

Session 3:

Future of Transport

ORGANISED BY



HOTEL PARTNER



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SUPPORTING CHAMBERS



Moderator



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Rhenus Air & Ocean



Roland Coppens
KLM Royal Dutch Airlines



Gianandrea Bruzzone
ABB



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Suranaree University of Technology

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KLM Royal Dutch Airlines

Roland Coppens

General Manager
AIR FRANCE KLM
South-East Asia and Oceania

Royal Dutch Airlines



since 1919



Purpose, Vision and Strategy



Purpose (Why)

Creating memorable experiences on the planet we care for



Vision (What)

Pioneering to become a frontrunner in sustainable aviation

Strategy



Run a great airline for our customers and our people

By connecting people and businesses across the world and investing in our strong brand and propositions.



Transform to a net positive company

KLM wants to generate more value for the world than it consumes to run its business.



Create technological advancement

We adopt new technologies in our business and catalyse innovation in the airline industry.



Thank you

KLM's Path to Net-Zero: Sustainable Aviation Fuel

18 May 2023

Roland Coppens

General Manager, AIR FRANCE KLM

South-East Asia and Oceania

Royal Dutch Airlines



Why Reduce Carbon Emissions in Aviation?

2050

10 billion passengers
20% of global CO₂ emissions

2019

3.8 Billion passengers
2-3% of global
CO₂ emissions





In the air
Fleet modernization



On board
Lighter seats

On the ground

Electrical ground vehicles



AIRFRANCE KLM
GROUP

KG-054
ETOPS



BATTERY
7400

Zero Emission

180 kVA
400 Hz

KLM Equipment Services
Schiphol Ground Power Unit Pool
Members:



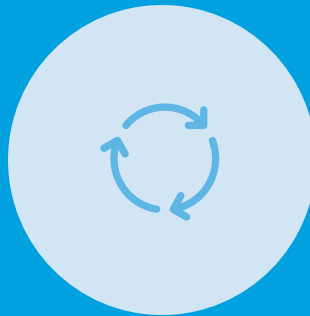
8.6 bar
122 psi

Output 2

What is Sustainable Aviation Fuel (SAF)?



Made from renewable resources



Produced in a cleaner, circular process



Reduce emissions by at least 75% compared to fossil fuel

Why Are Airlines Not Switching to SAF?



Limited
supply &
production
capacity



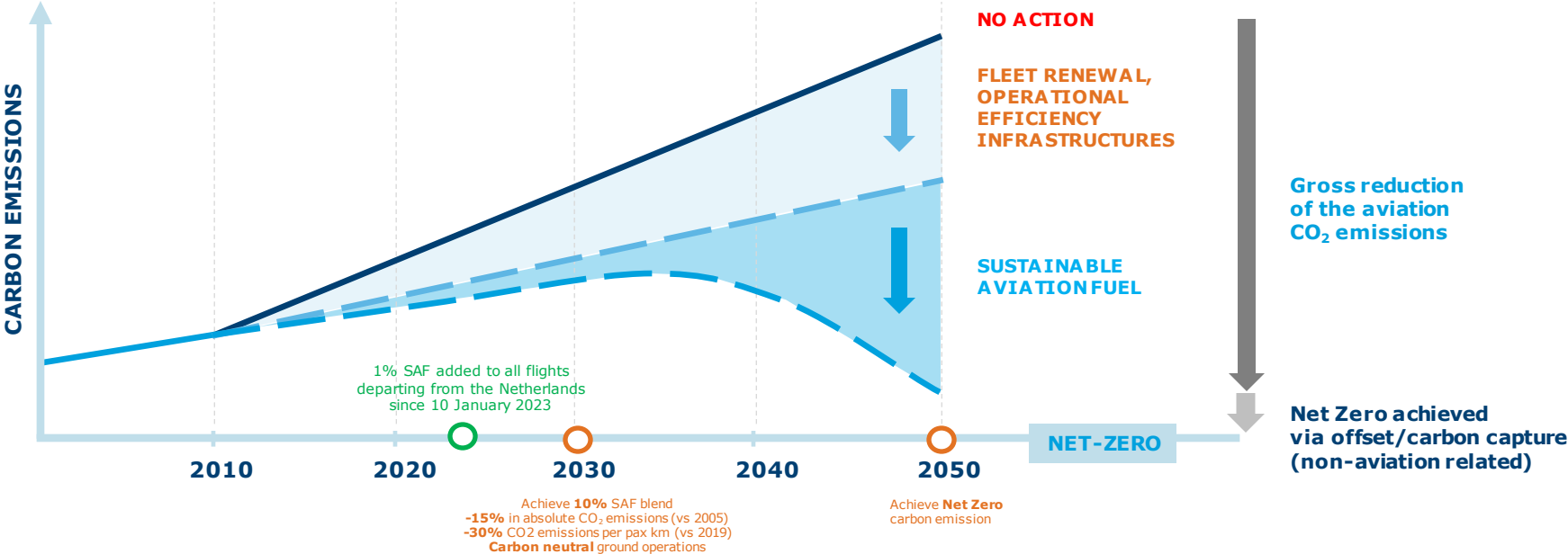
High prices



Low demand



KLM Sustainability Roadmap



KLM's path in blending SAF

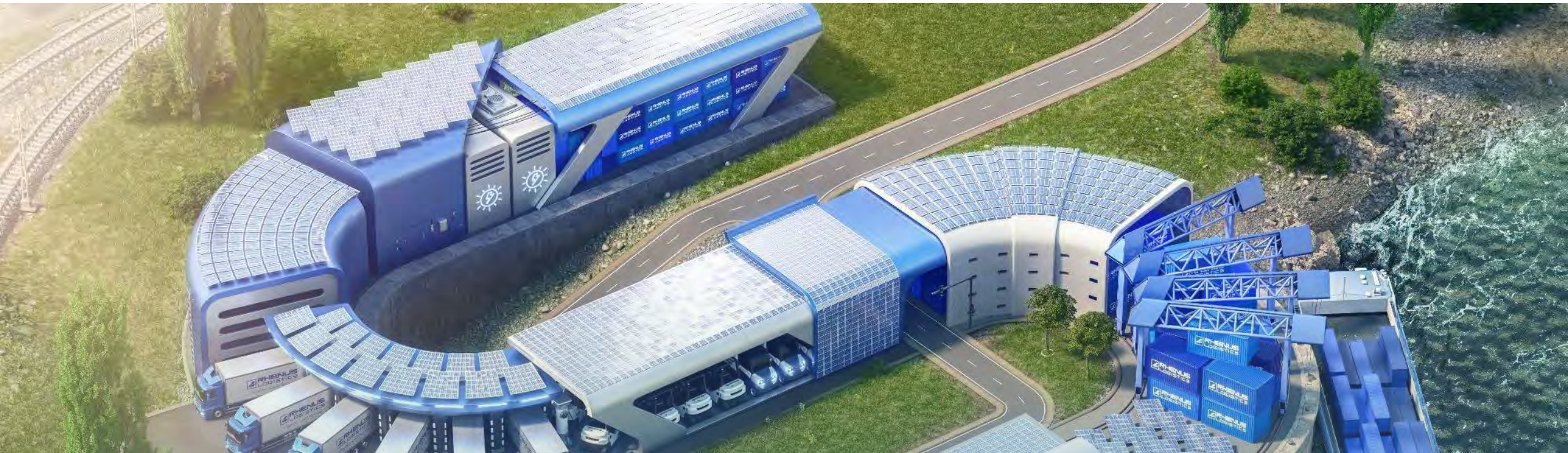
a small but important step forward



We aim to go beyond the EU mandate of RefuelEU's 2% SAF by 2025



**Together
we can make a bigger
difference!**



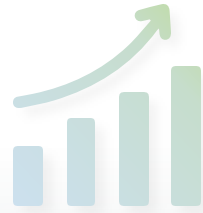
How Freight Forwarders are Leading the Change in **DECARBONIZING TRANSPORTATION**

RHENUS AT A GLANCE



Founded in

1912



Turnover

**€ 8.6
billion**



Employees

39,000



Sites

1,120

Rhenus Group offers comprehensive supply chain solutions that cover transportation, warehousing, customs clearance, and value-added services. As a family-owned business, Rhenus prioritizes the needs of its customers above all else and continuously strives for innovation. This commitment to excellence has solidified its reputation as a leader in the industry.

OUR SUSTAINABILITY PILLARS

From day one, Air & Ocean Division strives to broaden the definition of sustainability by focusing not just on the environment, but also on three key areas guided by 6 SDG's.

PEOPLE



Improving the wellbeing and equality of our people.

ENVIRONMENT



Tracking and reducing our carbon footprint.

SOLUTIONS



Offering sustainable solutions for our customers.

OUR SUSTAINABILITY CERTIFICATION

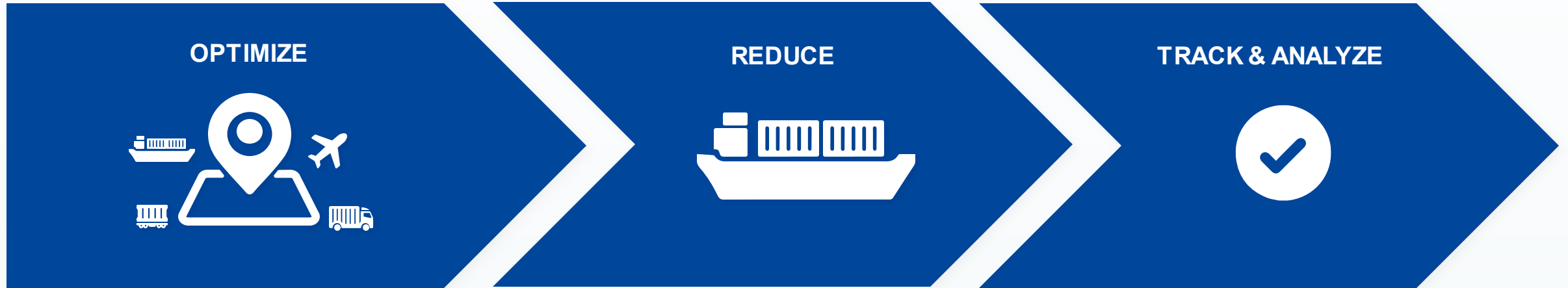


EcoVadis Gold Rating for environmental, social, and ethical practices in accordance with international standards.

OUR PARTNER IN CLIMATE ACTION



OUR SUSTAINABLE FRAMEWORK



PRE-SHIPMENT

- **GREEN SOLUTION CONSULTANCY**

Find sustainable options before selecting final transportation mode(s).

- **RHEGREEN**

Choose sustainable options for your air freight.



DURING SHIPMENT

- **BIOFUELS MARINE & AVIATION**

Reduce transport emissions with sustainable marine or aviation fuels.

- **CARBON OFFSET PROGRAMS**

Offset your carbon emission from FCL, LCL, and air freight shipments.

POST SHIPMENT

- **EMISSION DASHBOARD**

Track your shipment's carbon footprint from port to port.



PRE-SHIPMENT // Optimize

GREEN SOLUTION CONSULTANCY

Find sustainable options before selecting final transportation mode(s).



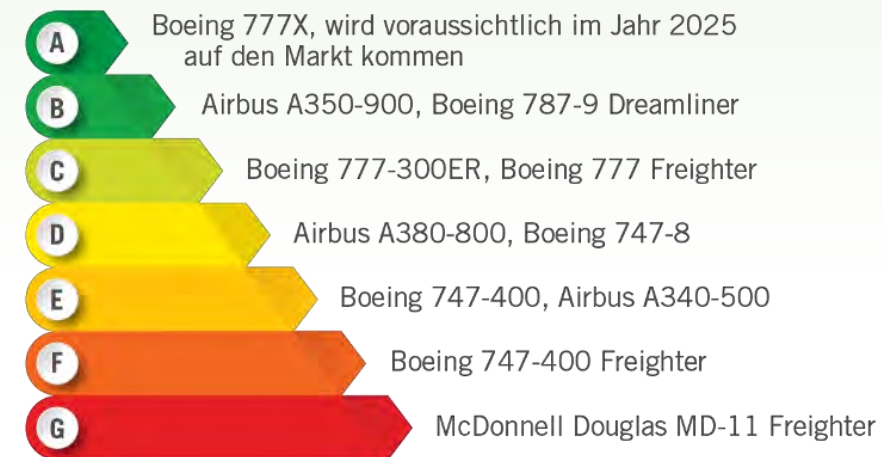
The world's first CO2 reduction program for air freight transportation.


The calculation method is based on aircraft types, fuel consumption, and distances to be covered.


Available at no extra cost to Rhenus Logistics customers from all offices to all destinations worldwide.




OUR SELECTION OF LONG-HAUL AIRCRAFT BASE ON CO2 EFFICIENCY



- 

Reduce up to 40% of your CO2 emissions.
- 

Mitigate your carbon footprint with every shipment.
- 

Ship sustainability without sacrificing efficiency.

DURING SHIPMENT // Reduce



Our Carbon Offset Programs

- /// **Ocean FCL**
 - Rhenus and CNC partner to offer carbon offset program for Intra-Asia trade lanes.
- /// **Ocean LCL**
 - Carbon offset programs for ocean LCL shipments.
- /// **Air Freight**
 - Rhenus and ClimatePartner calculate and offset CO2 emissions from the main haul of air freight cargo.

Alternatives Fuels

- /// Biofuel
- /// Sustainable Aviation Fuel (SAF)

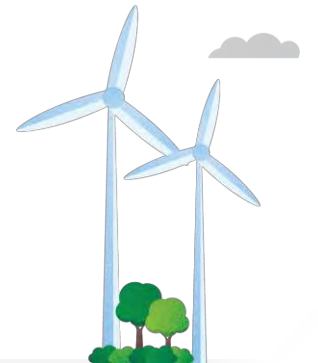
3,765.75 t CO2e

were offset through ClimatePartner.

Scan the QR code below to see the verified report on our freight emissions.



ClimatePartner



POST SHIPMENT // Track & Analyze



Emission Dashboard: CO2 Tracking Tool

- /// **Track CO2 emissions** from the main haul of air freight and ocean freight transport.
- /// **Monitor number of shipments** per freight type, gross weight, and volume in unit measurements.
- /// **Access accurate data on emissions** to better understand and reduce carbon footprint.



Available via freight portal and updated on a monthly basis



Carbon dioxide equivalent (CO₂ e) Well-To-Wheel



100% Transparency



Easy to understand, credible reporting, in line with **international standards**.

- European standard EN 16258 for Ocean freight
- IATA/ICAO standard for Air freight
- GHG Protocol by EcoTransIT
- GLEC Framework

THE DOMINO EFFECT

While we may not have direct control over reducing emissions, our actions can inspire a ripple effect. As a company, we aim to facilitate carbon reduction goals for our customers and motivate those without such objectives to **make positive changes towards sustainability**.

We can achieve this by making **eco-friendly solutions** more accessible to them by:



EMPOWERMENT

Empowering customers to reach their carbon reduction goals.



INSPIRATION

Inspiring positive actions towards sustainability among those without decarbonization objectives.



ACCESSIBILITY

Making green solutions more easily accessible for customers.

GET IN TOUCH WITH US

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Title : Director, Sustainability & Development - Rhenus Air & Ocean

Email : isawan.kaeo@ap.rhenus.com

Website : <https://www.rhenus.group/rhenus-group/sustainability/>



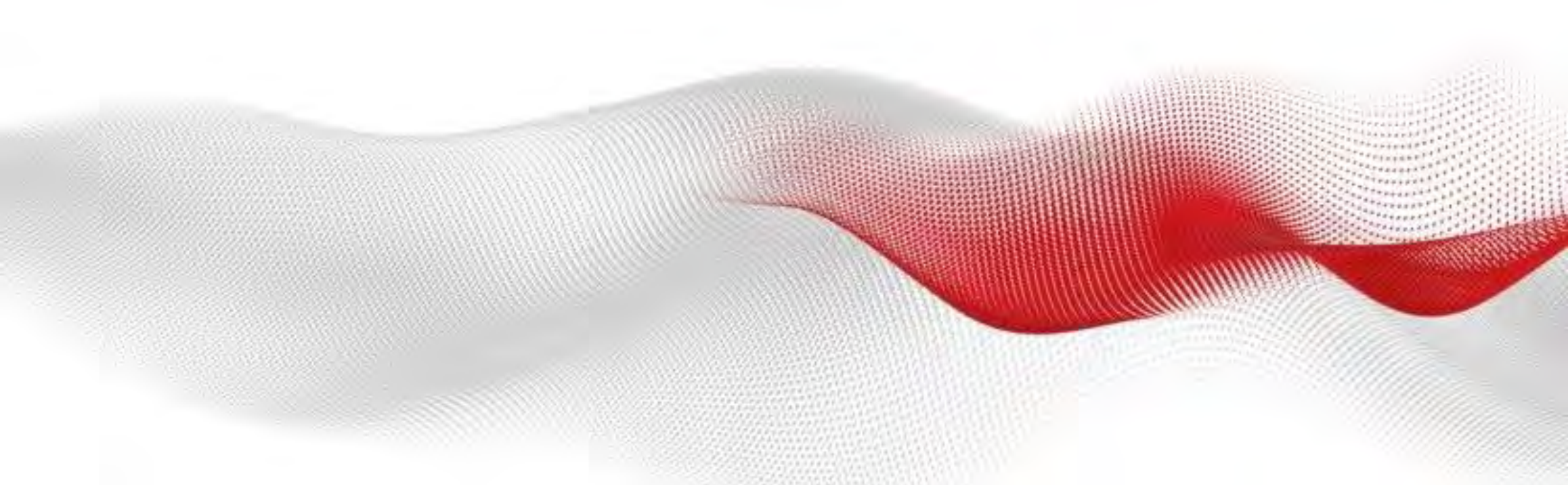


ABB Introduction & solutions offering

SBF23 / Sustainable Business Forum 2023 – Bangkok, Thailand

Gianandrea Bruzzone



Well positioned across global markets

Employees

~105,000

Countries

~100

Revenues

~\$26 bn

Europe

~\$9.6 bn

Americas

~\$7.9 bn

AMEA

~\$8.4 bn

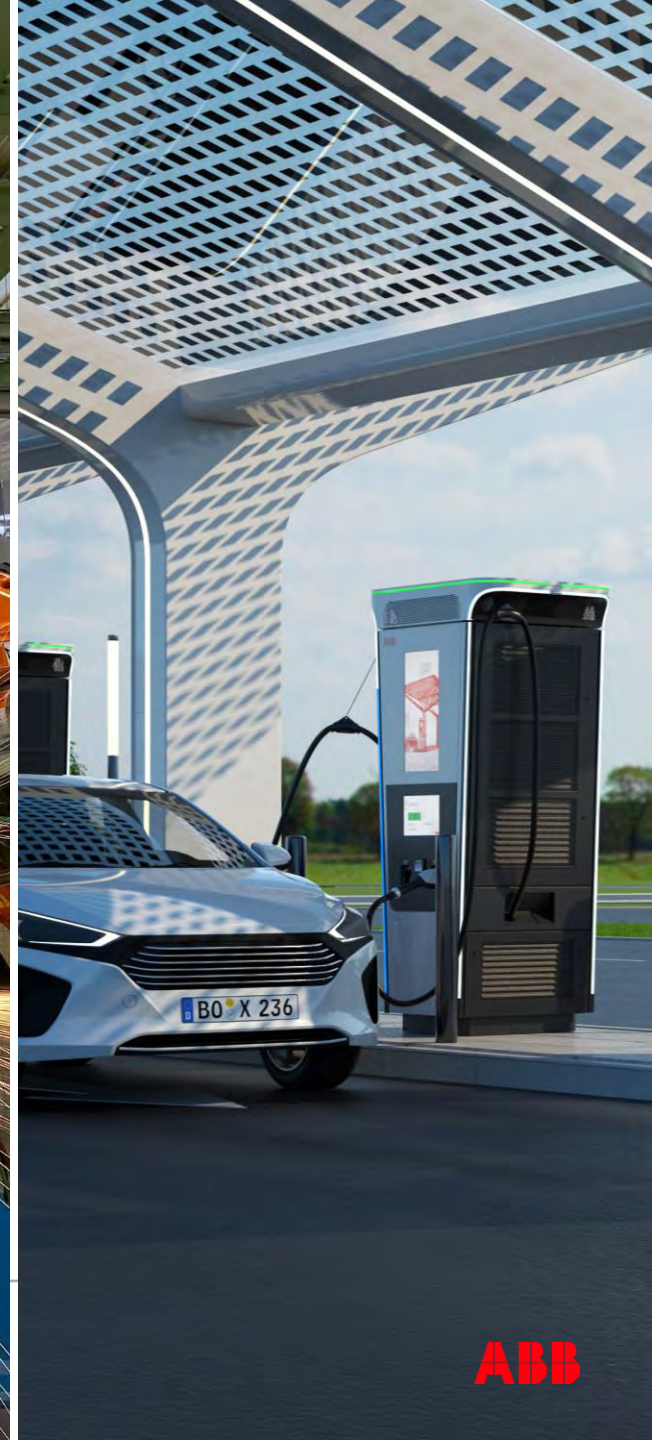
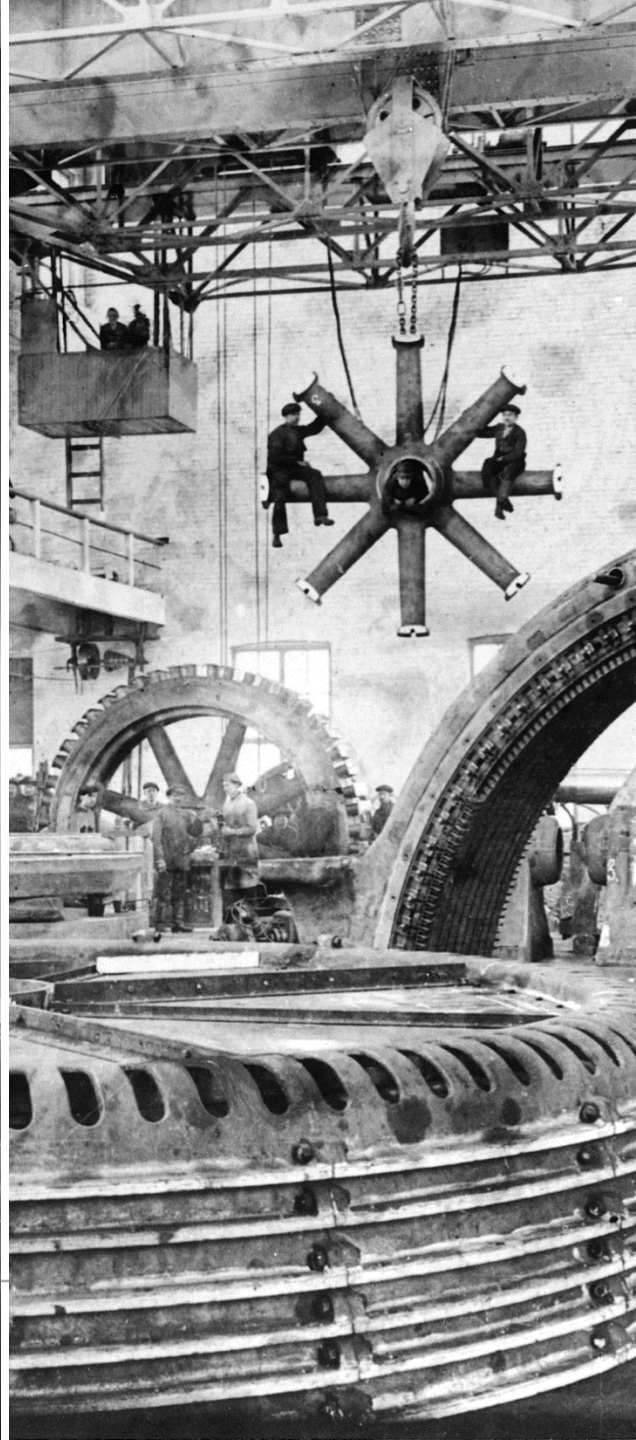
ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future.

By connecting software to its **electrification, motion, process automation and robotics & discrete automation** portfolio, ABB pushes the boundaries of technology to drive performance to new levels.

2020 figures

ABB

ABB has been pushing the boundaries of technology for +130 years



ABB

Fully decentralized business model with 21 Divisions

**BUSINESS
AREA**

Electrification



Distribution Solutions

Smart Power

Smart Buildings

Installation Products

Power Conversion

E-mobility

Motion



IEC LV Motors

Large Motors & Generators

NEMA Motors

Drive Products

Systems Drives

Service

Traction

Process Automation



Energy Industries

Process Industries

Marine & Ports

Turbocharging

Measurement & Analytics

Robotics & Discrete Automation



Robotics

Machine Automation

DIVISION

ABB in Thailand

Overview

Employees

~500

Office Locations

7

Annual Revenues

~\$250 MUSD

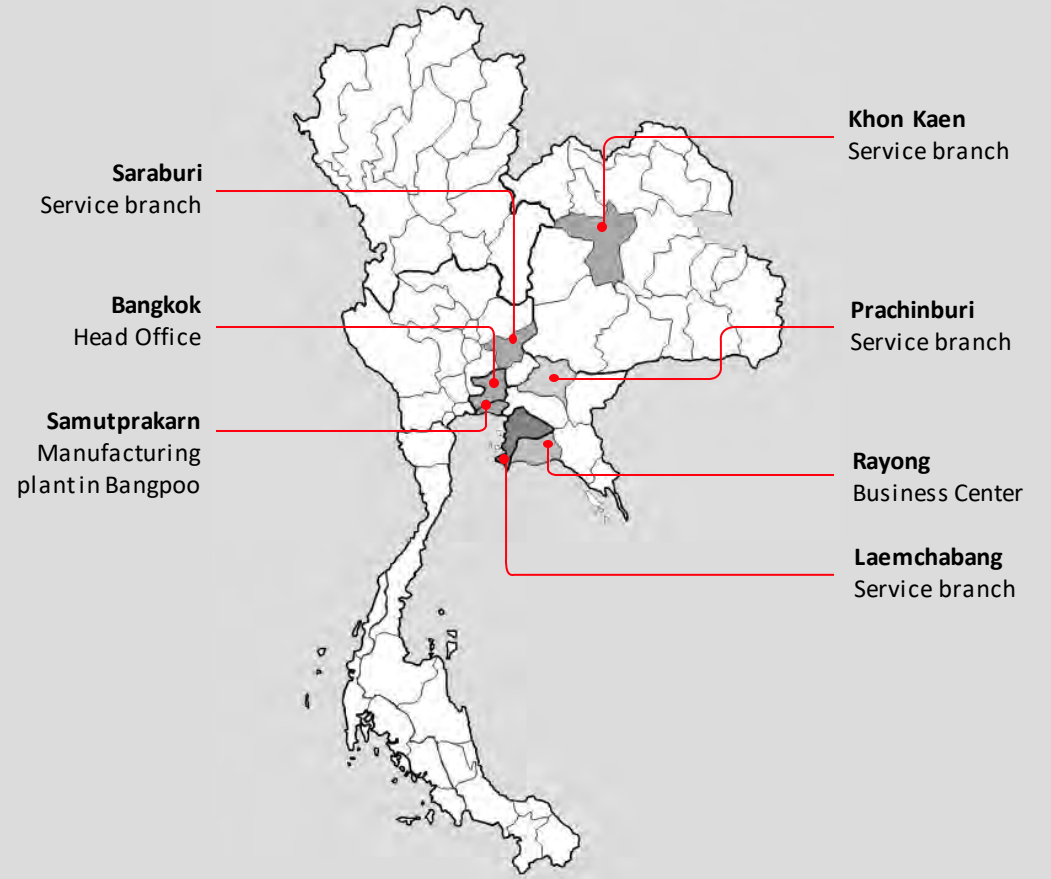
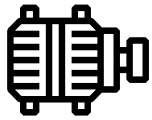


ABB in Thailand

From 1913, to establishment of THABB on 1978 with 45 years of local presence

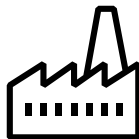
Business highlights



Year 1913: ABB first major delivery to the first Cement plant for SCG Group
– 1978 Asea Co., Ltd. established in Thailand



\$2 billion: Estimated ABB's installed base value



4 businesses: Covering all market segments - Utility, Industry, Buildings, Transport & Infrastructure



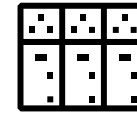
Service Hubs: Rayong and Saraburi



Headquarters: Located at SG Tower, Lumpini, Bangkok



TH Cluster: Business responsibility for Myanmar, Cambodia, Laos



Footprints: Key manufacturing in Bangpoo Industrial Estate, Samutprakarn



- MV & LV Switchgear, Relay Control & SCADA
- Robot Application Center (Welding & Cutting hub for SEA)

Focus areas / Key projects

INDUSTRY



Cement
Oil and Gas
Automotive
Food & Beverage
Data center

BUILDING



Large commercial and residential
areas
Shopping Malls
Hospitals

TRANSPORT & INFRASTRUCTURE



MRTA
BTS
Airport
Railway
e-mobility
Eastern Economic Corridor

UTILITIES



EGAT
MEA
PEA

ABB robots help accelerate COVID-19 vaccine development in Thailand



Challenge

Thailand's Mahidol University and the Institute of Molecular Biosciences needed a rapid and safe way of testing and handling various samples for vaccine development.

Solution

An ABB YuMi cobot and IRB 1100, an industrial robot work together as part of the AI-Immunizer system to handle samples of virus as well as antibodies



Application

The robots can perform tasks such as take samples by pipette, mix sample according to designed formulas and transporting them to test stations, performing repetitive actions that avoids risks to operators



ULH drives for district cooling plants, Thailand's largest fully integrated district

WHO

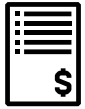


End user: One Bangkok (TCC Group)

EPC: Tokyo Gas Engineering Solution

Main contractor: Thai Shinryo Limited

Panel builder: CPT Drives and power public co., ltd.



WHAT

36 units of Ultra-Low Harmonic Drives ACH580-31/34

WHY



Advance ULH technology and completed solution

Fast response and excellent technical influencing to EPC

Strong committed team

Trust in local best support and service



Lenzing Thailand – the largest lyocell fiber plant

End user: LENZING (THAILAND) COMPANY LTD.

Project name: T3 project

Location: 304 Industrial Park, Prachinburi

EPCM : Wood (Foster Wheeler)

OVERVIEW

- The first step in bringing lyocell production to Asia
- The Lenzing's largest lyocell fiber plant in the world, plan capability 100,000 tons/year
- The total investment volume for the first production line, including infrastructure and site development, amounts to approximately EUR 400 million.

SCOPE

- Electrical and Instrument installation for the whole plant
- Supply manpower more than 1,400,000 Man Hours without TRIFR
- Support customer to achieved their schedule which was delayed by Covid-19 pandemic.



ABB's PCS100 UPS-I commissioned for AstraZeneca COVID-19 vaccine production in Thailand.

Siam Bioscience's new vaccine manufacturing facility for Thailand and Southeast Asian countries



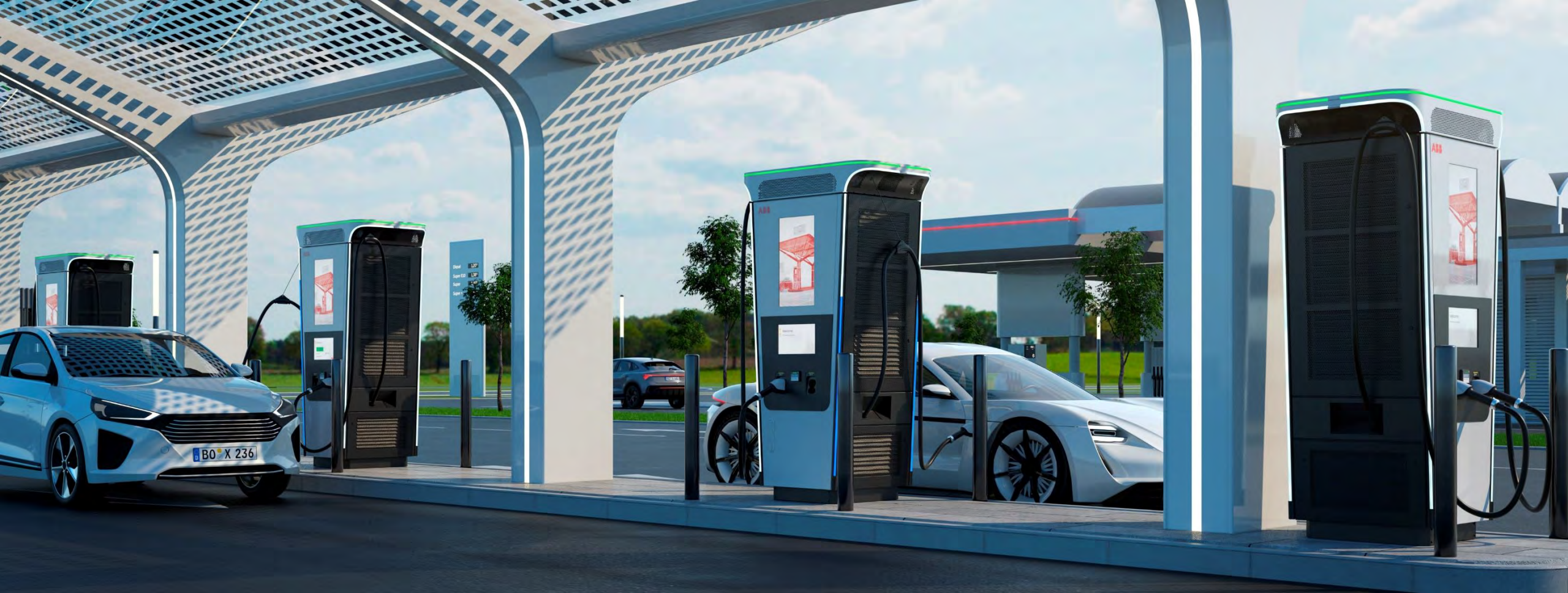
- ABB's PCS100 UPS-I to ensure operational efficiency and constant supply of high-quality power at Siam Bioscience's new manufacturing facility in Nonthaburi, Thailand.



- The new manufacturing facility is expected to produce 200 million doses per year for Thailand and Southeast Asian countries.



ABB



E-MOBILITY DIVISION

ABB E-mobility

Solutions in EV charging infrastructure and services





ABB E-mobility: The world leader in EV charging solutions

A pioneer of the green mobility revolution

\$256 mn

Total investment
by ABB from 2017 to 2021¹

\$323 mn

2021 revenue

61%

2017-2021 revenue CAGR

>650k

AC chargers sold

>30k

DC chargers sold

>350

Granted patents

>85

Markets served²

~1,000

Employees

>350

R&D experts³

Source: Company information

Note: Financial information is in draft form and is subject to completion and amendment; unless specified, figures are as of today

1. Total investment includes R&D expenses, capital expenditure, M&A and equity investments

2. Including via MDA (Master Distribution Agreement) with ABB Group

3. Includes contractors

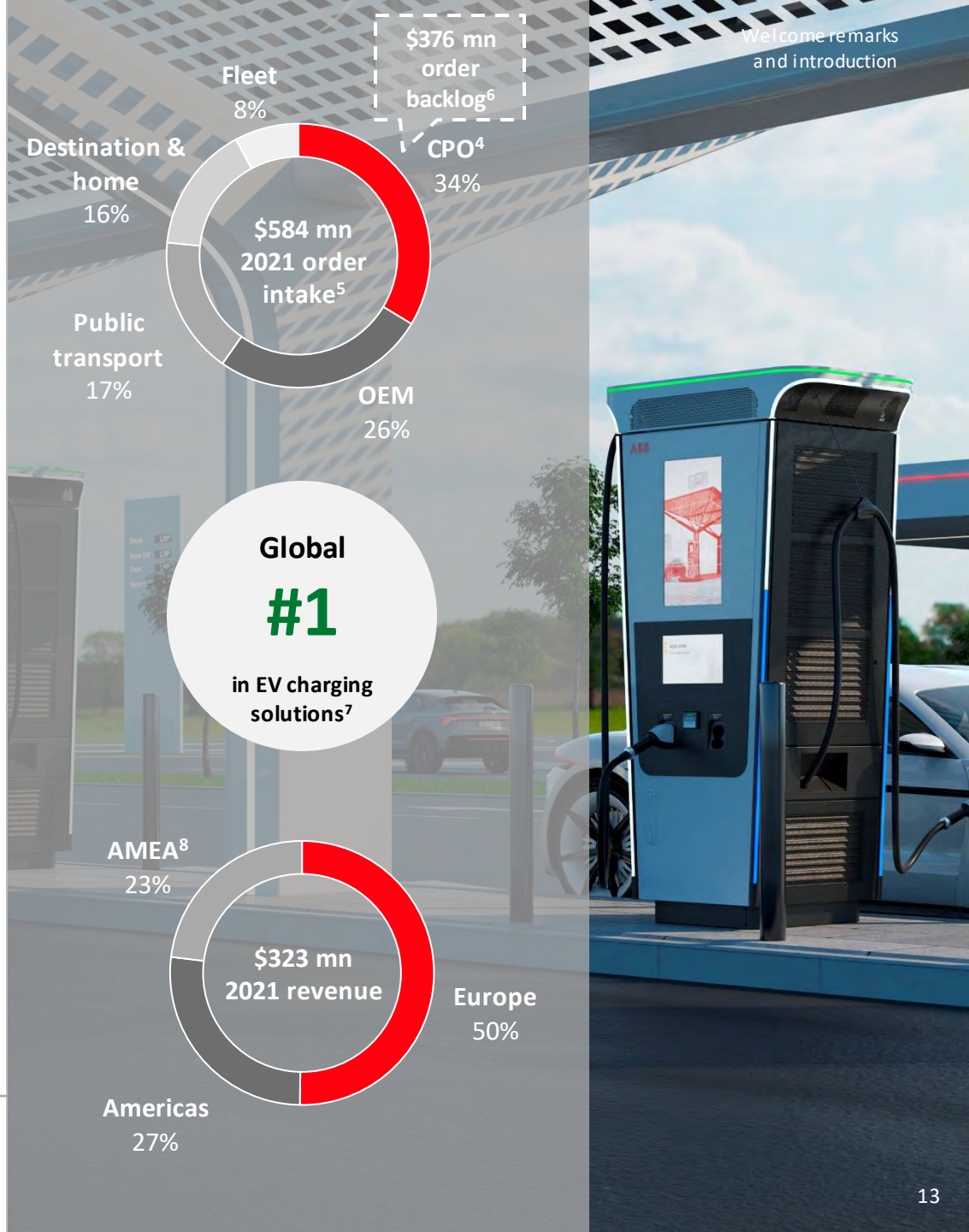
4. Charge Point Operator

5. Order intake represents the order value of contracts awarded during the respective accounting period to design, engineer, manufacture and/or provide EV charging solutions, services and software; split excludes unassigned segments and sales via ABB given no visibility on end-market (\$118 mn)

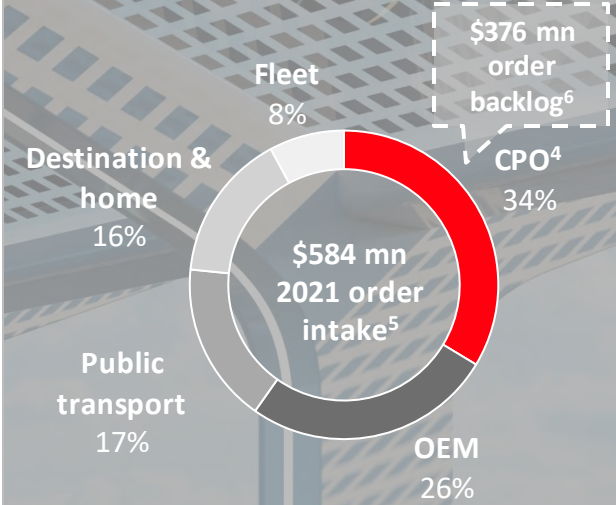
6. Order backlog for EV charging solutions, services and software represents the undiscounted value of future revenues that the Group expects to generate from our orders at any point in time; as of 31 December 2021

7. Based on ABB management assessment; Roland Berger conducted revenue, footprint and product breadth analysis

8. Asia, Middle East, Africa

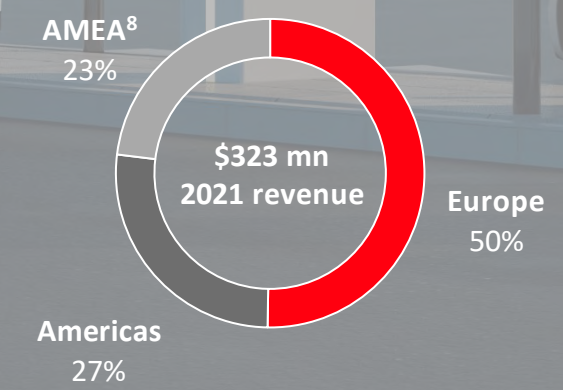


Welcome remarks
and introduction



\$376 mn order backlog⁶

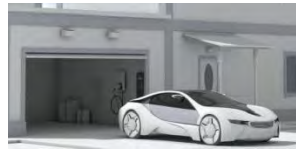
Global #1
in EV charging solutions⁷





Widest portfolio of EV charging solutions for customers across various use cases

Use case



Single home residential charging



Apartment, hotel & workplace destination charging



Commercial fleet



Public commercial parking



Fast-charging roadside stations



Bus charging



Industrial fleet



Heavy-duty truck charging

Charging products



Terra AC wallbox 3-22 kW



Terra Nova 11J (bi-directional) 11 kW



Terra DC wallbox 20-25 kW



Terra 124 60-120 kW



Terra HVC 50-180 kW



Terra 184 90-180 kW



Terra High Power (liquid cooled) 175-350 kW



Terra 360 (liquid cooled) 180-360 kW



Pantograph (panto up, panto down, connectors) 150-600 kW



To come in 2022

Megawatt charger up to 3 MW

Asset, energy & fleet management



Connectivity and remote software update



Remote support (configuration, troubleshooting)



24/7 network monitoring by ABB



User interface



Plug & charge



Payment module



EV site management



Bi-directional charging



Enable energy trading¹



Predictive load profiles



e-fleet schedules & management

Source: Company information
Note:

1. ABB E-mobility does not engage in energy trading but enables customers to do so

EV fast charging and global standardization

ABB leading in major developments this decade

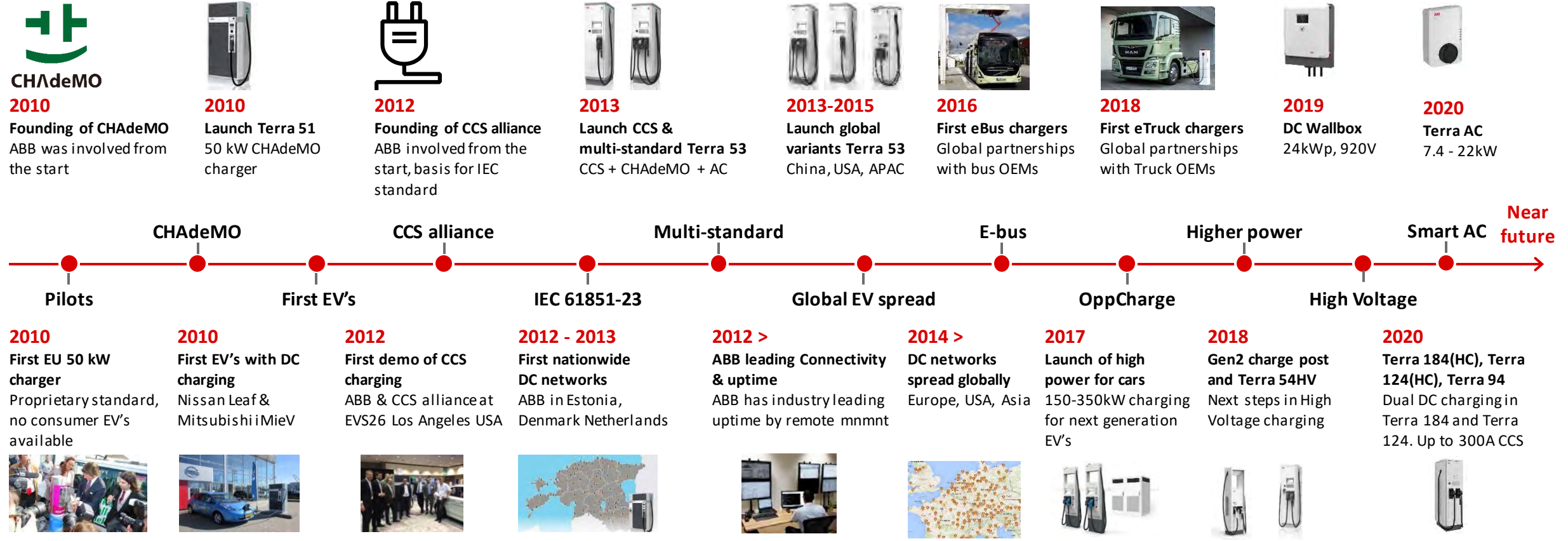


ABB is global charging partner for Car, Bus and Truck OEMs

Strong presence in China, USA and Europe

VOLVO
– R&D partners

BMW
– R&D partners
DC fast chargers at dealers

VW
– R&D partners
DC fast chargers at dealers

PORSCHE
– R&D partners
– DC Wallbox
– Formula E

Audi
– R&D partners
– Swiss market activation

JAGUAR
– R&D partners

RENAULT
– R&D partners

KIA
– DC fast chargers at dealers

VOLVO
– Global partnership
R&D partners

MAN
– Bus
– R&D partners

MAN
– Truck
– R&D & joint project

SCANIA
– R&D partners

HEULIEZBUS
– Cooperation
– R&D partners

TOYOTA
– R&D partners

Ford
– DC charging testing & R&D

NOVA BUS
– Partnership
– R&D partners

NEW FLYER
– Cooperation
– R&D partners

MOTOR COACH INDUSTRIES
– R&D partners

tm4
– Joint projects

Cummins
– Cooperation
– R&D partners

HESSE
– Cooperation
– R&D partners

HONDA
– R&D partners

GM
– DC charging testing & R&D

DONG FENG
– R&D partners
– DC fast chargers at dealers
– Cooperation Dong-Feng

SAUBER Engineering
– Charging partner

长安汽车 CHANGAN
– R&D partners

北汽集团 BAIC Group
– R&D partners

上汽集团 SAIC MOTOR
– R&D partners

DAIMLER
– R&D partners
DC wall box for Denza EV



DISTRIBUTION SOLUTIONS, MAY 2023

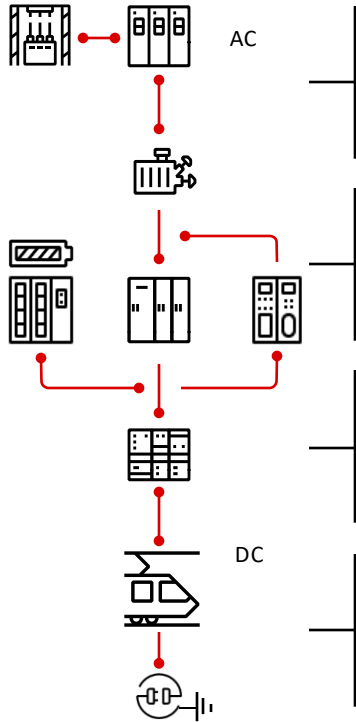
DC Traction Power Supply

Value propositions

DC Traction Power Supply

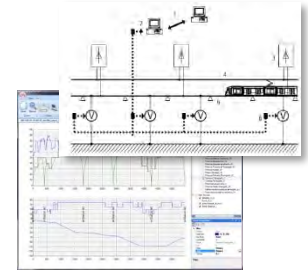
DC Traction Power Supply

ABB acting as single-source supplier



1

Primary and secondary air or gas insulated medium voltage switchgear



2

Transformer-rectifier groups, diode rectifiers and controlled rectifiers



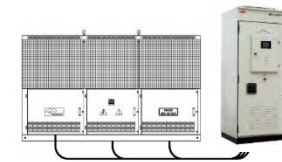
3

DC high-speed circuit breakers, DC switchgear and voltage limiting devices



4

Energy recuperation, energy storage systems and assured receptivity units



Value added services

End-to-end solutions out of one hand



DC Traction Power Supply

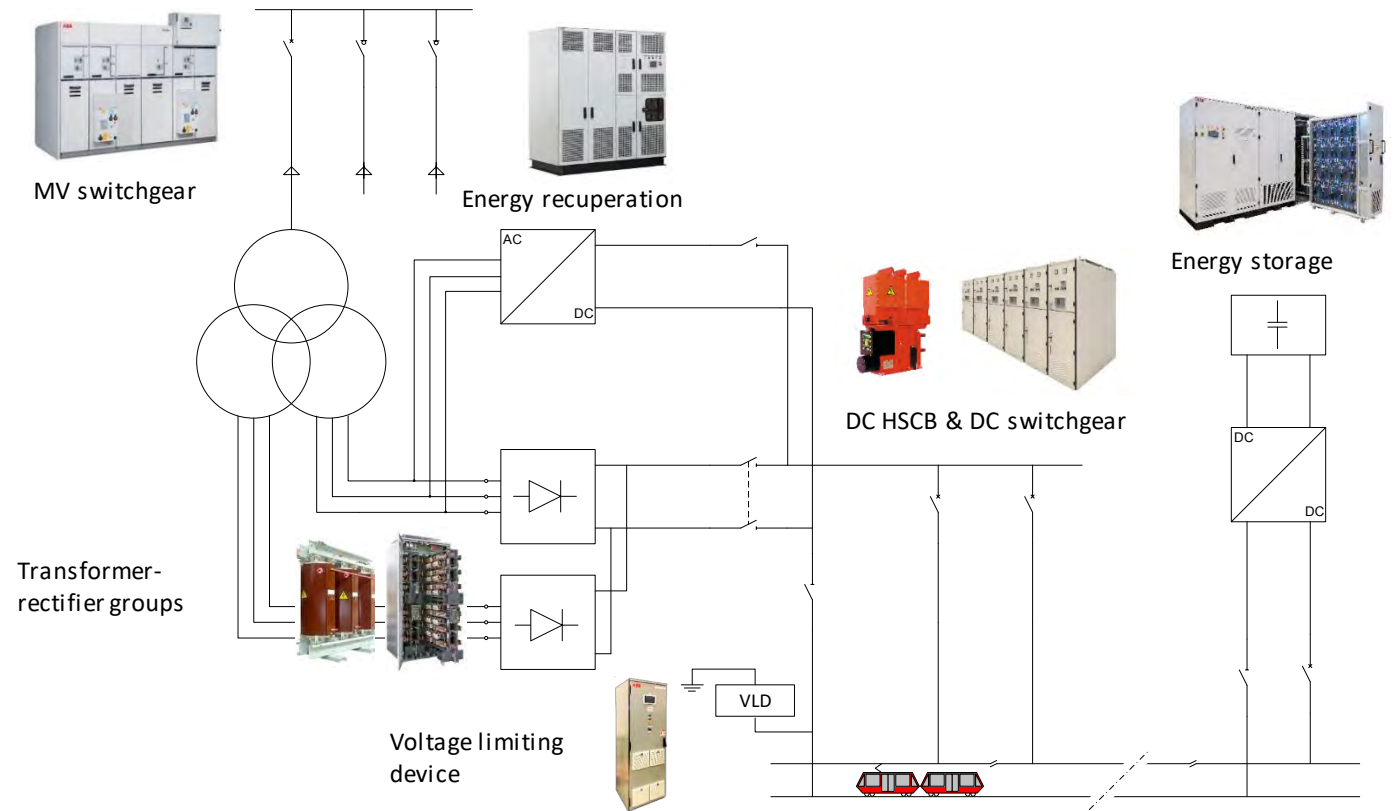
Main electrical equipment

End-to-end solutions

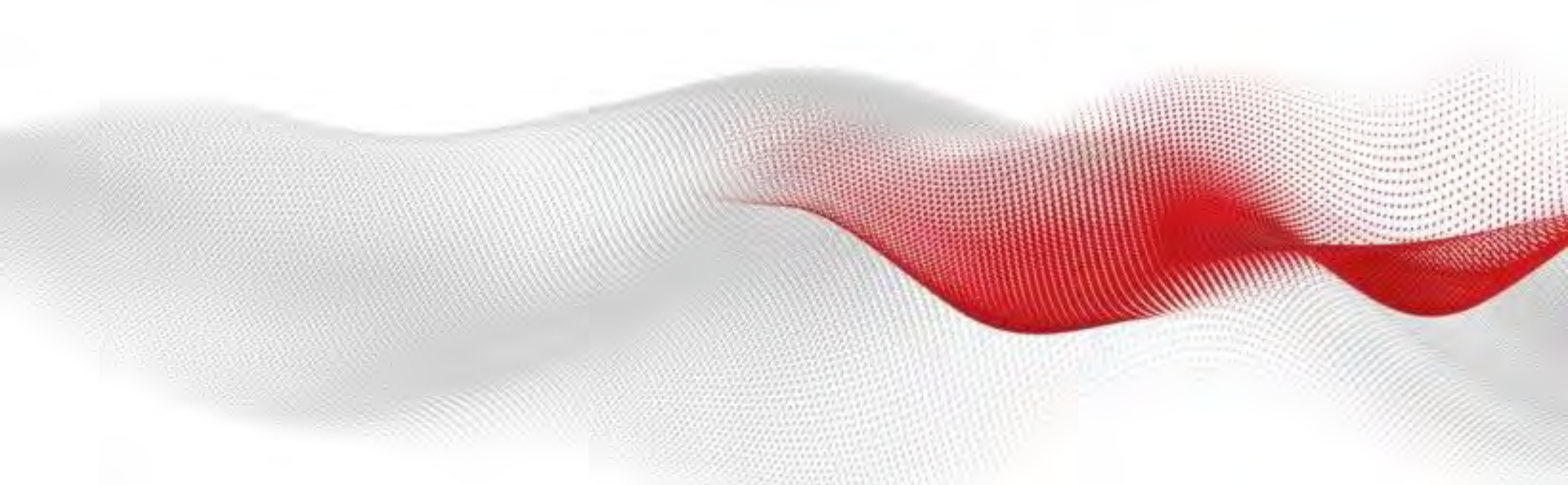
We provide all the services you need out of one hand, creating valuable synergies in the process and giving you unique opportunities to save costs.

Customer benefits:

- One-stop shop for complete electrification packages;
- Reliable, cost effective and energy efficient solutions for DC traction power networks.



ABB



Sustainability at ABB

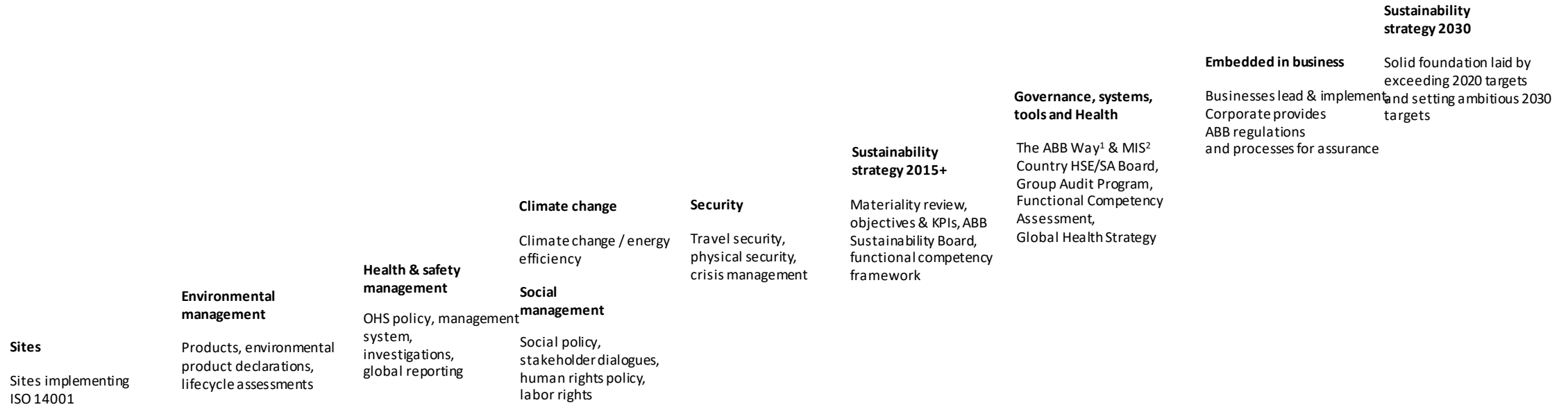
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Gianandrea Bruzzone



ABB's sustainability journey

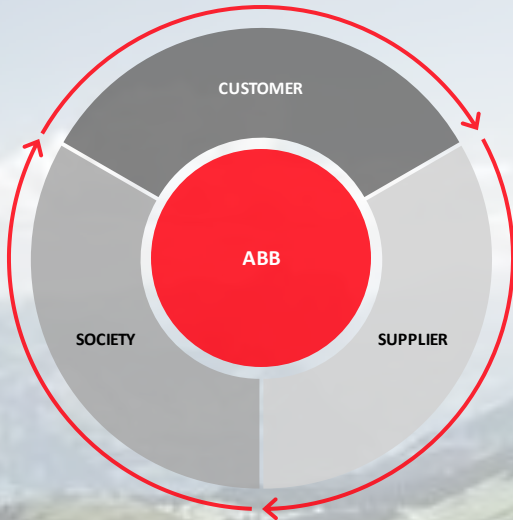
Sustainability principles have been progressively embedded in ABB's business strategy



- Notes:
1. The ABB Way for HSE and Security – a global management system, integrated into ABB regulations
 2. MIS – a global management information system for reporting against targets and KPIs and a source of data, e.g., for incident investigations
 3. OHS – Occupational, Health and Safety

Main sustainability targets

Striving to achieve all targets by 2030



Sustainable Value Chain

We enable a low-carbon society

- **Carbon neutrality** in own operations
- Support our customers in reducing annual CO₂ emissions by **>100 Mt¹**
- Supply chain emission reduction

We preserve resources

- **80%** of ABB products & solutions covered by circularity approach
- **Zero waste** to landfill²
- Supplier Sustainability Framework

We promote social progress

- **Zero harm** to our people and contractors
- Comprehensive D&I framework³; **25% women** among ABB leaders
- **Top-tier** employee engagement score in our industry
- Impactful support for community-building initiatives

INTEGRITY AND TRANSPARENCY ACROSS OUR VALUE CHAIN

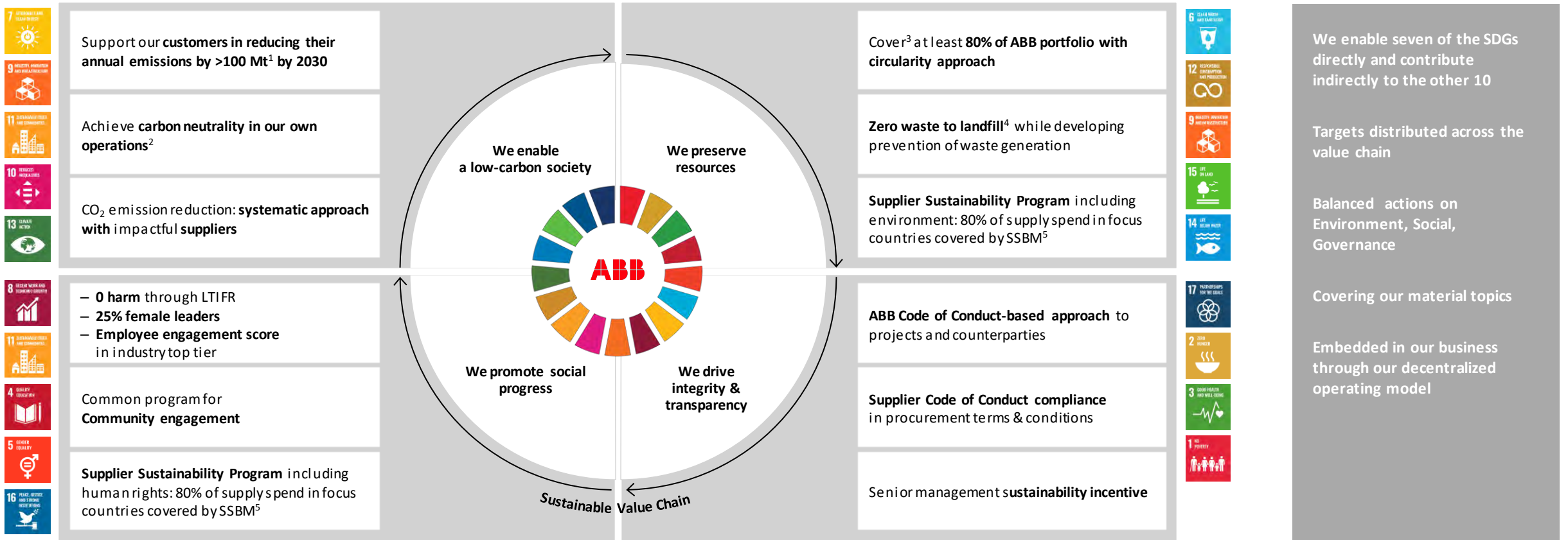
1. Savings in the year 2030 from solutions provided to customers 2021-30

2. Wherever local conditions allow

3. Diversity & Inclusion framework

With our sustainability strategy, we create superior value for all stakeholders

ABB supports the 17 United Nations' Sustainable Development Goals (SDGs)



1. Specific business cases supporting the minimum figure commitment – yearly saving in 2030 based on 2021–2030 savings
 2. Reducing our own emissions by at least 80% according to SBT guidelines
 3. Cover meaning that a systematic approach is applied (e.g., offer for recycling of ABB product to customers means the product is covered, even if not all customers make use of the offer);

the concept itself is not yet fully developed as of Q3/2020
 4. Zero waste to landfill means 0 waste is disposed directly to landfill or incineration without energy recovery except where local legal requirements impose disposal
 5. Sustainable Supplier Base Management (SSBM)

ABB eBus charging – Reference projects



UK

- Harrogate
- Birmingham
- Coventry
- Staines



Norway

- Trondheim
- Oslo
- Lillehammer
- Brakar



Sweden

- Varnamo
- Ostersund
- Gothenborg
- Skelleftea
- Uddevalla



Denmark

- Aarhus



Spain

- Zaragoza



Netherlands

- Dordrecht
- Leiden



Germany

- Hamburger Hochbahn
- Göttingen
- Rottweil



Belgium

- Namur
- Charleroi
- Leuven



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère du Développement durable
et des Infrastructures

Département de l'environnement



Luxembourg, Lux



France

- Paris
- La Rochelle
- Mulhouse
- Valance
- Rorthais



Czech Republic



Hungary



Austria

- CNL project



Switzerland

- Bern



Singapore

- LTA
- NTU Test track



Thailand

ABB Terra 124 EV charger installed at Elex by EGAT station

The nation's fastest public charging station



EleXA

ABB's Terra 124 EV fast charger with a charging power of 120 kW has been installed at Elex by EGAT station at five PT petrol stations situated on major highway routes located between 100-200 kilometers from Bangkok.



- ABB's Terra 124 typically charge EVs in just 20-30 minutes to reach 80 percent of their charging capacity
- With dual outlet CCS, the charger can provide a full battery charge to two vehicles simultaneously and is designed to meet EV battery voltage capabilities up to 920V



- The charger is compatible with all EVs currently on the market



Thailand

ABB's fast charging solution to shape the future of e-mobility

PEA Volta EV charging station

- PEA joins hands with Bangchak Corporation to install 124 of ABB's Terra 54 fast chargers at 62 sites across Bangchak's petrol stations and PEA offices within 2021.
- EV stations located in 40 provinces across the country.
- ABB Terra 54 fast chargers can charge a vehicle's battery up to 80% of the average charging capacity of the electric vehicle within 15 to 30 minutes.
- The charger is compatible with all EVs currently on the market



Thailand

ABB selected by Shell to provide High Performance Charging Stations for Shell-Recharge

Shell-Recharge High Power Charging site



- Shell-Recharge High Power Charging site launched in Bangyai, Nonthaburi, marks the start of a total eleven Shell EV fast charging stations in Thailand



- Shell, in partnership with Porsche Asia Pacific, invests in ABB's electric vehicle charging solutions to ensure reliability and advanced technological developments for EV charging station
- Shell, in partnership with Porsche Asia Pacific, announced the launch of the first Shell-Recharge High Performance Charging (HPC) site in Bangyai, Nonthaburi. This HPC site launch marks the start of the charging network construction of a total eleven Shell stations throughout Thailand.



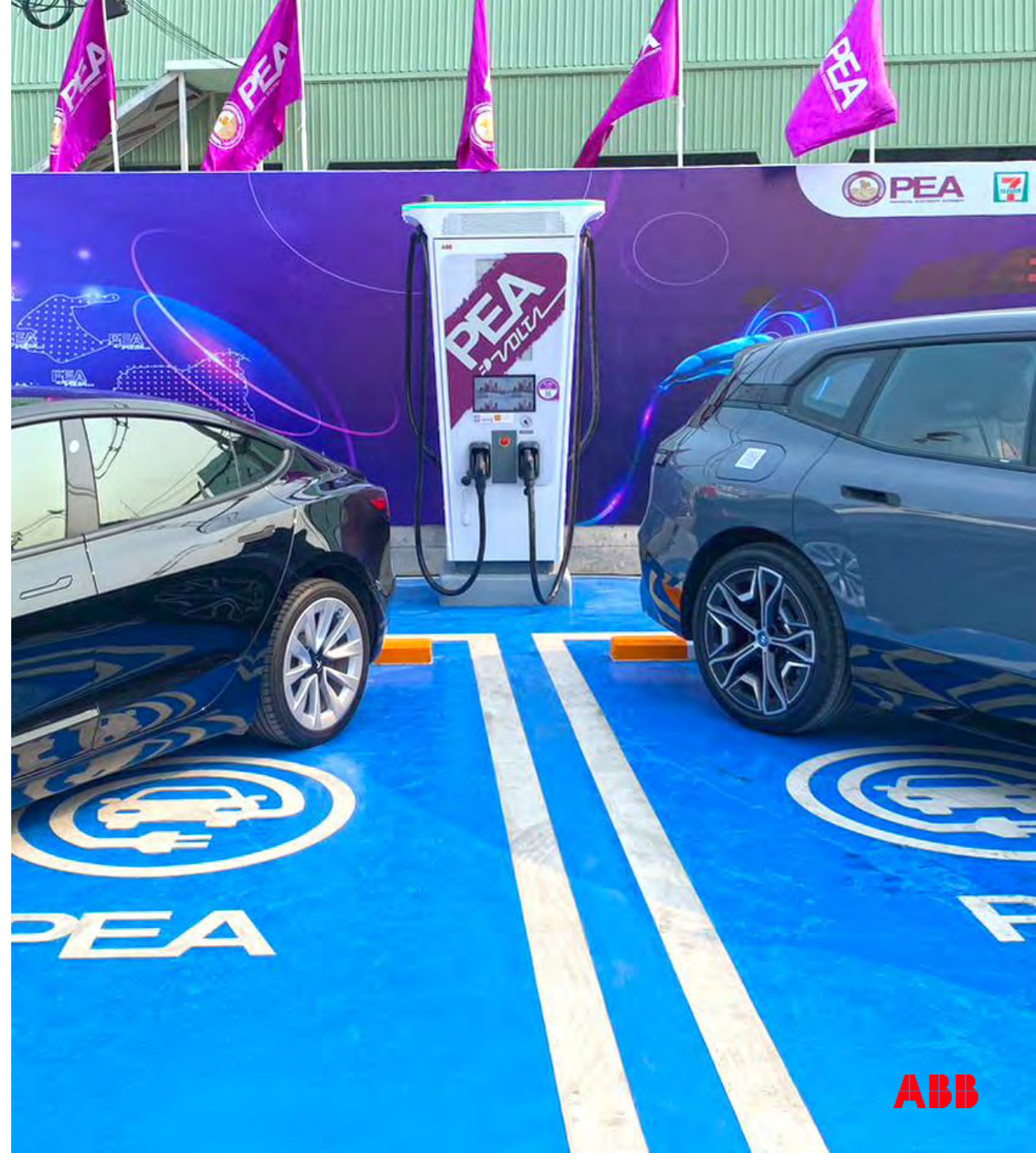
Thailand

PEA VOLTA has launched a new 360KW EV Super Charging station in Pattaya, Chonburi



PEA Volta EV Super charging station

- PEA VOLTA has launched a new 360KW EV Super Charging station at PEA VOLTA 7-Eleven in Bali Hai Pier, Pattaya-Chonburi.
- The ABB Terra 360 EV Charger is now switched on at the PEA VOLTA 7-11 station and is currently the most powerful EV charging station in Thailand and in Asia-Pacific region.
- Delivering up to 360 kW of power and a full charge in less than 15 minutes
- Adding 100 km in less than 3 minutes



ABB