

1918 - - - - - 2021

Industry

AARBAKKE 



The World's Most Sustainable

Within 2025

100 years





Aarbakke Smart Factory

The Learning Factory



Monza:engine

Monza Gateway
Customer service desk

Monza APS
Aarbakke Planning System

Monza SAFE
Production: Safe, Fast and Effective

Monza Q
Quality barriers

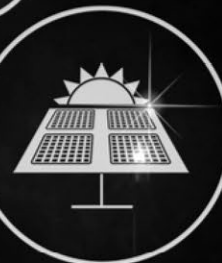
Monza Evidens
Manufacturing and product documentation

Monza Cargo
Goods receipt, shipment and warehouse

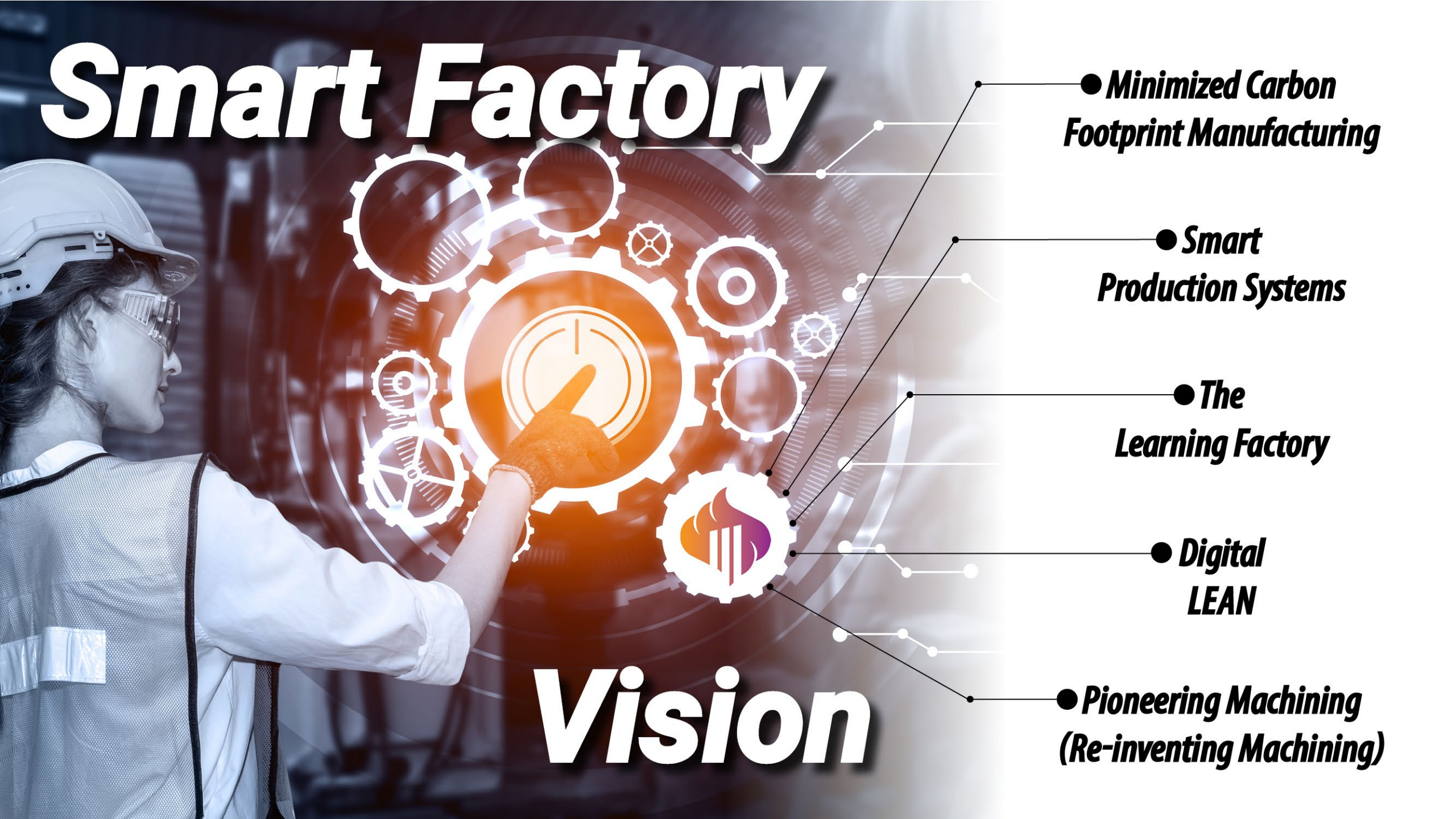
Monza Sales
Bid and proposals

Monza Pit Stop
Non-conformance and exceptions

Powered by:



Smart Factory



● ***Minimized Carbon Footprint Manufacturing***

● ***Smart Production Systems***

● ***The Learning Factory***

● ***Digital LEAN***

● ***Pioneering Machining (Re-inventing Machining)***

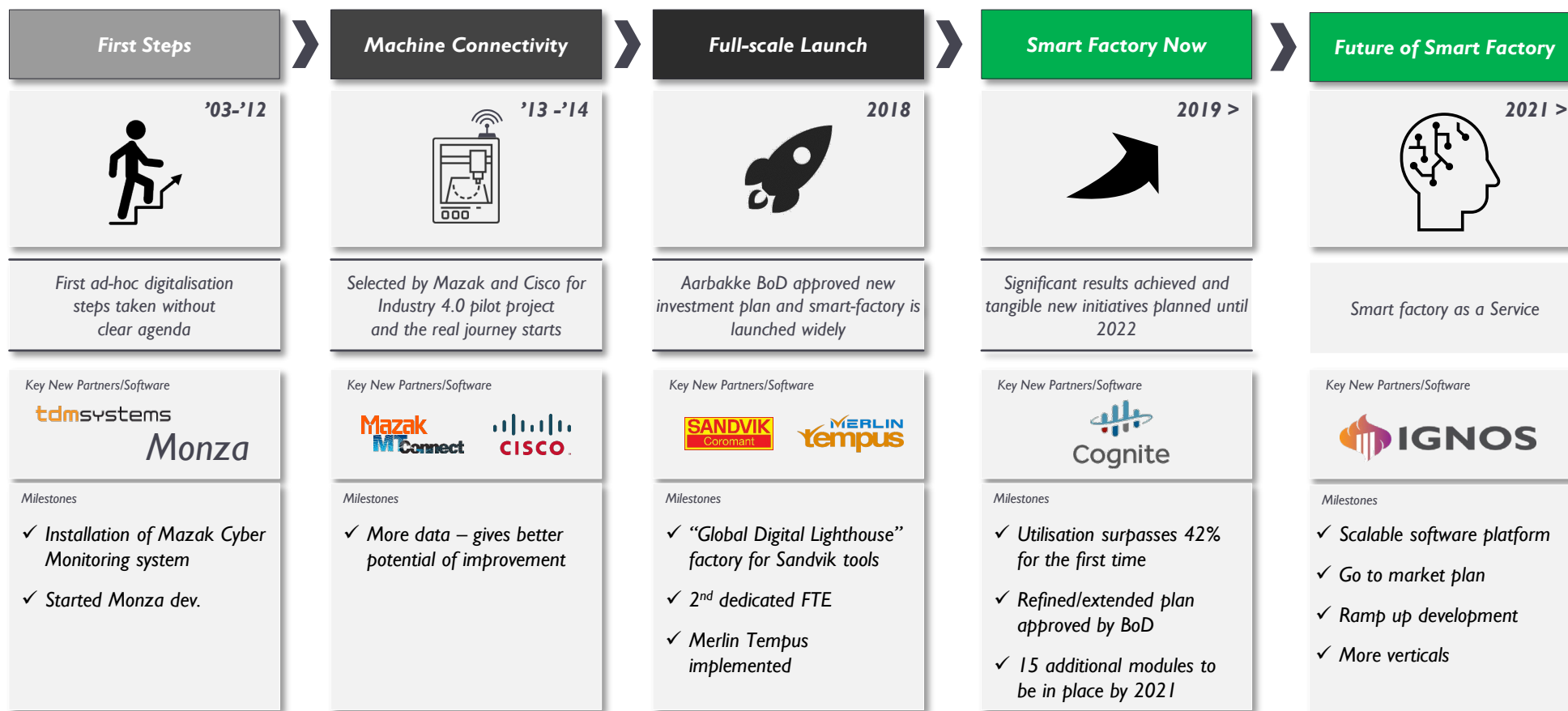
Vision



***“Sustainability is
a challenge to be
solved by the use
of data”***

- Deliver digital innovation thanks to IIoT connectivity and smart manufacturing.
- Trust, transparency and traceability in the data.
- Integrated solutions
- Digital trust and responsibility from workers

DEVELOPMENT SMART FACTORY

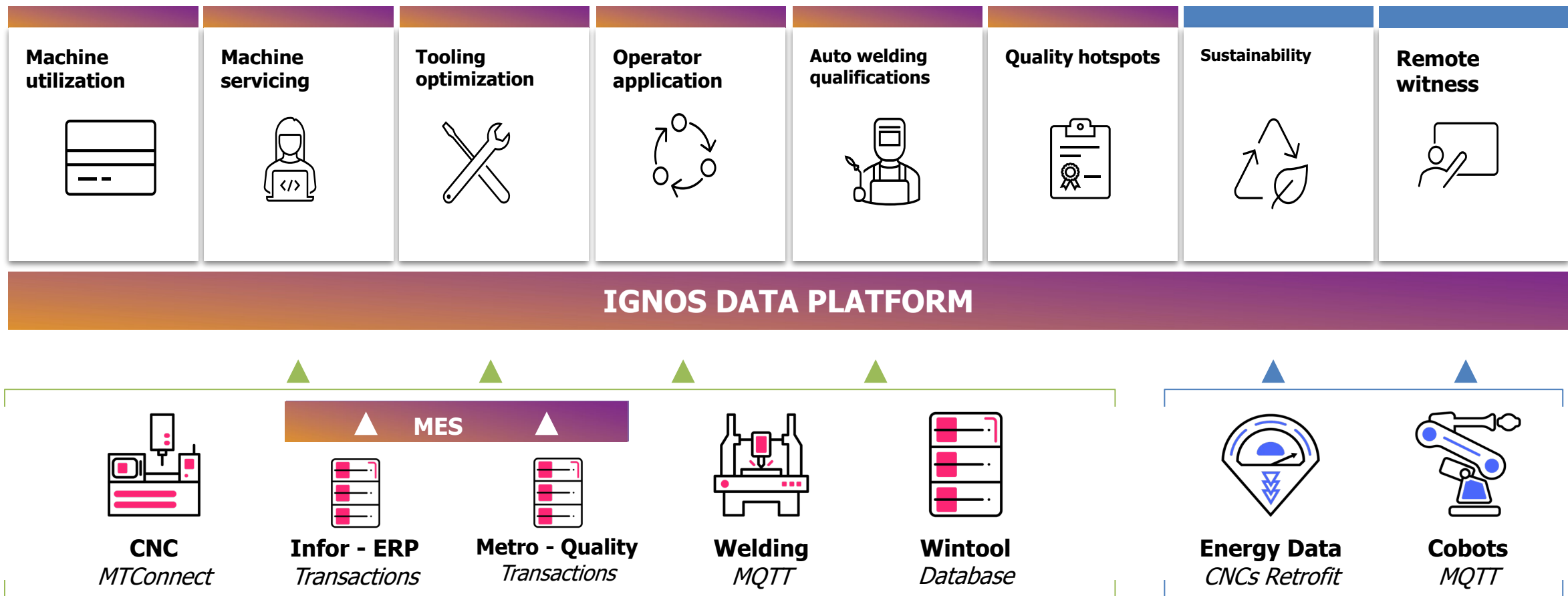


STRATEGIC PARTNERS

- Key strategic partnership to complement Aarbakke's deep expertise in machining and operations
- Focuses competence and efforts on core business
- Generates an ecosystem that creates organic benefits through connections between partners and technologies
- Too many digitalization programs end up "Lost in translation" With our model we avoid this



SMART FACTORY AS A SERVICE



The Key? Employees

NØKKELEN – DE ANSATTE

- Data er kilde til all forbedring
- LEAN er sunn fornuft satt i system og rammer
- Digitalisering / LEAN må drives fra gulvet og opp
- LEAN må være enkelt
- Nytt tankesett for de ansatte
- La de ansatte selv få tilgang til data
- Digitalisering er ingen trussel for ansatte
- Ikke vær redd for å gjøre feil, feil er de dyreste og beste kursene
- Fornuftige KPI

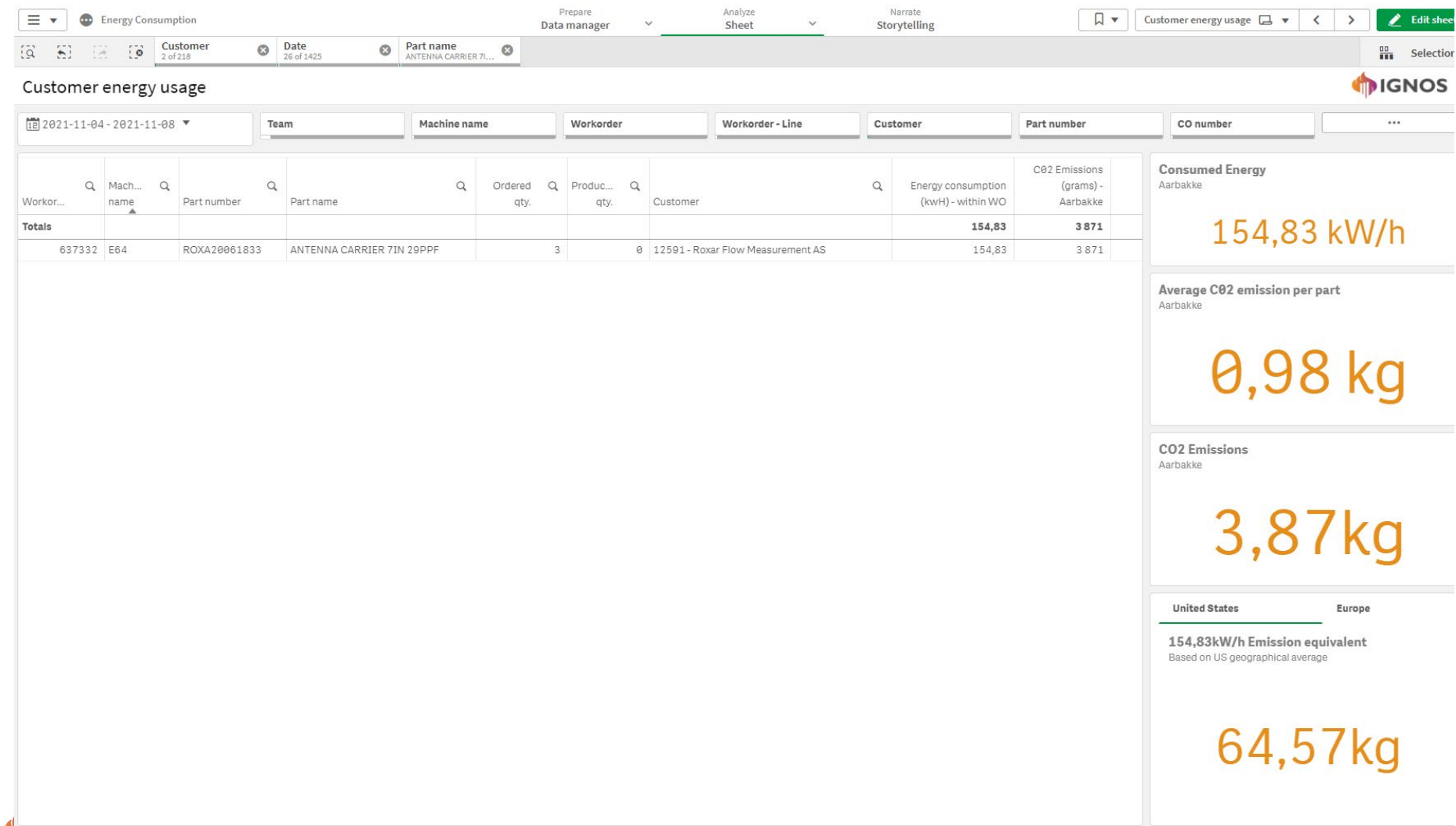
DIGITALISERING GIR PROFITT

- 22% økning i maskinutnyttelse (fra 35% til 45 %)
 - 2-5% mindre maskinkostnader
 - Mer enn 10% Førre kvalitetsavvik
- Servicekostnader redusert 20-30%
- Forventer ~60% reduksjon i verkøylager.
- Mer salg
- Mindre fotavtrykk
- Lavere kostbase (mindre investeringer)

KILDE: AARBAKKE



USE CASE: EMISSION CONTROL AND ENERGY MONITORING



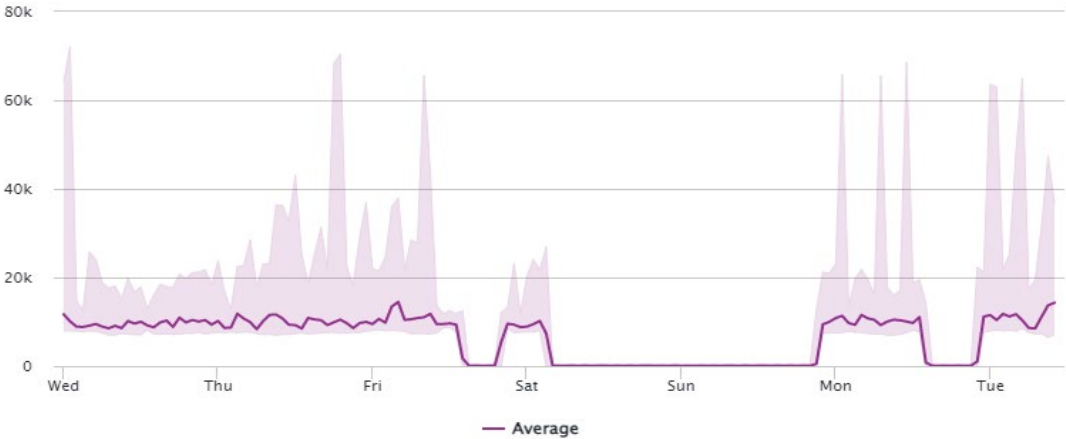
ENERGY CONSUMPTION / SUSTAINABILITY

Total consumption
2095 kWh

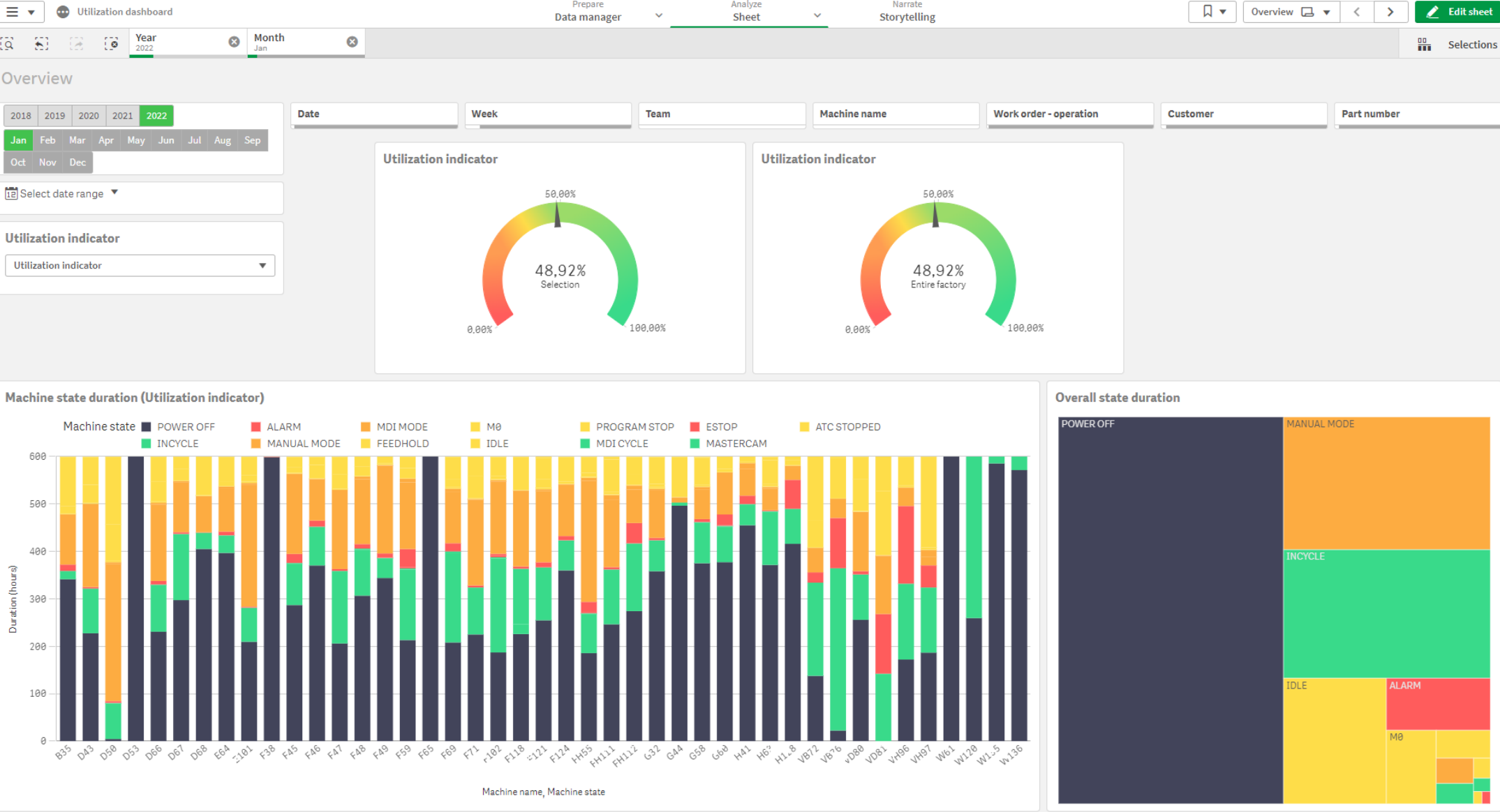
CO₂ Equivalent
52.4 kg CO₂



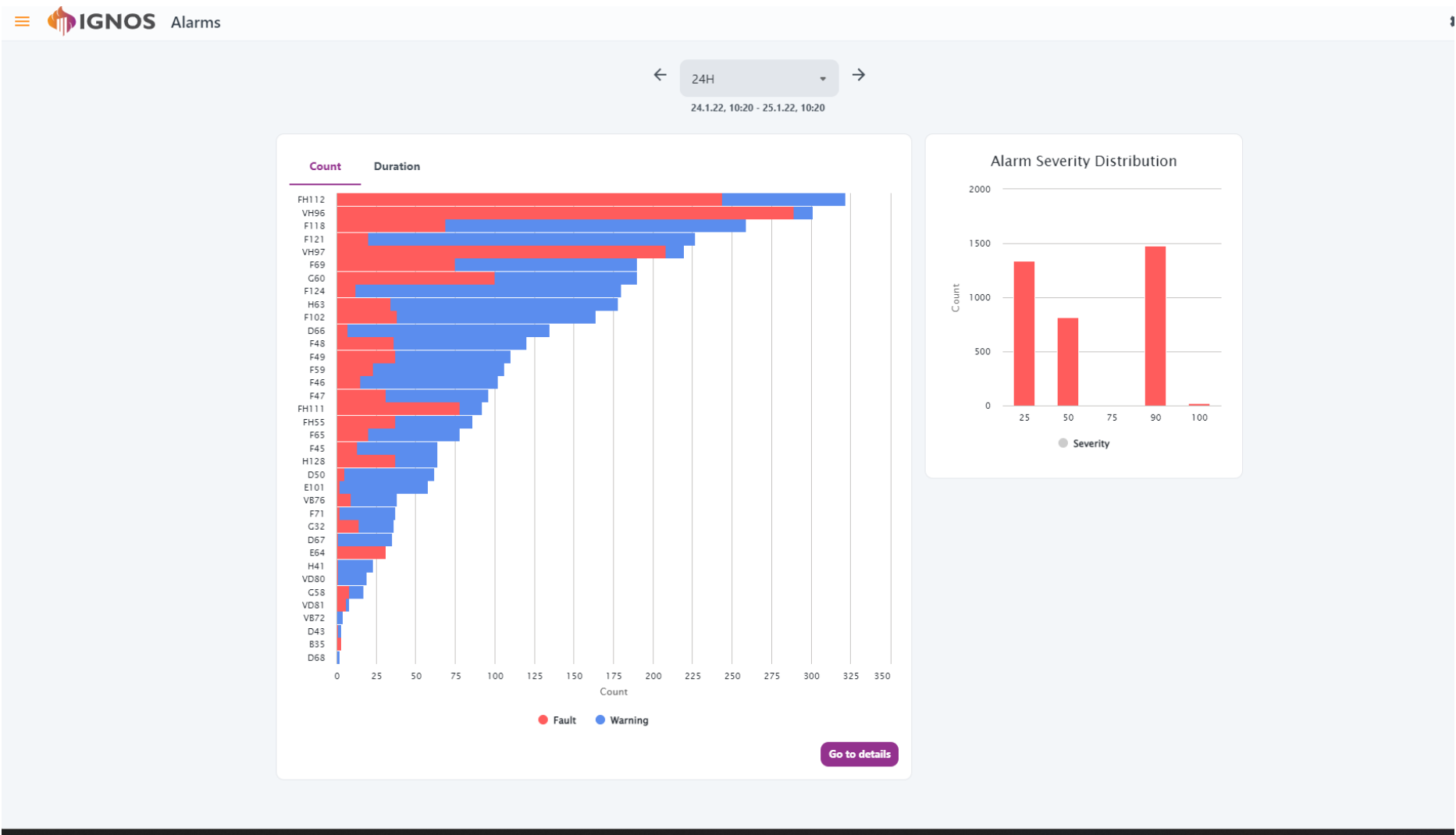
Power consumption F45



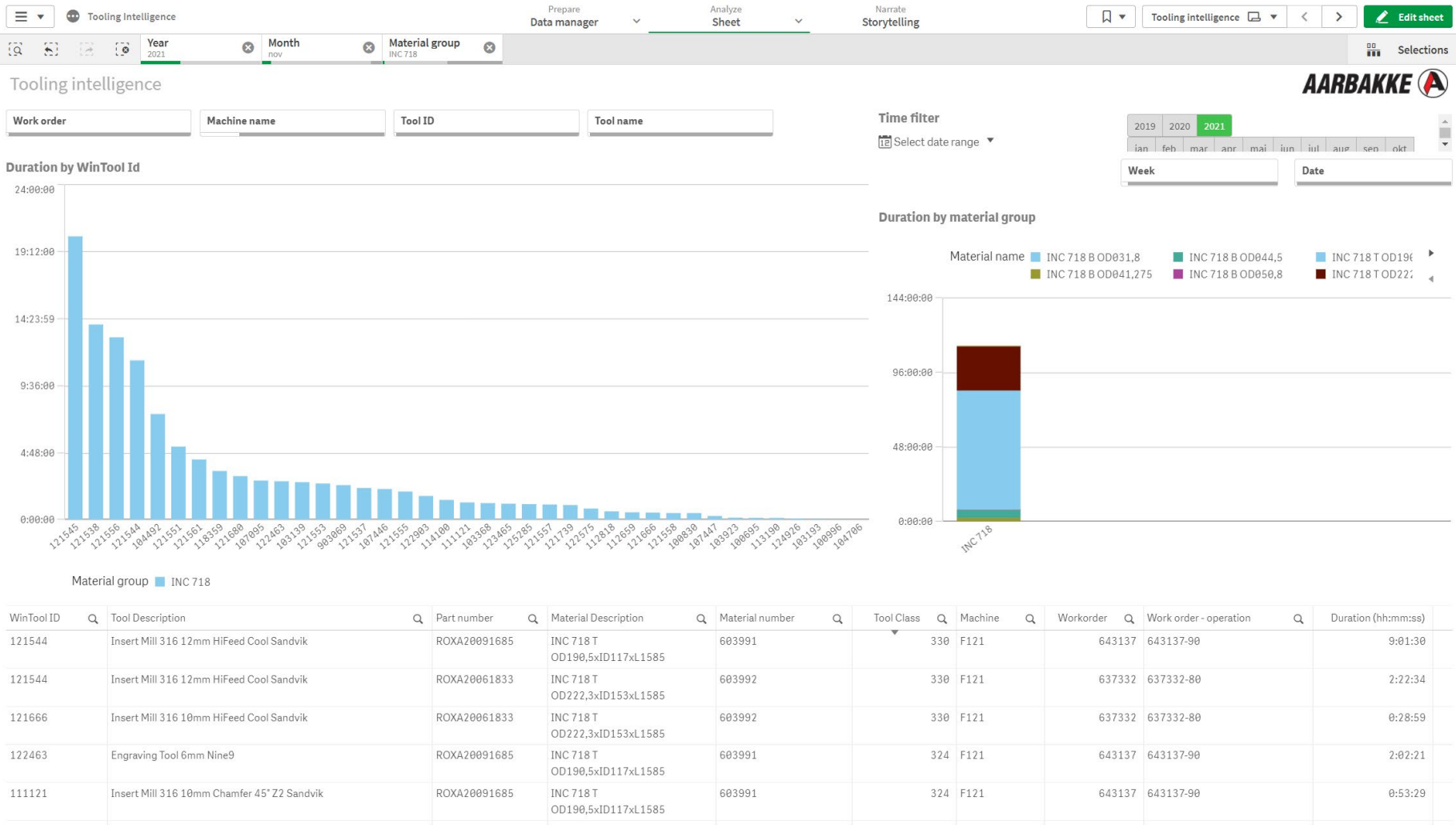
USE CASE: MACHINE MONITORING



USE CASE: SERVICE OVERVIEW



USE CASE: TOOLING INTELLIGENCE



USE CASE: MÅLEVERKTØY

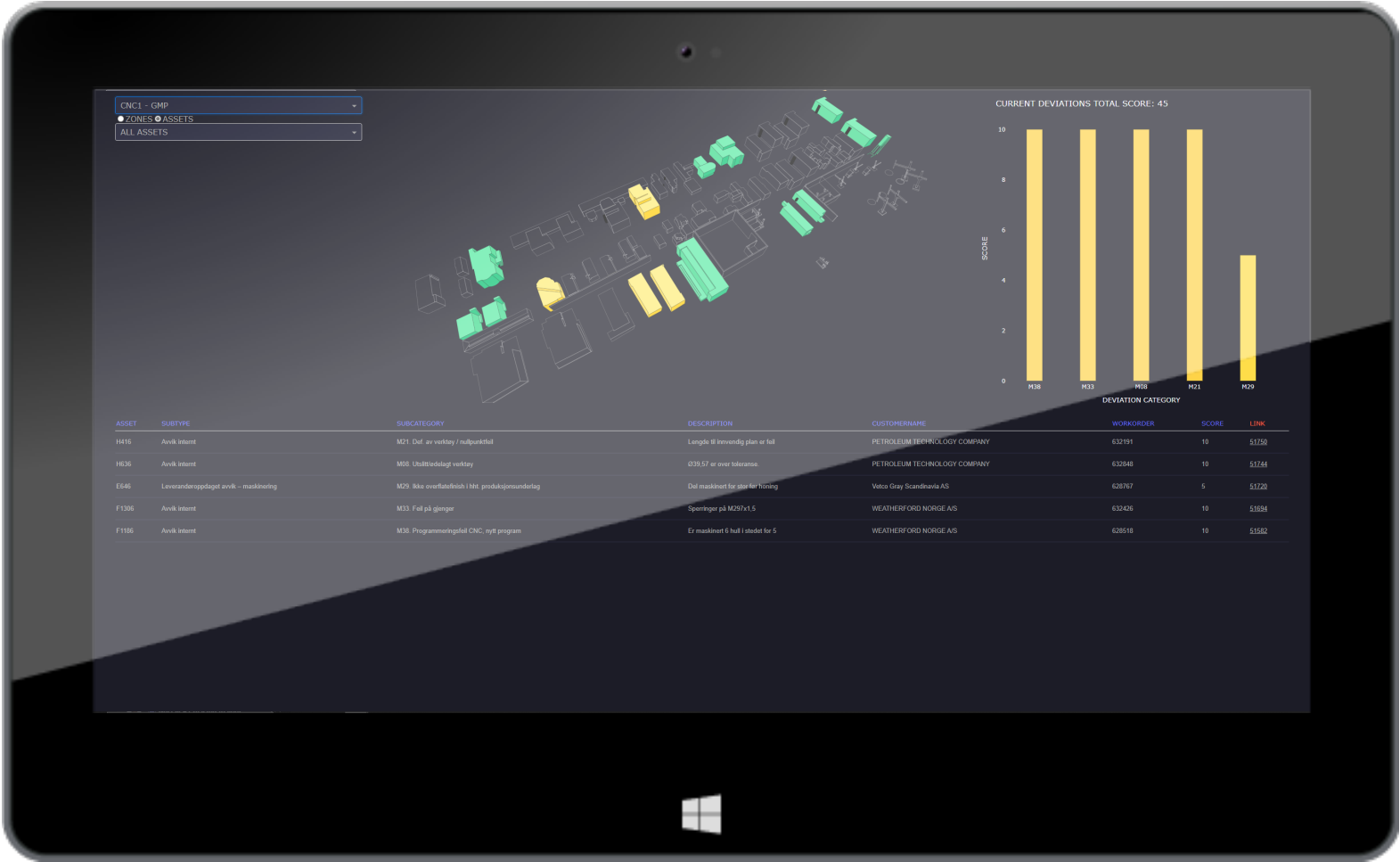
FiltersDensityExportAdd toolManage tool typesCalibration Lists

Search...

Id	Name	Manufacturer	Type	Sub Type	Min	Max	Last Location	Status
91505	VDS-30PMX	Mitutoyo	Caliper	Depth	0 mm	300 mm		Soon Due
91507	NC 56 Rotary	Tru-Thread	Thread gauge					Valid
91502	18EWR/E	Mahr	Caliper	Inside	0 mm	550 mm		Valid
91503	CD-P30P	Mitutoyo	Caliper	Inside	0 mm	300 mm		Expired
U5101	API threads	Aarbakke	Thread gauge					Uncalibrated
91501	CD-P15PR	Mitutoyo	Caliper	Inside	0 mm	150 mm		Valid
91508	Drift	Aarbakke	Drift		241 mm	241 mm		Valid
91509	NTD15-15C	Mitutoyo	Caliper	Neck	0 mm	150 mm		Soon Due
91504	VDS67-20PM	Mitutoyo	Caliper	Depth	0 mm	200 mm		Valid

Rows per page: 251-9 of 9

USE CASE: QA IN PROCESS



LEAN EXAMPLE, INSPECTION SHEET

Search...

Matching balloon

Hide completed

Balloon	Nominal	Machining Dim	Tolerance	Frequency	Coating	Progress
1	344 mm	344.05 mm	+0.805/+0.043	All	50 µm	0/2
Sequence Value Tool						
001						Ø344 +0.805 +0.043 Page: 2 Section: C.2
002						
2	1,6 µm		0/-1,6	First Article		0/2
Sequence Value Tool						
001						Ra1.6 Page: 2 Section: D.3
002						
3	1"-8 UNC-2B		/	First Article		0/2
Sequence Value Tool						
001						Comment: (2x) 1"-8 UNC-2B Page: 2 Section: A.4
002						
4	288 mm		+0.2/-0.2	First Article		0/2
Sequence Value Tool						
001						288 ±0.2 Page: 2 Section: A.6
002						
5	274,1 mm	274.15 mm	+0,1/0	First Article	50 µm	0/2
Sequence Value Tool						
001						Ø274.1 +0.1 0 Page: 2 Section: C.6
002						
6	273,1 mm	273.15 mm	+0,1/0	First Article	50 µm	0/2
Sequence Value Tool						
001						Ø273.1 +0.1 0 Page: 2 Section: C.7
002						

630388 50

WORK ORDER OPERATION

Not Completed

Sequences

Sequence All

Schemas

DU600431096 - A

COMPLETE

Links

Existing Links

There are no links

Link Candidates

There are no candidates

Tools

COPY TOOLS

Comment

Schema comment

0/1000

USE CASE: WELD LOGGING AND DOCUMENT GENERATOR

Welding Documentation

Machine:

Select Date:

Retrieve Data

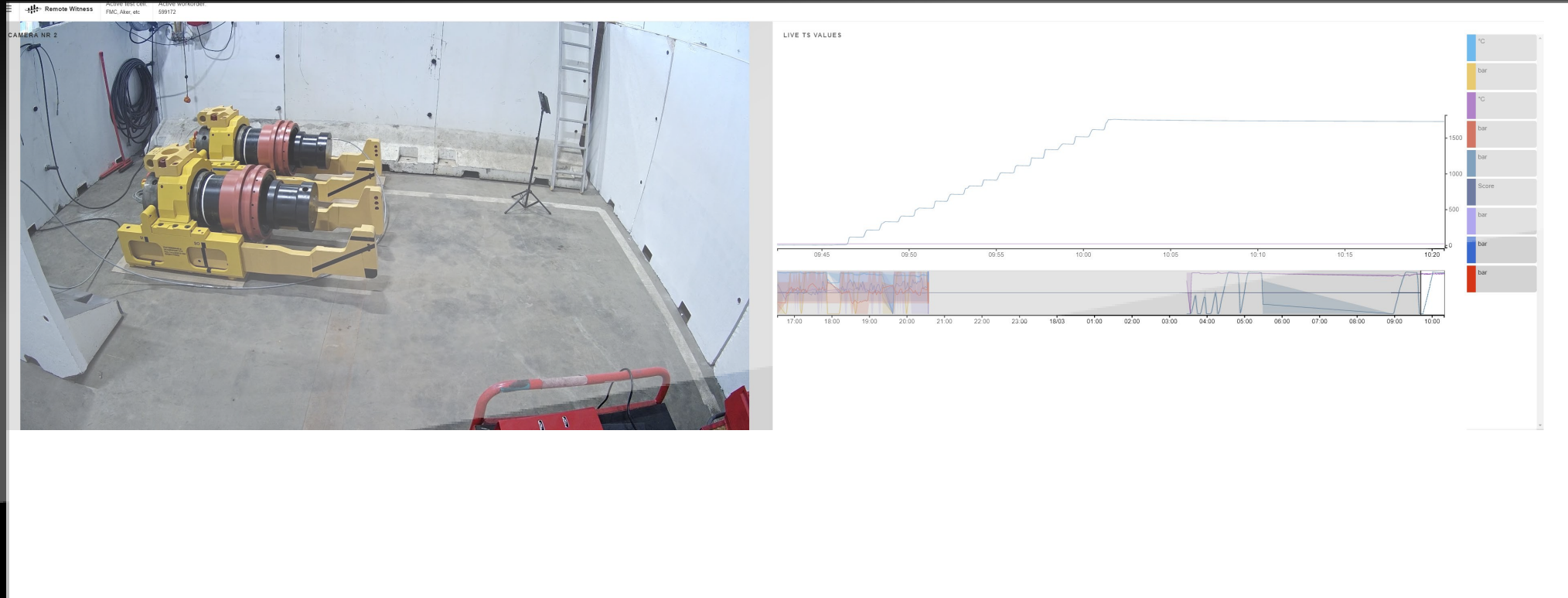
Select dataGraphPreview report

Report can be downloaded at the bottom of the page.

Pass	Index	Welding Method	k	Diam. [mm]	Gas shieldin g	Gas [L/min]	Polarity	Current [A]	Voltage [V]	Weld Time [sec]	Run length [mm]	Travel Speed [mm/min]	Wire Feed [m/min]	Heat input [kJ/mm]	Step [mm]
1	A	141 mech 1		1.14	Argon 4.0	19	DC-	200	12	12	48	249	1.9	0.58	0
2	A	141 mech 1		1.14	Argon 4.0	19	DC-	200	12	11	45	249	2	0.58	0
3	A	141 mech 1		1.14	Argon 4.0	19	DC-	200	12.1	12	48	249	2	0.58	3.1
4	A	141 mech 1		1.14	Argon 4.0	19	DC-	200	10.9	1	4	246	1.9	0.52	3.1

DOWNLOAD

REMOTE WITNESS: FAT, PRESSURE TESTING AND WELDING

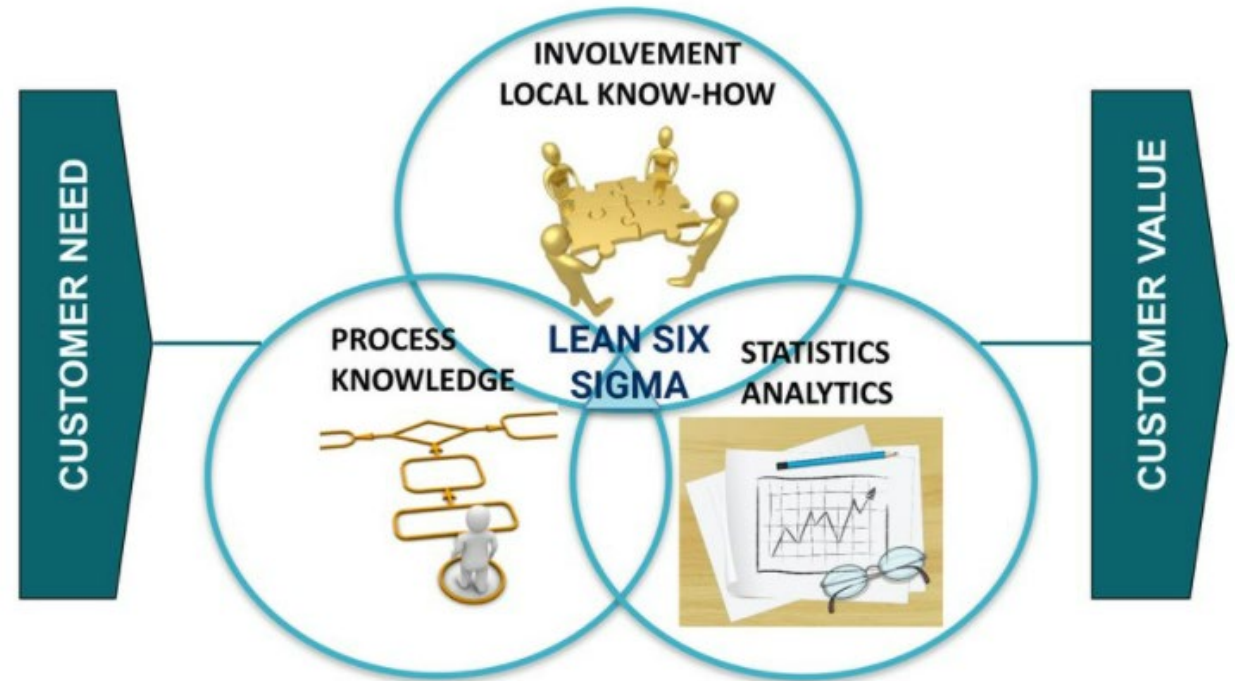


SMART FACTORY

THE LEAN FACTORY

Examples of LEAN solutions:

- Tooling insights reduce number of tools by 60%
- Tooling intelligence increase performance of tools by 10% (average)
- Machine learning detects most efficient machining method and teaches the system.
- Forklift automatic booking.
- QC in process reduce quality staff workload by 80%
- Learning across teams, departments and individuals



OPPSUMMERING – DEN LÆRENDE FABRIKKEN

- «LEAN» og GREEN er målet
- Alltid forbedre - alt
- Hold kontroll på kostnader
- Reduser sløsing og utslipp
- Identifiser problem tidlig – FAIL FAST
- Minst 10% av tiden bør brukes til å ta bort prosesser eller komponenter.

Hvordan:

- Collect and contextualize ALL data
- Gi operatørene mest data, la dem leke
- Etabler en kultur for endring
- Bygg LEAN inn i prosesser, LEAN er ikke en parallellaktivitet
- Involver og lytt



LESSONS LEARNED

- Ansatte er nøkkelen
- Samle mest mulig data, sett data i kontekst
- Forstå dataene, ha en retning og visjon
- Aldri være redd for å dele erfaringer
- Våg å feile
- Kommuniser hva og hvorfor en gjør digitalisering
- Hold prosjektene små, LEAN og fokuserte
- Digitalisering er ikke et IT prosjekt

Hva ville vi gjort annerledes:

- Inkludere tidligere
- Bruk mer tid på å stille åpne spørsmål på gulvet
- Slipp enkle prototype raskt.
 - Ikke driv med overengineering
- Bruk mer tid på å ta bort og forenkle





The Learning Factory