# Elop Technology

Øivind Horpestad, CEO

May 2022

# About Elop

Elop is a **Norwegian technology company** that delivers **tools** and **digital solutions** to **inspect**, **monitor** and **manage infrastructure** worldwide.

Elop's **mission** is to provide asset owners, managers, and technicians with solutions that **improve safety**, **efficiency**, **extend asset lifetime**, **minimize total lifecycle cost** and **environmental footprint**

Elop's **vision** is a future where **critical structures** are **safe**, **sustainable**, and **financially viable**

Elop is headquartered in Norway. For more information: www.elop.no

| | |
|---|---|
| **Employees:** | **40** |
| **HQ-office:** | **Oslo** |
| **Distribution:** | **27 countries** |


1: Development and Production to be focused entirely in India

# Concrete is the worlds most used construction material...

...and it is a major contributor to current environmental challenges as 8% of the world's $CO_2$ emissions stem from concrete production

- **Ageing infrastructure** with significant backlog of maintenance
- Lack of **efficient tools** to inspect structures
- Lack of inspection requirements **ensuring build quality**
- Lack of **efficient software** to manage maintenance and monitor the health of infrastructure

Reduced lifetime

Accidents


Increased cost

High $CO_2$ emissions

Source: Chatham House Report, ISBN: 978 1 78413 272 9

elop

- Develops hardware and software for structural health monitoring
- Hardware enables quality checks of new, and old, concrete constructions
- Software for monitoring and predictive maintenance
- **Increase safety, reduced waste, cost and environmental strain**

# Elop Technology has developed a revolutionary rolling ultrasound scanner for concrete

Current subsurface inspection technologies all have their **limitations**…

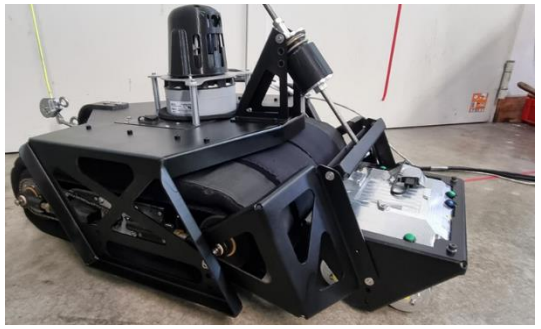
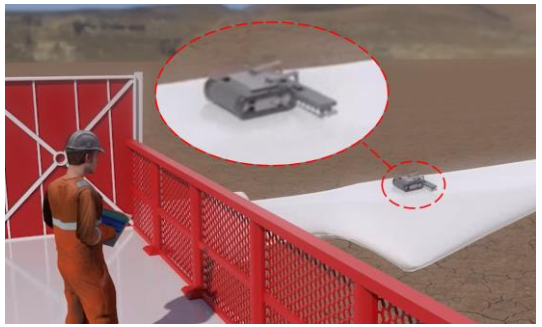
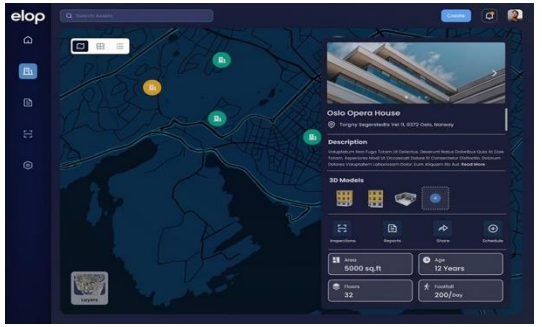
| Tech | Main use | Limitations |
|---|---|---|
| **Ultrasonic** | • Deep scans & multiple materials<br>• Thickness of concrete measurement<br>• Detection of air voids | • Point scanners - not practical to scan large areas<br>• Unable to assess the depth of cracks and air pockets<br>• Varying sophistication of software for visualizations on app / web |
| GPR | • Evaluation of interior structures<br>• Location of rebars | • Limited range<br>• Poor detection air voids<br>• Only usable for non-metallic structures |
| Seismic | • Mapping of large-scale concrete internal defects | • Low resolution |
| X-ray | • Rebar location<br>• Rebar damages | • Dangerous radiation<br>• Demands access to other end of scanned structure<br>• Large clearance area needed |

…which is why Elop developed and patented the **world's first rolling ultrasound scanner for concrete**

- Globally patented ultrasound scanning solution (dry coupling)
- Real-time 3D visualization
- Efficiently detects thickness, cracks, air pockets, voids, delamination and rebars
- Scalable cloud-based application


*"Elop Insight"*

# Elop Insight on market – development tracks progressing according to plan

| | On market | Q2 22 | Under development (2023) | |
|---|---|---|---|---|
| **Product** | Elop Insight | Elop Insight Crawler | Multrawheel | Asset Management System[1] |
| |  |  |  |  |
| **Description** | • Hand-held rolling ultrasound scanner<br>• For concrete<br>• Software for analyzing results and generating reports | • Rolling ultrasonic scanner combined with vacuum crawler<br>• For vertical or inverted concrete surfaces<br>• Software for analyzing results and generating reports | • Rolling ultrasound scanner (can be combined with crawler)<br>• For composite material<br>• Initial focus on windmill blades<br>• Software for analyzing results and generating reports | • Software<br>• For asset owners<br>• Full digital overview of structures, helping owners to monitor health and proactively plan for future maintenance |
| **Model** | • Scanner sold including software subscription | • Scanner sold including software subscription | • Scanner sold including software subscription | • Subscription based software license |

1: Development on-going in collaboration with partners. Version 1 expected to be launched in H2 2022.

# Elop's technology offers value for asset owners, inspection companies and society as a whole

1

Detection of critical flaws

2

Quick & accurate

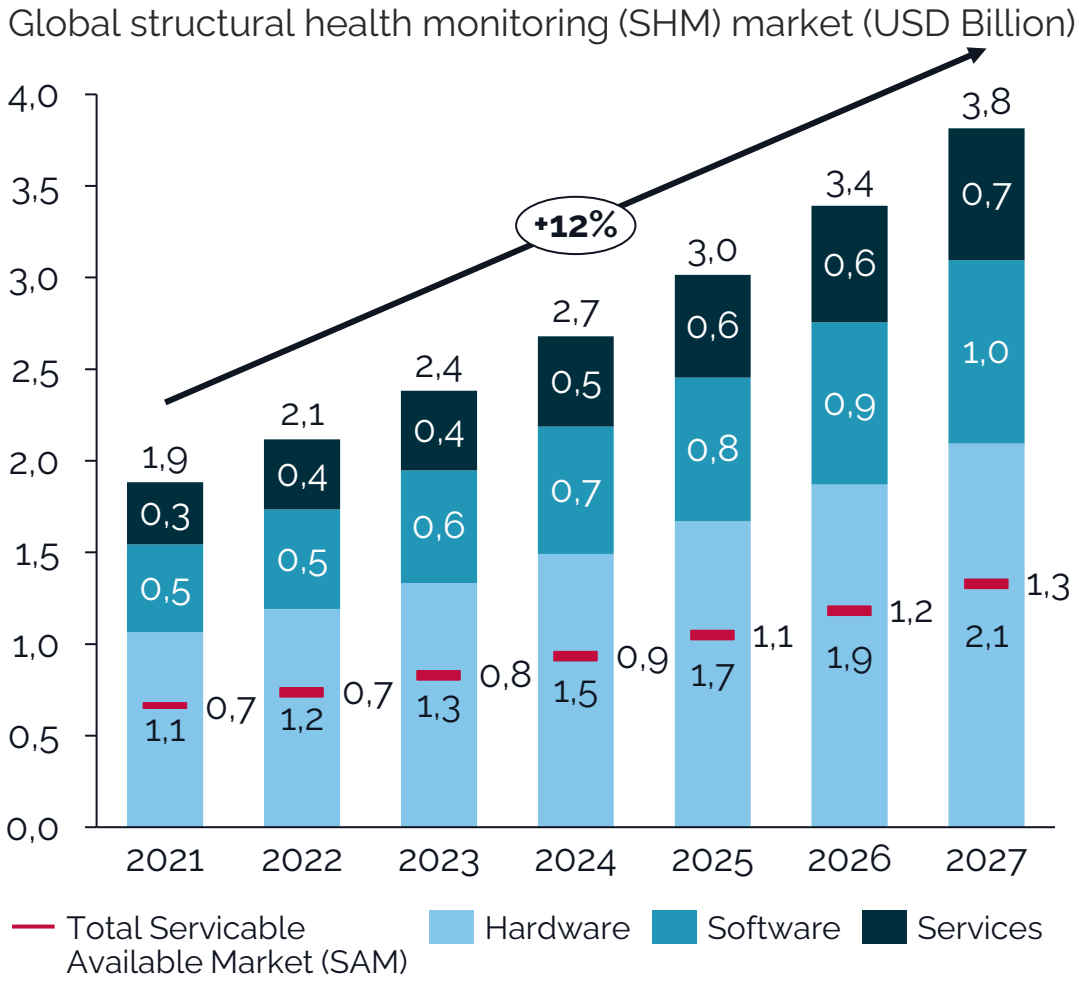
3

Improved insights

4

Easy to use

# The global structural health monitoring market is growing rapidly

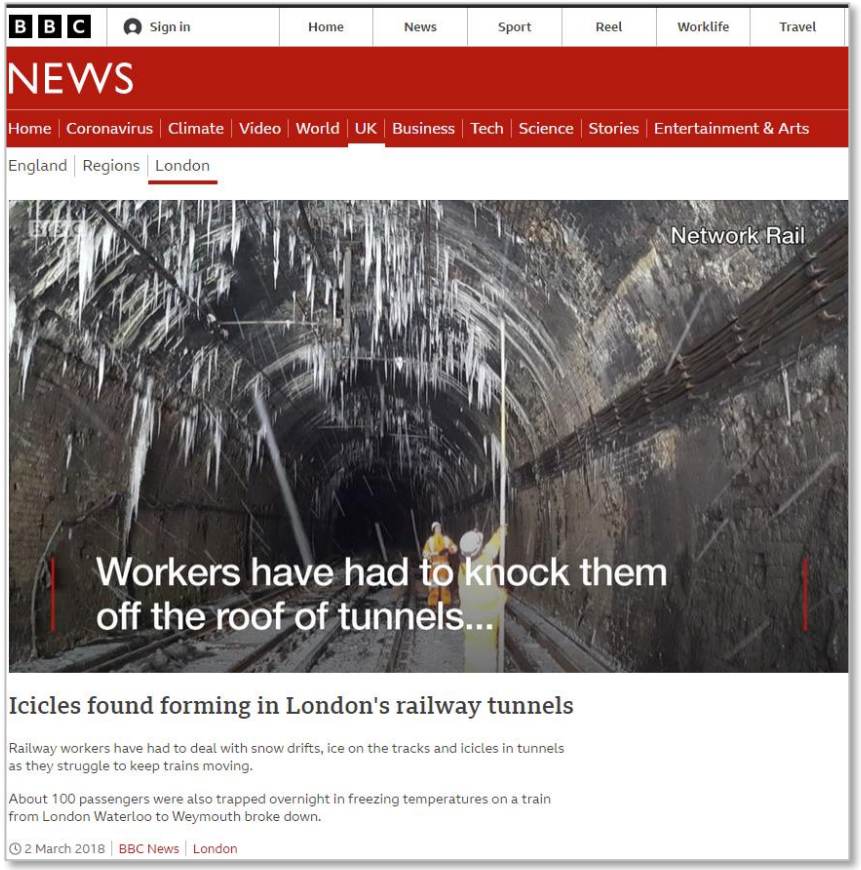



- SHM has become an important tool in the design, analysis, and maintenance of modern civil engineering structures and systems
- Market growth driven by:
  - Aging infrastructure in Europe and North America
  - Reduction of inspection costs
  - Frequent occurrences of natural calamities and
  - High-profile accidents
- In addition, growth in investments in infrastructure and technological advances drive market growth
- However, high implementation cost and challenges related to data normalization restrain the structural health monitoring market growth

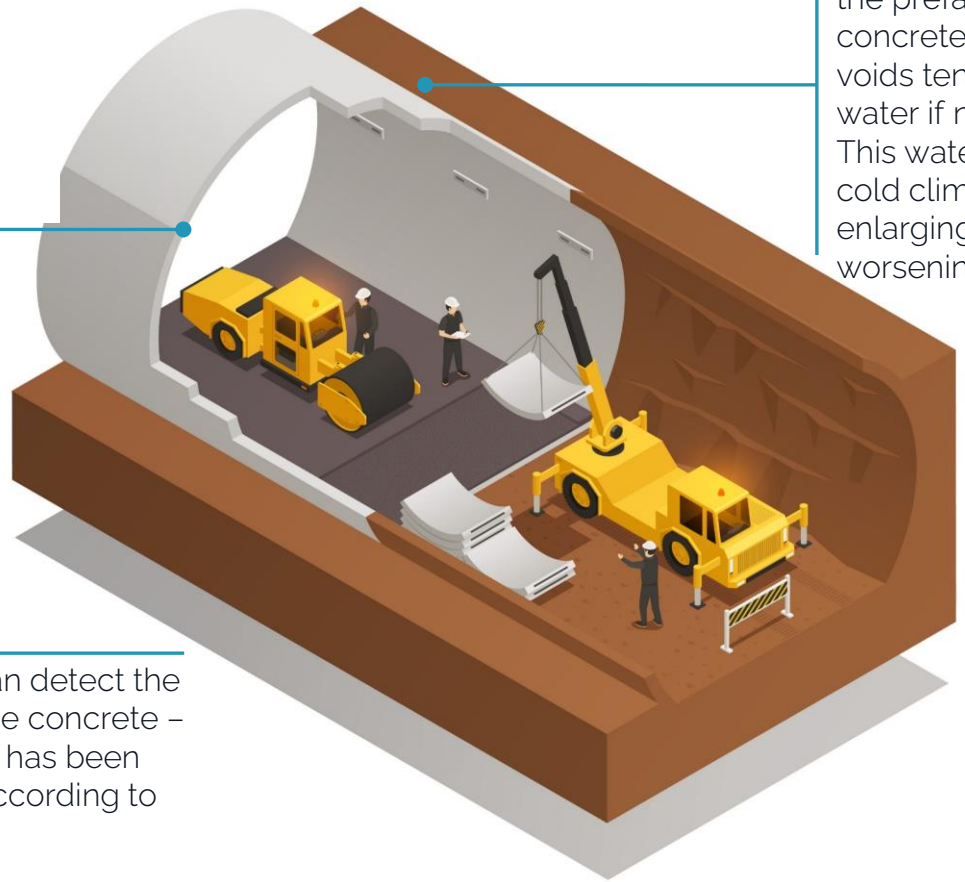
Source: https://www.alliedmarketresearch.com/structural-health-monitoring-market

# Currently no requirements on testing concrete before project handover

There has not been any practical way of testing the concrete in newly constructed tunnels until now…



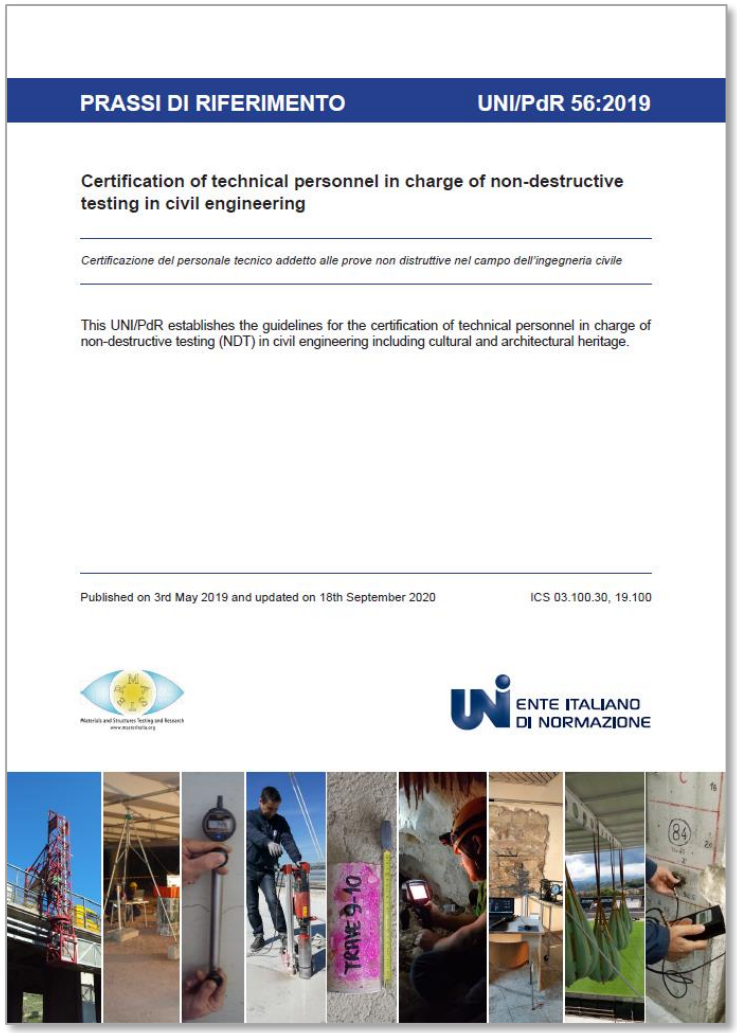

Before accepting delivery, check inside for; **cracks, air pockets**, delamination - correct **position of rebars**



Elop Insight can detect voids inside and behind the prefabricated concrete liner. These voids tend to fill up with water if not addressed. This water freezes in cold climates – enlarging the void and worsening the problem.

Elop Insight can detect the thickness of the concrete – to verify that it has been constructed according to specifications

# Concrete inspections moving towards increasing regulation and certification requirements



PRASSI DI RIFERIMENTO UNI/PdR 56:2019

Certification of technical personnel in charge of non-destructive testing in civil engineering

*Certificazione del personale tecnico addetto alle prove non distruttive nel campo dell'ingegneria civile*

This UNI/PdR establishes the guidelines for the certification of technical personnel in charge of non-destructive testing (NDT) in civil engineering including cultural and architectural heritage.

Published on 3rd May 2019 and updated on 18th September 2020 ICS 03.100.30, 19.100

ENTE ITALIANO DI NORMAZIONE

- Italy on forefront - ultrasonic testing likely to become part of standard
- "Prassi di riferimento" - a provisional guideline, **likely to be converted into norm sometime soon**
- Describes the procedure for the certification of technical personnel in charge of non-destructive testing in civil engineering

# We are expecting others to follow as soon as they learn about what Elop Insight enables

New Brunswick

**Cracks in foundation led to wind turbine's collapse, 49 others also at risk**

TransAlta Renewables Inc. has to replace foundations of 50 wind turbines at Kent Hills wind farm

Shane Fowler · CBC News · Posted: Jan 12, 2022 5:27 PM AT | Last Updated: January 12

A wind turbine at the Kent Hills wind farm was found collapsed across an access road. (Submitted by Steve Shannahan)

- Building project owners have historically, and are still today, demanding final inspection documentation on all areas except for concrete.
- This is mainly due to the lack of efficient inspection instruments
- High profile incidents such as closed highway bridges and collapsing structures are driving interest in, not only inspecting aging infrastructure, but new construction - to avoid future catastrophic faults
- By utilizing Elop Technology's Insight scanner it is for the first time feasible to conduct inspections of concrete as part of the hand-over process

**To reduce risk**: check newbuilt for cracks, air pockets, delamination - correct position of rebars. **Before accepting delivery**

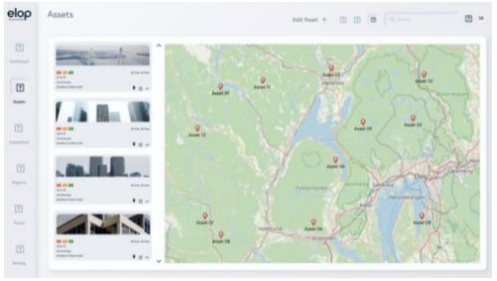
# Elop's technology for concrete inspection is unmatched in terms of efficiency

| | Products offered | Cracks | Voids | Concrete thickness | Delamination | On-site 3D | Rolling scanner | Distinguishing features |
|---|---|---|---|---|---|---|---|---|
| elop | Elop Insight | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | • Rolling 3D ultrasound concrete scanner<br>• Ability to scan large areas<br>• Inspections up to 2,500mm |
| ACS | Mira | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | • Inspections up to 2,500mm<br>• Compatible software for 'stitching' 2D images into a 3D image |
| | Mira Lite | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | • Portable version of Mira, inspections of concrete up to 1200mm |
| SCREENING EAGLE | PD8050 | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | • AI-powered for on-site data analysis<br>• Light weight |

# Overall strategy: Become a fully integrated technology provider

Elop Insight & Elop Multrawheel

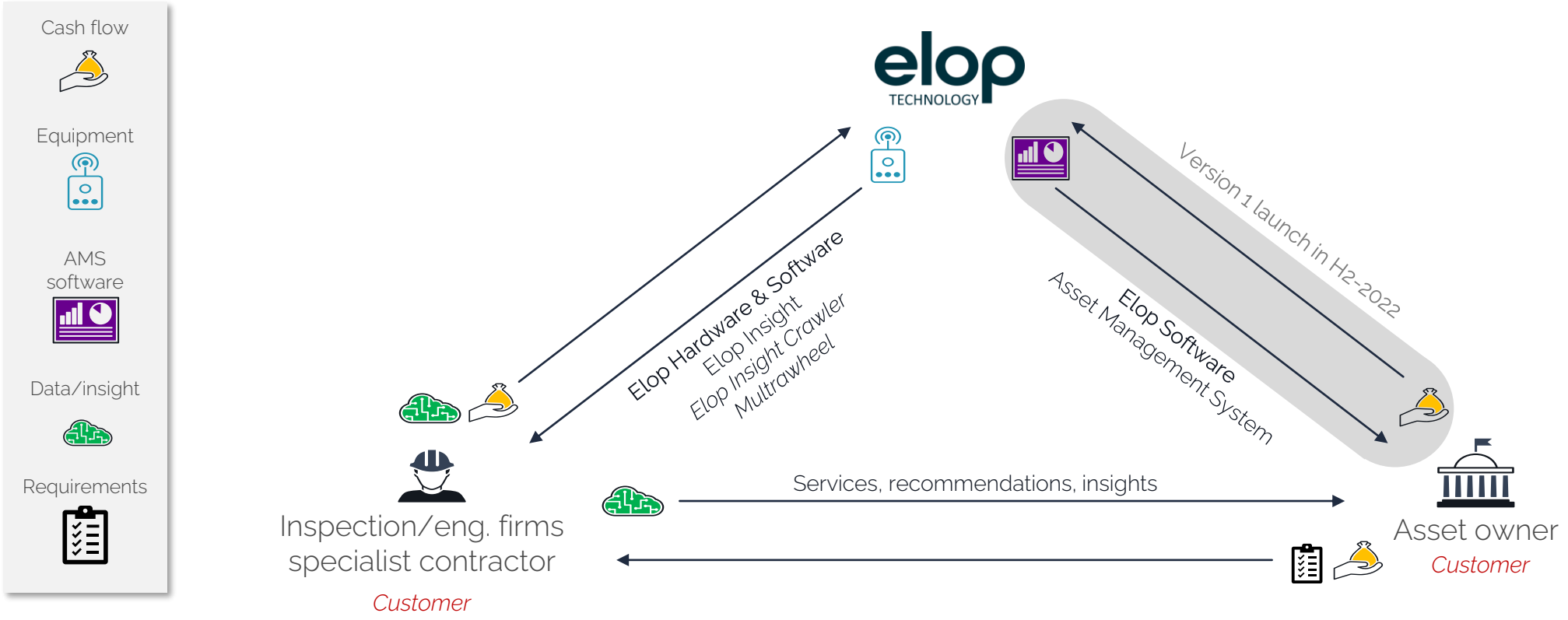
Elop Asset Management System





Hardware → Live data feed on site → Remote access → Asset management → Structural health monitoring →

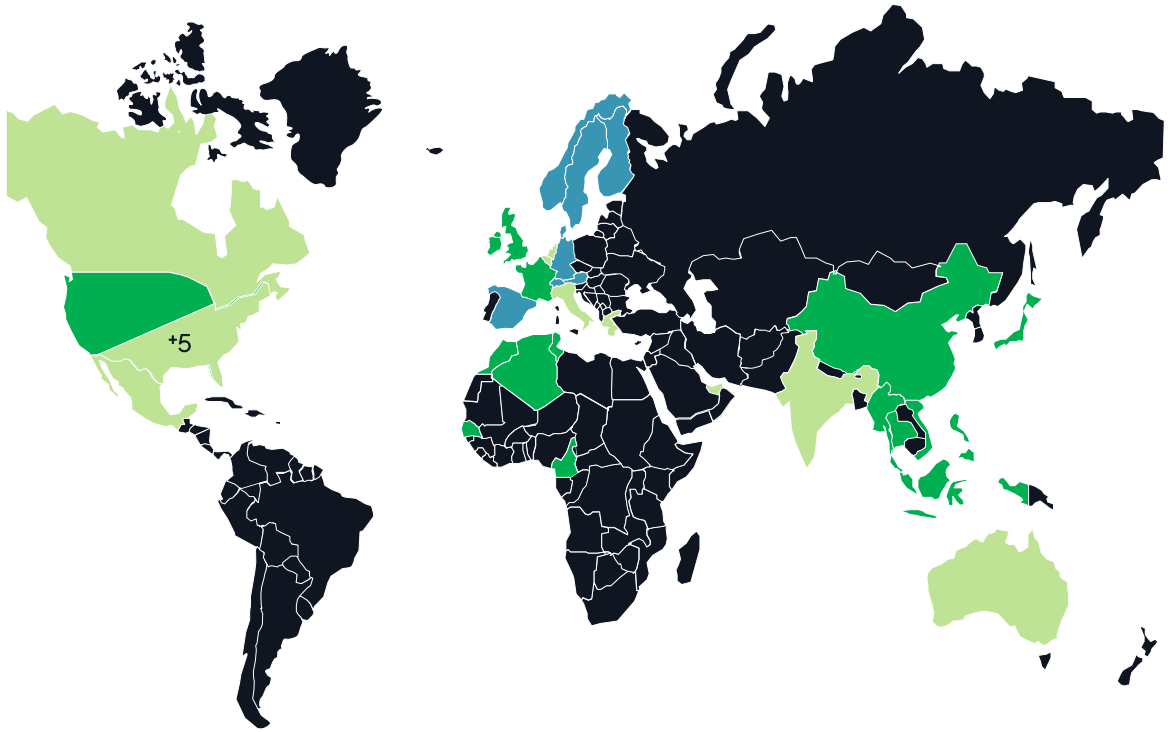
# Elop Technology's business model is based on a 3-way collaboration




1: E.g. Testing, Inspection & Certification (TIC) companies, engineering companies or specialist contractors

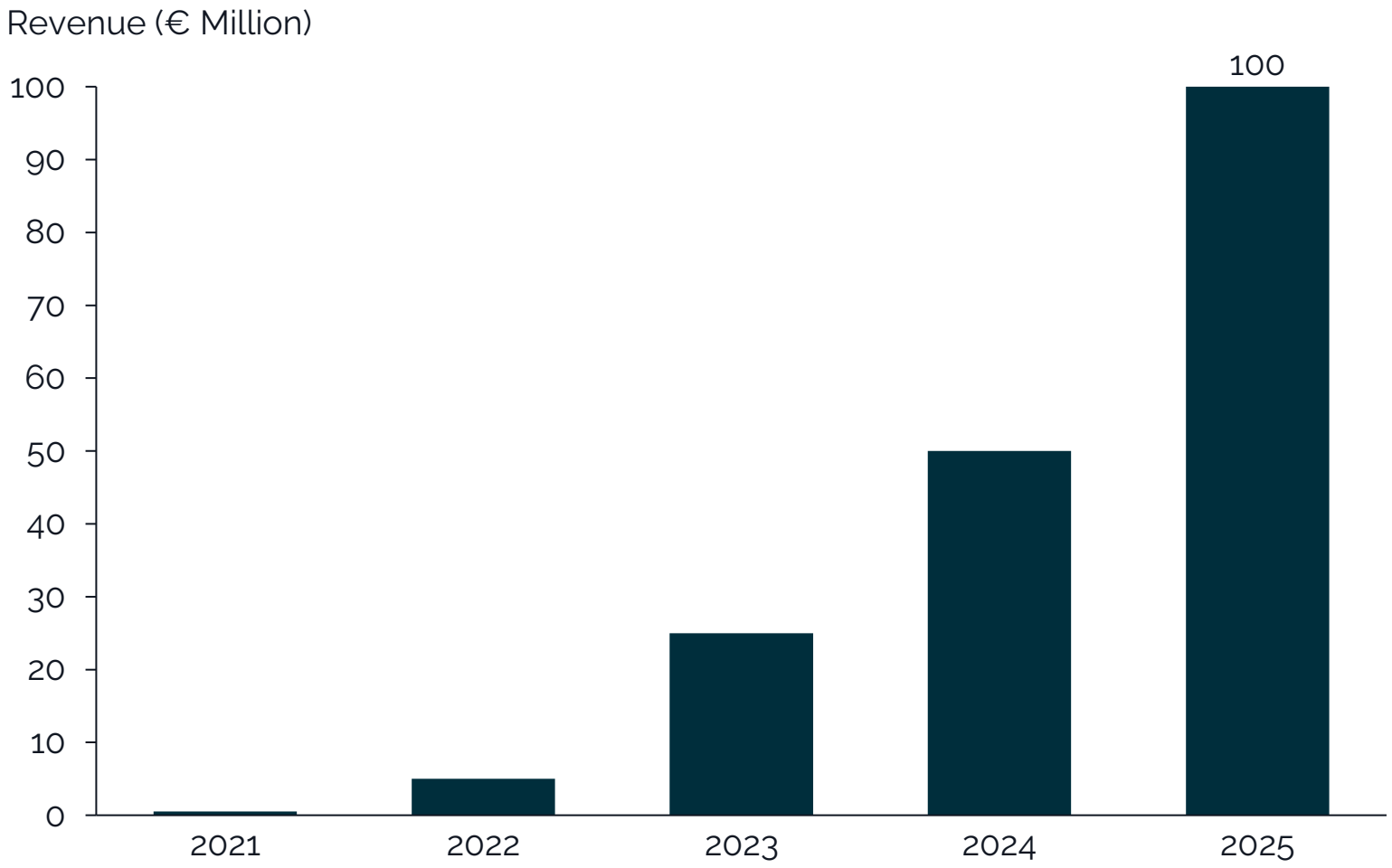
# Elop Technology is expanding its distributor & partner network

- Distributor agreements signed for all continents (except south America)
- Currently present in 27 countries
- Ongoing discussions with multiple distributors expected to be announced in the coming months
- Elop's Insight Scanner is tested by German research centers Fraunhofer and BAM with positive feedback
- Goal: Global distribution coverage within 12 months



# Ambition to exceed 100M€ revenue in 2025

- Potential to speed up commercialization with additional funding




## 2025 TARGETS

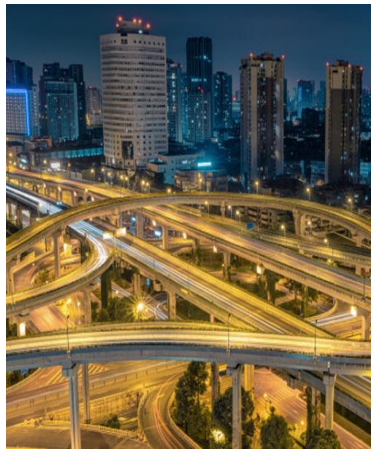
**>100M €**
Revenue

**>30%**
EBIT margin

**>30%**
ARR

# Elop's core business contributes to a sustainable future

## Securing critical infrastructure




Several global bridge and building collapses exemplifies the need for improved inspection, surveys and maintenance of critical infrastructure.

Elop Technology and its solutions provide information and insight into the condition of an asset. Using this data for optimised maintenance and control, ensures safe and secure operations throughout the lifecycle of the asset.

## Reducing the environmental impact


8% of the world's $CO_2$ emissions stems from the concrete production process. Extending life of existing concrete structures through optimised maintenance and inspection, will have a significant benefit to the environment.

Elop Technology's patented technology for structural health insight, combined with systems in development for managing and monitoring asset data, will give assets owners full insight into the condition of their constructions and the necessary tools to analyse and maintain their structures, in order to extend asset life and reduce the environmental impact.

## Innovating the construction industry


The construction industry is conservative and has a relative low degree of digitization. There are major shortcomings in the traditional approach to inspection and maintenance.

Elop Technology is digitizing crucial data and provides new and innovative solutions with major benefits to the industry.

We will continuously grow our competency and innovate together with our partners. We want to introduce new technology and solutions to the benefit of the society in general and our clients, in particular.

# Management team with good track-record and technical & commercial expertise

## Øivind Horpestad
CEO and Chair of The Board

- One of the original founders and former CEO of NRC Group, listed on Oslo Stock Exchange
- Responsible for developing and executing the strategy that transformed Endur ASA into a leading player within maritime infrastructure, former COB ENDUR ASA, listed on Oslo Stock Exchange
- Has broad industrial experience through former positions in Team Bane, VRS Rail AS and Coast Capital

## Kim Boman
Chief Financial Officer

- More than 20 years of experience from finance roles
- Former CFO of AqualisBraemar, Head of IR at Rec Solar and has corporate finance experience from DNB Markets and Swedbank

## Tedd Hansen
Head of Software

- 25 years of experience in the IT industry within programming, software architecture, outsourcing, consulting and development.
- Most recently, he was associated with DNB bank as a Technical Architect. Before that, he has spent around a decade as an IT consultant, specifically in finance sector and building system architecture and development.

## Bård Myrstad
Chief Operating Officer

- Strong background from the IT sector, having worked at Accenture, Embriq and Viz Risk Management

## Imran Tamboli
Chief Technology Officer

- More than 15 years of experience from technical leadership roles in various technology companies
- Prior experience includes Head of Delivery at EVRY Financial Services and CTO at Simplifai

# Management team with good track-record and technical & commercial expertise

## Erik Leung
Chief Product Officer

- Has more than 10 years of experience from product leadership roles at various technology companies
- Prior experience includes Head of AI at EVRY Financial Services

## Niklas Persson
Head of Global Sales

- More than 20 years industry experience from various business development and global sales management positions.
- Prior experience includes six years from DEKRA in Sweden and Germany as well as experience from Force Technology and Siemens

## Marcus Jocham
Head of Business Development

- Nearly 15 years' experience within strategic sales management and business development
- Prior experience includes 13 years within the DEKRA and Visatec systems

## Fredrik Ekholm
Head of Strategy

- 10+ years of Strategy, Corporate Dev't and M&A experience
- Prior experience includes in-house strategy positions at NRC Group and VR-Group as well as Strategy and M&A at EY and Deloitte

# Appendix

# Protected by patents worldwide (1/2)

| Title | About | Status | Country |
|---|---|---|---|
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Application allowed | Brazil |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | China |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Germany |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | EPO |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Spain |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | France |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | United Kingdom |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Italy |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Japan |
| Ultralydanordning | Elop Insight | Registered | Norway |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Poland |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Sweden |

# Protected by patents worldwide (2/2)

| Title | About | Status | Country |
|---|---|---|---|
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | Turkey |
| Device, Method and System for Ultrasonic Signal Transducer | Elop Insight | Registered | USA |
| Device, system and method for emission and reception of ultrasonic signals to and from a test material | MultraWheel | Application filed | Brazil |
| Device, system and method for emission and reception of ultrasonic signals to and from a test material | MultraWheel | Application filed | Canada |
| Device, system and method for emission and reception of ultrasonic signals to and from a test material | MultraWheel | Under examination | China |
| Device, system and method for emission and reception of ultrasonic signals to and from a test material | MultraWheel | Application filed | EPO |
| Device, system and method for emission and reception of ultrasonic signals to and from a test material | MultraWheel | Under examination | Japan |
| Device, system and method for emission and reception of ultrasonic signals to and from a test material | MultraWheel | Registered | USA |

# Trademarks

| Title | About | Status | Country |
|---|---|---|---|
| Elop | Elop | Registered | Norway |
| Elop Insight | Elop Insight | Registered | Norway |
| Elop Foresight | Elop Foresight | Registered | Norway |