



Smart Infrastructure Electrification & Automation

Shaping power distribution grids for tomorrow

UN Delegation BMWK 5-7 July 2023

Factory Tour

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 - Short Intro
 - Factory Tour
- Power Consultant
- Siemens Financial Services
- Lunch 12:45
- Departure 14:00

Siemens AG and Siemens Energy

Two legal entities from Oct 1, 2020

SIEMENS



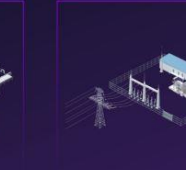


Businesses

Digital Industries	Smart Infrastructure	Mobility	Siemens Advanta	Portfolio Companies	Siemens Healthineers ¹
					

**Medium voltage
(1 ... 52 kV)**

SIEMENS energy

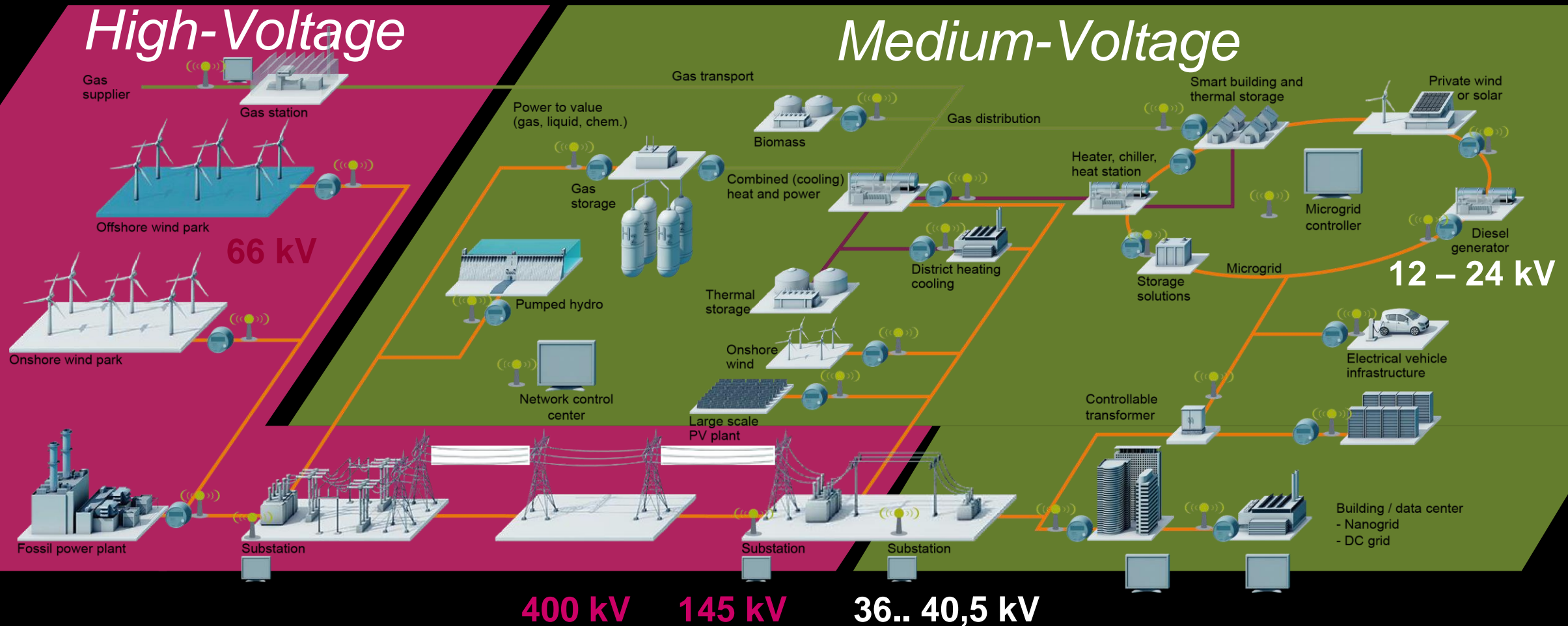
Businesses

Generation	Industrial Applications	Transmission	SGRE	New Energy Business
				

**High voltage
(above 52 kV)**

¹ Stock exchange listed subsidiary of Siemens; Siemens Healthineers with own set-up for regions and own Service & Governance

High- and Medium Voltage – different areas and tasks




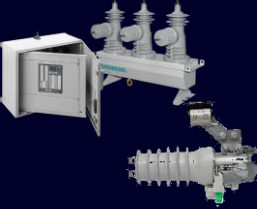




Smart power distribution from medium-voltage to low-voltage





Medium-voltage Components, Systems & Solutions

<p>Components</p>	<p>Primary Air-insulated Switchgear</p>	<p>Gas-insulated Switchgear Prim / Sec</p>	<p>SF6-free blue GIS Prim / Sec</p>
			

Low-voltage Systems

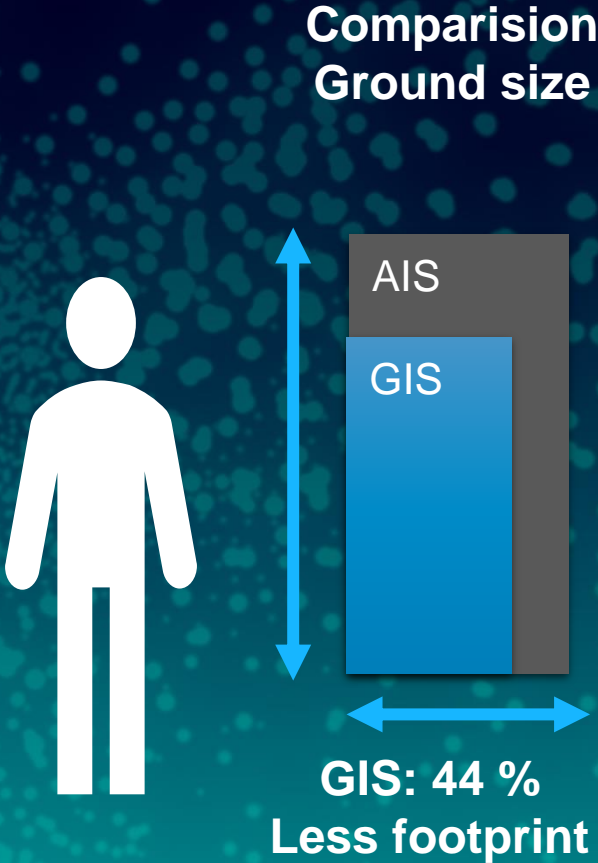
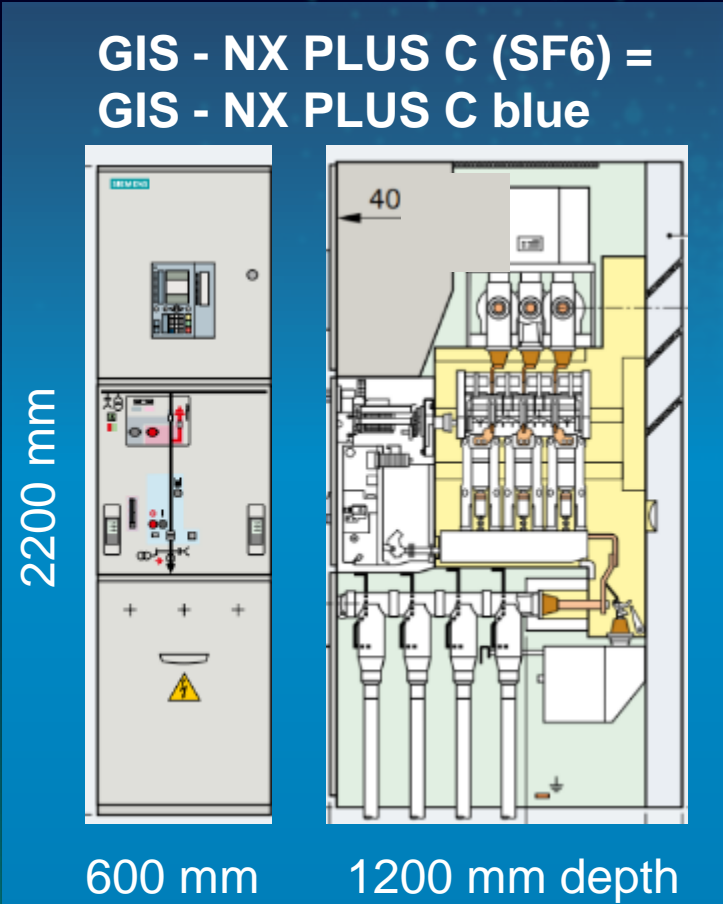
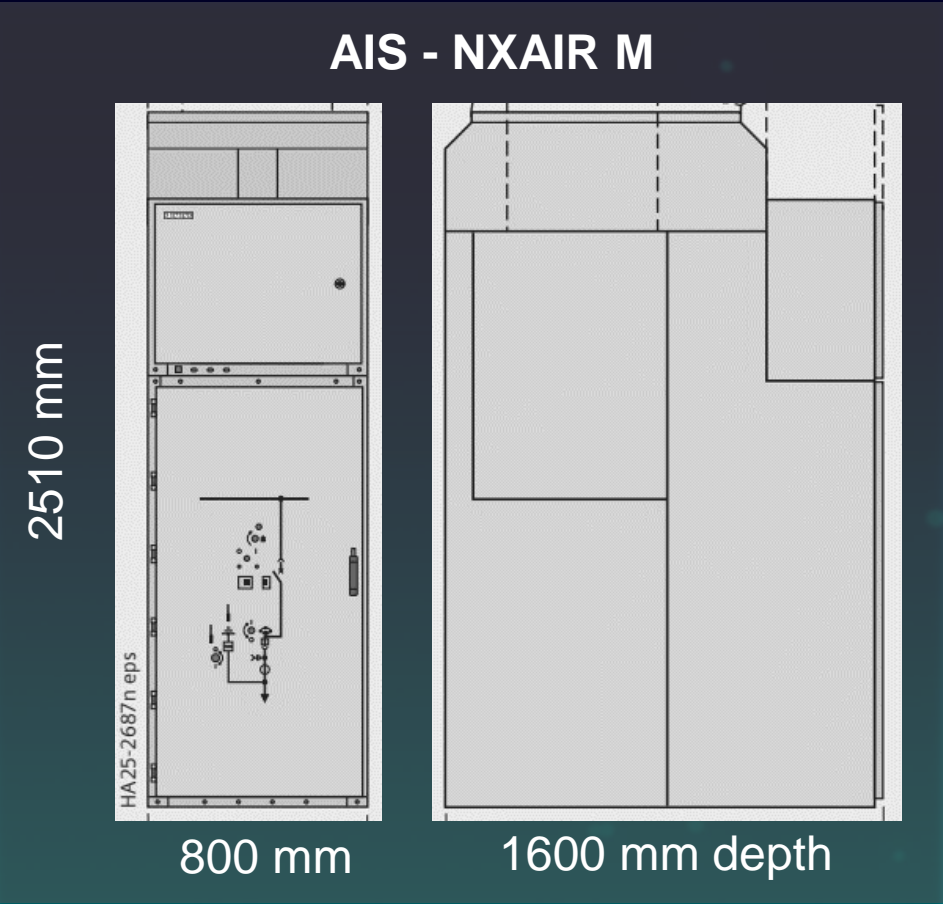
<p>Generator Circuit Breaker Switchgear</p>	<p>Photovoltaic (PV inverter systems)</p>	<p>Power Distribution Boards & Motor Control Centers</p>
		
<p>Outdoor Distribution Systems</p>	<p>Solution Business (E-House systems)</p>	<p>Busbar trunking systems</p>
		

Automation, Protection & Communication for high- and medium-voltage Systems

<p>Protection</p>	<p>Automation</p>	<p>Power Quality</p>	<p>Smart Communication</p>
			

Services

Footprint Comparison – AIS vs. GIS with 1250 A and 24kV



SI EA manufacturing network of 21 factories and 12 workshops / assembly centers

Global setup – local partner

SI EA O GIS
Frankfurt, GER

SI EA O BB
Köln, GER

SI EA KNE
Neckarsulm, GER

SI EA O AIS
Leipzig, GER

SI EA O SD
Berlin, GER

SI EA O PA
Berlin, GER

SI EA O BB
Mohelnice, CZE

SI EA O AIS
Kocaeli, TRK

SI EA O PA
Nanjing, CHN

SI EA O SD
Heber Springs, USA

RC-US SI EA
Wendell, USA

SI EA O SD
Queretaro, MEX

RC-IL SI EA
Gedera, ISR

Waltershausen, GER

Mexico City, MEX

Tenjo, COL

Jundiaí, BRA

RC-SA SI EA
Jeddah, SAU

SI EA O AIS
Jundiaí, BRA

SI EA O AIS
Karachi, PAK

SI EA O GIS
Goa, IND

SI EA O PA
Goa, IND

RC-AU SI EA
Yatala, AUS

SI EA O AIS
Jakarta, IDS

SI EA O AIS
Thane, IND

SI EA O BB
Binh Duong, VNM

Vienna, AUT

Jeddah, SAU

Goa, IND

Nanjing, CHN

SI EA O AIS
Wuxi, CHN

SI EA O GIS
Wuxi, CHN

SI EA O SD
Shanghai, CHN

- Air insulated Swgr / LV SB
- Gas insulated Swgr
- Switching Devices
- Busbars
- Protection & Automation
- KACO
- workshops / assembly centers

Our portfolio in detail

SI EA MV AIS Primary existing portfolio

NXAIR
 $\leq 36 \text{ kV}$
 $\leq 50 \text{ kA}$
 $\leq 4000 \text{ A}$

NXAir S
 $\leq 40.5 \text{ kV}$
 $\leq 31,5 \text{ kA}$
 $\leq 3150 \text{ A}$

SIMOPRIME
 $\leq 24 \text{ kV}$
 $\leq 40\text{kA}$
 $\leq 4000\text{A}$

CP Portfolio

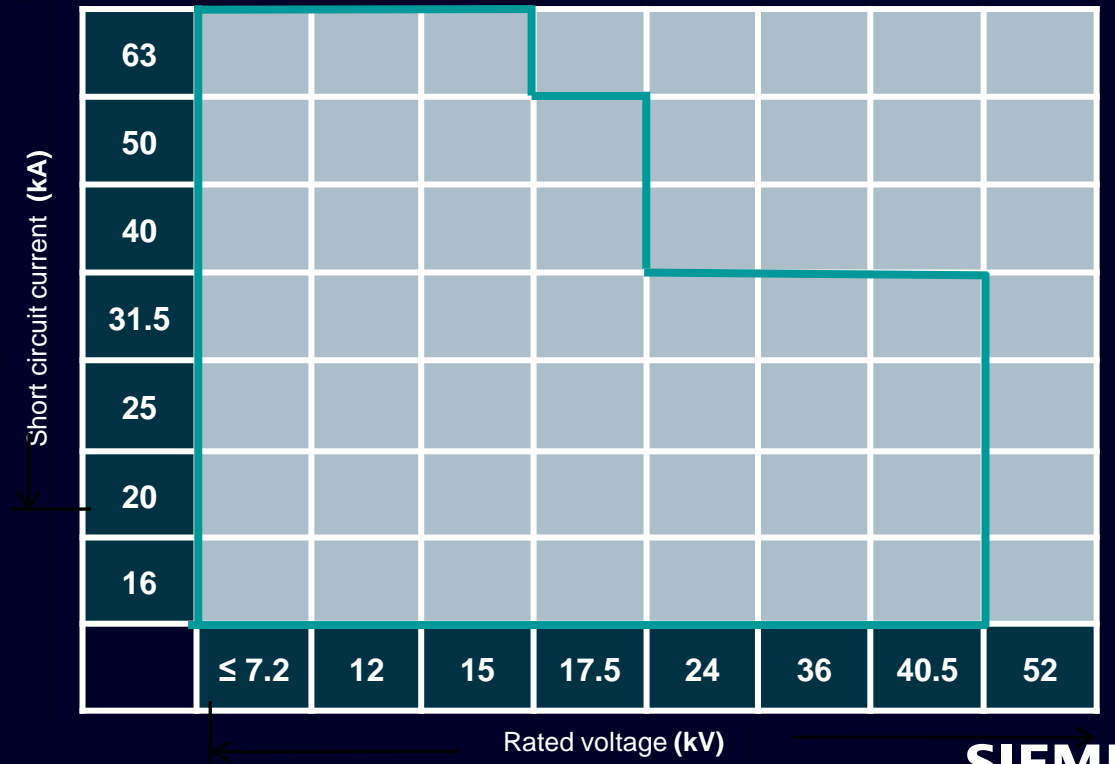
GM-SG
 $\leq 27 \text{ kV}$
 $\leq 63 \text{ kA}$
 $\leq 4,000 \text{ A}$

SIQuench
 Arc quenching
 device
 $tr < 5 \text{ ms}$

With AIS from Siemens you're always on the safe side!

Our switchgear is type-tested for indoor installation according to latest standards and has always been a synonym for maximum personal and operational safety as well as local added value. Your benefits:

- Ensure peace of mind
- Save lives
- Increase productivity
- Save money
- Preserve the environment
- Using environment friendly air as insulating medium



Sustainable power distribution – blue GIS

Primary power distribution



8DAB 12
≤ 12 kV | ≤ 40 kA | ≤ 2,750 A

NXPLUS C 24
≤ 24 kV | ≤ 25 kA | ≤ 1,250 A

Secondary power distribution



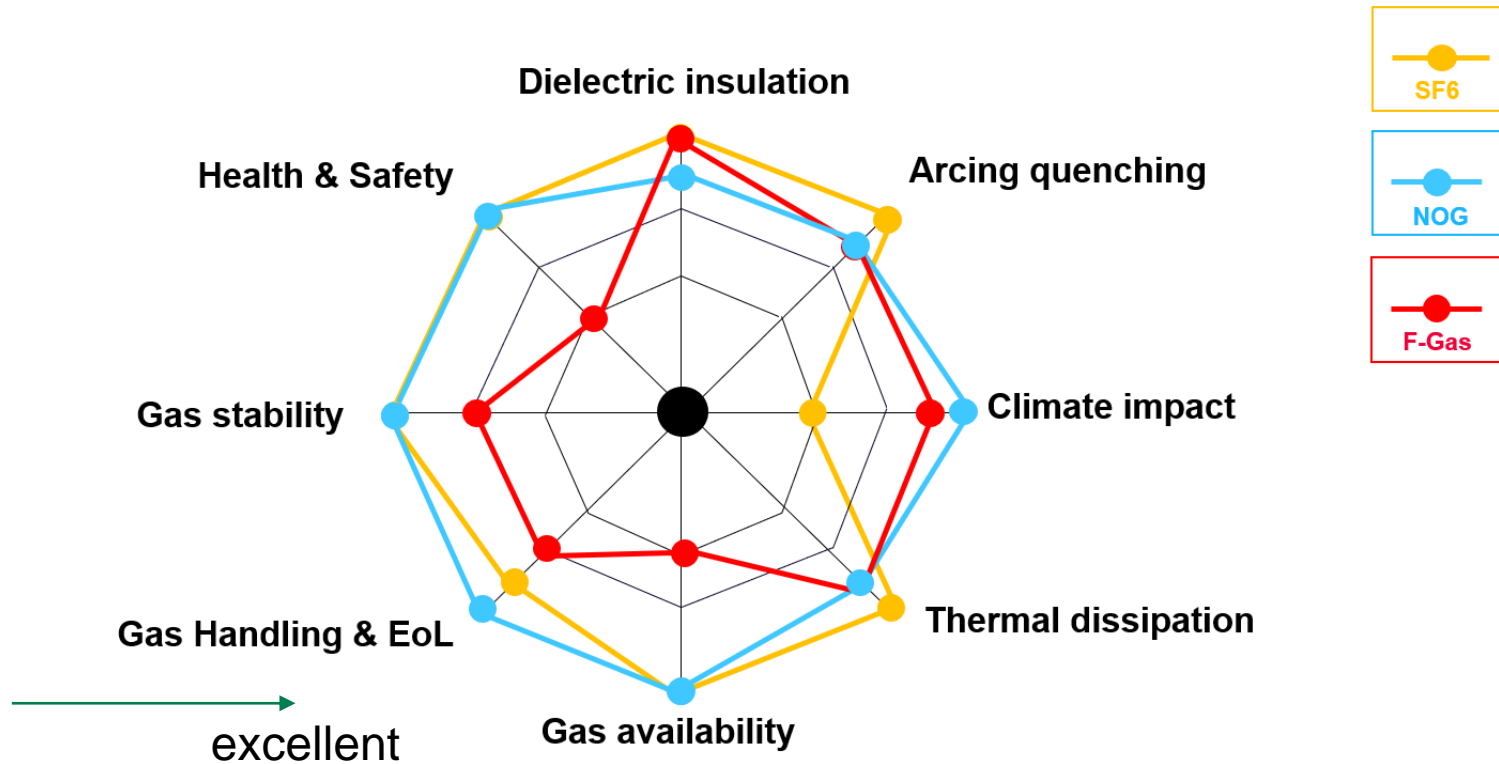
8DJH 12
≤ 12 kV | ≤ 20 kA | ≤ 630 A

8DJH 24
≤ 24 kV | ≤ 20 kA | ≤ 630 A

SC B3/A3 Colloquium 2023

2. Why Natural-Origin Gases are the best alternative?

Summary of the comparison of SF6 free alternatives



Natural Origin Gas (N_2 , O_2 , CO_2)

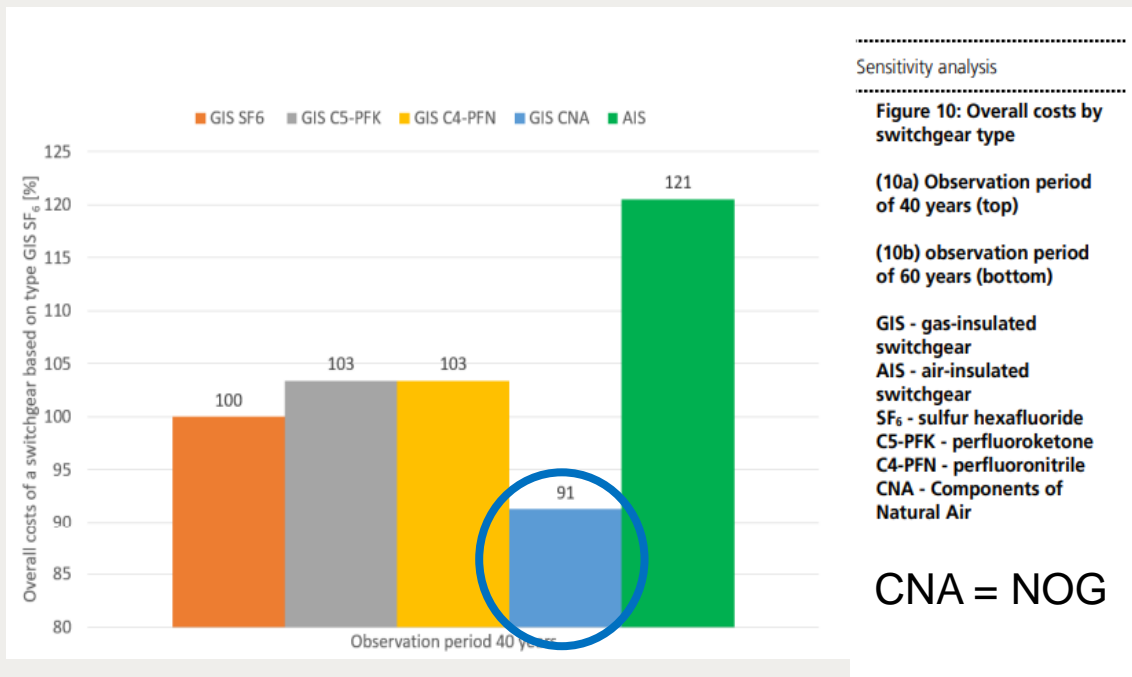
Mainly: C4-Fluoronitrile (C4-FN) and C5-Fluoroketone (C5-FK) belonging to PFAS

NOG consists of natural air elements (N_2 , O_2 and CO_2) not protected by patents.

SC B3/A3 Colloquium 2023

2. Why Natural-Origin Gases are the best alternative?

- **Life cycle costs including gas handling and end of life treatment**



The lowest total costs calculated for the **NOG-GIS**

- Study^{*)} covers processes: procurement to disposal
- Switchgear with typical number of panels in German public power networks
- IEE LCC-CO₂ tool + questionnaire
-> updated parameters due to customer feedback
- **main drivers for total costs:**
 - the costs for maintenance
 - electricity price: due to energy losses. incl. emissions
- **other cost factors:**
 - equipment,
 - replacement
 - safety tests
 - documentation

*) [17] [Fraunhofer Institute for Energy Economics and Energy System Technology IEE \(02.21-03. 22\)](#)

Additional Services

Electrification & Automation Partner Offerings

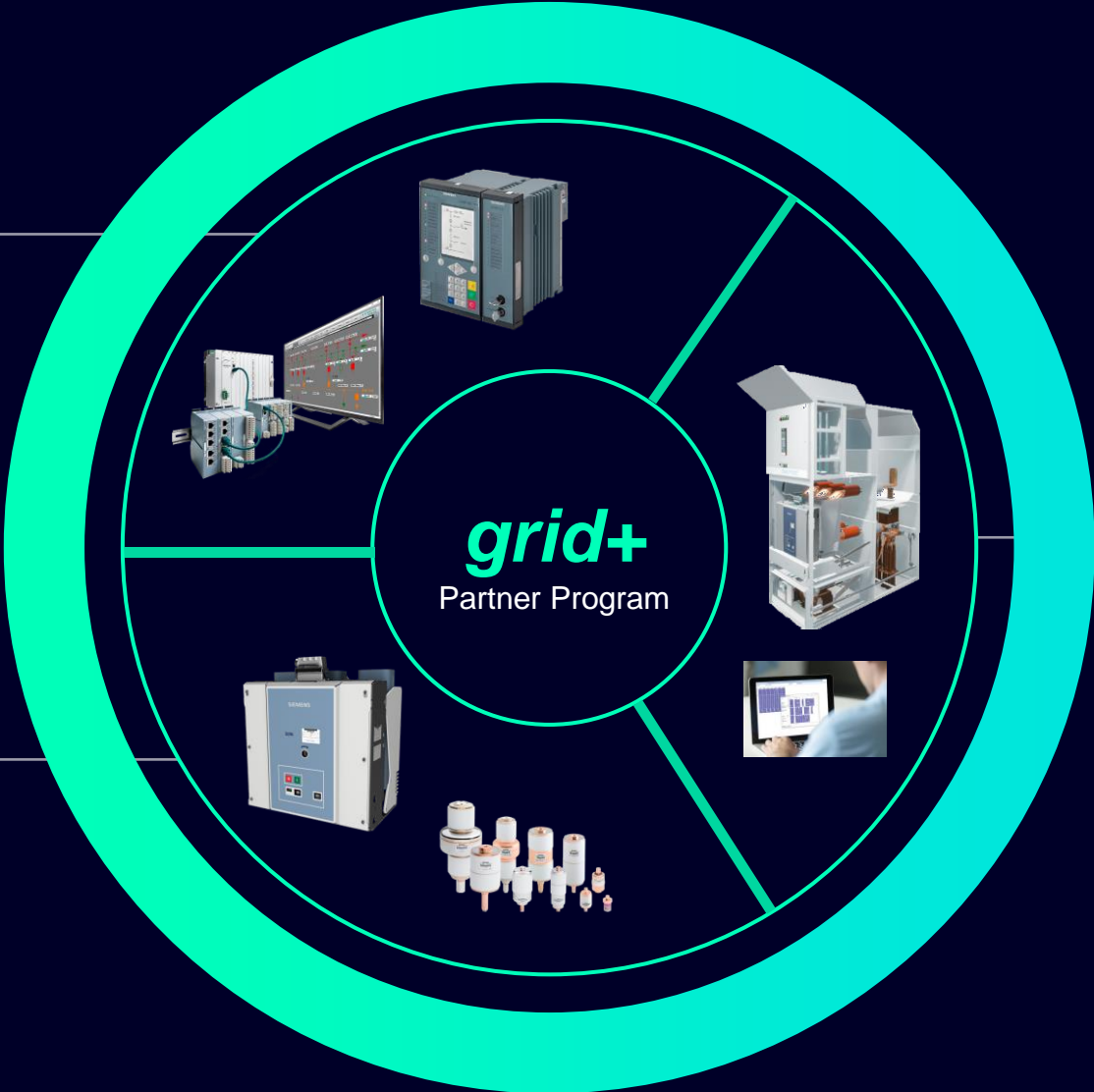
- 3 elements come together -

Protection & Automation

Products

Medium voltage

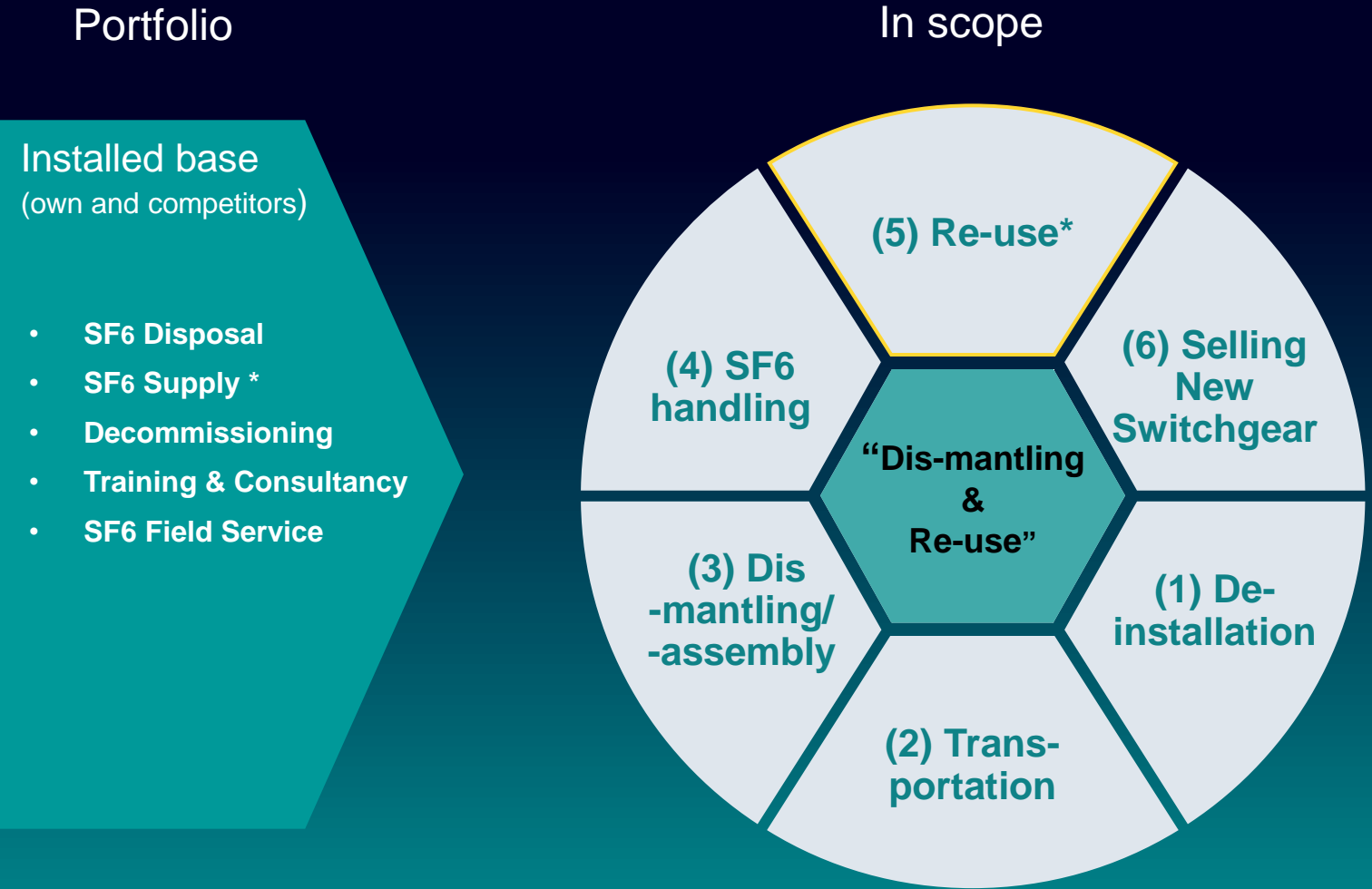
Products



License models

MV Switchgears

Scope Definition of “Dismantling & Re-use” portfolio element



Intro into PTI Consulting Services

Siemens Grid Software / PTI

Vinay Sarai | 06-July-2023



SIEMENS

Siemens Grid Software is part of Siemens AG

... one of three fast growing businesses under SI

Top 10

Siemens is one of the top ten industrial software companies¹

Industrial businesses

Smart Infrastructure



Digital Industries



Mobility



Siemens Healthineers²



Services and more

Siemens Financial Services

Siemens Advanta

Siemens Real Estate

Portfolio Companies

Global Business Services

Siemens Grid Software

- ... Grid Operators (plan-operate-maintain)
- ... Infrastructure & Industry (Grid Edge)
- ... Consulting (PTI)



2,550

Team members around the world

Installed base

200+

EnergyIP® installations

>100 m

Meters contracted

1,300

Control centers

70%

of the world's electricity consumption flows through infrastructure planned or analyzed by Siemens Grid Software

¹ In fiscal 2021 ² Publicly listed subsidiary of Siemens; Siemens' share in Siemens Healthineers: 75%

PTI Vendor-Agnostic Consulting

Trusted partner for future energy business and infrastructure

**Energy
Business
Advisory**



**Power
System
Consulting**

Guiding organizations to maximize customer value in an evolving energy landscape.

Planning and optimizing the structure, performance and operation of energy systems.



Customer value

Technology expertise

Excellence and innovation

Independent consulting

Manage complexity and de-risk the future with our strategic advisory portfolio



Digitalization Strategies & Transformation



Energy Efficiency & Decarbonization Strategies



Cybersecurity Consulting & Services



Energy Business Advisory



eMobility Strategies & System Integration



Smart Infrastructure Scoping



Integrated Energy System Planning



Economic Market Analysis



Optimize your power system structure and performance with our grid planning and consulting portfolio



Power System Analysis & Design



Protection, Control & Automation



Power Quality

Power System Consulting



System Dynamics & Transients



Interconnection & Grid Code Compliance



Grid Modeling & Grid Data Consulting



Real-time Protection Simulation & Testing

Siemens PTI is active with the development corporations with a global footprint

Sr. No.	DC	Country	Portfolio	Completion Year
1 ¹	UN	Tanzania	E-Mobility	Ongoing
2	WB	Iraq	vRE integration	Ongoing
3	AFD	Egypt	vRE integration	2023
4	WB	MENA Region	E-Mobility	2023
5	AFD	Egypt	Wind O&M	2022
6	GIZ	Egypt	Smart Grids	2021
7	UNDP	Botswana	E-Mobility	2021
8	GIZ	Rwanda	E-Mobility	2020
9	KFW	Tunisia	Smart Grids	2020
10	GIZ	Egypt	E-Mobility	2019
11	GIZ	Egypt	Smart Grids	2018
12	GIZ	VCT	E-Mobility	2017
13	GIZ	Uganda	Smart Grids	2017
14	GIZ	Global	Smart Grids	2015
15	GIZ	Montserrat	Smart Grids	2015
16	GIZ	Caribbean	E-Mobility	2015
17	GIZ	ASEAN Region	Smart Grids	2014



1) Awarded

How PTI can support with SF₆ transition

1

Alternative gases and future trends

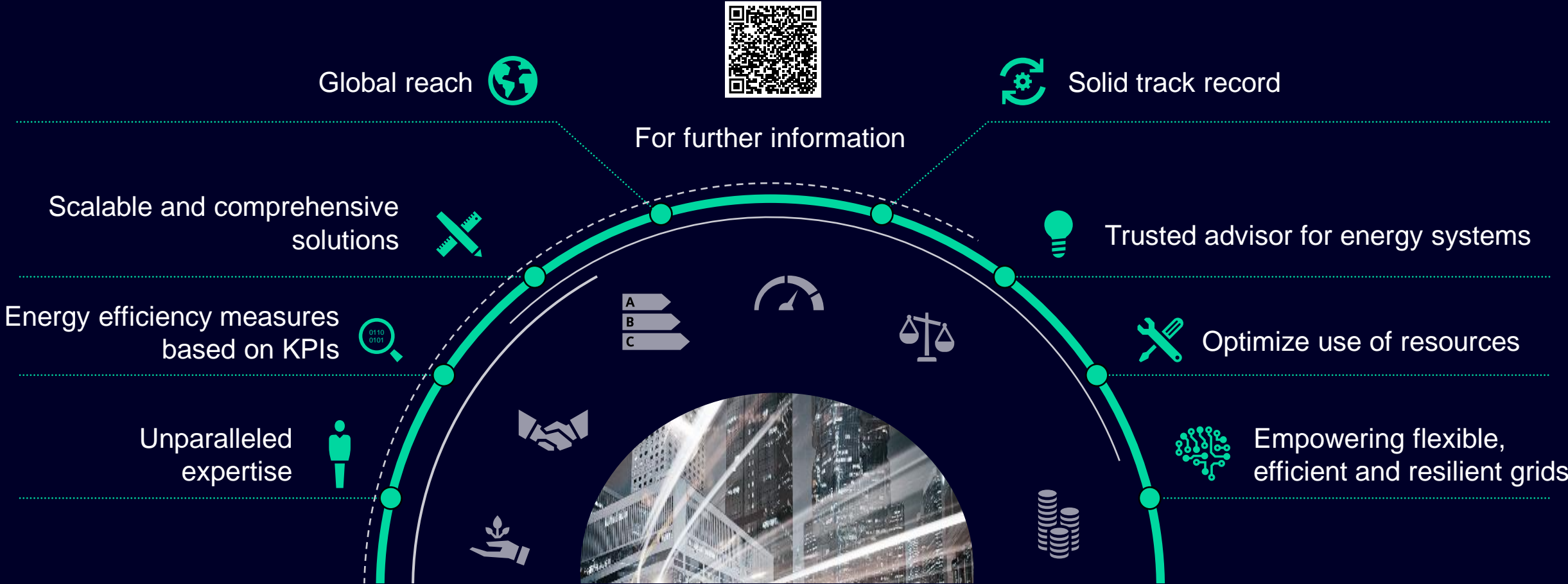
- Market analysis and evaluation for alternative gases, including adoption rates and business ecosystem
- Strategic roadmap planning, including the investment plan, for SF₆ transition to alternative gases in a sustainable manner

2

Regulatory Compliance & Policy Development

- Analyze the existing regulatory framework related to SF₆ and alternative gases and benchmark against international best practices and regulations
- Recommend high-level policy measures to create an enabling environment for adoption of a sustainable path for adoption of SF

Why Siemens PTI is your right partner?



Questions?



Siemens Financial Services

Presentation in the context of the F-gas Regulation
Learning Tour 2023

Contents

- 1** About Siemens Financial Services (SFS)
- 2** Products and solutions
- 3** Finance Advisory spectrum – Our offerings
- 4** ECA-backed financing
- 5** Contact

Siemens Financial Services

Management



Veronika Bienert
Chief Executive Officer (CEO)



Andreas Rudolf
Chief Financial Officer (CFO)

Foundation

1997



Siemens Group

SFS is a company of Siemens AG



Headquarters

Munich, Germany



Business

Offering of international financial solutions in the business-to-business area



Siemens company setup as of October 1, 2020

SFS – part of “Service & Governance”

Businesses

Digital Industries



Smart Infrastructure



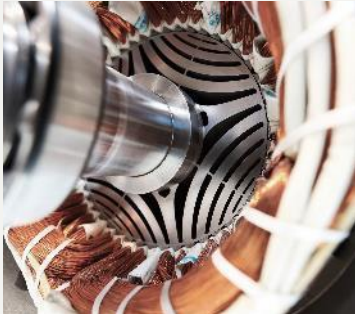
Mobility



Siemens Advanta



Portfolio Companies



Siemens Healthineers¹



Countries

Service & Governance

¹ Publicly listed subsidiary of Siemens; Siemens Healthineers with its own setup for Countries and Service & Governance

Siemens Financial Services

Financial solutions for Siemens

1 > SFS is a reliable financing and risk management partner for Siemens businesses and their customers in times when financing of investments becomes increasingly important

2 > Being part of the Siemens Group, SFS differentiates itself through superior market know-how and asset expertise in Siemens' domains

3 > Through a unique combination of risk competence, technological expertise and reliable financial resources SFS creates customer value and enhances customer competitiveness

4 > Building on the strength of our balance sheet, we provide financial solutions for Siemens' projects and products, open the way for new business ideas and signal confidence to the markets through long-term risk participation

Siemens Financial Services

Global presence



¹ As of September 30, 2022 | ² Assets reported according to the country of risk

Siemens Financial Services

Did you know?

SFS' current portfolio supports
22.4 GW
of wind energy with financing



Technology and financing simply go hand
in hand at Siemens – and it has been
that way for more than
175 years now



In our portfolio we have
financing volumes from
€1,000 over
€100,000,000



SFS has more than
278,000
customers in **60** countries



More than **2,600**
experts work in **20** countries
worldwide for SFS



We have close to **40%** share of women
in management positions



Digitalization

We finance more than
4,000
software projects



Electrification 1887

Foundation of Siemens lightning
company in St. Petersburg and beginning
of infrastructure financing in Russia



Contents

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Under the roof of Siemens Financial Services we provide an extensive portfolio of financial solutions

Siemens Financial Services

Business Units

Commercial Finance

Equity Finance

Project & Structured Finance Debt – Americas

Project & Structured Finance Debt – EMEA/AA

Financial Solutions

Equipment and Technology Finance

- Equipment and Technology Finance
- Vendor Finance

Working Capital Finance

- Extended Payment Plans
- Invoice Financing (Factoring)
- Trade Finance (only in the US)

Project and Structured Finance

- Equity Investments
- Debt Finance
- Asset Finance

Corporate Lending

- Leveraged Finance
- Asset-Based-Lending

Finance Advisory

- Advisory, Structuring and Arranging Financing Solutions

Entities (examples)

Siemens Financial Services GmbH

Siemens Financial Services Inc.

Siemens Bank GmbH

Siemens Project Ventures GmbH

Siemens Finance and Leasing GmbH

Contents

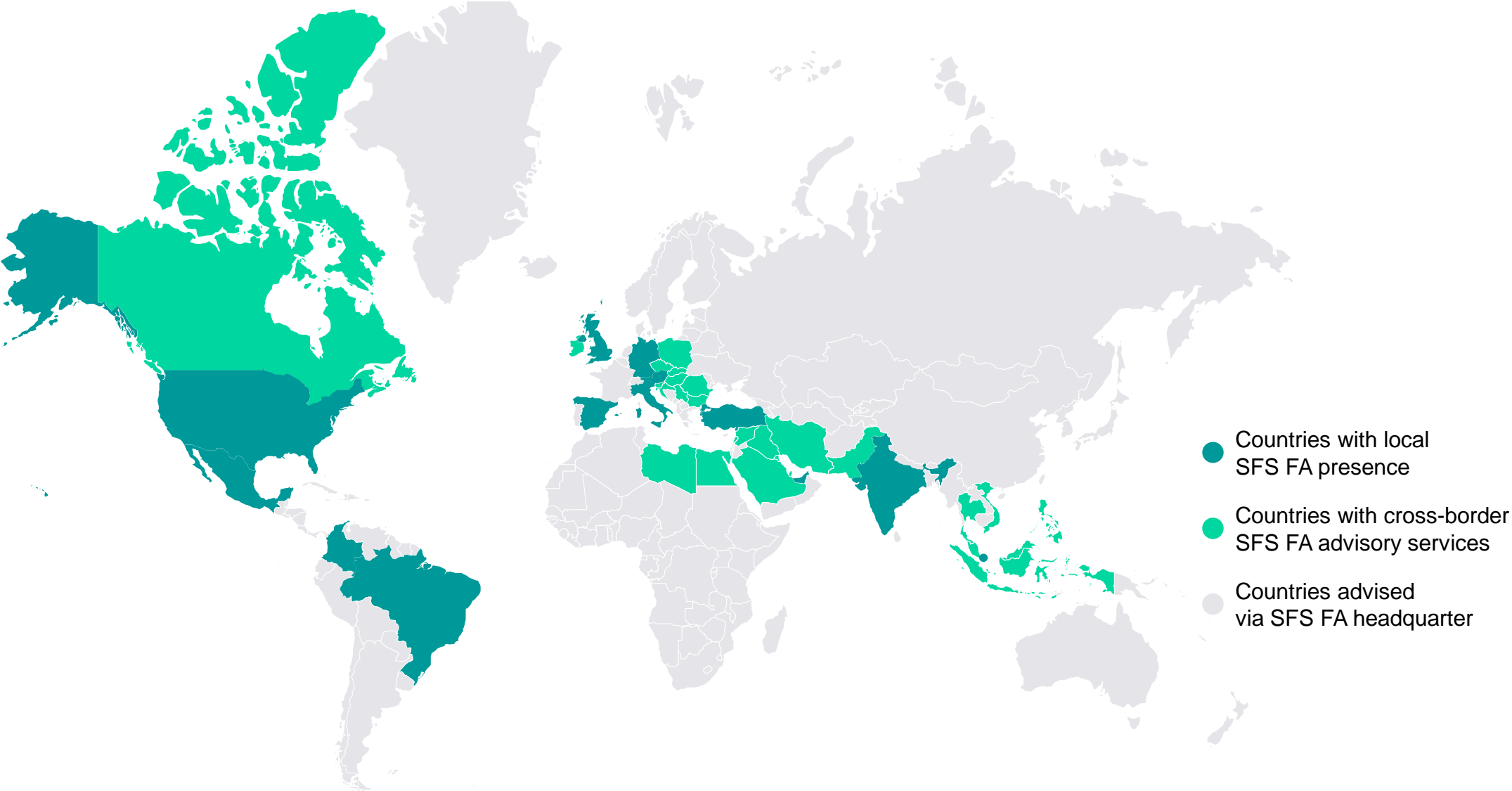
- 1 About Siemens Financial Services (SFS)
- 2 Products and solutions
- 3 Finance Advisory spectrum – Our offerings
- 4 ECA-backed financing
- 5 Contact



Find the **best available financing solution in the market** for all sales-related financing needs.”

We advise you with an international team to support Siemens Businesses globally

Global presence



Finance Advisory

What sets us apart

We act as a financial adviser to Siemens Businesses and **arrange financing solutions** for Siemens customers worldwide.



We structure, arrange and implement **financing solutions and risk-mitigation concepts** for your Siemens projects.



We are typically engaged in the early stages of project development and **ensure that financial and risk-related aspects are taken into consideration from day one.**



Tailored advisory services

for financing solutions from a single source

Support of early stage projects

including financial market background check

Preferred access to international banking market

utilizing long grown and proven relationships to promote and support projects for Siemens Businesses

Ability to introduce equity and debt financing using SFS's balance sheet



Finance Advisory spectrum

Our offerings



Sales-related financing solutions



Key interface to SFS-Financing solutions



Finance Intelligence Portal for Siemens Companies (FIPS)



International Financial Institutions (IFI)



(New) Business Models (XaaS) with embedded financing solutions



Sale of Receivables (SoR)



Export Credit Agencies (ECA) and Investment Insurance

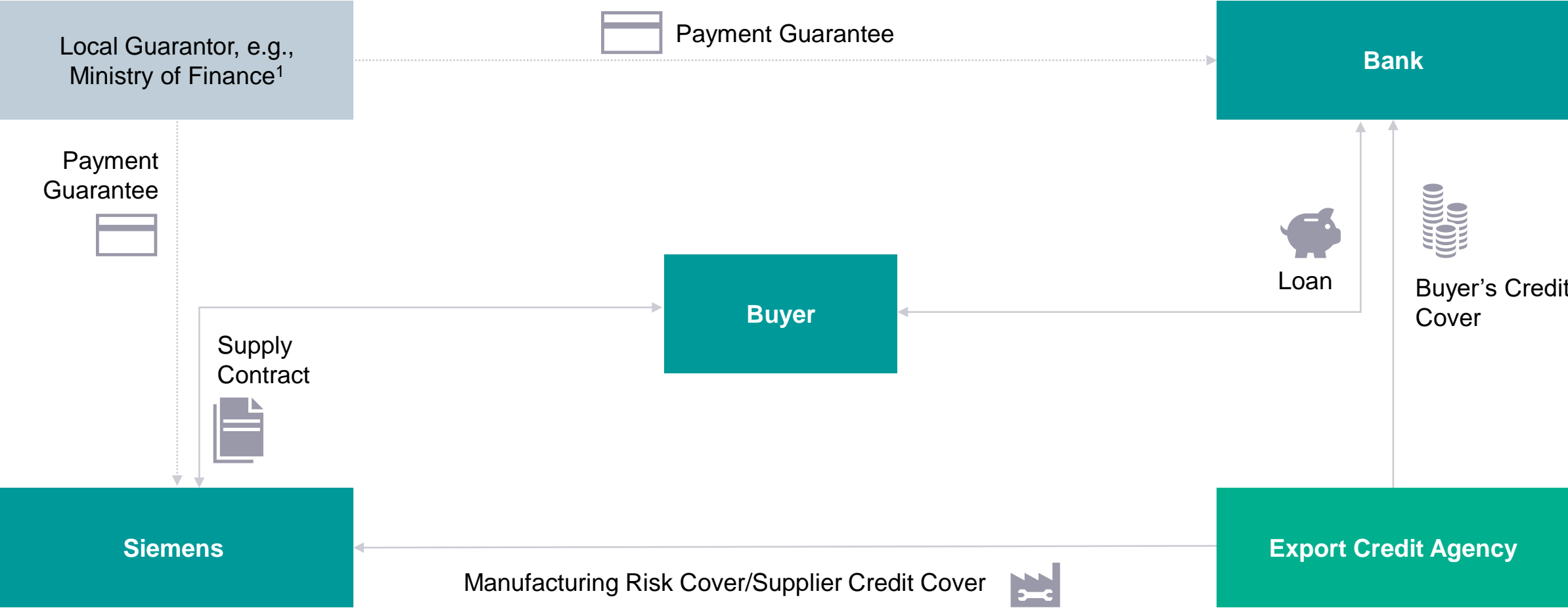


Preferred access to international banking market

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- 1** About Siemens Financial Services (SFS)
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Export Credit Agencies can be utilized by exporters or banks



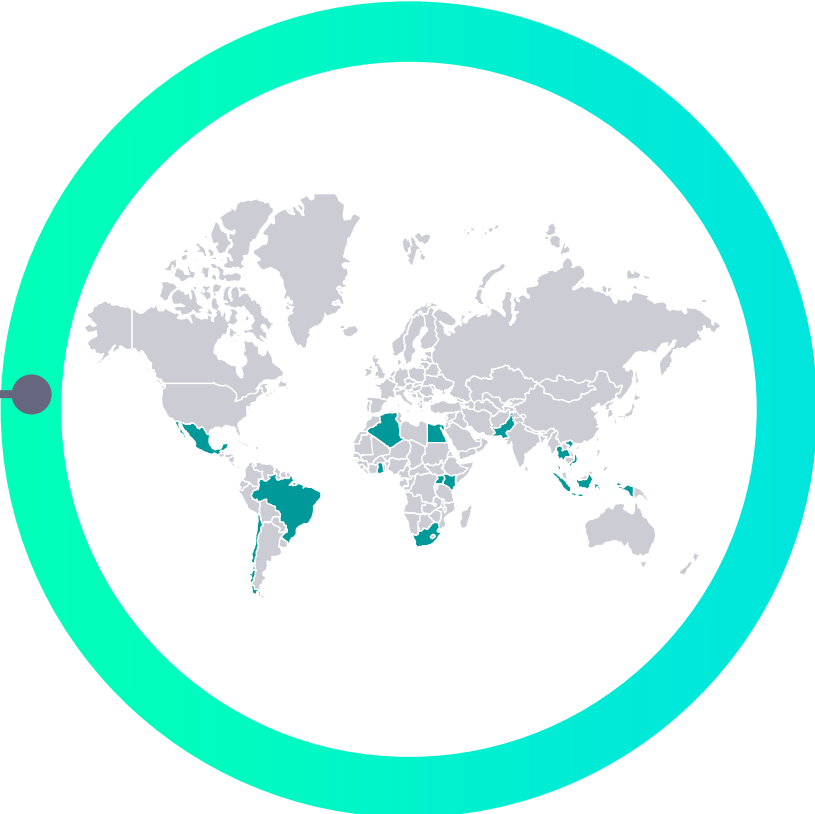
¹ If necessary

ECA-covered financing through Euler Hermes

Country cover policy in different countries



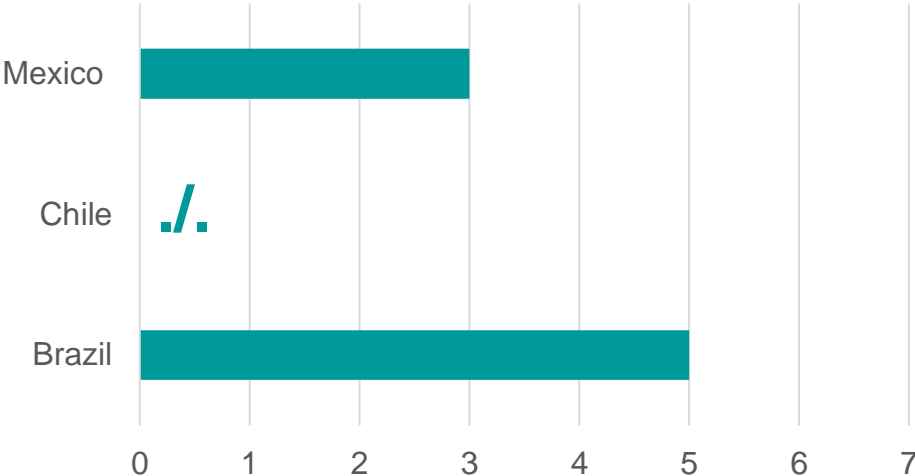
Coverage policy & country rating



South America



OECD Country Rating

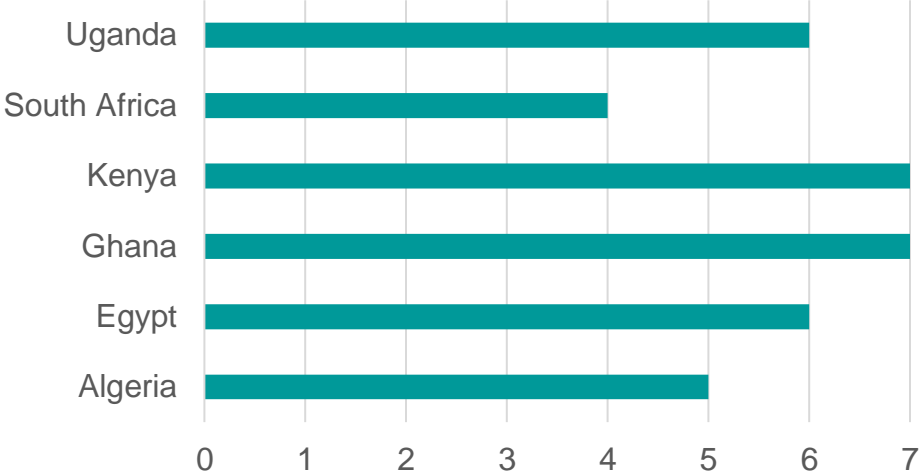


Country	Cover Policy		Collateral		
	Short-Term	Medium / Long-Term	Short-Term	Medium / Long-Term	Further information
Brazil	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Collateral is not normally required.	Collateral is not normally required.	-
Chile	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Collateral is not normally required.	Collateral is not normally required.	-
Mexico	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Collateral is not normally required.	Collateral is not normally required.	-

Africa



OECD Country Rating



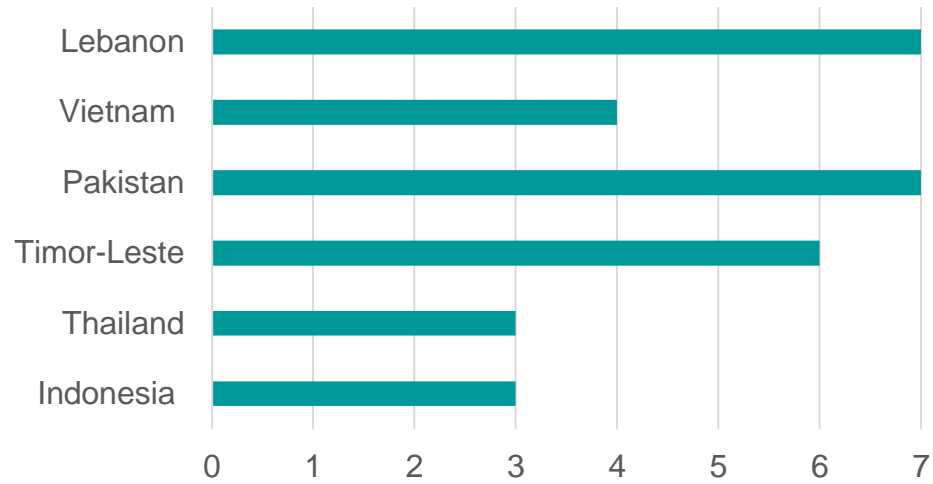
Country	Cover Policy		Collateral		
	Short-Term	Medium / Long-Term	Short-Term	Medium / Long-Term	Further information
Algeria	There are no formal restrictions on cover.	No formal restrictions on cover.	No formal restrictions on cover.	Transactions irrevocable letters of credit opened prior to the commencement of risk are required	As a rule, bank security is required for medium/long-term transactions.
Ghana	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Cover facilities are available on a case-by-case basis. Cover is available for project finance and other structured finance deals. Transactions with public buyers are governed by the OECD's sustainable lending principles.	-	For medium/long-term transactions with public buyers which are established as private sector organizations the same collateral requirements as for private buyers apply.
South Africa	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Collateral is not normally required.	Collateral is not normally required.	-

	Cover Policy		Collateral		
Country	Short-Term	Medium / Long-Term	Short-Term	Medium / Long-Term	Further information
Uganda	There are no formal restrictions on cover.	Cover facilities are available on a case-by-case basis. Cover is available for project finance and structured finance deals. Public buyers are governed by the OECD's sustainable lending principles. For credit transactions with public buyers the uninsured percentage under buyer credit cover is 10%. The amount of the uninsured percentage's mark-up may only be passed on to the exporter. In connection with supplier credit cover the uninsured percentage cannot be reduced to 5%.	-	Transactions with public buyers a guarantee from the Ministry of Finance or the central bank is required. Besides, additional, project-related risk mitigation measures are required. For transactions with public buyers which are established as private sector organizations the same collateral requirements as for private buyers apply.	For transactions with private buyers bank security is required if the foreign buyer's creditworthiness is inadequate. The assessment of a bank for acceptance as a guarantor or borrower is carried out case by case on the basis of informative documents and taking into account the risk involved.
Egypt	Transactions with public buyers cover facilities are available on a case-by-case basis. For transactions with private buyers cover facilities are available for transactions with credit periods of up to 360 days if informative information material on the buyer is available which justifies the granting of cover.	For transactions with public buyers cover facilities are available on a case-by-case basis	-	For medium and long-term transactions bank security has to be provided if the buyer's creditworthiness is inadequate.	The assessment of a bank for acceptance as a guarantor or borrower is carried out case by case on the basis of informative documents and taking into account the risk involved.
Kenya	There are no formal restrictions on cover.	Cover facilities are available on a case-by-case basis. In addition, cover is available for project finance and other structured finance deals.	For transactions with credit periods of less than 360 days collateral is not normally required.	As a rule, guarantees from the Ministry of Finance or the central bank are required for medium/long-term transactions with public buyers.	The assessment of a bank for acceptance as a guarantor or borrower is carried out case by case on the basis of informative documents and taking into account the risk involved.

Asia



OECD Country Rating



Country	Cover Policy		Collateral		
	Short-Term	Medium / Long-Term	Short-Term	Medium / Long-Term	Further information
Indonesia	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Collateral is not normally required.	Collateral is not normally required.	-
Lebanon	There are no formal restrictions on cover.	<p>Cover facilities are available for private buyers with a limit of the individual transaction of 10 million euros.</p> <p>No cover facilities for public buyers, transactions having special priority may be covered on a case-by-case basis.</p>	-	-	<p>If the foreign buyer's creditworthiness is inadequate bank security is required. State collateral – usually from the Ministry of Finance – may be accepted on a case-by-case basis.</p> <p>The assessment of a bank for acceptance as a guarantor or borrower is carried out case by case on the basis of informative documents and taking into account the risk involved.</p>

Country	Cover Policy		Collateral		
	Short-Term	Medium / Long-Term	Short-Term	Medium / Long-Term	Further information
Thailand	There are no formal restrictions on cover.	There are no formal restrictions on cover.	Collateral is not normally required.	Collateral is not normally required.	-
Timor Leste	No Short-Term information	No Medium / Long-Term information	No Collateral information		
Pakistan	There are no formal restrictions on cover.	Cover facilities are available on a case-by-case basis.	Collateral is not normally required.	Collateral is not normally required.	-
Vietnam	There are no formal restrictions on cover.	There are no formal restrictions on cover.	For short-term transactions bank security is required if the foreign buyer's creditworthiness is inadequate.	As a rule, bank security is required for medium/long-term transactions.	The assessment of a bank for acceptance as a guarantor or borrower is carried out case by case on the basis of informative documents and taking into account the risk involved.

Disclaimer

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www.siemens.com/power-technologies

End - to - end Cybersecurity

Comprehensive offering for Digital Grids



ASSESS

Evaluation of current security status through consulting services

- Security Assessments, compliance audits, penetration testing
- Information Security Management System (ISMS)
- Penetration Test



IMPLEMENT

Risk mitigation through implementation of security measures

- Secure products
- Secure system integration
- Migration to secure systems
- A solid baseline plus optional advanced security features



MANAGE

Continuous services to maintain the security level over time

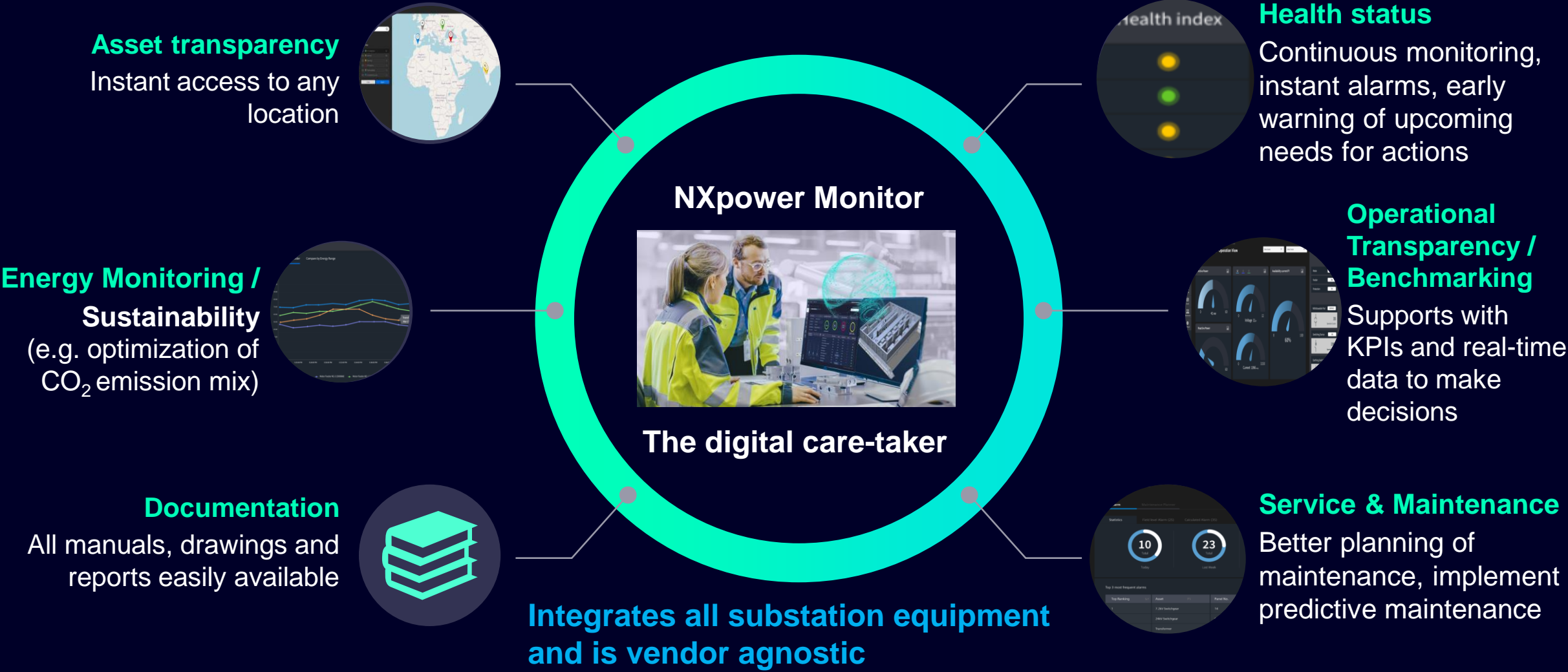
- Cybersecurity training
- Security patch management
- Periodic vulnerability assessments

Benefits

- ✓ Comprehensive coverage from a trusted partner
- ✓ Reduced downtime in the face of cyber threats
- ✓ Operational security with certified solutions
- ✓ Swift and secure incident response and recovery
- ✓ Premium service with proven competence



IoT solution: NXpower Monitor - The digital care-taker for your electrical distribution systems



Asset transparency
Instant access to any location

Health status
Continuous monitoring, instant alarms, early warning of upcoming needs for actions

Energy Monitoring / Sustainability
(e.g. optimization of CO₂ emission mix)

Operational Transparency / Benchmarking
Supports with KPIs and real-time data to make decisions

Documentation
All manuals, drawings and reports easily available

Service & Maintenance
Better planning of maintenance, implement predictive maintenance

Integrates all substation equipment and is vendor agnostic

[siemens.com/nxpowermonitor](https://www.siemens.com/nxpowermonitor)

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