HEXAGON

Empowering an autonomous, sustainable future

Hexagon corporate brochure

A note from Hexagon's President and CEO

The world faces a simple but daunting task: How can we collectively build a future that delivers growth, prosperity *and* sustainability?

This is the urgent conundrum of our time, that our customers – whether leaders in industry or government – are looking to solve. For decades, growth and sustainability have been considered mutually exclusive, a zero-sum game with no clear winner. Yet, we are all beneficiaries of the innovations and ideas that have helped bring about astonishing improvements in people's lives over the past century. Nobody wants to go backwards.

The world is playing catch-up in the race to achieve the UN's Sustainable Developments Goals, and by most accounts we are impossibly behind. We need more food, clean water, shelter, infrastructure, reliable and affordable energy, mobility and jobs. And in free-market economies around the world, capital markets will continue to measure the value of companies, and shareholders will expect growing profits.

The true path to sustainability must not abandon the progress and growth brought about by industry and innovation.

The only way to achieve what we haven't yet is to have industry at the table with the freedom to make a change.

Paolo Guglielmini
Hexagon President and CEO

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Meet Hexagon

Empowering an autonomous, sustainable future

Hexagon is a global technology innovation leader, delivering digital reality solutions to make factories, farms and mines more productive; cities and nations safer; industrial facilities more efficient; and construction projects more profitable.

Our sensor, software and autonomous technologies free customers to navigate the “internet of things” data deluge that’s essentially been holding industry back from profitable, scalable, sustainable growth. Our solutions create value by enabling customers to actually use all this data – to put it to work in new, world-changing ways.

With Hexagon, customers are creating tens of thousands of jobs, fueling the growth of entire economies, improving the safety and resiliency of the world’s infrastructure and safeguarding populations while accelerating access to safe, renewable energy.

Delivering a better world without sacrifice

At our very core is a powerful vision that balances the needs of business with that of humanity – where data is fully leveraged to free industry and humanity to thrive and scale sustainably.

We believe in a future where economic growth does not come at the expense of the planet and people.

We believe industry can be the answer to the world's sustainability challenges by harnessing the potential of digital reality technologies, data and automation.

We believe in driving innovations that free industry to optimise efficiency, productivity, quality, and safety at scale – the antidotes to waste, pollution, cost, diminishing margins and risk.

We believe in doing good by doing well – where the shift toward a more sustainable future is both prosperous and profitable.

Metrics that matter

We operate at scale, with revenue of over €5.4bn and more than 24,500 employees across 50 countries.

We prioritise innovation, allocating 15% of our revenue and more than 6,500 employees to R&D.

We drive sustainable progress, operating within nine ecosystems and 27+ industries.

We find ourselves at a point in history where we must do something that was never before possible: to achieve and sustain economic growth, prosperity, and safety while we reverse the course of overconsumption, inefficiency and waste.

Paolo Guglielmini
Hexagon President and CEO

Around the world, our technology...

Is used in:

95%

of all car manufacturing

75%

of all smartphones

90%

of all airplanes

Protects over

1 billion people

Helped construct:

Burj Khalifa

the tallest building

Gotthard Base Tunnel

the longest railway tunnel

Sultan Selim Bridge

one of the widest suspension bridges

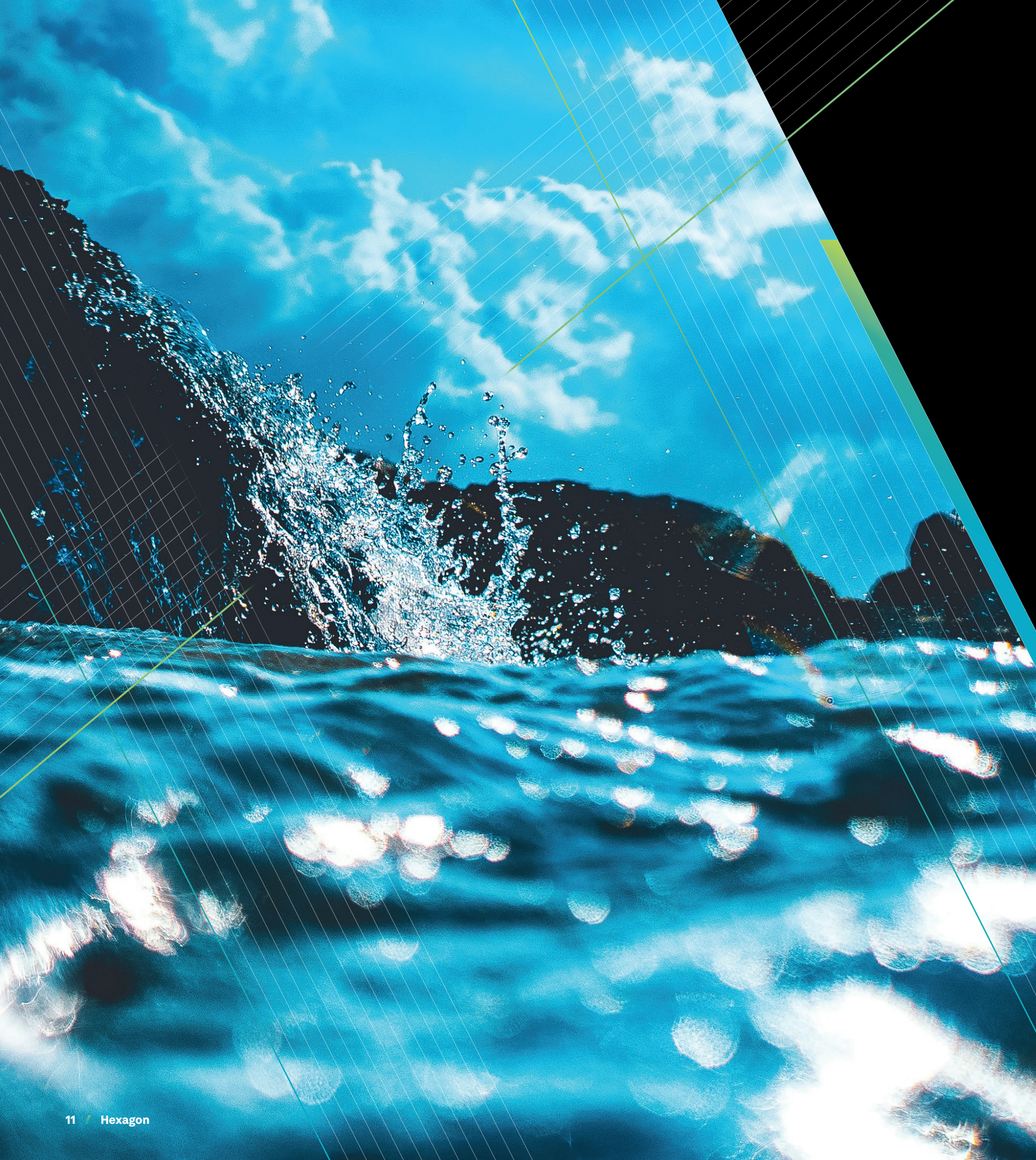
Has delivered more safe, reliable autonomous driving research vehicles than any other company

Drives efficiency for more than half of all

oil, gas and chemicals processed

Is working to lower nearly one-quarter of

greenhouse gases from agriculture, forestry and land use



Breaking industry free from inertia

The rich opportunities for the post-CO_2 Generation

For decades, industry rode a steep growth curve, fuelled by innovation and cheap fossil fuels. Today, we're experiencing the consequences of that approach – business-as-usual has led to rampant waste and catastrophic environmental impacts. Hexagon is leading a new hypergrowth curve to address the fundamental sustainability challenges of our day: enabling data-driven, autonomous enterprises that transform the CO_2 Generation to the Sustainable Generation.

The CO_2 Generation

CO_2 emissions have nearly doubled in the past 30 years. While the pace of year-on-year growth has slowed, significant declines have not been seen. We're on the way to cementing our legacy as the CO_2 Generation – the one that polluted and destroyed our planet without regard for the future.

Global temperatures are expected to reach the critical threshold of 1.5°C above pre-industrial levels between 2030 and 2050. The case for industry to invest in systemic, sustainable change is only getting clearer while the cost of unsustainable industry practices continues to rise. Where some may see insurmountable obstacles, we see opportunities to drive global prosperity that is both profitable and planet-saving.

It's time for the CO_2 Generation to break away from the inertia, from its dependencies and flawed practices. It's time to make the leap to sustainability at scale, becoming the Sustainability Generation. The only way to ensure this outcome is to have industry at the table, armed with the tools that hold back waste and depletion, not progress and growth.

The superpower of autonomy

The shift to a more sustainable future is not an easy one but it's certainly swifter and simpler with autonomy. Autonomy has the power to deliver financial benefits that yield both bottom-line and top-line returns. Not only can it mimic human activity but can also achieve far more than any of us – with certainty and predictably – in much less time.

While speed is important to creating systemic, sustainable change, industry's most powerful asset is data. 2.5 quintillion bytes of it are generated daily. Not surprisingly, it's grossly underleveraged. The sheer amount outruns our ability to mindfully process and use it. Even when leveraged, every decision or action we take is prone to human error.

Like human activities, data can be automated – from its creation or collection to its analysis and leverage. Quality, completeness and accessibility are already critical to data-driven decision-making. But advanced automation technologies like artificial intelligence add the ability to off-load real-time decision-making from humans to algorithms.

The more industry can enable action independent of human intervention, the closer we get to a fully sustainable economy.

Shaping innovation

Making the impossible possible: profitable sustainability at scale

Tech companies play an active role in helping achieve net-zero emissions and other sustainability initiatives. While innovation has enabled industry to drive digital transformation, in the coming years we must deliver beyond the balance sheet to create value and sustainability at scale.

Key challenges facing industry

Digitalisation
As the amount of data becomes increasingly vast, industries are under pressure to modernise processes to support the growing reliance on technology and digital platforms.

The war for talent
Companies must attract and retain top talent – especially in the technology, engineering and data analysis fields – and upskill their workforce to avoid large gaps in vital future skills.

Customer expectations
Industries must improve manufacturing processes, implement quality control measures, and invest in research and development to create better-quality products.

Sustainability
From reducing emissions to conserving resources and using renewable energy sources, companies that fail to prioritise sustainability will face negative consumer sentiment and regulatory action.

Freeing industry from constraints with digital realities

Digital transformation
Digital realities provide opportunities to digitalise processes, workflows and operations – connecting workers across entire ecosystems.

Data leverage
Digital realities provide opportunities to further leverage data to create automated processes – driving insights with the help of AI, machine learning and robotics.

Assuring quality, productivity and safety
Digital realities enable any industry to design and maintain assets for improved quality, productivity and safety.

Empowering sustainability
Digital realities enable sustainable practices through fewer inputs, less waste and less pollution.

The core competencies that matter

What matters most to compete in today's world? Growth and profitability? Efficiency? Productivity? Quality? Safety? Digital transformation? What about sustainability?

Thanks to advances in digital reality technologies, achieving these priorities equally is no longer insurmountable.

While there's no silver bullet – no standalone solution that can deliver the world-changing outcomes industry so urgently needs – there exists a historic opportunity for our customers to accelerate a profitable shift toward a more sustainable future.

Hexagon's innovation strategy is built on its established leadership in each of the core technologies critical to realising the full potential of data.

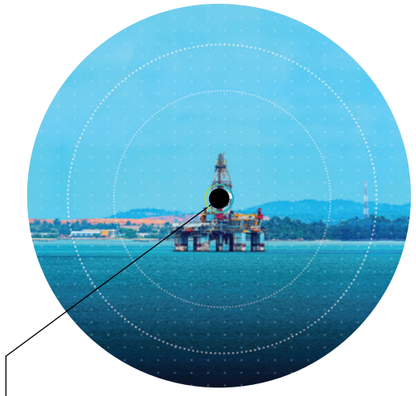
Reality capture

Digital capture of the physical world is the basic building block of a "digital reality" or twin. This includes documenting and preserving an exact truth about what's happened or happening; it means measuring and recording with perfect accuracy and precision; and it's the ability to see, monitor, recognise and understand both contextually and dimensionally in 3D.

Sensor-software systems: Purposely integrated hardware, software and robotics bring autonomous agility and speed to any reality capture workflow.

Extensive, ubiquitous portfolio: Industrial, terrestrial, airborne, handheld and robotic.

Pervasive, broad application: Proven value and ease of use in wide-ranging applications – from manufacturing, surveying and construction to safety and security, industrial facility operations, forensic investigation, historic preservation, real estate, media and entertainment and more.



Positioning

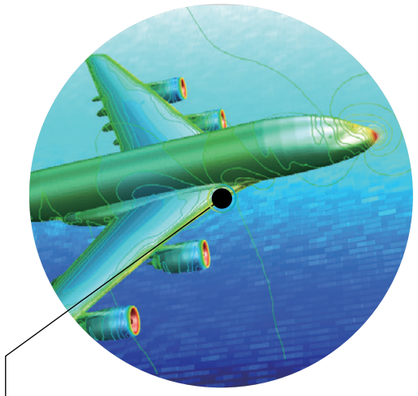
The need for accurate position information is essential for tracking and controlling the movement or mobility of assets and people. Additionally, achieving full autonomy isn't possible without positioning and other complementary technologies working together – finely-tuned and seamlessly – to make autonomy a reality.

Assured PNT (position, navigation and timing) for any industry: Receivers, IMUs, anti-jam antennas and correction services.

Autonomous technologies

Enriching automated systems with sensors, artificial intelligence (AI) and analytical capabilities enables systems to function and execute tasks without human control.

Pervasive, broad application: Software that learns and self-improves, often coupled with semi-autonomous or autonomous machines.



Design and simulation

Design and simulation technologies help solve real-world problems safely and efficiently – enabling the digital creation and exploration of what could be. The ability to model and simulate millions of real-world scenarios means we can predict failure and success before they occur.

Plant design software: Next-generation, data-centric, rule-driven solutions to streamline engineering design processes while preserving existing data and making it more usable/reusable.

Engineering design software: 2D drafting, 3D modelling, mechanical design and BIM.

Extensive portfolio of planning and simulation technologies: Creation of real-world scenarios in virtual settings – from manufacturing processes and scenarios for emergency incident planning and response to construction project performance and autonomous driving simulations.

Location intelligence

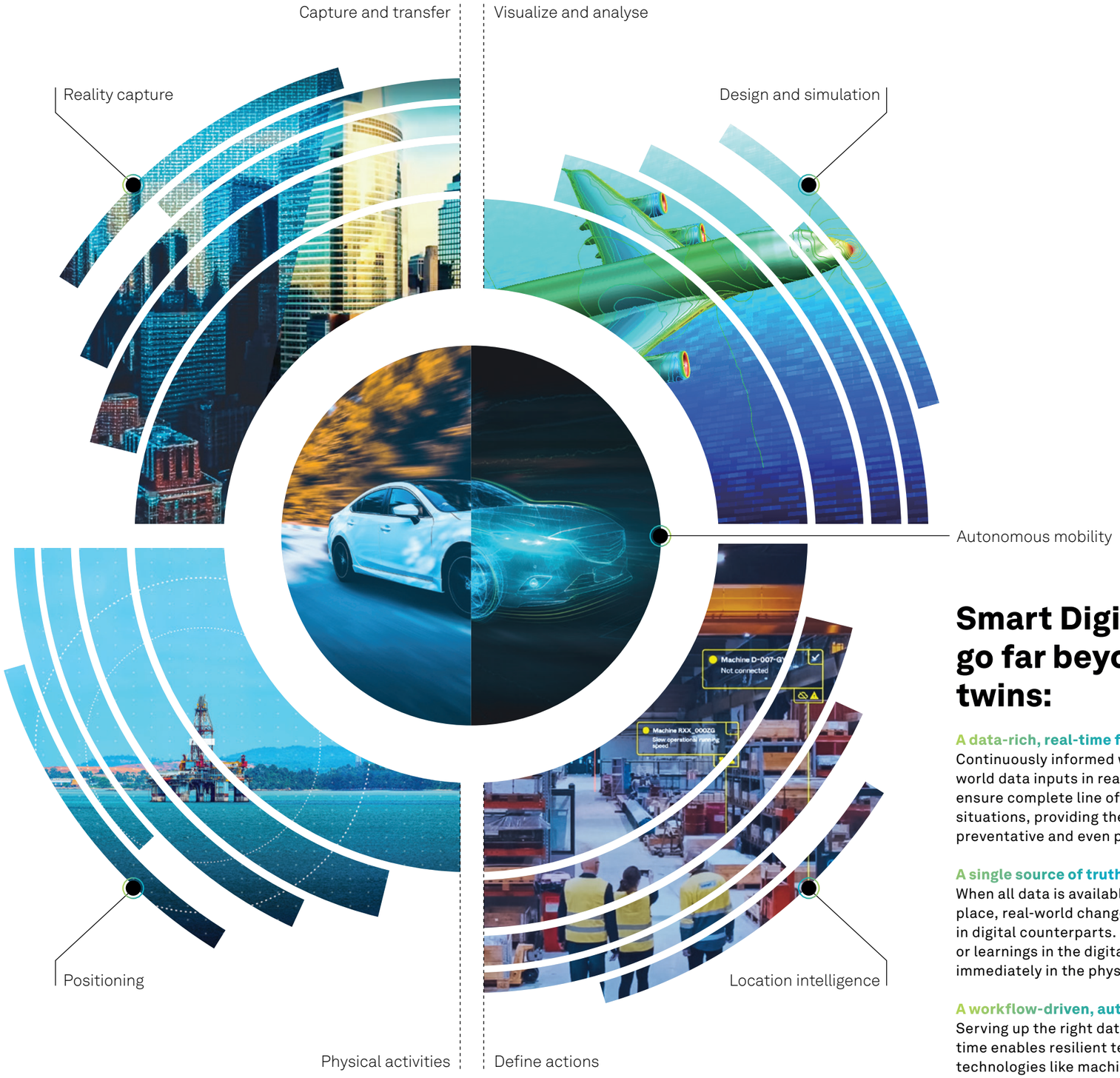
Complete line of sight to dynamic situations – at any time and from any location – is indispensable to decision-making for all mission-critical applications. The ability to instantly gain insight from complex data relationships leads to big-picture understanding and proactive problem-solving.

Comprehensive portfolio of situational awareness technologies: Spanning a myriad of industries and applications, intelligence of what's happening now to help identify issues before negative consequences emerge.

Beyond the digital twin: the Smart Digital Reality™

The sum of Hexagon's core technology competencies frees customers to use data to its greatest potential, where they can create and maintain a digital reality that evolves with change – the Smart Digital Reality.

Like digital twins, digital realities are built to represent anything – from human organs to entire cities. They have proved invaluable in reinventing industry, with infinite application. But they can be limited by the accessibility, accuracy, integrity and completeness of the data that informs them – the same data that users rely on to improve the real word. Moreover, they can become obsolete and unusable as quickly as the speed of change of whatever they represent.



Smart Digital Realities go far beyond digital twins:

A data-rich, real-time feedback loop
Continuously informed with physical- and digital-world data inputs in real-time, Smart Digital Realties ensure complete line of sight to ever-changing situations, providing the insight needed to be proactive, preventative and even predictive.

A single source of truth
When all data is available live, in context and in one place, real-world changes can be immediately reflected in digital counterparts. And vice-versa, simulations or learnings in the digital space can be actioned immediately in the physical world.

A workflow-driven, autonomous decision tool
Serving up the right data in the right place at the right time enables resilient teams and workflows while technologies like machine learning and AI interpret the mammoth flow of data to automate workflows, decisions and actions that reduce and even eliminate the need for human intervention.

Platforms: The fast track to Smart Digital Realities

Smart Digital Realities are revolutionary, but how easy are they to implement? Solutions and stakeholders must be linked if they are to share data and information in real-time. Smart Digital Realities require a digital infrastructure that enables essential lines of communication between data, teams and technologies to deliver actionable insights within any business context.

Hexagon's portfolio includes a foundational technology platform, Xalt, and a foundational digital reality platform, HxDR, alongside industry-specific platforms that enable customers to break down silos, facilitate collaboration and streamline mission-critical, workflow-driven business processes.

Foundational platforms

Xalt (foundational technology platform)
Accelerates the ability to extract the full potential of data within (or across) any Hexagon business solution.

HxDR (foundational digital reality platform)
Transforms the way customers work with, share, and perceive 3D spatial data.

Industry-specific platforms

HxGN Connect (public sector-specific)
Breaks down stakeholder barriers, enabling citywide collaboration to power crime, incident and operations centers for optimum management of ad-hoc, routine and emergency situations.

HxGN SDx (industrial facility-specific)
Provides universal access to trustworthy engineering data and documentation

Nexus (manufacturing-specific)
Streamlines information sharing, empowering cross-functional teams with the insights to solve unique problems and collaborate naturally in real time.

Power of One (mining-specific)
Connects all processes of a mine – from the pit to the plant.

HxGN Agron (farms-specific)
Enables the intelligent management of cultivation, harvest and transport operations.

Ecosystems served

Freeing customers to do to their best work

This is the real value of Smart Digital Realities. Industries no longer exist in a vacuum. We live in an interconnected, interdependent world, where dynamic business ecosystems have replaced the traditional focus on vertical sectors. Today, data must be fully leveraged to liberate multi-industry and multi-function stakeholders to tackle big challenges together. It's in this arena of complex ecosystems that Hexagon unleashes the full value of Smart Digital Realities.

> Hexagon's solutions are targeted at the two most critical mega ecosystems: production and people.

Production ecosystems

Production ecosystems encompass what humanity “takes and makes” from the planet. This includes everything from ore, minerals, grains and forests to refining oil and gas and manufacturing smart phones and automobiles. Hexagon’s digital reality solutions address the vast challenges and opportunities found within managing the complete lifecycle of discrete manufacturing, complex industrial plants and ships, open pit and underground mines and agricultural crops and forests. They also include autonomous road trains for safer, more efficient and cost effective mine-to-port ore transport and autonomous tractors for improved farming precision, bigger yields and greater financial returns.

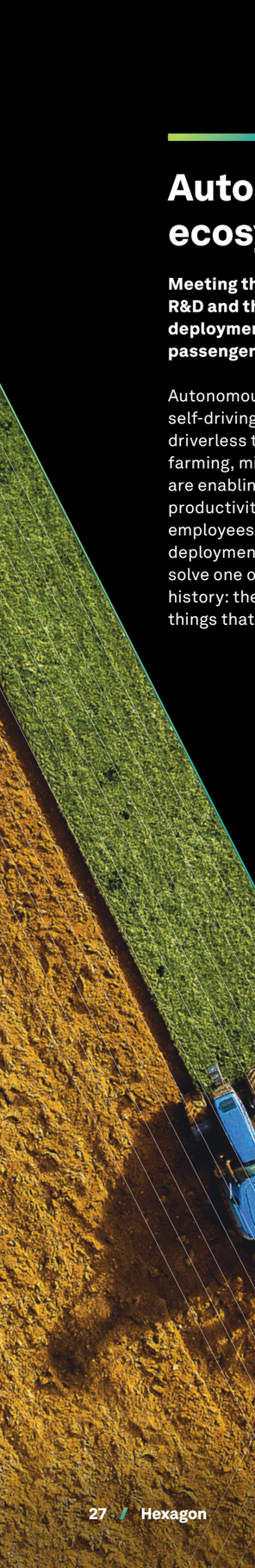
People ecosystems

A growing population and demand for higher living standards are challenges that must be tackled within the people ecosystems – all while ensuring that solutions add more value to society and the planet than what they destroy. Hexagon brings an entire portfolio of solutions to people ecosystems – from managing the complete lifecycle of vertical structures and large-scale engineering to ensuring public safety, economic vitality, quality of life for citizens and security and defence of nations. Together they address the urgent need to secure safe and intelligent cities, resilient infrastructure, buildings and homes, freedom of mobility and sustainable economies.

Autonomous mobility ecosystem

Meeting the challenges related to autonomous vehicle R&D and the sensor-software systems that make live deployment of AI drivers possible (on- and off-road; passenger and fleet).

Autonomous mobility has far-reaching benefits beyond self-driving cars and it's already driving industry: driverless technology applications within construction, farming, mining, shipping, supply chain and more are enabling industries to minimise waste, maximise productivity and improve the health and safety of employees. Our sensor-software systems make the deployment of AI drivers possible, helping customers solve one of the greatest technological challenges in history: the autonomous transportation of people and things that is safe, scalable and affordable.



Hexagon's approach is three-pronged:

Enabling solutions
Research and development platforms that enable automation functionality across a diverse set of control systems and industrial applications.

Accelerating solutions
Testing solutions that create a seamless workflow between real-world and simulated environments to accelerate, optimise, verify and validate billions of test-drive kilometres and real-world scenarios.

Deployment solutions
Comprehensive solutions that enable customers to quickly scale from prototype R&D and testing phases to full production in a variety of emerging and fast-paced market segments.

Key technologies

- Drive-by-wire systems
- Correction services
- AI-based perception
- Route planning software
- Simulation and testing software

Buildings ecosystem

Managing the full lifecycle of safely creating and maintaining vertical human-made infrastructure.

The built environment generates 40% of annual global CO_2 emissions with 27% of that from operation throughout the life of a building. It's clear we need to do better across the entire lifecycle. From design and planning through construction, operation and maintenance, stakeholders within the buildings ecosystem must depend on data that can be traced, connected, visualised, leveraged and updated for maximum value creation at each stage of the vertical structure lifecycle.

Design phase
Design and engineering solutions that capture an accurate digital reality of a building site's existing conditions, features and positioning to help digitally design models that minimise inputs and reduce waste during the project.

Plan phase
Software solutions that transform your vision and design into a plan of action, digitally mapping out every detail for the construction phase including materials, scheduling and cost.

Build phase
Building solutions that orchestrate the construction process more simply, creating a model of productivity and efficiency with higher quality, fewer reworks and less waste while ensuring worksite safety.

Operate and maintain phase
Completions and handover solutions that leverage all data from design, plan and build phases to create a Smart Digital Reality that delivers full transparency to every element of the completed building for owners.

Key technologies

- Surveying equipment and software
- Design and engineering software (3D BIM)
- Enterprise construction management software (4D and 5D BIM)
- Site monitoring and documentation software

Cities and nations ecosystem

Meeting the challenges related to delivering public sector services (e.g., public safety, utilities), connecting all related agencies and organisations to the same information (i.e., a single source of truth) for coordinated planning and event/incident management and response.

The speed and scale of urbanisation brings a host of challenges: providing viable infrastructure, like transportation, water and energy, ensuring safety through defence and first responders, delivery of basic services and creating a sound economy. Building cities and nations that work requires the delivery of public sector services that are resilient and sustainable. A data-driven approach will ensure citizen safety and connect all relevant stakeholders for coordinated event planning and response.

Governments and service providers are overcoming challenges and navigating uncertainty with Hexagon's Smart Digital Reality solutions across multiple disciplines:

Industrial and commercial resiliency
Scalable surveillance, security and incident management solutions that forge safer industrial and commercial facilities.

Mapping
Location intelligence solutions that capture, visualise, analyse and derive insights from location data to address a variety of urban and national challenges.

Public administration
Cloud-based applications and collaborative solutions to easily share data for census, cadastral management, public works and interagency situational awareness.

Public safety
Integrated technology solutions that improve the quality, accuracy and availability of critical information to enhance efficiency, security and productivity.

Transportation
Intuitive, integrated solutions for roads, railways, aviation and maritime to ensure effective planning, efficient operations and enhanced safety with minimal disruption.

Utilities and communications
Location-based technologies that achieve greater network service reliability, enhance integrity, increase efficiency and fulfil the expectations of utility stakeholders.

Key technologies

- Geospatial intelligence and asset management
- Situational awareness and 3D surveillance
- Visualisation and collaboration platforms
- Computer-aided dispatch and incident management software
- Network planning software

Defence ecosystem

Delivering innovative solutions across the naval, land, aerospace and electronic systems domains.

A long list of challenges confronts a nation's resilience. Nations rely on their defence forces and strategies to anticipate and protect against hostilities that could impact public health and safety. Threats still come from traditional geopolitical tensions, but can also come from new sectors, like cyber warfare, technology dominance and even climate change.

To ensure their national security, defence organisations require technological superiority to support real-time situational awareness and solve complex and dynamic challenges with digital reality solutions, including:

Administration operations
Scalable computer-aided dispatch, security software and reality capture systems, including surveillance sensors, to build safe and resilient bases and facilities.

APNT (Assured positioning, navigation and timing)
Anti-jamming and anti-spoofing technologies that ensure resilient and robust positioning in contested environments.

C4ISR [Command, Control, Communications, Computers (C4) Intelligence, Surveillance and Reconnaissance (ISR)]
We deliver world-class technology and services to provide sovereign nations with a strategic advantage. Situational awareness and real-time insights about adversaries and environments makes the swiftest response possible.

Mapping solutions
We deliver mapping and imagery intelligence capabilities and enable high-performance, real-time applications for command and control, mission planning and more.

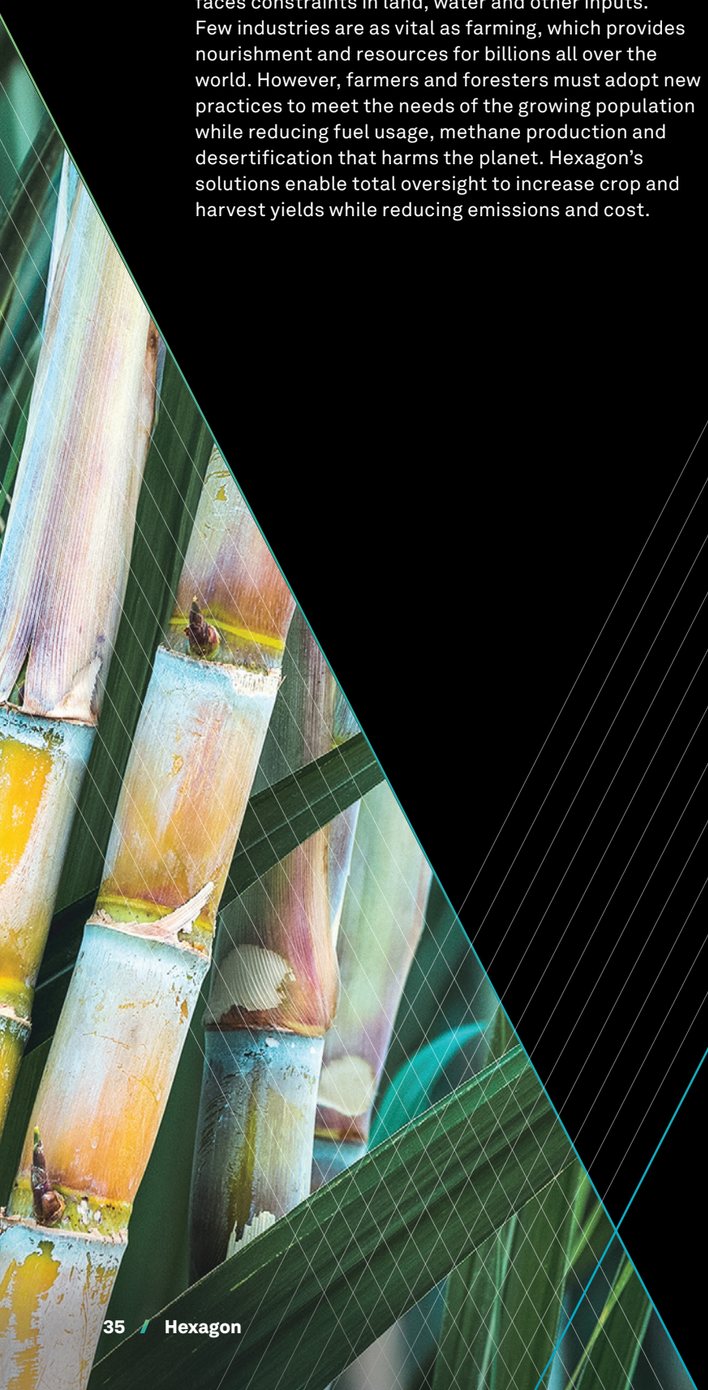
Key technologies

- GNSS anti-jam/anti-spoof
- Tactical edge mapping software
- Geospatial intelligence software
- Visualisation software

Farms ecosystem

Managing the full lifecycle of sugarcane, forestry and grain crops with more accurate techniques for planning, cultivation and harvesting – while also minimising resource use.

Demand for food is growing while the supply side faces constraints in land, water and other inputs. Few industries are as vital as farming, which provides nourishment and resources for billions all over the world. However, farmers and foresters must adopt new practices to meet the needs of the growing population while reducing fuel usage, methane production and desertification that harms the planet. Hexagon's solutions enable total oversight to increase crop and harvest yields while reducing emissions and cost.



Automation and autonomy
Turnkey automation and positioning solutions — from machine control to fully autonomous equipment — that reduce inputs, optimise yields and assure safety-critical operations while ensuring sustainability and resiliency across crop lifecycles.

Data management, logistics and analysis
Solutions that leverage data across the entire crop lifecycle of agricultural and forestry operations — from preparation to planting, cultivation to harvest — to ensure efficient field operations and maximum output.

OEMs
Field-ready advanced technologies for OEMs, including GNSS assured positioning and correction services for precision farming, machine controls and visualisation for analysis and planning.

Planning and optimisation
Solutions that overcome the inherent challenges of planning across multiple time horizons and optimise agricultural and forestry land use, workflows, equipment and processes to increase productivity and yield, and minimise waste.

Key technologies

- Smart antennas
- Precision agriculture machine control systems
- Field operations software

Industrial facilities ecosystem

Managing the full lifecycle of safely creating and maintaining the complex facilities that enable process manufacturing, while maintaining a single source of truth of the facility and related asset information.

The world consumes more than 100-billion metric tons of natural resources every year, which is unsustainable. It's never been clearer that energy security and cleaner energy are indivisible. While energy transition to renewables can't be achieved without fossil fuels, they must be made cleaner. If the industrial facilities ecosystem is to adapt and stay profitable in the future, it will be because data leverage has transformed the ecosystem into one that is both agile and sustainable. That means transitioning to renewable energy at the same time as increasing productivity, efficiency and output with dramatic reductions in harmful emissions and waste. This requires systemic change at every phase of the industrial asset lifecycle.

Design phase
Design and engineering software that transforms the project vision into a CAD model with precision and ease of use.

Plan phase
Sensor-software solutions that capture an exact digital twin of a site's existing conditions, features and precise location to facilitate digital design concepts that drive efficiencies and reduce waste throughout the asset lifecycle.

Build phase
Building solutions that orchestrate a construction project with a high level of productivity and efficiency — achieving the highest quality while avoiding rework and waste.

Operate and maintain phase
Facilities management and maintenance solutions that leverage data from the planning, design and build phases to create an operational twin that connects people, processes and events to keep a facility running optimally.

Key technologies

- Facility design, engineering and simulation tools
- Enterprise project performance software
- Enterprise asset management software
- Operational twins
- Operations risk management software

Infrastructure ecosystem

Managing the full lifecycle of safely creating and maintaining horizontal human-made infrastructure.

As the infrastructure ecosystem turns its focus towards a sustainable future, it must learn to manage complexities in delivering a new breed of projects on time and within budget. Stakeholders within this massive ecosystem must stay connected to deliver successful outcomes. Achieving the goal of sustainable infrastructure requires both urgency and patience. Yet, successfully navigating the pathway to net-zero emissions is the only acceptable outcome.

With Hexagon's solutions, data can do the heavy lifting, enabling governments and engineers to deliver sustainable infrastructure faster, profitably and sustainably at every phase of the project lifecycle.

Plan phase
Surveying solutions to visualise the site above and below ground, digitally mapping out every detail for the construction phase, including schedule, materials and cost.

Design phase
Design and engineering software that digitally captures all the right distances and volumes that are key to construction performance, with accurate positioning and measurements integrated into the 3D model.

Prepare phase
Solutions to help with everything from site evaluation to preparing machines, from underground utility detection to setting up GNSS corrections, to effectively mobilise your team and resources.

Construct phase
Maintain a data-driven approach to orchestrate the entire construction phase, creating a 3D model of productivity and efficiency – with higher quality, fewer reworks and less waste.

Operate and maintain phase
Solutions that provide 24/7 visibility into the operational twin to optimise safety, improve efficiency and extend the life of the infrastructure asset.

Key technologies

- Surveying equipment and software
- Machine control
- Quantity and takeoff solutions
- Design and engineering software (CAD and 3D BIM)

Manufacturing ecosystem

Managing the full lifecycle of discrete manufacturing, connecting workflows to deliver higher efficiency and productivity without compromising quality – while also using less material and creating less waste.

There is no ecosystem more vital to the global economy and more threatening to our sustainable future than manufacturing – and none is more susceptible to disruption. Competitive and fast-moving, the manufacturing ecosystem faces challenges from every stage in the life of a product. By harnessing data insights throughout the entire lifecycle, stakeholders can continuously improve time-to-market, quality and productivity while reducing waste, minimising risk and protecting profits at every phase.

Design and engineering
Innovations that enable users to digitally simulate and optimise product design and engineering to ensure component manufacturability, production productivity and output quality.

Production
Solutions that maintain a digital thread through production, optimise machine tools, measure environmental variances and prevent downtime with predictive data analyses.

Inspection
World-leading metrology hardware and software that automates and digitalises quality measurement, creating a bridge between the real and digital worlds.

Digital transformation
Sensor-software systems that transform and integrate siloed and disconnected processes, create value across the product lifecycle, enable new business models and automate workflows to become increasingly autonomous, efficient and sustainable.

Key technologies

- Computer-aided design and engineering
- Simulation software
- Computer-aided manufacturing
- Quality, metrology and inspection solutions
- Enterprise asset management software

Mines ecosystem

Managing the full lifecycle of raw material extraction, and connecting people, processes and workflows to deliver safer, more productive mines – while also using less material and creating less waste.

The transition to renewable energy will require massive inputs of metals and minerals that depend on a mining ecosystem with a legacy of unsustainable practices. To make the clean energy transition possible, we must focus efforts to meet the growing demand for materials, while making sure this growth is sustainable and minimal in its climate impact. A major driver of the global economy, underground and open pit mining is the focus of significant investment and a critical producer of raw materials for many industries. By embracing digital reality solutions, mines can adopt more sustainable and safer mining practices across the entire life of the mine.

Drill and blast
Technology that calculates and analyses the efficiency of each step in the drill and blast process via a tailored feedback loop to ensure continuous improvement through accuracy and precision.

Exploration
Technology that empowers the mine exploration process with the ability to store, manage and analyse drillhole data, perform geological interpretation of deposits and generate accurate block models.

Material movement
Technology that executes successful material movement through planning, fleet management, safety and slope monitoring.

Planning
Powerful 3D modelling and simulation, data visualisation and planning software for geologists and engineers that supports seamless workflows from exploration to production.

Survey and monitoring
Sensor-software systems and monitoring solutions that enable quick and informed decision-making without compromising safety or productivity.

Key technologies

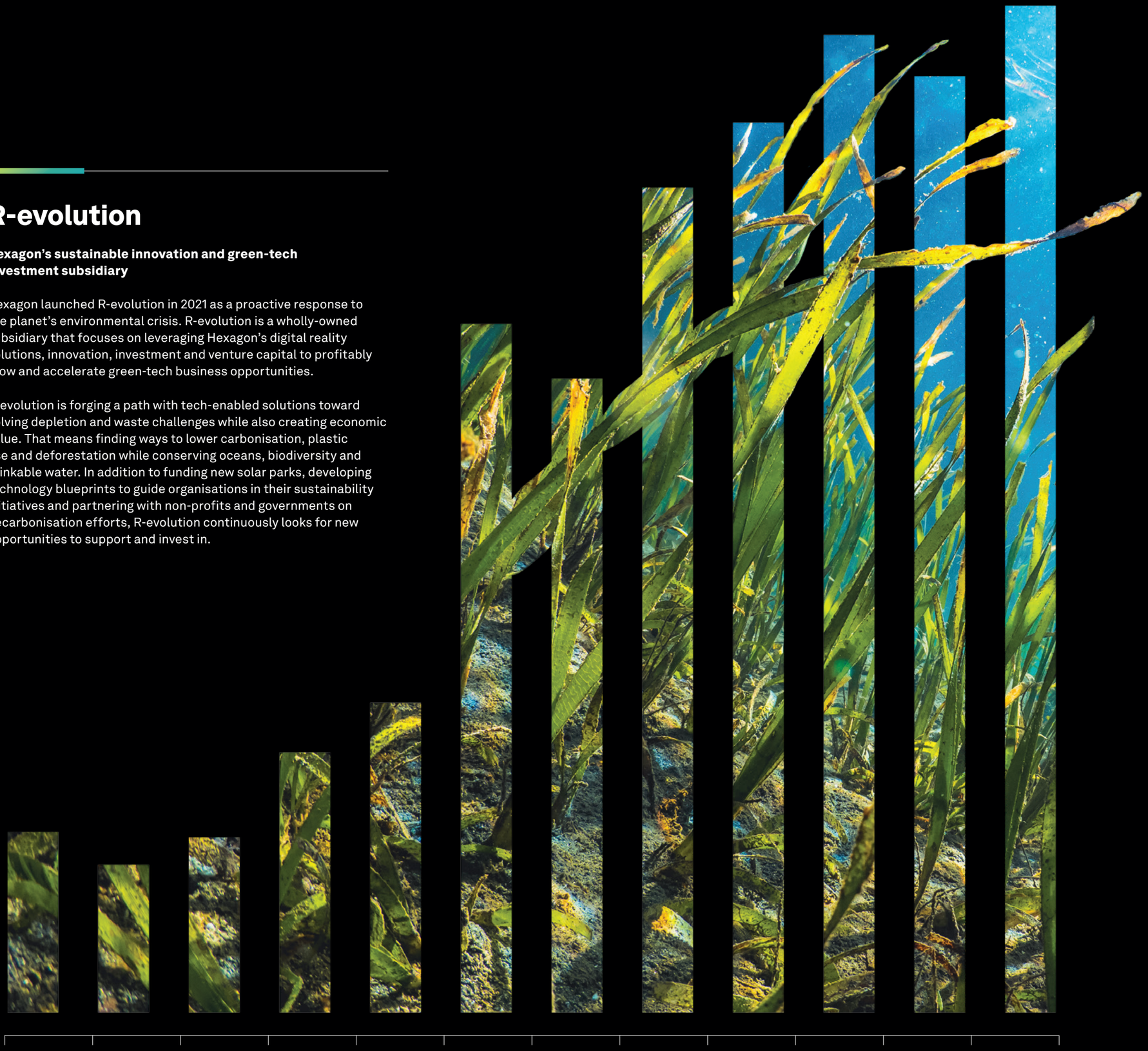
- Survey and monitoring equipment and software
- Mine design, exploration and planning software
- Drill and blast design and management
- Material movement and safety solutions
- Autonomous machine control systems

R-evolution

Hexagon's sustainable innovation and green-tech investment subsidiary

Hexagon launched R-evolution in 2021 as a proactive response to the planet's environmental crisis. R-evolution is a wholly-owned subsidiary that focuses on leveraging Hexagon's digital reality solutions, innovation, investment and venture capital to profitably grow and accelerate green-tech business opportunities.

R-evolution is forging a path with tech-enabled solutions toward solving depletion and waste challenges while also creating economic value. That means finding ways to lower carbonisation, plastic use and deforestation while conserving oceans, biodiversity and drinkable water. In addition to funding new solar parks, developing technology blueprints to guide organisations in their sustainability initiatives and partnering with non-profits and governments on decarbonisation efforts, R-evolution continuously looks for new opportunities to support and invest in.



CASE STUDY

Mapping the world's largest seagrass ecosystem

The Bahamian seagrass meadows store hundreds of millions of tonnes of CO_2 and make up 40% of the world's largest seagrass habitat. These beds house blue carbon ecosystems that store greenhouse gases 35 times faster than tropical rainforests. The Bahamian government needed to understand why these carbon sinks were being rapidly depleted.

R-evolution teamed up with Beneath The Waves in December 2021 to provide an accurate, scalable solution for year-over-year change detection and health monitoring of the seagrass ecosystem. The pilot programme included sensor-tagging tiger sharks who frequent the meadows, scuba surveys, marine vessel surveys and aerial data using Hexagon's airborne bathymetric LiDAR technology to develop an accurate visualisation of the health and activity of the meadows.

Following successful validation of Beneath The Waves' initial research, the Bahamian government is issuing blue carbon credits that are the first of their kind, with Beneath The Waves as the end-to-end science partner and R-evolution as the mapping supplier of superior point density and depth penetration for seagrass mapping and classification.

Architects of a new reality

The world finds itself at this historic inflection point that may only be fully appreciated in hindsight.

The old reality is headed to decline and obsolescence. Hexagon's bold vision for the future is to pivot – to chart a new course for industry – a course where the enormous potential of data is fully realised, so that business, industry and humanity sustainably thrive.

> **Genius is the ability to hold one's vision steady until it becomes reality.**
>
> Benjamin Franklin

Empowering an autonomous, sustainable future.

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. Our solutions target the rapidly widening gap of underleveraged data, putting it to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector and mobility applications.

We believe in a world where economic growth does not come at the expense of the planet and people. Our technologies are shaping production- and people-related ecosystems to become increasingly connected and autonomous – empowering customers to drive sustainability efforts in every aspect of their business.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 24,500 employees in 50 countries and net sales of approximately 5.4bn EUR. Learn more at hexagon.com and follow us @HexagonAB.

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