



ENRICHING LIVES
BY REDEFINING JOB SITES

“Product Development leading us towards a more Sustainable future”



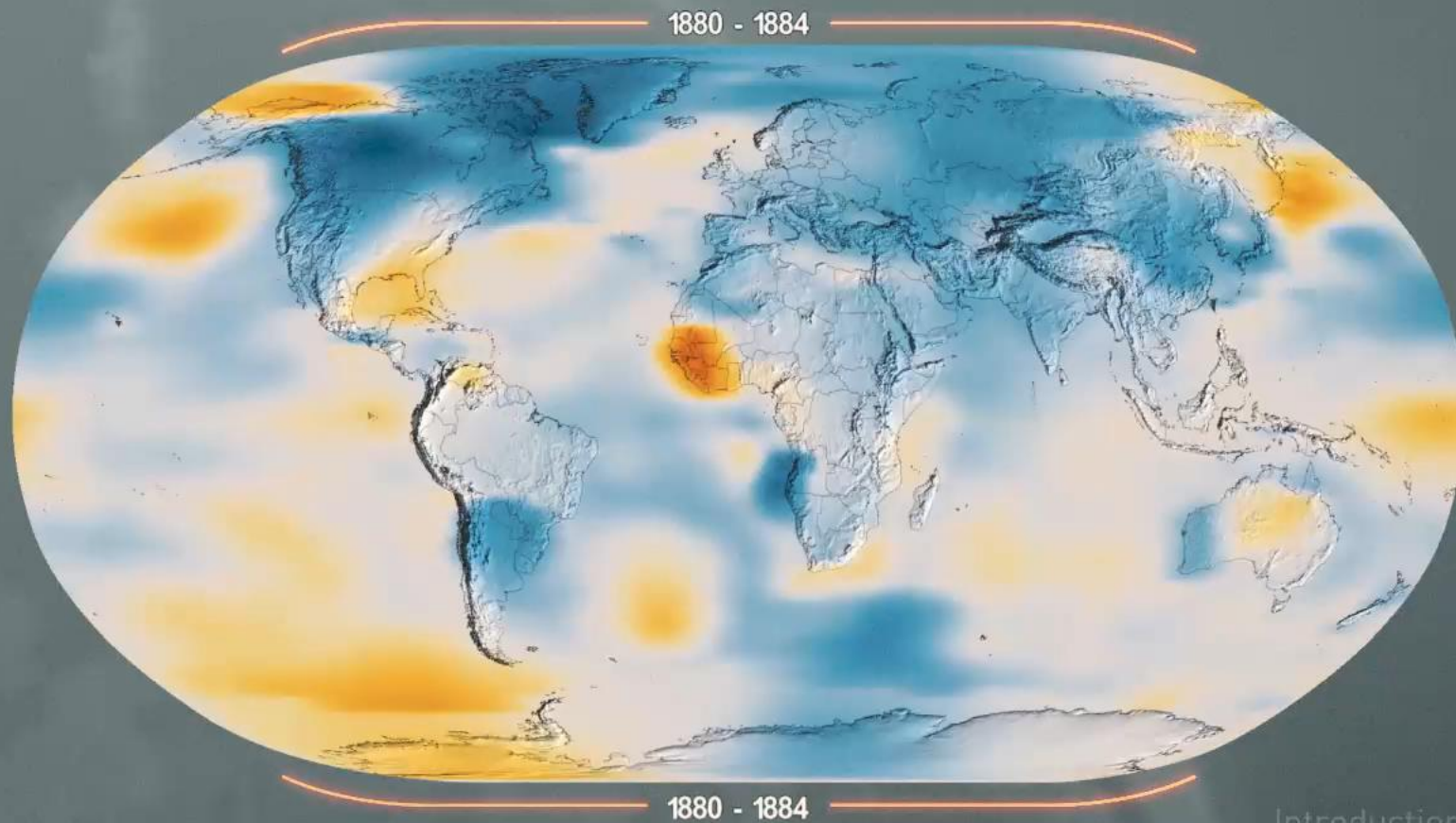
“Tino Sana” Wooden Bike

Introduction

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Change in Temperature
over 150 years

NASA



Introduction

Introduction

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Recognise ESG as a
strategic objective

Focusing our environmental
impact

E

Environmental



S

Social



G

Governance





Sustainability Efforts & Targets

Introduction

00 < >

Global environmental sustainability efforts



UN CLIMATE
CHANGE
CONFERENCE
UN 2021
we stand united with the world

UNITED NATIONS
PARIS CLIMATE
AGREEMENT
SIGNING CEREMONY
— 22 APRIL 2016 —



Dow Jones
Sustainability Index



From 2015 to 2025 Global Megatrends
have shifted significantly

Global Megatrends 2015 - 2020



Global
Marketplace



Productivity
Imperative



Sharing
Economy



Digital
Future



Urban
World

Global Megatrends 2021 - 2025



Shifts in Growth
and trade



Stronger
Societal Deal



Accelerating
Disruption



Digitally Powered
Customer



New Ways of
Working



COMMIT



DEVELOP

Introduction

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SCIENCE
BASED
TARGETS



OSHKOSH



SUBMIT



COMMUNICATE



DISCLOSE



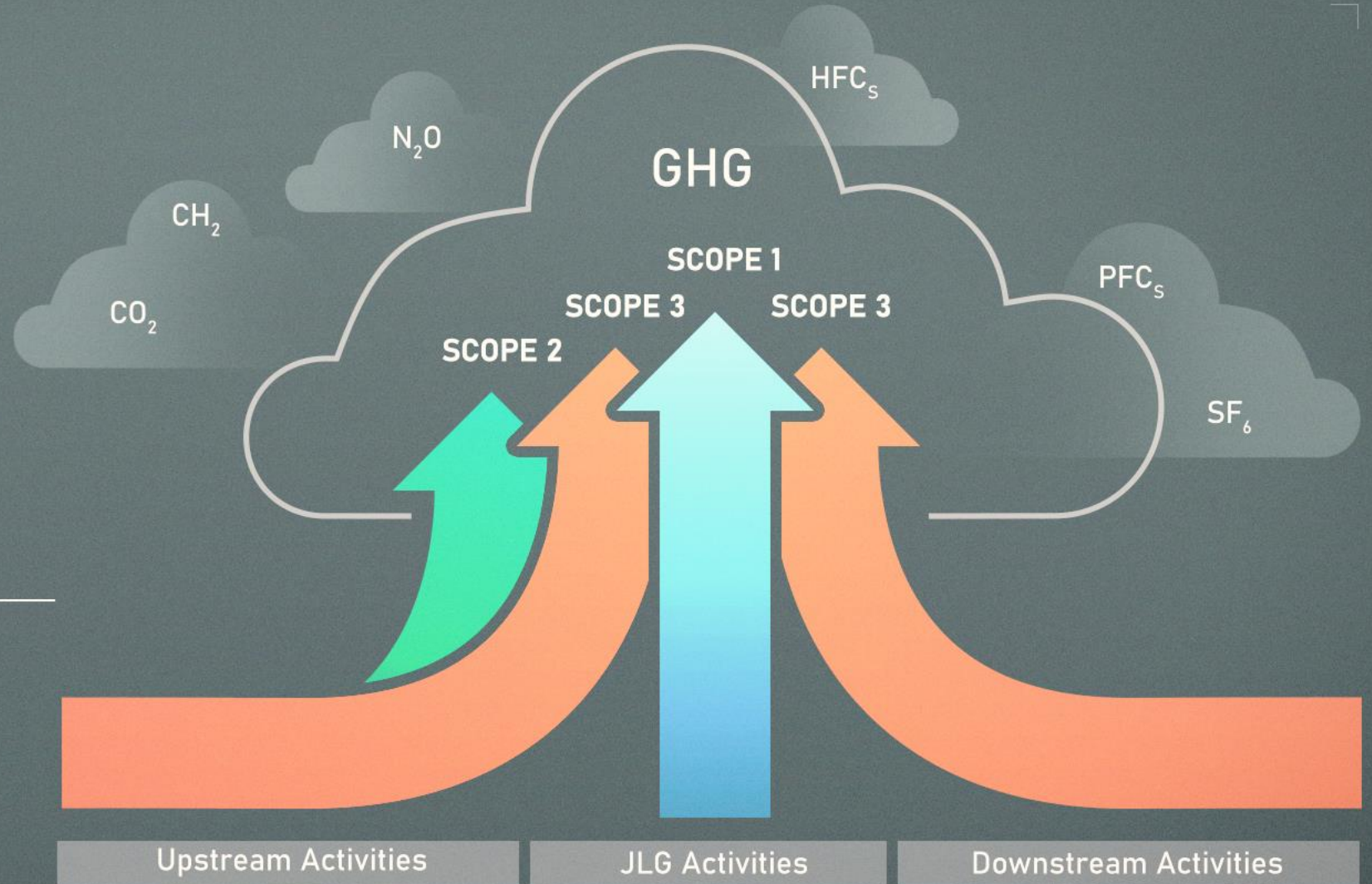
Scope 1, 2 and 3 emissions

Introduction

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What are
Scope 1, 2 and 3 emissions ?

How do they apply in the
construction Ecosystem



Introduction

Introduction

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The construction site of the
future is likely to look very different.



Introduction



Construction Site
of the Future

3

Efficient

2

Safe

4

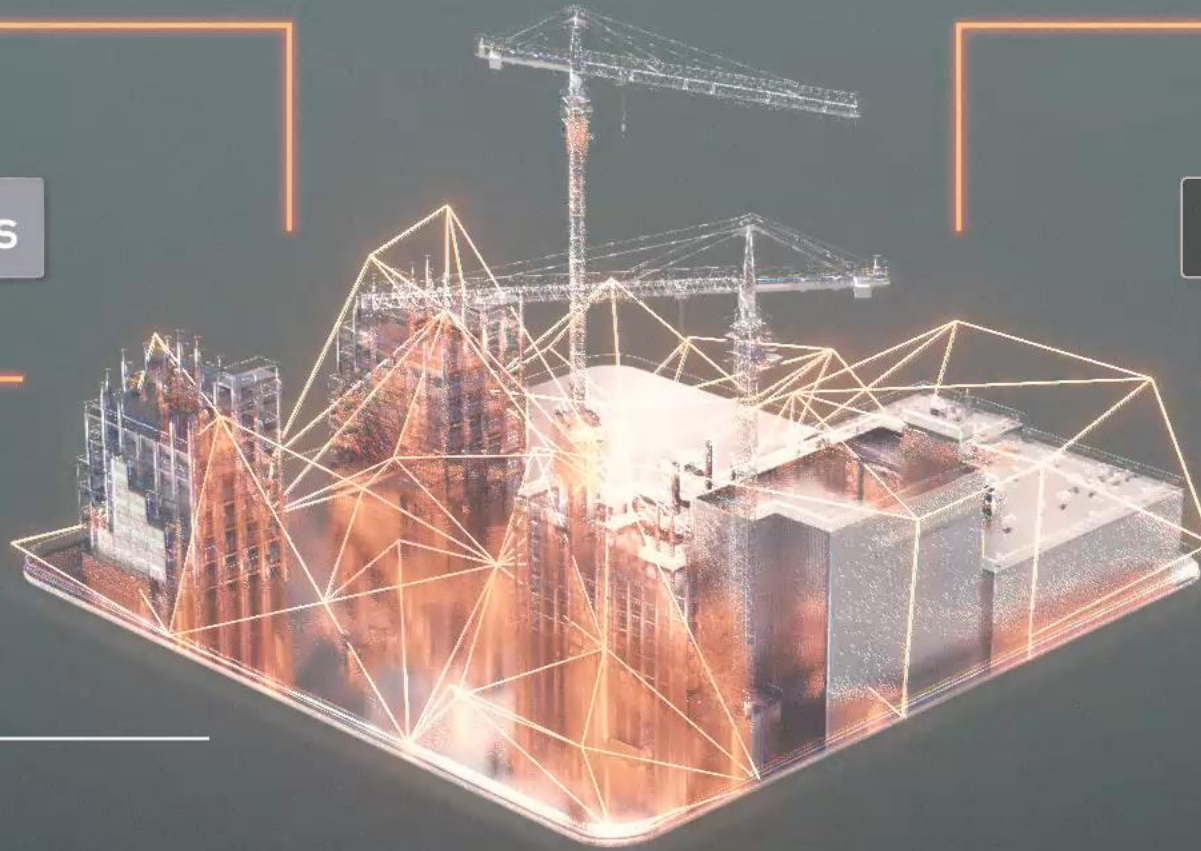
Connected

1

Zero Emissions

5

Automated



Introduction

00



Introduction

Introduction

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What is the Ecosystem ?

- Co-innovation
- Execution Focus
- Adoption chain



Introduction

Zero Emissions Equipment

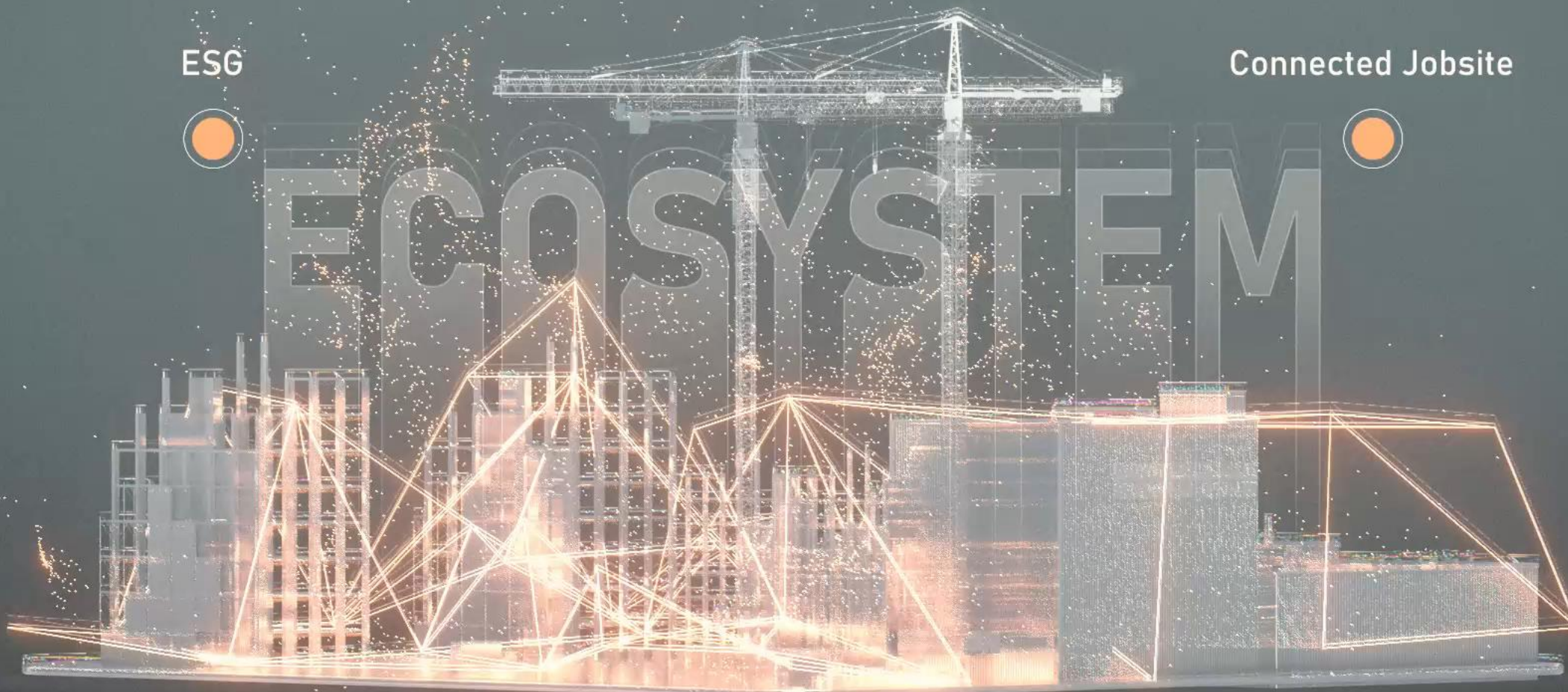
Regulations

Charging Infrastructure

ESG

Connected Jobsite

ECOSYSTEM



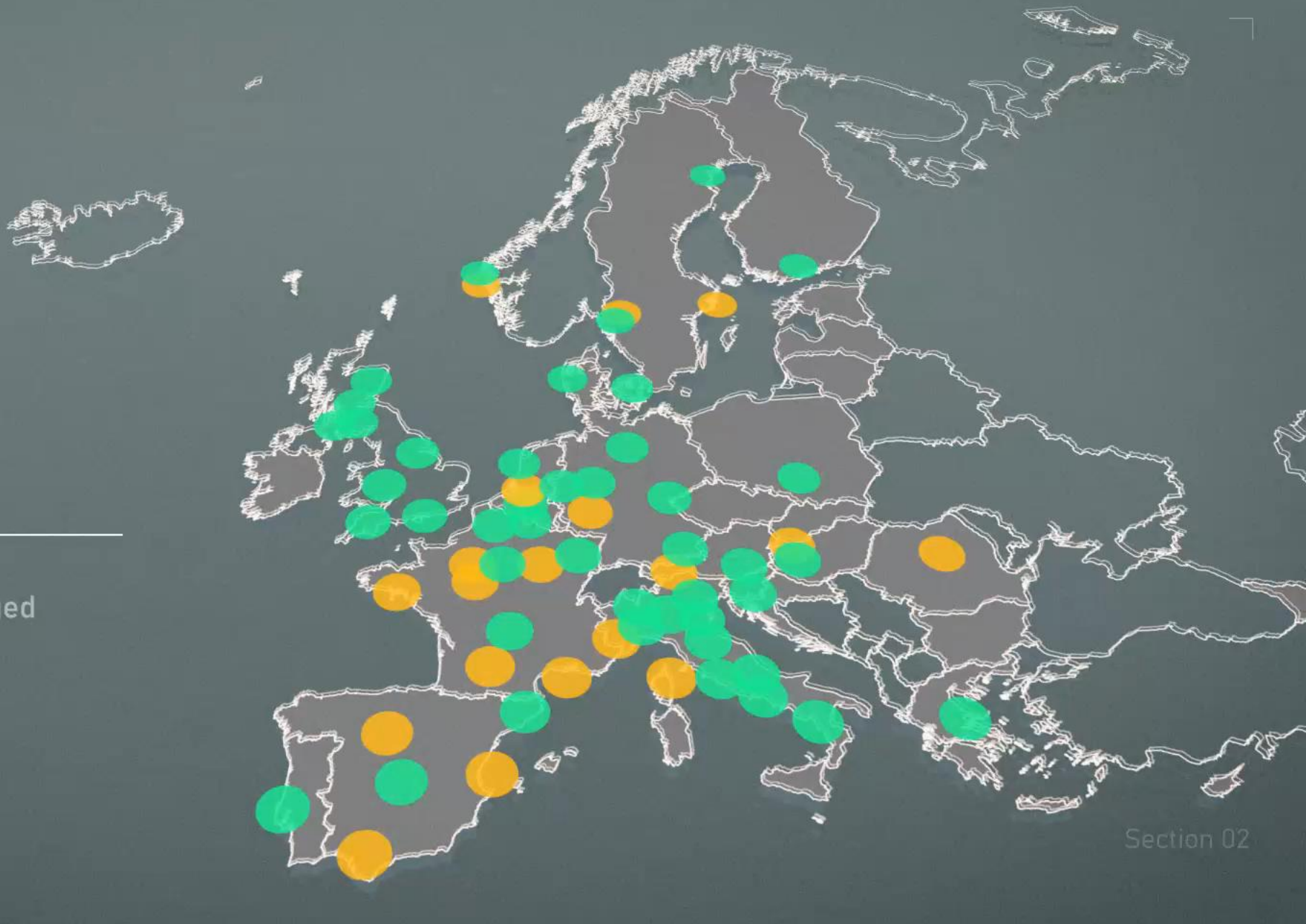
Section 02 <>

Creating Low Emissions Zones Via Electrification

Typically it's the job of the OEM
this idea might need to be challenged

● Low Emissions Zones

● Pollution Emergency



Zero Emissions Equipment

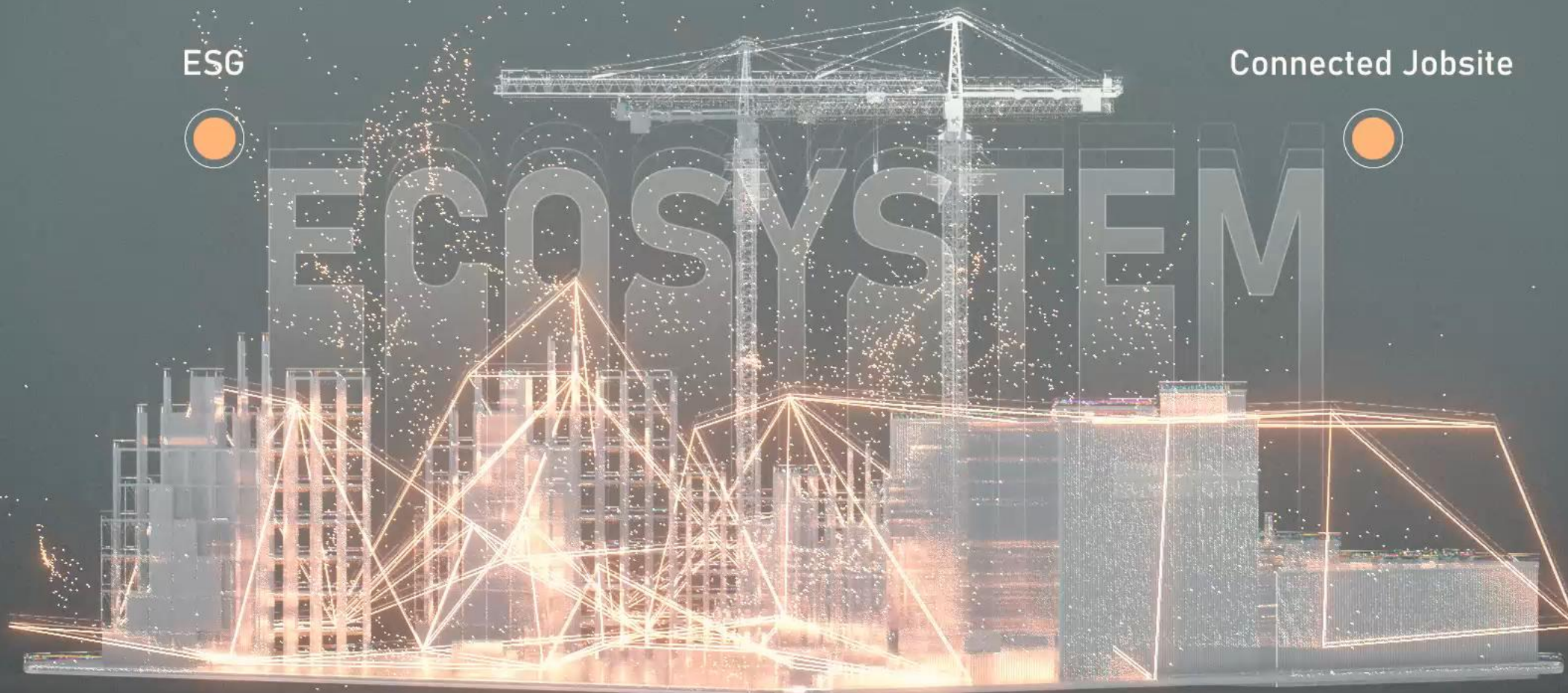
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ECOSYSTEM



Section **03**

In 2050 the emissions of GHG from Internal Combustion engines has been fully eliminated

Enabled By :

- Innovation from manufacturers
- Changes in working practices
- Abundant green energy supply
- Digitally connected jobsites

BATTERY
CONVERSION

Section 03



To achieve the Job site of the future
the work needs to start upstream

Implementing changes **will** have an impact
on Carbon footprint

Reduced Weight



Green Steel



Zero Emissions Tech

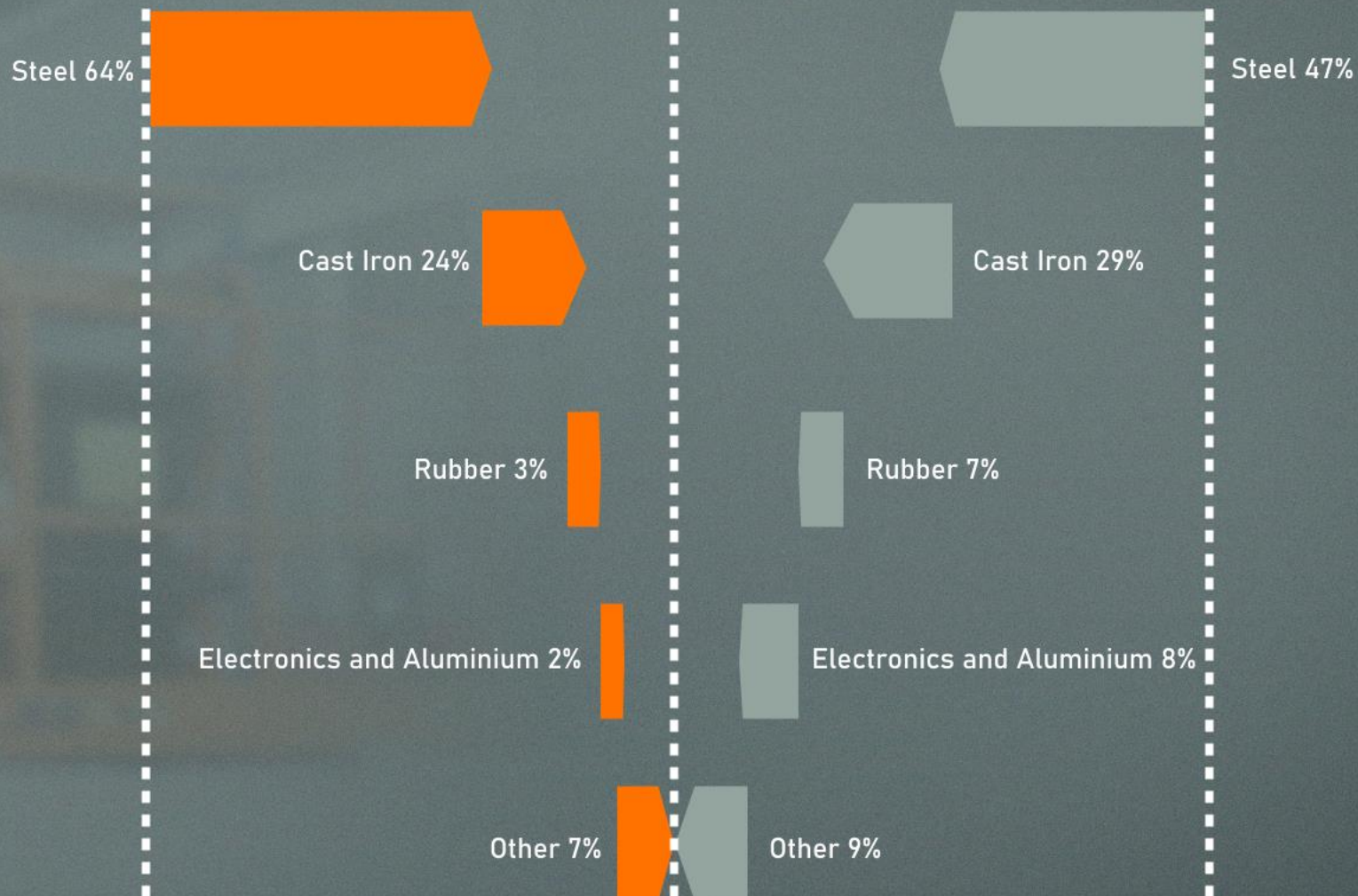


Section 03

Typical Boom lift CO₂e Taxonomy

Boom lift emission largely driven by steel

- Share of product gross weight
- Share of CO₂e emissions

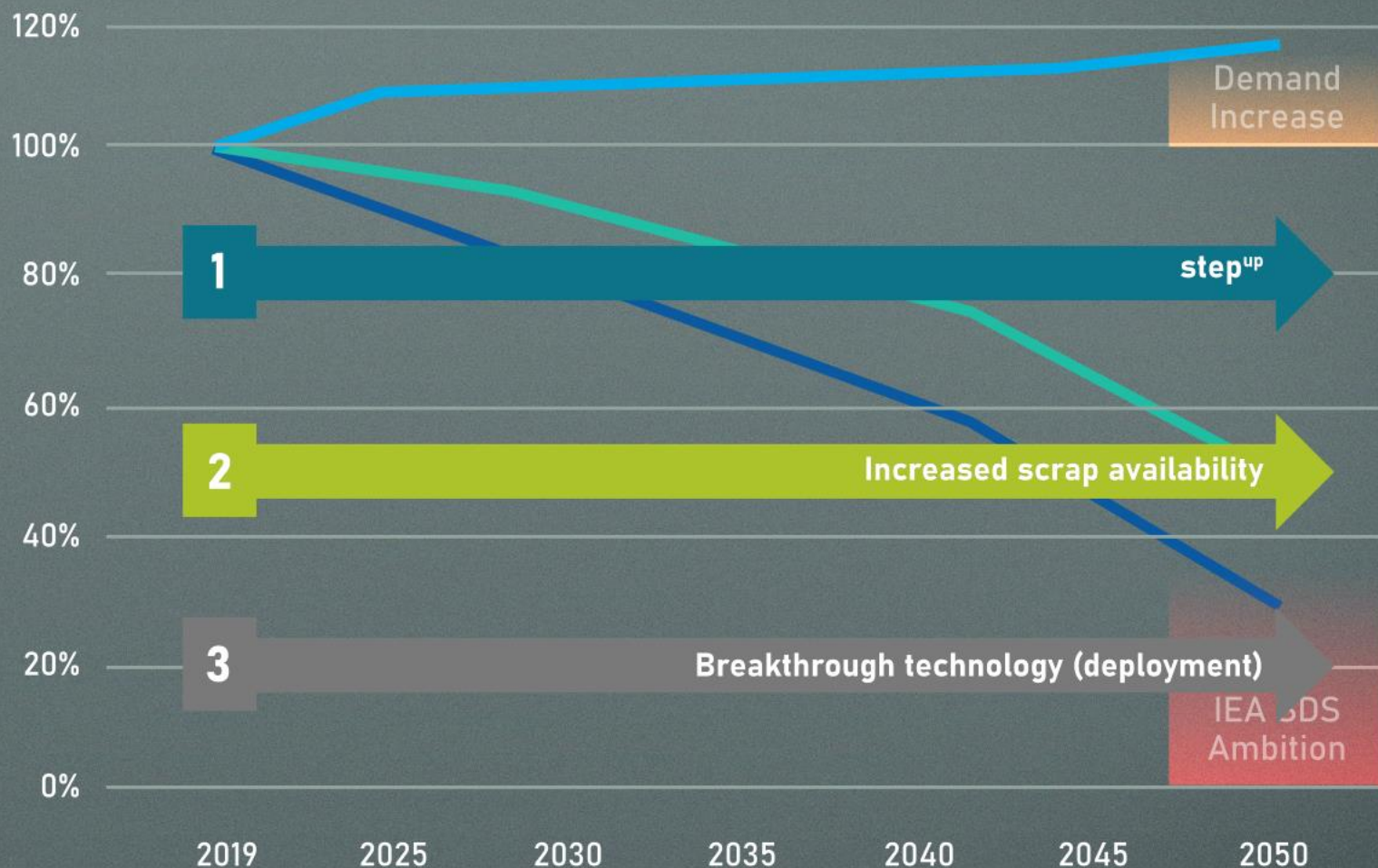


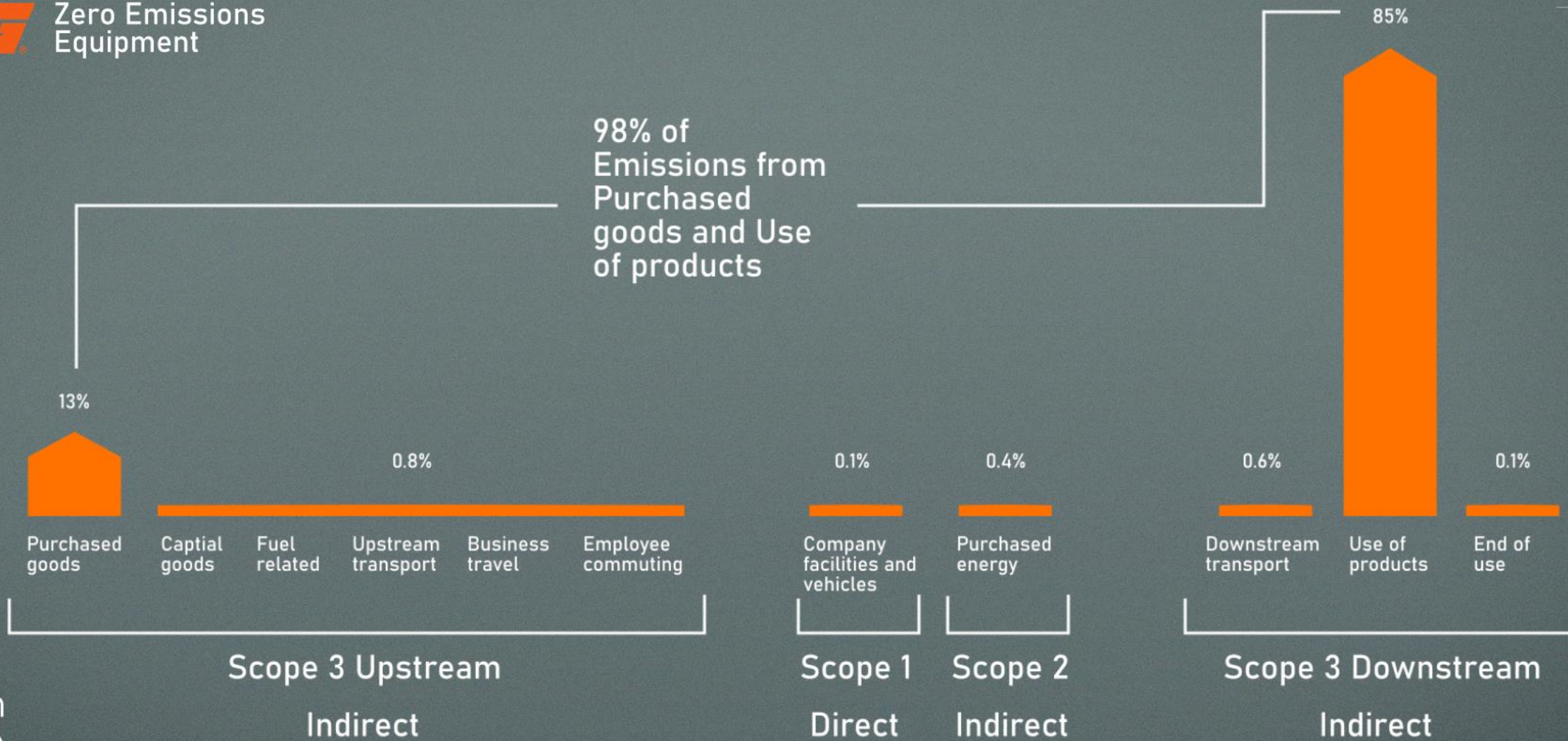
Section 03

Steel production total CO₂ emissions and CO₂ intensity

Based on data provided in the IEA's Iron and Steel Technology Roadmap, October 2020

- Steel production
- CO₂ emissions
- CO₂ intensity





Section **03**



Electrification Levels

- Traction Systems
- Accessory Systems
- Controls and sensing





Low - Level Acces

Compact Indoor Lifts



Scissors

Slab



100%



Rough Terrain



25%



Booms (Up to 24m)

Industrial



100%



Construction



10%



Booms (Above 24m)



5%



Section

03



Alternative Technologies vs. Engine Powered

Zero emissions is already under way. The industry has been producing
Zero Emissions machines for many years

Section 03



Low - Level Acces

Scissors

Booms
(Up to 24m)

Booms
(Above 24m)

24 - 48V System

Industrial

Construction

48 - 85V Systems

200V+ Systems

AGM / FLA to Li-ion

Section

03



Alternative Technologies vs. Engine Powered

Zero emissions is already under way. The industry has been producing
Zero Emissions machines for many years

Section 03

Zero Emissions Equipment

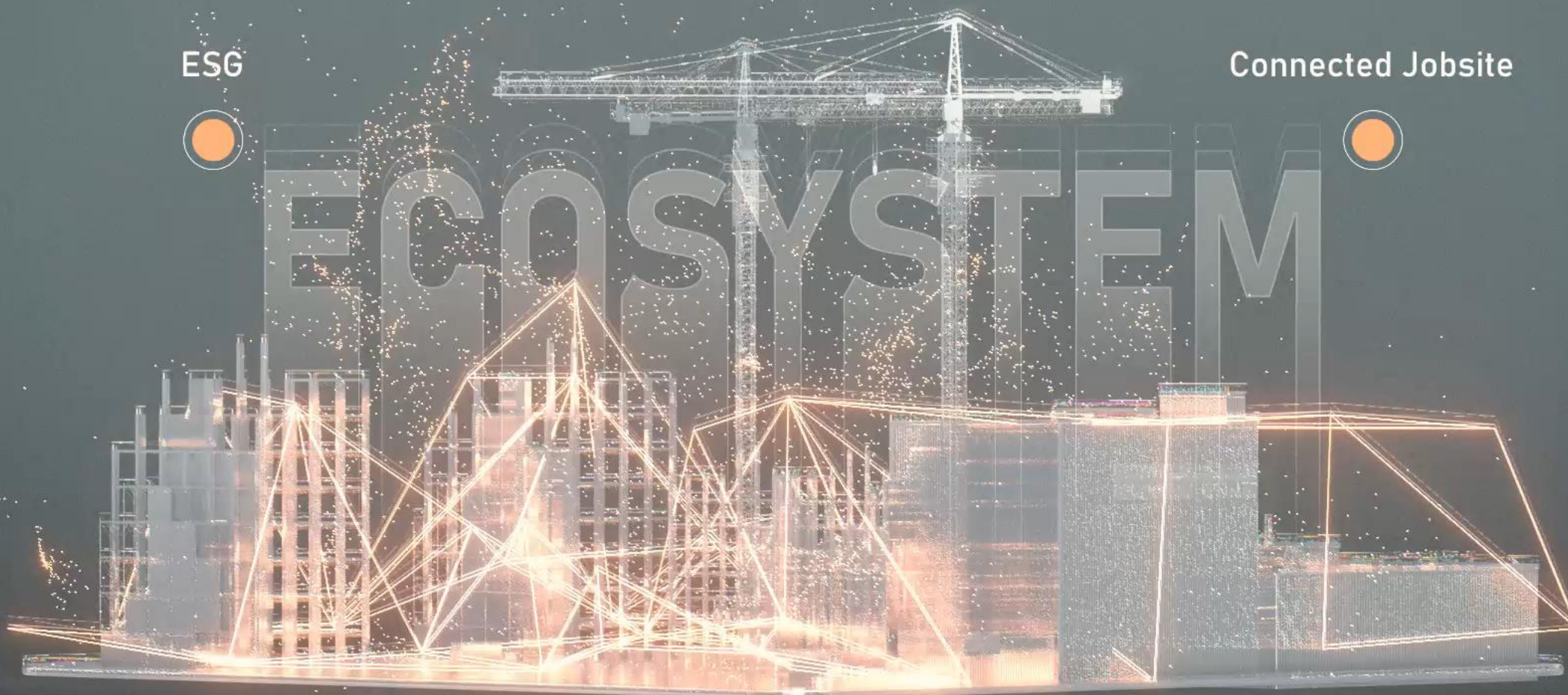
Regulations

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ECOSYSTEM



GENERATION



DISTRIBUTION



CHARGING

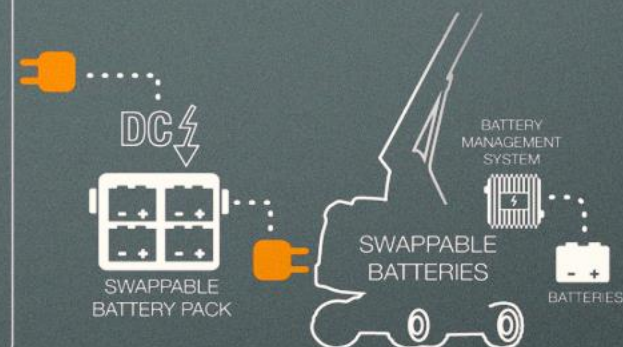
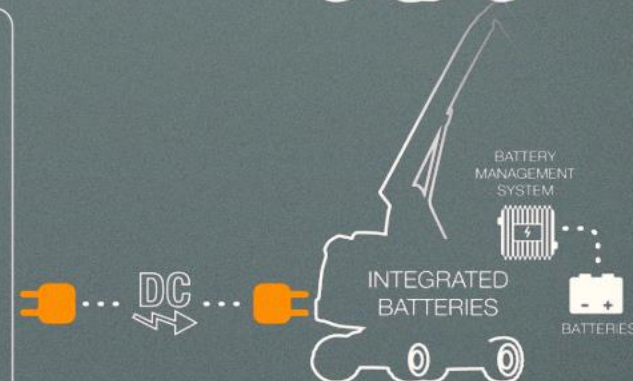
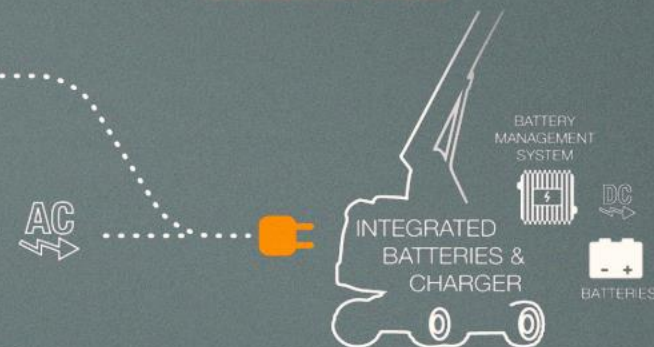


SEMI-STATIC POWER UNIT



MOBILE POWER UNIT

CONSUMPTION



Section 04 < >

Semi - Static Chargers

Is this the future
of the construction site ?

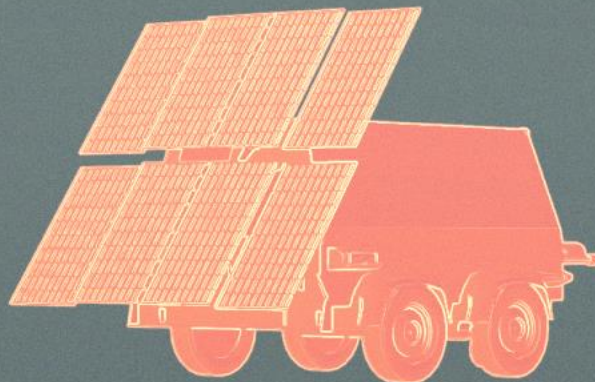
Section **04** < >

Examples of charging options

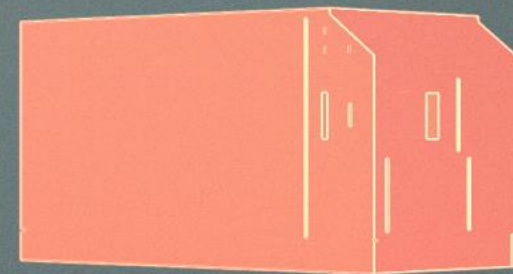
In both examples a standardised charging cable does not exist

***Depending upon battery capacity**

Solar Hybrid Generator



E - Generator



Pro's

- Can harness renewable energy
- Flexible options
- Portable (site to site)
- Multiple current capability










Con's

- Fixed position solar not optimised for energy harvest
- Charging only a few machines
- Fixed position on site
- Cost

Section
04 < >

Charging standards

Examples of global EV charging connector standards.

| | N.America | Japan | EU and rest of markets | China | All Markets except EU |
|----|--|---|--|---|--|
| AC |  |  |  |  |  |
| | J1772 (Type 1) | J1772 (Type 1) | Mennekes (Type 2) | GB / T | |
| DC |  |  |  |  | |
| | CCS1 | CHAdeMO | CCS2 | GB / T | Tesla |

Zero Emissions Equipment

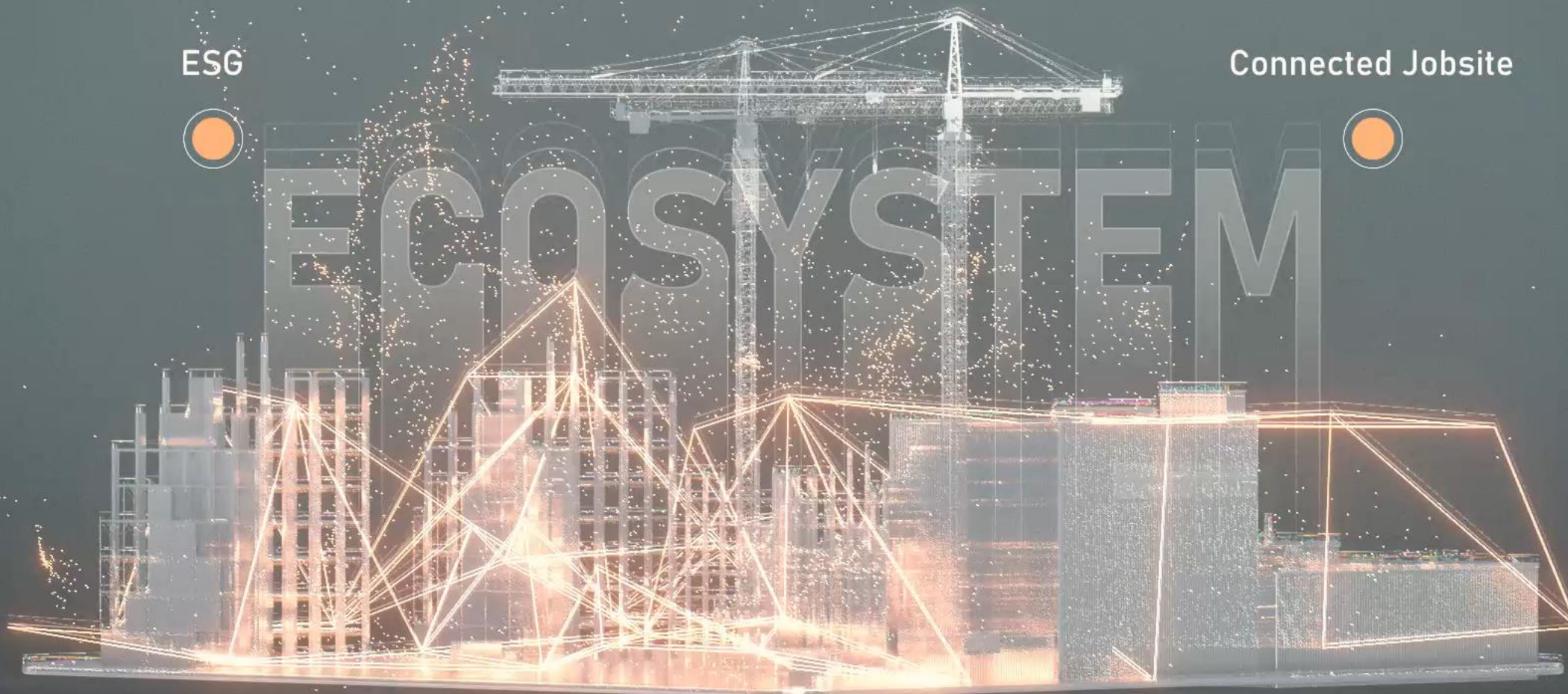
Regulations

Charging Infrastructure

ESG

Connected Jobsite

ECOSYSTEM



Section 05



The link between the physical and the digital world is getting stronger and stronger

- BIM
- Digital Twin
- Data Analytics
- Advanced Machine Telematics



Section 05

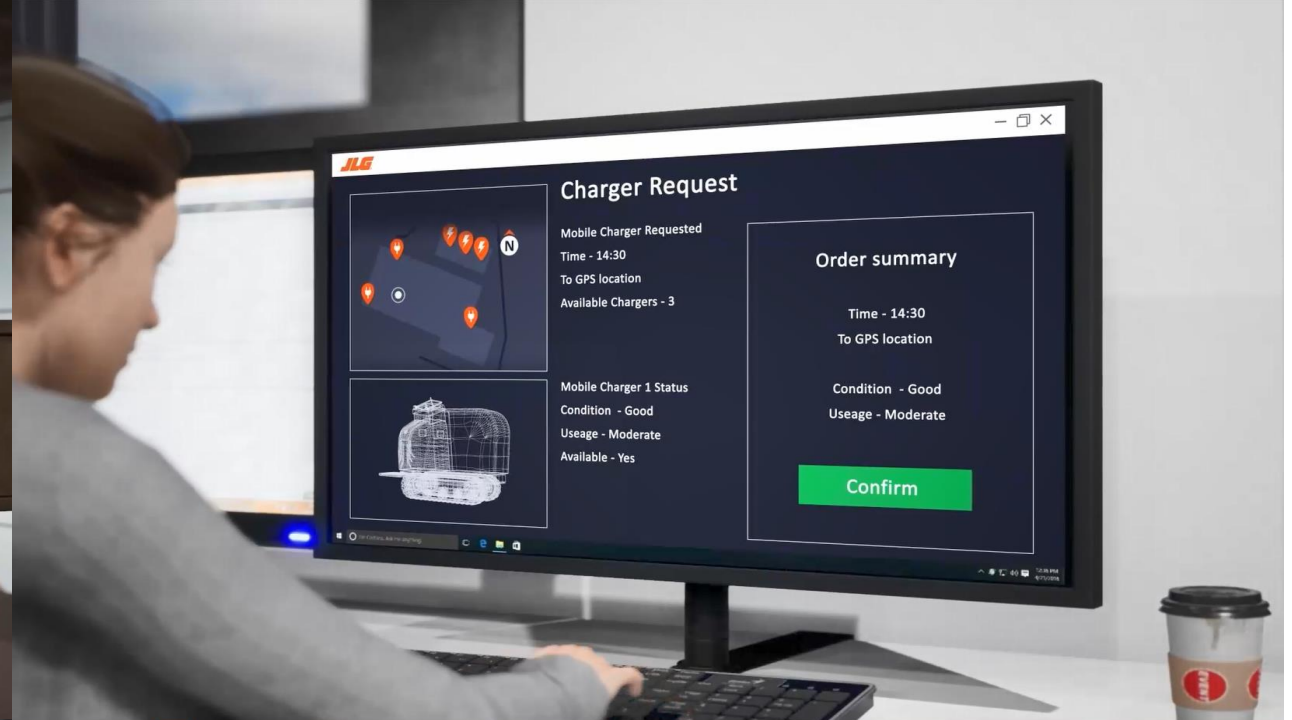
Play full JLG Around Me Video



AROUND
BY **JLG**

LOADING

Section 05



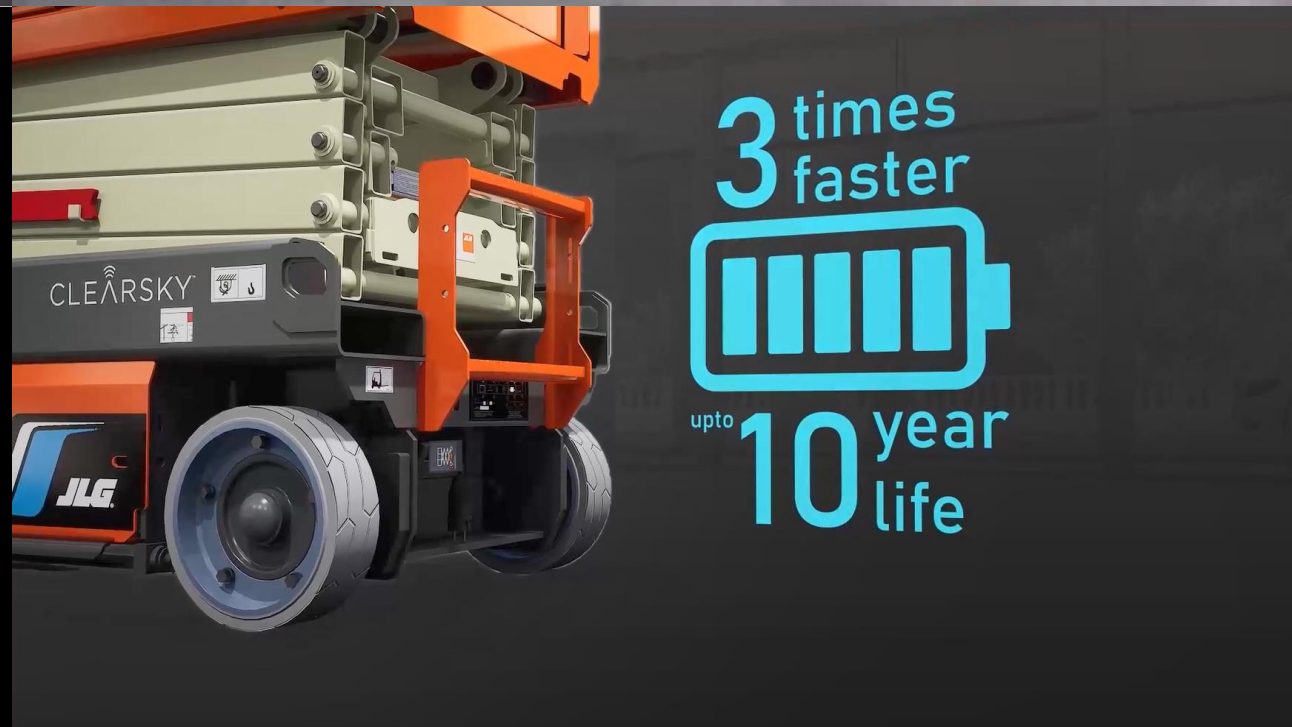
Section
05



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Section 05



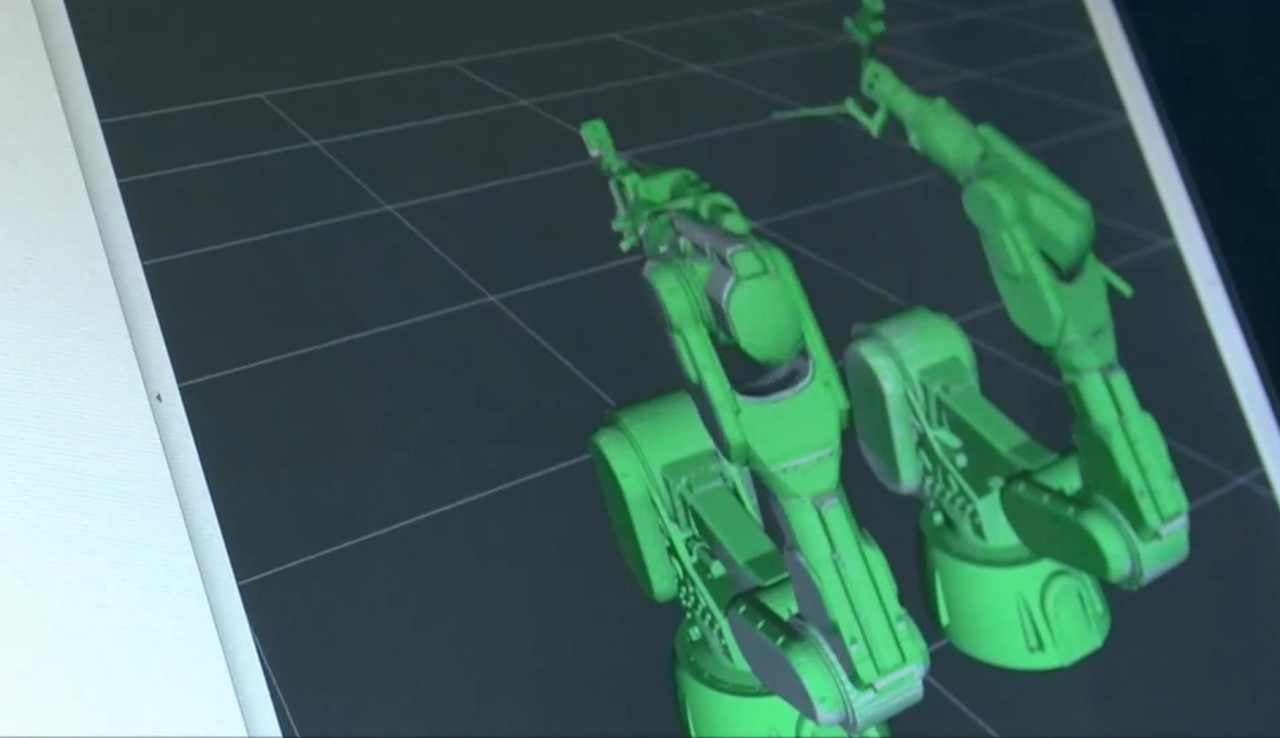
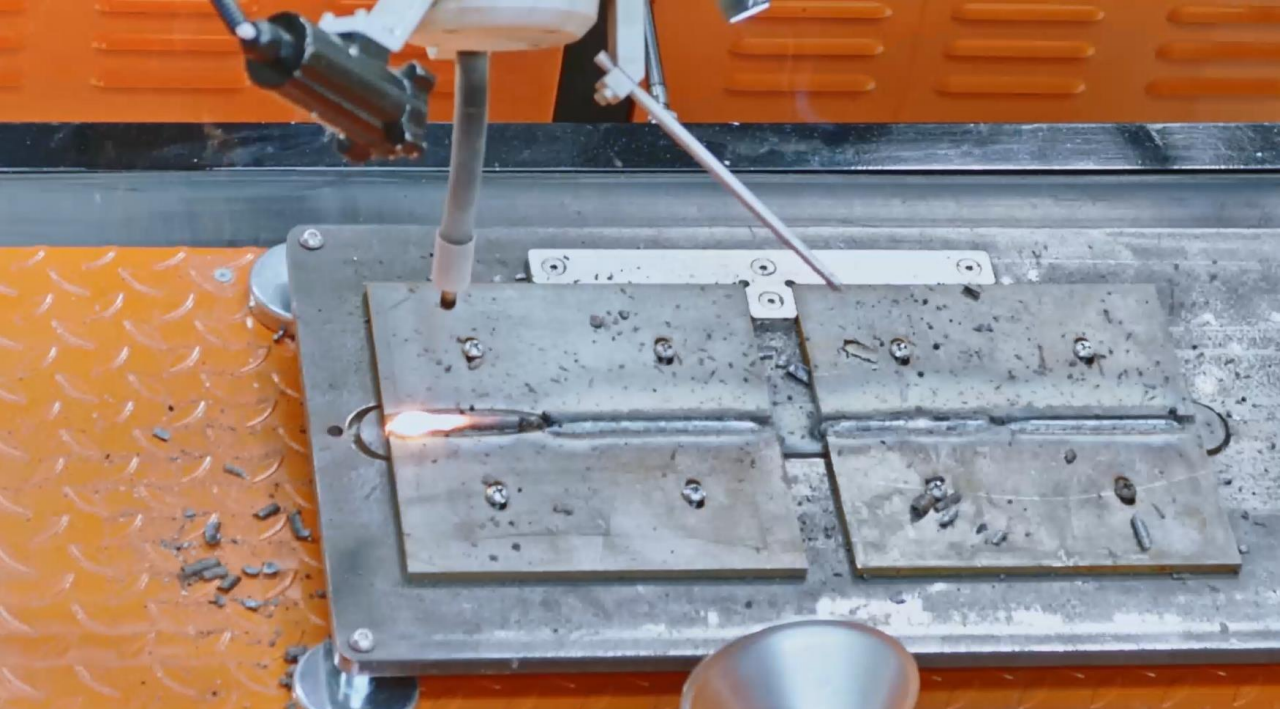
Section
05



Play Automation Video



Section 05



Section 05

Product design leads to sustainability

- Manufacturers know how to deliver Zero Emissions machines
- Operators and owners understand the challenges
- The demand is going to continue to increase
- The industry needs to learn how to take a holistic wide lens approach to deliver - ...

“The Zero Emissions value proposition to our end customers”





THANK YOU
FOR LISTENING