



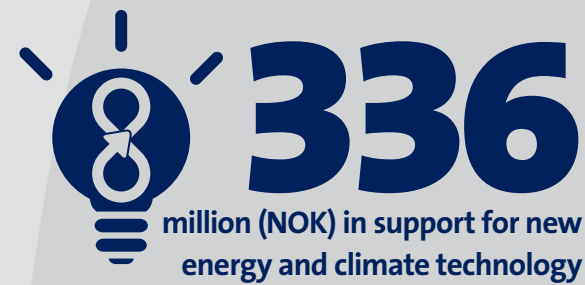
Annual report

2012

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Key Figures and facts 2012



Did you know that... support from Enova in 2012 will trigger investments in new energy and climate technology totalling NOK 1.1 billion.

Symbol key

Investigated	Renewable
Enova Lead the way	New Technology
Enova	Renewable Heating
Counseling/Communication	Renewable Power Production
Support	Industry
Programmes	Non-residential
Projects	Residential Buildings
Enova's View on the Market	Graphs / tables
Looking back/looking ahead	Targets
Collaboration/Agreement	Norwegian Standard



In 2012, we supported projects with a total energy result of 1.6 TWh through the Energy Fund, distributed over energy efficiency measures, energy conversion and increased utilization of renewable energy.

Did you know that... this is equal to the energy consumption of every household in the Drammen and Stavanger municipalities put together.

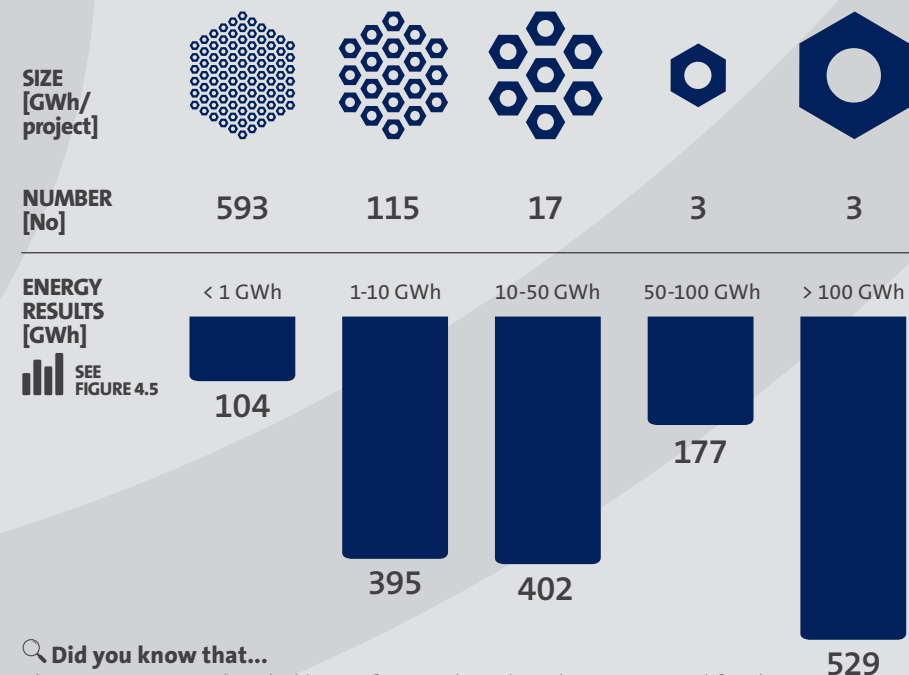
A project's lifecycle



From project applications to implemented projects with future-oriented energy solutions. We are headed towards an energy-efficient and renewable Norway.

Composition of the portfolio

This year's projects grouped by size in GWh



Did you know that... about 750 projects headed by professional market players received funding commitments in 2012. More than 6 250 households also received funding commitments for implementing energy measures.



Did you know that... 550 investors, technology developers, innovators and decision-makers participated in the two-day Enova Conference, The Green Gold, to discuss renewable energy and energy efficiency measures.



Ask Enova, our nationwide information and advice helpline, received more than 40 000 inquiries over the course of the year.

Did you know that... 12 000 of these were inquiries from the professional market.

Our largest industry project so far:



Did you know that... The silicon plant's annual electricity consumption totals about 1 TWh. The project is one of the reasons why Norwegian smelting plants are among the most energy-efficient in the world.

Enova – headed towards a green revolution



NILS KRISTIAN NAKSTAD
CEO Enova SF

Enova has been very active in 2012. We have embarked upon about 750 new projects in cooperation with customers. The renewed agreement with the Ministry of Petroleum and Energy for management of the Energy Fund from 2012 to 2015 was in place around the middle of the year. Our own organization was adapted to deliver on new objectives in new assignments. New programme services are on their way to the market.

Results and activities in 2012

The year was characterized by high activity. Our focus has been on maintaining a close and sound dialogue with customers. Many new project ideas have popped up. The figures for 2012 show 752 new projects distributed across our market areas, as well as support for minor measures in 6 260 households.

We are very pleased with the growth in the number of projects and good results. It is particularly gratifying that we were able to do more in the commercial buildings market. This was also a good year for industry cooperation. However, there was a declining trend in the renewable heating market.

Throughout the year we have been particularly concerned with projects that introduce new technology in the market. There is considerable interest in new technology, but it is often very challenging to finance projects that introduce new technology. We look at 2012 as the beginning of a period with increased focus on technology projects from Enova.

The dialogue with customers often deals with establishment and implementation of projects. And that's as it should be. We also meet customers at various professional forums where more long-term and strategic topics are discussed. In January 2012 – for the very first time – we started our own meeting place, the Enova Conference, with broad-based participation from the markets we are involved in. The purpose of the conference was to create an arena where we can gauge the markets, and find inspiration for new energy and climate measures in our own activities.

New agreement – new programmes/services for the market

After the Climate Agreement in the Storting (Norwegian Parliament) in the spring of 2012, a new agreement was written in June with the Ministry of Petroleum and Energy on the management of the Energy Fund for the years 2012 to 2015. The new agreement enables Enova to continue and increase its efforts in energy restructuring. In addition, the assignment is expanded with the purpose of reducing greenhouse gas emissions. In particular, the need to trigger projects that introduce new energy and climate technology is emphasized, nationally and internationally.

The new assignment is followed up through the financing of the Energy Fund. The Fund for the climate, renewable energy and

energy restructuring will increase from NOK 25 to 50 billion by the end of 2016. The current return on this Fund is a source of financing for the Energy Fund.

In general, the new guidelines and increased funds will empower Enova to enter into new projects. The objective is improved security of supply and reduced greenhouse gas emissions. We can continue supporting a regular influx of projects, and also gain the capacity to enter into the few projects that constitute major steps, such as support for testing new full-scale production lines in industry.

A green revolution

There is no shortage of heated debates on the topic of climate change and what we can do to stop it. The period of doubt as to whether we are in fact facing changes, and whether these were caused by human activity, appears to be ebbing away. The challenges are being taken seriously. The focus is increasingly on how to moderate and adapt to the changes.

It is generally believed that the best and most efficient instrument for stimulating climate measures is a sufficiently high global price on greenhouse gas emissions. Experience from several rounds of negotiations indicates that we are far from a global agreement on a carbon quota market. We are moving in the right direction, but it takes time, and there are many forces in play that try to counteract such an agreement.

A global price on greenhouse gas emissions is a general instrument that will impact nearly all markets. Also in Norway. State support for projects through the Energy Fund is a focused instrument that can be directed at special sectors. This system appears to be based on a bottom to top principle. As we currently perceive the Norwegian markets, the quota price (ETS) is too weak an incentive to trigger technology projects, while support from the Energy Fund can trigger such projects.

The development in green markets is staggering. Good examples include the energy restructuring in countries such as China, Japan and Germany, which have received much attention. We think this is the beginning of a trend that will take hold and spread. Could it be that the future's winners are thinking long-term, but acting now?

The time for action is now!

Nils K. Nakstad

Part 1

Perspectives

One step ahead

6

If Norway is to maintain its position as a leading energy and industrial nation, we need to be one step ahead. Enova will be a spearhead so we can harvest the green gold.

One step ahead

In order to solve the global climate challenges, we, together with the rest of the world, must move forward. If Norway is to maintain its position as a leading energy and industrial nation, we need to be one step ahead. The Climate Agreement designates Enova as a spearhead for this objective.

The UN's climate panel (Intergovernmental Panel on Climate Change – IPCC) has become increasingly certain of the link between climate changes and human activities. The consequences of doing nothing become graver by the minute and the time left to limit the temperature increase is becoming steadily shorter (IEA ETP 2012 and WEO 2012)¹.

The climate talks in Doha in the autumn of 2012 resulted in a continuation of the Kyoto Protocol – a small, but necessary step towards a more extensive climate agreement; a climate agreement that will hopefully also cover large polluting nations such as the US and China – and there is hope.

China is driven forward by major local climate and environmental problems, including very high levels of air pollution in Beijing, and is making vast investments in both renewable energy technology such as solar cells and wind turbines, as well as in renewable energy production. China installs more new wind power than any other country in the world. And the climate challenges have once again been put on the political agenda in the US.

In 2006, Nicholas Stern headed the work on the report discussing the financial consequences of climate change, a report which clearly concluded that it is significantly cheaper to try to prevent

climate changes than to do nothing. This is a message shared by, for example, the IEA in ETP 2012 – the reduced energy costs alone will cover the costs of reaching the UN's Two-Degree Target (see Figure 1.1)

Figure 1.1: The figure shows necessary investments in order to reach the UN's Two-Degree Target, distributed by sector. The figure also shows the savings that will be achieved through reduced energy needs given various assumptions on price effects and discount rates.

However, even though the solutions are known, the challenges are coming steadily closer. During the World Economic Forum in Davos in 2013, Stern used the opportunity to warn: "I got it wrong on climate change - it's far, far worse".

We need to develop new technology and new solutions, and we need to start using them – fast.

Industry has the ideas, Enova has the capital

In a global context, Norwegian mainland industry is environmentally friendly. This is both because it is largely based on renewable power, and because Norway has a longstanding focus on hazardous emissions. However, it is important that

industry continues reducing its emissions so Norway can meet its climate commitments, and reach its climate goals. This requires considerable technology development.

Many players have already started, and have long traditions of pushing the envelope of what is technologically feasible, while others need more help to get started. However, they all share the challenge of taking the innovative solutions from small-scale pilots and demonstration facilities to full-scale facilities that will qualify the technology for a market, as well as access to sufficient venture capital (see Figure 1.2).

The lack of capital in this phase is a general problem that has been amplified by the financial crisis and the subsequent Eurozone crisis. The crises and the weak development in the world economy have resulted in a strong decline in risk willing capital, which is further amplified by another consequence of the financial crisis: Stricter lending practices by banks, either self-imposed or as a result of stricter regulation.

Without capital there is not much technology development and innovation. With its resources, Enova can help the industry find solutions for the future.

Enova helps the industry make it happen.

Technology development for the climate and jobs

The development of the future's energy and climate solutions is not only a race against the clock to save the world; it is also a race

for who will be the future winners in the green economy. This was also a topic of Barack Obama's inaugural address in January 2013.

"We cannot cede to other nations the technology that will power new jobs and new industries, we must claim its promise. That's how we will maintain our economic vitality and our national treasure - our forests and waterways, our crop lands and snowcapped peaks".

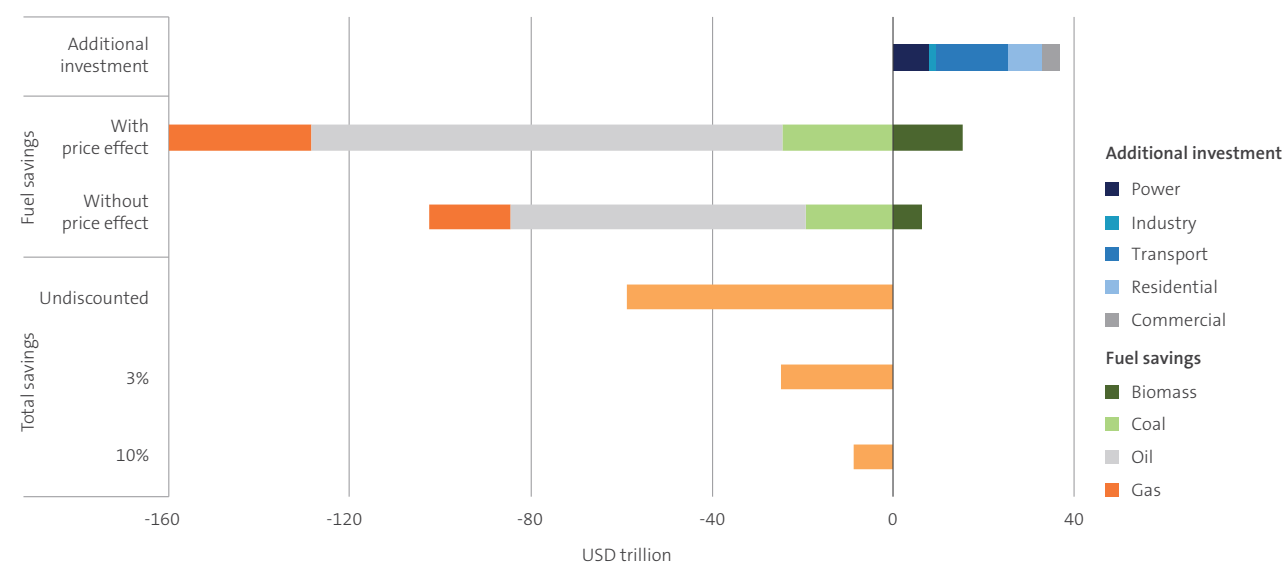
- Barack Obama (Inaugural Address 2013)

Norway has a competitive advantage with an energy and climate-efficient industry with considerable expertise in, and experience with, innovation. This expertise and experience is vital both to develop the future's energy and climate technologies, but also to develop jobs for the future.

Norwegian industry will not only meet competition from industries that do not have to pay for their greenhouse gas emissions, they also face competition from new plants based on modern technology – plants that will also have a competitive edge if there is a global price on greenhouse gas emissions.

To secure future competitiveness, it may no longer be sufficient to make continuous improvements on old technology and rest on a compensation system for CO₂ costs. We need to dare to take the big steps. The steps that break boundaries. The steps we see when the Norwegian aluminium industry sets the standard for energy use in the production process at 10 kWh/tonne or when Flumill in Arendal choose new technology for production of tidal power.

FIGURE 1.1 INVESTMENT NEED AND SAVINGS FROM THE UN'S TWO-DEGREE TARGET



Source: International Energy Agency (2012), Energy Technology Perspectives 2012, OECD/IEA, Paris (Processed by Enova)

Figure 1.1: Additional investment, Fuel saved, With price effect, Without price effect, Total savings, Not discounted, Additional investment, Power production, Industry, Transport, Households, Industry, Fuel saved, Biomass, Coal, Fuel Oil, Gas

¹ For an explanation of abbreviations and special terminology, see the list at the back of the report under "Definitions and explanation of terminology".

FIGURE 1.2 INNOVATION AND CAPITAL NEED

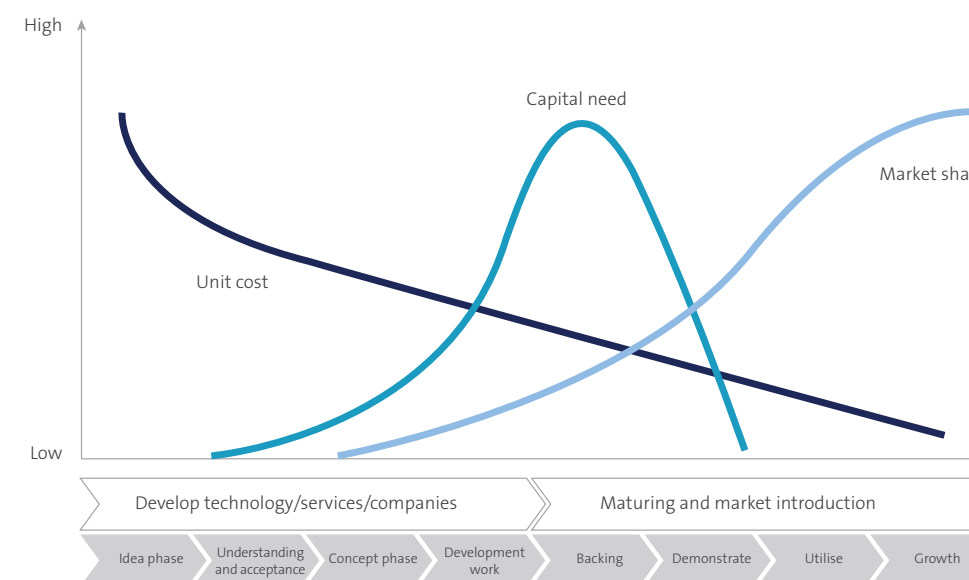


Figure 1.2: The figure illustrates how unit costs, market shares and capital need develop through the various phases of the innovation chain, from the idea phase to the growth phase in an established market.



Illustration of Lerkendal in Trondheim. The project received funding in 2012 and aims to be the world's most energy efficient hotel.
Illustration: Voll Arkitekter AS/Vizwork AS

Enova's efforts in new energy and climate technology enable Norwegian industry to remain one step ahead in the development.

The industry – one step ahead

Innovative buildings for the future

In an international context, Norway has very energy-efficient buildings, and with relatively low energy prices as well. With such a basis, one would think triggering even more energy efficiency measures would be more difficult than selling sand in the Sahara desert – luckily that isn't the case. Within the commercial buildings segment in particular, there is not only significant interest in energy efficiency measures, they also implement these measures – with a little help from Enova.

Globally, reduced energy use in buildings is one of the most important measures to reduce greenhouse gas emissions. Energy use in buildings represents an estimated 40 per cent of greenhouse gas emissions. The situation is somewhat different in Norway – both because we already have good buildings and because the direct greenhouse gas emissions from them are limited. Nevertheless, it is important to also reduce the energy need and energy use in buildings in this context.

Measures in buildings, and particularly structural measures, are important because they have long lifetimes. This means that choices made today impact energy use in the building for 20 to 50 years into the future. This impacts the security of supply in the short term, and in the long-term (post ETS) it impacts Norway's ability to become an important part of the European climate solution.

Enova's ambition is to encourage even more people to choose buildings for the future, which Arthur Buchhardt, among others, is doing in the new Lerkendal Hotel in Trondheim, where the ambition level for energy use is less than one-fourth of what is required in the applicable building regulations.

Enova supports those who pave the way.

Covering a need

- The future's technology and solutions must deliver based on need.
- Need is more than technical properties.
- New consumption patterns (from product to perception) require new solutions.

An important premise for new technology and new solutions to solve the climate challenges and improve security of supply is that they deliver based on actual needs, whether in industry, at the office or at home. A technology is not relevant until it is actually put to use.

While technologies and solutions directed at businesses and industry have a relatively simple goal; creating better profitability, the goal for households is significantly more complex. We rarely request energy efficiency or climate-friendliness as a quality, and certainly not as the only quality. It has often been the case that one must sacrifice important qualities to choose energy and environmentally friendly options – whether we are talking about range and charging times for electric cars, or a “cold” light from energy-saving fluorescent light bulbs.

Luckily, this is changing; today's energy-efficient lighting rivals the old incandescent bulbs, also with regard to that cosy feeling. The driving range on electric cars is also increasing steadily, and they otherwise function just like normal cars. And this is the very core for the success of energy and environmentally friendly solutions in the market; they have to become the natural choice – not because they are energy or climate-efficient, but because they deliver the best in what matters to users.

An investment in the future

The climate challenges faced by the world impose major innovation and restructuring requirements upon Norway and the rest of the world – and they have to come quickly. For Norway, investing in solutions for the future is not only necessary to ensure the living conditions of coming generations, but also to ensure the quality of life for future generations.

One step ahead to solve the climate challenges, and harvest the green gold.

Part 2

Enova's activities

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Enova promotes environmentally friendly restructuring of energy end-use and energy production as well as development of energy and climate technology. We are very concerned with how we accomplish our assignment.

Corporate social responsibility

Enova's primary task is to manage the resources from the Energy Fund within the objective of the Fund, and according to guidelines stipulated in the agreement with the Ministry of Petroleum and Energy. Our social mission is to create lasting change in the supply of and demand for efficient and renewable energy and climate solutions, and these activities will strengthen the security of supply and reduce greenhouse gas emissions.

The Government's definition of corporate social responsibility entails that companies should contribute to positive development in society through value creation, as well as integrate social and environmental considerations in their daily operations and in interactions with stakeholders.

Enova manages considerable State resources and we depend on trust in order to succeed. Our tasks will be performed in an orderly and professional manner, where the management of subsidies from the Energy Fund comply with objective and transparent criteria. Our social responsibility deals with operating our enterprise so it provides a positive contribution to value creation in society, both in relation to delivering our assignment, as well as how our deliveries are carried out.

Enova's assignment must be put into a long-term perspective. New energy and climate technology is a precondition for restructuring to a low-emission society. Enova focuses on the

societal consequences of our activities. Our work builds upon energy and technical expertise, and takes place in cooperation with businesses and industry and other public players. Enova aims for an enterprise characterized by professional integrity and high ethical quality in all stages. This means that all activities must be implemented in accordance with applicable statutes and regulations, in line with Enova's internal rules and good practices within areas such as health and safety, the environment, human rights, business ethics and anti-corruption. We use financial, social and environmental considerations as a basis for our strategy and the goals we set.

Enova wants to be perceived as a serious, reliable and credible partner. Mutual respect is a fundamental principle for our activities. Managing the State's resources requires a particular focus on risk and cost control. We set high requirements for ourselves and our various partners when it comes to HSE, ethics and social responsibility. Through financial support and guidance, we will contribute to expertise development which supports an energy-efficient and renewable Norway.

Our fundamental rules of conduct are described in Enova's ethical guidelines. Corporate social responsibility is a line responsibility and an integrated part of our activities. Focus on compliance enables continuous improvement and development.

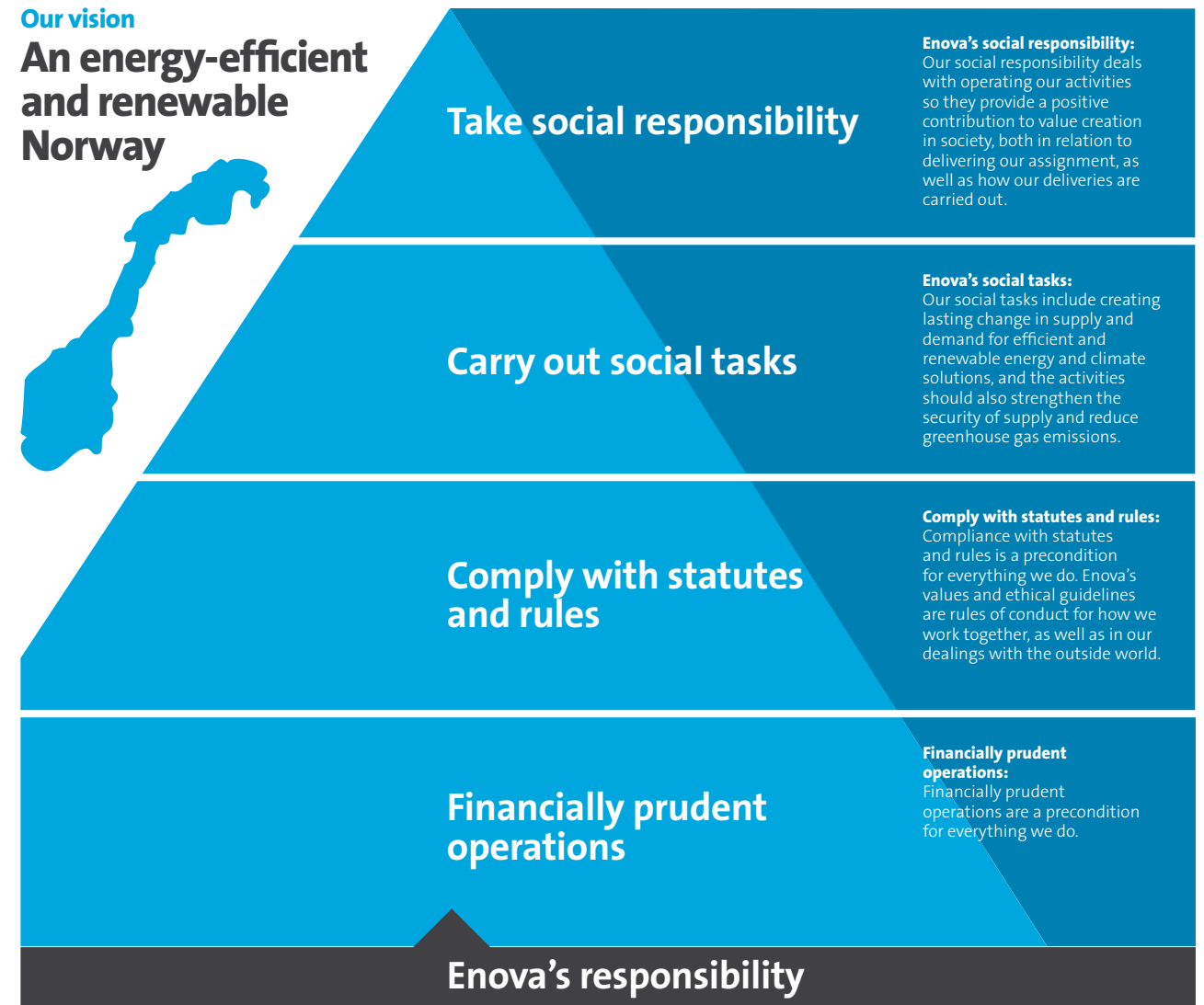
Organization

Enova will be an organization which inspires everyone to perform their best. As an organization, we must be willing to learn and dare to challenge ourselves and focus on our own development. That is why we work with culture and mindset, focusing on the best ways of working and how to best utilize our expertise. The values are key here. Delegation of responsibility and authority must stimulate each individual to use their experience and skills in activities that create results. We believe that teamwork creates results.

At the beginning of 2013, we will carry out a reorganization. The new organization will better equip Enova to reach its goals.

A good working environment is important to us. These values are anchored in Enova's organization, and are used as a basis for our overall Human Relations (HR) work. The employee survey from 2012 shows a positive development and confirms that the focus on culture and working environment has paid off. We are continuously developing to be a modern, inclusive and solid workplace.

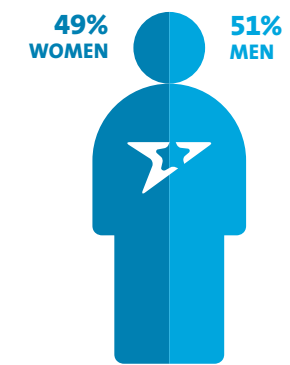
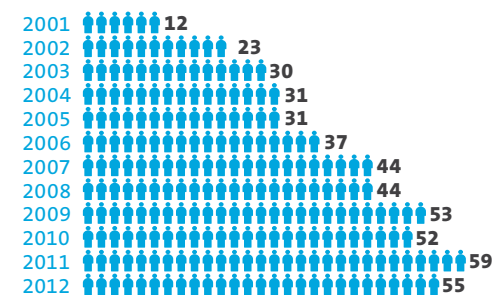
Enova has 55 full-time employees, of which 27 are women and 28 men. This is a small number in relation to what we do. Special expertise and capacity needs are solved through cooperation with others.



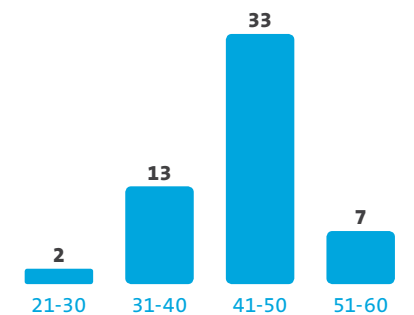
Our ethical guidelines and fundamental values are our rules of conduct for behaving ethically and in a socially responsible manner in all our activities.

- We have goals, values and ethical guidelines that describe the fundamental attitudes and the philosophy that characterize our organization.
- We are open, honest and sensitive in our communication and contact with the outside world.
- We exercise corporate governance where we emphasize openness, transparency, responsibility, equality and long-term perspectives.
- We do not discriminate based on gender, religion, nationality, ethnicity, social groups or political viewpoints.
- We set high integrity requirements, which e.g. entail that we do not tolerate any form of corruption. We promote free market competition.
- We are attentive to changes in what society in general considers good business practices. We evaluate and change our own practices when necessary.

NUMBER OF EMPLOYEES



AGE DISTRIBUTION





From left: Nils Kristian Nakstad, Audhild Kvam, Geir Nysetvold og Øyvind Leistad.

Management

Nils Kristian Nakstad *Chief Executive Officer*

Born: 1962
Position: CEO in Enova from May 2008.
Education: Chartered engineer with a degree from the Norwegian Institute of Technology.
Experience: Nakstad has worked as a researcher and research manager in SINTEF and project manager in Hydro. He has headed enterprises such as Trondhjem Preservering AS and ReVolt Technology AS.
External board positions: Board member in Pro Venture Seed AS, Trondhjem Preserving AS and Labek AS.

Audhild Kvam *Director of the Energy Efficiency Department*

Born: 1968
Position: Director of Enova's Energy Efficiency Department from August 2010. From January 2013, Kvam will start a new position as Head of Marketing in Enova.
Education: Chartered engineer from Pacific Lutheran University, USA.
Experience: Kvam has experience as the VP Strategy and Marketing in Powel ASA, has worked as an information consultant and head of information in Trondheim Energi, and has been CEO of Trondheim Energiverk Kraftsalg AS.
External board positions: Board member in Energi21.

Geir Nysetvold *Chief Financial Officer*

Born: 1961
Position: Chief Financial Officer in Enova from December 2007 and has also headed the department for strategy and analysis since 2009. From January 2013, Nysetvold will start a new position as director of Strategy and Communication in Enova.
Education: Chartered engineer with a degree from the Norwegian Institute of Technology, with a major in technical cybernetics. He also has several courses in technology, management and finance from the Norwegian Institute of Technology and Norwegian School of Economics.
Experience: Nysetvold has experience from several top positions, primarily within insurance, and as a division director and head of the corporate market area in Vital Forsikring.
External board positions: Member of the control committee in Norde

Øyvind Leistad *Director of the Energy Production Department*

Born: 1972
Position: Director of Enova's Energy Production Department from autumn 2007. From January 2013, Leistad will start a new position as director of Programme Development and Operations in Enova.
Education: Agricultural University of Norway, investment and financing.
Experience: Leistad was hired by Enova as senior adviser in 2005. He previously worked in the Ministry of Petroleum and Energy, where he worked with administration of various policy instruments related to stationary energy supply and renewable energy, and energy efficiency in particular.
External board positions: Member of the programme board for ENERGIX, Research Council of Norway.

Enova initiates energy restructuring

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Enova is equipped with two instruments to reach its goals: A fund (capital) and people (expertise). Using these instruments, we will achieve our goals, together with the market.

About Enova – objective and role

Enova promotes environmentally friendly restructuring of energy use and energy production, and development of energy and climate technology. In order to achieve our goals, we need to focus within our scope and use our instruments in a targeted manner to trigger the desired market changes.



The objective of the Energy Fund and the agreement between the Ministry of Petroleum and Energy (MPE) and Enova defines our goals for what we will achieve during this agreement period (2012 – 2015).

“Enova promotes environmentally friendly restructuring of energy end-use and energy production, and contributes to development of energy and climate technology.”

“Our activities will strengthen the security of supply and reduce greenhouse gas emissions.”

Enova is equipped with two instruments to reach its goals; a fund (capital) and people (expertise). Using these instruments, we will achieve our goals.

The technical potential for more efficient energy use, increased use of renewable energy carriers and reduced greenhouse gas emissions is high. However, it would not be sensible for society to realize the entire potential, as we only have limited resources available, and these resources also have an alternative application. But even considering the costs, there is a considerable potential, and triggering this makes sense in socioeconomic terms. Triggering a somewhat smaller part of this potential also makes sense with a view towards private or commercial financing. Enova’s mission is to trigger as much of this socioeconomic potential as possible. This is Enova’s scope (illustrated in Figure 3.1).



Financing

Enova’s first instrument is the resources in the Energy Fund, nearly NOK 2 billion per year during the agreement period. These are the resources that enable us to promote good energy and climate projects in the private and public sectors, projects that would never have seen the light of day had it not been for State support. We do this through covering a percentage of the additional costs assumed by the market in choosing more energy and environmentally friendly solutions. The State increases profitability and reduces the risk for project owners, giving the good energy and climate projects a stronger position.

As a coordinator of our society’s resources, we have a considerable responsibility in managing the capital so as to provide the best possible benefit for society. In this connection, the first commandment is not paying for something that would be done regardless – avoid overcompensation. We must admit that this is not as easy as it seems, but if we are able to lower the number of free rides and the degree of overcompensation, the

money will reach further in the form of more energy and climate projects.

Enova enters into projects with State support in the form of partial financing. The support amount constitutes a smaller share than the project owner’s own contribution, and is sufficient, but does not create overcompensation.



Guidance

Enova’s second instrument is employees and partners. Together, they enable us to give advice and manage the Fund.

A large part of the guidance takes place through dialogues with the applicant (project) and Enova during the time before a potential support decision is made. Following the decision, during the implementation of a project, we have regular contact through continuous reporting. In projects where there are inconsistencies from the planned implementation, guidance is relevant in connection with changes.

Most projects of a certain size involve an extensive dialogue between the project owner/applicant and Enova before the actual application is submitted and processed. Through this dialogue, projects can take advantage of our advisers’ expertise, and particularly the experience which Enova has accumulated through providing support for good projects since 2002.

Another very visible part of our guidance to professional players and households is the helpline (Ask Enova). This provides advice to professional players and private individuals (households).

Enova’s contribution in the form of State support and guidance is provided in a structured manner through programmes. Each programme is directed at a specific market. Enova carries out considerable work to design targeted programmes. Through these, we advise the market on who is eligible to apply, what issues and costs can be supported, what requirements are stipulated for implementation of projects, and what results it must lead to.

Enova has a relatively small organization in relation to its scope. We have therefore established good cooperation with partners outside our organization to secure sufficient capacity and expertise.

FIGURE 3.1 ENOVA’S SCOPE

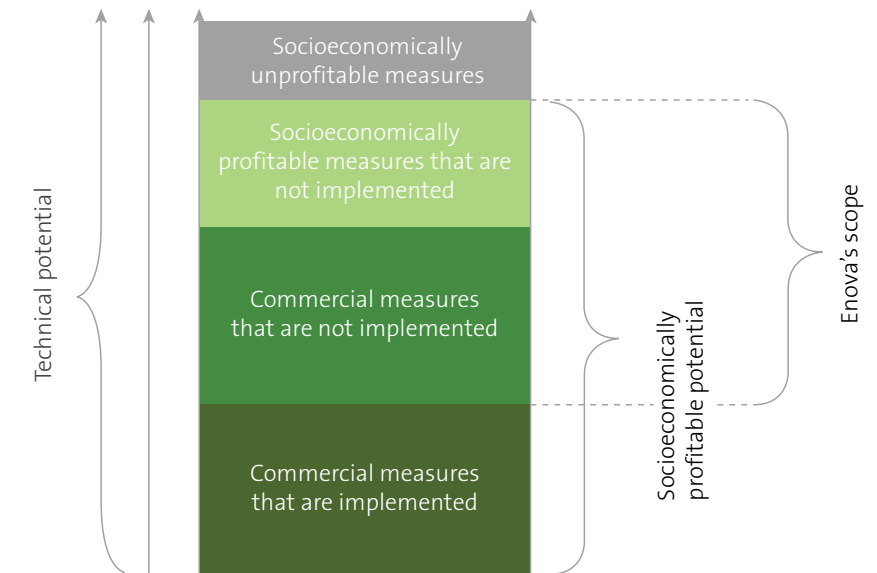


Figure 3.1: Schematic of the difference between technical, socioeconomic and commercial potential and what constitutes Enova’s scope.

Interaction creates market development

If Norway is to maintain its position as a leading energy and industrial nation, we need to be one step ahead. This requires coordinated interaction in the Norwegian policy instrument system, as well as between the policy system and market players.



Interaction

The road from good ideas to when the finished solutions are utilized can be long, and few ideas make it to the end. The goal of public policy instruments is not that all ideas should reach the market, but that more should. On the road from idea to market, the need for public support will change, there is therefore also a work distribution between the different public policy instruments.

Market development takes place gradually, over time. Through Enova’s contributions of knowledge and capital for projects,

which thus alleviate the risk, more market players are able to take the correct steps. At the same time, the market’s willingness to invest its own funds in energy and climate-friendly projects is a precondition for a development towards an energy-efficient and renewable Norway.

Constructive interaction is a key for development. We have taken a closer look at the market perspective on four of our focus areas; to determine what has happened since Enova was established and where are we headed.

A market perspective on renewable heating

Renewable heating provides flexibility in the energy system and increased security of supply.

After more than ten years of heating efforts, district heating has been established in 60 of Norway's 100 cities, and Enova has supported about 1 200 small and large projects with a total annual renewable heating delivery of more than 5 TWh for heating in buildings.

Due to its cold winters, Norway has a unique consumption pattern which runs counter to our stationary energy production, hydropower. Energy consumption is greatest when the influx is lowest. This constitutes the Norwegian security of supply issue, and makes consumers particularly vulnerable during years with little precipitation. Increased use of renewable heating provides flexibility in the energy system and helps solve challenges related to security of supply. Therefore, Enova has always placed considerable focus on effective restructuring to renewable heating, and will continue to do so in the future.

District heating is a good collective heating solution in densely populated areas, areas with a high heating need and with access to reasonable energy sources. In 2002, just under 2 TWh of district heating was delivered, and Enova's support focused on the major heat production and distribution plants. Good collective heating solutions make renewable heating available for rapid conversion of existing buildings with water-based central heating systems. By 2011, the district heating delivery had almost doubled compared with 2002. Increasing the percentage of renewables receives greater attention as district heating is developed. A large-scale solar collector power plant is an example of new technology that has been demonstrated in connection with district heating.

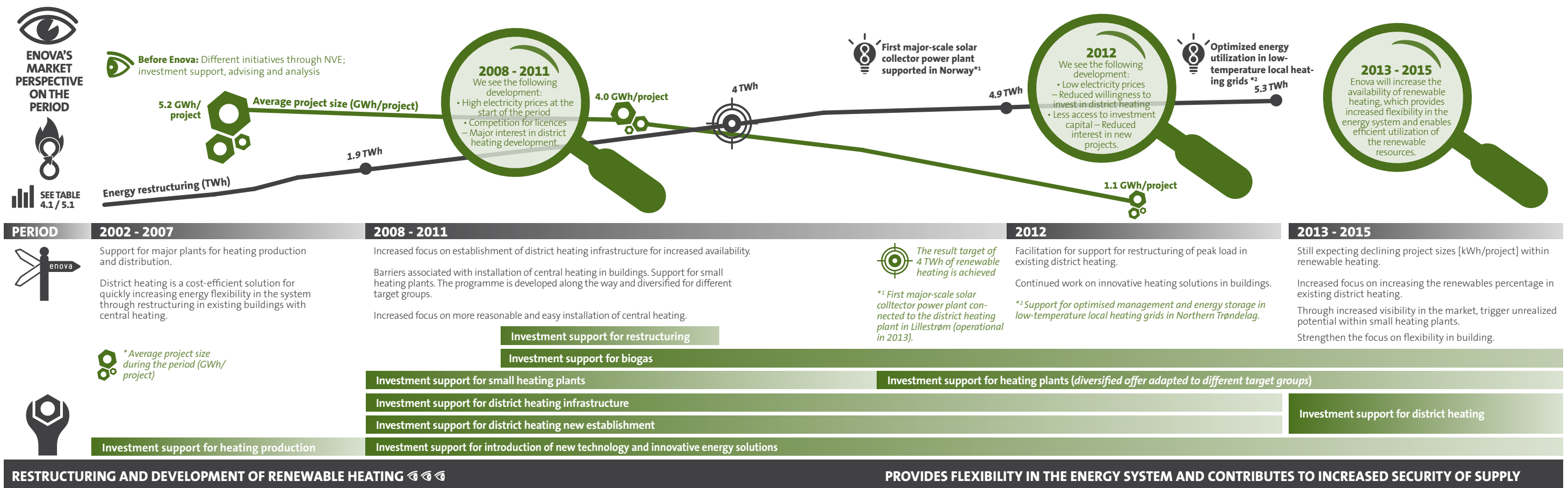
In 2007, Enova carried out an evaluation of the heating support, in addition to studies of the potential and barriers. The study on potential revealed major opportunities, including a significant potential for conversion to small heating plants outside typical

district heating areas. The barrier study identified lacking infrastructure for, and inside, buildings as vital barriers. Enova therefore launched more targeted support programmes in 2008. The programme for small heating plants was intended to make it easier to apply for support for small plants. The district heating efforts were focused on increasing availability to renewable heating through district heating infrastructure. Enova expanded its services further in 2011, which resulted in a sharp increase in the number of applications for small heating plants.

In 2009, Enova carried out an analysis of the costs of central heating, while also establishing a time-limited programme for conversion to central heating in buildings through the Government's economic stimulus package. Enova has since worked to promote reasonable and simple installations for central heating systems in buildings, carried out studies and supported demonstration projects to showcase new technology. This will become an

increasingly important area for Enova in coming years, as the potential related to conversion of existing buildings to central heating systems is triggered. Installation of flexible heating systems in buildings is an important part of the solution to the challenges associated with temperature-dependent consumption.

The potential for conversion to renewable heating is still great, and during the 2013 – 2015 period, we will place a special focus on property owners within reach of small heating plants. As regards district heating, Enova is receiving both fewer and less extensive applications than before. We will continue to focus on new establishment and expansion of district heating. An increased renewables percentage through conversion to renewable energy carriers within district heating is also a prioritized area. At the same time, Enova has increased its focus on innovation, both as regards heating plants inside the buildings and distribution to the buildings.



A market perspective on industry

From energy efficiency measures in an energy-intensive industry to comprehensive programmes for an energy-efficient industry powered by renewable energy.

Enova's close contact with the market provides us with a good foundation of experience for constructive interaction with the industry. Studies of the potential have provided us with further knowledge on barriers and market conditions.

In the beginning, there was a natural focus on energy-intensive industry and its potential to become more energy efficient. It was important to get started quickly and establish visible results and good examples for the industry. After ten years, the programmes were expanded to cover all businesses and to deconstruct significant barriers. Enova's efforts towards industry were carried out based on the vision of an energy-efficient industry powered by renewable energy.

Enova's studies have proven a potential to release 30 per cent of the industry's energy use through energy efficiency measures and recovery. There is also potential for conversion from fossil to renewable energy sources.

The most significant barriers are associated with awareness and expertise, profitability, access to capital and access to relevant technology. The interest in energy measures will always be present, but surrounding factors impact the extent of resources allocated. For energy-intensive activities, energy accounts for such a significant part of the costs that it is always closely monitored. For other industries, energy is just one of several areas that demand attention.

So far, Enova has awarded a total of NOK 1.6 billion in contractual support for the industry sector, support granted to projects that, together, will help release, restructure or generate more than 4.7 TWh each year.

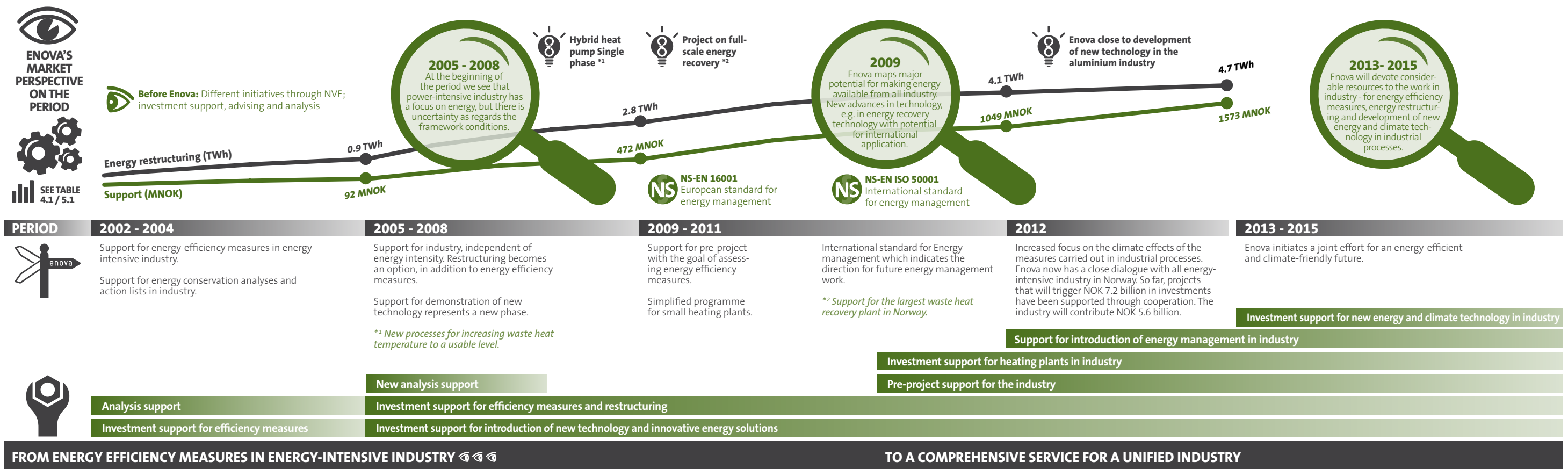
Enova developed its industry programmes so both the "soft" expertise elements and the "hard" investments are safeguarded – and has also strengthened the contribution to the industry's technology development in energy use and greenhouse gas emissions. There have been three significant

shifts in Enova's industry efforts. The first was in 2005 when we opened for investment support for smaller energy users and also met the industry's need for support for conversion to renewable energy. It also became possible to apply for support for demonstration of new technology through the technology programme which, until then, had only supported energy production. This resulted in the arrival of the portfolio's first development projects related to waste heat and energy recovery.

2009 was an important year. We carried out studies related to the industry's energy use and potential which subsequently set the premises for further development of the programmes offered to industry. The Government's economic stimulus package made room for what was then the largest industry project in Enova and the largest power recovery project in Norwegian industry; Finnfjord in Northern Norway.

Enova strengthened its programmes in 2011 with the addition of possible pre-project support and simplified applications for small heating plants. The same year saw increased applications for introduction of new technology from the industry. The aluminium industry was particularly active.

Enova's efforts were developed further in 2012, setting a clear direction for the future. An international standard for Energy Management shows how enterprises can take control over their energy use. Enova takes this further by supporting the industry's efforts to get this started. We will expand our commitment in energy and climate technology, and accept projects with climate results through improvement of industry processes.



A market perspective on non-residential buildings

A considerable improvement in the energy performance of new and existing commercial buildings.

In 2010, Norwegian non-residential buildings had an average annual energy use of 283 kWh per square metre. This corresponds to a total annual energy use of about 35 TWh. This is just over 20 per cent of stationary energy end-use in mainland Norway. The sector's energy use is therefore very important with regard to security of supply and the energy system.

Enova's Potential and Barrier Study (2011) documents a profitable potential for energy efficiency in commercial buildings of 25 per cent, corresponding to 9 TWh. The study also identifies the barriers preventing measures from being triggered. In summary, this deals with a lack of awareness of energy use in own buildings, limited knowledge of the potential and limited expertise related to design of necessary measures, as well as a lack of profitability in the projects.

Up to 2004, support was granted to projects that realized the

energy result through implementation of energy efficiency analyses and introduction of energy management and follow-up. Support was awarded under the assumption that investments would be made in physical measures. During 2004, we changed the programmes so the support was directly linked to the physical measures. The goal still involved creating lasting changes in routines, expertise and handling of energy issues on the part of building owners, but with greater certainty that physical measures would also be implemented. The change was based on an acknowledgement that a combination of physical and behavioural measures works best.

In 2005, Enova launched support for municipal energy and climate plans, pre-project support for municipalities and investment support for prototype projects.

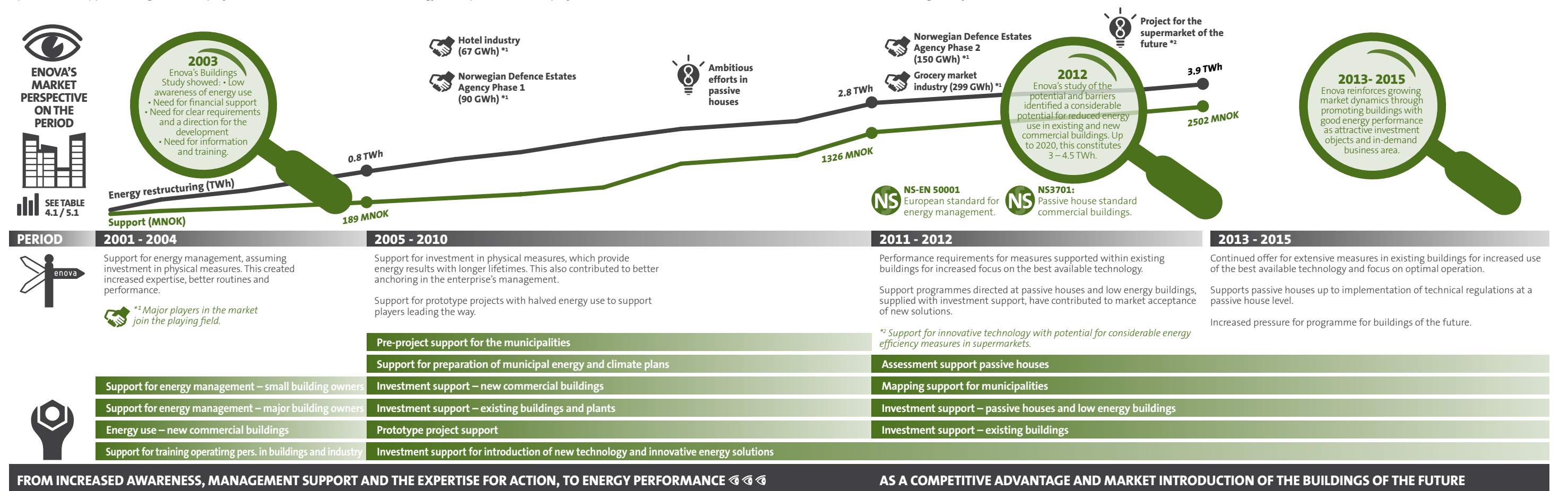
The prototype project programme was replaced by a programme for low energy and passive house projects in 2010. Enova's

efforts in promoting passive houses triggered a considerable number of building projects with high energy performance. This increases the experience basis and creates more expertise, which contributes to development of new technology and new solutions in the market. Performance requirements were introduced for the measures one could apply for in the support programme directed at existing buildings.

Up to 2012, commercial buildings contributed nearly 3.9 TWh (annually) to Enova's energy result and a total of NOK 2.5 billion has been granted in support. More than 1 700 projects have received support and this has contributed to a considerable increase in the attention on energy use in private and public non-residential buildings.

Enova's vision is an energy-efficient and renewable Norway, in line with the goals in the Climate Report and White Paper on Building Policy. A number of measures can contribute to

such development. Enova's Buildings Study from 2003 determined that there was a need for investment support, clear requirements for indicating the direction of development in the market, information and training. Based on this, Enova has developed and adapted its services to the market. Through its activities, Enova has contributed to the construction of passive houses adapted to Norwegian conditions and takes part in contributing to development of new technology and new solutions. The technical regulations will be amended in 2015 where the passive house standard is a possible level of amended energy requirements in buildings. We believe that this will in turn lead to the market setting stricter requirements for existing buildings, highlighted through the energy rating programme, and that the market is capable of delivering this. Up to 2015, Enova will help this development move faster and point the direction for the buildings of the future.



FROM INCREASED AWARENESS, MANAGEMENT SUPPORT AND THE EXPERTISE FOR ACTION, TO ENERGY PERFORMANCE

AS A COMPETITIVE ADVANTAGE AND MARKET INTRODUCTION OF THE BUILDINGS OF THE FUTURE

Bioenergy results/results within bioenergy

A well-functioning bioenergy market is an important precondition in order for renewable heating to become the preferred method. It is therefore important for Enova to follow the development in the bioenergy market in light of the projects we have supported.



6.3 TWh bioenergy triggered through support from Enova

In the period 2001-2012, Enova has supported 6.3 TWh of bio-based delivered heating¹ and production of different types of fuel through its various support programmes. This is distributed between 5 TWh of bio-based delivered heating and 1.3 TWh of biofuel production. Waste energy has been included in the delivered heating, a total of 1.8 TWh, which is considered bioenergy in official energy statistics.

Biofuel such as chips, pellets and briquettes constitute more than 50 per cent of the energy results we have achieved within heat production based on renewable energy sources.

The contractual energy result with bioenergy as the energy source represents a demand of about 1 million tonnes of chips, 180 000 tonnes of pellets and 18 000 tonnes of briquettes. Conversion to renewable heating based on bioenergy, either delivered via the district heating system or produced locally with each end user, works upwards in the value chain. This is illustrated in Figure 3.2.

Several major industry projects based on bioenergy were cancelled in 2012, which led to a reduction in the overall contractual energy result within bioenergy.

Bioenergy dominant fuel in 2012

In 2012, Enova supported 331 GWh of bio-based delivered heating and production of biofuel through its various support programmes. This is distributed between 252 GWh of bio-based delivered heating and 79 GWh of biogas production. The delivered heating includes waste energy with 73 GWh. Biofuel such as chips, pellets and briquettes constitutes more than 51 per cent of the energy results achieved within heat production based on renewable energy sources in 2012. Of this, chips dominate, and are used as fuel in 74 per cent of total heat production based on bioenergy.

Large facilities are important in order to trigger volumes within bioenergy. Enova has a close dialogue with the professional segment of the heating market and industry players.

In 2012, Enova commissioned a feasibility study for bioenergy in industry. The study points out a commercial potential for conversion to bioenergy in industry of 3 – 4 TWh, assuming an alternative energy source price of NOK 0,50 /kWh. The study shows the potential's vulnerability to the price of alternative energy sources, and, with current price levels, the financial potential is minor without support.

FIGURE 3.2 DELIVERED HEATING BASED ON BIOENERGY CONVERTED TO PRODUCED VOLUME OF BIOFUEL STATED IN TONNES

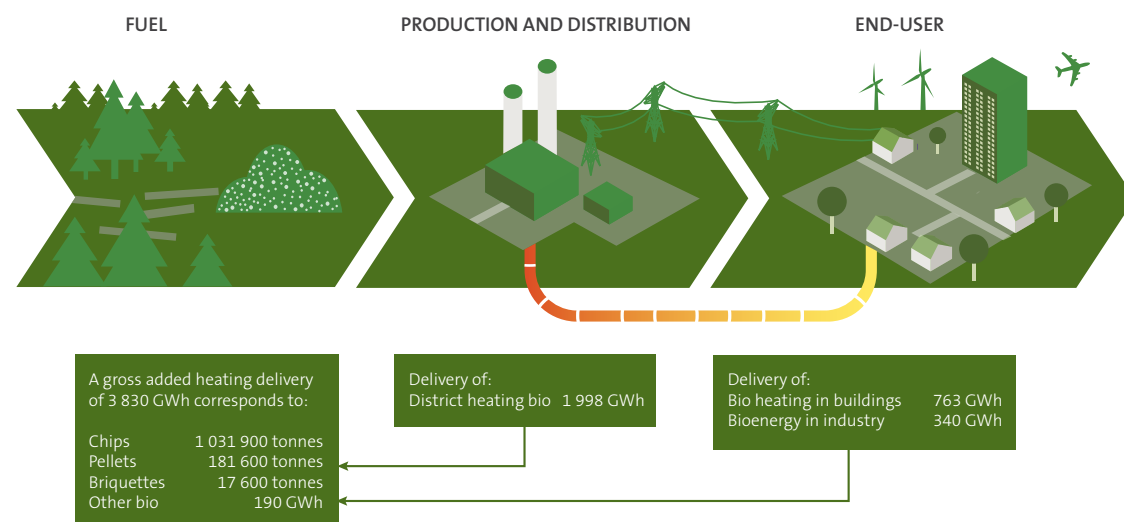


Figure 3.2: The figure illustrates how conversion to renewable heating based on bioenergy works upwards in the value chain and increases the demand for biofuel. Illustration: Endre Barstad (processed by Enova)

¹ Includes waste-based power production from projects with a combined power/heat production of 251 GWh. The household subsidy programme is not included.

The Energy Fund – Results 2012

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2012 has been a very active year for Enova. We have focused on maintaining a close and good dialogue with the stakeholders. The growth in the number of projects and new project ideas is indeed positive.

Enova's main goals

Changes were made both to Enova's objective and our main goals in the new agreement between the Ministry of Petroleum and Energy (MPE) and Enova. The most important change is a considerable strengthening of the mandate and responsibility within energy and climate technology.

Enova promotes environmentally friendly restructuring of energy end-use and energy production, as well as development of energy and climate technology.

The expanded responsibility is accompanied by a continuance of Enova's traditional market areas, with the exception of commercial renewable power production which will now be covered by the electricity certificate system. Enova's objective is further elaborated in the main goals:

Four of the main goals focus on what we must achieve:

- Development and introduction of new energy and climate technologies in the market.
- More efficient and flexible use of energy.
- Increased use of other energy carriers than electricity, natural gas and fuel oil for heating.
- Increased use of new energy resources, including through energy recovery and bioenergy.

New energy and climate technologies have a somewhat different time perspective than more mature technologies. Projects supported introduce innovative technology in the market, which in turn may enable such technologies to gain a foothold. Prioritisation of projects is therefore not primarily based on energy results for each project, but the technology's potential to contribute to energy restructuring and reduced greenhouse gas emissions.

It is natural to quantify energy results for the other three main goals. The main goals overlap to some extent and results from each should not be added up to a total sum. The energy target for the period from 2012 to the end of 2015 constitutes a total direct result of 6 ¼ TWh.

The remaining two main goals indicate how Enova should work:

- More well-functioning markets for efficient solutions that are environmentally and climate-friendly.
- Increased knowledge in society about the possibilities of utilizing energy-efficient, environmentally and climate-friendly solutions.

For these goals it is more natural to find other units of measurement than energy results to assess progress.

Main goal 1: Development and introduction of new energy and climate technologies in the market

The new agreement between the MPE and Enova strengthens the focus on development and introduction of new energy and climate technologies in the market. Many of the projects supported by Enova up to 2011 have involved clear technology development elements. We see that the experience gained from these projects is used in new technology projects supported in 2012. One example is the heating and power recovery project in Finn fjord in Troms County which received support from Enova in 2009. A new major-scale power recovery project was supported in 2012; this time at Elkem's plant in Salten in Nordland County.

Energy and climate technology is not exclusively tied to industry. Introduction of new solutions is also important in buildings, and we see that Enova's efforts in promoting passive houses are starting to pay off. The efforts include both passive and low energy commercial buildings and residential buildings.

This year we granted support for technology development within industry, commercial buildings and residential buildings, as well as projects within renewable heating and renewable power production. In total, support was granted to more than 200 projects within new energy and climate technology, with a total support amount of NOK 336 million and an energy result of 87 GWh.

Main goal 2: More efficient and flexible use of energy

More efficient and flexible use of energy is a precondition in order to strengthen security of supply both in the short and long term; by reducing peak loads and by increasing the possibilities to swap energy sources based on price and availability. Efficiency projects in buildings and industry, together with increased access to renewable heating, help us achieve this goal. In total, projects within these categories constitute 1.3 TWh in 2012.

Main goal 3: Increased use of energy carriers other than electricity, natural gas and fuel oil for heating

Renewable central heating contributes to increased utilization of other energy carriers than electricity and fossil fuels for heating. This increases energy flexibility and creates more opportunities for efficient utilization of our renewable energy resources. Furthermore, less use of fossil energy carriers creates a direct environmental benefit in the form of direct reductions in greenhouse gas emissions. In 2012, support was granted to projects with renewable heating totalling 389 GWh, of which one-third is related to conversion. The result comes from a wide range of projects; from major district heating projects and investment in district heating infrastructure to conversion projects in industry, small heating plants in buildings and simple measures in households.

Main goal 4: Increased use of new energy resources, including through energy recovery and bioenergy

Norway holds a special position with regard to the access to energy resources, both fossil and renewable. The electricity certificate system was introduced from 1 January 2012 to increase access to renewable power, but there is a considerable potential for increased energy production from energy resources that are not covered under this system. In 2012, Enova supported projects providing a total of 776 GWh in increased utilization of renewable energy sources and carriers.

Main goal 5: More well-functioning markets for efficient solutions that are energy, environmentally and climate-friendly

We will make the efficient and environmentally friendly energy solutions the preferred solutions in the market. By supporting innovators and early users, we create market development by making the good solutions more competitive as a result of increased demand and reduced unit costs. Enova employs several instruments. Through the subsidy programmes, we increase demand for future-oriented energy solutions in the professional market. Furthermore, we help develop the supply side by testing and making products available in the market. Through the household subsidy programme we stimulate demand in private households. The market development for heat pumps is a good example of this. Another instrument is familiarizing consumers with the good solutions already available in the market, for example through the "Enova Recommends" programme.

Main goal 6: Increased knowledge in society about the possibilities of utilizing energy-efficient, environmentally and climate-friendly solutions

Enova works in a systematic and targeted manner with communication measures to impact attitudes and change behaviour toward use of efficient and environmentally friendly energy solutions. We will give advice, increase awareness of environmentally friendly energy solutions, point out possibilities and trigger measures. In this work we target both households and the professional market within industry, buildings and production of environmentally friendly heating and power. We offer professional advisory teams, give advice through the application processing procedure and organize courses. The Rainmaker concept is an opportunity for us to reach many children and young people. We have a nationwide information and advisory service serving a diverse audience through telephone, email and social media.

Target and results for the Energy Fund

The new agreement sets the target for the 2012-2015 period at 6 ¼ TWh. While the goal in previous agreements has been an accumulated target for a longer period, for example 2001-2011, the goal in the new agreement only relates to the applicable agreement period. This means that projects supported before 2012 are part of a closed portfolio, and the results from this are reported separately from the portfolio of projects approved within the new agreement period.

Over the course of 2012, Enova has granted support for 752 projects, in addition to 6 260 measures through the household subsidy programme. In total, they represent an expected energy result of 1.6 TWh.

The most important contributors to the result are projects within the areas of non-residential buildings, industry and

renewable heating with 613 GWh, 555 GWh and 350 GWh, respectively, cf. Figure 4.1 and Table 4.1.

Results within non-residential buildings in 2012 constitute about two per cent of the total energy end-use in non-residential buildings in Norway of 30 – 32 TWh per year¹.

The result for industry is about 0.5 TWh. This is somewhat less than what we ideally wanted, but given the still tense financial situation in important markets for Norwegian industry, we are still satisfied.

In addition to the three mentioned market areas, Enova also granted support for projects within residential buildings, non-industrial plants and facilities and renewable power production totalling 87 GWh in 2012. The result from energy and

climate technology projects is included in the results from the respective market areas. For further details on these projects, see the reporting on energy and climate technology, as well as the 2012 project list.

Of the total allocated resources of just under NOK 1.9 billion in 2012, approximately NOK 1.7 billion were allocated directly within the market areas. The most resources were allocated within the market areas that also have the highest energy results. This is followed by the residential buildings area with a total allocation of NOK 121 million. This amount includes, among other things, the household subsidy programme.

Of the remaining NOK 200 million, NOK 45 million went to efforts including supporting Norwegian participation in international projects headed by the EU and IEA and to carrying

out studies and analyses of potential and barriers in Norway. Enova is one of multiple users in several of these projects. The purpose is not only to give Enova the best possible foundation for programme development, but also to increase the general knowledge basis for measures.

NOK 59 million were allocated within advisory services and communication in 2012. This includes Enova's helpline "Ask Enova", marketing and promotion of Enova's programmes, and the general information activity directed at the public.

The administration costs of NOK 98 million constitute five per cent of the allocated funds in 2012.

FIGURE 4.1 ENERGY RESULTS AND TARGET FOR THE ENERGY FUND

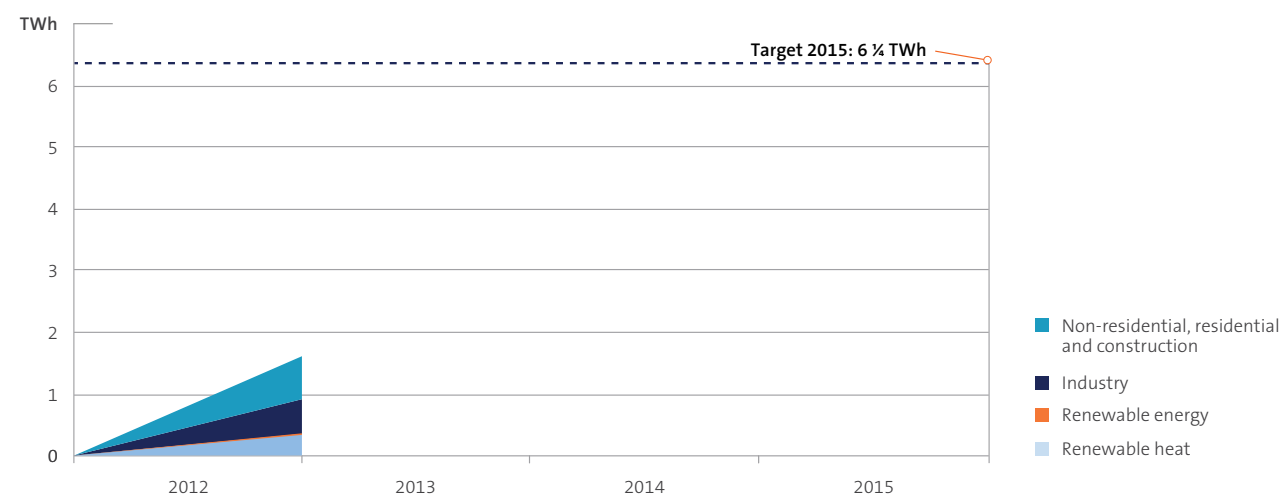


Figure 4.1: The figure shows accumulated energy results distributed by market area in the agreement period 2012-2015. The figures are corrected for cancelled projects and implemented projects where a final report has been submitted.

TABLE 4.1 THE ENERGY FUND'S ENERGY RESULTS AND ALLOCATIONS 2012

	2012	
	GWh	MNOK
Renewable heating	350	320
Renewable power production	8	63
Industry	555	524
Non-residential buildings	613	651
Non-industrial plants and facilities	22	13
Residential buildings	56	121
International projects	-	9
Advisory services and communication	-	59
External analyses and development measures	-	36
Administration	-	98
Total	1 606	1 894

Table 4.1: The table shows aggregated energy results and resources allocated from the Energy Fund in 2012, corrected for cancelled projects and projects where a final report has been submitted as of 31 December 2012. Results within the "Introduction of New Energy Technology" programme are distributed between respective market areas.

¹ Source: Enova's Building Statistics 2011

Results distributed by project category

Projects supported by Enova can be divided into four categories: Production, energy efficiency, distribution and conversion. Production projects include all projects where renewable electricity and/or renewable heating is produced and constituted 34 per cent of the results for 2012. We do not differentiate based on whether the generated energy is for sale or intended for own use. The latter is typically the case for energy recovery in the industry, where the recovered energy (electricity or heating) is used to reduce the need for purchased energy (electricity, fuel oil, gas). In Table 4.2, we see that energy recovery in industry represented most of the new production supported by Enova in 2012, with about 350 GWh out of a total 540 GWh.

Energy efficiency projects constitute the largest share both as regards total energy result (51 per cent) and the number of projects (43 per cent). These are projects aimed at increasing the efficiency of energy use amongst end users, either as reduced energy use or reduced specific energy use per produced unit. Energy efficiency in commercial buildings contributes most within this category, a total of 470 GWh out of 820 GWh. Enova is satisfied that commercial buildings owners maintain a high focus on reducing energy use in their own buildings. For comparison, projects within the public sector constitute 99 GWh. Taking into consideration that there are

more commercial buildings than public buildings, 62 per cent compared with 48 per cent, measured in m², the result achieved in the private sector is still significantly better than in the public sector.²

The distribution projects that constitute eight per cent, or 136 GWh, of the energy results are related to infrastructure for distribution of district heating. The conversion projects are projects where the energy carrier has been changed from electricity or fossil energy sources/ carriers to renewable energy carriers based on, for example, bioenergy. These projects totalled 112 GWh, representing seven per cent of the overall energy result in 2012.

Results distributed by renewable energy source/carrier

The projects that received support from Enova in 2012 will contribute in increasing the use of renewable energy sources/ carriers by a total of 776 GWh. The discrepancy from the total of production, distribution and conversion in Table 4.2 is due to the fact that projects with conversion from renewable energy sources/carriers to district heating are not included in Table 4.3. Energy recovery from the industry, i.e. utilization of waste heat, and increased use of bioenergy are the most important categories with 310 and 283 GWh, respectively. Chips represent the largest share within bioenergy, 135 GWh.

FIGURE 4.2 RESULTS DISTRIBUTED BY PROJECT CATEGORY

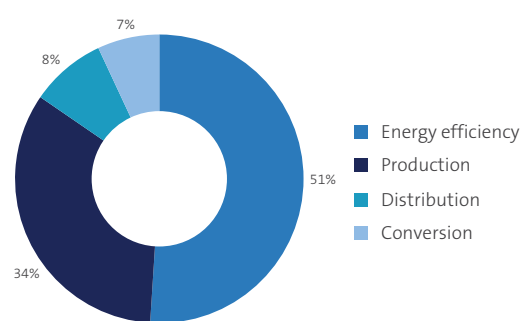


Figure 4.2: The figure shows the contractual energy result in 2012 distributed by project category. The table is corrected for cancelled projects approved in 2012.

² Source: Enova's Building Statistics 2011

TABLE 4.2 ENERGY RESULT 2012 DISTRIBUTED BY PROJECT CATEGORY

Market area	Energy efficiency	Production	Distribution	Conversion
	GWh	GWh	GWh	GWh
Renewable heating	-	184	136	30
Renewable power production	-	8	-	0
Industry	174	346	-	36
Non-residential buildings	569	-	-	44
Non-industrial plants and facilities	21	-	-	1
Residential buildings	55	-	-	1
Total	820	539	136	112

Table 4.2: The table shows contractual energy results in 2012 distributed by project category and market area. The figures are corrected for cancelled projects approved in 2012.

TABLE 4.3 ENERGY RESULT WITHIN PRODUCTION, DISTRIBUTION AND CONVERSION, DISTRIBUTED BY ENERGY SOURCE/CARRIER

Energy source/carrier	Energy result
	GWh
Waste	73
Bioenergy	283
<i>Biogas</i>	79
<i>Chips</i>	135
<i>Pellets</i>	49
<i>Other bio</i>	21
Waste heat	310
Heat pump	101
Tidal power	5
Hydropower	3
Solar heating	0.1
Total	776

Table 4.3: The table shows the distribution of Enova's energy result within production, distribution and conversion for each energy source/ carrier. Bioenergy is split into four sub-groups; biogas, chips, pellets and other bio.

Energy and climate technology

Over the course of 2012, Enova has supported 217 projects related to introduction of new energy and climate technology in the market, corresponding to an energy result of 87 GWh. In total, we have decided to support these projects with NOK 336 million. The agreement with the MPE stipulates that at least ten per cent of the annual available resources in the Energy Fund are earmarked for this focus area during the agreement period. Based on experience, the number of technology development projects varies from year to year, and constituted 18 per cent of overall allocations in 2012.

Most projects are related to construction of non-residential and residential buildings at a passive house or low energy level, with 144 projects. There are no adequate statistics of the number of newly constructed passive house or low energy non-residential and residential buildings, but the preliminary figures from the Energy Certification Programme indicate that, at the end of November 2012, a scant 500 residences (small houses and apartments) had received Energy Label A since the start of the Energy Certification Programme in June of 2010. Correspondingly, there were less than 100 non-residential buildings with Energy Label A. Even though the figures from the Energy Certification Programme do not show the whole picture of the distribution of passive houses and residences in the market, the trend is clearly positive, and strongest within private non-residential buildings.

Enova cooperates closely with other governmental agencies managing policy instruments for development of new energy and climate technology. The Research Council of Norway, Innovation Norway, Transnova and Enova currently comprise a coordinated support system with a range of policy instruments covering the whole value chain from basic research to market introduction. Clear distribution of roles, better coordination in the design of policy instruments and close cooperation in case processing and market activity have been emphasized and are important success factors for the cooperation.

The three largest individual projects that received support in 2012 are a tidal power project, Flumill; a passive house project, a new terminal at Oslo Airport Gardermoen; and a technology project in the industry segment at Hydro's test centre in Årdal.

Full-scale testing of a tide water turbine based on entirely new, patented technology developed by the company Flumill AS is planned in Rystraumen in Troms County. The goal of the project is to demonstrate the technology so that similar tide water turbines can be built worldwide, as well as in Norway in the future.

A high ambition level is fulfilled through utilizing innovative energy solutions when the new Terminal 2 at Oslo Airport will be developed

at a passive house level. Measuring about 114 000 square metres, this will be one of the world's largest passive buildings and quite certainly also the most visited, with an expected traffic capacity following construction of 28 million visitors each year.

Technology development within the aluminium industry is driven forward at Hydro's test centre in Årdal in Sogn og Fjordane County, with the goal of creating the most energy-efficient platform possible for the new aluminium smelting plants that

will be developed. Through this project, the specific energy use per produced unit is reduced through demonstration of new technology on the six electrolytic cells HAL4e. This is a step in maintaining the Norwegian aluminium industry's top global position within energy-efficient production.

The list of the largest energy and climate projects which Enova awarded support in 2012 is summarized in Table 4.5.

TABLE 4.4 SUPPORT FOR ENERGY AND CLIMATE TECHNOLOGY

Market area	Programme	Number of projects supported	Contractual energy result	Contractual support
		Number	GWh	MNOK
Renewable heating		1	1	7
	Introduction of New Energy Technology	1	1	7
Renewable power production		2	8	63
	Introduction of New Energy Technology	2	8	63
Industry		2	4	23
	Introduction of New Energy Technology	2	4	23
Non-residential buildings		133	70	212
	Investment Support for Passive Houses and Low Energy Buildings	81	67	183
	Support for Passive House Feasibility Studies	49	-	2
	Introduction of New Energy Technology	3	2	26
Residential buildings		79	4	32
	Investment Support for Passive Houses and Low Energy Buildings	58	4	31
	Investment Support for Passive Houses and Low Energy Buildings	5	-	-
	Support for Passive House Feasibility Studies	16	-	1
Total		217	87	336

Table 4.4: The table shows energy results and allocations within new energy and climate technology in 2012 distributed by market area.

TABLE 4.5 TEN LARGEST PROJECTS WITHIN NEW TECHNOLOGY IN 2012 MEASURED BY AWARDED SUPPORT

Project	Applicant	Market area	Programme	Contractual energy result	Contractual support
				GWh	MNOK
Flumill tide water turbine - pilot plant for power production in Rystraumen in Tromsø	Flumill AS	Renewable power production	Introduction of New Energy Technology	5.1	57.3
New airport terminal (T2) at passive house level	Oslo Lufthavn AS (Oslo Airport Gardermoen)	Non-residential buildings	Investment Support for Passive Houses and Low Energy Buildings	9.0	30.6
HAL4e Amperage Increase Project, Hydro Årdal	Hydro Aluminium AS	Industry	Introduction of New Energy Technology	1.5	16.2
Energy measures at Lerkendal Hotel	Lerkendal Invest AS	Non-residential buildings	Introduction of New Energy Technology	2.0	14.0
Deep renovation to low energy standard at Sven Oftedalsvei 10, Oslo	Aspelin Ramm Eiendom	Non-residential buildings	Investment Support for Passive Houses and Low Energy Buildings	16.5	13.1
New main Oslo Public Library (the Deichmanske Library) - introduction of technology solutions for the buildings of the future	City of Oslo Bjørvika Cultural Buildings	Non-residential buildings	Introduction of New Energy Technology	0.3	10.8
New Østfold Hospital in low energy standard	Helse Sør- Øst RHF	Non-residential buildings	Investment Support for Passive Houses and Low Energy Buildings	7.8	9.7
Fornebu Centre - New shopping centre and office building in passive house standard	KLP Eiendom	Non-residential buildings	Investment Support for Passive Houses and Low Energy Buildings	2.5	9.5
Lerkendal Student village in passive house standard	SiT Bolig (Residential Buildings unit of the Student Welfare Organization in Trondheim)	Non-residential buildings	Investment Support for Passive Houses and Low Energy Buildings	0.5	7.4
New main Oslo Public Library (the Deichmanske Library) in passive house standard	City of Oslo Bjørvika Cultural Buildings	Non-residential buildings	Investment Support for Passive Houses and Low Energy Buildings	1.8	6.8

Table 4.5: The table shows the ten largest projects within new energy and climate technology in 2012 measured by contractual support.

Reporting on climate impact

Enova plays a role in achieving emission reductions that help Norway reach its climate goals by supporting projects for increased deployment of renewable energy and energy efficiency. Our focus on the climate impact of our efforts was strengthened through the expanded mandate in 2012.

Our portfolio consists of different types of projects and measures. Some projects contribute to direct reductions in the use of fossil fuels, either through efficiency improvements or conversion from fossil to renewable energy sources/ carriers. The climate impact of these projects is reported as a *direct climate impact* here. Other types of measures such as increasing efficiency in electricity end-use and new electricity production from renewable sources are also included under Enova's programmes. Norway generates nearly all of its electricity from hydropower, and measures such as conserving electricity are assumed to yield no - or a low - *direct climate impact*. However, the Norwegian power system is connected to, and is a part of, the European power system. If we assume that renewable electricity production in Norway can replace electricity production from fossil fuels in other countries, it will have an *indirect climate impact*. The climate impact of projects that contribute to reduced electricity use or new electricity production from renewable sources is reported here as *indirect climate impact*.

Table 4.6 shows *direct climate impact* from Enova's project portfolio in 2012 for the various market areas. The first column shows the total reduction in oil consumption. In 2012, Enova established a database where we store oil reduction data for each project we support. This provides a better data basis for calculations of reduction in oil consumption and climate impact. Renewable heating is the market area with the largest reductions in oil consumption. It is followed by projects within industry,

non-industrial plants and facilities and non-residential buildings. The *direct climate impact* for each market area is indicated in Table 4.6. Emission factors for oil, gas and other types of fossil fuels were obtained from the database Ecoinvent v2.2, which contains emission data for energy processes and other types of processes.³ The unit used for *direct climate impact* is CO₂ equivalents. This unit indicates the combined effect of CO₂, as well as other greenhouse gases (such as CH₄ and N₂O). The market area with the greatest *direct climate impact* in 2012 is renewable heating, where an effect corresponding to an annual reduction of about 36 kilotonnes of CO₂ equivalents was achieved. As projects within renewable power only impact electricity, there is only an *indirect climate impact* (see Table 4.7) achieved within this market area. In total, the project portfolio from 2012 achieves a direct emission reduction corresponding to about 60 kilotonnes of CO₂ equivalents.

Table 4.7 shows the total climate impact of Enova's project portfolio in 2012 within each market area. Total climate impact refers to the sum of direct and indirect effects. The purpose is to model and highlight the indirect climate impact assuming various scenarios for the electricity mix. The first scenario is the effect that is achieved by assuming that Norwegian power can replace electricity produced in the Nordic region (Nordic mix), with an emission intensity of 117 g CO₂ equivalents/kWh (Ecoinvent v2.2). The second scenario is based on an assumption that Norwegian electricity can replace European power production, while the third scenario assumes replacement of coal-based power production in

TABLE 4.6 REDUCTION IN OIL CONSUMPTION AND DIRECT CLIMATE IMPACT FROM PROJECTS SUPPORTED WITHIN THE ENERGY FUND IN 2012

Market area	Reduction in oil consumption	Direct climate impact
	tonnes	ktonnes CO ₂ equivalents.
Renewable heating	6 148	36.4
Renewable power production	4	0.2
Industry	2 636	12.1
Non-residential buildings	1 408	6.7
Non-industrial plants and facilities	1 313	4.8
Residential buildings	54	0.2
Total	11 563	60.4

Table 4.6: The table shows the direct climate impact of Enova's work in 2012 measured in reduction of oil consumption and CO₂ emissions (CO₂ equivalents) within each market area.

³ Dones R., Bauer C., Bolliger R., Burger B., Faist Emmenegger M., Frischknecht R., Heck T., Jungbluth N. and Röder A. (2007) Life Cycle Inventories of Energy Systems: Results for Current Systems in Switzerland and other UCTE Countries. Final report ecoinvent data v2.0, No. 5. Swiss Centre for Life Cycle Inventories, Dübendorf, CH.

TABLE 4.7 TOTAL CLIMATE IMPACT (DIRECT + INDIRECT) FROM PROJECTS SUPPORTED WITHIN THE ENERGY FUND IN 2012

Market area	Nordic mix	European mix	Nordic coal power
	ktonnes CO ₂ equivalents	ktonnes CO ₂ equivalents	ktonnes CO ₂ equivalents
Renewable heating	49	86	121
Renewable power production	1	4	7
Industry	67	235	394
Non-residential buildings	98	266	452
Non-industrial plants and facilities	6	8	10
Residential buildings	7	25	42
Total	227	623	1 026

Table 4.7: The table shows the total climate impact (direct and indirect) of Enova's work in 2012 from the perspective of three different electricity scenarios. The results are shown per market area.

the Nordic region The emission intensities for these electricity mixes are 477 g CO₂ equivalents/kWh and 819 g CO₂ equivalents/kWh, respectively (Ecoinvent v2.2).⁴ Table 4.7 shows the total climate impact, given various assumptions regarding the electricity mix in the three scenarios described above.

It is worth noting that the results are highly dependent on the assumptions used as a basis for the alternative power supply. Using the European power mix as a basis, we achieve a total climate impact of approximately 620 kilotonnes of CO₂ equivalents. As the best case, if we assume that electricity saved or produced as a result of Enova's projects replace only coal power generated in the Nordic region, the 2012 portfolio contributes to emission reductions totalling approximately 1 000 kilotonnes of CO₂ equivalents.

Figure 4.3 shows the measure cost for reduced greenhouse gas emissions as a result of Enova's energy results for the 2012 portfolio. Correspondingly, the measure cost for climate impact is also very dependent on the type of electricity mix used as a basis. Taking a basis in the support level in 2012 and estimated greenhouse gas reductions for each mix, this corresponds to a measure cost in the order of NOK 207 – 1 181 per tonne CO₂ equivalents. For comparison, the quota price in 2012 for CO₂ in the EU's Emissions Trading System (EU ETS) was an average of NOK 67 per tonne CO₂ for emissions in December 2015.⁵

Our climate impact reporting will be further developed so that, as early as from 2013, we will be able to report which projects are subject to quotas within the European Emissions Trading System (EU ETS).

FIGURE 4.3 THE COST OF MEASURE FOR REDUCED CO₂ EMISSIONS

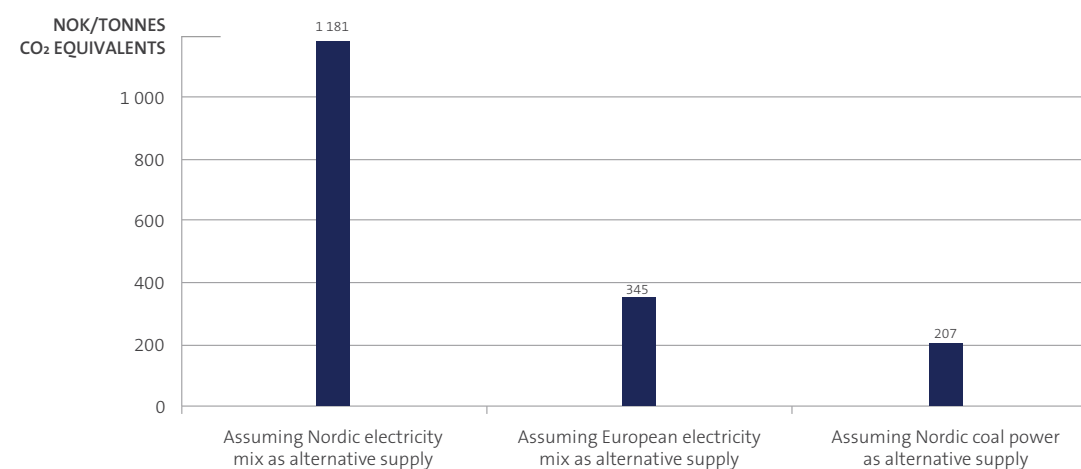


Figure 4.3: The figure shows the measure cost for reduced CO₂ emissions as a result of Enova's energy results for 2012.

⁴ The emission coefficients for Nordic and European power mixes are based on average production in these regions in 2000 (Ecoinvent v2.2). The emission coefficient for coal power is equal to average production from the technology installed in the Nordic region in 2000, and Ecoinvent v2.2 is the source here as well.

⁵ Source: Thomson Reuters Datastream, average price level for CO₂ quotas (Dec. 2015) sold at the European Energy Exchange (EEX) in 2012.

In-depth reporting

Energy results

When Enova decides to support a project, this is based on an estimate of the expected annual energy result of the project when it is implemented and fully operational. We call this the Contractual energy result. When the project is implemented, the project owner documents what has been accomplished and provides a revised estimate of the energy result – the Final reported energy result. There may be a natural discrepancy between the contractual and final reported result, also given that there is a better basis for estimating the energy result after implementation. Since implementation of most projects takes more than one year, the corrected energy results from final reporting will most likely not arrive the same year as the project is approved.

Table 4.8 provides an overview of the total energy result in projects supported by Enova in 2012 distributed by unit (gross

energy result). This energy result of 1 619 GWh is furthermore corrected for projects that were cancelled in the same year they were approved (2012). Together, this constitutes 13 GWh. A normal reason for why projects are cancelled is that the project is not able to secure necessary financing. Following this correction, Enova is left with a contractual energy result of 1 606 GWh for 2012, cf. Table 4.1.

Of the few projects that have been completed, there is a minor or no discrepancy between the contractual and final reported energy result.

Enova has established a practice for reviewing the projects three years after their final reports were submitted to assess the actually achieved energy results. This is described in more detail in Part 5 of the Annual Report.

TABLE 4.8 ENERGY RESULTS 2012 DISTRIBUTED BY MARKET AREA

Market area	Gross contractual result	Contractual result	Contractual result corrected for final reported result
	GWh	GWh	GWh
Renewable heating	360	351	350
Renewable power production	8	8	8
Industry	557	555	555
Non-residential buildings	615	613	613
Non-industrial plants and facilities	22	22	22
Residential buildings	57	56	56
Total	1 619	1 606	1 606

Table 4.8: The table shows contractual energy results (in GWh) distributed by market area, both before and after correction for cancelled and final reported projects. The "Contractual result" column shows the energy result by the end of 2012 corrected for cancellations in 2012.

Allocation of the Energy Fund's resources

Each year, the Energy Fund is supplemented with the returns from the Basic Fund, a parafiscal charge on the grid tariff and interest income from the capital in the Energy Fund itself. In 2012, this constituted a total of NOK 1 900 million. There was also an allocation directly over the fiscal budget for 2012 of NOK 20 million in connection with the Government's Environmental Technology Campaign.

A decision was made in connection with the Climate Agreement to strengthen the Basic Fund with NOK 25 billion in 2016, creating a total volume of NOK 50 billion. The first allocation of NOK 10 billion was made on 1 January 2013 at an interest rate of 2.2 per cent. This means that the returns from this of NOK 220 million, which Enova can use to support energy and climate technology projects in industry, will not be available until 2014.

Beyond freshly added funds (NOK 1 920 million in 2012), Enova allocates any unallocated funds transferred from the previous year. This constituted NOK 810 million in 2012.

When Enova supports projects, the amounts awarded are earmarked in the Energy Fund as commitments. The relevant amount is then disbursed in arrears based on actual project costs. The disbursement does not normally take place in the approval year. If projects are cancelled, the earmarked amount in the Energy Fund is released and made available for new projects. In 2012, NOK 480 million of earmarked funds in the Energy Fund were released as a result of cancelled projects. Most of these projects were supported before 2012.

Together, the fresh funds from the Basic Fund, the parafiscal charge on the grid tariff, interest income and direct allocations over the fiscal budget, together with transfers from 2011 and recycled funds in 2012, constituted a total of NOK 3 210 million. Of this, NOK 1 894 million were allocated in 2012, cf. Table 4.1,

and NOK 1 316 million were transferred to 2013. The allocated amount in 2012 corresponds to the new added funds in 2012. We transfer funds to 2013 and subsequent years for increased efforts in the future.

Enova has allocated funding commitments totalling about NOK 1.7 billion in 2012, which are in turn expected to trigger about NOK 5.5. billion from the market in connection with the projects that received the support. This will create total investments of more than NOK 7 billion in energy projects approved in 2012.

Even though Enova decided to support industry projects with a total of NOK 524 million (555 GWh) in 2012, the willingness to invest in Norwegian industry, with the exception of petroleum-related industry, is low. This is caused by factors such as continued weak development in the most important markets for Norwegian industry, an element which even important clarifications related to the industry's framework conditions (the compensation scheme for CO₂ costs) cannot offset.

In 2012, NOK 20 million was supplied to the Energy Fund as an earmarked allocation for environmental technology. This allocation was included in the support granted to the tidal power project Flumill in Troms County, and thus contributed to the full-scale demonstration of newly patented Norwegian technology in Norwegian waters. Enova's expanded mandate in connection with energy and climate technology was first clarified in the Climate Agreement in June 2012. With normal project development times for major energy and climate projects, Enova cannot expect an effect from this change in the mandate until well into 2013 and beyond in the agreement period. When the effect of the expanded mandate comes, the transferred funds from 2012 will provide Enova with good opportunities to promote major individual projects, including full-scale production lines in industry.

FIGURE 4.4 ALLOCATION OF THE ENERGY FUND'S RESOURCES

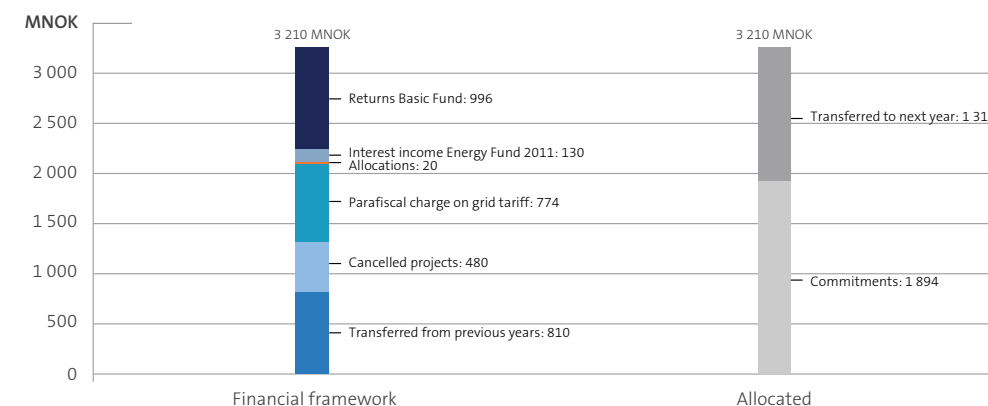


Figure 4.4: The figure shows a comparison of the Energy Fund's various sources of income and allocations thereof. Projects that are supported and cancelled in the same calendar year are not included in cancelled projects or commitments.

Funding level

Enova awards support based on what is necessary to ensure each project is implemented. Support from Enova should be sufficient to trigger an action that would not have taken place otherwise. The general rule is that the project-specific investments, operations and maintenance costs, together with the energy price, determine the support amount in each project. This means that the funding level measured in NOK per kilowatt hour (NOK/kWh) varies between the projects.

Since the necessary funding level is closely related to the projects' costs and income, the development in the markets both for input factors and actual project results will have considerable significance as regards the necessary funding level. One example is the development in energy prices, where low energy prices result in a low value for new production or savings, and thus entail an increased funding need.

Another important factor is the access to capital and competition for this capital. There always exists an alternative application for the capital available to project owners (in other projects). Less available capital and more alternatives for application of this capital increase competition for funds and thus also the requirement for return in the projects that are prioritised. This increases the support level necessary to trigger the projects.

The projects' access to capital is one of several key preconditions in order for Enova to achieve the goals in the agreement. The others are related to the energy price, interest level and investment pace. There is also interplay with other policy instruments. Through 2012, we have seen a decline in both the energy price (3-year forward prices at Nordpool) and interest level (NIBOR), while the access to capital and investment pace are still characterized by the financial and Eurozone crises. A low energy price, weak access to capital and willingness to invest will normally be challenging for

the access to new projects, while a low interest level can have the opposite effect. Enova therefore closely follows the development in these indicators.

Table 4.9 presents the funding level within four main groups of projects. The average funding level for projects in 2012 is NOK 1.03/kWh. This is higher than for previous years, but still a level that is acceptable based on achieving the goal for the agreement period of 6 ¼ TWh.

We see that the area of renewable power production has a considerably higher funding level than the others, which is due to the fact that this market area only includes energy and climate technology projects this year. Such projects generally have significantly higher costs and correspondingly lower income compared with other projects.

In the same way as the projects are very different as regards costs and income, there is also a considerable difference in the expected financial lifetime of the projects. If one divides the support granted by Enova by the projects' total energy result over their lifetimes, the funding level is significantly lower and, for many projects, could be compared with the energy price.

We generally expect projects within renewable heating and renewable power to have longer lifetimes than projects in buildings and industry. This obviously does not apply to all projects. Measures in building structures have longer lifetimes than the 15 years used as a basis in the table below. For industry, development is going in the direction of major investments directed at the company's core processes through measures with long lifetimes. Correspondingly, measures within distribution of district heating, the pipes in the ground, will have longer lifetimes than the actual heating plant.

TABLE 4.9 FUNDING LEVEL WITHIN THE ENERGY FUND

	Lifetime	2012	
		Distributed by contractual annual result	Lifetime-adjusted
		øre/kWh	
Renewable heating	20 years	90	4,5
Renewable power production	20 years	702	35,1
Industry	15 years	94	6,3
Non-residential and residential buildings, non-industrial plants and facilities	15 years	109	7,3
Total		103	6,5

Table 4.9: The table shows the funding level – both distributed by contractual annual result, as well as support distributed over the accumulated energy result measured over the lifetime. The results are corrected for cancelled projects.

Composition of the 2012 portfolio

Most projects that received funding commitments in 2012 were small projects with an expected energy result of less than 1 GWh. These projects make a relatively small contribution, approximately 100 GWh, to the overall energy result for 2012 of 1.6 TWh. This group of projects also receives more support (in NOK/kWh) than the other groups. The household subsidy programme is not included in this overview, but would only have amplified the picture.⁶

With the exception of the major individual projects of more than 100 GWh, the medium-sized projects from 1 to 100 GWh make the biggest contributions to the overall energy result. The projects of this size also require the least support measured in NOK per kWh.

There is a correlation between the size of the projects measured in support (NOK) or energy (kWh) and the implementation

time of the project. In Figure 4.6 we see that most projects are expected to be implemented by the end of 2013, i.e. about one year after they received support. Measured by energy result and disbursed support, the expected final date is just over three years after the approval date on average. By the end of 2015, it is expected that final reports will have been submitted for 96 per cent of the number of projects that entered into contracts in 2012. These constitute about 67 per cent of this year's contractual energy result.

A quick implementation time reduces the risk of external conditions changing in a negative direction for the projects. It also results in quicker recirculation of funds should the projects be cancelled.

FIGURE 4.5 PROJECTS DISTRIBUTED BY SIZE

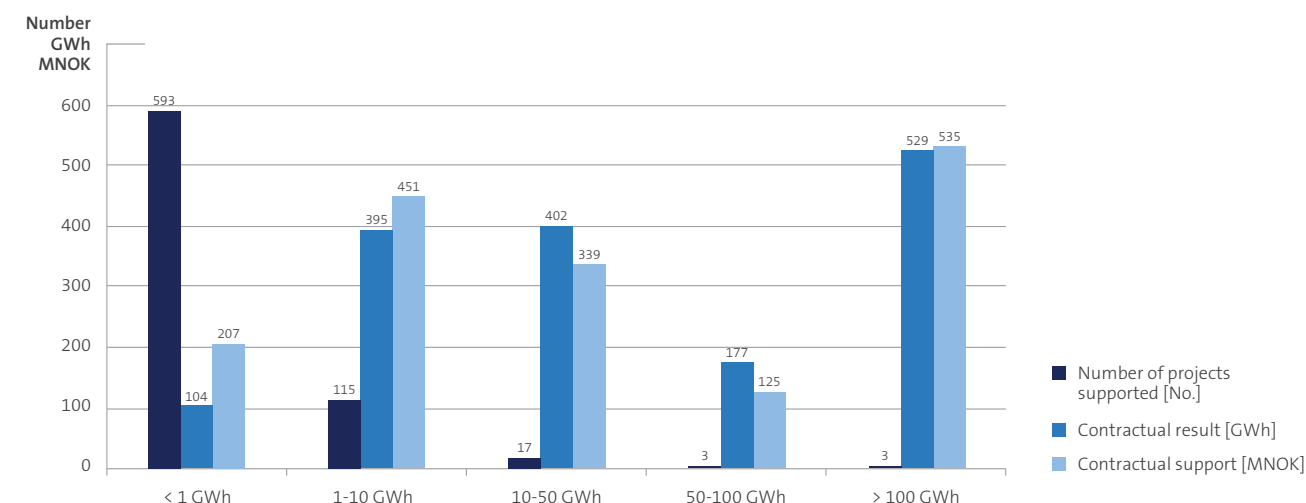


Figure 4.5: The figure shows distribution of projects entered into in 2012 grouped by project size in GWh. This graph only shows support granted to applicable programmes and does not include other activities (guidance, etc.) in the Energy Fund. The household subsidy programme is not included in this overview.

⁶ The household subsidy programme's portfolio consists of a very large number of small projects, both measured in energy yield and the support awarded for each project. Consequently, including this in the comparison with the rest of the project portfolio is in many cases not relevant.

Over the course of 2012, Enova received and processed about 7 600 applications, and more than 7 000 decisions were made regarding support for individual projects. Most applications and decisions are related to the household subsidy programme with about 6 700 applications and 6 300 decisions for approval, respectively.

The reason for the difference in the number of received and processed applications in a year is that applications received at the end of 2011 were not fully processed until the beginning of 2012. The reason why some processed applications do not receive support is primarily because they either do not fulfil the support criteria, the project has not been sufficiently documented, or the project is too expensive or too profitable for Enova to support it.

FIGURE 4.6 PROJECT PORTFOLIO DISTRIBUTED BY CONTRACTUAL FINAL DATE

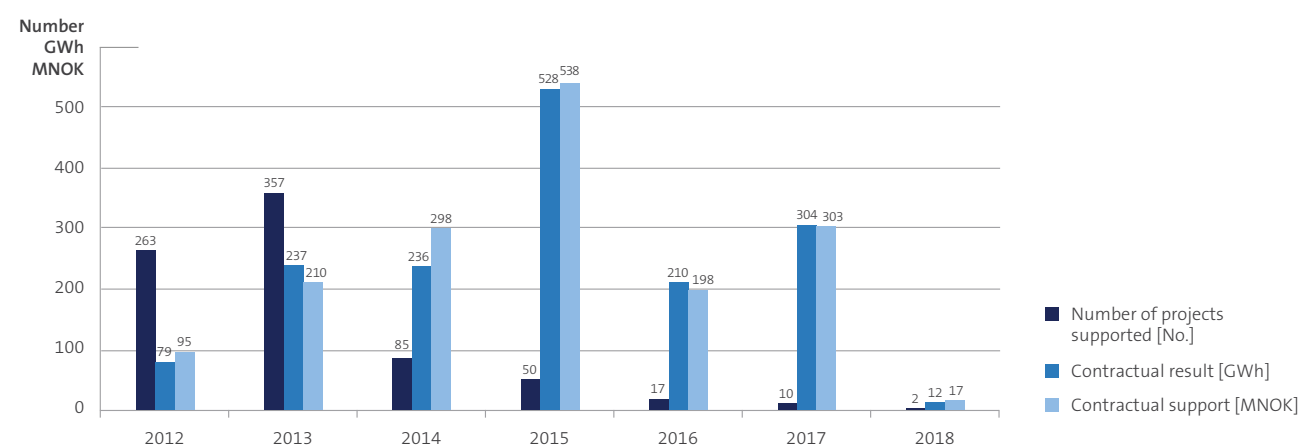


Figure 4.6: The figure shows the distribution of projects entered into in 2012 distributed by the projects' contractual final date. This graph only shows support granted to applicable programmes and does not include other activities (guidance, etc.) in the Energy Fund. The household subsidy programme is not included in this overview.

TABLE 4.10 ACTIVITY OVERVIEW OF APPLICABLE PROGRAMMES

Market area	Number of applications received	Number of applications processed	Number of projects processed	Contractual energy result	Contractual support
				GWh	MNOK
Renewable heating	275	264	237	351	320
Biogas Production	5	5	3	79	54
District Heating - New Establishment	23	19	15	102	114
District Heating - Infrastructure	25	25	20	103	105
Heating plants - Extended	53	47	40	49	31
Heating plants - Simplified	168	167	158	17	8
Introduction of New Energy Technology	2	3	1	1	7
Renewable power production	1	2	2	8	62
Introduction of New Energy Technology	5	6	2	8	62
Industry	100	85	77	555	523
Energy End-use - Industry	37	39	35	513	482
Heating plants - Industry	26	22	19	17	11
Introduction of Energy Management	23	11	11	21	4
Introduction of New Energy Technology	4	3	2	4	22
Pre-project support for Energy End-use Projects - Industry	10	10	10	-	4
Non-residential buildings	326	339	300	613	643
Investment Support for Passive Houses and Low Energy Buildings	91	87	80	67	183
Investment Support for Existing Buildings and Outdoor Facilities	121	142	118	544	426
Introduction of New Energy Technology	7	7	3	2	26
Support for Passive House Feasibility Studies	59	52	48	-	2
Pre-project Support - Improving Energy Efficiency and Conversion in Buildings and Outdoor Facilities	36	43	43	-	5
Pre-project Support - Heating and Infrastructure	14	10	8	-	1
Non-industrial plants and facilities	9	9	7	22	13
Investment Support for Existing Buildings and Outdoor Facilities	9	9	7	22	13
Residential buildings	6 836	6 708	6 347	56	94
Investment Support for Passive Houses and Low Energy Buildings	63	63	54	4	31
Investment Support for Passive Houses and Low Energy Private Residences	11	5	5	0	0,4
Investment Support for Existing Buildings and Outdoor Facilities	12	14	12	12	8
Support for Passive House Feasibility Studies	19	18	16	-	1
Enova's household subsidy programme	6 731	6 608	6 260	41	55
International activities	35	34	24	-	7
IEA Pre-project Support	7	6	4	-	0,3
IEE II Pre-project Support	12	12	8	-	1
IEE II National Co-funding	16	16	12	-	6
Total	7 582	7 441	6 994	1 606	1 661

Table 4.10: The table shows an overview of the number of applications received, processed (i.e.: a final decision on approval or rejection has been made), the number of projects supported⁷, as well as funds allocated within applicable programmes and associated energy results⁸ in 2012. The table only shows support for applicable programmes and not allocations for other activities within the Energy Fund. Applications for the programme "Introduction of New Energy Technology" are distributed by market area based on the type of project.

⁷ Number of projects approved for support is corrected for cancellation of projects approved in 2012. For the 2012 portfolio, this applies to 18 projects.
⁸ Allocated funds and contractual energy result are corrected for cancellation of projects approved in 2012.

Activities

Enova's programmes are directed at businesses and industry, public enterprises and households. We closely cooperate with the players in the market through investments, guidance and communication activities.

Commercial buildings and residential buildings

Apart from financial instruments, Enova has a wide range of information and advisory services with the short and long term purpose of helping achieve the goals of the Energy Fund. The activities offered include various campaigns, information and guidance on the web and a nationwide helpline. Enova's advisory services for passive houses are directed at players within the market for public buildings, commercial buildings and residential buildings. Our programmes for households will help develop markets for renewable heating solutions and energy efficiency (see Figure 4.7). We also have separate activities dedicated to shaping good attitudes and practices among children and young people and contributing to increased knowledge about energy and the climate.

Lower electricity prices and less media attention characterized the market and advisory services within residential buildings in 2012. Market channels such as Enova's website and the Ask Enova service noted a decline in traffic in 2012, compared with 2011. Both the advisory services and subsidy schemes provided for residential building owners are sensitive to campaign activities, fluctuations in price levels and energy attention in the media. There were no major campaign activities within the residential buildings segment this year. Enova's household subsidy programme made just as many disbursements in 2012 as in the previous year, but the number of applications was lower. The *Rainmakers' Day* and

the television programme the *Energy Challenge* achieved higher participation and more viewers than before (See Table 4.11).

Enova's Advisory Team for Passive Houses is a service provided for players within both the non-residential and residential buildings segments. The service was established to increase knowledge and expertise regarding passive houses, and will provide greater certainty when choosing to build new or renovate according to a passive house standard. The service is made up of four parts and deals with introductory advising, project-specific advising, a start-up course in planning passive houses and giving advice in architecture competitions (see Table 4.12).

The introductory advising service is directed at builders with the ambition of building a passive house. The project must be at an early phase and there are no size limitations in relation to the project.

Project-specific advising is provided to projects in the detailed engineering or construction phases.

Start-up courses in planning passive houses are provided to design engineers and building owners. The purpose of the course is to provide insight into what a passive house is, while also laying the foundation for design engineers to plan and design passive houses.

FIGURE 4.7 DECISIONS WITHIN THE HOUSEHOLD SUBSIDY PROGRAMME, DISTRIBUTED BY TECHNOLOGY

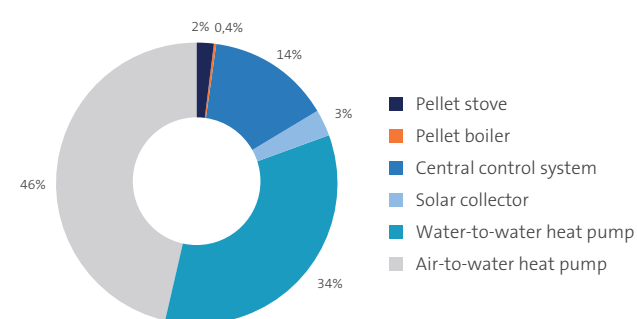


Figure 4.7: The figure shows the relative distribution of technologies/measures for the decisions within the household subsidy programme in 2012, distributed by number.

TABLE 4.11 ACTIVITIES WITHIN THE RESIDENTIAL BUILDINGS MARKET AREA

	Performance indicator	2012	Comments
Ask Enova 800 49 003	Number of inquiries	28 215	A generally low electricity price, less attention regarding conserving electricity in the media and fluctuations in individual markets have led to fewer inquiries and page views for the residential buildings segment than in previous years.
Daily page views, enova.no/privat ⁹	Number of page views	1 806	
Daily page views, Enova Rainmakers	Number of page views	727	Fewer campaigns than in previous years result in less page views. Decline of 38% from 2011.
Enova Rainmakers - Rainmaker schools	Number of schools that have implemented and reported 1-5 of the Rainmaker activities at www.regnmakerne.no	118	A survey carried out by TNS Gallup shows that use of and knowledge of the Rainmakers is significantly higher than the number of reports from the schools.
Enova Rainmakers - "real" Rainmaker schools	Number of schools that have implemented and reported all 5 Rainmaker activities on www.regnmakerne.no	64	
Participants at the Rainmakers' Day	Number of pupils	6 000 (Drammen)	Participation at the Rainmakers' Day was 20% higher than in 2011.
Ratings for the episodes of the Energy Challenge	Number of viewers	150 000 - 170 000	Somewhat higher ratings compared with 2011.
Campaigns	Number of campaigns	1	Campaign for the household subsidy programme.
Applications to the household subsidy programme	Number of applications	6 731	Decline from 2011. Caused by low electricity prices and less media attention.
Disbursements from the household subsidy programme	Number of subsidies disbursed	3 099	Disbursements on the same level as in 2011.

Table 4.11: The table shows activities within the residential buildings market area. The number of inquiries to Ask Enova refers to the number of inquiries that were related to the residential buildings market area.

TABLE 4.12 ACTIVITIES WITHIN ENOVA'S ADVISORY SERVICE

Aktiviteter	2012				Kommentarer
	Totalt	Delresultat Næringsbygg	Delresultat Offentlige bygg	Delresultat Bolig	
Prosjektspesifikk rådgiving	34	7	16	11	Interessen for tilbudet er relativt stabil, dog noe synkende for innledende rådgiving. Nedgangen kan skyldes at markedet har begynt å tilegne seg erfaring med passivhus.
Innledende rådgiving	57	6	17	34	
Startkurs i planlegging av passivhus	4 (130 deltakere)				Rådgiverteamet holder Startkurs i planlegging av passivhus på forespørsel. Interessen for kurset har vært synkende etter hvert som konseptet er blitt stadig bedre kjent.
Arkitekturkonkurranser	0				Rådgiverteamet er ikke benyttet inn mot arkitekturkonkurranser i 2012.

Table 4.12: The table shows activities within Enova's advisory service in 2012. The Advisory Team's services are provided to projects within both non-residential and residential buildings.

⁹ In 2012, Enova restructured its website in order to have everything within the residential buildings area gathered under one tab, unlike previous years where enova.no/hjemme and enova.no/enovaanbefaler were separate.

Assistance for architecture competitions is related to quality assurance of the requirement specification and evaluation of energy concepts.

Communications and public relations

Enova's communications strategy is founded in the enterprise's governance strategy. In 2012, activities were directed at supporting new programmes for the professional market. In January 2012, Enova established a national energy conference gathering a total

of 550 participants. This conference was very well received. A new programme was launched in the autumn of 2012 for the industry market through support for introduction of energy management in industry. Industry represents a significant percentage of energy end-use in Norway, and there is major potential for conversion to renewable energy sources and energy efficiency measures. Enova launched a campaign in November directed at industry, with the goal of having more players establish energy management to gain control over their own energy use. The campaign was visible in

TABLE 4.13 REPORTING ACTIVITIES WITHIN COMMUNICATIONS AND PUBLIC RELATIONS

	2012	Comments
Articles about Enova	3 344	Press mentions of Enova are at a stable high level, but somewhat lower in 2012 than in 2011. Enova's communications activity in 2012 was primarily directed at the professional market, and the activity vis-à-vis the consumer market has not been as high in 2012 as in previous years.
Inquiries to Ask Enova	40 152	The number of inquiries made to Ask Enova is at a high level, but lower than in 2011. A generally low electricity price and less media attention on electricity conservation are reasons for the somewhat lower number of inquiries to Ask Enova.

Table 4.13: The table shows activities within communications and public relations. The number of articles about Enova includes mention of Enova in Norwegian broadcasting, digital media, as well as paper-based media. The number of inquiries to Ask Enova includes both the private and professional markets.

the media in November and December in both printed and digital media, as well as broadcasting. The preliminary results indicate a doubling in the number of visits to www.enova.no, and an increase in unprompted knowledge from 17 to 30 per cent during the campaign period.

International activities

The international activities we engage in provide us with a learning arena for sharing expertise and experience. Through international cooperation and involvement, Enova shares and obtains information on on-going activities and best practices in other countries. Participation in international forums provides Enova and Norway with the possibility to influence the agenda, content and results of international energy development.

Enova is represented in multiple international forums:

- Management of the EU programme Intelligent Energy - Europe (IEE) in Norway.
- Participation in seven of the International Energy Agency's (IEA's) steering groups, so-called Implementing Agreements (IA), and projects organized by these.
- Participation in the European Energy Network (EnR) – a European network for Enova's sister organizations.
- Board membership in the European Council for an Energy Efficient Economy (ECEEE).

Table 4.14 provides an overview of IEA activities where Enova represents and/or contributes with co-funding.

In 2011, Enova established pre-project support for participation in those of the IEA's Implementing Agreements where Enova is represented in order to facilitate more IEA projects with Norwegian participation and coordination. Pre-project support was granted to three projects under this programme in 2012.

Enova manages Norway's participation in the IEE, the EU's non-technological programme within the energy area. Through concrete projects, this programme contributes to realization of the EU's climate and energy targets for 2020. Enova's administration of IEE entails marketing the programme vis-à-vis Norwegian market players and administration of the national support programmes included under the IEE programme. This is done through annual national information meetings, participation in the EU's Programme Committee for National Contact Points and the EU Commission's information meetings. We also manage the national support programmes for SAVE – a sub-programme for renewable energy. The IEE projects are collaboration projects between several European countries and Enova, and Enova allocates support for Norwegian project participants. A total of nine projects were granted pre-project support and 11 received national co-funding commitments in 2012.

TABLE 4.14 INTERNATIONAL ACTIVITIES

International Energy Agency (IEA) Implementing Agreements (IA) - ExCo representation by Enova	
Implementing Agreements	IA Title
IEA EEWP	IEA Energy Efficiency Working Party (EEWP)
End-Use Working Party (EUWP)	
EUWP 04	Heat Pump Programme (HPP)
EUWP 05	Demand Side Management (DSM)
EUWP 09	Industrial Energy-Related Technologies and Systems (IETS)
Renewable Energy Working Party (REWP)	
REWP 16	Renewable Energy Technology Deployment (RETD)
REWP 17	Solar Heating and Cooling (SHC)
Cross-Sectional activities (CS)	
CS 22	Energy Technology Data Exchange (ETDE)
Bioenergy	
CS 22	IEA Bioenergy
IEA Tasks/Annexes - representation by Enova	
Task/Annex	Title
IEA SHC 47	Solar renovation of Non-Residential Buildings
IEA SHC Task 39	SUPOL - Sustainable Polymers for Solar Collector Applications Polymeric Materials for Solar Thermal Applications
IEA SHC Task 41	Solar Energy and Architecture
IEA Bioenergy Task 40	Sustainable International Bioenergy Trade - Securing Supply and Demand
IEA HPP Annex 34	Thermally Driven Heat Pumps for Heating and Cooling
IEA HPP Annex 37	Measurement of Heat Pump Systems in Buildings
IEA HPP Annex 40	Heat Pump Concepts for Near Zero-energy Buildings
IEA DSM Task 21	Standardization of Energy Savings Calculations
IEA DSM Task 23	The Role of Customers in Delivering Effective Smart Grids
IEA DSM Task 24	Closing the loop - Behaviour change in DSM, from theory to policies and practice
IEA IETS Annex 12	Membranes as energy-efficient technologies for Separation of Hydrocarbons
IEA IETS Annex 13	Industrial Heat Pumps
IEA IETS Annex 15	Industrial Excess Heat Recovery
IEA IETS Annex 16	Energy Efficiency in SMEs
Other IEA	Project title
IEA's information centre AIVC	Norwegian participation in the IEA's information centre AIVC - Air Infiltration & Ventilation Centre
Other international (apart from the IEA)	
Forum	Title
IEE	Intelligent Energy Europe
ECEEE	European Council for an Energy Efficient Economy
EnR	European Energy Network
ISO (International standardization work)	Strategic Advisory Group on Energy Efficiency

Table 4.14: The table shows an overview of IEA activities and other forums where Enova represents and/or contributes with co-funding.

Geographical distribution and largest projects - the 2012 portfolio

Over the course of 2012, support was approved for projects covering every county in Norway, in addition to two projects on Svalbard. The number of projects within each county varies, from 13 in Sogn og Fjordane County to 80 in Akershus County. The most projects can be found in the most densely populated counties.

A county-by-county distribution of the expected energy result and approved support varies considerably more. Nordland County is number one with 319 GWh and NOK 362 million in support. This can be attributed to the largest individual project that was

approved for support in 2012, Elkem Salten with 300 GWh and NOK 350 million, which is located in Sørfold Municipality in Nordland County.

Projects characterized as “nationwide” apply to projects that involve measures in two or more counties. Examples of this are projects related to energy efficiency measures in commercial buildings; projects initiated by the international brands Coop, Thon and Rema 1000. These stand out as they consist of measures in several buildings distributed across the entire country

FIGURE 4.8 COUNTY-BY-COUNTY CONTRACTUAL ENERGY RESULT AND SUPPORT GRANTED IN 2012

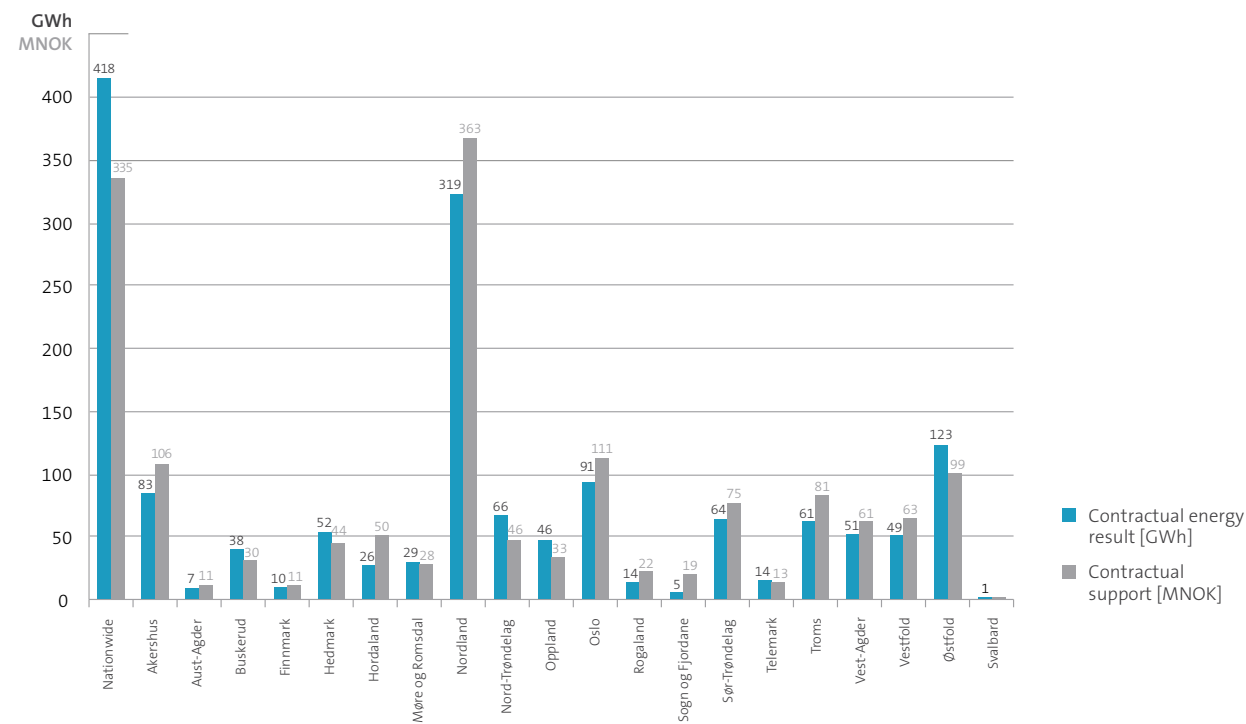


Figure 4.8: The figure shows contractual results and contractual support in 2012 distributed by county. Projects characterized as “nationwide” apply to projects that involve measures in two or more counties.

FIGURE 4.9 NUMBER OF PROJECTS SUPPORTED IN 2012 DISTRIBUTED BY COUNTY

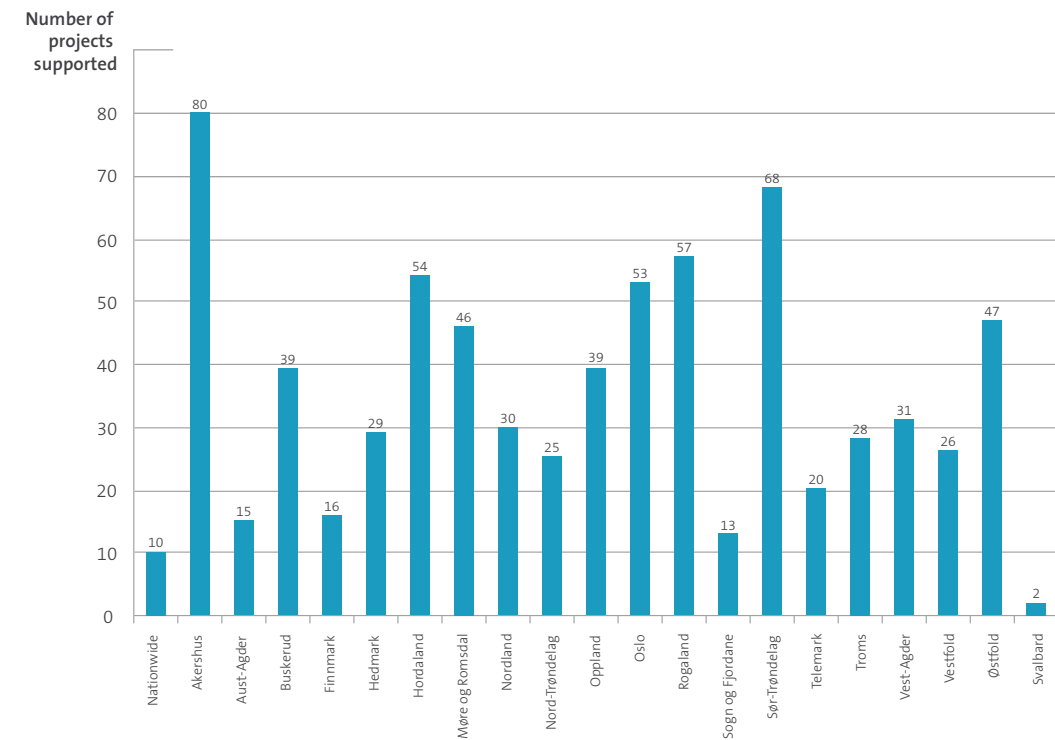
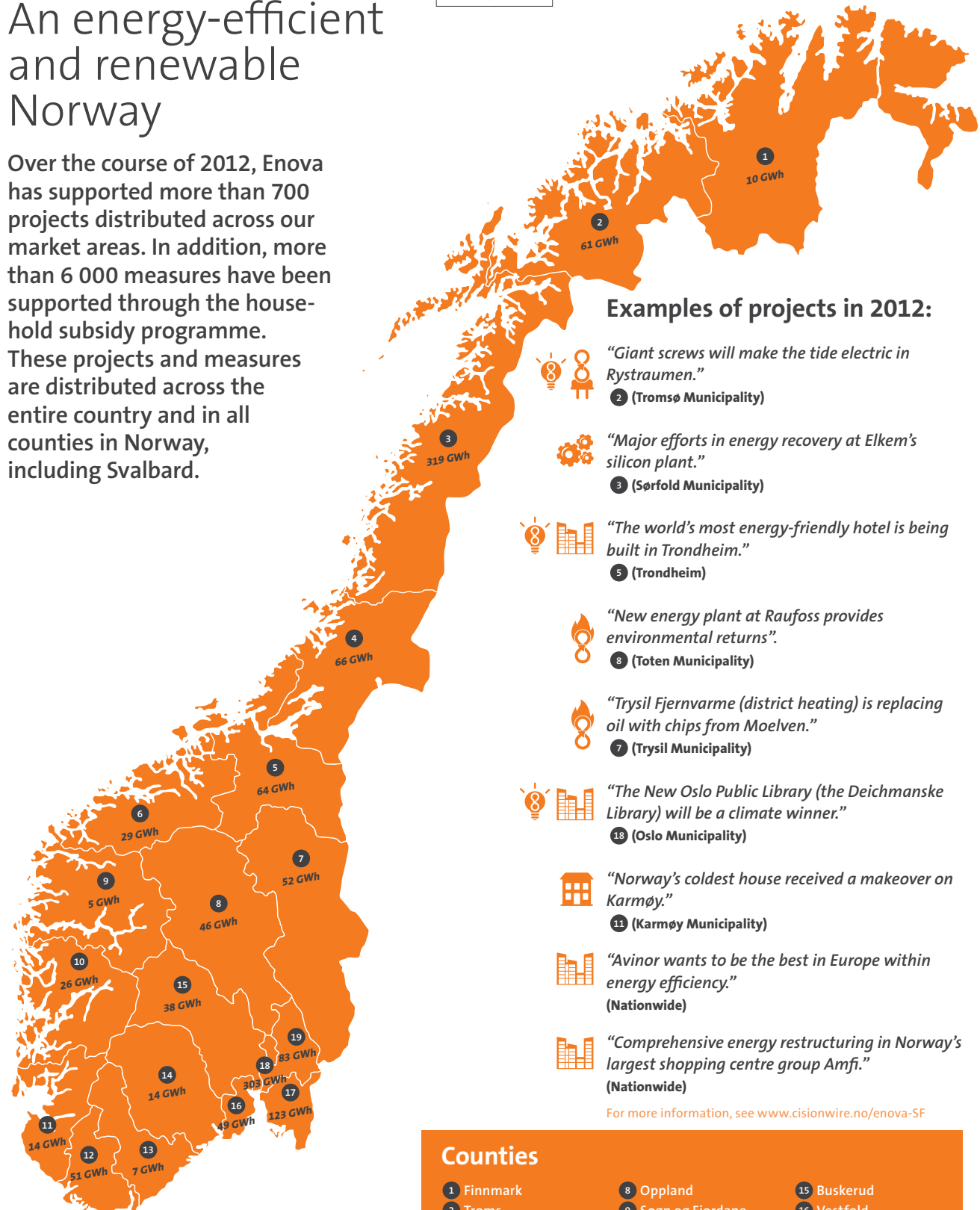


Figure 4.9: The figure shows the number of projects supported in each county in 2012. Projects characterized as “nationwide” apply to projects that involve measures in two or more counties.

An energy-efficient and renewable Norway

Over the course of 2012, Enova has supported more than 700 projects distributed across our market areas. In addition, more than 6 000 measures have been supported through the household subsidy programme. These projects and measures are distributed across the entire country and in all counties in Norway, including Svalbard.



Counties		
1 Finnmark	8 Oppland	15 Buskerud
2 Troms	9 Sogn og Fjordane	16 Vestfold
3 Nordland	10 Hordaland	17 Østfold
4 Nord-Trøndelag	11 Rogaland	18 Oslo
5 Sør-Trøndelag	12 Vest-Agder	19 Akershus
6 Møre og Romsdal	13 Aust-Agder	20 Svalbard
7 Hedmark	14 Telemark	

21 In addition, we have nationwide projects, totaling 205 GWh

TABLE 4.15 TOP 10 PROJECTS – ENERGY RESULT 2012

Market area	Project description	Contractual energy result GWh	Contractual support MNOK	Applicant
Industry	Energy recovery at Elkem Salten	300	350	Elkem AS
Commercial buildings	Energy efficiency measures in Coop Norge	123	100	Coop Norge SA
Commercial buildings	Energy programme, low energy lighting and air conditioning, period 2012 - 2017	106	85	Thon Holding AS
Industry	Energy efficiency measures Norske Skog Saugbrugs	70	50	Norske Skog Saugbrugs AS
Renewable heating	UASB reactor biogas production at Fiborgtangen	56	35	Biokraft AS
Commercial buildings	Energy cuts in 2013	51	40	Rema 1000 Norge AS
Renewable heating	District heating development Sandefjord	44	57	Bio Varme AS
Commercial buildings	NPRO building portfolio	41	33	Norwegian Property ASA
Public buildings	Energy efficiency project Northern Norway Regional Health Authority	40	32	Helse Nord RHF
Industry	Green Energy	36	5	N3pharma

Table 4.15: The table shows the ten largest projects in 2012 measured by contractual energy result.

TABLE 4.16 TOP 10 PROJECTS – SUPPORT AMOUNT 2012

Market area	Project description	Contractual energy result GWh	Contractual support MNOK	Applicant
Industry	Energy recovery at Elkem Salten	300	350	Elkem AS
Commercial buildings	Energy efficiency measures in Coop Norge	123	100	Coop Norge SA
Commercial buildings	Energy programme, low energy lighting and air conditioning, period 2012 - 2017	106	85	Thon Holding AS
Renewable heating	District heating development Sandefjord	44	57	Bio Varme AS
Renewable power	Flumill tide water turbine - pilot plant for power production in Rystraumen	5	57	Flumill AS
Industry	Energy efficiency measures Norske Skog Saugbrugs	70	50	Norske Skog Saugbrugs AS
Commercial buildings	Energy cuts in 2013	51	40	Rema 1000 Norge AS
Industry	Energy efficiency measures at Elkem Carbon, Fiskå	34	39	Elkem carbon AS
Renewable heating	UASB reactor biogas production at Fiborgtangen	56	35	Biokraft AS
Commercial buildings	NPRO building portfolio	41	33	Norwegian Property ASA

Table 4.16: The table shows the ten largest projects in 2012 measured by contractual support amount.

Part 5

The Energy Fund – Results 2001-2011

Energy results and allocations 2001-2011	49
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Through several thousand projects that are implemented in the market, we have many good stories which show that we are succeeding together to create lasting market change.

Energy results and allocations 2001-2011

This part of our Annual Report presents results from previous agreement periods with the Ministry of Petroleum and Energy.

Table 5.1 shows the allocation of resources from the Energy Fund and total energy results in the period 2001-2011 at the end of 2012, distributed by unit and year. This table takes a basis in the year the resources were allocated, not the year the framework was granted. Cancelled projects must be corrected for energy results for the year the contract was originally signed and recorded. The contractual support amount will be released and returned to the Energy Fund so it can be put into new projects that create results. The fact that cancellations are corrected with retroactive effect, results in released funds and transfer of resources between years.

Enova awarded about NOK 9 billion in support for energy projects during the period 2001-2011. This support is expected to trigger investments amounting to a total of about NOK 44 billion. The percentage of this total of which Enova's support constitutes varies from market area to market area. In building, heating and industry projects, the support constituted, on average, less than 20 per cent of the projects' total investments during the agreement period. Within new technology projects, the support constituted between 25 and 50 per cent of investments.

TABLE 5.1 ENERGY RESULTS AND ALLOCATIONS 2001-2011

	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		Total	
	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK
Renewable heating	328	-	173	49	233	31	141	71	167	64	599	287	634	274	747	382	821	635	871	499	586	529	5 300	2 821
Solid biofuel production	-	-	-	-	154	3	255	14	162	6	100	4	167	5	67	3	-	2	-	-	-	-	906	38
Renewable power production	120	-	80	35	127	27	441	186	334	137	-	-	-	55	80	453	1 067	491	978	-	-	2 100	2 510	
Industry	300	-	157	20	136	16	357	56	247	34	609	118	697	161	307	66	815	339	397	178	127	60	4 148	1 049
New technology	28	-	1	19	-	-	9	-	2	2	7	8	71	1	13	11	61	48	201	27	28	126	411	
Non-residential buildings ¹	44	-	146	56	301	65	262	67	528	115	381	106	201	73	379	150	294	517	227	176	529	513	3 292	1 838
Residential buildings ²	-	-	-	-	-	12	-	12	-	14	-	36	10	45	-	58	-	62	-	74	42	111	53	424
Analyses, development and strategy	-	-	-	7	-	7	-	6	-	5	-	8	-	11	-	9	-	9	-	17	-	32	-	112
International work	-	-	-	7	-	7	-	7	-	12	-	12	-	6	-	5	-	9	-	8	-	7	-	78
Communications and public relations	-	-	-	113	-	40	-	26	-	47	-	19	-	21	-	45	-	25	-	25	-	60	-	421
Administration	-	-	-	42	-	36	-	41	-	45	-	47	-	61	-	75	-	100	-	93	-	95	-	635
NVE contracts (2001)	-	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	385
Total	820	385	556	349	950	244	1 456	494	1 439	482	1 691	644	1 716	729	1 556	886	2 394	2 825	2 035	2 250	1 311	1 434	15 925	10 722

Table 5.1: The table shows aggregated energy results and funds allocated from the Energy Fund during the period 2001-2011, corrected for cancelled and final reported projects as of 31 December 2012. Funds in the NVE projects from 2001 (MNOK 385) are not distributed across the units. The associated energy result is distributed by units and constitutes a total of 820 GWh.

¹ Note that the results reported for non-residential buildings include non-industrial plants and facilities (2001-2011).

² The household subsidy programme for energy-efficient and environmentally friendly heating solutions was incorporated in the Energy Fund from 1 July 2011, and the energy results are recorded as of this date.

Table 5.2 shows contractual energy results for the period 2001-2011 distributed by unit and year, before and after correction for cancelled, final reported and achieved results. The net energy result is corrected for cancelled projects, which are deducted from the energy result for the year the contract was entered into and reported. The gross contractual energy result is 28 per cent higher than the sum of contractual results, the net energy result, for the period.

We see that the total contractual energy result is marginally changed after correction for final reported and achieved results. There are individual differences at a market area level. For industry and non-residential buildings, the projects generally have somewhat better energy results measured after a few years of operation than at the time of when the contract is signed.

Solid biofuel production shows the opposite development, while the energy results within renewable heating are marginally changed. Achieved results are described in more detail later in this report.

Figure 5.1 shows the percentage of final reported projects for each year retrospectively. We see that the percentage of final reported projects increases with the age of the projects. The figure illustrates the time perspective for Enova's investment support. We have final reported projects in every year between 2001 and 2011. We see that a considerable percentage (29) of the projects that received investment support in 2009 has now been final reported in 2012. Correspondingly, final reports have been submitted for more than 75 per cent of the projects from 2006.

The figure also differentiates between active projects where disbursement is in progress and active projects where disbursement has not yet begun. The risk of project cancellation has turned out to be significantly lower when disbursement of support has begun. More than 40 per cent of the projects that entered into contracts in 2011 had still not received disbursements at the end of 2012. This would indicate that there is still a certain cancellation risk for the 2011 projects, while the older part of the project portfolio consists nearly solely of projects that have started implementation. The percentage of projects where disbursements have started is particularly high for 2010, which is caused by new and revised programmes with a shorter project implementation time.

In total, the active projects where disbursement has not yet begun constitute six per cent of the energy results.

Cancellations affect the percentage of final reported projects. Cancellations reduce the total in the relevant year, thus causing an increase in the percentage of final reported projects, regardless of whether new projects have been final reported.

Enova carries out active follow up of the projects' progress and implementation. Systematic and sound follow-up contribute to the projects being implemented in line with the applicable agreement. In those cases where projects are not implemented for various reasons, close follow-up ensures that we avoid unnecessarily tying up funds in projects with no progress.

TABLE 5.2 ENERGY RESULTS 2001-2011, CORRECTED FOR CANCELLATIONS, FINAL REPORTING AND ACHIEVED RESULTS

Total for the period 2001-2011, updated as of 31 December 2012				
Market area	Gross contractual result	Contractual result	Contractual corrected for final reported result	Contractual corrected for final reported and achieved result
	2001-2011	2001-2011	2001-2011	2001-2011
	GWh	GWh	GWh	GWh
Renewable heating	6 348	5 361	5 300	5 397
Solid biofuel production	1 035	891	906	791
Renewable power production	3 630	2 108	2 100	1 965
Industry	5 370	4 043	4 148	4 167
New technology	185	166	126	127
Non-residential buildings ³	3 604	3 168	3 292	3 305
Residential buildings ⁴	90	53	53	53
Total	20 263	15 791	15 925	15 806

Table 5.2: The table shows contractual energy results (in GWh) distributed by market area and year, both before and after correction for cancelled, final reported and achieved results. The "Contractual result" column shows the energy result as of the end of 2012 corrected for cancellations during the 2001-2012 period.

³ Note that the results reported for Non-residential buildings include non-industrial plants and facilities (2001-2011).

⁴ Contractual energy results within the residential buildings area that were supported within the Energy Fund were, up to 2011, recorded under commercial buildings, with the exception of just a few individual measures in 2007. From and including 2011, energy results within the residential buildings area are reported separately under Residential Buildings. The household subsidy programme was incorporated in the Energy Fund from 1 July 2011, and energy results from this are recorded as of this date.

FIGURE 5.1 PERCENTAGE OF FINAL REPORTED PROJECTS

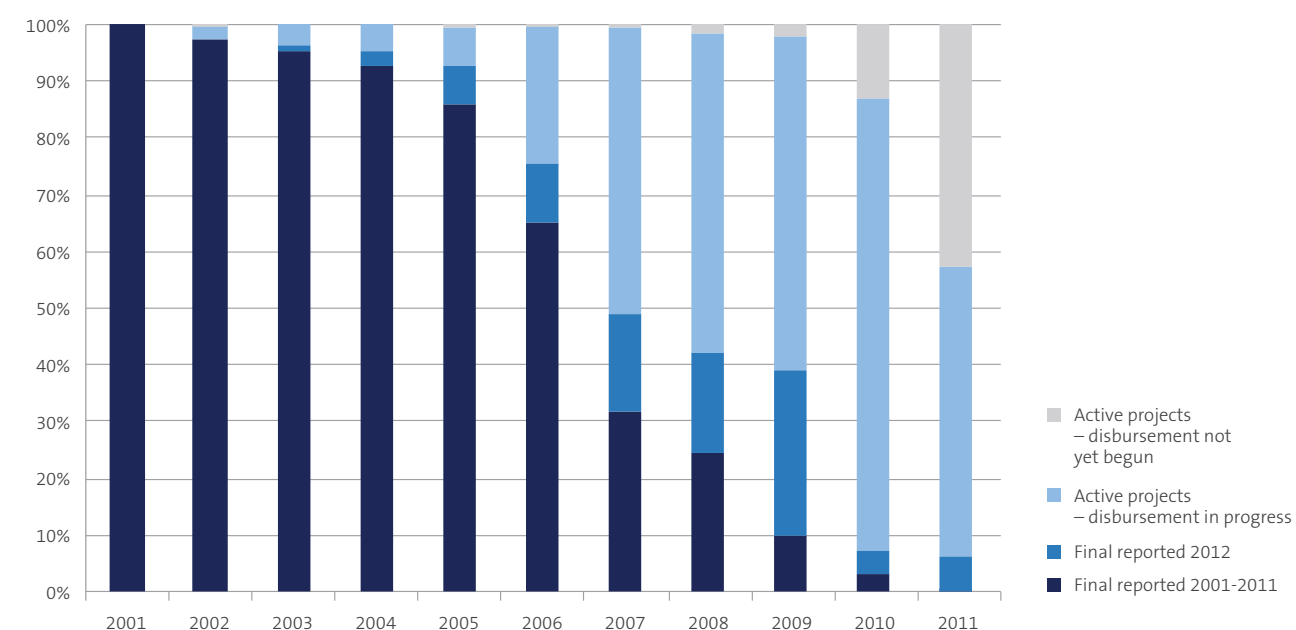


Figure 5.1: The figure shows the percentage of final reported active projects at the end of 2011, distributed by the year contracts were signed (measured in GWh). The figure also shows the percentage of the active projects where disbursement has started.

Figure 5.2 shows contractual energy results from contracts entered into from 2001-2011, distributed by the year the contract was signed.

Cancelled projects are deducted from the energy result for the year the contract was originally entered into and recorded. The figure shows how cancelled projects affect annual net energy results, in that the negative energy results are distributed as negative results retroactively.

The figure shows a normal distribution of cancellations. The largest share of new cancellations tends to come three years after contracts are signed. The scope of cancellations for the

2011 portfolio is, at four per cent, low compared with the gross energy result, while it constitutes 22 per cent for the 2009 portfolio. In 2012, projects from the previous portfolio corresponding to a total energy result of 753 GWh and funding commitments totalling MNOK 480 were cancelled. On average, 485 GWh were cancelled each year during the 2001-2011 period.

Many projects take several years from project application to completion. Then the implemented solutions enter into an operational phase, harvesting the energy results. After three years of operations, Enova measures the project's achieved energy results.

FIGURE 5.2 CANCELLED PROJECTS

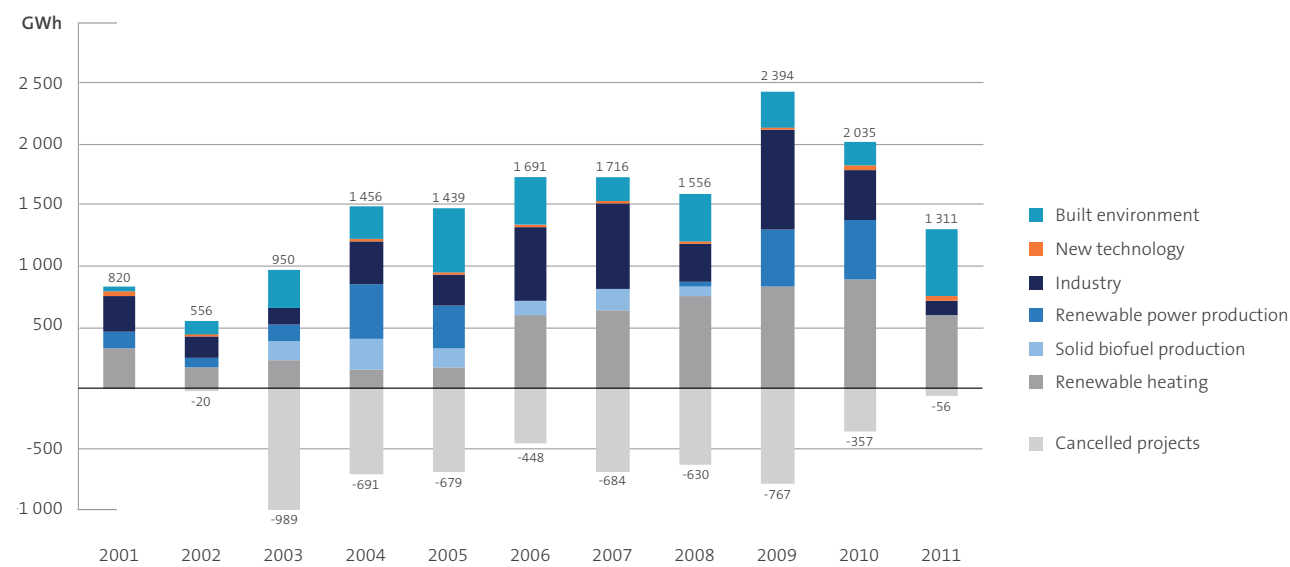


Figure 5.2: The figure shows contractual energy results from contracts entered into from 2001-2011, distributed by the year the contract was signed. The figure shows how cancelled contracts affect annual net energy results. Overall, the columns show the gross energy result for each year. Cancellations contribute to an annual accumulated deduction (the negative part of the columns) from Enova's net energy result (the positive part of the columns). The figures are corrected for changes in the energy results in final reported projects.

Achieved results

When Enova awards support for a project, the support recipient commits to achieving a certain energy result in the future. It takes time from project application until energy results can be harvested after project implementation. Implementation takes several years for the largest projects supported by Enova. The results (in the form of energy saved or renewable production) then vary from year to year.

Enova has existed for more than ten years, and the oldest projects have accumulated sufficient operational experience to report what results they have actually achieved. Enova examined the results from projects that were implemented in the period from 2001 to 2009. Enova supported more than 2 000 projects during this period. Of these projects, 442 were completed within the period, and data have been available from these.

Main results

In a normal year, these projects are expected to achieve a total energy result that corresponds with their final reported result. Most (about 60 per cent) of the projects have achieved the results they expected to, or more. In particular, wind power projects and projects within solid biofuel production achieve lower results than the final reported results. The other market areas have fulfilled contractual and final reported energy results.

Overall, the projects expect that results may fluctuate between -20 and +15 per cent from year to year.

Achieved results within the market areas

Figure 5.4 shows the contractual and final reported energy results for each market area, and the achieved energy result during a normal year. The expected interval for variation in energy results from year to year is indicated by horizontal lines on the column for the achieved result. Each project has reported the annual energy result they expect in the best and worst case scenarios, and the intervals are derived from this.

Projects within renewable heating realize about 10 per cent higher energy results than expected when the projects are completed. The projects expect considerable variations from year to year, but the energy results predicted upon completion will usually be higher – as much as 30 per cent higher than expected in some cases.

The industry and building projects generally realize higher energy results than expected upon project completion. This group of projects also reports the least uncertainty from year to year.

FIGURE 5.3 ACHIEVED RESULTS COMPARED WITH CONTRACTUAL AND FINAL REPORTED RESULTS

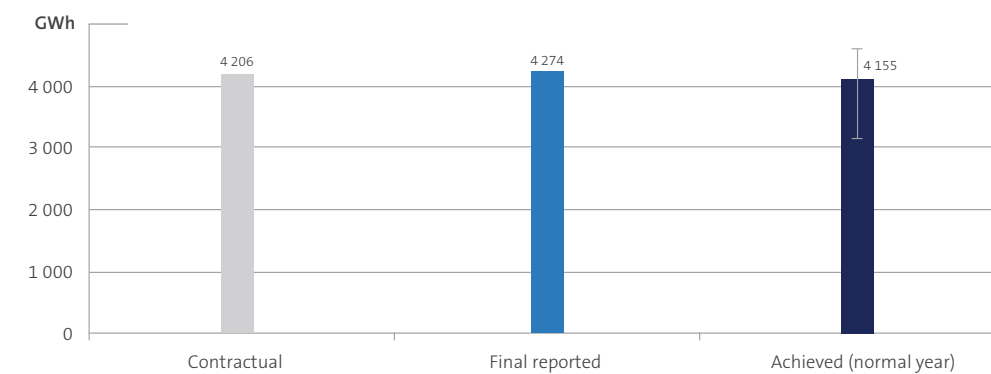


Figure 5.3: The figure shows aggregated results as of 31 December 2012 for projects where final reports were submitted before 31 December 2009. The total contractual, final reported and achieved results during a normal year. For achieved results, natural deviations from a normal year are also shown.

FIGURE 5.4 ACHIEVED RESULTS FOR EACH MARKET AREA COMPARED WITH CONTRACTUAL AND FINAL REPORTED RESULTS

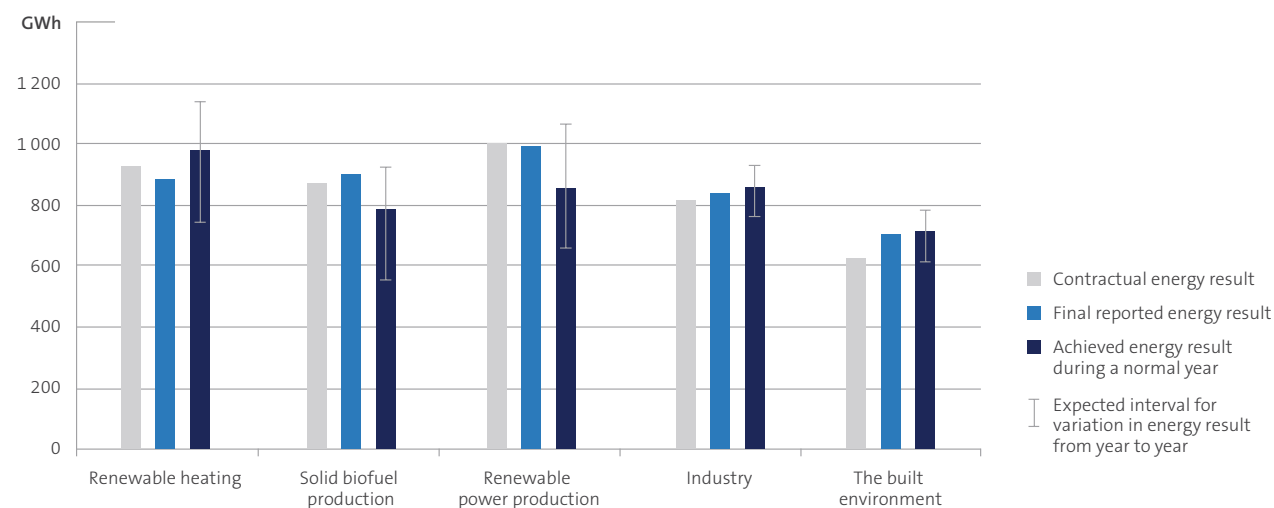


Figure 5.4: The figure shows achieved results during a normal year for each market area as of 31 December 2012, compared with contractual and final reported results for projects for which final reports were submitted by 31 December 2009. The expected intervals for variation in energy results from year to year are indicated with vertical lines on the columns for achieved results.

The wind power projects (renewable power production) constitute the largest percentage of energy results upon final reporting and these projects are unable to deliver the energy results they expected. The normal annual production is about 15 per cent lower than production estimates used as a basis upon completion of the projects. However, in a good year, it is possible to generate the expected volume of energy. These projects carry substantial uncertainty from year to year.

Biofuel projects are unable to deliver the results they expected, and the projects report a high risk of not delivering sufficient results. In the worst case, the result is 40 per cent lower than expected at the time of project implementation.

Composition of Enova's total energy results

Figure 5.5 shows how Enova's total energy results are distributed across projects with varying maturity. One year could both include contractual results from projects still in the start phase, as well as achieved results from completed projects that have been operational for several years (see for example the 2008 column). The earlier the year, the larger the percentage of final reported and achieved energy results. For 2002, all final reported projects have reported achieved energy results.

FIGURE 5.5 CONTRACTUAL, FINAL REPORTED AND ACHIEVED ENERGY RESULTS 2001-2011

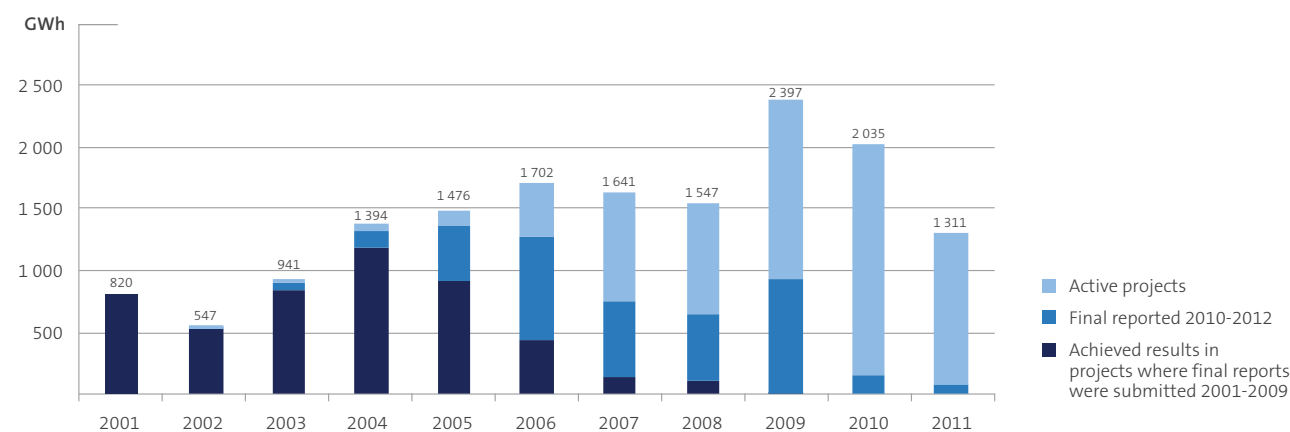


Figure 5.5: The figure shows the net contractual, final reported and achieved energy result distributed by the year the contract was entered into. The figure also shows the share of contractual results from active projects where disbursement has started. The figures have been corrected for changes to the energy result in final reported and achieved results.

Reporting on climate impact

This chapter summarizes the estimated climate impact from supported projects for the 2001-2011 period, including results from reduced oil consumption, as well as *direct* and *indirect climate impact* for the different market areas.

In 2012, we established a database which provides us with access to oil reduction data from each project we support. This contributes to a better data basis for calculation of oil reduction. However, the impact on oil consumption for the 2001-2011 portfolio is based on a routine assessment of each market area in Enova. It is estimated that half of the energy result from the renewable heating area replaces oil. Projects within the industry and buildings market are directed both at heating and electricity consumption. The reduction in oil consumption will generally constitute a smaller share of the results from these areas. Experience shows that each kWh in energy result from industry leads to an estimated 30 to 40 per cent reduction in oil consumption. Projects within the built environment are expected to yield a proportionately smaller reduction in oil consumption of just over 10 per cent.

Table 5.3 provides an estimate of the reduction in annual oil consumption as a result of Enova's results for the 2001-2011 period. The results show that Enova's efforts during the period are expected to reduce oil consumption by about 435 kilotonnes of oil when all projects have been completed.

Direct climate impact is what is achieved through reduced use of fossil energy sources. *Indirect climate impact* occurs as a result

of reduced electricity consumption or production of electricity from renewable energy sources. Table 5.4 shows the total *direct* and *indirect climate impact* for the 2001-2011 portfolio. We estimate that the energy results from renewable heating, the built environment and industry will replace 40 per cent oil and 60 per cent electricity. The energy results from renewable power and new technology projects are assumed to have a 100 per cent impact on electricity as an energy carrier. Table 5.4 shows the total climate effect of our previous portfolio assuming three different scenarios where we estimate that Norwegian power can replace power generated in the Nordic region (Nordic mix with an emission intensity of 117 g CO₂ equivalents/kWh), European power production (477 g CO₂ equivalents/kWh) and coal-based power production in the Nordic region (819 g CO₂ equivalents/kWh), respectively. The emission intensities were obtained from Ecoinvent v2.2, which is a database with emission factors for several types of energy processes and other processes.⁵

Renewable heating, industry and non-residential buildings are the areas with the highest climate impact. Results for the percentage of indirect climate impact depend on what electricity mix is used as a basis in the calculations. The best case is a scenario where Norwegian power replaces coal power where the 2001-2011 portfolio corresponds to a total reduction in greenhouse gas emissions of approximately 1 000 kilotonnes of CO₂ equivalents.

⁵ The emission coefficients for Nordic and European power mixes are based on the average production in these regions in 2000 (Ecoinvent v2.2). The emission coefficient for coal power corresponds to average production from the technology installed in the Nordic region in 2000. Source: Ecoinvent v2.2. Dones R., Bauer C., Bolliger R., Burger B., Faist Emmenegger M., Frischknecht R., Heck T., Jungbluth N. and Röder A. (2007) Life Cycle Inventories of Energy Systems: Results for Current Systems in Switzerland and other UCTE Countries. Final report ecoinvent data v2.0, No. 5. Swiss Centre for Life Cycle Inventories, Dübendorf, CH.

TABLE 5.3 REDUCTION IN OIL CONSUMPTION AND DIRECT CLIMATE IMPACT FROM PROJECTS SUPPORTED WITHIN THE ENERGY FUND 2001-2011

Market area	Reduction in oil consumption	Direct climate impact
	tonnes	ktonnes CO ₂ equivalents
Renewable heating	262 274	650
Renewable power production	0	0
Industry	134 500	490
New technology	0	0
Non-residential buildings ⁶	37 197	384
Residential buildings	622	6
Total	434 592	1 530

Table 5.3: The table shows the direct climate impact of Enova's work measured in reductions in oil consumption and CO₂ emissions (CO₂ equivalents) for each market area for projects supported during the 2001-2011 period.

TABLE 5.4 TOTAL CLIMATE EFFECT (DIRECT + INDIRECT) FROM PROJECTS SUPPORTED WITHIN THE ENERGY FUND 2001-2011

Market area	Nordic mix	European mix	Nordic coal power
	ktonnes CO ₂ equivalents	ktonnes CO ₂ equivalents	ktonnes CO ₂ equivalents
Renewable heating	1 026	2 184	3 284
Renewable power production	247	1 006	1 726
Industry	774	1 647	2 477
New technology	19	79	136
Non-residential buildings ⁶	606	1 291	1 941
Residential buildings	10	22	32
Total	2 682	6 228	9 596

Table 5.4: The table shows the total climate impact (direct and indirect) of projects supported during the 2001-2011 period seen from three different electricity scenarios. The results are shown for each market area.

⁶ Note that the results reported for non-residential buildings include non-industrial plants and facilities (2001-2011).

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Submitted viewpoints on hearings

Consultation submissions from Enova have been issued in the following areas in 2012:

The MPE's request for comments for NOU 2012:9 The Energy Assessment – value creation, security of supply and the environment

The Agency for Public Management and eGovernment's (Difi's) draft environmental criteria for buildings to be used in connection with building procurement

The Ministry of Local Government and Regional Development's proposed amendment to the Byggesaksforskriften (building application regulations)– order to renovate buildings worthy of preservation

Trondheim Municipality's town planning office's consultation on the residential area Brøseth, area regulation – consultation process

Publications

Enova's Annual Report 2011 (*in Norwegian*)
Enova 2012

Enova Annual Report 2011 – Results and Activities (*in English*)
Enova 2012

Programme evaluation. Enova's support for Biogas Production
Performed by Rambøll for Enova 2012

Analysis of Norwegian Bioenergy Statistics – Proposal for Improving Quality
Performed by the Norwegian Bioenergy Association for Enova

Study of Deep Geothermal Energy
Performed by Norconsult for Enova 2012

Innovation in District Heating
Performed by Devoteam daVinci for Enova 2012

Market Analysis – Small Heating Plants
Performed by ECgroup for Enova 2012

Evaluation of the District Heating Programmes 2008-2011
Performed by PricewaterhouseCoopers for Enova 2012

Energy-efficient Windows Worthy of Preservation
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Enova's Building Statistics 2011
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Long Term Market Transformation from a Short Term Subsidy: Energy Savings from Residential Air-to-Air Heat Pumps in Norway
Paper presented at the International Energy Program Evaluation Conference, Rome, Italy, June 2012 (peer review)
<http://www.iepec.org>
Prepared by Bjørnstad, E. og Helgesen, P.I., Enova 2012

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Paper presented at the ECEEE Industrial Summer Study, Arnhem, Netherlands, September 2012 (peer review)
<http://proceedings.eceee.org/visabstrakt.php?event=2&doc=1-115-12>
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Diffusion of renewable heating technologies in households. Experiences from the Norwegian Household Subsidy Programme.
Article in Energy Policy, Volume 48 (2012), 148-158 (peer review)
Prepared by Bjørnstad, E., Enova 2012

Definitions and terminology

Achieved energy result

Achieved energy results are measurements or estimates of achieved energy results after a measure has been implemented, and its effects can be observed. Unlike contractual and final reported energy result, the achieved energy result is based on observations, not expectations. The achieved energy result is based on a revision of what energy results the projects have actually achieved. In practice, it can be challenging to quantify achieved results, and the challenges can vary for energy production and energy end-use. It also takes time from when the measures are implemented until achieved results can be reported.

Climate impact

Climate impact means the impact on the climate from various energy initiatives measured in CO₂ equivalents. The report differentiates between direct climate impact; achieved through reduced use of fossil energy and indirect climate impact; the impact that arises from reduced electricity consumption or new electricity production from renewable energy sources.

CO₂ equivalent

CO₂ equivalents is a unit used in climate accounting and equal the effect a volume of CO₂ has on global warming over a certain period, normally 100 years. There are several types of greenhouse gases, and emission of these gasses is converted to CO₂ equivalents pursuant to their heating potential.

Contractual energy result

Contractual energy result is the annual energy result a project is expected to achieve in the future. The energy result is included as part of the contractual basis between the support recipient and Enova. All decisions within a calendar year are included in the calculation of gross contractual energy result for the year in question.

Cost efficiency

One of the objectives when establishing Enova was to achieve a more cost-effective effort in renewable energy and more efficient energy end-use. Enova prioritises projects based on the size of the support need in relation to the energy result (NOK/kWh), given the project's lifetime and the goals stated in the agreement with the MPE. Projects applying for support from Enova are evaluated in three steps. First, the technical energy content of the energy is assessed, followed by the financial aspects of the project and the need for support, and finally, Enova's cost connected to the project (support) is assessed against the energy result (kWh). Projects that do not deliver a high enough energy result in relation to the support amount, will not win in the competition for resources.

Energy restructuring

The contract between the MPE and Enova stipulates that the Energy Fund will be used to promote an environmentally friendly restructuring of energy end-use, energy production and development of energy and climate technology. The energy restructuring is a long-term effort in the development of the market for efficient and environmentally friendly energy solutions that contribute to strengthen the security of energy supply and reduce greenhouse gas emissions.

Energy result

Enova manages the Energy Fund to achieve energy results through reduced or more efficient use of energy or through increased production of renewable energy.

ESA

EFTA's monitoring organization (EFTA Surveillance Authority) enforces the state aid regulations in the EEA agreement. Government support granted to enterprises must as a rule be reported to the ESA.

Final reported energy result

All projects submit a final report upon the project's conclusion. The final reported energy result is an updated forecast of a project's expected achieved annual energy result. Enova assesses whether the project's final reported energy result is reasonable when the final report is submitted.

Free ride

Enova's definition of a free ride is a support recipient who receives support for projects which the recipient would have implemented anyway, i.e. cases where the Energy Fund's resources are not necessary to trigger the project. See definition of triggering effect.

Lifetime

A key issue related to new production of energy and reduced energy end-use is how long we will reap benefits from the results. Here one can differentiate between technical and financial lifetime. The technical lifetime is connected to how long the equipment can function with normal maintenance, while financial lifetime is related to how long it will take before it will be more profitable to replace the equipment with new and improved technology. Enova bases its lifetime consideration on financial lifetime. This is also reflected in Enova's investment analysis. In addition to the importance of project lifetime as a parameter in the assessment of the support need, it also expresses how long we will benefit from the energy result provided by the project. The project's lifetime multiplied by annual energy

result (year*kWh) will express the project's total energy result over its lifetime. Similarly, the energy cost over the lifetime can be expressed as (NOK/(year*kWh)).

Passive houses

Passive houses are buildings which require very little heating. Norwegian standards have been established both for passive residences (NS3700) and passive non-residential buildings (NS3701), adapted to Norwegian climatic conditions.

Programmes

Enova has chosen to organize its activities within programmes. A programme is an instrument directed towards one or more specific target groups, with set application deadlines and application criteria. This organization has been chosen to focus the use of policy instruments.

Renewable energy

Enova uses the same definition of renewable energy used in the EU's Renewables Directive (2001/77/EC). In the directive, renewable energy is defined as renewable, non-fossil and non-nuclear energy sources (wind, solar, geothermal energy, tidal energy, hydropower, biomass, gas from treatment plants and biogases). Biomass is furthermore defined as biologically degradable fractions of products, waste and agricultural remnants (plant or animal-based), forestry and associated industries, in addition to biologically degradable fractions from industrial and municipal waste.

The Energy Fund

The purpose of the Energy Fund is to promote environmentally friendly restructuring of energy end-use and energy production. The Energy Fund is a predictable and long-term source of financing for the restructuring efforts.

The overarching and long-term goals for application of the Energy Fund are related to energy restructuring and production of new renewable energy and other environmentally friendly energy. The Energy Fund is financed through allocations in the fiscal budget and a parafiscal charge (small additional charge on electricity bills) on the electricity grid tariff. In 2012, the charge was NOK 0.01 per kWh, which totalled NOK 774 million. This system will change from 2013. The parafiscal charge for electricity consumption in households will still be NOK 0.01 per kWh, while all other end users will pay NOK 800 per year per Measurement Point ID.

The allocations to the Energy Fund mainly consist of returns from the Basic Fund. In 2012, the capital in the Basic Fund was NOK

25 billion. In connection with the Climate Agreement in 2012, a decision was made to strengthen the Primary Capital Fund with a capital contribution of NOK 10 billion in 2013, followed by NOK 5 billion in 2014, 2015 and 201, respectively, cf. Storting White Paper No. 21 (2011-2012). The expansion of the mandate which this entailed for Enova is reflected in the name change of the fund, where the Basic Fund for renewable energy and energy efficiency was changed to the Fund for Climate, Renewable Energy and Energy Restructuring. We use the term Basic Fund throughout this report.

In 2012, the Energy Fund received NOK 996 million in returns from the Basic Fund. The resources from the Energy Fund are managed by Enova SF.

The Energy Fund is based on the Act relating to amendment of the Act dated 29 June 1990, No. 60 related to the generation, conversion, transmission, trading, distribution and use of energy, etc. (Energy Act, Section 4-4, cf. Odelsting Proposition No. 35 (2000-2001) and Recommendation to the Storting No. 59 (2000-2001). The Ministry of Energy and Petroleum (MPE) determines the statutes for the Energy Fund.

Triggering effect

As an administrator of public resources, it is important for Enova to ensure that the resources we manage are used in the best possible manner. This principle is stipulated in the agreement between Enova and the MPE in that support must contribute to triggering projects that would not have been implemented otherwise. Projects with a low cost per generated or reduced kWh will often be profitable by themselves, and therefore do not require support from the Energy Fund. Support is also considered to be triggering if it advances a project in time, or if a project has a larger scope than it otherwise would have had.

Abbreviations

ECEEE - European Council for an Energy Efficient Economy
EnR - European Energy Network
ETP 2012 – Energy Technology Perspectives 2012
EU ETS – The EU Emission Trading System
IEA – International Energy Agency
IPCC – Intergovernmental Panel on Climate Change
Klif – Climate and Pollution Agency
MPE – Ministry of Petroleum and Energy
SID – Case number
WEO 2012 – World Energy Outlook 2012



Enova is a government agency which promotes environmentally friendly restructuring of energy end-use, renewable energy production and new energy and climate technology. Our objective is to create lasting changes in the supply of and demand for efficient and renewable energy and climate solutions.

Enova's reports can be found at www.enova.no

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