



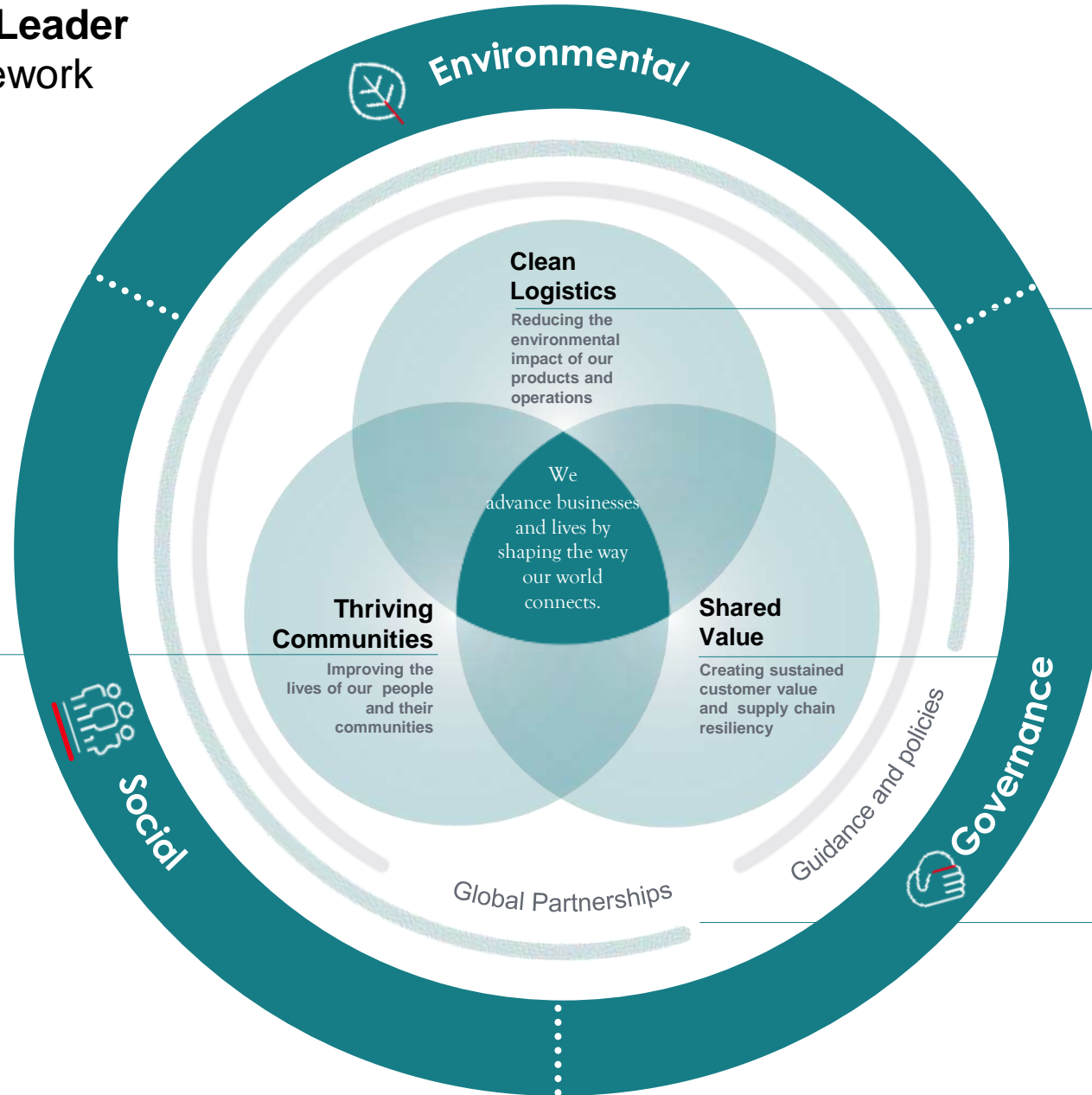
SCHENKER

Geospatial of logistics and Supply Chain





Sustainability Leader Strategic Framework



8 DECENT WORK AND ECONOMIC GROWTH
Providing fair work opportunities

3 GOOD HEALTH AND WELLBEING
Protecting our employee wellbeing

5 GENDER EQUALITY
Driving gender equality at work

10 AFFORDABLE AND CLEAN ENERGY
Creating inclusive workplaces

13 CLIMATE ACTION
Driving climate action

7 AFFORDABLE AND CLEAN ENERGY
Transitioning towards renewable energy

12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Managing resources effectively

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Developing sustainable solutions

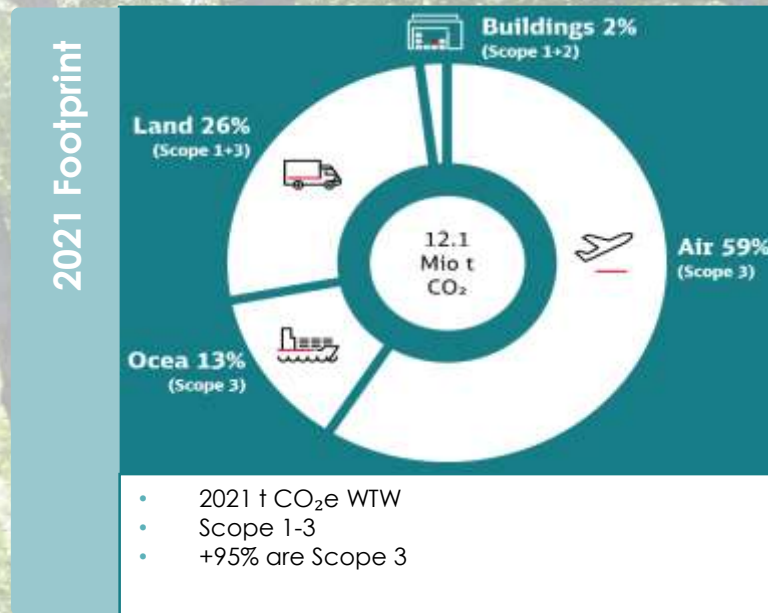
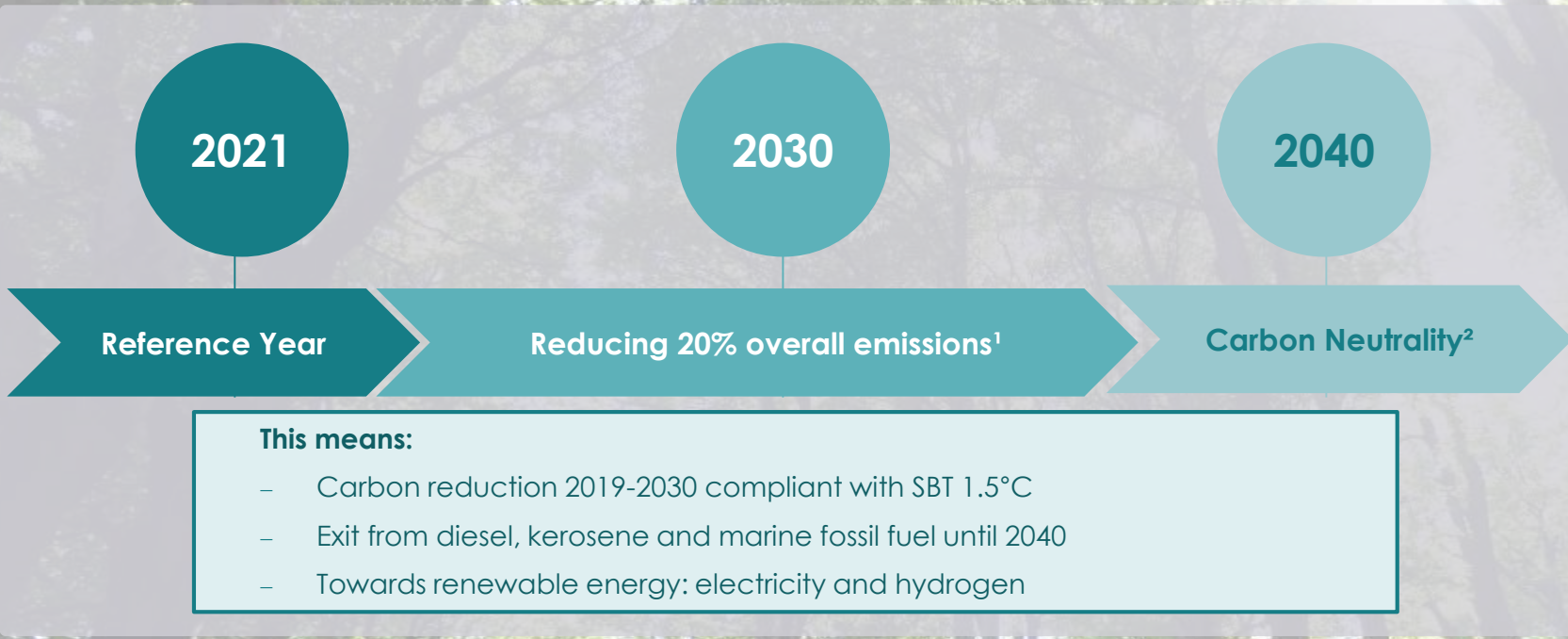
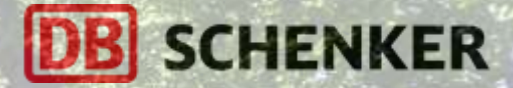
11 SUSTAINABLE CITIES AND COMMUNITIES
Pioneering urban logistics

4 QUALITY EDUCATION
Developing our people for the future

17 PARTNERSHIPS FOR THE GOALS
Partnering for the goals

Decarbonization targets to limit global warming to 1.5°C

DBS' climate protection targets 2030 and 2040



Compliant to

Science Based Target initiative
to stay within the 1.5°C global warming budget

„Fit for 55“ / European Green Deal

¹Scope 1 -3

² Science Based Target – validated to stay within 1.5 °C

Location Technology in Warehouse and Logistics

Geospatial Technology is an emerging field in Warehouse & Logistics that includes :

- **Geographic Information System (GIS)**
- **Remote Sensing (RS) and**
- **Global Positioning System (GPS).**

Geographic Information System (GIS) in Warehouse and Logistics

- For logistics companies, having an optimal service that suits every situation requires attention to every detail. Therefore, they need to know in a precise way where their work area is. To make it possible, technological tools are required. Specifically, **Geographic Information Systems (GIS)**.
- GIS can be used as a decision support for effective supply chain management. In the system, the data of the processing units, the customers, the distribution centers, the suppliers, and the topologies of the roads are stored and managed by the GIS.

Remote Sensing (RS) in Warehouse and Logistics

- Remote sensing is basically a means of being able to obtain geographic information about a particular location without needing to be physically present in that location at the time of data inquiry. It makes use of technological devices such as drones with LIDAR abilities (laser technology) for location surveillance and data acquisition.
- It is similar to GPS in the sense that it is used to collect data. Both GPS and remote sensing are similar in that they are used to collect data which is later processed by GIS software, however, the key difference lies in how this data is obtained.
- For GPS the individual needs to be in the location for the satellite to be able to locate the individual position, whereas for remote sensing the same data can be obtained from far away.

GPS in Warehouse and Logistics

- With GPS tracking technology, you can monitor vehicle speed, routes, engine start-up and shut down, idling and routes. You can tell whether the vehicle is going to the assigned destination, the routes were taken, and when the vehicle is resting.
- GPS tracking allows you to pinpoint the precise location, within your warehouse, of the pallet or product in question as long as the GPS tracking device is actively sending out a signal. This can result in fewer overtime hours and more productivity in the day for all your workers.
- With the DB Schenkersmartbox family you will receive a detailed overview of your freight around the clock & worldwide. Besides the realtime tracking via GPS and the recording of several different measured data, the DB Schenkersmart box family offers additional services :

The advantages for you at a glance:

- ! Real-time-tracking
- ! Online monitoring of e.g. temperature, humidity, light, G-Force, tilt, door alarm, movement, vibration
- ! Geo-Fencing
- ! Setting your own individual thresholds
- ! Easy and flexible installation procedures
- ! Reverse Logistics of device via air or ocean freight
- ! Consulting and Business Case analysis
- ! Customized reports and statistics
- ! Enhanced strategic process planning capabilities
- ! Improvement of operational processes
- ! Global network of product representatives and innovative partners
- ! Worldwide coverage with contact persons in each region and country



Why Warehouses Are Becoming Spatially Intelligent

Spatial intelligence solutions can help improve real-time operational visibility, enabling warehouse operators to increase worker productivity, asset utilization and safety. Location technologies can create an entire eco ecosystem surrounding IoT sensors, Warehouse operators can use location intelligence to streamline warehousing and fulfillment operations. Data points captured from sources including indoor positioning tools help to create a clear picture of how well warehouses are running.

E-commerce focused warehouses inherently require substantially more workers, space and transportation efficiency—differing greatly from traditional retail-focused warehouses. As a result, logistics and warehouse operators are looking for innovative solutions to increase worker productivity, asset usage and space utilization.

Cloud-based warehouse spatial intelligence (WSI) solutions—a new category of software solutions—have recently emerged. This new spatiotemporal approach combines unique spatial and real-time data (precise indoor location, HD images and videos, and advanced sensors) with advanced cloud-based analytics to gain actionable insights and automate decision making without human intervention. Following are some of the representative benefits that WSI-based solutions can bring to logistics and warehouses.

- Worker Productivity
- Asset and Space Utilization
- Loading Dock Efficiency
- Safety
- Integration with Robotics
- Connected Warehouses



Use of Tracking / Smart Technologies in Warehouse & Logistics

- RFID (Radio Frequency Identification) Tracking.
- Multi-Modal Technologies.
- Voice Tasking & Warehouse Efficiency.
- OAU (Optimal Asset Utilization)
- Predictive Assets Lifecycle Management.
- Streamlining Warehouse Lighting.
- IoT (Internet of Things)
- Drones.
- Robotics
- Warehouse Wearables –
 - Smart Glasses
 - Voice Headsets
 - Smart Watches



Smart Glasses

Smart glasses can provide an augmented reality interface for warehouse picking and packing solutions. Example applications for warehouse workers would be viewable order lists, barcode scanning and directional guides.

Voice Headsets

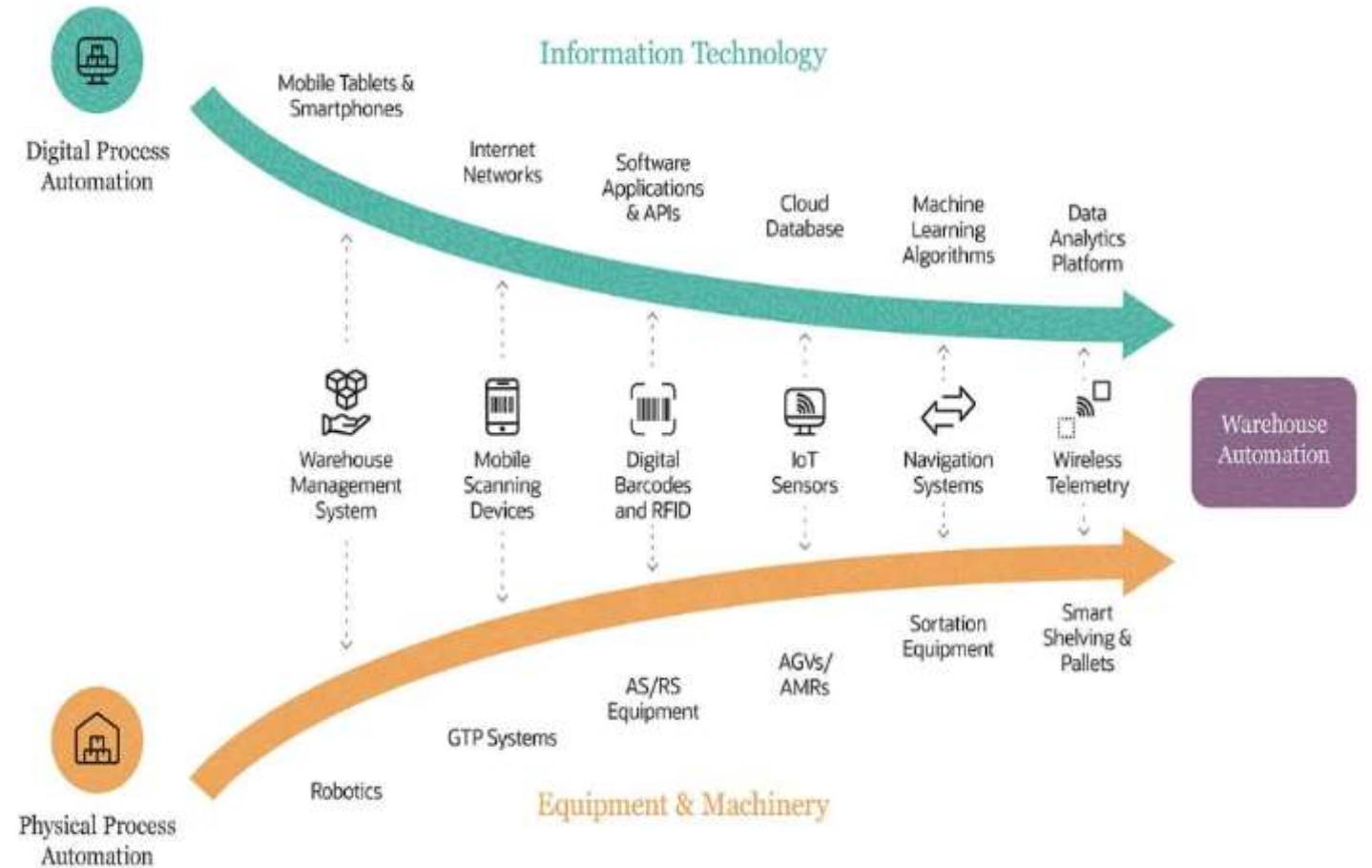
Voice control headsets are one of the oldest forms of wearable technology. A huge example application is provided above in the voice tasking section, allowing workers to maintain a dialogue with computer systems.

Smart Watches

There are many applications of smart watches that can be used in the warehouse. For example, pedometers can be used to increase efficiency by tracking the steps taken to perform operations in the warehouse by employees.

Warehouse Automation

- Automation can start with a warehouse management system (WMS), data collection and inventory control.
- While warehouse automation has significant upfront costs, there are many benefits, ranging from improving operations to minimizing human error.
- The future of automating the warehouse lies in robotics and integrating artificial intelligence (AI) onto the warehouse floor.
- Robots and humans work together to accomplish repetitive tasks while minimizing fatigue and injury



APAC ECO Program

OBJECTIVE:



Reduce Building CO₂



Manage Resource Effectively



Adopt Renewable Solution



APAC Eco Warehouses

- Eco Handbook & Guidelines for green features for new or exiting sites
- Resource Efficiency Programs, Targets and Manuals to operate green in place

TARGETS:



Energy -3% annually (kWh/m²)



Water -15%¹ (m³/hc)



Waste Recycling 60%¹

1

Track Site Consumption Data



2

Report Site Consumption & Cost Data



3

Analyze Site Resource Efficiency KPI's



4

Assess Improvement Measures



5

Improve Resource Efficiency, Reduce Emissions & Costs



Thank you!