Smart Industry - A (digital) transformation of industry …. its acceleration and the consequences

SMART INDUSTRY (Fourth IR/I40 in NL) DUTCH INDUSTRY FIT FOR THE FUTURE

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www.smartindustry.nl

Smart Industry is an initiative of:

FME POWERED BY DUTCH TECHNOLOGY

TNO innovation for life

kamer van koophandel

Ministerie van Economische Zaken en Klimaat

VNO NCW

dutch digital delta

Holland High Tech
Global Challenges, Smart Solutions

Holland.

Brabantse Ontwikkelings Maatschappij
BOM

LIOF

NOM
INVESTEREN IN ONTWIKKELING

Innovation Quarter

oost nl

Philosophy

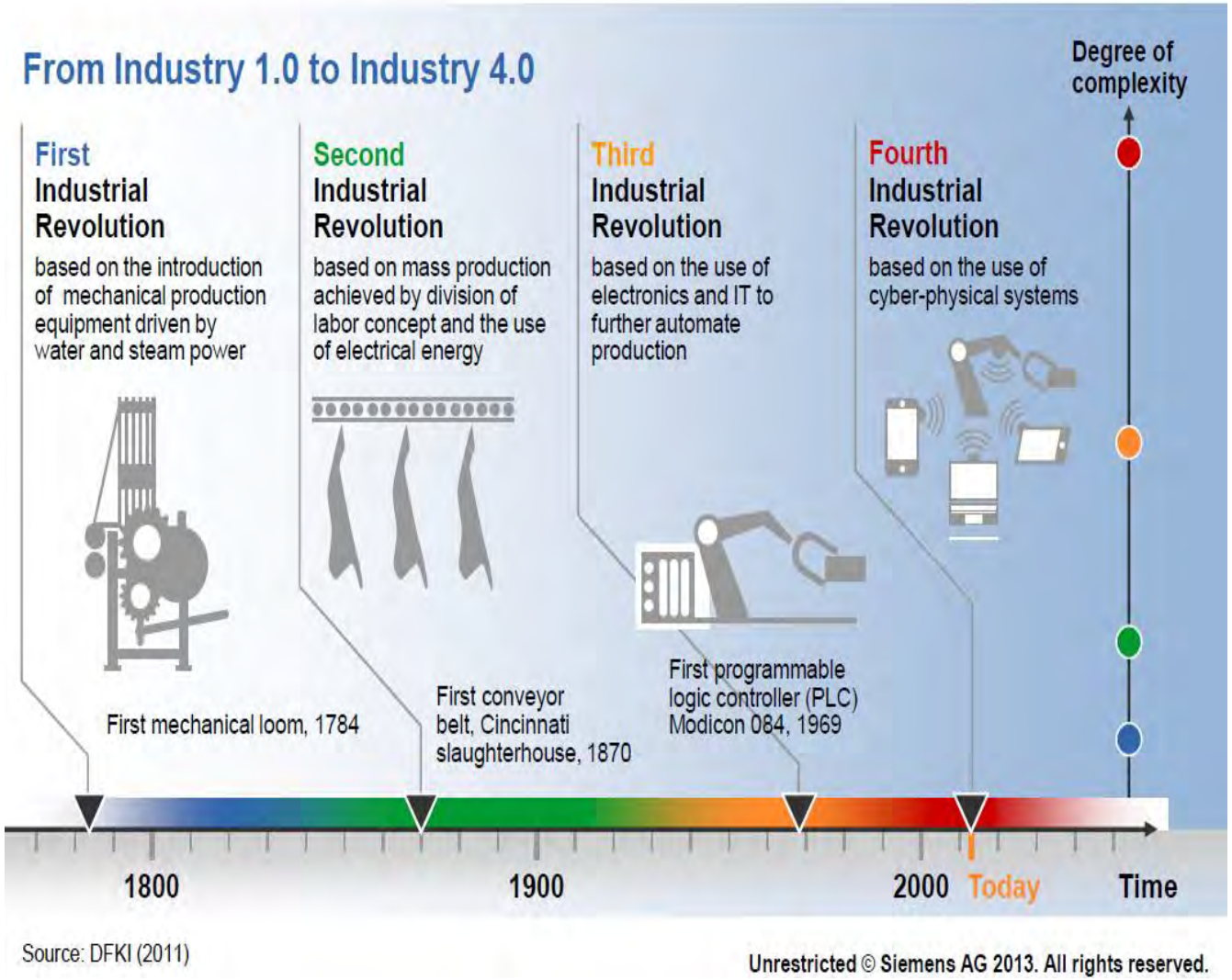
All about people

Pushing technology limits

Co-creation in world class ecosystems

All about global challenges

Industrial is changing faster



1600 Saw Mill/Sailboot/Wood
180 years, 6 generations

1780 Steam Engine/Steel
110 years, 4 generations

1890 Conveyor belt Mass prod.
70 years, 3 generations

1960 Mainframe, PLC, Robots
40 years, 1 generation

2000 Internet (of Things)
?? 25 years, < 1 generation

2020 Smart & Sustainability
Digitalisation/Servitisation

The history of Smart industry in the Netherlands

- The world is in anticipation of a fourth industrial revolution. This revolution is driven by giant leaps in ICT innovation and promises to radically alter the face of industry in the coming decades.

- The approach is in November 2014 formalised in an Action Agenda, which was renewed in 2018 with the Implementation Agenda.

2014

2016

2018

2020

Action agenda 3 action lines

	ACTION LINE 1 CAPITALISING ON EXISTING KNOWLEDGE
1	**'The Netherlands Smart Industry land'.** Informing a wide target group, including the business community, about Smart Industry developments, aimed at insight and support.
2	**Entrepreneurs get to work.** Entrepreneurs get to work more quickly with new business propositions, supported with information, coaching and advice aimed at cooperation and knowledge valorisation.
	ACTION LINE 2 ACCELERATING IN FIELD LABS
3	**Sample Field Labs at the start.** The aim is to have 10 Field Labs ready to go as soon as possible. Business plans must be detailed, consortia built up and financing arranged.
4	**Second instalment Field Labs.** There is a need for additional Field Labs. These Field Labs will be made ready for operation in 2015.
5	**Monitoring and knowledge exchange.** Investments will be made in getting to know Field Labs and spreading knowledge to education and the broad business community.

Action agenda 3 action lines

	ACTION LINE 3 STRENGTHENING THE FOUNDATION
	3A KNOWLEDGE
6	**Strengthening R&D incentive in Field Labs.** One component of the Field Labs is investing in research themes that are directly linked to the Field Labs. This takes place via the leading sectors, among others.
7	**Smart Industry research agenda.** For the somewhat more distant future, a long-term research agenda will be set up with the top sectors in cooperation with universities, TO2, STW and NOW, among others.
	3B SKILLS
8	**Human capital development within companies.** Together with companies and employees, actions will be performed in the area of employee pools and task rotation. Courses will also be offered to promote sustainable employability.
9	**Regional approach in connecting the business community with schools.** To coordinate the needs of companies and the offer from schools, Smart Industry research groups will be set up and modular educational blocks will be offered.
10	**Learning without interruption.** The relevant educational programmes from primary education to scientific education and dual education will be adapted to the needs of Smart Industry in future.
11	**Social innovation.** There will be a social innovation action programme aimed at Smart Industry to equip the organisation as well as the employee of the future for Smart Industry in future.

Action agenda 3 action lines

	3C PARAMETERS (ICT)
12	**Big data, big trust.** The development of technical solutions, business models and forms of cooperation that simplify the exchange and use of data.
13	**Software action plan.** Carrying out a research programme aimed at the development of software tools, with a view to chain cooperation, standardisation and interoperability.
14	**Cyber security.** Building on a robust and secure ICT infrastructure for Smart Industry.

Implementation agenda:*the acceleration of digitalisation of industry*

The objective for 2021:

to develop the best and most flexible digitally

connected production network in Europe and using less energy and

and materials for a sustainable & compatible economy

…….

Implementation agenda: based on 8 transformations

Acceleration projects to speed up the transformations

Nine acceleration projects to drive the process forward:

1. **Smart Industry Assessment Programme:** Helping businesses get started in the area of Smart Industry.
2. **Smart Industry Expertise Centre One-stop shop for businesses:** Focus on speeding up developments across the wider industrial SME sector and supporting implementation in achievable steps.
3. **Smart Industry Hubs Creation of a network of regional Smart Industry Hubs.**
4. **National Smart Industry Roadmap:** The combined NWA/HTSM/ICT Smart Industry Roadmap describes the intended development of Smart Industry knowledge.
5. **Linking SkillsLabs to Fieldlabs:** Helping every Fieldlab also become a SkillsLab.
6. **Human-oriented Technology Programme:** This programme is developing best practices in this area as a source of inspiration and a guide for developers and users of human-oriented technology.
7. **Cybersecurity Programme:** Making manufacturing firms digitally resilient by setting up a Smart Industry Digital Trust Centre.
8. **Data-sharing Programme Establishment of a Data Value Centre and Data-sharing Coalition.**
9. **International business with Smart Industry Organization of concrete collaborative projects** between businesses and knowledge institutions in the Netherlands, Germany and Belgium.

FOCUS TNO Smart Industry

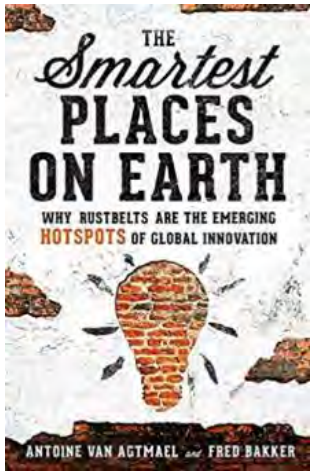
Propositions / Research groups

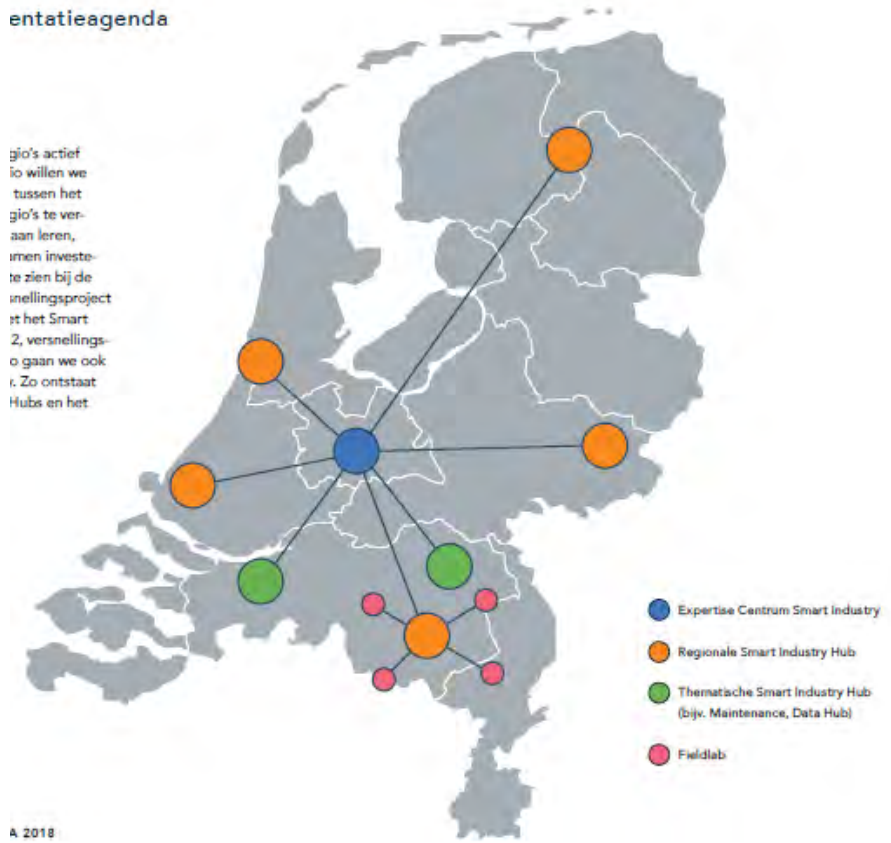
1. **Flexible Manufacturing**
2. **Digital Twinning**
3. **Data sharing**
4. **Smart Work**
5. **Smart Response**

Smart Industry is also a political challenge to improve productivity in industrial regions

Economist, 21 oct 2017
Left behind regions

From Rushbelt to Brainbelt:





Productivity growth by spillover effects creates the high productivity growth in Brainports. The challenges is to catch up productivity growth by bringing spillover effects to all other regions.

The **goal of Smart Industry is to accelerate productivity growth in all regions** in the Netherlands in each (industrial) region in the Netherlands (not only in Brainport-Eindhoven or the Zuid-West Vleugel) and to get from 600 companies since 5 years (1%) to 6000 (10%) of the 60.000 and ultimately all 60.000 manufacturing companies in NL

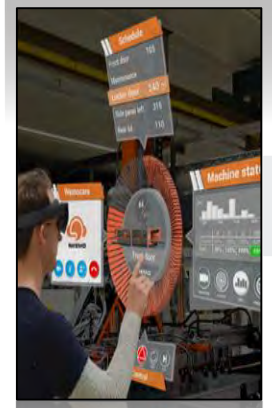
FIELD LABS: EIGHT SPECIALTIES IN THE REGION

BIG DATA INNOVATIEHUB

RAMLAB
metal parts on demand

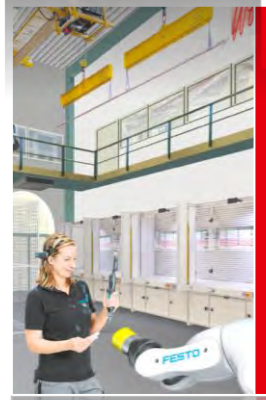
digital factory for composites

SAM XL
Smart Advanced Manufacturing



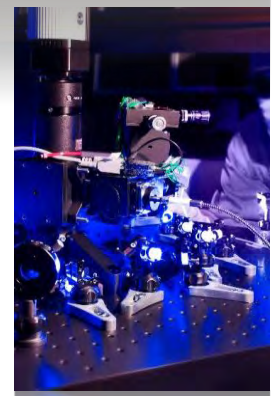
DUTCH GROWTH FACTORY

Duurzaamheidsfabriek



ROBO HOUSE

Dutch Optics Centre

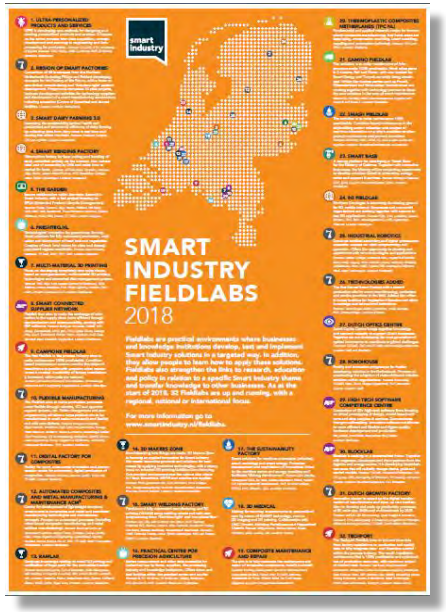


Brainport Industry Campus - Eindhoven

SMART INDUSTRY DUTCH INDUSTRY FIT FOR THE FUTURE

Smart Industry Field labs:

Field lab: *An industrial environment where Smart Industry solutions are developed, tested, implemented as well as where people can learn to apply them.*



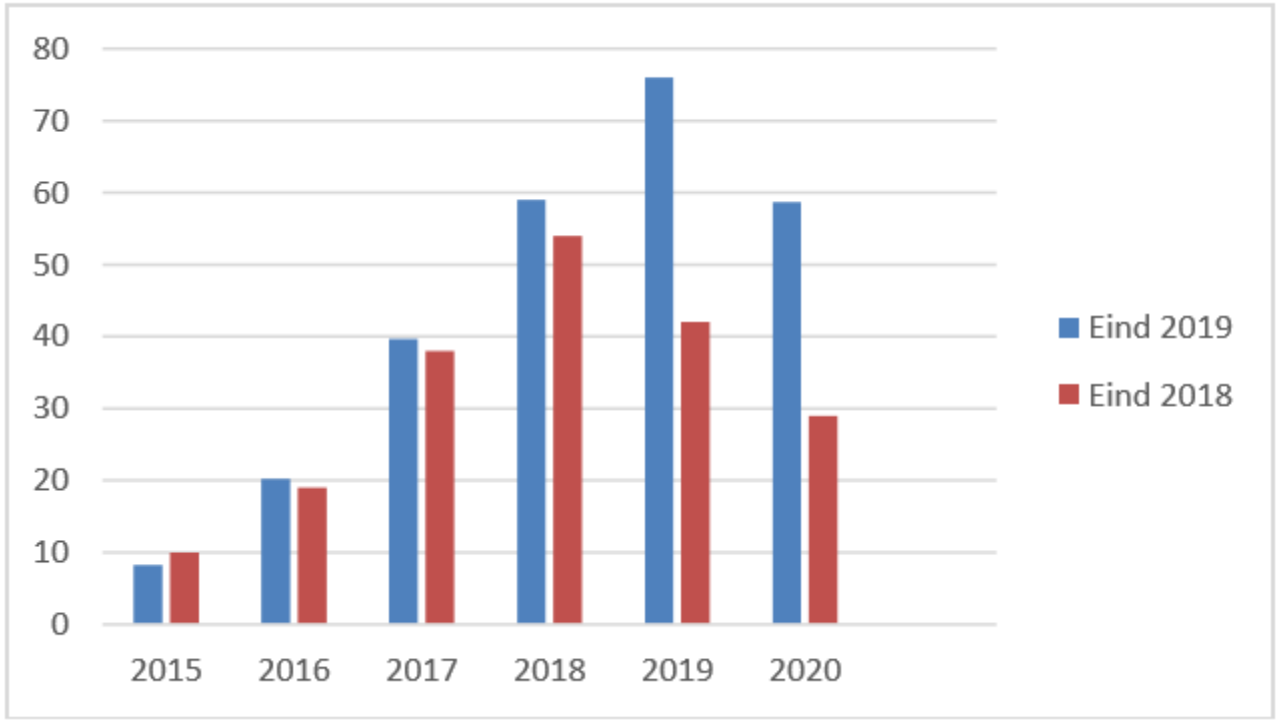
Criteria for a Smart Industry fieldlab
- Innovation eco-system
- Regional focus
- Radical innovations
- Interconnect higher & vocational education
- Training Human Capital
- Identification and application of new rules & standards
- Location with a program manager
- Program with 3+ year plan and multiple projects on innovation and education

Smart Industry Field labs: 45

- 01 UPPS
- 02 RoSF
- 03 Smart Dairy Farming
- 04 Smart Bending Factory
- 05 the Garden
- 06 Freshteq
- 07 MM3D
- 08 Smart Connected Supplier Network
- 09 CAMpione
- 10 Flexible Manufacturing
- 11 Digital Factory for Composites Manufacturing IJpenburg
- 12 ACM3 automcated composites and metal manufa en maintenance
- 13 3D RAMLAB Rotterdam
- 14 3D Makerszone Haarlem
- 15 Smart Welding Factory Enschede
- 16 Precision landbouw
- 17 Duurzaamheidsfabriek Dordrecht
- 18 Utrecht3DMedical
- 19 Composite reparatie Woensdrecht
- 20 TPC-NL - Thermoplasten Enschede
- 21 WCM CAMINO
- 22 SMASH
- 23 Smartbase
- 24 5G Groningen
- 25 AWL Industrial Robots Harderwijk
- 26 Added Emmen
- 27 Dutch Optics Centre
- 28 Robohouse Delft
- 29 High Tech Software cc
- 30 Blocklab logistiek - Rotterdam
- 31 Dutch Growth Factory - Rotterdam
- 32 Techport
- 33 TValley
- 34 Limburg robot (EFRO)
- 35 Spark - Den Bosch
- 36 SAM XL
- 37 Industrial Reality Lab
- 38 CITC
- 39 AML
- 40 Inclusive - Amfors
- 41 WCM Zephyros (wind op zee)
- 42 Bouw R&Do
- 43 ICD Innovatie Cluster Drachten
- 44 Smart Production Centre Arnhem
- 45 Breda Robotics

See: www.smartindustry.nl/en

Impact of the Field labs



Field lab budgets per year in million Euro's

Impact of the Field labs

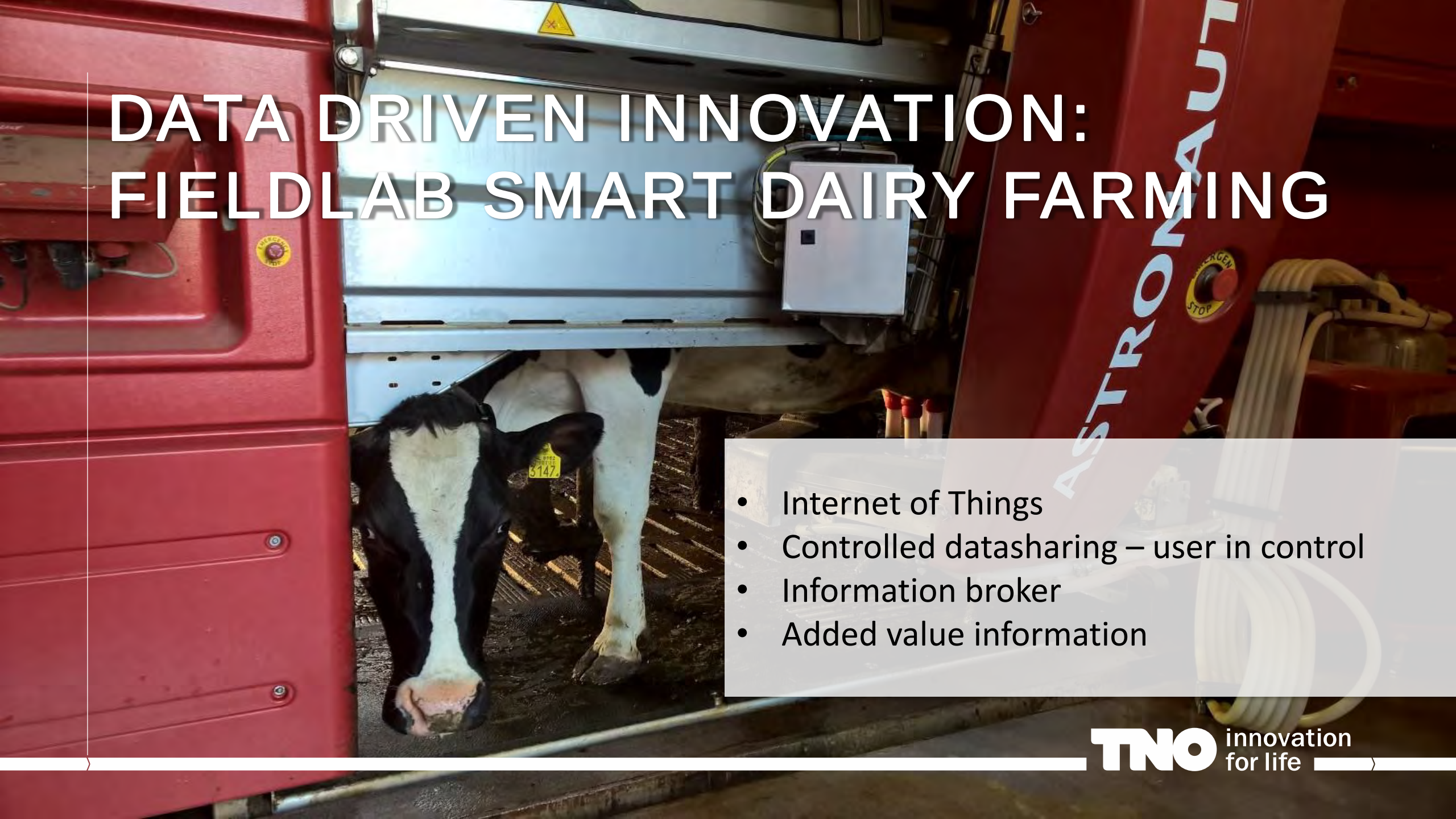
Impact indicator field labs	2018	2019
Employees	470	627
Partners	770	928
Partner firms	570	628
PhD’s	70	82
Students	5820	6326
Projects	280	429
Jobs generated	430	546
EU projects	11	14
Spin-offs	11	22

BIG DATA IN THE FACTORY
PHILIPS DRACHTEN

- High-precision sensor technology
- Big data analytics & machine learning
- Next generation factory automation

TNO innovation for life

DATA DRIVEN INNOVATION: FIELDLAB SMART DAIRY FARMING



- Internet of Things
- Controlled datasharing – user in control
- Information broker
- Added value information

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NETWORKED COLLABORATION: FIELDLAB SMART CONNECTED SUPPLIER NETWORK

- Collaboration in the supply chain
- Interconnecting ERP and PLM systems

Brainport Industries

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Questions?

Thank you for your attention