SIX Sustainable Industry X

MOBILE WORK MACHINES

KALMAR SANDVIK IOXIO SITRA VTT NOKIA VALTRA Junttan VALMET AUTOMOTIVE PONSSE

MoRE DATA

KiSun kiertotalouskahvit 1.2.2024

Pirkka Frosti / IOXIO

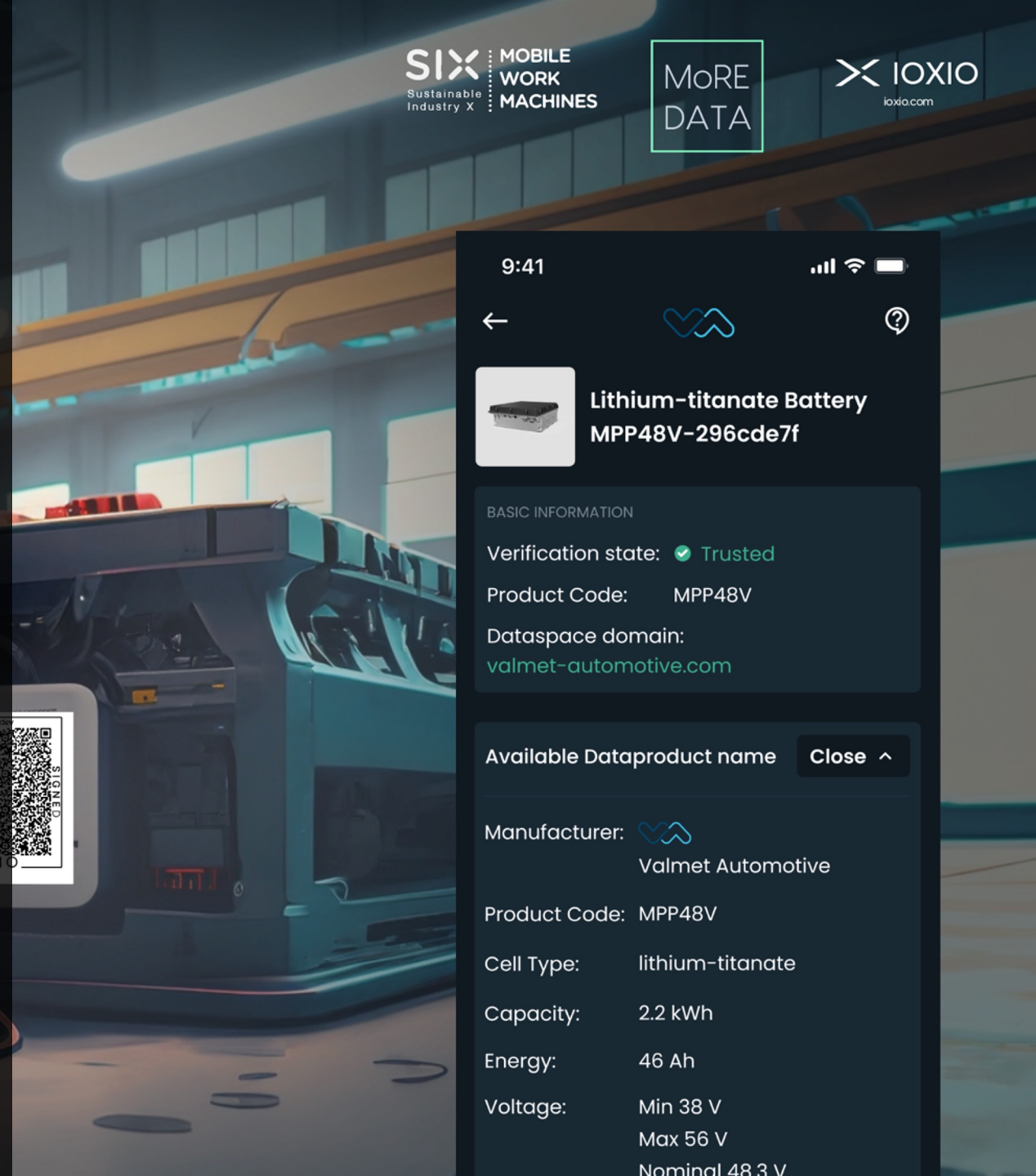
Objective of Pilot

The global industries must be able to lower their emissions and prove it all the way to the end customers. Rapidly electrifying work machines are helping global economy in mining, logistics, agriculture, forestry, and construction to meet the zero-carbon goals and lower emissions. The problem is that data can't be shared between various stakeholders in machines' lifecycle.

Sitra's funding enables to pilot the world's first battery passport for Movable Work Machines, showcasing **how complete lifecycle data can be linked to industrial batteries, machines, and users with the help of DPPs.**

The project provides a comprehensive example of how industrial data spaces and DPP can be utilized to deliver the EU Battery Directive and Data Act in practice.

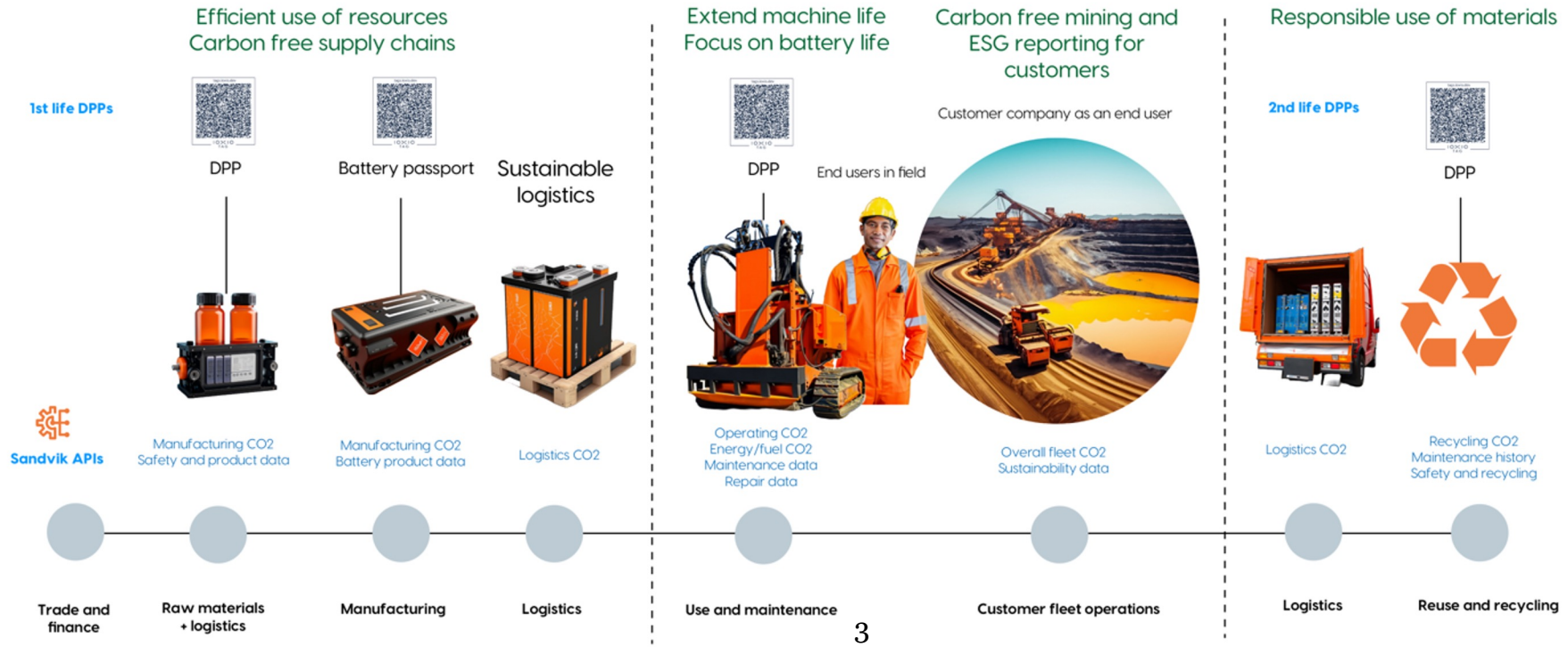
The SIX Movable Work Machines consortium, comprises of leading Nordic manufacturing companies such as Sandvik, Kalmar, Valtra, Ponsse, Junttan, Valmet Automotive, and Nokia.



We are testing how the DPPs can deliver the ESG data along the battery's lifecycle

How global end users in mines and ports can connect with machine's and battery's manufacturing ESG data just by reading the QR-code on the side of the machine

How the battery health data read directly from the battery QR-code can be used in sustainable finance of new batteries and to promote responsible 2nd life and recycling

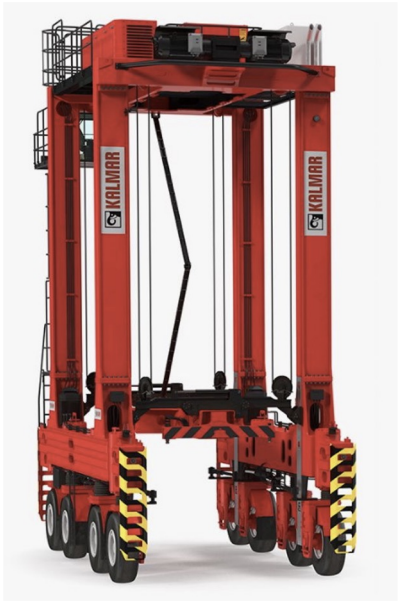


Pilot Companies: Sandvik and Kalmar

SANDVIK

The Sandvik Group is an international high-tech industrial conglomerate whose solutions enhance customers' operational productivity, profitability, and sustainability in the manufacturing, mining, and infrastructure industries.

Sandvik is piloting with the most advanced underground drill rig made in Tampere that makes it possible to reduce emissions in mines



KALMAR

Kalmar provides load handling solutions and services for ports, terminals, distribution centers, and heavy industrial use. Automation of terminals and energy-efficient container handling are pioneered by the company. Every fourth container globally is moved through the use of a Kalmar solution. Each of your transports is optimized through our extensive product range and global service network, and our ability to seamlessly integrate different terminal processes.

Kalmar is piloting with electrified straddle carrier used to make global ports more ecological

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MWM BATTERY DATA CONCEPTS

WHAT DATA EU WANTS IN BATTERY PASSPORT AND DATA ACT?

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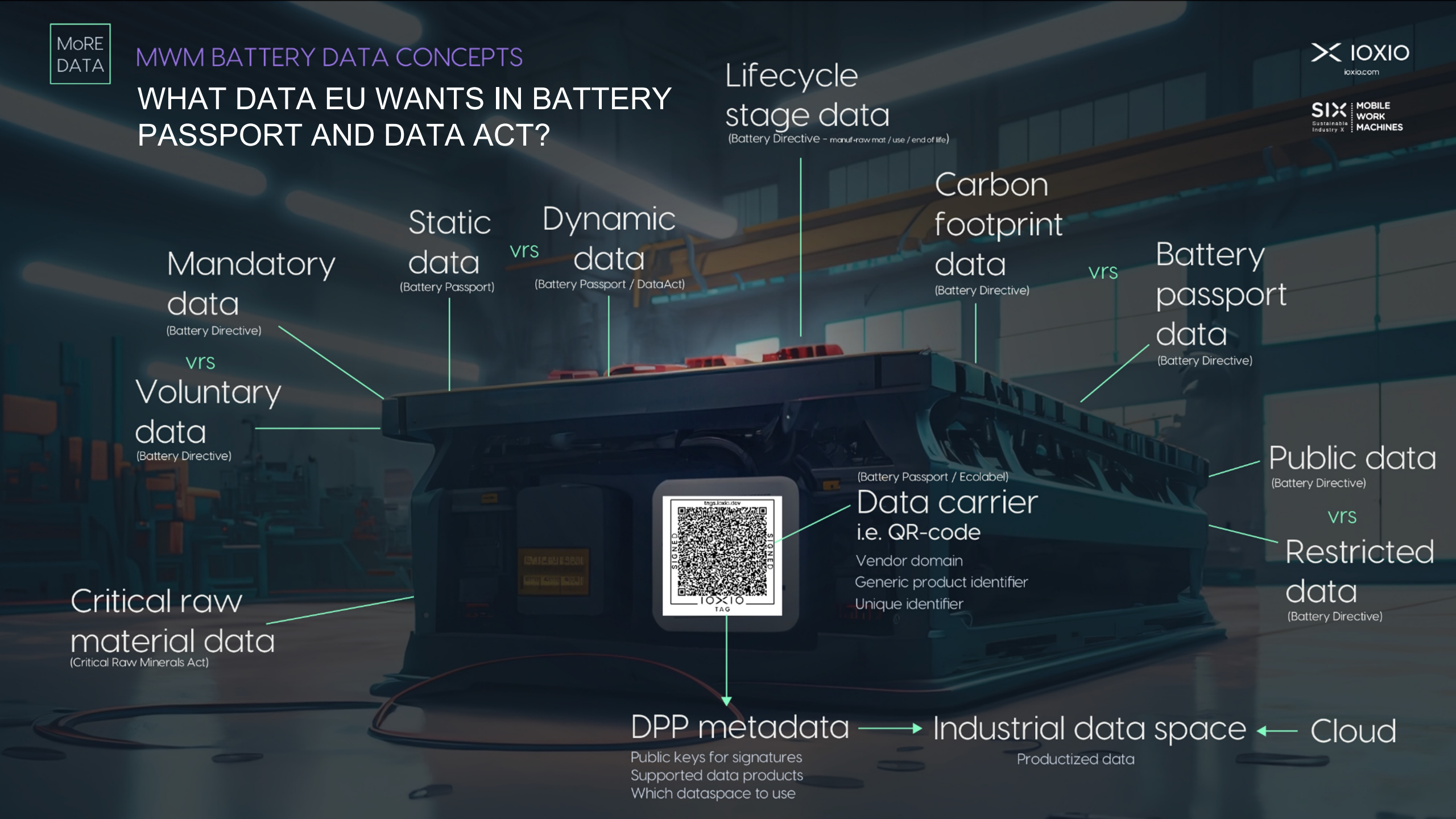
Lifecycle stage data
(Battery Directive – manuf-raw mat / use / end of life)

Static data (Battery Passport)
vrs
Dynamic data (Battery Passport / DataAct)

Carbon footprint data (Battery Directive)
vrs
Battery passport data (Battery Directive)

Mandatory data (Battery Directive)
vrs
Voluntary data (Battery Directive)



(Battery Passport / Ecolabel)
Data carrier
i.e. QR-code
Vendor domain
Generic product identifier
Unique identifier

Public data (Battery Directive)
vrs
Restricted data (Battery Directive)

Critical raw material data
(Critical Raw Minerals Act)

DPP metadata → **Industrial data space** ← **Cloud**
Public keys for signatures
Supported data products
Which dataspace to use
Productized data

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TEST USE CASES FOR SANDVIK'S FIRST BATTERY PASSPORT DPP PILOT

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UC1 DL422iE Jumbo is delivered to a new customer with FZSoNick battery and battery passport

(DPP/ESPR/EU Battery Directive)

Supply chains | Manufacturing and shipping | 1st life

Battery manufactured

Machine manufactured

DPP issued for machine and battery

Leaves as-built from factory

Customer reads the as-built data with DPP

APP1 IOXIO Tags Scanner

APP2 Sandvik UI (TBD)

Battery/CarbonFootprint
Battery/ManufacturingDataSheet

MobileWorkMachine/EnvironmentalFootprint
MobileWorkMachine/Drill/ManufacturingDataSheet

DS2 Sandvik "Product" API

DS3 Sandvik "BMS cloud" API

Battery/HealthData

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Industrial DataSpace

DS4 Bank API

Battery/Rating (TBD with [redacted])

DS1 Battery OEM API (FZSoNick)

UC2 Battery health data is accessed with DPP in 1st life use

(DPP/ESPR/EU Battery Directive + EU DataAct)

2nd life / recycle

Battery is being used and charged

Machine shares the data in cloud

Customer evaluates the battery health with DPP

EUC1 External use case with [redacted] Customer can access also the battery financial data *(e.g. risk/value)*

Sandvik shares battery manf. + health data with a bank *(customer consent)*

Bank assess the battery

Customer sees also the bank data with DPP

Kalmar and Sandvik are the first in the world to demonstrate the use of DPP in real test machine environments in February

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FZSoNick 48 TL200

BASIC INFORMATION

Verification state: Trusted

Product code: sodium-ion-75kWh

Identifier: 660e8400

Dataspace domain: sandbox.ioxio-dataspace.com

Carbon Footprint — Fetch

Manufacturing Data Sheet — Fetch

Health — Fetch

Battery value — Fetch

Made by IOXIO

9:41

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Sandvik DL422iE

BASIC INFORMATION

Verification state: Trusted

Product code: 177389-09633

Identifier: RP5SN0190A1

Dataspace domain: sandbox.ioxio-dataspace.com

Manufacturing Datasheet — Fetch

Environmental Footprint — Fetch

Made by IOXIO

9:41

SANDVIK

Sandvik DL422iE

BASIC INFORMATION

Verification state: Trusted

Product code: 177389-09633

Identifier: RP5SN0190A1

Dataspace domain: sandbox.ioxio-dataspace.com

Manufacturing Datasheet — Close

Returns the manufacturing data sheet of a Sandvik underground drill rig

Product Name: BEV Longhole Drill

Manufacturer Information: Sandvik Plc

Boom coverage: 3 m

Tramming distance: 3 km

Hole Length: 54 m

9:41

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Sandvik DL422iE

BASIC INFORMATION

Verification state: Trusted

Product code: 177389-09633

Identifier: RP5SN0190A1

Dataspace domain: sandbox.ioxio-dataspace.com

Manufacturing Datasheet — Fetch

Environmental Footprint — Close

Returns the manufacturing emissions of a underground drill rig

Pre Production Footprint: 2345.7 CO2e/kg

Main Production Footprint: 3504.4 CO2e/kg

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THANK YOU

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