



Technology for a better society

2003



**In** the summer of 1981 Statoil found large quantities of natural gas on the Tromsøflaket outside of Hammerfest. In the course of the next three years, several more discoveries in the area gave grounds for optimism for gas production offshore Finnmark. But the great distance to the market was a problem that would have to be overcome.

The first plan was for a buried pipeline across the Finnmarksvidda, but this was too expensive. The alternative was to employ LNG technology – chilling the gas to a liquid state. American companies held the patents on the method, and this solution was also too expensive. Plans to develop the field were abandoned.

However, not everyone was ready to give up. Einar Brendeng, a scientist at NTNU and SINTEF, had decided to break the LNG code and develop a new technology for liquefying natural gas.

In the course of the next 25 years, research collaboration involving SINTEF, NTNU and Statoil resulted in 12 doctorates and a large number of MSc dissertations, not to mention a new LNG technology which made it possible to develop the Snøhvit field.

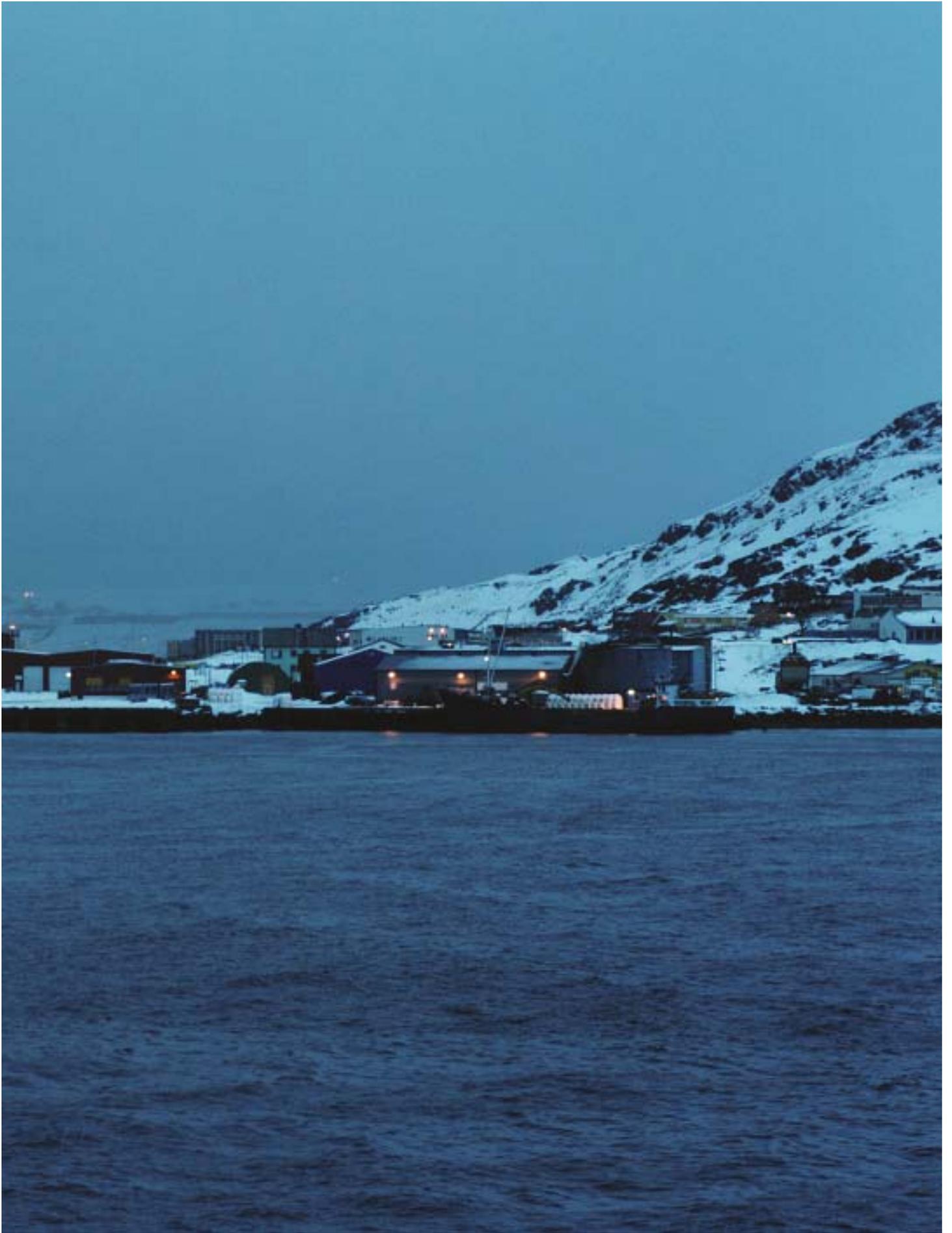
The natural gas plant on Melkøy Island outside Hammerfest is one of Norway's largest individual

construction projects. Statoil is investing around NOK 50 billion in concrete, steel and high technology, and has created 175 permanent jobs. The needs of the plant for goods and services will also provide Hammerfest and its region with somewhere between 100 and 200 new jobs.

Brit Sjøvold is among those who are pleased with this situation. She was actually on the point of leaving her native city, since the company for which she worked as a mechanical engineer had gone bankrupt. However, when Nordnorsk Byggekontroll found that it needed to take on more expert personnel, she stayed on, together with her husband and two children.

**Melkøya**, March 2004







- **Name:** Brit Sjøvold
- **Age:** 33
- **Position:** Mechanical engineer, Nordnorsk Byggekontroll
- **Wants:** To stay in Hammerfest with her family



## This is the SINTEF Group

The SINTEF Group is the largest independent research organisation in Scandinavia. We generate new knowledge and solutions for our customers, based on research and development in technology, the natural sciences, medicine and the social sciences.

At the turn of the year we had 1758 employees, who were responsible for a turnover of NOK 1.7 billion in 2003. Contracts for industry and the private sector account for more than 90% of our income, while just eight percent is in the form of basic grants from the Research Council of Norway.

### Partners in cooperation

SINTEF cooperates closely with the Norwegian University of Science and Technology (NTNU) and the University of Oslo. NTNU personnel work on SINTEF projects, while SINTEF staff teach at NTNU. Collaboration involves the extensive joint use of laboratories and equipment. We are in the process of establishing a similar pattern of collaboration with the Faculty of Mathematics and Natural Sciences in the University of Oslo.

### International activity

International contracts were responsible for 15 % of our turnover in 2003. Around fifty percent of our international turnover is derived from the EU's research programmes. These

programmes are given high priority by us, both because we regard it as important to participate in the multinational knowledge development - process and because such programmes give us access to interesting networks. The other half comes from contract research projects for foreign companies. Given our ambition to grow in the overseas market, we are concentrating on areas in which we are already particularly strong: oil and gas, energy and the environment, and materials science.

### Commercial spinoffs

SINTEF also acts as an incubator for new industrial companies. In 2003, we were involved in 27 companies which have been set up

technology developed by SINTEF. This brings essential knowledge-based industry to Norway. We are active owners of our spinoff companies, and we help them to develop and prosper. By selling our shares in successful spinoffs we also realise profits which will be invested in new knowledge development. Every year, SINTEF supports the development of 200 or so Norwegian and overseas companies via our research and development activity.

SINTEF's vision is "Technology for a better society". Our goal is to contribute to wealth creation and to the sound and sustainable development of society.



**Ronny Fjelde (29)**  
**SINTEF client**

**Rescue services** operator Ronny Fjelde works on board M/V "Rygedoktoren". This ambulance vessel is fitted out as an up-to-date doctor's surgery, and since summer 2002 it has been providing medical coverage for around 25000 people in the coastal

villages of the County of Ryfylke. The boat is crewed 24 hours a day by a doctor, in addition to its skipper and deckhand. The latter also act as ambulance personnel and have therefore also been trained in lifesaving techniques. The vessel has been built in carbon-fibre, making it 40% lighter than similar vessels built in traditional materials such as GRP or alu-

minium. Its specially designed hull was developed by SINTEF MARINTEK for high-speed operation in very heavy seas. In spite of the long distances and difficult waters involved "Rygedoktoren" usually takes no more than 15 minutes to reach its patients. Last year, two children were born on board the boat.

**Tonje Bruun (28)**  
**SINTEF client**

**Tonje** Bruun lives in the Kampen district of Oslo and can drink clean water right from the tap. Her water comes from lake Maridal, and it is

purified in Oset, Norway's biggest water purification plant, which is owned by the City of Oslo. Now, Oslo Waterworks and SINTEF are working together on a completely new water purification plant for Lake Maridal. If all goes according to plan, it will be

ready in May 2008 and will be known as "New Oset". The plant is being planned and designed with the help of SINTEF and will provide clean water for 90% of the inhabitants of Norway's capital.



## The SINTEF year in brief

- The National Centre for Information Security (SIS), launched by the Ministry of Trade and Industry, is established at SINTEF.
- SINTEF presents a new environmentally friendly battery that supplies mobile telephones with five times as much power as current batteries.
- The Universum Graduate Survey votes the SINTEF Group Norway's third most attractive workplace for technology students.
- SINTEF scientists introduce keyhole surgery techniques for advanced cancer treatment.
- SINTEF presents a method for toxin-free mussel farming.
- Opening of the first Gemini Centres, a joint venture of NTNU and SINTEF.
- Completion of the largest single investment in research ever made by Norway: the Microtechnology Research Laboratory in Gaustadbekkdalen in Oslo.
- SINTEF scientists take part in the biggest ever road-tunnel fire tests near Åndalsnes.
- The Gas Technology Centre, a joint venture of NTNU and SINTEF, is opened in Trondheim.
- The first true single-use syringe, developed by Dr. Christian Sandsdalen and SINTEF, is put into mass production in China.
- SINTEF launches a new method for long-distance transport of oil and gas on the seabed in standard steel pipes, a technique known as "Cold Flow".
- SINTEF's Award for Outstanding Research is given to Svein Sørdsal, Odd Kr. Ø. Pettersen and Jarle Svean for the development and commercialisation of the active ear-plug system PARAT.
- At the turn of the year, SINTEF is reorganised into six units, down from its previous 13.

## 8 ” A society developed solely by technologists?

I would never live there!

**When** he was still in high school he wanted to be a kindergarten teacher, but instead, Morten Loktu decided to earn a living in technology. He joined the Statoil Group's management team before he was forty years old, and now he is head of SINTEF. However, the jump from boyhood dream to adult career is not as great as it might appear, claims the 43-year-old.

“Behind our intellectual façade, we adults are still children at heart. Feedback is good for us, whether it takes the form of praise or blame. It is a matter of being seen. For me, as a leader, being able to respond is alpha and omega. In SINTEF, our means of production consist of what people have between their ears. If my colleagues are not happy, they cannot do a good job”.

Morten speaks intensely. He admits that he has a burning ambition to have an effect on the world around him, and he believes that being head of a technological research institute gives him a unique opportunity to do so.

“All the same, technology is no magic formula that automatically makes life better. It all depends on how it is used. In SINTEF, we are in the lucky position of also being in a position to ensure that our technology is used in a sensible way, across the whole spectrum of subjects, from traffic to work environment. Good interaction with people and nature is technology's only criterion of success. Technology for the sake of technology can only result in a poorer-quality society”.

Morten speaks proudly of the range of SINTEF's vision of the opposite state of affairs: “Technology for a better society”. He brings out as an example the fact that SINTEF is playing a leading role in testing gas-fired electricity generation with CO<sub>2</sub> treatment. And that the company is working on aquaculture technology that could provide more food for a hungry world.

“At the same time, our vision is a matter of ensuring that Norway has a competitive industrial sector, as well as an efficient public sector that delivers high-quality services”, he adds.

However, he vehemently denies that competitiveness is just a polite way of saying that Norwegians should just become richer and fatter.

“Not everyone is as well off as we are. Increasing the creation of wealth will make it easier to raise the standard of living of people who are not so well off at present. In a short while, a critical gap is going to open up between our petroleum revenues and our pension obligations, so we will need to take drastic measures on the innovation front if Norway is to manage to maintain the benefits of the welfare state. SINTEF has great ambitions in this area!”

Morten recommends that Norway should invest more in those industries in which the country is already strong. He makes no attempt to hide his belief that this will mean hard work for everyone – and is quite prepared to admit that he is keen to play his own part.

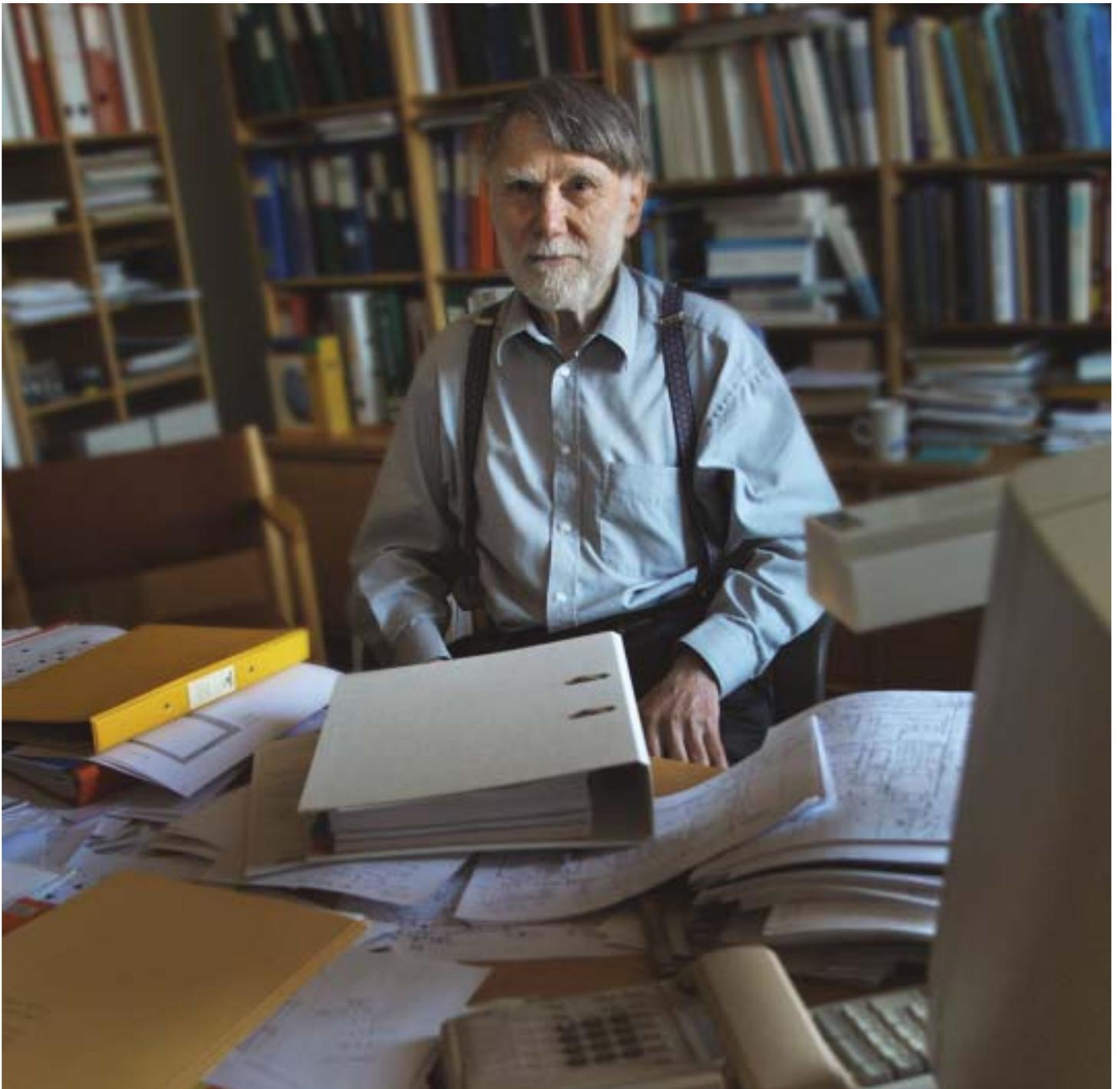
“I am like a child in kindergarten: life would be dull if we had nothing to reach out for!”



- **Name:** Morten Loktu
- **Age:** 43

- **Position:** Head of the SINTEF Group
- **Wants:** To ensure a future for the compassionate society





- **Name:** Einar Brendeng

- **Age:** 79

- **Position:** Professor, senior adviser in SINTEF

- **Wants:** Not a vacation, at any rate



” Well,  
I really don’t understand why they have given me this knighthood.

It is 19 September, 2003, and Professor Einar Brendeng is wearing a dark suit, white shirt and violet silk tie. Over his left breast pocket is a medal, the physical evidence that he has just been created Knight First Class of the Royal Norwegian Order of St. Olav. The citation for the award reads “The development of the giant Snøhvit gas field would scarcely have been possible without Professor Emeritus Einar Brendeng”. He has been given the Order because he launched LNG research in Norway, as well as for his work on main heat exchanger technology in large LNG plants, a technology that plays a decisive role in the perception of Snøhvit as an economically viable gas field.

Nevertheless, the professor cannot get it out of his mind that other members of his research team should have been awarded the coveted title.

A 60-year leap in time takes us back to the old Norwegian Institute of Technology in Trondheim, where a young boy from Oslo is studying mechanical engineering. His ambition is to go to Sweden to finish his training as an aircraft engineer. But as it turns out,

it is refrigeration technology that gradually captures Einar Brendeng’s interest

By the 70s, Brendeng had realised that transportation of liquefied natural gas would be vital for Norway. At that time, an American company was sitting on 90% of the market for LNG technology. But the actual operation of the heat exchanger, the most important component of that technology, was a well-guarded secret.

Brendeng decided to break the code and build his own version of the complex technology. His efforts produced 12 doctorates in the subject and a Norwegian research group capable of competing with the Americans, and at the beginning of the new millennium, Norwegian companies are earning considerable amounts from the technology initiated by Brendeng.

However, the professor is not resting on his laurels. He still works a 34.5 hour week and is not sure when he last took a vacation. But he does remember that it was a trip to the mountains with his wife.

Brendeng himself talks of his achievements as “peanuts” in a wider context, and says that working is an unalloyed pleasure, with which only walking on the moors can compete. He has seven pairs of skis and an Airedale terrier called Bente at home. And at the far end of his cellar, a few model aircraft.

” As a microbiologist,  
I regard myself as a detective.

It’s a role that I love.

**A** fair-haired woman cycles through the streets of Stockholm. It is Sunday morning, and the city is still asleep. Catrine Ahlén, newly qualified bio-engineer, has been on a quick visit to her work, where she has been looking after containers that her team has been using in a ground-breaking project: the development of the world’s first drinkable cholera vaccine. She has also given some comfort to 24 white mice.

Catrine strokes the little test subjects whenever her working day at the State Bacteriological Institute gives her a chance. In the name of medical science they all have cholera, which the young Ahlén feels qualifies them for some tenderness. “When I come to St. Peter, these little creatures will be waiting for me at the Pearly Gates”, she says to wondering colleagues.

Since that Sunday, 30 years have passed. Today, Catrine emphasises that her respect for life, in large or small forms, is undiminished. Now she holds a doctorate and is a senior scientist at SINTEF Health Research. She is one of this country’s leading experts on the connection between bad health and the microbes that surround us.

“When people become ill from environmental stresses, the immediate cause of their illnesses can long remain a mystery. My driving force is the idea of helping such people. If they have also been unfairly treated, then I really get involved”, says Catrine.

North Sea divers are her darlings. While “the bends” and brain damage have captured the interest of the media, Catrine has been working for years on health problems of this group of workers which are much less discussed. Offshore divers suffer regularly from inflammation of the ears and skin infections. For a long time, the divers themselves were blamed for bringing these infections from the surface. Catrine’s recent doctoral thesis found them not guilty: using DNA technology she demonstrated that the bacteria which cause these illnesses live aboard the diving vessels, where they have kept going in the freshwater systems for 20 years!

In collaboration with other colleagues from SINTEF she has also made important discoveries regarding work environments ashore. She has demonstrated that moulds are capable of adapting to temperatures of more than 37 °C when they are allowed to grow in ventilation systems. This allows such moulds to hook themselves to us and produce infections, which they are normally unable to do at our latitudes.

Curiosity is Catrine’s scientific trade-mark. It was her curiosity that helped a 17-year-old girl who was suffering from a serious problem of the lungs. Catrine got involved in her case for long enough to demonstrate that the girl’s illness was due to bacteria in the instrument she played in a brass band. This provided sufficient diagnostic evidence for a rapid cure.

“She had been diagnosed as suffering from asthma, but now she is completely healthy”, says Catrine.



- **Name:** Catrine Ahlén

- **Age:** 54

- **Position:** Senior scientist at SINTEF

- **Wants:** To expose microscopic bullies



” Industry doesn't care whether its energy comes from hydropower, coal or nuclear power stations, as long as it is cheap”.

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“I heard the expression ‘climate wars’ this morning”, says Erik Lindeberg, “and I visualise the USA's Mediterranean Fleet in combat against 100 million boat refugees. And then look at how the nations that use three-quarters of the world's energy resources are waging war against the Third World. A US citizen uses 30 times as much energy as an Indian - and we certainly can't allow every Indian to use as much energy as we do?”

Lindeberg's last question was ironic and rhetorical. The old radical wants resources to be distributed evenly. We will just have to accept reductions in our level of consumption, and cut down on emissions. If we don't we may as well just forget the Kyoto Agreement.

“People in the Third World know how it is here. Of course they are going to try to reach the same standard of living as us”, says Lindeberg. And if they do, the level of emissions will be enormous; and then it will be too late to do anything about them”.

As the saying goes: every little helps. But some things help more than others. Among other things, Erik Lindeberg has led projects that aimed to develop methods for storing CO<sub>2</sub> in petroleum reservoirs. As a result, petroleum resources are being exploited more efficiently, and less of the greenhouse gas CO<sub>2</sub> is released into the atmosphere. The Norwegian Petroleum Directorate estimates the added value potential of the technique to be NOK 400 billion. So perhaps it is not so strange that Lindeberg has hung on to his youthful dream of scientists being of some use to the community, and of the concept of positivism, i.e. that technology can solve the problems of society.

“I suppose that I have kept my naivety, because I am still a technology optimist. In spite of the fact that technology has a pretty black record, I still believe that the creativity of mankind is basically a force for good. And this is precisely why it is so important that research should take part in the process of social debate.

“It almost seems as if many scientists don't want to join in debates of this sort. If they are to put things in perspective, they need to acquire knowledge from other areas of expertise than their own, and that doesn't seem to fit in with their role as experts. I believe that this is wrong. SINTEF is a not-for-profit organisation. We need to be aware of our social responsibility”.

Erik Lindeberg has certainly accepted responsibility, for which he has been both praised and blamed. He has a soft spot for the environmental movement, and is happy to contribute to discussions and give lectures when given the opportunity.

Now and again he has been taken to task by SINTEF's management. “It sometimes happens that they think that I am shooting my mouth off about things that are not my business. But I stand up for my opinions, no matter what they are. I have been with SINTEF for 15 or 20 years now, so things can't be so bad”, he says.



- **Name:** Erik Lindeberg
- **Age:** 55

- **Position:** Senior scientist at SINTEF
- **Wants:** To "sink" CO<sub>2</sub> as far as possible





- **Name:** Svein Winther

- **Age:** 47

- **Position:** Chief scientist at SINTEF

- **Wants:** To export a little SINTEF to Africa



” We make a lot of strange things... better football pitches, for example.

**Svein** Winther saw the light in his early twenties – and in his case, it has never gone out.

“Light is seriously underestimated. Light can be used for so many different purposes, such as making food less perishable (the red wax coating on an Edam cheese filters the light and improves its storage qualities), persuading farmed salmon to spawn, improving road safety and mapping the seabed. Or enabling football fans to enjoy the match even better.”

One of the contracts that Winther’s research department recently took on with open arms was to optimise the lighting in a mobile greenhouse. When the problem is to make the grass grow faster on an English football pitch, botany can be of interest to physicists too.

“Grass grows very well when the light is right. The mobile greenhouse is a Norwegian invention, and we have helped to improve the pitch in Manchester City’s new stadium. The new system is now being watched with Argus eyes by half of England’s football world.”

But creating interactions among people is what Winther likes doing best.

“It is not at the technology front but on the human plane that projects go wrong!. There is nothing as important, or as difficult, as good communication”.

That is why he would have been happy to have a much darker skin. Not because he feels grey in a fluorescent-lit test room, but because he has a dream of exporting the concept of an independent, socially useful research institute to Africa. A white skin can be a

handicap there. He knows, because he has tried:

“It was the most enjoyable and most interesting thing I have ever been involved in. Norwegian Development Aid (Norad) and SINTEF were going to cooperate with a research institute in Zimbabwe. Everything was going according to plan. Contract research and industrial development were offering the hope of a better future – and the Africans fully agreed”.

But then President Mugabe decided that foreigners were not welcome, and Svein Winther and his colleagues were sent home before the project was completed. But the concept of “Technology for a better society” is still tailor-made for developing countries, he believes. Once again, he is close contact with Norad on the subject of exporting good ideas to the people who need them most.

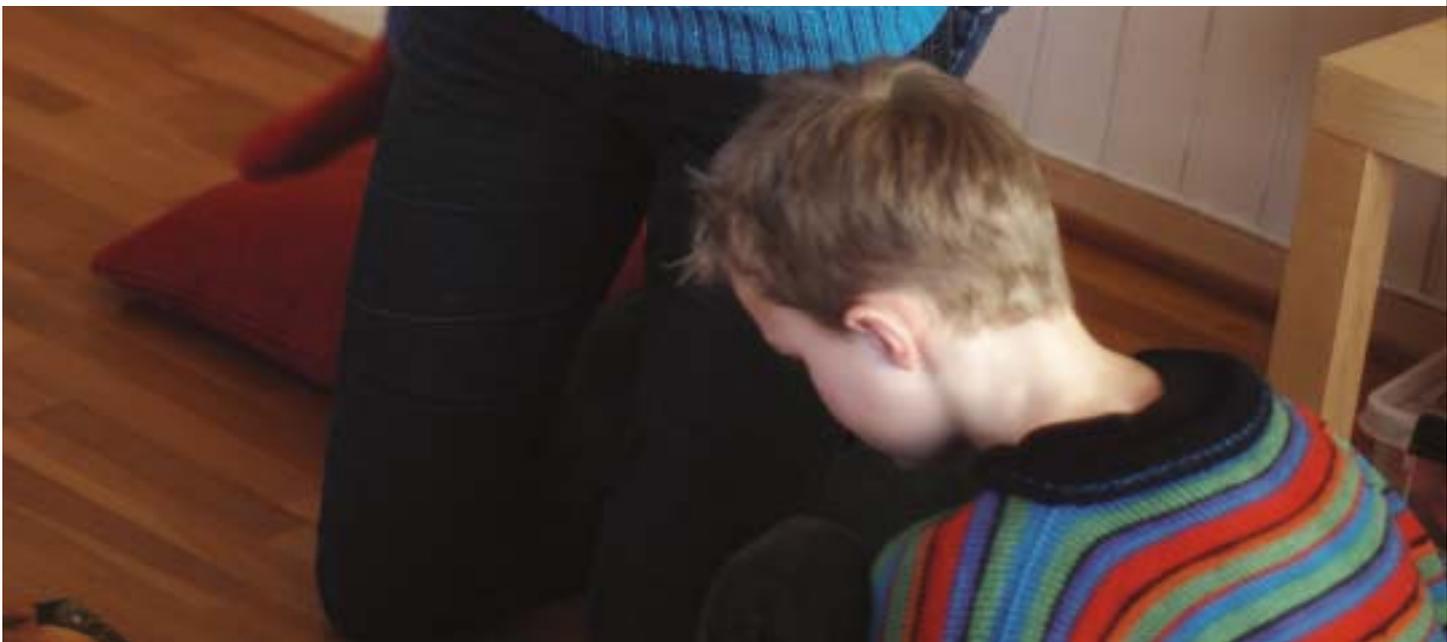


• **Name:** Frøydis Sjøvold

• **Age:** 33

• **Position:** Research scientist at SINTEF

• **Wants:** Better living conditions for people in real need



## ” We need to help other people than just ourselves...

**I**t is not given to everyone to be able to identify the exact point in time when she decided what to dedicate her life to. But Frøydis Sjøvold is one such person.

In autumn 1990 she was sitting in her apartment in Trondheim, watching a TV programme on “The Struggle for Water”. Although she was only watching on an old black and white set she had inherited from her grandfather, the programme made a powerful impression on her. Frøydis was no longer an embryonic architect: she decided that she was going to work with water.

“I suddenly realised just how important water is, and that access to clean water is by no means a matter of course for everyone”, says Frøydis.

Every day, ten thousand people die of water-related diseases. That’s why she is now a scientist, with water and sewage disposal as her field of research. Frøydis hopes to export SINTEF knowhow to the Third World, for example via international aid organisations.

“It seems that the need for environmentally related research is virtually unlimited. At the moment, we are developing a method that will make water and sewage services in Europe more efficient. But we are working on such things up here; I would like to get out into the world as well”.

Now Frøydis has been offered a chance to travel. Norwegian Church Aid has become interested in what she is doing, and wants to make use of her expertise in Iraq or Afghanistan. For the moment she has decided to stay at home.

“After more than ten years of war and sanctions, Iraq’s infrastructure has been completely destroyed. Before I had children I might well have gone, but at the moment it is not safe enough over there, particularly in Iraq. And it is a disadvantage to need uniformed protection all the time”.

However, the family is not a threat to her life as a scientist; rather the opposite. “SINTEF is a very flexible employer; what I can deliver is what counts. And that is very good to know when a certain child is lying on the floor and yelling, and doesn’t want to wear trousers but a dress. When I also have a great deal of freedom to do research on what interests me – not just things that are pressed on me from above – then I am satisfied. I am creating my own work-place”.

” Norway’s Technology Capital must be a single point on the map, so as not to confuse “foreigners” from Oslo – and other countries.

“I’m rather old to become Rector... but, well OK then, I’m healthy enough!”, thought physicist Eivind Hiis Hauge, as he agreed to his biggest challenge yet: the post of commander-in-chief at NTNU.

But before we turn to the Rector; a bit of history. More than fifty years ago, the SINTEF Foundation emerged from what was then called the Norwegian Institute of Technology (NTH). SINTEF was to be NTH’s interface with society; it would carry out research and provide support for Norwegian industry.

The plan was crowned with complete success: SINTEF grew and grew, and the twin institutions lived in a state of fruitful symbiosis. NTNU provided scientific findings and newly educated researchers to SINTEF, while the process of knowledge generation at SINTEF also benefited NTNU.

Laboratories, personnel and equipment were all being shared, and everyone was happy.

But in 2003, the demands made of universities were tightened up. They were allowed to set up limited companies, and the message was clear: from now on, the universities too were supposed to earn money by doing research. This turned NTNU and SINTEF into potential competitors. One of the challenges facing Hiis Hauge is to ensure that the process of constructive collaboration is maintained and continues to develop.

“The point is that we must cooperate in doing what is best for Norway plc. Obviously, we cannot behave like to private

companies that compete to the death with each other. Each of our two institutions has its own share of the joint task that they undertake on behalf of society: together we have to reinforce our position as a recognised node of technology in Europe”.

In 2003, five Gemini Centres were set up in Trondheim; five twin centres that gather together the knowhow of NTNU and SINTEF in areas in which the two institutions share major ambitions at international level. By cooperating in the Gemini centres, they reinforce their collaborative efforts rather than invading each other’s territories.

“The initiative for these centres came from our own research groups, and the management teams of SINTEF and NTNU have encouraged the whole process  
“We share a common goal: to attract highly competent professionals, good students and interesting research contracts from Norway, Europe and the rest of the world. We want to be at the forefront of international research – by working together”.

*The tradition of cooperation between NTNU and SINTEF led to the setting up of five Gemini Centres in 2003: these consist of parallel research milieux that are working in the following areas:*

*Marine structures engineering  
Applied refrigeration engineering  
Roads and transport  
Materials and energy  
Energy supply and air conditioning technology*



- **Name:** Eivind Hiis Hauge

- **Age:** 66

- **Position:** Rector and professor of theoretical physics in NTNU

- **Wants:** To market Norway's "Technology Capital"





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- **Name:** Erik Sandvold
- **Age:** 46
- **Position:** Research Director in Hydro Aluminium, Norsk Hydro
- **SINTEF client**



” We have recruited many of our most capable staff from SINTEF and NTNU research groups. This has been a clear strategy for us!

”**Within** the course of the last two years .. a treasure has been divined, unearthed and brought to light”, wrote Charles Dickens in 1857. “... what do you think of a metal as white as silver, as unalterable as gold, as easily melted as copper, as tough as iron, and ...lighter than glass?”, he continued, prophesying a glowing future for the metal aluminium.

Dickens was right. Today, aluminium is used in a wide range of objects in our everyday life. And aluminium is still regarded as the material of the future – because of its malleability and the combination of low weight with high strength. Five percent of the world’s total production of aluminium takes place in Norway. Norsk Hydro is the third largest producer of this material in the world – and is one of SINTEF’s most important clients.

“Originally it was hydropower that brought the Norwegian aluminium industry to the top of the world league. Nowadays, it is our technology and expertise that enable us to retain this position”, says Erik Sandvold, Hydro Aluminium’s director of research.

It is research that enables Hydro to produce aluminium today at a lower environmental cost and via more efficient production processes than in the past. “Now we use less energy and fewer raw materials to produce a given quantity of aluminium. Recycled aluminium has also become a high-value product (it requires only five percent of

the energy needed to produce raw aluminium), precisely as a result of R & D”.

Aluminium production is an energy-intensive process. However, much of the energy that goes into production is paid back with interest by the metal itself: its low weight reduces the energy consumption of vehicles, aircraft, ships and trains. This is one of the reasons why Hydro is currently Europe’s largest manufacturer of extruded bumpers for the vehicle industry. According to Erik Sandvold, this market position would have been quite impossible to achieve without an active process of collaboration with NTNU and SINTEF.



- **Name:** Ole Onsrud
- **Age:** 53

- **Position:** Technical manager, TiTech Visionsort
- **SINTEF client**



” Norway has something to learn about waste management from other countries.

**Waste** has become big business for the little Norwegian company TiTech Visionsort, which is based in Ryen, just south-east of Oslo. In collaboration with SINTEF, the company has developed equipment that uses infra-red light and sensors to identify and separate most recyclable materials from waste.

Technical manager Ole Onsrud is one of TiTech’s 32 employees. He has been with the company since its start as a spin-off from liquid food container manufacturer Elopak in 1993. “This time, the challenge was to develop a machine that would be capable of sorting plastic-laminated drink cartons from waste. The project went so well that it was developed even further to detect other materials such as different types of plastic and paper”, says Onsrud. The company’s technology means that it is now a world leader in its field.

Annual turnover is currently about NOK 120 million, and the company produces equipment for waste disposal facilities throughout much of Europe, Japan and the USA. However, the company has no Norwegian customers.

“Most countries deal with their waste differently from the way we do in Norway. Here we sort it manually. This is often an inaccurate process, since most sorters lack the knowledge that would enable them, for example, to distinguish different types of plastic, which is essential if these are going to be recycled. This means that we have to sort some waste twice, and that a lot of it ends up being burned”, says Onsrud.

In Europe, the usual procedure is to put all recyclable waste into one container and organic waste into another. The organic matter is composted, while packaging materials are separated out mechanically. These materials are turned into new products. Soft drinks bottles, for example, are made of polyethylene terephthalate (PET); which is also the raw material for synthetic fleece.

“There is a very good possi-

bility that sorting of this sort will be done in the future by an all-Norwegian machine, manufactured here in Ryen”, says Onsrud.

Last year, TiTech Visionsort supplied about 100 machines to sorting plants in other countries. In 2002, the company bought up its biggest German competitor and it now employs 14 people in Norway and 18 in Germany.

“We are making a deliberate effort to develop our technology, and we put about 10% of our turnover into R & D”, says Onsrud. The company is currently collaborating with SINTEF on a new environmental project that aims to reclaim harmful environmental toxins from waste. Ole Onsrud will say nothing about the whats and hows of the project, but he promises nothing less than a slightly cleaner world if the efforts of SINTEF and TiTech Visionsort are crowned with success.



**SINTEF's Board of Directors:**

From left: Per Ola Grøntvedt, Morten Loktu (President of SINTEF), Elisabeth Wille, Alexandra Bech Gjørnv, Jan Erik Korssjøen, Frode Rømo, Terje Østvold and Hans H. Faanes.

# Report of the Board of Directors

2003 was a good year for the SINTEF Group – in both financial and professional terms. The improvement in our results demonstrates not only that the Group is capable of restructuring itself during a difficult period, but also that Norwegian industry has become more competitive. A new strategic development plan and a reorganisation of its activities will make SINTEF even more competitive in an ever more globalised world.

The annual profit of NOK 48.8 million is an improvement of MNOK 68.1 on the result for 2002. Our book equity value of MNOK 855 is equivalent to 55% of total capital. Our level of investment was lower in 2003 than in the previous year, while significant resources were put into the internationalisation of the SINTEF Group, for example vis-à-vis the EU system.

On January 1, 2004, the SINTEF Group was restructured into six research divisions, which have been defined in terms of value chains and industrial market clusters. Our business concept is to sell research-based knowledge and

related services to Norwegian and overseas customers, in collaboration with NTNU and the University of Oslo. SINTEF will contribute to the development of existing and new industrial companies that have the potential to grow. A further task for SINTEF is to strengthen links between research-based education and industrially oriented research.

At the beginning of 2004, SINTEF's research divisions were the following: SINTEF ICT (the former Telecom and Informatics, Electronics and Cybernetics, and Applied Mathematics), SINTEF Materials and Chemistry (Materials Technology and Applied Chemistry), SINTEF Health Research (Unimed), SINTEF Technology and Society (Industrial Management and Civil and Environmental Engineering), SINTEF Oil and Energy (Energy Research and Petroleum Research), SINTEF Marine (MARINTEK, Fisheries and Aquaculture and the Dept. of Environmental Technology). The business areas that formerly made up SINTEF Solutions have been incorporated into SINTEF Technology and Society and SINTEF Oil and Energy.

The first four research divisions consist of units within the SINTEF Foundation, and the last two of limited companies in which SINTEF is the main shareholder. The SINTEF Group also comprises SINVENT AS, a wholly-owned subsidiary in which the Group's commercial activities and its shares in start-up companies are placed.

## **Technology for a better society**

*The new strategic development plan for 2003 – 2006 focuses on SINTEF's vision and social tasks. SINTEF has set itself the goal of becoming a driving force in the process of restructuring and developing Norwegian society.*

A number of facets of our activities are worth mentioning at this point: Cleaning technology for gas power has developed into a major interest of the SINTEF Group in the course of the past few years. This activity deals with the capture, transport and storage of CO<sub>2</sub> and it involves both industrially financed projects and competence development projects financed by the Research Council of Norway. We have also initi-

ated EU projects in this field. While our CO<sub>2</sub> research is based at SINTEF Oil and Energy, several other divisions are also involved.

In the course of the past year, SINTEF Health Research has developed a teleradiology service based on the broad-band network, that enables local hospitals to offer expert services at the same level as central hospitals. X-ray specialists at St. Olav's Hospital in Trondheim can now interpret 3D images via the Internet in collaboration with colleagues in Levanger and Molde. This means shorter journeys for patients, efficient training of X-ray doctors working in local hospitals and reduced loads on central hospitals. The "Distributed Interactive 3D Teleradiology" project is being financed by the Research Council of Norway.

In the Sognefjord, SINTEF Fisheries and Aquaculture has developed and tested methods for combating *Dinofysis acuta*, an alga that makes mussels toxic to human beings. A breakthrough in this area will be extremely important, since the mussel production

capacity of the Sognefjord has been estimated to be 150,000 tonnes, almost a third of Europe's current total production.

**28** MARINTEK's expertise has been in demand in connection with laying pipelines to the Ormen Lange offshore field, one of the biggest and most advanced industrial innovation projects in Europe. This project has involved the development of simulators for planning and designing the pipeline route.

The first integrated Metal Printing machine, which will make it possible to build functional objects direct from computer drawings, is due to be completed in summer 2004. The process, which has been developed by SINTEF Industrial Management, will make it possible to customise microstructures and various combinations of materials. Metal Printing is arousing considerable international interest.

**Many satisfied customers**  
*SINTEF will upgrade its market activities and improve levels of customer satisfaction. We will grow in national and international markets, be leaders in innovation and commercialisation, and turn SINTEF into a widely recognised trademark.*

A feature of 2003 was a general improvement in the Norwegian industrial sector, largely due to a weaker krone and improved competitiveness. The intro-

duction of the "Skattefunn" scheme (company tax deductions for industrial research) offered companies more advantageous conditions for investing in development-oriented activities.

There were only minor changes in the turnover of the SINTEF Group between 2002 and 2003, but we have noted a significant increase in areas that deal with the petroleum sector. A growing proportion of our turnover is derived from our international activities. The most serious fall in revenue was in Applied Mathematics, where a larger share of public-sector funds is being channelled to the recently established Simula Centre.

In 2003, SINTEF launched a number of internal improvement projects aimed at increasing turnover and raising levels of customer satisfaction. SINTEF has set itself the goal of developing a robust strategy for internationalisation which, in addition to a range of market-oriented measures, will focus on the organisation's international capacity. Another improvement project will focus on our market processes, including our ability to understand our clients' value chains and build networks with customers on a more strategic level.

In line with the development plan, SINTEF is also in the process of establishing itself in other regions of the country. We regard a regional presence as essential to

enable us to serve our customers better and to work more closely with the regional industrial development apparatus. At the beginning of 2004, SINTEF was in the process of establishing such presences in Bergen and Stavanger.

In 2003, our project portfolio comprised a total of 6321 projects.

#### **Scientific quality**

*SINTEF will raise the quality of its fields of scientific activity. Our scientific profile will be recognised as being at an internationally leading level. SINTEF will be a preferred partner for NTNU and the University of Oslo.*

Our collaboration with NTNU entered a new phase in 2003, with the establishment of five Gemini Centres. The Gemini concept is a model for cooperation between parallel research groups that has the objective of coordinating their strategic efforts, thus raising our level of quality and creating larger, more robust research groups. The model was drawn up on the basis of "best practice" studies carried out by four of NTNU's Deans of Faculty at the end of the 90s. The vision of the Gemini Centres is that their milieux should be international leaders in all respects, from teaching, through basic and applied research, to commercialisation. The intention is that this cooperative model will also be adopted by the University of Oslo.

On the basis of the strategic development plan, SINTEF has launched a process of identifying and developing what we call "scientific profiles", which will be developed into scientific "lighthouses" at international level. This will take place in close collaboration with our university partners and in full openness vis-à-vis our competitors and the authorities.

Public-sector funding for both long-term research and more basic aspects of industrial remained at a low level in 2003. This is a problem not only for SINTEF but for the country as a whole, at a time when the need for renewal and industrial innovation is great. A new public-sector support scheme for research groups that win contracts from the EU system is being launched in 2004, and this will be a great help for the process of internationalisation.

#### **Attractive work-place**

*SINTEF aims to be an attractive place to work, in which the company culture will be rooted in basic values such as honesty, generosity, courage and solidarity. The business culture of the organisation will be strengthened.*

In a questionnaire study carried out among technology students in 2003, SINTEF was ranked third among Norwegian companies in which they would like to work – up one place from the previous year. SINTEF is regarded as a

good school for young people who want to make a successful career for themselves, and we aim to work systematically to make SINTEF an even better place to work. SINTEF wishes to provide a creative and versatile environment for talented people of all ages.

The SINTEF Group had a total of 1758 (1770) employees on 31.12. 2003 (numbers in parentheses refer to 2002), of whom 1118 (1162) were employed by the SINTEF Foundation. Eighty-nine members of our research staff (11.1%) left the Foundation in the course of the year to work in industry, the public sector or the universities, while 74 joined us. 37.9% of the SINTEF Group's research staff hold doctorates.

**Financial freedom of action**  
*SINTEF aims to have a robust economy which will give us freedom of action for our own development and enable us to support the values for which we are responsible. Within the current planning period we will manage to develop knowledge capital equivalent to 10% of our revenues, and create a financial result equivalent to 5% of these.*

In 2003, the SINTEF Group generated gross operating revenues of MNOK 1,690 (1.619) and an operating result of MNOK 23.8 (-24.9) and a financial result of MNOK 30.1 (2.7). The result for the SINTEF Group, before tax and shares in associated companies and

minority interests, was MNOK 53.8 (-22.2).

The SINTEF Foundation had gross operating revenues of MNOK 1,109 (1,084). With an operating result of MNOK 14.5 (-4.9) and a financial result of MNOK -5.3 (5.3) the result for the Foundation came to MNOK 9.2 (0.4) before tax and shares in subsidiary companies.

On 31.12.2003 the SINTEF Foundation had an equity capital of MNOK 760 (710.7), which is equivalent to 61.5% (58.7%) of total capital. This provides a good basis for continued operation, and this is the assumption which underlies the presentation of these accounts. The boards of our subsidiary companies have performed similar analyses and have all concluded that continued operation is justified. The Board of the Foundation, which is identical with the Group Board, is of the same opinion. The Board has set out guidelines for assessment of financial risk. All in all, the Board regards the liquidity situation as satisfactory, and finds that the equity capital is quite sufficient to justify continued operation, given the scope of the company's planned activities.

At the beginning of 2004, the company's order reserve was satisfactory.

Since the closing of the annual accounts, there have been no developments of significance for the evalu-

ation of the Foundation or the Group.

The profit on the accounts for 2004 comes to MNOK 48.821, which the Board proposes to dispose of as follows. Transfer to reserve for valuation variances: MNOK 39.578; transfer to other equity capital: MNOK 9.243.

### **Management structure**

SINTEF's central management bodies are its Council and Board. Day-to-day management is in the hands of the Group's President and Vice-president, together with the directors of the six research divisions. SINTEF's Council is chaired by the Rector of NTNU and consists of 32 members, drawn from NTNU, our research companies, and representatives of industry. The Council meets twice a year, and ensures that the objectives of the Foundation are being pursued in accordance with its articles of association. The Council appoints the Board for two-year periods as follows: two members who hold full-time positions at NTNU, three members from industry or the public sector and two tenured SINTEF employees. The Council appoints an auditor and determines the fees to be paid to members of the Board.

The Board has responsibility and authority in all matters that are not the responsibility of the Council. The Board acts in accordance with SINTEF's articles of association, the Foundations Act,

and such aspects of company law as apply to foundations. The Board appoints SINTEF's President and sets his salary and other conditions of employment. The Board held eight meetings in 2003.

SINTEF's president runs the company in accordance with the Foundations articles of association and the Companies Act. He participates in meetings of the Council and the Board in his function as leader of the secretariat. The President has the authority to act on behalf of the Foundation, with the exception of carrying out purchases, sales or mortgages of real estate.

### **Equal opportunities**

Throughout the SINTEF Foundation as a whole, 66% of our employees are men and 34% are women. In 1999 – 2002, 21% of students in Norway who graduated with an M.Sc. in technological subjects were women. Naturally enough, with its technological orientation, SINTEF recruits from this group. The distribution of the sexes in our research staff is 24% women and 76% men.

The SINTEF Group management team consists of 25% women and 75% men. In our six research divisions, the proportion of women at chief scientist and middle management level is 24%, while 29% of the members of the Board are women. Among the externally elected representatives the

proportion of women is 40%, while the corresponding proportion in the Council is 31%.

SINTEF collaborates closely with the country's universities, and we hold regular presentations on the topic of making a career as a research scientist. In the course of these presentations we profile SINTEF as an attractive, exciting workplace for women. Where the proportion of female staff is lower than elsewhere in the company, we specifically encourage women to apply for vacant positions.

SINTEF performs systematic work environment surveys, which also identify gender differences.

### Work environment and external environment

SINTEF defines the concept of work environment in broad terms to include such areas as health, safety and the environment (HSE), management and company culture. Aims and guidelines for these areas are set out in our internal control system and in our annual plans. The climate of cooperation within the Work

Environment Committee has been good in 2003, and the network of HSE coordinators and safety representatives has functioned satisfactorily. In the course of the past year, we have focused in particular on developing management skills, and we have developed good in-house programmes which have been implemented in several parts of the organisation.

The rate of sick-leave was 4.3% in 2003 (3.9), 79% of which was due to long-term absenteeism. The incidence of personal injuries is low.

There is little in SINTEF's range of activities that produces negative effects on the external environment, and there have been no irregularities that have led to damage to the environment in the course of the past year.

### Prospects for the future

SINTEF is aware that international competition in the research sector is becoming more intense, and we intend to implement a number of measures that are aimed at making the organisation more robust in an inter-

national context. These measures will include the development of new ways of interacting with the market, a new strategy for internationalisation and a technology strategy that will raise SINTEF's scientific profile.

University collaboration is one of the keystones of SINTEF's activities, and is an important facet of our international competitiveness. A new Universities Act and new regulations that set out how the universities will be required to organise their contract research will offer a challenge to the traditional NTNU/SINTEF model. The Board wishes to ensure that this relationship is redefined on the basis of the new guidelines in a way that will ensure that the cooperative process is strengthened – for the benefit of both parties.

The coming year will also be of decisive importance as far as Norwegian research and industrial policy is concerned. A new strategy for the Research Council of Norway, and a new White Paper on research that will incorporate a survey of the

institute sector, will set out many of the premises for Norway's future research policy. A similar review of national innovation policy is also under way. SINTEF must actively involve itself in both of these processes in order to contribute to the development of a good policy framework for SINTEF and Norwegian society as a whole.

In both scientific and market terms, SINTEF perceives that exciting challenges are facing us on a number of fronts. Our new research divisions have been designed to encourage a greater degree of cooperation and to enable us to grasp more opportunities that cut across traditional disciplinary boundaries. This trend also demonstrates how SINTEF is gradually moving from its previous role as a supplier of high-level expertise within limited areas to also becoming a supplier of solutions that deal with complete value chains.

Finally, the Board wishes to thank all members of staff of the SINTEF Group for the good work they have done during the past year.



Hans H. Faanes



Elisabeth Wille



Per Ola Grøntvedt



Jan Erik Korssjøn  
(Chairman)



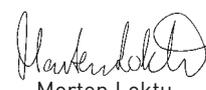
Alexandra Bech Gjorv



Terje Østvold



Frode Rømo



Morten Loktu  
(President – CEO)

# SINTEF's Prize for Outstanding Research for 2003 has been awarded to:



Jon B. Nysæther



Ovidiu Vermesan



Sigmund Clausen



Helge Rustad

The prize was awarded for their successful development of a biometric sensor system for fingerprint analysis and recognition. As well as analysing the fingerprint itself, the system also verifies that the signals are actually being read from a real finger. Their work is based on a SINTEF-owned patent and has been carried out in cooperation with the start-up company IDEX and the European electronics manufacturer ST Microelectronics. Each of the four scientists who have been awarded the prize has played a central role in his own field in the development effort.

The work of the Norwegian scientists gained widespread international recognition when it was presented at a major international conference and was published in international journals. It has brought significant new contracts to SINTEF and has demonstrated that first-class results can be obtained when several different academic disciplines work in close collaboration.

The prize comes to NOK 25 000 for each of the four scientists involved.

## 32 Equal opportunities report



The proportions of women and men in all categories employed by the SINTEF Foundation are:  
Men, 70%  
Women, 30%.



If we take the largest category, scientific personnel, the proportions are as follows:  
Men, 76%  
Women, 24%.

The proportion of women graduating in technological subjects at university level during the period 1999 – 2002, in comparison, was around 21%.



The relative proportions of the sexes in the SINTEF leadership group are about 25% women and 75% men.

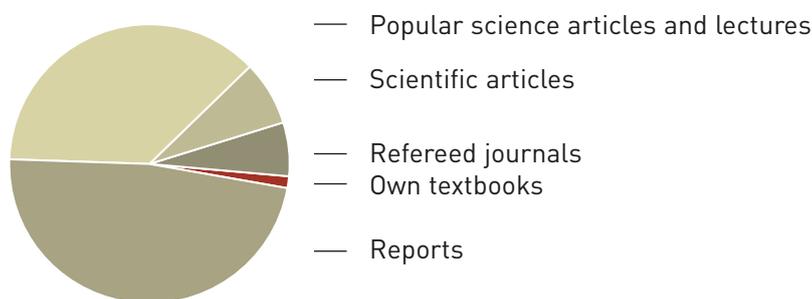
Two of seven members of the Board of the SINTEF Foundation are women, i.e. 30%.  
If we look at the proportion of external members of the Board, two out of five of these are women, i.e. 40%.

Advertisements of vacant positions include an invitation to the underrepresented sex to apply.

SINTEF carries out systematic internal work environment surveys, in the course of which gender differences are identified.

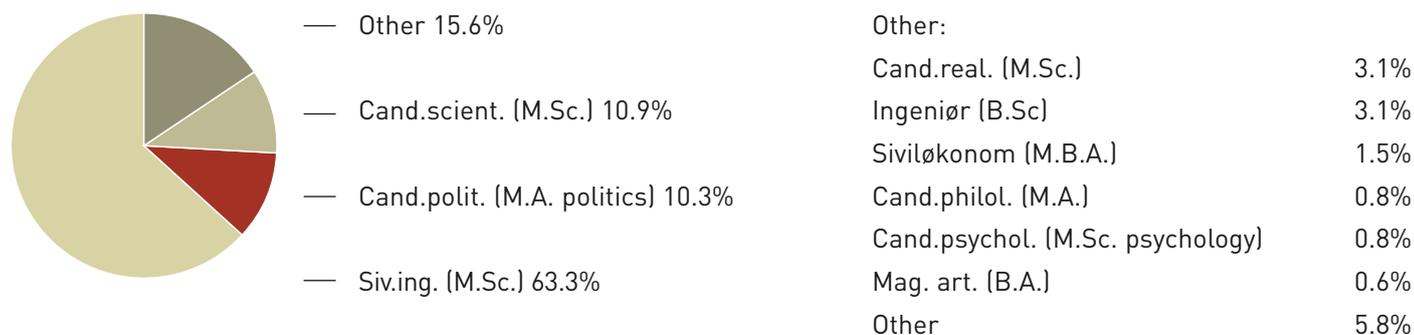
## Publication and communication of results generated by the SINTEF Group in 2003

Total publications: 3,652



## Educational background of research personnel employed by the Foundation in 2003

Total employees: 808



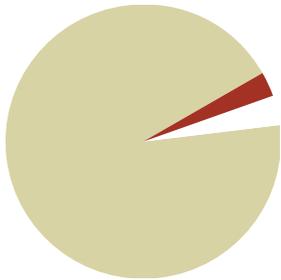
**37% of the SINTEF Group's research staff hold doctorates.**

# SINTEF Group revenues

SINTEF Group turnover in 2003: NOK 1.7 billion

Turnover by source of finance

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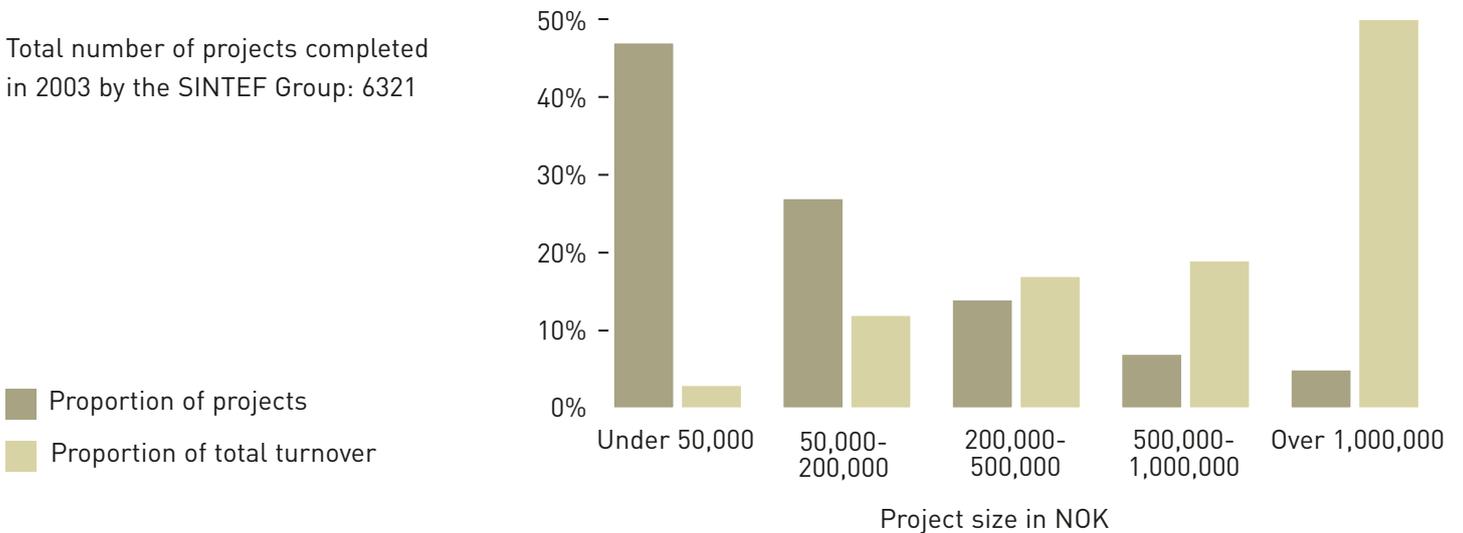
— Research contracts	93.6%
— Research Council: basic grant	2.9%
— Research Council: strategic programmes	3.5%

Research contracts comprise:

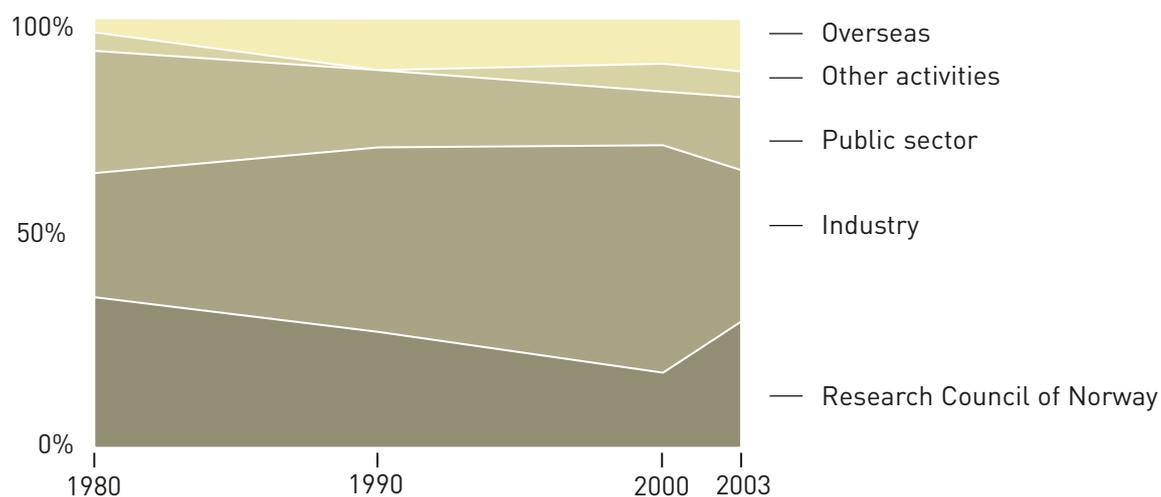
Industry	42.0%
Public sector	12.7%
International contracts	14.2%
Research Council project grants	19.7%
Other income	5.0%

# Projects completed in 2003

Total number of projects completed in 2003 by the SINTEF Group: 6321

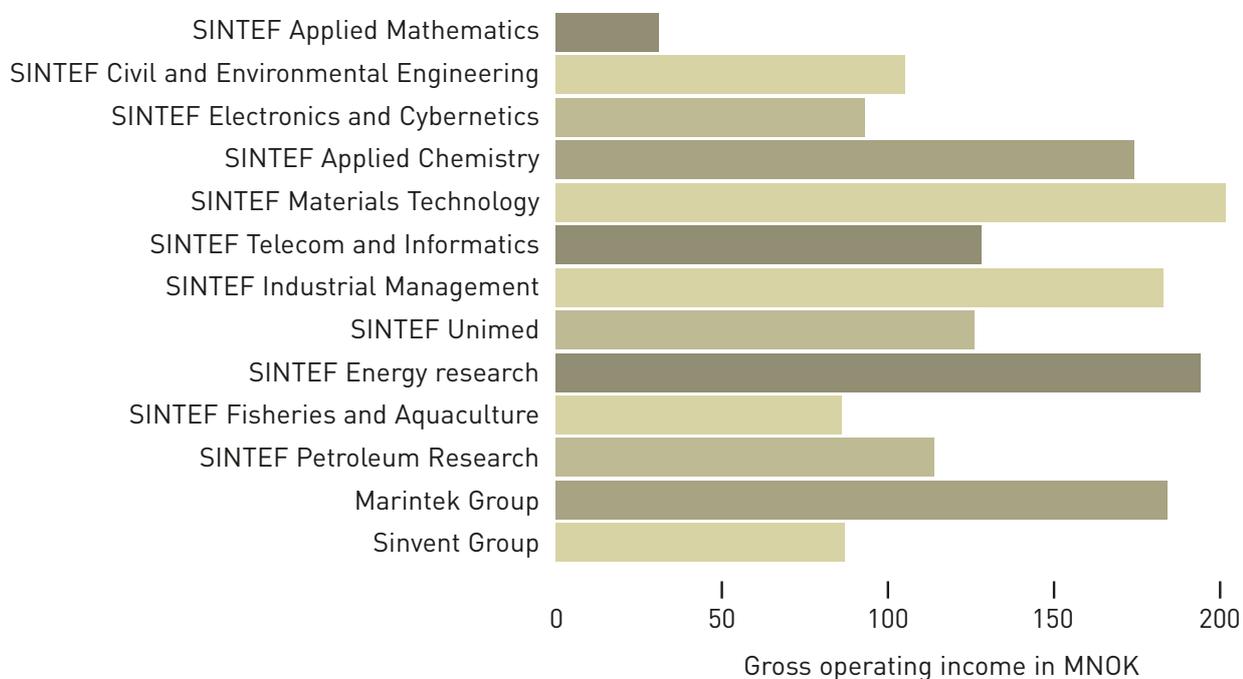


## The SINTEF Foundation's sources of finance



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## The SINTEF Group's turnover in 2003, by institute and research company



**Normah Ismail (36) and  
Ragnhild Drange (31)  
SINTEF clients**

**Ragnhild** Drange and Malaysian **Normah Ismail** have opened Café SAMMENSurium in Trondheim, where adults and children from Norway and many other countries get together once a month for a cup

of coffee and a chat. Naturally, exotic food from Malaysia is also on the menu. The first time that the two women met each other was in October 2003, when Ragnhild volunteered to be a refugee guide and Normah had just arrived in Norway. Normah is now the mother of nine-month-old Nur Hannah, and running the café has given her experience

that she will find useful when she joins the Norwegian labour market after her maternity leave. The refugee guide scheme aims to integrate immigrants into Norwegian society. The concept has been developed by the Norwegian Red Cross and the City of Trondheim in collaboration with SINTEF.



# Income statement

(all figures in NOK thousand)

The SINTEF Group			SINTEF	
2002	2003	Notes	2003	2002
<b>OPERATING INCOME AND EXPENSES</b>				
1 218 224	1 212 929		716 181	767 078
294 567	371 060		293 072	217 695
52 200	49 500		33 000	33 000
53 262	56 884		66 924	66 448
<b>1 618 253</b>	<b>1 690 374</b>	<b>4</b>	<b>1 109 178</b>	<b>1 084 220</b>
346 831	374 629		286 095	274 753
<b>1 271 421</b>	<b>1 315 745</b>		<b>823 083</b>	<b>809 467</b>
899 745	934 881	6	584 630	577 887
49 864	45 783	8	27 166	32 132
603	191		171	603
854	-	8	-	-
345 261	311 125		196 611	203 787
<b>1 296 327</b>	<b>1 291 981</b>		<b>808 579</b>	<b>814 409</b>
<b>-24 906</b>	<b>23 763</b>		<b>14 503</b>	<b>-4 942</b>
<b>FINANCIAL INCOME AND EXPENSES</b>				
30 268	37 338	3	15 499	12 573
27 610	7 261	3	20 760	7 281
<b>2 658</b>	<b>30 077</b>		<b>-5 261</b>	<b>5 293</b>
<b>-22 247</b>	<b>53 841</b>		<b>9 243</b>	<b>351</b>
-	-	9	39 578	-18 267
-3 734	-3 676	9	-	-
<b>-25 981</b>	<b>50 165</b>		<b>48 821</b>	<b>-17 916</b>
-7 174	-5 896	19	-	1 340
<b>-18 807</b>	<b>56 061</b>		<b>48 821</b>	<b>-19 256</b>
449	7 240		-	-
<b>-19 256</b>	<b>48 821</b>		<b>-</b>	<b>-</b>
		9, 17	39 578	-18 267
		17	9 243	-989
			<b>48 821</b>	<b>-19 256</b>

# Balance

(all figures in NOK thousand)

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The SINTEF Group			SINTEF		
2002	2003	Notes	Balance on 31.12.	2003	2002
<b>ASSETS</b>					
<b>Long-term assets</b>					
2 624	8 939	19	Deferred tax advantage	-	-
-	1 800		Research and development	-	-
<b>2 624</b>	<b>10 739</b>		<b>Intangible assets</b>	<b>-</b>	<b>-</b>
299 391	288 969	8	Real estate, buildings and other fixed assets	252 193	254 810
105 813	115 868	8	Buildings under construction	115 868	105 813
51 197	43 767	8	Scientific equipment	16 621	23 115
6 019	11 636	8	Other equipment, fixtures, etc.	1 814	2 504
<b>462 420</b>	<b>460 239</b>		<b>Long-term operating assets</b>	<b>386 495</b>	<b>386 242</b>
-	-	9	Investments in subsidiaries	254 375	214 753
4 867	1 150	9	Investments in associated companies	-	-
3 211	4 337	10	Shares in other companies	1 050	-
-	-		Consolidated long-term receivables	61 183	58 933
10 954	1 735	7, 11	Pension fund	-	-
6 527	6 234	11	Other long-term receivables	2 429	3 629
<b>25 560</b>	<b>13 456</b>		<b>Financial long-term assets</b>	<b>319 037</b>	<b>277 315</b>
<b>490 604</b>	<b>484 434</b>		<b>Total long-term assets</b>	<b>705 531</b>	<b>663 557</b>
<b>Liquid assets</b>					
1 711	1 838		Inventory of finished goods	1 649	1 522
85 394	106 681	5	Work in progress	71 690	50 408
<b>87 105</b>	<b>108 519</b>		<b>Goods</b>	<b>73 339</b>	<b>51 930</b>
426 311	387 781		Accounts receivable	224 580	255 111
-	-		Consolidated current receivables	17 602	34 453
21 940	21 196		Other current receivables	3 137	17 261
<b>448 251</b>	<b>408 977</b>		<b>Receivables</b>	<b>245 320</b>	<b>306 824</b>
58 596	46 260	10	Shares	-	-
236 876	253 273	12	Bonds and other securities	123 621	115 589
<b>295 472</b>	<b>299 533</b>		<b>Investments</b>	<b>123 621</b>	<b>115 589</b>
198 855	252 543		Cash, bank deposits	87 288	75 855
<b>198 855</b>	<b>252 543</b>		<b>Cash, bank deposits</b>	<b>87 288</b>	<b>75 855</b>
<b>1 029 682</b>	<b>1 069 572</b>		<b>Total liquid assets</b>	<b>529 567</b>	<b>550 199</b>
<b>1 520 285</b>	<b>1 554 005</b>		<b>TOTAL ASSETS</b>	<b>1 235 099</b>	<b>1 213 755</b>

The SINTEF Group			SINTEF		
2002	2003	Notes	Balance on 31.12.	2003	2002
<b>EQUITY AND LIABILITIES</b>					
<b>Equity</b>					
62 300	62 300	17	Foundation's equity	62 300	62 300
<b>62 300</b>	<b>62 300</b>		<b>Paid-up equity</b>	<b>62 300</b>	<b>62 300</b>
-	-	17	Reserve for valuation variances	216 386	176 764
648 412	697 748	17	Other equity	481 362	471 647
88 774	94 891		Minority interests	-	-
<b>737 186</b>	<b>792 639</b>		<b>Earned equity</b>	<b>697 748</b>	<b>648 411</b>
<b>799 486</b>	<b>854 939</b>		<b>Total equity</b>	<b>760 048</b>	<b>710 711</b>
<b>Liabilities</b>					
23 223	49 094	7	Pension liabilities	32 571	17 226
<b>23 223</b>	<b>49 094</b>		<b>Long-term liabilities</b>	<b>32 571</b>	<b>17 226</b>
4 118	5 177	14	Mortgage loans	-	-
-	34 625	15	Other long-term liabilities	34 625	-
<b>4 118</b>	<b>39 802</b>		<b>Other long-term liabilities</b>	<b>34 625</b>	<b>-</b>
103 755	86 107		Accounts payable	56 498	79 828
53 067	95		Credit line	95	43 497
1 589	196	19	Tax due	-	1 300
186 648	124 087		VAT, tax deductions, social security, etc.	65 552	128 481
236 739	231 565		Advance payments from customers	158 266	160 109
-	-		Consolidated current liabilities	5 644	8 701
-	1 125		Dividends to minority shareholders	-	-
111 662	166 996	18	Other current liabilities	121 799	63 901
<b>693 460</b>	<b>610 171</b>		<b>Current liabilities</b>	<b>407 854</b>	<b>485 817</b>
<b>720 800</b>	<b>699 067</b>		<b>Total liabilities</b>	<b>475 050</b>	<b>503 043</b>
<b>1 520 285</b>	<b>1 554 005</b>		<b>TOTAL EQUITY AND LIABILITIES</b>	<b>1 235 099</b>	<b>1 213 755</b>

Trondheim March 24th, 2004



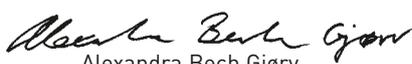
Hans H. Faanes



Elisabeth Wille



Per Ola Grøntvedt


Jan Erik Korssjøn  
(Chairman)


Alexandra Bech Gjørn



Terje Østvoll



Frode Rømo


Morten Loktu  
(President - CEO)

# Cash-flow analysis

(all figures in NOK thousand)

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The SINTEF Group			SINTEF	
2002	2003		2003	2002
		<b>Cash-flow from operations</b>		
-25 981	50 165	Profit before tax	48 821	-17 916
3 734	3 676	Percentage of profit from subsidiaries/associated companies	-39 578	18 267
50 719	45 783	Ordinary depreciations/write-downs	27 166	32 132
1 358	-138	Net sales of fixed assets	-	1 358
-38 891	-4 061	Change in investments	-8 032	-12 394
8 166	-	Depreciation of shares/financial long-term assets	-	-
-2 081	-21 287	Change in work in progress	-21 281	6 675
38 636	38 529	Change in accounts receivable	30 530	23 761
12 812	-17 648	Change in accounts payable	-23 330	21 456
90 130	-64 942	Change in accounts payable	-23 785	36 408
-4 677	-461	Tax paid	-	-240
7 663	-	Changes in composition of Group	-	-
-22 360	25 871	Change in pension obligations	15 345	-20 911
<b>119 229</b>	<b>55 487</b>	<b>Net cash-flow from operations (A)</b>	<b>5 855</b>	<b>88 597</b>
		<b>Cash-flow from investment activities</b>		
-137 795	-45 397	Purchases of long-term operating assets	-27 418	-101 110
-8 601	-	Investments in long-term financial assets	-2 101	-11 243
5 239	134	Sales of long-term operating assets	-	4 043
8 429	8 386	Sales of other financial assets	-	9 610
<b>-132 728</b>	<b>-36 877</b>	<b>Net cash-flow from investment activities (B)</b>	<b>-29 519</b>	<b>-98 700</b>
		<b>Cash-flow from financial activities</b>		
856	35 684	Payments on uptake of new long-term debt	34 625	-
-	-	Conversion of debt to equity capital	-	-4 450
-6 086	-606	Changes charged directly to equity capital	472	-
<b>-5 230</b>	<b>35 078</b>	<b>Net cash-flow from financial activities (C)</b>	<b>35 097</b>	<b>-4 450</b>
-18 730	53 688	Net change in cash holdings (A+B+C)	11 433	-14 553
217 585	198 855	Cash balance on 01.01.	75 855	90 408
<b>198 855</b>	<b>252 543</b>	<b>Cash balance on 31.12.</b>	<b>87 288</b>	<b>75 855</b>

**Geir Mikkelsen (31)**  
**SINTEF client**

**He** has sweated every summer and has had to wrap up extra warmly in the winter. Now new uniforms are ready for Geir Mikkelsen and the rest of Norway's motorcycle police, as a change from the leather suits they

have to wear today. The police made a scientific job of looking for an alternative uniform and their final choice was made on the basis of a project carried out by the Police Supply Service and SINTEF Health Research. SINTEF carried out a survey of users' experience of leather uniform clothing. The responses were used to

draw up a set of specifications for the new uniform. SINTEF subsequently tested the two sets of clothing that reached the final round of tendering, partly in order to check how well they could keep warm bodies ventilated. The police aim to supply all their motorcycle drivers with the new uniforms within three years.





**Michael Brinchmann (11)**  
**SINTEF client**

“**The Rosenberg** football team are fantastic, Eminem is the tops and Jarlsberg cheese is great, too. Especially in a sandwich after school”, thinks Michael. Now dairy products company TINE has good

news for the 11-year-old and other fans of this rather special Norwegian cheese. New production techniques that SINTEF has helped to develop should make Jarlsberg cheese even better. A bacterial culture is responsible for both the Jarlsberg taste and the holes in the cheese. A new centre in Jæren, where the tiny bacteria will

be cultured, will cut costs and further improve the well-known Jarlsberg aroma, according to TINE. Bacterial cultures from the new plant will be sent to the USA for production of Jarlsberg under licence. Starting in 2006, bacteria for domestic production of Jarlsberg will be raised in a similar “maternity unit”.

# Notes to the Annual Accounts for 2003

## 1. Accounting principles

### General

The annual accounts have been drawn up in accordance with the Norwegian Accounting Act of July 17, 1998, and are based on Norwegian accounting standards and guidelines for good accounting practice.

### Principles of consolidation

The consolidated accounts indicate the overall economic result and financial position when the parent company SINTEF and its shareholdings in other companies are presented as a financial unit. The consolidated accounts include all companies in which SINTEF owns more than 50% of the share capital or in which it has a decisive influence.

In addition to SINTEF, the parent company, the consolidated accounts include:

- SINTEF Petroleum Research
- SINTEF Energy Research
- SINTEF Fisheries and Aquaculture
- MARINTEK Concern
- SINVENT Concern

Please see also note 9 concerning subsidiaries.

All significant inter-company transactions, debts and unrealised internal earnings have been eliminated. The minority interests' share of the result forms part of the Group's result and the minority interests' share of equity forms part of the Group's equity.

### Principles employed in entering revenue

Project income is entered on a current basis, i.e. as a percentage of the work assumed to have been completed, such that the completed proportion of the earnings expected from a project is treated as income. The degree of completion is based on what has actually been produced.

Where projects are expected to result in a loss, the entire loss is entered as a cost item.

Public-sector support in the form of research council funding, etc. is entered in accordance with basic principles for entering income and expenses, i.e. that funding is entered at the same time as the income it is intended to generate or the cost that it is intended to reduce. Funding to which conditions are attached are entered as income at the time at which the conditions have been, or are likely to be, met.

Investments and support items are entered net. Investment support is deducted from the historical cost of the investment item.

Licence revenue is entered pro rata for the period of the licence.

### Classification

Current assets are items related to project activity or debts due to be repaid within one year, as well as other assets not intended for long-term ownership or use by the company. Other assets are long-term assets. The distinction between short-term and long-term debts is drawn at a due date of one year.

Shares in subsidiaries and other shareholdings of strategic or "non-financial" character are classified as long-term assets. Other shares are classified as current assets.

### Estimates of value of assets

Current assets are valued at historical cost or real value, whichever is lower. Long-term assets are valued at historical cost. If the real value of long-term assets is lower than their book value, and the fall in value is not expected to be temporary, their value is written down to their real value.

### Shares in subsidiary companies

Investments in consolidated associated companies are entered in accordance with the equity capital method in the company accounts, which means that the investment is valued as the parent company's share of the equity capital of the subsidiary, and the result of the share is entered as revenue or cost.

### Other long-term shares and stocks

Long-term shares in companies in which SINTEF does not have a significant influence are balanced at historical cost. Investments are written down to their real value if their fall in value is not temporary. Dividends received and other payments from company surpluses are entered as "Other financial income".

### Shares in other companies (current shares)

Shares that form part of the business portfolio are valued at their real value on balancing day. Other current shares are valued at mean historical cost or real value on balancing day, whichever is lower.

### Foreign currency

Foreign-currency items are valued at the exchange rate on balance day. Incoming and outgoing foreign exchange rate risks are reduced by means of futures contracts directly related to contracts. Spot transactions are also performed on excess currency amounts.

### Receivables

Accounts receivable and other receivables are valued at their nominal value, with deductions for anticipated losses. Provisions for losses are made on the basis of an individual evaluation of the specific receivable involved.

### Work in progress

This item includes work done but not invoiced. Accrued hours are valued at invoiceable rates and relative to the percentage of the project actually completed, with deductions for anticipated losses.

### Intangible assets

The costs of intangible assets, including research and development, are entered as costs in their entirety.

### Long-term operating assets

Operating assets costing more than NOK 50,000 and with an anticipated economic lifetime of three years or more, are activated and depreciated on purchase. Operating assets are depreciated linearly at the following rates: scientific equipment, office equipment, furniture and vehicles: 33%; buildings: 2 - 5%.

### Tax

Trondheim Tax Office has warned SINTEF that it is considering making the Foundation liable for tax from 2001. The Board of the Foundation has questioned the legitimacy of this decision. This matter has still to be cleared up and the effects of any tax liability have not been incorporated into the Foundation's accounts. Tax in the consolidated accounts refers exclusively to tax with the SINTEF Concern.

### Pensions

Pension costs are entered in the accounts in accordance with the provisions of the Norwegian Standard for Pension Cost Accounting. Net pension costs consist of the present value of pensions earned in the course of the year plus the cost of interest on pension obligations, less the anticipated yield of the pension fund, and corrected for the distributed effects of changes in the pension plan, estimates and deviations. Net pension costs are entered under "Salaries and Social Costs".

The Norwegian Accounting Standard states that a company's pension scheme is to be treated as a compensation plan, in which future pension payments are based on the number of years of earnings and the salary level at pensionable age. Pension funds are estimated at the end of each accounting year. The estimated value is adjusted annually in accordance with the statement provided by the life-insurance company on the basis of the transferable value of the pension funds.

Measurement of accumulated pension liabilities uses estimated liability at the end of the accounting year. This estimated value is adjusted annually in accordance with the statement provided by the insurance company regarding accumulated pension liability. Actuarial estimates are made every year by the insurance company on the basis of information provided by SINTEF.

Differences between estimated and actual values that are due to changes in economic or actuarial assumptions are

regarded as changes in accounting estimates. The Accounting Standard allows a special method of dealing with such differences in that differences of up to 10% of the larger of pension liability or pension funds may be excluded from the basis for calculating the result. Differences above the 10% limit must be entered in the result over the remaining earnings period. Differences due to changes in the pension plan are distributed systematically over the average remaining earnings period.

In consequence of the fall in long-term interest rates, the discounting rate and interest on anticipated pension fund yield has been reduced by one percent in comparison with previous years' estimates. This has brought about a significant increase in pension liabilities and pension costs for the year.

Agreed pension plans (the AFP scheme) are covered by the Standard for Pension Cost Accounting.

The SINTEF Group has a collective pension plan with an insurance company for all its employees. Our liability covers 1194 SINTEF employees and 233 pensioners. The pensions of a further four former employees are paid as part of our operating costs. Contributions by employees towards the partial financing of the pension scheme are treated as a reduction in salary costs and do not affect the pension costs of the period.

## 2. Financial market risks

The SINTEF Group is exposed to changes in exchange rates in that its project revenues are in other currencies, largely Euros and USD, than its costs. In order to reduce the exchange rate risks involved the company utilises foreign exchange futures contracts.

The SINTEF Group maintains considerable liquid reserves, which are centrally placed on behalf of the whole Group. The portfolio is placed in accordance with the "Guidelines for Financial Management" of December 2002.

Per 31.12. 2003 the market value of the portfolio was MNOK 253.3. The SINTEF Foundation was responsible for 48.81% of this amount.

Virtually the whole of the portfolio consists of bonds and other securities which per 31.12.2003 had a duration of 1.44. A 1% change in the rate of interest on the portfolio would have an effect of around MNOK 2.91 on the result. The remainder of the portfolio is made up of liquid assets and low-risk investments. The corresponding effect on the result for the Foundation would be MNOK 1.42.

### 3. Consolidated items

All figures in NOK 1000	The SINTEF Group	SINTEF
<b>Financial income:</b>		
Interest on bank deposits, etc.	6 862	2 868
Interest and foreign exchange gains	6 881	3 411
Interest on interest note	1 634	1 333
Gains from investments of capital	15 929	7 887
Remission of debt	984	0
Other financial income	5 048	
<b>Sum financial income</b>	<b>37 338</b>	<b>15 499</b>
<b>Financial costs:</b>		
Depreciation of financial liquid assets	1 210	17 732
Remission of accounts receivable		1 562
Interest costs	2 904	895
Foreign exchange losses	2 197	165
Interest on overdue payments	192	406
Charges	544	
Other financial costs	214	
<b>Sum financial costs</b>	<b>7 261</b>	<b>20 760</b>

### 4. Sales revenues for the SINTEF Group

All figures in NOK 1000

By area of activity within the SINTEF Group	2003	
Intercompany transactions		65 955
Civil and Environmental Engineering		105 465
Materials Technology		202 016
Industrial Management		182 559
Telecom and Informatics		128 117
Applied Mathematics		30 849
Applied Chemistry		174 419
Electronics and Cybernetics		93 375
Unimed		126 422
<b>Total Foundation</b>	<b>1 109 178</b>	
SINTEF Energy Research		194 405
Marintek Group		183 904
SINTEF Fisheries and Aquaculture		85 620
SINTEF Petroleum Research		113 517
SINVENT Group		86 998
Eliminated intercompany transactions		-83 248
<b>Total areas of activity</b>	<b>1 690 374</b>	
<b>Geographical distribution</b>	<b>The SINTEF Group</b>	<b>SINTEF</b>
Norway	1 424 046	949 289
European Union	108 467	70 086
Other countries	157 861	89 803
<b>Sum geographical distribution</b>	<b>1 690 374</b>	<b>1 109 178</b>

### 5. Work in progress

This figure includes a depreciation in value relative to the sales value of 7% of the company's share of work in progress, with the exception of MARINTEK, which shows a 4.17% depreciation of this item.

### 6. Salary costs, number of employees, fees, loans to employees, etc.

All figures in NOK 1000

The SINTEF Group			SINTEF	
2002	2003	Salary costs	2003	2002
711 387	719 385	Salaries	442 580	454 353
112 284	120 077	Employers' contribution	81 470	75 267
39 032	71 142	Pension costs	45 804	26 893
37 042	24 277	Other benefits	14 775	21 375
<b>899 745</b>	<b>934 881</b>		<b>584 630</b>	<b>577 888</b>
<b>1 744</b>	<b>1 795</b>	Average number of employees	<b>1 161</b>	<b>1 178</b>

The SINTEF Group's leading personnel are enrolled in the company's collective pension scheme. The President of SINTEF is enrolled in a pension scheme which will give him 66% of his full salary from the age of 67. He is also the beneficiary of an arrangement whereby he will receive 12 months' salary if the Board wishes him to resign from his position. Any other earnings during this period will be deducted from this sum. The salaries of the President of the company in 2003 came to MNOK 1.4, plus taxable benefits totalling MNOK 0.141. No fees were paid to the Council of SINTEF. Honoraria to SINTEF's Board of Directors came to MNOK 0.625 in 2003.

### Fees paid to auditor and collaborating companies

	SINTEF	The SINTEF Group
Deloitte State Authorised Public Accountants Ltd:		
Auditor's fees	174	604
Other auditing services	621	1 537
Other inspections carried out at the request of SINTEF	490	490
Deloitte Advocates DA:	1 447	1 594
<b>Total</b>	<b>2 732</b>	<b>4 225</b>

Deloitte Advocates DA collaborates with Deloitte State Authorised Public Accountants Ltd

### Loans to employees

The total sum of loans to employees amounted to MNOK 0.388, of which MNOK 0.155 were within SINTEF.

### 7. Pensions

The following assumptions for SINTEF and the Group as a whole have been made for 2003:

	2003	2002
Annual return on pension funds	7.0%	8.0%
Discount rate	6.0%	7.0%
Annual rate of growth of salaries	3.0%	3.0%
Annual adjustment of social security basic rate	3.0%	3.0%
Annual adjustment of pensions under payment	3.0%	3.0%
Turnover in all age groups	Different rates, depending on age and category of employment	
Average employment tax rate	14.1% (5.1% for Molab)	
Tendency to take advantage of AFP (early retirement scheme)	1-50%	

**Composition of pension costs for the period.**  
All figures in NOK 1000:

	SINTEF	SINTEF Group
Net present value of pension accumulation for the year	33 094	55 287
+ interest costs of accrued liabilities	30 143	47 888
- anticipated return on pension funds	25 762	42 660
+ amortisation of estimated deviation	8 329	10 627
<b>= Net pension costs, excluding employment tax</b>	<b>45 804</b>	<b>71 142</b>

Balance on 31.12.03, pension liabilities:	SINTEF	SINTEF Group
Estimated pension liabilities	554 412	871 678
- Estimated value of pension funds	421 260	672 246
- Unentered effect of estimated deviation	104 596	157 776
Estimated net pension due before employer tax	28 556	41 656
+ Periodised employment tax	4 015	5 703
<b>= Estimated pension due after tax</b>	<b>32 571</b>	<b>47 359</b>
Net liabilities, whereof:	32 571	47 359
Underfinanced pensions due	32 571	49 094
Overfinanced pensions due		1 735

**8. Long-term operating assets, furniture and buildings**

All figures in NOK 1000

SINTEF Group 2003	Scientific equipment	Office equipment, furniture, vehicles	Buildings	Buildings under constr.	Sum
Historical cost per 01.01.03	319 094	107 181	659 129	105 813	1 191 217
Purchases in 2003	21 245	4 099	8 198	10 055	43 597
Decrease at historical cost	0	-936	0	0	-936
Historical cost per 31.12.03	340 339	110 344	667 327	115 868	1 233 878
Total ordinary depreciation	295 720	99 214	378 356	0	773 290
Total depreciation	854	-506	0	0	348
Book value per 31.12.03	43 767	11 636	288 969	115 868	460 239
Ordinary depreciation for year	28 677	4 220	12 884	0	45 783
Depreciation for year	0	0	0	0	0
Economic lifetime	3 years	3 years	20-50 years		
Depreciation plan	Linear	Linear	Linear	Not deprec.	
Annual hire of operating assets not entered in Balance Sheet			39 094		39 094
Purchases <NOK 50.000	8 606	11 343			19 949

SINTEF 2003	Scientific equipment	Office equipment, furniture, vehicles	Buildings	Buildings under constr.	Sum
Historical cost per 01.01.03	188 530	89 989	592 618	105 813	976 950
Purchases in 2003	8 765	1 078	7 520	10 055	27 418
Decrease at historical cost	0	0	0	0	0
Historical cost per 31.12.03	197 295	91 067	600 138	115 868	1 004 365
Total ordinary depreciation	180 673	89 253	347 943		617 869
Book value per 31.12.03	16 621	1 814	252 194	115 868	386 495
Ordinary depreciation for year	15 260	1 768	10 137		27 166
Accumulated depreciation on decrease	2 209	0	0		2 209
Economic lifetime	3 years	3 years	20-50 years		
Depreciation plan	Linear	Linear	Linear	Not deprec.	
Annual hire of operating assets not entered in Balance Sheet			24 374		24 374
Purchases <NOK 50.000	1 734	10 441	0	0	12 175

From the turn of the year 2002/2003, SINTEF rented 22,049 m<sup>2</sup> from NTNU, including SINTEF Energy Research's 4,409 m<sup>2</sup>. NTNU rented 14.318 m<sup>2</sup> from SINTEF, including 235 m<sup>2</sup> in the EFI Building. SINTEF Energy Research has a separate contract with NTNU, but this is administered by SINTEF Property Services.

**9. Subsidiaries**

SINTEF's subsidiaries

Company	Date of purchase	Business office	Ownership	Voting percentage
MARINTEK – Norwegian Marine Technology Research Institute	19.12.84	Trondheim	56.0%	56.0%
SINTEF Petroleum Research	01.01.85	Trondheim	100.0%	100.0%
SINTEF Energy Research	16.12.85	Trondheim	61.0%	61.0%
Sinvent	01.01.88	Trondheim	100.0%	100.0%
SINTEF Fisheries and Aquaculture	01.01.99	Trondheim	96.9%	96.9%

The companies' accounts are drawn up in accordance with the equity capital method; see table below.

Company	SINTEF Petroleum Research	SINVENT Group	SINTEF Fisheries and Aquaculture	SINTEF Energy Research	MARINTEK Group	SUM
Historical cost	9 000	6 670	6 769	4 600	6 500	33 539
Equity capital in Balance Sheet at time of purchase	9 000	6 670	6 769	4 600	6 500	33 539
<b>Ingoing balance per 01.01.03</b>	<b>72 250</b>	<b>21 587</b>	<b>5 842</b>	<b>63 579</b>	<b>51 494</b>	<b>214 753</b>
Share of result for year	14 308	13 618	2 840	6 991	1 818	39 578
Other changes in course of year		-42	89			47
<b>Outgoing balance per 31.12.03</b>	<b>86 558</b>	<b>35 163</b>	<b>8 773</b>	<b>70 569</b>	<b>53 312</b>	<b>254 375</b>

Share of result for year, 39,578, has been transferred to reserve for valuation variances.

**Sinvent's subsidiary and associated companies**

Company Subsidiary company	Date of purchase	Business office	Shareholding	Voting percentage
SINTEF Venture AS	08.02.02	Trondheim	100.0%	100.0%
Sinvent Venture AS	01.08.02	Trondheim	100.0%	100.0%
SINTEF Solutions AS	29.12.00	Trondheim	100.0%	100.0%
SinRun AS	01.01.98	Trondheim	100.0%	100.0%
Norwegian Fire Research Laboratory AS	31.12.00	Trondheim	100.0%	100.0%
Molab as	01.01.90	Mo i Rana	60.0%	60.0%
<b>Associated companies</b>				
Bedriftsuniversitetet AS	17.07.00	Oslo	36.7%	36.7%
Raufoss Technology & Industrial Management AS	31.12.01	Raufoss	33.7%	33.7%

The companies' accounts are drawn up in accordance with the equity capital method: see next table. All figures in NOK 1000

Company	SINTEF Venture AS	Sinvent Venture AS	SINTEF Solutions AS	SinRun AS	Norwegian Fire Research Laboratory	Molab as	Sum
Historical cost	25 000	55 642	100	16 553	1 300	1 000	99 595
Equity capital in Balance Sheet at time of purchase	25 000	55 642	100	11 642	1 300	1 000	94 684
Goodwill	0	0	0	4 911	0	0	4 911
<b>Ingoing balance per 01.01.03</b>	<b>23 809</b>	<b>50 796</b>	<b>-6 355</b>	<b>26 868</b>	<b>1 703</b>	<b>11 218</b>	<b>108 039</b>
Share of result for year	-1 438	1 737	-6 667	1 502	1 061	1 876	-1 929
Correction made directly against EC	0	0	0	3 674	0	0	3 674
Contribution paid to Group	0	0	0	-13 002	-662	0	-13 664
Contribution received from Group	0	0	13 002	0	0	0	13 002
Share purchases	0	0	18 000	0	0	0	18 000
Dividends paid 2003	0	0	0	0	0	-1 687	-1 687
<b>Outgoing balance per 31.12.03</b>	<b>22 371</b>	<b>52 533</b>	<b>17 980</b>	<b>19 042</b>	<b>2 102</b>	<b>11 407</b>	<b>125 435</b>

Company	Bedrifts- univ. AS	Raufoss TIM AS	Sum
Historical cost	5 510	3 500	9 010
Equity capital in Balance Sheet at time of purchase	5 510	1 020	6 530
Goodwill	0	2 480	2 480
<b>Ingoing balance per 01.01.03</b>	<b>2 031</b>	<b>2 836</b>	<b>4 867</b>
Share of result for year	-2 654	-526	-3 180
Depreciation of goodwill	0	-496	-496
Equity capital posts	-41	0	-41
<b>Outgoing balance per 31.12.03</b>	<b>-664</b>	<b>1 814</b>	<b>1 150</b>

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## 10. The SINTEF Group's shareholdings in other companies

All figures in NOK 1000	Percentage shareholding	Book value
<b>Fixed assets</b>		
Norsk Jern Eiendom AS	2.10 %	3 000
MoTest AS	49.00 %	201
Coast Care	2.50 %	10
MTFS		1 000
Other shareholdings in fixed assets		126
<b>Total shareholdings in fixed assets</b>		<b>4 337</b>
<b>Current assets</b>		
Dtech-depotaksjer		156
Dtech	6.70 %	4 476
Numerical Objects AS	21.80 %	0
Green Trip AS	81.10 %	2 186
DAT AS	4.00 %	
Mon Aqua	33.50 %	316
Såskorninvest Midt-Norge	11.90 %	7 508
Trøndelag Vekst AS	1.00 %	165
KeraNor AS	14.50 %	165
Nacre AS	75.00 %	8 050
Mison AS	8.10 %	1 675
Norsk Helseinformatikk	65.00 %	530
A-vision AS	33.30 %	100
Metaphor AS	31.00 %	750
Comex AS	38.00 %	344
Euromast AS	20.00 %	350
Simula Research Laboratory AS		150
Alcon-Gruppen AS	22.50 %	900
Innovestco Holding AS		40
Leiv Eiriksson AS		5 391
CompuTouch AS		161
Norfood Research AS		300
AquaCon AS	19.40 %	825
CFD Norways	30.55 %	293
Lodic AS	24.99 %	125
ProNavis AS	24.90 %	300
Powel AS	7.21 %	994
Other shares with book values <100		2 628
General adjustment of value of share portfolio		-3 195
Securities fund (market value)		10 576
<b>Total short-term shareholdings</b>		<b>46 260</b>

## 11. Receivables with due date more than one year

SINTEF Group			SINTEF	
2002	2003		2003	2002
6 527	6 234	Other receivables	2 429	3 629
		Loans to businesses in Group	61 183	58 933
10 954	1 735	Pension funds	0	0

## 12. Bonds and other securities (business portfolio)

All figures in NOK 1000

Investments are distributed as follows	Historical cost	Currency	Market value	Book value	SINTEF's share (48.81%)
Cash deposits and derivatives	14 050	NOK	14 012	14 012	6 839
Certificates and bonds					
State	39 882	NOK	43 092	43 092	21 033
Guaranteed by municipality and county authorities	21 676	NOK	22 612	22 612	11 037
Commercial and savings banks	41 530	NOK	43 071	43 071	21 023
Finance/credit institutions	20 050	NOK	20 844	20 844	10 174
Other companies (including industry)	4 019	NOK	4 151	4 151	2 026
<b>Sum certificates and bonds</b>	<b>127 157</b>		<b>133 770</b>	<b>133 770</b>	<b>65 293</b>
Interest-bearing funds	65 370	NOK	68 584	68 584	33 475
Foreign interest-bearing funds	6 704	EURO	6 898	6 898	3 367
Index-linked stock	20 300	NOK	22 972	22 972	11 212
Overseas unit trusts	6 760	EURO	7 038	7 038	3 435
<b>Total investments</b>	<b>240 341</b>		<b>253 274</b>	<b>253 274</b>	<b>123 621</b>

The duration of the bonds and securities portfolio per 31.12.2003 was 1.44. This item includes investments drawn on the SINTEF Groups joint liquidity. SINTEF's share of capital investments came to 48.81% of their total value.

## 13. Foreign exchange

All figures in NOK 1000

Currency	EUR	USD	KWD	DKK	GBP	SEK	TND	CAD
Bank deposits	-413	111	28	-307	-28	0	0	0
Accounts receivable	2 501	165	18	1 278	0	22	77	27
Liabilities	-86	-1	0	-35	-9	-230	-77	0
Foreign exchange futures contracts	-2 038	150	-29	-4 042	0	0	0	0
Sum position	-36	424	17	-3 106	-37	-208	0	27

## 14. Long-term liabilities

Long-term liabilities consist of a mortgage to Molab, of which MNOK 5 is secured via collateral on long-term assets and MNOK 3.4 in customer receivables.

## 15. Mortgages and guarantees, etc.

The SINTEF Group has signed a contract with Den norske Bank regarding the operation of a common current account system. The parent company and its subsidiaries are jointly liable vis-à-vis the bank for any liability covered by the agreement.

SINTEF is required to post satisfactory security in the form of fixed assets for investing funds from its capital account in joint active management operations. In connection with the loan extended to the Microelectronics Laboratory in Oslo, a negative mortgage clause has been posted.

## 16. Intra-Group accounts

Internal turnover within the Group amounts to MNOK 80.4, exclusive of VAT.

For intra-Group receivables and debts, please refer to the relevant lines in the Balance Sheet.

## 17. Equity capital

The SINTEF Group

All figures in NOK 1000	Paid-up equity	Earned equity		Total equity
			Other equity incl. minority	
Equity per 01.01.03	62 300	737 186		799 486
Items entered directly against equity		517		517
Minority interest dividends		-1 125		-1 125
Concern result for the year		56 061		56 061
Equity per 31.12.03	62 300	792 639		854 939

## SINTEF

All figures in NOK 1000	Paid-up equity	Earned equity		Total equity
		Estimated differences	Other equity	
Equity per 01.01.03	62 300	176 764	471 647	710 711
Result for the year		39 578	9 243	48 821
Items entered directly against equity		44	472	517
Equity per 31.12.03	62 300	216 386	481 362	760 048

## 18. Other current liabilities

The item "Other current liabilities" in the accounts for the SINTEF Group includes provisions for accrued vacations, holiday pay and overtime, provisions for early retirement, bonuses and restructuring, investments in IT systems and obligations regarding invoices entered but unpaid.

## 19. Taxes

	SINTEF		SINTEF Group	
	2002	2003	2003	2002
<b>Ordinary result for the year:</b>				
Tax due	1 300	0	704	4 884
Changes in deferred tax	0	0	-6 608	-12 097
Insufficient provision for tax in previous years	40	0	8	40
<b>Tax on ordinary result</b>	<b>1 340</b>	<b>0</b>	<b>-5 896</b>	<b>-7 174</b>

### Specification of effect on tax of temporary differences and loss to be carried forward

	SINTEF		SINTEF Group	
	2002	2003	2003	2002
Operating assets			7 250	5 874
Shares			11 960	13 913
Receivables			347	3 428
Accounting provisions			0	-2 476
Pension obligations			2 289	3 202
Gains and losses account			-21 678	-39 855
Unutilised gains on shares			7 686	2 253
Loss to carry forward			24 072	23 033
<b>Sum</b>	<b>0</b>	<b>0</b>	<b>31 926</b>	<b>9 372</b>
<b>Deferred tax advantage (Sinvent Group)</b>			<b>8 939</b>	<b>2 624</b>
<b>Deferred tax</b>			<b>0</b>	<b>0</b>

# Deloitte

To: The Council of the Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF)

## Auditor's report 2003

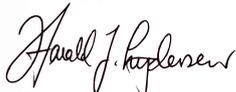
We have audited SINTEF's annual accounts for 2003; these show a profit for the year of NOK 48,821,000 for the parent company and of NOK 56,061,000 for the Group. We have also audited the information provided in the Annual Report regarding the accounts, the assumption of continued operation and proposals for allocation of the profits. The annual accounts consist of the profit and loss account, balance sheet, cash-flow analysis, notes and consolidated annual accounts. The annual accounts and the Annual Report have been drawn up by the Board of the Foundation and the director general of SINTEF. Our responsibility has been to express our opinion regarding the annual accounts and other matters under the terms of the Auditing Act..

We have conducted our audit in accordance with current laws and regulations and good auditing practice, which requires us to plan and implement our audit in such a way as to confirm that the accounts did not include material errors or omissions. We have checked selected parts of the material on which the accounts are based and the content and presentation of the annual accounts. To the extent that good auditing practice requires us to do so, we have also reviewed the Foundation's assets management and accounting and internal control practices. We believe that the audit provides adequate grounds for the following statements.

In our opinion:

- the annual accounts have been drawn up in accordance with current laws and regulations and present a satisfactory picture of the financial position of the Foundation and the Group on December 31, 2003, as well as of the result and cash-flows in the course of the accounting year, in accordance with good accounting practice in Norway.
- SINTEF's management has fulfilled its obligation to ensure that accounting information has been appropriately and clearly registered and documented, in accordance with Norwegian law and good accounting practice.
- the information contained in the Annual Report regarding the annual accounts, the assumption of continued operation and the proposals for allocation of the profits are consistent with the annual accounts and are in accordance with good accounting practice.

Trondheim, 24.03.2004  
Deloitte



Harald J. Lydersen  
State-authorized public accountant

# SINTEF's organisational structure

## **SINTEF Health Research**

Executive Vice President: Tonje Hamar

- Medical Technology
- Health Services Research
  - Mental Health Services Research*
  - Health Services Research*
  - Living Conditions and Service Delivery*
- Work Physiology and Microbial Exposure
- Department of Epidemiology
- Register Management
  - Norwegian Patient Register*
  - Patientclassification and Financing*
- New Priority
  - Hospital Planning*
  - Development Program*

Employees: 130. Gross revenues: NOK 126 million.

## **SINTEF ICT**

Executive Vice President: Aage J. Thunem

Assistant Executive Vice President: Ernst H. Kristiansen

- Acoustics
- Applied Cybernetics
- Applied Mathematics
- Communication Systems
- Cooperative and Trusted Systems
- Information Security and Safety
- Instrumentation and Microelectronics
- Microsystems and Nanotechnology
- Optical Measurement Systems and Data Analysis
- Photonics
- Software Engineering

Employees: 289. Gross revenues: NOK 252 million.

## **SINTEF Marine**

Executive Vice President Oddvar Aam

### **SINTEF Fisheries and Aquaculture**

- Aquaculture Technology
- Bioresources
- Coastal and Ocean Engineering
- Fisheries Technology
- Food Processing
- International Development Programmes
- Project Development BioMarine Industry

Employees: 96. Gross revenues: NOK 86 million.

### **MARINTEK – Norwegian Marine Technology Research Institute**

- Machinery and Technical Operations
- Marine Vehicles
- Structural Engineering
- Offshore Structures

Subsidiary: MARINTEK (USA), Inc.

Laboratories: Cavitation tunnel  
Machinery laboratory  
Marine structures laboratory  
Ocean basin laboratory  
Towing tank

Employees: 179. Gross revenues: NOK 184 million.

## **SINTEF Materials and Chemistry**

Executive Vice President: Unni Steinsmo

On January 1, the former SINTEF Materials Technology and SINTEF Applied Chemistry were amalgamated into SINTEF Materials and Chemistry. The activities of the new institute include materials science, applied chemistry and applied biology. The Institute has organised its scientific activities into eight departments, which cover the following disciplines:

- Advanced characterisation, testing and analysis
- Biotechnology
- Catalysis
- Chemical engineering
- Combinatorial chemistry
- Environmental technology
- Functional materials and nanotechnology
- Modelling and simulation
- Processing and manufacturing
- Production and recycling
- Properties and design
- Structural integrity
- Surface technology
- Synthesis

Employees: 360. Gross revenues: NOK 376 million.

## **SINTEF Oil and Energy**

Executive Vice President: Sverre Aam

### **SINTEF Energy Research**

- Electric Power Technology
- Energy Processes
- Energy Systems

Employees: 189. Gross revenues: NOK 194 million.

### **SINTEF Petroleum Research**

- Basin Modelling
- Formation Physics
- Multiphase Flow Technology
- Oil and Gas
- Reservoir Technology
- Seismics
- Well and Production Technology

Employees: 97. Gross revenues: NOK 114 million.

## **SINTEF Technology and Society**

Executive Vice President Tor Ulleberg

### **SINTEF Civil and Environmental Engineering**

- Architecture and Building Technology
- Cement and Concrete
- Roads and Transport
- Rock and Soil Mechanics
- Water and Environment

Employees: 115. Gross revenues: NOK 105 million.

### **SINTEF Industrial Management**

- Economics and Logistics
- IFIM, Institute of Social Research in Industry
- Innovation and Industrial Development
- Knowledge and Strategy
- New Praxis
- Productivity and Project Management
- Public Sector
- Safety and Reliability
- STEP, Centre for Innovation Research

Employees: 170. Gross revenues: NOK 183 million.

## **Sinvent**

Executive Vice President Nils Spidsøe

Employees: 5. Gross revenues: NOK 87 million.

## SINTEF Council 2003

Professor Eivind Hiis Hauge, Rector, (Chair)  
Professor Julie Feilberg, Pro Rector (Deputy Chair)  
Gunnar Berg, Chief engineer  
Svein Willy Danielsen, Ph.D. (Eng.)  
Professor Torbjørn Digernes  
Professor Helmer Fjellvåg  
Roar Flåthen, Assistant Manager  
Knut Fægri, Dean  
Rune Garen, Director  
Ingunn H. Geving, Researcher  
Professor Jostein Grepstad  
Knut Werner Hansen, Fisherman  
Else-Britt Hauge, Executive Officer  
Knut Herstad, Special Adviser  
Professor Anne Grete Hestnes  
Associate Professor Birthe Loa Knizek

Associate Professor Åse Krøkje  
Rannveig Ravnanger Landet, Group Leader  
Reidun de Lange, Chief Engineer  
Ole Lindefjeld, Chief Scientist  
Professor Astrid Læg Reid  
Professor David G. Nicholson  
Svein Nordenson, Senior Researcher  
Elisabeth Baumann Ofstad, Ass. Director  
Diderik Schnitler, Director  
Professor Ingvald Strømme  
Professor Arne Sølvberg  
Randi Ulvang, Project Secretary  
Professor Tore Ola Vorren  
Professor Sigmund Waagø  
Professor Petter Aaslestad

## SINTEF Board 2003

Jan Erik Korssjøen, President, Kongsberg Gruppen ASA (Chairman)  
Professor Terje Østvold, Dept. of Materials Technology, NTNU (Deputy Chairman)  
Professor Hans H. Faanes, Dept. of Electrical Power, NTNU  
Alexandra Bech Gjørnv, Executive Vice President, Norsk Hydro ASA  
Per Ola Grøntvedt, Senior Engineer, SINTEF Materials and Chemistry  
Frode Rømo, Senior Researcher, SINTEF Technology and Society  
Elisabeth Wille, Lawyer, Norwegian Bar Association

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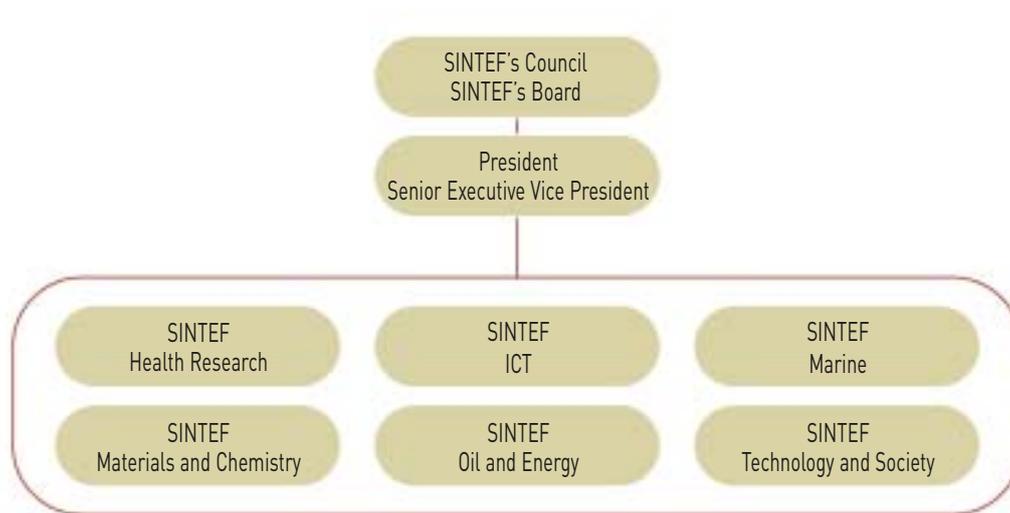
## The SINTEF Group's management team

Morten Loktu, President – CEO  
Svein Sivertsen, Senior Executive Vice President – Operations  
Gunnar Sand, Vice President, Corporate Strategy  
Anne Kathrine Slungård, Vice President, Corporate Communications  
Roger Strøm, Vice President, Market and Sales

Tonje Hamar, Executive Vice President	SINTEF Health Research
Aage J. Thunem, Executive Vice President	SINTEF ICT
Oddvar Aam, Executive Vice President	SINTEF Marine
Unni Steinsmo, Executive Vice President	SINTEF Materials and Chemistry
Sverre Aam, Executive Vice President	SINTEF Oil and energy
Tor Ulleberg, Executive Vice President	SINTEF Technology and Society



# The SINTEF Group



**SINTEF Health Research** performs goal-oriented research and development with the aim of raising standards of health and quality of life, in close collaboration with the authorities, the health sector and users of the health services.

**SINTEF ICT** offers integrated ICT-based knowledge via access to a more broadly-based competence and technology platform.

**SINTEF Marine** is made up of SINTEF Fisheries and Aquaculture and MARINTEK. SINTEF Marine is an important resource for industry and the authorities in the field of knowledge management for the future exploitation of the marine environment.

**SINTEF Materials and Chemistry** brings together SINTEF's expertise in materials science, applied chemistry and applied biology.

**SINTEF Oil and Energy** has been formed from SINTEF Petroleum Research and SINTEF Energy Research. SINTEF SINTEF Oil and Energy will identify future-oriented solutions throughout the petroleum products value chain and create a sustainable energy system based on renewable energy technologies.

**SINTEF Technology and Society** will improve the creation of value at company and community level, by promoting high levels of productivity and ability to innovate, a good working environment, high work safety standards and excellent knowledge-based management. We will also encourage future-oriented activity and technology in the construction and transport sectors.

PORTO BETALT  
PORT PAYÉ  
NORGE

**B** ÉCONOMIQUE

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 **SINTEF**