Energy Storage NEWS

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WEBINAR

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Future-proofing BESS data communications architecture

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Agenda

- Market Background
- Headwinds
- Integration Flexibility / Poll 1 & 2
- Operations & TCO / Poll 3
- Optimization & AIoT
- Summary & Wrap-up Poll 4
- Q&A

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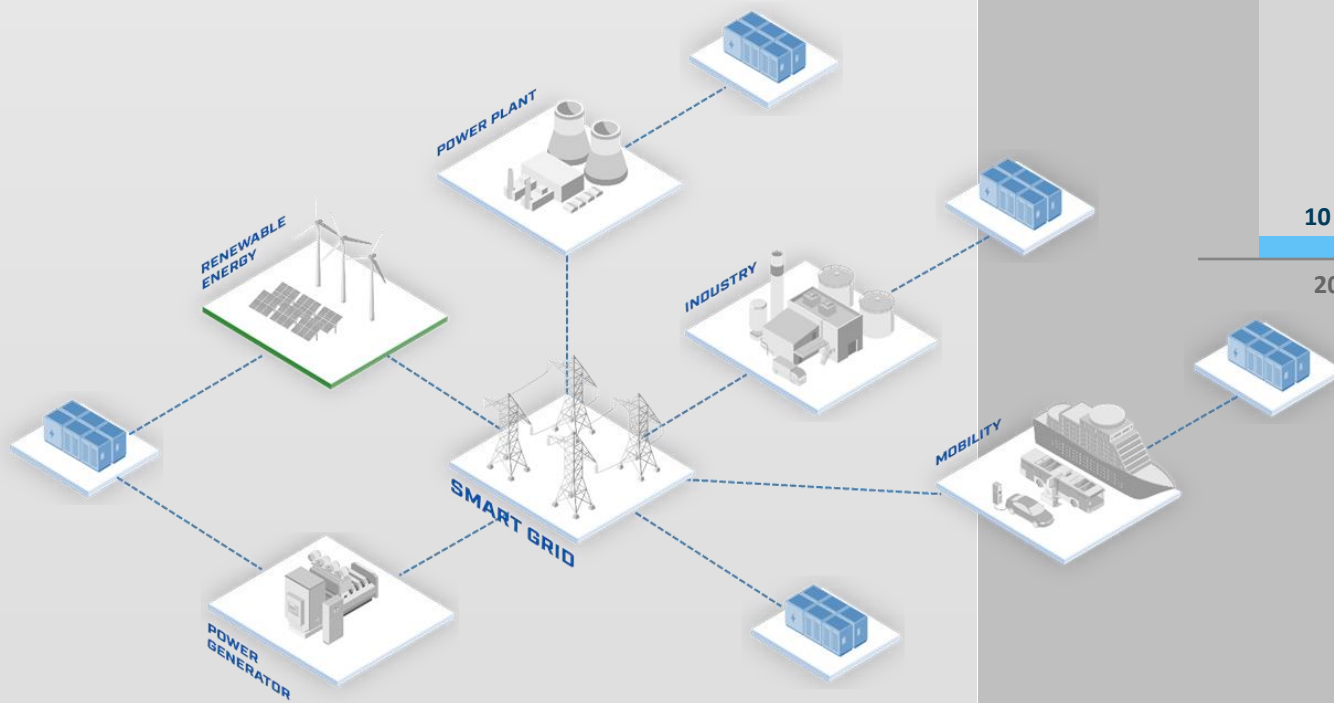PROCENTEC
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BESS Market Expansion

- Many use-cases for BESS

- ESS will become ubiquitous

370 KWh /rack

27K racks	**280K** racks	**600K** racks

CAGR 36 %

221 GWh

105 GWh

10 GWh

2020   2025   2030

Global ESS demand

RENEWABLE ENERGY

POWER PLANT

INDUSTRY

MOBILITY

SMART GRID

POWER GENERATOR

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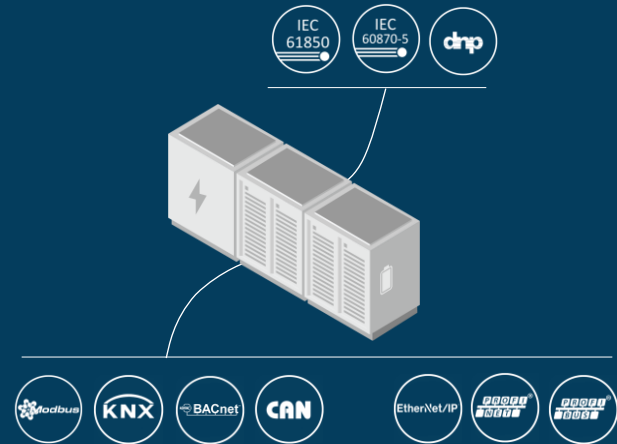
Scalability headwinds

- Integration (in)flexibility

Scalability headwinds

- **Commissioning, provisioning, maintenance**

20 % solution HW cost

Provisioning cost
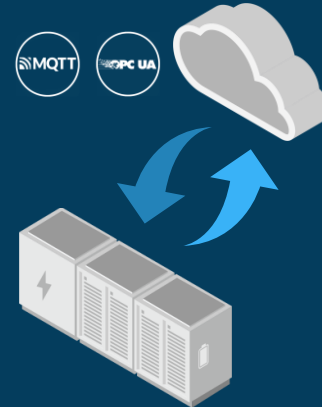
80 % Total cost of ownership (TCO)

Commissioning cost

Maintenance cost
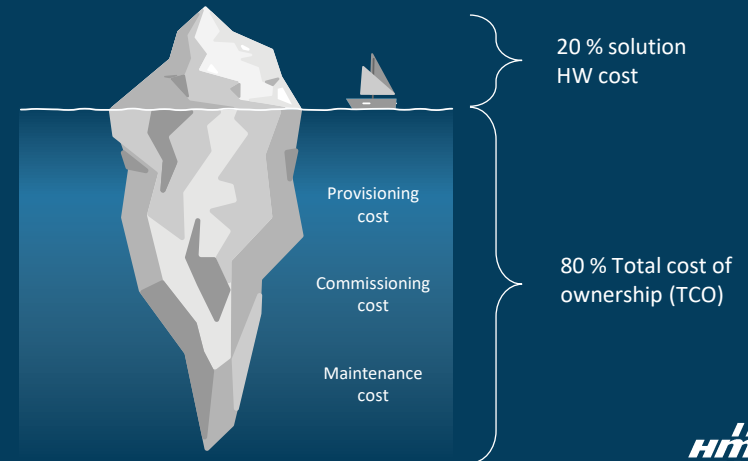
Scalability headwinds

- Performance & lifecycle optimization

Poll 1 & 2

Poll 1:

What northbound (external) communication protocols do most BESS systems support?

Modbus TCP   IEC60870-104   IEC61850

    DNP3   MQTT   OPC-UA

Poll 2:

What southbound (internal) communication protocols are used in most BESS systems?
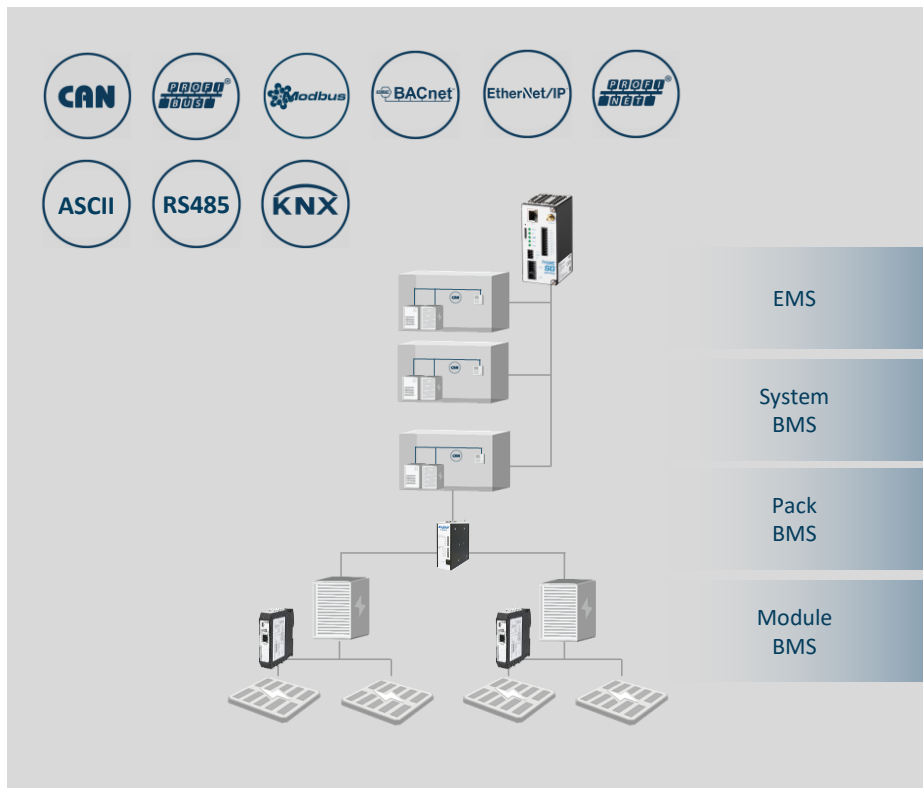
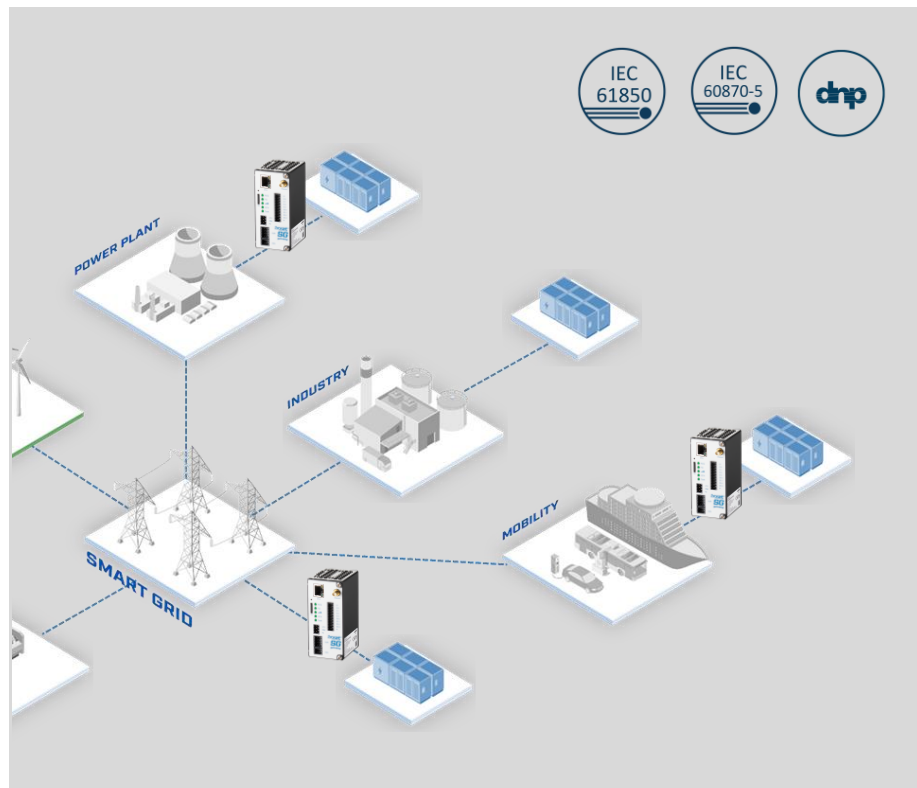CAN/CANopen   CAN-FD   Modbus TCP   Modbus RTU

    RS-485   M-Bus

Integration Flexibility – Multi-protocol Hardware

Internal

External

Poll 1 & 2 Results

What northbound (external) communication protocols do most BESS systems support?

Modbus TCP	31 (56%)
MQTT	7 (13%)
DNP3	6 (11%)
IEC61850	5 (9%)
IEC60870-104	4 (7%)
OPC-UA	2 (4%)

What southbound (internal) communication protocols are used in most BESS systems?

Modbus TCP	28 (39%)
CAN/CANopen	20 (28%)
Modbus RTU	12 (17%)
RS-485	11 (15%)
CAN-FD	1 (1%)
M-Bus	0%

Poll 3

From your perspective, which of these remote management capabilities are most valuable for your business?

Unmanned Realtime Access / Remote Desktop

Over-the-Air (OTA) Updates / Flashing

Remote monitoring and data visualization (dashboarding)

Remote Group Commissioning / Provisioning

On-demand Diagnostics / Troubleshooting
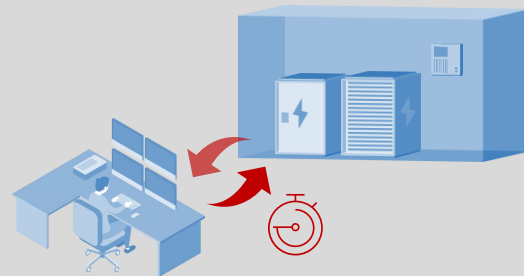
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Operations – Improve Total Cost of Ownership (TCO)

Remote management – Monitoring, diagnostics, maintenance, commissioning and provisioning
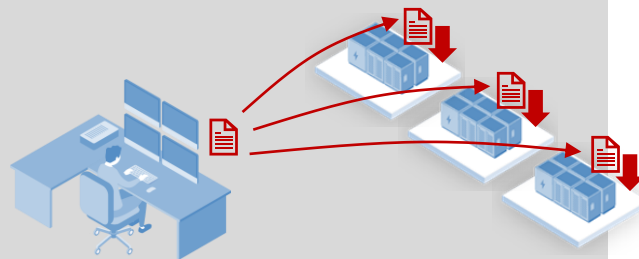
Remote monitoring and data visualization (dashboarding)

Unmanned real-time access / remote desktop

Over-the-Air (OTA) updates / flashing

Remote group commissioning / provisioning

Poll 3 Results

From your perspective, which of these remote management capabilities are most valuable for your business?

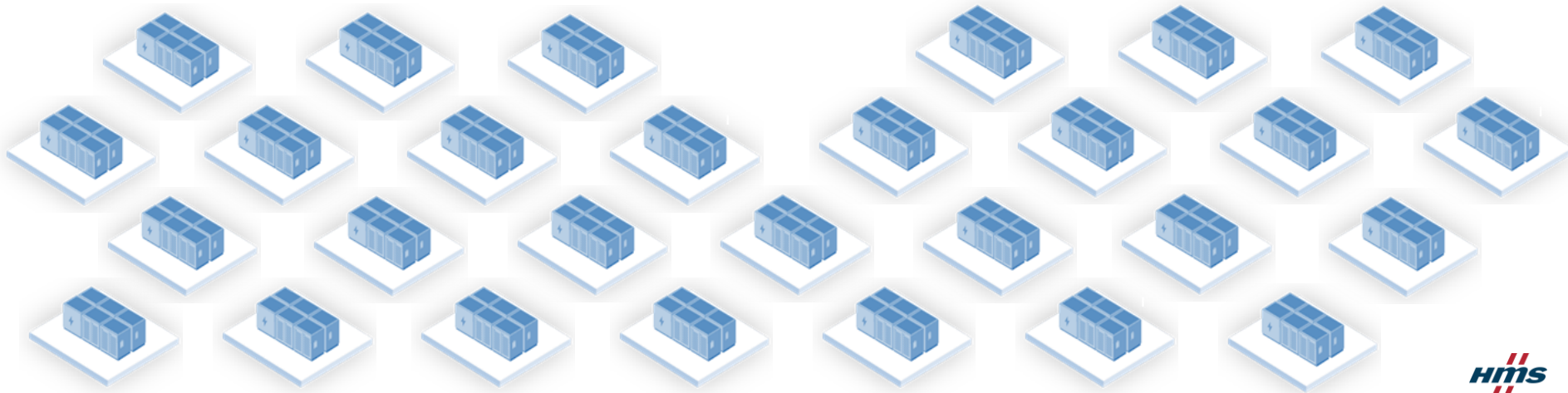|	
Remote monitoring and data visualization (dashboarding)	42 (49%)
Unmanned Realtime Access / Remote Desktop	18 (21%)
On-demand Diagnostics / Troubleshooting	14 (16%)
Over-the-Air (OTA) Updates / Flashing	8 (9%)
Remote Group Commissioning / Provisioning	4 (5%)

Towards the future
How to enable AIoT for future workflow improvement

How to enable AIoT for future workflow improvement

Cloud AI and Data Analytics
Training / optimizing / prediction
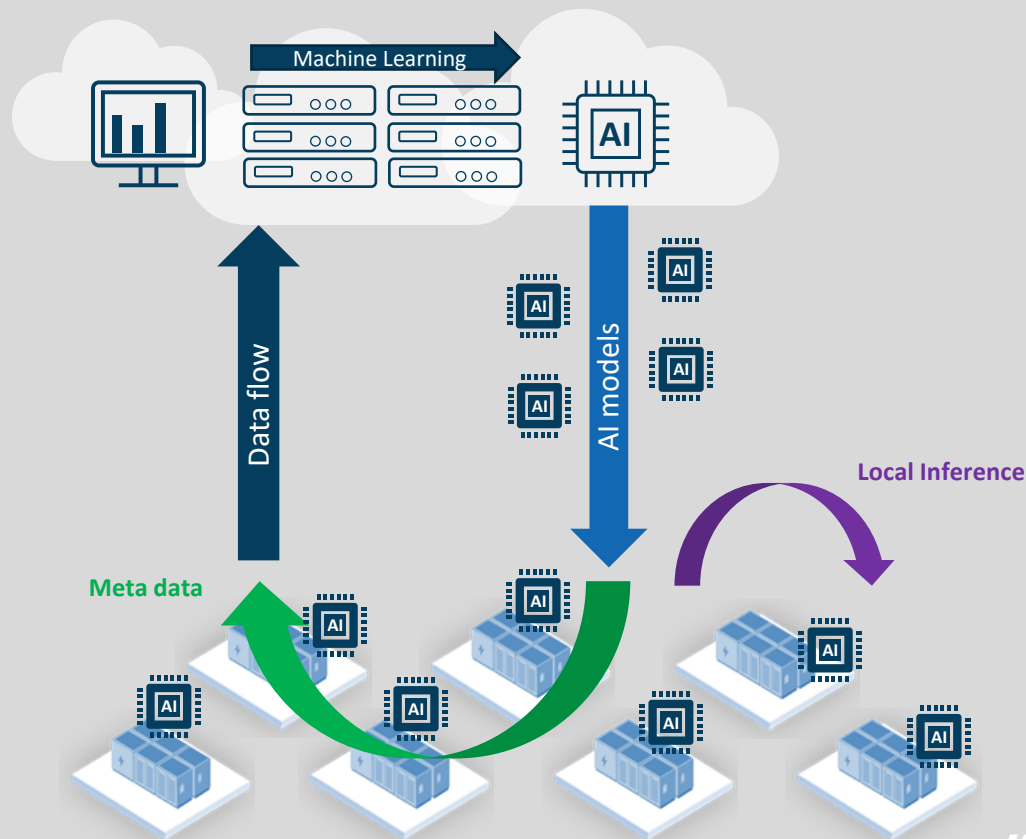
Centralized data monitoring
Data visualization / Decision making

Data Communication
Technologies: 5G, NB-IoT, LTE-M, LPWAN, etc.
Protocols: OPC-UA, MQTT, DNP3, IEC61850, etc.

Edge Computing and Edge AI
Local Inference / Machine Intelligence

Machine Learning

AI

Data flow

AI models

Local Inference

Meta data

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Scalability headwinds Recap

- Protocol flexibility

- Operations – commissioning provisioning, maintenance

- Performance & lifecycle optimization

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Poll 4 Results

Which of these do you see as the primary "headwinds" to scalability of BESS – either now or in the immediate future?

Performance & lifecycle optimization	28 (27%)
Battery supplier flexibility	26 (25%)
Grid integration flexibility	23 (22%)
Condition monitoring & failure prediction	19 (18%)
Installation & maintenance efficiency	7 (7%)

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Questions?

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