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# Annual Report 2010

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Part 1

# Enova now and onwards

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# Innovation yields opportunities

Over the course of the next few decades, our energy use is likely to change considerably. We will use less and less energy for heating as the building stock is gradually upgraded to more energy-efficient buildings. Over time we could also see energy-plus-houses, industry and motor vehicles that can deliver energy to the grid. Major changes to the end-user side and continued significant potential for increased energy production entail considerable challenges for the energy system. Through innovation, challenges can be turned into opportunities.

Innovation is a prerequisite for the energy efficiency and increased production from renewable energy sources that is necessary for ensuring security of supply, and for fulfilling national and international climate goals and commitments. In addition, new solutions will foster new business activity and results also beyond the Norwegian market.

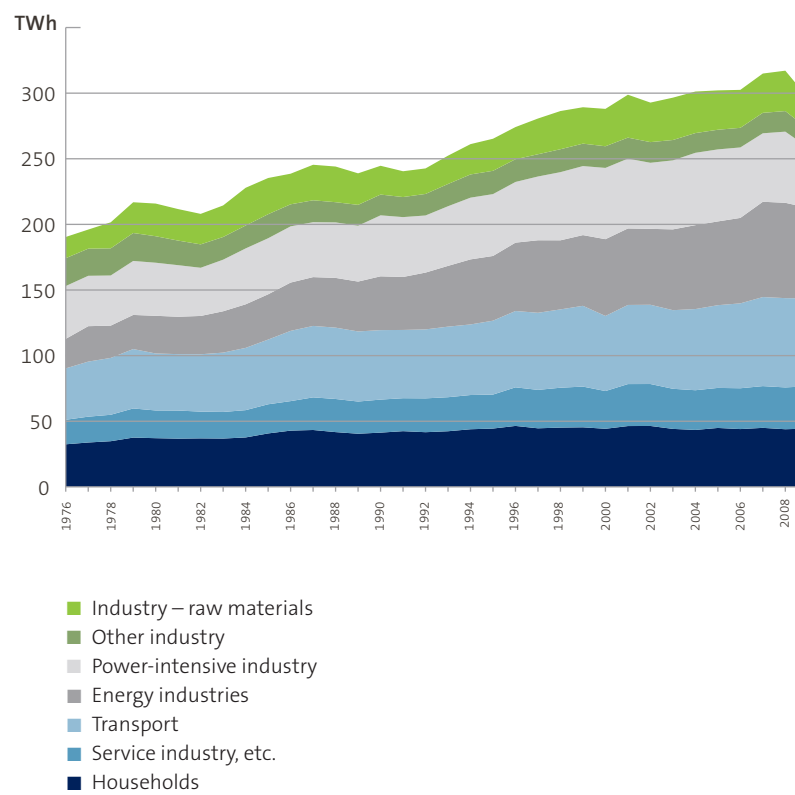
As a society, we are always looking for good solutions to our challenges. This applies both to everyday situations such as high electricity bills after a cold winter, or how we and the rest of the world can solve the global climate challenges. Often it is not the lack of technology in itself which poses the challenge, but rather achieving widespread utilization of new solutions. It is not enough to have products and services available, consumers must also demand them. Knowledge of the solutions must be established, and costs and risks must be at an acceptable level.

As private individuals we know that money spent on one purpose cannot be spent over again on something else. A list of sensible measures does not help if you can only afford a few of them. The same challenges apply to society. Without unlimited funds at your disposal, increased efforts in one area will mean reduced efforts for another. The only way to avoid this is to solve tasks more efficiently, either by using new solutions, improving existing solutions or using the solutions we have more efficiently.

### If we do nothing, energy use will increase

The demand for energy emerges from a need for various services that require energy. As regards households, this will typically include heating of rooms and tap water, lighting, etc. – similar to what you find in the public and private service industry. As regards industry, the need is largely related to the actual production processes. The development of these underlying needs will be a key factor in the future demand for energy.

FIGURE 1 TOTAL ENERGY CONSUMPTION IN NORWAY BY USER GROUP



Source: Norwegian Water Resources and Energy Directorate (NVE) / Statistics Norway (SSB)

The demand for certain energy services has natural restrictions – such as a limit to how far you can comfortably raise the indoor temperature. An increase from 20 to 25 °C will be acceptable for many people, but relatively few would increase the indoor temperature up to 30 °C. The demand for other energy services, such as use of media, continues to rise in step with increased economic growth. Similarly, the demand for energy services in the industry and service sectors will increase along with the activity.

Statistics Norway's population projection shows that the number of citizens in Norway will increase

towards 2050, possibly by as many as MNOK 1.3. If they use the same amount of energy that each of us do today, the household energy demand will increase by approx. 10 TWh.

More citizens will, along with general economic growth, increase the overall demand for energy services. A scenario analysis carried out by Enova in 2009, points to the fact that energy use within public and private services could increase by 16 TWh by 2050, compared with 2007.

Electric cars exploit energy much more efficiently than our current combustion engines. An electrification of the

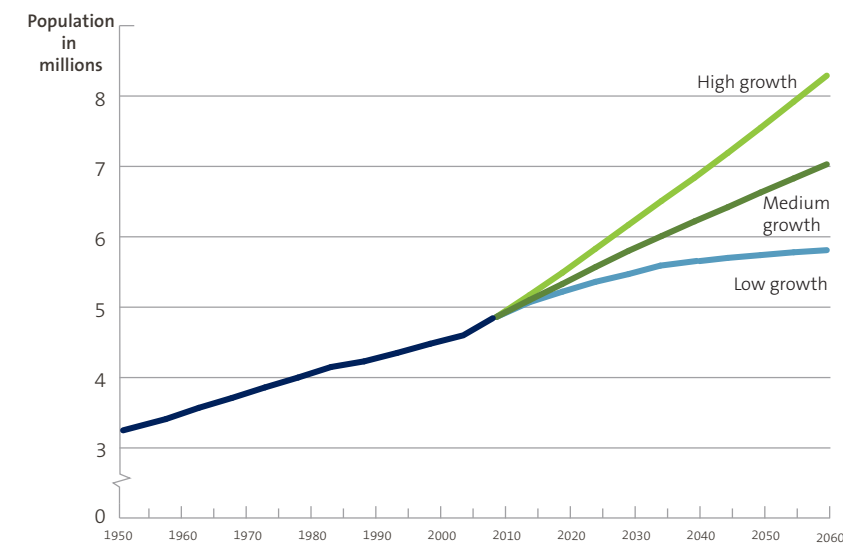
car fleet would entail a reduction of the energy need for transport, but an increase in the demand for power. Electrification of offshore oil and gas production would have the same effect. Even though we produce more electricity than we use in a normal year, this is a situation that will not last unless we take action.

If we want to avoid increased energy end-use with rising population and economic growth, we must use increasingly energy-efficient solutions. Even today, houses are being built that barely need any energy for heating. Correspondingly, there is a lot of equipment available with a very low energy demand, from household appliances to pumps and electrical engines for the industry. The challenge lies in smoothly switching to new and improved solutions. Inspiration, knowledge and money are needed to choose these. Growth and earning opportunities are necessary for introducing new solutions in the market.

The very best solutions are often too expensive to be used by the majority, but there are many good energy measures that are profitable, both for households, the industry and public and private service sectors. Most analyses of the opportunities for energy efficiency indicate that several seemingly profitable measures are not carried out.

Part of the reason could be that knowledge and experience are required for the market to pick up new solutions. This particularly applies to

FIGURE 2 POPULATION DEVELOPMENT IN NORWAY AND FUTURE PROJECTIONS, 1950-2060



A population projection is a calculation of expected future population size and composition as regards gender, age and place of residence (municipality). This is achieved by utilizing age and gender-specific probabilities or rates of deaths, immigration and emigration, and births (among women aged 15–49) in the population according to gender and age. Statistics Norway makes population projections from the beginning of one calendar year to the beginning of the next calendar year (i.e. 1 January).

Source: Statistics Norway (SSB)

complex products such as residences, heating and ventilation solutions, and solutions that have an impact on the industry's production processes. These types of measures place high demands on both planning and execution in order to achieve the desired energy results.

Innovators with the will and expertise to commit to new solutions, both on the supply and demand side, are essential for new solutions to win acceptance in the market.

#### Changed behaviour yields results

Expertise on the supply side is necessary, but not enough to ensure that good solutions are implemented. Focus on one's own energy use and knowledge of the opportunities available to you as an end-user are equally important. This also applies to trusting that the solutions offered actually deliver what they promise.

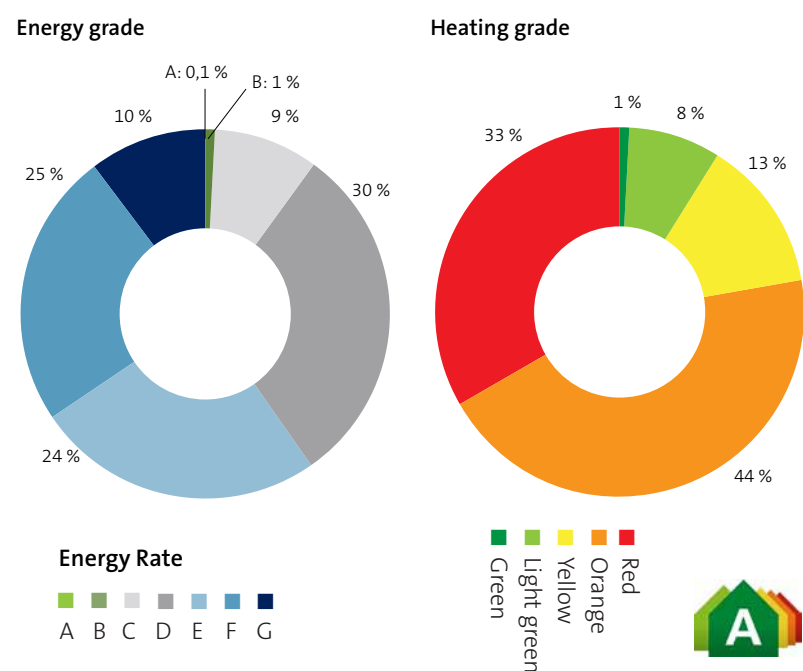
Every time a cold front visits Norway, the media has loads of good energy saving tips, and a survey<sup>1</sup> indicates that eight out of ten say they want to reduce energy use in their homes. However, the number that actually carry out energy efficiency measures is much lower. In another survey<sup>2</sup> carried out for the Norwegian Federation of Cooperative Housing Associations, half of the recipients state that they do not want to spend money to save energy – and in fact they may not need to; many can achieve quite a lot simply by being aware of their own energy use and taking simple steps that do not require investments.

A rule of thumb says that a reduction of 5-10 per cent can be achieved, simply by being more aware of our own energy use. For a household, the reduced energy expenses amount to between NOK 1 000 and 2 000 per year, and the overall amount for all households is estimated at NOK 2 to 4 billion per year. The Norwegian industry can also achieve a substantial reduction in its energy expenses by focusing on its own energy use. A study of the potential for energy efficiency in the industry commissioned by Enova in 2010, shows that the industry can reduce energy

use by up to 5 TWh merely by focusing on its own energy use. This amounts to well-over NOK 1 billion in direct reduced energy costs. Spending some money on energy management could prove worthwhile in order to exploit such potential.

Energy management is not just for large industrial companies. The potential to reduce energy use through energy management is also substantial for smaller enterprises and within public and private services. While the level of ambition for larger public and private

FIGURE 3 BUILDINGS WITH AN ENERGY LABEL AS OF 31.10.2010 - BY GRADE



The Energy Label consists of an energy grade and a heating grade. The energy grade ranges from A to G, and is based on estimated delivered energy. The heating grade is indicated using a five-colour scheme from red to green, ranking the building according to which heating system is installed. Nearly 52,000 buildings have received an energy label as of 31 December 2010, of which around 1,700 were non-residential buildings. For more information, see: [www.energimerking.no](http://www.energimerking.no)

Source: Norwegian Water Resources and Energy Directorate (NVE)

1 <http://www.nve.no/no/Nyhetsarkiv-/Pressemeldinger/Stor-lyst-til-a-investere-i-energieffektivisering/>  
 2 <http://www.nbbl.no/aktuelt-fra-nbbl/ID/14515/Tja-til-energisparing>  
 3 The Norwegian standard for Energy Management (NS/EN 1600)

players should include certification within energy management<sup>3</sup>, a simpler setup for energy management could be sufficient for smaller players.

Access to information about the most energy-efficient solutions is necessary in order to make good decisions. Energy labelling of e.g. appliances has existed for several years, and in 2010 energy labelling of buildings was introduced. This makes it much simpler both for households and public and private businesses to be aware of the energy performance of residential and commercial buildings.

#### Energy system undergoing change

Both the Norwegian and European energy systems will face considerable changes in the next decades. The changes will be driven both by the market and political objectives. The increased focus on energy efficiency and renewable energy, which comes from e.g. the EU's Energy Performance of Buildings Directive, the Energy End-use Efficiency and Energy Services Directive and the Renewable Energy Directive, affects not only the energy system in Norway, but in all of Europe. For example, the EU's revised Energy Performance of Buildings Directive sets a goal of all new buildings being "nearly zero-energy buildings"<sup>4</sup> within 2020. How quickly the demand for heating will fall is largely dependent on the rate of new construction and renovation, and how high we set the bar for energy efficiency. Even with relatively ambitious goals, the building mass we have today will constitute a significant share of the total building mass in a forty-year perspective.

The introduction of energy-plus-houses along with increased use of electrical cars and hybrid cars can result in new challenges related to operation of electricity grids. In addition, a major development in the use of renewable energy sources, for example solar and wind power, will mean that a larger share of the European power supply will be dependant on the climate, and thus be more variable. The ambitions related both to increased production of renewable energy and reduced energy end-use will provide new challenges and opportunities for Norwegian players.

#### Renewable energy bank

Norway has a significant potential for increased production of renewable energy, both onshore and offshore, in addition to potential for energy recovery from the industry. The joint electricity certificate scheme with Sweden has the ambition of releasing 13.2 TWh of this potential up to 2020,<sup>5</sup> but this only amounts to a small percentage of the overall potential for production of renewable energy in Norway.

There is a significant potential for increased power production primarily from offshore wind power, but also from waves, tidal and geothermal sources. Initially, these technologies are in an early innovation phase and are not competitive even under the electricity certificate scheme. Through structured and long-term efforts in innovation, Enova will promote cost reduction for these and other promising technologies, so that they will, over time, become commercially viable. If major public funds are to be used to develop new solutions for production

of renewable energy, there should be a long-term ambition for this to create new sources of income for Norway; income sources that can contribute to replace revenues from the oil and gas sector as these are reduced.

With an increasingly larger percentage of the European power supply coming from the sun and wind, the need for access to power which can balance natural fluctuations will also increase. For instance, Austrian pumped-storage power plants are currently being used to handle peak loads and periods of negative prices in the German market. With its large hydropower resources, Norway already has the possibility of taking on a larger role as a provider of load balancing in the European power market. This requires more transmission capacity between the Norwegian and European power market, and it requires that we have the power capacity available.

Over time, and if we are able to achieve sufficiently cost-effective solutions for e.g. offshore wind power, Norway could be an exporter of considerable amounts of electricity to the European market.

#### More renewable heating

We believe the development will continue in the direction of renewable heating covering more and more of the demand.

In the existing building mass, particularly commercial buildings, there is a significant potential for increasing the share of renewable heating. A far higher percentage of commercial

4 Nearly Zero Energy Buildings  
 5 The overall joint ambition level for Sweden and Norway is 26.4 TWh. We have assumed a 50/50 distribution as a basis. Actual distribution will depend on differences in technology costs.



buildings have installed central heating compared to the share of residential buildings. The percentage of commercial buildings that have already installed central heating is much higher than the percentage of residences. The costs of using renewable heating will therefore largely be related to replacing an oil boiler with a bio boiler, or connecting to a local or district heating system.

The current central heating solutions, particularly for residences, will serve little purpose in new residences with a low heating need. The costs of installing central heating are currently approx. 500 NOK/m<sup>2</sup> and up. Compared with the low heating need in for instance passive houses, this is too high. This poses a challenge to the heating sector as regards developing good solutions in collaboration with the building industry, so that flexible heating solutions can also be a relevant alternative as regards cost for new residences in the future.

Renewable heating will play a significant role in new commercial buildings. This means that, even though each individual building will require less energy for heating, there will also in the future be a market basis for solar heating facilities, various types of heat pumps, small heating plants and local and district heating. This development is supported by the technical regulations stipulating a requirement for at least 40–60 per cent of the heating need, to be covered by flexible heating solutions, depending on the size of the building.

#### New challenges require smart solutions

Both the European and Norwegian power markets will experience larger elements of local and unregulated energy production ahead, coming from energy-plus houses, motor vehicles or micro power plants (Micro CHP <sup>6</sup> in Europe). Although this type of power production can contribute to solving regional supply challenges, it will create new challenges related to operating the grid.

Similarly, electrification of the private car fleet will have relatively little significance for the energy balance, but if we all charge our cars at the same time, we have a capacity challenge. The development of new solutions for management, advanced meters and two-way communication; smart grid, provides new opportunities for optimising the exploitation of both production and grid capacity. In order to gain as much as possible from these new opportunities, they must be followed up with new and more flexible price agreements with power that provide end-users with the necessary information at the right time. To Enova this is a relevant area of effort for promoting innovative solutions.

#### Enova today and tomorrow

Enova has triggered measures corresponding to in excess of 10 per cent of overall stationary energy use in Norway. These results come from a wide range of measures within renewable energy production and energy efficiency. Enova will continue the work founded on a solid base of knowledge,

through the network of suppliers, external specialist environments and own staff, and the considerable funds made available through the Energy Fund. Enova will offer a wide range of programmes and services to consumers and professional players, which will be developed in line with the markets and in coordination with other public policy instruments.

In 2011, Enova will reinforce its efforts within energy efficiency in households, new high energy performance buildings, wider acceptance in the industry, innovation in the heating sector and demonstration of new solutions for production of renewable energy.

Enova will facilitate energy efficient behaviour both through communication and by stimulating establishment of energy management in the public and private sectors.

Enova is of the opinion that a continued sensible commitment to energy efficiency and introduction of new solutions can contribute to continued stability or reduction of energy use in Norway in the coming decades.

Enova believes that if we use our energy more consciously, along with greater use of renewable heating and increased production from renewable energy sources, this could form the basis for Norway as Europe's energy bank.



#### Our vision

# An energy-efficient and renewable Norway

#### Our objective

Enova's main objective is to promote environmentally friendly restructuring of energy end-use and energy production. The energy restructuring is a long-term initiative to develop the market for efficient and environmentally friendly energy solutions that contribute to strengthening the security of supply for energy and reduce the emissions of greenhouse gases.

#### Our business strategy

Through the management of our task we will achieve:

##### Technological development and innovation

- Introduction and development of new technologies and solutions in the energy market
- Creating opportunities for increased production of renewable energy and more efficient energy use through increased focus on reducing costs and stimulating players willing to commit to new solutions
- Goal-oriented qualification of new technologies and sharing the outcome

##### Market change

- Functional markets for efficient and environmentally friendly energy solutions
- Increase the demand for future energy solutions by creating confidence in the solutions among end-users
- Reducing production and process costs by increasing realized volume and building experience

- Increase expertise on the supply side to ensure good quality and efficient competition
- Lift new future energy solutions into the market and improve availability of good solutions

##### Behaviour change

- More general knowledge about the possibilities for using efficient, environmentally friendly energy solutions
- Motivate correct behaviour; increase end-users' insight into and attitude about own energy use and future energy solutions through making updated and correct knowledge accessible, and communicating and making good examples and experiences visible

#### Our values

Clear  
Responsible  
Inspiring  
Market  
proximity

<sup>6</sup> Combined Heat and Power (CHP)



## Enova – a ten-year-old with ambitions

NILS KRISTIAN NAKSTAD  
Chief Executive Officer

In 2011, Enova will be ten years old. What is there to celebrate? Nils Kristian Nakstad, Chief Executive Officer, looks at what we have achieved so far, and where we are headed from here.

### What is the most important achievement Enova has accomplished in these ten years?

Putting energy efficiency and new renewable energy high on the agenda in Norway. We would not have achieved these results without key players in the public sector, industry and commerce and households having real faith in the importance of committing to future energy solutions. Support from Enova for conversion to renewable energy has so far triggered investments in the market nearing NOK 40 billion. With up to 20 per cent support and active efforts from our side, Norwegian households alone have invested NOK 1.5 billion.

### How would you describe Enova today?

Enova's longstanding ambition is to be the driving force for future energy solutions in Norway. I believe we have consolidated this role today, ten years after starting up. We have a very competent staff that is able to combine the role of advisor and manager, and it has good insight into how the energy market functions.

We are becoming steadily better at pointing out where the potential within improving efficiency and renewable energy production lies. And we are able to adapt policy instruments to trigger these potentials as efficiently as possible. Enova still has room for improvement as regards the pace of this continuous adaptation, but in the near future we will be working at a good speed, which will also be apparent to our surroundings.

### Enova will renew its agreement during 2011. What happens after this?

We will not rest our laurels, but instead take a giant step forward. We will continue to be the most important policy instrument for restructuring of energy use and production in Norway. We must take the offensive in this work.

We have recently worked on revising our business strategy, and we believe we can point out the contours of the big picture after 2011. Naturally, there will be a new specific TWh goal.

Energy efficiency will continue to be key, particularly as regards Norwegian properties. We must intensify this dialogue and the cooperation with the various players, from decision-makers in the municipalities via developers to residents. This will be followed by an increased mass communication effort to contribute to the desired behaviour change.

A future certificate market will affect our role as regards production. At the same time, we can see that a clearer and more pronounced involvement vis-à-vis the new technology circles represents a great potential. Enova has in-depth knowledge regarding the markets where this technology can be utilized – and we have the financial muscle required for the important projects to see the light of day. Accordingly, this will be one of our main areas of effort in the future.

### What challenges does Enova face in the future?

Our profile must be even clearer. Conversion to renewable energy is a complex area, and we have a major teaching task as regards communicating the big picture and inspiring action and changed behaviour. We represent a centre of knowledge and we must do an even better job at sharing and spreading this. Many have high expectations of us. Managing public funds and ensuring the most efficient and goal-oriented use of resources possible is a big responsibility, and we certainly don't want to disappoint anyone. This means that we must work hard and with focus every day to reach our goals.

### Where will Enova be in 10 years?

By that time we should be able to say that we have made a significant contribution to reaching the Government's ambitions of an energy-efficient and renewable Norway. Enova should also be able to show that the many contractual projects have achieved the desired and expected results, and have provided education to promote even better solutions and projects in the future.

## Governance

### Corporate social responsibility

Enova's main objective is to *promote environmentally friendly restructuring of energy use and energy production*. Our most important contribution to society is to realize results in accordance with our task, and we care about how this is done.

Our task requires us to set stringent requirements for ourselves. It is important to us that:

- we have goals, values and ethical guidelines that describe the fundamental attitudes and the philosophy which should characterise our organization.
- we exercise a corporate governance where we place emphasis on openness, transparency, responsibility, equal treatment and long-term perspectives.
- we set high integrity requirements, which for example entail that we do not tolerate any form of corruption, and that we promote free competition.
- we must be open, honest and good listeners in our communication and contact with the outside world.
- we do not discriminate based on gender, religion, national or ethnic affiliation, social group or political opinion.
- we must be attentive to changes in what the community in general perceives as good business practices, and evaluate and change our own practice when necessary.

Enova manages the resources from the Energy Fund. The terms for this management are stipulated in a four-year agreement between the Ministry of Petroleum and Energy (MPE) and Enova. The agreement is intended to ensure that the funds are managed in accordance with the goals and assumptions that form the basis for utilization of the Fund's resources. The annual award letter expands on and supplements the terms, as well as specifies other activities Enova has been set to manage with funds outside of the Energy Fund.

Enova aims to allocate support funds in accordance with *objective and transparent* criteria. Management and internal control must take place in accordance with the rules for *financial management in the government*, including exercising prudent control over the processing of applications/award of funds, and also that *the recipients of support fulfil contractual conditions and performance goals*.

Enova allocates *governmental support* to projects. The support granted must also be within the framework of the government subsidy rules established as a consequence of the EEA agreement. All programmes and projects are subject to advance approval by ESA (EFTA Surveillance Authority). In 2010, we have executed considerable work, in cooperation with the MPE and ESA, with a view towards securing approval of Enova's programmes and projects into a new period. The current approval would have expired on 31 December 2010, but has now been extended through 2011.

### Organization

#### Values and ethical guidelines

The value basis in Enova has great significance. By focusing on our values: *Clear, Responsible, Inspiring and striving for Marked proximity*, also in our HSE and personnel management, we continually develop in order to be a modern, inclusive and challenging workplace. In the continuous work to achieve this, we have in 2010 put special emphasis on keeping in touch with the markets.

#### Working Environment

HSE is an important, prioritised area for Enova. A good working environment is one of our success criteria. Our vision and values are the foundation for the other elements of our overall Human Relations (HR) work. In 2010, active steps have been taken to further develop culture and the environment. This is reflected in the organizational structure, where there has been emphasis on clarifying roles and responsibilities, reflected in a revised authorisation structure. Good progress and excellent results from our employee surveys, give us clear signals that we are developing our working environment.

#### Professional development and growth

The employees' knowledge, expertise and skills are critical for success. Enova must be a workplace where employees of all ages have the opportunity for and expectations of professional development and growth in line with our goals and strategic platform. Focus on manager and employee development is a means of stimulating performance, both for

# Organization



the individual and as a team. Measures in 2010 have included the continuation of the leadership development programme and starting work to further develop a professional career model for the employees.

## Administration and control

### Responsible administrator with efficient work processes

Great emphasis has been placed on cost-effective administration of the Energy Fund. In line with the growing trust placed in Enova as an administrator, both our financial frameworks and activities have been expanded. The project portfolio is dynamic and growing, with a considerable percentage of active projects that are being implemented. Reporting and accountancy of results increase in scope and complexity every year, in line with the portfolio development. In addition to case administration, advising and analysis also make up a large part of our activity.

Enova has taken the step from the pioneering phase to a more robust organization that is well-equipped to stand out as a responsible manager. Efficient, robust and verifiable work processes and routines are preconditions in good internal control and management. In 2010, a pilot project was established to try out new methods for development of work processes.

### Goal management model

Safe, precise navigation requires good management tools. We have developed a goal management model with objectives and key statistics, which includes both results and processes in all segments of our enterprise, in terms of four perspectives; *results/economy, customers/market, internal processes/processing and organization/working environment*. Each organization unit has its separate score card, as well as reporting and follow-up of the 3–5 most important activities within the unit.

Goal-oriented risk management and good internal control are important for goal-fulfilment. Enova uses a simple reporting model to assist in the work of identifying, measuring and following up risks. The reporting model is part of Enova's goal management model.

## Back-up system and tools

In 2010, active steps have been taken to further develop utility systems and tools that will support efficient management and administration in accordance with the strategic platform:

### A new support system for procurement and contract management

Enova has implemented a new system utility for acquisitions and agreement management in 2010. Structured and quality-assured processes facilitate increased professionalism and efficiency in purchasing and agreement management.

### A newly developed investment calculator

In 2010, Enova has put a newly developed investment calculator into use. This is an integrated part of Enova's search portal and processing system which can be used both by applicants and Enova's executive officers. The investment calculator is a tool that, based on various financial parameters, provides a sensitivity analysis for the project applying for support.

### A newly developed system for follow-up of surcharge on the grid tariff

As a manager of the Energy Fund, Enova is responsible for control and follow-up of the Regulations relating to payment of surcharges on the grid tariff to the Energy Fund. In 2010, Enova completed an IT tool for notification and reminders as regards reporting and payment of the surcharge on grid tariff. The solution provides closer and more efficient follow-up and assurance that the Energy Fund receives funds in accordance with requirements stipulated in regulations.

### The processing and filing system

Enova works continuously and systematically to further develop and improve our case processing and support systems.



PART 2

# Enova's market areas

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Renewable Heating:

# Higher renewable share in heating projects

Enova wants to promote renewable heating as the preferred choice in buildings and in industry, including buildings with low heating demand. We do this by paving the way for increased use of alternative heat sources, through supporting the development of district heating and smaller heating plants in Norway.

**Barriers and goals**

The cost level for systems based on central heating is higher in Norway than in neighbouring countries. At the same time, lower demand for heating in future buildings will increase the demand for innovation and technology throughout the value chain. In order to reduce costs and make renewable heating competitive, the heating systems in buildings must become cheaper.

**Energy results 2010**

In 2010, 926 GWh of renewable heating was contracted. This is nearly on



Mosseporten Næringspark (Mosseporten Industrial Park) has developed an extensive energy project. A developed rock cavern is leased as a refrigeration hotel for Findus' main food product storage. Locally produced biogas is converted to electricity and heat in a biopower plant. The surplus heat and steam is used for district heating and industry. The plant delivers 9 GWh freezing capacity, 8.5 GWh district heating/steam and 8.5 GWh electricity. Photo: Mosseporten Næringspark

par with the record-breaking year of 2009, when Enova had extra funds to distribute through the Government's Stimulus Package in response to the financial crisis. District heating has been developed, or is in the process of being developed, in most major cities. We also expect new developments in smaller communities and extensions of existing facilities in cities. We expect this to result in an increased number of applications for smaller projects.

**Important events in 2010**

The focus has shifted within district heating. The renewable share in the mix of energy sources has become even more important, and suppliers of district heating see the value in taking on the role of full-service suppliers of thermal energy.

This year, we supported the first wood chip-fired plant in Norway, in addition to five projects delivering renewable cooling.

In this year's projects, bioenergy has dominated as fuel, and has been the source of 78 per cent of the energy results from the Renewable Heating Unit. One of these was the first major bio-fired combined heating and power plant, delivering electricity, district heating and industrial steam.

Furthermore, support was allocated to more than 100 GWh of biogas production. Biogas production entails recovery of a new energy product based on waste. This energy product can be used for several purposes, such as power and heat production.

**Support programmes**

There was a decline in the number of applications regarding district heating this year, while the number of applications regarding small heating plants was on par with 2009. According to the industry, the decline within district heating projects is due to the financial crisis and a greater focus on projects that have already received support.

The number of district heating plants based on pellets has increased in recent years. Naturally, this has led to a higher consumption of pellets. In 2009, approx. 43,000 tonnes of pellets were used in Norway, and this is expected to triple as projects supported by Enova are realized in the future.

We have started the work on evaluating and further developing the programme for small heating plants, a job that will deliver results in 2011.

**Potential and trends**

A study of the potential carried out in 2010 shows that there is still a great potential for conversion to renewable heating. The overall heating demand of buildings and the industry has been mapped to just over 43 TWh in 2020. The potential is particularly great within individual buildings and building clusters. The analysis also shows that the greatest potential lies with district heating in small communities within bioenergy, while heat pumps are competitive for delivering heating to individual buildings and households.

**Ambitions and strategy**

In order for renewable heating to become the preferred heating choice,

the entire value chain must be developed. A competition is planned in 2011 which is intended to result in reasonable and simple prototype facilities for central heating within residential and commercial buildings. We also want to further develop the existing options related to small heating plants and smaller district heating plants to further realize the potential. The 2010 pellet study showed that pellets are profitable in industry, and active measures will be taken to have this market convert to bioenergy. Lower heating demand in future buildings increases the need for innovation and technology in the entire value chain.

Opportunities will be emphasized in 2011, particularly within district heating. We also want to contribute to increased knowledge of the opportunities for renewable heating in passive houses.



## IN SHORT

HELLE H. GRØNLI  
Head of the Renewable Heating Unit

**What was your unit's most important achievement in 2010?**

Once again, we succeeded in maintaining a high energy result. The overall contractual renewable energy result of the heating has now surpassed 4.9 TWh.

**What posed the biggest challenge in 2010?**

The number of applications for district heating projects was lower than previous years due to the financial crisis, particularly within expansion of existing district heating systems.

**What has been most gratifying for you, as head of the unit, in 2010?**

The investment level in the industry has remained high despite the financial crisis. Furthermore, the projects that applied for support in 2010 have been well-prepared, which has contributed to maintaining a high level of activity in the area, despite fewer applications.

**What ambitions do you have for 2011?**

We want to emphasize that reasonable and simple central heating systems are possible, and continue to realize the great potential for renewable heating by offering an even better programme.

## Renewable Heating FACTS 2010

*Support programmes within the unit:*

- District Heating - New Establishment
- District Heating - Infrastructure
- The Small Heating Plants Programme
- The Biogas Production Programme

*Number of applications received:*

168 applications

*Number of applications approved:*

160 applications

*Funds allocated:*

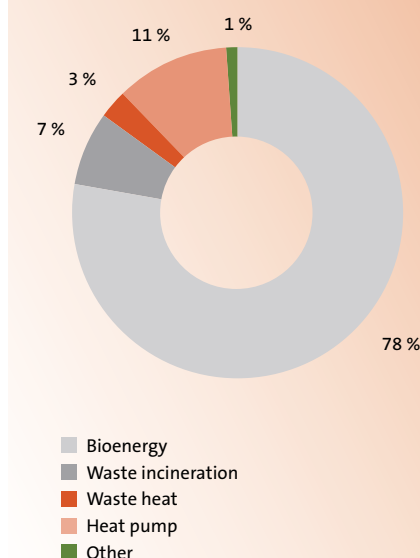
MNOK 541

*Contractual results:*

926 GWh in 2010

4 907 GWh in total (2001–2010)

FIGURE 4 ENERGY RESULT BY ENERGY SOURCE FOR 2010 WITHIN THE RENEWABLE HEATING UNIT



**Renewable Power Production:**

# Nearly NOK 1 billion in wind power support

Norway has major resources within renewable power production, both as regards hydropower and wind power. Our wind resources have been mapped as the best in Europe. These are good conditions for developing cost-effective products within renewable energy, both for deliverance to the Norwegian and the international market. It is our opinion that this provides a good basis for a large-scale development of wind power in Norway; primarily on land, but also offshore in the longer term.

**Barriers and goals**

The largest barrier for increased development of wind power is profitability. The difference between energy price and production costs for a onshore wind power plant is currently between NOK 0.20 and NOK 0.30 per kWh. The projects are therefore dependent on support from Enova in order to be realized. Technological development and reduced investment costs in combination with increased knowledge and operating experience is very important to improve profitability.

**Energy results 2010**

In 2010, a total of MNOK 978 was allocated in investment support to four wind power projects with an expected

power production of 491 GWh. This is approximately the same level as in 2009, where we gave MNOK 1 100 in support to four projects with an expected production of 450 GWh. Pending a joint Swedish-Norwegian electricity certificate market in 2012, there are no plans for new calls for applications for funding through Enova's Wind Power Programme in 2011. We expect that an electricity certificate market will contribute to increased wind power development on land in Norway.

**Important events in 2010**

A new call for applications was announced in November 2009, with an application deadline in January 2010. We received seven applications for support for the development of larger wind power plants, while two applications for support for establishing single turbines. The projects which were awarded support were Havøygavlen (in Finnmark County), Lista (in Vest-Agder County), Ytre Vikna (in Nord-Trøndelag County) and Midtfjellet (in Hordaland County).

Eleven of the eighteen projects that Enova has granted support to since 2001 are operative, while four are

under construction. The final three projects had not yet made an investment decision at the end of 2010.

The Norwegian Water Resources and Energy Directorate (NVE) and Enova also organized their annual wind power seminar this year, and the event gathered approximately 300 participants from the wind power business.

**Support programmes**

In 2010, we experienced significant interest from potential investors in wind power in the last applications round. Projects that received support in 2008 and 2009 are well underway with planning and construction in accordance with agreed milestones.

The investment support from Enova is an important policy instrument for increased production of Norwegian onshore wind power. Constructing wind power plants provides valuable knowledge and experience to the market, and contributes to more cost-effective developments and more optimal operations. After a few years of increases, we see that investment costs have declined somewhat from 2009 to 2010.

The Mehuken II wind power plant at Vågsøy in Sogn og Fjordane County was opened. The project was allocated MNOK 93 in support from Enova in 2008, and consists of eight new turbines with an expected power production of about 50 GWh. The project has received good support from the local community and has complied with all requirements made for the project implementation.

**Potential and trends**

The introduction of a joint Swedish-Norwegian electricity certificate market from 2012 will provide a long-term and predictable back-up system for renewable power production. A significant part of the hydropower potential and the wind power potential onshore is expected to be realized with support from the certificate market. However, some renewable energy resources will not be realized by electricity certificates due to a lack of technology and high costs. Examples of this include: wave and tidal power and offshore wind power, of which offshore wind power has the greatest potential and the most mature technology.

**Ambitions and strategy**

We will continue to focus on technological development within renewable energy, taking special aim at offshore wind power. Through efforts such as support for demonstration projects, we can contribute to a future realization of resource potential and value creation, while also increasing opportunities for export of expertise and technology.



## IN SHORT

KJELL OLAV SKJØLSVIK  
Head of the Renewable Power Production Unit

**What was your unit's most important achievement in 2010?**

In 2010, we contributed to contract 491 GWh of new renewable energy production in Norway by allocating investment support of nearly MNOK 1 000 to four wind power projects.

**What posed the biggest challenge in 2010?**

The process vis-à-vis EFTA Surveillance Authority (ESA) related to notification of six wind power projects that received support during the period 2008–2010 has been demanding. It was gratifying that ESA's conclusion was positive, and a notification was in place for five of the projects at the very end of the year.

**What has been most gratifying for you, as head of the unit, in 2010?**

That investment costs for onshore wind power continue to decline. The opening of the Mehuken II wind power plant at Vågsøy in Sogn og Fjordane was also an important milestone for wind power development in Norway.

**What ambitions do you have for 2011?**

In addition to follow-up of the ongoing projects within the Wind Power Programme, we will further develop programmes within technologies that will not be profitable in a new certificate market. This could include, for example, a dedicated programme for offshore wind power.

## Renewable Power Production FACTS 2010

**Support programme within the unit:**

The Wind Power Programme

**Number of applications received:**

9 applications

**Number of applications approved:**

4 applications

**Funds allocated:**

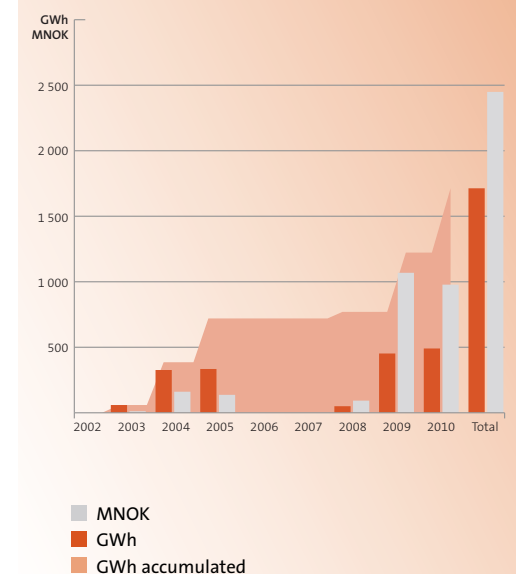
MNOK 978

**Contractual results:**

491 GWh in 2010

2 095 GWh in total (2001–2010)

**FIGURE 5 ENERGY RESULT BY ENERGY SOURCE FOR 2010 WITHIN THE RENEWABLE HEATING UNIT**



Mehuken II wind power plant was officially opened on 29 October. Overall, Mehuken I and Mehuken II generate approximately 65 GWh, which is equivalent to the annual end-use of 3 000 households. Photo: Einar Berg.



Industry:

# Energy management provides great opportunities

The challenges differ as regards energy efficiency and conversion in the industrial sector. While the aluminium industry works to reduce energy end-use in heavy core processes, many smaller companies are lacking enough awareness and expertise to change energy behaviour. At the same time, industries depend on maintaining control over energy use and costs to ensure competitiveness and further operations. There is a huge potential for energy efficiency and conversion within the industrial sector, and our job is to break down the barriers.

**Barriers and goals**

There are five essential barriers obstructing realization of the total efficiency potential in the industrial sector: Inadequate external infrastructure, immature technology, not being commercially attractive, limited access to capital, and low awareness and expertise. Our goal is to challenge these barriers along with market players, organisations and other parts of the public policy apparatus. Enova's objective is to contribute to help Norwegian industry realize its potential within energy efficiency and conversion, thus becoming the most energy-efficient industry in the world.

**Energy results 2010**

In 2010, the overall result of Enova's contracts with the industry equalled 665 GWh. This is a decline from the record-breaking year 2009. The overall contractual result vis-à-vis the industry since Enova's start-up in 2002 is 4.4 TWh. A total of MNOK 1 342 in support have been allocated to these

projects. 2010 seems to have been the year when the industry primarily held its ground after the period of financial uncertainty, as many companies have been hesitant to implement new efforts and investments.

**Important events in 2010**

In August, an investment decision was made at Elkem Thamshavn's energy recovery project. The project was granted support from Enova in 2009. This is the first project with an investment decision for this type of solution, and since Enova has previously supported several energy recovery projects where no investment decisions were made, it is gratifying to see this project implemented. In addition, several major energy users are in a process of gaining certification in accordance with the Norwegian standard in energy management. In 2010, we also strengthened efforts within Enova's Industry Network with associated benchmarking. We established an agreement with Price Waterhouse Coopers which, on Enova's behalf, will contribute to operate and further develop our services with the aim of strengthening the energy efforts in the industry.

There were final reports for projects equivalent to 60 GWh from Enova's industry efforts in 2010. Since the largest projects in the industry portfolio were in place after 2006, we are only just now seeing the projects complete development.

Over the course of 2010, we have worked to establish a more complete programme for the industry. We have

laid the foundation for programmes that will have a broader appeal in 2011.

**Support programmes**

The Support programme activity was lower than in 2009, but on par with earlier years. We see a rising number of applications from the food industry, and growing interest in conversion to renewable energy. In many cases, these companies can be referred to Enova's programme for Small Heating Plants.

Energy management contributes to increased expertise and awareness as regards energy, and is an important tool in achieving changed behaviour and market development. Therefore, we are working to direct the spotlight to energy management in the companies. In addition, we are marketing Enova's efforts in technology development and have contributed to Energi21's development of a strategy towards 2020.

After Enova carried out a study of the potential in the food industry in 2007, the industry has received more focused attention. This has led to a major increase in projects from this sector.

**Potential and trends**

Studies show great potential for energy efficiency and conversion in the industry. Enova's own study shows a potential to improve efficiency by 17 TWh towards 2020. Energi21's effort group for energy efficiency in the industry sector assumes a potential of 16 TWh for the same period. In

addition, there is potential for waste heat exploitation and conversion to renewable energy. We also see an increasing number of projects related to conversion of heat production from fossil fuels to renewables. In addition, several major energy users are now engaged in a certification process as regards the energy management standard.

**Ambitions and strategy**

In the time ahead, we will strengthen our work within changing behaviour, technological development and innovation. The programme portfolio will, to a greater extent than before, include small and medium-sized companies. In the short term, we will strengthen the investment support programme, and in the longer term we will enhance the main programme with more options.



## IN SHORT

MARIT SANDBAKK  
Head of the Industry Unit

**What was your unit's most important achievement in 2010?**

The study of the potential for energy efficiency in the industry sparked debate. The study and input gathered from the debate have contributed to establishing a strategy for further development of our industry efforts.

**What posed the biggest challenge in 2010?**

The general lag from the financial crisis was apparent in 2010, and investment decisions from the most energy-intensive companies were few and far between. Establishing major projects was therefore challenging.

**What has been most gratifying for you, as head of the unit, in 2010?**

An investment decision was made in Elkem on the energy recovery project at Thamshavn, which Enova supported in 2009. Enova's support helped trigger a decision regarding a project that is absolutely key as regards both power issues in Central Norway and Enova's goal for increased waste heat exploitation.

**What ambitions do you have for 2011?**

In 2011 we will have a strengthened industry effort in place that embraces the broadest aspects of both Enova and the industry.

Industry

# FACTS 2010

Support programme within the unit:

The Energy End-use Industry Programme

Number of applications received:

35 applications

Number of applications approved:

30 applications

Støtte tildelt:

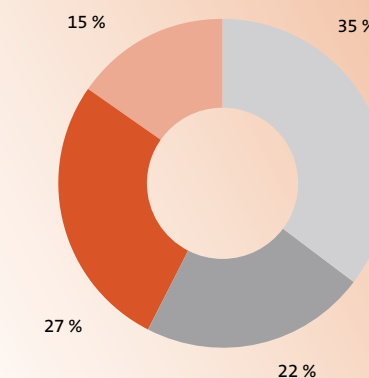
MNOK 298

Contractual results:

665 GWh in 2010

4 697 GWh in total (2001–2010)

FIGURE 6 SCORE ENERGY'S DISTRIBUTION IN 2010 WITHIN THE INDUSTRY



- Energy efficiency – energy-intensive industry
- Energy efficiency – less energy-intensive industry
- Conversion
- Energy recovery and power production

New Technology:

# World's largest wind turbine being tested

Changing the energy market is contingent upon the application of new knowledge and new solutions. By offering technology support, Enova contributes to demonstrating new technological solutions in the market, and to turning research and development results into investments that show the new solutions in practice.

**Barriers and goals**

There is often increased risk related to investment in new solutions. The objective of Enova's technology support is to increase knowledge about new solutions. Increased knowledge increases the market's confidence in the technology, and contributes to improvements that will reduce costs.

**The result in 2010**

In 2010, we experienced a decline in the number of projects compared with previous years. However, overall support increased from 2009, as several large individual projects received support. In 2010, support were allocated to projects within wind power, renewable heating and energy efficiency in the industry. We have experienced rising interest both within renewable heating and industry, and major new projects in these areas are also expected in 2011.

**Important events in 2010**

In 2010, several of the projects that have received support were completed. Hydra Tidal opened a tidal power plant in Gimsøystraumen in Nordland County, while Fesil Sunergy achieved a successful energy

efficient trial production of silicon in Sør-Trøndelag County. The year also represented a breakthrough in the heating market with funding commitments for a demonstration of large-scale solar heating production and demonstration of a new combustion technology in district heating plants. In 2010, the largest single funding commitment in Enova's history was given to a demonstration of a 10 MW wind power turbine. A successful demonstration here will represent a considerable technology step within wind power.

**Support programmes**

The overall number of applications has been lower than desired. The uncertainty in the financial market and the economy in general, has led to greater challenges as regards financing new demonstration projects.

We experience an increasing interest in innovation in buildings, and the heating and industry sectors, and we expect several new demonstration projects in these areas.



In 2010, Sway received support to build and test a self-developed wind turbine in Naturgas-sparken in Øygarden in Hordaland. The wind turbine will be the world's largest, with an installed capacity of 10 MW and a rotor diameter of 145 metres. Illustration: SWAY.

In 2010, the company Sway was allocated MNOK 137 in support for demonstration of a new wind turbine. The project that was allocated support under the programme "Renewable Marine Power Production" is the largest single funding commitment for technology support that Enova has given to a demonstration project. The support from Enova will contribute to the development of a 10 MW wind turbine in Øygarden in Hordaland County, where the new technology will be tested onshore over the next two years. The wind turbine will be the world's largest with a rotor diameter of 145 metres. Sway has developed the concept in cooperation with the Norwegian technology company Smartmotor AS. The goal is to reduce the weight of the turbine, the number of movable parts and to create a direct drive generator system. Overall, the solution will yield higher energy production for offshore wind power, and thus lower operating costs.



One of Norway's first street lighting facilities utilizing LED technology has been built at Bjel-land in Arendal municipality. LED street lighting will save up to 60 per cent energy compared with conventional fixtures, in addition to having longer lifetimes. Photo: Anders Martinsen.

**Potential and trends**

There is still significant unfulfilled potential related to developing and adopting new solutions within the built environment, industry and renewable heating in Norway. We are, however, noting an increasing level of interest, particularly within the built environment and industry. Offshore wind power is a topic that engages both the industry and Enova, and an area where there is a need for cost reductions through new technological solutions. We expect the interest in new projects in this area will continue to increase in the years ahead.

**Ambitions and strategy**

Enova's overall technology support to demonstration projects increased by MNOK 110 from 2009, and the ambition is to further develop this area so it continues to grow. In the long term, Enova's ambition is to develop technology support into one of our main areas of effort. A key challenge is to realize new competitive technological solutions, and realizing new potential for renewable energy production and energy efficiency. Our efforts within technology support aim to reduce the costs of new solutions and contribute to increased knowledge regarding the opportunities offered by new technology.



## IN SHORT

KJELL OLAV SKJØLSVIK  
Head of the New Technology Unit

**What was your unit's most important achievement in 2010?**

Multiple demonstration projects were put into operation in 2010. In addition, we put in place several projects relating to renewable heating.

**What posed the biggest challenge in 2010?**

It has been challenging to acquire capital for investments in technological development and demonstration projects.

**What has been most gratifying for you, as head of the unit, in 2010?**

That Norway confirmed its position as a leading maritime expertise nation through the start-up of one of the world's largest tidal power plants. This type of project receives considerable international attention.

**What ambitions do you have for 2011?**

In 2011, we will further develop our strategy of technology support. We want to increase our focus on innovation in the construction sector, and we want to look at how we, along with the industry, can develop new good projects to further reduce energy use.

## New Technology FACTS 2010

**Support programmes within the unit:**

- The Innovative Energy Solutions Programme
- The Introduction of New Technology Programme
- The Renewable Marine Power Production Programme

**Number of applications received:**

13 applications

**Number of applications approved:**

5 applications

**Funds allocated:**

MNOK 201

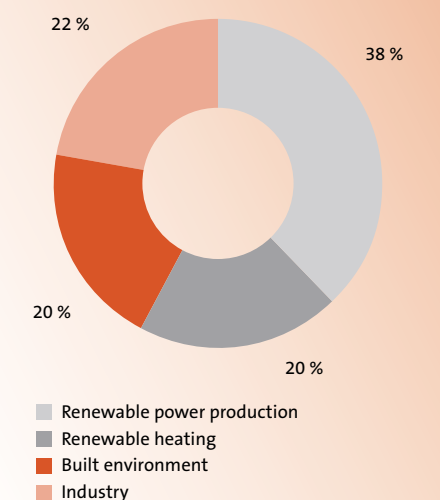
**Contractual results:**

47 GWh in 2010

122 GWh in total (2001–2010)

**FIGURE 7 PROJECTS WITHIN THE NEW TECHNOLOGY UNIT, BY SECTOR**

based on number of applications approved, 2002-2010





Commercial Buildings

# Greater energy ambitions within the commercial buildings sector

Enova will be an initiator and facilitator for high energy and environmental ambitions in the private property market in Norway. We want to cooperate with ambitious market players that are developing commercial properties and housing projects. Investment support, advising and communication make the added value of investing in robust future energy solutions visible. This applies both to construction of new buildings and measures in existing buildings.

**Barriers and goals**

The effort is directed towards contributing to market change through cooperation with property owners, developers, managers and operators that have the ambition, ability and willingness to carry out high quality projects. However, there is a challenge in reaching out in a large and fragmented market with many players that traditionally have not had much focus on energy. The goal is an increased market share of passive buildings in new constructions, along with a greater focus on robust and unified solutions as regards existing buildings.

**Energy results 2010**

In a year with a lot of attention on development of new programmes, the energy result was 214 GWh, which is lower than previous years. The energy result is divided between four (five) investment support programmes (before and after 1 June). As regards previous support programmes, funding rates and requirements related to the ambition level are communicated much more clearly

in current support programmes. We therefore expect an increased number of applications. Accordingly, we are aiming at a higher energy result goal in 2011.

**Important events in 2010**

We received substantial positive feedback regarding the new support programmes introduced in June. The criteria and funding level have become much clearer, and there is now a clear correlation between the projects' ambition level and how much support is granted. An important expansion to make our programmes more complete is the opportunity to participate in a start-up course for planning passive houses, receiving introductory advice, advising in architecture competitions, assessment support and professional support along the way in passive house projects.

**Support programmes**

In 2010, we experienced a large increase in the number of projects with ambitions of achieving passive house level. We are experiencing a huge response in relation to investment support, as well as various types of advisory support. The projects include most types of buildings, ranging from small, space-efficient single family homes to large non-residential buildings. Nordea Liv's new office building in Bergen in Hordaland County, the Inspiria Science Center in Østfold County and the student welfare organisation in Trondheim's new student housing in Sør-Trøndelag County, are good examples of flagship projects. We also see a trend toward large housing developments to be

developed with passive house level energy demand, for example the eco-friendly neighbourhoods of Granås in Trondheim (Sør-Trøndelag County), Rudshagen in the city of Oslo and Draget in Kristiansund (Møre og Romsdal County).

Our programmes will contribute to develop market demand in the direction of buildings with a minimal need for energy, both at the building level and for single components. We already see signs in the market that both large and smaller market players are building internal expertise and carrying out specific projects to meet future building requirements.

The objective of our new programme "support for passive house studies" is to break down barriers in the way of building passive houses. The studies will uncover the advantages of the passive house alternative, and we expect the scheme to trigger even more passive house projects in the future.



Nordea Liv's new offices at Kokstad in Bergen will be built according to the passive house standard. The project combines good architecture with environmental and energy efficient building and technical solutions. The MNOK 3.2 in support from Enova triggered the choice of a passive house standard. Illustration: Kristin Jarmund Arkitektkontor AS.

**Potential and trends**

There is a growing perception in the market that low energy costs are a competitive advantage. A great number of buildings will now receive an energy certificate, which is part of the Energy Performance of Buildings Directive. Increased focus on energy use is also reflected in the sector's establishment of the Norwegian Green Building Council, which will develop an environmental classification system called BREEAM-NOR. Energy efficiency will continue to be a highly relevant topic, and Enova has a strong desire to contribute to the realization of construction projects with high energy ambitions.

**Ambitions and strategies**

The International Energy Agency (IEA) has determined that improving energy efficiency is absolutely essential in order to reduce the world's emissions of greenhouse gases. In addition, efficient use of resources will contribute to increased security of supply. We will therefore continue to focus on energy efficiency in buildings through contributing to increase the level of experience and building expertise within the development of passive houses, and contributing to increased sales of measures with high energy quality requirements in existing buildings.



## IN SHORT

CHRISTIAN HEMMINGESEN  
Head of the Commercial Buildings Unit

**What was your unit's most important achievement in 2010?**

We have entered into cooperation with several large building owners/managers who have set ambitious energy goals. The trend is towards a more comprehensive approach when first implementing energy measures in the building.

**What posed the biggest challenge in 2010?**

The downward economic trend in the Norwegian economy led to a significant decline in building activity. It has been a challenge to achieve a dialogue about projects with emphasis on the advantages from carrying out energy measures in buildings.

**What has been most gratifying for you, as head of the unit, in 2010?**

That Enova's strategic efforts in passive houses over many years are showing results. Both large and small players are choosing to assess the passive house alternative for their projects through our support schemes, and more development projects on the passive house level are being carried out now.

**What ambitions do you have for 2011?**

We want a larger part of the market to see the competitive advantage in building energy-efficiently and using our support programmes, so that together we can reduce energy use in Norwegian buildings. We expect a considerable increase in the number of applications for our support programmes in 2011.

## Commercial Buildings FACTS 2010

*Support programmes within the unit:*

- Support for Passive House Feasibility Studies
- Investment Support for Passive Houses and Low-energy Buildings
- Investment Support for Existing Buildings and Outdoor Facilities
- The Small Heating Plants Programme<sup>1</sup>
- Enova's Advisory Team for Passive Houses,<sup>2</sup> including
  - Start-up course in planning passive houses
  - Introductory advice/workshops
  - Advice in architecture competitions
  - Advice/workshops in detail design and/or building phase

*Changes in 2010:*

In 2010, the support programmes were revised and adapted to the strategic direction – passive houses.

*Number of applications received:*

119 applications

*Number of applications approved:*

78 applications

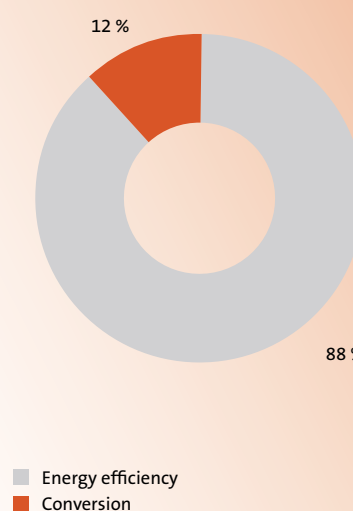
*Funds allocated:*

MNOK 119

*Contractual results:*

214 GWh in 2010  
2 754 GWh in total (2001–2010)

FIGURE 8 ENERGY RESULT BY MEASURE CATEGORY FOR 2010 WITHIN THE COMMERCIAL BUILDINGS UNIT



<sup>1</sup> The Small Heating Plants Programme is reported under the Renewable Heating Unit.  
<sup>2</sup> The advisory team is offered to both public and commercial buildings, and is reported under the Public Buildings Unit.

Public Buildings:

# Working towards a passive house standard

The Public Buildings Unit was established as a separate market unit in 2010, with the aim of being an initiator and facilitator for public sector developers and building managers to lead the way with high energy ambitions. The public sector in Norway, including the Directorate of Public Construction and Property, the Norwegian Defence Estates Agency, regional health authorities, universities, municipalities and county municipalities, manage about 49 square metres in commercial buildings. This amounts to approx. 40 per cent of all commercial buildings in Norway. In addition to advising and support programmes directed at new constructions and existing buildings, we provide training and support to municipalities in the role of a planning authority.

### Barriers and goals

Enova's objective is to increase the percentage of new buildings that conform to the passive house level. Deep renovation of existing buildings should comprise upgrading to a passive house level, and minor retrofitting should facilitate subsequent passive house renovation. Little knowledge of the passive house concept, increased costs as regards the regulation level and inadequate expertise, both in the ordering and execution stages, are barriers that our support programmes and activities will help break down.

### Energy results 2010

In 2010, public buildings contributed 40 GWh worth of energy efficiency in cooperation with Enova. A sampling of signed contracts in 2008 and 2009 shows that public buildings accounted

for about 25 GWh in each of these years. The activity in 2010 thus shows a clear increase, and this is expected to continue in 2011. There is a clear focus in the public sector on building passive houses. For example, several major cities have adopted goals of a passive house level for new municipal buildings from 2013–2014. Some municipalities are also motivating the private building owners and developers by offering discounts on building fees for passive house development.

### Important events in 2010

In 2010, Enova's advisory team for passive house development was established, and the service was rapidly in high demand. Another important event is that nearly all municipalities have completed or made resolutions regarding preparation of an energy and climate plan. Enova's support programme for such planning was introduced in 2005 and completed on 1 July 2010. According to KS, the municipalities' professional body and employers' organisation, it is unique that so many municipalities have already come so far in the planning process when governmental guidelines are made applicable. We strongly believe that the support programme and training measures have played an important part in this.

### Support programmes

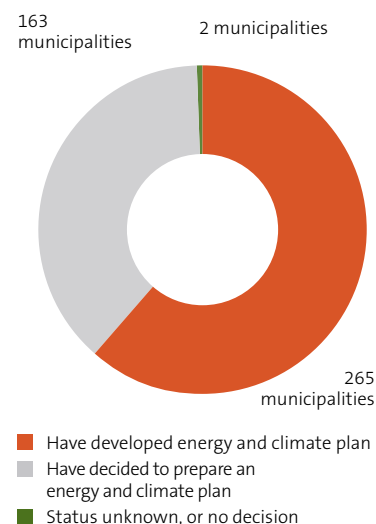
There was a rush of activity related to the support programme for energy and climate plans in the first six months of the year, and 95 municipalities received support. Enova's advisory team for passive house development has also been in demand, both for

courses and project advice. New support programmes for both new and existing buildings and outdoor facilities were introduced on 1 June. The first applications came in October, and the number of applications increased toward the end of the year.

Through the municipalities' energy and climate plans we see that the term "passive house" is becoming increasingly more recognized, and is a goal for many municipalities. Our training services and support programmes also contribute to this. Enova cooperates with several pioneering public sector players, and these organisations and networks are good at inspiring others to act through e.g. being good examples.

In Sunnmøre in Møre og Romsdal County, nine municipalities have collaborated on energy and climate planning with support from Enova.

FIGURE 9 ENERGY AND CLIMATE PLANS IN MUNICIPALITIES



They have mapped the energy efficiency potential, and have now started implementation of the identified measures. This is a good example that Enova's support programmes work in several phases of a process.

### Potential and trends

Average energy end-use in public commercial buildings is approx. 283 kWh/m<sup>2</sup> per year. If all these buildings were to be renovated to passive house level, the reduced energy demand would amount to approx. 10 TWh, compared with approx. 3.3 TWh with conventional renovation. In addition to significant interest in some geographical areas for new buildings at the passive house level, we can see an increasing interest in renovation with ambitious

energy goals. We believe this will be an important area in order to reduce energy use in public buildings in the future. Less extensive energy conservation measures will emerge, motivated by Enova's support programme to be more ambitious and unified.

### Ambitions and strategy

In the short term, we will help public building managers succeed with their energy efficiency projects in existing buildings. This is an important area in order to reduce energy use in the future. Less comprehensive energy conservation measures are also motivated to be more ambitious and unified through our support programmes.



## IN SHORT

TOR BREKKE  
Head of the Public Buildings Unit

### What was your unit's most important achievement in 2010?

That nearly all municipalities in Norway had drawn up or decided to prepare an energy and climate plan when the governmental order came on 1 July, and that several have started putting their plans into action.

### What posed the biggest challenge in 2010?

Completing the administrative work on the many projects supported under the 2009 Government Stimulus Package has been work-intensive, both for the public organisations that applied, and for Enova. It has also been demanding to finalize new support programmes and publicise them in the market.

### What has been most gratifying for you, as head of the unit, in 2010?

Meeting people working within public building management who are passionate about the work they're doing, thereby pulling both their own and other organisations in the right direction, with an impressive enthusiasm.

### What ambitions do you have for 2011?

That public sector developers will lead the way with high energy ambitions for new constructions, and that there will be a much higher activity level within energy efficiency in public buildings.

3 The Small Heating Plants Programme is reported under the Renewable Heating Unit.  
4 The unit was established in 2010. Energy results within the built environment before 2010 are reported under the Commercial Buildings Unit.  
5 The Advisory Team is offered to both public and commercial buildings, and is reported under the Public Buildings Unit.

## Public Buildings FACTS 2010

### Support programmes within the unit: Directed at the municipalities:

- Pre-project support, for improving energy efficiency and conversion in municipal buildings and facilities
- Pre-project support, for heating and infrastructure

### Directed at public sector developers and building managers

- Support for Passive House Feasibility Studies
- Investment Support for Passive Houses and Low-energy Buildings
- Investment Support for Existing Buildings and Outdoor Facilities
- The Small Heating Plants Programme<sup>3</sup>
- Enova's Advisory Team for Passive Houses,<sup>5</sup> including
  - Start-up course in passive house planning
  - Introductory advice/workshops
  - Advice in architecture competitions
  - Advice/workshops in detail design and/or building phase

### Changes in 2010:

In 2010, the support programmes were revised and adapted to the strategic direction – passive houses.

### Number of applications received:

174 applications

### Number of applications approved:

151 applications

### Funds allocated:

MNOK 52

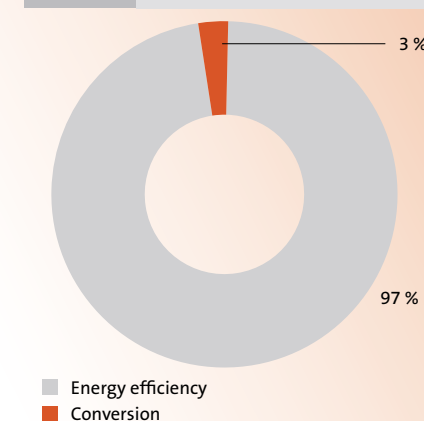
### Contractual results:

41 GWh in 2010  
41 GWh total (2001–2010)<sup>4</sup>

### Advisory team passive buildings<sup>5</sup>

Advisory team passive buildings <sup>5</sup>	Projects
Start-up course in passive house planning	13 (930 participants)
Introductory advising	50
Architecture competition	2 (jury assistance)
Project-specific consulting	24

FIGURE 10 ENERGY RESULT BY MEASURE CATEGORY FOR 2010 WITHIN THE PUBLIC BUILDINGS UNIT





Residential Buildings:

# Market lift for low energy windows and insulation

Our aim is to assist owners and residents in private households in making long-term energy choices that provide a good living, both in terms of comfort, cost and climate. We offer households energy advice and information through *Ask Enova* (our energy information helpline), *Enova At Home* (our advisory service for households), the magazine *Sfære* (Enova's magazine for households), *Enova Supports* (our household subsidy programme for energy-efficient and environmentally friendly heating solutions) and *Enova Recommends* (recommended products and solutions with particularly high energy performance). With the Rainmakers effort we seek to develop awareness, attitudes and knowledge on energy issues among children, focusing on the age group 9–12.

### Barriers and goals

Norway's two million households represent a significant potential for more efficient energy end-use. However, many important individual decisions are required in order to release this potential. Understanding how and why households make their energy decisions is therefore key for Enova's work. Our goal is to induce individual choices such as investing in passive houses or increasing the building's energy performance when retrofitting by adding insulation or replacing old windows with low energy windows.

### The result in 2010

A cold winter and expensive electricity served as a wake-up call for many in 2010. A general focus on efficient energy end-use contributed to a record-breaking number of enquiries and contacts from

private individuals through Enova's various channels. Good timing of campaign activities not only increased the number of Enova inquiries, but also the sales of low energy windows and insulation. An evaluation of the household subsidy programme shows that 90 per cent of all subsidy recipients are satisfied with their energy investment and report that they are saving energy. We also observe some progress in Enova's energy awareness programme for children, the Rainmakers, the knowledge of which has increased to 58 per cent in the target group.

### Important events in 2010

In April, *Enova Recommends* launched the campaign *Norway's Coldest House*. Taking a humorous view, we asked people to apply for the title, and the winner was elected via the internet and social media. A cold winter gave added attention to the theme, and the campaign contributed to many good conversations on adding insulation in buildings. The campaign also inspired action. We see a clear correlation between the campaign period and relevant market figures. The percentage of households that replaced insulation in their homes in Q2 increased from 2.5 per cent to 5 per cent.<sup>6</sup>

In November, *Enova Recommends* followed up with the campaign *Ice front at home* with a focus on insulation and windows. Yet again, the timing was good due to a coinciding cold period. The campaign resulted in a lot of traffic and attention on the internet and in the media.

The EU-project Kids4Future 2007–2009, headed by Enova, introduced the

Norwegian Rainmakers concept to nine new European countries. The books about the Rainmakers are now available in eleven languages and have been read by more than 40 000 children in Europe over three years. Evaluations show that the concept works well also in other countries.

### Subsidy programmes

In 2010, the household subsidy programme received 9 209 applications, and subsidies have been disbursed to 3 168 households. This exceeds previous years by 1 200 applications. Overall, Enova's Residential Building Unit has experienced a significant increase in inquiries from private individuals. More than two million people have contacted Enova through *Ask Enova*, *Enova At Home* (including the Rainmakers) and *Enova Recommends* (number of contact points is reported in Table 19). This is an increase of 300 000 compared to 2009.

An external evaluation confirms that the household subsidy programme has induced a market lift for several of the products that are or have been included in the programme. The interest is still greatest for air-to-water heat pumps, but the new trend is that the interest in liquid-to-water heat pumps is approaching the same level.

*Enova Recommends* has provided a boost to the market for low energy windows. Before the launch of the information campaign in 2008, there was only one Norwegian producer of such windows; now we have more than twenty. Low energy windows now have a market share of nearly 10 per cent. Approximately

every fourth household now chooses the low energy option when replacing windows.

### Potential and trends

Private individuals own the largest number of buildings in Norway. Approximately half the country's building area is wholly owned by private individuals (single-family and row houses). Policy instruments designed to reach the entire building mass therefore must address more than the construction and property industries.

The analysis company *Prognosesenteret's* market analysis Future Living shows that familiarity with the "Passive House"-concept in the population has increased to 16 per cent, from 3 per cent in 2008. Furthermore, 84 per cent of the people

surveyed replied that low expenses for heating is an important criterion for choosing a heating system in their home. About the same number replied that it is important that the heating system contributes to a better indoor environment. Four out of ten would prefer central heating systems.

### Ambitions and strategy

Enova will continue to stimulate the demand for passive houses through supporting building owners, builders and housing cooperatives that are willing to take the lead. At the same time, we will stimulate the market access to energy-efficient products and services. The Energy Label scheme will amplify Enova's efforts.



## IN SHORT

TURID HELLE  
Head of the Residential Buildings Unit

### What was your unit's most important achievement in 2010?

Increased attention regarding insulation and windows through *Norway's Coldest House* and *Ice front at home*, which increased activity in the market.

### What posed the biggest challenge in 2010?

Documenting the effect of *Enova Recommends'* campaign activity in the form of reliable figures for sales of low energy windows and insulation that indicate market changes.

### What has been most gratifying for you, as head of the unit, in 2010?

That there are more than 40,000 Rainmakers in Europe.

### Which are your ambitions for 2011?

Establishing comprehensive services (advisory services and financial subsidies) for renovation of houses and housing cooperatives.

## Residential Buildings FACTS 2010

### Key programmes within the unit:

- Enova Supports (the household subsidy programme)
- Enova At Home (energy advisory service for households)
- Ask Enova (the information helpline)
- Enova Recommends (recommended products)
- Enova Rainmakers (energy awareness programme for children)

### Enova Supports (the household subsidy programme)<sup>7</sup>

#### Number of applications received:

9 209 applications

#### Number of applications approved:

3 168 applications

#### Subsidies disbursed:

MNOK 28.5

### Other key figures:

Total number of contact points  
(*Enova Answers*, *Enova at Home*, *Enova Recommends* and *Enova Rainmakers*):

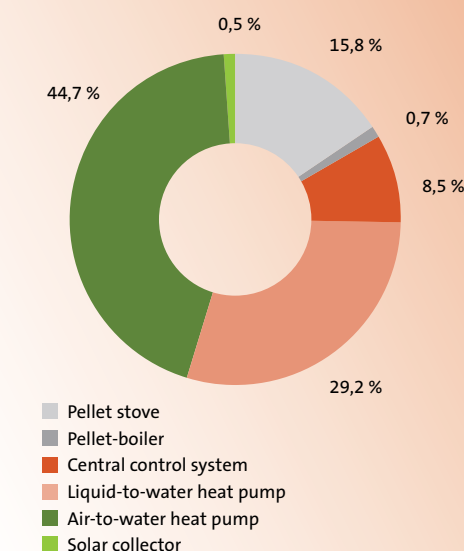
2.3 million

Familiarity with the Rainmakers  
in the target group:

58 %

FIGURE 11 HOUSEHOLD SUBSIDIES BY TECHNOLOGY

Disbursements under the household subsidy programme by various technologies



<sup>7</sup> The household subsidy programme receives earmark funding in the national budget and is not financed over the Energy Fund

<sup>6</sup> Source: *Byggmonitor* (quarterly statistics delivered by *Prognosesenteret*)

International activities:

# International engagement and exchanging experience

Enova is active in a number of international arenas, which is an important part of our efforts to transfer experience and enhance expertise. Participation in networks, forums and organisations facilitates use of best practice as regards choice of national policy instruments and objectives, while at the same time giving Enova and Norway the chance to present own experiences to others and influence international technical energy development.

Enova's international involvement includes management of the EU programme Intelligent Energy Europe II (IEE II), participation in the work headed by the International Energy Agency (IEA), the European Energy Network (EnR), the European Council for an Energy Efficient Economy (ECEEE) and the Nordic research project Nordic Energy Perspectives (NEP).

The three-year Nordic cooperation project NEP has been completed in 2010, and Enova has been represented on the project's board. NEP has involved scientists from 15 recognized Nordic research communities. Results from the analysis work have been collected in a total of 25 sub-reports, as well as a final report.<sup>8</sup> The analysis work focused on relevant challenges and opportunities in the energy system from a Nordic perspective, and the experiences gathered from the collaboration and from comparing

results from various analysis models provided valuable exchange of experience and interesting results. Through participation in IEA, Enova can actively influence the focus and priorities in ongoing work, and receives access to energy data in the form of analyses and reports. This information is useful when choosing national energy policy instruments and technology efforts. It allows Norway to get a head start on implementing efficient policy instruments through implementing technological measures that have had a proven effect in other countries. Enova actively participates in seven of the Agency's «Implementing Agreements» (IA) and is involved in 14 IEA projects, summarised in Table 1.

### Intelligent Energy Europe (IEE II)

Enova manages the EU's non-technological programme Intelligent Energy Europe (IEE)<sup>9</sup> on behalf of the Ministry of Petroleum and Energy (MPE). IEE is one of three sub-programmes under The Competitiveness and Innovation Framework Programme (CIP) and is now in its second period, lasting until 2013. CIP is a non-technological programme, with the purpose of removing or reducing cultural, institutional, economic, social and legal barriers that prevent and limit energy efficiency and use of renewable energy. CIP supports the EU's objectives to strengthen and ensure security of supply, a sustainable development and competitiveness.

Enova's management of IEE II entails marketing the programme vis-à-vis Norwegian players in the form of annual national information meetings, participation both in the EU's programme committee for National Contact Points and the EU Commission's information meetings. Enova also handles follow-up of results and reporting on Norwegian participation to the MPE, and administrates the national support schemes under the sub-programmes SAVE (energy efficiency) and ALTENER (renewable energy).

In 2010 the programme was opened for Market Replication Projects. The facility (sub-programme) is called ELENA and was mainly based on cooperation with the European Investment Bank (EIB) in 2010. The scheme (ELENA) was introduced in December 2009 with a limited budget in 2010 and with the objective of a further increase in 2011. The ELENA facility was expanded in 2010 when cooperation with the German bank KfW was introduced. ELENA (EIB and KfW) primarily targets realization of investment projects in the public sector.

### Applications for support

Call for proposals 2010 was introduced in March 2010 with an application deadline in June. Enova manages the schemes relating to pre-project support and support for national co-funding for Norwegian participants in the Intelligent Energy Europe programme.<sup>10</sup>

Pre-project support covers up to 50 per cent of approved accrued project costs. In 2010, 12 applications regarding pre-project support were received, of which five project proposals did not fulfil the project criteria. The overall funding commitment amounted to NOK 690 000 in 2010.<sup>10</sup>

Up to 75 per cent of eligible project costs are covered by the EU, but Enova can cover up to 25 per cent for Norwegian project participants through national co-funding. Eight applications were received in 2010 relating to national co-funding, of which one project proposal did not fulfil the programme criteria. The overall funding commitment was approx. MNOK 3.<sup>10</sup>

The commission has stated that a total of 22 projects were applied for with Norwegian partners/coordinators. Of these, two proposals are engaged in contract negotiations, while two are on the back-up list. None of these projects have a Norwegian coordinator.

TABLE 1 IEA ACTIVITY IN WHICH ENOVA IS REPRESENTED AND/OR PROVIDES FUNDING

IEA Implementing Agreements (IA) – Enova represented in ExCo	
IA	IA Title
	End User (EUWP)
EUWP 04	Heat Pumping Technologies
EUWP 05	Demand Side Management
EUWP 09	Industrial Energy-Related Technologies and Systems (IETS)
	Renewable Energy (REWP)
REWP 16	Renewable Energy Technology Deployment
REWP 17	Solar Heating and Cooling
	Cross(CS)
CS 22	Energy Technology Data Exchange
	Bioenergy
CS 22	IEA Bioenergy
IEA Tasks/Annexes – Enova represented	
Task/Annex	Title
	IEA
IEA EEWP	IEA Energy Efficiency Working Party (EEWP)
IEA SHC 37	Advanced Housing Renovation with Solar and Conservation
IEA SHC Task 39	SUPOL – Sustainable Polymers for Solar Collector Applications Polymeric Materials for Solar Thermal Applications
IEA SHC Task 40 - ECBCS Annex 52	Towards Net Zero Energy Buildings
IEA SHC Task 41	Solar Energy and Architecture
IEA Bioenergy Task 40	Sustainable International Bioenergy Trade – Securing supply and demand
IEA Wind – Task 29	Mexnext – Analysis of Wind tunnel measurements
IEA Heat Pump Programme (HPP) Annex 32	Economical Heating and Cooling systems for low energy houses
IEA Heat Pump Programme (HPP) Annex 34	Termisk drevne varmepumper for oppvarming og kjøling
IEA District Heating and Cooling - Annex IX	District Heating and Cooling incl. CHP
IEA DSM – Task 21	Standardisation of Energy Savings Calculations
IEA CERT	Committee on Energy Research and Technology
Other IEA projects supported by Enova	
	IEA information centre AIVC – Air Infiltration & Ventilation Centre
	IEA Building Communication group

### International activities

# FACTS 2010

#### Support programmes within the area:

IEE Pre-Project Support (PPS)  
IEE National Co-funding (NCF)

#### IEE II Pre-project Support (PPS) 2010:<sup>10</sup>

MNOK 0.7

#### IEE II National Co-funding (NCF) 2010:<sup>10</sup>

MNOK 3.0

#### Changes in 2010:

The upper limit for PPS was raised from NOK 50 000 to NOK 100 000 for partners and NOK 200 000 for coordinators

#### Number of applications approved:

14 applications (PPS+NCF)

#### Funds allocated:

MNOK 3.7

No. of applications sent to the EU with Norwegian partners:

22 applications

No. of projects granted EU-support in 2010:

2

<sup>8</sup> Information regarding NEP, including the final report, can be found on <http://www.nordicenergyperspectives.org>

<sup>9</sup> Additional information regarding IEE II can be found on the following website: [http://ec.europa.eu/energy/intelligent/call\\_for\\_proposals/index\\_en.htm](http://ec.europa.eu/energy/intelligent/call_for_proposals/index_en.htm)

<sup>10</sup> In accordance with the award letter from the MPE, Enova has the opportunity to support projects related to issues that lie outside Enova's mandate with funds that are allocated from the national budget. No new funds were allocated to IEE projects in this year's national budget, but a remaining amount from earlier allocations was transferred to 2010. Two applications were allocated support in 2010 with funds outside the Energy Fund and an overall funding commitment of about NOK 400 000 to pre-project support and national co-financing.



Communication and Public Relations:

# A more significant Enova

The Communications and Public Affairs Department, established in 2009, is responsible for coordinating internal and external communication, marketing/publicity and public affairs. The department also administers and works closely with the call centre Ask Enova, a part of Enova's nationwide information and advisory service.

**Barriers and goals**

Enova aims to inspire individuals and businesses to embrace responsible change by implementing measures that result in environmentally friendly restructuring of energy use and energy production. Goal-oriented and efficient communication measures will help highlight the potentials and opportunities in the market. Little familiarity with and knowledge about Enova constitute a barrier. An important goal is therefore to strengthen the public relations, profile, familiarity with and knowledge of Enova as an energy and climate policy instrument.

**The result in 2010**

During 2010 we have carried out several analyses to map the market's and other stakeholders' impression and opinion of Enova. Furthermore, considerable work has been carried out to establish a new communication platform for the company.

Relevant analyses include the market research company *TNS Gallup's* knowledge and profile measuring during the spring of 2010. This showed that general familiarity with Enova has stabilised at approximately the same level as in 2009. In May 2010, 28 per cent of the respondents said they were

familiar with Enova. This was a slight reduction of one percentage point from November 2009. Analyses on Enova's public relations show that we ought to have higher ambitions here. An important communication goal is to increase unprompted knowledge to 45 per cent by the end of 2012.

**Important events in 2010**

The year started with cold weather that highlighted the need for more efficient energy use, and among others we had an active part in the broadcast of a programme dedicated to the topic energy saving in the series "Forbrukerinspektørene" (the Consumer inspectors) on the national channel NRK.

The *Hold tett* campaign focused attention on the importance of quality in the building process. Airtight buildings constructed correctly were emphasized in the campaign, which was a project collaboration between Norwegian Technology, the Low Energy Programme, the Norwegian Association of Plumbing, Heating and Ventilation Contractors (NRL), the Building producers, the Master Builders Association, Nelfo (Association for electrical and IT companies) and Enova.

Wind power received considerable attention from the media in 2010, and the funding applications round supporting wind power projects received much attention during the spring and summer.

The campaign *Norway's Coldest House* was launched in April, taking

social media actively in use, as well as publishing advertisements in local newspapers nationwide.

The launch of new support programmes for the building industry was followed up by a larger market campaign vis-à-vis relevant target groups. The message was that Enova emphasizes and wishes to support ambitious construction projects.

**Communication activities**

We have strengthened the proactive PR in 2010, and the direct follow-up of about 300 incoming journalist inquiries were registered throughout the year. News monitoring of Norwegian media shows that nearly 4,600 articles or features were written about Enova.

Ask Enova experienced significant traffic throughout the year, and posted its highest transaction figure since 2003.

The department has cooperated closely with the market areas in Enova as regards campaigns and communication efforts.

The work on a new communication platform and analyses to map our public relations will be important for our communication work in the future. Furthermore, the *Norway's Coldest House* campaign was exciting and challenging as regards communication expertise. This was the first time Enova utilized social media actively to focus attention on saving energy, and the response was positive and overwhelming. Our activities in the future must reflect and be in accordance with the development and quick

changes in new communication tools and channels.

**Potential and trends**

The interest in saving energy and generating energy from renewable energy sources is increasing in our target groups, which gives grounds for implementing a number of good initiatives. Communication plays a key role, both

in informing about existing opportunities and stimulating to actual action and change.

**Ambitions and strategy**

Communications is given a strengthened role in Enova's business strategy for 2011-2014, with the ambition for Enova to become "a more distinctive and significant Enova".



## IN SHORT

BÅRD BJERKAKER  
Chief Communication Officer

**What was your department's most important achievement in 2010?**

Through important analyses and work on a new communication platform, we have facilitated the fulfilment of high ambitions regarding increased familiarity and knowledge and strengthened public relations for the company.

**What posed the biggest challenge in 2010?**

We have experienced increased pressure from the media and our surroundings. Wind power support, the Office of the Auditor General report and notification vis-à-vis EFTA Surveillance Authority (ESA) have been issues that have greatly involved the department, and which have been challenging as regards communication expertise.

**What has been most gratifying for you, as chief communication officer, in 2010?**

The significant attention and involvement surrounding Enova and our important task. It is clear that Enova has strengthened its position as an important public policy instrument in energy and climate issues, and there are high expectations.

**What ambitions do you have for 2011?**

Continuing to build Enova's public relations by delivering communication work that is targeted, effective and of a high professional standard. In this way we can contribute to making Enova a more distinctive and significant driving force in the work to promote environmentally friendly energy restructuring in Norway.

## Communication and Public Relations FACTS 2010

Number of Ask Enova inquiries:	48 681
Number of page views on Enova's website:	3 383 838
Number of registered media mentions:	4 587
Number of press releases:	45
Number of marketing campaigns:	5



New built environment programmes with a clear passive house focus were launched. Here is an example of an ad used by Enova.

## Natural gas:

# Faster development of infrastructure for natural gas

Enova manages funds appropriated via the fiscal budget which are earmarked for the Support Programme for Natural Gas Infrastructure. The purpose of the programme is to facilitate increased use of natural gas domestically, with particular emphasis on environmentally beneficial use of natural gas. Conversion from heavier fuels in industry, shipping and transport are prioritised market areas.

## Barriers and goals

A large part of the potential for conversion to natural gas from fuel oil within industry, shipping and transport must take place through application of LNG (Liquefied Natural Gas). Since transport must take place using tankers and tank lorries, a great number of reception and storage facilities must be established for LNG at industrial sites along the coast. The support programme is designed particularly for such facilities, and in the period from 2004 to 2010 Enova has taken part in financing eight facilities. Today they make a good starting point for an efficient and safe distribution system. In addition, natural gas companies and other players have built similar facilities without support from Enova. Development of infrastructure is expected to continue in line with the demand for natural gas.

## Important events in 2010

Naturgass Møre started production at its LNG plant in Bingsa at Ålesund in Møre og Romsdal County in 2010, and Barents Naturgass has, along with the owners of the LNG plant on Melkøya, established a facility for tapping LNG for local consumption in Finnmark

County. In total, the two facilities have received about MNOK 14 in support from Enova. Both projects have been completed in accordance with the agreed plan. Only one new agreement was entered into in 2010. Naturgass Møre is planning to lay a subsea pipeline for natural gas from Bingsa at Ålesund to industrial customers on Ellingsøya, and Enova will cover part of the investment.

## Interest and activity related to the Natural Gas Programme

The number of tenders for natural gas projects has been low in 2009 and 2010. We assume this is related to the financial crisis and low activity and investment plans in Norwegian industry. During the course of the year, two projects that were previously granted support through Enova's scheme were cancelled, and a third project was reduced in scope. The changes show that the activity level is reduced, but we expect this to be transitory.

The support programme has contributed to a quicker development of infrastructure for natural gas, and in some cases, the sizes of the facilities have increased. The access to natural gas is thus improved, and the industry's interest in using gas has increased. Positive operation experience has also created increased demand. The programme is organized in accordance with the guidelines that apply for "Public Service Obligations" (PSOs). Enova has developed a general draft for the design of LNG reception and storage facilities, customised to the designated service obligations and Norwegian conditions. This has

contributed to establishing an efficient and commercially viable logistics chain for natural gas in Norway.

## Potential and trends

A potential of more than 10 TWh has been mapped for conversion to natural gas from fuel oil in industry, shipping and transport. It is expected that natural gas will be used more widely, in particular within shipping. Several ferries, the Norwegian Coast Guard and supply ships already use LNG. Natural gas will also be a suitable fuel in the transition phase until biogas becomes accessible in sufficient amounts for bus transport and other heavier motor vehicles. A developed infrastructure for natural gas could also have great significance as regards producing and distributing biogas.

## Ambitions and strategy

MNOK 26 was allocated to the Natural Gas Programme in 2010, but this allocation was revoked in the revised budget. However, due to un-allocated funds that were transferred from 2009 to 2010, the financial frame for the programme was still satisfactory. No funds have been allocated for 2011, but the transferred funds are sufficient to continue the programme. The number of tenders for projects in 2011 is expected to be better than in the two previous years, and will provide important signals regarding the need for any continuation beyond 2011.

## The household subsidy programme

Enova has managed a subsidy programme for alternative heating and energy savings in households since 2006. Funds for the household subsidy programme are allocated directly in the national budget and are therefore not part of the Energy Fund. The programme is an important policy instrument for developing markets for future-oriented solutions for heating and energy efficiency. You can read more about the household subsidy programme in the description and reporting on activities for the Residential Buildings Unit.

## Municipality courses

Planning and implementation of municipality courses are financed with funds from the Ministry of Local Government and Regional Development (KRD). Remaining funds from the original assignment in 2007, with the title "Energy and climate planning in the municipality", were transferred to a new series of courses starting in November 2010. The new series of courses focuses on expertise enhancement, advising and information on energy efficiency and operation of municipal buildings. The course series is called "Energy-efficient buildings for the future" and approx. 30 courses are planned for the period 2010–2012.

## The Low Energy Programme

The Low Energy Programme is a co-operation between the Government and the construction industry with the purpose of achieving energy efficiency in the building sector and an environmentally friendly restructuring of energy use. The participants in the programme, other than Enova, are the

Federation of Norwegian Construction Industries, Norwegian architecture firms, the Norwegian Housing Bank, the National Office of Building Technology and Administration, the Norwegian Water Resources and Energy Directorate and the Directorate of Public Construction and Property.

The purpose of the Low Energy Programme is to contribute to improving energy efficiency in buildings and facilities and to ensure environmentally-friendly conversion to renewable energy sources. There is a need to increase expertise throughout the entire construction industry, from engineers to construction workers. This is necessary to enable the construction industry to design and build energy efficient and robust buildings for the future. In the past year, the programme has therefore had activity related to knowledge development and dissemination of expertise. The main target group of the Low Energy Programme encompasses the various stakeholders in the construction industry.

## Intelligent Energy Europe (IEE)

Since 2003, Enova has been the National Contact Point representing Norway in EU's non-technological programme Intelligent Energy Europe on behalf of the Ministry of Petroleum and Energy (MPE). Some of the projects in IEE are not covered by the mandate in the Energy Fund. In this case, Enova is given the opportunity to allocate pre-project support (FPS) and national co-funding (NMF) with funds granted directly via the national budget. More information on these projects and the IEE programme is given in the description and reporting under International activities.

## Energy Technology Data Exchange (ETDE)

The Energy Technology Data Exchange (ETDE) is the IEA's multinational information programme. The MPE designated Enova to be the Norwegian contractual party in the ETDE agreement, and Enova acts as a Norwegian representative in ETDE's Executive Committee (ExCo).

The ETDE concerns collecting and making energy-related literature accessible in a suitable manner. ETDEWEB is the world's largest energy database, with more than 4 million references to energy-technical topics, ranging from books, journals, websites and so on; several of these are available in their entirety.

Enova is responsible for following up and funding work related to maintenance and operation of the ETDE database on behalf of Norway. Astrid Gudmundseth Bibliotekjenester (AGB) has been hired by Enova to perform maintenance and operation of ETDE's Norwegian database. In 2010, 670 new documents and 863 new users were registered in Norway. There have been more than 13,000 Norwegian log-ins to the database. The allocation of MNOK 1.7 over the national budget has been used in its entirety.

PART 3

# Results and activities

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# Enova's objective and main goals

Our activities related to the management of the resources from the Energy Fund is stated in the agreement with our owner, the Ministry of Petroleum and Energy (MPE). This agreement, together with an annual award letter, governs our activities. The applicable agreement is for the period 1 June 2008 to 31 December 2011. Enova's objective and main goals are stated in the agreement with the MPE. Enova's Annual Report communicates our work and future strategy to fulfil our objective and reach our goals, and the results that have been achieved so far.

Our primary objective is to promote an environmentally friendly restructuring of energy end-use and energy production. The energy restructuring is a long-term commitment to develop markets for efficient and environmentally friendly energy solutions that contribute to strengthen the security of supply and reduce the emissions of greenhouse gases.

Three of the main goals focus on what we will achieve: More efficient use of energy; increased use of other energy carriers than electricity, natural gas and fuel oil for heating; increased production from renewable energy sources. These three main goals cover the areas where it's natural to report on quantifiable energy results.

The other three main goals indicate how Enova will work: Introduction and development of new technologies and solutions in the energy market; well-functioning markets for efficient and environmentally friendly energy solutions; enhanced general knowledge about the possibilities for using efficient, environmentally friendly energy solutions. It is more appropriate to use other measurement units than kWh to measure progress in reaching these goals.

## **Main goal 1:** **More efficient use of energy**

Enova's programmes and activities within industry, buildings and residences will stimulate the market to utilize more energy-efficient solutions, and introduce new solutions in the market. Over the course of 2010, Enova's building programmes were revised and the focus was directed at the innovators in the market to a greater extent, including a focus on passive houses. Not all effects of our programmes and activities are measured and reported as quantitative results, but of what we report on, 259 projects within the construction and industry sectors were supported in 2010, with an overall energy result of 920 GWh.

## **Main goal 2:** **Increased use of energy carriers other than electricity, natural gas and fuel oil for heating**

The background for this main goal is both to increase the security of electricity supply by reducing demand, as well as reducing the direct emissions of greenhouse gases by converting from fossil to renewable energy sources. In 2010, Enova supported 160 projects that, overall, will deliver 926 GWh of renewable heating. In addition, we have provided support for projects aimed at conversion to renewable heating in buildings and to bio-boilers in industrial applications equivalent to about 208 GWh in 2010.

## **Main goal 3:** **Increased production from renewable energy sources**

Ever since Enova was established, we have had specific goals for increased production of renewable power and improved access to renewable heating from hydronic systems. For the entire period from 2001 to the end of 2010, Enova has supported more than 2 TWh of renewable power production, as well as renewable heating projects with an overall energy result of well over 6 TWh.

## **Main goal 4:** **Introduction and development of new technologies and solutions in the energy market**

An important precondition for exploiting the substantial resources found e.g. within renewable power production, is that the technology to exploit these resources is established, and gradually also becomes competitive. Enova has a specific programme aimed at demonstration of new technology. In 2010, a new programme was also set up for marine power production, and this programme provided funding for two demonstration projects in the field of tidal power. Through providing support and advice for demonstration of new technology and for prototype buildings, Enova promotes the introduction and development of new technologies and efficient and environmentally friendly solutions in the fields of energy production and energy efficiency.

## **Main goal 5:** **Well functioning markets for efficient and environmentally friendly energy solutions.**

One of the main challenges is turning the efficient, environmentally friendly solutions into the preferred alternatives in the market. This means lifting the solutions from niche products that need support into being competitive, preferred products. Enova uses several policy instruments to address this challenge. On the one hand, we increase demand through support programmes which, over time, will reduce costs and make the good solutions more competitive. On the other hand we strive at making consumers more aware of the good solutions already available in the market through programmes such as *Enova Recommends*.

## **Main goal 6:** **More general knowledge about the possibilities for using efficient, environmentally friendly energy solutions.**

Enova works systematically and with dedication to promote communication measures that have an impact on changing attitudes and behaviour in accordance with the objective of an environmentally friendly restructuring of energy end-use and energy production. We will give advice, raise awareness regarding environmentally friendly energy solutions, point out opportunities and trigger action. This work is aimed at both households and the professional market within industry, buildings and production of environmentally friendly heating and power. We have a nationwide information and advisory service which serves the general public through telephone, e-mail and chat.



# Targets and results

Enova has an overarching energy target of 18 TWh by the end of 2011. At the end of 2010, Enova had an overall energy result of 15.5 TWh for the period 2001–2010.

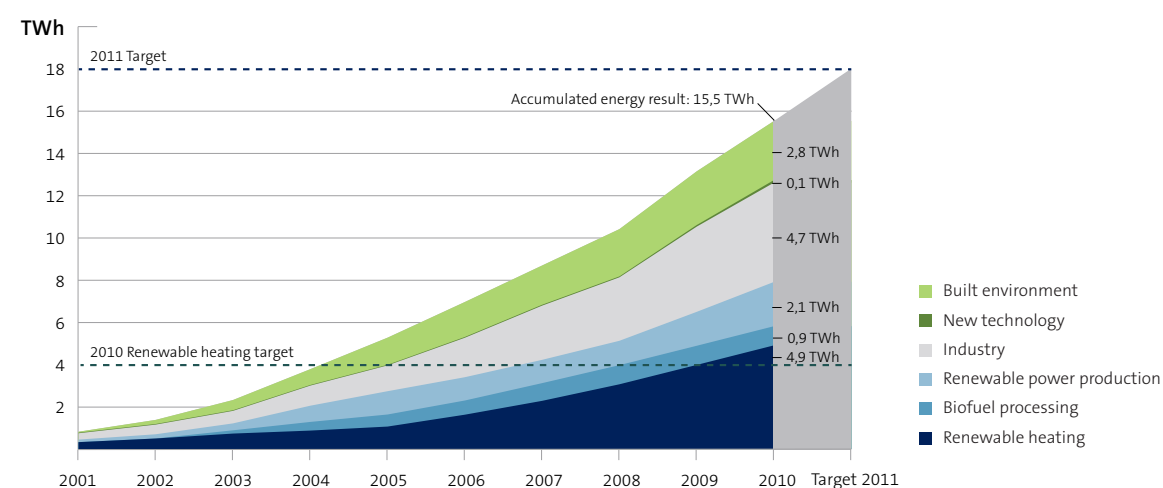
Implementing energy projects takes time, and the projects deliver results for many years following the project's implementation. It could take more than five years to implement major projects, and many of the measures will provide energy results for more than 20 years after that. When we agree to support a project, the expected annual energy result from the project is contracted – called the contractual energy result. About two-thirds of our overall energy result at the end of 2010 consists of contractual results, related to ongoing projects. When a project has been implemented, a new assessment is made of the annual energy result expected from the project. This new estimate is called the final reported energy result. As each project is carried out, we update the energy result with the updated estimates. 5.8 TWh (37 per cent) of the total energy result is from completed projects.

Figure 12 shows the development in accumulated energy results since 2001, divided between market areas. The graph shows that the growth has decreased somewhat in 2010 compared with the 2009 record year, but the overall result is still significant. Our overall energy result amounts to approximately 10 per cent of the stationary energy end-use in Norway.<sup>1</sup>

The overarching result target in the agreement with the Ministry of Petroleum and Energy (MPE) is an energy result of 18 TWh by the end of 2011. We consider it challenging to reach 18 TWh by the end of 2011. The general tendency is that it is becoming increasingly expensive to trigger an extra kWh in energy results. We must also assume that some of the supported projects will be cancelled and thus reduce the energy results. At the same time, studies confirm that there are large potentials to work with. External framework conditions play a role, and increasing energy prices will be a factor contributing to trigger new projects.

In addition to the general result target, a technology-specific result target has been set for the end of 2010: A minimum of 4 TWh increased access to heating from hydronic heating systems based on renewable energy sources, heat pumps and waste heat. This target has been achieved. If we sum up all the heating projects in our portfolio, we have delivered an overall result of 6.4 TWh of renewable heating at the end of 2010.

FIGURE 12 ENERGY RESULTS AND TARGETS



The figure shows accumulated contractual energy results, sorted by market areas and compared with the energy targets stated in the agreement with the MPE for 2011.<sup>2</sup>

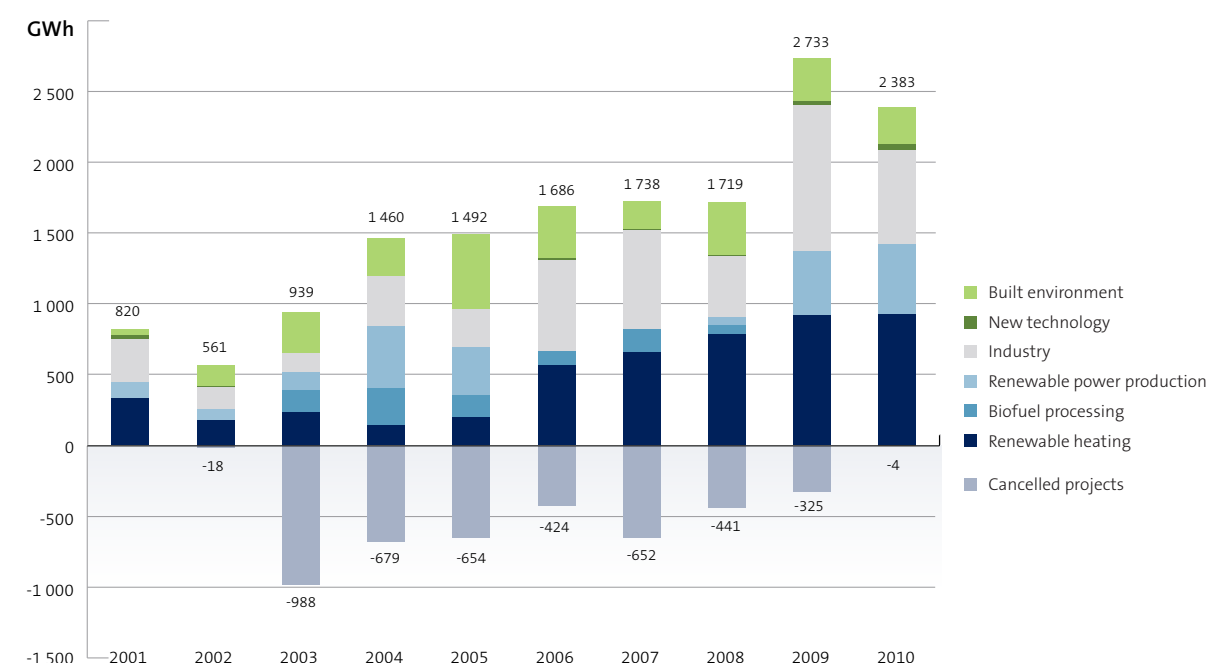
<sup>1</sup> Source: Statistics Norway, the energy balance 1998–2009, net domestic end-use excl. raw materials and transport, <http://www.ssb.no/emner/01/03/10/energiregn/tab-2010-11-25-17.html>  
<sup>2</sup> Enova's management of the Energy Fund is governed through an agreement with the Ministry of Petroleum and Energy. The agreement states result targets for the period 1 June 2008 to 31 December 2011. Cancellations in 2011 will reduce the overall energy result, and as a consequence increase the remaining contractual energy result required to reach the overarching target of 18 TWh by the end of 2011.

In 2010, contracts that yielded an overall energy result of 2 387.6 GWh were entered into. Of these, 4.2 GWh were cancelled in 2010, bringing the net energy result for new signed contracts in 2010 to 2 383.4 GWh. This is the second largest annual energy result we have presented so far.

The energy result for 2010 is 21 per cent below the result from 2009, in which Enova received an extraordinary transfer to the Energy Fund through the Government's Stimulus Package in connection with the financial crisis (here also referred to as the Stimulus Package). The allocated funds in 2010 were 27 per cent less than in 2009. All areas have delivered improved energy results per NOK of support in 2010 compared with 2009. The trend, however, is that an increasing amount of support is required to trigger extra kWhs of energy results. The funding level and Stimulus Package are discussed later in the report.

Figure 13 shows the energy results for every year, as well as the market areas' percentage of the energy results. The figure also shows the deductions due to cancelled projects.

FIGURE 13 CONTRACTUAL ENERGY RESULTS



The figure shows contractual energy results from contracts signed during the period from 2001 to 2010, sorted by the year in which the contracts were signed. The figure shows how cancellation of contracts affects the net annual energy results. Overall, the bar shows the gross energy result for the respective years. Each year, cancellations contribute to an accumulated deduction (equivalent to the negative sections of the bars) from Enova's net energy result (equivalent to the positive section of the bars). The numbers are corrected to reflect changes in the energy result in projects that have submitted final reports.

The Renewable Heating Unit contributed with the greatest interim result in 2010, in total 926 GWh. This interim result amounts to 39 per cent of our overall net energy result for 2010. The interim result is 7 per cent below the unit's result in 2009. District heating has now been initiated in most large cities, and the unit therefore expects smaller projects in the time ahead. The overall market potential is still considered to be large, even though a higher number of applications is necessary to maintain results on par with the past two years.

The Industry Unit's interim result of 665 GWh is the second largest, and amounts to 28 per cent of Enova's overall energy result for 2010. However, the interim result is only about half of what it was in 2009. This could partly be a result of the industry's hesitation concerning new efforts and investments after the financial uncertainty, and the companies seem to have primarily consolidated their positions in 2010.

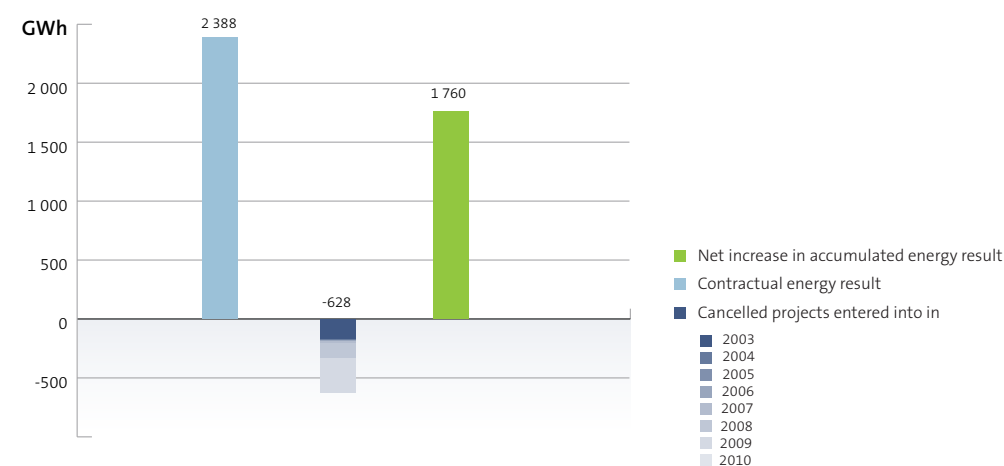
The Commercial Buildings Unit and the Public Buildings Unit delivered an overall interim result of 255 GWh. This is a reduction from previous years. The number of projects funded is on level with the number for 2009, which indicates that the projects have become smaller on average. The two building-related units have introduced new investment support programmes, with clearer support rates and requirements related to high ambition levels through efforts within passive houses. We expect increased results in the future as a result of these measures.

In the Renewable Power Production Unit, contracts were signed for four wind power projects representing 491 GWh. This is 8 per cent higher than the result for 2009. We are not planning to support more wind power projects, due to the transition to a joint electricity certificate market for Norway and Sweden which will enter into force in 2012.

Some projects are not carried out as initially planned. We allocate support to the most cost-effective projects, while the support also functions as a trigger for initiating the projects. There is still a risk that projects will not be carried out if other conditions develop unfavourably. There is therefore always a delicate balance as regards selecting which projects to fund, between taking a risk and choosing ambitious projects to achieve the most possible kilowatt-hours, or selecting robust projects with applicants that ensure necessary ability to execute. While the number of new contracts signed depends on the available budget frames and Enova's effort, we have little influence as regards projects being cancelled after the funding commitment has been given.

Over the course of 2010, cancelled contracts amounted to 628 GWh. As the same period also contracted 2 388 GWh in new contracts, this results in a net increase of the energy result by 1 760 GWh from 2009 to 2010 (see Figure 14).

FIGURE 14 ENERGY RESULT 2010 (GROSS AND NET)

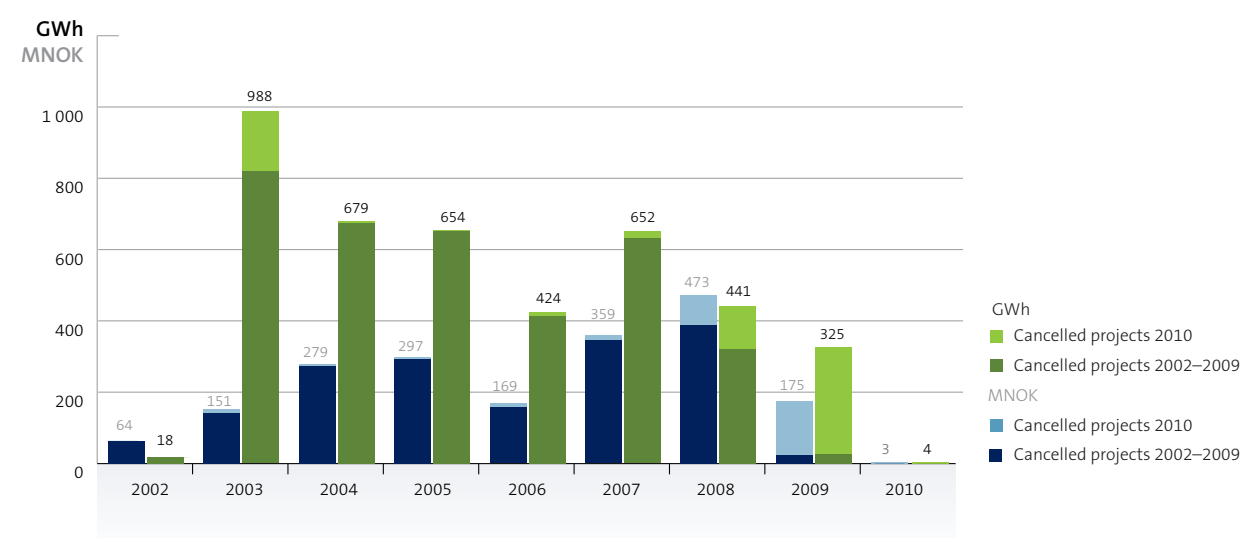


The figure shows a comparison of gross contractual energy result in 2010, cancelled energy result occurring in 2010, and the resulting net anticipated energy result. The net anticipated energy result is the same as the net annual contribution to the accumulated contractual energy result.

The reduction in energy results as a consequence of cancellations registered in 2010 is relatively low compared with the size of the portfolio of active projects. The degree of cancellation (measured as the interim cancelled energy result divided by the total energy result of active projects) has fallen from 11.8 per cent in 2009 to 7.3 per cent in 2010. Historically, the degree of cancellation has been around 10 per cent. If this lower degree of cancellation is maintained through an increase in completed projects, it will contribute to a stronger growth in results in the years ahead.

Cancelled contracts are deducted from the energy result for the year when the contract was originally signed and reported. Figure 15 shows how negative energy results as a consequence of cancelled contracts in 2010, is distributed as negative results back in time, along with cancellations from earlier years. Figure 15 also shows which associated funds are returned associated to the cancellations. Experience shows that money is not lost through cancellations. Our agreed support for these projects is returned to the Energy Fund, and is recycled to new projects.

FIGURE 15 CANCELLED PROJECTS



The figure shows the development in deducted energy results and associated returned funds linked to suspended and cancelled projects, sorted by year of the original contract signing. Cancellations reported during 2010 are highlighted.<sup>3</sup>

A cancellation level that is too low could be a potential warning signal that we are over-compensating the projects. We expect some projects to be cancelled, and we are satisfied with the current level.

<sup>3</sup> The year refers to the year a project is contracted, and does not necessarily indicate anything regarding when the cancellation of the project is registered. Therefore, the figures will not be directly comparable from year to year.

Table 2 shows the contractual energy result, and contractual energy result corrected for the final reported energy result from completed projects. Final reports were submitted for approximately 650 GWh over the course of 2010. At the end of 2010, the overall energy result for completed projects was approximately 5.8 TWh, corresponding to 37 per cent of our total energy result. The percentage of final reported projects is on par with the level at the end of 2009.

TABLE 2 ENERGY RESULTS DIVIDED BETWEEN UNITS AND YEARS

Unit	2001–2007	2008	2009	2010	Total contractual	Contractual, corrected for final reported result
	GWh	GWh	GWh	GWh	GWh	GWh
Renewable Heating	2 340	782	916	926	4 964	4 907
Biofuel Processing	831	60	-	-	891	906
Renewable Power Production	1 115	50	453	491	2 108	2 095
Industry	2 527	438	1 029	665	4 659	4 697
New Technology	76	3	32	47	159	122
Commercial Buildings	1 792	380	302	214	2 688	2 754
Public Buildings	-	-	-	41	41	41
Residential Buildings	10	-	-	-	10	10
<b>Total contractual</b>	<b>8 692</b>	<b>1 713</b>	<b>2 732</b>	<b>2 383</b>	<b>15 521</b>	-
<b>Contractual corrected for final reported result</b>	<b>8 696</b>	<b>1 719</b>	<b>2 733</b>	<b>2 383</b>	-	<b>15 532</b>

The table shows the contractual energy result in GWh divided between units and years, both before and after being corrected for final reported energy results from completed projects.<sup>4</sup>

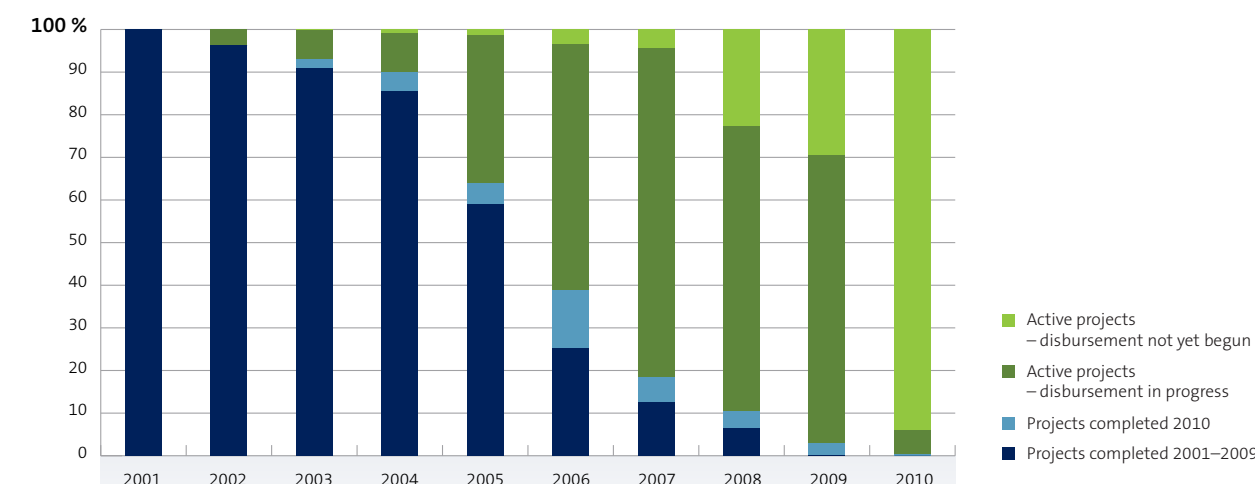
Table 2 shows that, at the aggregated level, there is very little deviation between the energy result expected before a project is started (contractual energy result) and at project completion (final reported energy result). This indicates that projects are mainly carried out as planned, with regard to the energy result that will be achieved. In those cases where a project changes considerably during the project period, the project is subject to a reassessment. In such cases it could be relevant to cancel the original project, after which the new revised project will be re-applied for.

<sup>4</sup> The 2001 projects were supported by the Norwegian Water Resources and Energy Directorate (NVE), and have since been followed up by Enova. Enova's agreement with the MPE, confirms that Enova can tally the results from these projects, which have an overall energy result of 820 GWh. These are divided among the various units and are tallied along with Enova's other energy results.

152 GWh of the Industry unit's energy results during the period 2001–2007 is from projects that have not been formalized in the form of contracts. The year refers to the year a project is contracted, and does not necessarily indicate when the project results are realized in the form of kWh.

Contractual results for the individual year will change from year to year due to cancelled/suspended projects and other changes. This means that the figures in the table are not necessarily the same as reported in Enova's result report for the previous years.

FIGURE 16 PERCENTAGE OF COMPLETED PROJECTS



The figure shows the percentage of final reported and active projects at the end of 2010, distributed by the year the contract was entered into. The percentage of the active projects where disbursement has begun is specifically stated.

Figure 16 shows that the percentage of final reported projects increases over time. The figure also distinguishes between active projects where disbursement has begun and active projects where disbursement has not begun. For most projects, some time elapses from when a contract is signed between Enova and the project owner until an investment decision is made and the project is initiated. In this period, the project's content, cost and results from the application are yet again assessed. In some cases, projects could be postponed or cancelled. The risk of a project being cancelled is regarded as being significantly lower when disbursement of support has begun.

About three-fourths of the total energy results are associated with projects that either have a final report or where disbursement of support has begun. For projects that were allocated support before 2010, as much as 90 per cent of the energy results have either been final reported or are related to started projects where disbursement has begun. Please note that cancellations also affect the percentage of final reported projects.

Cancellations reduce the total in the relevant year, and the percentage of final reported projects thus increases, regardless of whether new projects are finalized.

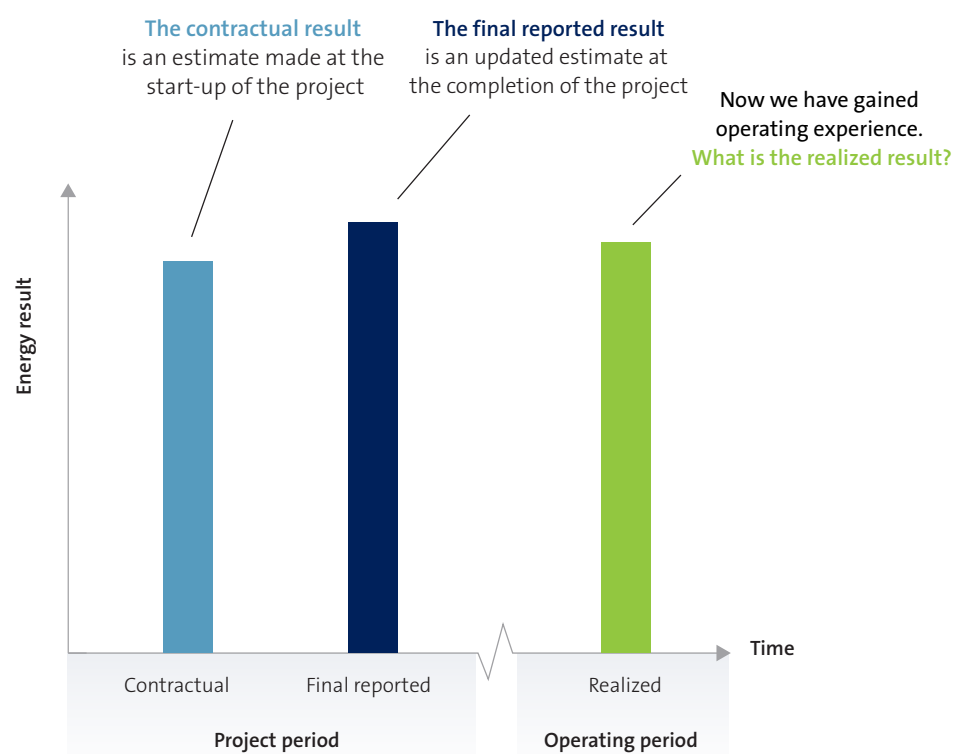
Our support should help trigger other financing. At the same time, it is important that we do not unnecessarily tie up funds in "sleeping" projects. Therefore, Enova actively follows up projects in relation to agreed progress and completion, with a view towards releasing previously reserved funds to support new activity.

<sup>5</sup> Percentages are measured in contractual energy results, corrected for final reported projects.

<sup>6</sup> Support from Enova is disbursed in arrears. This means that projects could be initiated even though disbursement of support has not begun.

Which results are finally realized depends on several factors – for example energy prices and market development. There is a long time perspective from the project application phase to harvesting results after project implementation. We are working on measuring realized energy results a few years after the projects are completed. At the same time, Enova is so young that relatively few supported projects have had multiple years of operation after final reporting. The basis of numbers we have is too thin to report realized results. We are aiming at reporting realized results in future result and activity reports.

FIGURE 17 CONTRACTUAL, FINAL REPORTED AND REALIZED ENERGY RESULTS – AN ILLUSTRATION



The figure shows an example of terminology for energy results at different stages in a project's lifetime.

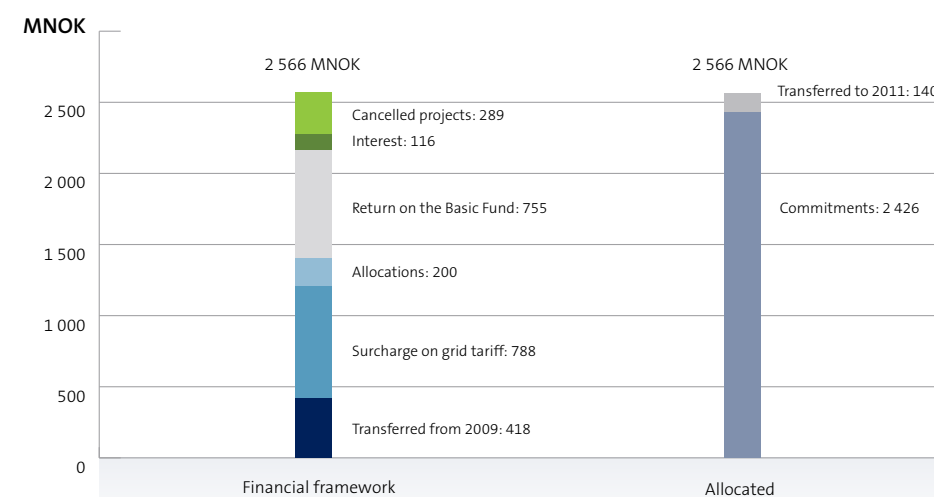
## Management of funds

At the turn of the year, MNOK 5 350 in the Energy Fund was tied to a portfolio of 1 656 active projects. We have a total of 3 912 projects in the portfolio including final reported projects.<sup>7</sup>

In 2010, Enova had MNOK 2 566 in funding at its disposal. This is the second largest financial framework Enova has managed this far. Compared with 2009, the financial framework has been reduced by 32 per cent. The difference is due to last year's extraordinary transfer to the Energy Fund of MNOK 1 190 through the Stimulus Package. Enova transferred funds from 2009 to 2010 corresponding to MNOK 418, and the reduction in assumed obligations in 2010 is less than the reduction in financial framework. The opportunity provided by the Energy Fund to transfer unused funds to subsequent years gives us the flexibility to exploit market trends, and trigger the greatest possible energy results over time.

The surcharge on the grid tariff was the main source of income for the Energy Fund, amounting to a contribution of MNOK 758 in 2010. The return on the Basic Fund for renewable energy supplied resources to the Energy Fund amounting to MNOK 755 in 2010. Funds were also returned as a result of cancellations, corresponding to MNOK 289.

FIGURE 18 FINANCIAL FRAMEWORK FOR THE ENERGY FUND IN 2010



The figure shows the Energy Fund's various income sources along with the disposition<sup>8</sup> of these.

Since Enova disburses the support in arrears as a percentage of the project's accrued costs, the support granted to projects that are later cancelled has not actually been disbursed, but is made available for new projects.

Table 3 shows the disposition of resources in the Energy Fund and total energy results at the end of 2010, sorted by unit and year. The basis for this table is the year when the disposition of the funds was made, not the year the financial framework was awarded. Accordingly, the values will change retroactively in the event of cancellations, and result in a transfer of funds between years.

<sup>7</sup> Cancelled projects are not included in the total number of projects.

<sup>8</sup> Gross liabilities in 2010 (including projects that were both approved and cancelled within the same year).



TABELL 3 THE ENERGY FUND'S ENERGY RESULTS AND ALLOCATIONS 2001–2010

	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		Total	
	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK
Renewable Heating	-	-	173	49	233	31	141	71	191	68	562	288	655	288	782	409	917	740	926	544	4 579	2 489
Biofuel Processing	-	-	-	-	154	3	255	14	162	6	100	4	167	5	67	3	-	2	-	-	906	38
Renewable Power Production	-	-	80	35	127	27	441	186	334	137	-	-	-	-	50	93	453	1 068	491	978	1 975	2 524
Industry	-	-	157	20	136	16	359	56	269	39	647	128	698	171	437	114	1 029	499	665	298	4 397	1 342
New Technology	-	-	1	19	-	-	-	9	-	2	8	7	4	71	2	16	32	90	47	201	94	415
Commercial Buildings	-	-	150	58	290	66	264	72	536	119	369	105	203	75	380	143	303	535	214	128	2 710	1 300
Public Buildings	-	-	-	-	-	-	-	-	-	2	-	6	-	6	-	16	-	22	41	52	41	103
Residential Buildings	-	-	-	-	-	12	-	12	-	14	-	36	10	45	-	59	-	62	-	75	10	315
Strategy, analyses and development	-	-	-	7	-	7	-	6	-	6	-	9	-	13	-	10	-	9	-	18	-	85
International activities	-	-	-	7	-	7	-	7	-	12	-	12	-	7	-	5	-	10	-	10	-	77
Communication and public affairs	-	-	-	113	-	40	-	26	-	47	-	19	-	21	-	45	-	26	-	25	-	362
Administration	-	-	-	42	-	36	-	41	-	45	-	47	-	61	-	75	-	100	-	93	-	540
NVE contracts (2001)	820	385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	820	385
<b>Total</b>	<b>820</b>	<b>385</b>	<b>561</b>	<b>350</b>	<b>939</b>	<b>245</b>	<b>1 460</b>	<b>500</b>	<b>1 492</b>	<b>498</b>	<b>1 686</b>	<b>661</b>	<b>1 738</b>	<b>763</b>	<b>1 719</b>	<b>987</b>	<b>2 733</b>	<b>3 163</b>	<b>2 383</b>	<b>2 423</b>	<b>15 532</b>	<b>9 973</b>

The table shows aggregated energy results and resources<sup>9</sup> from the Energy Fund from 2001<sup>10</sup>–2010, corrected for cancelled and final reported projects as of 31 December 2010.

We have allocated about MNOK 2 200 in support to energy projects in 2010. The total investments triggered in these projects amount to about MNOK 8 000. The percentage of support provided by Enova varies from project to project. With building and heating projects, the support amounts to less than 20 per cent of the projects' total investments. On the other hand, the support for projects within renewable power production and new technology amounts to nearly half of the investments.

The application inflow in 2010 was good compared with previous years, but considerably lower than in 2009 when we had an extremely high inflow of applications due to the Stimulus Package. We processed 535 applications in 2010. Historically, we have processed in excess of 300 applications per year, while we processed over 1 100 applications in 2009, of which nearly 800 were applications to the extraordinary programmes established as a result of the Stimulus Package.

<sup>9</sup> Total resources allocated per unit.

<sup>10</sup> The NVE results are not included at the unit level, as the funds from these projects have not been divided between units.

<sup>11</sup> Two applications were allocated support within the IEE programmes with resources outside the Energy Fund in 2010. The overall funding commitment for these was about MNOK 0.4, for pre-project support and national co-funding.

TABELL 4 THE ENERGY FUND 2010 – OVERVIEW OF APPLICATIONS PROCESSING ACTIVITIES

	Number of applications received	No. of applications processed	No. of projects supported	Contractual support	Contractual energy result
	stk	stk	stk	MNOK	GWh
<b>Renewable Heating</b>	<b>172</b>	<b>217</b>	<b>160</b>	<b>541</b>	<b>926</b>
District Heating - New Establishment	27	33	21	303	560
District Heating - Infrastructure	14	22	17	88	131
Small Heating Plants	120	151	115	55	71
Biogas Production	11	11	7	95	163
<b>Renewable Power Production</b>	<b>9</b>	<b>9</b>	<b>4</b>	<b>978</b>	<b>491</b>
Investment Support for Wind Power Projects	9	9	4	978	491
<b>Industry</b>	<b>35</b>	<b>35</b>	<b>30</b>	<b>298</b>	<b>665</b>
Energy End-Use Industry	35	35	30	298	665
<b>New Technology</b>	<b>13</b>	<b>13</b>	<b>5</b>	<b>201</b>	<b>47</b>
Introduction of New Technology	12	12	4	64	27
Renewable Marine Power Production	1	1	1	137	20
<b>Commercial Buildings</b>	<b>119</b>	<b>84</b>	<b>78</b>	<b>119</b>	<b>214</b>
Investment support for the Built Environment (Programme phased out in June 2010)	31	32	31	78	168
Investment support for Passive Houses and Low-Energy Buildings (New! July 2010)	26	14	12	15	5
Investment Support for Existing Buildings and Outdoor Facilities (New! July 2010)	32	18	17	25	41
Support for Passive House Feasibility Studies (New! July 2010)	30	20	18	1	-
<b>Public Buildings</b>	<b>174</b>	<b>160</b>	<b>151</b>	<b>52</b>	<b>41</b>
Investment Support for the Built Environment (Programme phased out in June 2010)	21	24	17	18	25
Investment support for Passive Houses and Low-Energy Buildings (New! July 2010)	14	9	9	13	4
Investment Support for Existing Buildings and Outdoor Facilities (New! July 2010)	20	7	6	8	12
Support for Passive House Feasibility Studies (New! July 2010)	14	6	6	0,3	-
Support to Energy and Climate Plans (Programme phased out in June 2010)	81	91	90	11	-
Pre-project Support - Improving Energy Efficiency and Conversion in Buildings and Outdoor Facilities	14	15	15	1	-
Pre-project Support - Heating and infrastructure	10	8	8	1	-
<b>International activities<sup>11</sup></b>	<b>18</b>	<b>18</b>	<b>12</b>	<b>3,3</b>	<b>-</b>
IEE II Pre-project Support	11	11	6	0,6	-
IEE II National Co-Funding	7	7	6	2,7	-
<b>Total</b>	<b>536</b>	<b>532</b>	<b>440</b>	<b>2 192</b>	<b>2 383</b>

The table shows an overview of the number of applications received, processed (i.e. submitted for final approval or rejection), percentage of projects approved for support, as well as total funds awarded within programmes accepting applications and the associated energy results in 2010.

About 530 applications were received and submitted for decision regarding final approval or rejection. Some of the applications processed in 2010 were received the preceding year, and some applications that were submitted late in 2010 will be processed in 2011. In addition, some of the received applications are withdrawn by the applicant before processing as a result of changed plans, inadequate financing, or that the application does not fulfil the application criteria. In many cases, the applications also undergo a processing phase in which Enova contributes advice to enhance the project's quality and yield. In some of these cases the application is withdrawn, and worked on further until a new application can be submitted. Of the processed applications in 2010, 83 per cent received funding commitments. This is a record-high level.

There is considerable variation in the number of processed applications between the various market areas. The largest number of applications belongs to the units Renewable Heating, Commercial Buildings and Public Buildings. These areas comprise more than 85 per cent of processed and approved applications. Within the Industry and New Technology units, we must to a greater extent work actively to obtain and follow-up projects, so that each individual application is more work-intensive.

### The 2009 Government Stimulus Package

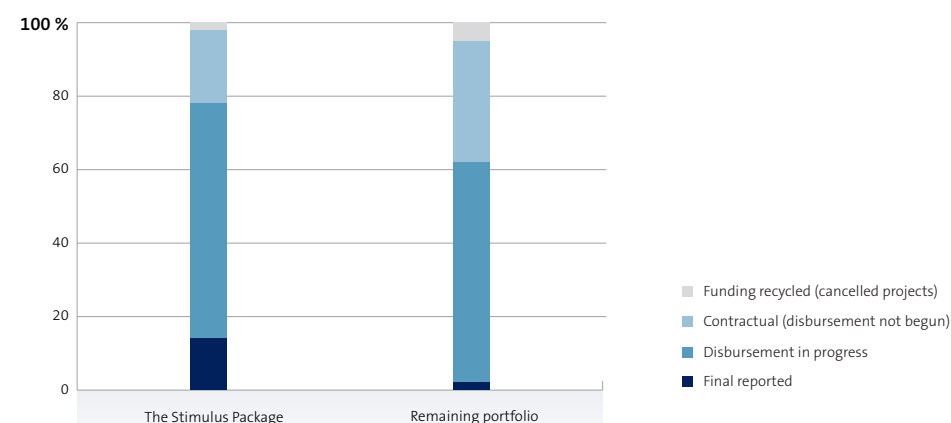
The Government Stimulus Package in connection with the financial crisis made 2009 a somewhat extraordinary year for Enova. The Government decided to carry out an extraordinary transfer to the Energy Fund of MNOK 1 190. The disposition of the stimulus funds is described in detail in the 2009 result and activity report. At the end of 2010, MNOK 489 out of MNOK 1 147 had been disbursed.

If we compare the Stimulus Package with the other project portfolio from 2009, we find the following main features:

- Considerably higher funding level (the funding level in the projects supported within the Stimulus Package is 1.48 NOK/kWh compared with 0.89 NOK/kWh in the remaining portfolio)
- Faster start-up (about 80 per cent of the projects supported within the Stimulus Package have received disbursement, compared with about 60 per cent in the remaining portfolio)
- Faster implementation (14 per cent of the projects supported within the Stimulus Package has been final reported compared with 2 per cent in the remaining portfolio)
- Fewer cancellations (2 per cent cancellation among projects supported within the Stimulus Package compared with 5 per cent in the remaining portfolio)

Figure 19 below compares the progress of projects in the Stimulus Package with the other projects supported in 2009. The comparison is based on the granted support.

FIGURE 19 PROGRESS IN STIMULUS PACKAGE SUPPORTED PROJECTS VS THE REMAINING PROJECT PORTFOLIO FOR 2009



The figure shows the distribution between cancelled, carried out (final reported) and active projects, for projects supported in 2009 within the Stimulus Package and for the remaining portfolio, respectively. Active projects where disbursement has begun are specifically stated. The percentages are measured by the granted support amount.

## Funding levels

Enova's support to projects measured in NOK/kWh varies over time and between the different market areas, in part because Enova is responsible for market development and offering programmes within all sectors, as well as the fact that the programmes' character and target groups change over time.

A comparison of funding level per contractual kWh over time within the same unit provides information on the development in support level needed to trigger a specific annual capacity of energy production or energy efficiency. It is assumed that the support from Enova triggers implementation of the project, without over-compensating. The level of cancellations indicates that we provide support to projects with marginal profitability that otherwise would not have been carried out. In cancelled projects, the support was not sufficient to ensure implementation. Our assessment is that the funding level triggers implementation of projects, and that this criterion is one of the reasons that the funding level is on the rise.

Projects within the various market areas can have very different properties. One important property, for example, is the expected number of years the projects will deliver energy results. The calculated funding level does not reflect how effective the allocation of the funds between the units is, if lifetime is not taken into consideration.

TABLE 5 FUNDING LEVELS

	Levetid	2002–2005		2006		2007		2008		2009		2010		2002–2010	
		Divided by contractual annual result	Lifetime-adjusted	Divided by contractual annual result	Lifetime-adjusted	Divided by contractual annual result	Lifetime-adjusted	Divided by contractual annual result	Lifetime-adjusted	Divided by contractual annual result	Lifetime-adjusted	Divided by contractual annual result	Lifetime-adjusted	Divided by contractual annual result	Lifetime-adjusted
		øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	øre/kWh	
Renewable Power Production	20 år	39	1,9	-	-	-	-	185	9,3	236	11,8	199	10,0	127	6,3
Renewable Heating	20 år	28	1,4	52	2,6	43	2,1	52	2,6	81	4,0	59	2,9	54	2,7
Industry	10 år	40	4,0	20	2,0	25	2,5	26	2,6	48	4,8	45	4,5	31	3,1
The Built environment	15 år	30	2,0	41	2,8	59	4,0	57	3,8	205	13,7	100	6,6	64	4,2
<b>Weighted average</b>		<b>28</b>	<b>2,0</b>	<b>36</b>	<b>2,2</b>	<b>37</b>	<b>2,3</b>	<b>50</b>	<b>3,0</b>	<b>108</b>	<b>6,6</b>	<b>89</b>	<b>5,2</b>	<b>59</b>	<b>3,4</b>

The table shows the funding level – both divided by contractual annual result,<sup>12</sup> as well as support divided by the overall energy result measured over the lifetime.<sup>13</sup> The results are corrected for cancelled projects.

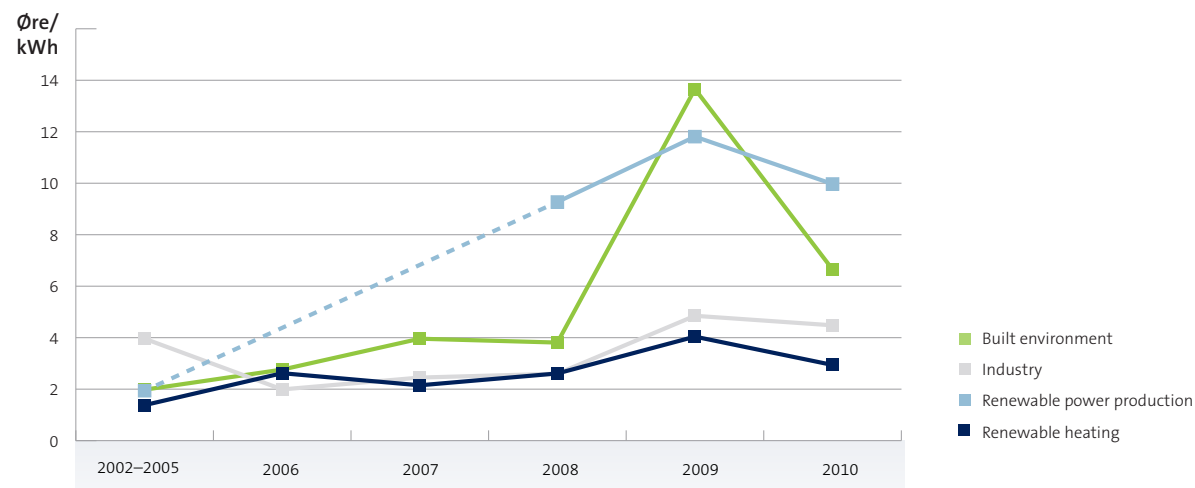
By correcting for the projects' lifetime, the energy result is standardised so that the costs between projects within different market areas become comparable. In Table 4 we see that the average funding level in 2010 for lifetime-adjusted energy results was 5.2 øre/kWh. Even though this is lower than in 2009, the trend is on the rise. 2009 was a special year, because the measures carried out as part of the Government Stimulus Package received a significantly higher percentage of support than normal. This was particularly evident in an increase of the funding level within measures aimed at energy end-use. New programmes were introduced in 2010. We are increasingly utilizing a wider policy apparatus as regards energy efficiency, which entails an increase in the measured funding level. In the Public Buildings Unit we have, for example, provided pre-project support and supported preparation of municipal energy and climate plans that do not yield direct energy results.

<sup>12</sup> The year refers to the year a project is contracted, and does not necessarily indicate when the project results will be realized in the form of kWh. Starting with 2006, relevant costs associated with training are included in each unit. This could mean that the cost level has increased from and including 2006.

<sup>13</sup> The lifetimes are estimates of the average lifetime of projects in Enova's portfolio. The lifetime-adjusted support amount per kWh is estimated by distributing the total support allocated within a unit by the contractual energy result multiplied by the lifetime. The average support amount is weighted by energy result per unit. The effect of the support on the projects' cash flow will depend on variables such as the discount factor, and this is not taken into consideration here.

Figure 20 shows that renewable heating and industrial projects have the least need for support, with less than 5 øre/kWh lifetime-adjusted. Wind power projects have the largest support need with 10 øre/kWh lifetime-adjusted.

FIGURE 20 DEVELOPMENT IN FUNDING LEVELS



The figure shows the development in the funding level measured over the lifetime in øre/kWh for projects within renewable heating, renewable power production, industry and the built environment.<sup>14</sup>

Support per contractual kWh is based on the individual project. In order to give a correct assessment of cost efficiency between the units, an assessment must be made of the overall effect of the programmes over time. This includes both direct and indirect effects of the programmes (dispersion effects). We work methodically to evaluate the overall effect of our programmes and activities. It is emphasized that neither the support level measured against the contractual energy result nor the energy result over the lifetime can be directly compared with a supposed funding level for, e.g., a certificate market. This is in part because the recipient's assessment of the value of the support in the future compared with the support today (discounting) is not taken into account in the calculation.

<sup>14</sup> No project support was allocated to renewable power in 2006. The allocation in 2007 has since been cancelled. We therefore have no supported projects for renewable power production from these years.

## Climate effect of Enova's work

Enova shall contribute to reduce greenhouse gas emissions. More efficient energy use is beneficial for the climate as it can contribute in reducing the use of fossil energy sources. In the same manner, generating power and heating from renewable energy sources is positive for the climate, since it can replace energy production from fossil energy sources.

Our work comprises both these positions. Some of the projects we support lead to direct emission reductions by reducing the consumption of fossil fuel. Reducing electricity use or increasing the production of renewable electricity can have an indirect climate impact as it will gradually allow us to phase out electricity generated from fossil energy sources.

The climate impact is indicated as estimated reductions in annual fuel oil consumption and estimated reductions in annual emissions of CO<sub>2</sub>. The impact on fuel oil consumption will differ among the various programme areas. The percentage of the energy result that yields fuel oil reductions is highest from the heating area. The heating projects replace heating from fuel oil, electricity and other types of energy. Customers may already have different alternatives for heating, which means that fuel oil consumption will vary from year to year. In order to gauge the impact on fuel oil consumption, we estimate that about half of the energy result from the renewable heating projects will replace fuel oil. Projects within the industry and building market target both heating and electricity-specific consumption. The reduction in fuel oil consumption will consistently be less from these areas. We have seen that each kWh of energy result within industry leads to an estimated reduction in fuel oil consumption of between 30 and 40 per cent. Projects within the built environment area are considered to yield a proportionately smaller reduction in fuel oil consumption, slightly more than 10 per cent.

Table 6 indicates estimated reductions in annual fuel oil consumption in Norway as a result of projects supported by Enova. For the period 2001 to 2010, we have supported projects which are expected to reduce fuel oil consumption by a total of 433 176 tonnes of oil. In 2010, Enova supported projects which are expected to reduce fuel oil consumption by a total of about 90 234 tonnes. The level of reduction of fuel oil consumption thereby remains high, mainly due to many fuel oil-related projects supported within industry.

TABLE 6 REDUCTION IN ANNUAL FUEL OIL CONSUMPTION

Reduction in annual fuel oil consumption	2008	2009	2010	2001-2010
	tonnes	tonnes	tonnes	tonnes
<b>Total tonnes of fuel oil</b>	<b>45 637</b>	<b>84 965</b>	<b>90 234</b>	<b>433 176</b>

The table shows the reduction in annual fuel oil consumption as a result of Enova's projects<sup>15</sup>.

The climate effect of Enova's projects is highly dependent on the assumptions used as a basis for the alternative power production. The climate effect also varies according to which energy carriers are affected by the projects. In Table 7 on the following page, this is illustrated by the expected reduction in CO<sub>2</sub> emissions varying from 0.8 to 14 million tonnes for the period 2001-2010, depending on which assumptions are used as a basis for the calculation.

If we assume that the energy result substitutes gas power production and that the energy results from the Renewable Heating, Commercial buildings, Public Buildings and Industry units are distributed between 40 per cent for fuel oil and 60 per cent for electricity, then the effect of the projects supported by Enova is estimated at an annual reduction of 5.3 million tonnes of CO<sub>2</sub>. If the energy result substitutes for a electricity production equivalent to a European mix, then the effect amounts to 7.8 million tonnes of CO<sub>2</sub>. The Norwegian emissions of greenhouse gases amounted to 50.8 million tonnes CO<sub>2</sub> equivalents in 2009<sup>16</sup>. The reduction in CO<sub>2</sub> emissions from the projects we have supported is thus assumed to be in the order of about 10 per cent of Norway's total emissions.

<sup>15</sup> The years refer to the year when a project is contracted, and does not indicate when the results of the project could be realized in the form of reduced fuel oil consumption. The estimated reduced fuel oil consumption is based on an efficiency rate of 85 per cent.

<sup>16</sup> Statistics Norway, emissions of greenhouse gases, <http://www.ssb.no/klimagassn/>

# Results and activities per market area

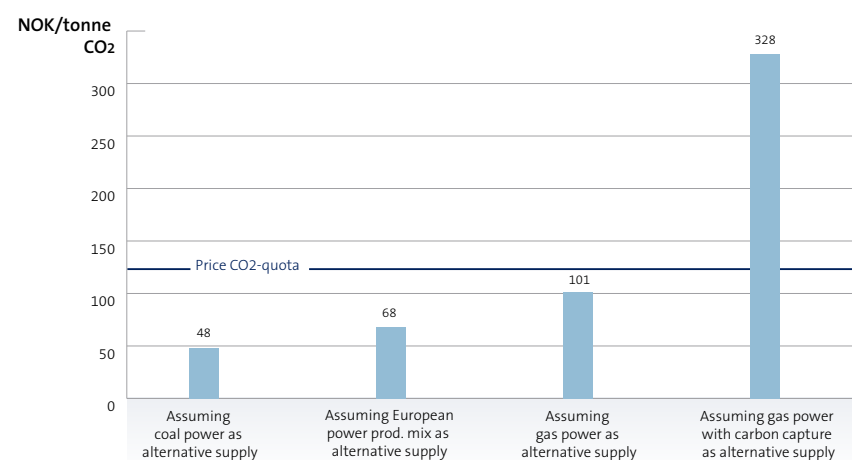
TABLE 7 CLIMATE EFFECT MEASURED IN CO<sub>2</sub> REDUCTION

Million tonnes of CO <sub>2</sub> per year	2010		2001–2010	
	40% fuel oil and 60% electricity	Electricity only	40% fuel oil and 60% electricity	Fuel oil only
Renewable power and reduced energy end-use replaces:				
Type of electricity:				
Coal power	1,8	14	11	6,5
European mix (NS-EN 15603:2008)	1,3	9,1	7,8	5,8
Natural gas power	0,9	5,4	5,3	5,2
Gas power with carbon capture	0,4	0,8	2,3	4,6

The table shows the reduction in annual emissions of CO<sub>2</sub> as a result of projects supported by Enova <sup>17</sup>

With basis in the average funding level for Enova's project portfolio and the estimated reduction of CO<sub>2</sub> emissions, the cost of measures is equivalent to NOK 101 per tonne of CO<sub>2</sub>, if we assume that the alternative power supply would be gas power without carbon capture. The costs of measures with other assumptions for alternative power supply are shown in Figure 21. In comparison, the 2010 CO<sub>2</sub>-quota price in the EU's Emissions Trading scheme was on average NOK 123 per tonne of CO<sub>2</sub> for emissions in December 2012.

FIGURE 21 COST OF MEASURES FOR REDUCED CO<sub>2</sub> EMISSIONS



The figure shows the costs of measures for reduced CO<sub>2</sub> emissions as a consequence of Enova's projects during the period 2001–2010 <sup>18</sup>

<sup>17</sup> The breakdown of 40 per cent fuel oil and 60 per cent electricity is based on the same distribution as in Table 5, but taking into account that other renewable energy sources are also used.

The years refer to the year when a project is contracted, and does not indicate when the results of the project could be realized in the form of reduced fuel oil consumption.

These calculations assume an emissions coefficient for gas power equal to 367 kg CO<sub>2</sub>/MWh. This is an average of oil-firing in the industry amounting to 331 kg CO<sub>2</sub>/MWh and 378 kg CO<sub>2</sub>/MWh from other sectors. The source is the Norwegian Petroleum Industry Association. Emissions from a European mix of power production are presumably equal to 617 kg CO<sub>2</sub>/MWh. The source is Standards Norway NS-EN 15603:2008.

<sup>18</sup> Source: Reuters EcoWin, average price level of CO<sub>2</sub> quotas (Dec. 2012), traded on the IntercontinentalExchange (ICE) in 2010.

Enova provides a wide range of programmes to private households, to public sector owners and managers and to industry and commerce. Our market units cooperate closely with stakeholders in the energy markets through financing, advising and communication activities. The market units administer a wide range of programmes, customised to the various market segments. Some programmes contract energy results, while other programmes provide support for planning and assessment work.

The Fund also finances nationwide information and advisory services that, in the short and long term, support and facilitate reaching the Fund's targets. Most work areas in Enova depend on market measures to achieve energy results. These are activities such as information and advertising through goal-oriented campaigns in the media, sales meetings, seminars, guideline materials and customer follow-up via telephone and the internet.

The Fund resources are also used to actively promote the innovation chain, through demonstration and introduction of technology for efficient energy solutions and environmentally friendly energy production. These will support the targets for energy restructuring in the long term.

The New Technology Unit, the Public Buildings Unit and the Residential Buildings Unit have established and report on activity targets in order to evaluate and emphasize results and responses from activities that do not yield direct energy results.

## The Renewable Heating Unit

### Energy results

TABLE 8 CONTRACTUAL ENERGY RESULTS AND FUNDS ALLOCATED WITHIN THE RENEWABLE HEATING UNIT

	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
Years	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	328	328	-	-
2002	166	173	49	49
2003	240	233	31	31
2004	207	141	71	63
2005	179	191	68	54
2006	551	562	288	248
2007	670	655	288	181
2008	782	782	409	175
2009	916	917	740	149
2010	926	926	544	16
<b>Total</b>	<b>4 964</b>	<b>4 907</b>	<b>2 489</b>	<b>967</b>



TABLE 9 RESULTS AND FUNDS DIVIDED AMONG THE PROGRAMMES WITHIN THE RENEWABLE HEATING UNIT<sup>19</sup>

Years	Heating		District Heating New Establishment		District Heating Infrastructure		Small Heating Plants		Conversion		Biogas Production		Total	
	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK
2002	173	49	-	-	-	-	-	-	-	-	-	-	173	49
2003	233	31	-	-	-	-	-	-	-	-	-	-	233	31
2004	141	71	-	-	-	-	-	-	-	-	-	-	141	71
2005	191	68	-	-	-	-	-	-	-	-	-	-	191	68
2006	562	288	-	-	-	-	-	-	-	-	-	-	562	288
2007	655	288	-	-	-	-	-	-	-	-	-	-	655	288
2008	-	-	519	261	206	120	57	28	-	-	-	-	782	409
2009	-	2	383	268	415	255	66	64	28	136	25	15	917	740
2010	-	-	560	304	131	88	71	57	-	-	163	95	926	544
<b>Total</b>	<b>1 954</b>	<b>797</b>	<b>1 462</b>	<b>833</b>	<b>753</b>	<b>463</b>	<b>194</b>	<b>149</b>	<b>28</b>	<b>136</b>	<b>187</b>	<b>110</b>	<b>4 579</b>	<b>2 489</b>

TABLE 10 CONTRACTUAL ENERGY RESULTS WITHIN DISTRICT HEATING AND TOTAL DEVELOPED DISTRICT HEATING CAPACITY<sup>20</sup>

Years	Energy result (renewable heating delivery)	Total installed capacity
	GWh	GWh
2002	151	188
2004	113	129
2005	170	299
2006	505	674
2007	343	398
2008	725	869
2009	798	1 010
2010	692	795
<b>Total</b>	<b>3 684</b>	<b>4 551</b>

<sup>19</sup> The Renewable Heating Unit changed its programme structure in 2008, dividing one general programme into several more specific programmes. Starting in 2008, the results are divided among these programmes. The programme "Conversion of Heating Systems in Buildings" was specifically established and carried out with funds from the Government Stimulus Package in 2009. The table does not include NVE projects from 2001.

<sup>20</sup> Under the agreement with the Ministry of Petroleum and Energy (MPE) regarding management of the resources from the Energy Fund, as regards district heating projects, both the total developed district heating capacity along with the delivered renewable heating shall be reported. In our energy result we only report the renewable heating delivered. However, we do not have figures for total capacity for some of the older projects. For these, the total energy result has been set equal to the renewable energy result.

TABLE 11 ENERGY RESULTS AND FUNDS ALLOCATED TO BIOFUEL PROCESSING

Years	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	-	-	-	-
2002	-	-	-	-
2003	151	154	3	3
2004	255	255	14	14
2005	162	162	6	6
2006	100	100	4	4
2007	163	167	5	5
2008	60	67	3	3
2009	-	-	2	2
2010	-	-	-	-
<b>Total</b>	<b>891</b>	<b>906</b>	<b>38</b>	<b>37</b>

### The Renewable Power Production Unit Energy results

TABLE 12 CONTRACTUAL ENERGY RESULTS AND FUNDS ALLOCATED WITHIN THE RENEWABLE POWER PRODUCTION UNIT

Years	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	120	120	-	-
2002	80	80	35	35
2003	124	127	27	27
2004	454	441	186	186
2005	337	334	137	137
2006	-	-	-	-
2007	-	-	-	-
2008	50	50	93	72
2009	453	453	1 068	167
2010	491	491	978	12
<b>Total</b>	<b>2 108</b>	<b>2 095</b>	<b>2 524</b>	<b>637</b>

## The Industry Unit

### Energy results

TABLE 13 CONTRACTUAL ENERGY RESULTS AND FUNDS ALLOCATED WITHIN THE INDUSTRY UNIT

	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
Years	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	300	300	-	-
2002	177	157	20	20
2003	104	136	16	16
2004	343	359	56	54
2005	262	269	39	30
2006	643	647	128	81
2007	699	698	171	76
2008	438	437	114	22
2009	1 029	1 029	499	38
2010	665	665	298	9
<b>Total</b>	<b>4 659</b>	<b>4 697</b>	<b>1 342</b>	<b>346</b>

## The New Technology Unit

### Energy results

TABLE 14 CONTRACTUAL ENERGY RESULTS AND FUNDS ALLOCATED WITHIN THE NEW TECHNOLOGY UNIT

	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
Years	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	28	28	-	-
2002	1	1	19	19
2003	-	-	-	-
2004	35	-	9	8
2005	1	-	2	2
2006	7	8	7	6
2007	5	4	71	59
2008	3	2	16	9
2009	32	32	90	35
2010	47	47	201	-
<b>Total</b>	<b>159</b>	<b>122</b>	<b>415</b>	<b>138</b>

### Activity goals

The New Technology Unit had two main activity goals for 2010 related to knowledge enhancement and advising, and programme implementation, respectively.

Enhancing knowledge, advising and information were defined as important activities in communicating the opportunities represented by introduction of new technology. Activities planned for 2010 that have been implemented are:

- *Active information and knowledge enhancement through joint meeting places.*

Enova helped organize the 2010 Energy Week, and arranged a separate wave and tidal seminar in Trondheim in cooperation with Innovation Norway. In addition, Enova organized an investor seminar for energy technology in Oslo in cooperation with Statkraft, Investinor and Cleantech Scandinavia.

- *Knowledge communication.* We carried out a study of the potential for liquid biofuel in cooperation with *Transnova*. The report has been published on Enova's website. Articles were published on selected implemented demonstration projects. A study of the potential of geothermal energy has started, and the results from this work will be submitted in 2011.

During the implementation of the programmes, the goal was to support ten projects within a framework of MNOK 250. Five projects were supported, with MNOK 201 in overall support. There was considerable uncertainty related to the goal for 2010, as access to private capital for demonstration projects was identified as a considerable barrier for such projects at the beginning of the year.

TABLE 15 ACTIVITY GOALS AND GOAL ACHIEVEMENT WITHIN THE NEW TECHNOLOGY UNIT

Activity	Performance indicator	2010		
		Activity goal	Result	Comment to deviation
Knowledge enhancement and advising	Number of events	2	3	An extra event was added after the plan for 2010 had been established.
Programme implementation	Number of new projects	10	5	Expected high uncertainty connected to goal. In 2010, it was challenging to find private financing for demonstration projects, which resulted in fewer applications and fewer new projects compared with 2009.

## The Commercial Buildings Unit

### Energy results

TABLE 16 CONTRACTUAL ENERGY RESULTS AND FUNDS ALLOCATED WITHIN THE COMMERCIAL BUILDINGS UNIT<sup>21</sup>

	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
Years	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	44	44	-	-
2002	139	150	58	56
2003	257	290	66	63
2004	254	264	72	61
2005	540	536	119	98
2006	354	369	105	75
2007	203	203	75	37
2008	380	380	143	51
2009	302	303	535	351
2010	214	214	128	1
<b>Total</b>	<b>2 688</b>	<b>2 754</b>	<b>1 300</b>	<b>792</b>

## The Public Buildings Unit

### Energy results

TABLE 17 CONTRACTUAL ENERGY RESULTS AND FUNDS ALLOCATED WITHIN THE PUBLIC BUILDINGS UNIT<sup>22</sup>

	Contractual energy result	Contractual energy result, corrected for final reported	Allocated	Disbursed
Years	GWh	GWh	MNOK	MNOK
Transfer from NVE (2001)	-	-	-	-
2002	-	-	-	-
2003	-	-	-	-
2004	-	-	-	-
2005	-	-	2	2
2006	-	-	6	5
2007	-	-	6	5
2008	-	-	16	11
2009	-	-	22	9
2010	41	41	52	1
<b>Total</b>	<b>41</b>	<b>41</b>	<b>103</b>	<b>32</b>

<sup>21</sup> The Energy Efficiency Department was re-organized in 2010. The unit previously called the Built Environment was divided into Commercial Buildings and Public Buildings. At the same time, the activities and programmes for municipalities was organized under the Public Buildings Unit. The results for all projects within the Built Environment up to and including 2009 are reported under the Commercial Buildings Unit.

<sup>22</sup> The Public Buildings Unit was established in 2010. Results within the building sector up to and including 2009 are reported under the Commercial Buildings Unit. This is the reason why the Public Buildings Unit has no recorded energy results prior to 2010. Allocated funds before 2010 are funds allocated within the earlier Municipality market area for planning and pre-project support. However, these projects have no quantifiable energy results.

### Activity goals

The Municipality market area that was merged into the Public Buildings Unit in 2010, has carried out comprehensive information work within municipal energy and climate planning for several years. The effect has been measured through the inflow of applications for planning support and final reports. It has been a goal that all municipalities should have started the process of developing an energy and climate plan by 1 July 2010, when Government planning guidelines required all municipalities to prepare energy and climate plans. The response has been very good. See [www.klimakommune.enova.no](http://www.klimakommune.enova.no) for the status of the various municipalities' plans.

TABLE 18 ACTIVITY GOALS AND GOAL ACHIEVEMENT WITHIN THE PUBLIC BUILDINGS UNIT

Activity	Performance indicator	2009		2010		Comment to deviation
		Activity goal	Result	Activity goal	Result	
Energy and climate plan	Percentage of municipalities that have applied to Enova for planning support	80 %	75 %	100 %	99,5 %	When the support programme was terminated on 1 July 2010, all Norwegian municipalities but two had applied for support

## The Residential Buildings Unit

Enova provides nationwide information and advising services. These programmes and activities are primarily organized under the Residential Buildings Unit. The programme consists of a nationwide answering service, available information and advice on the internet and our presence at the nationwide home improvement exhibition *Gjør Din Bolig Bedre (Improve Your Home)*. In addition, the unit administers a subsidy programme for households and is responsible for work related to shaping attitudes in children and young people.

Since 2006, Enova has managed a subsidy programme for alternative heating and saving electricity in households. Funds for the household subsidy programme are allocated directly in the fiscal budget and therefore do not belong in the Energy Fund. The programme is an important strategic policy instrument to develop markets for future heating solutions.

### Activity goals

The tables show activity goals and results in 2009–2010 for selected activities in the Residential Buildings Unit. Comments are provided for deviations from 2010 goals.

TABLE 19 ACTIVITY GOALS AND GOAL ACHIEVEMENT WITHIN THE RESIDENTIAL BUILDINGS UNIT<sup>23</sup>

Activity	Performance indicator	2009		2010		Comment to deviation
		Activity goal	Result	Activity goal	Result	
Ask Enova + 47 800 49 003	Number of inquiries	40 000	31 486	35 000	41 231	Multiple campaigns and a high interest in Enova's policy instruments in the media helped to exceed the goal.
Enova stand at building exhibitions	Number of visitors	200 000	186 584	200 000	100 516	Low result achievement as a result of participation with stands only in the first six months due to trying out alternative exhibition activities
Enova At Home	Number of page views	800 000	884 899	800 000	964 262	Multiple campaigns in the media and on the internet helped to exceed goals
Enova Recommends	Number of page views		246 006	300 000	677 896	Multiple campaigns in the media with good timing and response, not only met but doubled the target for the year. The <i>Norway's Coldest House</i> campaign provided a considerable contribution
Enova Rainmakers	Number of page views		441 690	600 000	536 746	Target figure not achieved, even with advertising efforts since 2009. Still, the number of page views is more than 20 per cent higher than last year's result.
<b>Total number of contact points</b>			<b>1 790 665</b>	<b>1 935 000</b>	<b>2 320 651</b>	

TABLE 20 ACTIVITY GOALS AND GOAL ACHIEVEMENT WITHIN THE RESIDENTIAL BUILDINGS UNIT (FINANCED OUTSIDE THE ENERGY FUND)

Activity	Performance indicator	2009		2010		Comment to deviation
		Activity goal	Result	Activity goal	Result	
Enova Supports (the household subsidy programme)	Number of received applications		7 960	8 500	9 209	The cold period and attention towards energy efficiency in the media gave an increase in number of applications
Enova Supports (the household subsidy programme)	Number of disbursed subsidies	n/a	3 637	3 400	3 168	The percentage of disbursed subsidies is lower than the target figure, which is assumed to be connected with the decline in the building and rehabilitation, modification and addition market in 2009 and 2010

<sup>23</sup> The number of Ask Enova inquiries refers with this to the number of inquiries connected to the Residential Buildings Unit.

<sup>24</sup> The number of campaigns from 2006 to 2008 only applies to the Residential Buildings Unit.

## Activities

TABLE 21 ACTIVITIES WITHIN THE RESIDENTIAL BUILDINGS UNIT<sup>24</sup>

	2003	2004	2005	2006	2007	2008	2009	2010	Comments 2010
Distributed material, number	n/a	124 000	137 156	262 000	218 410	149 026	107 383	106 741	Does not include <i>sfære</i> , which is published twice a year with 430 000 copies
Visitors at trade fairs	40 000	250 000	250 000	160 000	50 000	170 374	150 080	100 516	Low result achievement as a result of participation only in the first six months due to a desire to consider and try out alternative exhibition activities.
Page views per day, enova.no/hjemme	n/a	n/a	n/a	n/a	1 260	2 489	2 425	2 642	Multiple campaigns in the media and on the internet yielded excellent results
Campaigns	3	4	4	2	2	2	4	4	Two campaigns in Enova Recommends, one campaign regarding <i>Enova Supports</i> and one campaign in <i>Enova At Home</i>
No. of schoolchildren at the Rainmakers' annual Energy Friends Day	n/a	4 000 Oslo	4 000 Trondheim	4 500 Bergen	3 500 Kristian-sand	5 500 Stavanger	6 000 Fredrikstad	5 700 Hamar	Expected participation is evaluated based on number of pupils in the hosting town. The results depend on the schools signing up their students. The percentage of participants is very good
Audience ratings per broadcast of the Energy Challenge	250 000– 350 000	340 000– 560 000	270 000– 330 000	263 000– 413 300	329 000– 492 000	279 000– 472 000	343 000– 528 000	156 000– 259 000	Low audience ratings due to the Energy Challenge only being shown on NRK Super and not on the main channel NRK 1 as originally planned. The ratings from NRK Super by themselves are very good

TABLE 22 ACTIVITIES WITHIN THE RESIDENTIAL BUILDINGS UNIT (FINANCED OUTSIDE THE ENERGY FUND)

	2003	2004	2005	2006	2007	2008	2009	2010	Comments 2010
No. of applications to Enova Supports, the household subsidy programme	n/a	n/a	n/a	15 238	5 956	8 684	7 960	9 209	The cold period and attention towards energy efficiency in the media is the cause of the increased number of applications
No. of subsidies disbursed under the household subsidy programme	n/a	n/a	n/a	-	4 692	3 317	3 637	3 168	The number of disbursed subsidies is somewhat lower than expected, which is assumed to be connected to the decline in the building and rehabilitation market in 2009 and 2010



## Communication and Public Affairs Activities

TABLE 23 ACTIVITIES WITHIN COMMUNICATION AND PUBLIC AFFAIRS<sup>25</sup>

	2003	2004	2005	2006	2007	2008	2009	2010
Articles about Enova	n/a	675	657	2463	2971	2815	5870	4587
Campaigns	3	4	4	4	4	3	6	5
Ask Enova inquiries	55 500	35 000	22 000	33 000	26 635	28 578	38 460	48 681
Press releases	n/a	n/a	23	26	23	27	71	45

## International activities

TABLE 24 APPROVED APPLICATIONS REGARDING PRE-PROJECT SUPPORT WITHIN INTELLIGENT ENERGY EUROPE (IEE)

Programme	Project name	Applicant	Allocated
			NOK
ALTENER	Proposal Zebra (Zero emission buildings regarding renewable (Energy) applications)	KanEnergi AS	200 000
SAVE	Euro-TopTen III	Norges Naturvernforbund (Friends of the Earth Norway)	30 000
Integrated initiatives	EnExchange – Capacity building between experienced local authorities and learning local authorities	New Energy Performance AS (NEPAS)	40 000
Integrated initiatives	SEC-BENCH II (resubmission) – Preparation of Large Scale Roll-Out of Municipal Benchmarking)	New Energy Performance AS (NEPAS)	150 000
SAVE	Developing Nordic expertise: Practical knowledge of energy efficiency in planning and operating of municipal buildings	Regional Council in Sør-Østerdal	60 000
Integrated initiatives	10/468 – Involving Citizens in Local Sustainable Energy Projects	Stavanger Municipality	150 000

TABLE 25 APPROVED APPLICATIONS REGARDING PRE-PROJECT SUPPORT WITHIN IEE (FINANCED OUTSIDE THE ENERGY FUND)

Programme	Project name	Applicant	Allocated
			NOK
ALTENER	HYDROHOPE PLATFORM – to tackle barriers for the development of the EU hydropower sector (tentative)	Samnanger Municipality	350 000

TABLE 26 APPROVED APPLICATIONS REGARDING NATIONAL CO-FUNDING WITHIN INTELLIGENT ENERGY EUROPE (IEE)

Programme	Project name	Applicant	Allocated
			NOK
SAVE	Energy efficiency in greenhouses	SMI Energi & Miljø AS	355 000
SAVE	Re-Commissioning – Raising Energy Performance in Existing Non-Residential Buildings	Norsk Enøk og Energi AS	400 000
Integrated initiatives	Involving Citizens in Local Sustainable Energy Projects	Stavanger Municipality	711 600
SAVE	Euro-TopTen III	Norges Naturvernforbund (Friends of the Earth Norway)	222 580
ALTENER	Proposal Zebra (Zero emission buildings regarding renewable (Energy) applications)	KanEnergi AS	297 250
Integrated initiatives	SEC-BENCH II – Preparation for Large Scale Roll-Out of Municipal Benchmarking	New Energy Performance AS (NEPAS)	700 000

TABLE 27 APPROVED APPLICATIONS REGARDING NATIONAL CO-FUNDING WITHIN IEE (FINANCED OUTSIDE THE ENERGY FUND)

Programme	Prosjektnavn	Applicant	Allocated
			NOK
ALTENER	HYDROHOPE PLATFORM – to tackle barriers for the development of the EU hydropower sector (tentative)	Samnanger Municipality	350 000

## Natural Gas

TABLE 28 CONTRACTUAL ENERGY RESULTS AND ALLOCATED FUNDS WITHIN NATURAL GAS INFRASTRUCTURE (FINANCED OUTSIDE THE ENERGY FUND)

År	Capacity	Contractual	Allocated
	GWh	GWh	MNOK
2004	685	405	29
2005	680	545	24
2006	400	175	10
2007	90	90	6
2008	1 500	1 200	36
2009	0	0	0
2010	9	8	1
<b>Total</b>	<b>3 364</b>	<b>2 423</b>	<b>106</b>

The table shows contractual energy results and funds<sup>26</sup> during the period 2004–2010 in the support programme for infrastructure for natural gas, as well as total capacity<sup>27</sup>. Funds for this programme are allocated via the fiscal budget, and thus are not part of the Energy Fund.

<sup>25</sup> The number of Ask Enova inquiries refers here to the total number of inquiries in 2010.

<sup>26</sup> Contractual energy results are the expected annual gas sales five years after start-up. The figures are corrected for cancellations and changes to the contract

<sup>27</sup> Capacity is the facility's normal technical capacity

# Projects supported in 2010

A complete overview of all projects supported in 2010 by the Energy Fund can be downloaded from Enova's website at [www.enova.no](http://www.enova.no).

FIGURE 22 CONTRACTUAL ENERGY RESULT AND COMMITMENT – BU COUNTY

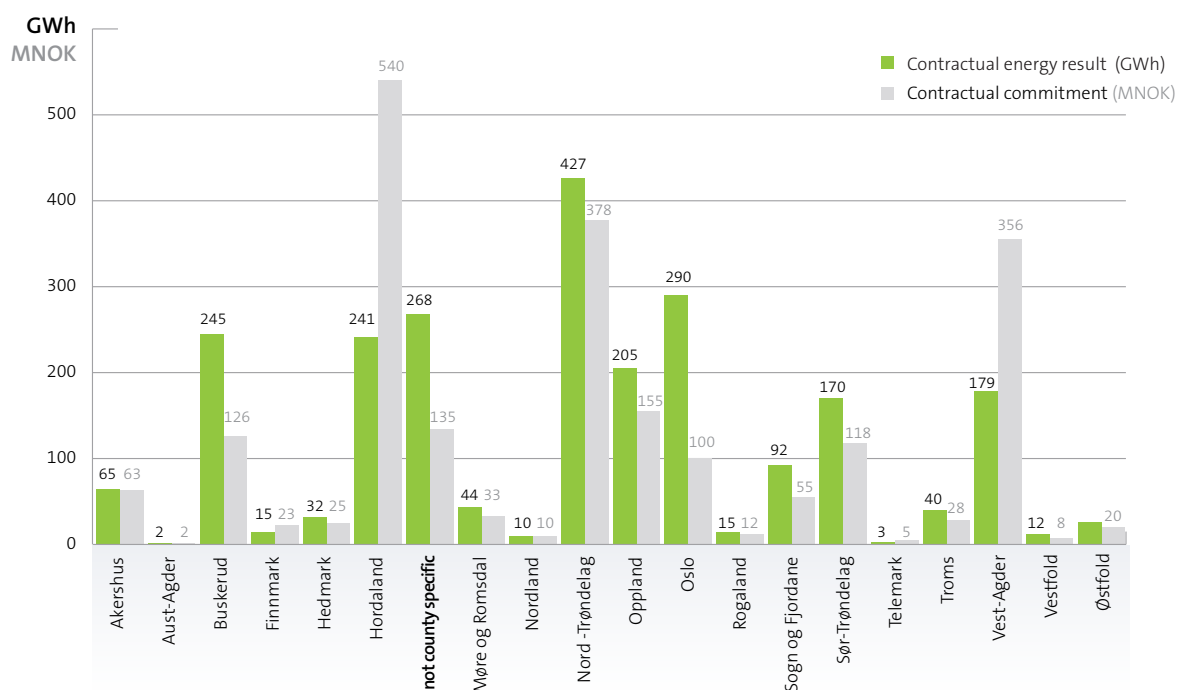


FIGURE 23 NUMBER OF PROJECTS SUPPORTED – BY COUNTY

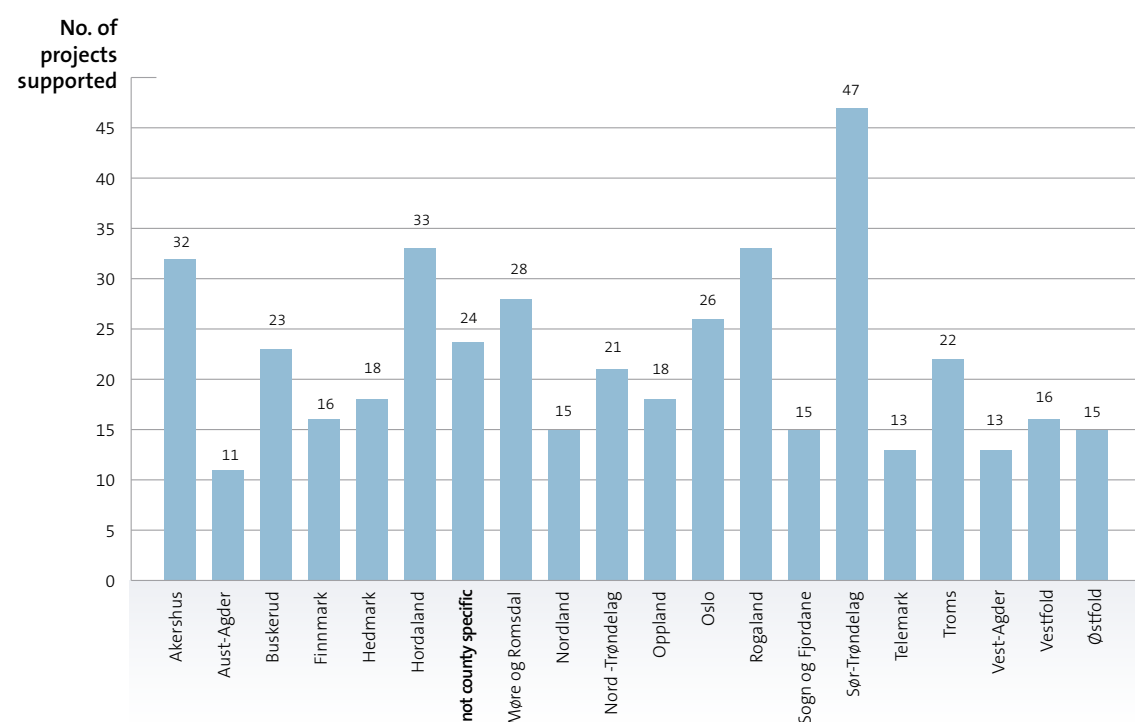


TABLE 29 TOP 10 IN 2010 – HIGHEST SUPPORT PER PROJECT

SID <sup>28</sup>	Market unit	Project description	Energy result	Allocated	Applicant
			KWh	NOK	
10/110	Renewable Power Production	Lista Wind Power Plant	206 600 000	<b>388 000 000</b>	Norsk Miljø Energi Sør AS
10/112	Renewable Power Production	Midtfjellet Wind Power Plant	165 800 000	<b>346 500 000</b>	Midtfjellet Vindkraft AS
10/108	Renewable Power Production	Ytre Vikna Wind Power Plant	110 100 000	<b>228 000 000</b>	Nord-Trøndelag Elektrisitetsverk Energi AS NTE
09/1744	New Technology	10 Megawatt Lightweight Offshore Wind Turbine	20 000 000	<b>137 200 000</b>	Sway AS
10/1002	Renewable Heating	Bioenergy project – Gjøvik	156 012 402	<b>126 969 000</b>	Eidsiva Bioenergi AS
10/531	Industry	Fiborgtangen Biopower	270 000 000	<b>120 000 000</b>	Fiborgtangen Vekst AS
10/995	Industry	Portfolio project for energy efficiency at Södra Cell Tofte AS	200 000 000	<b>100 000 000</b>	Södra Cell Tofte AS
09/1771	Renewable Heating	New wood chip-fired boiler at Haraldrud District Heating Plant	200 000 000	<b>40 000 000</b>	Hafslund Fjernvarme AS
10/982	Renewable Heating	Biopower – AGA cooperation, biogas production based on marine category 2 biomass: Biogas production	75 000 000	<b>37 440 000</b>	Biokraft AS
10/313	Renewable Heating	Production of biogas from waste, City of Oslo: Biogas production	51 500 000	<b>35 000 000</b>	Oslo municipality Energy Recovery Agency

TABLE 30 TOP 10 IN 2010 – HIGHEST ENERGY RESULT PER PROJECT

SID	Market unit	Project description	Energy result	Allocated	Applicant
			KWh	NOK	
10/531	Industry	Fiborgtangen Biopower	<b>270 000 000</b>	120 000 000	Fiborgtangen Vekst AS
10/110	Renewable Power Production	Lista Wind Power Plant	<b>206 600 000</b>	388 000 000	Norsk Miljø Energi Sør AS
10/995	Industry	Portfolio project for energy efficiency at Södra Cell Tofte AS	<b>200 000 000</b>	100 000 000	Södra Cell Tofte AS
09/1771	Renewable Heating	New wood chip-fired boiler Haraldrud District Heating Plant	<b>200 000 000</b>	40 000 000	Hafslund Fjernvarme AS
10/112	Renewable Power Production	Midtfjellet Wind Power Plant	<b>165 800 000</b>	346 500 000	Midtfjellet Vindkraft AS
10/1002	Renewable Heating	Bioenergy project - Gjøvik	<b>156 012 402</b>	126 969 000	Eidsiva Bioenergi AS
10/108	Renewable Power Production	Ytre Vikna Wind Power Plant	<b>110 100 000</b>	228 000 000	Nord-Trøndelag Elektrisitetsverk Energi AS NTE
10/982	Renewable Heating	Biopower - AGA cooperation, biogas production based on marine category 2 biomass: Biogas production	<b>75 000 000</b>	37 440 000	Biokraft AS
10/313	Renewable Heating	Production of biogas from waste, City of Oslo: Biogas production	<b>51 500 000</b>	35 000 000	Oslo municipality Energy Recovery Agency
09/1805	Renewable Heating	Ulvesund Combined Heat and Power Plant and District Heating System	<b>48 760 000</b>	28 000 000	Fjord Miljøenergi AS

<sup>28</sup> SID (Case ID No.) is a unique identification number which is assigned to each individual application that is submitted to Enova.

# Submitted viewpoints on hearings

## Consultation submissions have been issued by Enova in the following areas:

The MPE's proposal for changes in the energy regulations, and regulations stipulated in pursuance of the energy regulations

The Ministry of the Environment's consultation regarding Climate Cure 2020 (Klimakur 2020)

Ministry of Local Government and Regional Development's proposal for adjustment in new building matter section in the Planning and Building Act

Econ Pöyry's report 2010-017 – Adjustment of district heating prices

The Norwegian Board of Technology's proposal for establishment of a Norwegian carbon fund

The Ministry of Government Administration, Reform and Church Affairs' consultation regarding the SGEI package from 2005 (proposal for state aid requirements for services of general economic interest)

# Publications

## Reports, studies and other publications, published by Enova in 2010:

Enova's industrial activities and results from 2009  
**Enova (2010)**

Enova's Results and Activities Report 2009  
(Annual Report 2009)  
- In Norwegian and English  
**Enova (2010)**

Costs of district heating development. Status 2010  
**Bioen AS for Enova and Norsk Fjernvarme (2010)**

A functioning pellet market – principal analysis  
**Xrgia for Enova (2010)**

Market report: The pellet market in Central Norway  
**Xrgia for Enova (2010)**

Costs of installing central heating  
**Prognosesenteret for Enova (2010)**

Study of the potential for liquid biofuel  
**Econ Pöyry for Enova and Transnova (2010)**

Evaluation of the subsidy programme for electricity saving in households  
**Rambøll for Enova (2010)**

Subsidy programme for electricity saving in households  
**Evaluation 2006–2009, Fact section and calculated energy result  
Enova (2010)**

Guide: Enova's household subsidy programme  
**Enova (2010)**

Guide: Building houses of the future  
**Enova (2010)**

The *sfære* magazine, Nos. 1 and 2  
**Enova (2010)**



# Definitions and terminology

## Contractual energy result

Allocated support in projects is linked to an expected energy result. This energy result is part of the contractual basis between support recipient and Enova. If the result is not achieved, it will result in a proportional reduction of the support amount. The contractual energy result is the expected final energy result at the time of contract.

## Cost effectiveness

One of the objectives when establishing Enova was to achieve a more cost-efficient effort in renewable energy and 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. The projects applying for support from Enova are evaluated in three steps. First, the technical energy content of the project 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.

## The Energy Fund

Support for the promotion of environmentally friendly restructuring of energy end-use and production in the form of increased production from renewable energy sources, increased access to thermal energy and reduced energy end-use, is financed by the Norwegian Energy Fund. Financing for the Energy Fund includes a surcharge on the grid tariff for using power from the distribution grid. Since 1 July 2004, this surcharge has been 0.01 NOK/kWh, and in 2010 this amounted to a total of approx. MNOK 788. In addition, beginning in 2008 the Energy Fund has been supplemented from the yield from the Basic Fund for renewable energy and energy efficiency. The Basic Fund received NOK 10 billion in fund capital in the fiscal budget for 2007. The fund capital has since been increased through new appropriations in the fiscal budget, and is now NOK 25 billion. The objectives which have been set for Enova are based on the assumption that the Basic Fund will be further supplemented by NOK 5 billion in 2012. In 2010, the Energy Fund was supplemented with the yield from the Basic Fund in an amount totaling MNOK 755. The Energy Fund also receives resources through appropriations in the fiscal budget, interest income and commitments.

The background for the Energy Fund is the Act relating to the amendment of the Act of 29 June 1990, No. 60 relating to production, conversion, transmission and trading, distribution and use of energy, etc. (the Energy Act), Section 4-4, cf. Odelsting Proposition No. 35 (2000–2001) and Recommendation to the Odelsting No. 59 (2000–2001). In

2006, the Ministry of Petroleum and Energy (MPE) conducted an evaluation of Enova SF and the Energy Fund, presented to the Storting in Storting Proposition No. 69 (2006–2007). This is part of the basis for the current agreement with the MPE for the period 1 June 2008 – 31 December 2011. The Ministry of Petroleum and Energy (MPE) determines the by-laws for the Energy Fund.

## Energy restructuring

The contract between the Ministry of Petroleum and Energy (MPE) and Enova, stipulates that the Energy Fund will be used to promote an environmentally friendly restructuring of energy end-use and energy production. 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 emissions of greenhouse gases.

## Energy results

One of the Energy Fund's main goals is to contribute to energy results, whether through reduced energy end-use or through increased environmentally friendly production of energy. This is an important aspect of Enova's agreement with the MPE. In this agreement, two different terms are used to describe energy results, contractual and realized, respectively.

## ESA

EFTA's monitoring organisation (EFTA Surveillance Authority) enforces the state support 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 with energy results submit a final report upon the project's conclusion. The final reported energy result is an updated forecast of realized results at the project's conclusion. Enova assesses whether the project's reported energy result is reasonable.

## Indicator

An indicator is used to quantify something that is difficult to measure directly. In an energy efficiency context, intensities that relate energy use to a volume that drives the energy demand, for example kWh per m<sup>2</sup>, kWh per refrigerator per year, kWh per tonne steel produced, etc. are often used. Other types of indicators could be market shares for new energy-efficient solutions, the percentage renewable energy, etc.

## 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 is also expressed over the lifetime (NOK/(year\*kWh)).

## Other renewable energy

For the purposes of this publication, other renewable energy means renewable energy that is not wind power or renewable heating.

## Passive buildings

Passive buildings are buildings which require very little energy for heating. This is achieved by reducing heat loss from the building to a minimum. Passive buildings are well-insulated, have minimal thermal bridges and air leakage and have good heat recovery from ventilation air. There are also requirements for energy-efficient equipment and the use of renewable energy to heat passive buildings. The term "passive building" was first introduced by the Passive Building Institute in Germany, which has a certification scheme for building products and buildings. Passive buildings have become widespread in Germany, Austria and gradually also in a number of other European countries. There is a Norwegian standard for passive buildings, adapted to Norwegian climatic conditions and building methods. A similar standard for commercial buildings is underway.

## 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 organisation has been chosen to focus the use of policy instruments.

## Programme coordinator

Enova outsources some of the initial processing to free up internal capacity and ensure fast processing. The external processors are called Enova's programme coordinators.

## Realized result

Measurement or estimate of achieved energy result after a measure has been implemented and the effect of the measure can be observed. In contrast to contractual and final reported energy results, the realized energy result is based on observations, rather than expectations. The realized energy result is based on a review/audit of energy results actually achieved by the project. In practice, it can be challenging to quantify realized results, and the challenges may vary for energy production and energy end-use. It also takes time from when the measures are implemented until realized results can be reported.

## Renewable energy


Enova uses the same definition of renewable energy used in the European Union's (EU's) Renewables Directive (2001/77/EC). In the directive, renewable energy is defined as renewable, not fossil energy sources (wind, solar, geothermal energy, tidal energy, hydropower, biomass, gas from landfills, 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.

## Ripple effects

While contractual energy result is the direct effect of support provided by Enova, the ripple effects are the indirect effects of the support. Ripple effects can fall into many different categories. Examples include more profitable investments as a consequence of the initial investment, market changes in the form of reduced costs, etc.

## 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 realizing projects that would not have been realized 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.



Enova will initiate and promote an environmentally friendly restructuring of energy end-use and energy production in Norway. Our goal is to make it easier for households, industry and commerce and the public sector to select energy-efficient and climate-friendly solutions. Enova is owned by the Ministry of Petroleum and Energy.

For more information on Enova, see:

**[www.Enova.no](http://www.Enova.no)**

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