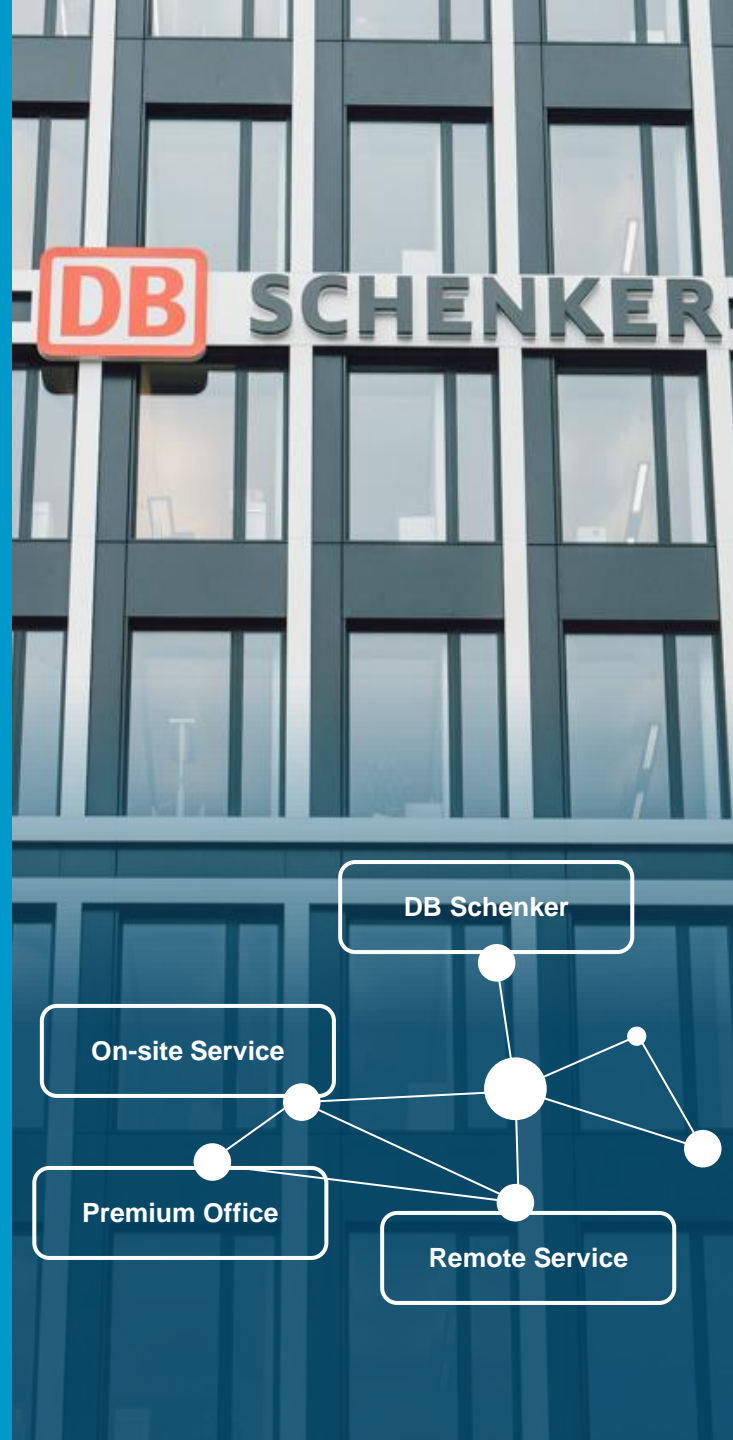 cooling, air conditioning, lighting and dimming at a touch

More reliable and secure operations

Unlock the potential

More reliable and secure operation
State-of-the-art energy management
Lower operational costs
LEED-certified

DB Schenker

On-site Service

Premium Office

Remote Service

Greater resilience for leading hospital in the UK

»Emergency power management for critical infrastructure«

– Reduce risk of power outages with fast load shedding by selectively disconnecting less important sections

– Manage backup generators in case of grid loss and restore all critical power loads < 1min

– Solution based on redundant SICAM controllers utilizing GOOSE messages via IEC61850 for fast tripping

More reliable and secure operations

Unlock the potential

More reliable and secure operation

Greater resiliency with energy restoration inside 1 minute

Safe lives through minimized power outage time

Avoid significant outage penalties

Customer ready for distributed energy system

Emergency Power Management System

SICAM Controller

GOOSE

IEC61850
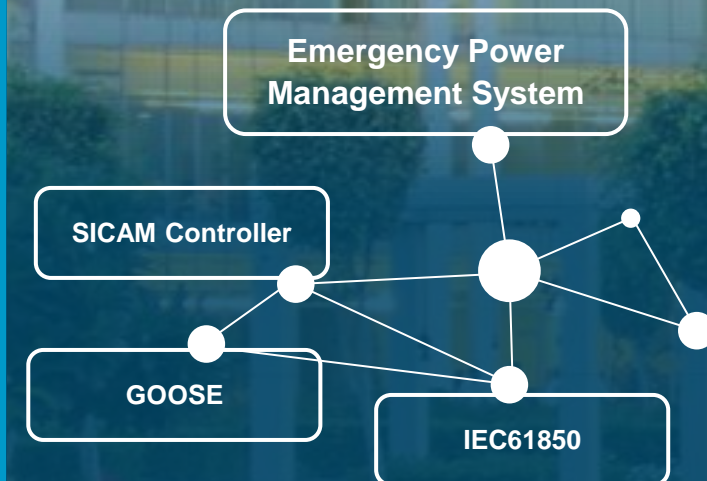
Cybersecurity – a critical factor
for the success of the digital economy

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Charter of Trust
for a secure digital world

Key principles

1. **Ownership of cyber and IT security**

2. **Responsibility throughout the digital supply chain**

3. **Security by default**

4. **User-centricity**

5. **Innovation and co-creation**

6. **Education**

7. **Certification for critical infrastructure and solutions**

8. **Transparency and response**

9. **Regulatory framework**

10. **Joint initiatives**

SIEMENS AES AIRBUS Allianz Atos enel

DAIMLER IBM Munich Security Conference msc Münchner Sicherheitskonferenz NXP SGS T··

charter-of-trust.com

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Digitalize your building – Unlock the potential

Premium office

Data centers

Industrial

Hotels

Corporate real estate

Universities

Campus and city quarter

Hospitals

Life science