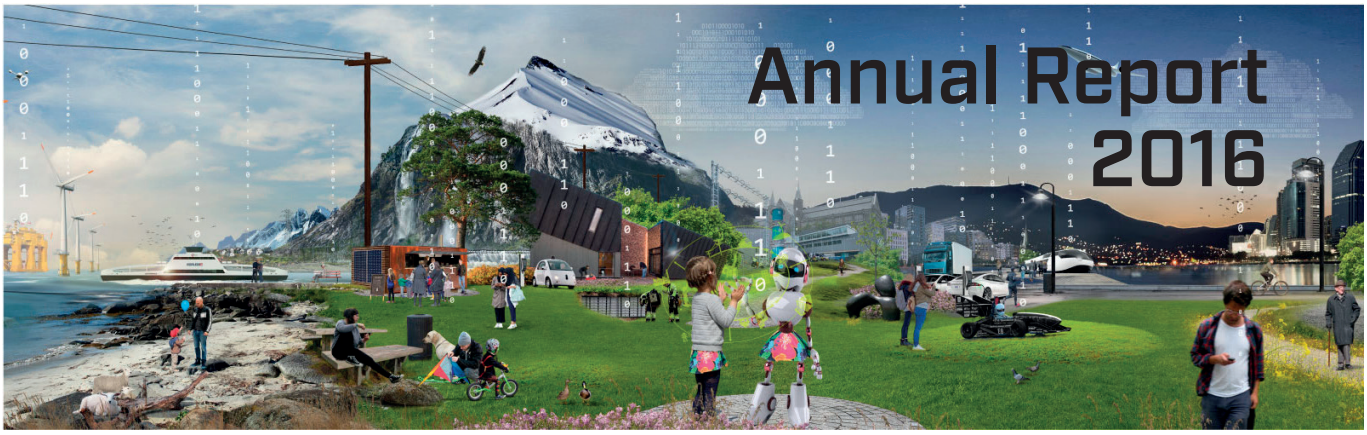

SINTEF Energy Research has a pronounced research profile and is involved in six of the Research Council of Norway's Research Centres for Environmentally-Friendly Energy (CEERs) in partnership with industry and other research institutions. The institute maintains a strong position in the EU's Framework Programme for research, and participates in an extensive range of projects linked to issues such as energy planning, energy efficiency, wind-power, CO2 transport and storage, and cleaning technologies for gas- and coal-fired power plants. The high-level technical profile developed by the institute, via activities such as assisting the Norwegian Parliament (Storting) to achieve its cross-party Climate Change Policy Consensus, means that its research community is now at the forefront of European energy research.

SINTEF Energy Research is part of the SINTEF Group and is a non-profit research organisation. It works closely with NTNU in support of teaching and research work, which forms a natural part of its activities. It makes every effort to maintain good dialogue with energy sector enterprises engaged in its area of business activities.

SINTEF Energy Research is a non-profit organisation and awards no dividends to its owners. Any resources generated by our activities are allocated solely for the purpose of achieving the institute's objectives. The institute is identified by the EU Commission as a non-profit organisation.

It is located on the Gløshaugen university campus in Trondheim and its business address is Sem Sælands vei 11, 7034 Trondheim. The SINTEF Energy Lab is located at Risvollan, three kilometres south of Gløshaugen. The institute's owners consist of the SINTEF Foundation (61.0%), Energi Norge (33.4%) and Norsk Industri (5.6%).

Technology for a better society

SINTEF Energy Research carries out R&D with the aim of promoting cost-effective and environmentally sound solutions for energy use and the supply of heat and power. The institute contributes towards the mitigation of negative environmental impacts, wealth generation for energy sector companies, and the enhanced exploitation of energy resources by society as a whole.

It also contributes towards boosting the safe end environmentally-friendly exploitation of Norwegian oil and gas resources by means of developing innovative technologies, such as energy efficiency and subsea power supply systems, for oil companies and supply industry.

Clients

Our projects are funded primarily by the industrial sector. Funding from industry is a prerequisite for obtaining additional funds from the Research Council of Norway. It is thus crucial to SINTEF Energy Research that our research work continues to make a contribution towards growth in knowledge and wealth generation within the industrial and business sectors.

As a result of the Norwegian Parliament's cross-party Climate Change Policy Consensus, public sector funding of energy-related research increased considerably during 2008, 2009 and 2010 in comparison with previous years. These new levels have been maintained to the present day. The Research Council of Norway established the Research Centres for Environmentally-Friendly Energy (CEERs), starting in 2009. SINTEF Energy Research headed four of these centres, and was a partner in two.

In 2016, a decision was taken to establish eight new CEER centres. SINTEF Energy Research is currently the host

institution for three of these centres, and participates in three others as a partner. The centres which SINTEF Energy Research is heading, and in which it participates, focus on CO2 capture, transport and storage (CCS), energy efficiency in the industrial sector, smart grids, hydropower, bio-energy and smart cities.

The institute currently has an extensive project portfolio for the Research Council of Norway. One of the Council's initiatives involves the so-called Knowledge-building Projects for Industry (KPN) scheme, which is key to the development of new skills and expertise in Norway. In order to ensure that relevant research is carried out as part of these projects, it is of vital importance that commercial businesses and the public authorities are also involved. In 2016 we launched a total of 21 new KPN and IPN (private sector innovation) projects, and have obtained assurances for the go-ahead of 18 new projects in 2017, including the Research Infrastructure (INFRA) project.

In the case of EU projects, the institute focuses on participation and taking on the role of project coordinator. This enables us to obtain funding for skills and expertise development and to establish networks with current and potential European clients and research institutes. Participation in EU projects enables us to make a contribution towards achieving the aims set out in the SET (Strategic Energy Technology) Plan, and to realise our vision – "we shape tomorrow's energy solutions". In 2016 we participated in a total of 27 EU-funded projects, and acted as coordinator for six of them. Turnover linked to our EU projects was NOK 43 million.

SINTEF Energy Research is an active participant in several of the EU's technology platforms in which strategies for the various research disciplines are shaped. It also participates in strategic fora such as the European Research Area Board (ERAB), the European Energy Research Alliance (EERA) and EARTO – an association of European research organisations. We also have a seat on the EU Commission's advisory group for energy issues as part of the Horizon 2020 programme.

Fourteen per cent of the institute's turnover is generated from foreign organisations based in countries both inside and outside the EU. The most important among the latter are Malaysia and Japan.

Research

The global community is facing major challenges in terms of obtaining sufficient energy to meet its needs and in implementing the shift in energy supply systems needed to ensure that the impacts of climate change can be resolved as quickly and as cost-effectively as possible. At the UN Climate Change Summit in Paris in December 2015, all the nations of the world agreed on a target to restrict global warming to 1.5 degrees.

The institute is engaged in many research disciplines within the fields of energy supply, energy use and oil and gas technology, all of which are relevant in this context. Our ambition is to become a world leader in the field of energy-related research.

Our collaboration with, and close proximity to, NTNU is our greatest scientific comparative advantage. Both institutes make good use of our shared resources such as laboratories, workshops and scientific instruments. Both are substantially involved in each other's research activities, and during the fourth quarter of 2016 we finally entered into new joint agreements for the shared use of laboratories and premises. Collaboration between SINTEF and NTNU is exercised systematically at all levels within the two organisations. This includes the mentoring of Master's and Ph.D students.

2016 was yet another excellent year for scientific publications sourced by the institute. The number of publications has exceeded 200, and we have accumulated 215 publication credits.

Category	2011	2012	2013	2014	2015	2016
No. of publications	164	189	171	198	181	216
Publication credits	143	148	148	151	180	215

People

At the close of 2016 the institute employed a total of 240 people, of which 191 were research scientists, seven were engineers, and the remainder technical and administrative support personnel. In 2016 the institute employed 73 women and 167 men from 19 different countries. The average age of employees is 44.

SINTEF Energy Research is working systematically to enhance its working environment and carries out surveys that are followed up by implementing measures for improvement in the respective research departments.

In collaboration with NTNU, NVE, BKK Nett, Lyse Elnett, Statnett and Energi Norge, the institute has established a trainee scheme under which two new persons are employed every year on two-year contracts. This has become a popular initiative and has drawn attention from outside the institute.

Ethics

SINTEF operates with a code of ethics that is published as a pocket handbook and posted on the institute's intranet. This handbook is an excellent aid in the institute's day-to-day activities.

SINTEF has established a system by which employees can apply in confidence to an Ethics Council and an Ethics Ombudsman if they wish to discuss an ethical issue outside the line management hierarchy.

SINTEF is a member of the anti-corruption organisations Transparency International and UN Global Compact which work in the fields of human rights, employee rights, the environment and anti-corruption.

Diversity and equal opportunity

The institute meets the requirements of its employees with special needs. In 2011, the institute was granted status as an Inclusive Working Life (IA) organisation, and we enjoy good working relations with the Norwegian Labour and Welfare Administration (NAV).

To ensure that foreign employees are made to feel welcome, SINTEF operates with an integration programme for employees from other nations and their families. The programme offers traditional integration and ex-pat services, free Norwegian language courses, and tuition in English at the SINTEF School. During the recruitment process we evaluate applicants' qualifications in compliance with the intentions set out in legislation.

Work to promote equal opportunity is a fundamental principle exercised by SINTEF Group Management. Our personnel policy and administrative personnel procedures meet all the requirements set out in the Norwegian Equal Opportunities Act (likestillingsloven). The proportion of women employed at the institute is 30 per cent, and 42 per cent of the institute's management team is female. We are making every effort as part of our recruitment policies to increase the proportion of women and are preparing plans to promote career development among our senior female research scientists. Sixty-seven per cent of shareholder-elected, and 33 per cent of employee-elected, Board members are women. The institute operates with flexible working hours and employment benefit arrangements. We contribute towards a kindergarten service via the Aurora Foundation.

Anonymised working environment surveys are carried out every two years. These have demonstrated that our employees regard the work carried out by the institute to promote equal opportunity is adequate, and that there is no gender discrimination in terms of opportunity. An in-house survey carried out by SINTEF in 2008 concluded that there was no gender discrimination in terms of salary policy at the institute. Salaries and conditions of employment are determined by negotiation and discussion with representatives in the respective employee organisations. We are a signatory to the agreements that the Confederation of Norwegian Enterprise (NHO) has entered into with the employee organisations Tekna, NITO and NTL. We only rarely enter into temporary employment contracts.

Communications and public relations

Cristin is the name given to a Norwegian system used to assess scientific publications. Statistics from this system constitute the platform for basic funding allocations from the Research Council of Norway. Currently, popular science contributions do not form part of the evaluation criteria for basic funding. However, we also register these contributions in the Cristin system. The institute has had a major increase in registrations in the Cristin system in recent years. The "#SINTEFenergy" blog was launched in December 2014 and reflects the increase in popular science publications sourced from SINTEF Energy Research.

Summary:

- Media contributions: 138
- Information material (brochures, blogs, etc.): 120
- Facebook followers: 3734
- Twitter followers: 1147

Health, Safety and the Environment (HSE)

Sickness absence was at 3.8 per cent in 2016, an increase of 0.6 per cent on 2015.

The institute has an active sports club which receives internal financial support.

SINTEF Energy Research has experienced five incidents formally registered as accidents:

- Blow-out in a gas regulator resulting in possible hearing damage (critical risk potential)

- Electric shock (230 V) without actual injury, although the person was placed under observation in hospital (critical risk potential)
- Damage to a car (material damage only)
- Explosion in a heating cabinet (material damage only)
- A cabinet that received dents after toppling over (material damage only)

In addition, five near misses and 71 hazardous situations/ observations were recorded.

The institute operates with proactive procedures designed to ensure that our activities focus on protection of the external environment. These include the management of various types of waste, including hazardous waste. The institute carries out systematic risk assessments and analyses that include consideration of the external environment. Our activities do not result in any pollution of the external environment that is in contravention of existing legislation. The institute is certified in accordance with the ISO 14001 standard.

In 2016, SINTEF Energy Research carried out an emergency response exercise with the Faculty of Information Technology and Electrical Engineering (E-faculty) at NTNU. The exercise was very informative and the parties have subsequently entered into a joint agreement on how they will collaborate in the event of an incident affecting both NTNU and SINTEF. The management team took part in SINTEF's "emergency response day", at which SINTEF Energy Research played a key role in planning and organisation. The emergency response plan underwent two revisions during 2016.

Financial status

The Annual Accounts have been prepared under the going concern assumption, and reveal an after-tax profit of NOK 13.7 million. Total net operating revenues were NOK 331.3 million, with an operating profit of NOK 17.6 million. The pre-tax profit was NOK 20.3 million, and net financial revenues NOK 2.7 million.

Equity as of 31 December 2016 is NOK 339.3 million, and constitutes 65% of total capital, of which the company's share capital is NOK 7.5 million. The liquidity situation is described as good.

The company is exposed in some degree to currency exchange fluctuations in that 14 per cent of its project revenues are in foreign currencies. On the other hand, project costs are entirely or in part in Norwegian kroner. This exposure is primarily in Euros and US dollars. In order to mitigate the risk, we operate with future exchange contracts in the currencies concerned. The company also operates in a global and highly competitive market in which several of our competitors are located within the Euro zone.

SINTEF has established a joint arrangement for the investment of its liquidity reserves. The portfolio is allocated according to the "Rules governing financial management", which are revised annually.

The Board is not aware of any circumstances that have arisen since the balance sheet date that affect its opinion regarding the company's financial status.

In the opinion of the Board, the Annual Accounts as presented provide a true picture of the company's financial status as of 31 December 2016.

Corporate management

Since 1999, the institute has been working with a dedicated focus on the introduction and implementation of a value-based management system, and with organisational development initiatives that continue to operate at all levels within the organisation. Focus is directed on the development of human capital in which the abilities to build networks and promote continuous innovation are assigned high priority.

In 2016 SINTEF chose to launch a process towards certification in accordance with the ISO 9001:2015 (quality) standard, the ISO 14001:2015 (external environment) standard and the OHSAS 18001 (working environment) standard. The certification audits were carried out during weeks 49 and 50. SINTEF Energy Research received no non-conformance notifications in connection with these audits.

Client satisfaction surveys are carried out at the close of selected projects. The results reveal an overall high level of satisfaction with our products and services. Negative feedback is recorded as a non-conformance and is followed up. However, in 2016 SINTEF Energy Research received no non-conformance notifications in feedback from our clients.

Administrative personnel at SINTEF Energy Research assist the research departments with specialist expertise in the fields of finances, HR, HSE, quality, safety, and administrative and operational services. Shared services work in accordance with a client- and service-oriented model that overlaps across the aforementioned areas in order to ensure efficient administration and adequate redundancy. Specialist units shall ensure that the institute continues to operate within prevailing legislation,

regulations and procedures, the research departments receive the services they need, and that the institute always obtains adequate decision support and correct governance information.

All institutes at SINTEF have introduced a system of tertial risk reporting. These reports are discussed by the institute's Board and risk-mitigating measures implemented, as appropriate.

Shared corporate risk and uncertainty are linked to factors such as the market and our major clients, the terms and conditions of participation in EU projects, industrial espionage and intelligence, reputation, liabilities linked to major contracts, the loss of core expertise, management of immaterial rights, recruitment, and safety linked to laboratory and field work.

Future prospects and challenges

In recent years, the current global economic situation has resulted in many companies cutting back on their research budgets. A massive fall in the oil price, as well as prevailing energy prices, both influence our clients' opportunities to invest in research. The challenges created by climate change continue to attract major political focus in Europe, and this trend has intensified following the UN Climate Change Summit. This results in policy decisions triggering major levels of public sector investment in research and technology development, which in turn encourages the private sector to focus on capturing market shares linked to new energy technologies. The world's largest research programme, known as Horizon 2020, is following this trend, reflected in an almost two-fold increase in funding for renewable energy projects. In connection with the Paris summit, Norway and 19 other countries signed a letter of intent to increase their research efforts in the field of climate change by one billion by 2020. The programme has been given the name Mission Innovation.

In the long term, oil and gas will continue to be important energy carriers, including in scenarios in which global warming is restricted to +1.5 degrees Celsius. It is important for Norway to ensure that this sector also has a role to play within the framework of a future, sustainable, energy supply system. This is best achieved by developing technologies linked to both environmentally sound oil and gas production, such as subsea power supply systems, energy efficiency and the environmentally-friendly use of fossil fuels, such as carbon management.

The key drivers behind this strategy are as follows:

1. Secure and cost-effective energy systems for application in Norway
2. Wealth generation based on Norwegian energy resources
3. Technology development in the global market place

Ten strategic areas of focus have been identified, all of which are linked to specific action plans:

1. Energy efficiency
2. CCS
3. Hydropower
4. Marine wind power
5. Bioenergy
6. System integration of renewable energy sources
7. Smart grids
8. Transmission
9. Gas technology, LNG and hydrogen
10. Subsea power supply and processing systems

2015 saw the launch of SINTEF's new principal strategy. The strategy incorporates five areas of focus, and SINTEF Energy Research has been active in contributing sub-strategies for these areas. In order to achieve meaningful links between SINTEF Energy Research's strategy and the core strategies, it has been necessary to update the institute's areas of focus.

The EU's aggressive and long-term focus on energy research provides a sound foundation for international collaborations in which the institute can participate as a project partner. It is to our advantage that the EU's energy research strategies encompass the entire range of activities within the sector, and that they are compatible with both Norway's and our own strategies.

Expansion in the energy aspect of the Horizon 2020 programme, and the Norwegian Government's expectations in terms of increased levels of interaction and participation, mean that the volume of research that Norwegian research institutes can expect to obtain from Europe is almost half of that earmarked in Norway. Our participation in strategic energy fora within the EU, combined with our good name and willingness to assume the role of project coordinator, will improve our opportunities both to be able to participate in the shaping of the research agenda and to take part in projects.

In the future it will be important for the institute to adapt and focus on areas where it is, or has the potential to be, in the forefront of global research. It will also be important to build the right kind of alliances both in domestic and

international arenas. Our clients will continue to an ever-increasing degree to seek out the best international research institutes. This trend represents both a challenge and a major opportunity for the institute. SINTEF Energy Research's focus on the industry's needs, combined with its close working relationships with industrial sector partners, provides us with a good base from which to make the most of these opportunities.

Thank you

The Board takes this opportunity to thank all employees at SINTEF Energy Research for an excellent year's work, both in terms of our scientific and financial results.

Trondheim, 23. March 2017

Inge R. Gran
President

Alexandra Bech Gjørv
Board Chair

Geir Kulås
Board member

Kristin Lian
Board member

Stein Iver Koi
Board member

Randi Viksund
Board member

Ingvald Strømmen
Board member

Ove Wolfgang
Board member

Svend Tollak Munkejord
Board member

Marit Jagtøyen Mazzetti
Board member