VISION ZERO IMPACT FACTORY

How we define GREEN in the Smart Factory

Learning Journey
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Porsche Consulting
Strategic Vision. Smart Implementation.

PORSCHE PRODUCTION 4.0

We produce enthusiasm

SMART.

We must
think further than
Digitalization & Automation

LEAN.

We see Lean as
our driver
of the digital transformation

GREEN.

Our vision of the
Zero Impact Factory
is supposed to be implemented

Source: Porsche AG & Porsche Consulting

~1.8x

earths are needed

...

to provide resources and absorb waste

~17 YEARS

until the exhaustion of fresh water

...

...

as long as the water use isn‘t drastically reduced

~27 YEARS

until the breakdown of the food supply

...

...

if global food system aren‘t transformed

~76 YEARS

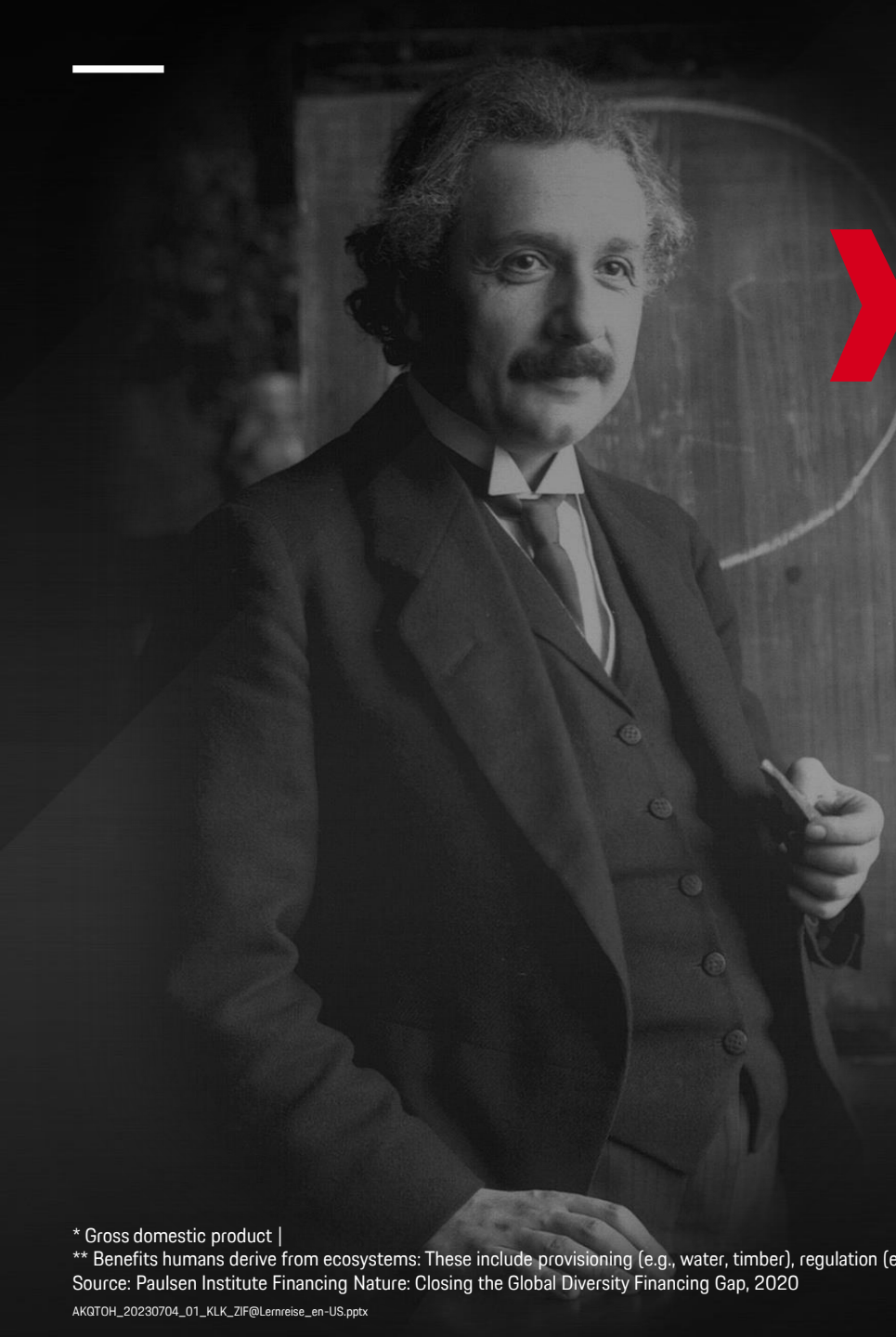
until the destruction of the rainforests

...

...

if current deforestation trends aren‘t changed

Source: The World Counts (https://ö/)



‘The world as we have created it is the result of our thinking. Therefore, it cannot be changed without changing our thinking.’

Albert Einstein | 1879 - 1955

HUMAN **AND** INDUSTRY

We all need nature

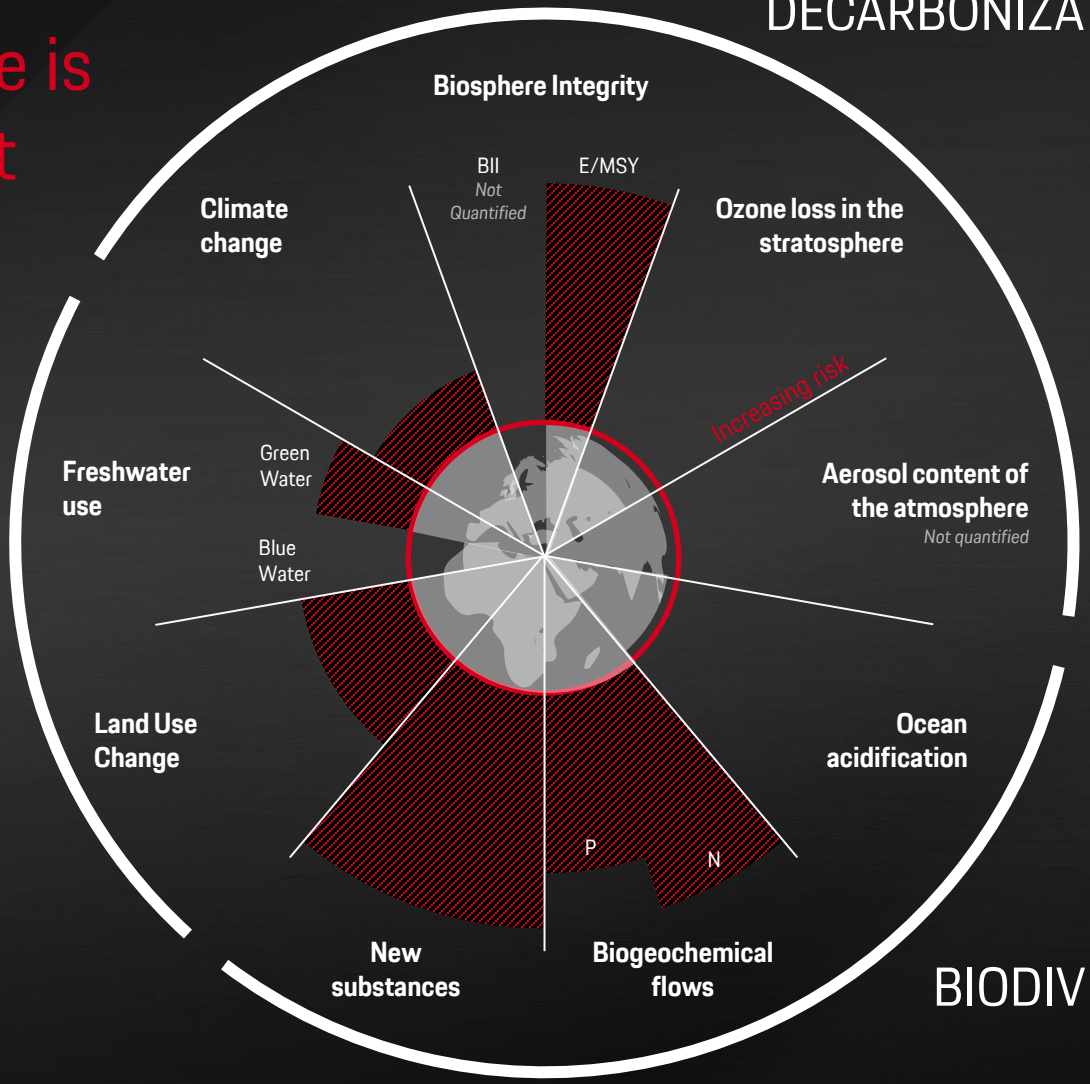
~50% **of global GDP* depends on ecosystem services****

* Gross domestic product |
** Benefits humans derive from ecosystems: These include provisioning (e.g., water, timber), regulation (e.g., carbon sequestration, water treatment), and other (e.g., soil formation, nutrient cycling).
Source: Paulsen Institute Financing Nature: Closing the Global Diversity Financing Gap, 2020

6 of the 9 planetary boundaries have already been crossed

Climate change is not the biggest challenge!

DECARBONIZATION



CIRCULAR ECONOMY

BIODIVERSITY

~50% global greenhouse gas emissions

&

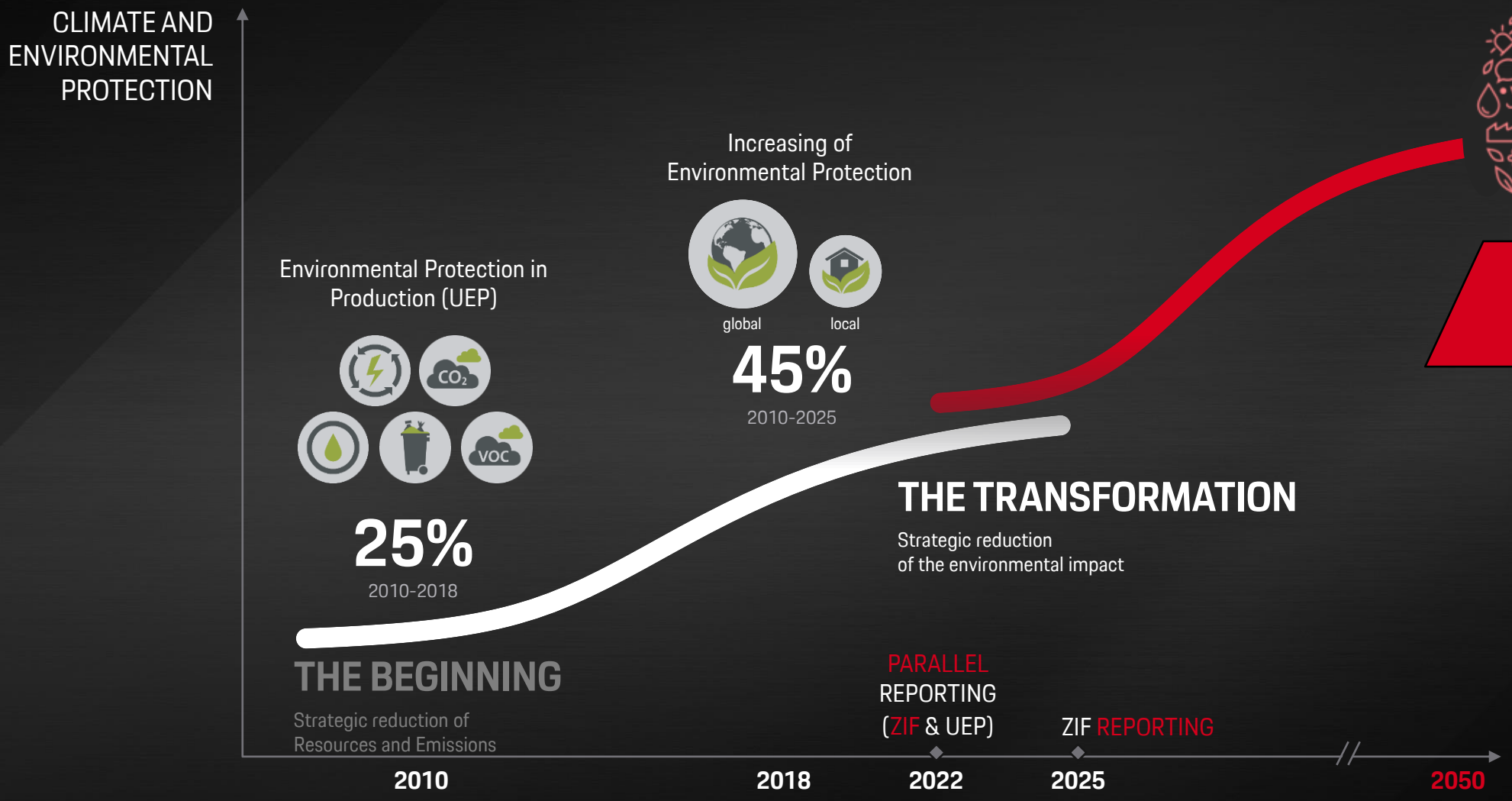
~90% the species and water pollution

are caused through

resource extraction & production

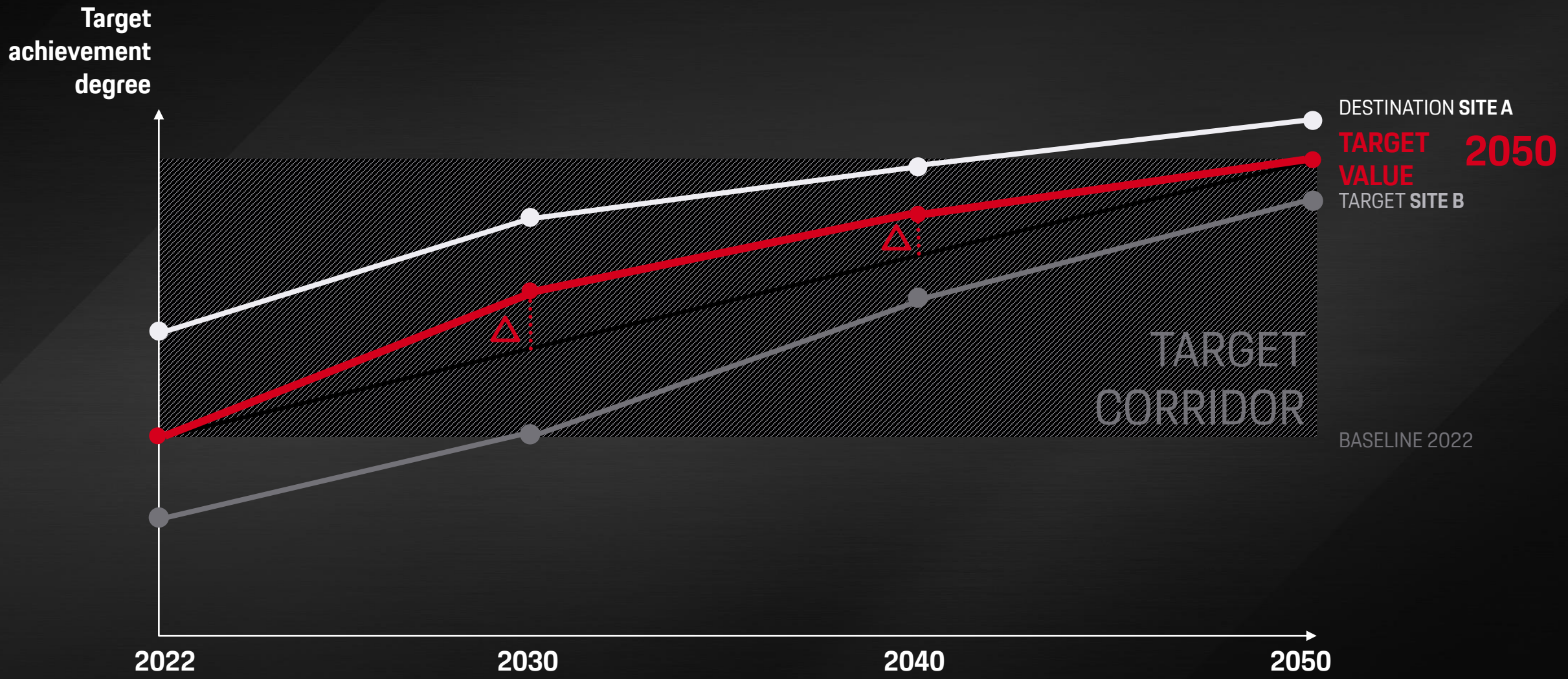
Source: Stockholmresilience, Porsche Consulting

The VW Group is undergoing an ecological transformation



Source: Porsche AG, Porsche Consulting

The path to ZIF is described by a target corridor



Source: Porsche AG, Porsche Consulting

The core is a differentiated approach – locally and globally

QUANTIFICATION OF ENVIRONMENTAL IMPACT

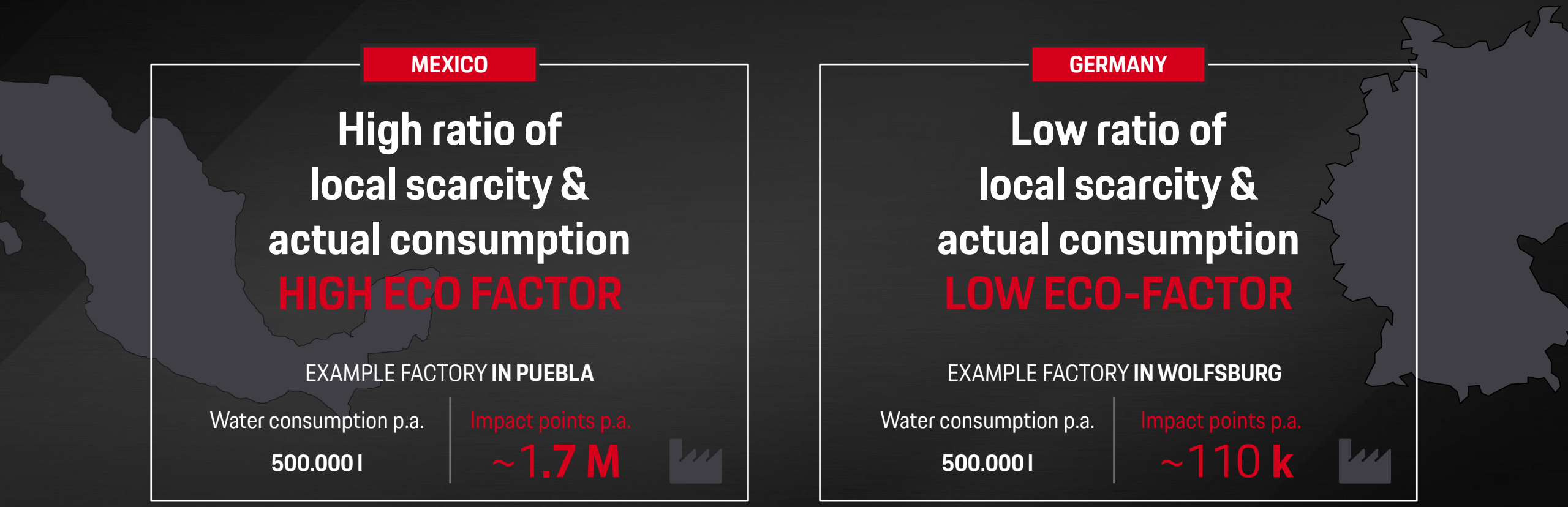
&

QUALITIVE EVALUATION OF THE SITES

... as a solid foundation for corporate sustainability performance

* DGNB - German Sustainable Building Council (Deutsche Gesellschaft für Nachhaltiges Bauen)
Source: Porsche Consulting

The evaluation is based on the scarcity of resources



MEXICO

High ratio of local scarcity & actual consumption

HIGH ECO FACTOR

EXAMPLE FACTORY **IN PUEBLA**

Water consumption p.a.	Impact points p.a.
500.000 l	**~1.7 M**

GERMANY

Low ratio of local scarcity & actual consumption

LOW ECO-FACTOR

EXAMPLE FACTORY **IN WOLFSBURG**

Water consumption p.a.	Impact points p.a.
500.000 l	**~110 k**

One liter of water consumption isn't equal to one liter of water consumption

Source: Porsche AG, Porsche Consulting

Our database makes global action comparable

Environmental aspect

Six environmental aspects define the **overall impact of the production-related environmental aspects**

×

Country-specific eco-factor

Country-specific eco-factors provide a **predictable and comparable KPI for environmental impacts**

=

Environmental impact

Performance evaluation based on **impact points for quantitative assessment of ecological impact worldwide**

OUR DATABASE

includes **>110 factories as benchmark**

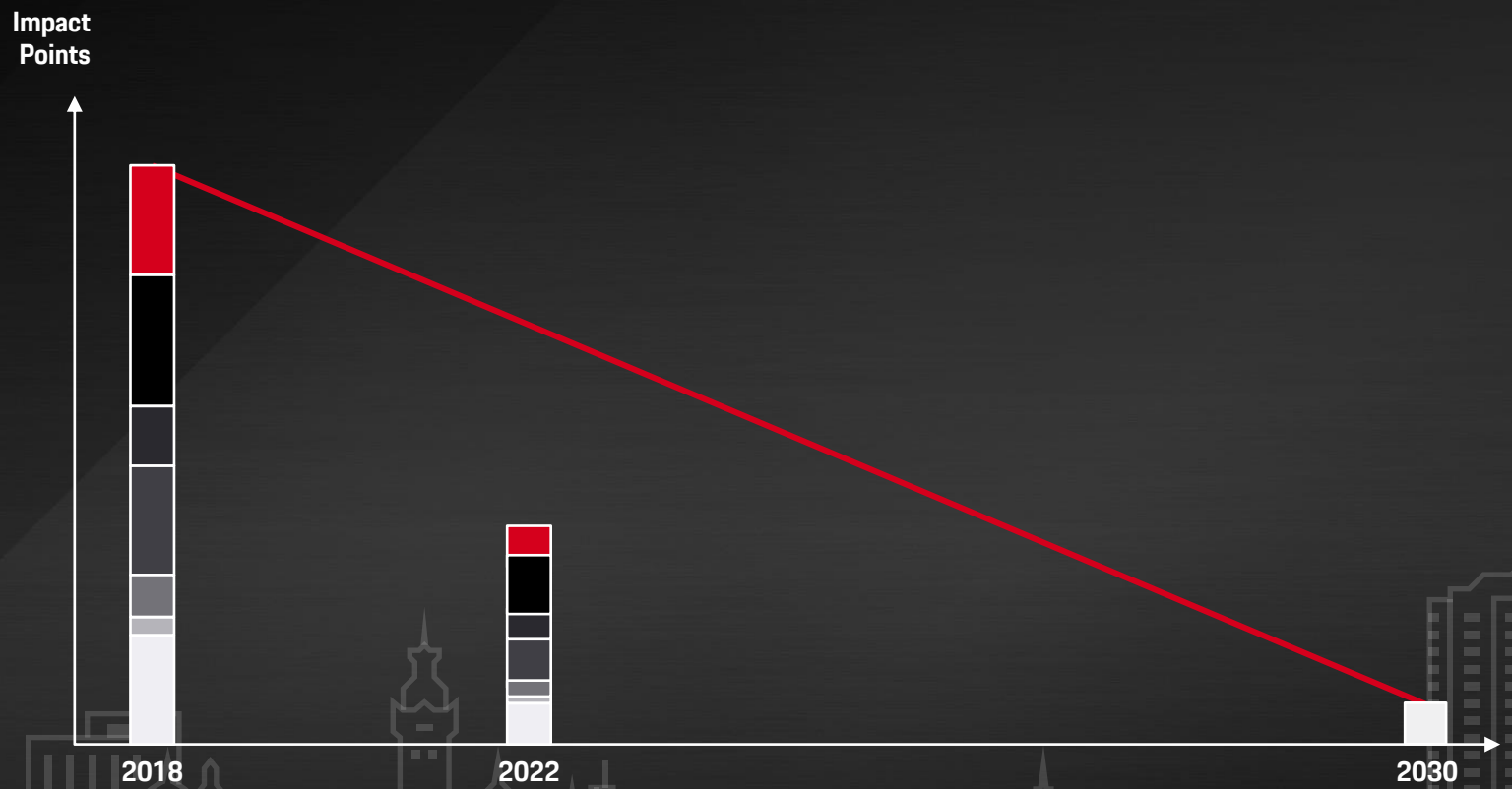
includes **>130 eco-factors in 25 countries**

offers **standardized Calculations**

... IS OUR ASSET!

Source: VW Group, Porsche AG, Porsche Consulting

Target achievement at the Leipzig site is progressing rapidly



Positive development since 2018

- **CO_2** equivalents: Purchase of biomethane since 2021
- **Waste:** Changed disposal routes and improved allocation of fractions to the key performance indicator system
- **Overall:** Implementation of resource efficiency measures

Legend: ■ Primary energy ■ Power plant emissions (KWE) ■ CO_2 equivalents ■ Air pollutants ■ Local water risk ■ Wastewater ■ Waste
Source: Porsche AG, Porsche Consulting

11 fields of action within the ZERO IMPACT FACTORY VISION

01
Environ. Compliance
Effective Environment Compliance Management

02
Archit. & Perception
Integration in ecological environ. and positive appearance

03
Planning
Integration of ZIF into the factory planning process

04
Digitization
Digit. processes & technology promote optimal use of resources

05
Water
Lowest possible impact on local water resources

06
Energy & CO_2
Net-zero design of production sites

07
Material
Efficient use of materials, waste minimization & recycling

08
Floor
Reduction of land sealing & preservation of soil function

09
Biodiversity
Protection against and compensation of negative influences

10
Pollutants
No emission of substances that endanger the eco-system

11
Mobility
Net-zero logistics and employee mobility

VISION zero
IMPACT FACTORY

Source: Porsche AG, Porsche Consulting

The ecological maturity of the operations is evaluated

143 Criteria

	FROM …	… UNTIL
GOVERNANCE	Nothing yet	Each project is defined with clear environmental goals defined
RESOURCES-EFFICIENCY	Nothing yet	Waste as a resource; closed, Pareto-efficient material cycles
WATER	Nothing yet	Completely cascading water system
FIELD OF ACTION X		

Degree of fulfillment

4 – FULL
3 – LARGELY
2 – PARTIAL
1 – NOTHING

Partner

PRISMA Performance and Policy Research in Sustainability Measurement and Assessr
TECHNISCHE UNIVERSITÄT DRESDEN
DREES & SOMMER
Technische Universität Berlin
TÜV NORD

Source: Porsche AG, Porsche Consulting

The site checklists formulate concrete requirements

ARCHITECTURE & PERCEPTION

VISION | Positive external image and visual integration into environment

Measure	Date	✓
Break areas are designed close to nature (indoor / outdoor areas / roofs)	DD/MM/YYYY	
Dialogue with relevant stakeholders sought and requirements derived	DD/MM/YYYY	
Complaints system established and no complaints in defined categories	DD/MM/YYYY	
No disturbing effects from light emissions on ecosystems	DD/MM/YYYY	

Source: Porsche AG, Porsche Consulting

The site checklists formulate concrete requirements

PLANNING

VISION | **Projects are planned holistically and environmental issues are taken into account**

Measure	Date	✓
Energy and environmental department involved in planning process	DD/MM/YYYY	
Responsible persons for environment and energy in the planning department are appointed and trained annually with regard to new environmental requirements	DD/MM/YYYY	
Factory development plans describe a path to the technical realization of the Zero Impact Factory	DD/MM/YYYY	
Planning projects include quantified environmental and energy targets	DD/MM/YYYY	

Source: Porsche AG, Porsche Consulting

The site checklists formulate concrete requirements

ENERGY EFFICIENCY/CO_2

VISION | Production sites are net-zero and maximally energy-efficient as well as renewable

Measure	Date	✓
Compliance with predefined energy efficiency KPIs* ensured	DD/MM/YYYY	○
Demand-driven activation of consumers implemented	DD/MM/YYYY	○
Monitoring and optimization of energetic processes standardized	DD/MM/YYYY	○
The factory is operated in a climate-neutral manner (including compensation of CO_2 emissions)	DD/MM/YYYY	○

* Key Performance Indicators
Source: Porsche AG, Porsche Consulting

The site checklists formulate concrete requirements

WATER

VISION | Production sites do not negatively affect the local resource of water

Measure	Date	✓
Protective mechanisms against leakage of contaminated water implemented	DD/MM/YYYY	
Compliance with predefined water KPIs* ensured	DD/MM/YYYY	
Natural purification capacity of the water not exceeded	DD/MM/YYYY	
Unused, uncontaminated rainwater is 100% infiltrated close to the site	DD/MM/YYYY	

* Key Performance Indicators
Source: Porsche AG, Porsche Consulting

The ZIF aims to fulfill the environmental ESG requirements

Pillar	ENVIRONMENTAL	SOCIAL	GOVERNANCE
	E	S	G
Rating	●●●	●●○	●○○
	90% coverage by Zero Impact Factory Vision		

ESG-RATING-AGENCIES	Sustainalytics	ISS ESG	MSCI

●●● Good score ●●○ Medium score ●○○ Poor score ○○○ Not applicable

Source: Porsche Consulting

We are happy to answer your questions and to stay in contact

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