WEBINAR

How energy storage system operators can benefit from digitalisation

15 Dec 2021

ARNAUD-GUILHEM DE LOZE
ESS Product Manager
Saft

CARLOS HEIN
Director of Global Services, Energy Storage Solutions
Saft

MICHAEL LIPPERT
Director Innovation and Solutions for Energy
Saft

STÉPHANE ALAIMO
Digital Software Manager
Saft

KRISTIN SCHUMANN
Deputy Manager, ESS Storage Solutions (ESS)
TotalEnergies Renewables

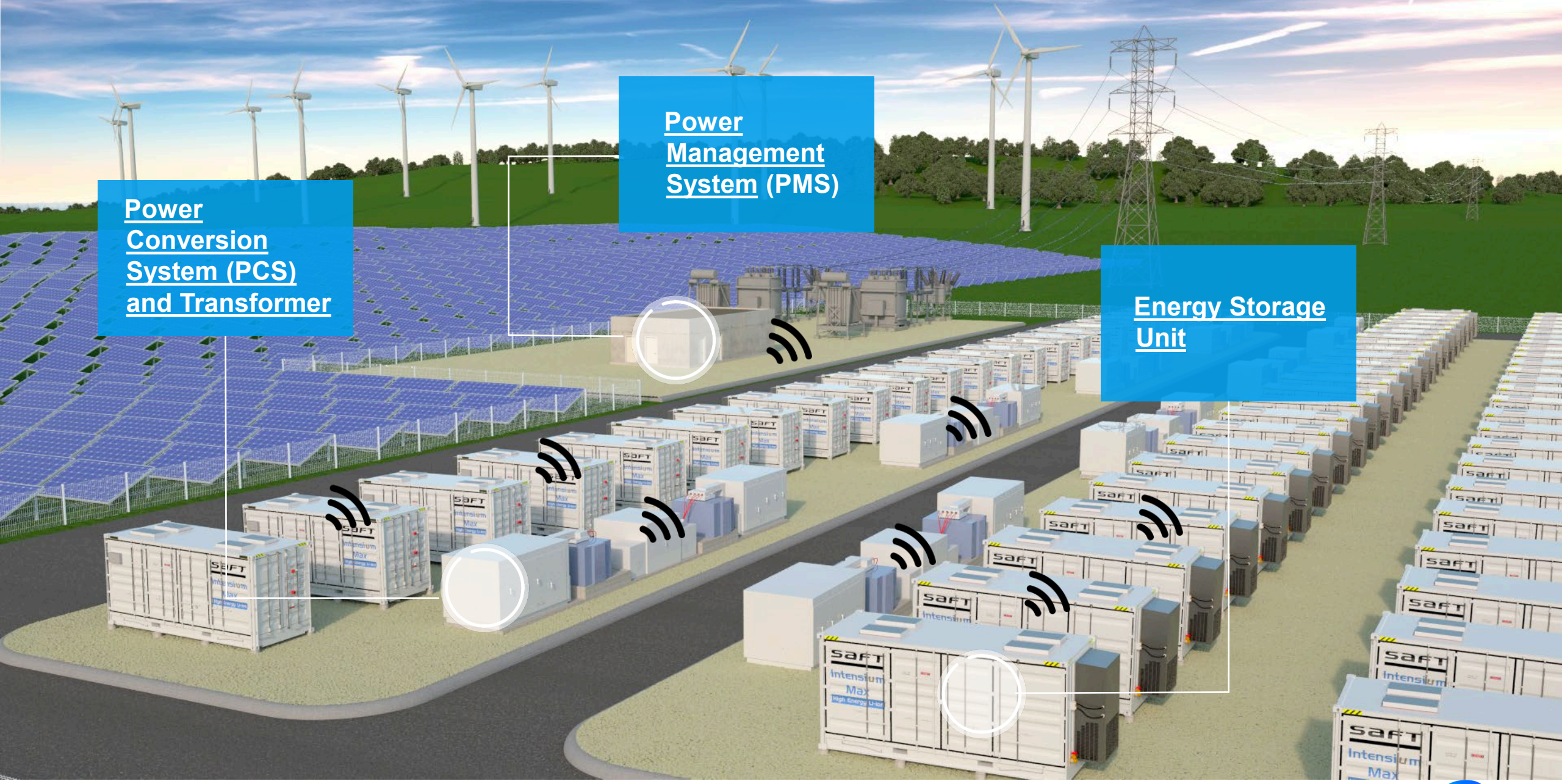
Moderated by
ANDY COLTHORPE
Editor
Energy-Storage.news

How energy storage system operators can benefit from digitalisation

contact.webinar@saftbatteries.com

Summary

- Why should ESS go digital ?
- Three recommendations to create value
- Data infrastructure and cybersecurity
- Future-proof functionalities
- Use case demonstration



TotalEnergies

01.

Why should ESS go digital ?

Remoteness

- Distance and time to access unmanned sites
- Management of multiple sites

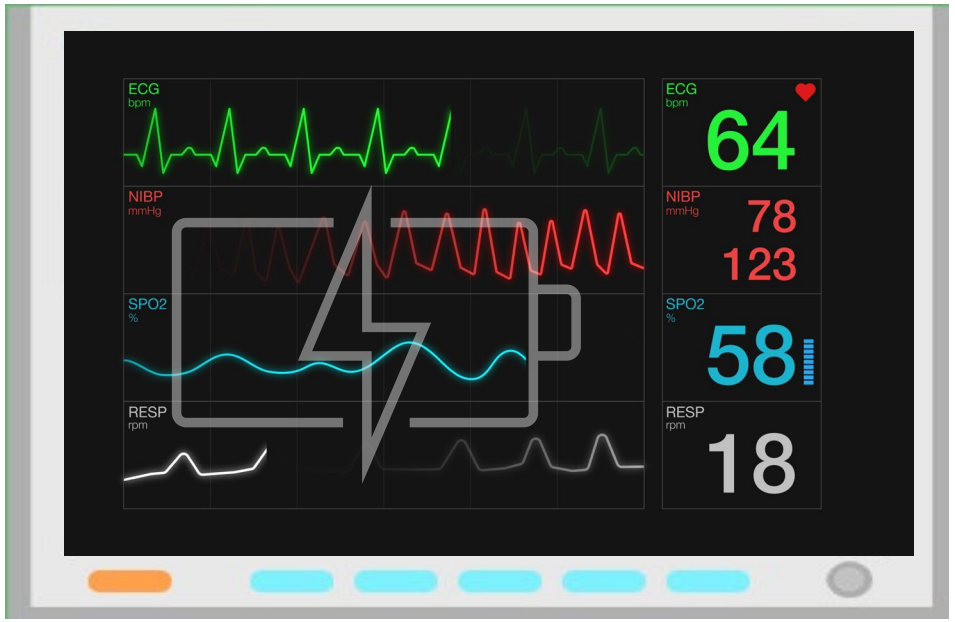
Avoid travelling

Save time

Gain reactivity and effectiveness

Battery Health and Performance

- Multiple operations factors
- Multiple battery parameters determine
  - Health and lifetime
  - Performance
  - Safety
- Ageing behavior specific to each battery technology



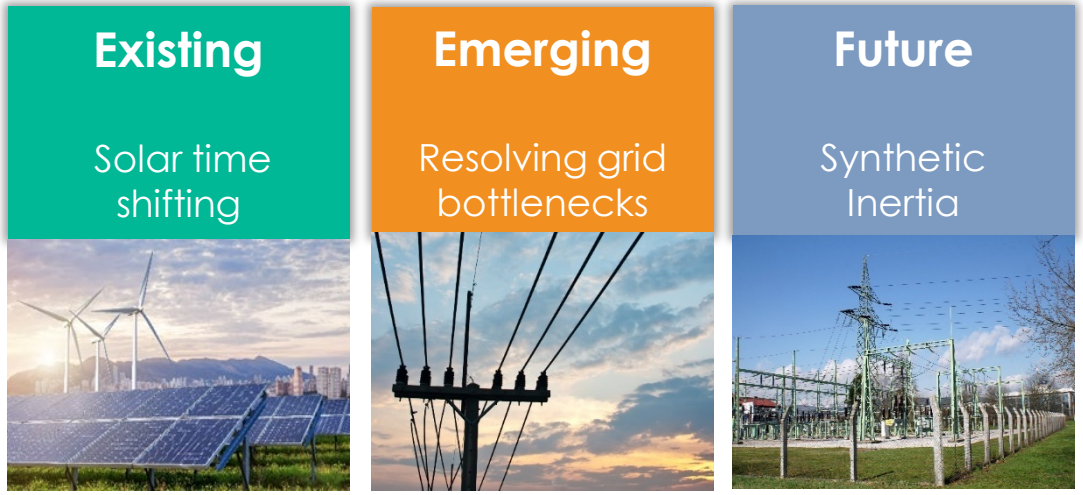
Prevent / anticipate failures

Optimize life time

Make informed arbitrage decisions

Flexibility

- Adapt operation pattern of the ESS
  - changing market conditions and rules
  - capture new revenue potential



Assess key parameters for feasibility

Adapt setpoints

Adapt guarantees

The view of a storage developer

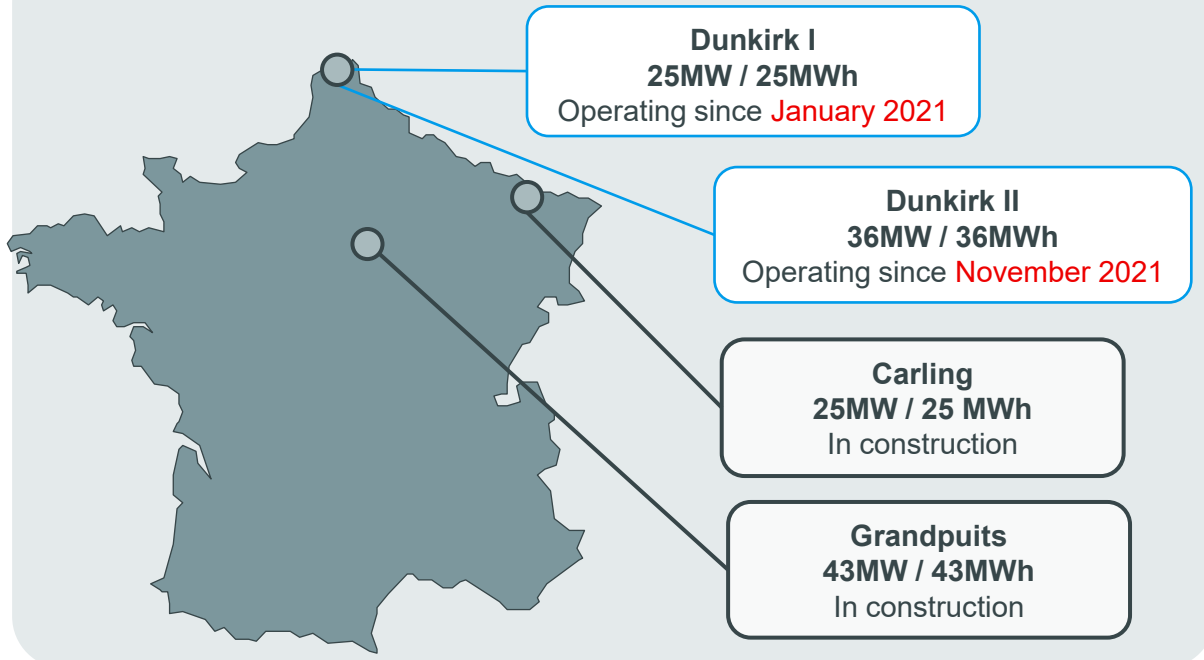
Dunkirk / France

Kristin Schumann
Deputy Manager ESS
TotalEnergies

A real case

saft

TotalEnergies 61 MW ESS in Dunkirk



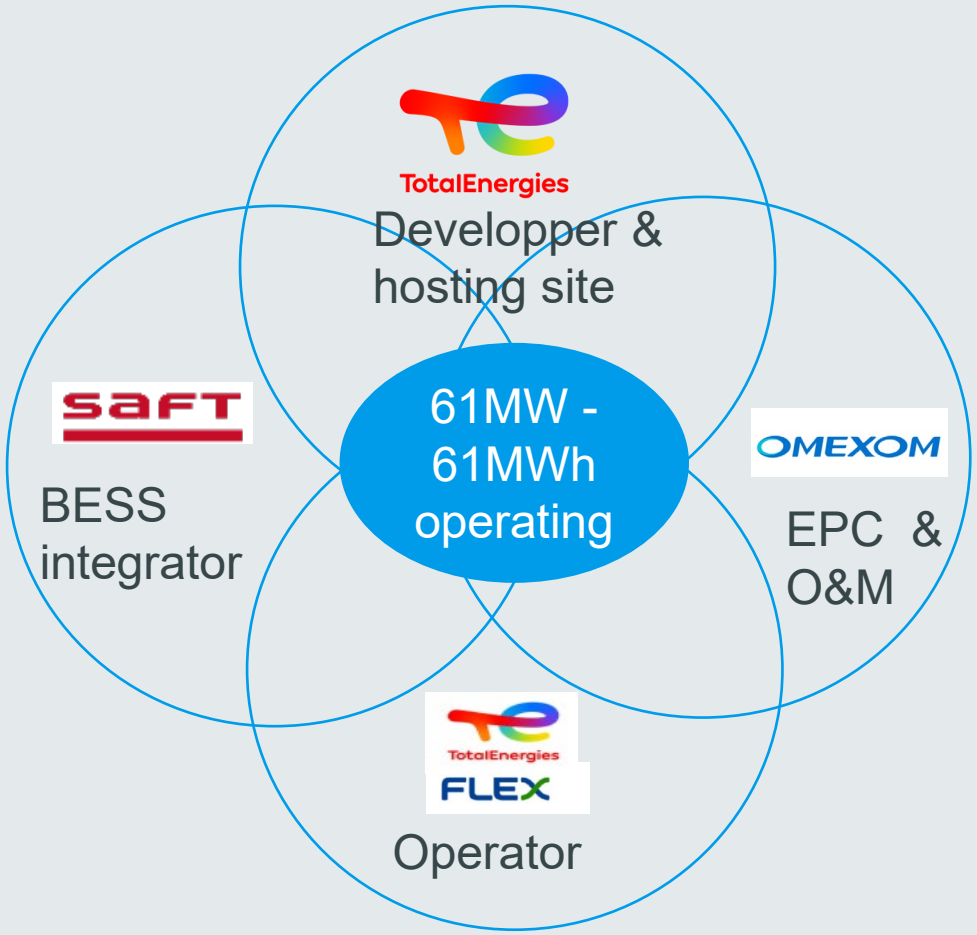
Revenue streams :

Ancillary services (FCR) (70%)

Capacity market (30%)

TotalEnergies

Requirements



- Operation 24/7 for ancillary and grid services
- Largest installation on French grid
  - ➔ non – availability = heavy impact

RTE has heavy penalties in case of non-fulfilment of service

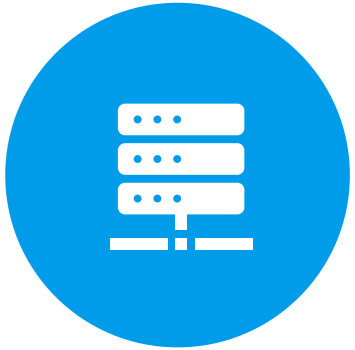
Technical requirements:

- Fully automated operation, little human monitoring
- 25 data points to RTE every 10 seconds (voltage, frequency, reactive power, …)
- Reliable, secure, high resolution data & collection in a data center
- Remote, aggregation for multiple sites by Flex
- Instant information to SCADA of BESS system health

02.

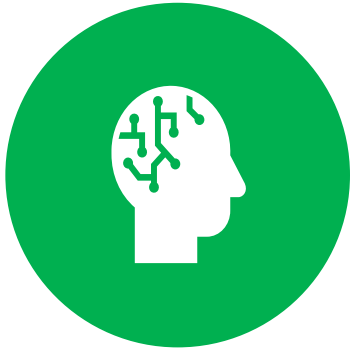
Three recommendations to create value

Three recommendations to create value



Have a consistent, cybersecure data acquisition and management **infrastructure**

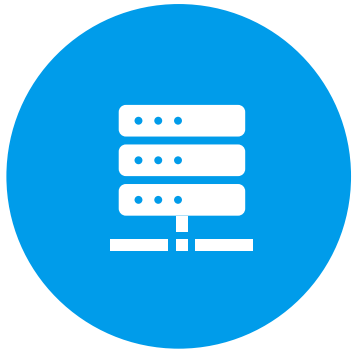
Combine data and models into analytical functions in close cooperation with operators and service teams



Be future – proof

Three recommendations to create value

Data acquisition and management infrastructure



Parameters

- Nature of data
- Hierachy
- Granularity
- Bi-directionality
- Cybersecurity
- Standards

Benefits

Reliable and high quality information

based on good data

Three recommendations to create value

Develop analytical functions in close cooperation with Operators (O) and Services (S)

Key Points

	O	S
• Dashboard	☑	☑
• History data	☑	☑
• Configuration		☑
• Alarms		☑
• Health	☑	☑
• Performance	☑	

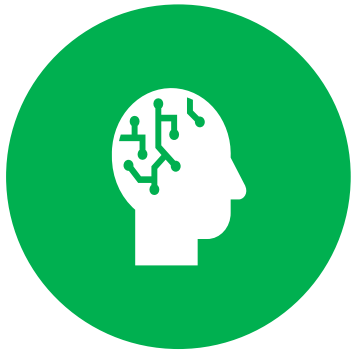
Benefit

Information matching needs of Operators and Services

- ✓ Availability
- ✓ Perform to spec
- ✓ Minimum Opex
- ✓ Safe operation

Three recommendations to create value

Be future-proof



Parameters

- Data quality
- Platform flexibility
- Data storage capacity
- Models (chemistry, system, thermal)
- Field experience

Benefits

Anticipate future ESS configurations and usages

Anticipate new analytical, predictive and automation functions

03.

Data infrastructure and Cybersecurity

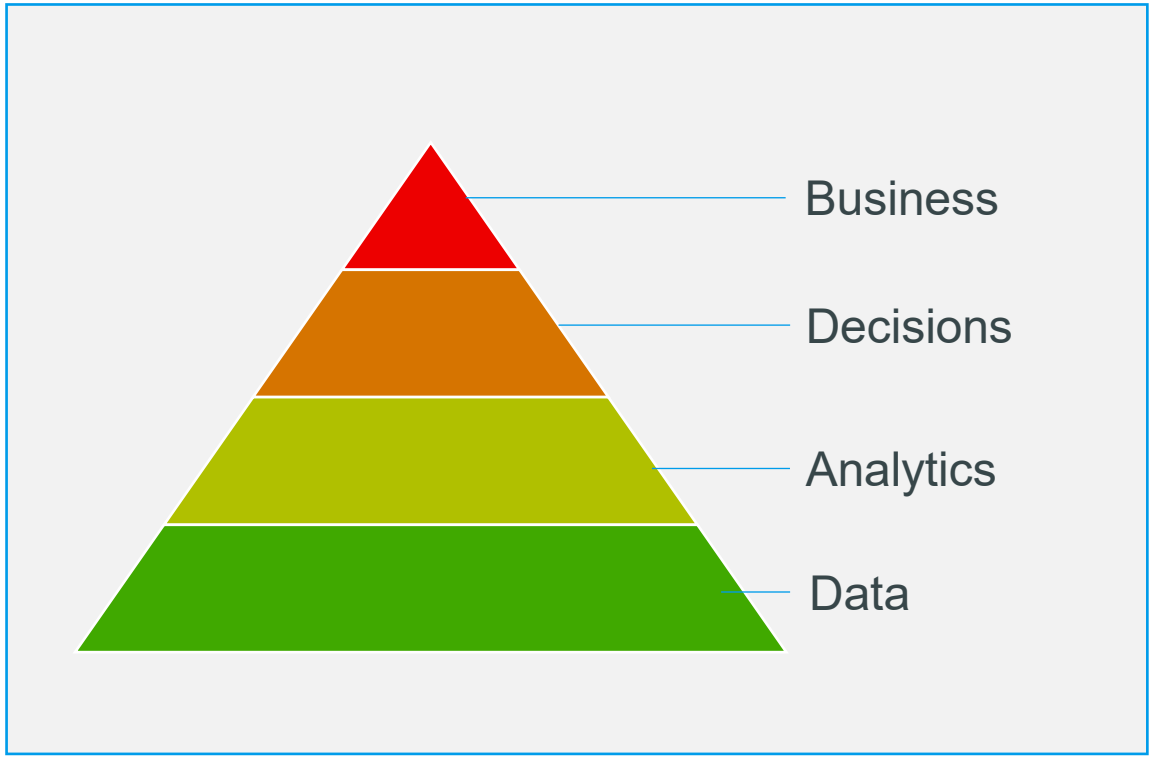
Stéphane Alaimo

Technical challenges

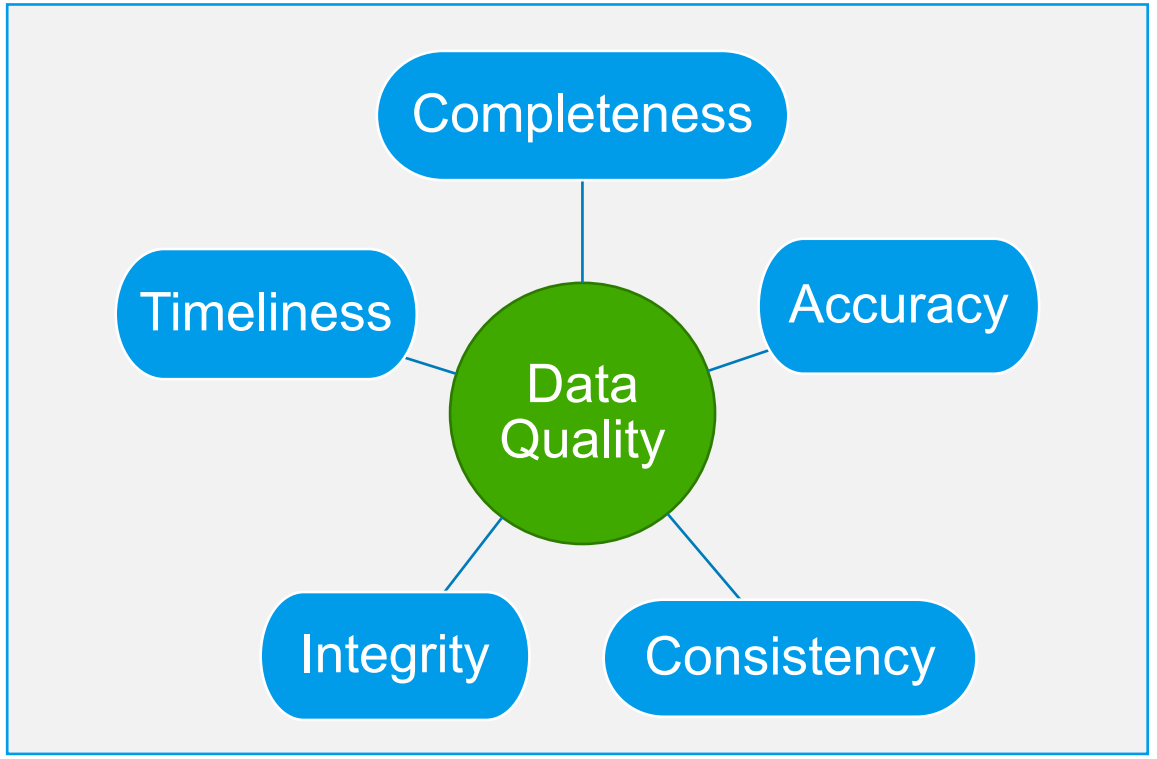
- **Data quality**
- **Flexibility and scalability**
- **Cybersecurity**

Data Quality: Why and what?

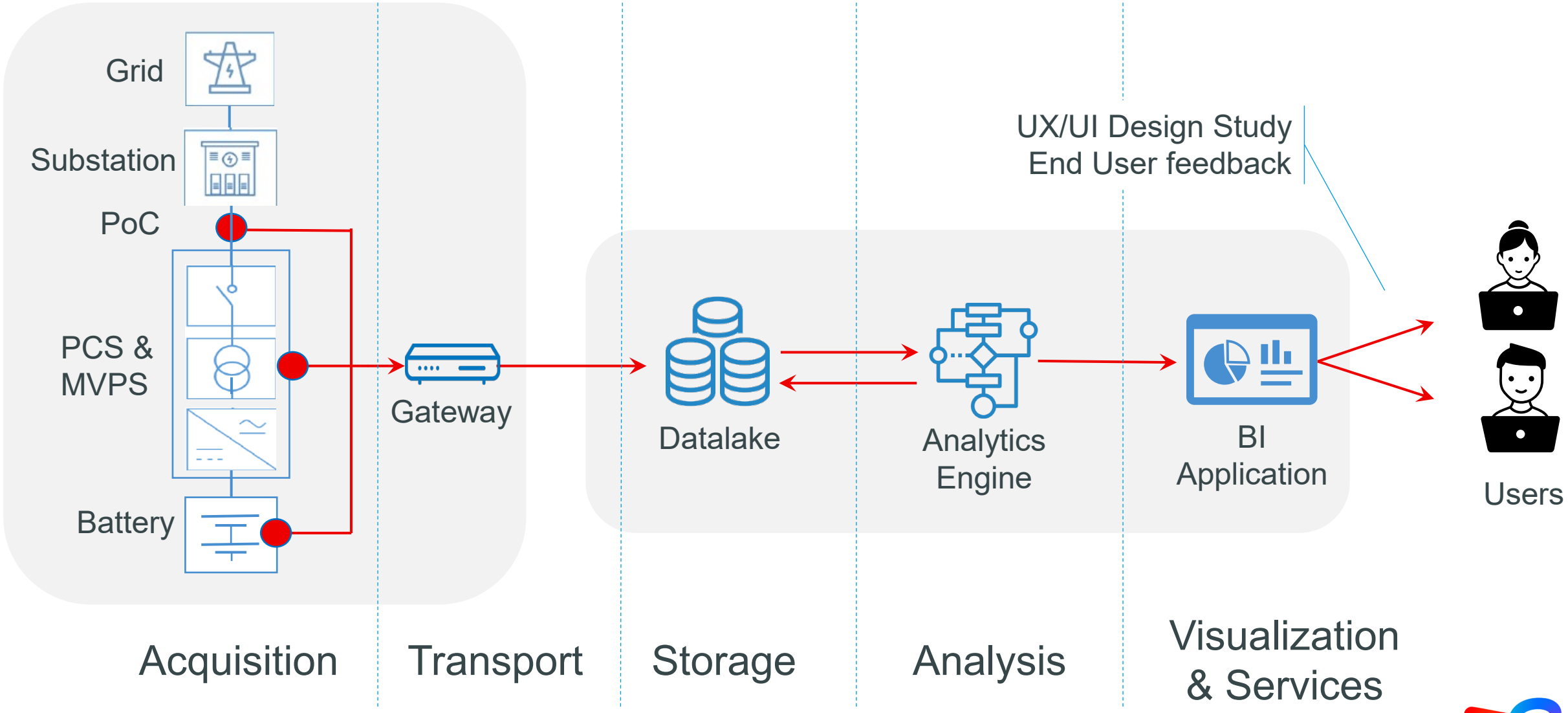
Why is data quality crucial ?



What are the key characteristics?



Data Quality along the Data Pipeline



Digital Platform Flexibility and Scalability

- Data volume explosion
- High availability requirements
- Worldwide installations & users
- Future functionalities and services
- Long lifetime

- Cloud native
- Big data ecosystem
- Open Standards
- Agile & DevOps

SUNSPEC ALLIANCE

MESA
Open Standards for Energy Storage

Cybersecurity Risks

63% of organizations surveyed had an industrial cybersecurity incident in the past two years

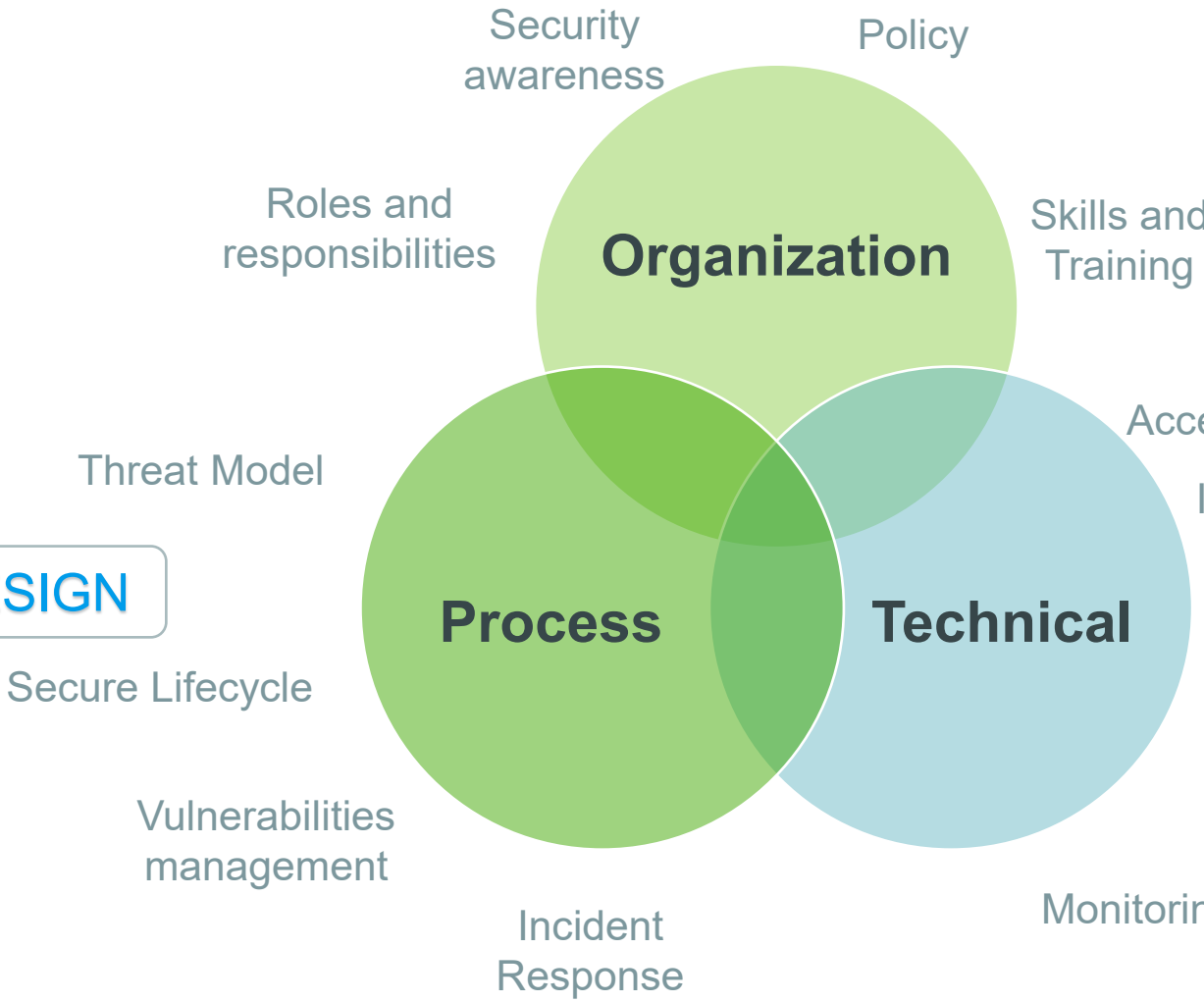
Source: Dargos

ESS Digital Solution is at the convergence of IT and OT worlds

Saft Approach

IEC 62443

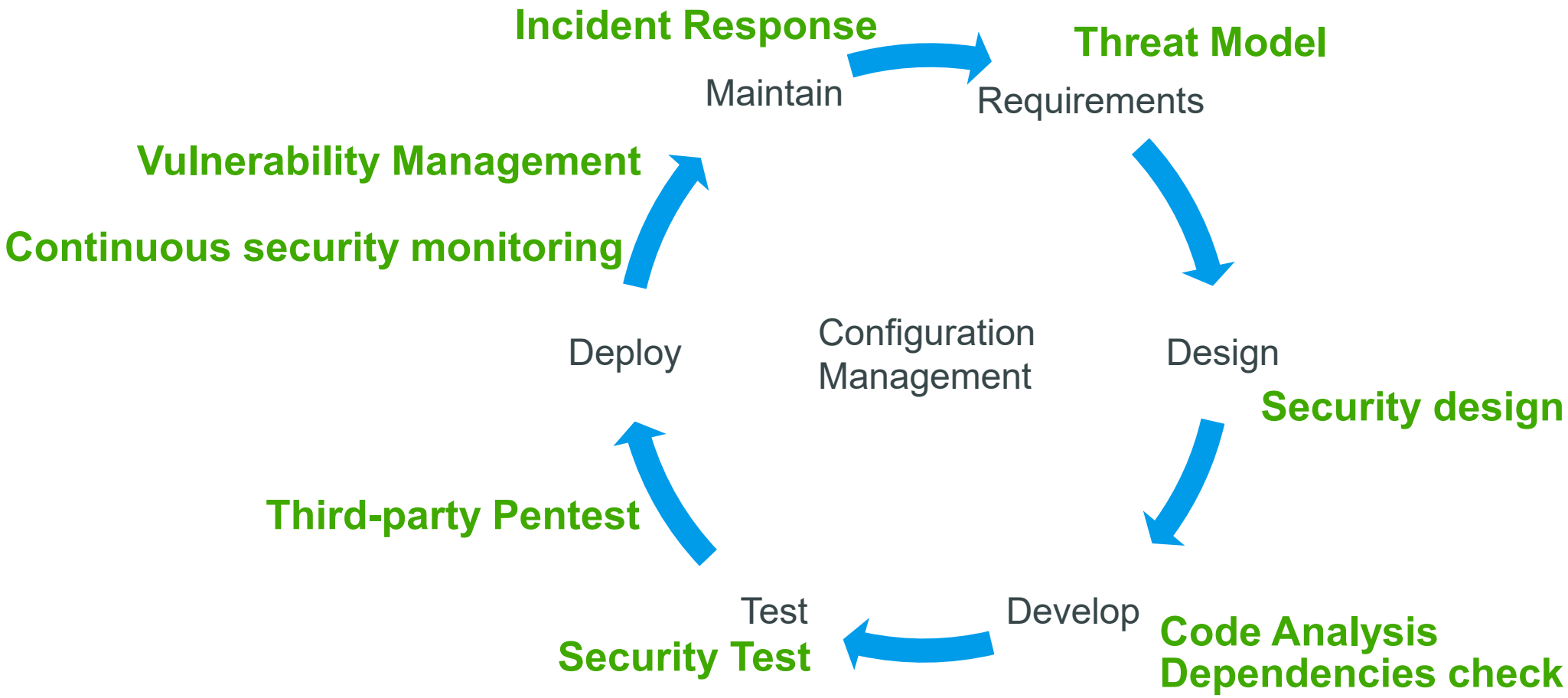
STRATEGIC SECURITY

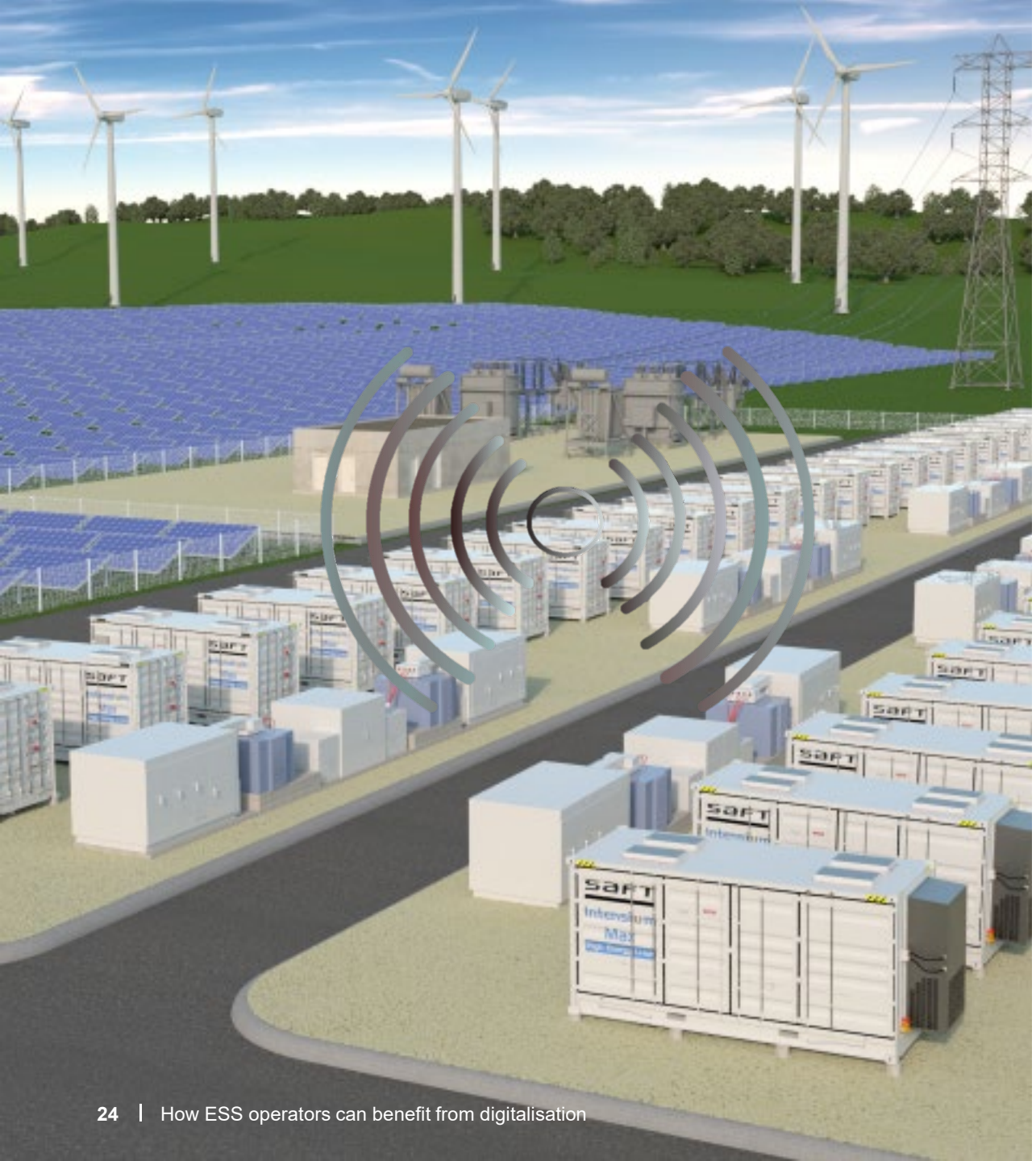


SECURE BY DESIGN

DEFENSE-IN-DEPTH

Secure by design





04.

Future-proof functionalities

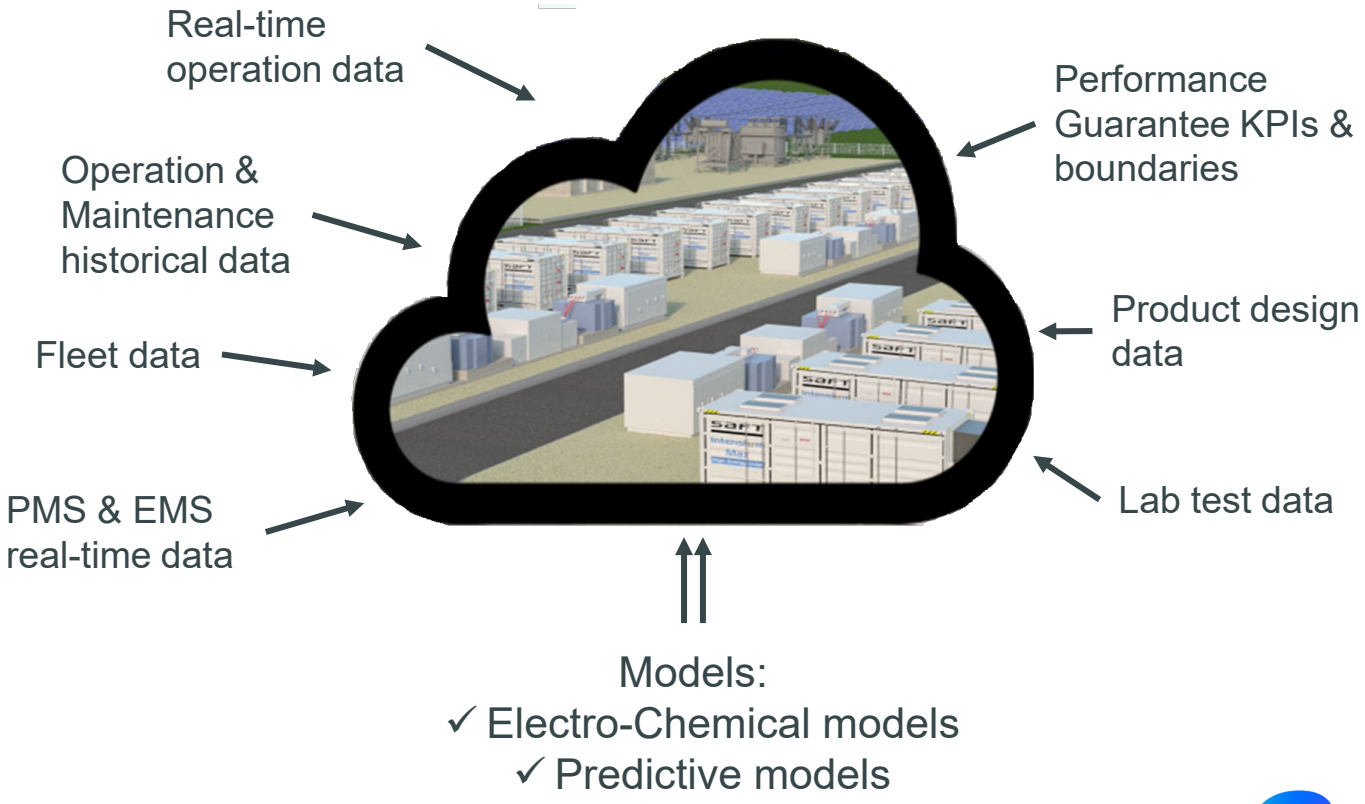
Arnaud-Guilhem de Loze

Digital roadmap

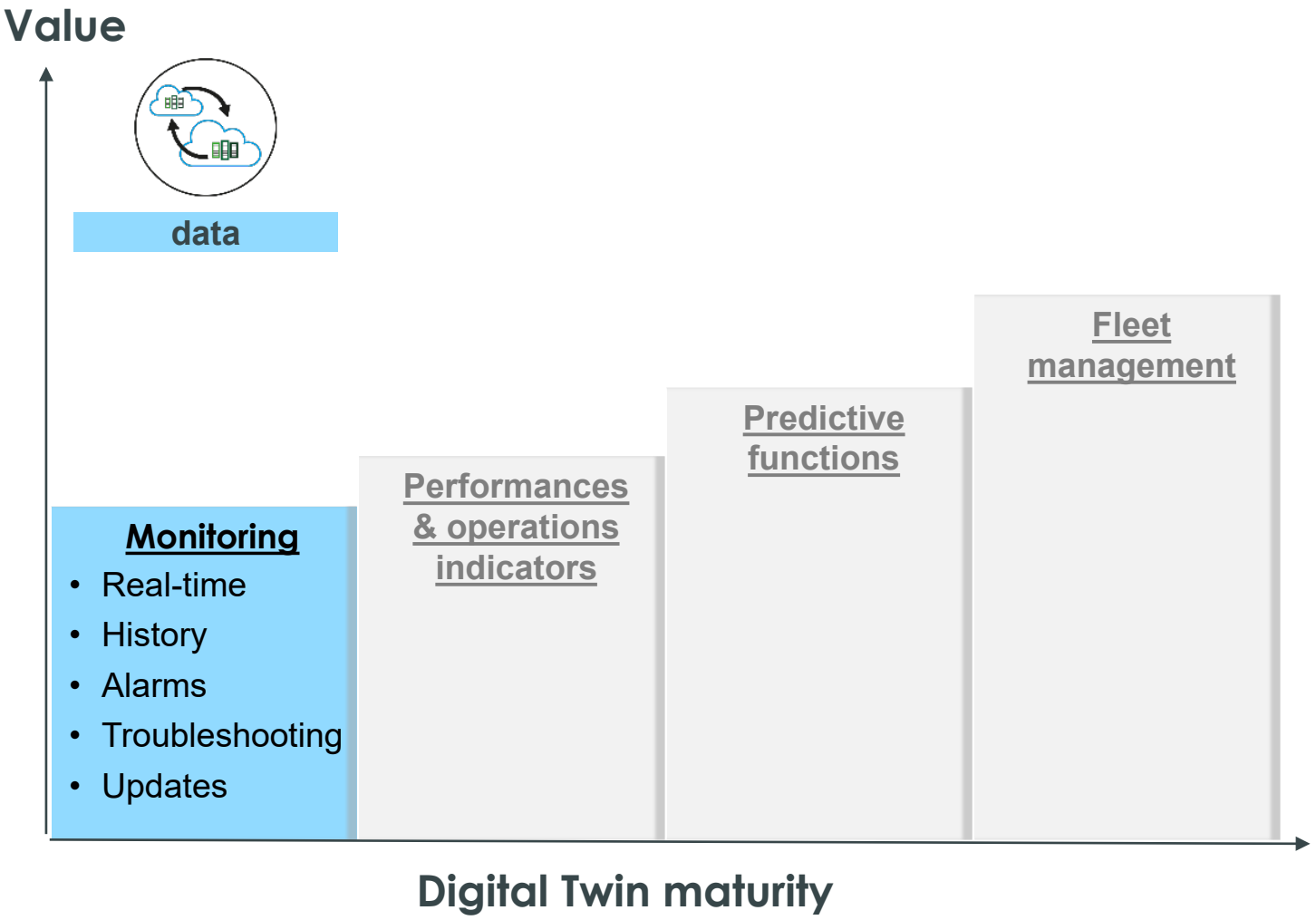
How to build a functional roadmap ?

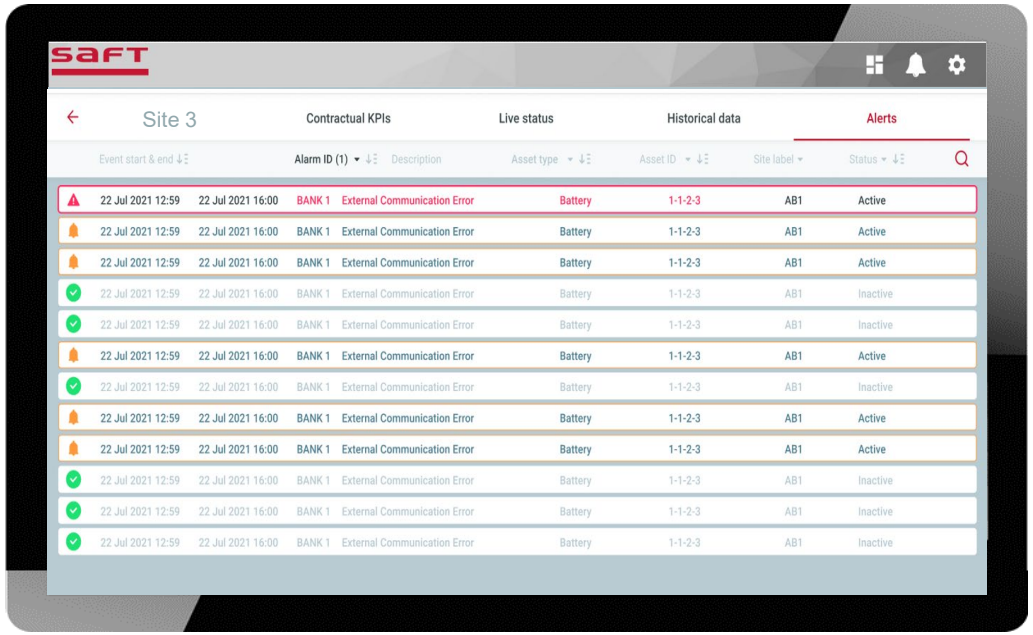
- Value driven functionalities
- Users oriented interfaces
- Iterative development
- Future proof ready

What is a digital twin for ESS ?



Digital roadmap based on customer use cases

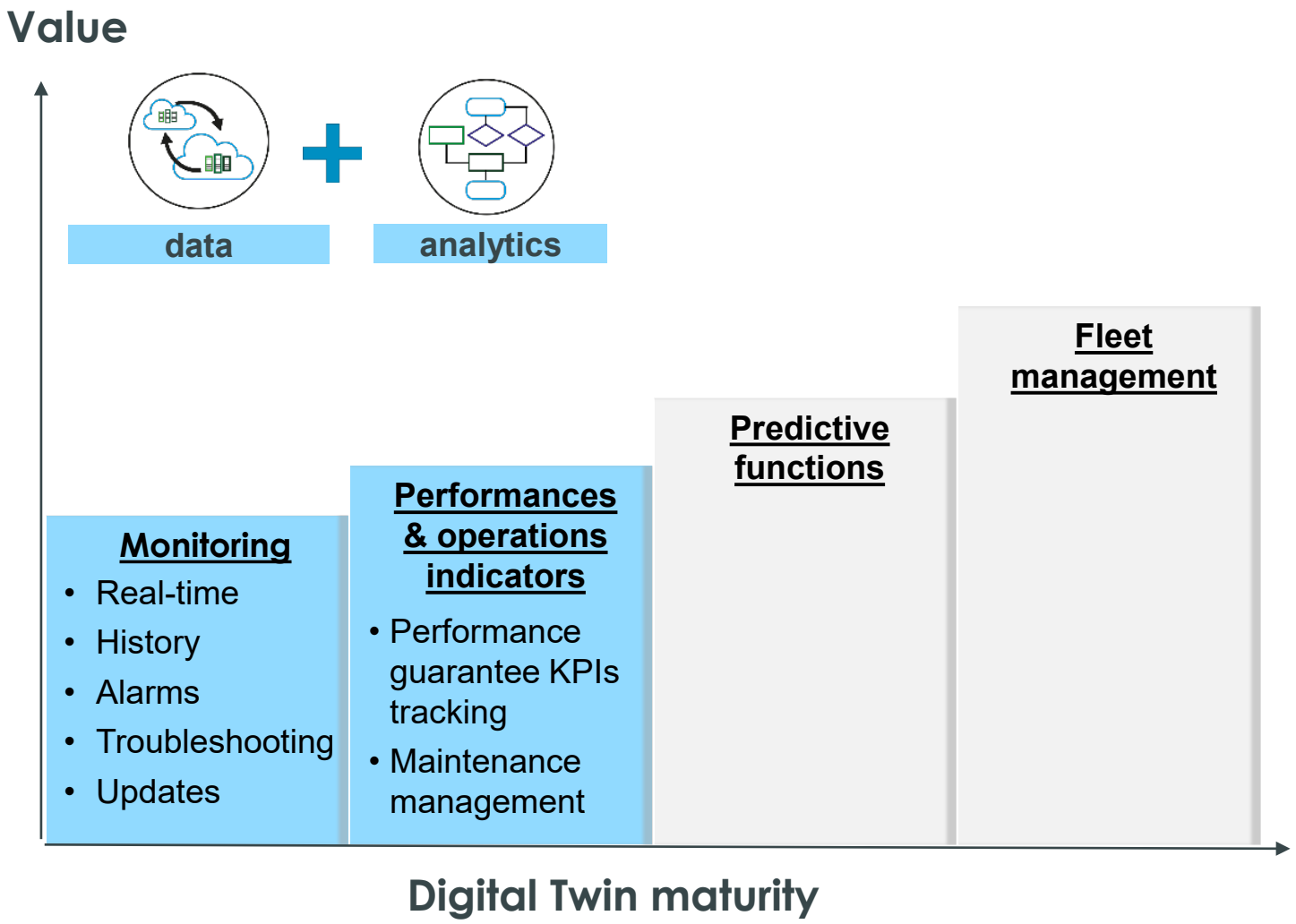


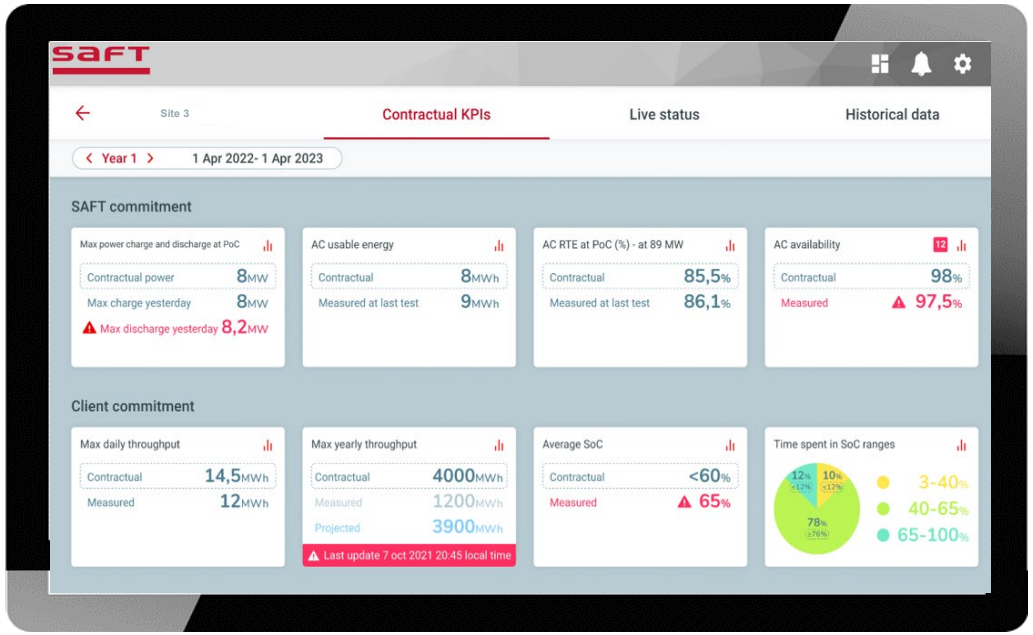


Benefits:

- ✓ Avoid unnecessary travels
- ✓ Save time & increase availability
- ✓ Increase reactivity

Digital roadmap based on customer use cases



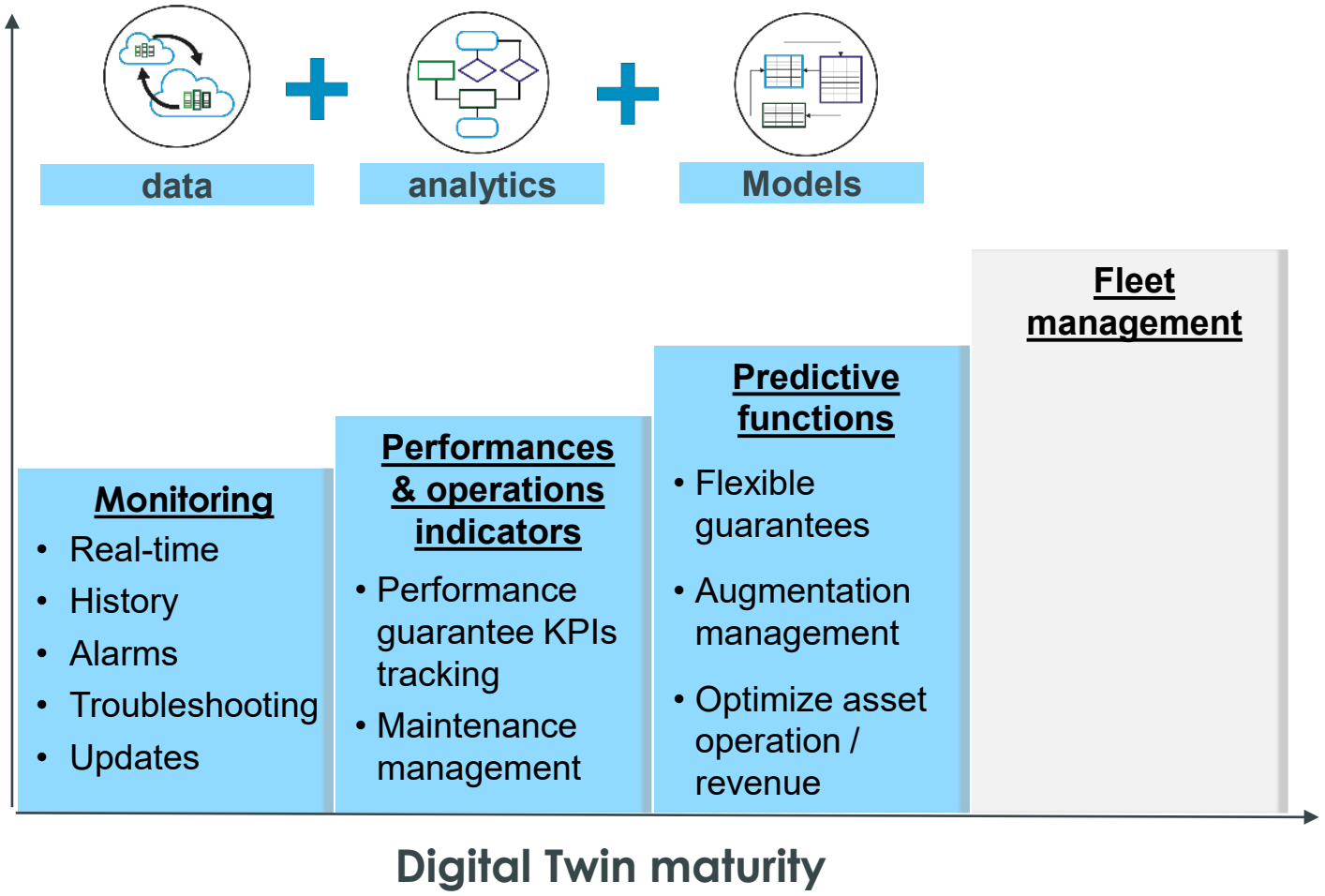


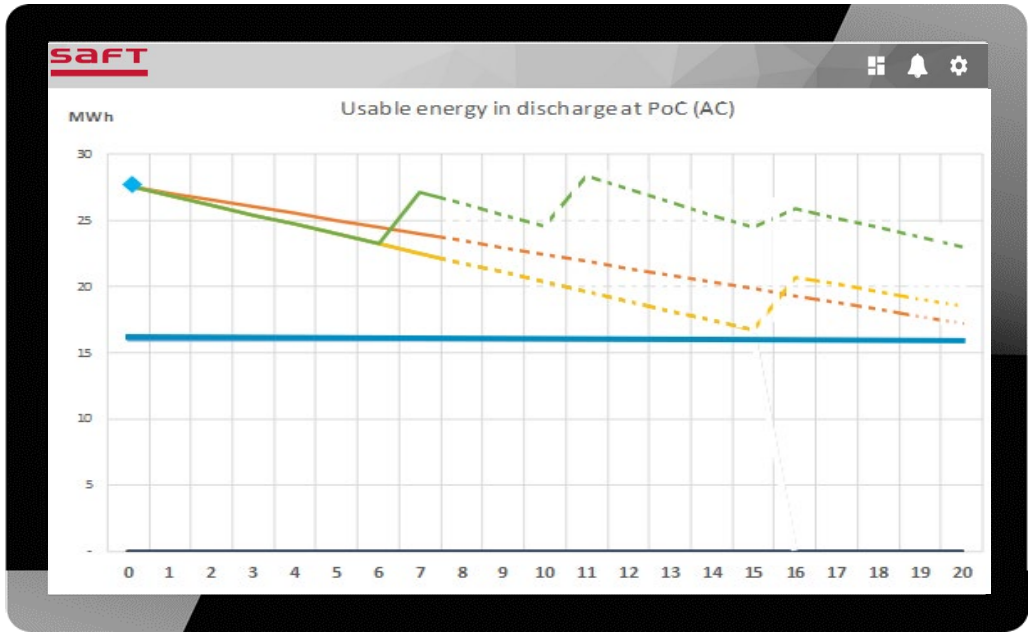
Benefits:

- ✓ Automatize KPIs computation
- ✓ Early identification & correction of performance guarantee deviations
- ✓ Ensure usage within guarantee boundaries

Digital roadmap based on customer use cases

Value





Benefits:

- ✓ Ability to change operation patterns while keeping flexible guarantees
- ✓ Optimize augmentation schedules

Digital roadmap based on customer use cases

Value

data + analytics + Models + Automation

Monitoring
- Real-time
- History
- Alarms
- Troubleshooting
- Updates

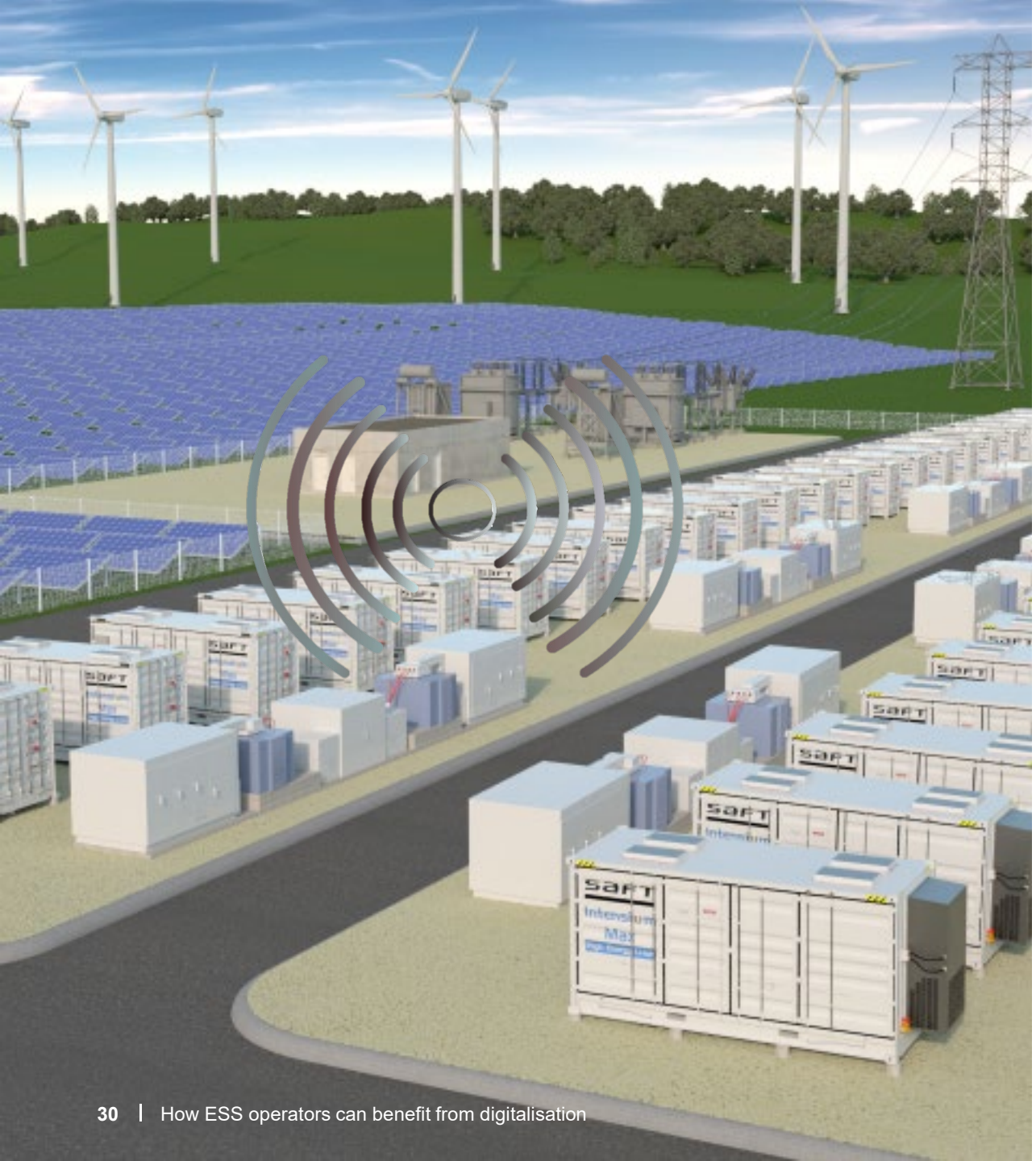
Performances & operations indicators
- Performance guarantee KPIs tracking
- Maintenance management

Predictive functions
- Flexible guarantees
- Augmentation management
- Optimize asset operation / revenue

Fleet management
- Condition based maintenance schedules
- Fully automated operation

Digital Twin maturity

Benefits:
- ✓ Optimize maintenance activities & costs
- ✓ Increase availability
- ✓ Optimize battery health



05.

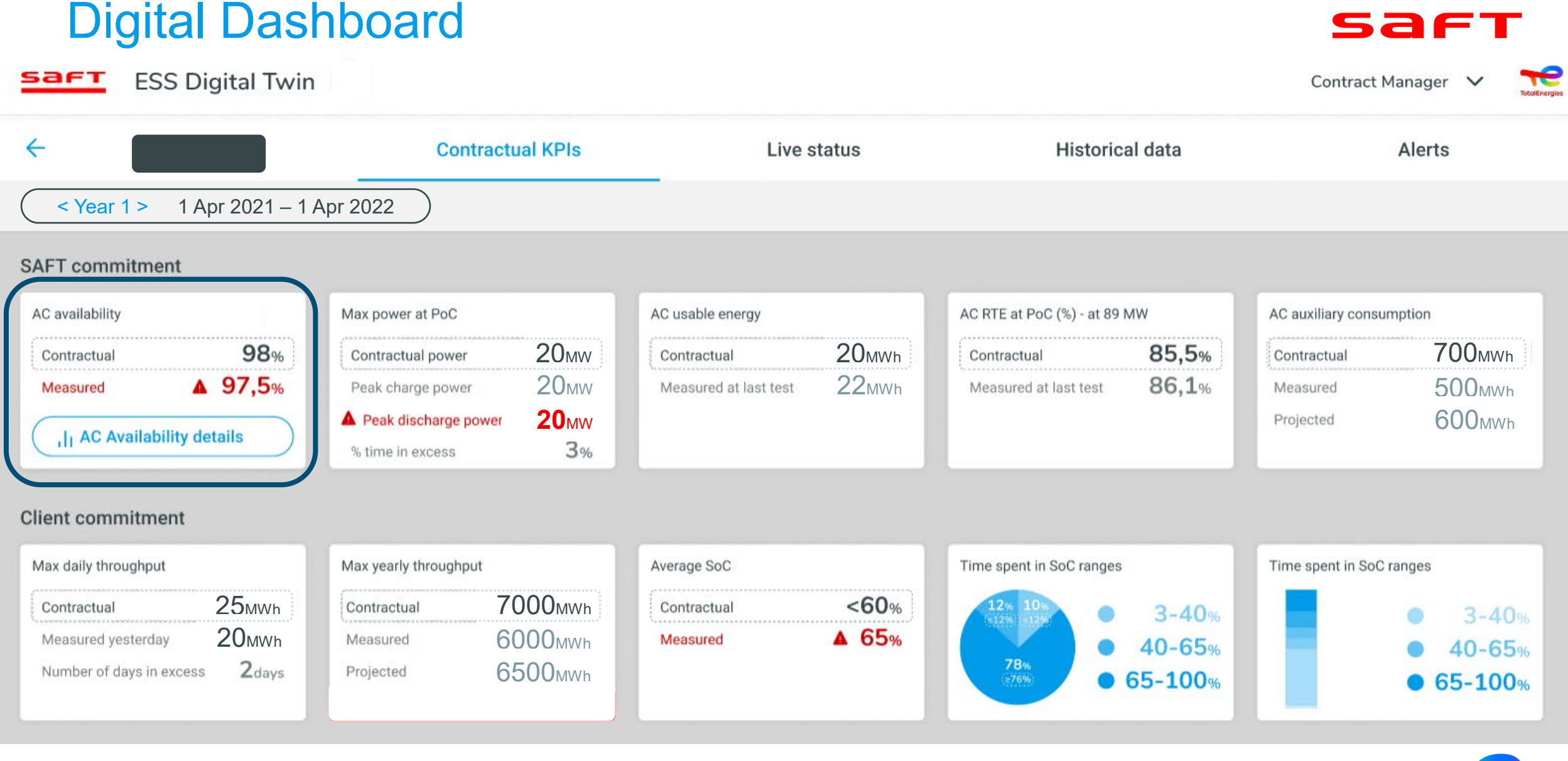
Use case demonstration

Carlos Hein
Director of Global Services

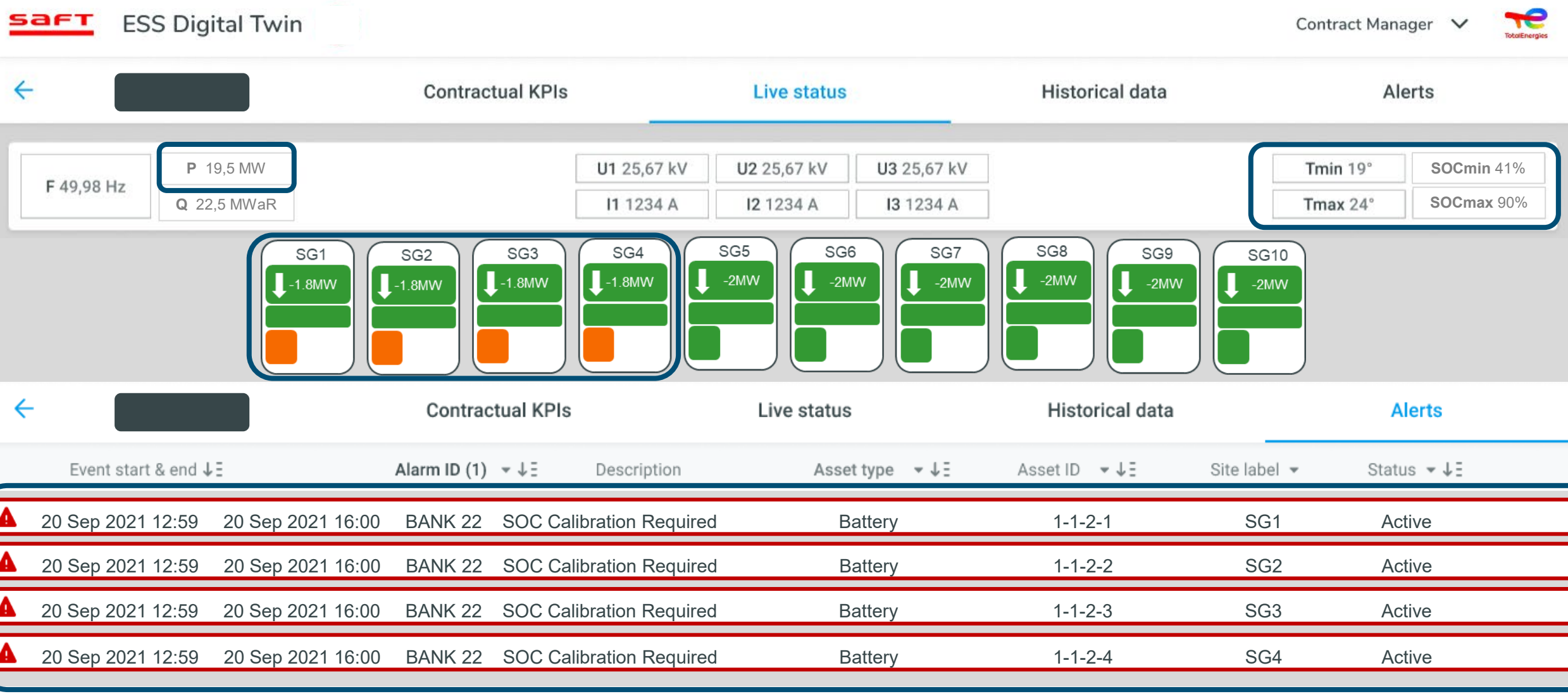
Services Case Study

Solving BESS O&M Issues Remotely with Saft's Digital Tools

Digital Dashboard



Remote Diagnosis



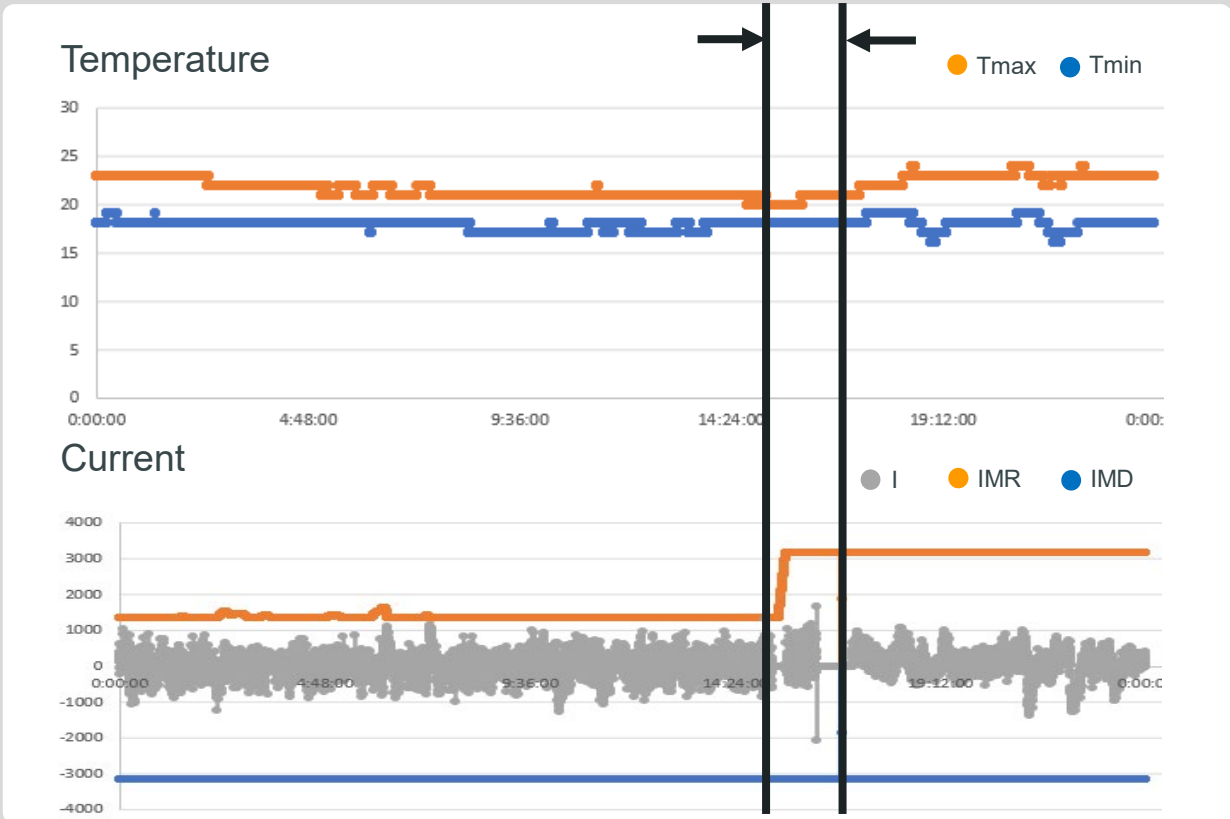
Remote Diagnosis

ESS Digital Twin

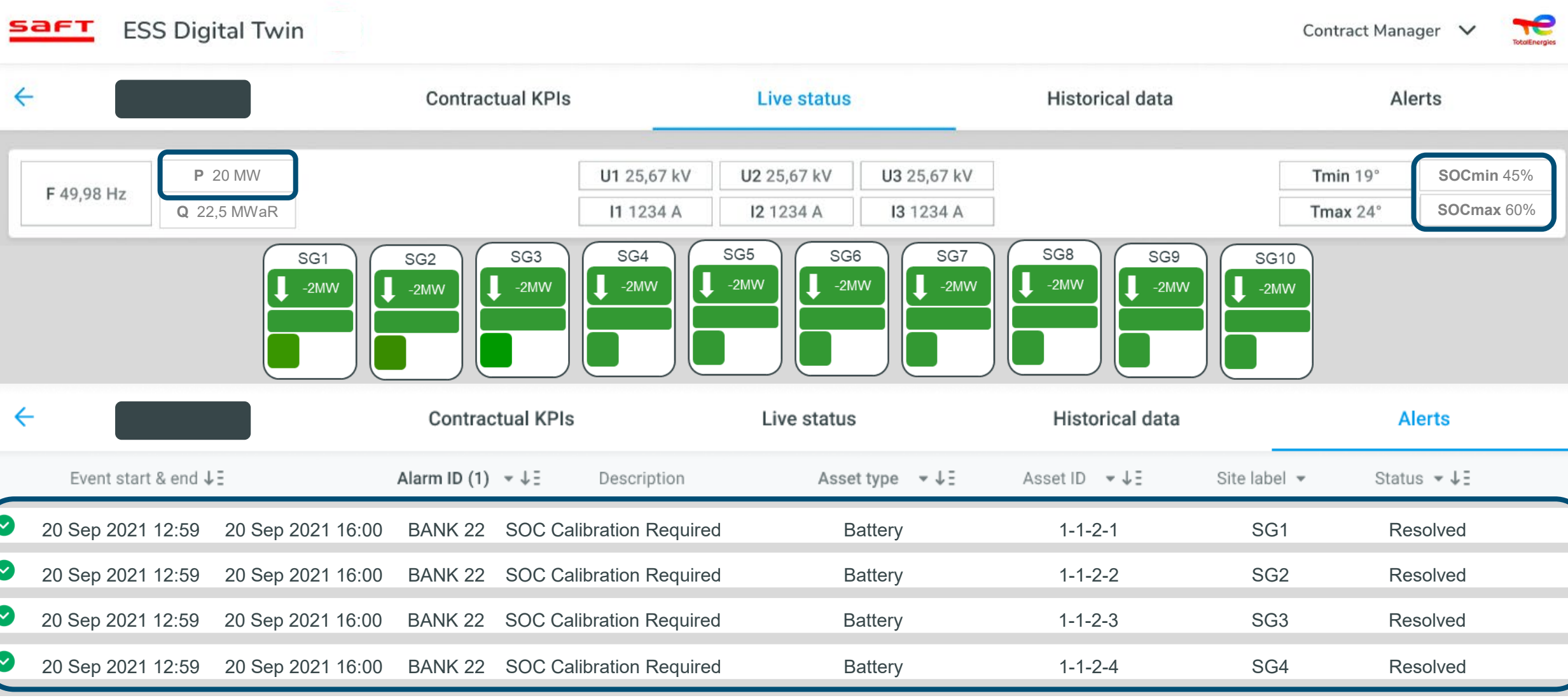
Contract Manager

Contractual KPIs | Live status | Historical data | Alerts

Battery Bank **1-1-2-1** Site Label **AB1** Contract year < Year 1 > Year **2021** Month **September**



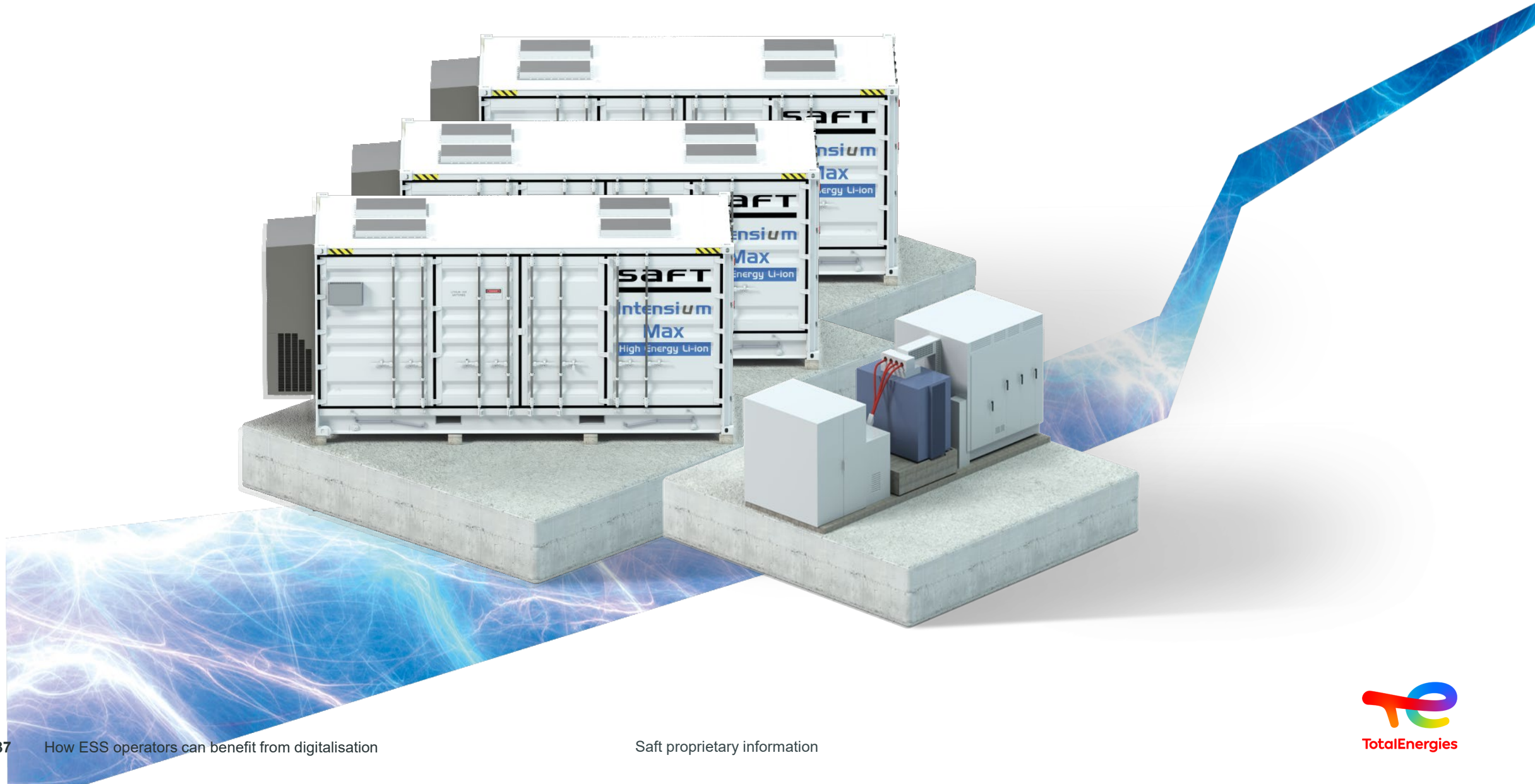
Remote Solution



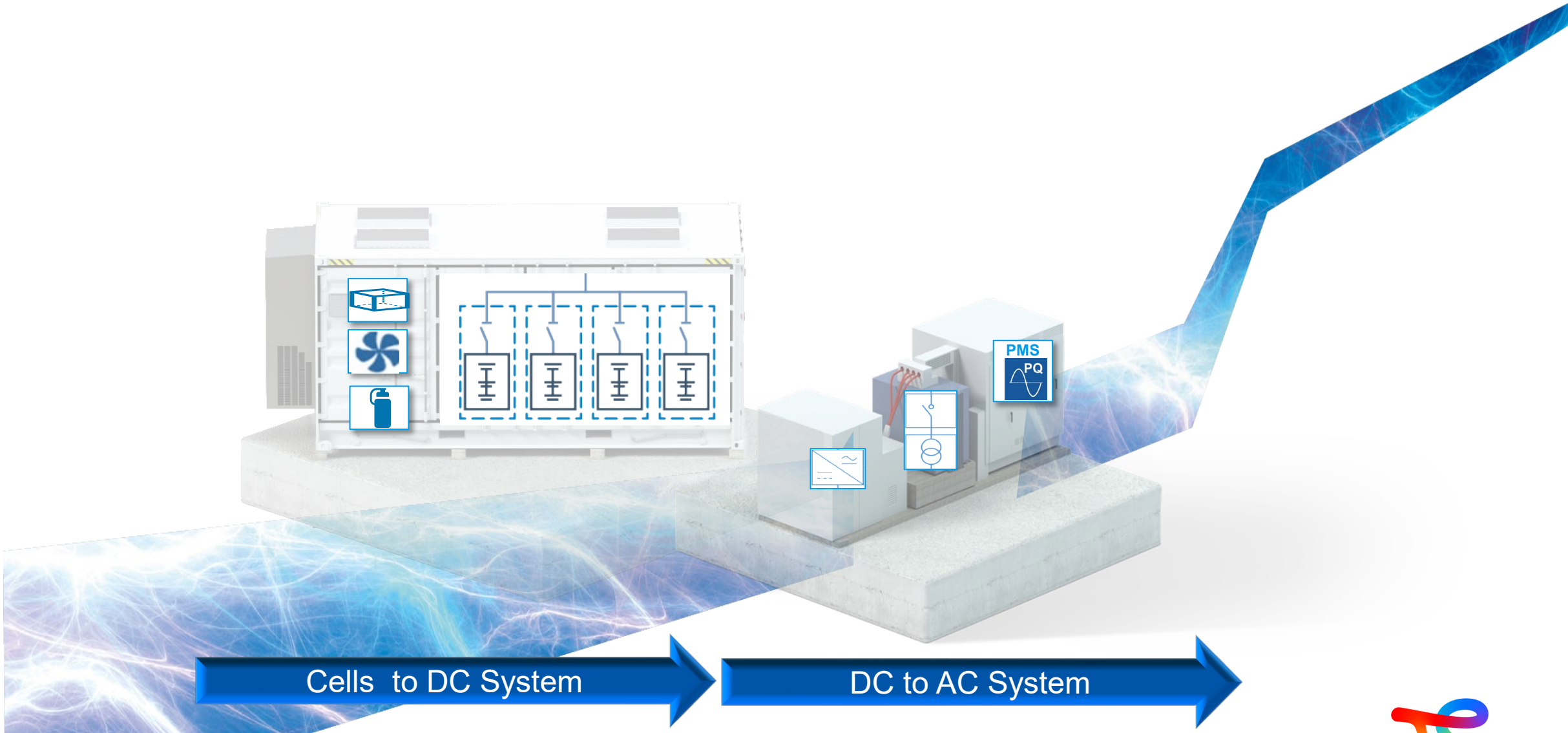
06.

Wrap-up

Holistic approach



Holistic approach



Holistic approach

- Quality Data
- Battery models
- Flexibility
- Interoperability
- Security

- Health
- Availability
- Performance
- Maintenance
- Safety

Thank You

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