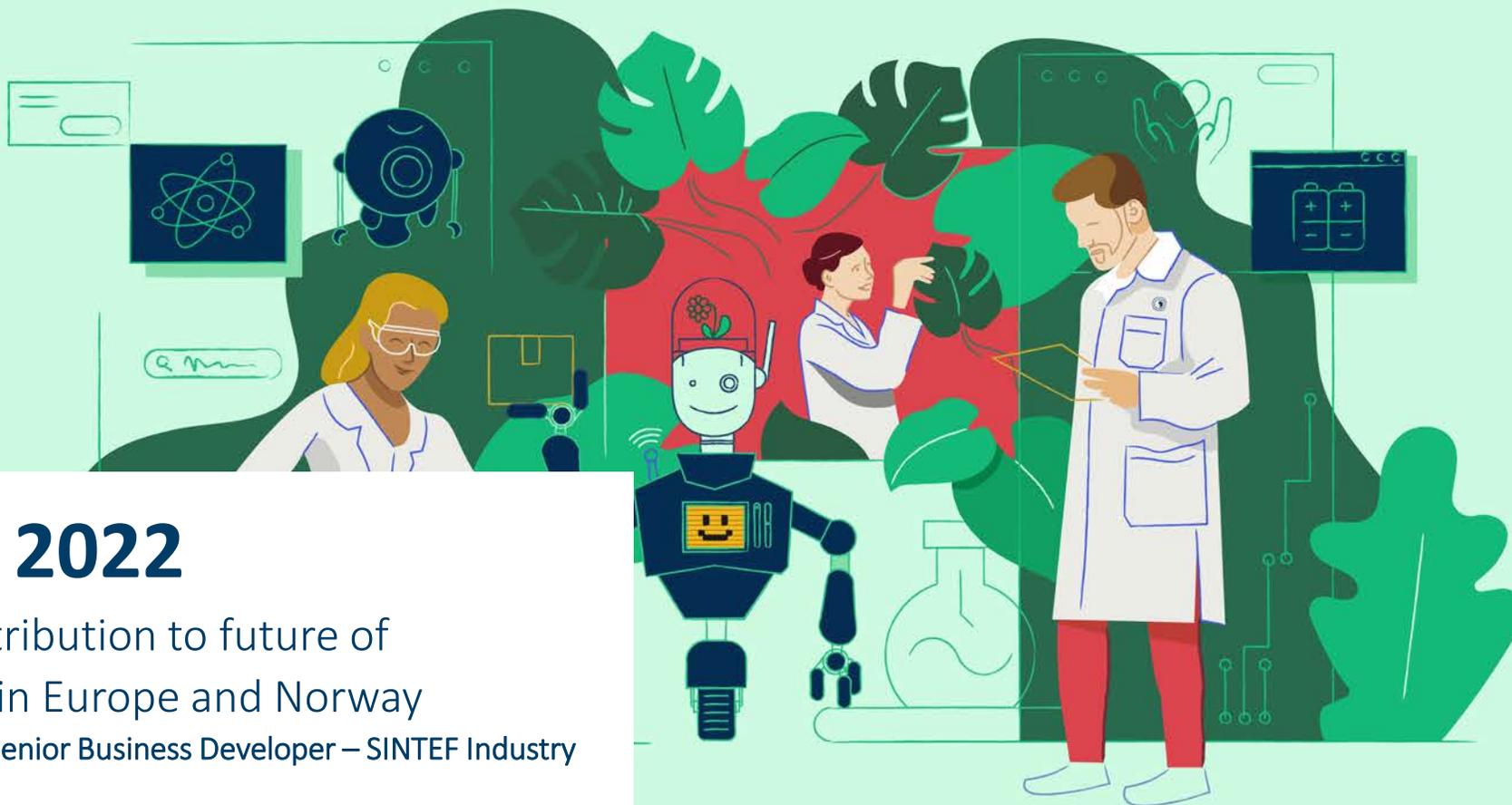




SINTEF



DigiBio 2022

SINTEF's contribution to future of
bioeconomy in Europe and Norway
Christian Simon – Senior Business Developer – SINTEF Industry



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- I. SINTEF. Who we are
- II. SINTEF involvement in H2020
- III. PYROCO2 and PERFECOAT. Two examples of SINTEF engagement and contribution
- IV. Contribution to bioeconomy and digitalisation





SINTEF

One of Europe's largest independent research organisations

SALES



€ 334.5

million

EMPLOYEES



2000

PROJECTS



6800

CLIENTS



3400

GLOBALLY

€ 46.2 million

PUBLICATIONS

5100

NATIONALITIES

75

CLIENT SATISFACTION

4.6 out of 5



SINTEF

Our key roles in society



Research and innovation

We generate new technologies and knowledge together with our clients



Laboratories and software

We build and operate key research infrastructure



Commercialisation

We create new products and businesses



Thought leadership

We offer advice and knowledge that informs public debate and policymaking



SINTEF

Vision: Technology for a better society

Expertise from ocean space to outer space





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We invest in laboratories

NOK 1.2 billion invested in laboratories, scientific equipment and other operating assets in the last 10 years

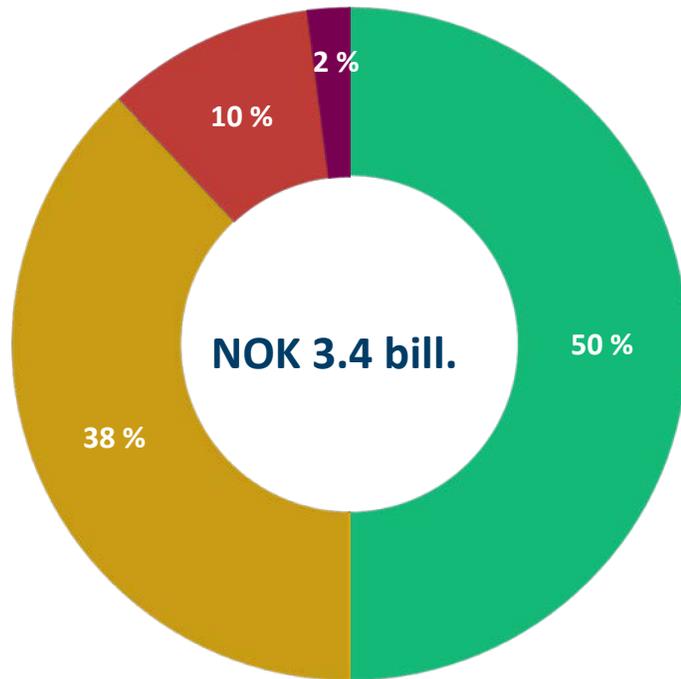


Technology for a better society



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Revenues obtained via open competitive tenders



■ Business and public sector — 50%

■ EU-/RCN-funded projects — 38%

■ Basic grant funding from RCN — 10%

■ Other revenues — 2%

EU research is important

- The EU and the UK are the main market for Norwegian business and industry
- Contributes to Norwegian competence and technology being competitive and relevant in European and global markets
- We have the opportunity to influence Europe's political and strategic initiatives
- Together with legislation and other funding mechanisms, Horizon Europe is one of the EU's most important tools for achieving goals and realizing the policy in 'Green transition'
- The EU is the key to Norway's success in restructuring and can achieve Norway's climate ambitions





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SINTEF has many partners from H2020 projects

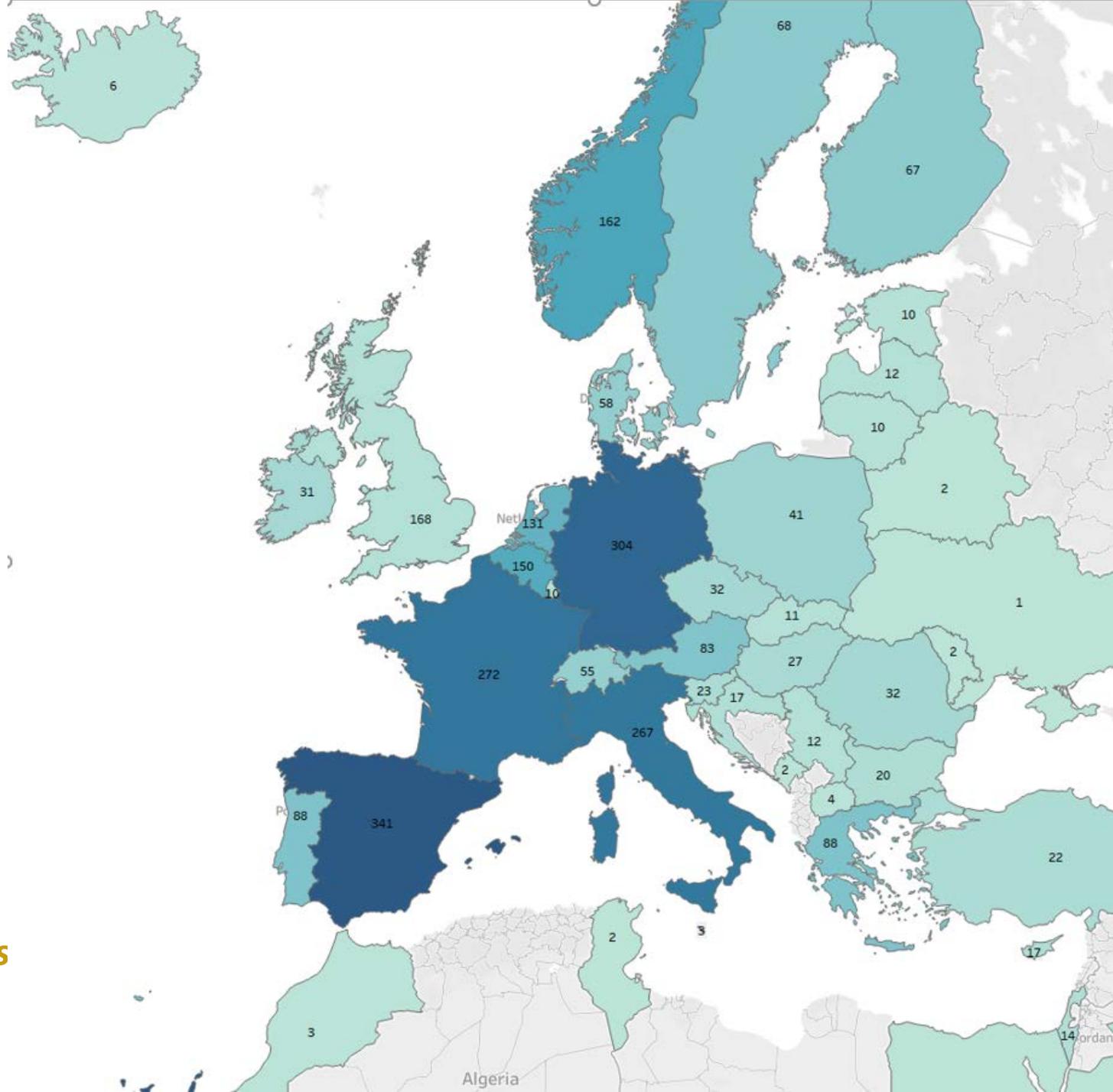
2764 partners are distributed

- 1690 companies
- 403 universities
- 379 institutes
- 116 from the public sector
- ...& 179 outside the above categories

The partners come from a total of 64 countries

Kilde: eCorda.

Note: Last data are from April 2021.



Rapid development and scaling require environments with a high success rate

9 of 11 projects involve SINTEF as R&D partner



SINTEF i Grønn Plattform

- AlgOpti – CO2-nøytralt laksefôr fra industri
- AluGreen – Ny bruk av resirkulert aluminium
- Ammonia Fuel Bunkering Network
- Avfallsfrie byggeplasser
- Norwegian Battery Packing Network
- Carbon Links – Storskala CO2-lagring
- Hybride sol- og vannkraftverk
- Ocean Grid – nett for havvind
- Zero Kyst – nullutslipps fiskefartøy og infrastruktur

Teknologi for et bedre samfunn

Success rate H2020:

- EU average: 12%
- Norway average: 15%
- SINTEF: 23%



SINTEF **Green Deal-prosjekter**

- REFHYNE II: 100MW hydrogenelektrolyse
- PYROCO2: Konvertering av CO2 til produkter
- ARV: Energieffektiv og sirkulær byggenæring
- TULIPS: Bærekraftige flyplasser
- StoRIES: Økosystem for energilagring
- ILIAD: Digital tvilling av havet
- ZeroW: Forsyningskjeder mot matsvinn
- ENOUGH: Klimanøytrale næringskjeder

Teknologi for et bedre samfunn

SINTEF received totally 16.5% of all the Green Deal fundings, corresponding to 295 M€

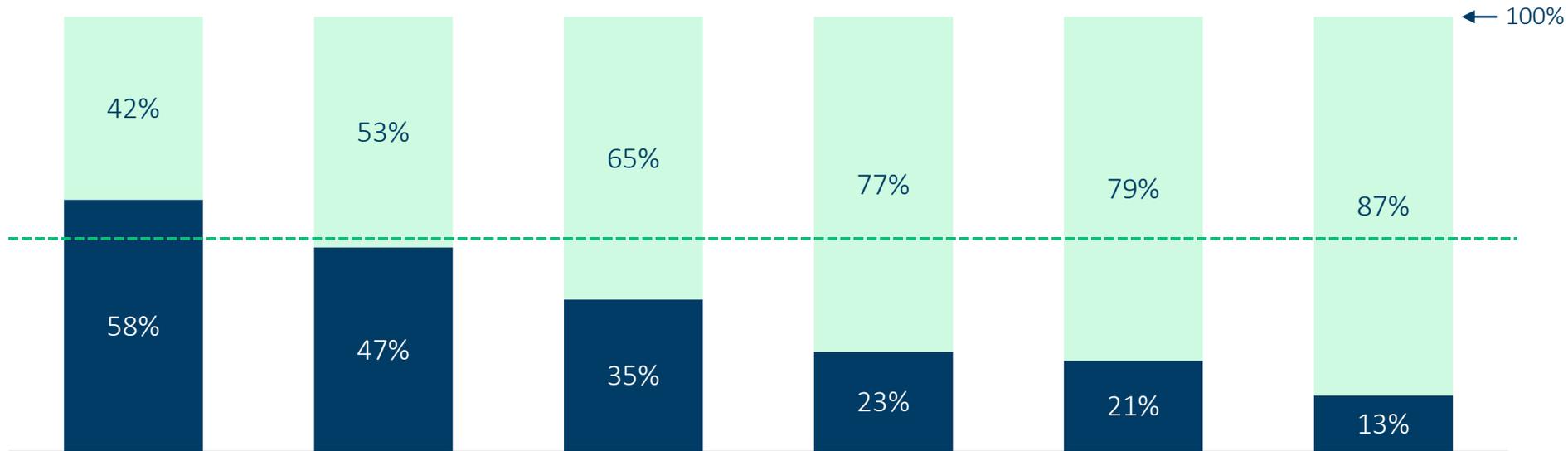


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Norwegian institutes have very low basic funding and extremely vulnerable for cut in calls

Basic funding
Other external revenues

Share of turnover (%)



Other European institutes



Participating institutes, in arbitrary order:

- CEA – France
- RISE – Sweden
- SINTEF – Norway
- TECNALIA – Spain
- TNO – Netherland
- VTT – Finland



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Converting CO₂ emissions into products - SINTEF is coordinating the European Green Deal project PYROCO₂

PYROCO₂ - Demonstrating sustainable value creation from industrial CO₂ by its thermophilic microbial conversion into acetone

PYROCO₂



The PYROCO₂ project will demonstrate the scalability and economic viability of carbon capture and utilization (CCU) using innovative biotechnology to make climate-positive platform chemicals for the chemicals, fuel additives, and materials markets.

Our aim is to become a key driver for the broad implementation of CCUS in Europe through communicating its wide spectrum of opportunities for the European chemical and other carbon-intensive industries, providing options to stay globally leading while contributing to achieving Europe's ambitious climate goals.



<https://www.pyroco2.eu/>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101037009.



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Achieving a climate-neutral Europe by 2050 requires the replacement of fossil-based material with bio-based material on a broad basis.

- SINTEF is coordinating the BBI-JU project PERFECOAT



PERFECOAT - High Performance Bio-based Functional Coatings for Wood and Decorative Applications



The goal of the PERFECOAT project is to develop and validate a new generation of industrial wood and decorative coatings with significantly more than 25% bio-based components that meet and even surpass the current quality and sustainability standards. Our concept is based on a flexible platform of novel technologies to produce and functionalize new, bio-based bulk coating components and assemble them into new coating formulations.

This project has received funding from the Bio-based Industries Joint Undertaking (JU) under the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101022370. The JU receives support from the European Union’s Horizon 2020 research and innovation programme and the Bio-based Industries Consortium.

 	
 <p>Term 01 May 2021 – 30 April 2024</p>	 <p>BBI JU contribution € 4,999,567.50</p>
 <p>Type of action Research & Innovation Action</p>	 <p>Feedstock origin Forest-based & Agri-based</p>

<https://perfecoat-project.eu/>



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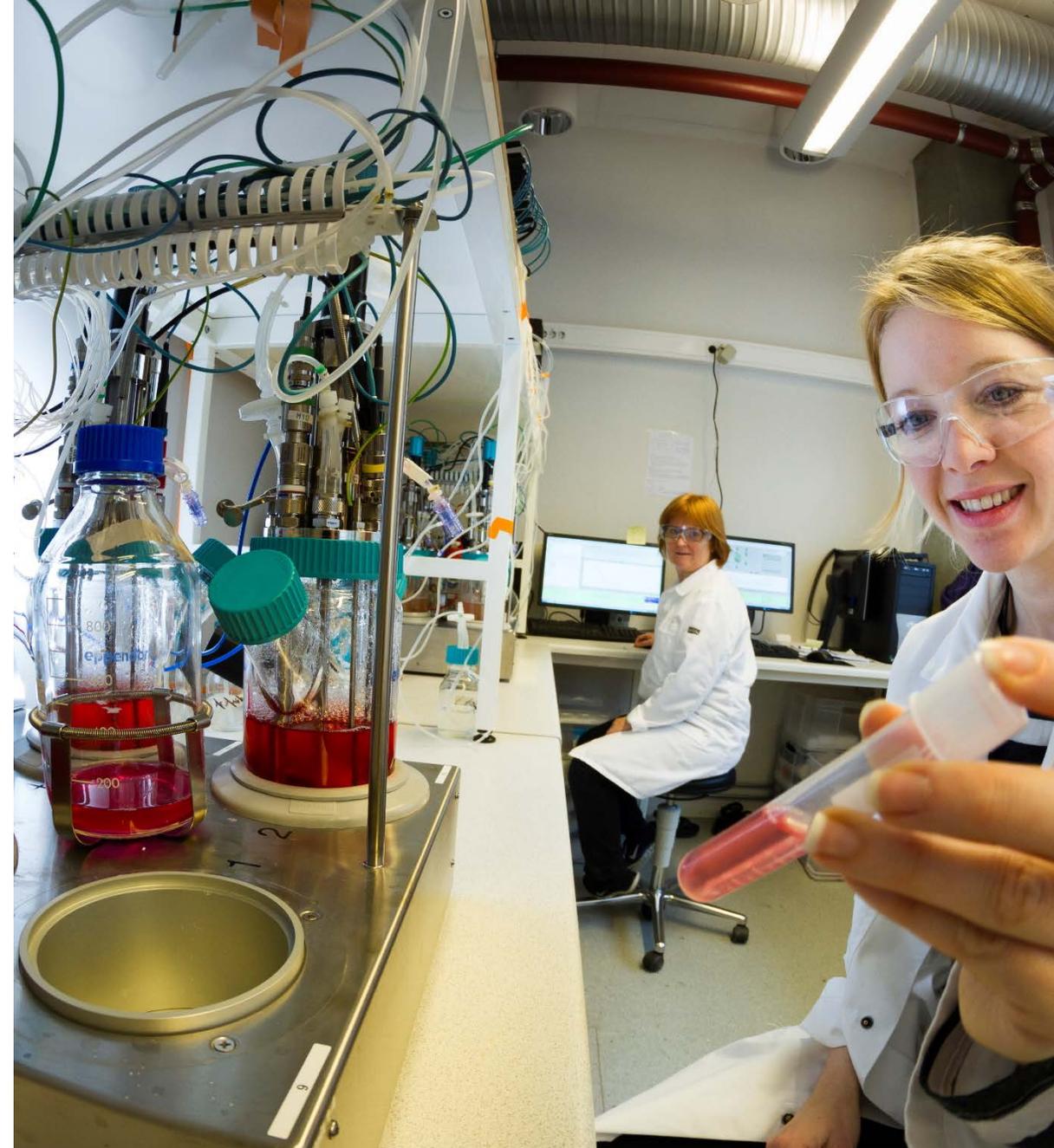
SINTEF Department of Biotechnology and Nanomedicine SINTEF

Our expertise:

- Bioprocess development
- Microbial molecular biology
- Advanced research-based analyses
- Nanomedicine, polymer particles and surface chemistry

Applied within:

- Pharmaceuticals, vaccines, biomaterials, enzymes, food, feed, chemicals and energy
- High strategic focus on digitalization of processes in industrial biotechnology





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Biotechnology and Nanomedicine and the digitalization of biotechnology

“Digitalization allows sensors, machines, equipment, and people to communicate and collaborate while providing real-time data to improve both plant processes and the products they create”

Focus on the digitalization of biotechnology through laboratory automation systems :

High-throughput screening: *safety and effect screening on primary, normal and cancer cells from mammalian cells (cytotoxicity, genotoxicity, immune responses, stress and ROS), advanced cell models (organoids, scaffold-based, barrier models), microorganisms (anti-microbial, anti-biofilm), virus (anti-viral, disinfection).* This is coupled with **Agilent RapidFire** for a rapid high-throughput mass spectrometry

Automated fermentation equipment (only 3 in Europe) and online mass spectrometer & process gas analyser.

Established workflow for automation of in-silico data analysis processes



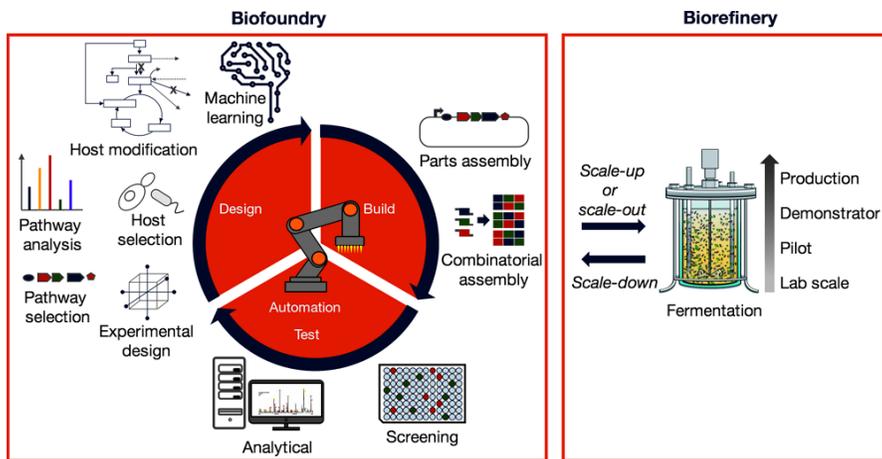


Digitalization in biotechnology and the drive to accelerate more bio sustainable and less carbon-intensive production?

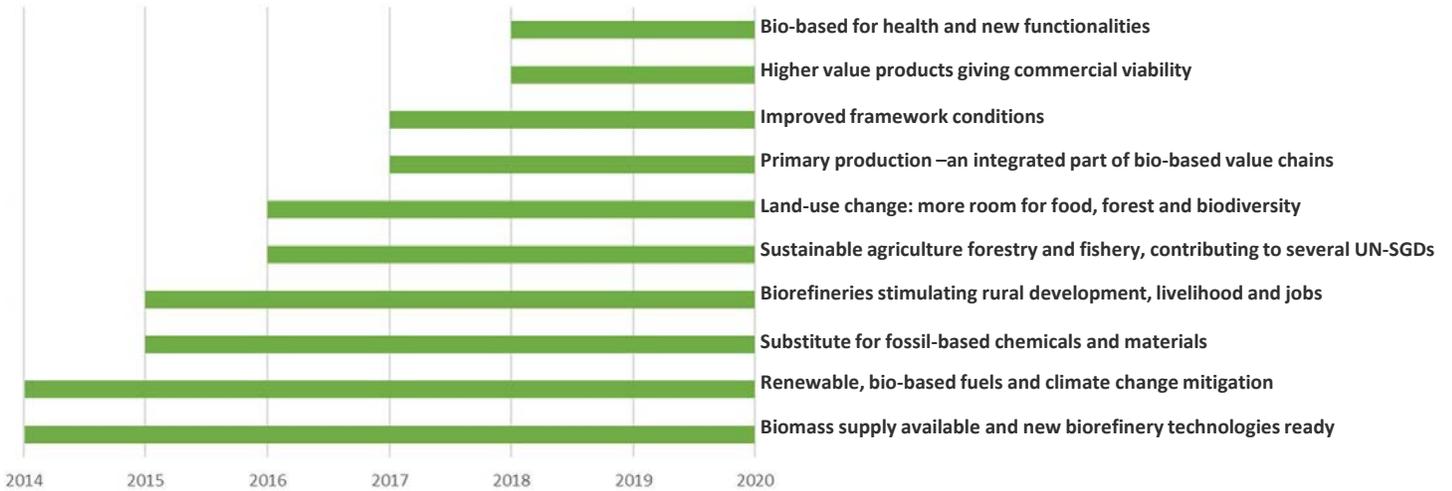
Digitalization through automation and big data analysis to boost the Design-Build-Test Iteration Cycle

Automation brings faster “design-build-test” cycles, which will go a long way to conquering two of the long-term challenges of biotechnology, namely the **lack of reproducibility and reliability.**

<https://doi.org/10.1016/j.tibtech.2019.03.017>



Major drivers for developing the circular bio-based economy in EU



<https://doi.org/10.3389/fbioe.2020.619066>

To be impactful, these advances should target and boost the key drivers of the bio-based economy in EU

For future **value creation in industries, biosustainability** and a **low carbon-intensive production** needs to be supported by addressing three key areas: building talent, handling complexity, and improving commercial and development execution.

At **SINTEF** we contribute equally to these aspects through strategic innovation in key areas (e.g. digitalization). This involves the development of new infrastructure and highly specialized researchers and business developers. The continuous interaction with policymakers and stakeholders gives the opportunity to develop concrete and targeted action plans.



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Our projects contribute to meeting the UN's Sustainable Development Goals

SUSTAINABLE DEVELOPMENT GOALS



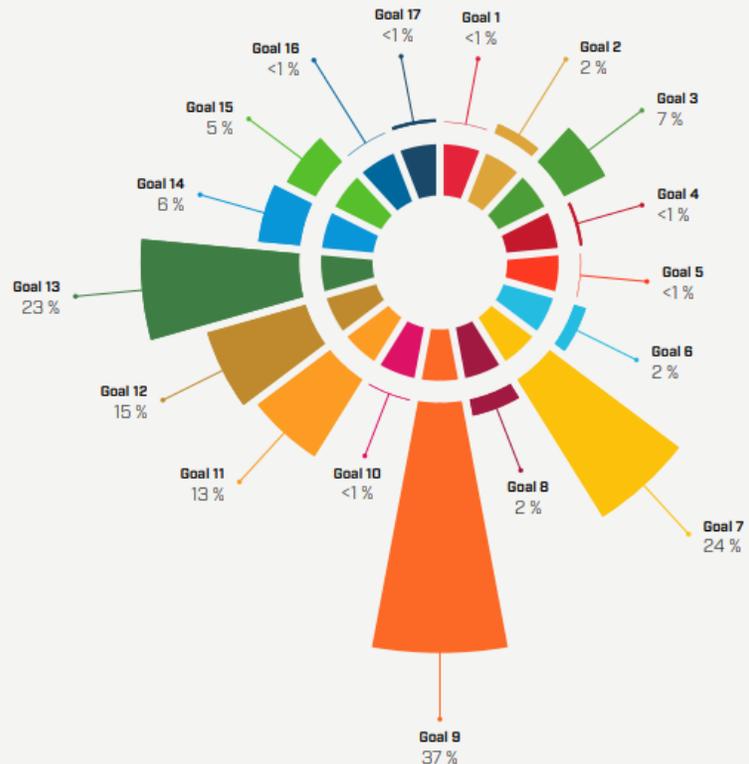
SINTEF's corporate strategy, adopted in 2019, is guided by the UN Sustainable Development Goals (SDGs). The goals refine SINTEF's vision. This expands the obligations we have had as a member of the UN Global Compact since 2009. The 17 SDGs set out what we and the world have to achieve in the work on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



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Our projects contribute to meeting the UN's Sustainable Development Goals

Gross turnover per Sustainable Development Goal



SINTEF's net turnover in 2020 sorted according to the Sustainable Development Goals



1. Zero poverty
2. No hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below the water
15. Life on land
16. Peace, justice and strong institutions
17. Partnerships for the goals



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Technology for a
better society