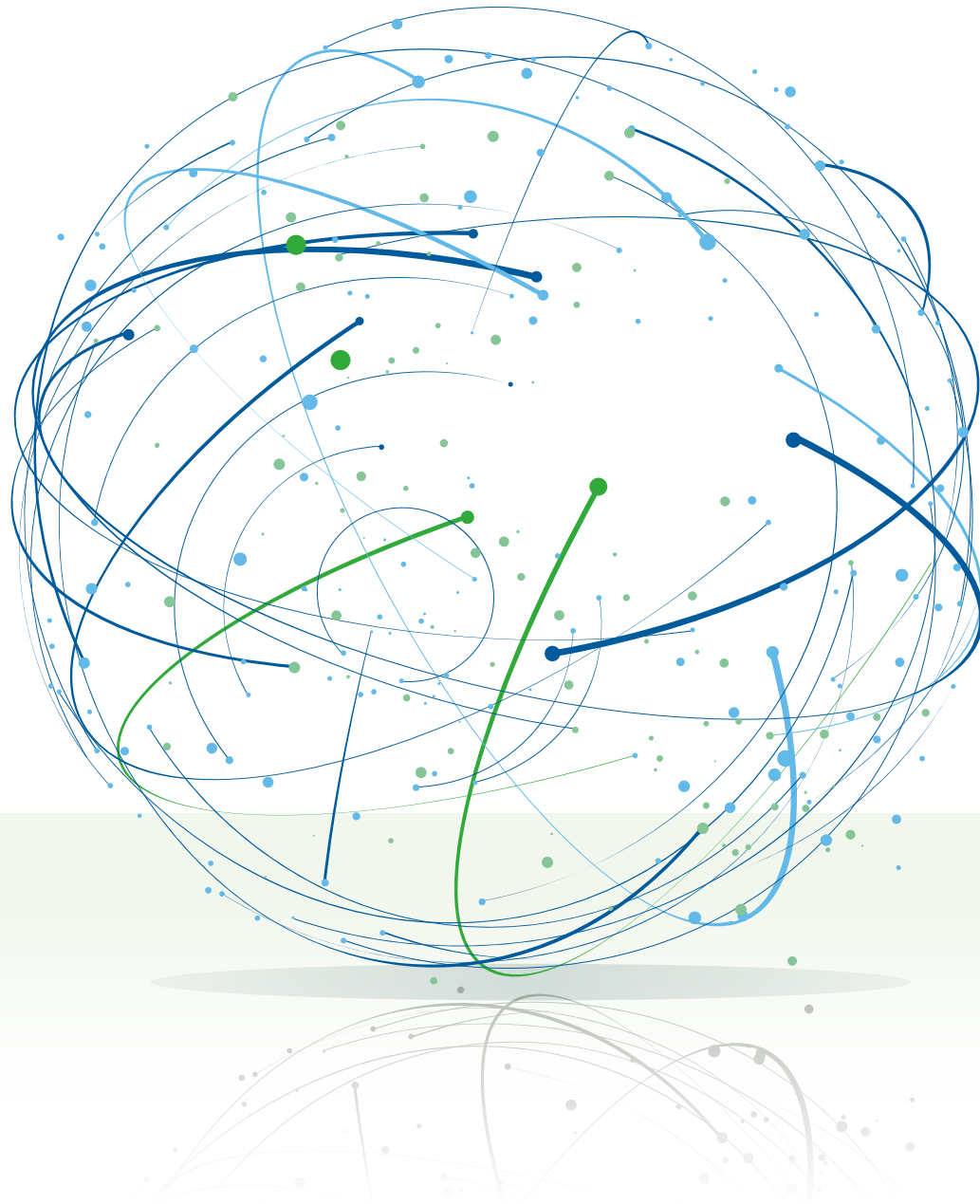


2025

SNAM • INNOVATION • PLAN

Transforming our future



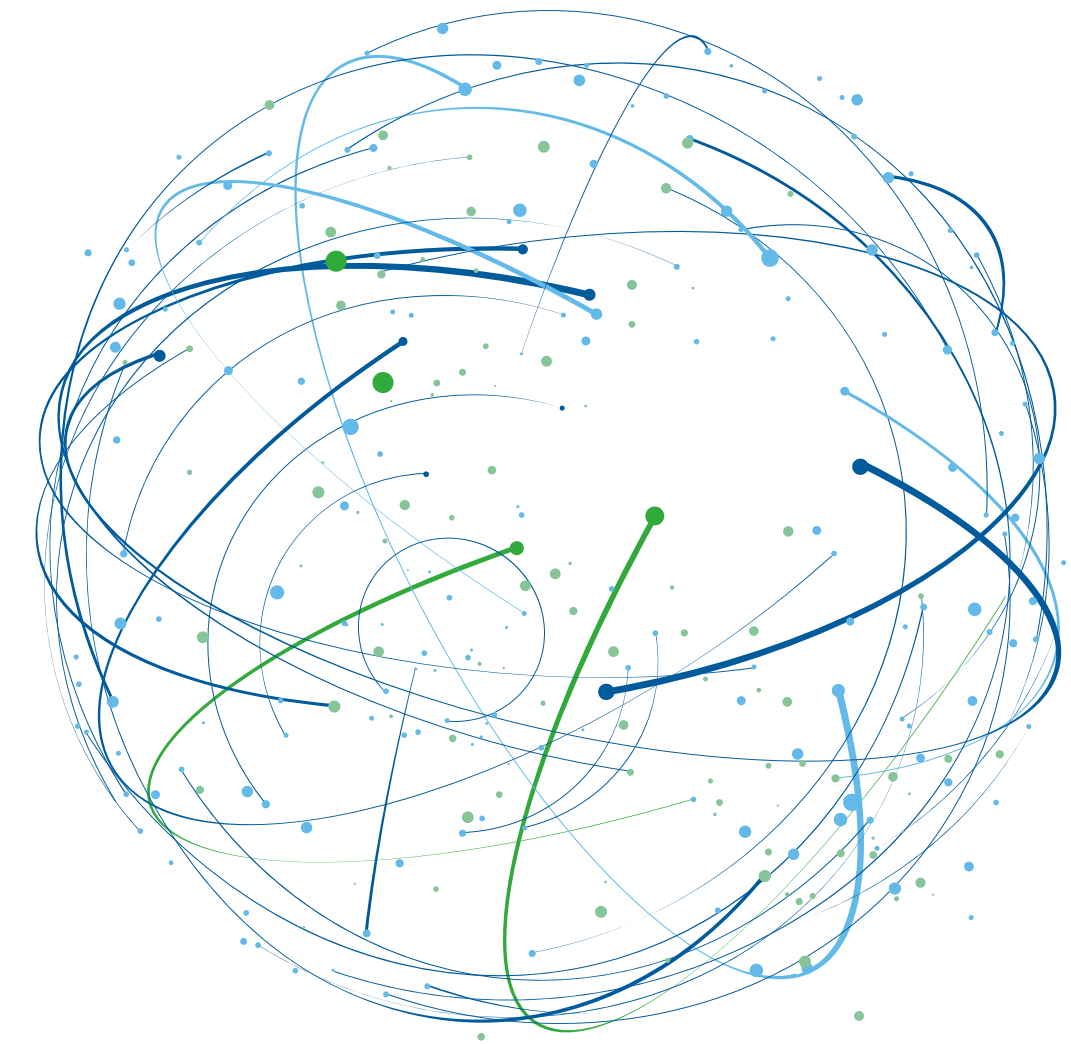
**DRIVING CONTEXT
EVOLUTION WITH
TRANSFORMATIVE
INNOVATION**

**HOW WE PURSUE
TRANSFORMATIVE
INNOVATION**

**INNOVATING THE
CORE: ASSETS
AND OPERATIONS
TRANSFORMATION**

**MOVING FORWARD:
RESEARCH,
DEVELOPMENT
AND INNOVATION
TO ENABLE
DECARBONISATION
AND DIGITALISATION**

**FUTURE OUTLOOK
FOR INNOVATION
PLANNING**



SNAM•INNOVATION•PLAN
Transforming our future

WHY WE NEED AN INNOVATION PLAN

"The secret of change is to focus all of your energy, not on fighting the old, but on building the new"
attributed to Socrates by Dan Millman

Innovation has been a cornerstone of Snam's identity since its founding in 1941. For over 80 years, our company has been a driving force behind major infrastructural, technological, and market transformations across the Italian and European energy landscape.



Who is Snam?

From pioneering methanisation and stimulating Italy's industrial and economic growth, to diversifying natural gas assets such as storage facilities and Liquefied Natural Gas (LNG) infrastructure, Snam has continuously evolved to meet energy needs. More recently, the company has embraced digitalisation and energy transition initiatives, while also developing a new concept of a mid-stream infrastructure player, reinforcing its commitment to delivering a secure, affordable, and sustainable energy system for the future. Transition to net zero and this rich legacy has shaped **Snam's strategic ambition**: to build a **pan-European multi-molecule infrastructure**. The vision aims to ensure the safety, security, efficiency and resilience of natural gas assets, while simultaneously developing infrastructure for decarbonised molecules, such as biomethane, hydrogen, and CO₂.



To achieve this, Snam's strategy is implemented through **two strategic levers**:

1. "All-round" sustainability

2. "Transformative" innovation.



TPR

The concept of **"all-round" sustainability** is the backbone of our **Transition Plan Roadmap**, which sets new industry benchmarks for sustainability reporting. This roadmap outlines actionable initiatives to reduce emissions, decarbonise operations, accelerate the energy transition, preserve

biodiversity, support local communities, and increase sustainable financing. These efforts align with the company's commitments to carbon neutrality by 2040 and net zero by 2050, milestone that will continue to shape and drive our sustainability ambitions.

This **Innovation Plan** addresses the strategic lever of **"transformative" innovation** and represents both a synthesis of the work done over the past few years and a reflection on Snam's evolution over the next decade.

Innovation is a strategic, transformative force for Snam. Since 2018, the company has applied a structured methodology through its **SnamTEC (Tomorrow's Energy Company)** programme—a comprehensive digitalisation and transformation initiative. This programme harnesses the collective expertise of over 200 dedicated employees with diverse backgrounds, alongside contributions from over 500 individuals, including other employees and technology partners. This transformative effort is designed to effectively and rapidly assess the robustness and value of new technologies and tools, with the goal of transforming core business processes, enhancing asset performance and resilience, and improving operational safety and security.

In parallel, Snam actively **deploys both existing and emerging technologies across multiple domains** to integrate various types of molecules into its infrastructure and the broader energy system, thereby pursuing its vision. By implementing and testing low-carbon technologies across the industrial, energy, and transport sectors, Snam supports system-wide decarbonisation while unlocking new opportunities. Moreover, Snam is committed to creating value for its ecosystem by exploring new business ventures, promoting innovation, and fostering collaboration across the entire value chain.

Unlike sustainability, where actions are guided by interim targets set on the path to net zero, the pace of innovation is inherently uncertain, shaped by rapid, unpredictable and non-linear technological progress. It is therefore essential to share a clear vision of Snam's evolution—one that is widely understood among stakeholders, consistent over time, and embraced across the entire organisation. This shared innovation vision ensures that all involved

parties remain aligned, engaged, and moving forward together.

The SnamTEC programme leverages a set of technologies that are already driving Snam's transformation journey. Cutting-edge technologies such as smart sensors, tele-diagnostics, remote terminal units, no/low emission assets and devices, AI, smart grids, advanced computing, augmented and virtual reality, drones and satellites, are integrated and combined in a user-centric approach to address operational needs and unlock safer, more sustainable, and more efficient processes. Thanks to comprehensive data analysis and predictive risk modelling, they enhance decision-making and enable proactive operational management.

Building on this solid foundation and emerging trends, the **Innovation Plan defines Snam's ambition and vision for the next decade**, providing clear directions for our journey while actively engaging all stakeholders. Acknowledging the fast-changing market and technological landscape, the Innovation Plan is designed to be agile and dynamic, evolving regularly to adapt to emerging challenges and opportunities.

In doing so, Snam reaffirms its commitment to excelling in its role as a gas Transmission System Operator (TSO), leveraging innovation and technology to optimise the balance of the **energy trilemma**: security, sustainability, and affordability. At the same time, Snam is evolving to become a leading infrastructure player in the energy transition, inspiring the future of sustainable energy. The company's ability to lead this transformation relies on its capacity to innovate as a gas TSO while experimenting with energy transition technologies, within and for its assets. Rather than merely adapting to change, Snam aims to be an enabler of progress, with the foresight to anticipate change, the flexibility to keep options open, and the agility to act decisively. With this proactive approach, Snam is not adapting to the future but actively contributing to shape it.

This Innovation Plan focuses on the strategic lever of "transformative" innovation, summarizing recent achievements and outlining Snam's evolution over the next decade.



EXECUTIVE SUMMARY

The transformation of energy systems requires continuous technological advancements to its infrastructures, and Snam is positioning itself at the forefront of this change, leveraging innovation to ensure security, efficiency, and “all-round” sustainability of its assets. As markets evolve towards decarbonised molecules, and while artificial intelligence (AI) & digitalisation open new opportunities, energy infrastructure operators must integrate new technologies and enhance operational flexibility to maintain reliability, safety and ensure competitiveness.

Energy markets are facing mounting challenges: the increasing volatility of energy demand requires smarter, more flexible network operations; the integration of decarbonised molecules within energy systems requires new infrastructure solutions; and the pervasive role of digitalisation—enabling extensive use of AI—is reshaping how operations and corporate processes are optimised. These trends underscore the strategic value of innovation for Snam in rethinking how infrastructure is designed, operated, and integrated within an increasing complex energy ecosystem.

All this resonates with Snam’s innovation vision of evolving into a **pan-European, platform-based, and data-driven, multi-molecule infrastructure operator**, redefining the management and optimisation of energy networks. This transformation involves shifting from a traditional asset-based model to a dynamic platform approach, where data, advanced analytics, AI agents, and digital ecosystems enable seamless interactions between infrastructure, market operators, end users and other key stakeholders, while gradually integrating multiple molecules.

To achieve this vision, Snam’s innovation strategy is built on a **dual-track approach**, leveraging **proven solutions** while **exploring new technological domains**. **Proven innovation** focuses on fully deploying scalable, market-ready technologies to enhance operational performance, security, and sustainability. In parallel, **explorative innovation** involves researching, testing, and developing breakthrough solutions that will shape Snam’s future in the long run.

This approach ensures that Snam remains agile, capturing immediate benefits while positioning itself for long-term sustainable innovation. As a system operator and integrator of technologies, Snam leverages external innovation through R&D, partnerships, venture investments, and collaborations with academia and industrial players. Open innovation is a key driver, engaging startups, research institutions, and industrial partners to accelerate technology readiness. The goal is not merely experimentation but scalability and industrialisation—ensuring that new solutions become reliable, deployable, and fully integrated into operations.

Snam’s innovation efforts are focused on evolving our core business and operations, while fostering clean technologies to enable the multi-molecule vision and embracing AI & digital transformation across the whole company. In core operations, Snam is innovating with AI/ data-driven infrastructure and automated monitor/control systems, as well as with hydrogen- and CO2-ready assets. In clean tech, Snam is advancing solutions to integrate new molecules into its infrastructure. Finally, through AI, data architecture, cloud and edge infrastructure and digital platforms, Snam is transforming and optimising corporate-wide services.

Looking ahead to 2035, our technological roadmap is inherently designed to be adaptable. With an increasingly dynamic technological landscape, the company prioritises agile governance to enable fast decisions, quick iterations, and the ability to pivot when necessary. A participative approach to innovation—with over 200 full-time employees dedicated to SnamTEC and about 30 people contributing to explorative innovation—fosters a culture where new ideas emerge from across all functions and employees. The company’s systemic impact ensures that its innovations not only enhance internal operations but contribute to a more resilient, decarbonised European energy system. Innovation at Snam is a long-term mission, not just an initiative. By combining strategic foresight with executive discipline, we reaffirm our leadership in the energy midstream supply chain, ensuring that our infrastructure remains future-ready in a world where transformation is the only constant.

VISION

Becoming a pan-European, platform-based, and data-driven multi-molecule infrastructure operator



EXECUTIVE SUMMARY

A quick guide to what is inside



Snam's Innovation Plan Website

FOUNDATIONAL PILLARS

WHY WE INNOVATE

HOW WE INNOVATE

WHAT WE INNOVATE

HOW WE EMBRACE THE FUTURE

DISCLOSURE ELEMENTS

Context trends in relation to Snam's ambition

Innovation culture, strategy, principles, ecosystem

Focus on our innovation initiatives

Adaptable innovation management to navigate the next decade of change and opportunities

CHAPTERS IN THIS DOCUMENT

1. Driving context evolution with transformative innovation

2. How we pursue transformative innovation

3. Innovating the core: transformation of assets and operations

4. Moving forwards: research, development and innovation to enable decarbonisation and digitalisation

5. Future outlook for innovation planning

CHAPTER

01

**DRIVING CONTEXT
EVOLUTION WITH
TRANSFORMATIVE
INNOVATION**

1.1 THE WORLD AROUND US

A shifting global landscape: why innovation is more urgent than ever

Innovation is a **key strategic lever** for driving success in the transformation journey. Indeed, achieving a net-zero future and mitigating climate change depends on technological breakthroughs, yet many necessary solutions remain either too costly or undeveloped for reliable industrial-scale deployment. Simultaneously, the AI revolution catalysed by the rise of generative and agentic AI is propelling digital transformation to a higher level. Since the 2000s, technology and digital revolutions have profoundly reshaped businesses and markets, with the capitalisation of digital companies overtaking industrial players. Amid these transformations, companies must prioritise innovation to remain competitive and relevant.

Despite setting ambitious sustainability targets, Europe continues to face **structural challenges** that prevent it from turning these aspirations into a competitive advantage. These challenges include slow productivity growth, demographics, skill gaps and high energy costs. Against this high-stake backdrop, the **EU urgently needs large-scale investments to revitalise its innovation ecosystem**. Key priorities include leveraging innovation to reduce energy costs, unlocking substantial capital flows to drive technological transformation, and embedding innovation as a core economic pillar. Over the next five years, Europe will need to invest an estimated €450 billion annually for the energy transition, €150 billion for digital technologies, and €100-150 billion for productivity and innovation¹.

As an historical Italian company with a pan-European presence, Snam must navigate these challenges while leveraging its core strengths and European aspirations to drive innovation and sustainable growth. For Snam, innovation is both an opportunity to enhance our work and a necessity to fulfil our role as a leader in the energy transition, continuously seeking new solutions that remain largely untapped.

Key energy market trends and scenarios

Snam's core business is at the heart of Italy's energy system, with a strong focus on infrastructure for natural gas and decarbonised molecules, a position that requires continuous investment to ensure resilience, efficiency, and sustainability. The **integration of gas and electricity value chains** is intensifying, a trend expected to accelerate

in the coming years. While natural gas is today Italy's main source of power generation, **decarbonised molecules** and their infrastructure will be **essential enablers of the transition**. For this reason, assessing energy market evolution calls for a system-wide perspective in which several key trends are emerging, poised to shape the future landscape.

Uncertainty in energy demand and transition

Globally, there is a disconnect between long-term scenarios projecting an 0.9% annual reduction in energy demand to 2050² and short-term forecasts projecting continued growth, driven by increasing industrial, commercial and residential needs across China, India, Southeast Asia and other southern hemisphere regions³.

Cloud computing & AI are also significant contributors to rising energy demand: between 2020 and 2024, global energy consumption by data centres doubled to 500 TWh, and this figure is expected to more than double again by 2029, reaching approximately 4% of global power demand by 2030⁴.

Much of this **new demand** comes **from entirely new electricity needs**, compounding the impact of ongoing electrification efforts. While electrification coupled with energy efficiency remains a critical lever for the energy transition, progress has been slower than anticipated in the EU, despite policy support in transport as well as residential and commercial heating. For instance, challenges have emerged in the rollout of electric vehicles (EVs) and electric heat pumps (EHPs), with sales growth rates decelerating in 2023 and even dropping in 2024 vs 2023 for EVs⁵ and EHPs⁶.

Solar and wind driving power supply decarbonisation and grid investments

As electrification expands and new energy demands emerge, decarbonising additional electricity generation is crucial to avoid merely shifting emissions upstream. **Solar and wind** energy are the **main drivers of power generation decarbonisation**, alongside more traditional sources like hydro. By 2024, renewables accounted for over 45% of the EU's power generation, up from 34% in 2019, primarily driven by solar and wind growth. For the first time, solar photovoltaic

energy (PV) overtook coal with an 11% share, while wind remained at 17% and hydro at 13%⁷. In terms of new capacity, the EU added 65.5 GW of PV in 2024, bringing total installed capacity to almost 350 GW. Wind capacity grew by 13 GW, bringing total capacity to 231 GW.

Nuclear energy is also **regaining attention** as a carbon-free source to meet future baseload needs. Target-driven scenarios project a surge in nuclear power across the EU, particularly in France where plans include renewing its 63 GW capacity both with new large-scale plants and up to 4GW in small reactors by 2050⁸. The UK is also scaling up, aiming for 24 GW by 2050 up from 6 GW today⁹. There is a strong technological debate on small reactors (SMRs), generation IV reactors, and nuclear fusion, although their impact remains uncertain, especially over the next decade.

While the development of solar and wind power marks significant progress towards decarbonisation, their **intermittency and unpredictability require greater system-level responsiveness** to maintain energy security and stabilise prices. Oversupply of renewable energy can drive power prices down or cause grid congestion and curtailment. On the other hand, supply shortages such as during Dunkelflaute events¹⁰ can trigger sharp price spikes. Germany provides a clear example: in 2024, power prices were negative for 468 hours and peaked above €200/MWh for 144 hours, including 10 hours at over €800/MWh, while the yearly average settled at €80/MWh.

One of the solutions that is expected to expand significantly in the coming years is the development of **additional grid capacity**—both within and across borders—to ease bottlenecks. To ensure the necessary system flexibility and resilience other solutions should be scaled and integrated along with grid expansion.

Decarbonising natural gas operations

The Oil & Gas sector at the heart of the global decarbonisation challenge, holds a crucial responsibility in mitigating the impact of climate change and driving sustainable and decarbonised solutions. While **natural gas** remains a **critical energy source for security, affordability, and flexibility**, ensuring its long-term sustainability requires addressing emissions across the entire value chain—from production to end use. The industry must take decisive action,

leveraging technology to minimise methane emissions, reduce leakage, and optimise efficiency, making these efforts a core pillar of the energy transition.

Key priorities include detecting and reducing methane leaks, mitigating and adapting to climate change, deploying low-emission infrastructure and operational models, and integrating carbon management technologies such as Carbon Capture and Storage (CCS) while minimising flaring and venting. Achieving these objectives demands not only technology, but also a shift in operational models supported by digital transformation.

The adoption of Operational Technology (OT), advanced real-time monitoring systems, and AI-driven predictive analytics enables a proactive approach to emissions management. Digital twins, smart sensors, satellite-based leak detection, and automated control systems provide unprecedented visibility and control over infrastructure performance. Furthermore, the integration of AI and advanced computing facilitates predictive maintenance, dynamic system optimisation, and improved efficiency in gas transportation and storage.

Addressing these challenges has become a top priority. By integrating cutting-edge technology and rethinking operational models, the industry can lead by example, demonstrating that natural gas infrastructure can play an active role in emissions reduction and energy system optimisation.

Snam is fully committed to this transformation, ensuring that its infrastructure not only adapts to the evolving energy landscape but actively contributes to shaping a more sustainable future, as shown in its ambitious targets for emissions and gas leakage reduction.

Decarbonised molecules for a comprehensive and reliable transition

Decarbonised gases are widely recognised as **pivotal to achieving** both **net-zero emissions** by 2050 and meeting the EU's target of a 55% CO₂-equivalent reduction by 2030. Their contribution will be particularly significant in hard-to-abate sectors such as cement, steel, pulp, ceramic and glass industries, in serving as clean feedstock for chemicals and refineries, and in heavy transportation such as long-haul road transportation aviation and shipping. Beyond industrial and

¹ 2024, Mario Draghi, "The future of European competitiveness"

² 2024, IEA, World Energy Outlook 2024

³ 2024, IEA, Electricity 2024 and 2024, IEA, Electricity Mid-Year Update – July 2024

⁴ 2024, Energy&Strategy, Digitalisation and Decarbonisation Report

⁵ 2023, ACEA, New car registrations

⁶ 2024, European Heat Pump Association

⁷ 2025, Ember, European Electricity Review

⁸ 2025, IEA, The Path to a New Era for Nuclear Energy (APS scenario)

⁹ 2025, IEA, The Path to a New Era for Nuclear Energy (APS scenario) 1 and 2024, World Nuclear Association (UK Country profile)

¹⁰ "Dunkelflaute" is a German term, popular in the energy industry, which describes weather conditions where scarcity of sunlight and wind leads to little or no energy being generated from windfarms and solar power plants

transport applications, decarbonised gases will also provide essential **clean flexibility** to the power system.

Biomethane, a mature and sustainable alternative to fossil gas, reached 5 bcm in EU production in 2024¹¹. However, meeting the Repower EU target of 35 bcm by 2030 will require a sharp acceleration from the current inertial forecast of 16 bcm¹². Similarly, reaching the Italian production target of 5 bcm by 2030, as stated in the 2024 Italian National Energy and Climate Plan (NECP), will require significant upscaling to more than ten-fold the current value. This requires robust infrastructure development and deployment, particularly in regions with abundant feedstock. Alongside biomethane, advanced biofuels—such as biodiesel and Bio-SAF (Sustainable Aviation Fuel)—will be essential in decarbonising transportation.

Hydrogen (H₂) is a key pillar of the EU's decarbonisation strategy. With Final Investment Decisions (FIDs) increasing in both number and scale, the low-carbon H₂ markets are set to grow in the coming years to replace grey hydrogen in chemicals and refineries, enable the production of green steel, and gradually expand into other sectors as costs decline and infrastructure develops. **The Italian National Hydrogen Strategy** published in November 2024 projects a gradual development of the H₂ market: 8.4 TWh of green hydrogen by 2030 out of a total consumption of 20 TWh (in line with the Italian NECP); and a demand between 74 to 138 TWh by 2050, to support the deep decarbonisation of Italian transport and industry sectors, efficiently leveraging import-export pipelines and ports. Accelerating market uptake will require a strong focus on production, end-user technology and market design to mitigate uncertainties around costs and long-term offtakes. The availability of green hydrogen would also unlock the production of e-fuels such as green ammonia (NH₃), methanol (MeOH), synthetic or e-methane and e-SAF. These molecules can both decarbonise existing uses and serve as liquid carriers for H₂ transport.

Carbon Capture and Storage (CCS) is gaining strong traction as a technology capable of addressing heavy industrial process emissions, particularly in cement production. When combined with gas power, CCS also offers clean and dispatchable power. Beyond carbon emissions, CCS can also enable carbon removal through Direct Air Capture (DAC) and BioEnergy Carbon Capture and Storage (BECCS) of biomethane. With CCS approaching a commercial tipping point faster than other decarbonisation alternatives, the EU has embraced this **key decarbonisation lever**, targeting 50 MtCO₂ captured annually by 2030, 280 MtCO₂ by 2040, and 450 MtCO₂/year by 2050¹². At the national level, the NECP targets the capture of 4 MtCO₂/year by 2030.

Infrastructure development will be essential to harness the potential of these technologies. Biomethane, typically produced at a small scale near feedstock sources, must be efficiently integrated into the existing gas network. Hydrogen benefits from economies of scale, requiring the development of dedicated transport infrastructure, including pipelines and distribution networks. Finally, the success of CCS hubs will depend on an extensive infrastructure ecosystem, not only for CO₂ storage but also for transport via pipelines and shipping routes.

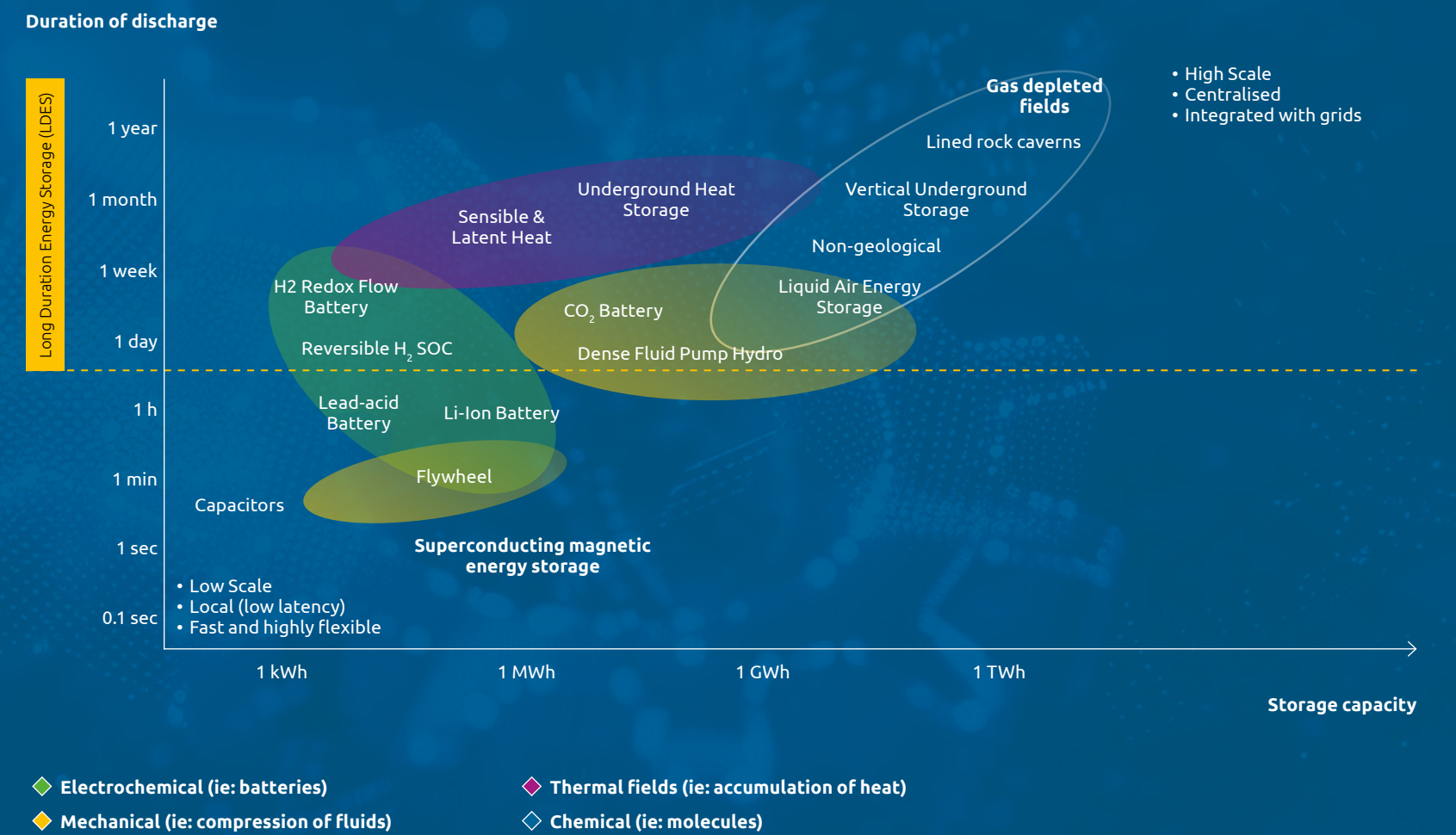
Ensuring system stability – role of natural gas and long duration storage

Natural gas storage plays a **critical role in energy system stability**, balancing demand fluctuations driven by weather-dependent seasonality and serving as a critical backup for a power system increasingly reliant on intermittent wind and solar renewables. While natural gas power generation has been steadily declining in Europe, gas-to-power demand surged significantly during the 2024 Dunkelflaute with storage availability proving essential to maintaining system resilience.

As renewable penetration and electricity demand continue to grow, the **need for flexibility will only intensify**. To support a decarbonised energy system, **storage must evolve into a multi-technology, multi-fuel ecosystem**. Short-term flexibility will be primarily provided by demand response behaviours and Battery Energy Storage Systems (BESS). Seasonal and long-term system flexibility will rely on Pumped Hydro Storages (PHS) and Long-Duration Energy Storage (LDES) solutions. Currently, PHS provides 96% of utility-scale energy storage globally, with the EU hosting a quarter of worldwide installed capacity¹³. In parallel, technologies like flow batteries, Compressed Air Energy Storage (CAES), thermal storage and molecule-based storage (e.g., hydrogen and derivatives, liquid air/CO₂) are rapidly progressing to meet the growing demand for higher-volume, longer-duration flexibility and backup solutions – see figure 1.

Beyond supporting power system flexibility, the rise of decarbonised molecule markets—both gaseous and liquid—will require dedicated storage solutions to ensure demand-supply balancing and security of supply. In some cases, existing infrastructure can be adapted, particularly for drop-in fuels such as biomethane, e-methane, and biodiesel. In other cases, new assets will need to be developed, particularly for hydrogen and CO₂ storage.

FIGURE 1 - LONG DURATION ENERGY STORAGE SOLUTIONS REPRESENTATION – DURATION VS CAPACITY



¹¹ 2025, European Biogas Association, Statistical Report 2024
¹² 2024, European Commission, Industrial Carbon Management Strategy
¹³ 2023, Joint Research Centre, Hydropower and pumped hydropower storage in the European Union

1.2 OUR ROLE

Snam is a **leading European operator in gas infrastructure** with a network exceeding 40,000 km across Italy and Europe. It holds one-sixth of the European Union's entire storage capacity and manages (or co-manages) an estimated annual regasification capacity of 28 billion cubic metres, including the Ravenna LNG plant.

In recent years, Snam has expanded beyond traditional gas infrastructure, investing in small scale LNG, sustainable mobility, energy efficiency businesses, as well as in low-carbon gases such as biomethane, hydrogen, and CCS. These initiatives support our strategic 2025-29 plan to build a **pan-European, multi-molecule infrastructure, ensuring the resilience and stability of the gas (and power) system while enabling the scale-up of decarbonised gas** via the development of dedicated infrastructure, both new and repurposed, to optimise costs and reduce deployment time.

We are already putting our strategy into action. Through Snam, Italy has increased its regasification capacity by acquiring two new Floating Storage and Regasification Units (FSRUs) and has launched important infrastructure projects to increase both gas storage and pipeline transport capacity, such as the Linea Adriatica project. On the decarbonised molecule front, Snam is the leading partner of the South2Corridor project, positioning Italy as the potential gateway for southern Mediterranean hydrogen to supply the hard-to-abate industries in northern Italy, Austria, and Germany. Additionally, in partnership with Eni, Snam has also launched Ravenna CCS, the most important CO₂ capture and storage initiative in the Mediterranean region. This project is crucial for ensuring the socially and economically sustainable decarbonisation of energy-intensive industries. Finally, Snam is actively supporting the scale-up of Italy's biomethane market, managing more than 218 biomethane connection contracts in 2024, a 11-fold increase compared to 2020.

FIGURE 2 - SNAM INVESTMENTS IN THE 2025-29 STRATEGIC PLAN

Snam's 2025-29 strategic plan and long-term view

In its latest strategic plan, Snam has reinforced its ambition by investing €12.4 billion (net of approximately €1 billion in grants) over the 2025-29 period, with €1.5 billion dedicated to the energy transition initiatives.

Beyond its business objectives, Snam recognises **innovation as a key strategic lever** in achieving Snam's vision. Over the plan's horizon, Snam will invest €400 million in innovation activities, including €338 million in proven technologies and €62 million in explorative innovation. Compared to the previous strategic plan, this represents a 15% increase in investments (from €350 million over 2023-27).



BUSINESS FOCUS

Gas infrastructure to secure competitive energy supply
Energy transition platform to accelerate decarbonization

€ 12.4 B Capex 2025-29
(€13.4 B gross of grants)

- 41% Taxonomy aligned investments
- 58% SDGs aligned investments
- € 10.9 B investments in Gas Infrastructure
- € 1.5 B investments in Energy Transition

Promoting a pan European multi- molecule system



STRATEGIC LEVERS

Transformative Innovation
All round sustainable strategic framework

Dual-track innovation approach to drive operational excellence and sustainability

- € 338 M invested in Proven Innovation
- € 62 M invested in Explorative Innovation

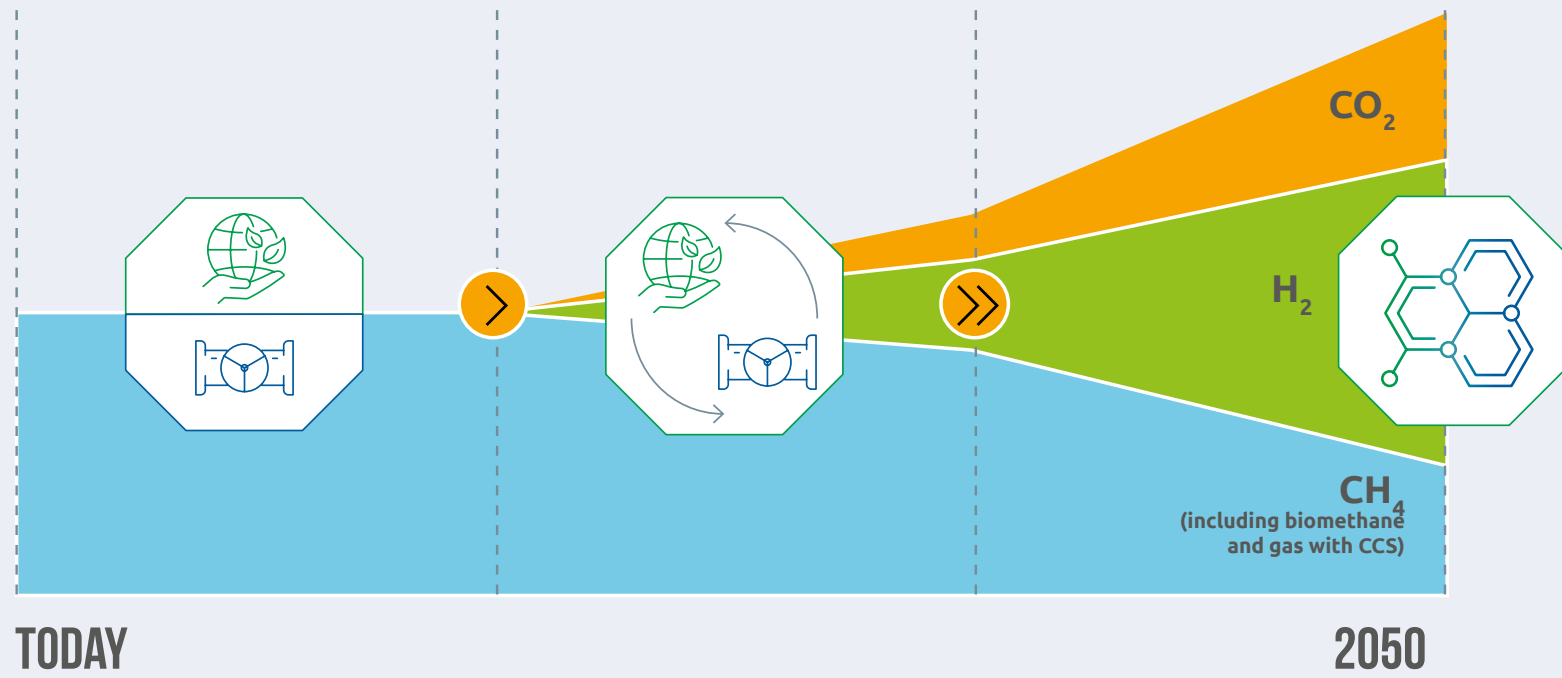
All-round sustainable framework based on 7 pillars with a distinct ambition and scorecard targets

We believe the **energy transition is not only a complex challenge, but also a nonlinear process.** In the near/midterm, natural gas will remain essential for both system security and the energy transition, offering the dual benefits of ensuring stability while facilitating the integration of intermittent renewable energy sources by balancing the grid. Moving forward, decarbonised gas markets will emerge, requiring infrastructure to evolve and adapt, leveraging digital and proven

technologies to transform and define a new role for TSOs.

Moreover, throughout this journey, unpredictable technological developments and breakthroughs may accelerate or slow down this transition. For this reason, it is critical for Snam to continuously monitor its technological arena.

FIGURE 3 - INDICATIVE ITALIAN DOMESTIC VOLUME 2050



*Source: Snam internal estimates. Scenario aligned to 1.5° (Including export)



1.3 SNAM'S TECHNOLOGICAL ARENA

Snam is neither a tech manufacturer nor a digital technology company. However, **the joint development, testing, integration, and application of cutting-edge technologies** are integral and distinctive to its identity, reflecting its unique scale and comprehensive presence across the midstream gas value chain, both onshore and offshore. The following provides an overview of how Snam leverages broader technological trends, continuously adapting its well-established business and operations to the rapid progress led by innovation.

As an energy infrastructure company aiming for a multi-molecule infrastructure, Snam focuses on **two primary technological domains**, each with a specific strategic approach for **core technologies**:

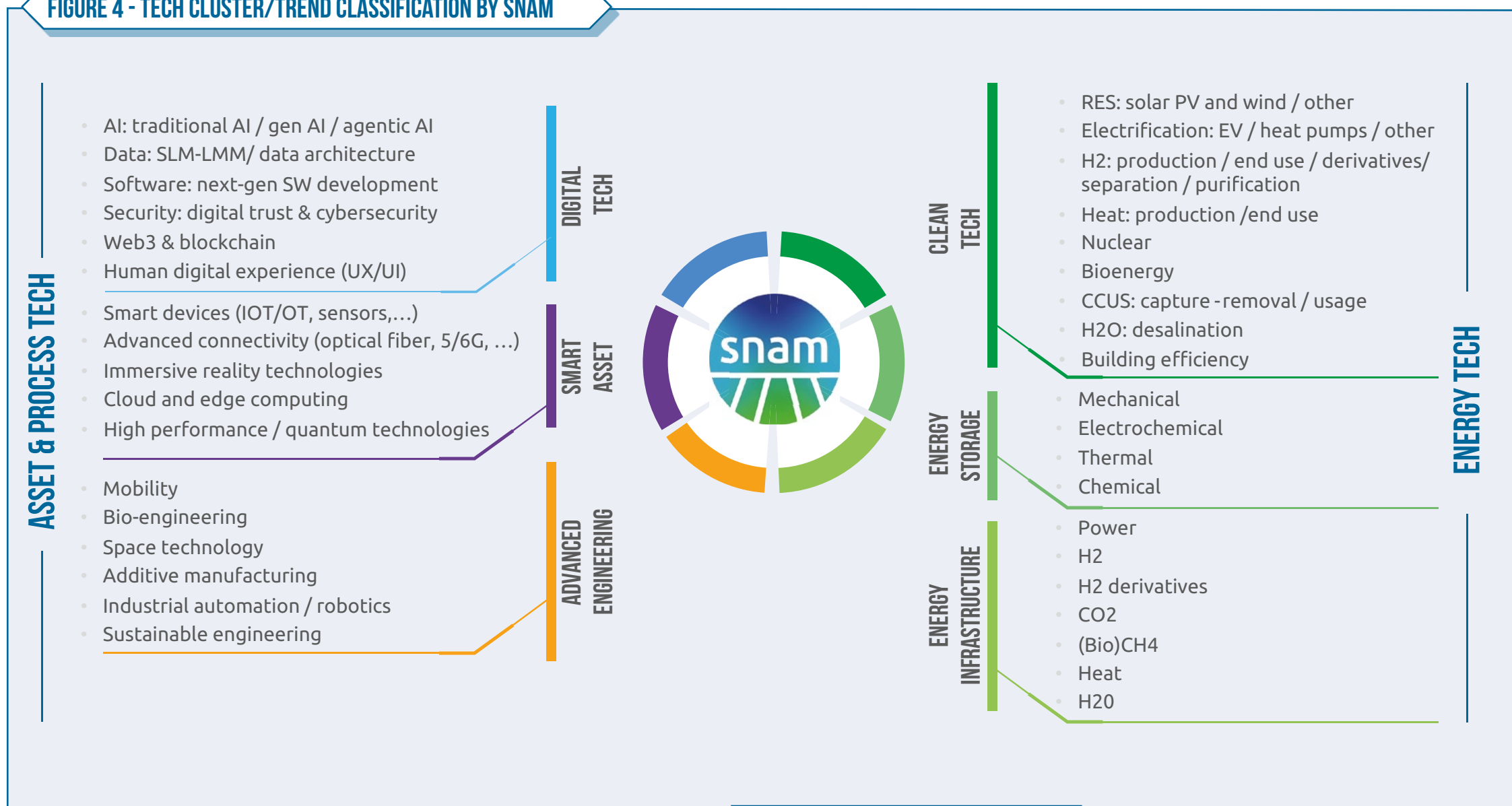
1. Asset and Process Technologies – encompassing digital/AI solutions, smart asset management, and advanced engineering.

Core technologies of interest in this domain are often already available on the market and adopted in other industries but have yet to be applied to gas infrastructure. The most effective innovation approach here involves customising these solutions to meet our specific needs and selectively adopting best-in-class technologies. Examples include space technologies, robotics, immersive reality, and AI-driven applications, which are often combined to enable efficient and effective operation of gas infrastructure assets and corporate processes.

2. Energy Technologies – spanning the entire value chain, including clean tech (energy production and use), energy storage and infrastructure.

Core technologies related to the transport, regasification, liquefaction, compression, separation and storage of biomethane, hydrogen, and CO₂ at various scales constitute the hardware backbone of Snam's future. In many cases, these technologies exhibit lower Technology Readiness Levels (TRL) and remain confined to niche markets. Innovation efforts in this area focus on direct R&D support, testing, and scaling to enhance readiness and future-proof these technologies by integrating them within our infrastructure.

FIGURE 4 - TECH CLUSTER/TREND CLASSIFICATION BY SNAM



The classification of figure 4 into **six clusters**, further broken down into key **technology trends**, serves as an initial compass for Snam's navigation of the evolving technology landscape.

While not exhaustive, this framework needs to be continuously updated, and technology trends closely monitored, to enhance understanding of the broader context, assess potential business impacts, and formulate strategies for portfolio adaptation and integration.

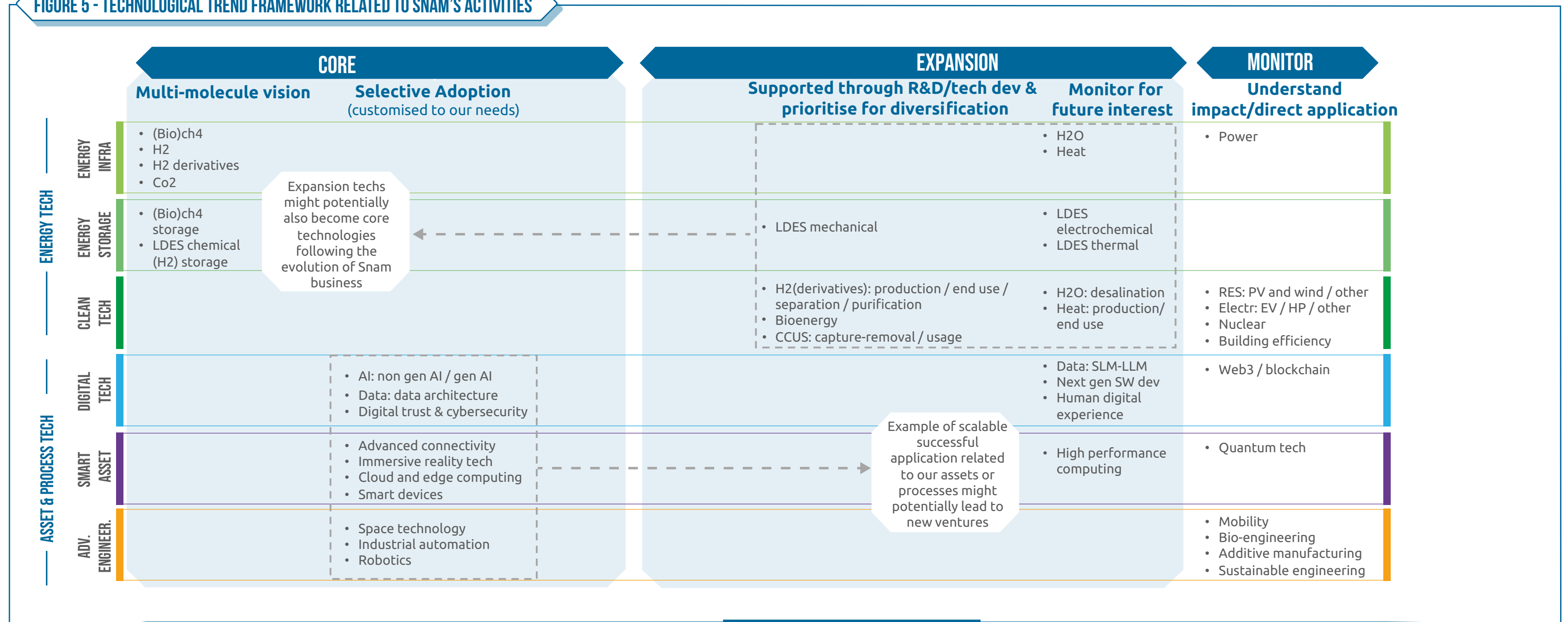
Beyond core technologies, there is a range of decarbonisation solutions that align with Snam's multi-molecule vision, extending beyond its traditional role in midstream infrastructure. These technologies present potential **opportunities for expansion** into adjacent business areas or may warrant strategic support due to their alignment with our long-term goals. Notable examples include:

- **Upstream and downstream technologies** enabling the production, end-use, or transformation of decarbonised molecules. Supporting such technologies through R&D and testing serves two main objectives: (1) fostering market development, which in turn drives demand for Snam's core midstream infrastructure, and (2) offering diversification opportunities that can be evaluated in light of evolving regulatory constraints.
- **Broader energy solutions** – While further from our core business, future opportunities may arise in areas beyond decarbonised gas molecules, where synergies with Snam's expertise could be identified. Examples include water/heat infrastructure or alternative LDES solutions.

Finally, there are technologies—both within energy and asset/process domains—that currently hold little relevance to Snam's business. However, we continue to monitor these areas, as unexpected developments in business or technology could alter their potential relevance and impact in the future.

The framework of figure 5 is highly dynamic, as posture and classification may evolve over time in response to changes in the business and market landscape. Moreover, expansion technologies could eventually become integral to Snam's business while scalable and successful core applications could result in new ventures and business diversification. Thus, **today's explorative initiatives evolve into tomorrow's core business activities, and vice versa**, allowing Snam to keep pace with technological developments while maximising the value of innovation both internally and externally.

FIGURE 5 - TECHNOLOGICAL TREND FRAMEWORK RELATED TO SNAM'S ACTIVITIES



1.4 TRANSFORMATIVE INNOVATION: A STRATEGIC IMPERATIVE

Transformative innovation is a cornerstone of Snam’s vision and has been a fundamental component of the Group’s strategic plan since 2023, when it was identified as one of two key strategic levers alongside “all-round” sustainability.

FIGURE 6 - SNAM’S STRATEGY FRAMEWORK (STRATEGIC PLAN 2025-2029)



Transformative innovation stands for Snam’s **ability and agility to not only anticipate change but also drive the transformation of both the organisation and the sector through pioneering industrial process innovations.** This proactive approach positions Snam not merely as a responder to future trends, but as a leader in shaping them.

Recognising the profound impact that digitalisation and decarbonisation will have on our business, our ambition is to become a **pan-European, platform-based, and data-driven, multi-molecule infrastructure operator,** to optimise operations and deliver superior value to stakeholders. To achieve this vision, a number of initiatives are already underway with others in the pipeline.

These efforts collectively contribute to the following strategic missions:

- **Elevate Asset Integrity and Process Efficiency:** improve safety, operational performance, asset resilience, and security of supply.
- **Pioneer a Multi-Molecule Infrastructure:** redefine the future of energy transport and storage by integrating diverse molecules, enabling seamless management of multiple entry points and vector flows with distinct production and transportation dynamics.
- **Drive Full-Spectrum Decarbonisation:** accelerate the adoption of zero- and low-carbon technologies across industrial, energy, and transportation sectors.
- **Lead Clean Tech Solutions for Snam and the Ecosystem:** develop, test, and scale cutting-edge technologies and enhance their value generation through ventures, strategic supplier collaborations, and intellectual property.

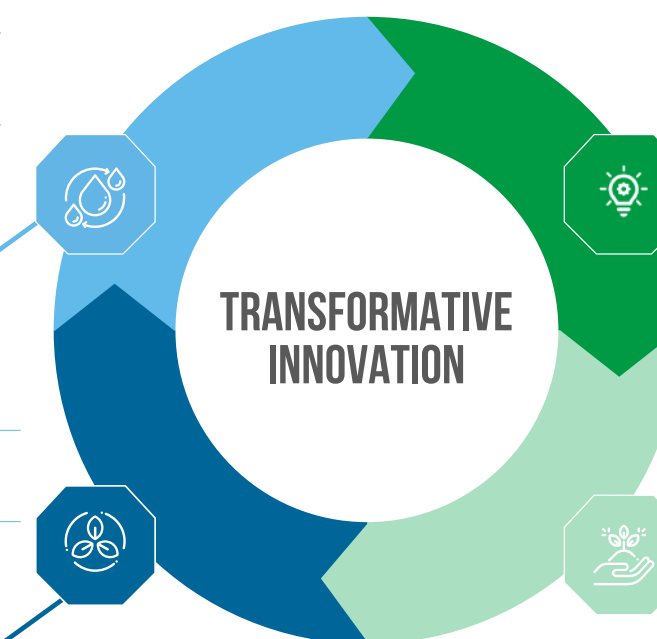
FIGURE 7 - TRANSFORMATIVE INNOVATION

PIONEER A MULTI-MOLECULE INFRASTRUCTURE

Redefine the future of energy transport and storage by integrating diverse molecules

ELEVATE ASSET INTEGRITY AND PROCESS EFFICIENCY

Improve safety and operational performance, assets resilience and security of supply



DRIVE FULL-SPECTRUM DECARBONISATION

Accelerate the adoption of zero- and low- carbon technologies across industrial, energy, and transportation sectors

LEAD CLEAN TECH SOLUTIONS FOR SNAM AND THE ECOSYSTEM

Develop, test, and scale cutting-edge technologies and enhance their value generation

Fulfilling this vision requires more than just technology and business processes—it **fundamentally relies on people, skills, and culture.** Snam’s comprehensive innovation strategy goes beyond technological advancements to rethink the very nature of work, fostering a workplace that is dynamic, insightful, and inclusive.

For Snam, transformative innovation is inherently complex and multifaceted. It begins with cultural shifts that ripple through people, technologies, and processes. Innovation becomes a **collective effort, empowering employees at all levels to act as leaders and catalysts of change.** By fostering an inclusive innovation culture, Snam unlocks a powerful cycle where each new idea fuels the next, generating a snowball effect that permeates the entire organisation.

CHAPTER

02

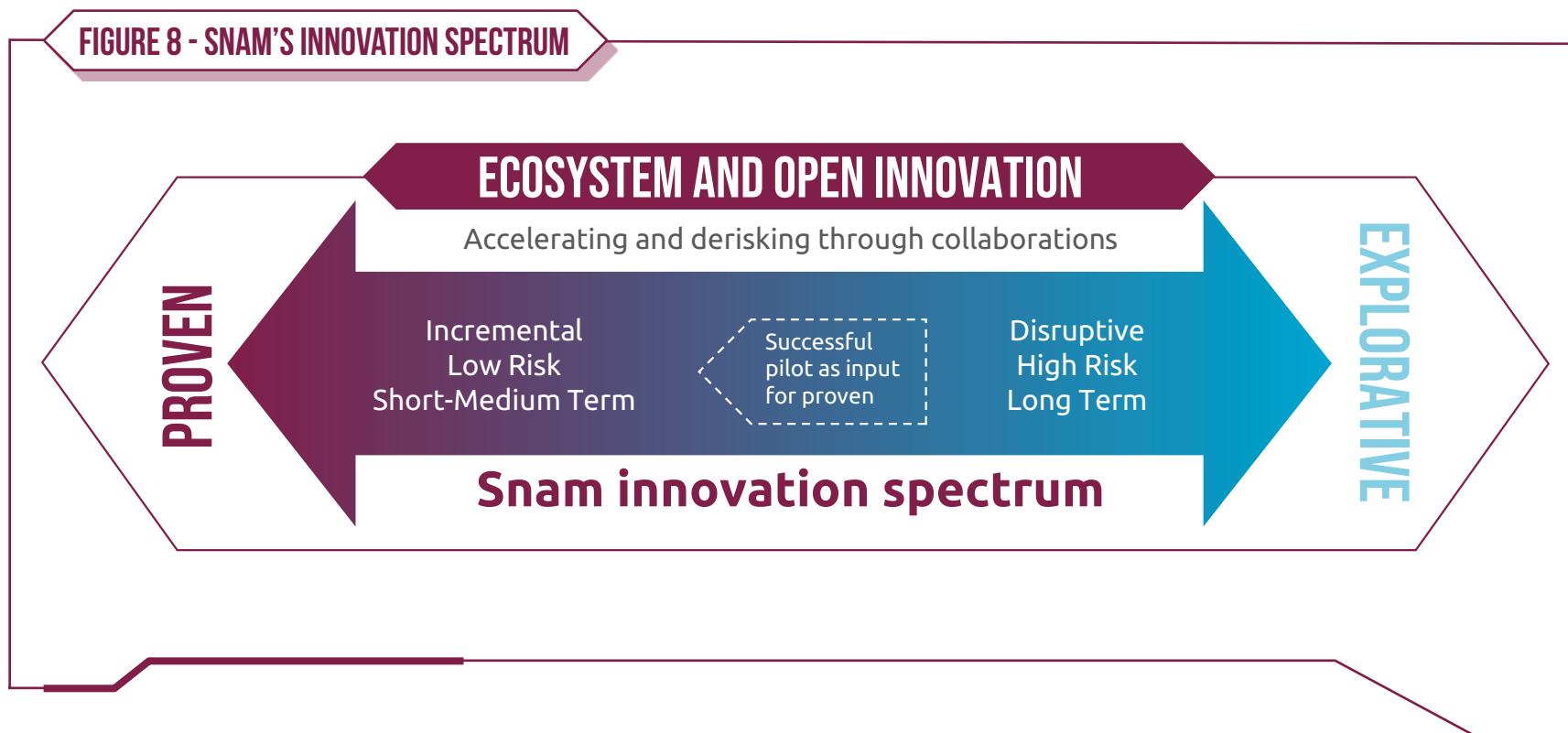
HOW WE PURSUE
TRANSFORMATIVE
INNOVATION

2.1 OUR DUAL-TRACK INNOVATION STRATEGY

Snam's innovation strategy describes both our approach to managing innovation and the areas in which we seek to innovate. Innovation is multifaceted, spanning the optimisation and upscaling of existing solutions to the exploration of novel ideas¹⁴.

Following this principle, our approach is rooted in what we define as a **dual-track approach**, which emphasises the balanced coexistence of proven and explorative innovation.

FIGURE 8 - SNAM'S INNOVATION SPECTRUM



Proven innovation concentrates on scalable, reliable, and market-ready solutions that address the operational needs of our assets and industrial processes. These needs include safety, security, reliability, cost optimisation, and emissions reduction. This approach involves continuous monitoring of market trends and of peers' solutions, as well as active engagement with technology suppliers, research centres and startups to meet specific requirements. Projects within this category are executed via structured technical innovation programmes.

Explorative innovation covers a wide array of novel ideas and emerging technologies that have lower market readiness but may hold potential for disruption, driving long-term business transformation and sustainability. Explorative innovation activities range from partnerships with startups, accelerators, and universities via R&D programmes, to fostering internal idea generation. After

successful testing, R&D and pilot studies, mature solutions can be scaled up, serving as inputs for proven innovation activities.

This dual-track strategy fosters continuous improvement while proactively seeking external opportunities. The boundaries between proven and explorative innovation are permeable, allowing outcomes from explorative initiatives to feed into proven innovation programmes, and developments from proven innovation to inspire new explorative ventures. This synergy between exploratory phases to increase maturity and alignment with Snam, followed by rapid upscaling and industrialisation of the solution helps bridge the gap between innovation and operational impact, ensuring that promising technologies become integral parts of the business. In this context, **open innovation** is more than just an approach—it represents the backbone that connects both proven and explorative initiatives, ensuring permeability with the global ecosystem. At the same time,

it plays a key role in fostering and spreading a company culture that champions innovation and encourages continuous learning.

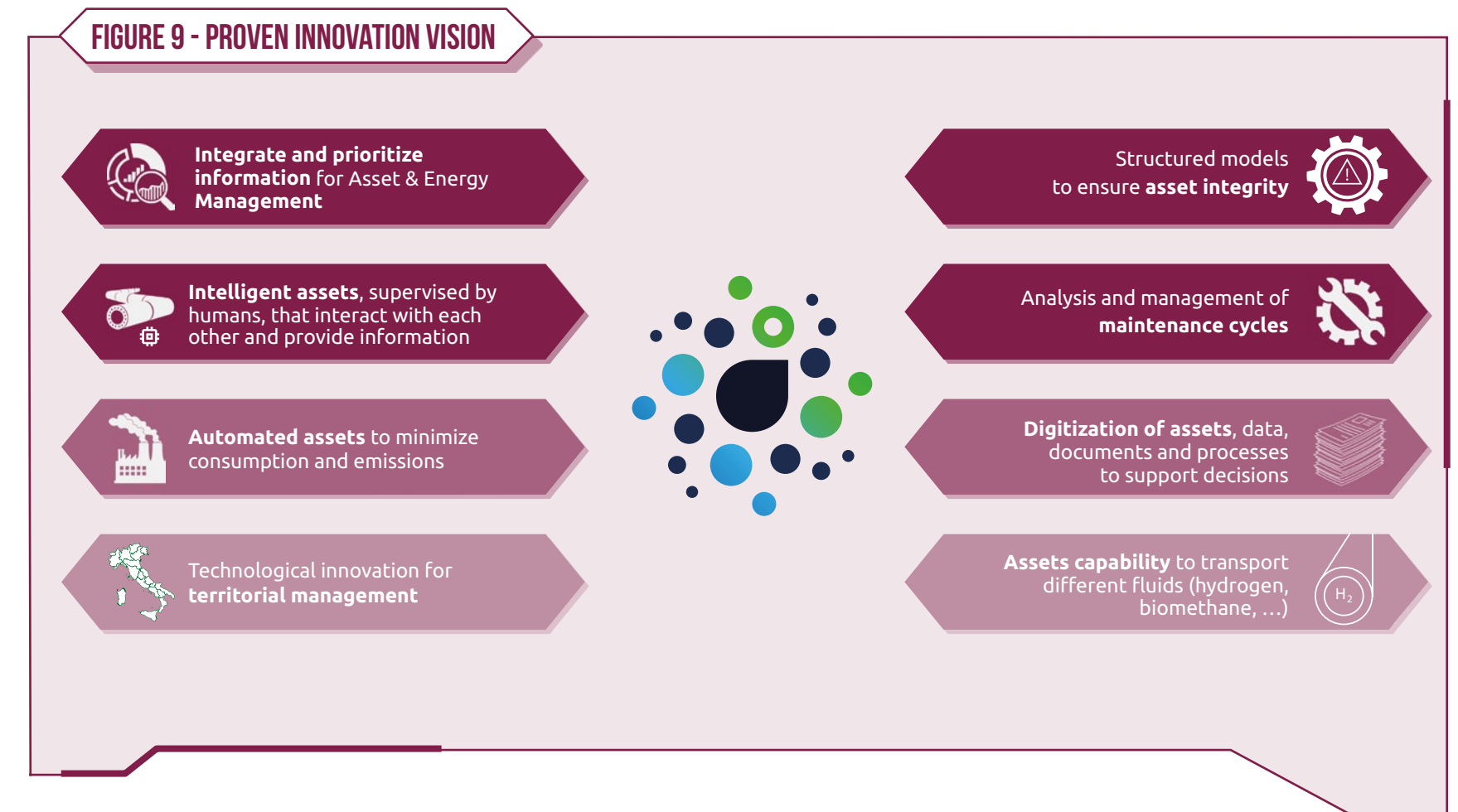
To fulfil Snam's vision of becoming a **pan-European, platform-based, data-driven, multi-molecule infrastructure operator**, leading the energy transition and integrating sustainability, efficiency and security into every aspect of its operations, the company is leveraging two fundamental technological clusters: Clean tech and AI & digitalisation. Clean tech innovation plays a crucial role in developing and scaling decarbonised solutions, with a strong focus on hydrogen, carbon capture and storage, long-duration energy storage and bioenergy. AI & digitalisation are reshaping the way Snam operates, transforming our 84-year-old company into a data-driven infrastructure operator, integrating IT, OT, and advanced telecommunications. Algorithms, high-performance computing, as

well as traditional/ generative/ agentic AI are being deployed to optimise efficiency, reduce emissions, and streamline corporate processes through system-wide digitalisation.

Proven Innovation

Proven innovation is the first pillar of Snam's dual-track approach, aimed at deploying **scalable, reliable and market-ready solutions to support process optimisation, asset resilience, safety and environmental protection**. By leveraging internal skills and expertise alongside the capabilities of established industrial partners and digital system operators, we aim to advance operations through technological enablers in alignment with Snam's strategic objectives. Our technological evolution is guided by a shared vision and the following key guidelines:

FIGURE 9 - PROVEN INNOVATION VISION



¹⁴ 2020, Strategizer, What type of innovation are you talking about?

FIGURE 10 - PROVEN INNOVATION GOVERNANCE



Close **collaboration between business and technology is essential** to creating a strong, need-driven link between innovation and operations. This enables a people-centric digital transformation, delivering tailored, cutting-edge solutions that address real business challenges.

To drive Snam’s technological evolution in line with these guidelines, proven innovation is mainly developed within **SnamTEC**, a programme founded in 2018 with a **dual governance** (business & technology) spanning the entire initiative. SnamTEC serves as Snam’s transformational framework, orchestrating all projects linked to upgrading operations, shaping a shared vision and translating the company’s strategic objectives into process improvements. The programme encompasses over 50 projects—a dynamic and continuously evolving perimeter—across four operational areas (Construction and O&M, Gas operations, Asset integrity, Asset enhancement).

The **Asset Control Room (ACR)** serves as the central platform driving the company’s digitalisation and transformation. With a

portfolio of more than 25 projects, it enables integrated process management and enhanced data management, fostering a more innovative and data-driven approach to operational management. ACR ensures real-time seamless control and monitoring of activities and assets while integrating new tools and technologies. ACR currently manages **47 end-to-end processes**, supports over **2,000 users** with **99.2% availability** and an overall quality performance (APDEX) score of 88/100.

To ensure the **successful identification and integration of innovative technologies and solutions** into SnamTEC, several support programmes have been established:

- **Organisational framework:** Defines new processes, roles and responsibilities to support the programme.
- **Change management/Workforce development:** Sets up a transformational process coupled with targeted training activities to reskill and upskill internal teams, ensuring they are equipped with the necessary skills to adopt and deploy new technologies.
- **Technology platform for SnamTEC:** Provides IT infrastructure to support ACR operations

- **T.LAB:** Functions as a bridge between explorative and proven innovation
- **Corporate process integration:** Expands the SnamTEC model and solutions to corporate functions within **ACR**, enabling the organisation to capitalise on gained experience and best practices.
- **OLTRE:** Establishes a structured framework to generate new ideas and projects that feed into SnamTEC and enhance ACR.

To ensure the seamless and successful execution of large-scale, complex projects, the programme’s governance **integrates all key functions related to industrial assets**. Chaired by the CEO, this committee serves as a strategic decision-making body, that meets monthly to review key progress updates, monitor achievements and make decisions on programmes and projects.

Explorative Innovation

Explorative innovation is the second pillar of our dual-track approach, dedicated to uncovering **new ideas and disruptive technologies through a dynamic innovation ecosystem**. By integrating external stakeholders and players—startups, universities, industrial partners, venture capital funds and other investors—with internal know-how, we gain access to a diverse network that accelerates technology knowledge, fosters cross-industry adoption, and drives innovation beyond traditional boundaries..

Explorative activities focus on three key goals:

- Scout, develop, assess and integrate emerging technologies to expand Snam’s strategic options.
- Anticipate and prepare for various future market scenarios.
- Strengthen and activate the innovation ecosystem, maximising the central role of our multi-molecule infrastructure.

Explorative innovation relies primarily on two key mechanisms. On one hand, Snam carries out **R&D and the testing/scaling** of emerging technologies and solutions that are not yet ready for full-scale deployment. To select the most promising and relevant projects, Snam monitors various technological trends (see Chapter1) and formalises its strategic technology positioning. On the other hand, Snam places a strong emphasis on **internal engagement**, encouraging employee creativity, integrating new approaches in daily operations, and creating a work environment where contributions

are recognised and valued. This attitude fuels the generation of new ideas and solutions, driving continuous improvement and long-term value creation.

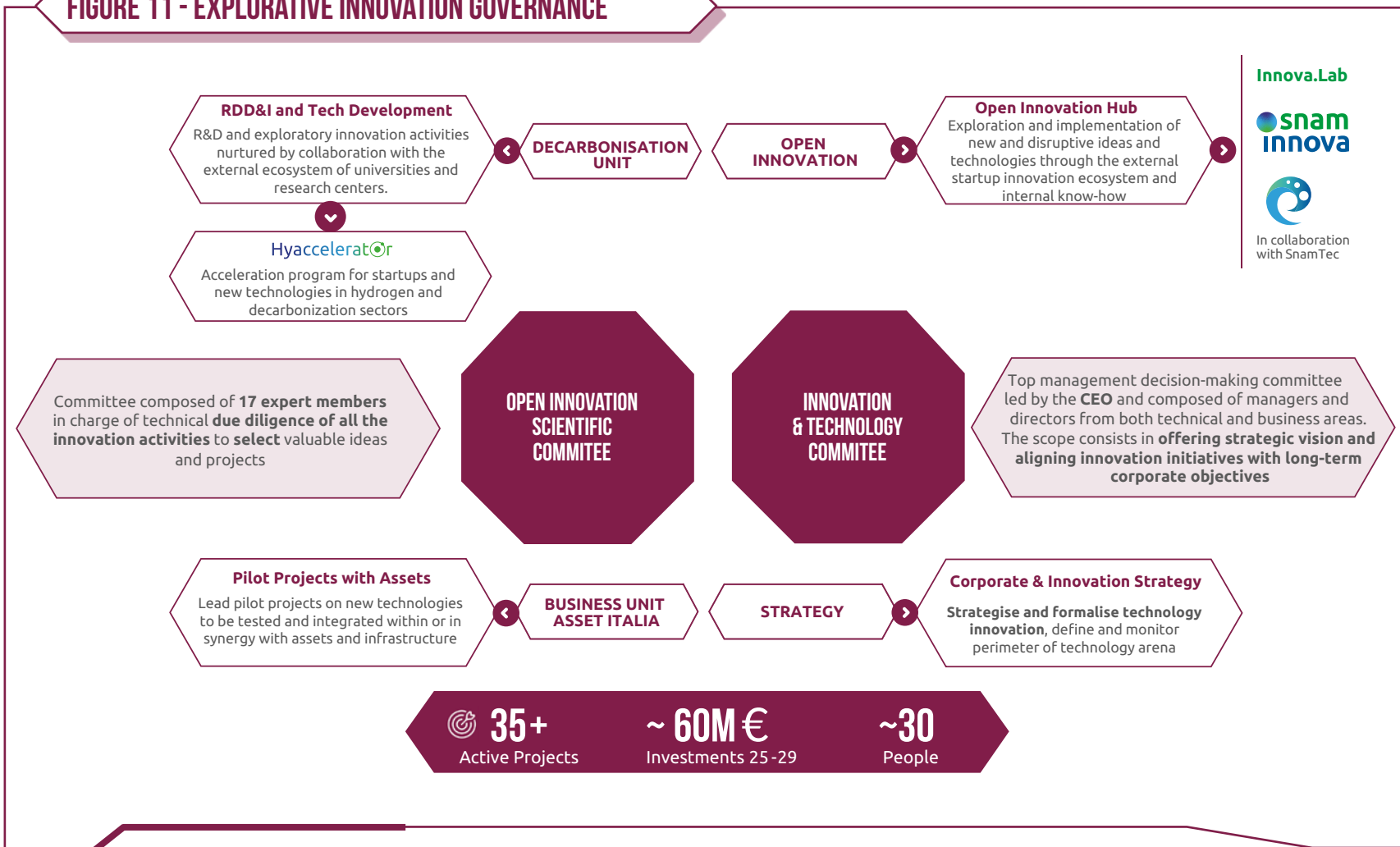
Unlike proven innovation that is primarily integrated within the SnamTEC programme, explorative innovation is **distributed across the organisation**. Given the diversity of technologies that Snam engages with, different programmes and business units actively contribute, leveraging **open innovation** as a tool to jointly develop solutions (see 2.4 Ecosystem and Open Innovation).

Collectively, these activities contribute to Snam’s ever-growing innovation portfolio, generating value through a) integration into the core business, b) diversification and new external ventures, and c) creation of an innovation culture throughout the company.

The breadth of topics and technologies covered by explorative innovation is also reflected in its governance and organisation. While some activities are carried out autonomously within the given business units, a **clear governance framework** has been defined to streamline decision-making and ensure alignment with strategic priorities. This governance includes two dedicated committees:

- The **Innovation and Technology Committee** is chaired quarterly by the CEO and includes managers and directors from both technical and business areas. Its primary role is to provide strategic oversight, ensuring that all innovation activities—led by dedicated committees or business units—remain aligned with long-term corporate objectives.
- The **Open Innovation Scientific Committee** is composed of internal and external technical experts responsible for conducting in-depth technical due diligence on all innovation activities. This committee plays a critical role in selecting the most valuable ideas and projects, leveraging technical and scientific expertise as well as industry experience.

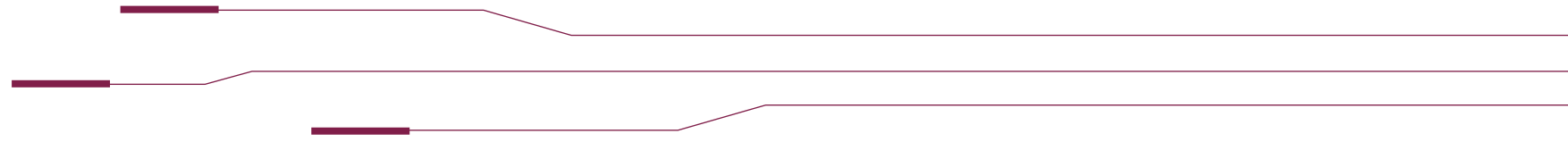
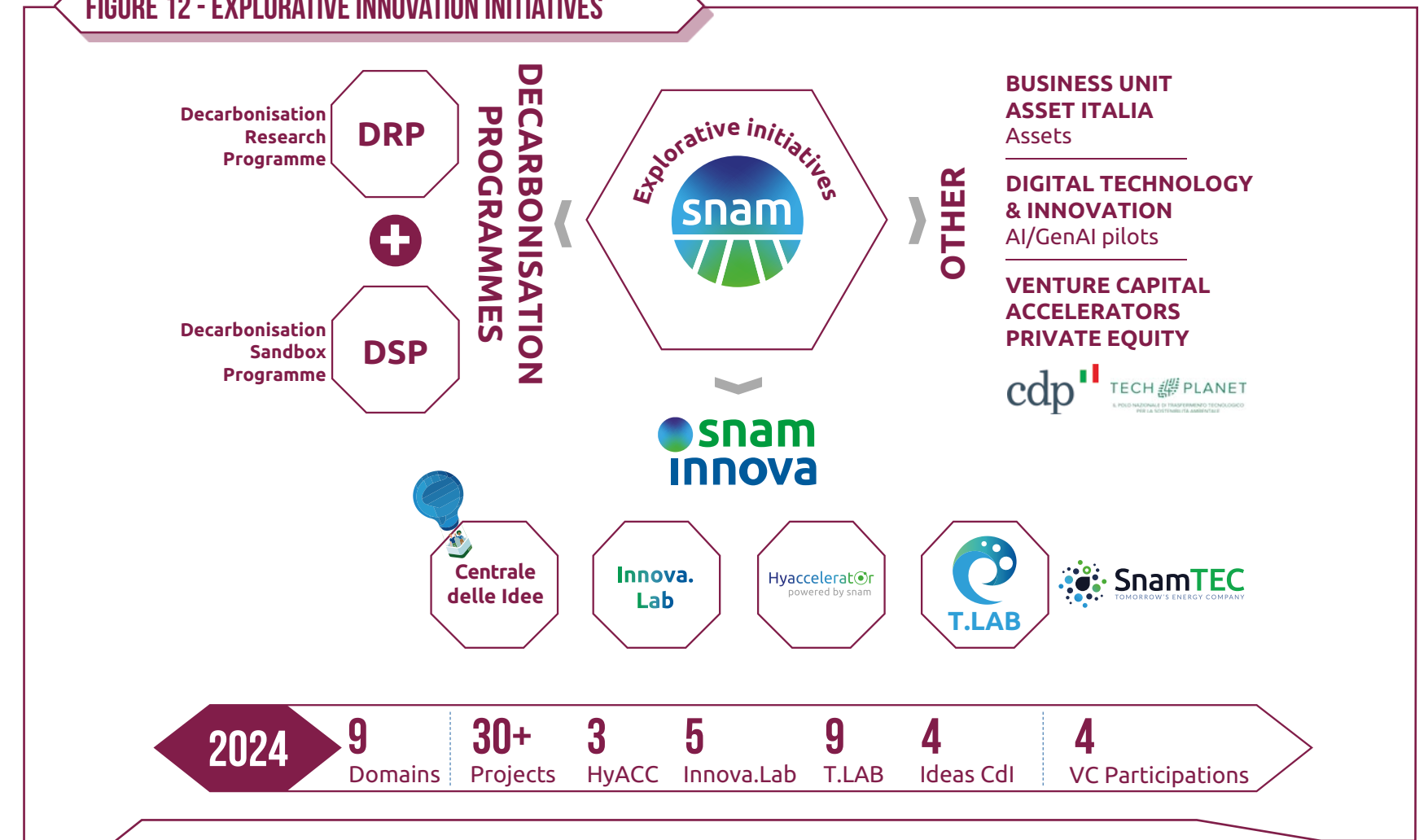
FIGURE 11 - EXPLORATIVE INNOVATION GOVERNANCE



As of today, more than 30 explorative activities are underway, spanning R&D, technology development and testing, as well as the early adoption and adaptation/customisation of technologies into Snam's assets and processes. These initiatives span nine distinct domains and

are driven by six dedicated programmes, involving five internal business units and four venture capital participations.

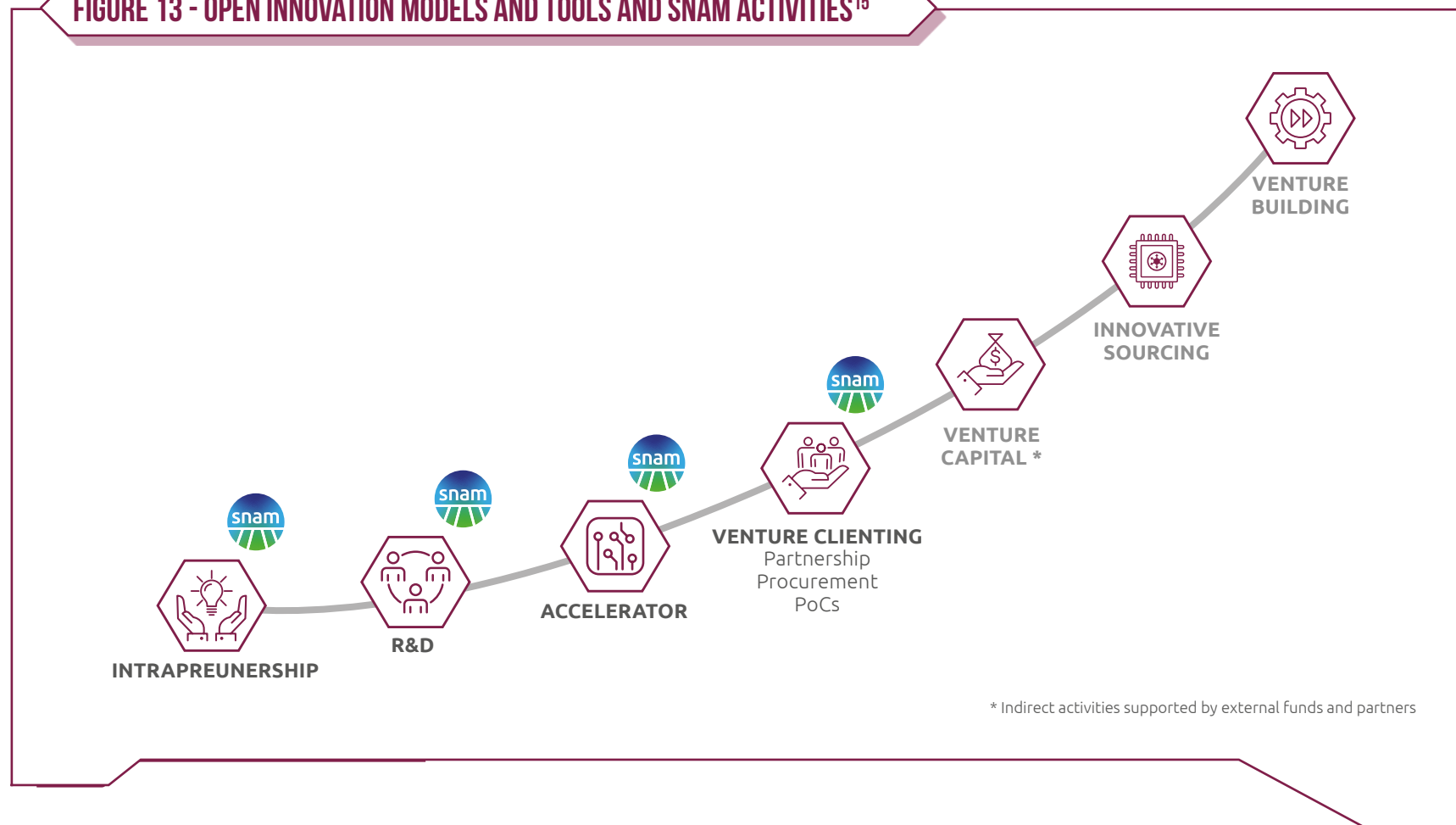
FIGURE 12 - EXPLORATIVE INNOVATION INITIATIVES



2.2 THE OPEN INNOVATION APPROACH AND ECOSYSTEM

Open Innovation is a multi-faceted approach, exploiting various models and tools as represented below, including those deployed by Snam.

FIGURE 13 - OPEN INNOVATION MODELS AND TOOLS AND SNAM ACTIVITIES¹⁵



Through Open Innovation, Snam explores and tests disruptive ideas and emerging technologies via a dynamic flexible innovation network. The interaction between Snam and the innovation ecosystem is bidirectional: Snam benefits from external technologies, ideas, and expertise while simultaneously offering resources, infrastructure, and collaboration opportunities. This diverse ecosystem is in constant motion, involving collaborations with:

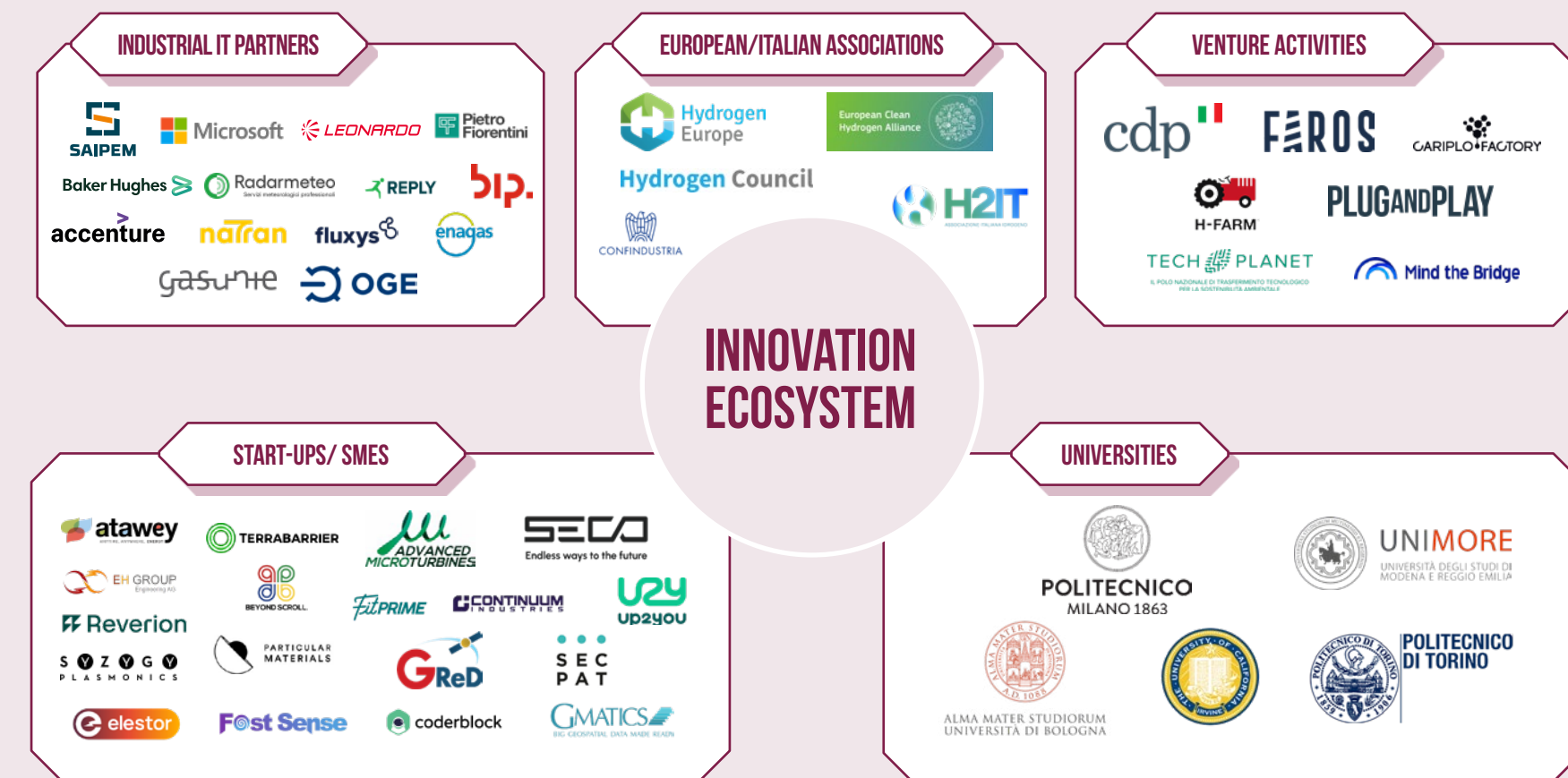
- **Universities and Research Institutes** – Joint research projects provide access to cutting-edge knowledge and unique lab infrastructure.
- **Startups** – Snam scouts high-potential startups to facilitate the development of decarbonisation technologies, to test emerging

technologies potentially integrable in our operational processes and to engage digital solutions for corporate applications.

- **Venture Capital Funds** – Snam participates in well-targeted venture capital initiatives to access breakthrough technologies aligned with its strategic vision.
- **Industrial Partners** – Snam integrates market-ready innovations while co-developing solutions with external providers. Active engagement with European gas TSOs also fosters collaborative innovation in a pre-competitive framework.
- **Sector Associations** – Snam leverages associations to drive innovation and foster technology adoption.

The testing of technological solutions, **from proofs of concepts (PoCs) to their potential scaling** within Snam's businesses, can originate through collaborations with a wide range of ecosystem actors, from startups to leading universities and research centres.

FIGURE 14 - REPRESENTATION OF SNAM'S INNOVATION ECOSYSTEM (NOT EXHAUSTIVE)

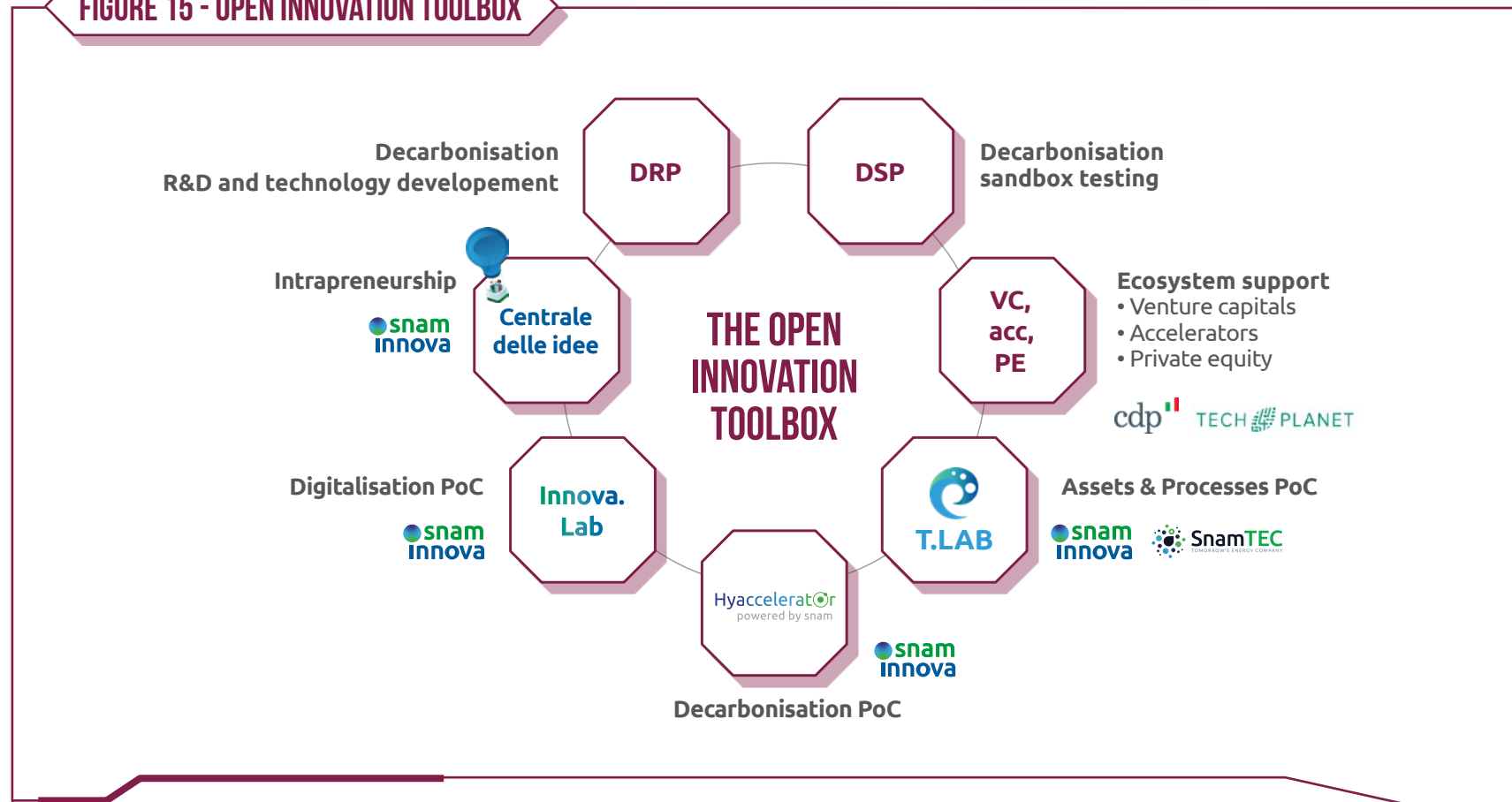


¹⁵ Inspired by Mind the Bridge, The Open Innovation Imperative: Adapting to Stay Competitive – Evolve or Be Extinct Season 2024

The Open Innovation toolbox

Snam has adopted a structured Open Innovation framework, establishing dedicated programmes and tools to maximise impact:

FIGURE 15 - OPEN INNOVATION TOOLBOX



Snaminnova

Snaminnova is the programme designed to accelerate innovation and seize new opportunities by combining internal expertise with startups. Over the years, Snaminnova has strengthened collaboration opportunities and developed solutions by actively engaging employees and external innovators. The programme consists of several key initiatives:

- **Centrale delle Idee** is Snam’s intrapreneurship programme, designed to foster engagement and unlock employee-driven innovation. The programme stimulates the bottom-up generation of solutions, nurtures the entrepreneurial spirit of employees, and promotes cross-functional collaboration, leading to more comprehensive solutions that integrate diverse expertise and perspectives.



• **HyAccelerator** is the first corporate accelerator dedicated to hydrogen technologies, expanding in 2025 to include CCUS and LDES solutions. Startups are selected through an annual international call and enter a six-month acceleration period, during which they refine their business model, strengthen their technology proposition through knowledge exchange, and develop a pre-feasibility study for a real-world use case. Snam provides mentorship and support, ensuring that relevant solutions are further tested in synergy with Snam’s infrastructure or its associates.

- **Innova.Lab** promotes collaborations with startups by launching external calls and conducting continuous scouting through a venture client model, for the cross-sector adoption of innovative technologies, with a specific focus on digital solutions.

- **T.LAB** is Snam’s experimental innovation lab, dedicated to studying and testing emerging technologies that are on the verge of being integrated into operational processes, as well as in existing or future assets. T.LAB ensures continuous monitoring of industrial technology trends, acting as a gateway to the SnamTEC programme.

Decarbonisation Research Programme (DRP)

Snam’s **DRP** is a collaboration with leading universities, research centres and industrial partners to advance technology development in hydrogen, carbon capture and LDES. From 2021 to 2024, the programme established six R&D hubs and launched seven projects, resulting in four patent filings and the possible development of one spin-off.

Decarbonisation Sandbox Programme (DSP)

Snam is building a state-of-the-art, open-access testing platform to co-develop, validate, and scale both internal and external technologies. This initiative offers testing services to startups, academic and industrial partners, ensuring technological feasibility in real-world applications.

Venture Capital, Accelerators and Private Equity

Venture capital funds serve as an indirect tool to gain deeper insights into startups that align with Snam’s vision and assets. Snam currently participates as limited partner in two main funds:

- **Tech4Planet**¹⁶ is the technology transfer hub of CDP Venture Capital SGR.
- **CDP Venture Capital - Corporate Partners I Fund**¹⁷ invests in post-seed companies and operates in four sectors: IndustryTech, EnergyTech, ServiceTech and InfraTech.

Beyond these venture capital funds, Snam has strengthened its position within the ecosystem by participating in the Faros accelerator¹⁸ (dedicated to startups in the blue economy) and Hy24¹⁹ (the world’s first and largest hydrogen private equity asset manager, dedicated to scaling up the hydrogen economy).

CULTURE: INNOVATION AMBASSADORS AND DIGITAL GURUS

At Snam, fostering a culture of innovation is at the heart of our strategic vision. We believe that an innovative mindset is essential for driving continuous improvement and staying ahead in the energy sector.

For this reason, we created a community of innovation ambassadors who actively promote and cultivate innovation within Snam. Over 100 colleagues, participating on a voluntary basis, engage in training sessions, community-building activities, and open innovation projects, serving as key catalysts for our intrapreneurship programme. In 2025, we also launched a digital gurus’ community to champion digital best practices, experiment with emerging technologies, and accelerate company-wide digital adoption.

¹⁶ Tech 4 Planet | Il Polo Nazionale di Trasferimento Tecnologico dedicato alla Sostenibilità ambientale

¹⁷ FONDO CORPORATE PARTNERS I - CDP Venture Capital

¹⁸ Faros Accelerator

¹⁹ Hy24 - We are the world’s first and largest hydrogen private equity asset manager

CHAPTER

03



INNOVATING THE CORE BUSINESS: TRANSFORMING ASSETS AND OPERATIONS



Tomorrow's Energy
Company

3.1 SNAM'S EXCELLENCE IN OPERATIONAL ACTIVITIES

To address the key findings described in the previous chapter and seize all present and future opportunities—ensuring the achievement of corporate objectives in operational activities, including safety, operational continuity, environmental protection, and process optimisation—Snam has designed and started implementing a significant **technological evolution of its industrial operations**. This transformation has led to a fundamental shift in its core business approach, embracing models that leverage mature, cost-efficient, and rapidly deployable technologies tailored to meet Snam's specific business needs while responding to emerging challenges in an agile and sustainable manner.

This paradigm shift is driven by two key pillars: **sustainability**, with the integration of future-proof assets, and **digitalisation**, by evolving towards smart assets and processes, supported by AI and data management. Guided by this vision, Snam has embarked on a technological evolution journey across its operational activities, covering industrial assets, associated processes, and supporting applications. The goal is to accelerate the company's innovation journey towards the energy system of the future, where data serves as the cornerstone of advanced process expertise. By leveraging technology, Snam is enabling more advanced and efficient interactions with its assets, while also facilitating the collection and processing of a vast amount of field data to support all operational activities. The implementation of this vision has materialised under the **SnamTEC** programme, which is described in detail in the following sections.

The evolution of Snam's core assets and operations stands out for its **comprehensive 360-degree approach**, integrating digital solutions, smart assets and advanced engineering technologies to enhance the efficiency and effectiveness of key operational process. Through the tailored adoption of proven technologies within our infrastructure, this systemic approach strengthens **Snam's leadership in advanced gas assets and operations**, significantly contributing to a more resilient, decarbonised European energy system.



3.2 OUR APPROACH TO THE EVOLUTION OF ASSETS AND PROCESSES

Since 2018, Snam has developed a strategic approach to evolve its assets and operational processes, implementing a data-driven methodology to obtain real-time data, introducing self-regulating assets and comprehensive monitoring capabilities. This approach fosters the development of an intelligent, self-regulating and optimised operating model that supports insightful decision-making.

For **industrial assets**, the approach focuses on measuring technological innovation through “smartness” indicators. This enables the identification and prioritisation of development initiatives to improve asset monitoring, self-regulation, and self-diagnostics.

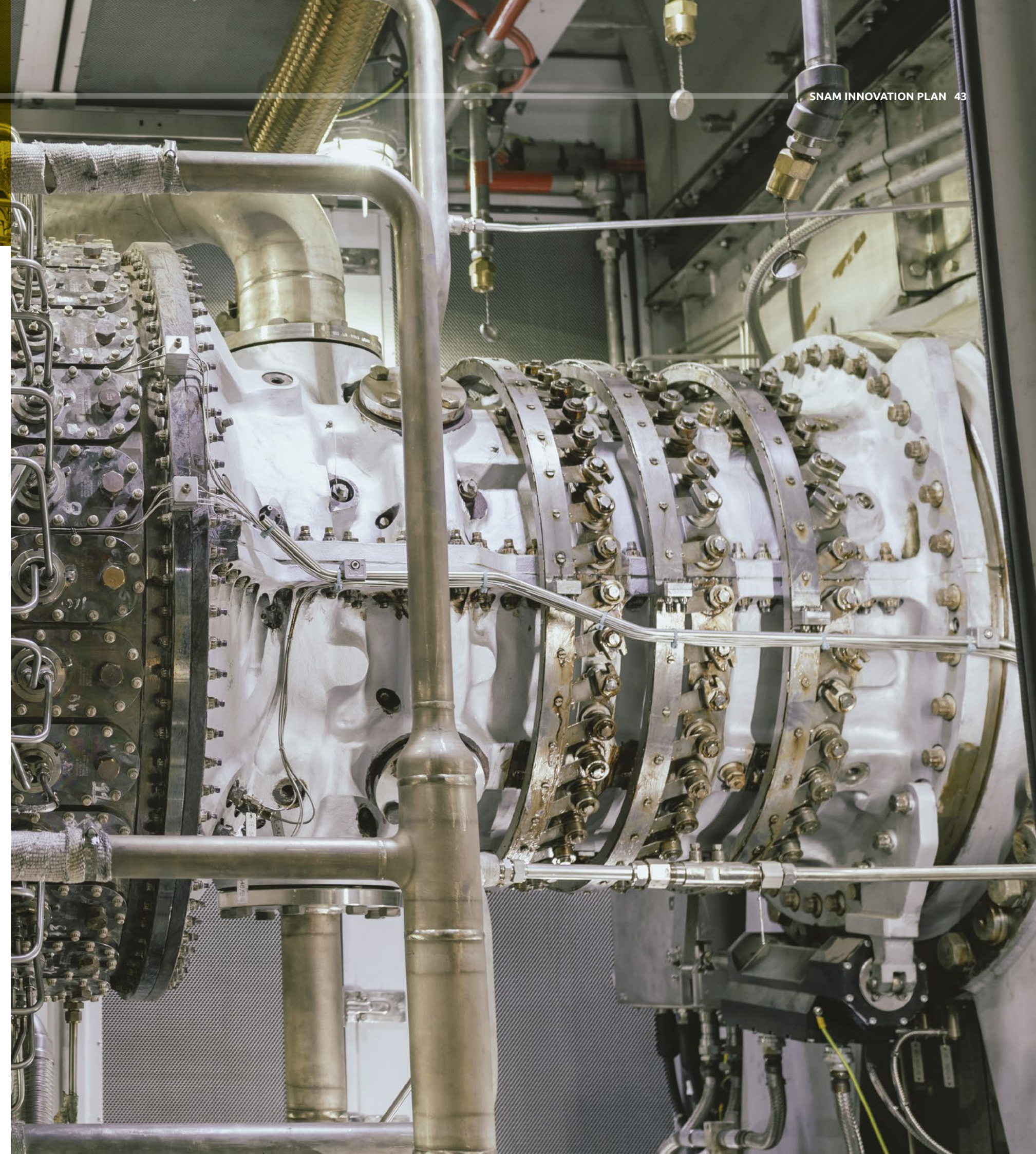
For **operational processes**, the approach involves a detailed analysis of each operational and management activity, breaking it down into its components to identify opportunities for digitalisation, automation, and optimisation. This analysis leads to a complete transformation of operational workflows into an integrated model supported by advanced analytical tools.

The transformative approach consists of four main phases, all driven by strong cooperation between operations and technology functions:

- **Structured, evidence-based assessment** of asset intelligence levels and process digitalisation.

- **Identification of gaps** relative to best-in-class monitoring, automation, and optimisation standards.
- **Definition of technological evolution initiatives**, integrating advanced solutions such as smart objects, large-scale datasets, mathematical models, and simulation algorithms to drive continuous improvement of assets and processes.
- **Prioritisation of initiatives** through use cases that evaluate the cost-benefit ratio and alignment with corporate strategy.

To date, the approach has systematically analysed assets, including compression and storage stations, reduction, regulation, and interception plants, as well as the regasification plant in Panigaglia. Regarding processes, the evaluation has focused on operational management, asset integrity monitoring, and continuous asset management. In the near future, this evaluation will be extended to all assets and operational processes.



3.3 THE EVOLUTION PILLARS

Asset intelligence pillar

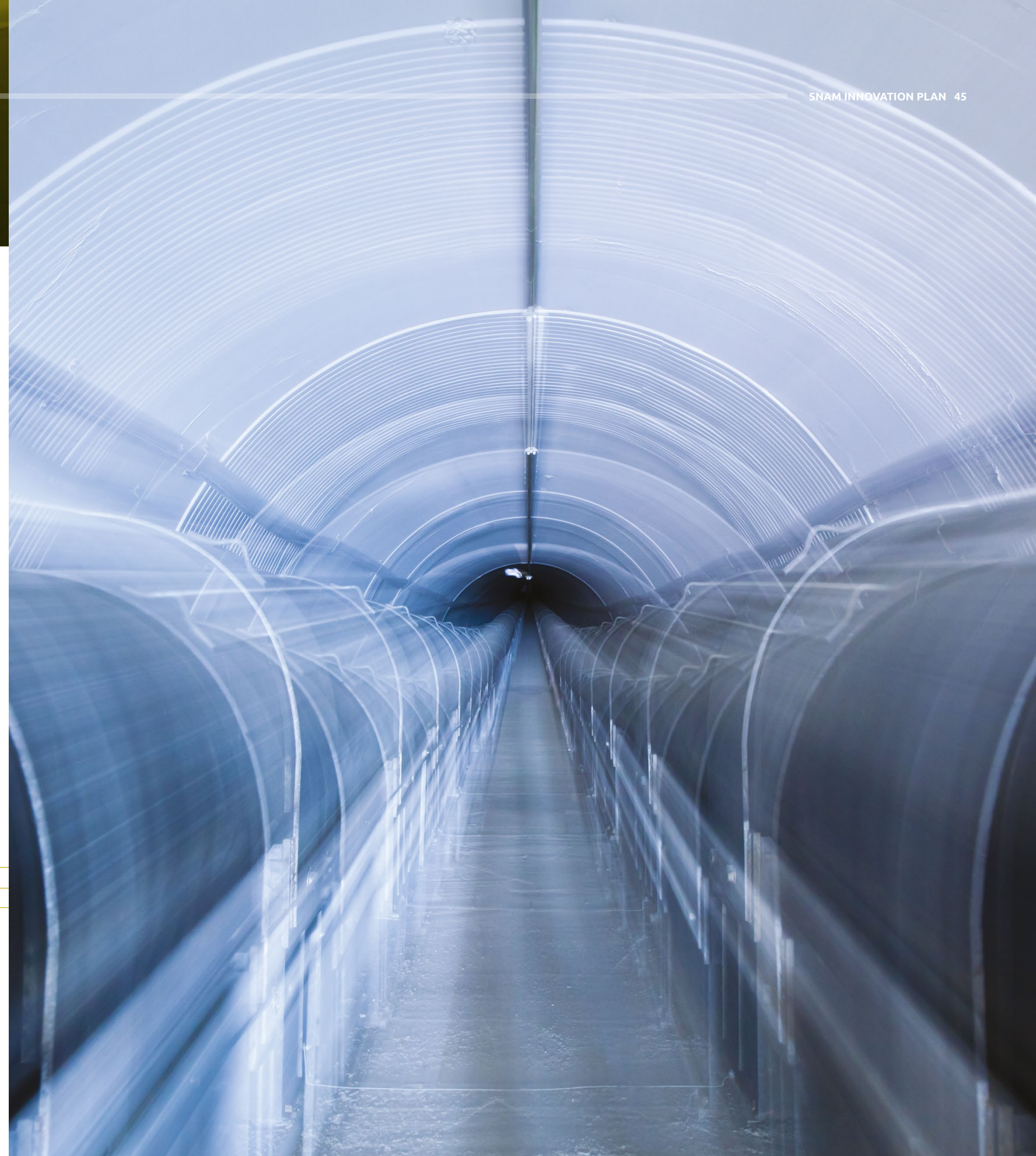
From an asset perspective, our transformative approach has defined a technological evolution roadmap towards "assets of the future," with key features outlined below:

- **Self-diagnostics and self-regulation:** the objective is to develop smart assets that provide real-time operational data and health information, enabling remote monitoring, predictive maintenance and autonomous field adjustments, keeping human oversight in the loop. In early 2025, Snam has launched multiple initiatives, including a remote monitoring system for diagnostic parameters across various assets. This system currently monitors 67 turbochargers, 9 storage treatment plants, 3 experimental pipeline sections and 2 spot sites, as well as the Panigaglia regasification plant, collecting over 1.5 billion signals per day. Additionally, a working group is defining the technical specifications of a future smart facility, and a digital modelling campaign is underway to create 3D digital twins of physical assets.
- **Minimisation of environmental impact:** the objective is to develop near-zero emission assets, capable of minimising their environmental impact, and reduce energy consumption thanks to design solutions and operational logic. Snam is advancing asset replacement programmes in line with its decarbonisation and energy transition plan, while adopting new technologies to improve gas leak detection and prevention. Working groups are analysing energy requirements across various types of facilities, factoring in the new dual-fuel compressor stations (electricity and gas) set to start operating in late 2025. Feasibility studies, pilot projects, and experimental initiatives are also exploring generation technologies.
- **Suitability for transporting new energy carriers:** the objective is to optimise gas infrastructure management processes to accommodate a multi-carrier energy system and ensure assets can safely transport new low- or zero-emission energy carriers (e.g., H₂, CO₂, biomethane). Feasibility studies, pilot projects, and experimental initiatives are currently evaluating the existing infrastructure's suitability, while network simulation tools and advanced algorithms are being developed to support gas operations, optimise emissions and energy consumption.

Process pillars

Snam's approach has structured its evolution journey into the following key steps:

- **Digitalisation** of all processes and activities, centralising process data from various sources, standardising data views, maximising operational efficiency through integrated process management. Since the early 2000s, 100% of core operational processes and over 85% of activities representing 3,000 activities across more than 100 operational processes have been digitalised. The remaining 15% of minor activities will be completed in the coming years.
- **Data-driven decision support** by leveraging centralised and digitalised data through advanced algorithms and analytical models. These systems will provide alerts, recommendations, and pre-analysed solutions to assist in decision-making. Snam has launched a development programme to integrate these advanced algorithms and models into its operational applications.
- **Transformation** ways of working and overseeing activities by leveraging process synergies thanks to real-time access to end-to-end process data and insights. As part of this transformation, Snam plans to cover 100% of operational processes, and so far over 40 operational processes have been transformed in line with strategic guidelines.

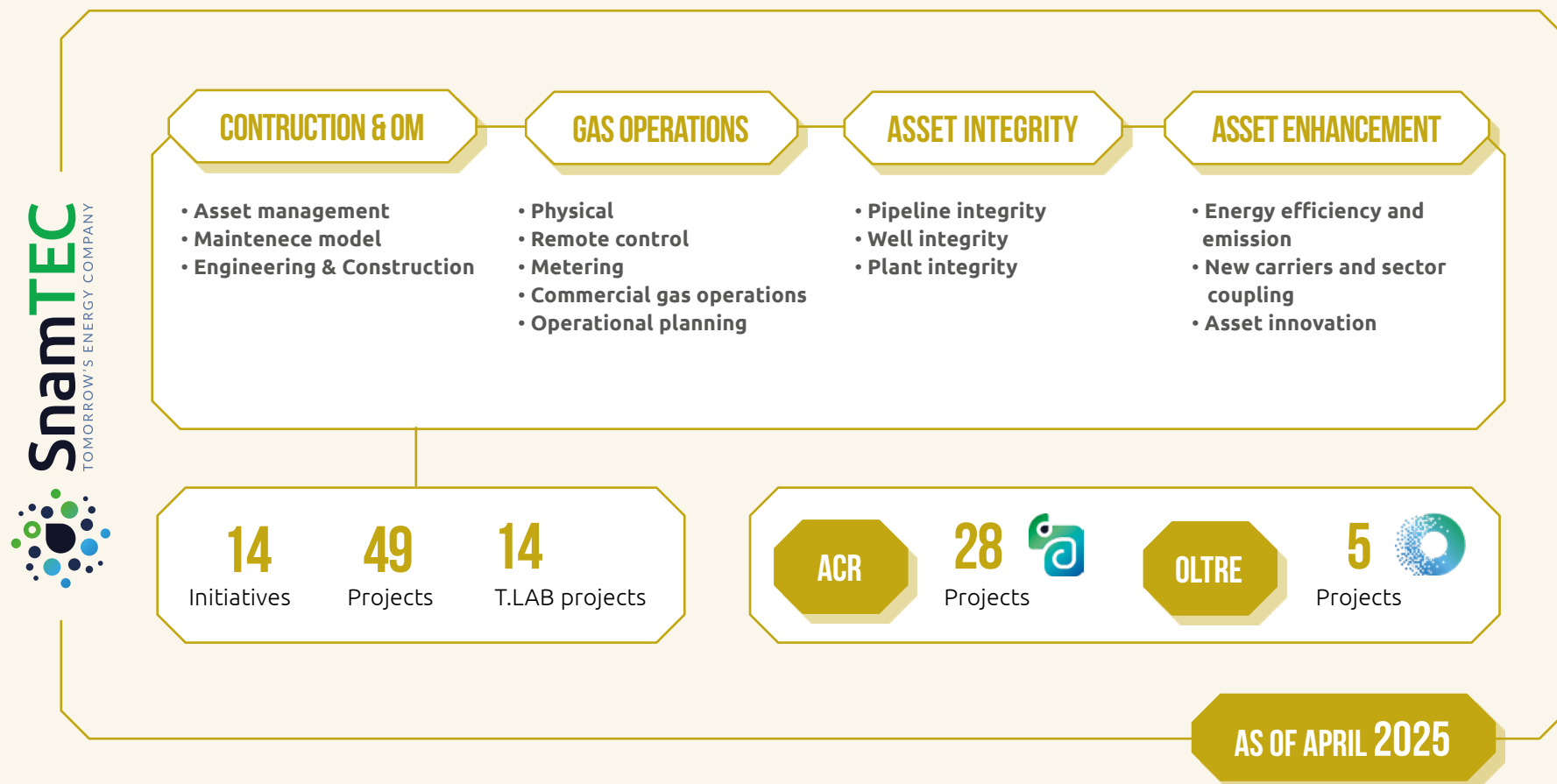


3.4 THE SNAMTEC PROGRAMME

The approach outlined above is fully overseen by SnamTEC (Tomorrow's Energy Company), Snam's innovation and transformation programme, through which the company pursues its key objectives: ensuring people's safety, maintaining operational

resilience, reducing environmental impact, and optimising processes. By aligning these objectives with the company's technological evolution roadmap, SnamTEC ensures a forward-looking, high impact transformation of industrial operations.

FIGURE 16 - SNAMTEC INITIATIVES OVERVIEW



SnamTEC comprises approximately 50 projects, structured into **four strategic areas of intervention**:

1. Construction & O&M - This area focuses on transforming asset development and management processes, from feasibility, design to maintenance and decommissioning. Key objectives include:

- **Optimising maintenance policies** through risk-based, data-driven approaches
- **Integrating and correlating all asset lifecycle data** within a unified digital model
- **Introducing new technological solutions** to support field operations
- **Developing innovative solutions** for project monitoring and management

2. Gas Operations - This area aims to enhance physical and commercial dispatching, remote control, and volume&quality measurements. Key objectives include:

- **Optimising network configurations** using advanced models and machine learning
- **Enhancing emergency management**, with scenario analysis and real-time data access.
- **Upgrading field measurement instrumentation** to ensure higher accuracy
- **Introducing new functionalities and improved user experience** to facilitate interactions with external stakeholders (e.g., customers)

3. Asset Integrity - This area focuses on strengthening asset health monitoring and defining necessary interventions. Key objectives include:

- **Implementing remote monitoring for diagnostics and asset control**
- **Applying risk-based models** to support asset integrity decision-making
- **Adopting new technologies and tools** for hydrogeological monitoring
- **Developing new models and algorithms** to optimise pipeline control

4. Asset Enhancement - This area drives innovation to maximise asset performance and sustainability. Key objectives include:

- **Enhancing asset intelligence** with real-time field data collection technologies
- **Optimising energy consumption**
- **Minimising environmental impact**, particularly emissions reduction
- **Facilitating the energy transition** through sector coupling and new energy carriers.

A SELECTION OF SNAMTEC PROJECTS TO ILLUSTRATE SNAM'S EVOLUTION JOURNEY IN EACH AREA OF INTERVENTION

ATLANTE – Construction & O&M

The company's cartographic systems have evolved to incorporate new tools and processes to implement the BIM methodology, in compliance with deadlines set by the new public procurement code. The new platform will extend beyond 2D representations, introducing 3D visualisation of assets enriched with historical and real-time data across the entire asset lifecycle. These enhancements will be integrated into the territorial context, enabling more advanced and efficient asset management.

UNICO – Gas Operations

This initiative centralises customer data and supports their operations and interactions with Snam. The core focus is to enhance user experience by creating a seamless integrated system that optimises activities, relationships, and information exchanges.

PIMOS (Pressure Intelligent Monitoring System) – Asset Integrity

An advanced machine learning system has been developed to analyse pressure data and predict potential methane pipeline leaks. By integrating data from distributed sensors, it distinguishes normal fluctuations of pressure from anomalies, accurately identifying and geolocating high-risk areas—20 times more accurately than the previous baseline (i.e: hundreds of metres instead of kilometres). Alerts are immediately sent to control room operators, who then coordinate field interventions.

The PIMOS initiative emerged from a bottom-up approach, originating from the intuition of an operations technician in 2017. Following a feasibility study and a pilot phase, Snam began installation, configuration, and testing in 2021. By 2023, PIMOS was fully deployed across the national gas network. Snam is now developing additional functionalities related to network losses, including pipeline inspection gauge (PIG) passages, central and reduction plant blocks/stops, and operational manoeuvres. This initiative exemplifies the power of internal innovation, demonstrating how frontline expertise can drive groundbreaking progress in asset integrity monitoring.

H₂ Readiness - Asset Enhancement

To prepare Snam's existing gas infrastructure for hydrogen transport (H₂), guidelines have been drafted to assess the current system's suitability while evaluating its impact on processes, regulations, and IT systems. Additionally, Snam is conducting studies and experimental trials with hydrogen at increasing concentration levels, focusing on turbines, centrifugal compressors, and storage facilities.

Furthermore, Snam actively participates in working groups and experimental initiatives to shape future technical regulations for hydrogen transport, covering both existing and newly constructed pipelines.

CO₂ Readiness - Asset Enhancement

To repurpose Snam's existing transport infrastructure for future conversion to CO₂ transport, necessary retrofitting activities must be carried out in compliance with current regulations. To guide this process, international standards such as ISO 27913 and DNV-RP-F104 have been adopted, setting requirements for CO₂ transport and providing specifications beyond general transportation standards.

In 2024, Snam began drafting a new technical regulation for CO₂ transport, scheduled for publication in 2025. Additionally, Snam, in a joint venture with ENI, is actively developing the Ravenna CCS Project, which successfully completed its first CO₂ injection into a storage reservoir in August 2024.

Enabling industrial technologies within SnamTEC

A fundamental pillar of Snam's transformation journey is the role of industrial technologies as enablers of an innovative and transformative corporate vision. These technologies are essential for creating synergies between processes and systems within SnamTEC, empowering the company to address current challenges while

preparing for future ones. By adopting advanced solutions that are carefully selected based on business needs, Snam ensures scalability, operational efficiency, sustainability, and adaptability.

In this context, Snam has implemented the following key technologies, organised across the technology clusters and trends that were identified in our technological arena:

FIGURE 17 - INDUSTRIAL TECHNOLOGIES WITHIN SNAMTEC

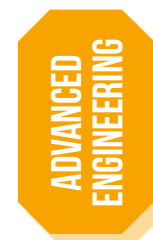


Immersive Reality technologies

- **Technologies supporting digital models:** new tools enabling the digital twin of existing assets (e.g., laser scanning, IFC – industry foundation classes).

Smart devices

- **Smart intelligent devices,** selected through testing and validation processes based on specific use cases, enabling automation and real-time monitoring to improve field operation reliability.
- **Asset integrity instrumentation:** new tools for data collection and analysis related to extreme weather events that could impact Snam's infrastructure integrity (e.g., landslide monitoring, seismic events, floods, tidal wave monitoring).
- **OT field devices:** new field devices for collecting and transmitting real-time data, enabling advanced remote asset management (e.g., advanced OT remote terminal units, edge OT).



Space technology

- **Satellites:** collection and processing of satellite imagery to support hydrogeological monitoring and territory oversight.
- **Drones:** deployment of drones equipped with specialised instrumentation for pipeline surveillance, hydrogeological monitoring, and methane leakage detection.

Sustainable engineering

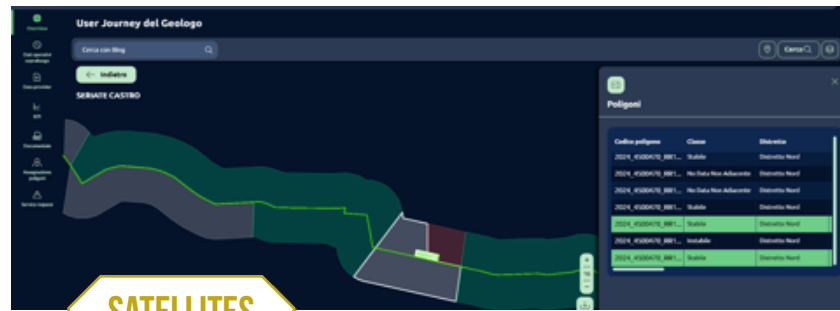
- **No/Low-emission equipment:** next-generation equipment, procedures, and plant solutions designed to minimise environmental impacts and support decarbonisation (e.g., LDAR, adsorbed natural gas).



H₂ and CO₂ infrastructures

- **H₂ and CO₂ ready materials & equipment:** adoption of new materials and technologies to enable the safe transport of new energy carriers.

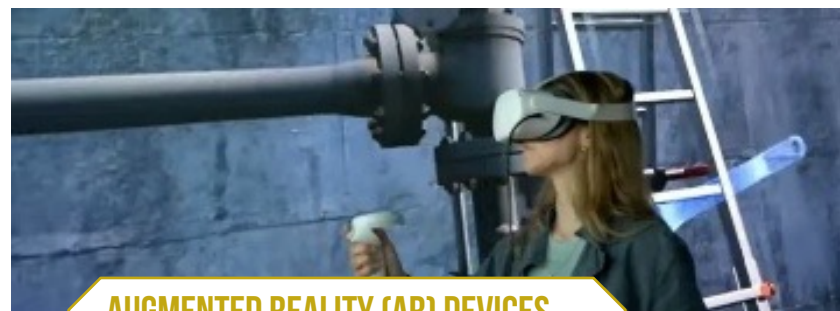
Additional **application paradigms** within SnamTEC focuses on the development of solutions based on emerging technologies (e.g., IoT, micro-front-end, cloud-based solutions) to provide users with easier access to data and functionalities (e.g. ACR).



SATELLITES



DRONES



AUGMENTED REALITY (AR) DEVICES



SMART FIELD DEVICES

T.LAB

For the past five years, Snam has been operating T.LAB, a laboratory dedicated to the explorative testing of new technologies and innovative solutions provided by industrial partners as well as startups to upgrade assets and processes as previously introduced in Chapter 2. Upon successful completion of experimentation, technologies and solutions are fully scaled within SnamTEC.

A structured process has been established within T.LAB to manage the lifecycle of potential new technological solutions, divided into the following key phases:

- **Prioritisation:** Innovative ideas addressing asset and process evolution needs are assessed and categorised based on their alignment with SnamTEC's vision. The business impact, expected benefits, and preliminary time and cost estimates are determined. A custom Snam scoring model selects high-potential solutions, considering the technology's maturity level.
- **Field Testing:** The selected technology is tested in real-world conditions to evaluate feasibility and suitability for Snam's operational context, as well as any potential adoption challenges.
- **Evaluation:** Solutions are assessed based on technological maturity and business impact. Possible outcomes include:
 - **Archiving** (if unsatisfactory)
 - **Continuous monitoring** (if promising but immature)
 - **Integration into the SnamTEC programme** (for company-wide implementation).

OPEN INNOVATION TOOLBOX FOR ASSETS AND PROCESSES

T.LAB is actively conducting experiments on a wide range of innovative technologies applied to various domains:

- Tools and algorithms to facilitate field operations.
- Satellite imaging and algorithms for improved infrastructure project planning.
- Innovative technologies for territory and hydrogeological monitoring.

Representative experimentations in T.LAB include:

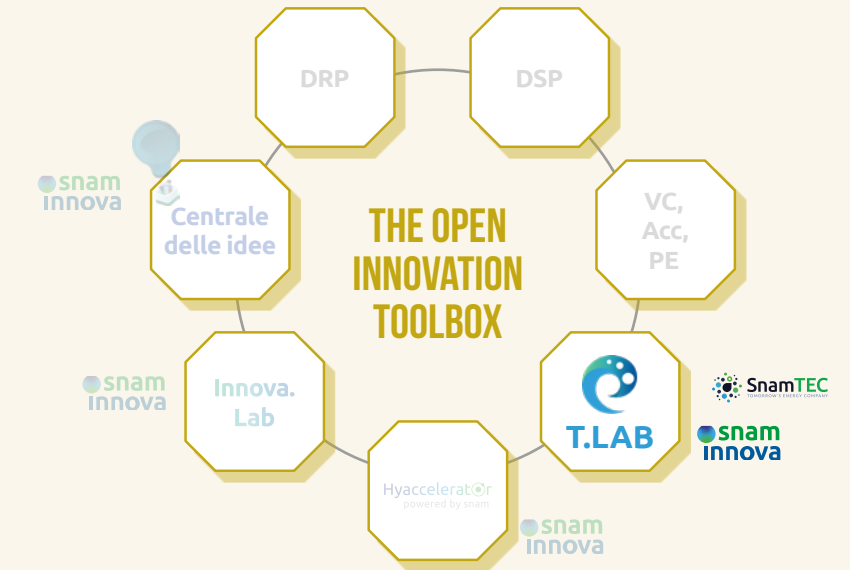
Methane detector: Engineering a hyperspectral camera for the detection and precise quantification of gas leaks at industrial scale. The proposed solution under development is expected to enhance methane leak management through real-time, high-resolution mapping of the affected areas.

Marine weather monitoring: Establishing a marine weather observatory at Panigaglia LNG and Ravenna FSRU, integrating advanced sensors and weather forecast analytics. This system will streamline management of ship operations, increasing safety, optimising planning activities, and guiding decision-making based on real-time weather and maritime forecasts.

Zero-emission valves: Developing remotely controllable, zero-emission pilot-operated reduction valves, without requiring replacements. The solution includes both retrofitting the existing valves and the installation of new ones.

Biodiversity monitoring: Developing laser scanner technology to monitor vegetation restoration after construction works are completed, applying the SBTN (Science Based Targets Network) biodiversity protocol for net-zero land use conversion.

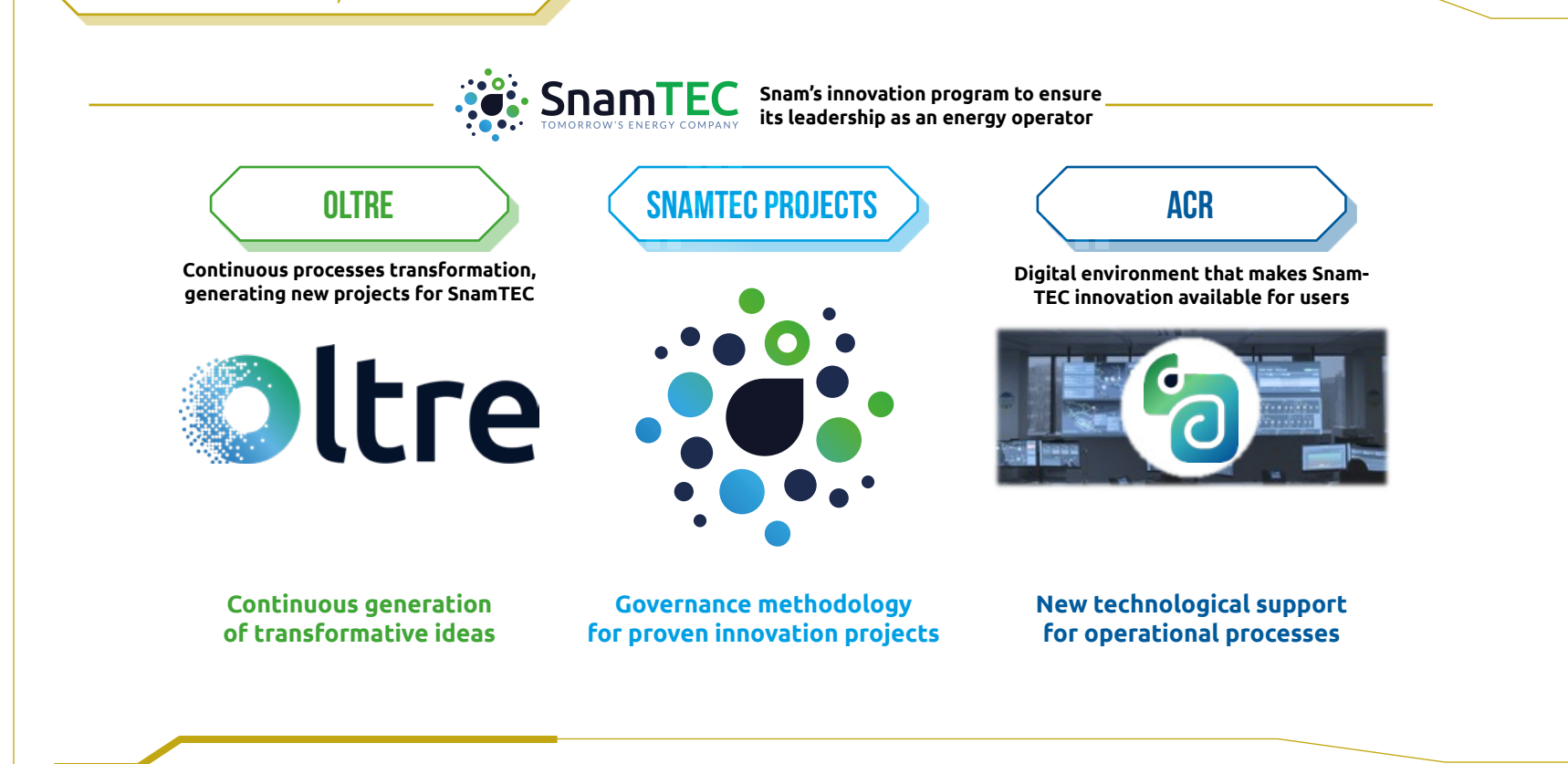
FIGURE 18 - OPEN INNOVATION FOR ASSETS AND PROCESSES



To fully exploit the potential of SnamTEC and to make innovation accessible to end users, we developed the following two frameworks that will be further detailed in the next dedicated chapters:

- ACR – a digital environment that makes SnamTEC innovation available for users
- OLTRE – a transformative framework to generate new projects for SnamTEC

FIGURE 19 - SNAMTEC, ACR AND OLTRE



Asset Control Room

The Asset Control Room (ACR) is a cutting-edge platform that harnesses innovative technologies to meet business needs, bringing SnamTEC's vision to life for all end-users while driving transformation of operational processes.

SnamTEC's guiding principles for the ACR include:

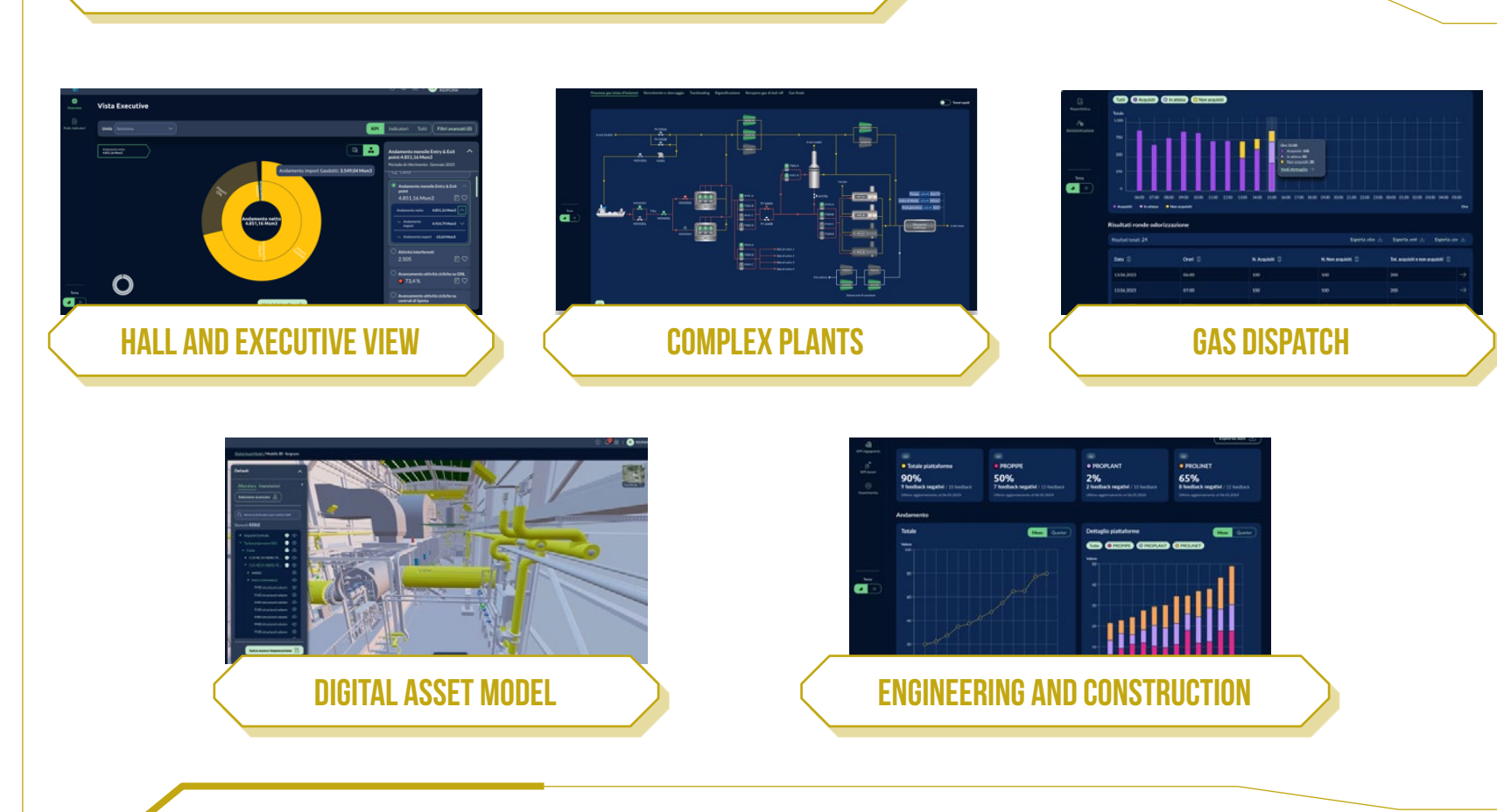
- A **simplified, unified user experience**, focused on **processes rather than siloed applications**
- A single source of **certified, accessible data** for all business functions
- A structured **data governance** with well-defined ownership and responsibilities
- The ability to perform **advanced data correlations** to support decision-making

- **Remote** asset management
- **End-to-end visibility** of increasingly integrated processes (covering 47 end-to-end processes)
- Access to **advanced models** to continuously optimise processes and activities
- **Streamlined analysis and communication** among stakeholders involved in the same process
- Ability to manage **complexity** of a **multi-energy carrier system**

The Asset Control Room enables data-driven execution of operational activities, providing real-time control and monitoring of activities and assets. By integrating advanced tools and technologies, it fosters innovation and creates new opportunities through risk-based and predictive simulation models. Designed with a strong focus on User Experience (UX) and User

Interface (UI), ACR delivers a simple, intuitive, and user-centred digital experience. As of the first quarter of 2025, ACR boasts over 2,000 active users and excellent performance results, achieving 99.2% availability (99.2%) and an APDEX user satisfaction score of 88/100.

FIGURE 20 - THE ACR USER INTERFACE WITH REPRESENTATIVE VIEWS



ACR components

The Asset Control Room comprises **five integrated components** designed to optimise asset management and transform operations at Snam. The **Data Platform & Governance** treats data as a strategic asset, ensuring structured federated management, active governance, and on-demand analytics. The **Document Platform & Governance** organises documents as digital entities, facilitating access, storage, and lifecycle management. The **Hall** supports user

onboarding, with an intuitive, process-driven experience and a customisable homepage, accessible across all electronic devices. **ACR Walls** provides integrated, end-to-end process views, enabling effective activity monitoring and management. Finally, the **Digital Asset Models** offer continuously updated digital twins of corporate assets, consolidating master, process, maintenance, and operational data and documents, ensuring alignment with field conditions in real-time.

ACR USE CASES AND SNAM'S CENTRES OF COMPETENCE

ACR is designed to serve the entire corporate population from frontline staff and innovation teams to executives, each with dedicated tools and interfaces tailored to their needs. ACR has also enabled process transformation- through the integration of advanced technologies.

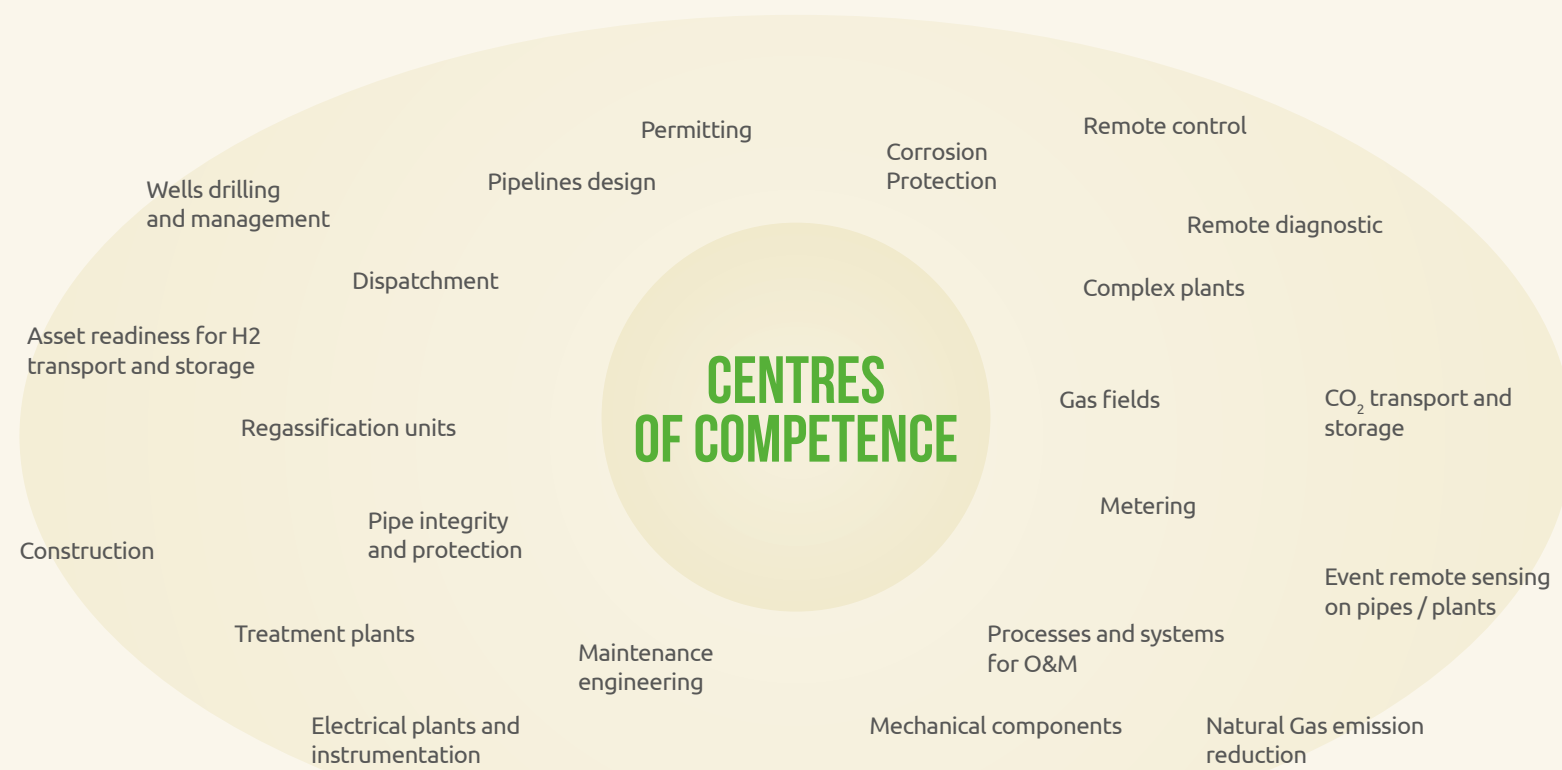
Some key examples of how ACR-transformed processes support our people in managing and monitoring assets include:

- **New visualisations for asset integrity** that aggregate data to better support operational interventions, such as a dedicated hydrogeology view that enhances the geologist's experience.
- **Mass-scale data collection**, reaching millions of data points per day, enabling real-time asset monitoring and proactive intervention planning, such as tele-diagnostics data made accessible to experts.

- **PIMOS**, a tool supporting dispatch operations by continuously monitoring and "listening" to events across the pipeline network, leveraging data from field monitoring units.

Snam's **centres of competence** are among the primary users of ACR. These centres, each specialised in a specific technical area, play a key role in spreading knowledge and defining the operational "rules" that ensure safety of people and physical assets, continuity of service, environmental compliance, and process optimisation. A core ambition for ACR moving forward is to capitalise and embed the extensive know-how of these **centres of competence** into an advanced algorithm, enhancing operational intelligence and decision-making capabilities across the company.

FIGURE 21 - SNAM'S CENTRES OF COMPETENCE



22

Centres

~140

People involved

Evolution Lab: beyond digitalisation - a hybrid space for innovation

Snam envisions a future where full digitalisation and information-driven decision-making, powered by advanced algorithms (AI/agents), shape the company's transformation. However, it also recognises the critical role of physical spaces in bringing ideas to life, supporting experimentation, and fostering collaboration. To bridge the digital and physical worlds, Snam has created a hybrid space where teams can test new functionalities, explore emerging opportunities, share experiences, generate new ideas, and receive business-driven training using innovative tools.

The goal is to create a dynamic collaborative environment, fostering a sense of belonging and motivation where teams challenge assumptions, exchange ideas and push the boundaries of company innovation.

This space is evolving from a simple meeting hub into a fully integrated environment that offers a 360° digital and physical experience, structured into several functional environments:

- **Collaboration Hub:** A space for team alignment, experience sharing, and functionality testing.
- **Advanced Training Room:** A training space equipped with ACR technologies, supporting learning processes aligned with strategic visions and process guidelines.
- **Virtual Reality Room:** An immersive environment to develop and test virtual technologies, where simulation contributes to innovation.
- **Innovative Instrumentation Lab:** A space focused on designing, developing, and testing field devices to enhance asset intelligence (e.g. smart devices, unified machines, ground movement monitoring sensors).
- **Data Playground:** A dedicated area for data analysis and simulation, allowing multiple users to collaborate, analyse data, simulate scenarios, and make data-driven decisions.

OLTRE

SnamTEC has initiated a process of evolution and innovation within operations. Thanks to ACR, these advancements are accessible to all, transforming activities and workflows through simplification and digitalisation.

In this context, OLTRE represents "what's next", the compass of future innovations applied to industrial operations. It is an Open Innovation framework designed to give the principles and directions

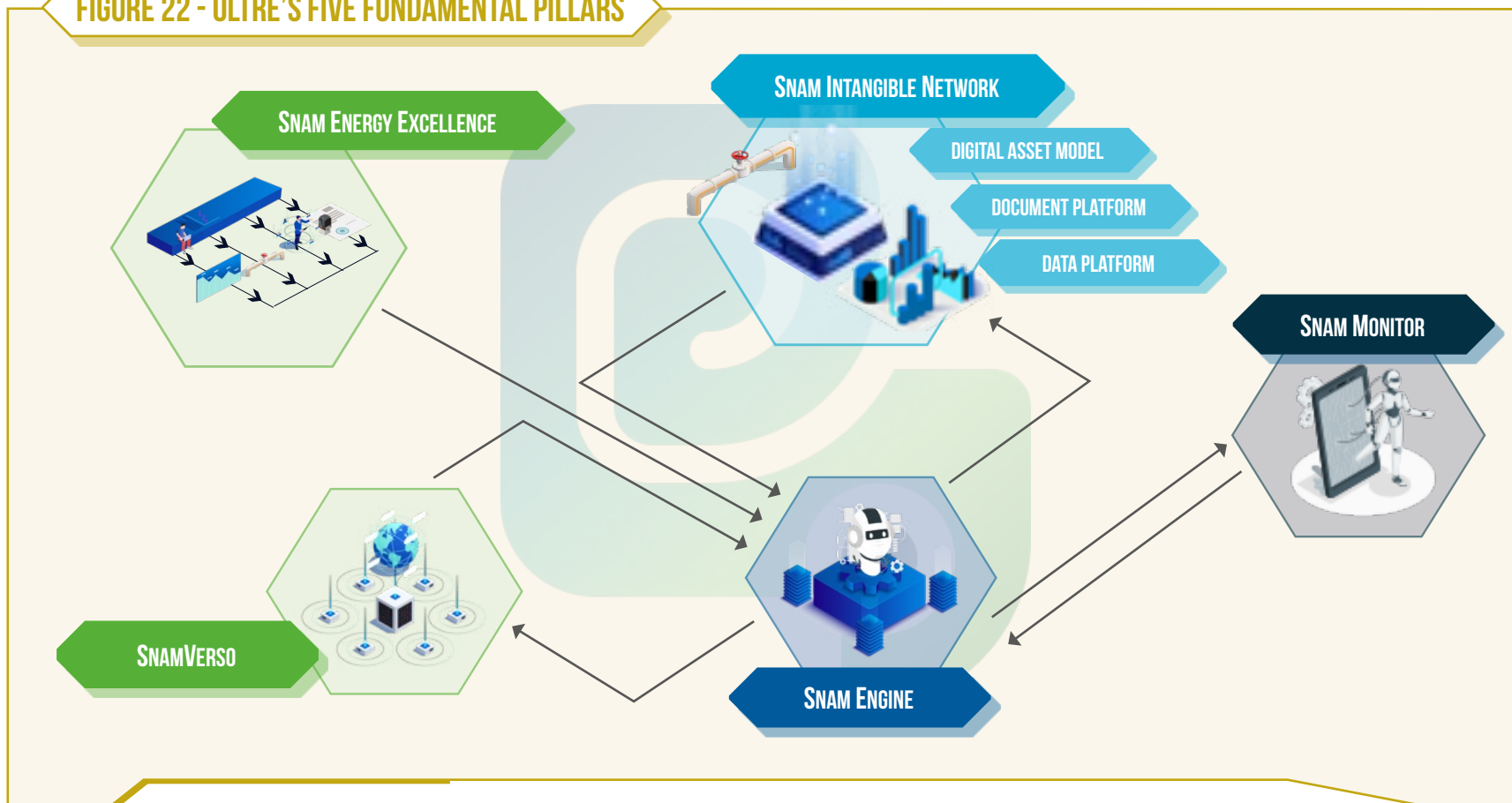
to guide Snam's transformation towards excellence, generating new ideas and new projects that feed into the SnamTEC programme and enhance ACR functionalities. In other words, OLTRE powers the next transformation cycle of the programme.

OLTRE is a structured innovation framework built on five fundamental pillars, each working in synergy to shape Snam's long-term transformation journey.

- **Snam Energy Excellence** – This guiding framework provides a comprehensive digital representation of operational processes, assets and technical expertise. It defines objectives, tracks performance through specific KPIs/KPOs, and identifies opportunities for process improvement and offers transformative insights.
- **Snam Intangible Network** – The corporate knowledge base is a continuously evolving repository of corporate information, integrating data from the Data Platform, Document Platform and Digital Models. It ensures structured, accessible and actionable management of corporate know-how for all stakeholders.
- **SnamVerso** – This secure gateway to external insights manages rules, procedures, and tools for consulting external information sources, both periodically and in response to specific events. It guarantees data security and reliability while enriching Snam's corporate knowledge base.
- **Snam Engine** – This innovation catalyst is a generator of transformative ideas for operational processes and corporate regulations and integrates new technologies (including AI/agents) with Snam's strategic vision. It identifies key strategic questions, and develops high-value proposals by combining:
 - Corporate guidelines, know-how and experience (from Snam Energy Excellence),
 - Structured information assets (from Snam Intangible Network),
 - Market trend and external insights (from SnamVerso)
- **Snam Monitor** – The intelligent user interface within OLTRE is a data driven, interactive interface that processes and synthesises insights from Snam Engine. It presents findings with clear, intuitive visualisations and facilitates collaborative discussions on proposed solutions.

Together, these five pillars form a dynamic innovation ecosystem, empowering Snam to navigate future challenges and drive continuous transformation.

FIGURE 22 - OLTRE'S FIVE FUNDAMENTAL PILLARS



3.5 THE INTEGRATED MASTERPLAN: SHAPING ASSET AND PROCESS EVOLUTION THROUGH THE 2030s

Since 2018, Snam has achieved a series of transformational milestones through the evolution of assets and processes, with plans to further strengthen these achievements over the next five years.

FIGURE 23 - SNAMTEC & ACR ACHIEVEMENTS AND 2030 TARGETS

+2.000 km analysed by **INSAR** to detect soil movements

+33.000 km monitored via high-frequency **Leak Detection System (LDS)**

+30 network plants monitored with new **smart devices**

+30.000 new data acquisition equipment installed

~1.5 bn/day signals acquired via **remote diagnostics** from turbochargers, network and gas treatment assets and LNG plant of Panigaglia

+10 Mln/day data elaborated on **edge**

100% new assets designed, realised and managed through **BIM-compliant processes and tools**

2025

+70 main processes transformed to exploit value of digitalisation

100% existing assets digitalised, BIM compliant and with real time data

100% asset monitored via **remote diagnostics**

+50 AI algorithms to enable data-driven decisions

20-30x E2E data chain throughput increase

180 TB storage increased from 12 TB today

400 GB bandwidth increased from 15 GB today

2030



Moving ahead, Snam has a clear and ambitious vision for the transformation of its industrial assets and processes in the coming years: the Integrated Masterplan, which serves as a structured and progressive roadmap unfolding over five overlapping periods:

1. Implementation of ACR and digital transformation of processes (2019-2029)

This phase focuses on fully implementing ACR as the company's global integrated platform for monitoring, controlling, and optimising industrial assets. The progressive transformation of all processes will unlock the full benefits of our technological evolution strategy, reduce asset management complexity, improve responsiveness in anomaly prevention, and ultimately optimise the entire asset lifecycle.

This transformation will also extend across the entire Group, accelerating corporate process digitalisation, with the implementation of a corporate data platform, and enabling other businesses of the Group to adopt SnamTEC's tested technologies and approaches.

2. Modelling and digitalisation of existing industrial assets (2023-2029)

This phase advances asset intelligence and contributes to building the **Snam Energy Excellence**. By creating a digital twin of Snam's infrastructure, integrating all asset lifecycle data and documents, the company will shift to a fully data-driven operating model, enhancing planning, maintenance, and infrastructure management capabilities, while shifting from reactive to predictive and proactive operations.

3. Implementation of the Document Platform (2024-2027) and continuous evolution of the Data Platform

To fully transform operational processes, the development of advanced data and document management platforms will be essential. This will include the adoption of new rules, procedures, and digital workflows to ensure seamless integration. Easy access to structured data and documents will enhance the advanced tools and functionalities available within the ACR ecosystem.

4. Development and implementation of OLTRE (2024-2032)

OLTRE will become a key framework for Snam's core innovation strategy, designed to drive continuous improvement by generating system-wide transformative ideas.

5. Activation of a continuous improvement cycle (2032-2040+)

The final phase aims to establish a long-term cycle of iterative innovation, fostering ongoing adaptability to technological and regulatory changes. This perpetual transformation process will strengthen Snam's long-term competitiveness.

CHAPTER

04

**MOVING FORWARD:
RESEARCH, DEVELOPMENT
AND INNOVATION
TO ENABLE
DECARBONISATION AND
DIGITALISATION**

INTRODUCTION

Snam has integrated research, development and innovation into its core activities, focusing on technologies that will shape the future infrastructure and landscape of fluid energy vectors. The evolving energy and digital transitions are key drivers of this transformation. The former is marked by progress in advanced clean energy and storage technologies, while the latter is driven by breakthroughs in AI, next-generation software, advanced algorithms and connectivity.

Recognising the importance of staying ahead in a rapidly evolving landscape, Snam has embraced R&D and innovation, prioritising two main technological areas: decarbonisation and digital technologies. Both areas require ongoing development of specialised know-how, particularly in R&D and disruptive technologies.

To support this, Snam actively collaborates with universities and research centres to attract talent with specialised backgrounds and expand the company's technical skills.

To accelerate progress and seamlessly integrate both core business and enabling technologies—ranging from multi-molecule upstream, midstream and downstream applications to corporate innovations—Snam has



4.1 OUR DECARBONISATION TECHNOLOGY PLATFORM

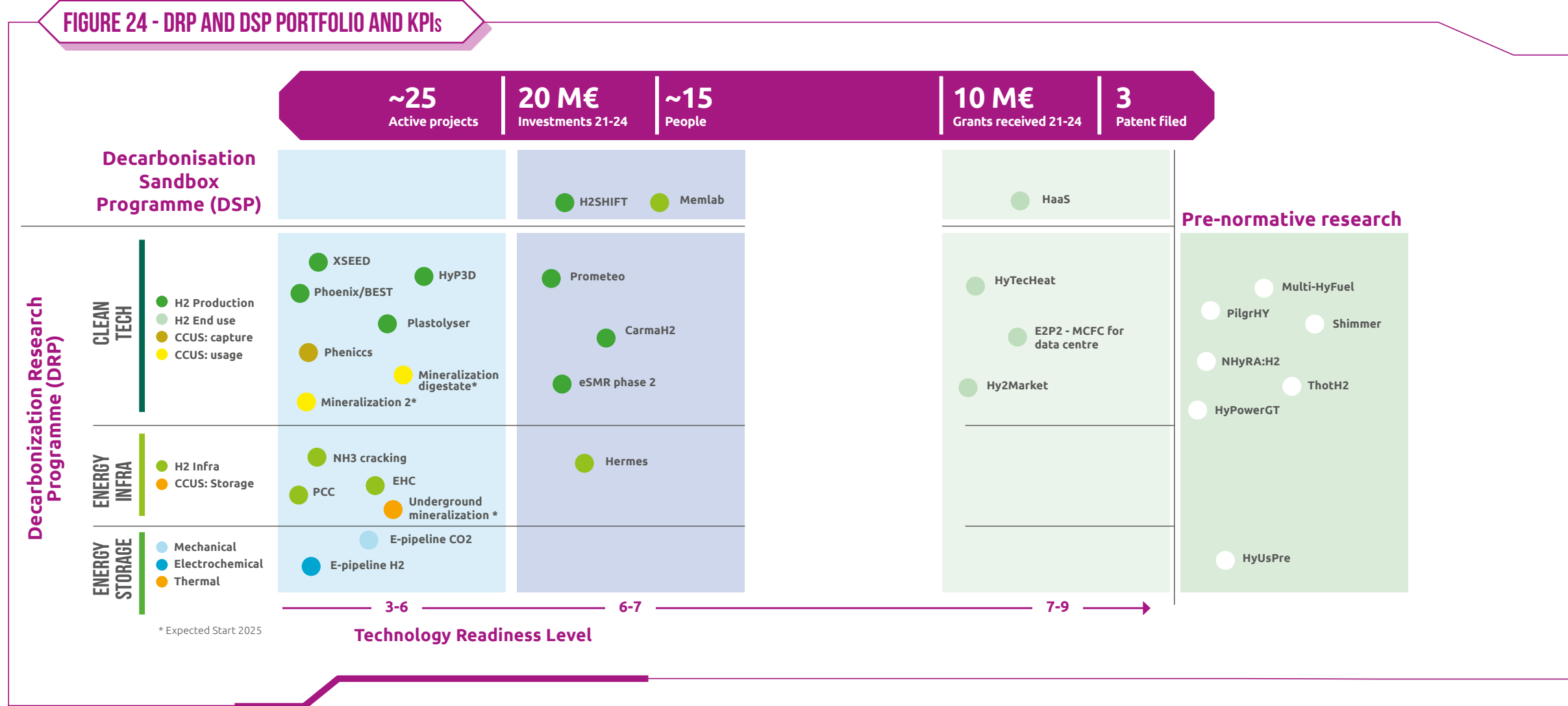
On Our way to Net-Zero

Snam's objective of reaching carbon neutrality by 2040²⁰ has driven a firm commitment to Research, Development, Demonstration and Innovation (RDD&I), laying the groundwork for a sustainable future powered by cleantech technologies.

In 2021, Snam established Decarbonisation Technology Solutions (DECTES), a dedicated unit to drive cleantech RDD&I with a high degree of technology fluency. Its journey has been defined by collaborations with national and international universities, research centres, industrial partners and start-ups. Through this ecosystem, Snam is transforming innovation into reality, enabling the energy transition by advancing technologies for clean molecules.

Snam initially focused on hydrogen technologies before expanding to cover the entire value chain of decarbonised molecules and their derivatives, including biomethane and CCUS. Its scope further extends to interrelated domains such as LDES and sector-coupling, promoting technology-agnostic, end-to-end solutions for decarbonising energy-intensive applications. By addressing the full technological value chain, Snam is preparing for the deployment and operation of a future multi-molecule infrastructure, while also enabling and supporting upstream and downstream segments essential to ensuring supply and demand balance.

Pre-normative research on hydrogen and CO₂ management plays a crucial role in ensuring the safe and effective deployment of clean energy infrastructures. These efforts involve comprehensive and rigorous testing, modeling, and the development of guidelines to define harmonised standards across Europe.



Decarbonisation Research Program (DRP)

DRP aims at scouting and developing cleantechs for decarbonised molecules as well as contributing to the development of pre-normative research.

- Technology-related R&D** consists of both internal projects and collaborations. In this perspective, Snam has established a network of universities and research centers to advance hydrogen, CCUS, and LDES technologies. DRP network includes Politecnico di Milano, Politecnico di Torino, Università di Modena e Reggio, Università di Bologna, Università di Trieste and University of California Irvine (USA). From 2021 to 2024, a total of 7 projects were initiated.
- Pre-normative research (PNR)** is crucial for developing, validating, assessing methodologies (e.g. available and new testing procedures), and filling knowledge gaps. This work, performed in close collaboration with Snam's technical experts, is essential to provide input for new standards. PNR also includes preliminary activities bridging the gap between infrastructure projects and innovation..

In parallel with advancing technology maturity and providing the technical foundation for future standards, the crucial role of DRP activities is to enhance Snam's business opportunities. R&D efforts can lead to patent submissions, which can be leveraged both internally through technology integration within our assets, and externally via licensing, joint development agreements (JDA) or spin-offs.

INTELLECTUAL PROPERTY

A global key focus for the coming years will be Intellectual Property (IP) licensing, which spans both explorative innovation characterised by a high degree of technological innovation and proven innovation, where existing technologies are enhanced and tailored to Snam's infrastructure needs. As IP increasingly emerges as a strategic asset in Snam's transformational journey, our approach to IP management is designed to both protect unique solutions that give us a competitive advantage and facilitate licensing agreements that enable third parties to leverage Snam's expertise. Examples of such innovations include:

1. A novel hybrid-photoreactor for H2 production,
2. A method and device to preserve pipeline integrity,
3. An electrified reactor for endothermic reactions.

In the coming years, Snam aims to further expand its patent portfolio, increasing both the number of patents and the breadth of technological families covered. Currently, several additional candidates from both explorative and proven innovation initiatives are undergoing a preliminary evaluation, highlighting the company's growing innovation capacity and potential.

²⁰ 2024, Snam, Transition Plan, Transition • Plan • Roadmap | snam

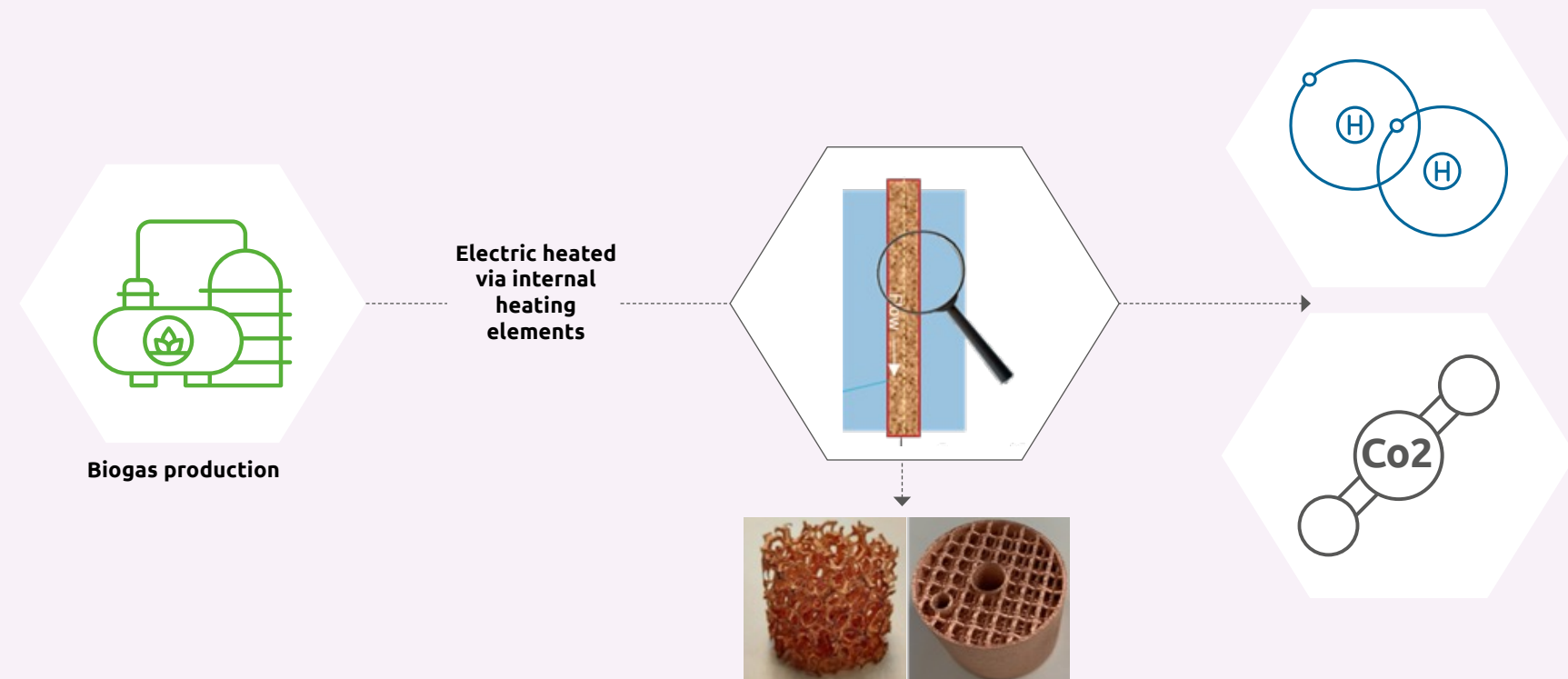
A SELECTION OF DRP PROJECTS

Electrified Steam Methane Reformer (eSMR) - Clean Tech / H₂ Production

Most of hydrogen today is produced through well-established industrial process—steam methane reforming (SMR)—which relies on natural gas both as a feedstock and as an energy vector, generating significant CO₂ emissions.

Launched in 2021 in collaboration with Politecnico di Milano, the eSMR project aims to develop an electrified steam methane reforming reactor (advancing from TRL 3 to 5-6) to produce low-carbon hydrogen. This approach significantly improves CO₂ separation and capture costs by generating highly concentrated output streams. Furthermore, by powering it with 100% renewable energy, eSMR dramatically reduces emissions, eliminating combustion-related emissions, which account for the majority of emissions in the current SMR process. Moreover, its relatively low specific energy consumption (approximately 17 kWh/kg H₂ with biogas feed) and reduced capex makes it an attractive alternative to other hydrogen production systems.

FIGURE 25 - PROCESS DIAGRAM OF THE ESMR PILOT TESTED IN REAL CONDITIONS UNDER THE H2SHIFT, INCLUDING EXAMPLES OF INTERNAL FOAMS HOSTING THE CATALYST

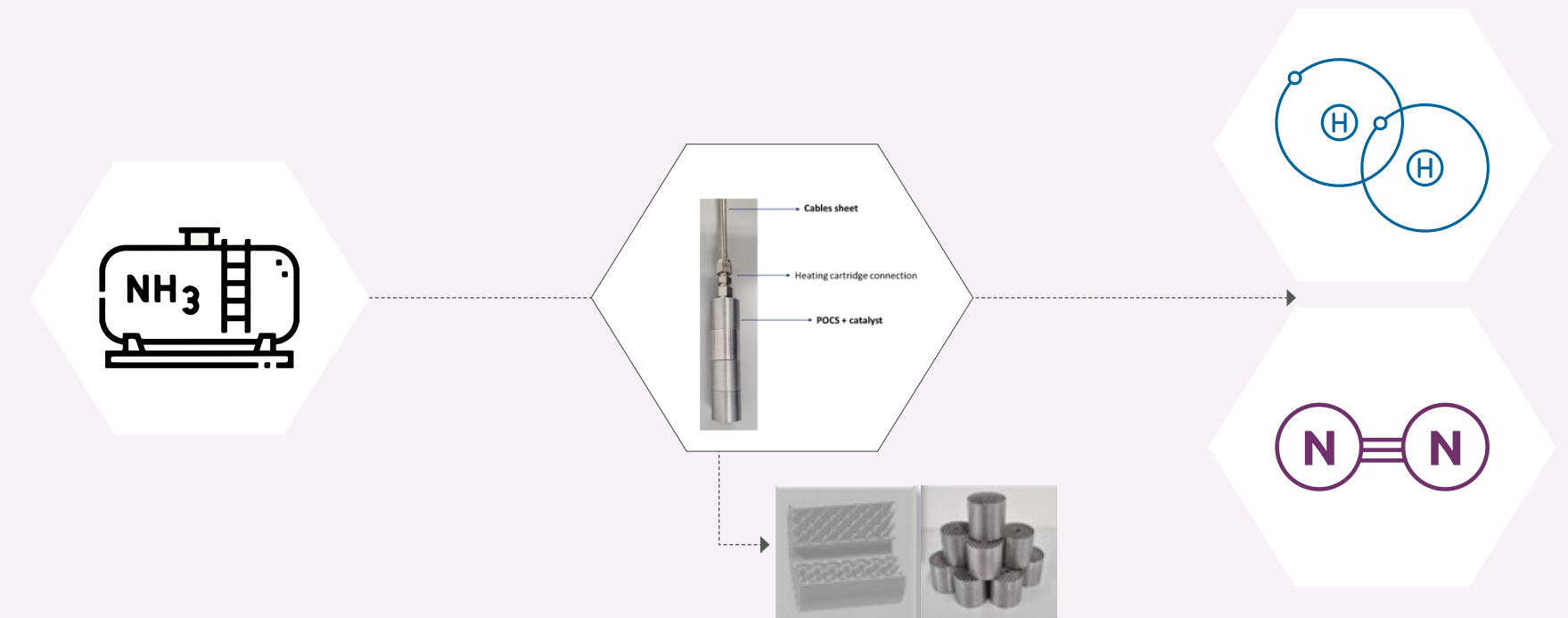


Electrified ammonia cracking (e-NH₃ cracking) – Energy Infra / H₂ Infrastructure

Ammonia (NH₃) is widely considered one of the future hydrogen liquid carriers to transport hydrogen from low-cost production regions to demand centers. NH₃ can either be used directly or cracked back into hydrogen at import hubs.

Launched recently in 2024, this project addresses the need to produce low-cost, low-carbon hydrogen from imported renewable ammonia, enhancing security of supply and diversifying feedstock sources, in line with Snam's multimolecular vision. Based on the same patent family as the eSMR, it focuses on developing an ammonia cracking system (TRL 3-5). The electrified reactor enables production of hydrogen from ammonia through a highly efficient modular process, targeting a specific consumption of approximately 7 kWh/kg H₂.

FIGURE 26 - EXAMPLES OF INTERNAL FOAMS AND MATRICES HOSTING THE CATALYST OF THE LAB-SCALE REACTOR

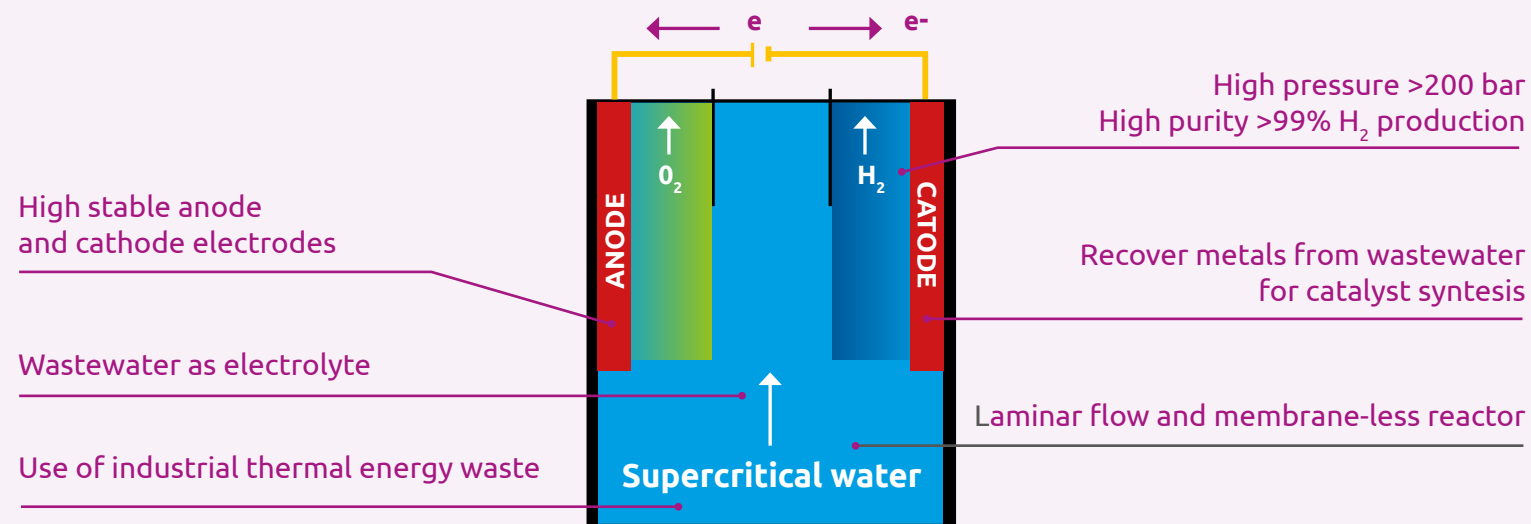


Development of an experimental supercritical electrolyser (X-SEED)– Clean Tech / H₂ Production

Low-carbon hydrogen will ultimately be produced from water and renewable energy via electrolysis. While several technologies are emerging and the industry continues to grow, challenges remain regarding efficiency, circularity and long-term system durability. The X-SEED project aims to improve electrolytic systems, making green hydrogen production more competitive, and accelerating the development of the H₂ ecosystem.

Funded by the Clean Hydrogen Partnership JU in 2024, the project will develop by 2028 an alkaline, membrane-less electrolyser stack of five cells, for a total power of 0.5 kW (TRL 2-4) operating in supercritical water conditions (>374°C, >220 bar). Intelligent fluid dynamics management and geometric cell design will ensure the correct separation of hydrogen and oxygen. In collaboration with Industrie De Nora, Particular Materials, Leitat and DTU, XSEED aims to improve overall efficiency by producing H₂ directly at high pressure and temperature, targeting a specific energy consumption as low as 48 kWh/kg H₂ and a current density exceeding 3 A/cm², thereby reducing production costs. The membrane-less configuration and the use of earth-abundant materials makes it a cost-effective, durable and sustainable solution. In addition, the electrolyser can operate by using wastewater as an electrolyte, integrating a resource-efficient approach that not only generates hydrogen but also contributes to water treatment. Moreover, wastewaters enriched with metals could be considered as a source for catalyst synthesis, thereby enhancing the circular approach within the project.

FIGURE 26 - SCHEMATIC REPRESENTATION OF THE SUPERCRITICAL CELL



Hydrogen-readiness and storage activities

Snam is assessing the H₂-readiness of relevant elements within its transmission and storage infrastructure, in particular:



- Within the framework of the pre-normative **HyUsPre project**, supported by the Fuel Cell and Hydrogen Joint Undertaking and completed in 2024, the feasibility of hydrogen storage in depleted porous reservoirs was demonstrated. This experience, combined with Snam's core expertise in underground storage, serves as a crucial foundation for advancing multi-molecule and long-duration energy storage solutions.



- Within the ongoing **Project Bains**, a UK-based storage initiative led by **dCarbonX** - a 50%-owned subsidiary specialised in multi-molecule storage - the strong potential of underground energy storage will be demonstrated as a strategic enabler of energy security and the transition to a low-carbon future. Initially focused on natural gas and biomethane, the project is designed to transition to hydrogen as the ecosystem scales up.

This focus on hydrogen infrastructure innovation extends to additional projects and technologies in synergy with the SouthH2Corridor. In the following, we list a series of relevant pre-normative research projects in which Snam is involved.



Hydrogen-powered gas turbine engine (HyPowerGT) – H₂ pre-normative research

Funded by the Clean Hydrogen Partnership JU, this 2024 European project aims to push technological boundaries and enable gas turbines to operate on hydrogen without dilution. The core innovation is a dry low-emission combustion technology (DLE H₂) capable of handling natural gas-hydrogen mixtures with concentrations of up to 100% H₂. The combustion technology had been successfully pre-validated by Baker Hughes in early 2021 at TRL5, retrofitted on the combustion system of a 13 MWe industrial gas turbine (NovaLT12). Within HyPowerGT, the consortium—led by SINTEF, with Baker Hughes as a key partner—will test the technology on a 16.9 MWe gas turbine (NovaLT16) at higher TRL (7). In addition to ensuring low emissions and high efficiency, the DLE H₂ combustion technology offers fuel versatility and response capability on par with modern gas-turbine engines running on natural gas.



Pre-Normative Research on Hydrogen Release Assessment (NHyRA) – H₂ pre-normative research

This second 2024 EU project coordinated by Snam, focuses on pre-normative research to lay the groundwork for a new technical normative framework. The overall objective of the project is to assess H₂ emissions across supply chains, assessing critical knowledge gaps and enhancing understanding among policymakers and stakeholders regarding the large-scale deployment of H₂ as an energy carrier and industrial feedstock. Beyond the inventory of emission types, NHyRA will focus on methodologies and technologies to measure, detect, quantify and assess H₂ emissions. The resulting recommendations for standards and technical specifications will play a key role in supporting the development of effective mitigation solutions to minimise any potential climate impact.



Novel test methods to measure natural gas and hydrogen mixtures (THOTH2) – H₂ pre-normative research

Led by Snam since 2023, this EU project focuses on evaluating solutions capable of accurately measuring the physical parameters of H₂:NG mixtures with increasing hydrogen concentrations, up to 100% H₂. Key project activities include: 1) developing and validating methodologies, protocols, and facilities to assess the metrological performance of measuring devices installed in NG transmission and distribution systems, 2) verifying safety and durability of such devices and 3) identifying future needs to overcome current technical barriers and limitations, ensuring accurate measurements in increasingly complex multi-molecule energy systems.

Decarbonisation Sandbox Programme (DSP)

Snam is building a series of ‘testing sandboxes’ or ‘testing platforms’, comprising both fixed and mobile facilities in industrial environments, where novel technologies can be validated at TRL 5-7. By offering testing services to technology developers, Snam reinforces its role not only as an energy system operator but also as a technology enabler. The DSP facilities are:

- H2Shift – A launchpad for hydrogen production technologies**
H2Shift enables - through 9 dedicated test lines across 7 European countries - real-world testing of hydrogen production also in synergy with CCU technologies, bridging the gap between research and industrial applications. With €7 million funding from Horizon Europe, H2Shift provides startups, SMEs, and corporate partners with an industrially relevant environment to test and refine hydrogen solutions. Notably, the first test will demonstrate TRL 6 of biohydrogen production from the biomethane plant in Legnano with the eSMR technology (see above) developed within DRP, in collaboration with Politecnico di Milano.
- Mem-Lab – Advancing hydrogen separation**
The challenge of integrating hydrogen blends into existing gas networks, rather than relying only on dedicated pipelines, has long been hindered by the lack of efficient, large-scale H₂/CH₄ debinding solutions. Located in Mortara (PV), Mem-Lab is a unique testing facility dedicated to gas separation and purification technologies. Supported by ARERA (€3.96M of public funding), Mem-Lab will advance separation and purification technologies, not only for debinding but also for hydrogen purification after underground storage. The first technology to be tested will be a highly selective palladium-based membrane provided by H2SITE, a Spanish startup scouted during the 2022 HyAccelerator edition.
- Hydrogen as a Service (HaaS) – Bringing hydrogen to industry**
The HaaS programme is a pioneering leasing service by Snam to help companies transition from conventional fuels to hydrogen without requiring capital commitments. It provides containerised electrolysis systems, allowing industrial users to test hydrogen as a fuel or feedstock. The first user was Tenaris, the leading manufacturer of industrial pipes, where a six-month hydrogen combustion test campaign was conducted in one of their furnaces in Dalmine. Further similar projects are under development, including hydrogen for dispensing in Hydrogen Refueling Stations (HRS) for heavy-duty transport and refineries.

Open innovation toolbox for decarbonisation

Snam promotes internal ideas and collaborates with startups developing decarbonisation technologies, targeting energy transition and net-zero solutions. In line with its multi-molecule infrastructure vision, Snam scouts cutting-edge solutions through the HyAccelerator, identifying technologies across all energy vectors, including hydrogen, biogas, and CO₂, to integrate them into a cohesive and efficient system.

CO2VAULT

Winner of the 2022 edition of Centrale delle Idee, CO₂VAULT is a decarbonisation tool designed to generate and trade high-quality carbon credits obtained via carbon capture technologies applied to biomethane plants. It pioneers Carbon Dioxide Removal (CDR) services within Snam. CO₂VAULT leverages Snam’s know-how and assets through a dedicated internal budget, opening the door to potential synergies with Bioenergy’s biomethane plants and the CCUS Ravenna project.

Particular Materials

Particular Materials is an Italian startup selected by HyAccelerator that develops hydrogen production solutions under supercritical high-pressure conditions. As part of the X-SEED project, the startup has signed with Snam and secured €3 million in European funding to develop a complete electrolyser.

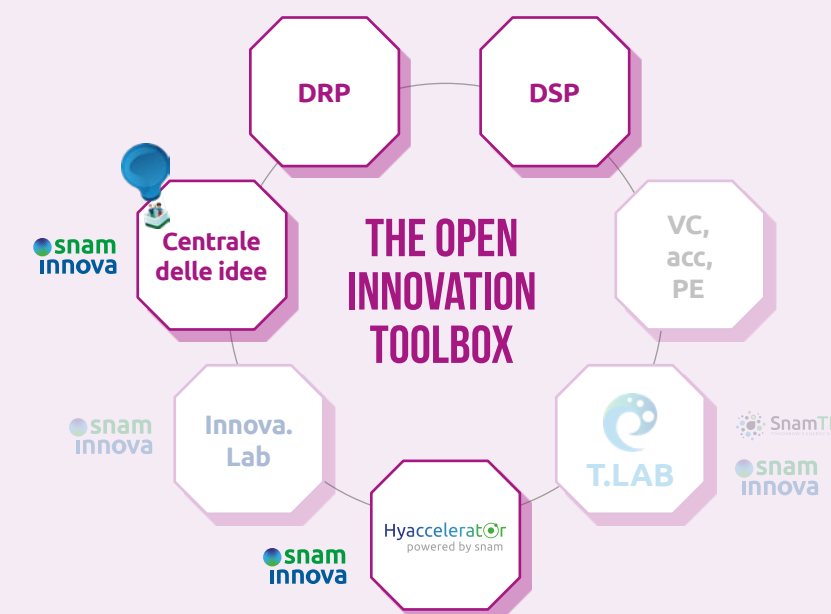
TerraBarrier

TerraBarrier is a Swedish startup, winner of the third edition of the HyAccelerator. It develops an innovative chemical process which creates ultra-dense barriers on alloy surfaces, addressing hydrogen permeation, embrittlement, and corrosion.

H2SITE

H2SITE is Spanish startup which produces palladium-based membranes for hydrogen separation from natural gas and was selected to join the Mem-Lab testing platform project, as part of DSP.

FIGURE 28 - SELECTED EXAMPLES OF OPEN INNOVATION X DECARBONISATION



Evolution of our clean technologies portfolio

In the coming years, our cleantech project portfolio will continue to evolve, expanding beyond hydrogen-related projects to include CCUS and LDES.

This strategic expansion aims to **strengthen Snam’s decarbonisation portfolio**, better addressing the needs of industrial players—particularly in hard-to-abate sectors—while maximising synergies with new multi-molecule assets. By securing a key technological position, Snam will generate substantial value through the creation and valorisation of intellectual property (IP) and potential spinoffs. A special focus will be placed on capitalising past R&D investments and leveraging our testing sandboxes to validate advanced TRLs of new technologies. By generating cutting-edge know-how and actively scouting for innovative technologies, we will continue to support our affiliates and drive forward our commitment to the energy transition.

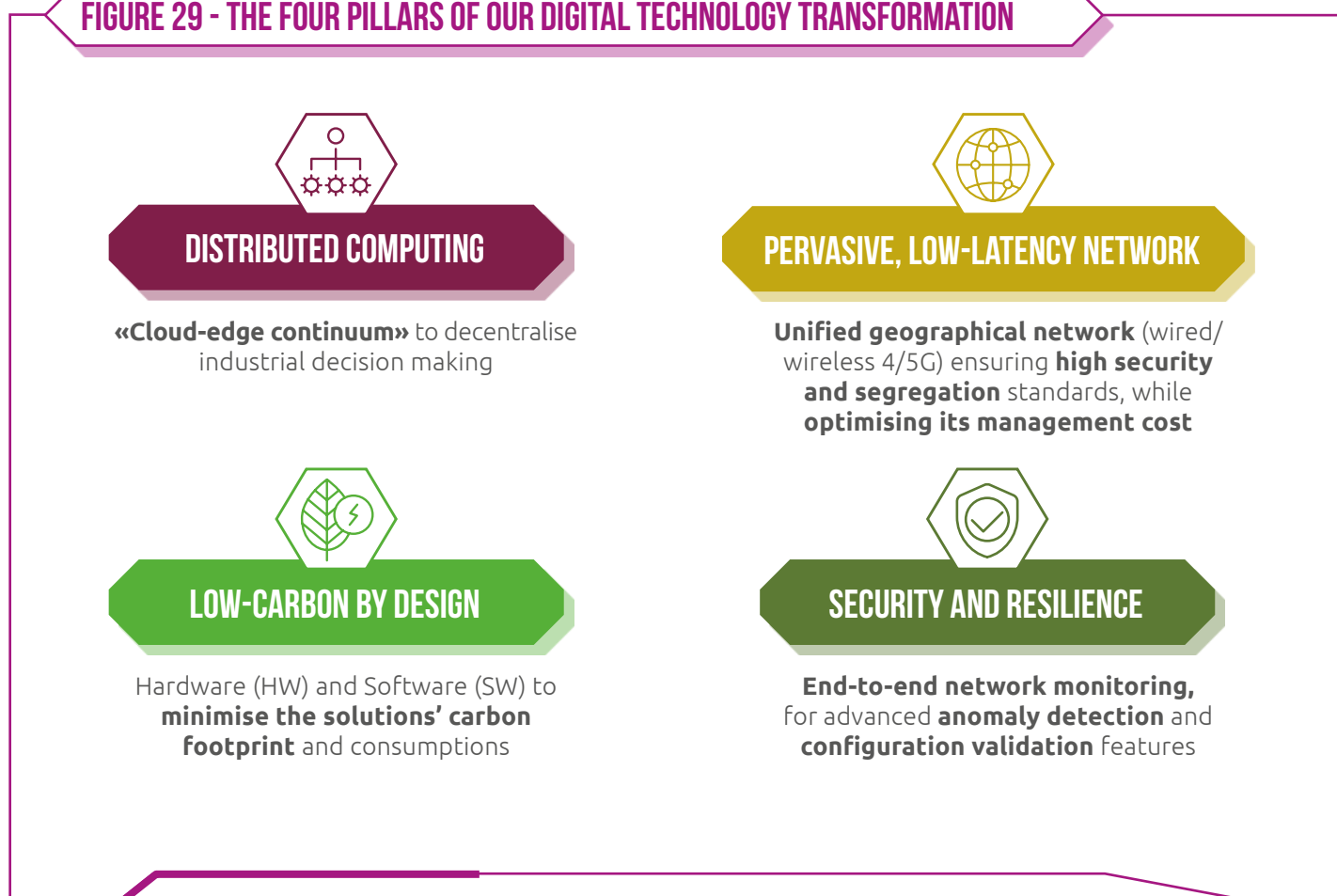
4.2 OUR DIGITAL TECHNOLOGY PLATFORM

Technological advancements to enhance business functions

Snam has embarked on a transformative digital journey, adopting a structured and multifaceted approach. By integrating advanced technologies, we are enhancing efficiency and driving innovation across the entire organisation, with a strong focus on commercial and corporate services, operations and assets.

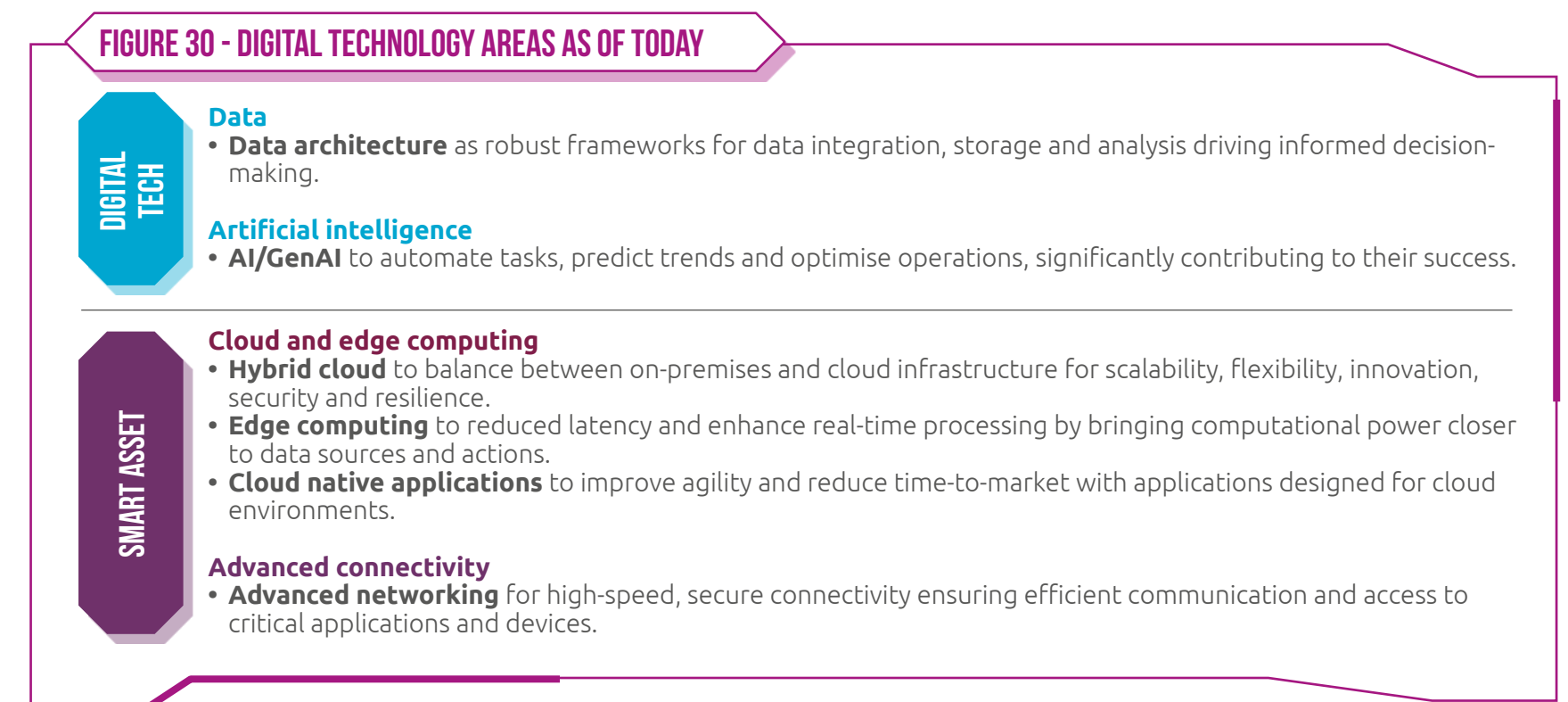
Our digital transformation is guided by four pillars: developing a distributed computing system, establishing a pervasive low latency network, designing a low-carbon configuration, and ensuring network security and resilience.

FIGURE 29 - THE FOUR PILLARS OF OUR DIGITAL TECHNOLOGY TRANSFORMATION



Asset digitalisation is largely covered by the SnamTEC programme, which drives the adoption of multiple digital technologies, each tailored to specific use cases as described in Chapter 3. These enabling technologies, structured within Snam's tech arena as follows, play a fundamental role not only in asset management but also in the digitalisation of corporate and commercial processes:

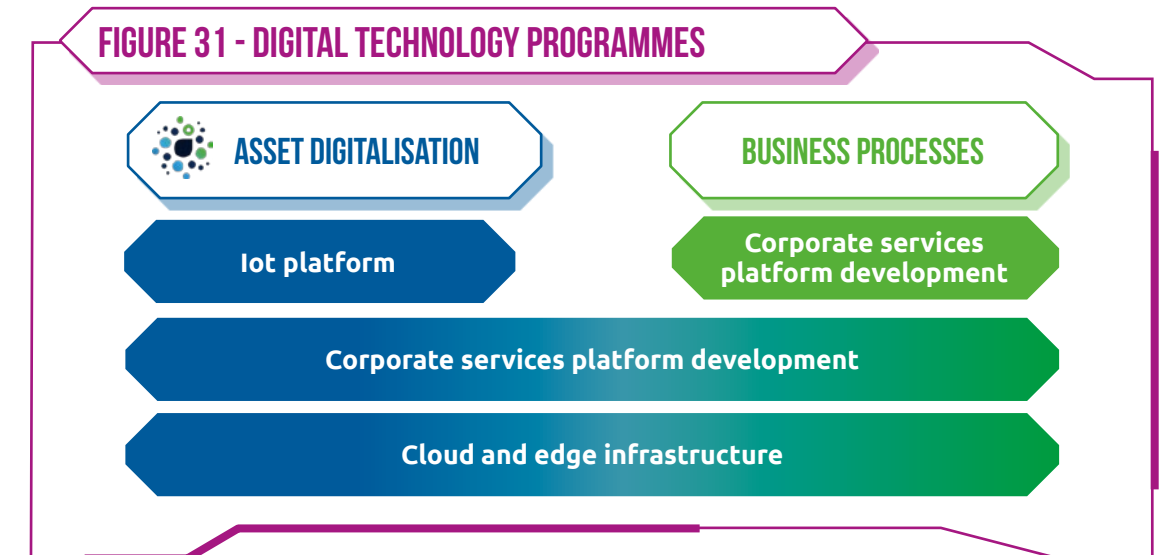
FIGURE 30 - DIGITAL TECHNOLOGY AREAS AS OF TODAY



Digital technology programmes

The integration of technologies has been structured into **four digital technology programmes**, designed to optimise asset management, enhance operational efficiency, mitigate risks, reduce costs, and support data-driven decision making.

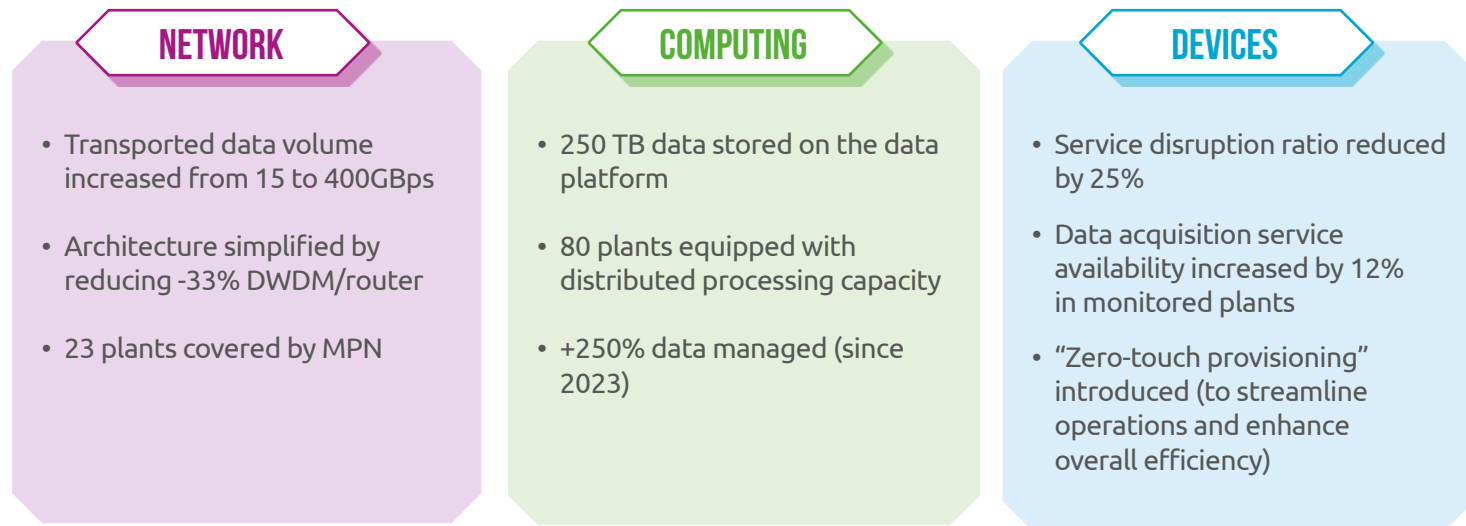
FIGURE 31 - DIGITAL TECHNOLOGY PROGRAMMES



IoT platform within the SnamTEC programme

As part of the SnamTEC programme, Snam has developed a state-of-the-art Internet-of-Things (IoT) technology platform to optimise and boost computational performance. It is built on three integrated key components:

FIGURE 32 - KEY COMPONENTS OF THE IOT PLATFORM



• **Network** - A 5G Mobile Private Network (MPN) has been deployed to expand mobile service coverage and ensure optimal wireless performance for IoT devices, increasing data throughput, reducing latency, and lowering power consumption.

computing ensures technology consistency, distributed processing, dynamic scalability, and automation. Operational continuity is guaranteed through a multi-site redundant cloud architecture and distributed platforms for on-site data processing.

In addition, the evolution of geographic connectivity into a unified national data transport network has increased Snam's network resilience, reduced the number of devices required, and improved both bandwidth and latency performance. An advanced monitoring system and fibre optic cables have been introduced to enable device sharing across IoT, corporate, and telecontrol networks while maintaining security through logical segregation.

• **Devices** - Advanced systems for data acquisition and remote monitoring of field devices have been implemented, including correlation models and an integrated monitoring system for anomaly detection and predictive maintenance. Snam is also focusing on automation and centralised device management technologies to enhance operational efficiency and support proactive maintenance.

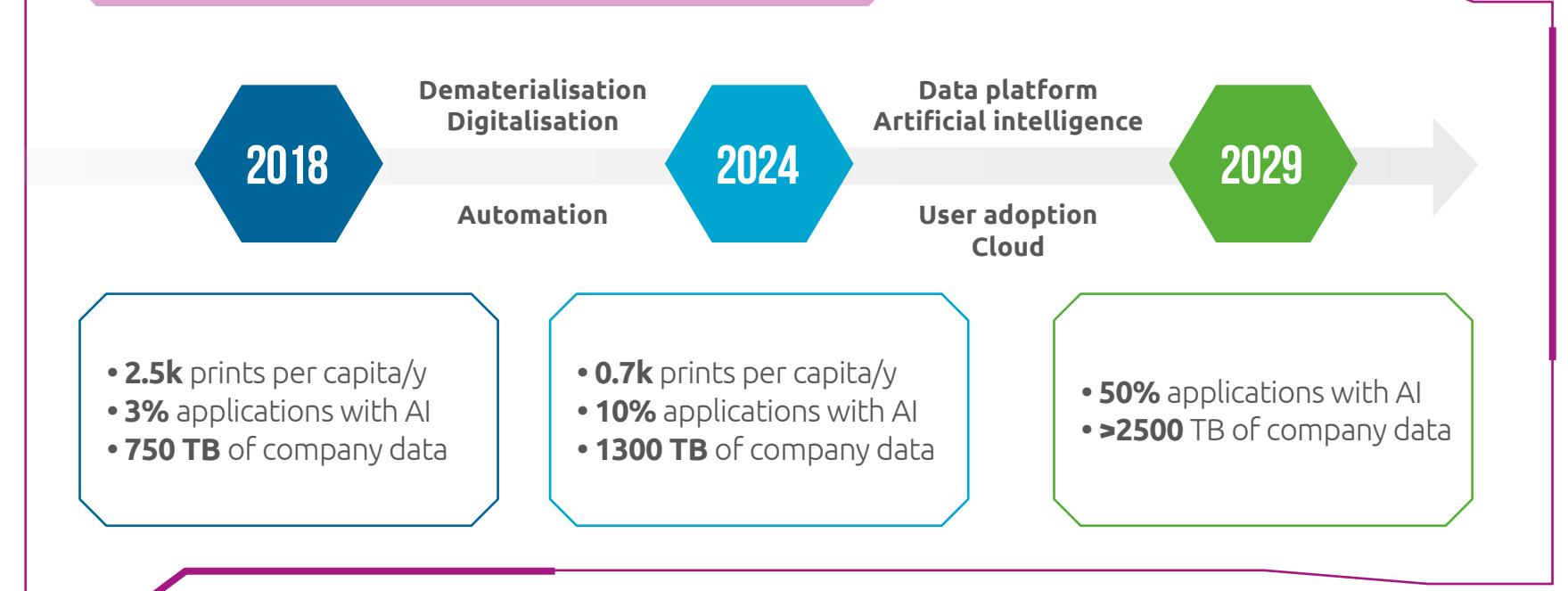
• **Computing** - Computing capabilities have been strengthened to bring cloud services closer to the field, providing real-time diagnostics and advanced analytics/AI capabilities. Cloud

Corporate services platform integration

Snam's corporate services are undergoing significant digitalisation through the implementation of digital platforms that support corporate processes, paperless solutions and AI/RPA (Robotic Process Automation) / agentic applications, such as:

- Platform integration of key corporate functions and processes, including reporting for commercial, finance, control & accounting, HR, and supply chain operations, using best-in-class market solutions (see box for our commercial IT platform Jarvis)
- Go-to-cloud strategy to leverage top market solutions, enhancing efficiency, security and speed
- Automation of low value tasks using RPAs and AI-agents
- Introduction of AI tools in business processes to streamline drafting, document comparison/ analysis, and minutes editing
- Digitalisation of paper workflows, document creation, archiving, and sharing
- Adoption of interactive tools, like e-whiteboards, for paperless offices

FIGURE 33 - PROGRESS AND TARGETS OF OUR PAPERLESS STRATEGY



JARVIS: OUR END-TO-END COMMERCIAL IT PLATFORM

In 2018, Snam launched the digital commercial platform Jarvis, riding the wave of innovation and digitalisation of commercial activities. It is groundbreaking in many aspects with:

- **The implementation** of cloud-native technologies, enabling over 80 releases per year across 230 microservices,
- **An agile working** methodology contributing to a 30% reduction in business process lead time,
- **New partnership models with customers and suppliers**, resulting in an impressive 34,000 trading transactions per month,
- **A novel customer-centric approach** with nearly 90,000 user visits and a 40% decrease in customer tickets

Over time, new technologies have been introduced, including AI-powered customer care, the first data platform for commercial operations, an app interface and a data marketplace where clients can automatically access services to retrieve data.

Jarvis is continuously adapting to our customers' evolving needs with regular updates to improve efficiency and adaptability, while introducing agile management in full synchronisation with product and technology development teams.

FIGURE 34 - JARVIS' KPIS



1. Internal and external



Discover more

Artificial intelligence and automation

AI and automation activities aim to enhance Snam's operational excellence by leveraging data and intelligent technologies. Specialised AI-powered applications are deployed to improve processes, while smart tools maximise value extraction through simplified accessible data platforms.

Artificial intelligence

Our AI applications, models and technologies have continuously evolved, integrating technological advancements and innovations to drive ongoing improvement. This approach strengthens internal know-how and capabilities, while keeping us at the forefront of technological breakthroughs. Some of the most impactful applications designed and deployed are:

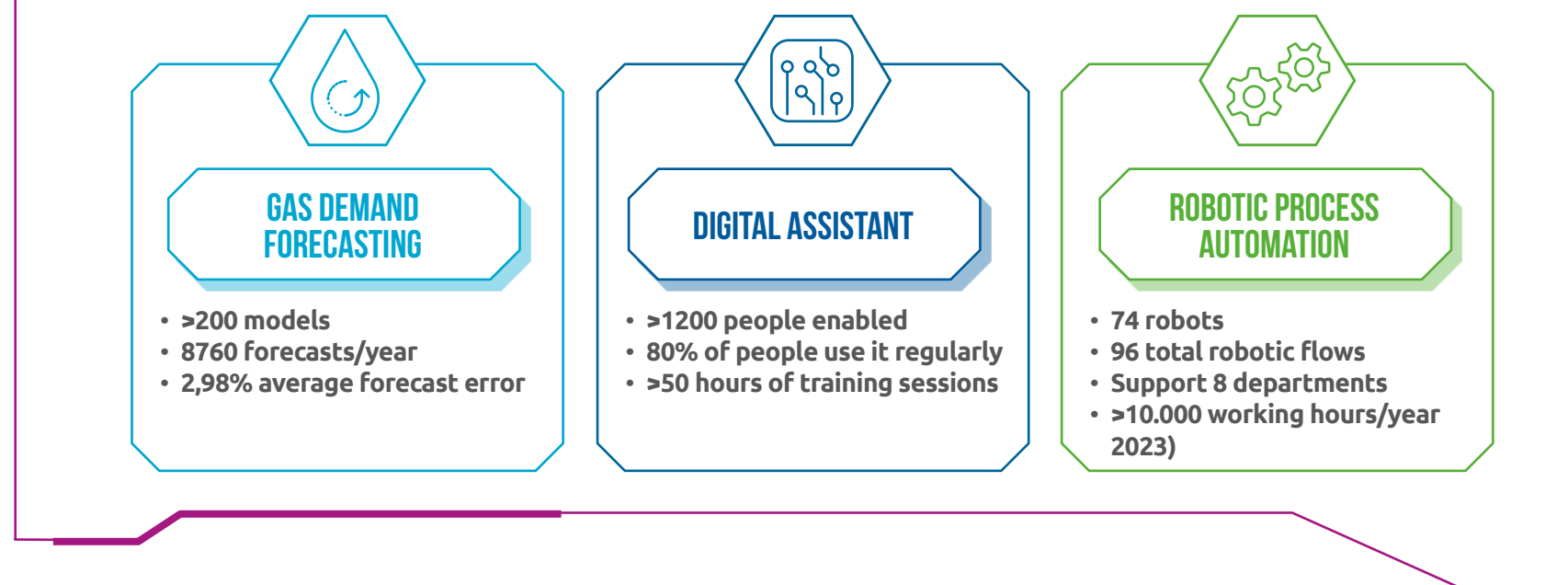
- **Predictive maintenance models** for complex plant equipment; **hourly gas demand forecasts** (intraday, one day ahead and up to six days ahead) to support network balancing activities; **leak detection identification models**
- **Complex digital monitoring and remote-control devices**
- **Cognitive AI applications** for automated extraction of insights from documents, such as tender responses and contracts
- **Generative AI applications** to analyse and generate content from market reports, interact with and summarise technical specifications
- **Smarty, a conversational agent** that simplifies employee interactions with internal IT services and logistics, accelerating troubleshooting.
- **Full-scale** deployment of the Copilot application, to assist employees in daily tasks, with dedicated training and use cases to maximise adoption and boost productivity.

Automation

An **automation programme** has been launched to support processes and applications with **RPAs** (Robotic Process Automation), streamlining operations by reducing low-value tasks.

Moreover, an **AI and Automation Competence Centre** has been set up to select the most suitable technologies, develop advanced AI solutions, define technical guidelines, and oversee AI governance. Acting as an "enabling team", it supports other IT functions in the design and integration of AI systems and tools. The centre also provides comprehensive advisory services, including expertise in data science, statistical and mathematical analysis.

FIGURE 35 - AI AND AUTOMATION KPIS



DEEPPAKE PREVENTION

While AI offers significant business opportunities, it also amplifies existing cyber threats. A prime example is deepfakes—AI-generated or manipulated content that can evade traditional security measures, making it increasingly difficult to distinguish between real and fake information.

Deepfakes are exploited for a range of malicious purposes, including financial fraud, identity theft, disinformation and fake news, phishing, and social engineering. Disinformation is particularly concerning: the World Economic Forum (WEF) lists it as the top global risk by estimated impact over the next two years.

The main line of defense is raising people's awareness through adequate security education programmes. At the same time, it is essential to invest in advanced recognition technologies. Snam addresses this by conducting regular scouting and testing activities to assess the maturity and effectiveness of solutions capable of identifying various forms of deepfakes—whether images, pre-recorded audio or video, or real-time content like video conferences.

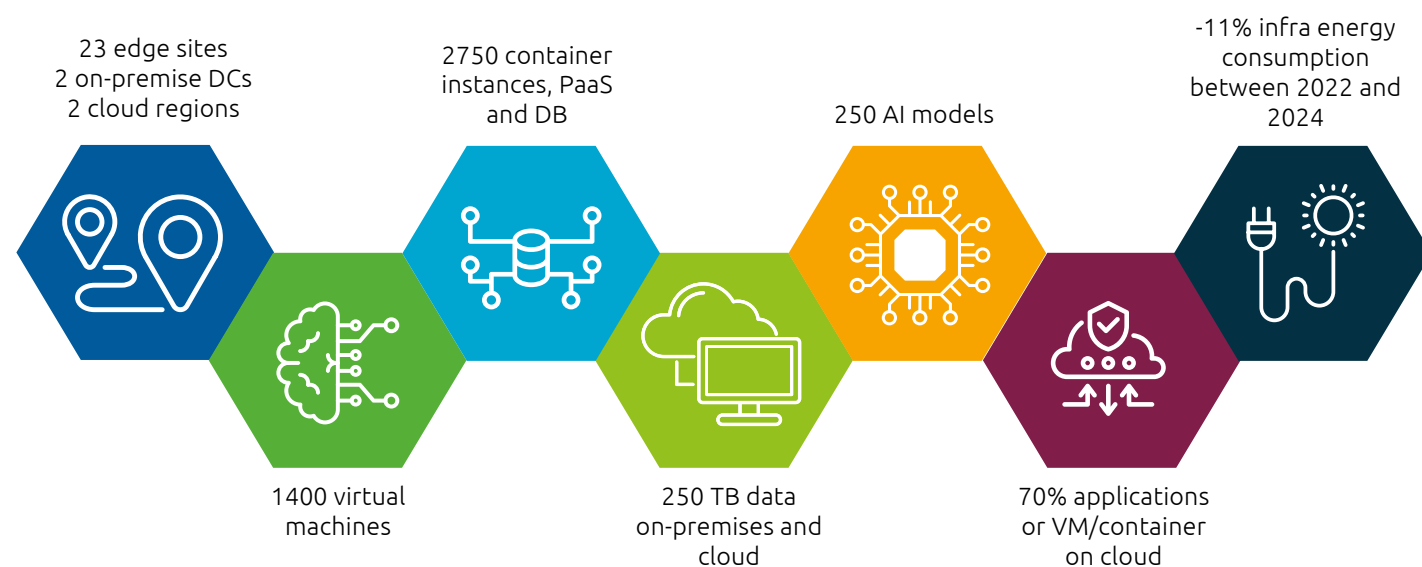
Cloud and edge infrastructure

The implementation of these initiatives has demanded exponential increases in computing, network and storage capabilities, requiring a complete redesign with innovative hardware, software, and services, all while integrating sustainability criteria.

To meet these demands, a cutting-edge Hybrid Cloud infrastructure has been deployed, providing high-performance computing power and speed across Snam's industrial sites, personnel, and R&D partners. This infrastructure ensures instant access to computational resources upon the release of new services.

FIGURE 36 - KEY METRICS OF CLOUD AND EDGE INFRASTRUCTURE

Snam's cloud and edge infrastructure facts and trends



CYBERSECURITY

Cyber threats continue to proliferate and reach unprecedented levels of sophistication. While technological innovation is essential for developing effective protection strategies, it also presents new opportunities for cybercriminals. At Snam, cybersecurity is recognised as a crucial business enabler, with two main areas of intervention:

1. Security by Design: Snam integrates cybersecurity considerations from the earliest stages of all technological projects. This approach enables the timely implementation of countermeasures, and reduces vulnerabilities from the outset. Applications become more resilient, significantly minimising the need for rework later. This process will continue to be refined, with increased attention to balancing risk, benefits, and costs.

2. Business Process Resilience: As IT and OT networks increasingly converge and IT functionalities are integrated into OT systems, OT is exposed to vulnerabilities once confined to IT environments. Cyberattacks on OT systems can result in severe consequences, including operational disruptions and safety hazards. In response, Snam is implementing comprehensive cybersecurity measures to ensure operational resilience and reliability, even amid a growing threat landscape that includes ransomware, nation-state actors, and insider threats, often targeting industrial environments through unsecured third-party access.

FIGURE 37 - OVERVIEW OF IMPROVEMENT ACTIVITIES FOR BUSINESS PROCESS RESILIENCE



Perimeter of business process resilience

Snam has already invested significant resources to protect its critical assets and will increase its efforts in response to emerging challenges and threats, particularly those related to digital transformation and the integration of new energy molecules and processes. To this end, Snam has adopted a multi-layered security strategy, that includes endpoint protection, network segmentation, continuous monitoring, threat detection, and incident response. By safeguarding OT systems, Snam mitigates risks, enhances operational continuity, and preserves the integrity of its critical infrastructure.

Snam also focuses on standardising cybersecurity practices across its industrial plants complying with international standards, such as IEC62443. This improves the effectiveness of security processes,

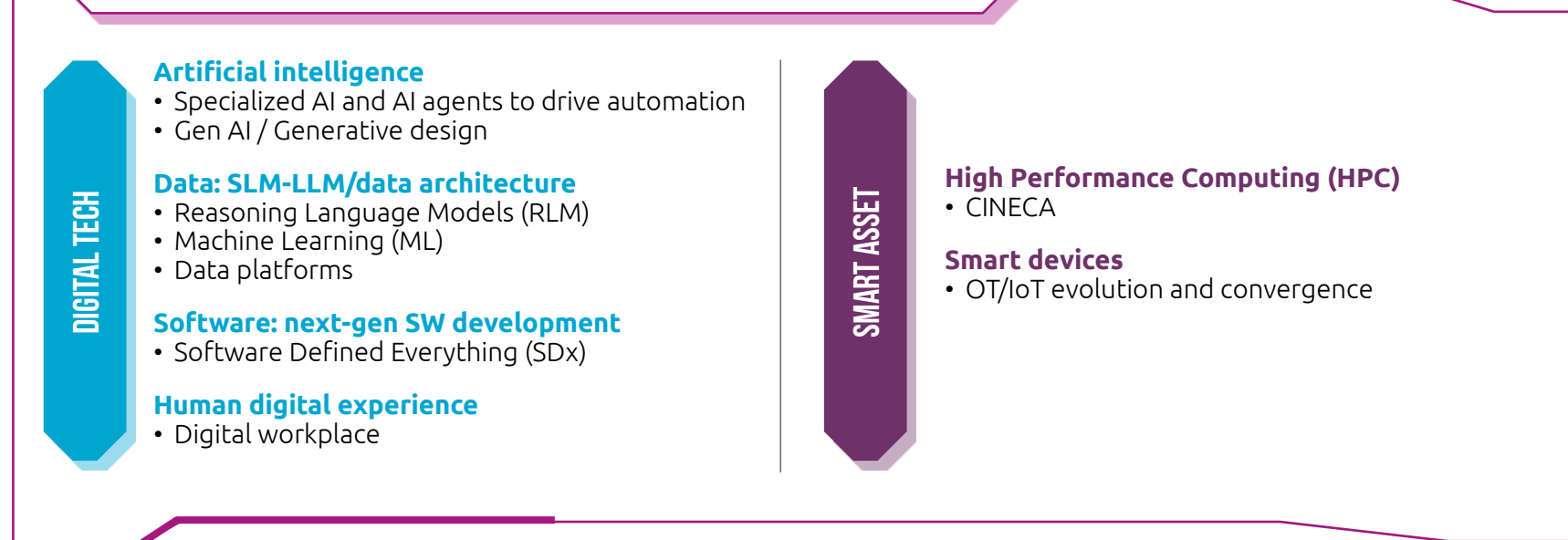
in particular the activities related to incident and vulnerability management. The adoption of advanced security technologies also enables optimised asset management, enhanced visibility and lifecycle monitoring, accelerated preventive maintenance, and streamlined problem analysis and remediation.

Looking ahead, Snam will tackle future challenges from a solid and homogeneous foundation, adopting new technologies to drive a data-informed adaptive security model that evolves in step with digital innovation and the energy transition.

Future evolution of our digital technology platforms

In the coming years, we will continue to build upon our existing digital foundations, further reinforcing our expertise and leveraging emerging technologies. Our main areas of interest include:

FIGURE 38 - TECHNOLOGY AREAS ON OUR RADAR FOR THE 2025-2029 PLAN



Future of artificial intelligence and automation

AI is evolving at an unprecedented pace, and Snam's strategy will continue to emphasise both specialised and "self-service" AI, exploiting their synergies to tackle complex problems, assist decision-making processes and optimise daily activities. This strategic approach will permeate the entire organisation, aiming to transform ways of working in all business areas and foster a strong AI culture. AI tools will become an integral part of employee's daily activities. By 2029, we expect AI-driven solutions to power more than 40% of our applications.

Our upcoming initiatives include:

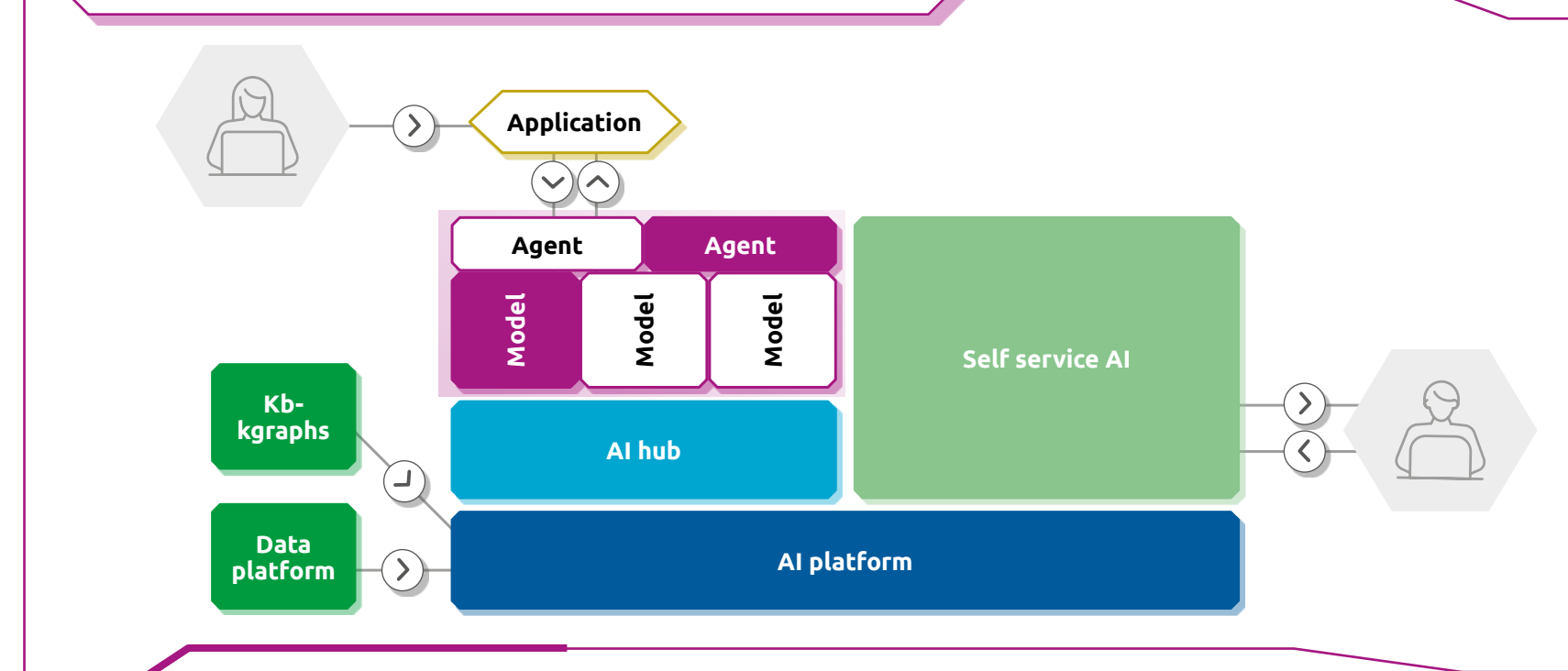
- **Advancing algorithmic models powered by specialised AI** to refine prediction accuracy and support complex problem solving, such as optimising asset utilisation, or conducting detailed real-

time simulations of multi-molecule environments.

- **Strengthening the new frontier of agentic AI by integrating autonomous AI agents** into digital platforms and internal service desks, enabling intelligent self-service reporting and operations by aggregating and summarising structured and unstructured data sources across the entire organisation

These initiatives will be **accelerated through a multifaceted AI platform**, featuring an advanced **AI governance framework**, and a dedicated **AI hub** to support various generative AI use cases under a broad framework, represented in figure 39.

FIGURE 39 - REPRESENTATION OF SNAM'S MULTIFACETED AI PLATFORM



The AI and Automation Competence Centre also houses an "AI Lab", which will be further consolidated to continuously identify and integrate the most suitable AI technologies.

Key focus areas will include: **reasoning language models** (capable of deductive and inductive reasoning, making assumptions, and solving problems within defined constraints while generalising findings), **generative design** (to create new materials and simulate their behaviour), **causal inference** (to identify cause-effect relationships in complex processes), **GenAI and knowledge graphs** (to enhance reliability and accuracy through structured knowledge and domain-specific insights), and advanced **Machine Learning (ML) algorithms** (for better performance and explainability).

As it integrates these tools, Snam is committed to adopting **responsible AI** best practices, ensuring the ethical development and deployment of AI, with a strong emphasis on transparency, accountability and the protection of data privacy and security. In doing so, AI can also contribute positively to societal well-being, reinforcing long-term sustainability and trust.

Data platforms and High-Performance Computing (HPC)

To further increase HPC and AI capabilities, Snam has joined a consortium led by **CINECA** to build and operate EuroHPC's first industrial-grade supercomputer, expected to be fully operational by 2026.

Expanding computational power and expertise will transform our Data Platform into a **Data-as-a-Product model**, ensuring a unified, high-quality and trustworthy data ecosystem. This evolution paves the way towards a data-driven economy, leveraging a platform-based approach with advanced marketplace capabilities.

Software-Defined Everything

Software-Defined Everything (SDx) is reshaping the digital landscape by integrating software-defined networking (SDN), software-defined data centres (SDDC), and software-defined storage (SDS) into a unified framework.

By decoupling hardware from software, SDx provides unparalleled flexibility, scalability, and efficiency, enabling dynamic resource allocation, rapid application deployment, and seamless technology integration. This transformation results in greater infrastructure adaptability, making networks smarter and more responsive. The ultimate goal is **full asset automation**, powered by a

comprehensive SDx approach. This will drive **greater overall efficiency and operational performance, reduce infrastructure oversizing, and enhance sustainability**, while mitigating risks during critical operations.

OT and IoT evolution

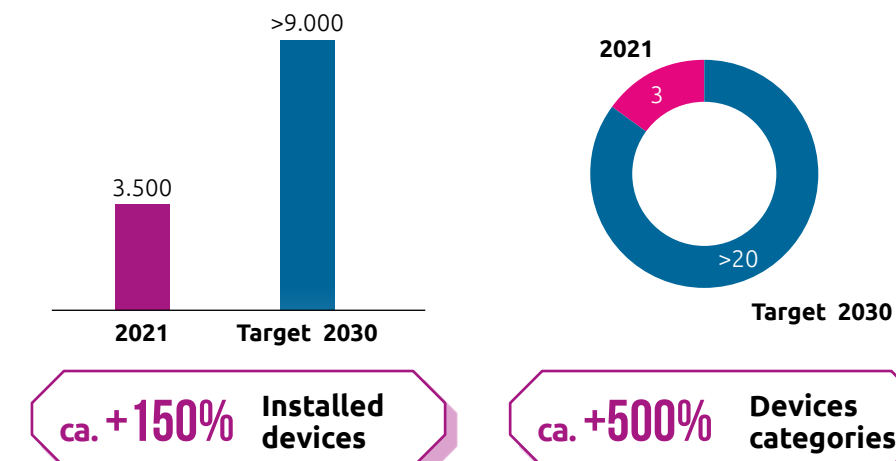
Snam's innovation strategy embraces a data-driven approach to managing our future multi-molecule infrastructure, relying on high-quality, timely, and reliable data from diverse sources. To meet these needs, Snam plans to enhance its Operational Technology (OT) infrastructure by progressively integrating it with an expanding industrial Internet-of-Things (IoT) network, leveraging the latest advancements in digital and technological innovation.

The challenges ahead require a highly automated, scalable, secure and **ML/AI-ready OT platform**. To address this, Snam is committed to driving innovation by introducing cutting-edge infrastructure technologies within the OT space. These will significantly enhance system scalability, real-time data processing, data storage flexibility, automation and operational efficiency.

This next-generation OT platform will be reinforced by an **advanced device management platform**, designed to reach a high degree of process automation. It will ensure seamless OT-IoT integration, optimise lifecycle management of OT/SCADA and IoT devices, and strengthen security through deep automation of pre-provisioning, provisioning and configuration processes.

Moreover, Snam's future OT/IoT remote data acquisition infrastructure will **integrate advanced network capabilities**, including 5G and Low Earth Orbit (LEO) satellite communications. This integration will extend connectivity across the Snam network, reaching even the most remote sites currently lacking service.

FIGURE 40 - INSTALLATION METRICS AND TARGETS FOR IOT DEVICES



Advanced workplace

Besides its commitment to continuous process and operational progress, Snam strongly believes in the critical role of people and the potential to empower, enhance, and develop their capabilities through advanced technologies and solutions.

To support this people-centric vision, Snam is redefining employee experience, both on-site and off-site, by integrating comfort, sustainability and advanced digital technologies into its headquarters, marking a significant shift from traditional work models.

OPEN INNOVATION TOOLBOX FOR CORPORATE PROCESS DIGITALISATION

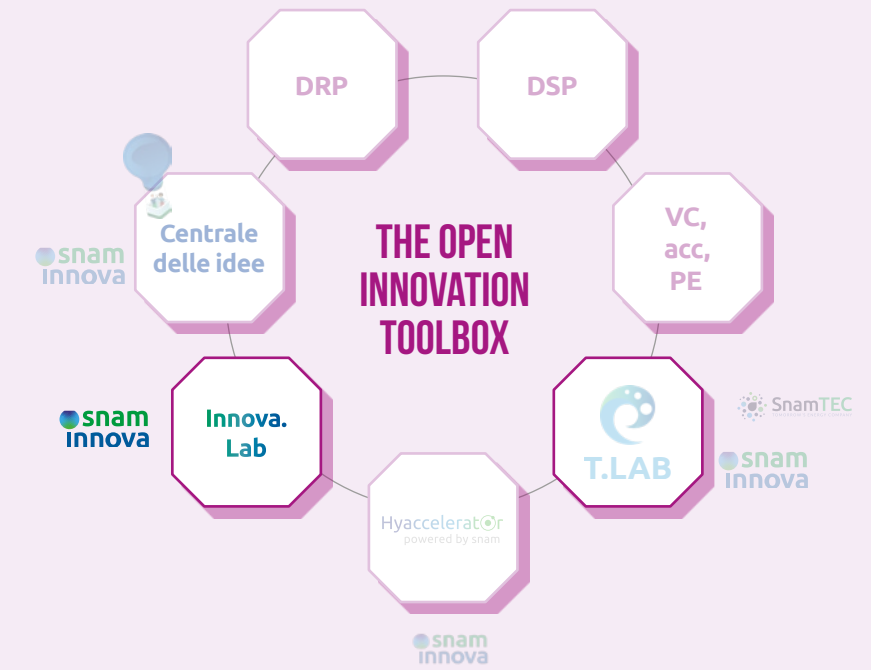
Corporate/digital tech – This area focuses on collaborating with startups that provide innovative solutions to improve Snam's internal business processes and corporate operations. These startups offer technologies for human resources management, business process digitalisation, cybersecurity, and other areas that contribute to improving the company's operational efficiency and performance. threats, often targeting industrial environments through unsecured third-party access.

SkillGym – Innova.Lab
In 2022, Snam initiated a collaboration with Lifelike, owner of the SkillGym platform, and winner of the Snaminnova's Call4Startup in "Innovative Learning".

SkillGym is an AI-powered digital platform designed to improve soft skills, by simulating realistic high-stakes conversations, with a focus on leadership and peer-to-peer interactions. It offers a catalogue of conversation scenarios and provides feedback based on Snam's competency model. This technology enables employees to practice and refine their soft skills in a controlled, virtual environment, making the learning process both engaging and effective.

The experimentation lasted 12 weeks and involved over 100 managers. The positive results from this phase led Snam to adopt SkillGym as a permanent solution, integrating it into its training programmes to foster continuous learning and skill development.

FIGURE 41 - A REPRESENTATIVE ILLUSTRATION OF OPEN INNOVATION X DIGITALISATION



CHAPTER

05

**FUTURE OUTLOOK
FOR INNOVATION
PLANNING**

5.1 MIDSTREAM (R)EVOLUTION

Over the next decade, energy infrastructure will need to evolve to meet changing system demands driven by the energy transition, climate change, and progress in digitalisation and platform technologies. At its core, **midstream infrastructure will play a crucial role in seamlessly integrating increasingly interconnected value chains while maintaining operational excellence, safety, sustainability and resilience.**

Key transformational forces include:

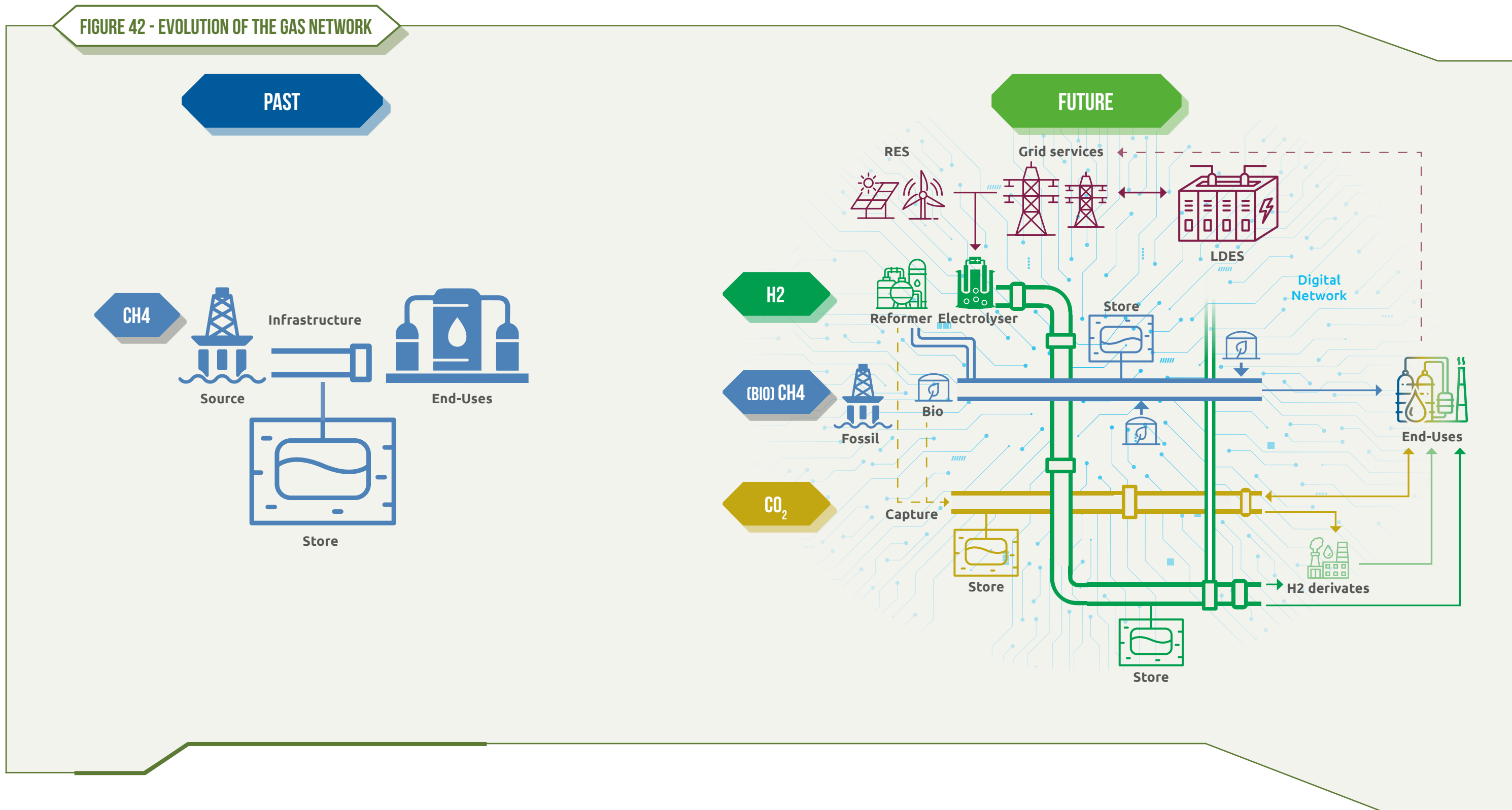
- 1. Integration of diverse molecules:** Future infrastructure will need to accommodate not only natural gas and biomethane (CH₄) but also hydrogen (H₂) and carbon dioxide (CO₂). Derivative fuels or feedstocks such as ammonia (NH₃), methanol (CH₃OH) and other e-fuels, alongside oxygen (O₂) or even heat, could potentially become part of the equation. Each molecule or carrier has distinct physical and chemical properties requiring tailored handling technologies and processes for transport, storage, and compression. The successful development of these technologies is one of the main pillars of our Innovation Plan.
- 2. Integration of multiple energy infrastructures (i.e. sector coupling):** Energy systems and infrastructure will become increasingly interconnected at various levels:
 - **Molecules-to-molecules:** The energy landscape will see growing synergies between different molecules. For example, low-carbon hydrogen production depends on natural gas and CCS, while e-fuels require renewable hydrogen of non-biological origin (RFNBO) and biogenic CO₂ from sources such as biomethane plants. This multi-molecule approach demands enhanced coordination by the infrastructure operator through digital tools and new technologies.
 - **Molecules-to-electrons:** The large-scale deployment of renewable energies will require grid balancing solutions and energy storage capabilities to ensure reliability and reduce system costs. Power-to-H₂ strategies will play a key role in addressing these needs. As a result, gas networks of the future must integrate not only with the electricity grid, but also with multiple injection/extraction points and large-scale storage sites, where volumes and flows will vary based on factors such as weather conditions or final user obligations (e.g., CO₂ reduction targets). Our Innovation Plan therefore focuses on equipping the grid with the necessary technologies to meet these future demands.

- 3. Tracing and certification for market development:** Molecules differ in origin and sustainability attributes. Methane can be fossil, biosourced (i.e. biomethane) or synthetic, while hydrogen varies from being renewable of non-biological origin (RFNBO), renewable of biological origin (i.e. RFBO or biohydrogen) to low-carbon hydrogen derived from natural gas with CCS. CO₂ can be fossil-based, biogenic from biofuel plants or removed directly from the air. As regulatory frameworks evolve to take into account these different origins, efficient tracing and certification systems will be essential to ensure compliance, facilitate transparent pricing and support market development.
- 4. The increasing role of data and artificial intelligence:** With the deployment of digital-native infrastructure, the volume of collected data will grow exponentially. Digital twins will become more sophisticated, and increasingly powerful artificial intelligence, high-performance-computing and quantum algorithms will redefine how we design, simulate, optimise, maintain and manage physical infrastructure. These advancements will enable advanced scenario analysis, predictive maintenance, multidimensional optimisation of integrated energy systems including networks, storage facilities, regasification terminals and biogas plants, and seamless coordination with other markets such as electricity and hydrogen. Snam will gain deeper insights to support real-time decision-making processes at all stages of planning and operation, ultimately delegating commercial and staff operations to agentic AI.

The **next decade will be marked by a profound systemic (r)evolution in gas and energy infrastructures.** While emerging multi-molecule markets inherently offer diversification and growth opportunities, incumbent players must **embrace all-round innovation** to fully capitalise on these prospects and maintain their leadership in the future energy system. **Innovation serves as an enabler, providing both risk mitigation and strategic flexibility, allowing businesses to easily adapt to the evolving context through an agile and forward-thinking approach.**

	PAST INFRASTRUCTURE	FUTURE INFRASTRUCTURE
Carried molecules	CH ₄	Fossil&bio CH ₄ , H ₂ , CO ₂ , eFuel, (+ O ₂ , heat)
Molecule traceability requirements	Low	Multi-molecule integration with increased source hybridisation, requiring both physical and digital tracking solutions
Infrastructure architecture	Centralised injection points, distributed deliveries	Hybrid (a combination of large, centralised sources with smaller distributed ones, including potential bilateral configurations)
Safety	Well-established CH ₄ safety measures	Complex comprehensive multi-molecule safety measures
Sector coupling	Low	Interlinked/hybrid value chains (molecules and electrons)
Flexibility requirements	Provided by gas storage capacity, to prevent disruption and guarantee system resilience	Multiparametric and dynamic flexibility needs due to higher RES penetration and cross-sector dependencies
Role of data and artificial intelligence	Static data and AI integration	Data-driven assets and processes, with AI agents performing complex tasks
Security	Focus on gas assets	Broader scope across multiple energy vectors and digital systems
Systemic efficiency	Linear system optimisation	Interdependent system optimisation

FIGURE 42 - EVOLUTION OF THE GAS NETWORK



5.2 SNAM'S TRANSFORMATIVE INNOVATION VISION FOR THE NEXT DECADE AND BEYOND

To sustain this change over time, our transformative innovation vision (see Chapter 1.4) is to **become a pan European, platform-based, and data-driven, multi-molecule infrastructure operator**, redefining how energy networks are managed and optimised. This transformation involves three fundamental shifts:

- **Multi-molecule readiness**, integrating and adapting infrastructure to accommodate a mix of molecules—including natural gas, hydrogen, CO₂, biomethane, and synthetic fuels—ensuring system resilience and flexibility in response to the energy transition.
- **A data-driven energy system powered by agentic AI** to continuously improve operations, forecast accuracy, and decision-making. Data and AI will gradually evolve from mere efficiency-enhancing tools into intelligent agents capable of autonomously managing system flows, balancing demand and supply in a multi-molecule ecosystem, and driving greater energy efficiency.
- **A platform-based model** moving away from a traditional static physical asset framework toward a dynamic platform approach, where physical infrastructure and data are seamlessly interconnected. This transformation enables smarter interactions between network operators, market players, and end users, enhancing efficiency and agility.



5.3 KEY INNOVATION DOMAINS SHAPING SNAM'S VISION FOR THE NEXT DECADE AND BEYOND

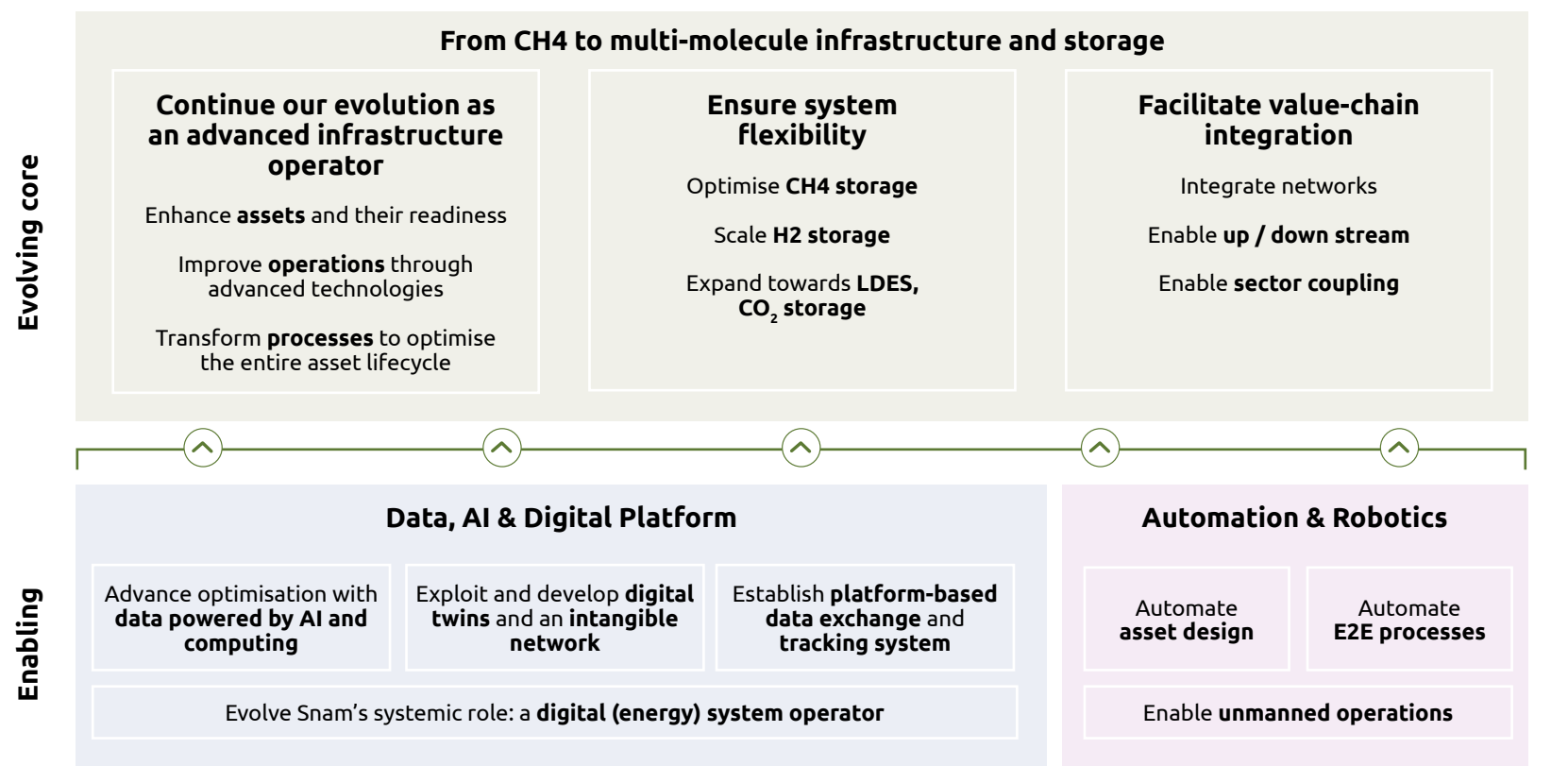
The infrastructure transformation outlined in our innovation vision is a long-term journey, shaped by technological breakthroughs, the scale of technology deployment, and evolving market dynamics. While the technological landscape is rapidly evolving and not all future technologies can be anticipated, we can identify **three key technological domains (one core and two enabling) that will likely drive our transformation** over the next decade.

- 1. Evolving core infrastructure from CH₄ to multi-molecule infrastructure and storage:** development of transportation networks and storage systems capable of securely managing multiple molecules, mitigating risk, ensuring flexibility, seamless market adoption and system resilience.
- 2. Augmenting core infrastructure with data, AI and digital platforms:** leveraging data as a strategic asset, through artificial intelligence, high-performance computing, and digital twins to optimise asset management and enable Snam's transition into a **Digital Energy System Operator**.
- 3. Automating core infrastructure through robotics:** designing automation-ready infrastructure by integrating robotics, process automation, and unmanned surveillance & maintenance to enhance efficiency and safety.

These domains form the foundation of our long-term innovation roadmap, enabling Snam to evolve from a traditional gas infrastructure operator into a multi-energy platform orchestrator.

FIGURE 43 - VISION AND FRAMEWORK WITH A FOCUS ON SPECIFIC AREAS OF INNOVATION

Vision: becoming a pan-European, platform-based, and data-driven, multi-molecule infrastructure operator



Multi-molecule infrastructure and storage: enabling flexibility and integration

Beyond the continuous improvement of assets, operations and processes, the transition to a multi-molecule energy system requires the development of dedicated transport and storage infrastructure for each molecule, either by retrofitting existing systems or by building new infrastructure. To ensure system integration, operational flexibility and resilience, these networks must be interconnected, digitally enhanced, and equipped with state-of-the-art materials and supporting technologies.

In preparing networks for new molecules and ensuring readiness, areas of focus include:

- Materials and asset repurposing** – Developing advanced materials and coatings to ensure safety, durability, and cost-effectiveness in pipelines and storage systems. This includes supporting new H₂, CO₂-ready (and other molecules) assets, as well as repurposing existing infrastructure.
- H₂ network stability and distributed storage** – Implementing modular storage solutions and integrating local production plants along the network to manage intermittencies and multi-point injections/extractions throughout the network.
- First-/Last-mile connectivity** – Expanding access to infrastructure for producers and end users who are not connected to traditional pipelines via virtual pipelines (trucking, shipping) and decentralised storage solutions.
- Molecule conversion and processing** – Advancing technologies such as reforming, methanation, separation, and purification to facilitate cross-molecule interconnections.
- Zero- and low-emission equipment** – Implementing new equipment to reduce emissions of molecules beyond methane, including leak detection and repair solutions, in asset-based processes.
- Scaling up hydrogen storage** to accommodate gaseous, liquid and solid-state H₂, including:
 - Repurposing depleted gas fields for hydrogen storage
 - Salt caverns, aquifers, artificial lined rock caverns, and compressed H₂ systems.
 - Liquid hydrogen (LH₂), liquid organic hydrogen carriers (LOHCs), and hydrogen-derived carriers such as ammonia (NH₃), methanol (MeOH), and e-fuels.
 - Solid-state H₂ storage, via metal hydrides and H₂ hydrate technologies.
- Expanding LDES** solutions spanning mechanical (air, CO₂-based) to redox flow batteries and CO₂-based energy storage, to enhance grid responsiveness.

Moreover, as CO₂ capture and removal efforts scale up, technological innovations for **long-term or permanent CO₂ storage** will be essential, as well as the development of secondary markets such as e-fuels and industrial applications. Snam is well-positioned to lead the development, scaling, and integration of these solutions, while supporting the growth of **CO₂-based markets**. By combining infrastructure upgrades with innovative storage strategies, Snam is positioning itself as the backbone of a flexible, multi-molecule energy system.

With increasing volatility in energy demand and supply, **storage** will be a cornerstone of system stability. Various storage solutions can be explored, including:

- Optimising natural gas (CH₄) storage** – Natural gas, including biomethane and abated gas, will continue to play a vital role in coping with the rising penetration of intermittent renewables. Storage assets will be critical in ensuring resiliency and adaptability.

Data, AI and digital platforms: the foundation of a data-driven energy system

Through SnamTEC and ACR, Snam is already undergoing a deep digital transformation, leveraging data, digital twins, AI and high-performance computing to optimise assets and operations. However, the full potential of quantum computing, HPC and AI extends far beyond optimisation. Snam aims to reinforce its role by coordinating systemic digital transitions and enabling cross-industry collaborations. Key innovation areas include:

- **Computing and AI for system optimisation and enhanced cybersecurity**
 - Exploit HPC capabilities and explore quantum computing for solving complex optimisation and simulation problems
 - Enhanced molecule production and demand forecasting, integrating weather patterns (by leveraging SnamTEC activities for meteorological data), geographical data, and energy system interactions.
 - Molecule Flow Simulation and Balancing, optimising storage, dispatching, and network interactions.
 - AI agents and LLMs for decision support and automation, developing intelligent systems capable of partially self-regulating infrastructure and integrating data from multiple sources to support operations.
 - AI- and data-driven security approaches to ensure a more effective protection of critical assets with the adoption of new technologies and the mitigation of new risks.
- **Digital twin and infrastructure virtualisation**
 - Comprehensive virtualisation of existing assets, expanding digital twin capabilities to infrastructure not yet digitalised using advanced technologies like laser scanning, and Industry Foundation Classes (IFC).
 - Remote monitoring and control, accelerating the deployment of AI-enabled smart devices and advanced OT solutions (remote terminal units, edge OT, ...), to suggest optimal next actions.
 - Real-time simulations, analysing multi-molecule coexistence dynamics.
 - System-wide energy optimisation, integrating power and molecules.
 - Advanced forecasting and scenario modelling, strengthening system resilience.

- **Platform-based data exchange and advanced tracking system**
 - Establishing a unified digital platform (leveraging ACR functionalities) to connect physical and digital assets and ensure seamless data flows across energy carriers, industries, and markets.
 - Adopting blockchain and advanced systems for gases origin certification (bioCH₄, H₂) and emissions and carbon credit tracking

By leveraging these three identified areas, Snam has the potential to support the system as a **digital energy system operator**, centralising and integrating data and digital twins beyond its physical infrastructure perimeter. Building a unique intelligent platform could unlock new levels of optimisation across entire energy value chains, harnessing advanced algorithms and AI to go beyond current capabilities. Such a platform would be instrumental in managing the growing complexities and interdependencies of the energy landscape, enabling system simulations and predictive forecasting. Additionally, it would foster a plug-and-play ecosystem, allowing Snam's business and technology partners to seamlessly collaborate through native digital channels, including API and data marketplaces.

By taking on this role, Snam could evolve into a digital asset orchestrator, where AI- and data-driven insights not only enhance operational performance, but also unlock new market opportunities.

Automation and robotics: building an advanced and future-proof infrastructure

Automation and robotics are transforming industrial operations, and Snam must proactively design its future assets to seamlessly integrate these technologies. Infrastructure should feature robot-friendly layouts, removing barriers and fostering a collaborative human-machine environment. Key innovation areas:

- **Smart asset design** – Leveraging AI and advanced tools to automate design, planification and engineering of new assets.
- **End-to-End process automation** – Implementing automation across both physical assets and corporate functions, increasing efficiency while minimising manual intervention.
- **Unmanned surveillance and remote operations, with automation-ready infrastructure** – Designing new facilities with built-in capabilities for robotic integration and leveraging LEO (Low Earth Orbit) satellites, drones, automated monitoring systems and robotics to improve safety and lower operational costs.

By embedding automation at the core of infrastructure planning, Snam will create a safer, more resilient, and cost-efficient energy system.

5.4 HOW WE INTEND TO ADVANCE INNOVATION OVER THE NEXT DECADE AND BEYOND

Navigating a **10-year+ innovation horizon** presents unique challenges, given the fast-evolving energy landscape, emerging technologies, and shifting regulatory frameworks. Rather than adhering to rigid methodologies, Snam has adopted an **agile, principle-driven approach** that provides **clear direction**. To sustain innovation as a key driver of Snam's transformation into a future-proof infrastructure operator, we have identified three guiding principles that will shape our innovation management strategy over the next decade:

- 1. Strengthen the portfolio with flexible tools and processes** – Maintain agility in innovation management by balancing proven and exploratory initiatives, continuously refine the innovation toolbox, portfolio and align strategic priorities to evolving market needs.
- 2. Maximise value creation and extraction within and beyond Snam** – Unlock the full potential of innovation through strategic pathways such as internal development, venture building (see BOX), innovative sourcing and intellectual property monetisation. This approach ensures the evolution of Snam's core business, thanks to converging and synergic efforts from both proven and explorative innovation, ultimately expanding Snam's asset base and their management.
- 3. Measure the impact of innovation** – Embrace a goal-driven mindset for innovation, defining clear metrics and KPIs to assess effectiveness, efficiency, and alignment with long-term business objectives. Innovation is not only a driver of opportunity but a necessity to mitigate potential negative impacts and financial risks; highlighted in the double materiality assessment under the Corporate Sustainability Reporting Directive (CSRD). Snam's strategic levers—"transformative innovation" and "all-round sustainability"—are deeply interconnected, with innovation playing a direct and measurable role on sustainability issues. As part of our Transition Plan 2024, Snam has therefore identified a set of KPIs to be included in the **sustainability scorecard**, such as innovation spending, number of proof-of-concepts and scaled solutions indicating technology adoption into core business activities, and share of AI-powered applications. Additional metrics will be adopted to measure both the input and output/outcomes of innovation initiatives from a portfolio-wide perspective as well as project-specific KPIs.

CORPORATE VENTURE BUILDING

Corporate Venture Building (CVB) is a strategic approach that transforms internal innovations into independent ventures. It serves as a mechanism for developing new businesses and revenue streams, mitigating risks, freeing up resources for other activities, and accelerating market entry, all while leveraging external expertise and funding. By involving investors and technical partners, Snam gains access to additional capital and industry expertise, ensuring rigorous due diligence and facilitating the selection of the most promising opportunities.



Snam's sustainability scorecard

In addition to these principles, three **cross-cutting enablers** will play a pivotal role in shaping our journey. These will be explored in dedicated focus areas:

- **Innovation spending and financing** – Adopt a flexible approach to budget commitments and spending allocation (see BOX)
- **Regulation** – Maintain constant alignment with regulators, securing support for innovation objectives
- **People and culture (see Chapter 5.5)** – Cultivate the skills, mindset and organisational culture to drive and sustain innovation.

INNOVATION SPENDING AND FINANCING

Snam plans to invest nearly €30 billion by 2035, with €1.8 billion dedicated to innovation and digitalisation, equivalent to 6% of the total investment plan. Annually, spending on innovation and digitalisation is projected to average 4% of annual revenues.

Given the rapidly evolving energy landscape, budget commitment and spending allocation for innovation and digitalisation programmes must remain flexible, adapting to shifting strategic priorities, technological breakthroughs, and market dynamics.

To finance innovation activities, Snam will leverage both internal resources and external funding, including European grants and national public funding as well as private investments through innovative sourcing, to accelerate technology development, solution scaling, and venture-building activities.

Snam is open to explore new financing opportunities, including sustainable finance, whenever innovation activities align with ESG targets.

5.5 PEOPLE STRATEGY AT THE HEART OF SNAM'S INNOVATION

To fulfil our innovation vision, **people, skills and expertise are fundamental levers of success**. For over 80 years, Snam's unique heritage of skills and know-how has shaped the advancement of energy infrastructure. Today, more than ever, this internal knowledge must be continuously enriched with new capabilities to navigate future technological and business transformations. The energy transition and digital/AI transformation, require not only technology enhancement but also a profound cultural and professional shift in skills, people, and knowledge.

Our dual track approach enables us to build new capabilities, foster teamwork, and drive innovation. Through explorative activities and a dynamic open innovation ecosystem, we engage with startups, universities, and strategic partners to explore emerging technologies and expand our knowledge base. At the same time, by fostering proven initiatives, we deepen our expertise in mature technologies, ensuring continuous process and asset improvement.

At the heart of Snam's people strategy is the ability to adapt swiftly and efficiently to market dynamics and emerging technologies. Our strategy is built on a set of **key pillars**:

- 1. Employer branding and talent acquisition** – Snam has implemented a brand-new, unified approach to attracting and integrating 1,700 new talents over the next 6 years, supported by a structured company-wide onboarding process.
- 2. People-centric technologies** – Snam leverages traditional and generative AI to enhance employee experience, modernise HR services and foster a data-driven company culture with a strong attention to people.
- 3. Performance-based compensation** – Snam has adopted pay-for-performance in variable remuneration, increasing transparency and strengthening equity-based incentives.
- 4. Simplified processes and organisation** – Snam strives to eliminate inefficiencies and bureaucracy, allowing employees to focus on high-value activities.
- 5. Optimised resource allocation** – Snam has implemented a new workforce planning tool, driven by KPIs, to align talent deployment with business priorities.
- 6. Performance and Development** – Snam enhances gender equality and promotes STEM and leadership development through comprehensive and structured career growth initiatives.
- 7. Employee engagement and well-being** – Snam monitors and measures engagement levels, and implements targeted micro and macro action plans to foster a positive work environment.

Together, these pillars will attract and retain talents, enhance engagement, foster a collaborative agile culture, and drive long-term innovation and business performance. Additionally, our Innovation ambassadors' community (see dedicated box) plays a crucial role in spreading the innovation mindset across the company, driving a

broader cultural shift.

Furthermore, Snam supports continuous learning and capability development through the **Snam Institute, a dedicated platform that equips our workforce with the skills to tackle future challenges**. Through upskilling and reskilling programmes, we ensure our people remain at the forefront of the industry's evolution with a strong emphasis on digitalisation beyond energy transition.

To support this objective, we have launched the 'Digital Journey at Snam' initiative through the Snam Institute. The programme was created based on an assessment of our employees' digital and AI skills, aiming to raise awareness and boost their skills. So far, we have held four 60-minute live events named 'Digital Café,' covering topics like data culture, AI, cybersecurity, and lifelong learning. These events featured industry experts and 20 digital gurus (see dedicated box), each attracting over 1,000 participants. This initiative illustrates how continuous learning, coupled with a data-driven culture, is key to our new operational paradigm. By establishing a **new digital and AI culture**, our people will not only become more proficient in data interpretation but will also use AI to enhance productivity, creativity, innovation and efficiency. Ad-hoc trainings promoting a wide adoption of digital and AI applications across the whole organisation will ensure that these new tools become integrated into each employee's daily routine. Moreover, AI will play a central role in advancing both business operations and personalised learning, bridging skill gaps and accelerating career development.

The Snam Institute also values experience and established the **Excellence Hub and centres of competence to preserve and transfer our distinctive technical know-how to future generations**, ensuring that our legacy evolves in step with industry transformations. Moreover, as the future demands a balance of technical and human skills, critical thinking, leadership, social influence, and creativity will remain essential. To address this, Snam Institute collaborates with top business schools to deliver leadership and managerial development programmes, equipping our people to navigate complexity.

CONCLUSIONS

As this Innovation Plan draws to a close, one message stands clear: at Snam, innovation is not just an ambition—it is a transformative force, —one that is already reshaping the way we work, think, and create value.

In an energy landscape evolving at unprecedented speed, **transformative innovation** powers our ability **to lead, adapt and anticipate the challenges of an increasingly complex and interconnected energy system**. This plan is not just a roadmap, it is a declaration of intent, a commitment to shaping the future with clarity, agility and readiness to adapt. This journey, however, did not start today. It builds upon the solid foundation of the SnamTEC programme —a company-wide transformation launched in 2018 deeply rooted in our culture, that has progressively embedded advanced technologies, deep digitalisation, and new ways of working into our operations, redefining our TSO model with cutting-edge solutions and a digital-first mindset.

As a result, Snam operates today with a **new level of leadership in the energy infrastructure sector**. This transformation has not only empowered our teams but has also turned their expertise into a strategic intangible asset—one that is shared, continuously enhanced, and fully integrated into our innovation engine.

Looking ahead, we are ready to scale this transformation even further, **accelerating our evolution from a traditional TSO to a multi-molecule, platform-based, data-driven infrastructure operator**. This shift goes beyond adopting new technologies—it is about scaling their impact, extending their reach, and embedding innovation into the very fabric of our business.

To achieve this, we will **strengthen our execution capabilities, promote a culture of agility and experimentation, and embrace the complexity of the energy transition** with confidence and pragmatism. At the heart of this transformation lies a powerful combination: a clear strategic vision to anticipate and shape the future, operational excellence to turn innovation into reality, and the talent and expertise of our people who have proven their ability to lead change and pioneer solutions.

Building on this momentum, we will continue to integrate new molecules, digital intelligence, and next-generation infrastructure to drive the energy transition. More than ever, we need to balance the urgency of today with the foresight of tomorrow, ensuring that our infrastructure remains secure, flexible, and sustainable in a world undergoing radical transformation.

Innovation will reinforce our core role as an energy infrastructure operator while unlocking new frontiers—from AI and automation to multi-molecule ecosystems and digital platforms. This dual approach ensures that we not only lead in our traditional domain but also stay agile and ready to seize new opportunities that will shape the energy systems of the future.

Ultimately, **innovation at Snam is not just about technology—it's about cultivating a culture of openness, collaboration, ambition, and continuous progress**. It is the key to unlocking new opportunities, reinforcing our leadership, and fulfilling our mission: to build a more resilient, efficient, and decarbonised energy system for Italy and Europe.

As we look ahead, one thing is certain: the future of energy will not simply happen—it will be built by those who innovate.

"The best way to predict the future is to create it." — Peter Drucker

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