

Intentional Islanding to increase resilience in European Power Grids

Britta Buchholz

Microgrids Symposium in Lappeenranta, Finland **16 June 2026, public**

Public

About Hitachi Energy

HITACHI



50,000+ employees

150
nationalities

60
countries

100+
years of heritage

1,800+
field engineers

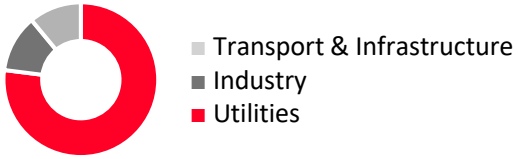
2,600+
R&D experts

~$16 billion USD business revenues

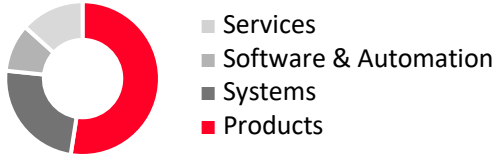
Business Units

- **Grid Automation**
- **Grid Integration**
- **High Voltage Products**
- **Service**
- **Transformers**

Customers



Offering



Geographies



Business mix by revenue FY2023

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Hitachi Energy in Finland

We play a key role and role in:

- Inspiring the next era of sustainable energy
- Supporting and accelerating electrification
- Supporting Finland's electricity security

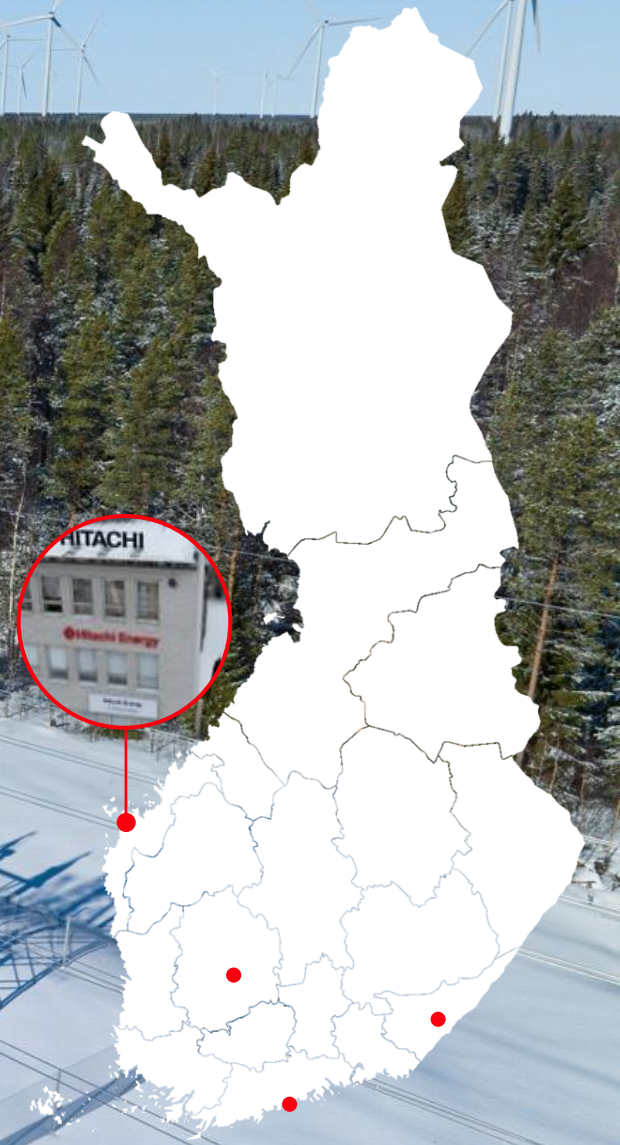
Business Units
Grid Integration
Grid Automation
Transformers
Service

Transformers factory
Vaasa

7 Locations
Vaasa: ~600
Helsinki, Tampere and other cities: ~90

715 people
17 nationalities

> 140 years
Of heritage and
R&D in Finland



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Hitachi Energy in Finland - references and highlights

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Ensuring the availability, reliability and safety of all **Länsimetro** metro stations and tunnels

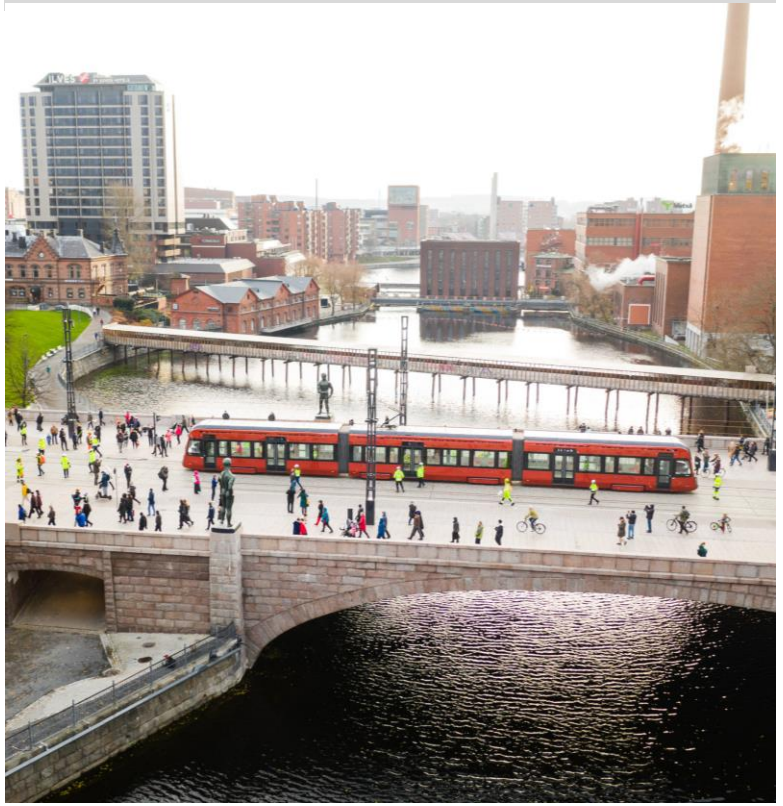


Photo: Länsimetro

Control and monitoring of the entire electric **railway track** in Finland



Securing power supply for **Tampere tram**



Welcome

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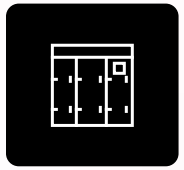
Transformation of European Power System



Intentional Islanding to increase resilience & regulation in Europe



Africa

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Transformation of European Power System



Remote generation

Highly distributed generation

Variable generation

Power electronics everywhere

And in addition: new regulations

- **EU Taxonomy**
- **CBAM**
- **Net Zero Industry Act**
- **…**

And: Acceleration of transition

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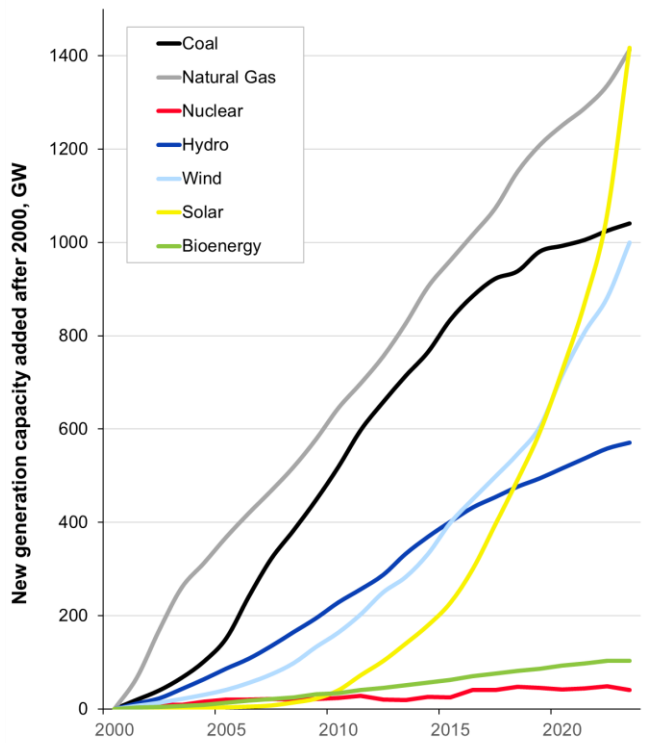
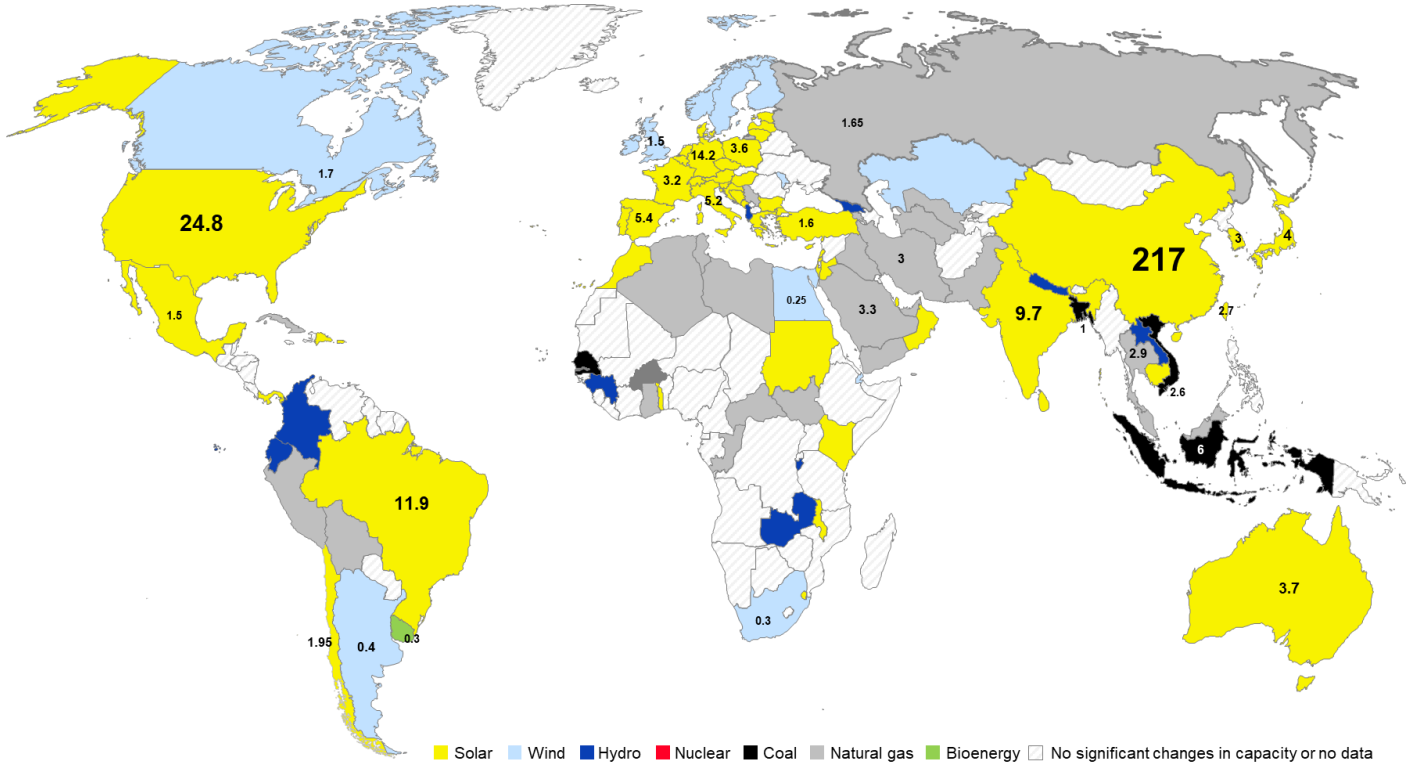
Rapidly accelerating global expansion of renewable energy capacity

Cumulative installed generation capacity



Leading regional power generation resources by newly installed capacity in 2023 (Gigawatts)



Solar PV technology has been at the forefront of generation capacity growth in recent years, with its increasing accessibility and sustained market dominance expected to continue

Source: Ember, Energy Charts, ENTSO-E, EIA

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Intentional Islanding to increase resilience

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Extreme weather explained by Electron



Grid Guardians Unite!

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Workshop between Distribution System Operators and Industry

Traditionally, islanding has been seen as undesired operating condition

Can become an opportunity with increasing DERs

Operate predesigned parts of the distribution system as island

- Continuity of supply
- Resilience
- Increase flexibility

Regulatory Framework

E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

T&D europe

- Predefined operational criteria and procedures
- Managed under responsibility of DSO based on operational objectives
  - maintain supply to critical loads
  - Increase resilience
  - support system restoration
- Target operational state of operation for DSO, e.g. in case of loss of the upstream network either planned or unexpected
- Key requirements for controlled islanding
  - Local balance between generation, storage and demand
  - Voltage and frequency support
  - Observability
  - Reliable and secure communication infrastructures
  - Clear operational processes

Joint efforts of DSOs, TSOs, industry, academia, policy makers and society needed to increase resilience.

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Examples

Project ALOIS, Spain

[Alois] Control and protection system of real medium voltage feeders for a stable and sustainable island operation over time | Kohesio

Funded by ERDF
European Regional Development Fund

Project coordiNet, Spain

Final_Spanish_demo_report_results_and_analysis_of_the_full-scale_demonstration.pdf

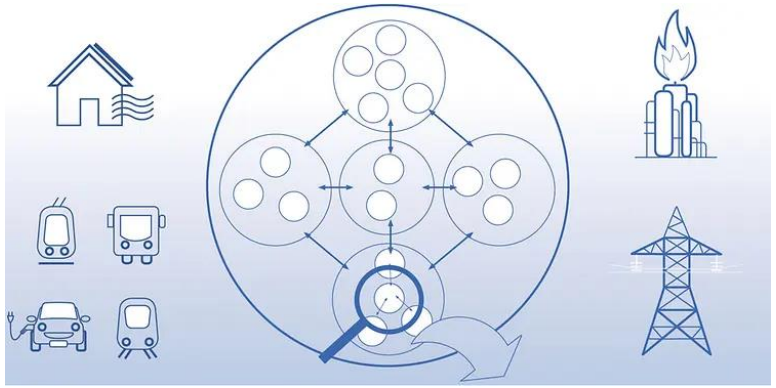
Coordination between TSO and DSO on controlled islanding and other topics

This project has received funding from the European Union's *Horizon 2020 research and innovation programme* under grant agreement n° 824414

Cellular Energy System, Germany

VDE-ETG Sub-committee Cellular energy systems

V 2.4. Zellulare Energiesysteme



Source: VDE

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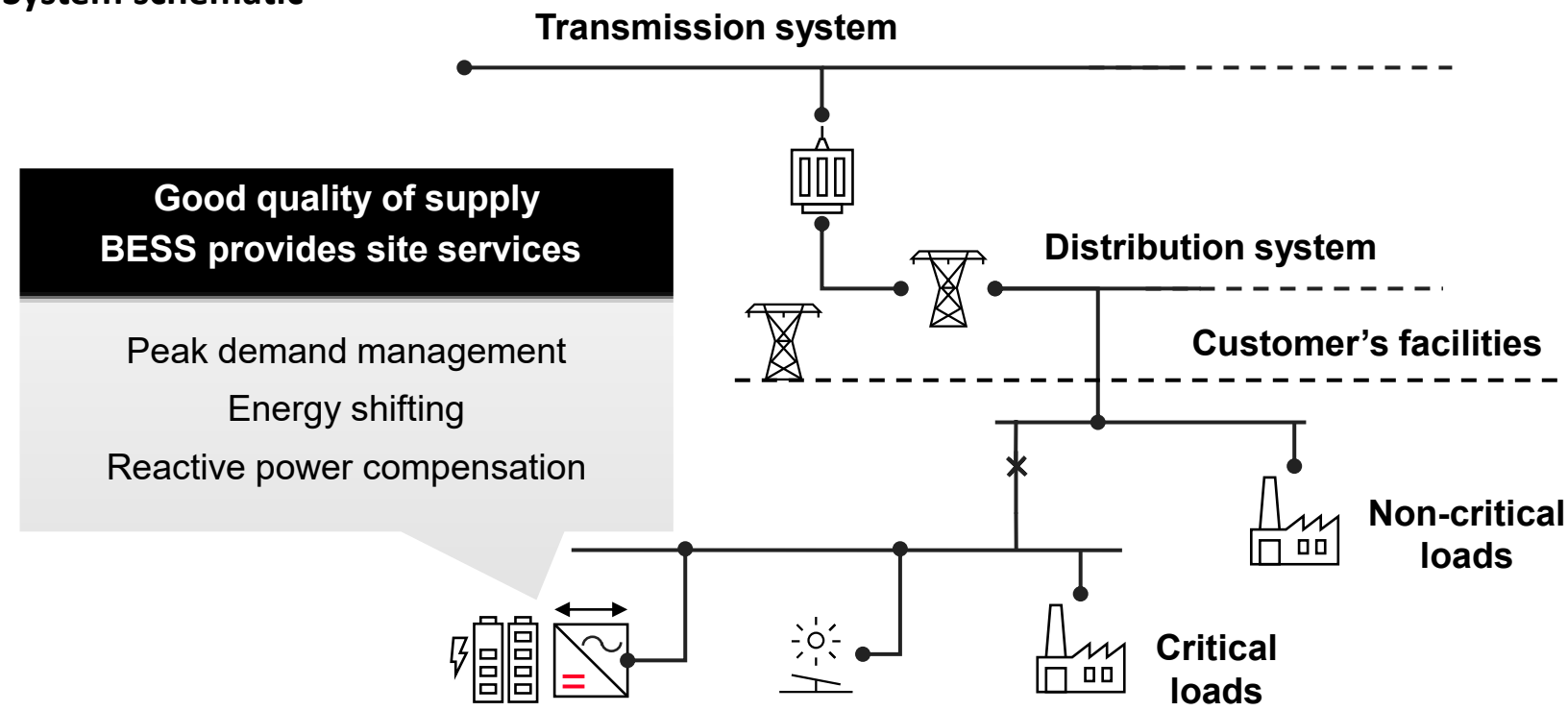
BESS as an Emergency Power Supply System

Key aspects to consider:

- Nature of the grid event
- Speed and accuracy of event detection devices
- Timing of breaker operation (opening)
- Capabilities of converter control systems to manage the transition and form the grid
- Seamless transition between operating modes
- Grid-forming functionality

System schematic



BESS operation: grid and customer services

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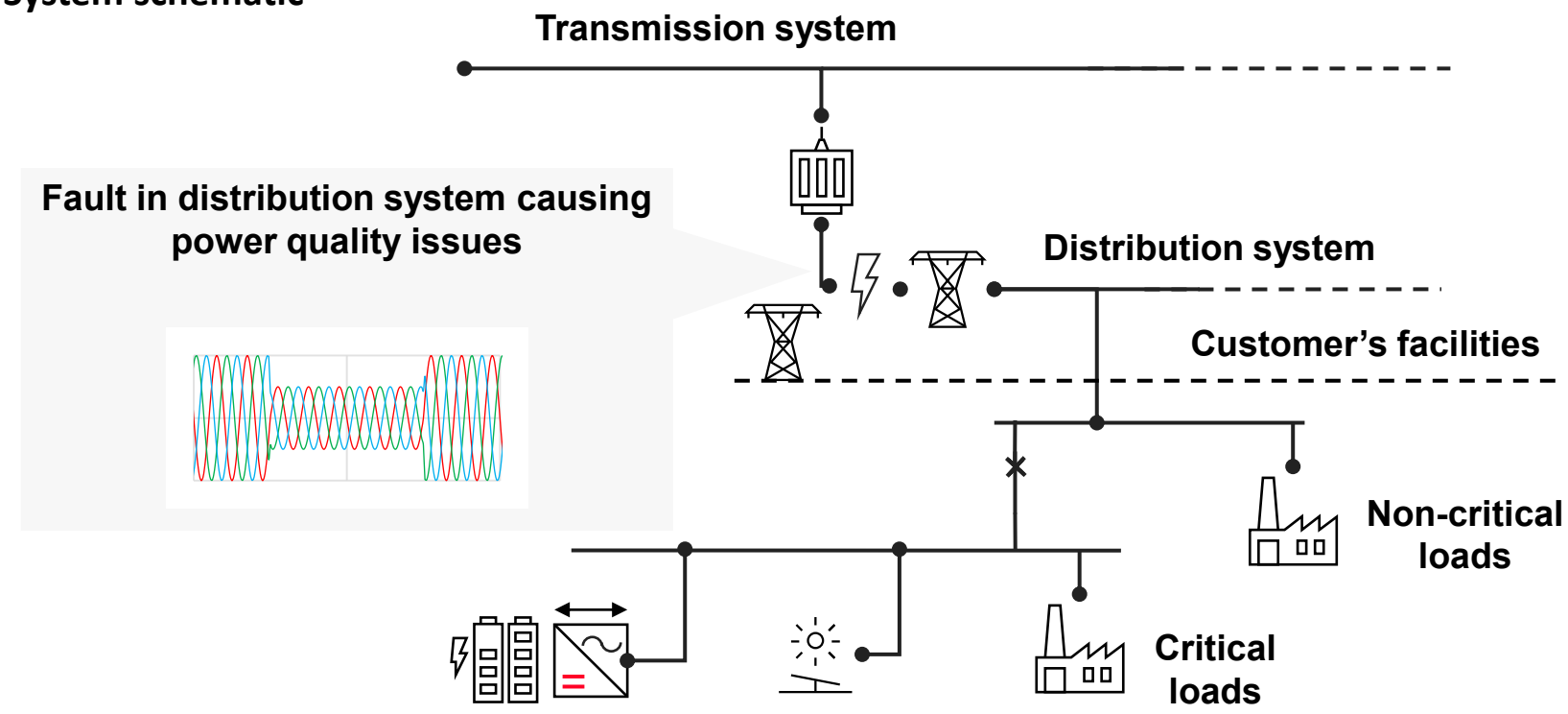

BESS switching to EPSS operation

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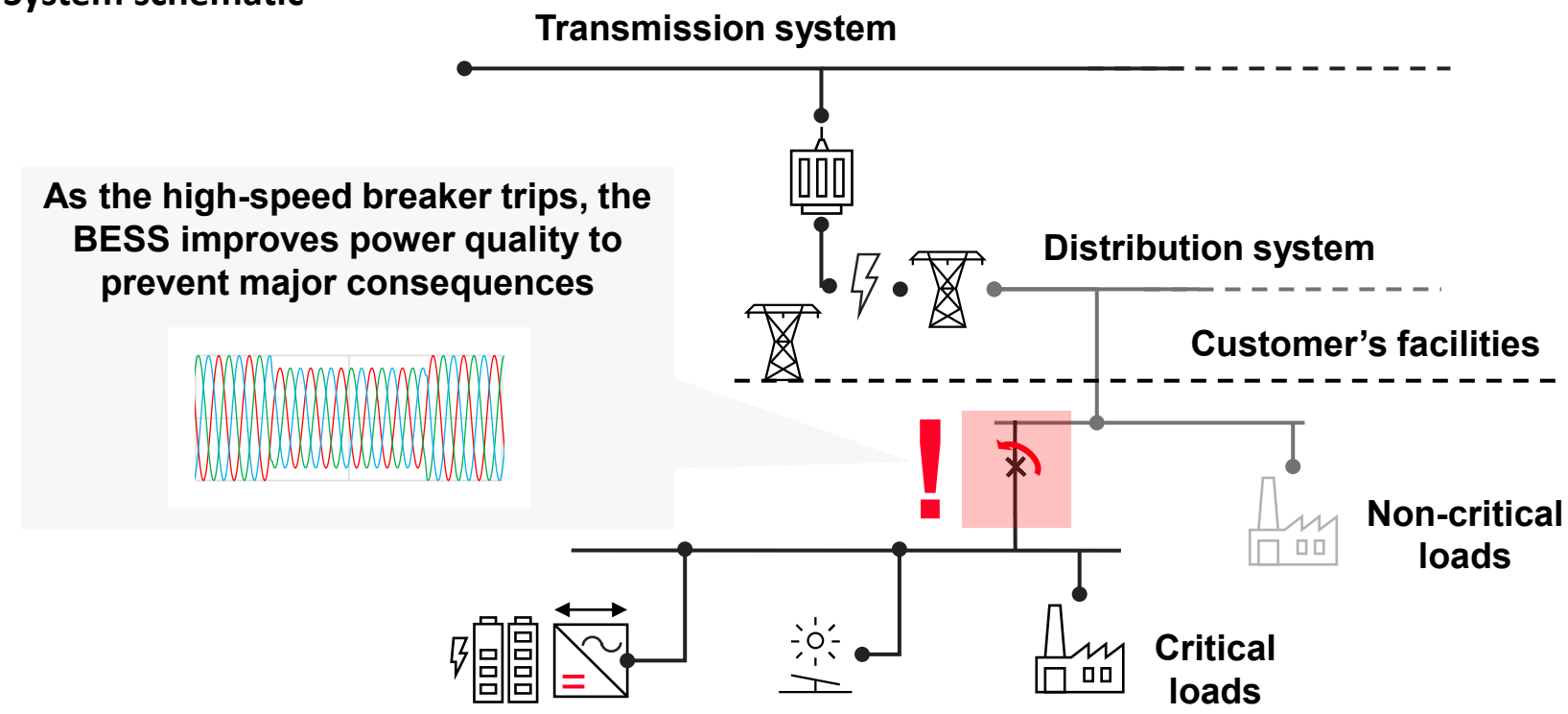

BESS preventing loss of production

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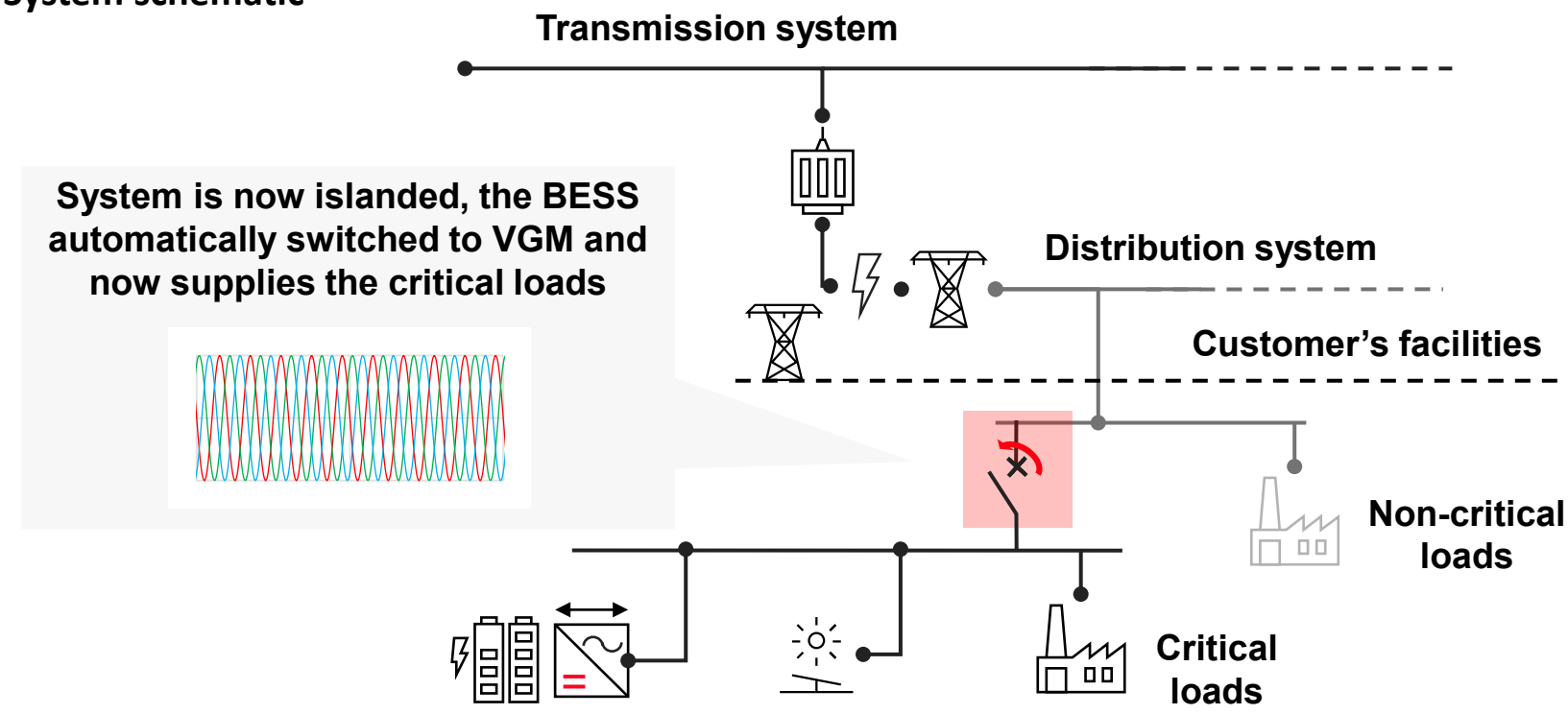

BESS managing critical load together with local renewable generation

VGM: Virtual Generator Mode

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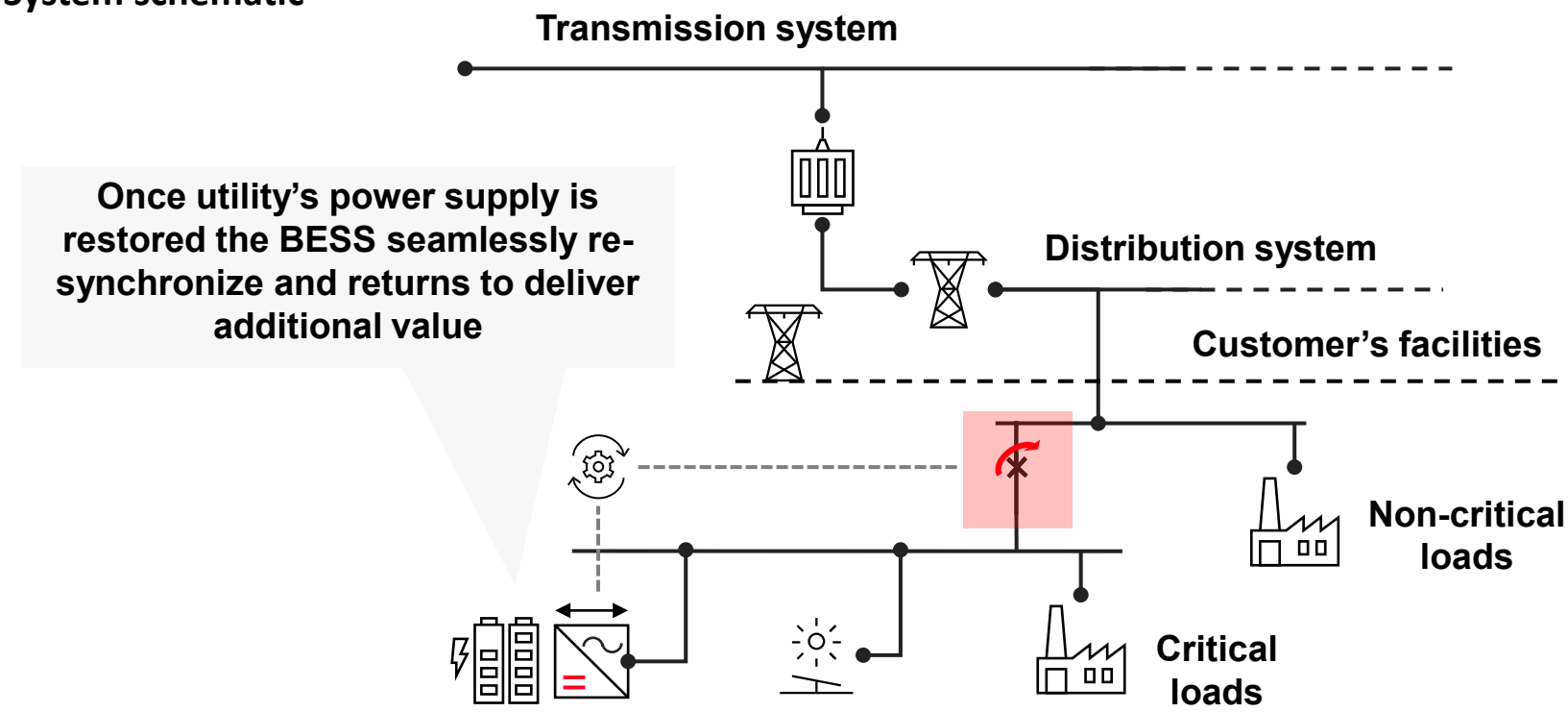

BESS re-synchronizing load to network

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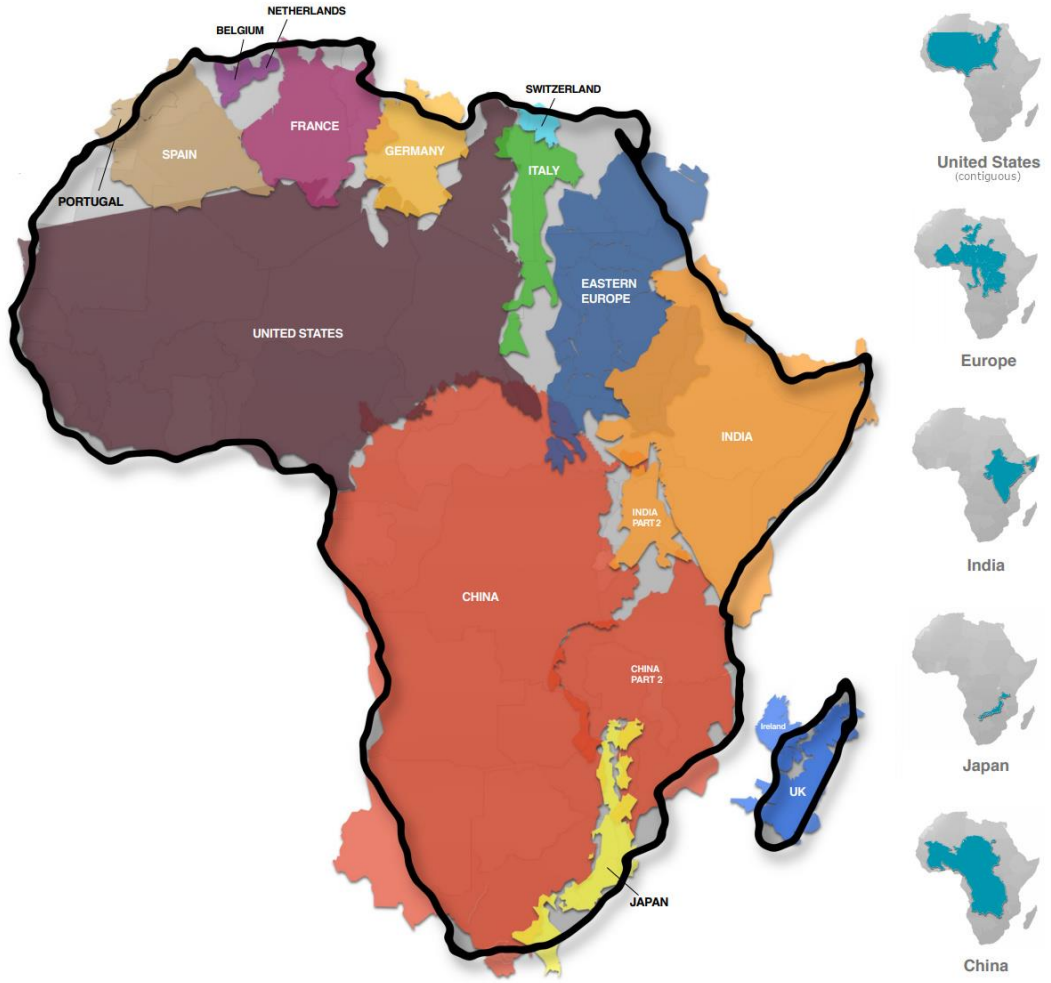
Africa

- South Africa – BESS for renewables storage and grid balancing
- Zambia: utility note expects BESS with reneables as a default now to avoid grid instability
- Kenya and Angola: move to security communities with standalone microgrids
- Angola in process of finalizing several hundred MW in a single project (Sun Africa)
- Microgrids will play a significant role in the World Bank Mission 300 initiative.



Mapped: Visualizing the True Size of Africa - Visual Capitalist

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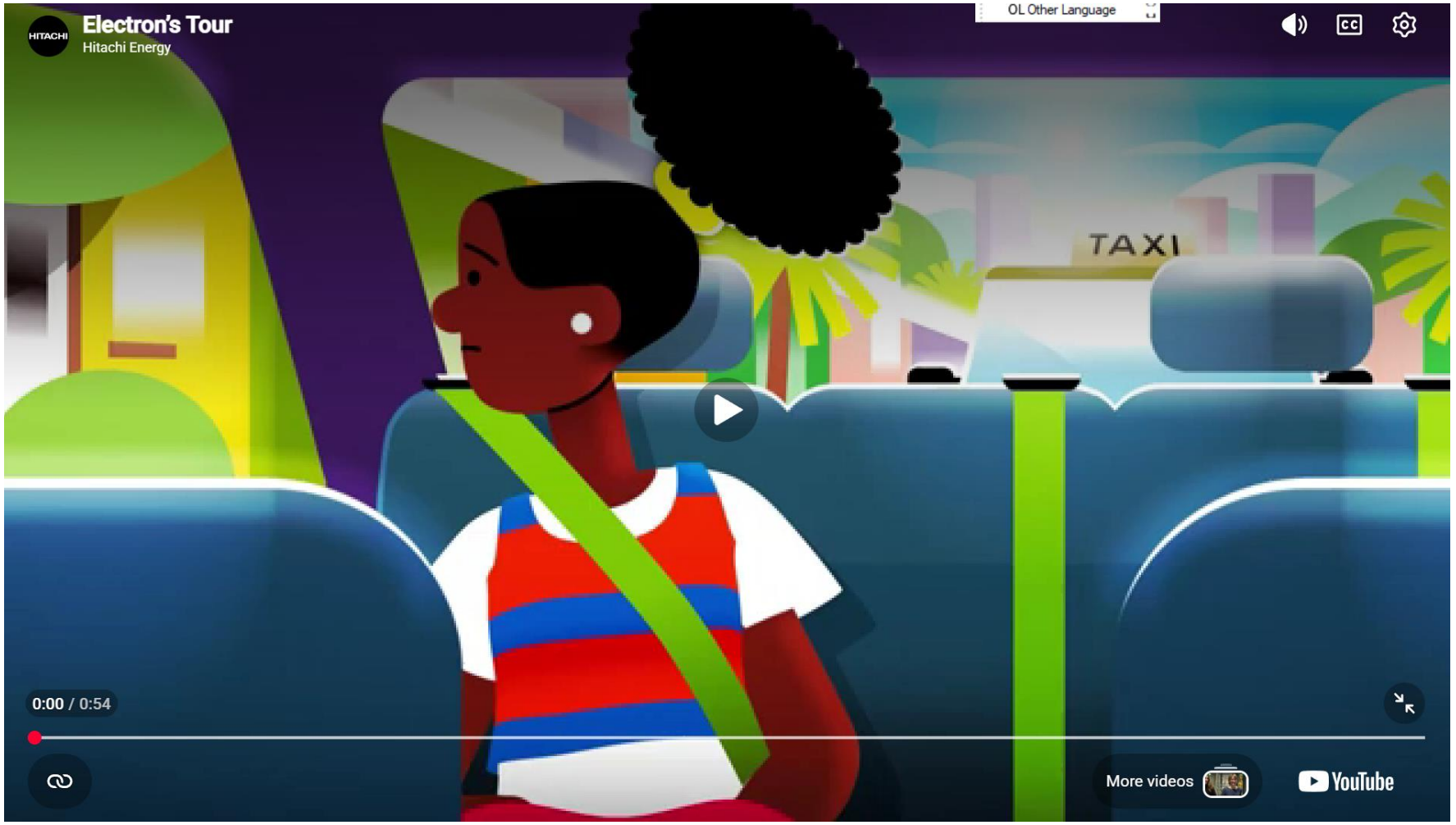
Greetings from Africa

https://youtu.be/_hXerBwp0ro



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Thank you!

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