



SINTEF supports the Sustainable Development Goals

Sustainability Report SINTEF

Technology for a better society



Preface

SINTEF became member of UN Global Compact in 2009, and this is our 12th communication of progress report.

SINTEF is a private, not-for-profit research institute, which is organized as a foundation with subsidiaries. Through first-rate solution-oriented research and knowledge generation, SINTEF creates significant value for its Norwegian and international customers, the public sector and society as a whole. Our strategy is guided by the UN Sustainable Development Goals and lays a heavy emphasis on SINTEF's role in and commitment to developing society through research and innovation.

Statement of continued support – Technology for a better society

SINTEFs vision is "Technology for a better society". We are committed to contribute to a sustainable future, to human rights, labour rights, sound environment and anti-corruption and to comply with the ten universal principles of the UN Global Compact.

SINTEF acts in accordance with the principles by the way we conduct our own operations. But our most important contribution is the impact from our research and innovation.

We are convinced that research plays an essential role respecting both the Global Compact principles and to reach the 17 sustainable development goals, set to end poverty, protect the planet and ensure prosperity for all.

Our sustainability report describes our research and innovation agenda and illustrate our impact on the global environment and society via case examples covering all 17 sustainable development goals. It presents SINTEF's commitment to operating our organisation in accordance with our sustainability ambitions, including policies, commitments and reporting on human rights, labour, environment and anti-corruption.



Alexandra Bech Gjørsvik
President and CEO

Letter from the CEO




Alexandra Bech Gjørsvik

President and CEO

At the time of writing, the war in Ukraine is overshadowing everything else. SINTEF opposes the Russian government's invasion and acts of war, and we are complying with Western sanctions by reviewing our portfolio and export control measures. We have donated NOK 250,000 to the Norwegian Refugee Council to help ameliorate the enormous humanitarian suffering and challenges. One of our research environments has also developed technology that is helping refugees and those trying to help them find each other safely and effectively in confusing border situations.

At the same time, we recognise that our role in analysing or providing relief in the immediate war situation is limited. SINTEF's main role must be to significantly contribute to solutions to the wider ripple effects of the war. For example, we would like our expertise in renewables and technologies to help boost energy supplies in Europe, and for our expertise in energy efficiency within construction and industry to help reduce energy needs, and thereby contribute to the same goal.

Looking back a few months, the Covid-19 crisis demanded a lot of attention in 2021 as well. However, we believe that the management of this crisis has also provided opportunities to prioritise measures that promote solutions to the climate crisis. The EU's Green Deal announcements and the Norwegian Green Platform Initiative have been significant measures where SINTEF has mobilised strongly. SINTEF is participating in 10 out of the 12 Green Platform projects awarded funding in 2021/at the start of 2022. In the Green Deal, we are

participating in projects that have attracted 17.5 per cent of the EUR 1 billion in green funds the EU has made available. We are proud to be a respected partner when business and governments seek to accelerate the green transition.

National and global emissions dropped when the Covid-19 crisis struck. However, it is paradoxical how little difference this made in relation to the major needs the report of the Intergovernmental Panel on Climate Change (IPCC) outlines for the global community. In SINTEF, we are also working on our own climate footprint and for 2021 we have produced a more detailed climate report in which we have mapped our emissions and those in our upstream supply chain (Scope 3). SINTEF has developed methods and models to help it produce climate reports efficiently based on the organisation's purchasing data. This is a service that we also hope to offer to our external clients going forward. The climate report will make it clear to us and others what further measures we should take to reduce our climate footprint in the future.

One important SINTEF initiative in 2021 was the launch of the SINTEF Global Climate Fund at the climate summit in Glasgow in November. The Climate Fund supports research into the solutions that will remove greenhouse gases (GHG) from the cycle and on which all of the scenarios for achieving the 1.5°C goal depend. We hope that inventing new technologies that remove GHG from the air and water will make up for the fact that we will continue to produce some emissions in the immediate future from running world leading research and

laboratories. With its launch, we invited other companies and financial institutions to join in and contribute to the new climate-positive solutions, and we have announced SpareBank 1 SMN as our first partner.

Biodiversity is also a clearer priority – externally and internally. In 2021, we invested in a new group-wide initiative in this area. This aims to enable technological development and value creation on nature's terms. By working together with external knowledge environments, such as the Norwegian Institute for Nature Research (NINA), we want to develop expertise and new projects that can further promote comprehensive solutions that integrate and take account of environmental considerations. Biodiversity must be protected in everything from road building to aquaculture, and through the group-wide initiative we will dedicate ourselves to these issues together with the various technology environments across SINTEF.

In the last year, we have also focused heavily on exploring how SINTEF can use the EU taxonomy to strengthen our client offering in order to accelerate the transition to a sustainable society. We are also working on clarifying how we, as a research institute, should adapt to the taxonomy. Sustainable transition is the key to most of what SINTEF does and it is pleasing to see that social conditions are also being established as criteria in the taxonomy. This is also important internally in SINTEF, and equality and diversity were among those topics that received a lot of attention at around the turn of the year.

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Sustainability report published in May [Norwegian] and June 2022 [English]. All of the figures in the report are from 2021, unless otherwise specified.

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1

About SINTEF

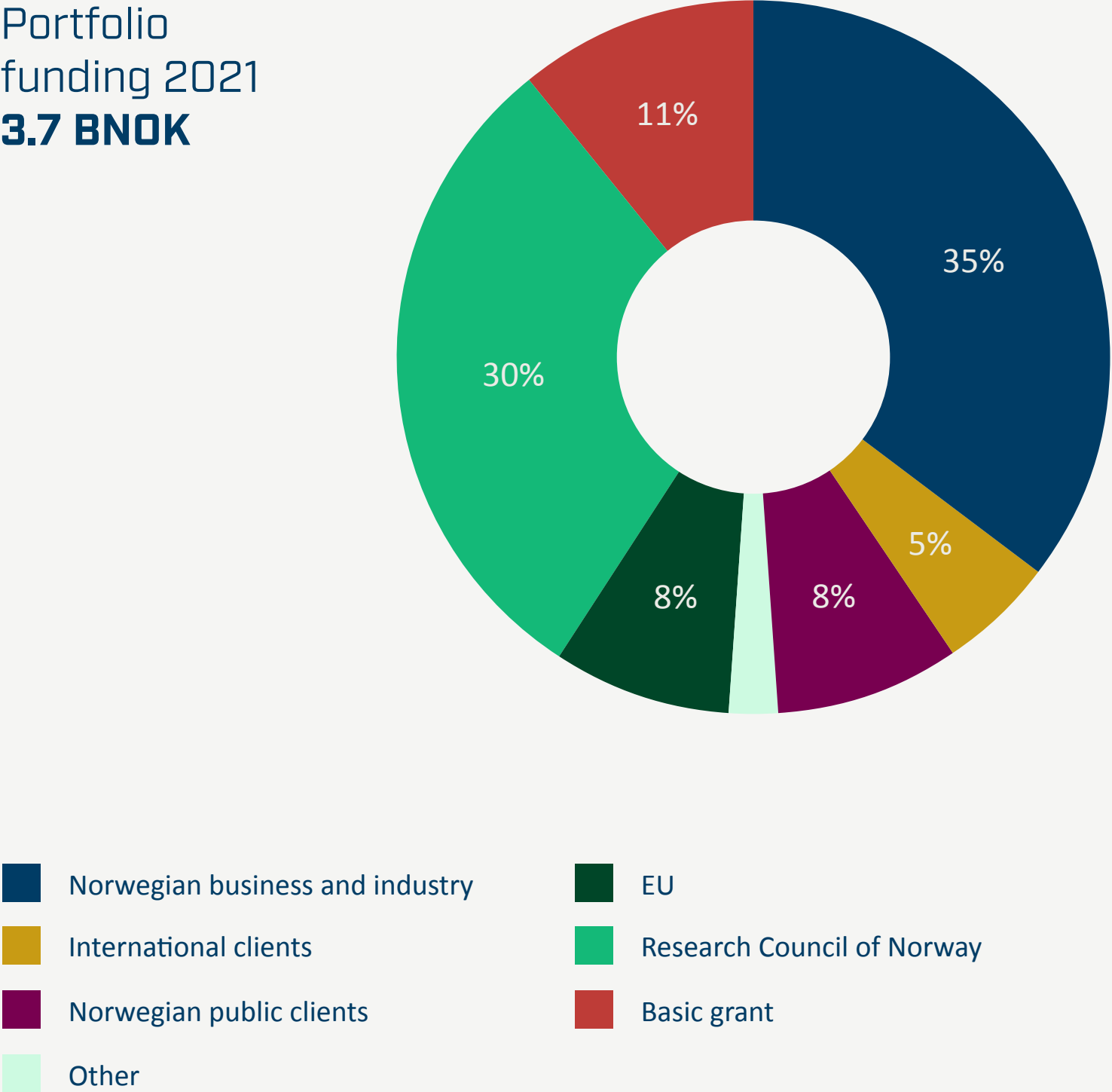
SINTEF is the largest research institute in Norway and one of the largest in Europe



With a total of **EUR 223 million**, awarded, SINTEF has contributed to Norway's positioning in the EU's framework research programme, Horizon 2020

A broad portfolio with an emphasis on applied research with the business sector

Portfolio funding 2021
3.7 BNOK



Source: SINTEF

SINTEF’s business model is primarily based on carrying out research and innovation projects.

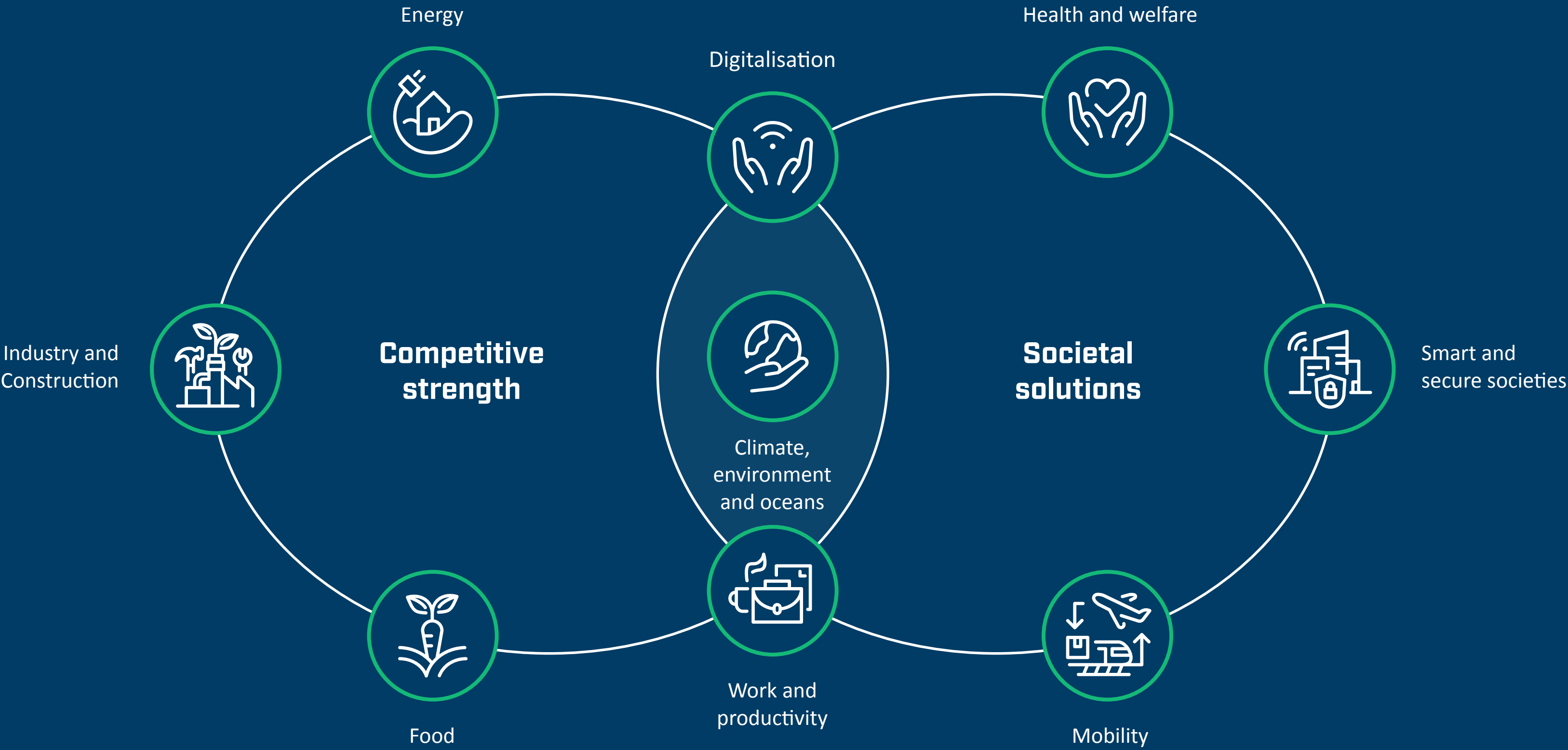
Our laboratories are closely involved in the research and also assist clients with their innovation and development work through testing, prototype and verification projects.

SINTEF also commercialises research results through licensing, selling technology and startups.

With our continuous knowledge and capacity building, SINTEF is in a position to contribute substantial knowledge, ideas and recommendations to public debates and policymaking.

Our strategy is to move the research front and facilitate a transition towards a sustainable society, nationally and internationally. We want to contribute to societal solutions and competitiveness for our partners that in turn have positive ripple effects for the general public and end users of the technology.

Cutting edge expertise from ocean space to outer space



Stakeholder engagement and material topics in SINTEF’s sustainability reporting

As part of strengthening our sustainability reporting and social role, we have focused on producing a more systematic overview of our stakeholders and material topics in SINTEF’s reporting for 2021. This is part of our long-term work on standardising SINTEF’s sustainability reporting, where a number of steps will be taken for the report for 2022.

A mapping of our stakeholders shows that we answer to, work with and influence a number of stakeholders. Our main stakeholders are listed in the table.

More generally, our overall reputation in society testifies to the fact that we play a number of wide-ranging roles, not least within sustainability. SINTEF scores highly in national reputation surveys and the majority of respondents have a positive impression of SINTEF. We score the highest in environmental awareness, social responsibility and morality in various areas.

The IPSOS profile survey of major Norwegian companies shows that SINTEF has a strong reputation. Some 60 per cent have a fairly good or very good impression of SINTEF.^[1] A national profile survey conducted by Norfakta







confirms widespread familiarity with SINTEF (82 per cent) and that SINTEF is perceived to be credible, an expert in our fields, and important for the development of sustainable solutions and for creating competitiveness for industry and business.^[2] Our staff also believe that the work the organisation does is important for society.^[3]

A media analysis by Retriever shows that there was a sharp increase in media coverage of SINTEF’s research in 2021. SINTEF was mentioned in 9,300 items. Some 38 per cent (international) and 16 per cent (national), respectively, of the coverage was linked to the topics of the climate, environment and renewables. The rest of the items were about ocean spaces, buildings and infrastructure, organisation, society and transport, health and welfare, and digitalisation.^[4]

The topics we raise in public debates largely reflect the material topics in SINTEF’s sustainability reporting. At the start of 2022, the group management team assessed the areas in which SINTEF has the greatest societal impact and also in which areas we will be impacted most by what is happening around us.

SINTEF’s main stakeholders

Main stakeholders







-  Employees
-  Clients
-  Authorities
-  Research Council of Norway
-  EU
-  Partners

Brief description

- SINTEF’s employees.
- Business and public bodies (including county authorities and municipalities) in their capacity as orderers of research/ research projects, as well as partners in research projects/ centres.
- National authorities (government and ministries) as well as regional and local authorities. In some cases, authorities are also clients in their capacity as orderers of, or partners in, research projects (see above).
- Central to the application of adopted policies and distribution of allocated research funds in Norway.
- Leading player for research programmes in the EU. Central in shaping policy and the direction of research.
- Primarily research institutes and universities (NTNU, UiO) as well as organisations (especially the Confederation of Norwegian Enterprise (NHO)).







[1] IPSOS profile survey 2021.
[2] SINTEF/Norfakta brand tracker: Public knowledge and attitudes concerning SINTEF – 2020.
[3] The working environment survey in SINTEF, January 2022.
[4] Retriever media analysis 2021.

The assessment is that SINTEF makes its greatest contribution to society through our research and innovation in collaboration with clients and partners. In SINTEF’s experience, our importance for society, but also where society influences us, is particularly great in the following areas:

-  Climate and clean energy (SDGs 13 and 7)
-  Biodiversity (SDGs 14 and 15)
-  Circular economy (SDG 12)
-  Responsible production and green innovation (SDGs 12 and 9)
-  Health (SDG 3)
-  Infrastructure and mobility (SDGs 9 and 11)

The numbers in brackets note which of the UN Sustainable Development Goals (SDGs) are involved and we will look at this more closely in chapters 2 and 3.

At the same time, it is vital for our role in society, and the trust it has in us, that we take our responsibilities within the organisation seriously as well. This is especially true for our work on:

-  Health, safety and environment (HSE)
-  Climate and environmental footprint
-  Equality and diversity
-  Labour and human rights
-  Ethics and integrity
-  General compliance with laws and rules

In the future, this materiality analysis will have an even greater influence on how we follow up and report on sustainability in SINTEF. However, it is already clear today that it largely reflects our strategy and provisional mapping of our contributions to achieving the SDGs, as described in more detail in the next chapter.



2

SINTEF's strategy and sustainable development

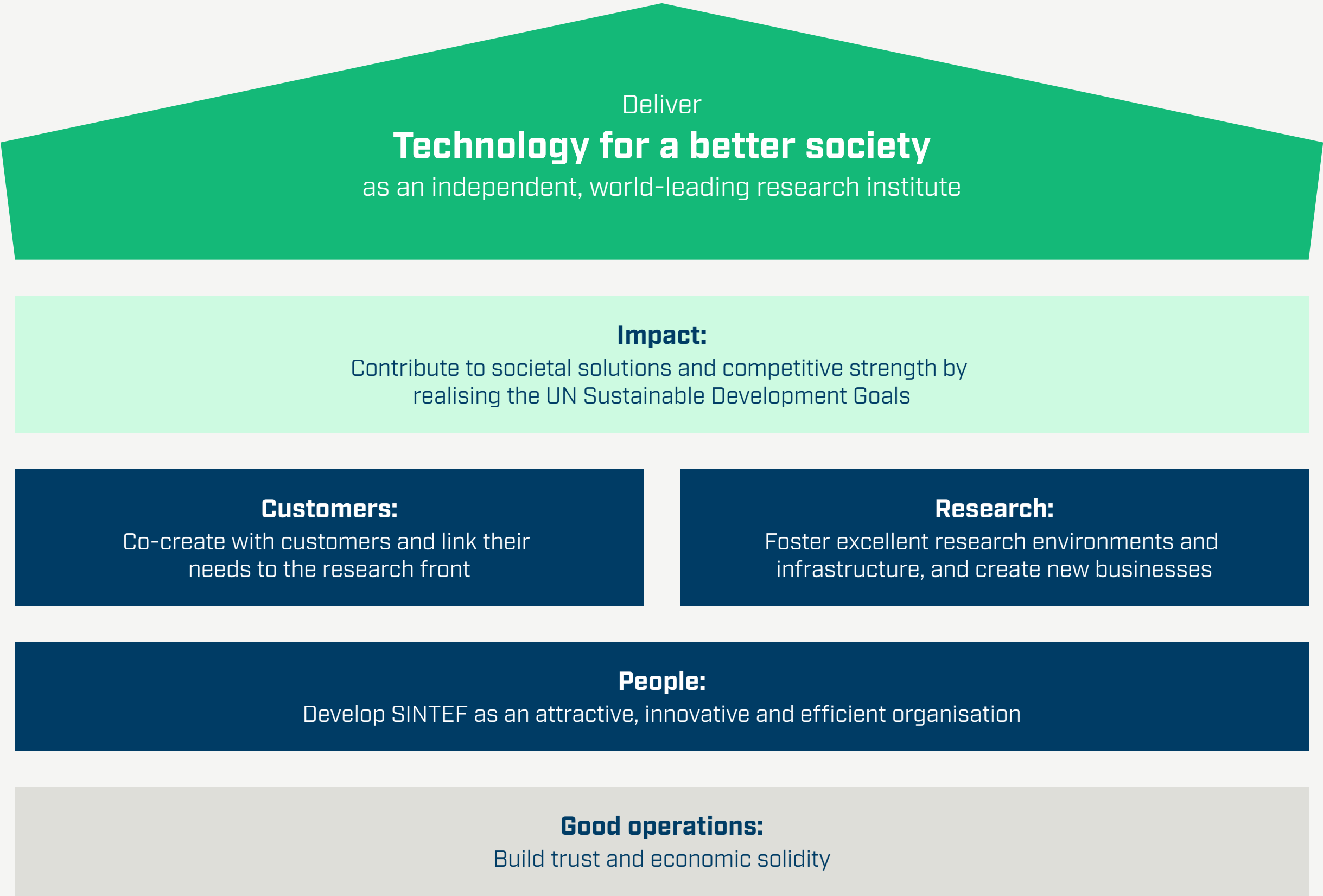
SINTEF’s corporate strategy, adopted in 2019, is guided by the UN Sustainable Development Goals (SDGs). The goals refine SINTEF’s vision. This expands the obligations we have had as a member of the UN Global Compact since 2009. The 17 SDGs set out what we and the world have to achieve in the work on creating a better society.

SUSTAINABLE DEVELOPMENT GOALS



In our updated strategic objectives, our top priority is our impact on the world around us: contributing to societal solutions and competitive strength by realising the SDGs. To achieve this, we need to co-create with customers, foster excellent research environments and infrastructure, and create new businesses. Our strong organisation and good corporate governance allow us to take on such a role.

SINTEF’s strategic objectives



More specifically, as a research institute, SINTEF is involved in a very large number of value chains, sectors and areas of expertise, with an emphasis on sectors in which technological solutions play an important role. This breadth means that we want to deliver on the entire sustainability agenda and have in our corporate strategy committed ourselves to all 17 SDGs. At the same time, it is clear that SINTEF delivers significantly more in relation to some goals than others, which is also partly due to where research funds are targeted.

In our corporate strategy, we prioritise nine strategic areas where we can deliver ‘Technology for a better society’, as illustrated on page 7. It is through these areas that we seek to promote social benefits and competitiveness.

We have also focused on specified areas where we believe that SINTEF can play a major role in the green and digital transition by collaborating across fields. These 14 group-wide initiatives are: circular economy, new climate-positive measures, wind and solar, batteries, hydrogen, food and agri, smart communities, biodiversity, manufacturing, societal security, health and welfare, EU step change, mobility and digitalisation.

Besides this, all six of the institutes in SINTEF have priority research areas that sharpen our main contributions to society, clients and the world of research. Examples of these include offshore wind, energy efficiency, climate adaptation, industrial cybersecurity, nanomedicine and sustainable health services.



This strategic focus is clear from an analysis of our project portfolio. The figure on the right shows an analysis of the research projects' relevance to the various SDGs, measured in terms of turnover in 2021. The figure shows that in 2021 we made significant contributions to eight SDGs in particular, ranked by the proportion of our turnover linked to each SDG in the project portfolio.

^[5] These are a good fit with areas of strength and focus, as well as the assessment of material topics for SINTEF's sustainability reporting above:

- Goal 9) Industry, Innovation and Infrastructure
- Goal 7) Affordable and Clean Energy
- Goal 13) Climate Action
- Goal 12) Responsible Consumption and Production
- Goal 11) Sustainable Cities and Communities
- Goal 3) Good Health and Well-being
- Goal 14) Life Below Water
- Goal 15) Life on Land

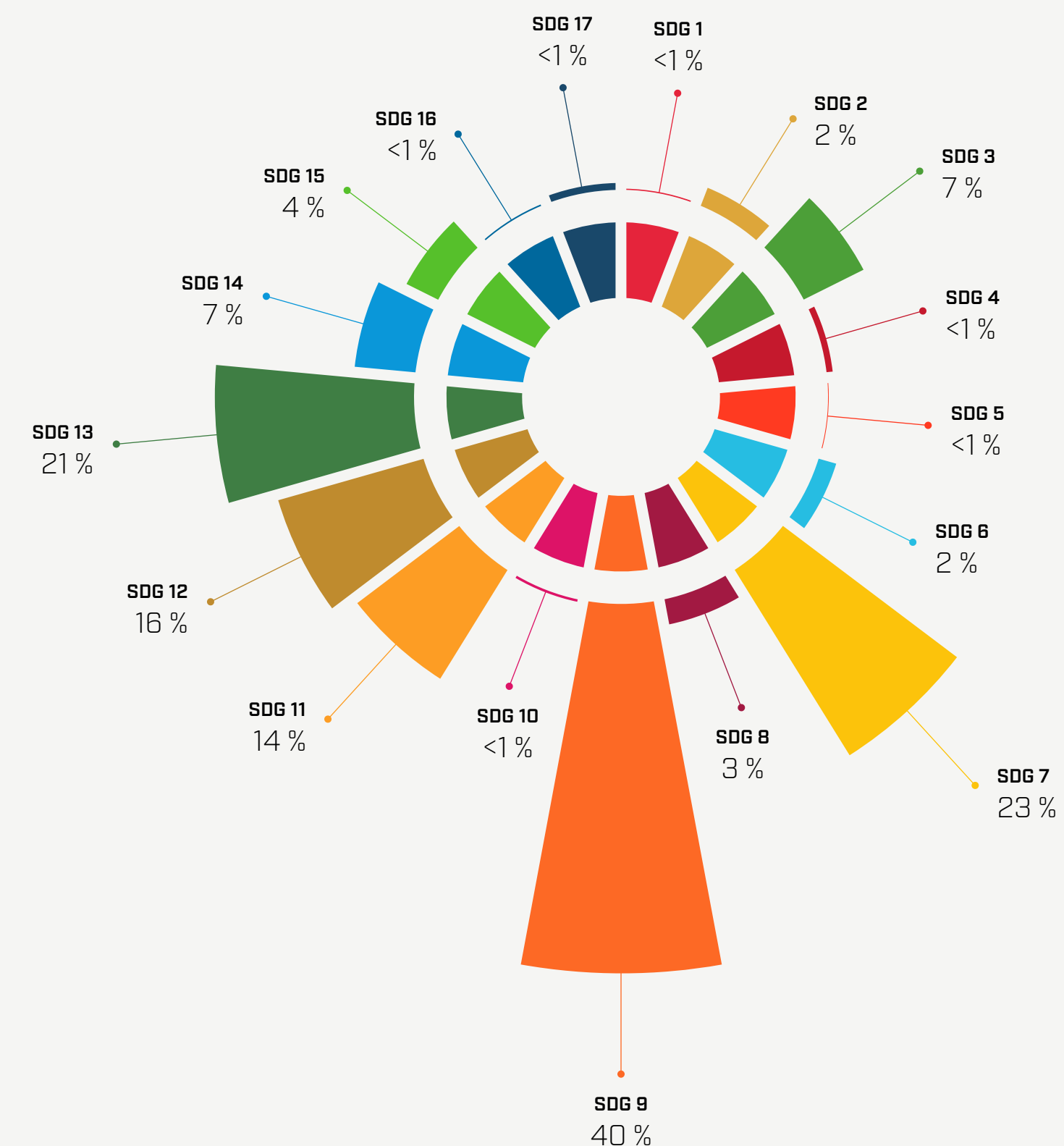
We also have activities related to the other SDGs, but some are marginal, especially in relation to goal 5) Gender Equality and goal 16) Peace, Justice and Strong

Institutions. As the materiality analysis indicates, it is nevertheless crucial that we take a systematic approach to working on such topics in our own organisation, including gender balance and good management.

The process of continuously mapping the project portfolio to the SDGs is primarily a bottom-up one, where quality depends on awareness, effort, and competence in SINTEF's research environments. Over time, we have expanded to allow the mapping to include up to three SDGs per project to illustrate how solutions interact to contribute to the various SDGs.

In our opinion, our profile largely reflects the priorities and areas of strength that SINTEF has as a technology-oriented research institute. At the same time, we recognise that the model has methodological challenges with regards to e.g. differences in perspectives, assessments and/or knowledge about the SDGs. Going forward, we will evaluate what will provide the best mapping of our research portfolio from a societal perspective.

Gross turnover per Sustainable Development Goal



The full title of each goal may be found on p. 10

Source: SINTEF

^[5] The model shows the share of gross turnover for research projects in SINTEF's six institutes in 2021 that contribute to the various SDGs, with up to three SDGs tagged per project. "Other/Outside" and the untagged portfolio (representing a total of around 8 per cent of the turnover) are not included in the model.

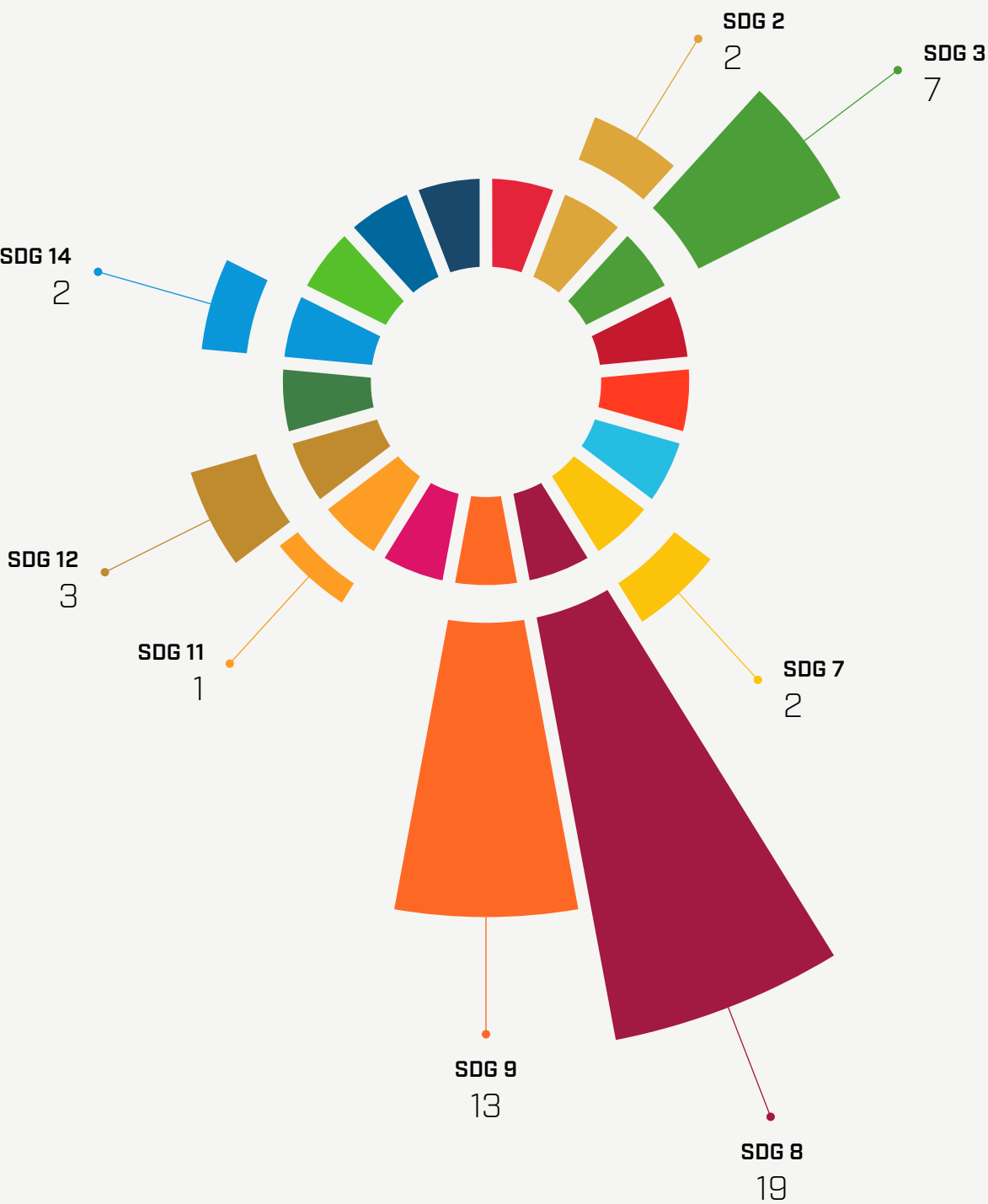
The research projects are an important component in how SINTEF contributes to society, although the research-based startups also produce innovations that provide social benefits and competitiveness. Creating and investing in startups is a part of SINTEF's strategy for commercialisation. SINTEF has been commercialising research results since the 1980s. SINTEF's commercialisation activities primarily focus on the pre-seed phase, followed by the seed phase. These are important activities when it comes to realising SINTEF's vision of 'Technology for a better society'. The potential return on investments in these phases is high, although so is the risk. SINTEF has developed a profitable and recognised model for the commercialisation of research results, and we have successfully built up a strong investor group that provides us with the financial muscle to further boost this work.

The commercialisation concept is based on close collaboration between SINTEF's R&D departments, SINTEF TTO and qualified partners, and its mission is commercial value creation and then exit. Thanks to the closeness of the R&D departments to the market, completed projects, and outreach networking, our market intervention is now good. SINTEF has started several new companies since we were able to realise the investment funds SINTEF Venture IV (2014) and SINTEF Venture V (2018).

SINTEF's investment funds and startups are managed in line with SINTEF's ethical principles and guidelines for commercial activities. Both funds and startups are based on the UN Global Compact, and result in a universal definition of responsible activities and encourage all companies to operate in ways that, as a minimum, respect fundamental responsibilities in the areas of human rights, workforce, the environment and anti-corruption. In addition, the startups will also transform business models in order to serve society's needs and enter new markets, at the same time as this drives the company's growth and success.

SINTEF's portfolio of 19 startups have been mapped according to relevance and where they can contribute to the 17 SDGs. The companies are in an early phase where commercial potential and development will be realised over time. A successful startup with a scalable business model, will be in a position to contribute to the SDGs. All of the companies have been tagged with goal 8) Decent Work and Economic Growth and many with goal 9) Industry, Innovation and Infrastructure. Many of these companies are involved in the application of key technologies within IT, biotechnology and nanotechnology that will facilitate a variety of products, services, and value chains for sustainable innovation. In recent years, we have also seen a significant increase in startups targeting goal 3) Good Health and Well-being. Other companies also target goal 12) Responsible Consumption and Production, 14) Life Below Water, and 7) Affordable and Clean Energy, and 2) Zero Hunger.

Startups per Sustainable Development Goal



The full title of each goal may be found on p. 10

Source: SINTEF

The SDGs represent a clarification of SINTEF’s vision, and it is pleasing that no less than 88 per cent of the Group’s employees believe that their work is contributing to sustainable development and that this is a growing trend among our staff.^[6]

We also believe that sustainability analyses, assessments and advice are developing into a specialist and market area for SINTEF. SINTEF wants to motivate research scientists and decision-makers in the public and private sectors to take into account their influence on the SDGs and assist with assessing this.

Since 2019, we have started several projects that will systematically assess sustainability impact. The work focuses on modelling the scaling up of new technologies, how they impact and change global value chains, and what long-term effects these changes in value chains and the new technologies will have on sustainability. The effects will be measured and assessed with the aid of the 17 SDGs and selected indicators. This framework can be used by clients who want to analyse their value chain’s impact on society, or internally in SINTEF to estimate the effects of our research projects. It can also be used to analyse the effects of various policies going forward, or other future scenarios.

A number of tools are being worked on in order to look at the global effects on an individual company’s value chain, which could include several of the indicators in the SDGs. The concepts combine generic methodological knowledge, knowledge about the SDGs and in-depth knowledge about various sectors/technologies. This will enable SINTEF to help businesses/sectors calculate and improve their contributions to the SDGs.

We are also working on the EU taxonomy, both to see how we can advise and integrate this expertise in our research and innovation areas, but also to see how we can adapt to it in our own organisation.

If we are to be successful in relation to the SDGs and, not least, the need for climate adaptation, then significant expertise and capacity building will be required for countries of the South. SINTEF already has a lot of experience from projects for low-income countries, especially within issues related to health, energy supply and circular economy, and wishes to extend this project portfolio. SINTEF has commenced a dialogue with the authorities and funding bodies to establish a project model that can facilitate more long-term projects aiming to support a green transition in these countries.

Below we look in more detail at how research and innovation in SINTEF contributes to the 17 SDGs.

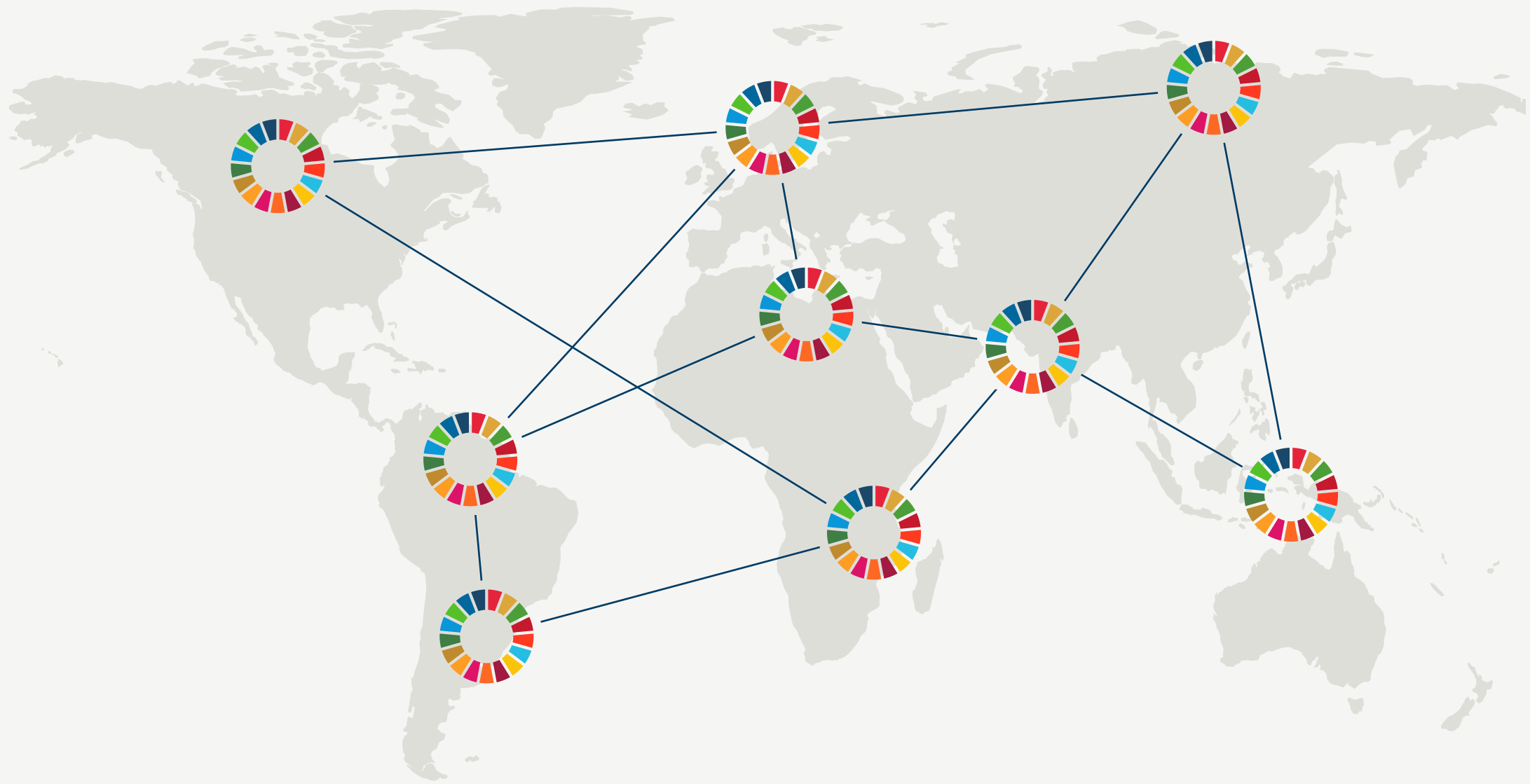











Illustration of how technology and product development and implementation impact global value chains and have effects in relation to the UN Sustainable Development Goals around the world.

[6] SINTEF’s working environment survey in January 2022, based on a total of 1,905 responses to the question: “I believe my work contributes to sustainable development.”

3

Reporting on contributions to the Sustainable Development Goals

SDG 9	Industry, Innovation and Infrastructure	
SDG 7	Affordable and Clean Energy	
SDG 13	Climate Action	
SDG 12	Responsible Consumption and Production	
SDG 11	Sustainable Cities and Communities	
SDG 3	Good Health and Well-being	
SDG 14	Life Below Water	
SDG 15	Life on Land	
Other SDGs		

Industry, Innovation and Infrastructure

The large volume of projects related to SDG 9 reflects the fact that SINTEF has a substantial project portfolio linked to increasing the sustainability of society's infrastructure and makes major contributions to industry and innovation.

Research and development (R&D) is a necessary and affordable 'insurance premium' tied to enormous investments in infrastructure and aimed at, among other things, ensuring future-oriented development, avoiding investment mistakes, and developing Norwegian industry.

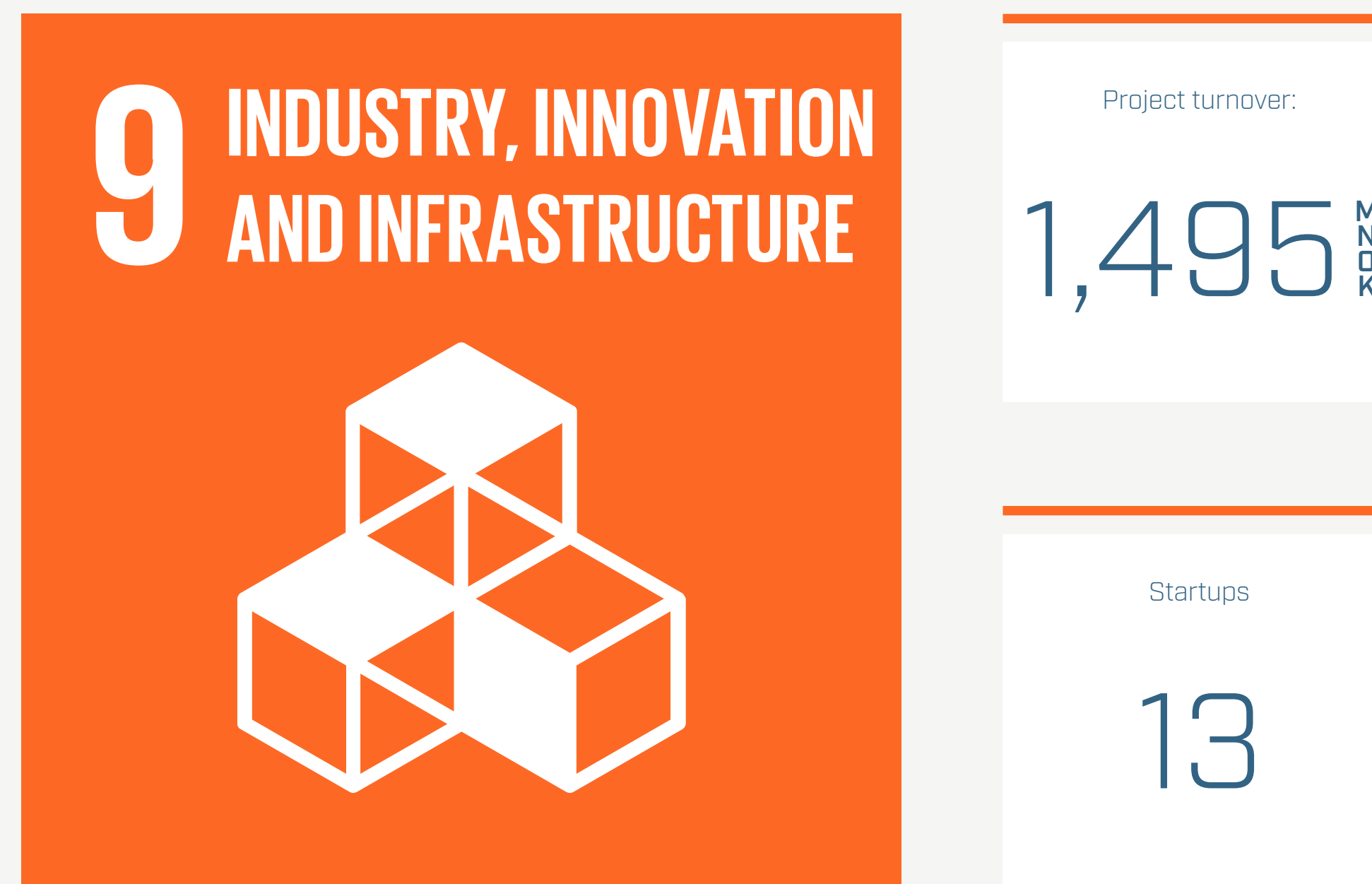
Our research contributes to:

- Better utilisation, development and maintenance of existing infrastructure
- Analysing and assessing the need for new or changed infrastructure
- Developing new standards, products, methods and trading platforms for materials, equipment and services for infrastructure development
- Increasing the security of critical infrastructure in society
- We are also helping to make society more resilient to global warming through climate adaptation. The Centre for Research-based Innovation (SFI) Climate 2050 conducts important research activities in this area. Likewise, FME CINELDI contributes to greater resilience in the power grid.

We are also contributing to digital infrastructure in society and to digitalisation as an enabling technology in a number of areas for innovation and development. Digitalisation and its underlying and enabling technologies are viewed as a necessity in successfully achieving several of the SDGs. SINTEF is working on digital value chains and providing integrated services, including digital twins and ecosystems for data sharing. Connecting the physical world to the digital world appears to be becoming increasingly important when it comes to observing/measuring data, facilitating data, processing and doing calculations in data models, right up to visualisation and decision-making support aimed at improving goal attainment in line with the SDGs in different areas and domains. For example, SINTEF can assist the processing industry, the seafood industry or distribution in the energy supply by using digital expertise to support sustainable development.

In the future, the role of climate adaptation will increase while historical emissions will be a driver of almost unavoidable global warming. The Intergovernmental Panel on Climate Change (IPCC) strongly emphasises the need for climate adaptation in its latest report on impacts, vulnerability and adaptation.^[7] In addition to important research projects at SINTEF, like Climate 2050 and CINELDI, we see a need for a renewed and strengthened effort in this area.

[7] IPCC Sixth Assessment Report, Climate Change 2022: Impacts, Adaption and Vulnerability <https://www.ipcc.ch/report/ar6/wg2/>



SINTEF as innovation infrastructure

SINTEF's research and innovation work is mainly carried out in collaborations with partners in the private and public sectors. This allows us to make sure that the research is relevant and contributes to innovation in practice. We contribute research and innovation expertise to the collaboration, as well as research, verification, and test infrastructure, which we often refer to as 'laboratories'. In this way, SINTEF itself, as an institute, represents infrastructure that enhances the innovative capacity of society.

Research institutes like SINTEF play a key role in the Norwegian research and innovation system. In 2020, the institute sector carried out 19 per cent of Norway's total research and development production, equivalent to NOK 15 billion per year.^[8] In many ways, the research institutes can be considered the business sector's research and development departments, or a supplement to these.

To deliver on SINTEF's social mission, we and our partners depend on a well-functioning public support system that mitigates the risk companies and other clients face in early and long-term development processes. The support system also allows investments to be made in research that may have major long-term effects but where no well-functioning market exists yet.

Almost all of SINTEF's research and innovation activities take place through active co-creation with clients and often through consortia consisting of multiple clients with complex

interests in a value chain. Nevertheless, there is a distinction between what we call contract research and what is referred to as collaborative research.

Put simply, in principle our contract research portfolio consists of projects where companies have identified challenges or opportunities they want to explore, and they own the research results. In these projects, we meet their needs and function as the companies' research and development department. However, it is also the case that in many of the projects the clients are looking for risk mitigation, with support especially from the Research Council of Norway, Innovation Norway, SkatteFUNN or the EU. SINTEF also takes the initiative in relation to companies when we see opportunities for projects for which the companies should apply for support. This is how we trigger research investments in the business sector.

As far as collaborative research is concerned, in principle it is SINTEF itself that sees the opportunities afforded by new knowledge or technology and then applies for public funding for the research associated with such opportunities. These projects often receive co-funding from partner companies. Collaborative research is demand driven in the companies, which contribute their input and co-funding. The research is intended to ensure that the business community is part of the research front within their existing or potential future market areas. By building consortia with businesses and others as partners, we are releasing more basic innovation and creativity in the businesses. Public investment in such research provides benefits in the form of publication and a high degree of transparency surrounding

Iliad: Digital twin of the ocean

ILIAD's ambition is to create an infrastructure for digital twins of ocean spaces with both a marine and maritime perspective. The system will combine existing and new ocean modelling systems and ocean observatories in a common platform, and will make use of existing data collection systems, including new sensor technologies. The project is part of a larger collaboration between a number of projects under the EU's Green Deal and Mission Ocean programme. SINTEF is responsible for coordinating the technical architecture for digital twins, as well as for pilot applications for past, present and future ocean data in interaction with digital twin applications for offshore wind farms, pollution, aquaculture, biodiversity, sea freight and ports.



THE PROJECT IS FUNDED
BY HORIZON 2020



SDG:

THE PROJECT ALSO CONTRIBUTES TO:

[8] NIFU Insight 2021, no. 12 and no. 18.

the results and their application, as is regulated through the state aid regulations. Collaborative research mobilises via mitigating more of industry's risk in larger research and innovation efforts than it would be profitable for each individual company to invest in.

We increase the expertise and pace of transitioning in companies and public organisations in both collaborative research and contract research. By partnering with companies in many different industries, we are spreading technological solutions that we own while simultaneously protecting our clients' property.

SINTEF is an organisation with clients and a presence throughout Norway. We have also actively focused on strengthening innovative capacity in regional industrial environments, partly through collaboration with clusters and partly through our own startups and mergers in several parts of the country. We have clients and collaborations across the country and believe that this is contributing to the national transition. Thanks to our regional presence – from Tromsø in the north to Arendal in the south – we have bolstered our expertise and taken the initiative to establish development projects as a supplement to our ordinary project collaborations anchored in the large research environments in SINTEF, where Trondheim and Oslo are centres of gravity. In 2021, we started looking at how we can, as a national institute,

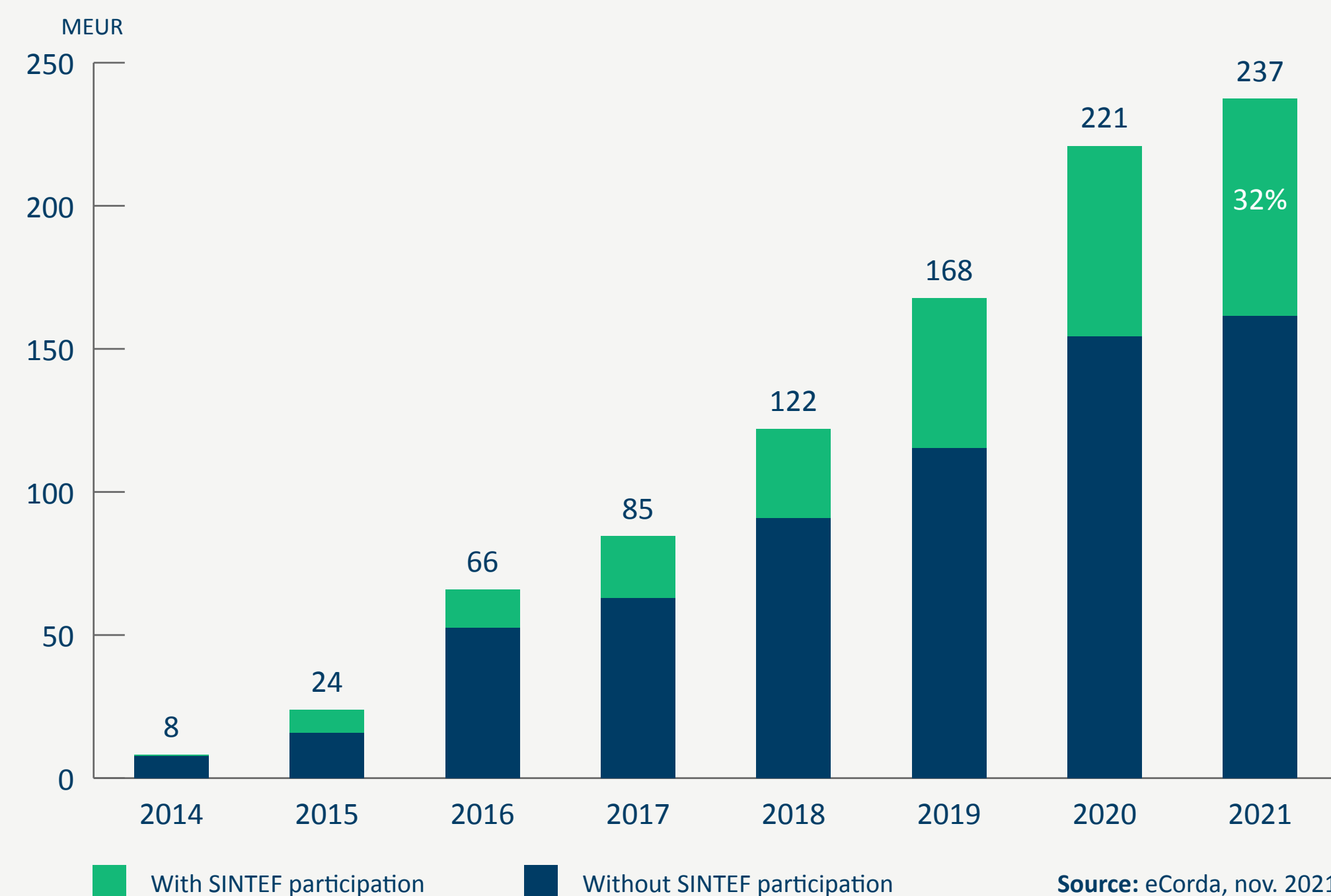
make the greatest contribution to regional business development through regional markets and our presence. Our newest office opened in Kongsberg at the start of 2022.

SINTEF's contribution to EU research programmes

EU research is an important aspect of SINTEF's ambition to perform world leading research. Research from EU projects are invaluable in maintaining SINTEF's leading position and competitiveness. At the same time, by getting partners from business and the public sector involved in commercially-oriented research projects in the EU, we are helping Norwegian stakeholders improve their competitiveness by participating in the international research front.

The EU's research programme is an important contributor to the development of EU policies and regulations, and ensures the focus is on solving global challenges. Horizon 2020 (H2020), which ran from 2014 to 2020, was the world's largest research programme with available funds of around EUR 80 billion. SINTEF was the Norwegian participant that won the most projects in H2020, with EUR 223 million in research and innovation funding. This represents 13.4 per cent of the funds brought home to Norway. SINTEF participates in 32 per cent of all the H2020 projects with Norwegian industry participation that have two or more Norwegian participants.^[9] These trigger activities in

SINTEF participates in 32% of Norwegian business and industry's collaborative projects in the EU^[10]



[9] SINTEF's Sustainability Report for 2020 reported that 23 per cent of Norwegian companies that obtained research and development funding from the EU did so in collaboration with SINTEF as per 2020 (at the time, the analysis included mono contracts and projects where Norwegian business was the sole participant, as well as projects with two or more Norwegian participants). An error was discovered in the calculations. New figures for 2020 show that the proportion was 17 per cent. We have changed the method this year to ensure that we only measure SINTEF's proportion within project types that enable business to work with partners.

[10] The graph shows the accumulated volume of projects for Norwegian business partnership projects in the EU. These are EU projects with two or more Norwegian partners, i.e. exclusive of mono contracts and projects in which Norwegian business is the sole Norwegian participant. The graph also shows the proportion of the volume of projects with and without SINTEF participation.

Norwegian business and industry that involves companies in collaborations with clients and other companies on the research front at an EU level. SINTEF’s goal is to double turnover in relation to the EU (from the level in 2019) during the new framework programme, Horizon Europe, which will run up to 2027. This assumes that the economic framework conditions for our participation will improve and not deteriorate.

As mentioned, SINTEF is an important contributor to the Green Deal, the EU’s green growth strategy, which aims to make the European Union climate neutral by 2050. We participate in projects that in total receive 17.5 per cent of the EUR 1 billion in green funds the EU has made available. We are also playing an important role in the transition via the Green Platform, where 10 out of 12 transition projects have chosen SINTEF as their R&D partner. There are clear synergies between the Green Platform and our activities in the EU arena.

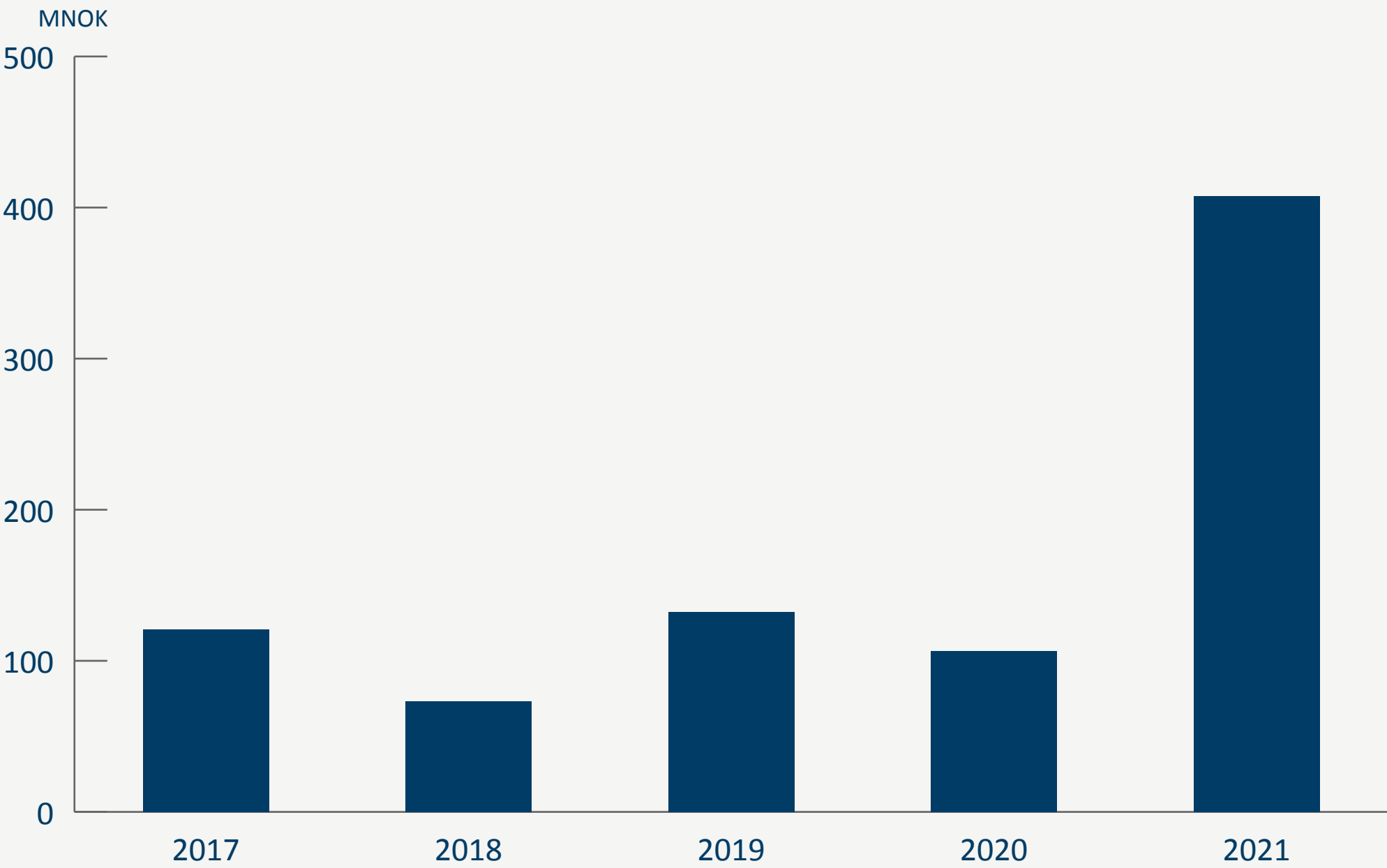
Research infrastructure

Research infrastructure plays an important role in how we can carry out projects for clients. We are further developing the infrastructure through our own investments, as well as through contributions from national and international infrastructure schemes, including from the Research Council of Norway and Innovation Norway, which are helping to ‘boost’ our investments. SINTEF has invested NOK 1.5 billion of its own funds in research infrastructure from its surplus in the

last 10 years and has more than 100 laboratories. In 2021, we invested our own funds in establishing Norway’s first laboratory for the production and testing of battery cells, so that Norwegian battery cell manufacturers can perform all the testing necessary before scaling up to factory production. The battery lab is partly funded by the Research Council of Norway via the infrastructure scheme.

The Ocean Space Centre is a particularly important infrastructure that we have been working on since 2005, and 2021 was a milestone when the Norwegian parliament approved implementation of the project with a budget of approximately NOK 8.2 billion. The Ocean Space Centre is fully funded by the state and its ownership will be managed by the Norwegian University of Science and Technology (NTNU) and will ensure value creation for Norway through competitive Norwegian ocean industries. SINTEF plays a key role as the operator of the largest laboratories and, together with NTNU, will contribute to making Norwegian ocean industries more productive through advances in knowledge and technology, a world-leading educational environment, knowledge externalities and business transition. The government funding is anchored via ESA notification, and SINTEF is also contributing through investments of approximately NOK 250 million of our own funds targeted at energy and structures. The overall project in Trondheim, Hitra/Frøya and Ålesund is scheduled for completion in 2028/2029, with the first full year of operation in 2030.

We are investing in new laboratories, scientific equipment and other research production equipment



Source: SINTEF

SINTEF’s innovation and value creation through startups

SINTEF’s startups emerge from our research activities and contribute to value creation and employment in society. These startups are testimony to the fact that not all new knowledge can be commercialised in collaboration with existing companies. Strong trends such as digitalisation and sustainability are driving a need for technologies that the current business sector has not always demanded through contract research. In our long-term research funded through our own and free funds, we attempt to develop technology that can contribute to creating a completely new business sector. These companies are highly competitive because their operations are based on expertise and leading technology. Together, these companies therefore represent a significant contribution to the renewal of the Norwegian business sector.

A total of 84 companies have emerged from SINTEF since the middle of the 1980s. Of these, 58 are still in operation as separate companies, nine have merged with others

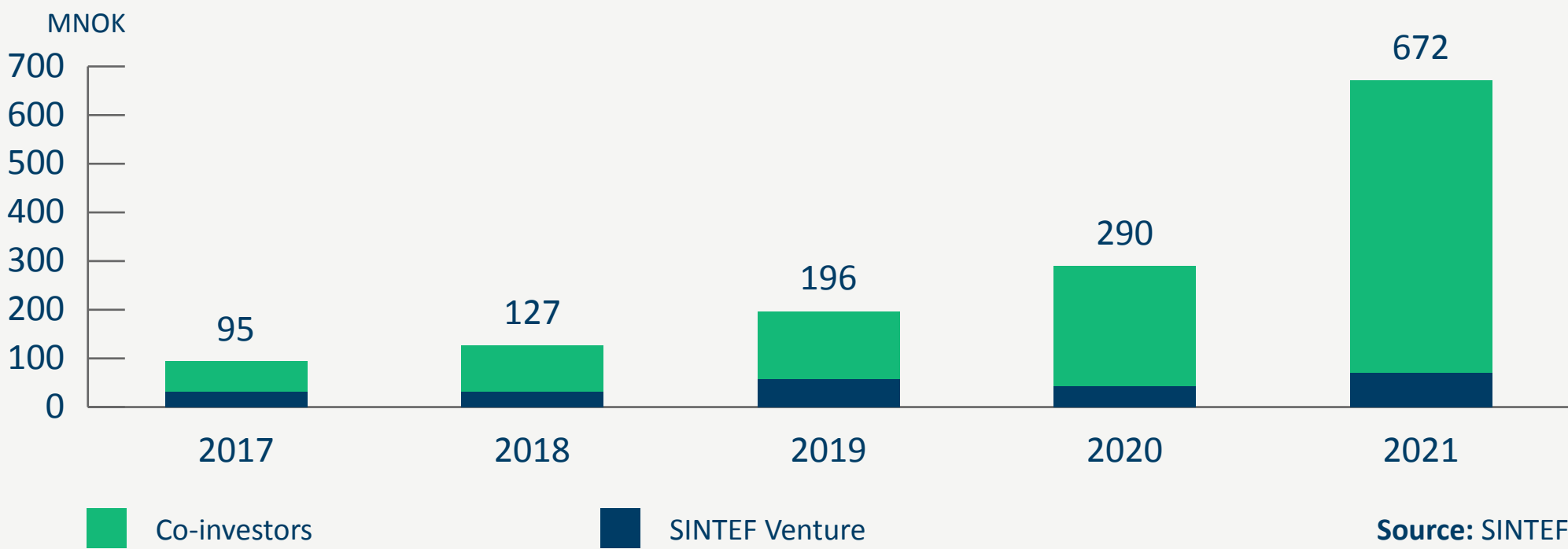
and the rest have been wound up. Some 56 of the 84 companies were established in the Trondheim region. The active companies employ a total of 1,942 people (2021).

SINTEF has achieved good results from these commercialisation activities. The sale of startups has resulted in both returns for owners and the further development of the companies. The companies Nacre, GasSecure, Spermvital and Resman are good examples of this.

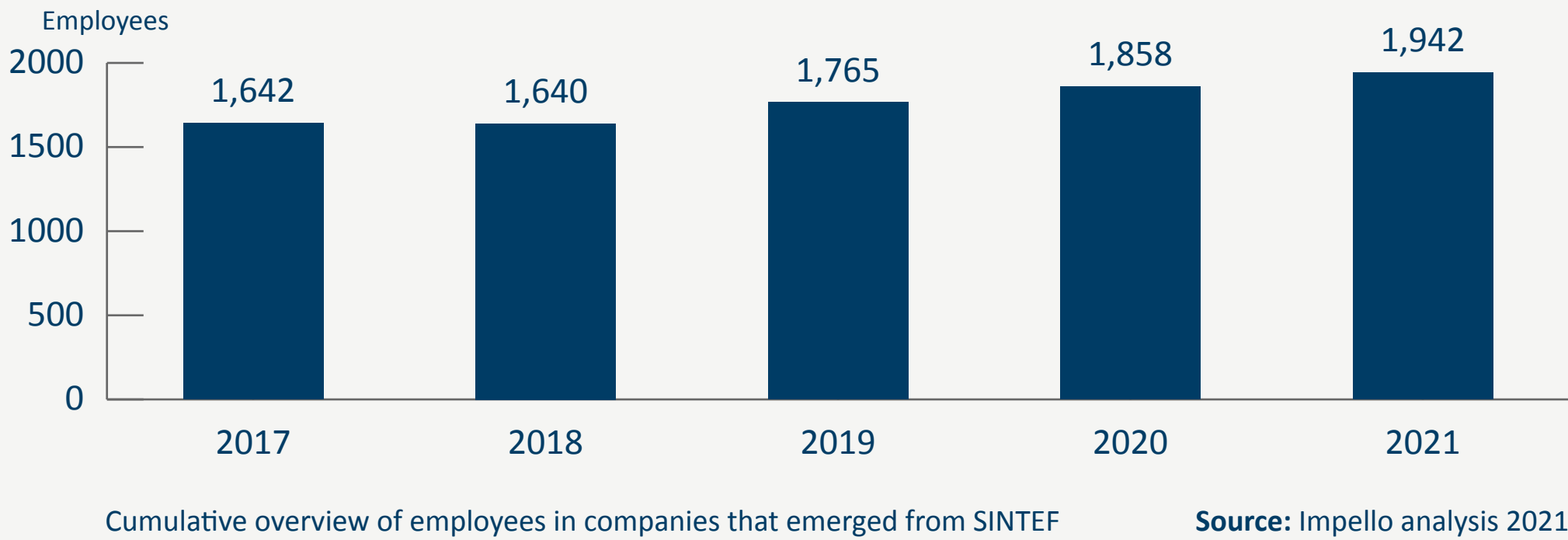
There was a high level of investment activity in SINTEF’s portfolio companies in 2021, with external investors showing great interest in joining our startups. Several of the startups have entered scaling and commercial growth phases. Many of the companies successfully raised substantial capital in 2021 to fund their scaling up.

KIT AR is a good example of a start-up that is contributing to SDGs 9 and 8. KIT AR is developing an industrial product that enables greater workforce mobility in advanced manufacturing as a result of simpler and more efficient training.

Internal and external capital supplied to create new companies

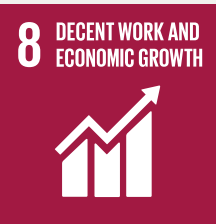


We create jobs through startups





THE COMPANY ALSO
CONTRIBUTES TO



Links to more info
kit-ar.com

KIT AR

Augmented reality to accelerate kaizen in human centered manufacturing

KIT AR Ltd. is a spin-off company from SINTEF that has developed an end-to-end solution for the manual manufacturing industry meeting the current challenges of manual handling.

KIT AR delivers Mixed Reality solutions for advanced manufacturing processes in robotics, aerospace and automobile industry.

Impact for clients, users, and society

Human operators are able to see and interact with step-by-step instructions overlaid on shopfloor equipment through the power of augmented reality.

Moreover, this innovative solution adds Q&A, compliance and Business Insight modules for improved feedback from shop floor / use to the engineering team.



Application and scalability

The expectation for growth in the enterprise AR market is very high in the coming years and KIT AR Ltd. is addressing a segment that needs improvement to remain competitive globally and locally. The market segment KIT AR Ltd. is targeting is sufficiently large to support a multitude of competitors and market intelligence and experience from interests in pilots indicate that there is a willingness to purchase for full deployment.

Total activity 2002-2021



814

Ideas from research institutes in SINTEF



103

Commercialisations through startups, licences and technology sales



3.5 mrd.

In exit value

Portfolio as of 2021

19

Startup companies

601 mill.

Total investment by co-investors

71 mill.

Total investment by SINTEF Venture funds

Source: SINTEF

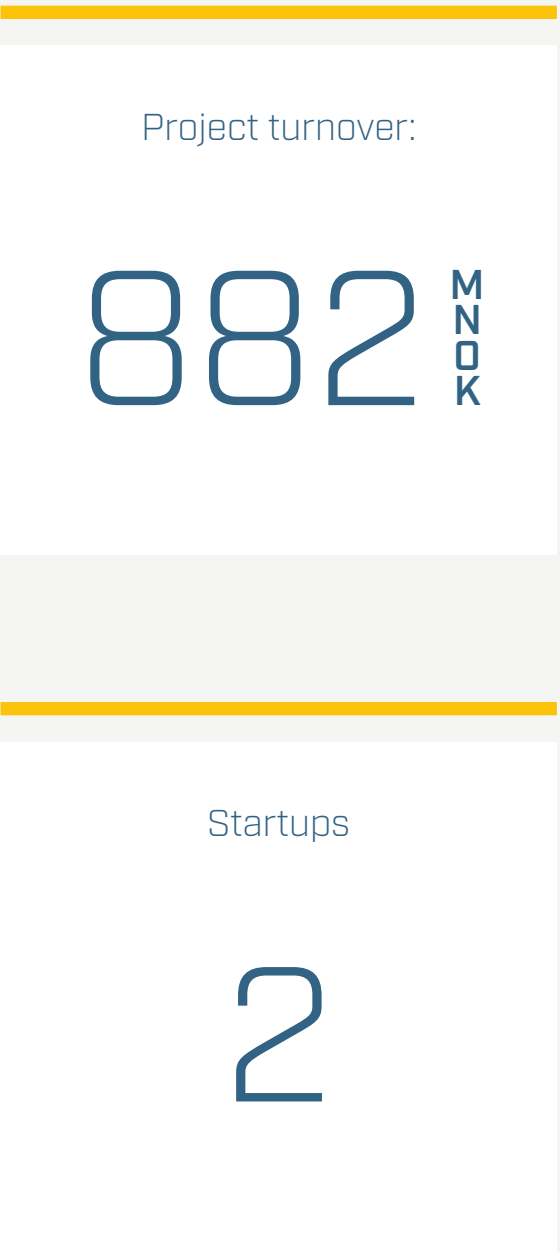
Affordable and Clean Energy

Affordable and clean energy is a prerequisite for transitioning to a sustainable society. We have been given a good reference in the EU’s classification system for sustainable investments, the taxonomy, which breaks down the Paris Agreement’s goals by sector and financial activities. The taxonomy also covers SDGs related to the circular economy, biodiversity, ocean and marine environments, pollution and respect for social standards.

Global progress is being made in affordable and clean energy. This is mainly due to the expansion of, and lower costs for, solar and wind energy. We are proud that SINTEF has contributed to the formidable advances in technology over many decades. Together with the realisation of hydrogen as an energy carrier and carbon capture and storage (CCS), SINTEF has contributed to

a wide-ranging and scientifically-based approach to the challenges. This includes substantial research infrastructure that we benefit from, often together with our university partners.

Many countries are taking the climate challenges seriously and actively working to cut emissions. In poor countries, finding a balance between improving people’s prosperity and active climate measures can be difficult, if at the same time one has limited resources and expertise. Richer countries may face the same challenges but have better access to expertise and a more long-term experience of these issues. We need to strengthen international collaboration to achieve good global solutions that work across national borders, cultures and local conditions.



REFHYNE I and II

Refhyne I, Europe’s largest PEM electrolyser for hydrogen, was completed on 2 July 2021. Refhyne II was launched on the same day and will scale up from 10 to 100 MW. The goals are to produce hydrogen at less than EUR 3 per kg and set the standard for future gigawatt level plants. The plant will be completed in 2024.

The significance of this EU Green Deal project is that it will allow us to take a big step towards a zero-emission future where both heavy transport and industry can be converted to renewables.



PROJECT I IS FUNDED BY
HORIZON 2020 AND FCH,
PROJECT II IS FUNDED BY
HORIZON 2020



SDG:

7 AFFORDABLE AND CLEAN ENERGY

THE PROJECT ALSO CONTRIBUTES TO:

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

OCEANGRID

Green energy from floating offshore wind turbines could meet current global energy needs many times over. SINTEF’s offshore wind research groups are world leaders and are building bridges to the international market. In the OceanGrid (Havnett) project, SINTEF, NTNU and the University of Oslo (UiO) will work with 13 industry partners to develop solutions for profitable offshore wind development, including how power from offshore wind can be connected to the grid and provide renewable energy for more people.



SDG:

7 AFFORDABLE AND CLEAN ENERGY

THE PROJECT ALSO CONTRIBUTES TO:

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

13 CLIMATE ACTION

SINTEF's research and innovation activities aimed at the green transition include:

- Hosting three research centres for eco-friendly energy (FME centres), being a strategic partner for the five other technology centres and being a partner in a social science FME centre. The FME centres are large innovation and value creation-oriented collaborations between research environments, business and the public sector that last for up to 8 years, tied to renewable energy, energy efficiency, CO₂ management, and social sciences. The FMEs are national in character and span the whole country, as well as strong international links and partnerships.
- We are working on further developing renewables and electrification technology. We have in particular been instrumental in positioning Norwegian industry within solar and offshore wind, as well as the optimal utilisation of, and investments in, the electricity grid and hydropower system. As a zero-emission energy carrier, hydrogen has played a vital role in mobilising Norwegian industry in relation to the EU.
- SINTEF has a broad focus on the bioeconomy of the future through the utilisation of sustainable renewable biomasses. Our efforts are directed at establishing new

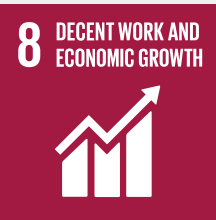
technology and climate-positive processes and the future processing of biomass into bio-based chemicals, biomaterials, as well as bioenergy and advanced biofuels designed for long-haul and air transport.

- In addition to renewables, the research groups at SINTEF and NTNU are world leaders in the development of zero-emission energy solutions from natural gas with carbon capture and storage (CCS). We host FME NCCS, which is one of the world's largest CCS research centres. Reforming and removing CO₂ from natural gas can produce clean hydrogen with very low GHG emissions, sometimes referred to as 'blue' hydrogen. Pure hydrogen (blue and green) is the theme of a new FME that SINTEF and its partners will be starting in 2022: FME HYDROGENi.
- SINTEF is also a leader within social science research into sustainable transformation. We are developing new knowledge about technological and social change processes, including systemic changes through new strategies, collaborative models and tools for sustainable innovation. This is taking place in, for example, FME NTRANS (eco-friendly energy transition) and in the research centre INTRANSIT, which focuses on innovation policies for green and smart transition.





THE COMPANY ALSO CONTRIBUTES TO



Hystar

Efficient electrolyzers for green hydrogen production

Hystar AS is a spin-off company from SINTEF developing electrolyzers for green hydrogen production.

Hystar's solution consists of a fully integrated electrolysis of water-stack including a process modification that potentially reduces the energy loss of 50%. If this is the case of full-scale production it means an increased production capacity in the electrolyser of 150%.

Electrolysis of water would then be competitive with production of hydrogen from fossil fuels and the potential market will be huge.

Impact for clients, users, and society

Green hydrogen has a central role in shaping a sustainable energy future.

Hystar believes that the full potential of renewables can only be realized by large scale energy storage and use of hydrogen in heavy duty transportation and in industry.

Hystar's solution will secure lower cost for the end user as a result of the increased production capacity in the stack.



Links to more info
hystar.com

Application and scalability

Annual production of hydrogen exceeds 70 million tonnes with a market value of ca 118 bUSD. This market is expected to grow 4,8% annually for the next 5 years. Today, hydrogen produced by electrolysis of water make up about 4% of this market.

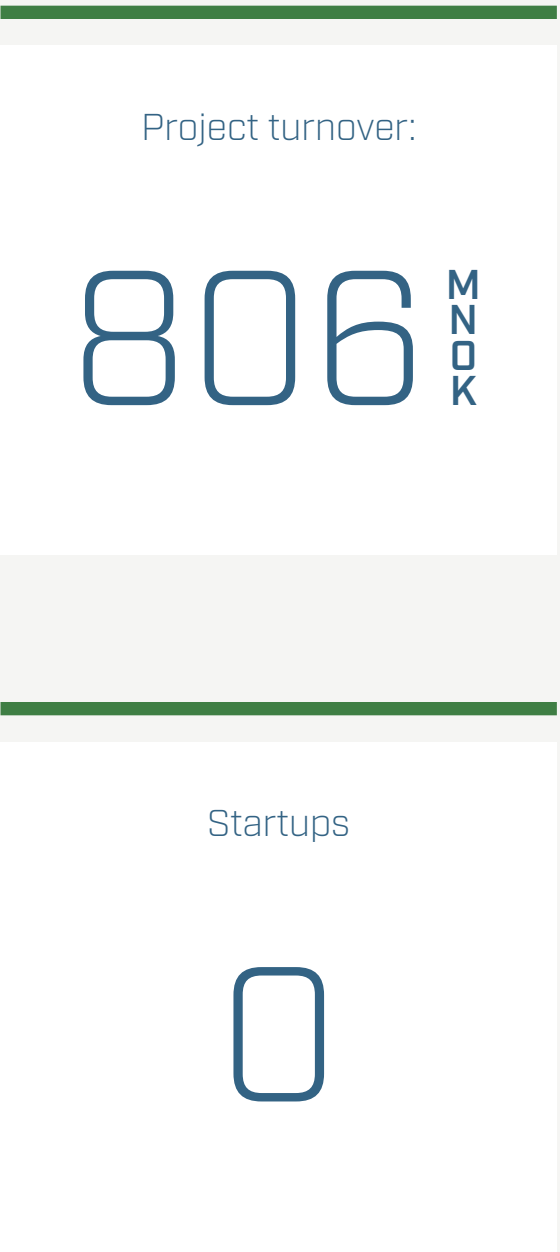
Climate Action

Norway’s goal is to reduce GHG emissions by 55 per cent by 2030 compared with 1990. To achieve this, the government will probably have to steer towards a carbon price of NOK 2,000 per tonne of CO₂. The objectives send some interesting signals to the market. An allowance price of NOK 2,000 would make a lot of climate measures profitable. Most of the measures in the Climate Cure 2030 report published by the Norwegian Environment Agency cost somewhere in the region of, or less than, NOK 2,000 per tonne CO₂.^[11]

The Paris Agreement’s goal of limiting global warming to close to 1.5°C means that Norway must achieve net zero GHG emissions in 2050. This must mainly be done by: 1) lower and more efficient energy and resource use, including circular economy; 2) more renewables as well as increased transmission capacity and storage capacity in a flexible energy system; 3) measures that eliminate and return emissions from fossil energy; and 4) removing GHG (especially CO₂) from the cycle. SINTEF’s mission is to contribute technology and innovation to the transition in the period up to 2050. We are working on all

of the four main strategies closely linked to ‘Affordable and Clean Energy’, since the energy sector traditionally accounts for the majority of GHG emissions. Efficient energy use in buildings and industry are focus areas for two FME centres that work closely with industry and business. Hydropower, onshore and offshore wind are also driven forward by FME centres that focus on renewables on nature’s terms. Advances in SINTEF’s research environment have turned carbon capture into a European initiative, also based on an FME.

In addition to the above measures, the Intergovernmental Panel on Climate Change (IPCC) is acknowledging that it may be necessary to remove CO₂ already present in the atmosphere and the ocean. It is feared that the world will be unable to cut emissions fast enough and that there are sectors where it will be hard to achieve zero emissions, such as in agriculture, parts of manufacturing and the transport sector (e.g. transcontinental air and maritime transport). Some estimates indicate a need in the range of 10-15 per cent of current emissions, which must be balanced by climate-positive solutions.^[12]



[11] Norwegian Environment Agency, Climate Cure 2030: measures and means up to 2030. <https://www.miljodirektoratet.no/globalassets/publikasjoner/m1625/m1625.pdf>

[12] Estimates based on the global need for climate-positive solutions depending on the Intergovernmental Panel on Climate Change (IPCC) scenarios P1 to P4, assumed to be the same for Norway.

Atmospheric CO₂ is a problem that is “everybody’s and nobody’s responsibility.” The drivers for a business model for CO₂ removal measures and for mobilising the necessary research are currently weak. Therefore, in 2019, SINTEF decided to establish a group initiative called ‘New climate-positive measures’, where our goal is to identify and develop solutions together with the government and industry. So far, the work has focused on idea generation and paving the way for research and innovation arenas.

It would be natural to look at opportunities for capturing CO₂ in new biomass production and by using chemical/mechanical solutions for capture from air and oceans. Given Norway’s ambitions and advantages as a maritime nation, it would be natural to look at opportunities in ocean spaces and in the crossover between blue and green value chains. As far as storage is concerned, it is possible to bind carbon in new, valuable and stable materials on some scale. Storage in the form of CO₂ or carbon would represent large-scale solutions to the

problem. The carbon will have to be stored in a form that isolate it from the atmosphere for a long time, and the solutions have to be environmentally and socially acceptable.

Dedicated processes for the extraction and long-term storage of biocarbon is a relatively new field and the proposed solutions are mostly at the laboratory stage, or at best in pilot scale. SINTEF has initiated five projects ranging from CO₂ capture from water to the long-term storage of carbon through cultivating sea grass and other algae production. Recarbonising concrete is another alternative, as is the long-term storage of carbon through following the life cycle of wood.

The EU and Norway have a growing R&D and innovation agenda for this important area. The EU is working on a proposal for incentives and regulations for accelerating this development. Our corporate focus is on developing technical and market solutions and creating an understanding of the need for solutions in society.

KPN Reduced CO₂ Emissions: Metallurgical industry on the path to zero emissions

The metallurgical industry currently uses fossil carbon to reduce metal ore to metal with CO₂ emissions as a by-product.

This project aims to develop new technologies with a high potential for producing silicon, ferrosilicon and manganese alloys without CO₂ emissions in 2050. In the short term, the focus will be on biocarbon instead of fossil carbon. In the longer term, completely new carbon-free processes will be developed where coal and coke are replaced by hydrogen.

13 CLIMATE ACTION



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



17 PARTNERSHIPS FOR THE GOALS



SDG:

THE PROJECT ALSO CONTRIBUTES TO:

SINTEF Global Climate Fund

SINTEF has invested its own funds into climate-positive research in 2021 in order to boost solutions to the global climate challenges. With NOK 21 million over 3 years, we are launching new research that can contribute to climate-positive solutions that remove atmospheric GHG as required by all the scenarios for 1.5°C.

SINTEF's Global Climate Fund was launched at the climate summit in Glasgow in November in order to integrate other partners into this work. We have established a mechanism for counteracting systemic failure and enabling businesses, financial institutions and philanthropic entities to voluntarily contribute funds to climate-positive research.

SINTEF views our own investment in the Climate Fund as means of counter-balancing some of the emissions from our activities, which we are working to cut but

will be unable to eliminate completely (in the short and medium term). We believe that it is through our research and innovation that we can have the greatest impact with respect to climate challenges, and since the launch, Sparebank 1 SMN has joined the fund as our first external partner.

In 2022, the Climate Fund will work on creating the foundation for an expanded partnership network that sees a common interest in promoting new climate-positive technologies, to the point where an emerging market is able to take them further. The Climate Fund thus represents a new type of model for research and innovation work that we hope can further strengthen our contribution to sustainable development.

One of the projects the fund has funded so far is looking at how seaweed can remove emissions:

Seaweed in the climate fight

Cultivating seaweed is climate-friendly biomass production that has many applications. For example, macroalgae provide a nature-based solution for capturing and storing CO₂.

SINTEF is participating in several research projects that are investigating large-scale kelp cultivation's CO₂ potential with respect to removal (CDR) and storage.

Among other things, we are looking at the possibility of creating climate-friendly 'graveyards' for cultivated seaweed by sinking seaweed to great ocean depths and converting seaweed plants into charcoal like biochar. The charcoal can be buried onshore, perhaps in fields and meadows where it will be sequestered without emitting CO₂. The biochar can probably also be used to improve arable land.

We are thus developing technologies that can eliminate emitted CO₂ from nature's cycles.

13 CLIMATE ACTION



7 AFFORDABLE AND CLEAN ENERGY



14 LIFE BELOW WATER



SDG:

THE PROJECT ALSO CONTRIBUTES TO:

Responsible Consumption and Production

The green transition is partly about reducing and removing GHG emissions but also involves transforming into a less resource-intensive society. The growing scarcity of raw materials and increasing volumes of waste and pollution make the development of sustainable consumption and production patterns an important goal. The transition to a circular society will be complex, and business and the public sector needs insights into the effects of a circular economic model and support with developing new business models, processes, and products.

SINTEF has strategically focused on the circular economy since 2016 with a vision of “challenging and supporting Norway in the circular transition.” We spend the Research Council of Norway’s basic grant on delivering

basic knowledge about the importance and potential of a Norwegian circular economy for value creation, employment and cutting emissions.

SINTEF hosts the annual Norwegian Circular Economy Conference, which makes a strong contribution to the public debate on how we will achieve responsible consumption and production. This was arranged in collaboration with NTNU, the Research Council of Norway and Innovation Norway in 2021. The interaction with external partners is vital and we are contributing to the development and implementation of ‘10 circular principles for Norwegian business’ in collaboration with Skift, Deloitte and the WWF.



SINTEF contributes research expertise within recovery technology, product condition detection, product design for longevity, analyses documenting environmental and social impacts, and the strategic development of more circular business models. In 2021, we prioritised the importance of the EU taxonomy for sustainable economic activities by analysing the criteria proposed by the European Commission.

We are seeing an increase in market demand for research-based advice on the taxonomy criteria. It will also be important to develop research methods that capture the entirety of the taxonomy framework, including how circular economic measures impact environmental, economic and social conditions in practice. The taxonomy will thus act as a strategic framework for future project development within the circular economy.

AluGreen: Aluminium Green Platform

Aluminium is a circular material that can be recycled over and over again without it losing its original properties such as strength, lightness, conductivity, formability, durability, impermeability and recyclability. This makes the material an important resource for a climate neutral and circular economy in key sectors across Europe.

AluGreen will create at least 1,500 highly qualified, green and sustainable jobs in Norway by developing technology and creating pilots using recycled aluminium in road and energy infrastructure, electric motors, battery protection systems and concrete reinforcement.



SDG: THE PROJECT ALSO CONTRIBUTES TO:

Sustainable Cities and Communities

Some 1.8 million people live in Norway's five largest cities.^[13] How we develop our cities in the future will be important for our social lives, for the environment and for how we make use of society's shared resources.

While life in the city and in the countryside may seem different, we face many of the same challenges. We need new ways of living and sustainable health services that can cope with the coming 'age wave' so that we can keep living at home for as long as possible. We need infrastructure that secures energy supplies and the transport of people and goods, homes that are energy efficient and good to live in, and businesses that ensure jobs and local value creation.

By collaborating with the public and private sectors, SINTEF is helping to solve these challenges and create new businesses in both cities and rural areas. In 2021, we signed a cooperation agreement with innovative municipalities that want to develop their local communities further, both to make them more attractive and to create jobs for the people living there. We are involved in the innovation districts of Trondheim Tech Port and Oslo Science City to help boost these major cities within research and

development. In the EU STOP-IT project, we collaborated with the City of Oslo and more than 20 European partners to develop solutions that protect critical water infrastructure from both physical attack and cyberattacks.

Transforming urban areas is central in many Norwegian cities, and in Trondheim we are following – across the range of disciplines in SINTEF – the transformation of Nyhavna from a traditional industrial area to an exciting mixture of housing, industry, recreation, culture, and canal and harbour space.

The ZEB laboratory was completed in Lerkendal, Trondheim in 2021. This is a zero-emission 'office laboratory' packed with equipment and sensors that allows us to investigate and inspect modern and innovative building materials and solutions.

It is estimated that 80 per cent of today's buildings will still be standing in 2050. Our calculations indicate that improving the energy efficiency of the building stock could reduce energy consumption in Norway by as much as 10-23 TWh annually.



[13] Statistics Norway, Population and land area in urban settlements, 2021 <https://www.ssb.no/befolkning/folketall/statistikk/tettsteders-befolkning-og-areal>

Access to mobility services is crucial for people and businesses in districts and urban areas. The public want to travel to and from work and leisure activities efficiently, and we would prefer goods to be delivered right to our doors. Business and industry depend on efficient and reliable transport systems for supplies of goods and for exporting products.

Technology provides opportunities for developing efficient and competitive transport systems despite long distances to the markets. At the same time, the transport sector faces numerous sustainability challenges: The main one is reducing GHG emissions from transport, where Norway is aiming for a 50 per cent cut by 2030 and climate neutrality by 2050. Other emissions to air must also be reduced to improve air quality. SINTEF believes that in the future all transport will be virtually emission-free.

Road safety is another challenge: The zero vision of no fatalities or serious injuries has made Norway a world leader in road traffic safety, although too many still die on the roads. SINTEF believes that transport technology can further reduce accident figures.

The other sustainability challenges faced by the sector include safeguarding biodiversity, climate adaptation and the availability of efficient mobility solutions. Our group-wide mobility efforts are aimed at contributing to solving many of these challenges. Knowledge, technology, and innovation must be developed and implemented on a large scale to ensure rapid adaptations in society to achieve sustainable mobility.

SINTEF is working on energy efficient transport solutions, and we have major initiatives within zero-emission technology relating to batteries, charging solutions, fuel cells, clean hydrogen, and biofuels. We are carrying out research into autonomous and automated transport that will contribute to safe and efficient transport services with the least possible use of resources. SINTEF hosts SFI Smart Maritime, which is developing the zero-emission and eco-friendly ships of the future and is a key partner in SFI Autoship along with NTNU. We have a series of major EU projects in all of the above-mentioned areas.

TULIPS: Green solutions for emission-free airports

Over the next few decades, the aviation sector will have to solve many demanding climate footprint challenges. Some 29 partners – airports, knowledge institutions and industry partners throughout Europe – have joined the TULIPS project led by Amsterdam Airport Schiphol in order to accelerate the roll-out of sustainable aviation technologies.

SINTEF will take part in testing and developing green solutions both at Amsterdam Airport Schiphol and Norwegian airports, and we are thereby helping to speed up efforts to make airports emission-free.

11 SUSTAINABLE CITIES AND COMMUNITIES



SDG:

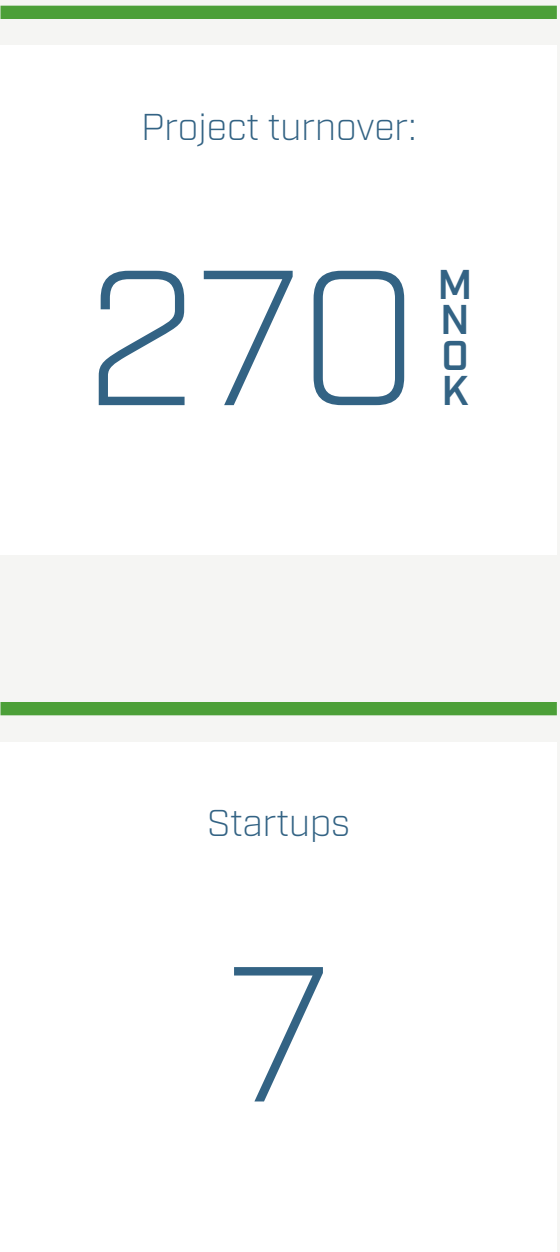


THE PROJECT IS FUNDED
BY HORIZON 2020

Good Health and Well-being

SINTEF aims to contribute to healthy living, better healthcare services, better resource utilisation in the healthcare system and growth in the healthcare industry. Our research contributes to healthier living and to improved diagnosis, treatment and follow-up of patients. This is being done in collaboration with health care organisations, research organisations, patient and user organisations, as well as the health industry. SINTEF is an important research institute for the health industry: A survey carried out by the Research Council of Norway for the Ministry of Trade, Industry and Fisheries shows that SINTEF is by far the largest recipient of contracts from the health industry among Norwegian research institutes.^[14]

SINTEF is engaged globally to promote health and quality of life in low and middle-income countries, where access to health services for the very weakest in society is especially important. Demographic changes toward more elderly people in the population will also be a growing global challenge going forward. Using new technology and solutions that boost quality and capacity in the healthcare sector is therefore important to meet these challenges in sustainable ways. SINTEF has established its own multidisciplinary working group tasked with coming up with concepts where technology help promote health and quality of life in low and middle-income countries.



[14] The Research Council of Norway, 1 July 2021, survey of potential for increased collaboration in relevant parts of the institute sector. Report discussed in EHiNpodden, Ole Johan Borge – En bro mellom helsenæringen og forskningsinstitusjonene <https://ehin.no/en/ehinpodden/>

Norway and other high-income countries generally offer good health services, but maintaining and improving these services in coming years is challenging. The Norwegian government's Perspective Report 2021 estimates that almost 260,000 more healthcare FTEs will be needed in 2060, which means that the health sector will employ up to 31 per cent of available new workers each year, compared with 13 per cent today. This is not sustainable because society also needs workers in many other sectors. 'Sustainable healthcare' has been defined as a priority research area in SINTEF. SINTEF carries out research on how the healthcare system can be better organised to make better use of limited resources. This effort also includes enabling more patients to be treated in 'home hospitals' rather than in hospital beds. We are also working on how optimisation technology can help healthcare personnel make more efficient use of their time and how artificial intelligence and other computer sciences can help us achieve faster, more accurate and less labour-demanding diagnostic solutions. We are also developing new, advanced medicines and new treatment approaches that speed up the treatment and recovery process, are more targeted to the patient's needs and come with fewer side effects.

We are working on technology, services and physical environments that make it easier for the sick and elderly to manage on their own and live autonomous lives with a good quality of life. A more sustainable health-care system must interact better with relatives and the voluntary sector, and must promote patient self-management, where early intervention, prevention and health promotion are important ingredients. Our 'Aging-Friendly Societies' initiative aims to investigate how we can design and realise communities and living environments adapted to the needs of an aging population with care needs, but also with an interest to participate in society as well. Together with the National Association of Norwegian Architects and commissioned by the Norwegian Directorate of Health, we have produced a handbook for municipalities on more age-friendly location development. In the Gemini centre HelsA, we are working with NTNU to build research expertise that can contribute to social development where the physical framework for good public health forms a natural part of creating a better society.

SMILE: Smart technology support for elderly people living at home

SMILE is creating smart, inclusive solutions that enable elderly persons to age safely in their own home. We are doing this through both method and technology development. The solutions are designed to encompass the perspectives and needs of older people, while at the same time ensuring that the technologies are fit to succeed in the market. In SMILE, SINTEF develops a smart digital assistant. This assistant will be able to converse with users on their own terms and will hopefully be able to provide advice and answer questions from the users. The digital assistant's knowledge will be accumulated by collecting relevant data from the user, and machine learning will teach the assistant how to provide good advice and answers.



SDG:

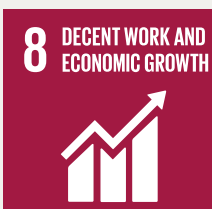


THE PROJECT IS FUNDED
BY HORIZON 2020

3 GOOD HEALTH AND WELL-BEING



THE COMPANY ALSO CONTRIBUTES TO



SonoClear

Acoustic coupling fluid for enhanced ultrasound imaging.

SonoClear was established in 2016 as a spin-off from the Ultrasound and Image Guided Therapy Centre in Trondheim, and is the result of more than 20 years of collaboration between St. Olavs Hospital, NTNU and SINTEF.

The company has developed an acoustic coupling fluid for use in intraoperative ultrasound in neuro-surgery. The fluid imitates the acoustic properties of the surrounding brain tissue and effectively eliminates artefacts from the ultrasound images, thereby making it possible to remove more of the cancerous tissue.

Impact for clients, users, and society

Increased use of intraoperative ultrasound during neurosurgery leads to:

- Increased chance of improved outcome of surgery and consequently increased chance of survival.
- With ultrasound being available everywhere and relatively inexpensive in purchase and use, more people can receive better treatment.



Links to more info

sonoclear.no

Application and scalability

Sonoclear AS is developing a medical device product that targets an underserved niche in the neurosurgery space and can expect relatively rapid uptake once the benefits are widely accepted. The biggest driver in terms of timing is the growth of the ultrasound market and the willingness to use US in an increasing number of procedures, including neurosurgery.

Life Below Water

The global systems and all life on Earth needs the ocean. More than three billion people worldwide directly depend on ocean biodiversity. Furthermore, it is estimated that the ocean absorbs as much as 40 per cent of carbon dioxide emissions.

While life below water is invaluable for humans, it is also under pressure. Marine pollution is increasingly impacting both biodiversity and humankind. Some 30 per cent of the world's fish stocks are overfished. Invasive species are taking over ecosystems. The ocean is getting warmer because of climate change. Even without these challenges, managing the way we exploit the ocean would have been vital. The challenges put the ocean under extreme pressure though, and require us to work together to ensure we manage the way we interact with it sustainably.

This is further complicated though by the fact that nobody – or everybody – owns 70 per cent of all the ocean area globally. These are areas outside national

jurisdictions. The management of these areas is currently highly fragmented, from fisheries to biodiversity, shipping, and pollution. In these areas, the freedom of the seas – mare liberum – and a fragmented landscape of various cooperation agreements between states on specific topics such as for example tuna management, whale conservation, and migratory birds have so far been the rule.

Environmental considerations are becoming an increasingly important factor in the sustainable development of ocean-based industries. Ensuring a clean and productive ocean is something SINTEF is especially interested in, and we make use of our multi- and interdisciplinary expertise to solve challenges and create value for both our clients, and in turn, society at large. SINTEF's strategic research area on biodiversity and area use started in 2021. Biodiversity protection and restoration are factors that the innovative advances in ocean technology we develop must consider to ensure increased value creation possible, on the terms of nature.



Project turnover:

247 M
NOK

Startups

2

SINTEF is therefore focusing on issues related to challenges faced by the Ocean, which in turn affect ocean industries and communities. We are developing technologies that contribute to preserving biodiversity and moving towards a green transition for increased value creation. For example, SINTEF is developing and using models for mapping and managing environmental risk for the sustainable harvesting and production of marine resources. The modelling tools SINMOD (hydrodynamic ocean model), DREAM (dispersal model for chemicals and particles) and OSCAR (dispersal model for oil spills) are used by the industry to support decision-making related to mitigating environmental risks from its activities and evaluating impacts on external environmental parameters during operations.

We are also developing technologies and systems that employ digitalisation and autonomy in ocean industries, such as using artificial intelligence and machine learning

in fisheries management. Furthermore, the Ocean Space Centre has started construction in Trondheim. This will be one of the world's most advanced ocean research and teaching facilities. Once the centre has been completed, it will secure Norway's position as a leading marine research nation, and at the same time contribute to the green transition of Norwegian ocean industries.

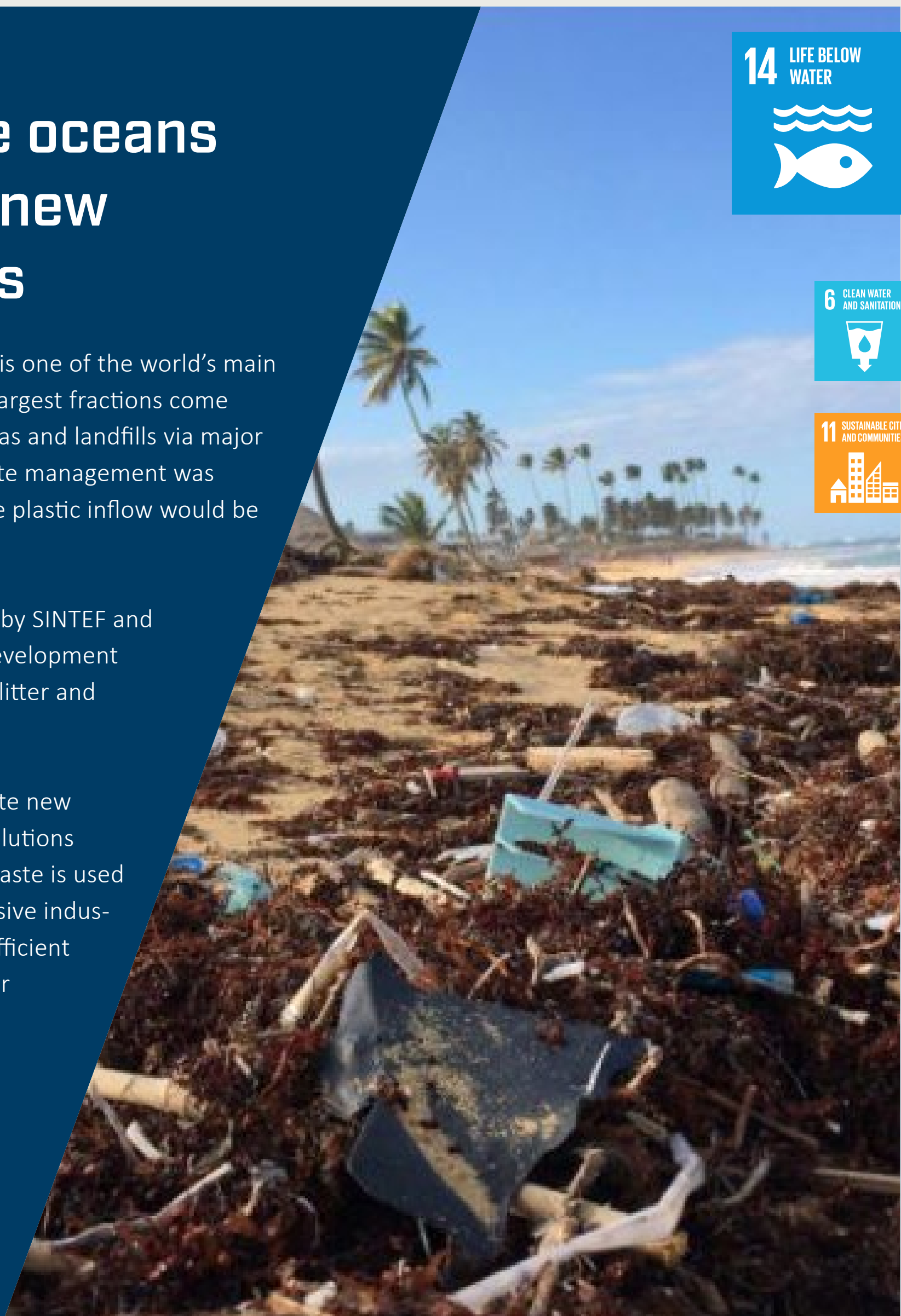
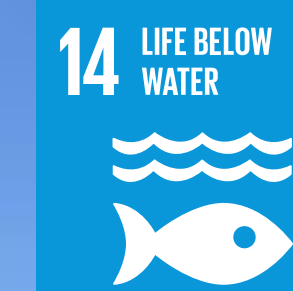
SINTEF also has international expertise in the field of political science and international relations. This field is about theoretical and practical politics and the distribution of power at local, national and international levels, and how institutions, practices and relations evolve to together constitute the public administration of the shared resources that can be harvested from the ocean. This combined interdisciplinary expertise improves our ability to manage human activity in the ocean environment sustainably.

Plastic in the oceans can present new opportunities

The plastic pollution in oceans is one of the world's main environmental problems. The largest fractions come from runoff from industrial areas and landfills via major rivers, especially in Asia. If waste management was improved in these areas, future plastic inflow would be significantly reduced.

The OPTOCE project is headed by SINTEF and is funded via the Norwegian development programme to combat marine litter and microplastics.

The project aims to demonstrate new win-win waste management solutions where non-recyclable plastic waste is used as energy in local energy-intensive industries. This is the most energy efficient method and in line with circular economic thinking.

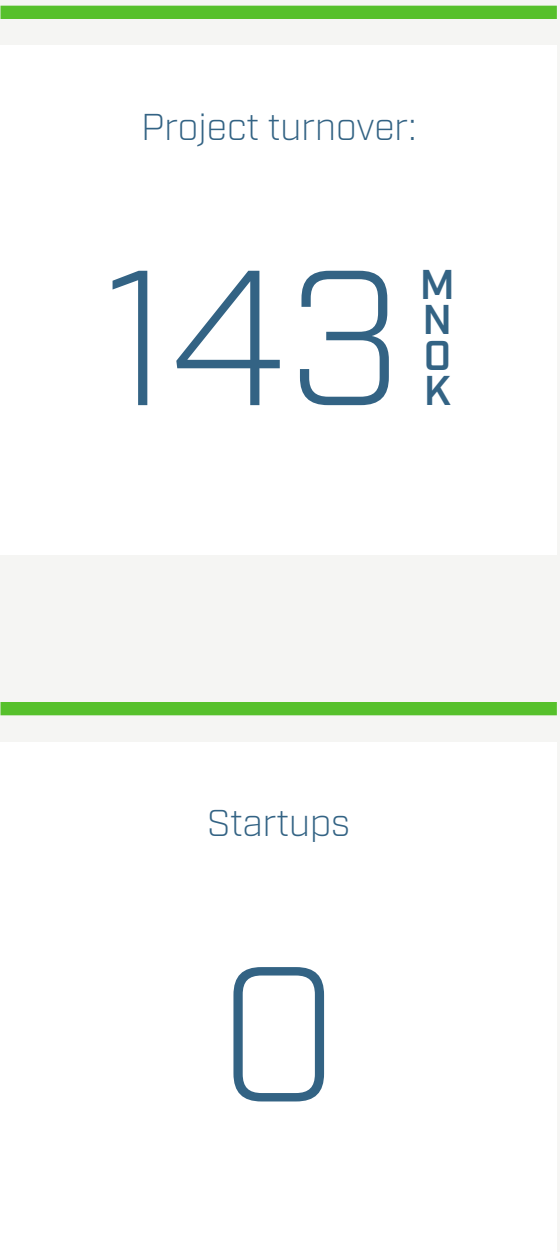


Life on Land

Nature is essential to life and gifts many benefits to humans. When developing technological innovations for industry and society, we must take into account the critical importance of protecting and restoring nature's biodiversity, in order to contribute to increased value creation on the terms of nature and for the future. We have, in fact, an economic interest in protecting nature. The UN's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) launched its latest report in 2019. In this report, we learn that protecting biodiversity and developing nature-based solutions, i.e. solutions that are developed on nature's terms, will be crucial moving forward.

This is because the biodiversity crisis we are now experiencing is referred to as the sixth mass extinction.

Many species will die out without us ever knowing that they even existed. So far, scientists have only identified around 1.75 million species on Earth. Estimates suggest, though, that there could be in the region of 5-50 million species, with recent estimates suggesting a figure of around 8.7 million. The goods and services provided us by this plenitude of biodiversity should have an assigned value. Not just in themselves, but in economic terms as well, based on the value of what is lost in nature when one develops a natural site for human use. For example, marshes and their role in storing CO₂ is often downsized in importance, when put up against the needs of humans for recreational homes. Modern society poses an increasing threat to these services and our knowledge of nature's load-bearing capacity is quite limited.



At SINTEF, we acknowledge IPBES statements that nature and biodiversity have taken a backseat to the global focus on climate change mitigation and adaptation. In 2021, we decided to make a stronger, targeted effort to highlight the importance of this to SINTEF and our project portfolio by establishing a strategic research area of biodiversity and area use. We want this to be fundamental considerations for our activities and technological developments, and we collaborate transdisciplinary with industry, management, and the research community to increase our collective contributions to sustainability and biodiversity protection.

In total for 2021, we can see that around 4 per cent of our turnover was linked to the SDG15. The ambition is to increase this and have a broader scope of activities around this moving forward. SINTEF’s work on biodiversity is based on the complex and complicated relationship that develops at the intersection of technology, nature, and society. Our goal is to develop technologies and innovative solutions where the impact is positive change and value creation, as well as nature positive.

Fish ladder design

Some hundred years of hydropower and industrial activities in the Blokken River in Vesterålen have brought fish stocks in the river to the brink of extinction. Research scientists from SINTEF and NINA have drawn up a restoration plan that includes carving a fish ladder into the rock, a world first. We hope that the restoration project in the Blokken River will ensure that the river will see sustainable stocks of salmon, trout and arctic char in the future.



SDG: THE PROJECT ALSO CONTRIBUTES TO:

Other Sustainable Development Goals

Decent Work and Economic Growth

SINTEF's project activities make a direct contribution to value creation and employment in society. Our research generally focuses on producing societal solutions and competitiveness, and from this perspective a large number of the projects contribute to the work on achieving goal 8) Decent Work and Economic Growth, although relatively few have been tagged with this as a (main) goal. SINTEF's 19 startups have also been assessed as being contributors to goal 8, and especially target 8.2 Diversify, Innovate and Upgrade for Economic Productivity.

In order to ensure safe and secure working environments, we are working on tripartite cooperation and preventive working environment work, and in particular have recently had projects looking at the impact of digitalisation on working life. SINTEF also carries out extensive research related to HSE in the workplace, for example to mitigate the risks associated with working in fishing and aquaculture. SINTEF promotes human rights and decent working conditions in connection with the production of goods and services. This also applies to our subcontractors at home and abroad. Economic benefits are often achieved through research-based improvements to the technologies and work processes on which products and services are based.

Zero Hunger

We have elevated the topic of sustainable food to the highest level in SINTEF's corporate strategy, where food represents one of SINTEF's nine strategy areas. Furthermore, in 2018, we established the group-wide initiative Food and Agri to contribute to the more efficient, profitable, and climate-friendly production and processing of raw materials, not just from the sea but also from fields and forests. In our work, we focus on several SDGs such as goal 2) Zero Hunger, goal 7) Affordable and Clean Energy, goal 9) Industry, Innovation and Infrastructure, goal 12) Responsible Consumption and Production, goal 14) Life Below Water and goal 15) Life on Land.

The distribution of the world's food resources is skewed from a global perspective. The challenge is related to the paradox that while more than 800 million people in the world are still undernourished, on average we eat a third more calories than in 1961 and twice as much vegetable oil and meat. Around 25-30 per cent of all the food produced for people is not eaten. It is expected that by 2050, the planet will be home to around 10 billion people. Demand for food, materials and energy will increase. Therefore, in order to meet the world's needs we must develop new processes and technological solutions so production can be increased sustainably and we can make better use of the food we already produce.



DAT4.ZERO: Zero Defect Manufacturing

DAT4.ZERO is an EU project involving more than 20 partners that aims to provide European companies with essential tools that enable them to successfully reduce production errors and non-conformities – with the goal of zero defect manufacturing (ZDM). The project uses digital technologies such as artificial intelligence and machine learning in addition to the human aspect to prevent errors. Zero defect manufacturing not only helps improve quality and productivity, it also contributes an important dimension to sustainability with reduced waste, reprocessing and material consumption.



THE PROJECT IS FUNDED
BY HORIZON 2020

SDG:

8 DECENT WORK AND ECONOMIC GROWTH

THE PROJECT ALSO CONTRIBUTES TO:

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

17 PARTNERSHIPS FOR THE GOALS

Research on food waste in the Norwegian seafood industry

The estimated food waste from salmon, whitefish, pelagic fish and other seafood amounted to 12,400 tonnes in 2020. The total GHG emissions associated with food waste were approximately 30,600 tCO₂e and the financial losses amounted to NOK 530-600 million. The main causes of food waste are fish falling on the floor, a lack of personnel training/experience, poor planning and time pressure.

SINTEF conducts continuous research into food waste in the seafood industry, including registering and reporting food waste, both on a sector-by-sector basis and collectively for the industry. The aim of this work is to identify solutions that can reduce food waste.

SDG:

2 ZERO HUNGER

THE PROJECT ALSO CONTRIBUTES TO:

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

14 LIFE BELOW WATER

SINTEF has significant activity related to food through its work on developing new solutions for more efficient and sustainable food production both onshore and offshore. SINTEF is involved in projects that focus on a digital transformation of the agricultural industry. The end goal is to lower the threshold required to implement precision agricultural methods, which in turn will permit the optimal use of resources such as seed, water, fertiliser and pesticide. We are contributing by developing digital and autonomous solutions and determining optimal energy solutions for both farmers and breeders for greener and more climate-friendly food production.

Aquaculture will be an important component of future food, energy and raw material sources and good interaction between the agricultural and marine sectors will be crucial in feeding the world's growing population.

Reducing food waste and the total utilisation of all raw materials are prerequisites for sustainable growth.

Clean Water and Sanitation

Clean water and sanitation also require new solutions, and these must be secured for the sake of the world's entire population. The frequency and intensity of precipitation has increased dramatically in the North, while water shortages are causing enormous tragedies in many countries (droughts, fires and more). Water quality in Norway has also deteriorated as a direct consequence of climate change. In addition to this, there are concerns about emerging new pathogens and micropollutants in water, which may constitute a danger to people and ecosystems.

Water supply and wastewater facilities are critical infrastructure. Other driving forces that impact public buildings and infrastructure are urbanisation, security, less economic room for action, rapid advances in technology and digitalisation. Many cities have a large maintenance backlog when it comes to existing infrastructure, and safety, vulnerability and preparedness routines are not always satisfactory.

Environmental protection and a greater focus on resource optimisation are also important drivers. The requirements of the Water Framework Directive regarding chemically and ecologically unaffected water bodies must be complied with and stricter regulations are expected for sewage sludge and wastewater.

Reliable, user-friendly solutions against legionella in tap water

Legionella bacteria are found naturally in freshwater and wet soil all over the world. However, in tap water installations with favourable growth conditions, the bacterium can multiply, become infectious and cause severe legionnaires' disease. This can happen when small water droplets or aerosols containing bacteria are inhaled while, for example, showering or swimming.

In the Sessile project, SINTEF is developing models that assess and predict the risk of legionella and ensure good water quality in buildings in a sustainable and cost-effective manner.



SINTEF contributes expertise within:

- Managing the consequences of climate change in the form of stormwater management, using reservoirs for flood mitigation, nature-based solutions, not just for stormwater but also for improving water quality.
- Safe and sustainable water treatment and resource recovery, which must safeguard public health while conserving resources and minimising emissions and waste.
- Integrated water management, which combines knowledge about water resources, water management infrastructure, economics, and society to develop sustainable solutions throughout the water cycle.
- The water industry is transitioning from analogue to digital solutions for processes and systems. This is providing opportunities to improve existing technology and working methods ('digital maintenance') and to develop new solutions for controlling water quality and security of supply.

Societal security

SINTEF has a group-wide initiative within societal security, which is of relevance to goal 16) Peace, Justice and

Strong Institutions. This goal aims to promote peaceful and inclusive societies in order to ensure sustainable development, ensure access to legal protections for all, and build well-functioning, responsible and inclusive institutions at all levels. SINTEF's societal security efforts involve research into hybrid threats, cybersecurity, sensor systems, security of supply, climate adaptation and humankind's important role in relation to digital and autonomous systems.

SINTEF's societal security research is currently intensifying its focus on the topic of hybrid threats, which is an increasingly relevant issue in relation to security policy changes in Europe and between the world's major powers. Hybrid threats designed to attack or project strategic influence have both local and national impacts and are therefore both a societal and a government security problem.^[15] They can involve synchronised attacks on society via the combined means of disinformation, cyberattacks, business investments, economic or diplomatic sanctions, or the use of armed forces. Attacks can be carried out by military or private groups, sometimes via proxies, and seek to influence political, social and economic decisions and control social developments.

MEDSAM: Models for citizen co-creation

MEDSAM studies models for citizen co-creation as a method for local community development. We involve a broad spectrum of citizens via the municipality by facilitating meetings and arenas, although we always base our work on an existing local community development initiative. Co-creation takes place through the municipality providing assistance via its resources, professionals and experts and the local community mobilising and getting involved. This has resulted in everything from hiking trails to new schools and inclusion projects. The project is led by NORCE and SINTEF is one of several research partners.



SDG: THE PROJECT ALSO CONTRIBUTES TO:



[15] NSM 2022, "Risiko 2022: økt risiko krever økt årvåkenhet" https://nsm.no/getfile.php/137798-1644424185/Filer/Dokumenter/Rapporter/NSM_rapport_final_online_enekeltsider.pdf

SINTEF’s work on hybrid threats takes a wide-ranging scientific approach and seeks to coordinate our knowledge within public security in all areas to produce the best situational awareness of future threats. It therefore includes security perspectives within media and society, cyber, economics, energy supply, industrial innovation, food and water supplies, human factors and other.

Hybrid threats are difficult to detect as they can work at a low intensity over a long period of time, combining methods and involving a mix of actors, and they cut through geographical boundaries and traditional ideas of what constitutes war and peace. SINTEF’s research in this field specifically looks at how democratic institutions may be strengthened against potential attempts to negatively influence social development for strategic purposes. The approach therefore combines focus on stronger cognitive resilience among the population and technology that enable complex situational awareness for security authorities.

A number of paradoxes arise in the intersection of security and freedom. Freedom of speech, freedom of the press and the right to information are principles that we seek to protect, while the impact on public opinion of disinformation and fake news makes our society particularly vulnerable in a politically unstable Europe. The research particularly focuses on a social science understanding of the changed security situation both in Norway and abroad. The development of digital tools aimed at adding methods for emergency preparedness and defense is part of this and requires computer engineers and social scientists to work together closely.

SINTEF also has some activities of relevance to the other SDGs, as illustrated by the following examples:

Himalayan Aquatic Biodiversity and Hydropower

Reliable and affordable access to energy is one of the main measures for eradicating poverty. Today, 30 per cent of Nepalese people lack a connection to the public power grid. Theoretically, the country’s hydropower development potential is substantial, and it could supply the entire region with electricity. Research scientists from SINTEF are supporting the World Bank to advise the Nepalese government in identifying measures that will ensure a sustainable development and management of hydropower taking into account people, nature, and wildlife.



SDG:

THE PROJECT ALSO CONTRIBUTES TO:

Schools of tomorrow: promoting pupil well- being, motivation and a desire to learn

How well do today’s schools really work and are they being used as intended?

An interdisciplinary project researching the interplay between architectural design, education and organisation of the school day is aiming to develop knowledge about how a school’s physical environments are used and experienced by different users, and how this corresponds to the educational goals and conditions.



SDG:



Model for assessing green jobs in Turkey

The objective of the Green Jobs Assessment Model is to measure the social and employment effects of each country’s local policies for implementing their obligations under the Paris Agreement. The model is based on data on the individual country’s economy and reflects the structural changes that follow the implementation of measures. The model was developed in close cooperation with the International Labour Organisation (ILO) and is used by the UN Development Programme.

By describing employment effects by gender, one will be able to design policies that both address climate change and facilitate an equal labour market. The model shows that it is the service sector, with its preponderance of women, that will grow with the transition to more circular production regimes.



SDG:



THE PROJECT ALSO CONTRIBUTES TO:

Home buying experiences of people with disabilities

Many people with a disability find buying a home in the ordinary housing market both possible and attractive.

Owning your own home is an important goal in Norwegian welfare policy. Ownership and co-determination as far as your own home is concerned is important for both equality and normality.

A SINTEF report shows that we should rethink housing development and housing provision for people with disabilities. The process can be complex and resource intensive: ‘Rent-to-buy’ can often be a good solution. However, in addition to a home, residents often need adapted services and an inclusive neighbourhood.



SDG:

THE PROJECT ALSO CONTRIBUTES TO:

SFI Industrial Biotechnology

Industrial biotechnology is the industrial application of modern biotechnological methods, enzymes and micro-organisms for the production of a variety of products. Examples include chemicals, pharmaceuticals, food and feed ingredients, detergents, textiles, energy and materials.

Globally, industrial biotechnology is expected to become an important driver behind establishing a much-needed sustainable bioeconomy. In partnerships between research, business and industry clusters, SFI Industrial Biotechnology ensures close collaboration between companies and prominent research environments and contributes to faster effects within competence development, technology transfer, internationalisation and the education of new researchers.



SDG:

THE PROJECT ALSO CONTRIBUTES TO:

4

SINTEF's operations and management are based on sustainable principles

A non-profit research group tasked with realising the Foundation's purposes

As a foundation, SINTEF has no owners, but it does have a responsibility to fulfil its purpose and social mission. No dividends can be paid out and our entire surplus is used to boost the organisation's financial strength and innovation capacity through improving expertise and investing in infrastructure and strategic priorities.

As a non-profit foundation with a board and council, we have involved important groups of stakeholders in our formal corporate governance. For example, SINTEF's

Council is chaired by NTNU's rector and includes employees, business people, experts from NTNU and the University of Oslo, employer and employee organisations, and people with a background from the public sector.

The [SINTEF Foundation's articles of association](#) describe its purpose and overarching management principles. The Board produces a [report describing SINTEF's corporate governance](#) every year. [Our annual report](#) presents our financial results.



Sustainability as part of management and organisation

Integrating sustainability into the core of how we work is not only important for our business areas. It is also about how we manage and organise ourselves.

The formal organisation of the group management team confirms the importance sustainability has in SINTEF's agenda. SINTEF established the position of EVP Sustainability in 2015 as an expansion of the position of Climate Director (2012-2015), formerly known as the Climate Technology Director (2008-2012). The position has been part of the group management team since 2008.

Historically, SINTEF's reporting on its internal sustainability performance has not been as high a priority. We are systematically trying to improve our dedicated annual sustainability reports, which we have now published since 2019, as well as how we integrate our

reporting on sustainability into SINTEF's other reporting. This reflects our ambitions, the external expectations of our clients, partners and society as a whole, as well as future legal requirements, including the EU taxonomy and upcoming sustainability reporting directives.

Our sustainability profile is also being strengthened in SINTEF's portfolio of startups. When new companies are established, SINTEF requires them to organise and manage themselves in line with the same principles as SINTEF, with the UN Global Compact's principles acting as guidance. In our experience, investors include sustainability in their investment criteria both because they want to contribute, but also because they want to assess and price risk.

In-house 'Green Teams' have been established (environmental working groups) at institute and group levels with responsibility for our internal green transition and eco-friendly operations.

The basis for SINTEF's work includes formal certifications. SINTEF must always strive to ensure that the requirements and expectations of our clients and other partners are properly met. SINTEF's management systems are certified in accordance with the internationally recognised standards, ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018. SINTEF's certificates were renewed for a new 3-year period in 2021. This means that we have a management system designed to ensure that SINTEF delivers products and services of the agreed quality, takes account of the external environment, and works systematically on its working environment and safety. SINTEF

promotes human rights and decent working conditions in connection with the production of goods and services. This also applies to our subcontractors at home and abroad.

SINTEF conducts ongoing client satisfaction surveys. The survey is sent to contact people in private and public organisations after projects are completed and we receive around 500 responses annually. The 2021 survey shows a satisfaction score of 4.53 measured on a scale from 1 to 5. The score was on a par with previous years and above the target of 4.5. Projects that receive a low evaluation score (1 or 2) are followed up directly with the client in line with the management system. The survey is used to increase value creation in future projects and identify areas with improvement potential. The results are shown on the following page.

Since 2017, all of our clients have also been asked to evaluate the contribution the activities make to innovation and the external environment. The clients confirm the positive results here too, although as the figure shows at a slightly lower level than the average for questions in the survey. In 2021, we saw a positive development in the assessment of how we are contributing to the external environment. SINTEF wants to make an even better contribution to competitiveness and societal solutions in line with the SDGs and our strategy.

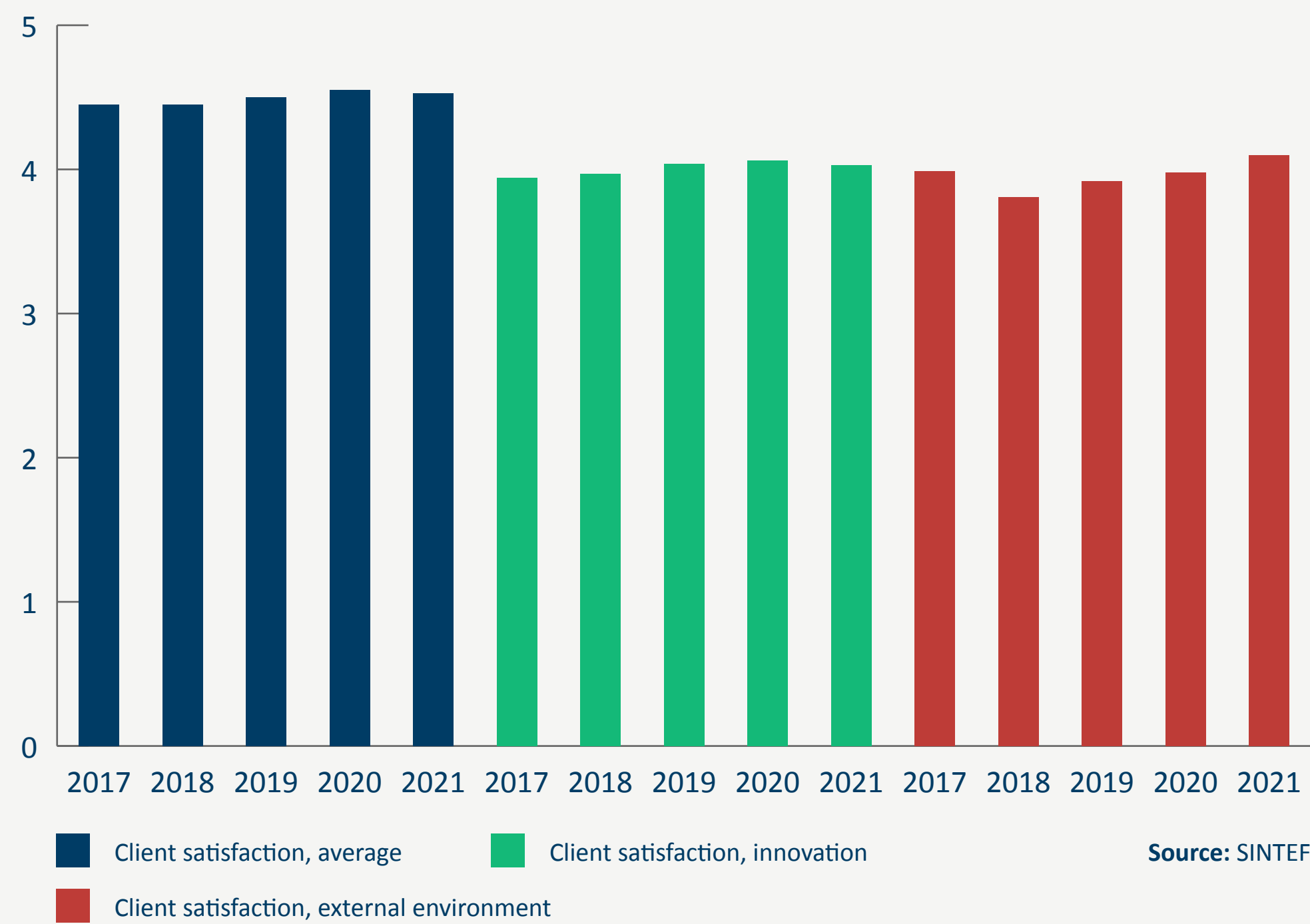
We are also paying greater attention to sustainability in our work with suppliers. This is reflected in requests for tenders sent out by SINTEF and in documentation following procurements. Today, we use SINTEF’s declaration on social responsibility and business conduct when we enter into contracts and when sending out requests for tenders for contracts under the auspices of the Group. We also apply procedures for the procurement of goods and services that establish that all procurements must comply with SINTEF’s code of conduct. The supplier is subject to an evaluation in all procurements over a threshold value. The evaluation covers all technical areas such as social responsibility, economics, IT, quality, HSE, subcontractors and ethics. We also always check whether or not the business concerned has documented its compliance with human rights principles and the ILO

convention, and that it has implemented the principles of recognised standards or guidelines for ethics and social responsibility, such as the UN Global Compact, GRI, SA 8000 and ETI. SINTEF promotes human rights and decent working conditions in connection with the production of goods and services. This also applies to our subcontractors at home and abroad.

In our experience, sustainability is very important to our employees, clients, and suppliers. The key figures included in supplier follow-up highlight our focus on sustainability and cover factors such as food waste, carbon footprint, ecology and fair trade, as well as employee satisfaction. One example where many of these are relevant is the supplier agreement we have signed for the procurement of furniture. The agreement focuses on the reuse, repair, maintenance, sustainable manufacturing, and transport of the furniture. Circular economy therefore has a key position in the agreement.

Work on ensuring compliance with the new Transparency Act, which comes into force in spring, is well under way. The Act requires organisations to survey and assess the negative consequences for fundamental human rights and decent working conditions that are directly linked to the organisation’s business activities, products or services via supply chains or business partners.

Our clients are satisfied and confirm that SINTEF contributes to innovation and the external environment (scale from 1 to 5)



SINTEF wants to reduce its climate footprint

SINTEF’s environmental policy governs how we operate our buildings and conduct our research activities. By systematically working to reduce SINTEF’s impact on the environment we are trying to live up to our own sustainability ambitions, fulfil our social responsibility and meet the expectations of our clients and the rest of the world.

2021 is the first year for which SINTEF is publishing a comprehensive reporting on GHG emissions. In the past, we have reported emissions from energy from properties and air travel. SINTEF’s scientific environment has developed a purchasing data-based model for efficiently calculating GHG emissions in line with the Greenhouse Gas Protocol standard. This will become a research-based tool that we also want offer to external clients. Systematically surveying emissions will enable SINTEF to reduce our climate footprint even more in the future.

However, we are aware that these are complex calculations that in all cases will be encumbered with some uncertainty and inaccuracy. It has not been possible to capture some marginal sources of emissions through available purchasing data, as described in more detail in the notes.

The climate reporting complies with the Greenhouse Gas Protocol and divides the emissions into direct emissions

from operations (Scope 1), indirect emissions from energy consumption (Scope 2) and all indirect emissions upstream in the value chain (Scope 3). According to the protocol, indirect downstream GHG emissions should also be documented. We have not done that in this year’s analysis because the data and method must be finalised. This can be included in the climate report for 2022. This will have a positive impact on SINTEF’s climate footprint since a large proportion of our portfolio and research results contribute to reducing or removing emissions (ref. chapter 3).

It is clear that the Scope 3 effects related to the purchase of goods and services are the largest emission category in SINTEF today. Next come Scope 2 emissions linked to energy consumption. The GHG emissions related to investments made in 2021 were also significant.

GHG emissions will be key figures that can be included in supplier follow-up and with total data about the footprint from purchases it will be possible to follow this up more holistically in the future. SINTEF had around 4,000 different suppliers in 2021. Based on the data from the climate report we can include an estimate of the emissions each individual purchase from individual suppliers represents. This key figure can then be used in the subsequent work on following up suppliers.

Climate Report 2021

	Total	Direct suppliers	Suppliers’ suppliers	Further in global value chains	Proportion of total purchases
Scopes 1 and 2	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e	Per cent
Scope 1 ^[16]	298	-	-	-	0.5%
Scope 2 ^[17]	5,578	5,578	-	-	1.0%
Scope 3 – Upstream	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e	Per cent
1. Purchased goods and services	12,055	1,572	3,167	7,316	83.8%
2. Capital goods	3,917	541	1,041	2,335	14.0%
3. Fuel and energy-related activities (not included in Scope 1 or Scope 2)	240	5	87	148	1.5%
4. Upstream transport and distribution	583	345	105	133	0.4%
5. Waste from operations	91	69	9	13	0.2%
6. Business travel ^[18]	401	389	4	8	0.1%
7. Employee ^[19] commuting	N/A	-	-	-	-
8. Upstream leased assets	11	0	3	8	0.1%
Total ^[20]	23,174	8,498	4,417	9,961	

[16] SINTEF owns eight company vehicles (four diesel and four electric) and a boat. Emissions from their use represent total direct emissions of 77 tonnes of CO₂ equivalents (tCO₂e). Around NOK 7 million in gas purchases represent direct emissions of 221 tCO₂e.

[17] SINTEF uses 24.15 GWh representing estimated emissions of 231 grams of CO₂ equivalents per kWh (gCO₂e/kWh) (source: IEA). SINTEF owns ~60 per cent of the total building space it uses. Energy emissions related to the ~40 per cent of building space not owned but used by SINTEF are calculated based on lease costs from providers of real property management services.

[18] Business travel is not included in the purchasing data from SINTEF’s accounts system. SINTEF’s travel agency has estimated the GHG emissions for all flights taken by SINTEF employees. Other travel expenses for employees are not included in the calculation. These amounted to around NOK 11.5 million in 2021, which represents less than 1 per cent of the total expenditure included in the analysis.

[19] Information about SINTEF employees’ compensated expenses was not available for reporting in the same degree of detail as other expenses. This amounted to NOK 19.7 million in 2021 and has not been included. In relation to the other expenses, this represents around 1 per cent of the total expenditure included in the analysis.

[20] No data on GHG emissions linked to the employees’ commuting was available for reporting.

Energy consumption, property, water and waste

SINTEF’s environmental action plan contains several measures aimed at more energy efficient operations and better waste management. For 2021, the information on our energy-related CO₂ emissions includes buildings managed by SINTEF Eiendom and owned by the SINTEF Foundation. A significant proportion of our building stock consists of laboratories that require continuous 24/7 operation, which means that they cannot be compared with ordinary office buildings. Nonetheless, SINTEF is working to improve and reduce energy use in areas where this is possible. In 2021, we continued to work on improving the energy efficiency of buildings owned by SINTEF. SINTEF’s water consumption varies greatly in the different buildings and reflects the proportion of the space used for laboratories. We are also working on how we can reduce our climate and environmental impact from activities in leased buildings and the climate results for these are included in Scope 3 above.

The waste reports from our suppliers have now been collated into a single report for SINTEF, which permits more general analyses of, for example, source separation rates. It is clear that the Covid-19 pandemic influenced

overall waste quantities, which were considerably lower in both 2020 and 2021 than in 2019. The source separation rate has remained relatively stable but low. The report also shows that the proportion of residual waste is high, and we need to raise awareness and improve practices with respect to waste separation.

SINTEF, in partnership with our suppliers, is continuously working to improve source separation routines for waste. To date, we have established a source separation system with separate waste fractions for household plastic and food waste linked to canteen operations, but the supplier does not have a reception system for the fractions. This has not been part of the government’s mandatory source separation requirements for business waste. We have

increased our focus on this and have several measures aimed at improving our source separation rate. In particular, we are working with the suppliers in Oslo to make correct source separation simpler.

Our vision for waste separation in SINTEF must be circular in order to preserve the assets and resources that good source separation will represent. We must focus on waste reduction and source separation, as well as ensuring that what cannot be reused/recycled goes to energy recovery through incineration. This must be done by increasing the awareness of all parties, from those who process the waste (employees) to those who treat the waste for us (the waste reception centre), with respect to how we want to reuse/recycle the waste we generate.

SINTEF is working on developing its premises and aims to ensure that all investments in new buildings satisfy the BREEAM-NOR Excellent standard. BREEAM-NOR is a Norwegian adaptation of BREEAM – Norway’s most widespread environmental certification for all types of buildings. The modernisation of our premises in Forskningsveien 1 in Oslo, which has a budget of NOK 165 million, will be completed in spring 2022. The project was supported by ENOVA because it is innovative and will, among other things, result in energy efficiency gains of 1,550,000 kWh per year and have a direct climate impact in Norway of 9,672,000 kg CO₂e per year.

	2017	2018	2019	2020	2021	KPI
Total energy GWh	28.65	26.96	25.95	25.23	24.15	24.35 in 2021
Reduction (from 2017) in energy consumption		Reduction of 5.7%	Reduction of 9.2%	Reduction of 11.9%	Reduction of 15.7%	>15% reduction in 2021 measured in relation to 2017 ^[21]
Source separation rate Trondheim	33	37	47	43	47	>60
Source separation rate Oslo	42	37	29	35	34	>60
Mains water consumption in millions of litres			31	29	26	None

[21] In SINTEF’s building operations by the end of 2021, measured in relation to 2017. The reduction is an estimate.

Travel

SINTEF’s ambition is to be a world-leading research institute. At the same time, we want to reduce our climate footprint from travel. Some travel activity will be required when an organisation, its clients and its partners are based in different locations across Norway and the rest of the world. These are factors that must provide a basis for assessing and prioritising what journeys have to be made.

The table below summarises emissions from SINTEF’s air travel, which is the travel activity we measure in relation to CO₂ emissions. The Covid-19 pandemic reduced travel activity in 2021 as well. CO₂ emissions from air travel fell by a further 26 per cent from 2020 to 2021, and compared with the last normal year, 2019, emissions have fallen by 85 per cent.

	2017	2018	2019	2020	2021
Kg CO ₂ per FTE from domestic air travel	444 ^[22]	427 ^[22]	607	135	136
Kg CO ₂ per FTE from international air travel	784 ^[22]	792 ^[22]	849	146	65
Total tonnes of CO ₂ from air travel	2,219 ^[22]	2,244 ^[22]	2,534	519	383

Source: Power BI (Berg Hansen and Maconomy)

More travel activity is expected going forward, although all departments have reviewed this so that they can reduce their activity compared with 2019. It will be important to keep an eye on this and to use emissions data from our flights as a basis for discussions within the organisation concerning emissions history and travel patterns.

SINTEF’s aim is to ensure that decisions about when travel is necessary are properly thought through so that we all contribute to achieving our shared ambition of reducing emissions.

Climate neutrality

SINTEF’s activities will produce GHG emissions, including from travel activities, for the foreseeable future. Therefore, we have given some consideration to whether or not we should purchase climate allowances or implement other

compensatory measures outside the organisation in order to help SINTEF become climate neutral. Companies such as Amazon, Microsoft, Starbucks, and Bosch want to achieve climate neutrality and aim to do so through both direct action in their own operations and compensatory measures. However, in our opinion, the most effective contribution SINTEF could make to climate neutrality would be to invest the funds we would otherwise have spent on allowances in our research on major and time-critical climate improvements for which there is currently no functional market. In the coming years, we will spend NOK 7 million annually on funding research into technologies and solutions that aim to result in the net removal of GHG from the atmosphere. This will take place through the establishment of the SINTEF Global Climate Fund, which we have invited external partners to join, as described in chapter 3 under ‘Climate Action’.

[22] Our provider of travel statistics changed its method for calculating emissions between 2018 and 2019, and the data from before this is not directly comparable with later data although it does provide an indication of trends.

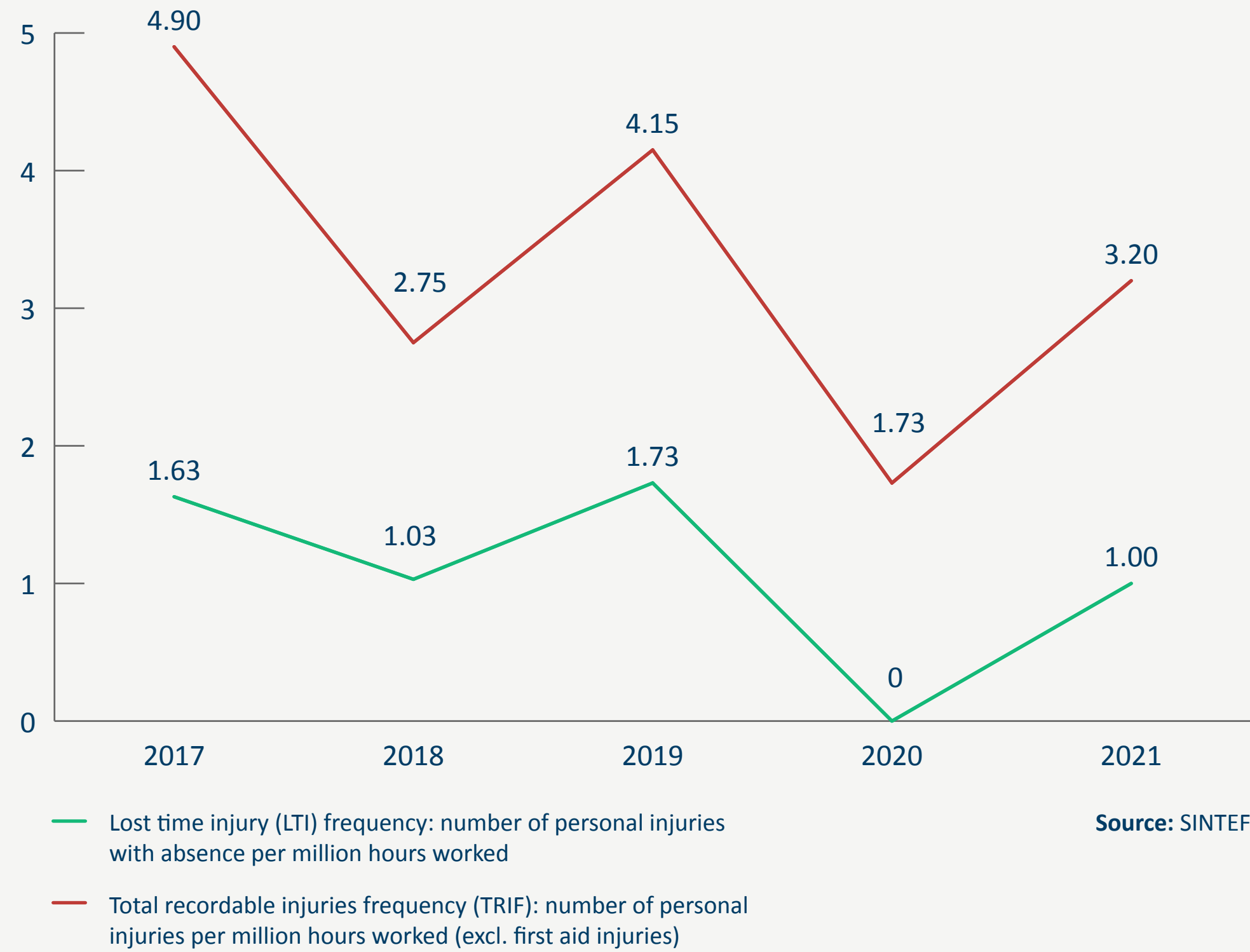
HSE is a top priority in SINTEF

HSE is a top priority in SINTEF and systematic efforts are made to safeguard the safety and working environment of employees. Our HSE ambitions were spotlighted in the work on SINTEF's strategic objectives in 2021: SINTEF must 'safeguard people through its systematic work on HSE in the organisation.' SINTEF's HSE standard must match the strategy, policy and objectives within the area of HSE.

Learning from incidents and sharing experience are important factors in improvement work and all HSE reports are reported to the group management team

on a weekly basis. Of the approximately 350 reports in 2021, 29 were accidents and 31 were near accidents. A decrease in the number of dangerous situations and observations was registered in 2020, although in 2021 the curves have levelled off and a slight increase was evident in the last tertial. The number of dangerous situations reported per 100 FTEs years was 15, which is the same as in 2020. One page HSE factsheets are prepared based on specific incidents. These are important for ensuring good experience transfer and are shared both internally and externally.

Personnel injury frequency [LTI and TRIF rates]



There was a total of 20 injuries in 2021. Of these, 12 required first aid and eight staff members needed medical treatment. Three incidents resulted in absence. This represents a lost time injury (LTI) frequency and total recordable injuries frequency (TRIF) of 1.0 and 3.2, respectively.

In November, there was an incident involving gas going astray at SINTEF Industry in which employees were exposed to phosphine gas. Three employees were directly involved in the incident and received medical follow-up. None has reported physical health problems following the incident. The incident has been investigated and several measures have been implemented.

In 2021, SINTEF’s sick leave rate was 3.0 per cent, and 0.2 per cent was work related. All sickness absence is systematically followed up in the institutes. The follow-up involves managers maintaining close contact with the person on sick leave and sickness absences being prevented through the proper exercise of management principles.

The ‘HSE boost’ is a continuous improvement project in SINTEF. The priority area for the period 2020-2022 is handling chemicals. The ‘chemicals boost’ has turned the spotlight on ensuring the right expertise, correct labelling and good registration of chemicals and exposure. One of the training measures was the ‘Au!’ campaign conducted in the period October-December 2021. The campaign consisted of a number of central and local activities where the goal was to create awareness around handling chemicals and contribute to employee training.

The Covid-19 pandemic heavily impacted the working day in 2021 as well, and SINTEF has the whole time established and communicated clear guidelines based on the government’s measures and recommendations. During the year, many of SINTEF’s employees worked from home for shorter and longer periods. At the same time, some employees have been at work throughout the pandemic in order to keep operations running in laboratories and workshops.

Sick leave



SINTEF’s employees – human rights, labour rights, gender equality and diversity

SINTEF is one of Norway’s most attractive employers. This is demonstrated by, among other things, the substantial number of highly qualified applicants who responded to our advertised positions in 2021. In the major Universum ranking of attractive employers, SINTEF is now ranked sixth by all Norwegian university and university college students in technical and natural sciences.^[23] The surveys also show that we are the second choice overall among the students from NTNU and UiO. Looking at SINTEF’s ranking among the students with the highest grades is also pleasant reading given that we have previously seen a modest decline among these attractive candidates. Nationally, we are now the second choice due to being number one among women and number three among men. This shows that our result-oriented employer branding work targeted at these candidates and institutions and others has borne fruit. However, we cannot rest on our laurels. Recruiting the most talented people is still demanding in a number of fields and in the current labour market it is we, as the employer, who are up for election and not the candidates. We are constantly actively trying to increase our attractiveness among ICT students in the Universum survey where we are ranked number 38. Those working in ICT fields now rank us as their 31st choice. This represents progress from 43rd place last year. As far as our ranking among those

working in natural sciences and engineering subjects is concerned, we are now in a pleasant fourth place and number one among all working female engineers.

When survey respondents are asked what they are looking for from a future employer, the answers are: inspiring purposes, opportunities to have an impact, corporate social responsibility and sustainability, but the most important factor in the surveys remains a good working environment. A significant shift towards the importance of good rewards and opportunities for high future earnings is also discernible.

Diversity and a good gender balance are essential for delivering on major social challenges. This is because diverse experiences, approaches and perspectives are required to succeed as a research institute. SINTEF’s strategy for people states that diversity and a good gender balance are important, and that we will achieve these through broad scientific expertise, gender, age, nationality, cultural background, and personal characteristics.

The diversity work is anchored in SINTEF’s Board and the group management team. SINTEF’s managers are responsible for building, developing, and using the resources that

diversity and gender balance represent within their areas. Managers are also given responsibility for allocating pay, development opportunities and other benefits in a manner that ensures equality between men and women. Diversity leadership is an important theme in the SINTEF Academy’s management development programme. SINTEF’s strategy for people also states that all employees are expected to contribute to diversity through complying with SINTEF’s core values, honesty, generosity, courage, and solidarity, by contributing what they have to offer and appreciating the particular contributions and competencies of others.

International employees provide SINTEF with access to valuable scientific and cultural competence. Some 30 per cent of all of SINTEF’s employees in 2021 came from

countries other than Norway. In total, they represent 80 different countries with the largest groups with international backgrounds coming from Germany, France, Italy, and Sweden. This shows that SINTEF is an attractive place to work for international researchers and that we are helping to recruit highly qualified labour to Norway. SINTEF has established an integration programme for international employees and their families to ensure international employees are properly looked after. The programme offers expat services, free Norwegian language courses and teaching in English in the SINTEF Academy. The working environment survey has documented that international employees enjoy working at SINTEF.

Diversity based on country of birth

	2017	2018	2019	2020	2021
No. of countries excl. Norway	75	72	74	74	80
Proportion of international employees	23%	24%	26%	28%	30%
No. of international employees	436	469	518	571	632

Source: statistics for annual report as of December 2021

[23] Universum Survey, Norway. <https://universumglobal.com/rankings/norway/>

SINTEF’s goal is to increase the proportion of women among our researchers and managers. SINTEF’s CEO is a woman and the proportion of women in the group management team is 38 per cent. SINTEF strives to recruit women when hiring and to develop female managers and researchers from within our own ranks. Nevertheless, the structural biases that exist between fields in educational institutions continue to be reflected in SINTEF’s recruitment base.

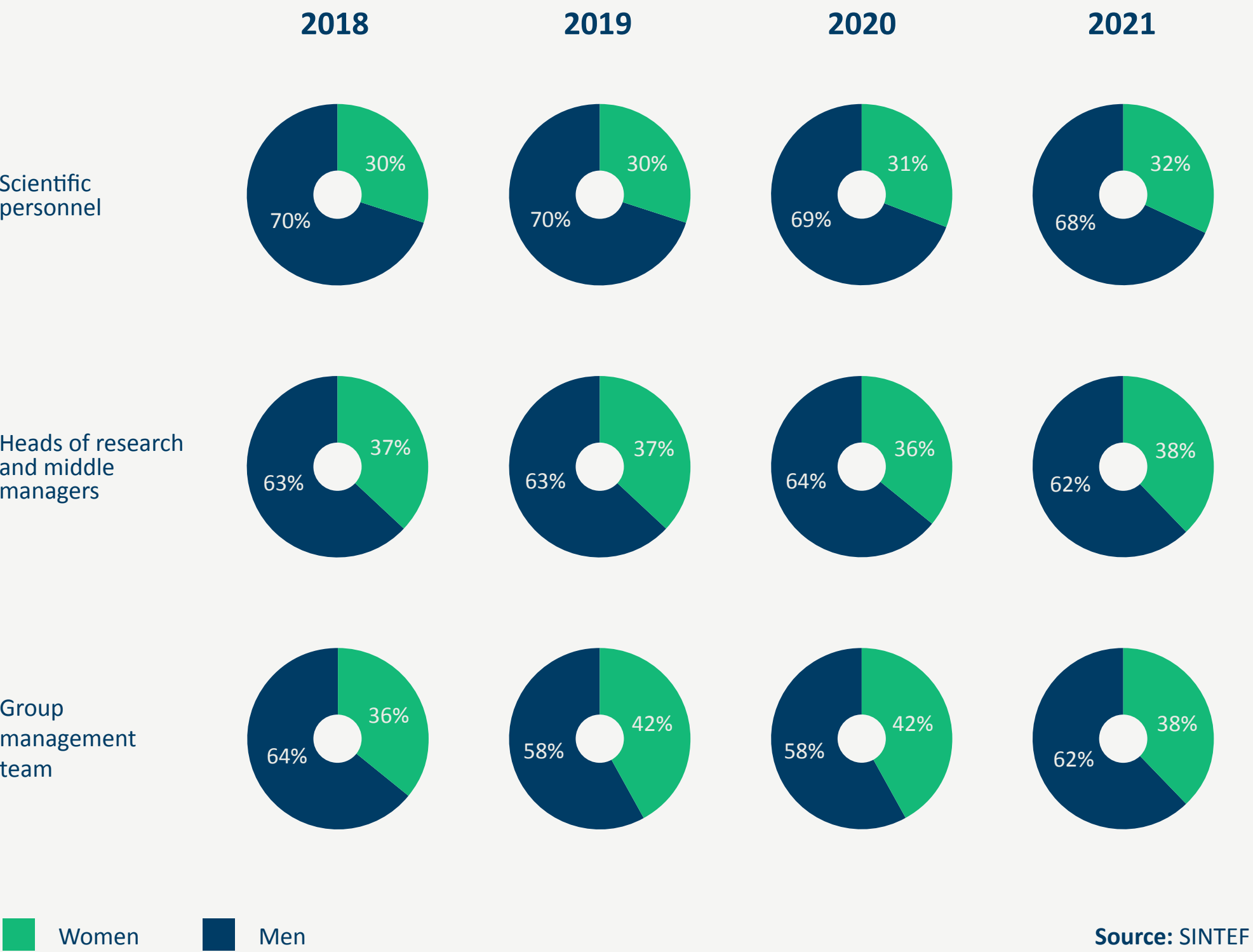
SINTEF has approved a Gender Equality Plan in line with the requirements of the EU and the Research Council of Norway. The plan will provide a basis for the further development of gender equality and diversity in the organisation.

Because of the high degree of diversity, we are aware that our employees have different needs. SINTEF, therefore, facilitates flexible solutions to meet the needs of individuals. Wherever possible, we make adaptations for employees who develop or have disabilities, and during recruiting we focus on competencies, not limitations due

to a disability. Another important area requiring facilitation is employees with children. In practice, all employees have flexible working hours, with core hours between 09:00-15:00 when one is expected to be present, and flexitime periods between 07:00-09:00 and 15:00-17:00. This is practised liberally, and most employees are able to make use of flexitime within core hours as well. Employees who have been on parental leave for more than 3 months in the last year receive at least an average pay rise. This may only be deviated from with reasonable cause, which cannot be the parental leave.

SINTEF has a good, well-regulated relationship with the trade unions and full freedom of association is practised on a par with other Norwegian companies. Trade union representatives attend all courses for new employees of SINTEF, both Norwegian and international employees. The representative informs the course participants about the work of the trade union, what it is and why it is important. Around 70 per cent of SINTEF’s employees are members of a trade union.

Gender distribution – scientific personnel and managers



We also want to offer employees good conditions, across different life situations. SINTEF has a modern hybrid pension scheme with a maximum rate for contributions. An extra contribution is paid for women due to their higher life expectancy. Our insurance schemes are also very good. We emphasise having coverage that is as similar as possible at work and in leisure time, and we only make exceptions where legislative restrictions exist. If employees become ill or will be taking parental leave, SINTEF covers the difference between the amount paid by the public purse (up to a maximum of six times the national insurance basic amount – G) and the full salary of the employee.

According to SINTEF’s code of conduct, we must work to achieve a good working environment characterised by equality and opportunities. SINTEF’s working environment surveys are a good indicator of whether we are achieving this goal.

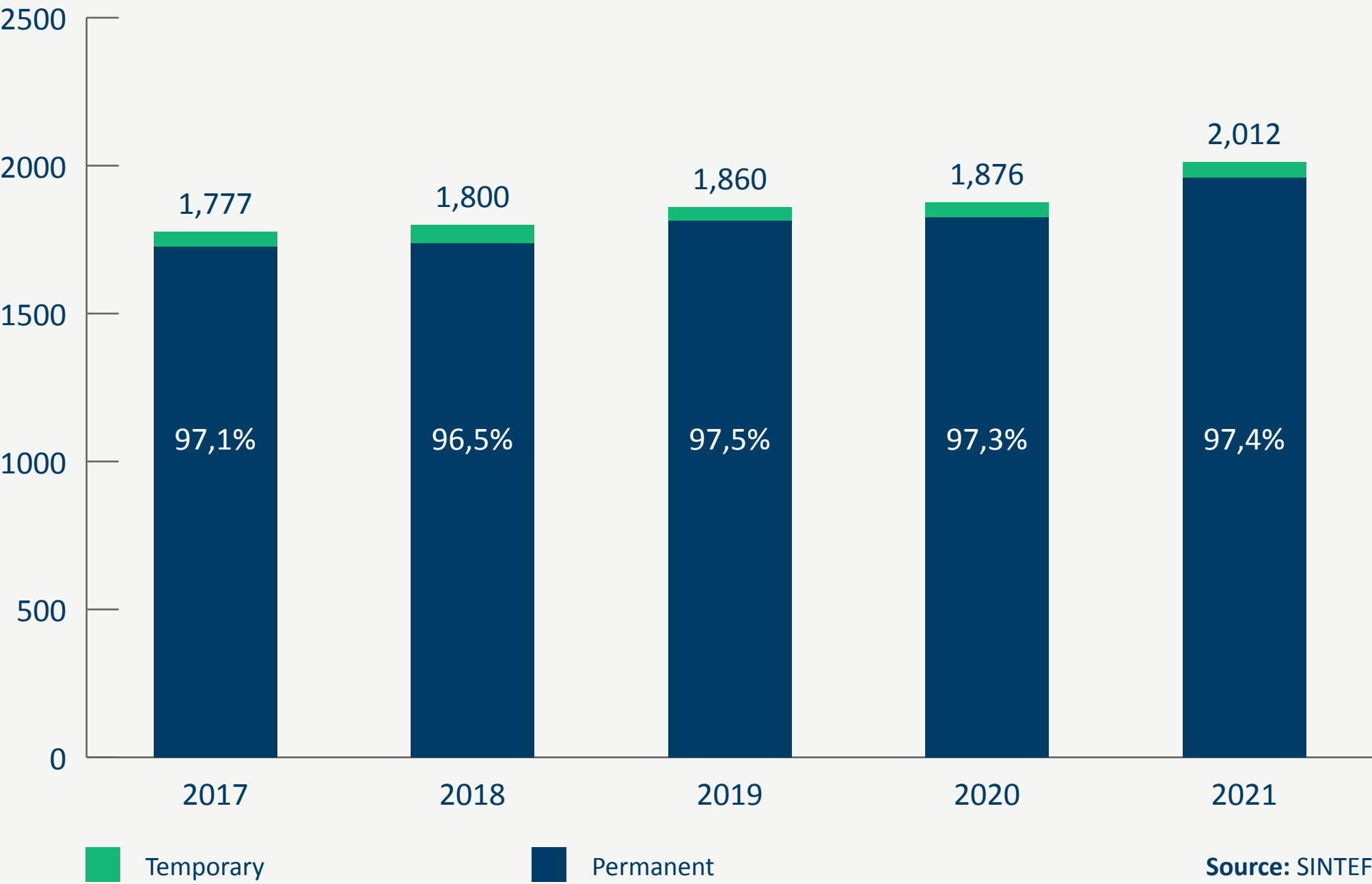
The response rate to working environment surveys is usually high and in January 2022 it was 94 per cent. We want SINTEF to be an attractive place to work with unique development opportunities, which the working

environment survey indicates it is. This is a consequence of the fact that we have done good work on developing SINTEF’s working environment over time.

SINTEF has donated to the annual TV fundraising campaign since 2007, and in addition to a well-deserved Christmas gift for the employees, SINTEF also donated a charitable Christmas gift in 2021. The NOK 120,000 Christmas gift from SINTEF, which also triggered NOK 15,000 from each of its partners EuroAccident and MyWorkout, was shared among five NGOs: Mental Helse, WWF – Plastic in the Ocean, the Norwegian Childhood Cancer Society, the Church City Mission and Amnesty International.

We employed 2,146 people (2,012 FTEs) at the end of 2021. Some 61 per cent of SINTEF’s researchers have a PhD. Most jobs in SINTEF are permanent positions. To the extent that temporary positions are used in SINTEF, this is done in special cases, such as temporary posts and to bring in particular expertise in individual projects. In 2021, 2.6 per cent of the workforce were temporary employees. We believe that offering permanent positions makes us an attractive employer and partner.

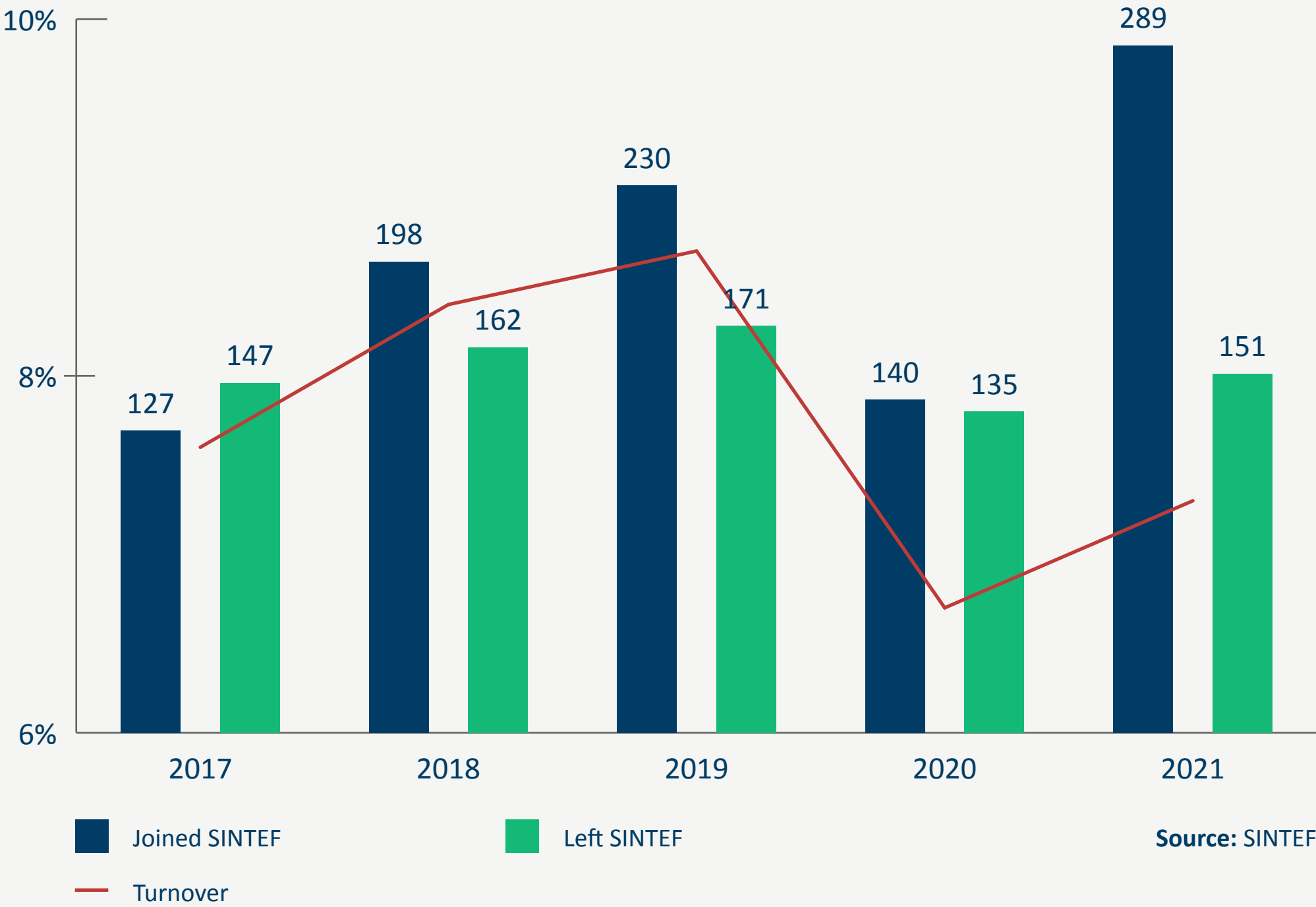
FTEs as of December



Both attracting and retaining the right expertise are crucial to SINTEF’s success. Over the last 4 years, there has been an increase in new recruitment, and we are experiencing a good supply of qualified applicants within most fields. At the same time, we view it as positive, and part of our social mission, that, through their work, employees of SINTEF are developing insights and skills that represent attractive competencies for business and other organisations, and thereby contributing to strengthening their capacity for innovation.

The SINTEF Academy is a strategically important tool for developing employees and the organisation. Our overarching goal is to provide employees and managers with the knowledge they need to be successful in their work and for SINTEF to achieve its strategic objectives. In 2021, a total of 458 employees took part in our mandatory classroom courses, of which 201 were new employees who took part in our 2-day ‘Welcome to SINTEF’ course. Management programmes, project management training, and our digital academy with introductions and detailed training within machine learning, optimisation and digital systems are also key parts of our training provision.

New hires and turnover



Ethics, anti-corruption, and good management are prerequisites for our activities

Ethics constitute an integral part of SINTEF’s strategy and apply to all employees. The group management team frequently discusses ethical dilemmas relating to the activities.

SINTEF has a clear ethical platform, which is also set out in our ethical compass.

Ethics training was provided in four different courses run by the SINTEF Academy in 2021. Nine project manager courses were completed with a dedicated module on ethics. A special course module on ethics and management has been produced for each of the management development programmes: ‘The Manager Platform’ and ‘Good Management in SINTEF’, with an emphasis on the ethical responsibilities of managers and training through ethics exercises. A total of two management courses including ethics training were carried out in 2021. Work on a plan for an e-learning ethics module started in 2021 and will be completed in 2022. Four training modules in ethics, which form part of the SINTEF Academy, have been continued: (1) ‘Course on Research Methodology’, (2) ‘New Project Manager course’, (3) ethics module for ‘The Manager Platform’, and (4) ethics module in ‘Good Management in SINTEF’.

Our research ethics are based on the guidelines from national research ethics committees, the principles promoted by the European Group of Ethics in Science and New Technologies, as well as international conventions and Norwegian law. Our business ethics, relationship ethics and research ethics are well aligned with SINTEF’s vision, values, goals, and social mission.

SINTEF appointed an Integrity Committee for the area of research ethics in 2021. The committee meets at least once a year and in cases where suspected deviations from research ethics have been reported. The Integrity Committee will also support the ethics ombudsperson in other matters to do with ethics as required.

During the course of last year, the ethics ombudsperson has been contacted by employees about various concerns and ethical questions. These were about research ethics, including publication rules, line manager and project manager responsibilities and describing ethics in EU proposals. There were also various enquiries concerning role descriptions or uncertainty related to a work situation. The ethics ombudsperson contributed to departmental meetings, management meetings and

meetings of the group management team in which the topic of ethics was discussed.

The procedures for ethics can be found on SINTEF’s intranet. These state, among other things, that SINTEF believes it is important to have a good climate in the organisation where people feel comfortable about expressing their opinions. Employees are encouraged to report wrongdoing. The routine describes what is meant by wrongdoing, the whistleblowing procedure, the administrative procedures in whistleblowing cases, as well as the protection of whistleblowers and follow-up of whistleblowing cases. A number of whistleblowing cases/cases of concern were reported in 2021 and were considered by a whistleblowing committee, one of which was considered in line with the new procedure for whistleblowing. Other cases were resolved through dialogue and clarification in the line organisation.

Transparency, audits and internal audits continue to be considered important. SINTEF conducts advance checks of foreign companies through the RDC due diligence database to obtain information about whether a company has previously been found guilty of corruption or other irregularities such as bribery, price fixing

or child labour. Such checks must be carried out before project work or partnerships are commenced with foreign companies so that a careful assessment can be made of whether SINTEF should collaborate with the particular company. SINTEF makes use of Transparency International’s corruption index database and the associated social analysis for each country. SINTEF’s third important source is information from the Norwegian Ministry of Foreign Affairs. SINTEF is a member of Transparency International, follows their annual corruption conferences and receives information about corruption and ongoing anti-corruption work.

SINTEF’s management system includes a requirement regarding the proper management of ethics and social responsibility, and this is reflected in our code of conduct and in the 15 overarching policy documents. One important management policy in this context is SINTEF’s policy on defence-related research and development, which specifies principles for performing research activities for military purposes and describes our attitudes and ethical principles in relation to the dilemmas that arise within these types of research activities.

5

The way forward

This year's sustainability report summarises our work in 2021 and some trends in our activities. In 2022-2023, we will continue to work on our corporate strategy and how sustainability is integrated into it, in line with our updated strategic objectives.

Among other things, we want to look at new measures for growth in areas that promote sustainability and encourage transition in business and the public sector.

It is also important to clarify our future ambitions for the reporting. This year's report is a step in the right direction to producing a clearer stakeholder and materiality analysis, as well as a more complete climate report. It is important to work on these improvements, not least because of our strategy of seeking to make an impact in society, as well as society's ever-higher expectations and requirements for how business and enterprises create and take account of sustainability through their activities.

SINTEF will work on new improvement measures for our 2022 reporting and beyond. The measures that need to be assessed and enhanced include:

- Further defining our organisation's own sustainability ambitions
- Addressing climate risk and biodiversity risk in our own activities
- Using the stakeholder and materiality analysis to standardise the report
- Addressing new legislative sustainability requirements that affect us
- Collating the annual and sustainability report into a single publication
- Working towards the external auditing of non-financial information
- Considering mapping the portfolio in new ways given the challenges of mapping in relation to the SDGs, their time horizon of 2030, and the introduction of the EU taxonomy as formative for businesses
- Working on systematising and potentially mapping the impact of our research

With our vision of 'Technology for a better society' SINTEF is highly motivated for the future!



Clarifications

- Page 19: The Iliad project received support from the EU’s research and innovation programme Horizon 2020 under grant agreement no. 101037643. SINTEF is responsible for the contents of this project description, and it may not necessarily match the EU’s perceptions.
- Page 26: The REFHYNE project received support from Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement no. 779579, as well as from the EU’s research and innovation programme Horizon 2020, the Hydrogen Europe programme and Hydrogen Europe Research. The REFHYNE II project received support from the EU’s research and innovation programme Horizon 2020 under grant agreement no. 101036970. SINTEF is responsible for the contents of this project description, and it may not necessarily match the perceptions of the FCH and the EU.
- Page 35: The TULIPS project received support from the EU’s research and innovation programme Horizon 2020 under grant agreement no. 101036996. SINTEF is responsible for the contents of this project description, and it may not necessarily match the EU’s perceptions.
- Page 37: The SMILE project received support from the EU’s research and innovation programme Horizon 2020 under grant agreement no. 101016848. SINTEF is responsible for the contents of this project description, and it may not necessarily match the EU’s perceptions.
- Page 44: The DAT4-ZERO project received support from the EU’s research and innovation programme Horizon 2020 under grant agreement no. 958363. SINTEF is responsible for the contents of this project description, and it may not necessarily match the EU’s perceptions.

Sources

- References to external resources are provided in footnotes/figures.
- Other use of SINTEF’s data and content from, among other places, Sintef.no and Gemini.no.

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